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- STORMW ATER DIVISION; WERE SCANNED IN THE REGULAR COURSE OF BUSINESS PURSUANT TO GUIDELINES ESTABLISHED BY THE LIBRARY OF VIRGINIA AND ARCHIVES; AND HA VE BEEN VERIFIED IN THE CUSTODY OF THE INDIVIDUAL LISTED BELOW.

BMPNUMBER: **PC185**

DATE VERIFIED: **June 17, 2016**

QUALITY ASSURANCE TECHNICIAN: **Charles E. Lovett II**

LOCATION: WILLIAMSBURG, VIRGINIA

Stormwater Division

MEMORANDUM

DATE: March 9, 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: PC185

PIN: 3240100026C

Subdivision, Tract, Business or Owner Name (if known): Williamsburg Plantation

Property Description: Timeshare

Site Address: 4870 Longhill Road

(For Internal use only) **Box** 7 **Drawer:** 4

Agreements: (in file as of scan date) **Y** **Book or Doc#:** 020021018 **Page:**

010004388

135 491

523 36

Comments

Two Inspection Maint. Agreements in file - Williamsburg Plantation Section 7 units 134-161; Section 8 units 162-183 AND Williamsburg Planation Coach House Road Extension

File

COPY

COUNTY OF JAMES CITY, VIRGINIA

DECLARATION OF COVENANTS

INSPECTION/MAINTENANCE OF DRAINAGE SYSTEM

THIS DECLARATION, made this 26 day of AUGUST, 2002, between WILLIAMSBURG PLANTATION, INC., and all successors in interest, ("COVENANTOR(S),") owner(s) of the following property: WILLIAMSBURG PLANTATION, project name, SECTION 7: UNITS 134-161 AND SECTION 8: UNITS 162-183, Document No._____, Deed Book 523, Page No. 36; Instrument No. _____, and the County of James City, Virginia ("COUNTY.")

WITNESSETH:

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

1. The COVENANTOR(S) shall provide maintenance for the drainage system including any runoff control facilities, conveyance systems and associated easements, hereinafter referred to as the "SYSTEM," located on and serving the above-described property to ensure that the SYSTEM is and remains in proper working condition in accordance with approved design standards, and with the law and applicable executive regulations. The SYSTEM shall not include any elements located within any Virginia Department of Transportation rights-of-way.

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

3. The COVENANTOR(S) shall provide and maintain perpetual access from public right-of-ways to the SYSTEM for the COUNTY, its agent and its contractor.

4. The COVENANTOR(S) shall grant the COUNTY, its agent and its contractor a right of entry to the SYSTEM for the purpose of inspecting, operating, installing, constructing, reconstructing, maintaining or repairing the SYSTEM.

5. If, after reasonable notice by the COUNTY, the COVENANTOR(S) shall fail to maintain the SYSTEM in accordance with the approved design standards and with the law and applicable executive regulations, the COUNTY may perform all necessary repair or maintenance work, and the COUNTY may assess the COVENANTOR(S) and/or all property served by the SYSTEM for the cost of the work and any applicable penalties.

Instrument # 020021018
Recorded Sept. 13, 2002

6. The COVENANTOR(S) shall indemnify and save the COUNTY harmless from any and all claims for damages to persons or property arising from the installation, construction, maintenance, repair, operation or use of the SYSTEM.

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

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

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

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

COVENANTOR(S)

Print Name/Title J.P. OTTINO, III
VICE PRESIDENT
WILLIAMSBURG PLANTATION, INC

ATTEST:

Tammy L Archard
TAMMY L. ARCHARD

COVENANTOR(S)

_____

Print Name/Title _____

ATTEST:

_____

STATE OF FLORIDA
~~COMMONWEALTH OF VIRGINIA~~
CITY/COUNTY OF BROWARD

I hereby certify that on this 26 day of August, 2002, before the subscribed, a Notary Public of the State of ~~Virginia~~ Florida, and for the City/County of Broward, aforesaid personally appeared J.P. Ottino III and did acknowledge the aforegoing instrument to be their Act.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal this 26 day of August, 2002.

Tammy L. Archard
Commission # DD 068537
Expires Oct. 30, 2005
Bonded Thru
Atlantic Bonding Co., Inc.

Tammy L Archard
Notary Public TAMMY L. ARCHARD

My Commission expires: _____

Approved as to form:

Asst. County Attorney

This Declaration of Covenants prepared by:

CHARLES RECORDS
AES CONSULTING ENGINEERS
(Print Name)

PROJECT ENGINEER
(Title)

5248 OLDE TOWNE ROAD, SUITE #1
(Address)

WILLIAMSBURG VA 23188
(City) (State) (Zip)

drainage.pre

DECLARATION OF COVENANTS

COPY

INSPECTION/MAINTENANCE OF DRAINAGE SYSTEM

THIS DECLARATION, made this 9th day of March, ~~19~~ 2001, between WILLIAMSBURG PLANTATION, INC, and all successors in interest, hereinafter referred to as the "COVENANTOR(S)," owner(s) of the following property: WILLIAMSBURG PLANTATION, COACH HOUSE ROAD EXTENSION Deed Book 135, Page No. 491 or Instrument No. _____, and James City County, Virginia, hereinafter referred to as the "COUNTY."

WITNESSETH:

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

1. The COVENANTOR(S) shall provide maintenance for the drainage system including any runoff control facilities, conveyance systems and associated easements, hereinafter referred to as the "SYSTEM," located on and serving the above-described property to ensure that the SYSTEM is and remains in proper working condition in accordance with approved design standards, and with the law and applicable executive regulations. The SYSTEM shall not include any elements located within any Virginia Department of Transportation rights-of-way.

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

3. The COVENANTOR(S) shall provide and maintain perpetual access from public right-of-ways to the SYSTEM for the COUNTY, its agent and its contractor.

4. The COVENANTOR(S) shall grant the COUNTY, its agent and its contractor a right of entry to the SYSTEM for the purpose of inspecting, operating, installing, constructing, reconstructing, maintaining or repairing the SYSTEM.

5. If, after reasonable notice by the COUNTY, the COVENANTOR(S) shall fail to maintain the SYSTEM in accordance with the approved design standards and with the law and applicable executive regulations, the COUNTY may perform all necessary repair or maintenance work, and the COUNTY may assess the COVENANTOR(S) and/or all property served by the SYSTEM for the cost of the work and any applicable penalties.

6. The COVENANTOR(S) shall indemnify and save the COUNTY harmless from any and all claims for damages to persons or property arising from the installation, construction, maintenance, repair, operation or use of the SYSTEM.

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

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

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

Instrument # 010004388
Recorded on March 14, 2001

IN WITNESS WHEREOF, the COVENANTOR(S) have executed this DECLARATION OF COVENANTS as of this 9th day of March, ~~19~~ 2001

COVENANTOR(S)

Print Name/Title J.P. OTTINO, III
VICE PRESIDENT
WILLIAMSBURG PLANTATION, INC.

ATTEST:

COVENANTOR(S)

Print Name/Title

ATTEST:

COMMONWEALTH OF VIRGINIA
CITY/COUNTY OF James City

I hereby certify that on this 9th day of March, ~~19~~ 2001, before the subscribed, a Notary Public of the State of Virginia, and for the City/County of James City, aforesaid personally appeared J. P. OTTINO, III and did acknowledge the aforegoing instrument to be their Act.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal this 9th day of March, ~~19~~ 2001.

Notary Public

My Commission expires: May 31, 2004

Approved as to form:

Deputy County Attorney

This Declaration of Covenants prepared by:
AES CONSULTING
CHARLES RECORDS - ENGINEERS
(Print Name)

PROJECT ENGINEER
(Title)

1248 OLDE TOWNE ROAD, SUITE 1
(Address)

WILLIAMSBURG VIRGINIA 23188
(City) (State) (Zip)

drainage.pre
Revised 2/97

SD-136-02 SEC 7 & 8 DRAIN TO THIS BMP.

James City County, Virginia
Environmental Division

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

County Plan No.: SP-111-00
Project Name: WILLIAMSBURG PLANTATION COACH HOUSE RD EXT.
Stormwater Management Facility: DRY ~~[illegible]~~ POND SWM/BMP #3
Phase: ☐ I ☐ II ☒ III

- ☑ Information Received. Date/By: MAR 31 '03 AES
- ☑ Administrative Check.
  - ☑ Record Drawing Date/By: 3/27/03 AES; AB Cert 3/27/03 AES
  - ☑ Construction Certification Date/By: FES 6/5/01
  - ☑ RD/CC Standard Forms (Required for all BMPs after Feb 1st 2001 Only)
  - ☑ Insp/Maint Agreement #/Date: #010004388 3/14/01
  - ☑ BMP Maintenance Plan Location: Sheet 8
  - ☐ Other:
- ☑ Standard E&SC Note on Approved Plan Requiring RD/CC or County comment in plan review file. AB, CL
  ☑ Yes ☐ No Location: NOTE 19 SHEET 10 DAM NOTE #1 Sheet 8 CC
- ☑ Assign **County BMP ID Code**: Code: PC 185
- ☑ Preliminary Input into Division's "As-Built Tracking Log"
- ☑ Add Location to GIS Database Map. Obtain site information (GPIN, Owner, Site Area, Address, etc.)
- ☑ Preliminary Log into Access BMP Database (BMP ID #, Plan No., GPIN, Project Name, etc.)
- ☑ Active Project File Review (correspondence, H&H, etc.).
- ☑ Initial As-Built File setup (Label, copy hydraulics, BMP plan and detail information, etc.).
- ☒ Inspector Check of RD/CC (forward to inspector using transmittal for cursory review).
- ☒ Pre-Inspection Drawing Review - Approved Plan (Quick look prior to Field Inspection).
- ☒ Final Inspection (FI) Performed Date: 1/18/07
- ☒ Record Drawing (RD) Review (***) Date: ~~2/28/08~~ Final 1/16/08
- ☒ Construction Certification (CC) Review Date: 2/28/08 Final
- ☐ Actions:
  - ☐ No comments.
  - ☐ Comments. Letter Forwarded. Date: 1/26/07
    - ☒ Record Drawing (RD)
    - ☐ Construction Certification (CC)
    - ☒ Construction-Related (CR)
    - ☒ Site Issues (SI)
    - ☐ Other :
- ☒ Second Submission: 2/28/08
- ☒ Reinspection (if necessary): 11/29/07
- ☒ Acceptable for stormwater managment facility purposes (RD/CC/CR/Other). Proceed with bond release.
- ☒ If ok for full release, notify Inspector and Inspector Supervisor using "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 log into computer.
- ☐ Add to JCC Hydrology & Hydraulic database (optional).
- ☒ Complete "As-built Tracking Log".

SJT

JBB

BMP Certification Information Acceptable

Plan Reviewer: [signature] Date: 01/28/08

*** See separate checklist.

PLANTATION GROUP, L. L. C.
4029 Ironbound Road, Suite 200
Williamsburg, VA 23188
(757) 220-2874 mel
FAX (757) 229-2542

LETTER OF TRANSMITTAL

DATE: 2/27/08
JOB NO.: 493
ATTENTION: Scott Thomas

TO: James City County
Development Management

101-E Mounts Bay Road
Williamsburg, VA 23187

RE: Williamsburg Plantation – Coach House Lane Extension

GENTLEMEN:

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

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

Copies	NO.	DESCRIPTION
1	1/28/2008	JCC Development Management letter Re: Williamsburg Plantation – Coach House Road Extension
1	2/27/2008	FES Engineering Services Letter; Re: Williamsburg Plantation - Coach House Lane Dam

THESE ARE TRANSMITTED as checked below:

☐ For your approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval

☒ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution

☒ As requested ☐ Returned for corrections ☐ Return _____ corrected prints

☐ For reviews and comment ☐ _____

☐ FOR BIDS DUE _____ 20 ____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS: The attached documents are forwarded per your request.

COPY TO _____

SIGNED: Mel Spruill, Vice President

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

LT-584-2
PRINTED IN U.S.A.

Home of America's 400th Anniversary
James City County 1607-2007 Jamestown

DEVELOPMENT MANAGEMENT

101-A MOUNTS BAY ROAD, P.O. BOX 8784, WILLIAMSBURG, VIRGINIA 23187-8784
(757) 253-6671
E-MAIL: devman@james-city.va.us
FAX: (757) 253-6822

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

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

COUNTY ENGINEER
(757) 253-6678

INTEGRATED PEST MANAGEMENT
(757) 259-4116

January 28, 2008

Williamsburg Plantation Inc.
Ms. Corina Caldwell
4870 Longhill Road
Williamsburg VA 23188

RE: Williamsburg Plantation – Coach House Road Extension

Dear Ms. Caldwell:

The purpose of this letter is to inform you that the $25,000 Letter of Credit No. 3035278 for the above referenced project expires on March 9, 2008. As stated in the Siltation Agreement prior to release of this surety all construction must be complete. The as-builts and the construction certification for the stromwater detention facility have not been received and the final inspection has not been completed. As there are outstanding items, the Letter of Credit must be extended.

James City County will grant an extension to this Letter of Credit for up to one year. We will require delivery of the revised Letter of Credit to the **James City County Environmental Division, 101-E Mounts Bay Road, Williamsburg VA 23185** no later than 4:00 p.m., **February 29, 2008**, to avoid draw of existing surety.

Sincerely,

Scott J. Thomas / mjd

Scott J. Thomas
Environmental Director

Hal will get Reja to do final inspection.

cc: Bank of America

As builts have been turned in to County by AES

FES

ENGINEERING SERVICES

- Soil Borings – Drilling Services [Residential, Commercial, Public & Environmental]
- Geotechnical Engineering [Residential, Commercial & Public]
- Construction Inspection Services [Materials Testing & Special Inspection Services]

CONSTRUCTION SERVICES

- Segmental Retaining Wall Construction
- Helical Anchor Installation [New & Foundation Repair]
- Hardscape Construction
- Foundation, Walls, Slopes & Drainage Evaluation Repairs

"QUALITY IS OUR NUMBER ONE SERVICE"

www.fescompany.com

1-800-891-8488

February 27, 2008

Mr. Mel Spruill
C/O Williamsburg Plantation, Inc.
4029 Ironbound Road, Suite 200
Williamsburg, Virginia 23188

Re: Coach House Lane Dam Certification Letter
Williamsburg Plantation-Coach House Lane Dam
James City County, Virginia
FES Report No. 1-9C120.680

Dear Mr. Spruill:

A Professional Engineer with **FES** reviewed all the compaction density tests and inspections performed for the Dam. **FES** certifies that the Dam located along Coach House Lane within Williamsburg Plantation Project was inspected and tested during construction. To the best my knowledge all the work that was inspected by **FES** meets the approved project plans for the Dam.

FES appreciates the opportunity to be of service to **Williamsburg Plantation, Inc.** on this important project and look forward to its successful completion. If you have any questions in regards to our report, please do not hesitate to contact the undersigned.

Respectfully Submitted,

COMMONWEALTH OF VIRGINIA
RAJA S. ELAWAR
Lic. No. 026383
PROFESSIONAL ENGINEER

2/27/08

Raja S. El-Awar, PE
Principal Engineer
VA Reg. No. 026383
relawar@fescompany.com

O:\PROJECTS\1-9C120 Williamsburg Plantation\1-9C120.680 Dam Certification Letter.doc

DEVELOPMENT MANAGEMENT

101-E MOUNTS BAY ROAD, P.O. BOX 8784, WILLIAMSBURG, VIRGINIA 23187-8784
(757) 253-6671
E-MAIL: devtman@james-city.va.us
FAX: (757) 259-4032

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

January 26, 2007

Mr. Ken Yerby
Williamsburg Plantation, Inc.
4029 Ironbound Road, Suite 200
Williamsburg, VA 23188

Re: Williamsburg Plantation Coach House Road Ext
County Plan No. SP-111-00
County BMP ID Code: Pc-185

Dear Mr. Yerby:

The Environmental Divisions has received an interim record drawing asbuilt and construction certification for the stormwater management facility for the above referenced project. The record drawing provides as-built information for the dry pond situated on the North side of the site.

Based on our review of the project and a pre-final field inspection as performed on January 18, 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 & Construction Certification:

1. In accordance with the Note # 19 on Sheet 10 of the approved plan, record drawings asbuilt and construction certifications were required for the onsite stormwater management/BMP. Interim certification for the asbuilt was provided on March 27, 2003, and an Interim construction certification was received on June 5, 2001. We will need a final asbuilt and construction certification after pond has been converted from temporary sediment basin mode to permanent dry pond BMP mode. When the final certifications are received by James City County Environmental a final inspection will be done by a James City County Environmental inspector.

Construction Certification:

2. In accordance with the Note # 19 on Sheet 10 of the approved plan, construction certification for the stormwater management/BMP facility is required. We will need a final certification after pond has been converted from temporary sediment basin mode to permanent dry pond BMP mode. This is especially important since the facility has an engineered and compacted earthen embankment. The certification can be in letter format or by use of the certification statements in Section 4 of the JCC, Stormwater Management/BMP Facilities, Record Drawing and Construction Certification, Standard Forms & Instructions.

3. A professional engineer's seal and signature is required on construction certification.

4. If possible add the following County identifiers to the construction certification documents: County Plan Number SP-111-00 and BMP ID No. Pc-185.

Record Drawing:

5. In accordance with Note # 19 on Sheet 10 of the approved plan, a record (asbuilt) drawing is required for the stormwater management/BMP facility. The record drawing requires certification consistent with the provisions of Section 4 of the *James City County Environmental Division, Stormwater Management/BMP Facilities, Record Drawing and Construction Certification, Standard Forms & Instructions.*

6. Along with the record drawing set, submit completed record drawing and construction certification forms, Sections 1 through 5, and applicable record drawing checklists from the *James City County, Stormwater Management/BMP Facilities, Record Drawing and Construction Certification, Standard Forms & Instructions* (packet). The Environmental Division began use of the forms and checklists in this packet effective February 1st 2001.

7. Show the following additional information on the record drawing since the March 27, 2003, interim asbuilt: North indicator arrow on BMP sheet, 15" HDPE outfall with the flared end section located at the West slope of the pond and the 15" HDPE outfall with the flared end section located at the South slope of the Pond.

8. A professional seal and signature is required on the record drawing.

9. If possible add the following County identifiers to the lower right hand corner of the record drawing: County Plan Number SP-111-00 and BMP ID Code: PC 185.

Pre-Final Inspection Construction - Related Items:

10. Grass along the Northwest, North, Northeast embankment was 2 to 4 feet in height. Mow grass on the embankment to a height of 2- 4 inches to promote growth of desirable grasses and to allow for proper future inspection.

12. Stabilize with seed and mulch or matting all disturbed soil areas present along the Southwest slope.

13. Erosion gullies present should be backfilled with compacted material, reseeded and mulched or matted for stabilization there are gullies present on the Southwest and Southeast slopes.

14. Remove trees and woody vegetation on the downslope embankment. Usually trees, shrubs and woody vegetation are not permitted to grow on any part of pond embankments constructed using engineered (compacted) fills. Saturated roots mats combined with high wind can cause trees to overtop and accelerate soil erosion and embankment failure. For older facilities which may have established tree growth, we recommend that trees be cut flush to or below ground level and be maintained in that fashion as to not disturb root systems that may already be extensive. Efforts should then be made to reduce tree restablishment and to replace tree growth with an acceptable low-maintenance grass covering.

15. Clean out the dewatering device and remove silt fence by the riser.

16. Clear and remove all vegetation and brush within the paved flume and riprap of the outfall end of the pipe barrel through the dam.

17. Clear and remove all vegetation and brush within the emergency spillway of the facility. The emergency spillway for this facility is a 10 feet wide, concreted lined, trapezoidal-shaped channel located at Northeast end of the embankment next to the riser.

18. Clean and remove sediment accumulations and vegetation within 10 feet of the outfall end of the 15 inch HDPE storm drain pipe which enters the basin at the West slope. Sediment accumulations were 1-2 ft. deep at the outfall end of the pipe and covered most of the outlet protection pad. ***There is also major erosion above the pipe above the outfall that needs to be filled, compacted and stabilized. The two drop inlets that connect to the pipe have sinkholes around them that need repair.***

19. Clean and remove sediment accumulations and vegetation within 10 feet of the outfall end of the 15 inch HDPE storm drain pipe which enters the basin at the South slope. Sediment accumulations were 1 ft deep at the outfall end of the pipe and covered most of the outlet protection pad. ***There are sinkholes above and along the pipe that need repair.***

20. Clean and remove sediment accumulations and vegetation within 10 feet of the outfall end of the 30 inch HDPE storm drain pipe which enters the basin at the Southwest slope. Sediment accumulations were 1 ft deep at the outfall end of the pipe and covered most of the outlet protection pad.

21. Conversion of the principal flow control structure (riser) from temporary sediment basin mode to final BMP mode is incomplete. This is to be done after final construction and stabilization is complete for the drainage area that the BMP serves.

This is a courtesy pre-final BMP inspection. This was done as an effort to hopefully speed up the process for the surety release when the project is complete. A final inspection of the pond will be done when we receive the final asbuilt and construction certifications. 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 and items from the final inspection.

Please contact me at 757-259-4026 or Chief Engineer, Scott Thomas, at 757-253-6639 if you have any further comments, questions, or meet at the site.

Sincerely,

Jason Beck

Jason L. Beck
Environmental Inspector, II
Environmental Division

cc: Scott Thomas, Chief Engineer - Storm Water
Richard A. Costello, AES

G:\AsBuilts\reviews\final\SP11100.pc185pre-final

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

County BMP ID Code (if known): PC-185 Coach House

Name of Facility: Williamsburg Plantation Road Extension BMP No.: 1 of 1 Date: 1/18/07

Location: Williamsburg Plantation (Longhill Road) NE

Name of Owner:

Name of Inspector: Jason Beck

Type of Facility: Dry Pond

Weather Conditions: cold/wet Type: ☒ Final Inspection ☐ County BMP Inspection Program ☐ Owner Inspection

If an inspection item is not applicable, mark NA, otherwise mark the appropriate column. SP-111-00

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		✓		1st side tall grass
Vegetation Condition	✓			
Tree Growth		✓		
Erosion	✓	✓		Erosion on bank across from Riser
Trash & Debris	✓			
Seepage	✓			
Fencing or Benches				
Interior Landscaping/Planted Areas: ☐ None ☐ Constructed Wetland/Shallow Marsh ☒ Naturally Established Vegetation				
Vegetated Conditions	✓			
Trash & Debris	✓			
Floating Material	✓			
Erosion	✓	✓		SE Bank
Sediment	✓			
Dead Plant	✓			
Aesthetics				
Other				
Notes:				
Water Pools: ☐ Permanent Pool (Retention Basin) ☐ Shallow Marsh (Detention Basin) ☐ None, Dry (Detention Basin)				
Shoreline Erosion	✓			
Algae	✓			

Facility Item	O.K.	Routine	Urgent	Comments
Trash & Debris				
Sediment	✓			
Aesthetics	✓			
Other	✓			
Inflows (Describe Types/Locations):				
Condition of Structure			✓	① 12" Erosion above pipe upslope & down ② 12" Erosion at manhouse & two DS's
Erosion			✓	③ 25" Plastic corrugated metal End section plan HPE
Trash and Debris	✓			
Sediment		✓		1, 2, 3
Outlet Protection		✓		
Other				
Principal Flow Control Structure - Riser, Intake, etc. (Describe Type):				
Condition of Structure	✓	✓		Need to convert to BMP Mode
Corrosion	✓			
Trash and Debris	✓			
Sediment	✓			
Vegetation		✓		Need to cut grass + trees
Other		✓		Remove silt fence
Principal Outlet Structure - Barrel, Conduit, etc. :				
Condition of Structure				
Settlement	✓			
Trash & Debris	✓			
Erosion/Sediment	✓			
Outlet Protection	✓			
Other				
Emergency Spillway (Overflow):				
Vegetation		✓		remove from flume
Lining	✓			Paved flume Concrete trapzoidal
Erosion	✓			
Trash & Debris	✓			
Other				
Notes:				
Nuisance Type Conditions:				
Mosquito Breeding	✓			
Animal Burrows	✓			

Facility Item	O.K.	Routine	Urgent	Comments
Graffiti				
Other				
Surrounding Perimeter Conditions:				
Land Uses	✓			Time Shares + 199 Route
Vegetation	✓			
Trash & Debris	✓			
Aesthetics	✓			
Access /Maintenance Roads or Paths	✓			
Other				

Remarks:

~~Reinspection~~
11/29/07 Pond repairs have been made.
Looks okay to release.

Overall Environmental Division Internal Rating: 4

Signature: Jason Bell **Date:** 11/29/07

Title: Environmental Inspector

SWMProg\BMP\CoInspProg\DetRet.wpd

James City County, Virginia
Environmental Division

Stormwater Management / BMP Facilities Record Drawing and Construction Certification

Standard Forms & Instructions

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Record Drawing and Construction Certification Forms

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SP-111-00
PC185

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: Williamsburg Plantation Road Extension
Structure/BMP Name: SWM / BMP #3 Dry Pond
Project Location: 4870 Longhill Road
BMP Location: End of Coach House Lane North
County Plan No.: SP - 111 - 00

Project Type:
- ☒ Residential
- ☐ Commercial
- ☐ Institutional
- ☐ Public
- ☐ Other
- ☐ Business
- ☐ Office
- ☐ Industrial
- ☐ Roadway

Tax Map/Parcel No.: (32-4)(1-26C)
BMP ID Code (if known): PC 185
Zoning District: Limited Residential (R-2)
Land Use:
Site Area (sf or acres): 1.3 +/- Ac.

Brief Description of Stormwater Management/BMP Facility: Dry Pond constructed with 42" riser pipe and concrete spillway to handle storm water from northeast drainage from Williamsburg Plantation.

Nearest Visible Landmark to SWM/BMP Facility: RTE. 199

Nearest Vertical Ground Control (if known):
☐ JCC Geodetic Ground Control ☐ USGS ☐ Temporary ☐ Arbitrary ☒ Other
Station Number or Name:
Datum or Reference Elevation: 73.99
Control Description: Inv. In. Exist. 36" RCP under 199
Control Location from Subject Facility: Down Stream

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: 02/01
Facility Monitored by County Representative during Construction: ☒ Yes ☐ No ☐ Unknown
Name of Site Work Contractor Who Constructed Facility: George Nice & Sons
Name of Professional Firm Who Routinely Monitored Construction: FES, Inc.
Date of Completion for SWM/BMP Facility: 10/02
Date of Record Drawing/Construction Certification Submittal: _____

(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: The Berkeley Group
Mailing Address: Berkeley South Bldg., Exec. Suite 115
3015 N. Ocean Blvd., Ft. Lauderdale, FL 33308
Business Phone: (954) 537-4765 Fax: (954) 328-0130
Contact Person: Mr. J.P. Ottino, III Title: _____

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

Firm Name: AES
Mailing Address: 5248 Olde Towne Road, Suite 1
Williamsburg, VA 23188
Business Phone: (757) 253-0040
Fax: (757) 220-8994
Responsible Plan Preparer: Charles B. Records
Title: Project Engineer
Plan Name: Williamsburg Plantation Road Extension
Firm's Project No. 7555-14
Plan Date: 9/11/00 Rev. 1/12/01
Sheet No.'s Applicable to SWM/BMP Facility: 1 / 4 / 8 / ____ / ____

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

Name: George Nice & Sons, Inc.
Mailing Address: 143 Skimino Road
Williamsburg, VA 23185-2229
Business Phone: (757) 565-2885
Fax: (757) 565-1526
Contact Person: Ray Nice, P. E.
Site Foreman/Supervisor: _____
Specialty Subcontractors & Purpose (for BMP Construction Only):

Section 4 – Professional Certifications:

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

Record Drawing and Construction Certifications for Stormwater Management / BMP Facilities

Record Drawing Certification

Firm Name: AES
Mailing Address: 5248 Olde Towne Road
Williamsburg, VA 23188
Business Phone: (757) 253-0040
Fax: (757) 220-8994

Name: Richard A. Costello, P. E.
Title: President

Signature: _____
Date: _____

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.

COMMONWEALTH OF VIRGINIA
RICHARD A. COSTELLO
CERTIFICATE NO.
013250
3/27/03
CERTIFIED PROFESSIONAL ENGINEER

_____ (Seal)

Virginia Registered Professional Engineer
Or Certified Land Surveyor

Construction Certification

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

Name: _____
Title: _____

Signature: _____
Date: _____

I hereby certify to the best of my knowledge and belief that this 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.

PREVIOUSLY SUBMITTED

_____ (Seal)

Virginia Registered
Professional Engineer

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

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

XX 1. All constructed facilities meet approved design plans, unless otherwise shown. Record information or deviations from approved design plan shown in clearly annotated format and/or boxed beside design values.

XX 2. Elevations to the nearest 0.1' unless higher accuracy is needed to show positive drainage.

XX 3. All plan sheets labeled with "RECORD DRAWING" in large text in lower right hand corner (Approved County Plan Number and BMP ID Code can be included if known).

XX 4. All plans sheet revision blocks modified to indicate date and record drawing status.

XX 5. All plan sheets have certification statements and certifying professional's signature and seal.

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

XX 1. All requirements of Section I (Methods and Presentation) apply to this section.

XX 2. Plan Views: Show general location, arrangement and dimensions. Location and alignment shall generally match approved design plans.

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.

XX 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.

XX 7. Profile or elevations along the entire centerline of the emergency spillway. Emergency spillway may be steeper, but no flatter or narrower than design.

XX 8. Elevation of the principal spillway crest or outlet crest of the structure.

XX	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.
XX	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.
XX	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.**
XX	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.
XX	18.	Maintenance plan taken from approved design plan transposed onto record drawing set.
N/A	19.	Fencing location and type, if applicable to facility.
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.
N/A	22.	Any other information formally requested by the Environmental Division specific to the constructed SWM/BMP facility.

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

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

XX	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.)
Inc.	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
XX	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.
XX	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.
XX	F12.	Stilling basin or standard outlet protection provided at principal spillway outlet.
XX	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.
XX	F15.	No visual signs of erosion or channel degradation immediately downstream of facility.
Inc.	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.

CURRENTLY FUNCTIONING AS A SEDIMENT BASIN.

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.

SP-111-00
PC 184/185

FOUNDATION ENGINEERING SCIENCE, INC.

- Geotechnical Engineering [Drilling; Foundation, Retaining Wall & Pavement Design]
- Environmental Management [Phase I & II, Asbestos and Lead Paint Sampling]
- Construction Materials Testing & Inspection [Quality Control & Quality Assurance]
- Foundation & Pavement Problems Evaluations & Remediations
- Value Engineering During Design & Construction

RECEIVED
PLANNING DEPARTMENT
JUN 2001

Mr. Ken Yerby
Williamsburg Plantation Inc.
4029 Ironbound Road, Suite 200
Williamsburg, Virginia 23188

June 5, 2001

Re: Interim Earthen Dam Report
Williamsburg Plantation, Coach House Lane-Earthen Dam
James City County, Virginia
FES Report No. 1-9C120.145

Dear Mr. Yerby:

Foundation Engineering Science, Inc. (FES) hereby certifies to the best of our knowledge and belief that the Storm Water Management/BMP facility for Williamsburg Plantation, Coach House Lane was monitored and constructed in general accordance with the provisions of the approved design plans, specifications and storm water management plan.

FES appreciates the opportunity to be of service to **Williamsburg Plantation, Inc.** on this important project and looks forward to its successful completion. Should you have any questions regarding this report, please do not hesitate to contact the undersigned.

Respectfully submitted,

FOUNDATION ENGINEERING SCIENCE, INC.

6/6/2001
Idres Hawarry
Project Engineer

6/6/01
Raja S. Elawar, P.E.
Principal Engineer
VA Reg. No. 26383

XCopies: (1) Client

C:\company\oldfiles\1999\cmt\1-9C120.145

11843 B CANON BOULEVARD ➤ NEWPORT NEWS, VIRGINIA 23606 ➤ PHONE: 757-873-4113 FAX: 757-873-4114

FILE: WMSBURG PLANTATION
COACH HOUSE ROAD
PC 184/185

FOUNDATION ENGINEERING SCIENCE, INC.

- Geotechnical Engineering [Drilling; Foundation, Retaining Wall & Pavement Design]
- Environmental Management [Phase I & II, Asbestos and Lead Paint Sampling]
- Construction Materials Testing & Inspection [Quality Control & Quality Assurance]
- Foundation & Pavement Problems Evaluations & Remediations
- Value Engineering During Design & Construction

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Williamsburg Plantation Inc.
4029 Ironbound Road, Suite 200
Williamsburg, Virginia 23188

June 5, 2001

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James City County, Virginia
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Respectfully submitted,

FOUNDATION ENGINEERING SCIENCE, INC.

6/6/2001
Idres Hawarry
Project Engineer

6/6/01
Raja S. Elawar, P.E.
Principal Engineer
VA Reg. No. 26383

XCopies: (1) Client

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AES CONSULTING ENGINEERS
Engineering, Surveying, and Planning
5248 Olde Towne Road, Suite 1
WILLIAMSBURG, VIRGINIA 23188

Phone: (757) 253-0040
Fax: (757) 220-8994

LETTER OF TRANSMITTAL

ATTN: **Jason L. Beck**

Environmental Inspector

CO.: JCC

Address: 101-E Mounts Bay Road
Williamsburg, VA 23185

cc:

DATE	JOB NO.
2-28-2008	7555-17

FROM: Matt Good

RE
Williamsburg Plantation BMP AS-BUILT

RECEIVED
FEB 2 8 2008
ENVIRONMENTAL DIVISION

WE ARE SENDING YOU THE FOLLOWING ITEMS: ☐ Attached ☐ Under separate cover via

☐ Original(s) ☒ Print(s) ☐ Plan(s) ☐ Specification(s) ☐ Change Order

☐ Copy of letter(s) ☐ Other:

COPIES	DATE	No. of Pages	DESCRIPTION
1	2-28-08	3	Williamsburg Plantation BMP AS-BUILT
1	2-28-08	3	Williamsburg Plantation BMP AS-BUILT (MYLAR)

THESE ARE TRANSMITTED as checked below:

☒ For your approval ☐ For your signature ☐ For review and comment

☐ For your use ☐ As you requested ☐ As requested by:

☐ Other:

REMARKS:

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

BMP RECORD DRAWINGS

WILLIAMSBURG PLANTATION

ROAD EXTENSION

FOR

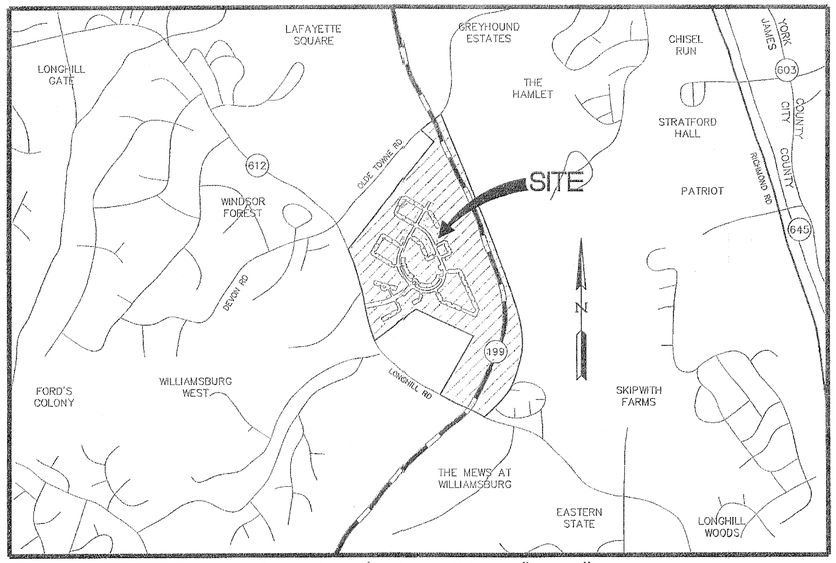
WILLIAMSBURG PLANTATION, INC.

GENERAL NOTES

1. PROPERTY ZONING: LIMITED RESIDENTIAL DISTRICT R-2.
2. PROPERTY TAX PARCEL NO.: PART OF (32-4) (1-26C)
3. PROPERTY ADDRESS: 4870 LONGHILL ROAD
4. THIS SITE PLAN IS FOR THE EXTENSION OF THE SPINE ROAD FOR AN APPROVED OVERALL CLUSTER DEVELOPMENT PLAN (JCC CASE NO. MP-02-00).
5. OVERALL SITE DENSITY IS 3.99 UNITS/ ACRE AS APPROVED WITH AMENDED MASTER PLAN MP-02-00. TOTAL APPROVED UNITS TO DATE = 96 UNITS.
6. ALL UTILITIES SHALL BE PLACED UNDERGROUND AND SHALL HAVE A MINIMUM OF 36" OF COVER.
7. THE CONTRACTOR SHALL SATISFY HIMSELF AS TO ALL SITE CONDITIONS PRIOR TO CONSTRUCTION. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND SHALL NOTIFY MISS UTILITY (1-800-552-7001) PRIOR TO ANY EXCAVATION OR DEMOLITION.
8. VERIFY ALL DIMENSIONS AND NOTIFY JAMES CITY SERVICE AUTHORITY PRIOR TO ANY EXCAVATION OR DEMOLITION WITHIN UTILITY CORRIDORS.
9. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS PRIOR TO COMMENCEMENT OF WORK, TO INCLUDE, BUT NOT LIMITED TO, JAMES CITY COUNTY LAND DISTURBANCE, BUILDING, AND UTILITY.
10. A LAND DISTURBING PERMIT AND SILTATION AGREEMENT, WITH SURETY, ARE REQUIRED FOR THIS PROJECT.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF CONSTRUCTION EFFORTS WITH VIRGINIA NATURAL GAS, VIRGINIA POWER, APPROPRIATE TELEPHONE COMPANY, APPROPRIATE CABLE COMPANY, JAMES CITY SERVICE AUTHORITY, AND OTHERS THAT MAY BE REQUIRED.
12. PROJECT TO BE SERVED BY PUBLIC WATER AND SEWER OWNED BY THE JAMES CITY SERVICE AUTHORITY. ALL WATER AND SEWER CONSTRUCTION TO BE IN ACCORDANCE WITH THE JAMES CITY SERVICE AUTHORITY STANDARDS AND SPECIFICATIONS. THE CONTRACTOR SHALL AT ALL TIMES POSSESS AND MAINTAIN A CURRENT COPY OF THE JAMES CITY SERVICE AUTHORITY STANDARDS AND SPECIFICATIONS ON THE SITE.
13. ALL PARKING SPACES SHALL BE DELINEATED WITH PAINT STRIPING. THE MINIMUM NUMBER OF PARKING SPACES SHALL BE TWO PER DWELLING UNIT, IN ACCORDANCE WITH SEC. 24-59 (A) (1) OF THE JCC ZONING ORDINANCE. HANDICAP PARKING SPACES SHALL BE DESIGNATED BY ABOVE GROUND SIGNS PER USBC REQUIREMENTS.
14. REFUSE TO BE REMOVED BY PRIVATE CONTRACTOR.
15. THE SITE DOES NOT LIE WITHIN ANY RESOURCE PROTECTION AREAS.
16. THIS PROPERTY LIES IN ZONE "X" (AREAS DETERMINED TO BE OUTSIDE THE 500 YEAR FLOOD PLAIN) AS SHOWN ON COMMUNITY PANEL #510201 0035 B, DATED 2/6/ 1991 OF THE FLOOD INSURANCE RATE MAPS FOR JAMES CITY COUNTY, VIRGINIA.
17. CONTOUR INTERVAL IS ONE FOOT.
18. ANY NEW SIGNS SHALL BE IN ACCORDANCE WITH SECTION 24-70 OF THE JCC ZONING ORDINANCE.
19. ANY OLD WELLS THAT MAY BE ON-SITE THAT WILL NOT BE USED MUST BE PROPERLY ABANDONED ACCORDING TO STATE PRIVATE WELL REGULATIONS AND JAMES CITY COUNTY CODE.
20. NO WETLANDS, RPA, HYDRIC SOILS OR SLOPES IN EXCESS OF 25% ARE LOCATED ON THE SITE.
21. OWNER/ DEVELOPER: THE BERKELEY GROUP
    MR. J.P. OTTINO, III
    BERKELEY SOUTH BLDG, EXEC. SUITE 115
    3015 N. OCEAN BLVD
    FT. LAUDERDALE, FL 33308

INDEX OF SHEETS

SHEET NUMBER	DESCRIPTION
1	COVER SHEET
~~2~~	~~ROAD PLAN~~
~~3~~	~~UTILITY PLAN~~
4	DRAINAGE AND EROSION AND SEDIMENT CONTROL PLAN
~~5~~	~~DRAINAGE AND EROSION AND SEDIMENT CONTROL PLAN~~
~~6~~	~~ROAD AND UTILITY PROFILES~~
~~7~~	~~BMP LANDSCAPING PLAN~~
8	DAM NOTES AND DETAILS
~~9~~	~~NOTES AND DETAILS~~
~~10~~	~~NOTES AND DETAILS~~



VICINITY MAP (APPROX. SCALE 1"=1000')

DATE: SEPTEMBER 11, 2000
PROJECT NO.: 7555-14
REVISION DATE: JANUARY 12, 2001
APPROVAL DATE: MARCH 8, 2001

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

COMMONWEALTH OF VIRGINIA
1-16-2008
THOMAS C. SUBLETT
No. 1886
LAND SURVEYOR

Thomas C. Sublett 1-16-2008
THOMAS C. SUBLETT DATE

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

LEGEND

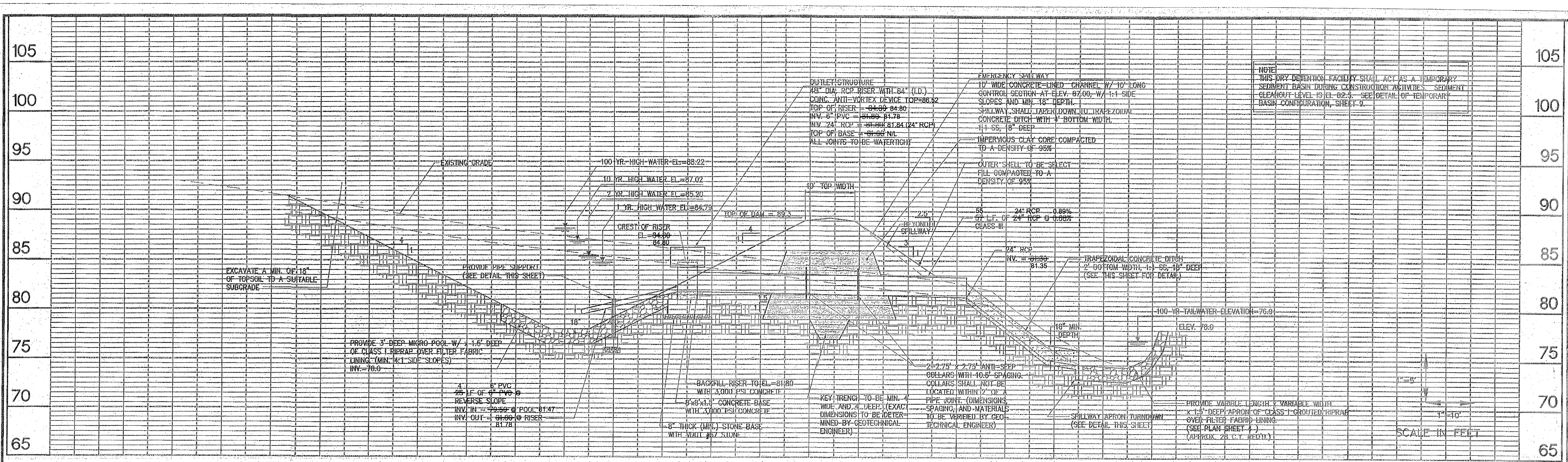
EXISTING		PROPOSED	EXISTING		PROPOSED
W	WATER	W		EXISTING TREELINE	
S	SANITARY SEWER	S	SAMPLE	EXISTING TREE	
	STORM SEWER			LIMITS OF CLEARING	
FM	FORCE MAIN	FM		SILT FENCE	SF
O/H TELE	OVERHEAD TELEPHONE LINE	O/H TELE		WIRE REINFORCED SILT FENCE	WSF
PHONE	UNDERGROUND PHONE LINE	PHONE		INLET PROTECTION	IP
O/E	OVERHEAD ELECTRIC LINE	O/E		CHECK DAM	CD
G	GAS LINE	G		STRAW BALE BARRIER	SB
FO	FIBER OPTIC	FO		DIVERSION DIKE	DD
	OVERHEAD CABLE			RIP RAP	
	MANHOLE			REVERSE GRADE GUTTER PAN	
	CURB DROP INLET			BORING	
	YARD DROP INLET			BENCH MARK	
	FLARED END SECTION			GROUND ELEVATION	
	VALVE			TOP OF CURB ELEV.	TC= ELEV
	FIRE HYDRANT ASSEMBLY			FINISH GRADE ELEV.	FG= ELEV
	BLOW-OFF VALVE			TOP OF WALL ELEV.	TW= ELEV
	AIR RELEASE ASSEMBLY			GRADING LINE TIE-IN	
	CLEAN OUT			EXISTING CONTOUR ELEV.	80
	WATER METER			CONTOUR ELEV.	80
	POWER POLE			GRADING BY OTHERS	80
	POWER POLE W/GUY WIRE			RESERVED PARKING	
	LIGHT POLE			YARD HYDRANT	
	STREETLIGHT			MAILBOX	
	CENTERLINE/BASELINE			SIGN	
	RIGHT OF WAY			WETLANDS	
	PROPERTY LINE			RPA BUFFER	
	℄ DITCH/SWALE			25% SLOPES OR GREATER	
	CONCRETE LINED DITCH			AREA OF FILL	
	EC-3 LINED DITCH			HIGH POINT	HP
	BITUMINOUS CONCRETE				
	CONCRETE				
	AGGREGATE/GRAVEL				

RECEIVED
FEB 28 2008
ENVIRONMENTAL DIVISION

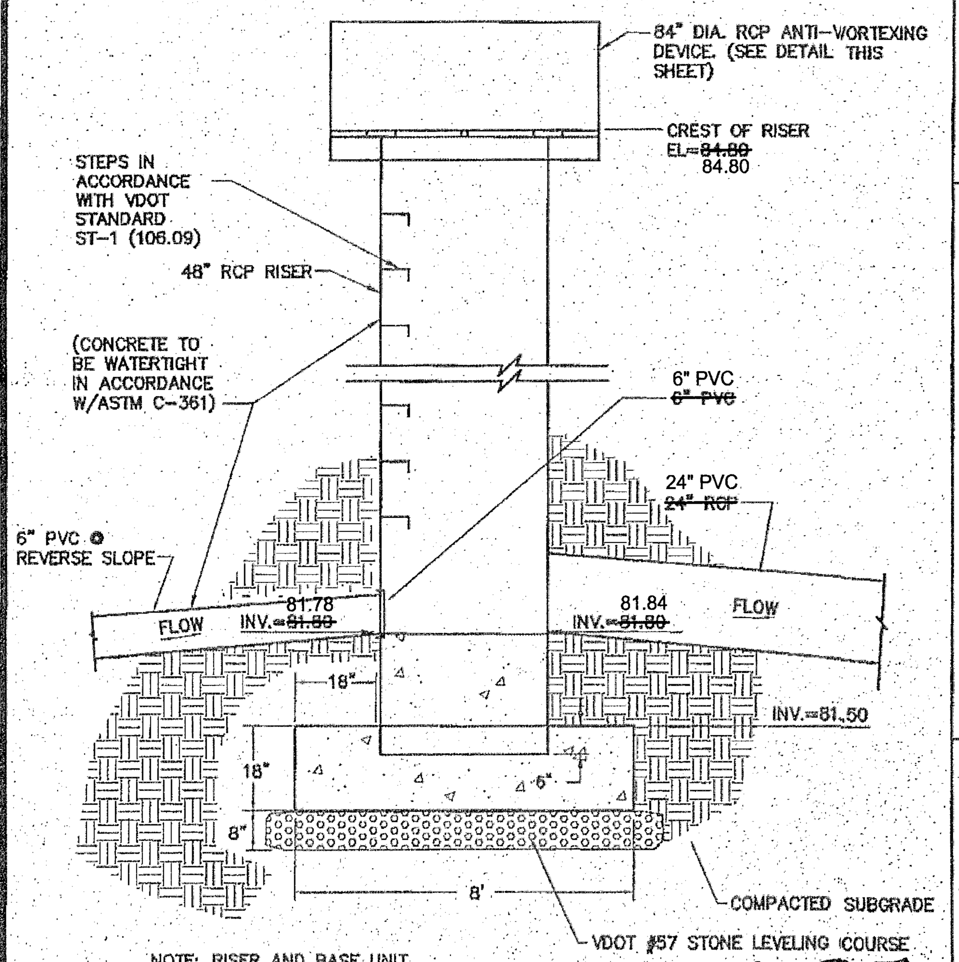
No.	DATE	REVISION / COMMENT / NOTE	BY
3	1/12/01	REVISED PER JCC ENVIRONMENTAL DIVISION COMMENTS	CDR
2	12/5/00	REVISED PER VDOT COMMENTS	CDR
1	11/6/00	REVISED PER JCC REVIEW COMMENTS	CDR

O:\Jobs Archive\7555\14-Road Design\dwg\cad\755514C01.dwg, 1/18/2008 2:22:01 PM, matt.good.

LBA 01.11.01-08:50 755514C01.dwg



SWM/BMP #3 FACILITY DRY POND - SECTION A-A



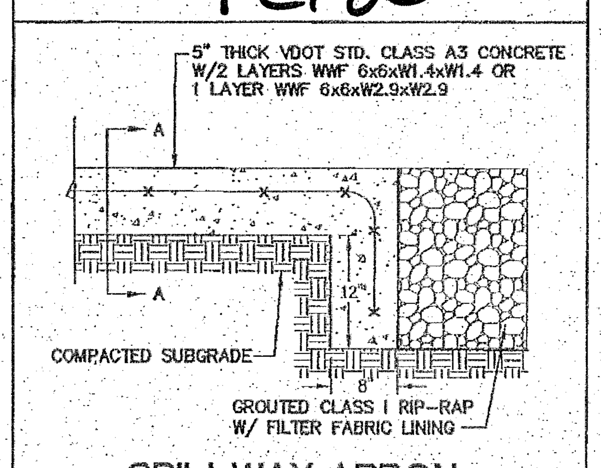
NOTE: RISER AND BASE UNIT TO BE PRECAST.

PC185

CROSS SECTION PROP. 48" RISER STRUCTURE WITH ANTI-VORTEXING TOP

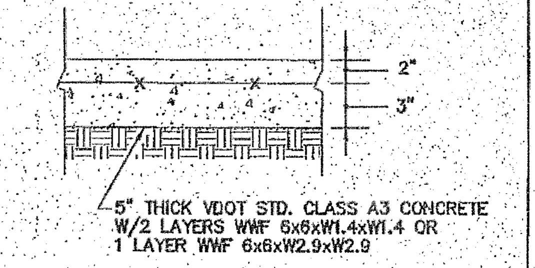
NOT TO SCALE

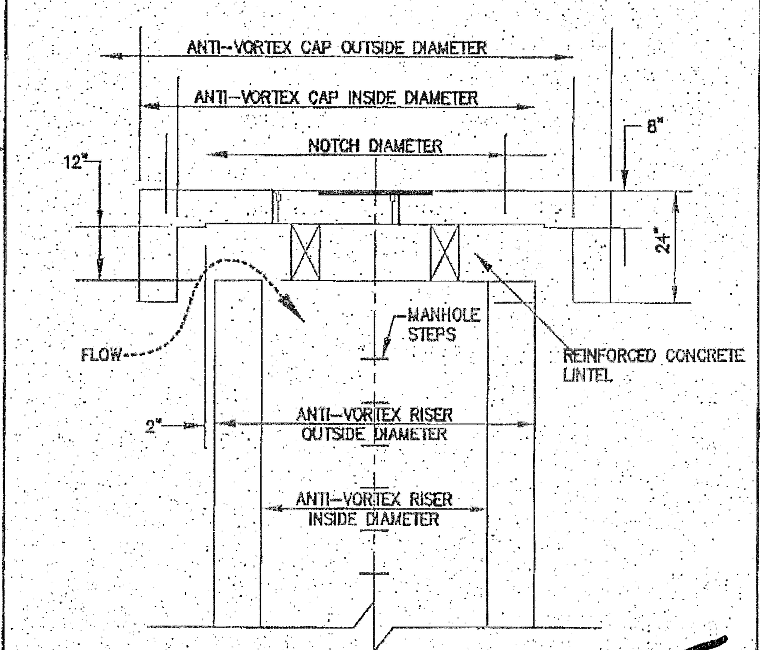
PC185



SPILLWAY APRON TURNDOWN

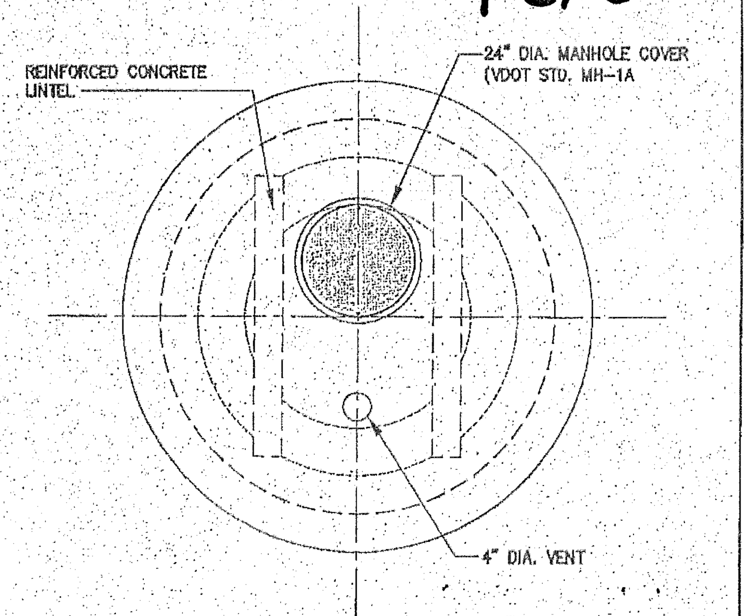
N.T.S.





SECTION

PC185



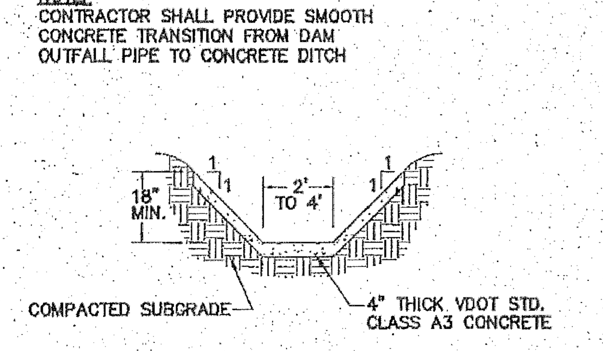
PLAN - TOP SLAB

1. ANTI-VORTEX DEVICE (CAP AND RISER) MANUFACTURED IN ACCORDANCE WITH ASTM C478.
2. DIMENSIONS SUBJECT TO PERMISSIBLE VARIATIONS OF ASTM C478
3. INLET AREA (AREA BETWEEN DEVICE I.D. AND RISER O.D.) IS GREATER THAN OUTLET AREA (AREA OF RISER I.D.)
4. SLAB REINFORCEMENT TO BE ASTM A615 #4 BARS @ 8" E.W. CIRCUMFERENCIAL.

ANTI- VORTEX DETAIL

NOT TO SCALE

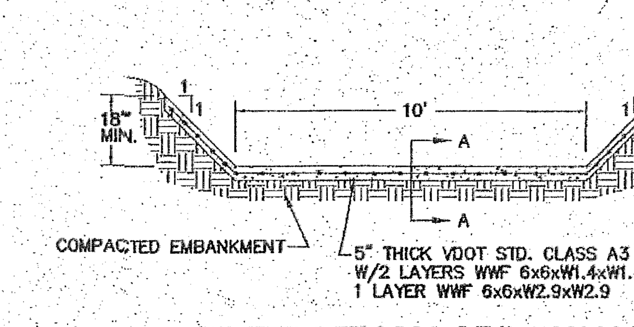
NOTE:
CONTRACTOR SHALL PROVIDE SMOOTH CONCRETE TRANSITION FROM DAM OUTFALL PIPE TO CONCRETE DITCH



CONCRETE DITCH

N.T.S.

PC185



EMERGENCY SPILLWAY

N.T.S.

DAM CONSTRUCTION NOTES

1. A GEOTECHNICAL SUBSURFACE EXPLORATION AT THE PROPOSED DAM SITE SHALL BE PERFORMED TO ENSURE SUITABILITY OF THE SUBGRADE. THE GEOTECHNICAL INVESTIGATION WILL DETERMINE SUITABILITY OF THE FILL MATERIAL, RECOMMENDED ANTI-SEEP MEASURES, KEY TRENCH DEPTH AND WIDTH, AND THE ANTICIPATED LOCATION OF THE PHREATIC LINE. THESE RECOMMENDATIONS ARE HEREBY MADE A PART OF THE DAM'S CONSTRUCTION SPECIFICATIONS. A REPRESENTATIVE OF THE GEOTECHNICAL CONSULTANT SHALL BE ON SITE DURING CONSTRUCTION TO ENSURE PROPER MATERIALS AND DAM CONSTRUCTION METHODS ARE UTILIZED. FOLLOWING DAM CONSTRUCTION, THE GEOTECHNICAL CONSULTANT SHALL PROVIDE WRITTEN DOCUMENTATION, SIGNED BY A PROFESSIONAL ENGINEER, THAT THE DAM WAS BUILT IN ACCORDANCE WITH THEIR RECOMMENDATIONS, PLANS, AND SPECIFICATIONS. THE GEOTECHNICAL CONSULTANT SHALL COORDINATE WITH THE DESIGN ENGINEER IN ORDER TO COMPLETE THE JCC ENVIRONMENTAL DIVISION STORMWATER MANAGEMENT/BMP FACILITIES CONSTRUCTION AND AS-BUILT CERTIFICATION FORM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE DAM CONSTRUCTION SCHEDULE WITH THE GEOTECHNICAL CONSULTANT IN ORDER TO ENSURE ON-SITE MONITORING.

2. SITE PREPARATION:
THE CONTRACTOR SHALL STRIP ALL AREAS OF THE PERMANENT COVER IN CONSTRUCTION AREA TO REMOVE ALL UNSUITABLE MATERIALS. THE UNSUITABLE MATERIALS TO BE REMOVED BY STRIPPING SHALL INCLUDE ALL TOPSOIL, DEBRIS AND VEGETABLE MATTER, INCLUDING STUMPS AND ROOTS, AND ALL OTHER MATERIALS WHICH MAY BE UNSUITABLE FOR USE IN THE PERMANENT CONSTRUCTION.

3. EMBANKMENT:
THE EXPOSED SUB GRADE SOILS SHALL BE CAREFULLY INSPECTED BY THE GEOTECHNICAL ENGINEER ANY UNSUITABLE MATERIALS THUS EXPOSED SHALL BE REMOVED AND REPLACED WITH A WELL COMPACTED, SUITABLE MATERIAL. DENSITY TESTING, AT THE DISCRETION OF THE OWNER/GEOTECHNICAL ENGINEER, SHALL BE PERFORMED AT THIS TIME. THE EMBANKMENT SHALL BE KEYED INTO THE UNDISTURBED (EXISTING) SOIL STRATUM. EMBANKMENT SHOULD BE KEYED AT LEAST 3 FEET INTO THE STRATUM OR AS SPECIFIED BY THE GEOTECHNICAL ENGINEER (WIDTH=6 FT. MIN.) THE EMBANKMENT FOUNDATION AND ABUTMENTS SHALL BEAR ON FIRM AND STABLE EXISTING SUB-GRADE WHICH HAS BEEN PREPARED SO AS TO REMOVE ALL ORGANIC, LOOSE , AND GENERALLY UNSUITABLE MATERIAL. ALL MATERIALS TO BE USED FOR BACKFILL OR COMPACTED FILL SHALL BE INSPECTED AND, IF NECESSARY, TESTED BY THE GEOTECHNIAL ENGINEER IN ACCORDANCE WITH ASTM D2487 PRIOR TO PLACEMENT, TO DETERMINE IF THEY ARE SUITABLE FOR THE INTENDED USE. THE FILL MATERIAL SHALL BE TAKEN FROM APPROVED BORROW AREAS. IT SHALL BE CLEAN MINERAL SOIL, FREE OF ROOTS, WOOD VEGETATION, OVERSIZED STONES, ROCKS, OR OTHER OBJECTIONABLE MATERIALS. MATERIALS TO BE USED FOR THE CONSTRUCTION OF THE SHELL SHALL BE SELECT BACKFILL FREE OF STUMPS, ROOTS, ROCKS, TRASH, ETC. AND SHALL BE MORE PERVIOUS THAN THE IMPERVIOUS CLAY CORE. AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED A MINIMUM OF 4 INCHES PRIOR TO PLACEMENT OF FILL.
THE FILL MATERIAL'S MOISTURE CONTENT SHALL BE (+3 TO -2) PERCENTAGE POINTS OF OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D2216 (I.E. IN GENERAL THE FILL MATERIAL SHOULD CONTAIN SUFFICIENT MOISTURE SO THAT IT CAN BE FORMED INTO A BALL WITHOUT CRUMBLING. IF WATER CAN BE SQUEEZED OUT OF THE BALL, IT IS TOO WET FOR PROPER COMPACTION). FILL MATERIAL WILL BE PLACED IN 6 TO 8 INCH CONTINUOUS LAYERS OVER THE ENTIRE LENGTH OF THE FILL. FIRST LIFT ON SUBGRADE MAY BE PLACED AT A DEPTH UP TO 30 INCHES TO BRIDGE SUBGRADE WITH OVER OPTIMUM MOISTURE CONTENT. COMPACTION, AS NOTED ON PLAN, SHALL BE OBTAINED GENERALLY BY USING A SHEEPSFOOT COMPACTOR. FINISHED GRADES SHALL BE MERGED NATURALLY INTO THE EXISTING GRADES.

4. CUTOFF TRENCH/KEY TRENCH:
THE TRENCH SHALL BE EXCAVATED ALONG THE CENTERLINE OF THE DAM. THE MINIMUM DEPTH SHALL BE AS SHOWN ON THE PLANS AND SHALL EXTEND UP BOTH ABUTMENTS. THE BOTTOM WIDTH SHALL BE WIDE ENOUGH TO PERMIT OPERATION OF COMPACTING EQUIPMENT. THE SIDE SLOPES SHALL BE NO STEEPER THAN 1:1. COMPACTING REQUIREMENTS SHALL BE THE SAME AS THOSE FOR EMBANKMENT. THE TRENCH SHALL BE KEPT DRAINED DURING THE BACKFILLING - COMPACTING OPERATIONS.

5. PRINCIPAL SPILLWAY:
THE BOTTOM OF THE SPILLWAY RISER FOUNDATION BASE EXCAVATION SHALL BE OBSERVED BY THE GEOTECHNICAL ENGINEER TO ENSURE THAT ALL UNSUITABLE AND LOOSE MATERIALS ARE REMOVED AND THAT ACCEPTABLE BEARING CONDITIONS EXIST IN THE FOUNDATION'S BASE. ALL JOINTS IN THE PRINCIPAL SPILLWAY STRUCTURE SHALL BE WATERTIGHT CONSTRUCTION. PERVIOUS MATERIALS SUCH AS SAND, GRAVEL OR CRUSHED STONE SHALL NOT BE USED AS BACKFILL AROUND THE BARREL OR ANTI-SEEP COLLAR. FILL MATERIAL SHALL BE PLACED AROUND THE PIPE IN 4 INCH LAYERS AND COMPACTED BY HAND TO THE SAME DENSITY AS THE EMBANKMENT. AMINIMUM OF TWO FEET OF FILL SHALL BE HAND-COMPACTED OVER THE BARREL BEFORE CROSSING IT WITH CONSTRUCTION EQUIPMENT.

6. VEGETATIVE STABILIZATION:
FINAL VEGETATIVE COVER (STABILIZATION) SHALL CONSIST OF TOP SOILING, LIMING, FERTILIZING, SEEDING, AND MULCHING TO ASSURE A FIRM STAND OF GRASS AS SOON AS PRACTICAL. SEDIMENT BASINS AND OTHER TEMPORARY EROSION CONTROL MEASURES ARE TO BE REMOVED ONLY WHEN STABILIZATION IS COMPLETE. FINAL VEGETAL COVER SHALL BE PROVIDED IN ACCORDANCE WITH THE FOLLOWING:

TOPSOIL:	AT LEAST 4" THICKNESS OBTAINED FROM STOCKPILES ON SITE, FREE OF LARGE DEBRIS.
LIME:	4,000#/ACRE (90#/1,000 S.F.)
SEED:	KENTUCKY-31 TALL FESCUE 250#/ACRE (6#/1,000 S.F.)
FERTILIZER:	10/10/10 MIX, 1,000#/ACRE FALL (23#/1,000 S.F.)
MULCH:	STRAW OR HAY (LOCALLY OBTAINED) 4,000#/ACRE (90#/1,000 S.F.)

NOTE:
VDOT DOES NOT ASSUME RESPONSIBILITY FOR MAINTENANCE OF THE DETENTION/RETENTION POND OR ITS STRUCTURES, AND SHALL BE SAVED HARMLESS FROM ANY DAMAGE.

STORMWATER MANAGEMENT/ BMP FACILITY MAINTENANCE PLAN

PROPER MAINTENANCE OF THIS FACILITY IS ENCOURAGED TO PREVENT THE INTRODUCTION OF DEBRIS AND SEDIMENT IN TO THE FACILITY, SPILLWAY(S) AND DOWNSTREAM WATERWAYS. FOLLOWING INSTALLATION OF THE FACILITY AND ESTABLISHMENT OF VEGETATION IN DISTURBED AREAS, INSPECTIONS FOR SEDIMENT BUILDUPS WILL BE PERFORMED AT LEAST QUARTERLY. IT IS ANTICIPATED THAT UNDER NORMAL CONDITIONS, SEDIMENT REMOVAL FROM THE FACILITY WILL BE REQUIRED ONCE EVERY 10 YEARS. IF OTHER CONSTRUCTION OR RELATED ACTIVITIES ARE PERFORMED ON UPSLOPE PARCELS, ADEQUATE PROTECTION SHOULD BE PROVIDED AND INSPECTIONS PERFORMED AT LEAST ONCE WEEKLY.

A DESIGNATED REPRESENTATIVE OF THE OWNER WILL INSPECT THE SWM STRUCTURE AFTER EACH SIGNIFICANT RAINFALL EVENT OR THE FOLLOWING WORKING DAY IF A WEEKEND OR HOLIDAY OCCURS. A SIGNIFICANT RAINFALL FOR THIS STRUCTURE IS DEFINED AS ONE (1) INCH OR MORE OF GAUGED RAINFALL WITHIN A 24 HOUR PERIOD. ONCE PER YEAR, A REPRESENTATIVE OF THE COUNTY MAY JOINTLY INSPECT THE STRUCTURE. APPROPRIATE ACTION, PERFORMED AT THE COST OF THE OWNER, WILL BE TAKEN TO ENSURE APPROPRIATE MAINTENANCE. WHERE STRUCTURES ARE TO BE MAINTAINED JOINTLY, ALLOCATION OF MAINTENANCE COSTS WILL BE IN ACCORDANCE WITH THE TERMS ESTABLISHED IN MAINTENANCE AGREEMENTS. KEYS TO LOCKED ACCESS POINTS SHALL BE MADE AVAILABLE TO COUNTY INSPECTION PERSONNEL UPON REQUEST.

INSPECTION AND MAINTENANCE OF THE FACILITY WILL CONSIST OF THE FOLLOWING ADDITIONAL MEASURES:

1. THE INSPECTION FOR SEDIMENT BUILDUP WILL BE PERFORMED BY VISUAL INSPECTION AND A PHYSICAL DETERMINATION OF SEDIMENT DEPTH WITHIN THE STORAGE AREA. IF THE DEPTH OF SEDIMENT REACHES THE DEPTH OF 1.0 ft. ABOVE THE BOTTOM OF SEDIMENT FOREBAY (i.e. CLEANOUT ELEVATION 79.0), REMOVAL IS REQUIRED USING A RUBBER-WHEELED BACKHOE. AT THE SAME TIME, OR AT LEAST ONCE PER YEAR, CLEAN THE RISER BOTTOM AND OUTLET PIPE OF ACCUMULATED SEDIMENTS. DISPOSE OF SEDIMENTS REMOVED FROM THE FACILITY AT AN ACCEPTABLE DISPOSAL AREA.

2. PERFORM MAINTENANCE MOWING OF POND GRASSES AT LEAST TWICE EACH YEAR. GRASSES SUCH AS TALL FESCUE SHOULD BE MOWED IN EARLY SUMMER AFTER EMERGENCE OF THE HEADS ON COOL SEASON GRASSES AND IN LATE FALL TO PREVENT SEEDS OF ANNUAL WEEDS FROM MATURING. MOWING OF LEGUMES CAN BE LESS FREQUENT. TREES AND SHRUBS SHOULD NOT BE PERMITTED TO GROW ON ANY PART OF THE GRADED EMBANKMENT.

3. PERFORM SOIL SAMPLING ON STABILIZED POND SOIL AREAS ONCE EVERY FOUR (4) YEARS. SOIL SAMPLING AND TESTING SHOULD BE PERFORMED BY A QUALIFIED INDEPENDENT TESTING LABORATORY. APPLY ADDITIONAL LIME AND FERTILIZER IN ACCORDANCE WITH TEST RECOMMENDATIONS.

4. IN STABILIZED POND AREAS, IF VEGETATION COVERS LESS THAN 40% OF SOIL SURFACES, LIME FERTILIZE AND SEED IN ACCORDANCE WITH RECOMMENDATIONS FOR NEW SEEDLINGS, AS LISTED IN DAM CONSTRUCTION NOTES. IF VEGETATION COVERS MORE THAN 40% BUT LESS THAN 70% OF SOIL SURFACES, LIME FERTILIZE AND OVERSEED IN ACCORDANCE WITH CURRENT SEEDLING RECOMMENDATIONS.

5. PERFORM QUARTERLY INSPECTIONS OF THE RISER SECTION AND CREST OF SPILLWAY FOR THE OBSERVANCE OF COLLECTED DEBRIS. IMMEDIATELY REMOVE ANY DEBRIS TO MAINTAIN THE INTEGRITY OF THE STRUCTURE AND PROVIDE AN ATTRACTIVE APPEARANCE.

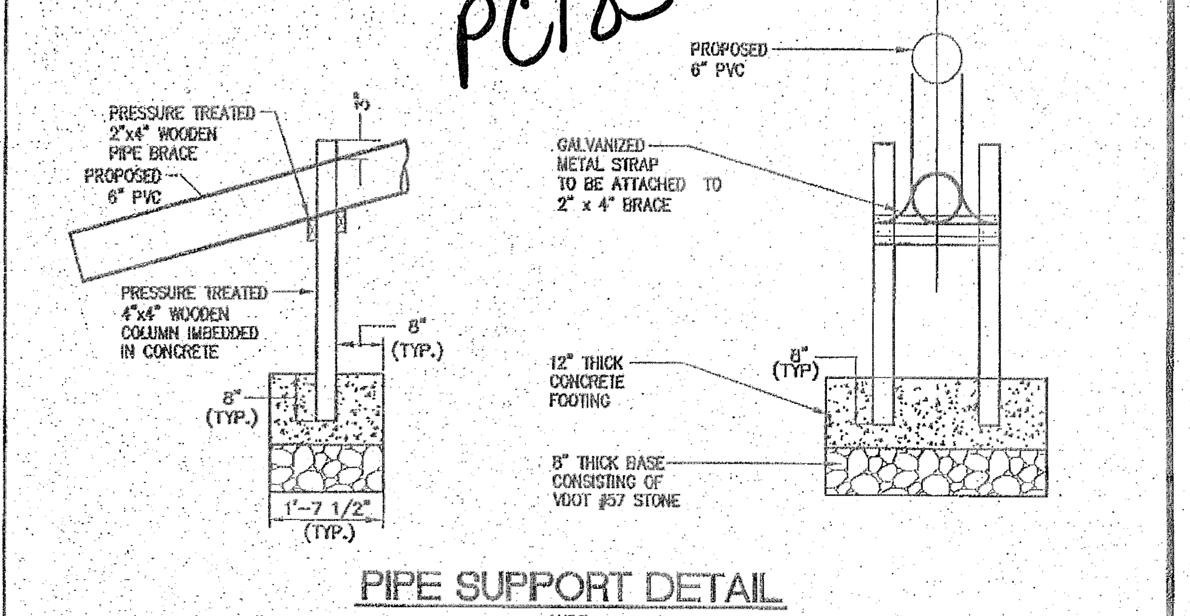
6. PERFORM YEARLY STRUCTURAL INSPECTIONS OF THE FACILITY FOR DAMAGE. STRUCTURAL INSPECTION SHALL BE PERFORMED ON THE CONCRETE RISER, ANTI-VORTEX DEVICE, TRASH RACK, ORIFICE/ WEIR(S), OUTLET BARREL AND POND EMBANKMENT. IF DAMAGE IS EVIDENT, FURTHER INVESTIGATION BY A PROFESSIONAL ENGINEER MAY BE REQUIRED TO ASSESS THE INTEGRITY OF THE STRUCTURE.

7. PERFORM QUARTERLY INSPECTIONS OF THE GRADED SIDE SLOPES OF THE DETENTION FACILITY FOR SIGNS OF ANIMAL/ RODENT BORROWS OR SLOPE EROSION. IMMEDIATELY PERFORM NECESSARY REPAIRS, REFILLING OR RESEEDING AS APPROPRIATE.

8. RECORD KEEPING. THE OWNER OR DESIGNATED REPRESENTATIVE SHALL KEEP REASONABLE, ACCURATE WRITTEN RECORDS OR INSPECTIONS PERFORMED FOR THE STRUCTURE. RECORDS SHALL DOCUMENT OR REPAIRS PERFORMED. COPIES SHALL BE PROVIDED TO THE COUNTY UPON REQUEST.

9. THE FACILITY SHALL NOT BE MODIFIED IN ANY WAY WITHOUT PRIOR CONSENT/ APPROVAL OF THE COUNTY.

PC185



PIPE SUPPORT DETAIL

N.T.S.

No.	DATE	REVISION / COMMENT / NOTE	BY
3	1/12/01	REVISED PER JCC ENVIRONMENTAL DIVISION COMMENTS	CBR
2	12/5/00	REVISED PER VDOT COMMENTS	CBR
1	11/6/00	REVISED PER JCC REVIEW COMMENTS	CBR

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

NOTES AND DETAILS
WILLIAMSBURG PLANTATION
ROAD DESIGN
OWNER/DEVELOPER: WILLIAMSBURG PLANTATION, INC.
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed DPW/CBR	Drawn DPW
Scale AS NOTED	Date 9/11/00
Project No. 7555-14	
Drawing No. 8	

RECORD DRAWING.: 1/16/2008

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NOTES:
1. ALL RADII ARE TO FACE OF CURB.
2. SEE SHEET 9 FOR PAVEMENT SECTION DETAILS.
3. THE FOLLOWING PIPE MATERIALS ARE APPROVED FOR CONSTRUCTION OF THE STORM SEWER:
   REINFORCED CONCRETE CLASS III (RCP)
   HIGH DENSITY POLYETHYLENE (HDPE)
   ALUMINIZED STEEL TYPE II (ASCP II)
   OR OTHER APPROVED BY ENGINEER
4. PIPE BEDDING, INSTALLATION, AND OTHER COMPACTION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND GUIDELINES.

BELLE GROVE COURT

NOTE:
1. FUTURE BUILDING PAD LOCATIONS SHALL BE FILLED AS NECESSARY WITH SUITABLE EXCESS MATERIAL FROM OTHER PORTIONS OF THE PROJECT TO ACHIEVE FINISHED FLOOR ELEVATIONS.
2. CONTRACTOR SHALL INSTALL SILT FENCE ON ALL DOWNSTREAM SIDES OF FILL LOCATIONS TO ENSURE SEDIMENT IS CONTAINED.
3. CONTRACTOR SHALL STRIP TOPSOIL DOWN TO SUITABLE SUBGRADE AND GEOTECHNICAL ENGINEER SHALL INSPECT BEFORE PLACING COMPACTED FILL
4. CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE OCCURS THROUGHOUT ALL OF THE FILL AREAS AT ALL TIMES.
5. NO MORE THAN 1 ACRE OF FILL AREA SHALL BE DENUDED AT A TIME.
6. SEE E&S NOTE 9 ON SHEET 10 FOR STABILIZATION OF FILL AREAS.

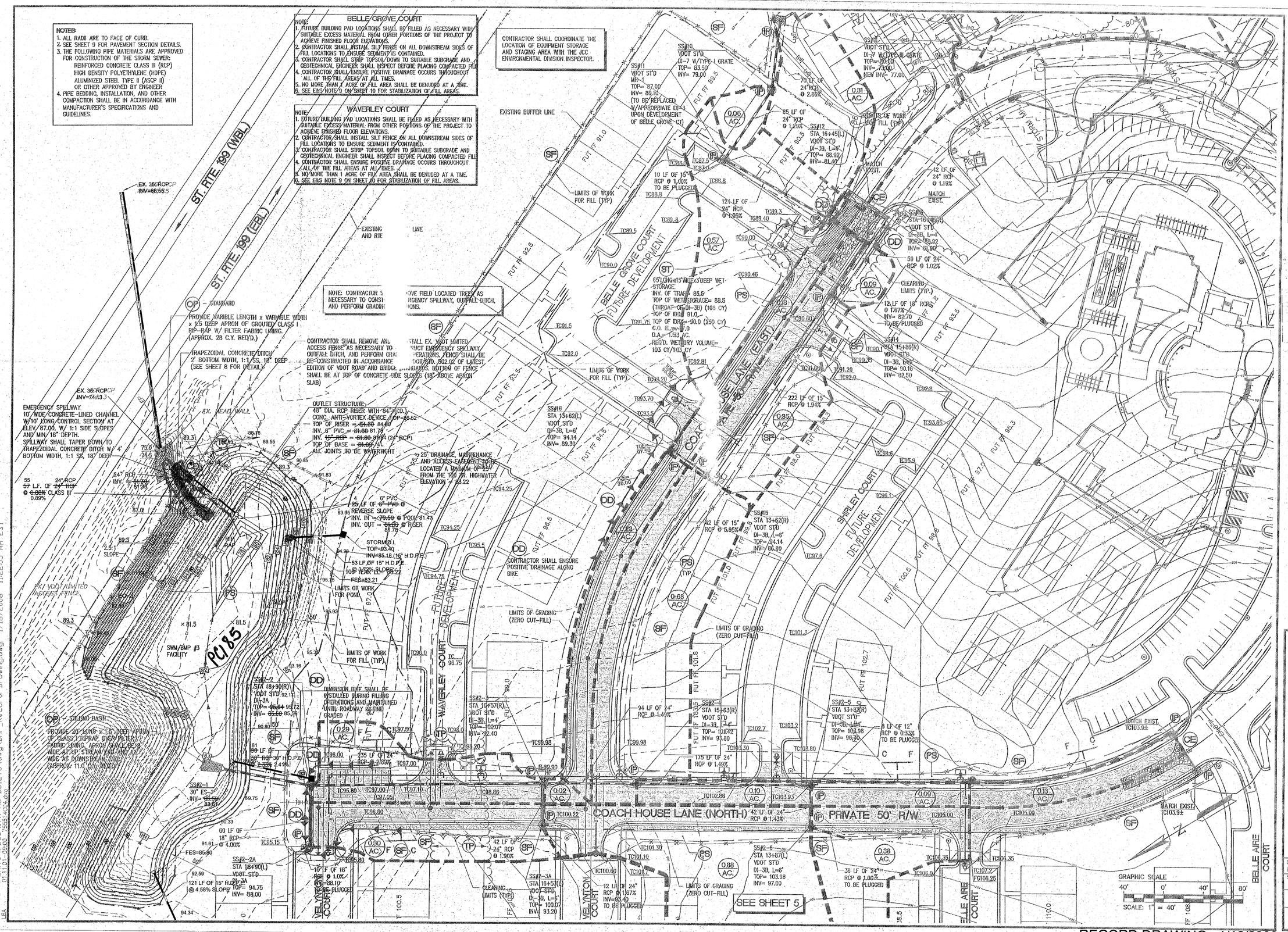
WAVERLEY COURT

NOTE:
1. FUTURE BUILDING PAD LOCATIONS SHALL BE FILLED AS NECESSARY WITH SUITABLE EXCESS MATERIAL FROM OTHER PORTIONS OF THE PROJECT TO ACHIEVE FINISHED FLOOR ELEVATIONS.
2. CONTRACTOR SHALL INSTALL SILT FENCE ON ALL DOWNSTREAM SIDES OF FILL LOCATIONS TO ENSURE SEDIMENT IS CONTAINED.
3. CONTRACTOR SHALL STRIP TOPSOIL DOWN TO SUITABLE SUBGRADE AND GEOTECHNICAL ENGINEER SHALL INSPECT BEFORE PLACING COMPACTED FILL
4. CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE OCCURS THROUGHOUT ALL OF THE FILL AREAS AT ALL TIMES.
5. NO MORE THAN 1 ACRE OF FILL AREA SHALL BE DENUDED AT A TIME.
6. SEE E&S NOTE 9 ON SHEET 10 FOR STABILIZATION OF FILL AREAS.

CONTRACTOR SHALL COORDINATE THE LOCATION OF EQUIPMENT STORAGE AND STAGING AREA WITH THE JCC ENVIRONMENTAL DIVISION INSPECTOR.

NOTE: CONTRACTOR S... NECESSARY TO CONST... AND PERFORM GRADIN... ...OVE FIELD LOCATED TREES AS ...RGENCY SPILLWAY, OUTFALL DITCH, ...IONS.

CONTRACTOR SHALL REMOVE AN... ...STALL EX. VDOT LIMITED ACCESS FENCE AS NECESSARY TO ...RUCT EMERGENCY SPILLWAY, OUTFALL DITCH, AND PERFORM GRA... ...PERATIONS. FENCE SHALL BE RE-CONSTRUCTED IN ACCORDANCE ...DOT ROAD AND BRIDGE STANDARDS. BOTTOM OF FENCE EDITION OF VDOT ROAD AND BRIDGE STANDARDS. BOTTOM OF FENCE SHALL BE AT TOP OF CONCRETE SIDE SLOPES (18" ABOVE APRON SLAB)



No.	DATE	REVISION / COMMENT / NOTE	BY
3	1/16/08	REVISED PER JCC ENVIRONMENTAL DIVISION COMMENTS	GBR
2	12/5/00	REVISED PER VDOT COMMENTS	GBR
1	11/6/00	REVISED PER JCC REVIEW COMMENTS	GBR

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

DRAINAGE AND EROSION AND SEDIMENT CONTROL PLAN
WILLIAMSBURG PLANTATION
ROAD DESIGN
OWNER/DEVELOPER: WILLIAMSBURG PLANTATION, INC.
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
DPW/CBR	RMK/LBA
Scale	Date
1"=40'	9/11/00

Project No. 7555-14

Drawing No. 4

RECORD DRAWING.: 1/16/2008

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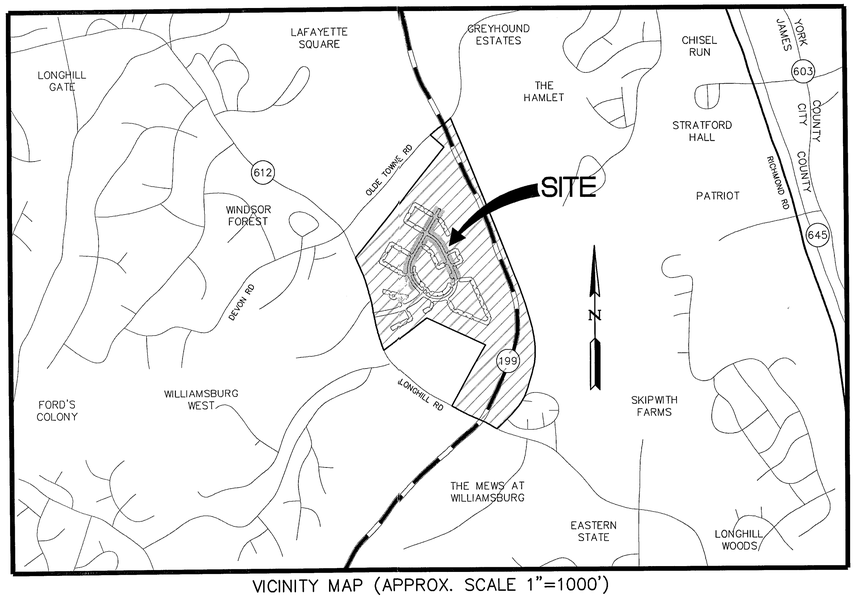
WILLIAMSBURG PLANTATION
ROAD EXTENSION
FOR
WILLIAMSBURG PLANTATION, INC.

GENERAL NOTES

1. PROPERTY ZONING: LIMITED RESIDENTIAL DISTRICT R-2.
2. PROPERTY TAX PARCEL NO.: PART OF (32-4) (1-26C)
3. PROPERTY ADDRESS: 4870 LONGHILL ROAD
4. THIS SITE PLAN IS FOR THE EXTENSION OF THE SPINE ROAD FOR AN APPROVED OVERALL CLUSTER DEVELOPMENT PLAN (JCC CASE NO. MP-02-00).
5. OVERALL SITE DENSITY IS 3.99 UNITS/ ACRE AS APPROVED WITH AMENDED MASTER PLAN MP-02-00. TOTAL APPROVED UNITS TO DATE = 96 UNITS.
6. ALL UTILITIES SHALL BE PLACED UNDERGROUND AND SHALL HAVE A MINIMUM OF 36" OF COVER.
7. THE CONTRACTOR SHALL SATISFY HIMSELF AS TO ALL SITE CONDITIONS PRIOR TO CONSTRUCTION. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND SHALL NOTIFY MISS UTILITY (1-800-552-7001) PRIOR TO ANY EXCAVATION OR DEMOLITION.
8. VERIFY ALL DIMENSIONS AND NOTIFY JAMES CITY SERVICE AUTHORITY PRIOR TO ANY EXCAVATION OR DEMOLITION WITHIN UTILITY CORRIDORS.
9. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS PRIOR TO COMMENCEMENT OF WORK, TO INCLUDE, BUT NOT LIMITED TO, JAMES CITY COUNTY LAND DISTURBANCE, BUILDING, AND UTILITY.
10. A LAND DISTURBING PERMIT AND SILTATION AGREEMENT, WITH SURETY, ARE REQUIRED FOR THIS PROJECT.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF CONSTRUCTION EFFORTS WITH VIRGINIA NATURAL GAS, VIRGINIA POWER, APPROPRIATE TELEPHONE COMPANY, APPROPRIATE CABLE COMPANY, JAMES CITY SERVICE AUTHORITY, AND OTHERS THAT MAY BE REQUIRED.
12. PROJECT TO BE SERVED BY PUBLIC WATER AND SEWER OWNED BY THE JAMES CITY SERVICE AUTHORITY. ALL WATER AND SEWER CONSTRUCTION TO BE IN ACCORDANCE WITH THE JAMES CITY SERVICE AUTHORITY STANDARDS AND SPECIFICATIONS. THE CONTRACTOR SHALL AT ALL TIMES POSSESS AND MAINTAIN A CURRENT COPY OF THE JAMES CITY SERVICE AUTHORITY STANDARDS AND SPECIFICATIONS ON THE SITE.
13. ALL PARKING SPACES SHALL BE DELINEATED WITH PAINT STRIPING. THE MINIMUM NUMBER OF PARKING SPACES SHALL BE TWO PER DWELLING UNIT, IN ACCORDANCE WITH SEC. 24-59 (A) (1 OF THE JCC ZONING ORDINANCE. HANDICAP PARKING SPACES SHALL BE DESIGNATED BY ABOVE GROUND SIGNS PER USBC REQUIREMENTS.
14. REFUSE TO BE REMOVED BY PRIVATE CONTRACTOR.
15. THE SITE DOES NOT LIE WITHIN ANY RESOURCE PROTECTION AREAS.
16. THIS PROPERTY LIES IN ZONE "X" (AREAS DETERMINED TO BE OUTSIDE THE 500 YEAR FLOOD PLAIN) AS SHOWN ON COMMUNITY PANEL #510201 0035 B, DATED 2/6/ 1991 OF THE FLOOD INSURANCE RATE MAPS FOR JAMES CITY COUNTY, VIRGINIA.
17. CONTOUR INTERVAL IS ONE FOOT.
18. ANY NEW SIGNS SHALL BE IN ACCORDANCE WITH SECTION 24-70 OF THE JCC ZONING ORDINANCE.
19. ANY OLD WELLS THAT MAY BE ON-SITE THAT WILL NOT BE USED MUST BE PROPERLY ABANDONED ACCORDING TO STATE PRIVATE WELL REGULATIONS AND JAMES CITY COUNTY CODE.
20. NO WETLANDS, RPA, HYDRIC SOILS OR SLOPES IN EXCESS OF 25% ARE LOCATED ON THE SITE.
21. OWNER/ DEVELOPER: THE BERKELEY GROUP
    MR. J.P. OTTINO, III
    BERKELEY SOUTH BLDG, EXEC. SUITE 115
    3015 N. OCEAN BLVD
    FT. LAUDERDALE, FL 33308



VICINITY MAP (APPROX. SCALE 1"=1000')

DATE: SEPTEMBER 11, 2000
PROJECT NO.: 7555-14
REVISION DATE: JANUARY 12, 2001
APPROVAL DATE: MARCH 8, 2001

LEGEND

EXISTING		PROPOSED	EXISTING		PROPOSED
W	WATER	W		EXISTING TREELINE	
S	SANITARY SEWER	S	8"MAPLE	EXISTING TREE	
	STORM SEWER			LIMITS OF CLEARING	
FM	FORCE MAIN	FM		SILT FENCE	SF
O/H TELE	OVERHEAD TELEPHONE LINE	O/H TELE		WIRE REINFORCED SILT FENCE	SSF
PHONE	UNDERGROUND PHONE LINE	PHONE		INLET PROTECTION	IP
O/E	OVERHEAD ELECTRIC LINE	O/E		CHECK DAM	CD
G	GAS LINE	G		STRAW BALE BARRIER	SB
FO	FIBER OPTIC	FO		DIVERSION DIKE	DD
	OVERHEAD CABLE			RIP RAP	
	MANHOLE			REVERSE GRADE GUTTER PAN	
	CURB DROP INLET			BORING	
	YARD DROP INLET			BENCH MARK	
	FARED END SECTION		25.1	GROUND ELEVATION	25.1
	VALVE			TOP OF CURB ELEV.	TC= ELEV
	FIR HYDRANT ASSEMBLY			FINISH GRADE ELEV.	FG= ELEV
	FLOW-OFF VALVE			TOP OF WALL ELEV.	TW= ELEV
	GAS RELEASE ASSEMBLY			GRADING LINE TIE-IN	
	CLEAN OUT		80	EXISTING CONTOUR ELEV.	
	WATER METER			CONTOUR ELEV.	80
	POWER POLE			GRADING BY OTHERS	80
	POWER POLE W/GUY WIRE			RESERVED PARKING	
	LIGHT POLE			YARD HYDRANT	W
	STREETLIGHT			MAILBOX	
	CENTERLINE/BASELINE			SIGN	
	RIGHT OF WAY			WETLANDS	
	PROPERTY LINE			RPA BUFFER	
	℄ DITCH/SWALE			25% SLOPES OR GREATER	
	CONCRETE LINED DITCH			AREA OF FILL	
	EC-3 LINED DITCH			HIGH POINT	HP
	BITUMINOUS CONCRETE				
	CONCRETE				
	AGGREGATE/GRAVEL				

INDEX OF SHEETS

SHEET NUMBER	DESCRIPTION
1	COVER SHEET
2	ROAD PLAN
3	UTILITY PLAN
4	DRAINAGE AND EROSION AND SEDIMENT CONTROL PLAN
5	DRAINAGE AND EROSION AND SEDIMENT CONTROL PLAN
6	ROAD AND UTILITY PROFILES
7	BMP LANDSCAPING PLAN
8	DAM NOTES AND DETAILS
9	NOTES AND DETAILS
10	NOTES AND DETAILS

RECORD DRAWING BASED ON INFORMATION AS SURVEYED 1-11-02 BY A.E.S. CONSULTING ENGINEERS

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

I HEREBY CERTIFY TO THE BEST OF MY JUDGEMENT, KNOWLEDGE, AND BELIEF THAT THIS RECORD DRAWING REPRESENTS THE CONDITIONS OF THE SITE ON THE DATE IT WAS SURVEYED. THE SITE APPEARS TO CONFORM WITH THE PROVISIONS OF THE APPROVED DESIGN PLAN.

ENGINEER — DATE 3/27/03

COMMONWEALTH OF VIRGINIA
RICHARD A. COSTELLO
CERTIFICATE NO. 013250
3/21/03
CERTIFIED PROFESSIONAL ENGINEER

SJT REVIEW SET
PC 185; SP-111-00

No.	DATE	REVISION / COMMENT / NOTE	BY
4	3/27/03	SWM/BMP DRY POND RECORD DRAWING	CBR
3	1/12/01	REVISED PER JCC ENVIRONMENTAL DIVISION COMMENTS	CBR
2	12/5/00	REVISED PER VDOT COMMENTS	CBR
1	11/6/00	REVISED PER JCC REVIEW COMMENTS	CBR

SP -111-00 RECORD DRAWING-3/27/03

03.27.03-10:58 7555142RP01.dwg
LBA

NOTES:
1. ALL RADII ARE TO FACE OF CURB.
2. SEE SHEET 9 FOR PAVEMENT SECTION DETAILS.
3. THE FOLLOWING PIPE MATERIALS ARE APPROVED FOR CONSTRUCTION OF THE STORM SEWER:
   REINFORCED CONCRETE CLASS III (RCP)
   HIGH DENSITY POLYETHYLENE (HDPE)
   ALUMINIZED STEEL TYPE II (ASCP II)
   OR OTHER APPROVED BY ENGINEER
4. PIPE BEDDING, INSTALLATION, AND OTHER COMPACTION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND GUIDELINES.

BELLE GROVE COURT

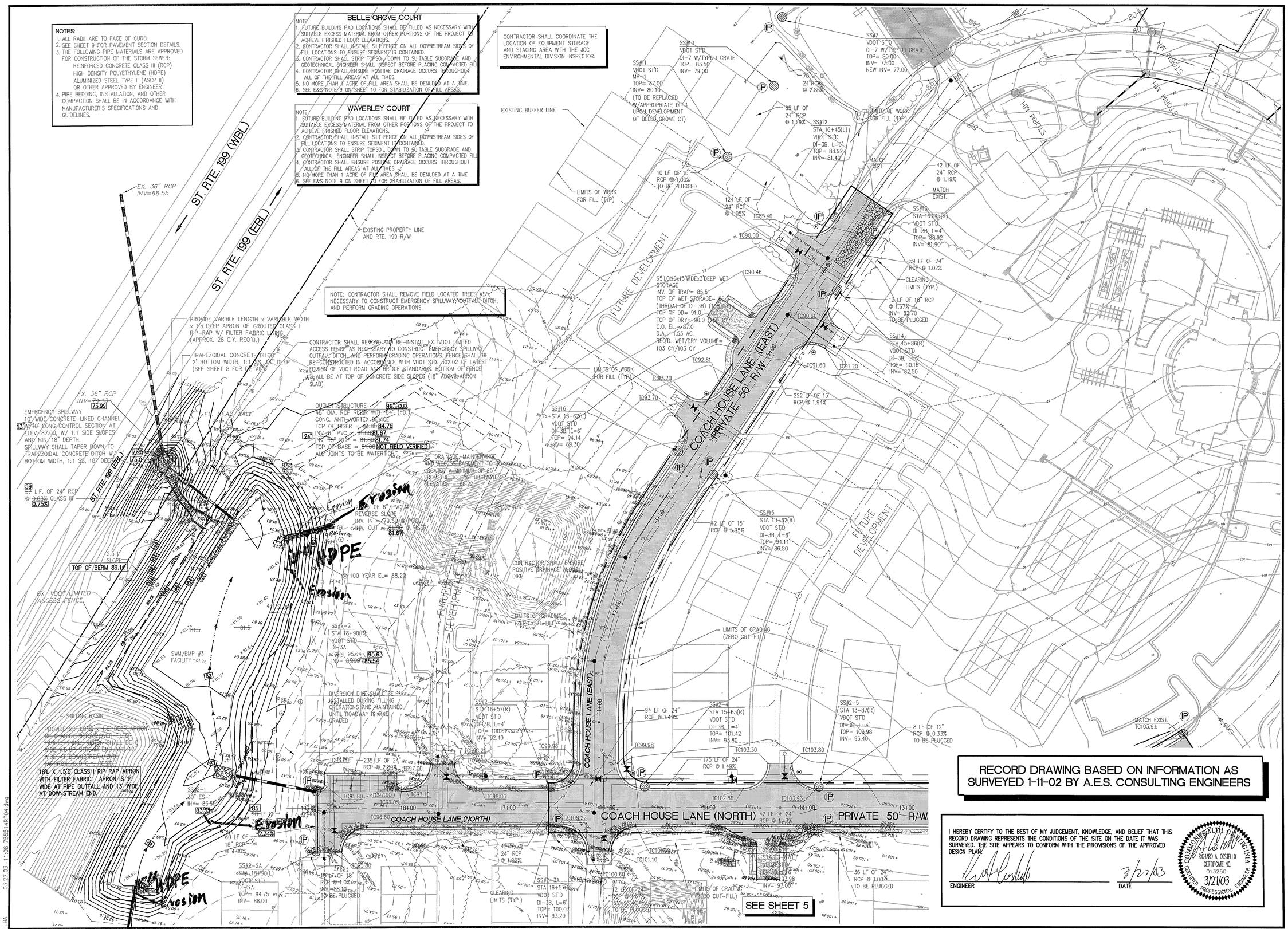
NOTE:
1. FUTURE BUILDING PAD LOCATIONS SHALL BE FILLED AS NECESSARY WITH SUITABLE EXCESS MATERIAL FROM OTHER PORTIONS OF THE PROJECT TO ACHIEVE FINISHED FLOOR ELEVATIONS.
2. CONTRACTOR SHALL INSTALL SILT FENCE ON ALL DOWNSTREAM SIDES OF FILL LOCATIONS TO ENSURE SEDIMENT IS CONTAINED.
3. CONTRACTOR SHALL STRIP TOPSOIL DOWN TO SUITABLE SUBGRADE AND GEOTECHNICAL ENGINEER SHALL INSPECT BEFORE PLACING COMPACTED FILL
4. CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE OCCURS THROUGHOUT ALL OF THE FILL AREAS AT ALL TIMES.
5. NO MORE THAN 1 ACRE OF FILL AREA SHALL BE DENUDED AT A TIME.
6. SEE E&S NOTE 9 ON SHEET 10 FOR STABILIZATION OF FILL AREAS.

WAVERLEY COURT

NOTE:
1. FUTURE BUILDING PAD LOCATIONS SHALL BE FILLED AS NECESSARY WITH SUITABLE EXCESS MATERIAL FROM OTHER PORTIONS OF THE PROJECT TO ACHIEVE FINISHED FLOOR ELEVATIONS.
2. CONTRACTOR SHALL INSTALL SILT FENCE ON ALL DOWNSTREAM SIDES OF FILL LOCATIONS TO ENSURE SEDIMENT IS CONTAINED.
3. CONTRACTOR SHALL STRIP TOPSOIL DOWN TO SUITABLE SUBGRADE AND GEOTECHNICAL ENGINEER SHALL INSPECT BEFORE PLACING COMPACTED FILL
4. CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE OCCURS THROUGHOUT ALL OF THE FILL AREAS AT ALL TIMES.
5. NO MORE THAN 1 ACRE OF FILL AREA SHALL BE DENUDED AT A TIME.
6. SEE E&S NOTE 9 ON SHEET 10 FOR STABILIZATION OF FILL AREAS.

CONTRACTOR SHALL COORDINATE THE LOCATION OF EQUIPMENT STORAGE AND STAGING AREA WITH THE JCC ENVIRONMENTAL DIVISION INSPECTOR.

NOTE: CONTRACTOR SHALL REMOVE FIELD LOCATED TREES AS NECESSARY TO CONSTRUCT EMERGENCY SPILLWAY, OUTFALL DITCH, AND PERFORM GRADING OPERATIONS.



RECORD DRAWING BASED ON INFORMATION AS SURVEYED 1-11-02 BY A.E.S. CONSULTING ENGINEERS

I HEREBY CERTIFY TO THE BEST OF MY JUDGEMENT, KNOWLEDGE, AND BELIEF THAT THIS RECORD DRAWING REPRESENTS THE CONDITIONS OF THE SITE ON THE DATE IT WAS SURVEYED. THE SITE APPEARS TO CONFORM WITH THE PROVISIONS OF THE APPROVED DESIGN PLAN.

ENGINEER — DATE 3/27/03

COMMONWEALTH OF VIRGINIA — RICHARD A. COSTELLO — CERTIFICATE NO. 013250 — 3/27/03 — CERTIFIED PROFESSIONAL ENGINEER

No.	DATE	REVISION / COMMENT / NOTE	BY
4	3/27/03	SWM/BMP DRY POND RECORD DRAWING	CBR
3	1/12/01	REVISED PER JCC ENVIRONMENTAL DIVISION COMMENTS	CBR
2	12/5/00	REVISED PER VDOT COMMENTS	CBR
1	11/8/00	REVISED PER JCC REVIEW COMMENTS	CBR

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

DRAINAGE AND EROSION AND SEDIMENT CONTROL PLAN
WILLIAMSBURG PLANTATION
ROAD DESIGN
OWNER/DEVELOPER: WILLIAMSBURG PLANTATION, INC.
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
DPW/CBR	RMK/LBA
Scale	Date
1"=40'	9/11/00

Project No. 7555-14
Drawing No. 4

SP-111-00 RECORD DRAWING-3/27/03

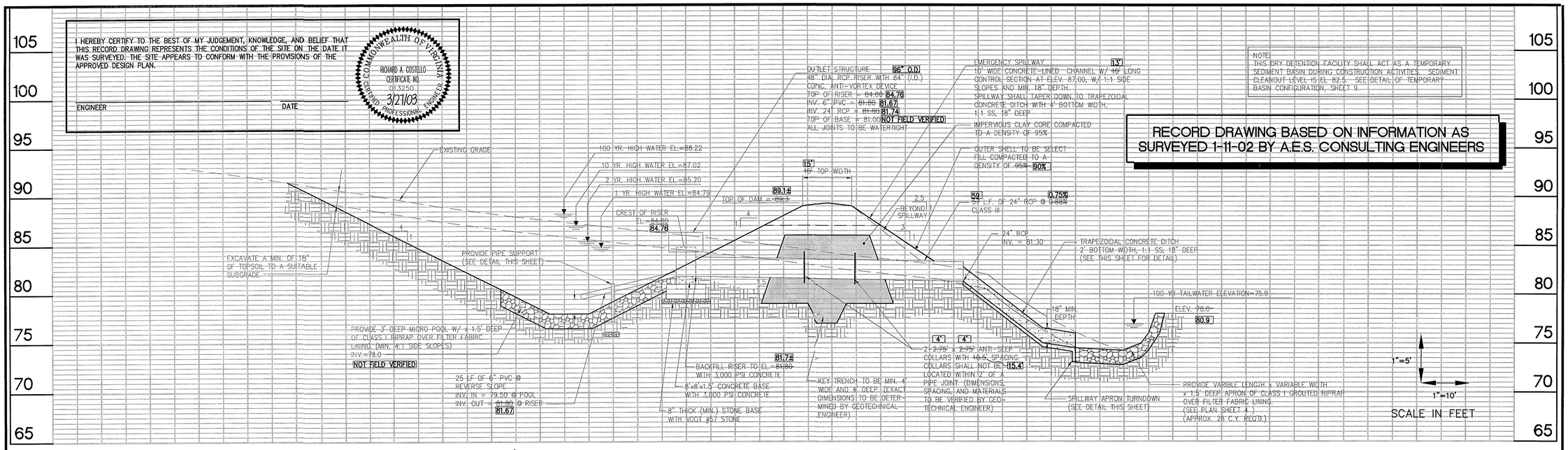
I HEREBY CERTIFY TO THE BEST OF MY JUDGEMENT, KNOWLEDGE, AND BELIEF THAT THIS RECORD DRAWING REPRESENTS THE CONDITIONS OF THE SITE ON THE DATE IT WAS SURVEYED; THE SITE APPEARS TO CONFORM WITH THE PROVISIONS OF THE APPROVED DESIGN PLAN.

ENGINEER DATE

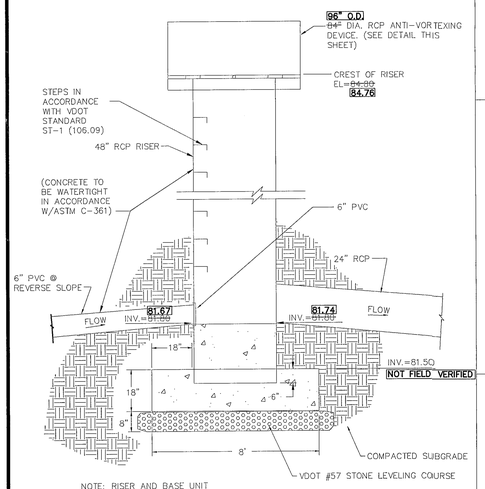
COMMONWEALTH OF VIRGINIA
RICHARD A. COSTELLO
CERTIFICATE NO. 013250
3/27/03
REGISTERED PROFESSIONAL ENGINEER

RECORD DRAWING BASED ON INFORMATION AS SURVEYED 1-11-02 BY A.E.S. CONSULTING ENGINEERS

NOTE:
THIS DRY DETENTION FACILITY SHALL ACT AS A TEMPORARY SEDIMENT BASIN DURING CONSTRUCTION ACTIVITIES. SEDIMENT CLEANOUT LEVEL IS EL. 82.5. SEE DETAIL OF TEMPORARY BASIN CONFIGURATION, SHEET 9.



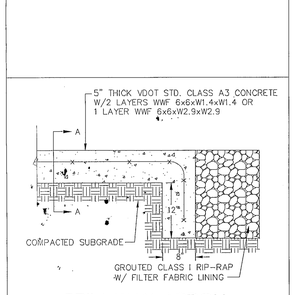
SWM/BMP #3 FACILITY DRY POND - SECTION A-A



NOTE: RISER AND BASE UNIT TO BE PRECAST.

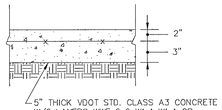
CROSS SECTION PROP. 48" RISER STRUCTURE WITH ANTI-VORTEXING TOP

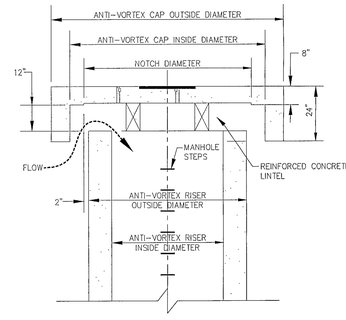
NOT TO SCALE



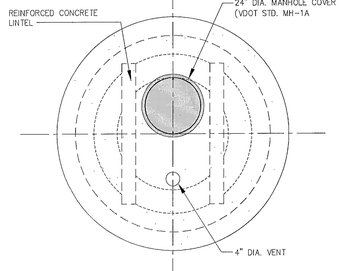
SPILLWAY APRON TURNDOWN

N.T.S.





SECTION



PLAN - TOP SLAB

1. ANTI-VORTEX DEVICE (CAP AND RISER) MANUFACTURED IN ACCORDANCE WITH ASTM C478.
2. DIMENSIONS SUBJECT TO PERMISSIBLE VARIATIONS OF ASTM C478
3. INLET AREA (AREA BETWEEN DEVICE I.D. AND RISER O.D.) IS GREATER THAN OUTLET AREA (AREA OF RISER I.D.)
4. SLAB REINFORCEMENT TO BE ASTM A615 #4 BARS @ 8" E.W. CIRCUMFERENCIAL.

ANTI- VORTEX DETAIL

NOT TO SCALE

DAM CONSTRUCTION NOTES

1. A GEOTECHNICAL SUBSURFACE EXPLORATION AT THE PROPOSED DAM SITE SHALL BE PERFORMED TO ENSURE SUITABILITY OF THE SUBGRADE. THE GEOTECHNICAL INVESTIGATION WILL DETERMINE SUITABILITY OF THE FILL MATERIAL, RECOMMENDED ANTI-SEEP MEASURES, KEY TRENCH DEPTH AND WIDTH, AND THE ANTICIPATED LOCATION OF THE PHREATIC LINE. THESE RECOMMENDATIONS ARE HEREBY MADE A PART OF THE DAM'S CONSTRUCTION SPECIFICATIONS. A REPRESENTATIVE OF THE GEOTECHNICAL CONSULTANT SHALL BE ON SITE DURING CONSTRUCTION TO ENSURE PROPER MATERIALS AND DAM CONSTRUCTION METHODS ARE UTILIZED. FOLLOWING DAM CONSTRUCTION, THE GEOTECHNICAL CONSULTANT SHALL PROVIDE WRITTEN DOCUMENTATION, SIGNED BY A PROFESSIONAL ENGINEER, THAT THE DAM WAS BUILT IN ACCORDANCE WITH THEIR RECOMMENDATIONS, PLANS, AND SPECIFICATIONS. THE GEOTECHNICAL CONSULTANT SHALL COORDINATE WITH THE DESIGN ENGINEER IN ORDER TO COMPLETE THE JCC ENVIRONMENTAL DIVISION STORMWATER MANAGEMENT/BMP FACILITIES CONSTRUCTION AND AS-BUILT CERTIFICATION FORM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE DAM CONSTRUCTION SCHEDULE WITH THE GEOTECHNICAL CONSULTANT IN ORDER TO ENSURE ON-SITE MONITORING.

2. SITE PREPARATION:
THE CONTRACTOR SHALL STRIP ALL AREAS OF THE PERMANENT COVER IN CONSTRUCTION AREA TO REMOVE ALL UNSUITABLE MATERIALS. THE UNSUITABLE MATERIALS TO BE REMOVED BY STRIPPING SHALL INCLUDE ALL TOPSOIL, DEBRIS AND VEGETABLE MATTER, INCLUDING STUMPS AND ROOTS, AND ALL OTHER MATERIALS WHICH MAY BE UNSUITABLE FOR USE IN THE PERMANENT CONSTRUCTION.

3. EMBANKMENT:
THE EXPOSED SUB GRADE SOILS SHALL BE CAREFULLY INSPECTED BY THE GEOTECHNICAL ENGINEER ANY UNSUITABLE MATERIALS THUS EXPOSED SHALL BE REMOVED AND REPLACED WITH A WELL COMPACTED, SUITABLE MATERIAL. DENSITY TESTING, AT THE DISCRETION OF THE OWNER/GEOTECHNICAL ENGINEER, SHALL BE PERFORMED AT THIS TIME. THE EMBANKMENT SHALL BE KEYED INTO THE UNDISTURBED (EXISTING) SOIL STRATUM. EMBANKMENT SHOULD BE KEYED AT LEAST 3 FEET INTO THE STRATUM OR AS SPECIFIED BY THE GEOTECHNICAL ENGINEER (WIDTH=6 FT. MIN.) THE EMBANKMENT FOUNDATION AND ABUTMENTS SHALL BEAR ON FIRM AND STABLE EXISTING SUB-GRADE WHICH HAS BEEN PREPARED SO AS TO REMOVE ALL ORGANIC, LOOSE , AND GENERALLY UNSUITABLE MATERIAL. ALL MATERIALS TO BE USED FOR BACKFILL OR COMPACTED FILL SHALL BE INSPECTED AND, IF NECESSARY, TESTED BY THE GEOTECHNICAL ENGINEER IN ACCORDANCE WITH ASTM D2487 PRIOR TO PLACEMENT, TO DETERMINE IF THEY ARE SUITABLE FOR THE INTENDED USE. THE FILL MATERIAL SHALL BE TAKEN FROM APPROVED BORROW AREAS. IT SHALL BE CLEAN MINERAL SOIL FREE OF ROOTS, WOOD VEGETATION, OVERSIZED STONES, ROCKS, OR OTHER OBJECTIONABLE MATERIALS. MATERIALS TO BE USED FOR THE CONSTRUCTION OF THE SHELL SHALL BE SELECT BACKFILL FREE OF STUMPS, ROOTS, ROCKS, TRASH, ETC. AND SHALL BE MORE PERVIOUS THAN THE IMPERVIOUS CLAY CORE. AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED A MINIMUM OF 4 INCHES PRIOR TO PLACEMENT OF FILL.
THE FILL MATERIAL'S MOISTURE CONTENT SHALL BE (+3 TO -2) PERCENTAGE POINTS OF OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D2216 (I.E. IN GENERAL THE FILL MATERIAL SHOULD CONTAIN SUFFICIENT MOISTURE SO THAT IT CAN BE FORMED INTO A BALL WITHOUT CRUMBLING. IF WATER CAN BE SQUEEZED OUT OF THE BALL, IT IS TOO WET FOR PROPER COMPACTION). FILL MATERIAL WILL BE PLACED IN 6 TO 8 INCH CONTINUOUS LAYERS OVER THE ENTIRE LENGTH OF THE FILL. FIRST LIFT ON SUBGRADE MAY BE PLACED AT A DEPTH UP TO 30 INCHES TO BRIDGE SUBGRADE WITH OVER OPTIMUM MOISTURE CONTENT. COMPACTION, AS NOTED ON PLAN, SHALL BE OBTAINED GENERALLY BY USING A SHEEPSFOOT COMPACTOR. FINISHED GRADES SHALL BE MERGED NATURALLY INTO THE EXISTING GRADES.

4. CUTOFF TRENCH/KEY TRENCH:
THE TRENCH SHALL BE EXCAVATED ALONG THE CENTERLINE OF THE DAM. THE MINIMUM DEPTH SHALL BE AS SHOWN ON THE PLANS AND SHALL EXTEND UP BOTH ABUTMENTS. THE BOTTOM WIDTH SHALL BE WIDE ENOUGH TO PERMIT OPERATION OF COMPACTING EQUIPMENT. THE SIDE SLOPES SHALL BE NO STEEPER THAN 1:1. COMPACTING REQUIREMENTS SHALL BE THE SAME AS THOSE FOR EMBANKMENT. THE TRENCH SHALL BE KEPT DRAINED DURING THE BACKFILLING - COMPACTING OPERATIONS.

5. PRINCIPAL SPILLWAY:
THE BOTTOM OF THE SPILLWAY RISER FOUNDATION BASE EXCAVATION SHALL BE OBSERVED BY THE GEOTECHNICAL ENGINEER TO ENSURE THAT ALL UNSUITABLE AND LOOSE MATERIALS ARE REMOVED AND THAT ACCEPTABLE BEARING CONDITIONS EXIST IN THE FOUNDATION'S BASE. ALL JOINTS IN THE PRINCIPAL SPILLWAY STRUCTURE SHALL BE WATERTIGHT CONSTRUCTION. PERVIOUS MATERIALS SUCH AS SAND, GRAVEL OR CRUSHED STONE SHALL NOT BE USED AS BACKFILL AROUND THE BARREL OR ANTI-SEEP COLLAR. FILL MATERIAL SHALL BE PLACED AROUND THE PIPE IN 4 INCH LAYERS AND COMPACTED BY HAND TO THE SAME DENSITY AS THE EMBANKMENT. AMINIMUM OF TWO FEET OF FILL SHALL BE HAND-COMPACTED OVER THE BARREL BEFORE CROSSING IT WITH CONSTRUCTION EQUIPMENT.

6. VEGETATIVE STABILIZATION:
FINAL VEGETATIVE COVER (STABILIZATION) SHALL CONSIST OF TOP SOILING, LIMING, FERTILIZING, SEEDING, AND MULCHING TO ASSURE A FIRM STAND OF GRASS AS SOON AS PRACTICAL. SEDIMENT BASINS AND OTHER TEMPORARY EROSION CONTROL MEASURES ARE TO BE REMOVED ONLY WHEN STABILIZATION IS COMPLETE. FINAL VEGETAL COVER SHALL BE PROVIDED IN ACCORDANCE WITH THE FOLLOWING:

TOPSOIL:	AT LEAST 4" THICKNESS OBTAINED FROM STOCKPILES ON SITE, FREE OF LARGE DEBRIS.
LIME:	4,000#/ACRE (90#/1,000 S.F.)
SEED:	KENTUCKY 31 TALL FESCUE 250#/ACRE (6#/1,000 S.F.)
FERTILIZER:	10/10/10 MIX, 1,000#/ACRE FALL (23#/1,000 S.F.)
MULCH:	STRAW OR HAY (LOCALLY OBTAINED) 4,000#/ACRE (90#/1,000 S.F.)

NOTE:
VDOT DOES NOT ASSUME RESPONSIBILITY FOR MAINTENANCE OF THE DETENTION/RETENTION POND OR ITS STRUCTURES, AND SHALL BE SAVED HARMLESS FROM ANY DAMAGE.

STORMWATER MANAGEMENT/ BMP FACILITY MAINTENANCE PLAN

PROPER MAINTENANCE OF THIS FACILITY IS ENCOURAGED TO PREVENT THE INTRODUCTION OF DEBRIS AND SEDIMENT IN TO THE FACILITY, SPILLWAY(S) AND DOWNSTREAM WATERWAYS. FOLLOWING INSTALLATION OF THE FACILITY AND ESTABLISHMENT OF VEGETATION IN DISTURBED AREAS, INSPECTIONS FOR SEDIMENT BUILDUPS WILL BE PERFORMED AT LEAST QUARTERLY. IT IS ANTICIPATED THAT UNDER NORMAL CONDITIONS, SEDIMENT REMOVAL FROM THE FACILITY WILL BE REQUIRED ONCE EVERY 10 YEARS. IF OTHER CONSTRUCTION OR RELATED ACTIVITIES ARE PERFORMED ON UPSLOPE PARCELS, ADEQUATE PROTECTION SHOULD BE PROVIDED AND INSPECTIONS PERFORMED AT LEAST ONCE WEEKLY.

A DESIGNATED REPRESENTATIVE OF THE OWNER WILL INSPECT THE SWM STRUCTURE AFTER EACH SIGNIFICANT RAINFALL EVENT OR THE FOLLOWING WORKING DAY IF A WEEKEND OR HOLIDAY OCCURS. A SIGNIFICANT RAINFALL FOR THIS STRUCTURE IS DEFINED AS ONE (1) INCH OR MORE OF GAUGED RAINFALL WITHIN A 24 HOUR PERIOD. ONCE PER YEAR, A REPRESENTATIVE OF THE COUNTY MAY JOINTLY INSPECT THE STRUCTURE. APPROPRIATE ACTION, PERFORMED AT THE COST OF THE OWNER, WILL BE TAKEN TO ENSURE APPROPRIATE MAINTENANCE. WHERE STRUCTURES ARE TO BE MAINTAINED JOINTLY, ALLOCATION OF MAINTENANCE COSTS WILL BE IN ACCORDANCE WITH THE TERMS ESTABLISHED IN MAINTENANCE AGREEMENTS. KEYS TO LOCKED ACCESS POINTS SHALL BE MADE AVAILABLE TO COUNTY INSPECTION PERSONNEL UPON REQUEST.

INSPECTION AND MAINTENANCE OF THE FACILITY WILL CONSIST OF THE FOLLOWING ADDITIONAL MEASURES:

1. THE INSPECTION FOR SEDIMENT BUILDUP WILL BE PERFORMED BY VISUAL INSPECTION AND A PHYSICAL DETERMINATION OF SEDIMENT DEPTH WITHIN THE STORAGE AREA. IF THE DEPTH OF SEDIMENT REACHES THE DEPTH OF 1.0 ft. ABOVE THE BOTTOM OF SEDIMENT FOREBAY (i.e. CLEANOUT ELEVATION 79.0), REMOVAL IS REQUIRED USING A RUBBER-WHEELED BACKHOE. AT THE SAME TIME, OR AT LEAST ONCE PER YEAR, CLEAN THE RISER BOTTOM AND OUTLET PIPE OF ACCUMULATED SEDIMENTS. DISPOSE OF SEDIMENTS REMOVED FROM THE FACILITY AT AN ACCEPTABLE DISPOSAL AREA.

2. PERFORM MAINTENANCE MOWING OF POND GRASSES AT LEAST TWICE EACH YEAR. GRASSES SUCH AS TALL FESCUE SHOULD BE MOWED IN EARLY SUMMER AFTER EMERGENCE OF THE HEADS ON COOL SEASON GRASSES AND IN LATE FALL TO PREVENT SEEDS OF ANNUAL WEEDS FROM MATURING. MOWING OF LEGUMES CAN BE LESS FREQUENT TREES AND SHRUBS SHOULD NOT BE PERMITTED TO GROW ON ANY PART OF THE GRADED EMBANKMENT.

3. PERFORM SOIL SAMPLING ON STABILIZED POND SOIL AREAS ONCE EVERY FOUR (4) YEARS. SOIL SAMPLING AND TESTING SHOULD BE PERFORMED BY A QUALIFIED INDEPENDENT TESTING LABORATORY. APPLY ADDITIONAL LIME AND FERTILIZER IN ACCORDANCE WITH TEST RECOMMENDATIONS.

4. IN STABILIZED POND AREAS, IF VEGETATION COVERS LESS THAN 40% OF SOIL SURFACES, LIME FERTILIZE AND SEED IN ACCORDANCE WITH RECOMMENDATIONS FOR NEW SEEDLINGS, AS LISTED IN DAM CONSTRUCTION NOTES. IF VEGETATION COVERS MORE THAN 40% BUT LESS THAN 70% OF SOIL SURFACES, LIME FERTILIZE AND OVERSEED IN ACCORDANCE WITH CURRENT SEEDLING RECOMMENDATIONS.

5. PERFORM QUARTERLY INSPECTIONS OF THE RISER SECTION AND CREST OF SPILLWAY FOR THE OBSERVANCE OF COLLECTED DEBRIS. IMMEDIATELY REMOVE ANY DEBRIS TO MAINTAIN THE INTEGRITY OF THE STRUCTURE AND PROVIDE AN ATTRACTIVE APPEARANCE.

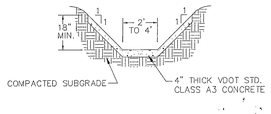
6. PERFORM YEARLY STRUCTURAL INSPECTIONS OF THE FACILITY FOR DAMAGE. STRUCTURAL INSPECTION SHALL BE PERFORMED ON THE CONCRETE RISER, ANTI-VORTEX DEVICE, TRASH RACK, ORIFICE/ WEIR(S), OUTLET BARREL AND POND EMBANKMENT. IF DAMAGE IS EVIDENT, FURTHER INVESTIGATION BY A PROFESSIONAL ENGINEER MAY BE REQUIRED TO ASSESS THE INTEGRITY OF THE STRUCTURE.

7. PERFORM QUARTERLY INSPECTIONS OF THE GRADED SIDE SLOPES OF THE DETENTION FACILITY FOR SIGNS OF ANIMAL/ RODENT BORROWS OR SLOPE EROSION. IMMEDIATELY PERFORM NECESSARY REPAIRS, REFILLING OR RESEEDING AS APPROPRIATE.

8. RECORD KEEPING. THE OWNER OR DESIGNATED REPRESENTATIVE SHALL KEEP REASONABLE, ACCURATE WRITTEN RECORDS OR INSPECTIONS PERFORMED FOR THE STRUCTURE. RECORDS SHALL DOCUMENT OR REPAIRS PERFORMED. COPIES SHALL BE PROVIDED TO THE COUNTY UPON REQUEST.

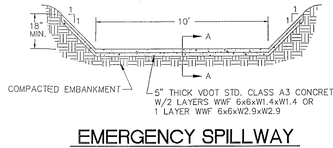
9. THE FACILITY SHALL NOT BE MODIFIED IN ANY WAY WITHOUT PRIOR CONSENT/ APPROVAL OF THE COUNTY.

NOTE:
CONTRACTOR SHALL PROVIDE SMOOTH CONCRETE TRANSITION FROM DAM OUTFALL PIPE TO CONCRETE DITCH



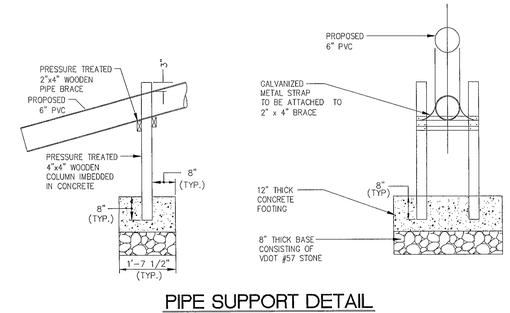
CONCRETE DITCH

N.T.S.



EMERGENCY SPILLWAY

N.T.S.



PIPE SUPPORT DETAIL

N.T.S.

No.	DATE	REVISION / COMMENT / NOTE	BY
4.	3/27/03	SWM/BMP DRY POND RECORD DRAWING	CBR
3.	1/12/01	REVISED PER JCC ENVIRONMENTAL DIVISION COMMENTS	CBR
2.	12/5/00	REVISED PER VDOT COMMENTS	CBR
1.	11/6/00	REVISED PER JCC REVIEW COMMENTS	CBR

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

NOTES AND DETAILS
WILLIAMSBURG PLANTATION
ROAD DESIGN
OWNER/DEVELOPER: WILLIAMSBURG PLANTATION, INC.
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
DPW/CBR	DPW
Scale	Date
AS NOTED	9/11/00

Project No. 7555-14
Drawing No. 8

SP-111-00 RECORD DRAWING-3/27/03

03.27.03-11:03 755514RP08.dwg, LBA

WILLIAMSBURG PLANTATION

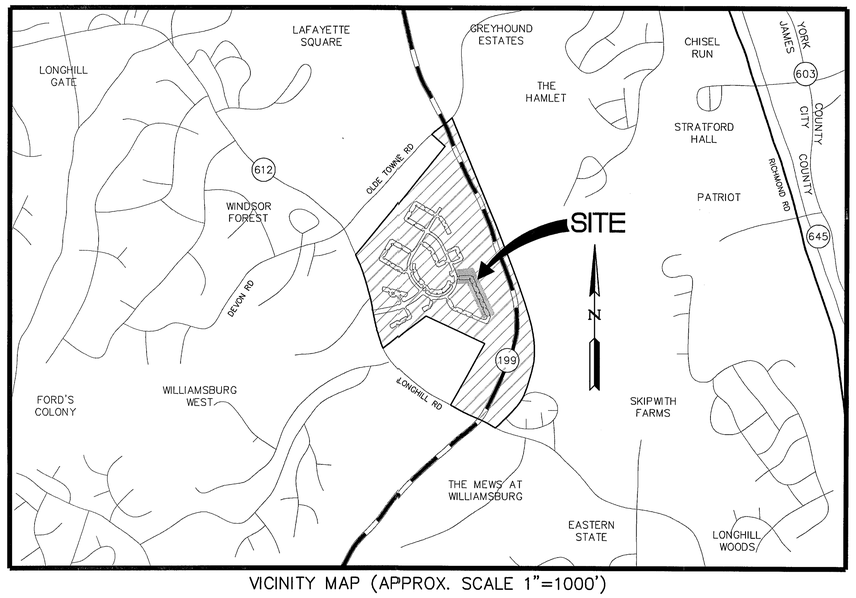
SECTION 5: UNITS 97–133

FOR

WILLIAMSBURG PLANTATION, INC.

GENERAL NOTES

1. PROPERTY ZONING: LIMITED RESIDENTIAL DISTRICT R-2.
2. PROPERTY TAX PARCEL NO.: PART OF (32-4) (1-26C)
3. PROPERTY ADDRESS: 4870 LONGHILL ROAD
4. THIS SITE PLAN IS FOR A SECTION OF TIMESHARE UNITS WHICH IS PART OF AN APPROVED OVERALL CLUSTER DEVELOPMENT PLAN (JCC CASE NO. MP-02-00).
5. THE UNITS ARE 2 STORIES, USE GROUP B, AND CONSTRUCTION TYPE 3B. MAXIMUM BUILDING HEIGHT IS 35 FEET.
6. OVERALL SITE DENSITY IS 3.99 UNITS/ ACRE AS APPROVED WITH AMENDED MASTER PLAN MP-02-00. TOTAL APPROVED UNITS TO DATE = 96 UNITS.
7. ALL UTILITIES SHALL BE PLACED UNDERGROUND AND SHALL HAVE A MINIMUM OF 36" OF COVER.
8. THE CONTRACTOR SHALL SATISFY HIMSELF AS TO ALL SITE CONDITIONS PRIOR TO CONSTRUCTION. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND SHALL NOTIFY MISS UTILITY (1-800-552-7001) PRIOR TO ANY EXCAVATION OR DEMOLITION.
9. VERIFY ALL DIMENSIONS AND NOTIFY JAMES CITY SERVICE AUTHORITY PRIOR TO ANY EXCAVATION OR DEMOLITION WITHIN UTILITY CORRIDORS.
10. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS PRIOR TO COMMENCEMENT OF WORK, TO INCLUDE, BUT NOT LIMITED TO, JAMES CITY COUNTY LAND DISTURBANCE, BUILDING, AND UTILITY.
11. A LAND DISTURBING PERMIT AND SILTATION AGREEMENT, WITH SURETY, ARE REQUIRED FOR THIS PROJECT.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF CONSTRUCTION EFFORTS WITH VIRGINIA NATURAL GAS, VIRGINIA POWER, APPROPRIATE TELEPHONE COMPANY, APPROPRIATE CABLE COMPANY, JAMES CITY SERVICE AUTHORITY, AND OTHERS THAT MAY BE REQUIRED.
13. PROJECT TO BE SERVED BY PUBLIC WATER AND SEWER OWNED BY THE JAMES CITY SERVICE AUTHORITY. ALL PROPOSED WATER AND SANITARY IMPROVEMENTS TO BE CONSTRUCTED IN ACCORDANCE WITH JCSA STANDARDS AND SPECIFICATIONS.
14. ALL PARKING SPACES SHALL BE DELINEATED WITH PAINT STRIPING. THE MINIMUM NUMBER OF PARKING SPACES SHALL BE 2.5 PER DWELLING UNIT, IN ACCORDANCE WITH SEC. 24-59 (A) (1) OF THE JCC ZONING ORDINANCE. HANDICAP PARKING SPACES SHALL BE DESIGNATED BY ABOVE GROUND SIGNS PER USBC REQUIREMENTS.
15. REFUSE TO BE REMOVED BY PRIVATE CONTRACTOR.
16. THE SITE DOES NOT LIE WITHIN ANY RESOURCE PROTECTION AREAS.
17. THIS PROPERTY LIES IN ZONE "X" (AREAS DETERMINED TO BE OUTSIDE THE 500 YEAR FLOOD PLAIN) AS SHOWN ON COMMUNITY PANEL #510201 0035 B, DATED 2/6/ 1991 OF THE FLOOD INSURANCE RATE MAPS FOR JAMES CITY COUNTY, VIRGINIA.
18. CONTOUR INTERVAL IS ONE FOOT.
19. ANY NEW SIGNS SHALL BE IN ACCORDANCE WITH ARTICLE II, DIVISION 3 OF THE JCC ZONING ORDINANCE.
20. ANY OLD WELLS THAT MAY BE ON-SITE THAT WILL NOT BE USED MUST BE PROPERLY ABANDONED ACCORDING TO STATE PRIVATE WELL REGULATIONS AND JAMES CITY COUNTY CODE.
21. OWNER/ DEVELOPER: THE BERKELEY GROUP
    MR. J.P. OTTINO, III
    BERKELEY SOUTH BLDG, EXEC. SUITE 115
    3015 N. OCEAN BLVD
    FT. LAUDERDALE, FL 33308



VICINITY MAP (APPROX. SCALE 1"=1000')

DATE: AUGUST 23, 2000
REVISED: NOVEMBER 16, 2000
PROJECT NO.: 7555-12

LEGEND

EXISTING		PROPOSED	EXISTING		PROPOSED
W	WATER	W		EXISTING TREELINE	
S	SANITARY SEWER	S	6"MAPLE	EXISTING TREE	
	STORM SEWER			LIMITS OF CLEARING	
FM	FORCE MAIN	FM		SILT FENCE	SF
O/H TELE	OVERHEAD TELEPHONE LINE	O/H TELE		WIRE REINFORCED SILT FENCE	SSF
PHONE	UNDERGROUND PHONE LINE	PHONE		INLET PROTECTION	IP
O/E	OVERHEAD ELECTRIC LINE	O/E		CHECK DAM	CD
G	GAS LINE	G		STRAW BALE BARRIER	SB
FO	FIBER OPTIC	FO		DIVERSION DIKE	DD
	OVERHEAD CABLE			RIP RAP	
	MANHOLE			REVERSE GRADE GUTTER PAN	
	CURB DROP INLET			BORING	
	YARD DROP INLET			BENCH MARK	
	FLARED END SECTION		251	GROUND ELEVATION	251
	VALVE			TOP OF CURB ELEV.	TC= ELEV
	FIRE HYDRANT ASSEMBLY			FINISH GRADE ELEV.	FG= ELEV
	BLOW-OFF VALVE			TOP OF WALL ELEV.	TW= ELEV
	AIR RELEASE ASSEMBLY			GRADING LINE TIE-IN	
	CLEAN OUT		80	EXISTING CONTOUR ELEV.	
	WATER METER			CONTOUR ELEV.	80
	POWER POLE			GRADING BY OTHERS	80
	POWER POLE W/GUY WIRE			RESERVED PARKING	
	LIGHT POLE			YARD HYDRANT	W
	STREETLIGHT			MAILBOX	
	CENTERLINE/BASELINE			SIGN	
	RIGHT OF WAY			WETLANDS	
	PROPERTY LINE			RPA BUFFER	
	℄ DITCH/SWALE			25% SLOPES OR GREATER	
	CONCRETE LINED DITCH			AREA OF FILL	
	EC-3 LINED DITCH			HIGH POINT	HP
	BITUMINOUS CONCRETE				
	CONCRETE				
	AGGREGATE/GRAVEL				

SJT REVIEW SET
SP-103-00; PC175

INDEX OF SHEETS

SHEET NUMBER	DESCRIPTION
1	COVER SHEET
2	SITE AND UTILITY PLAN/GRADING, DRAINAGE AND E&S PLAN (PHASE I)
2A	UTILITY PROFILES, NOTES AND DETAILS (PHASE I)
3	SITE PLAN (PHASE II)
3A	INTERIM GRADING, EROSION AND SEDIMENT CONTROL PLAN (PHASE II)
3B	GRADING, EROSION AND SEDIMENT CONTROL PLAN (PHASE II)
4	DRAINAGE AND UTILITY PLAN
5	UTILITY PROFILES
6	LANDSCAPE PLAN AND DETAILS
7	LIGHTING PLAN AND DETAILS
8	ENVIRONMENTAL INVENTORY
9	NOTES AND DETAILS
10	NOTES AND DETAILS
11	SMP (VDOT FACILITY "G") NOTES AND DETAILS

I HEREBY CERTIFY TO THE BEST OF MY JUDGEMENT, KNOWLEDGE, AND BELIEF THAT THIS RECORD DRAWING REPRESENTS THE CONDITIONS OF THE SITE ON THE DATE IT WAS SURVEYED. THE SITE APPEARS TO CONFORM WITH THE PROVISIONS OF THE APPROVED DESIGN PLAN.

ENGINEER — DATE 3/27/03

COMMONWEALTH OF VIRGINIA — RICHARD A. COSTELLO — CERTIFICATE NO. 013250 — 3/27/03 — CERTIFIED PROFESSIONAL ENGINEER

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

RECORD DRAWING BASED ON INFORMATION AS SURVEYED 5-02 BY A.E.S. CONSULTING ENGINEERS

No.	DATE	REVISION / COMMENT / NOTE	BY
6	3/27/03	RECORD DRAWING STORM WATER MANAGEMENT/ BMP FACILITY	CBR
5	5/4/01	REVISED PER JCSA COMMENTS DATED 5/4/01	CBR
4	4/17/01	REVISED PER JCC ENVIR. COMMENTS AND TO INDICATE PHASING	CBR
3	3/23/01	REVISED PER VDOT COMMENTS (DRY POND) FACILITY "G"	CBR
2	11/16/00	REVISED PER JCSA COMMENTS	CBR
1	10/18/00	REVISED SITE LAYOUT & REVISIONS PER JCC COMMENTS	CBR

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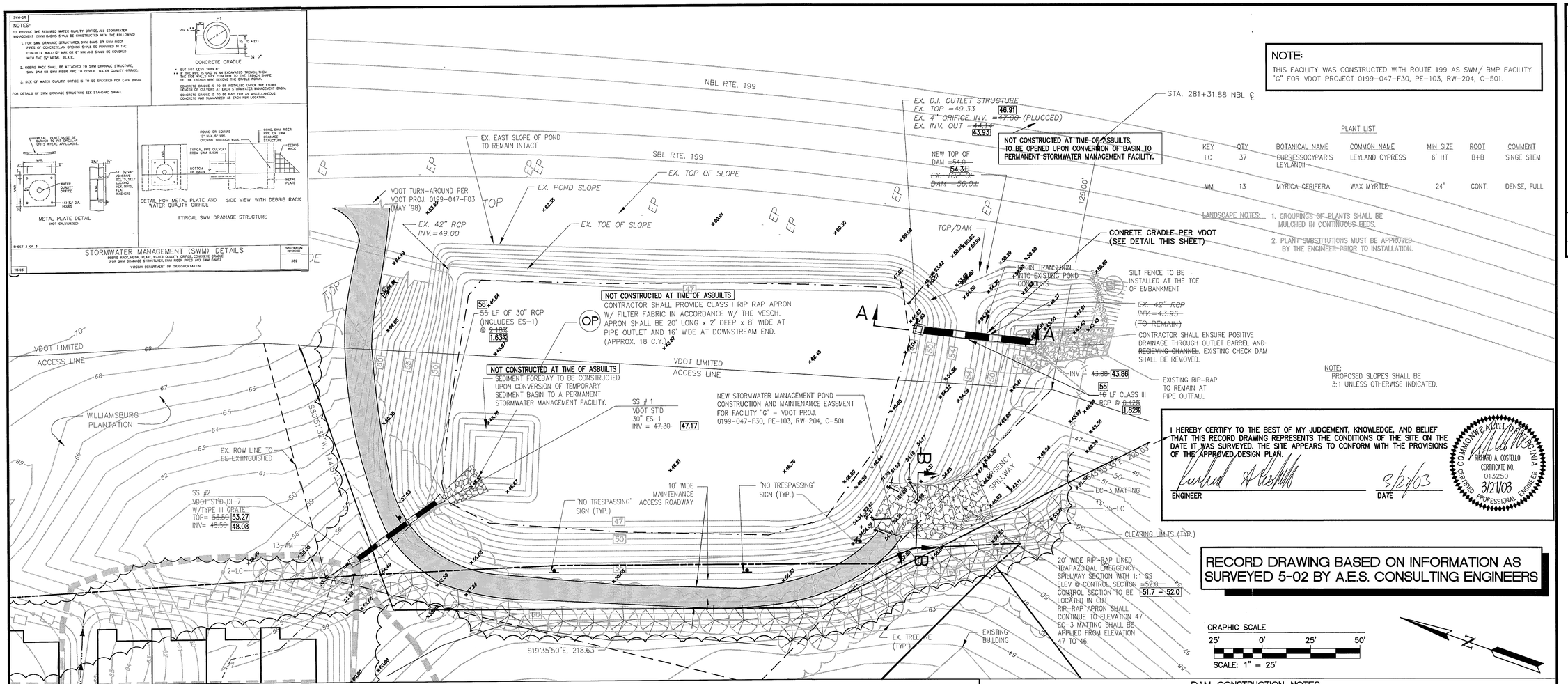
LBA



PLANT LIST

KEY	QTY	BOTANICAL NAME	COMMON NAME	MIN SIZE	ROOT	COMMENT
LC	37	CUPRESSOCYPARIS LEYLANDII	LEYLAND CYPRESS	6' HT	B+B	SINGE STEM
WM	13	MYRICA CERIFERA	WAX MYRTLE	24"	CONT.	DENSE, FULL

LANDSCAPE NOTES:
1. GROUPINGS OF PLANTS SHALL BE MULCHED IN CONTINUOUS BEDS.
2. PLANT SUBSTITUTIONS MUST BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.

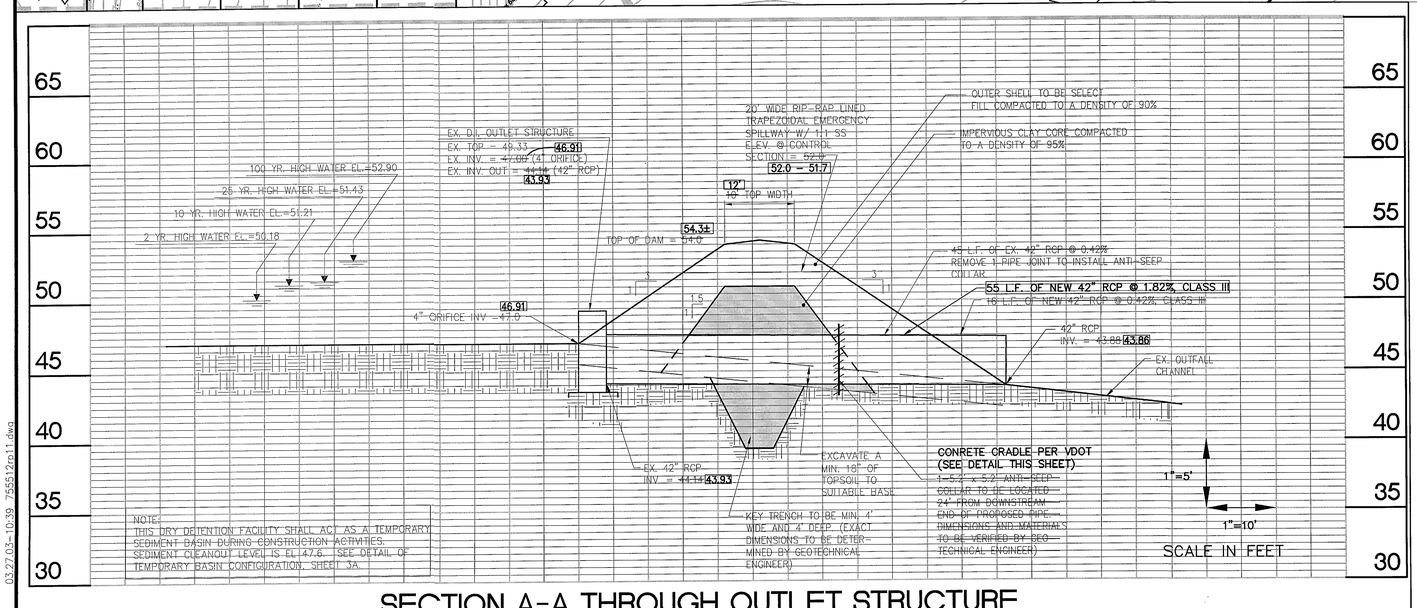
NOTE:
PROPOSED SLOPES SHALL BE 3:1 UNLESS OTHERWISE INDICATED.

I HEREBY CERTIFY TO THE BEST OF MY JUDGEMENT, KNOWLEDGE, AND BELIEF THAT THIS RECORD DRAWING REPRESENTS THE CONDITIONS OF THE SITE ON THE DATE IT WAS SURVEYED. THE SITE APPEARS TO CONFORM WITH THE PROVISIONS OF THE APPROVED DESIGN PLAN.

ENGINEER — DATE 3/27/03

COMMONWEALTH OF VIRGINIA — RICHARD A. COSTELLO — CERTIFICATE NO. 013250 — CERTIFIED PROFESSIONAL ENGINEER — 3/21/03

RECORD DRAWING BASED ON INFORMATION AS SURVEYED 5-02 BY A.E.S. CONSULTING ENGINEERS



NOTE:
THIS DRY DETENTION FACILITY SHALL ACT AS A TEMPORARY SEDIMENT BASIN DURING CONSTRUCTION ACTIVITIES. SEDIMENT CLEANOUT LEVEL IS EL 47.6. SEE DETAIL OF TEMPORARY BASIN CONFIGURATION, SHEET 3A.

SECTION A-A THROUGH OUTLET STRUCTURE

DAM CONSTRUCTION NOTES

1. A GEOTECHNICAL SUBSURFACE EXPLORATION AT THE PROPOSED DAM SITE SHALL BE PERFORMED TO ENSURE SUITABILITY OF THE SUBGRADE. THE GEOTECHNICAL INVESTIGATION WILL DETERMINE SUITABILITY OF THE FILL MATERIAL, RECOMMENDED ANTI-SEEP MEASURES, KEY TRENCH DEPTH AND WIDTH, AND THE ANTICIPATED LOCATION OF THE PHREATIC LINE. THESE RECOMMENDATIONS ARE HEREBY MADE A PART OF THE DAM'S CONSTRUCTION SPECIFICATIONS. A REPRESENTATIVE OF THE GEOTECHNICAL CONSULTANT SHALL BE ON SITE DURING CONSTRUCTION TO ENSURE PROPER MATERIALS AND DAM CONSTRUCTION METHODS ARE UTILIZED. FOLLOWING DAM CONSTRUCTION, THE GEOTECHNICAL CONSULTANT SHALL PROVIDE WRITTEN DOCUMENTATION, SIGNED BY A PROFESSIONAL ENGINEER, THAT THE DAM WAS BUILT IN ACCORDANCE WITH THEIR RECOMMENDATIONS, PLANS, AND SPECIFICATIONS. THE GEOTECHNICAL CONSULTANT SHALL COORDINATE WITH THE DESIGN ENGINEER IN ORDER TO COMPLETE THE JCC ENVIRONMENTAL DIVISION STORMWATER MANAGEMENT/BMP FACILITIES CONSTRUCTION AND AS-BUILT CERTIFICATION FORM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE DAM CONSTRUCTION SCHEDULE WITH THE GEOTECHNICAL CONSULTANT IN ORDER TO ENSURE ON-SITE MONITORING.

2. SITE PREPARATION:
THE CONTRACTOR SHALL STRIP ALL AREAS OF THE PERMANENT COVER IN CONSTRUCTION AREA TO REMOVE ALL UNSUITABLE MATERIALS. THE UNSUITABLE MATERIALS TO BE REMOVED BY STRIPPING SHALL INCLUDE ALL TOPSOIL, DEBRIS AND VEGETABLE MATTER, INCLUDING STUMPS AND ROOTS, AND ALL OTHER MATERIALS WHICH MAY BE UNSUITABLE FOR USE IN THE PERMANENT CONSTRUCTION.

3. EMBANKMENT:
THE EXPOSED SUB GRADE SOILS SHALL BE CAREFULLY INSPECTED BY THE GEOTECHNICAL ENGINEER ANY UNSUITABLE MATERIALS THUS EXPOSED SHALL BE REMOVED AND REPLACED WITH A WELL COMPACTED, SUITABLE MATERIAL. DENSITY TESTING, AT THE DISCRETION OF THE OWNER/GEOTECHNICAL ENGINEER, SHALL BE PERFORMED AT THIS TIME. THE EMBANKMENT SHALL BE KEYED INTO THE UNDISTURBED (EXISTING) SOIL STRATUM. EMBANKMENT SHOULD BE KEYED AT LEAST 3 FEET INTO THE STRATUM OR AS SPECIFIED BY THE GEOTECHNICAL ENGINEER (WIDTH=6 FT. MIN.) THE EMBANKMENT FOUNDATION AND ABUTMENTS SHALL BEAR ON FIRM AND STABLE EXISTING SUB-GRADE WHICH HAS BEEN PREPARED SO AS TO REMOVE ALL ORGANIC, LOOSE , AND GENERALLY UNSUITABLE MATERIAL. ALL MATERIALS TO BE USED FOR BACKFILL OR COMPACTED FILL SHALL BE INSPECTED AND, IF NECESSARY, TESTED BY THE GEOTECHNIAL ENGINEER IN ACCORDANCE WITH ASTM D2487 PRIOR TO PLACEMENT, TO DETERMINE IF THEY ARE SUITABLE FOR THE INTENDED USE. THE FILL MATERIAL SHALL BE TAKEN FROM APPROVED BORROW AREAS. IT SHALL BE CLEAN MINERAL SOIL, FREE OF ROOTS, WOOD VEGETATION, OVERSIZED STONES, ROCKS, OR OTHER OBJECTIONABLE MATERIALS. MATERIALS TO BE USED FOR THE CONSTRUCTION OF THE SHELL SHALL BE SELECT BACKFILL FREE OF STUMPS, ROOTS, ROCKS, TRASH, ETC. AND SHALL BE MORE PERVIOUS THAN THE IMPERVIOUS CLAY CORE. AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED A MINIMUM OF 4 INCHES PRIOR TO PLACEMENT OF FILL.
THE FILL MATERIAL'S MOISTURE CONTENT SHALL BE (+3 TO -2) PERCENTAGE POINTS OF OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D2216 (I.E. IN GENERAL THE FILL MATERIAL SHOULD CONTAIN SUFFICIENT MOISTURE SO THAT IT CAN BE FORMED INTO A BALL WITHOUT CRUMBLING. IF WATER CAN BE SQUEEZED OUT OF THE BALL, IT IS TOO WET FOR PROPER COMPACTION). FILL MATERIAL WILL BE PLACED IN 6 TO 8 INCH CONTINUOUS LAYERS OVER THE ENTIRE LENGTH OF THE FILL. FIRST LIFT ON SUBGRADE MAY BE PLACED AT A DEPTH UP TO 30 INCHES TO BRIDGE SUBGRADE WITH OVER OPTIMUM MOISTURE CONTENT. COMPACTION, AS NOTED ON PLAN, SHALL BE OBTAINED GENERALLY BY USING A SHEEPSFOOT COMPACTOR. FINISHED GRADES SHALL BE MERGED NATURALLY INTO THE EXISTING GRADES.

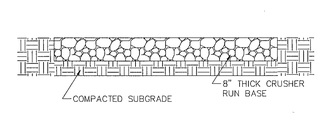
4. CUTOFF TRENCH/KEY TRENCH:
THE TRENCH SHALL BE EXCAVATED ALONG THE CENTERLINE OF THE DAM. THE MINIMUM DEPTH SHALL BE AS SHOWN ON THE PLANS AND SHALL EXTEND UP BOTH ABUTMENTS. THE BOTTOM WIDTH SHALL BE WIDE ENOUGH TO PERMIT OPERATION OF COMPACTING EQUIPMENT. THE SIDE SLOPES SHALL BE NO STEEPER THAN 1:1. COMPACTING REQUIREMENTS SHALL BE THE SAME AS THOSE FOR EMBANKMENT. THE TRENCH SHALL BE KEPT DRAINED DURING THE BACKFILLING - COMPACTING OPERATIONS.

5. PRINCIPAL SPILLWAY:
THE BOTTOM OF THE SPILLWAY RISER FOUNDATION BASE EXCAVATION SHALL BE OBSERVED BY THE GEOTECHNICAL ENGINEER TO ENSURE THAT ALL UNSUITABLE AND LOOSE MATERIALS ARE REMOVED AND THAT ACCEPTABLE BEARING CONDITIONS EXIST IN THE FOUNDATION'S BASE. ALL JOINTS IN THE PRINCIPAL SPILLWAY STRUCTURE SHALL BE WATERTIGHT CONSTRUCTION. PERVIOUS MATERIALS SUCH AS SAND, GRAVEL OR CRUSHED STONE SHALL NOT BE USED AS BACKFILL AROUND THE BARREL OR ANTI-SEEP COLLAR. FILL MATERIAL SHALL BE PLACED AROUND THE PIPE IN 4 INCH LAYERS AND COMPACTED BY HAND TO THE SAME DENSITY AS THE EMBANKMENT. AMMIMUM OF TWO FEET OF FILL SHALL BE HAND-COMPACTED OVER THE BARREL BEFORE CROSSING IT WITH CONSTRUCTION EQUIPMENT.

6. VEGETATIVE STABILIZATION:
FINAL VEGETATIVE COVER (STABILIZATION) SHALL CONSIST OF TOP SOILING, LIMING, FERTILIZING, SEEDING, AND MULCHING TO ASSURE A FIRM STAND OF GRASS AS SOON AS PRACTICAL. SEDIMENT BASINS AND OTHER TEMPORARY EROSION CONTROL MEASURES ARE TO BE REMOVED ONLY WHEN STABILIZATION IS COMPLETE. FINAL VEGETAL COVER SHALL BE PROVIDED IN ACCORDANCE WITH THE FOLLOWING:

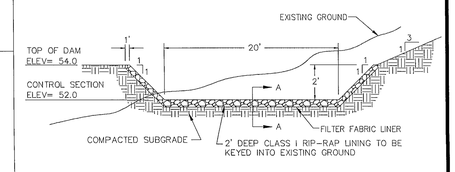
TOPSOIL: AT LEAST 4" THICKNESS OBTAINED FROM STOCKPILES ON SITE, FREE OF LARGE DEBRIS.
LIME: 4,000#/ACRE (90#/1,000 S.F.)
SEED: KENTUCKY 31 TALL FESCUE 250#/ACRE (6#/1,000 S.F.)
FERTILIZER: 10/10/10 MIX, 1,000#/ACRE FALL (23#/1,000 S.F.)
MULCH: STRAW OR HAY (LOCALLY OBTAINED) 4,000#/ACRE (90#/1,000 S.F.)

NOTE:
VDOT SHALL BE SOLELY RESPONSIBLE FOR THE MAINTENANCE OF THIS FACILITY ONCE CONSTRUCTED AND ACCEPTED.



MAINTENANCE ACCESS/ROAD DETAIL

N.T.S.



EMERGENCY SPILLWAY CROSS-SECTION SECTION B-B

N.T.S.

JCC S-103-00 RECORD DRAWING-3/27/03

No.	DATE	REVISION / COMMENT / NOTE	BY
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5	5/4/01	REVISED PER JCSA COMMENTS DATED 5/1/01	CBR
4	4/17/01	REVISED PER JCC ENVIR. COMMENTS AND TO INDICATE PHASING	CBR
3	3/23/01	REVISED PER VDOT COMMENTS (DRY POND) FACILITY "G"	CBR
2	11/16/00	REVISED PER JCSA COMMENTS	CBR
1	10/18/00	REVISED SITE LAYOUT & REVISIONS PER JCC COMMENTS	CBR

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

SMP (VDOT FACILITY "G") NOTES AND DETAILS
WILLIAMSBURG PLANTATION
SECTION 5 UNITS 97-133
OWNER/DEVELOPER: WILLIAMSBURG PLANTATION, INC.
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
DPW/CBR	RMK
Scale	Date
AS NOTED	8/23/00
Project No.	
7555-12	
Drawing No.	
11	

03/27/03-10:39 7555\12\ev11.dwg
LBA

DEVELOPMENT MANAGEMENT

101-E MOUNTS BAY ROAD, P.O. BOX 8784, WILLIAMSBURG, VIRGINIA 23187-8784
(757) 253-6671
E-MAIL: devtman@james-city.va.us
FAX: (757) 259-4032

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

January 26, 2007

Mr. Ken Yerby
Williamsburg Plantation, Inc.
4029 Ironbound Road, Suite 200
Williamsburg, VA 23188

Re: Williamsburg Plantation Coach House Road Ext
County Plan No. SP-111-00
County BMP ID Code: Pc-185

Dear Mr. Yerby:

The Environmental Divisions has received an interim record drawing asbuilt and construction certification for the stormwater management facility for the above referenced project. The record drawing provides as-built information for the dry pond situated on the North side of the site.

Based on our review of the project and a pre-final field inspection as performed on January 18, 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 & Construction Certification:

1. In accordance with the Note # 19 on Sheet 10 of the approved plan, record drawings asbuilt and construction certifications were required for the onsite stormwater management/BMP. Interim certification for the asbuilt was provided on March 27, 2003, and an Interim construction certification was received on June 5, 2001. We will need a final asbuilt and construction certification after pond has been converted from temporary sediment basin mode to permanent dry pond BMP mode. When the final certifications are received by James City County Environmental a final inspection will be done by a James City County Environmental inspector.

Construction Certification:

2. In accordance with the Note # 19 on Sheet 10 of the approved plan, construction certification for the stormwater management/BMP facility is required. We will need a final certification after pond has been converted from temporary sediment basin mode to permanent dry pond BMP mode. This is especially important since the facility has an engineered and compacted earthen embankment. The certification can be in letter format or by use of the certification statements in Section 4 of the JCC, Stormwater Management/BMP Facilities, Record Drawing and Construction Certification, Standard Forms & Instructions.

3. A professional engineer's seal and signature is required on construction certification.

4. If possible add the following County identifiers to the construction certification documents: County Plan Number SP-111-00 and BMP ID No. Pc-185.

Record Drawing:

5. In accordance with Note # 19 on Sheet 10 of the approved plan, a record (asbuilt) drawing is required for the stormwater management/BMP facility. The record drawing requires certification consistent with the provisions of Section 4 of the *James City County Environmental Division, Stormwater Management/BMP Facilities, Record Drawing and Construction Certification, Standard Forms & Instructions.*

6. Along with the record drawing set, submit completed record drawing and construction certification forms, Sections 1 through 5, and applicable record drawing checklists from the *James City County, Stormwater Management/BMP Facilities, Record Drawing and Construction Certification, Standard Forms & Instructions* (packet). The Environmental Division began use of the forms and checklists in this packet effective February 1st 2001.

7. Show the following additional information on the record drawing since the March 27, 2003, interim asbuilt: North indicator arrow on BMP sheet, 15" HDPE outfall with the flared end section located at the West slope of the pond and the 15" HDPE outfall with the flared end section located at the South slope of the Pond.

8. A professional seal and signature is required on the record drawing.

9. If possible add the following County identifiers to the lower right hand corner of the record drawing: County Plan Number SP-111-00 and BMP ID Code: PC 185.

Pre-Final Inspection Construction - Related Items:

10. Grass along the Northwest, North, Northeast embankment was 2 to 4 feet in height. Mow grass on the embankment to a height of 2- 4 inches to promote growth of desirable grasses and to allow for proper future inspection.

12. Stabilize with seed and mulch or matting all disturbed soil areas present along the Southwest slope.

13. Erosion gullies present should be backfilled with compacted material, reseeded and mulched or matted for stabilization there are gullies present on the Southwest and Southeast slopes.

14. Remove trees and woody vegetation on the downslope embankment. Usually trees, shrubs and woody vegetation are not permitted to grow on any part of pond embankments constructed using engineered (compacted) fills. Saturated roots mats combined with high wind can cause trees to overtop and accelerate soil erosion and embankment failure. For older facilities which may have established tree growth, we recommend that trees be cut flush to or below ground level and be maintained in that fashion as to not disturb root systems that may already be extensive. Efforts should then be made to reduce tree restablishment and to replace tree growth with an acceptable low-maintenance grass covering.

15. Clean out the dewatering device and remove silt fence by the riser.

16. Clear and remove all vegetation and brush within the paved flume and riprap of the outfall end of the pipe barrel through the dam.

17. Clear and remove all vegetation and brush within the emergency spillway of the facility. The emergency spillway for this facility is a 10 feet wide, concreted lined, trapezoidal-shaped channel located at Northeast end of the embankment next to the riser.

18. Clean and remove sediment accumulations and vegetation within 10 feet of the outfall end of the 15 inch HDPE storm drain pipe which enters the basin at the West slope. Sediment accumulations were 1-2 ft. deep at the outfall end of the pipe and covered most of the outlet protection pad. ***There is also major erosion above the pipe above the outfall that needs to be filled, compacted and stabilized. The two drop inlets that connect to the pipe have sinkholes around them that need repair.***

19. Clean and remove sediment accumulations and vegetation within 10 feet of the outfall end of the 15 inch HDPE storm drain pipe which enters the basin at the South slope. Sediment accumulations were 1 ft deep at the outfall end of the pipe and covered most of the outlet protection pad. ***There are sinkholes above and along the pipe that need repair.***

20. Clean and remove sediment accumulations and vegetation within 10 feet of the outfall end of the 30 inch HDPE storm drain pipe which enters the basin at the Southwest slope. Sediment accumulations were 1 ft deep at the outfall end of the pipe and covered most of the outlet protection pad.

21. Conversion of the principal flow control structure (riser) from temporary sediment basin mode to final BMP mode is incomplete. This is to be done after final construction and stabilization is complete for the drainage area that the BMP serves.

This is a courtesy pre-final BMP inspection. This was done as an effort to hopefully speed up the process for the surety release when the project is complete. A final inspection of the pond will be done when we receive the final asbuilt and construction certifications. 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 and items from the final inspection.

Please contact me at 757-259-4026 or Chief Engineer, Scott Thomas, at 757-253-6639 if you have any further comments, questions, or meet at the site.

Sincerely,

Jason Beck

Jason L. Beck
Environmental Inspector, II
Environmental Division

cc: Scott Thomas, Chief Engineer - Storm Water
Richard A. Costello, AES

G:\AsBuilts\reviews\final\SP11100.pc185pre-final

1/26/07 Fax + Mail

JAMES CITY COUNTY - ENVIRONMENTAL DIVISION

Office Phone: 757-253-6670 Fax Number: 757-259-4032

DATE SENT: 1/26/07

Name: Rich Costello
Firm or Company: AES
Facsimile Number: 220-8994
Number of pages including this transmittal: 4
From: Jason Beck 259-4026

James City County
P O Box 8784
Williamsburg VA 23187-8784

Comments:

If you do not receive all pages, call 757-253-6670 as soon as possible

Fax + Mail

JAMES CITY COUNTY - ENVIRONMENTAL DIVISION

Office Phone: 757-253-6670 Fax Number: 757-259-4032

DATE SENT: 1/26/07

Name: Ken Yerby
Firm or Company: Bush Construction
Facsimile Number: ~~220-899~~ 229-2542
Number of pages including this transmittal: 4
From: Jason Beck

James City County
P O Box 8784
Williamsburg VA 23187-8784

Comments:

If you do not receive all pages, call 757-253-6670 as soon as possible

AES
Fax: 220-8994
Busch
Fax: 229-2542

DEVELOPMENT MANAGEMENT

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

January 26, 2007

Mr. Ken Yerby
Williamsburg Plantation, Inc.
4029 Ironbound Road, Suite 200
Williamsburg, VA 23188

Re: Williamsburg Plantation Coach House Road Ext
County Plan No. SP-111-00
County BMP ID Code: Pc-185

Dear Mr. Yerby:

The Environmental Divisions has received an interim record drawing asbuilt and construction certification for the stormwater management facility for the above referenced project. The record drawing provides as-built information for the dry pond situated on the North side of the site.

Based on our review of the project and a pre-final field inspection as performed on January 18, 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 & Construction Certification:

1. In accordance with the Note # 19 on Sheet 10 of the approved plan, record drawings asbuilt and construction certifications were required for the onsite stormwater management/BMP. Interim certification for the asbuilt was provided on March 27, 2003, and an Interim construction certification was received on June 5, 2001. We will need a final asbuilt and construction certification after pond has been converted from temporary sediment basin mode to permanent dry pond BMP mode. When the final certifications are received by James City County Environmental a final inspection will be done by a James City County Environmental inspector.

Construction Certification:

2. In accordance with the Note # 19 on Sheet 10 of the approved plan, construction certification for the stormwater management/BMP facility is required. We will need a final certification after pond has been converted from temporary sediment basin mode to permanent dry pond BMP mode. This is especially important since the facility has an engineered and compacted earthen embankment. The certification can be in letter format or by use of the certification statements in Section 4 of the JCC, Stormwater Management/BMP Facilities, Record Drawing and Construction Certification, Standard Forms & Instructions.

3. A professional engineer's seal and signature is required on construction certification.

4. If possible add the following County identifiers to the construction certification documents: County Plan Number SP-111-00 and BMP ID No. Pc-185.

Record Drawing:

5. In accordance with Note # 19 on Sheet 10 of the approved plan, a record (asbuilt) drawing is required for the stormwater management/BMP facility. The record drawing requires certification consistent with the provisions of Section 4 of the *James City County Environmental Division, Stormwater Management/BMP Facilities, Record Drawing and Construction Certification, Standard Forms & Instructions.*

6. Along with the record drawing set, submit completed record drawing and construction certification forms, Sections 1 through 5, and applicable record drawing checklists from the *James City County, Stormwater Management/BMP Facilities, Record Drawing and Construction Certification, Standard Forms & Instructions* (packet). The Environmental Division began use of the forms and checklists in this packet effective February 1st 2001.

7. Show the following additional information on the record drawing since the March 27, 2003, interim asbuilt: North indicator arrow on BMP sheet, 15" HDPE outfall with the flared end section located at the West slope of the pond and the 15" HDPE outfall with the flared end section located at the South slope of the Pond.

8. A professional seal and signature is required on the record drawing.

9. If possible add the following County identifiers to the lower right hand corner of the record drawing: County Plan Number SP-111-00 and BMP ID Code: PC 185.

Pre-Final Inspection Construction - Related Items:

10. Grass along the Northwest, North, Northeast embankment was 2 to 4 feet in height. Mow grass on the embankment to a height of 2- 4 inches to promote growth of desirable grasses and to allow for proper future inspection.

12. Stabilize with seed and mulch or matting all disturbed soil areas present along the Southwest slope.

13. Erosion gullies present should be backfilled with compacted material, reseeded and mulched or matted for stabilization there are gullies present on the Southwest and Southeast slopes.

14. Remove trees and woody vegetation on the downslope embankment. Usually trees, shrubs and woody vegetation are not permitted to grow on any part of pond embankments constructed using engineered (compacted) fills. Saturated roots mats combined with high wind can cause trees to overtop and accelerate soil erosion and embankment failure. For older facilities which may have established tree growth, we recommend that trees be cut flush to or below ground level and be maintained in that fashion as to not disturb root systems that may already be extensive. Efforts should then be made to reduce tree restablishment and to replace tree growth with an acceptable low-maintenance grass covering.

15. Clean out the dewatering device and remove silt fence by the riser.

16. Clear and remove all vegetation and brush within the paved flume and riprap of the outfall end of the pipe barrel through the dam.

17. Clear and remove all vegetation and brush within the emergency spillway of the facility. The emergency spillway for this facility is a 10 feet wide, concreted lined, trapezoidal-shaped channel located at Northeast end of the embankment next to the riser.

18. Clean and remove sediment accumulations and vegetation within 10 feet of the outfall end of the 15 inch HDPE storm drain pipe which enters the basin at the West slope. Sediment accumulations were 1-2 ft. deep at the outfall end of the pipe and covered most of the outlet protection pad. ***There is also major erosion above the pipe above the outfall that needs to be filled, compacted and stabilized. The two drop inlets that connect to the pipe have sinkholes around them that need repair.***

19. Clean and remove sediment accumulations and vegetation within 10 feet of the outfall end of the 15 inch HDPE storm drain pipe which enters the basin at the South slope. Sediment accumulations were 1 ft deep at the outfall end of the pipe and covered most of the outlet protection pad. ***There are sinkholes above and along the pipe that need repair.***

20. Clean and remove sediment accumulations and vegetation within 10 feet of the outfall end of the 30 inch HDPE storm drain pipe which enters the basin at the Southwest slope. Sediment accumulations were 1 ft deep at the outfall end of the pipe and covered most of the outlet protection pad.

21. Conversion of the principal flow control structure (riser) from temporary sediment basin mode to final BMP mode is incomplete. This is to be done after final construction and stabilization is complete for the drainage area that the BMP serves.

This is a courtesy pre-final BMP inspection. This was done as an effort to hopefully speed up the process for the surety release when the project is complete. A final inspection of the pond will be done when we receive the final asbuilt and construction certifications. 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 and items from the final inspection.

Please contact me at 757-259-4026 or Chief Engineer, Scott Thomas, at 757-253-6639 if you have any further comments, questions, or meet at the site.

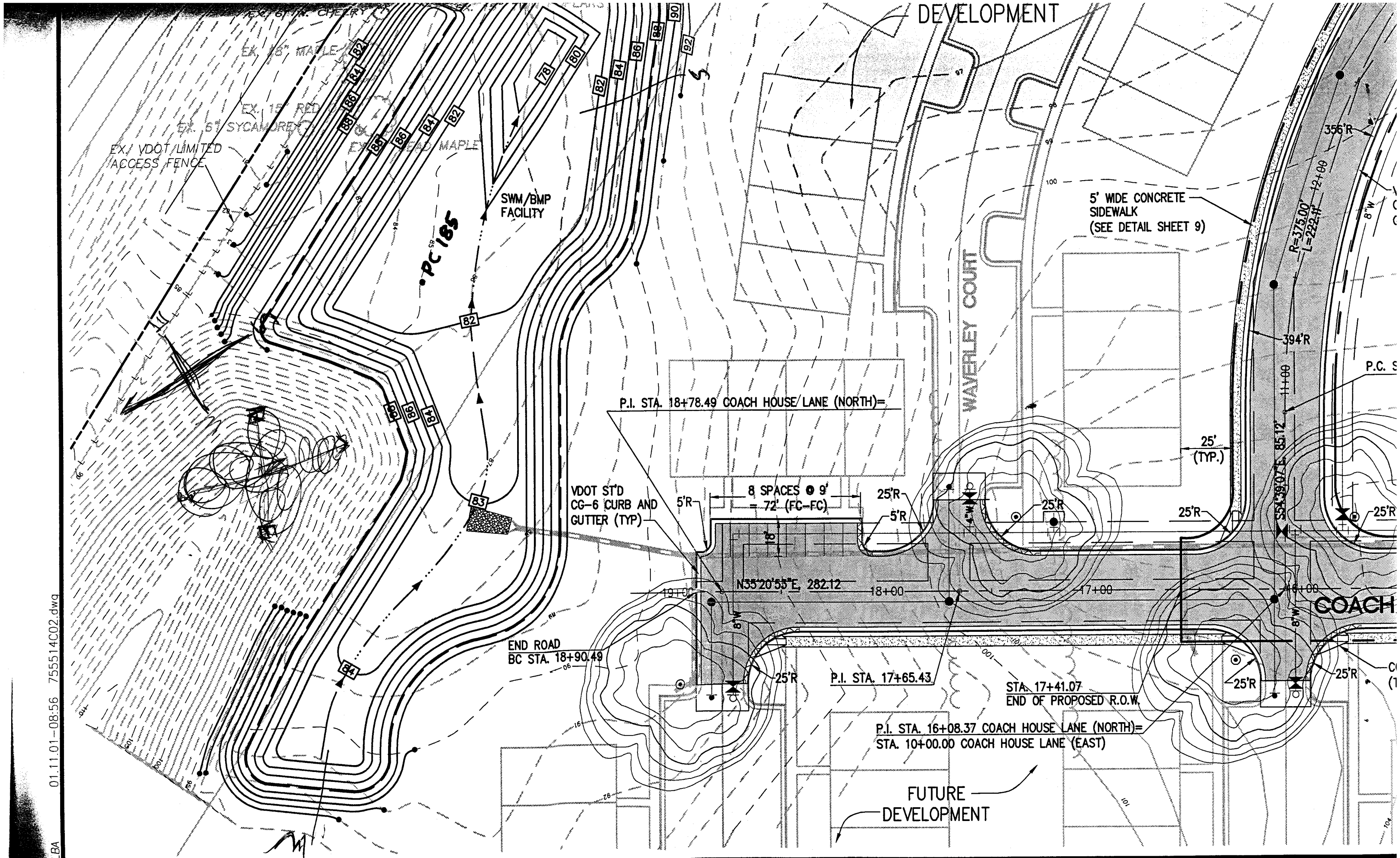
Sincerely,

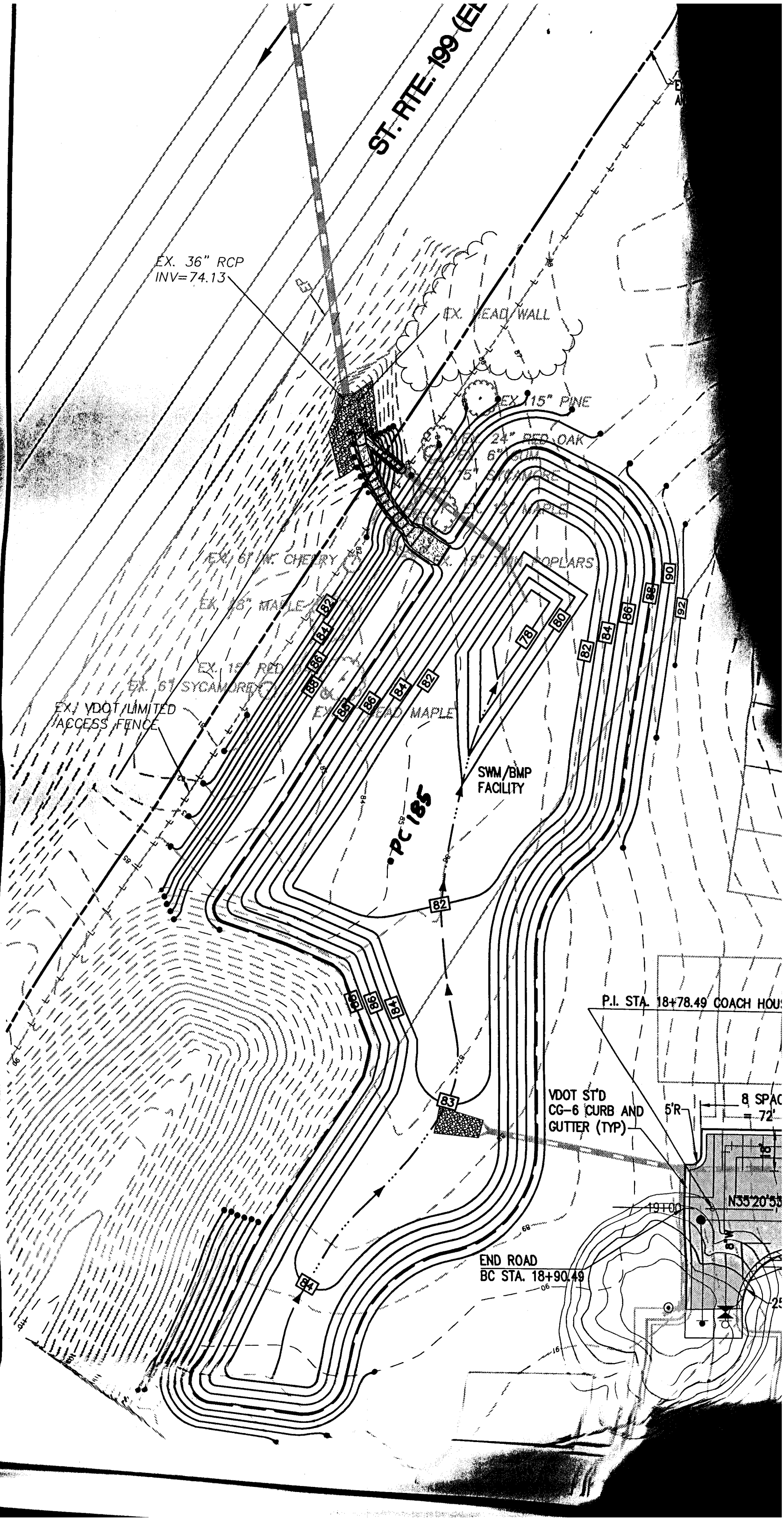
Jason Beck

Jason L. Beck
Environmental Inspector, II
Environmental Division

cc: Scott Thomas, Chief Engineer - Storm Water
Richard A. Costello, AES

G:\AsBuilts\reviews\final\SP11100.pc185pre-final


DEVELOPMENT
EX. 6" MAPLE
EX. 6" SYCAMORE
EX. VDOT LIMITED ACCESS FENCE
SWM/BMP FACILITY
PC 185
5' WIDE CONCRETE SIDEWALK (SEE DETAIL SHEET 9)
WAVERLEY COURT
P.I. STA. 18+78.49 COACH HOUSE LANE (NORTH)=
VDOT ST'D CG-6 CURB AND GUTTER (TYP)
8 SPACES @ 9' = 72' (FC-FC)
N35°20'55"E, 282.12
END ROAD BC STA. 18+90.49
P.I. STA. 17+65.43
STA. 17+41.07 END OF PROPOSED R.O.W.
P.I. STA. 16+08.37 COACH HOUSE LANE (NORTH)= STA. 10+00.00 COACH HOUSE LANE (EAST)
FUTURE DEVELOPMENT
R=375.00' L=222.41'
S54°39'07"E 85.12'
356'R
394'R
25' (TYP.)
25'R
5'R
8"W
P.C. S
COACH
LBA 01.11.01-08:56 755514C02.dwg


ST. RTE. 199 (E
EX. 36" RCP
INV=74.13
EX. HEAD WALL
EX. 15" PINE
24" RED OAK
EX. 61" W. CHERRY
EX. 18" MAPLE
EX. 15" RED
EX. 61" SYCAMORE
EX. VDOT LIMITED
ACCESS FENCE
SWM/BMP
FACILITY
PC 185
P.I. STA. 18+78.49 COACH HOU
VDOT ST'D
CG-6 CURB AND
GUTTER (TYP)
5'R
8 SPAC
= 72'
N35°20'5
END ROAD
BC STA. 18+90.49
91.11.01-08:56 7555140C02.dwg

ST. RTE. 199 (E

EXISTING P
AND RTE.

NOTE: CONTRACTOR SH
NECESSARY TO CONSTR
AND PERFORM GRADING

OP - STANDARD

PROVIDE VARIBLE LENGTH x VARIABLE WIDTH x 1.5 DEEP APRON OF GROUTED CLASS I RIP-RAP W/ FILTER FABRIC LINING. (APPROX. 28 C.Y. REQ'D.)

TRAPEZOIDAL CONCRETE DITCH 2' BOTTOM WIDTH, 1:1 SS, 18" DEEP (SEE SHEET 8 FOR DETAIL)

CONTRACTOR SHALL REMOVE AN
ACCESS FENCE AS NECESSARY
OUTFALL DITCH, AND PERFORM
RE-CONSTRUCTED IN ACCORDAN
EDITION OF VDOT ROAD AND BR
SHALL BE AT TOP OF CONCRET
SLAB)

EX. 36" RCP
INV=74.13

EMERGENCY SPILLWAY
10' WIDE CONCRETE-LINED CHANNEL W/ 10' LONG CONTROL SECTION AT ELEV. 87.00, W/ 1:1 SIDE SLOPES AND MIN. 18" DEPTH. SPILLWAY SHALL TAPER DOWN TO TRAPEZOIDAL CONCRETE DITCH W/ 4' BOTTOM WIDTH, 1:1 SS, 18" DEEP

EX. HEAD WALL

OUTLET STRUCTURE
48" DIA. RCP RISER WITH
CONC. ANTI-VORTEX DEVICE
TOP OF RISER = 84.80
INV. 6" PVC = 81.80
INV. 15" RCP = 81.80
TOP OF BASE = 81.00
ALL JOINTS TO BE WATERTI

75.0
74.5

24" RCP
INV. = 81.30

57 LF OF 24" RCP
@ 0.88% CLASS III

87.0

89.3

2.5:1
SLOPE

4:1 SLOPE

25 LF OF 6'
REVERSE SL
INV. IN = 7
INV. OUT =

100 YEAR EL=

LIMITS OF WORK
FOR POND

EX. VDOT LIMITED ACCESS FENCE

EC-2

PS

4:1 SLOPE

50'

× 81.5

× 81.5

SWM/BMP #3
FACILITY

LIMITS OF WO
FOR FILL (TYP

SS#2-2
STA 18+90(R)
VDOT ST'D
DI-3A
TOP= 95.64
INV= 85.60

DD

DIVERSION DIKE SHALL
INSTALLED DURING FILL
OPERATIONS AND MAIN
UNTIL ROADWAY IS FIN
GRADED

OP - STILLING BASIN

PROVIDE 20' LONG x 1.5' DEEP APRON OF CLASS I RIPRAP OVER FILTER FABRIC LINING. APRON SHALL BE 8' WIDE AT UP STREAM END AND 12' WIDE AT DOWNSTREAM END. (APPROX. 11.0 C.Y. REQ'D.)

0.29
AC.

90 LF OF
30" RCP
@ 2.33%

TC96.00

235 LF
RCP

SS#2-1
30" ES-1
INV= 83.50

TC95.80

60 LF OF
18" RCP
@ 4.00%

TC95.15

SS#2-2A
STA 18+90(L)
VDOT ST'D
DI-3A
TOP= 94.75

10' LF OF 18"
RCP @ 1.0%
INV.=88.10
TO BE PLUGGED

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NOTE: CONTRACTOR SHALL REMOVE FIELD LOCATED TREES AS NECESSARY TO CONSTRUCT EMERGENCY SPILLWAY, OUTFALL DITCH AND PERFORM GRADING OPERATIONS.

OP – STANDARD

PROVIDE VARIBLE LENGTH x VARIABLE WIDTH x 1.5 DEEP APRON OF GROUTED CLASS I RIP-RAP W/ FILTER FABRIC LINING. (APPROX. 28 C.Y. REQ'D.)

TRAPEZOIDAL CONCRETE DITCH 2' BOTTOM WIDTH, 1:1 SS, 18" DEEP (SEE SHEET 8 FOR DETAIL)

CONTRACTOR SHALL REMOVE AND RE-INSTALL EX. VDOT LIMITED ACCESS FENCE AS NECESSARY TO CONSTRUCT EMERGENCY SPILLWAY, OUTFALL DITCH, AND PERFORM GRADING OPERATIONS. FENCE SHALL BE RE-CONSTRUCTED IN ACCORDANCE WITH VDOT STD. 502.02 OF LATEST EDITION OF VDOT ROAD AND BRIDGE STANDARDS. BOTTOM OF FENCE SHALL BE AT TOP OF CONCRETE SIDE SLOPES (18" ABOVE APRON SLAB)

EX. 36" RCP
INV=74.13

OUTLET STRUCTURE
48" DIA. RCP RISER WITH 84" (I.D.)
CONC. ANTI-VORTEX DEVICE
TOP OF RISER = 84.80
INV. 6" PVC = 81.80
INV. 15" RCP = 81.80
TOP OF BASE = 81.00
ALL JOINTS TO BE WATERTIGHT

25' DRAINAGE, MAINTENANCE AND ACCESS EASEMENT TO LOCATED A MINIMUM OF 25' FROM THE 100 YR. HIGHWATI ELEVATION = ~~87.94~~ 88.22

25 LF OF 6" PVC @ 1.0% REVERSE SLOPE
INV. IN = 79.50 @ POOL
INV. OUT = 81.80 @ RISER

100 YEAR EL= 88.22

LIMITS OF WORK FOR POND

LIMITS OF WORK FOR FILL (TYP)

2.5:1 SLOPE

4:1 SLOPE

SWM/BMP #3 FACILITY

STILLING BASIN

20' LONG x 1.5' DEEP APRON CLASS I RIPRAP OVER FILTER LINING. APRON SHALL BE 8' UP STREAM END AND 12' DOWNSTREAM END. (APPROX. 11.0 C.Y. REQ'D.)

SS#2-2
STA 18+90(R)
VDOT ST'D
DI-3A
TOP= 95.64
INV= 85.60

DIVERSION DIKE SHALL BE INSTALLED DURING FILLING OPERATIONS AND MAINTAINED UNTIL ROADWAY IS FINE GRADED

90 LF OF 30" RCP @ 2.33%

235 LF OF 24 RCP @ 2.89%

SS#2-1
30" ES-1
INV= 83.50

60 LF OF 18" RCP @ 4.00%

SS#2-2A
STA 18+90(L)
VDOT ST'D
DI-3A
TOP= 94.75
INV= 88.00

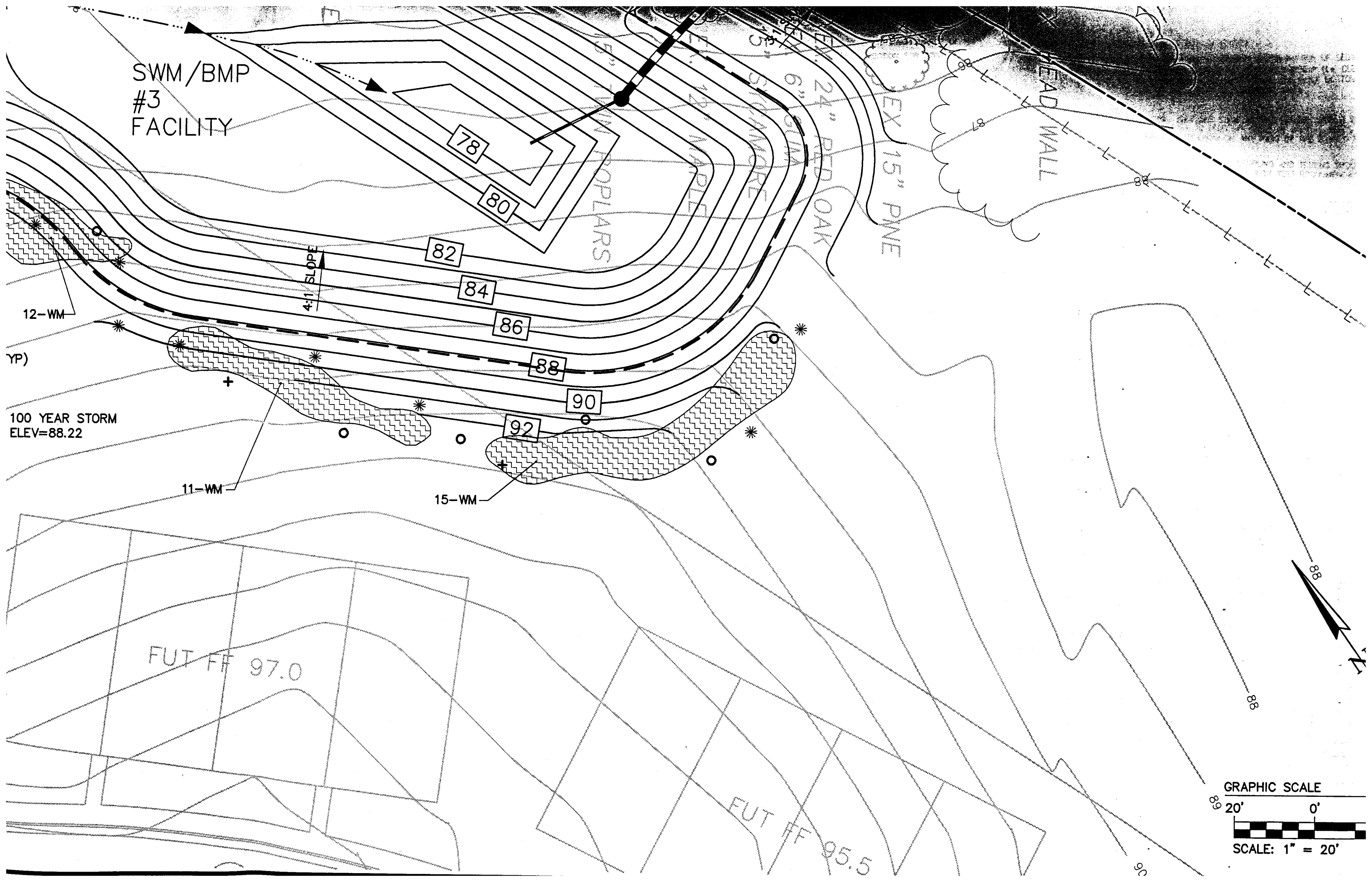
10 LF OF 18" RCP @ 1.0%
INV.=88.10
TO BE PLUGGED

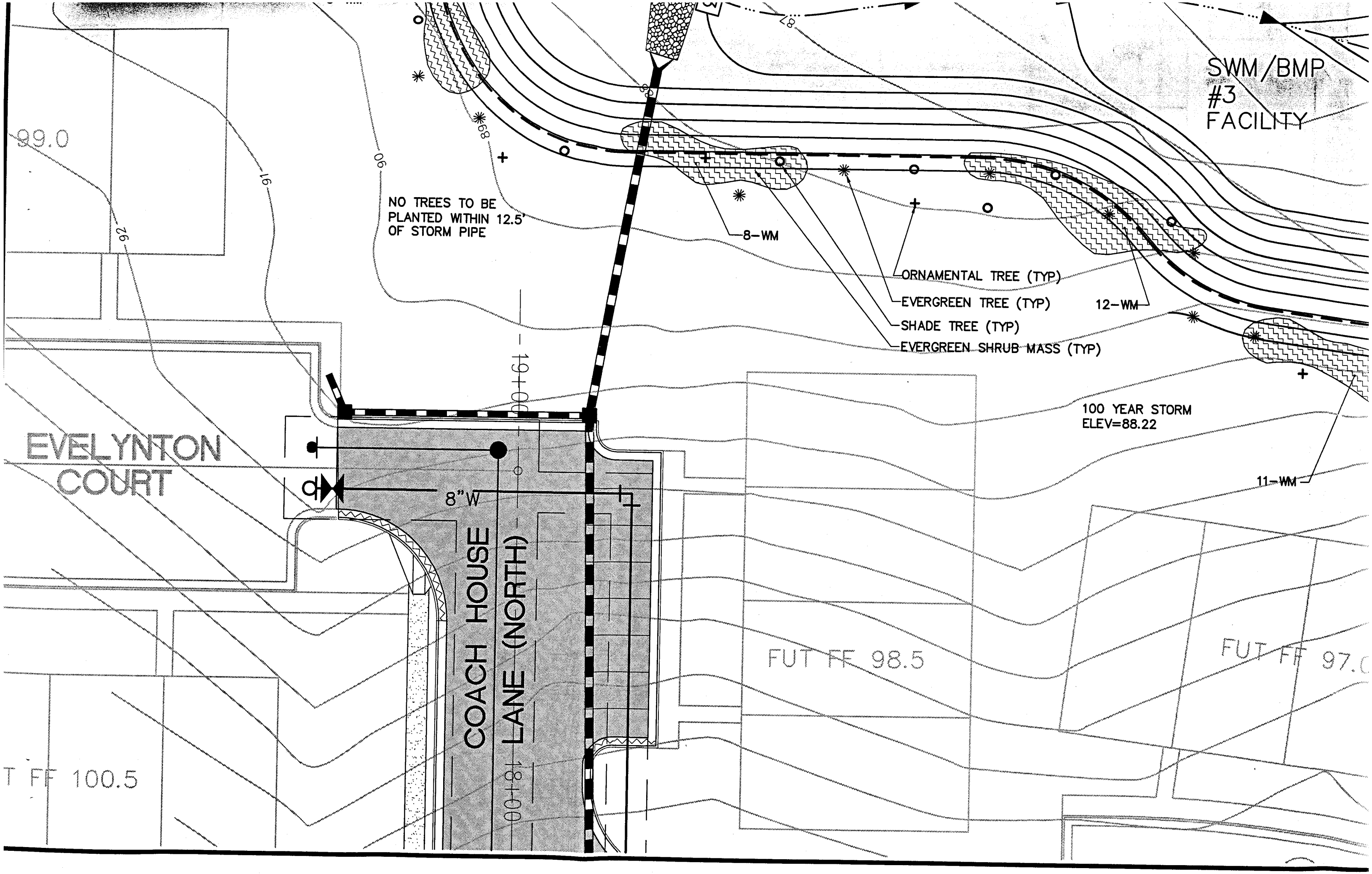
SS#2-3
STA 16+5
VDOT ST'
DI-3B, L=
TOP= 100
INV= 92.4

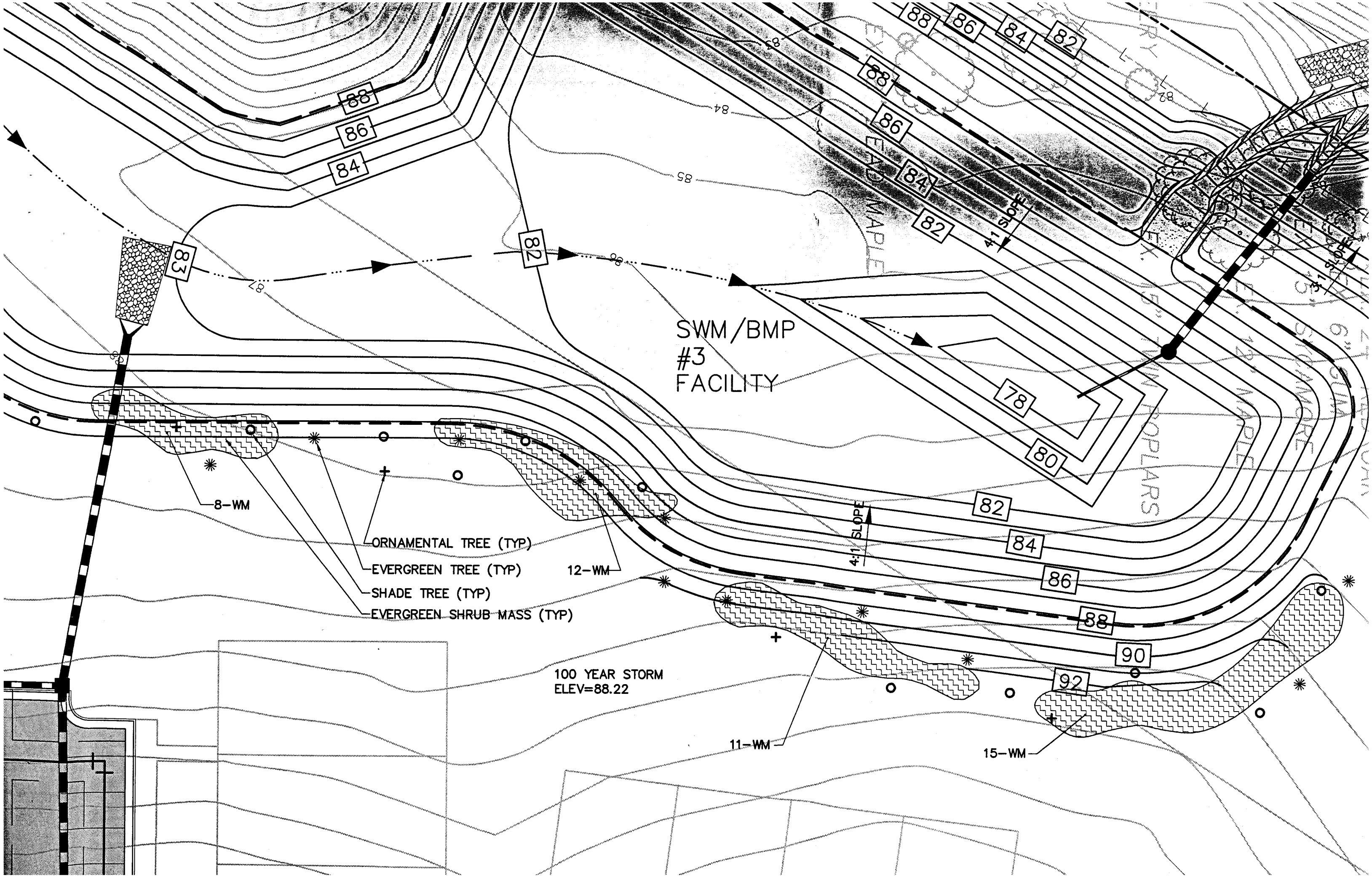
FUTURE DEVELOPMENT

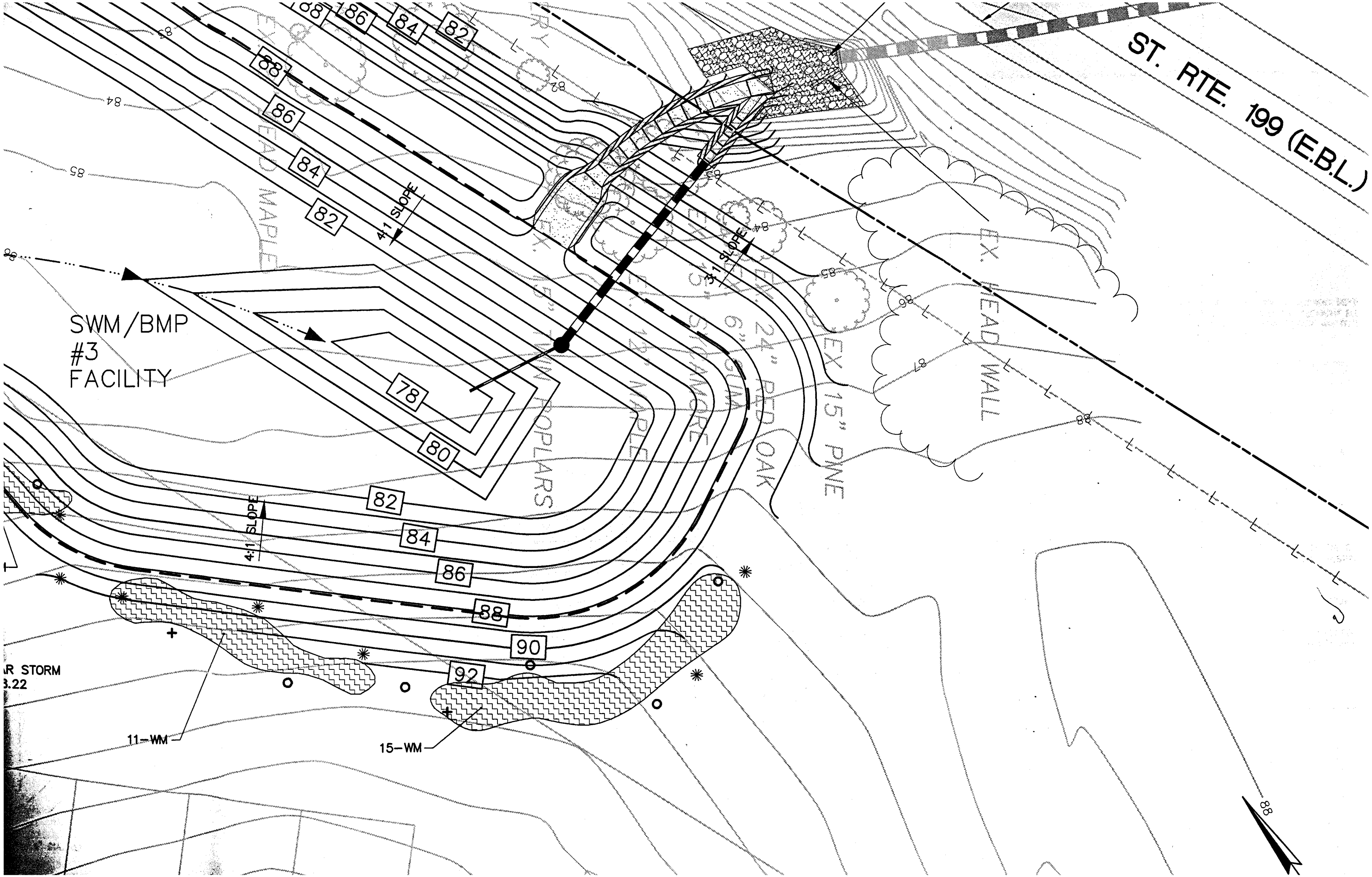
WAVERLY COURT

CLEA LIMIT


SWM/BMP
#3
FACILITY
78
80
82
84
86
88
90
92
4:1 SLOPE
12-WM
11-WM
15-WM
100 YEAR STORM
ELEV=88.22
FUT FF 97.0
FUT FF 95.5
EX 15" PINE
EX 24" RED OAK
6" SYCAMORE
12" MAPLE
HOPLARS
HEAD WALL
88
89
90
GRAPHIC SCALE
20'
0'
SCALE: 1" = 20'


SWM/BMP
#3
FACILITY
99.0
NO TREES TO BE
PLANTED WITHIN 12.5'
OF STORM PIPE
8-WM
ORNAMENTAL TREE (TYP)
EVERGREEN TREE (TYP)
SHADE TREE (TYP)
EVERGREEN SHRUB MASS (TYP)
12-WM
100 YEAR STORM
ELEV=88.22
11-WM
EVELYNTON
COURT
8"W
COACH HOUSE
LANE (NORTH)
FUT FF 98.5
FUT FF 97.0
T FF 100.5


SWM/BMP
#3
FACILITY
100 YEAR STORM
ELEV=88.22
ORNAMENTAL TREE (TYP)
EVERGREEN TREE (TYP)
SHADE TREE (TYP)
EVERGREEN SHRUB MASS (TYP)
8-WM
11-WM
12-WM
15-WM
4:1 SLOPE
3:1 SLOPE
78
80
82
84
86
88
90
92
83
87
85


ST. RTE. 199 (E.B.L.)
SWM/BMP
#3
FACILITY
4:1 SLOPE
3:1 SLOPE
4:1 SLOPE
EX. HEAD WALL
EX. 24" RED OAK
EX. 15" PINE
POPLARS
MAPLE
11-WM
15-WM
78
80
82
84
86
88
90
92

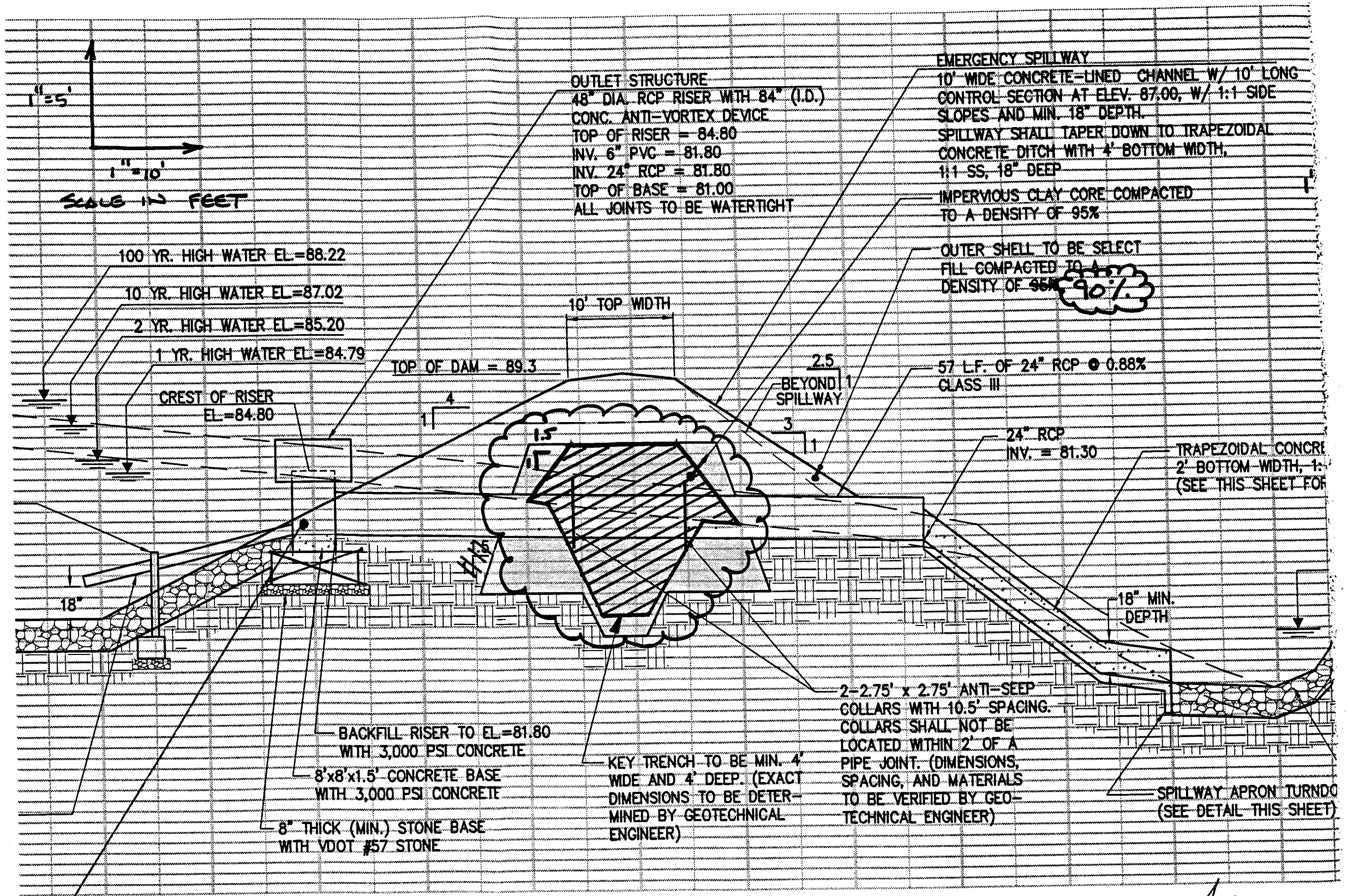
WILLIAMSBURG PLANTATION
ROAD EXTENSION OF
COACH HOUSE LANE

REVISION TO CLAY
CORE OF SWM/BMP
#3 FACILITY

SECTION A-A
FROM SHEET 8
OF CONSTRUCTION
PLANS

COMMONWEALTH OF VIRGINIA
RICHARD A. COSTELLO
CERTIFICATE NO.
012280
4/26/01
CERTIFIED PROFESSIONAL ENGINEER

DATE: 4/26/01

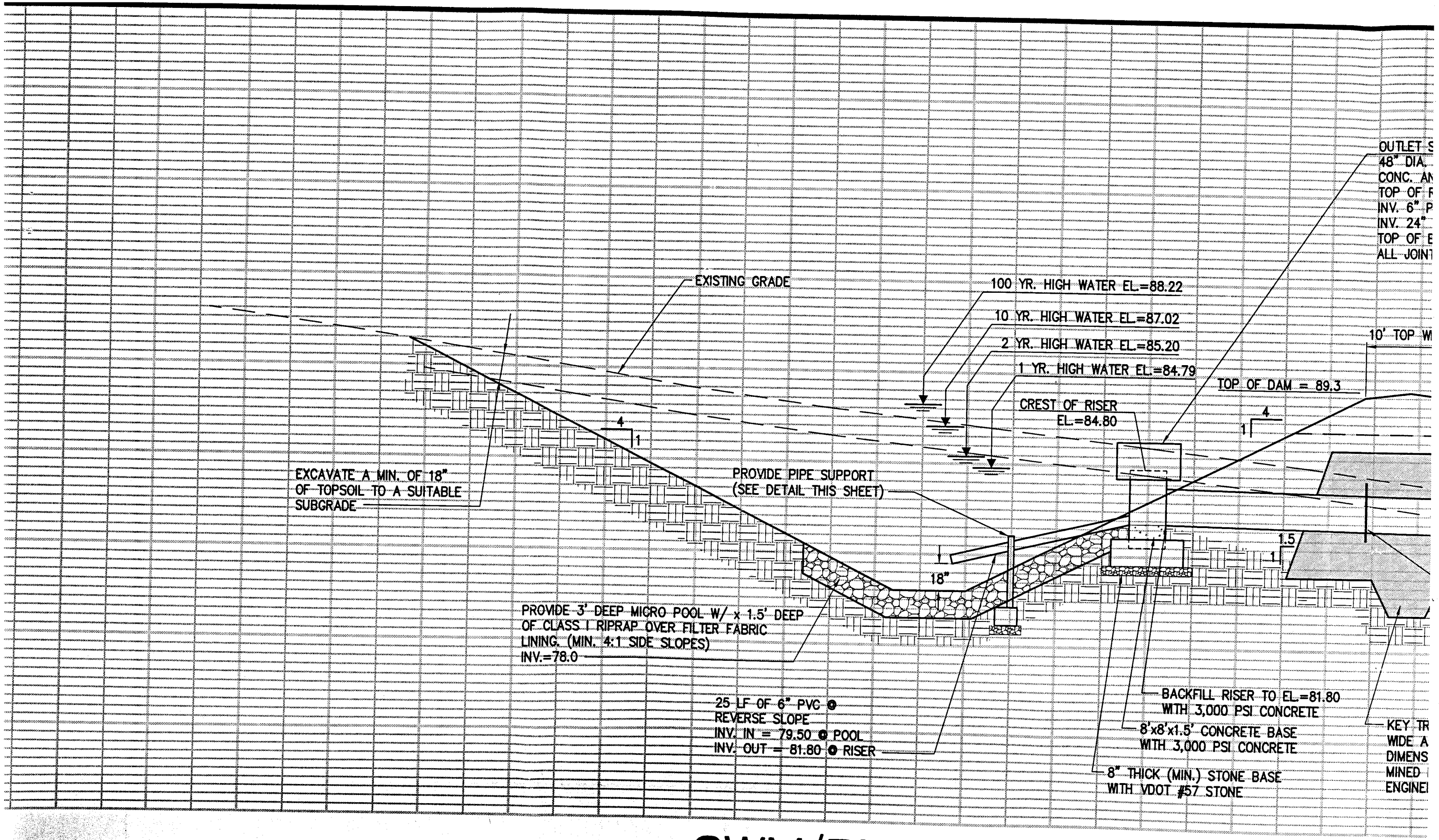


REV O-RING PIPE

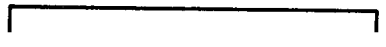
STANDARD ASTM C478
PRECAST MANHOLE W/
PROFILE GASKETS ASTM C443
BASE.

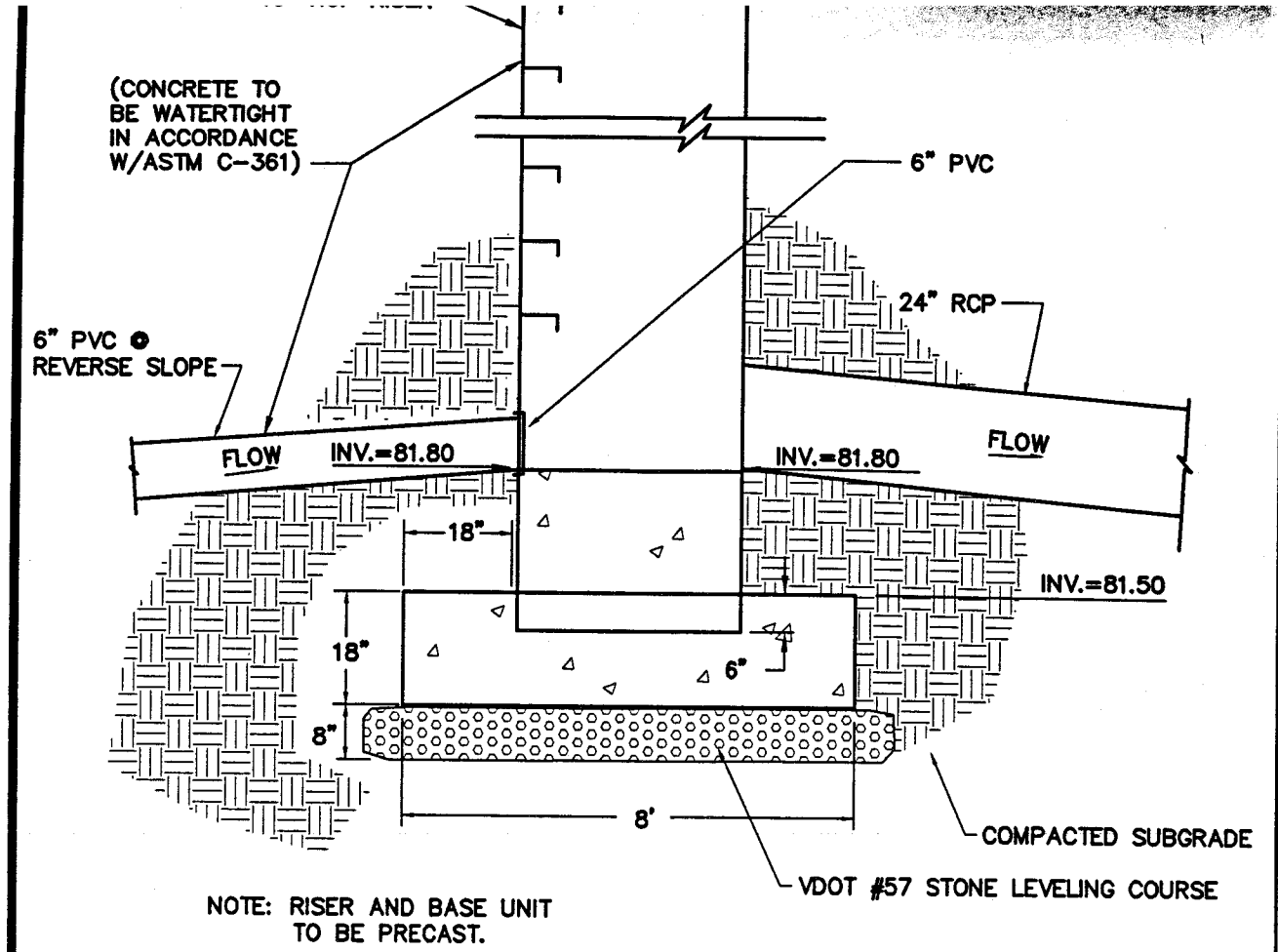
SAT 05-04-01

SAT 05-02-01



SWM/BMP #3 FACILITY DRY P

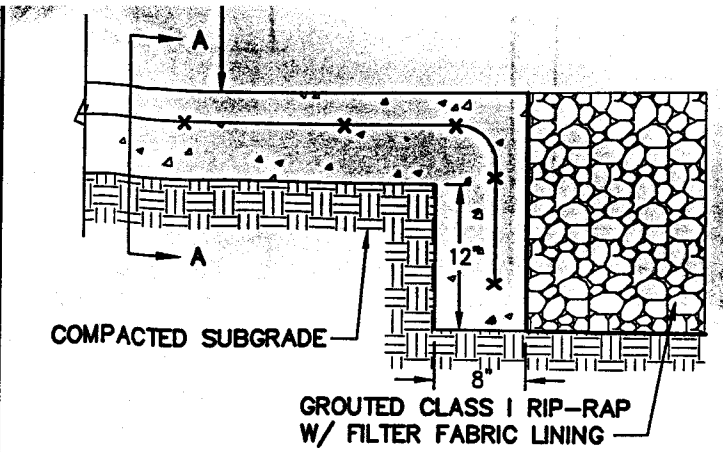




NOTE: RISER AND BASE UNIT TO BE PRECAST.

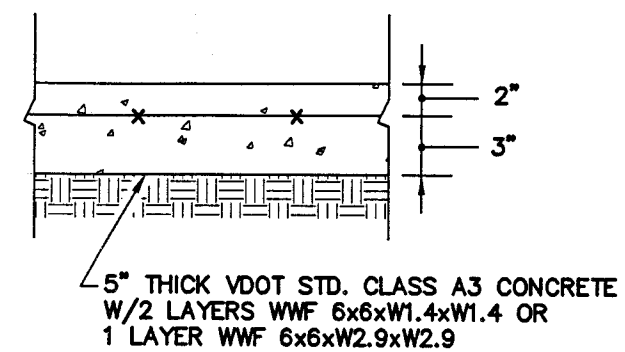
CROSS SECTION PROP. 48" RISER STRUCTURE WITH ANTI-VORTEXING TOP

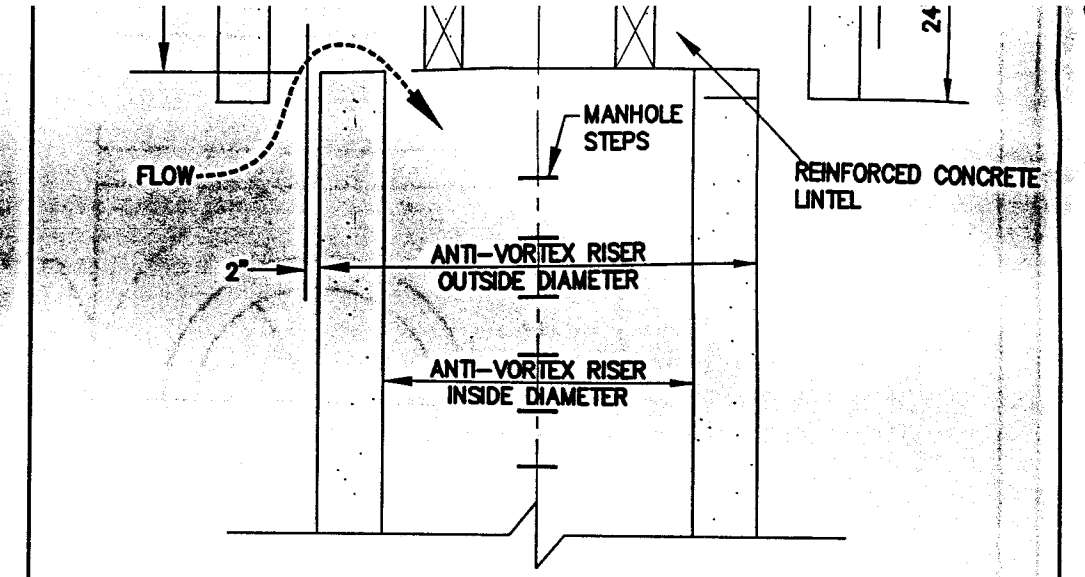
NOT TO SCALE



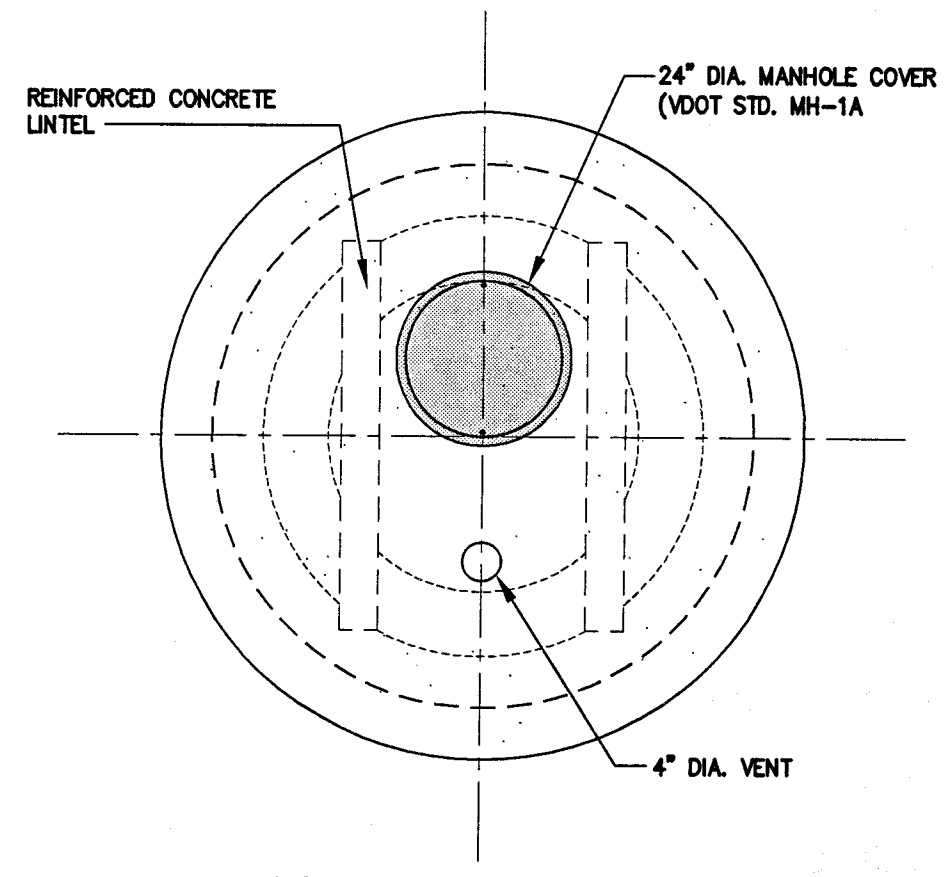
SPILLWAY APRON TURNDOWN

N.T.S.





SECTION



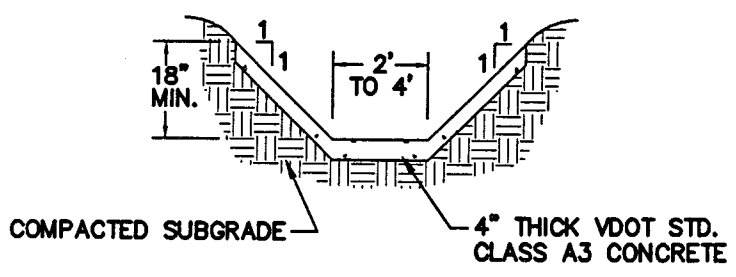
PLAN - TOP SLAB

1. ANTI-VORTEX DEVICE (CAP AND RISER) MANUFACTURED IN ACCORDANCE WITH ASTM C478.
2. DIMENSIONS SUBJECT TO PERMISSIBLE VARIATIONS OF ASTM C478
3. INLET AREA (AREA BETWEEN DEVICE I.D. AND RISER O.D.) IS GREATER THAN OUTLET AREA (AREA OF RISER I.D.)
4. SLAB REINFORCEMENT TO BE ASTM A615 #4 BARS @ 8" E.W. CIRCUMFERENCIAL.

ANTI- VORTEX DETAIL

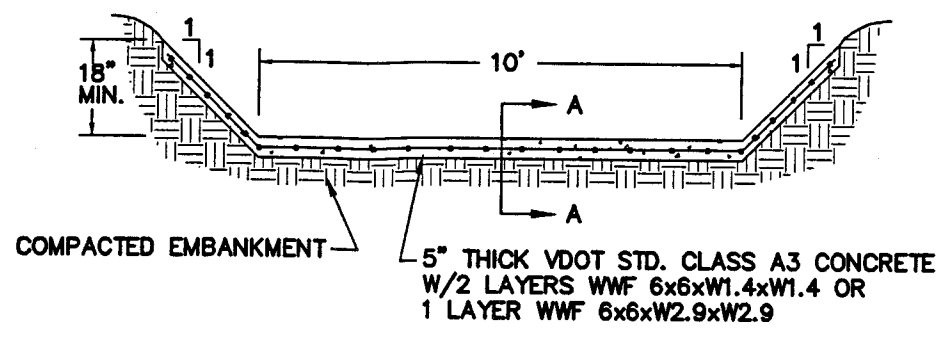
NOT TO SCALE

NOTE:
CONTRACTOR SHALL PROVIDE SMOOTH CONCRETE TRANSITION FROM DAM OUTFALL PIPE TO CONCRETE DITCH



CONCRETE DITCH

N.T.S.



EMERGENCY SPILLWAY

N.T.S.

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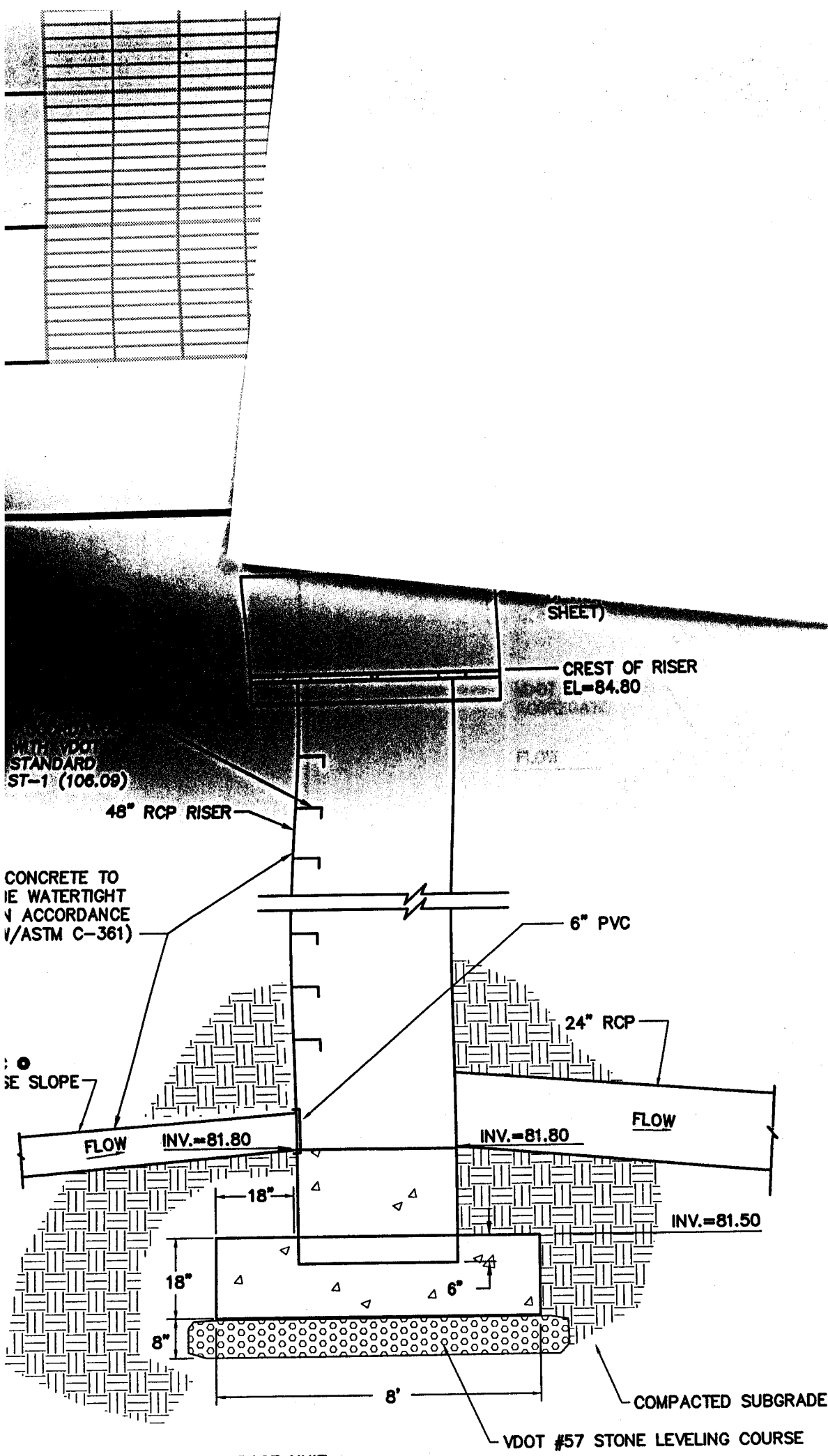
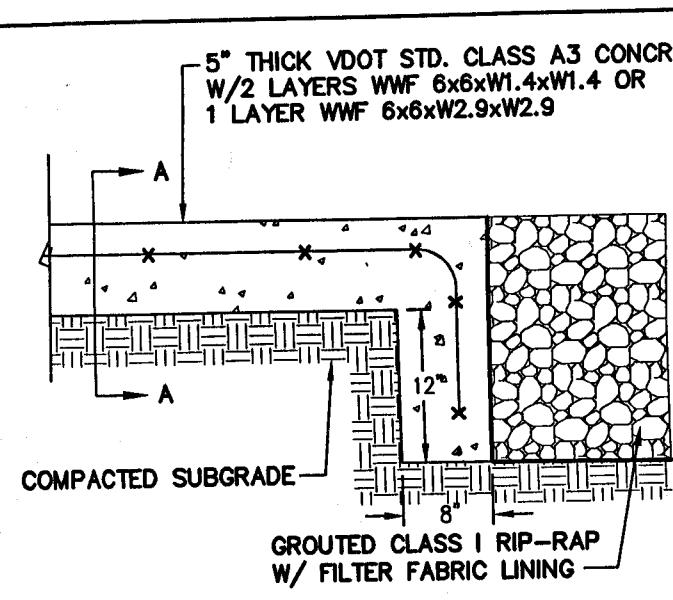


NOTE: RISER AND BASE UNIT TO BE PRECAST.

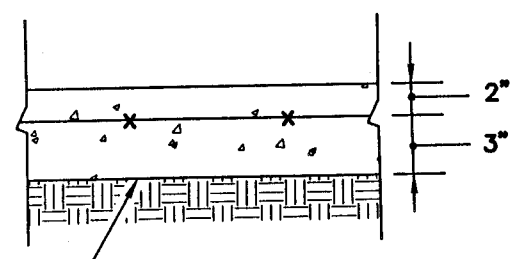
CROSS SECTION PROP. 48" RISER STRUCTURE WITH ANTI-VORTEXING TOP

NOT TO SCALE



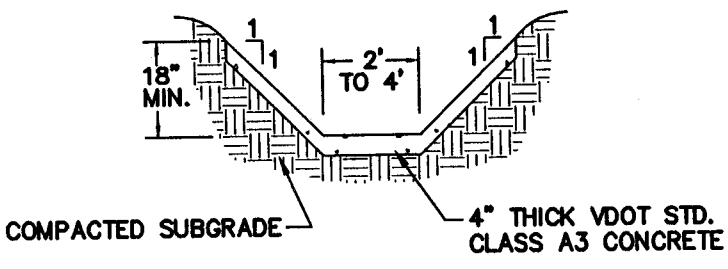
SPILLWAY APRON TURNDOWN

N.T.S.



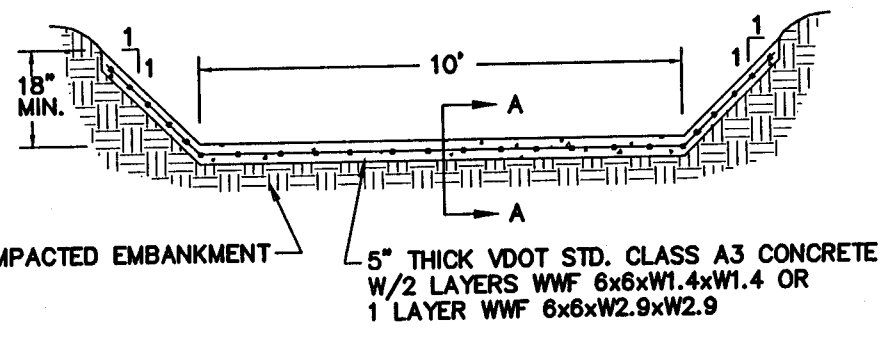
5" THICK VDOT STD. CLASS A3 CONCRETE
W/2 LAYERS WWF 6x6xW1.4xW1.4 OR
1 LAYER WWF 6x6xW2.9xW2.9

NOTE:
CONTRACTOR SHALL PROVIDE SMOOTH CONCRETE TRANSITION FROM DAM OUTFALL PIPE TO CONCRETE DITCH



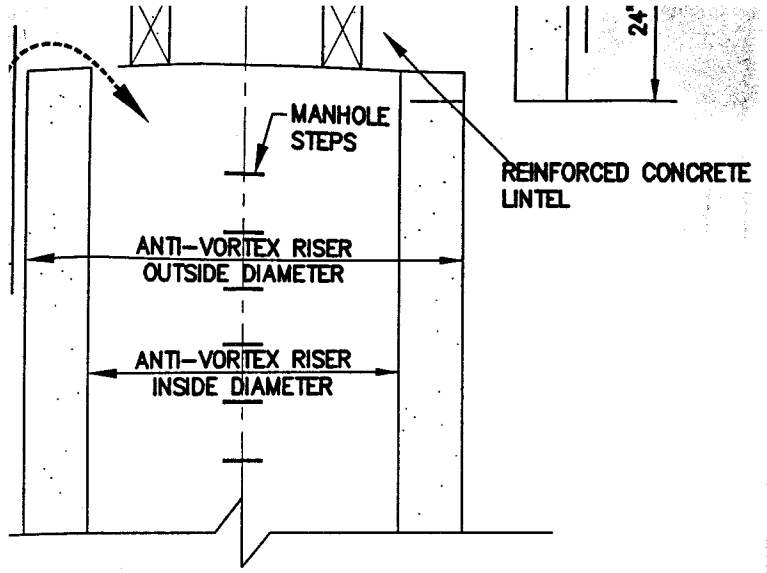
CONCRETE DITCH

N.T.S.

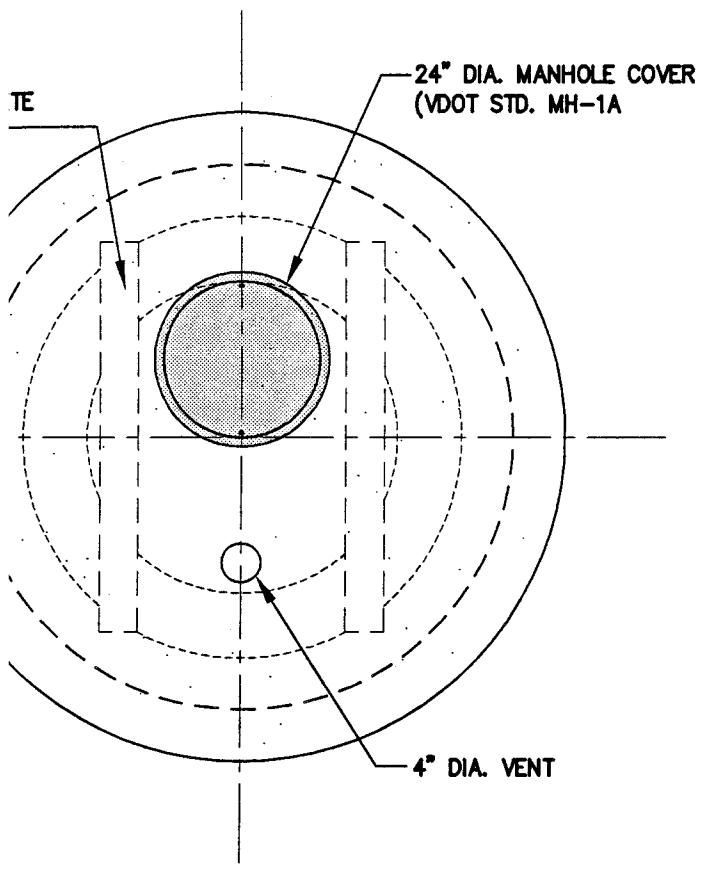


EMERGENCY SPILLWAY

N.T.S.



SECTION



PLAN - TOP SLAB

TI-VORTEX DEVICE (CAP AND RISER) MANUFACTURED
ACCORDANCE WITH ASTM C478.
IENSIONS SUBJECT TO PERMISSIBLE VARIATIONS
ASTM C478
ET AREA (AREA BETWEEN DEVICE I.D. AND RISER
.) IS GREATER THAN OUTLET AREA (AREA OF RISER I.D.)
AB REINFORCEMENT TO BE ASTM A615 #4 BARS @ 8" E.W.
RCUMFERENCIAL.

ANTI- VORTEX DETAIL

NOT TO SCALE

CONSULTANT MUST BE ENGAGED TO ENSURE ON-SITE MONITORING

2. SITE PREPARATION:
THE CONTRACTOR SHALL STRIP ALL AREAS OF THE PERMANENT COVER IN CONSTRUCTION AREA TO REMOVE ALL UNSUITABLE MATERIALS. THE UNSUITABLE MATERIALS TO BE REMOVED BY STRIPPING SHALL INCLUDE ALL TOPSOIL, DEBRIS AND VEGETABLE MATTER, INCLUDING STUMPS AND ROOTS, AND ALL OTHER MATERIALS WHICH MAY BE UNSUITABLE FOR USE IN THE PERMANENT CONSTRUCTION.

3. EMBANKMENT:
THE EXPOSED SUB GRADE SOILS SHALL BE CAREFULLY INSPECTED BY THE GEOTECHNICAL ENGINEER ANY UNSUITABLE MATERIALS THUS EXPOSED SHALL BE REMOVED AND REPLACED WITH A WELL COMPACTED, SUITABLE MATERIAL. DENSITY TESTING, AT THE DISCRETION OF THE OWNER/GEOTECHNICAL ENGINEER, SHALL BE PERFORMED AT THIS TIME. THE EMBANKMENT SHALL BE KEYED INTO THE UNDISTURBED (EXISTING) SOIL STRATUM. EMBANKMENT SHOULD BE KEYED AT LEAST 3 FEET INTO THE STRATUM OR AS SPECIFIED BY THE GEOTECHNICAL ENGINEER (WIDTH=6 FT. MIN.) THE EMBANKMENT FOUNDATION AND ABUTMENTS SHALL BEAR ON FIRM AND STABLE EXISTING SUB-GRADE WHICH HAS BEEN PREPARED SO AS TO REMOVE ALL ORGANIC, LOOSE , AND GENERALLY UNSUITABLE MATERIAL. ALL MATERIALS TO BE USED FOR BACKFILL OR COMPACTED FILL SHALL BE INSPECTED AND, IF NECESSARY, TESTED BY THE GEOTECHNIAL ENGINEER IN ACCORDANCE WITH ASTM D2487 PRIOR TO PLACEMENT, TO DETERMINE IF THEY ARE SUITABLE FOR THE INTENDED USE. THE FILL MATERIAL SHALL BE TAKEN FROM APPROVED BORROW AREAS. IT SHALL BE CLEAN MINERAL SOIL, FREE OF ROOTS, WOOD VEGETATION, OVERSIZED STONES, ROCKS, OR OTHER OBJECTIONABLE MATERIALS. MATERIALS TO BE USED FOR THE CONSTRUCTION OF THE SHELL SHALL BE SELECT BACKFILL FREE OF STUMPS, ROOTS, ROCKS, TRASH, ETC. AND SHALL BE MORE PERVIOUS THAN THE IMPERVIOUS CLAY CORE. AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED A MINIMUM OF 4 INCHES PRIOR TO PLACEMENT OF FILL.
THE FILL MATERIAL'S MOISTURE CONTENT SHALL BE (+3 TO −2) PERCENTAGE POINTS OF OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D2216 (I.E. IN GENERAL THE FILL MATERIAL SHOULD CONTAIN SUFFICIENT MOISTURE SO THAT IT CAN BE FORMED INTO A BALL WITHOUT CRUMBLING. IF WATER CAN BE SQUEEZED OUT OF THE BALL, IT IS TOO WET FOR PROPER COMPACTION). FILL MATERIAL WILL BE PLACED IN 6 TO 8 INCH CONTINUOUS LAYERS OVER THE ENTIRE LENGTH OF THE FILL. FIRST LIFT ON SUBGRADE MAY BE PLACED AT A DEPTH UP TO 30 INCHES TO BRIDGE SUBGRADE WITH OVER OPTIMUM MOISTURE CONTENT. COMPACTION, AS NOTED ON PLAN, SHALL BE OBTAINED GENERALLY BY USING A SHEEPSFOOT COMPACTOR. FINISHED GRADES SHALL BE MERGED NATURALLY INTO THE EXISTING GRADES.

4. CUTOFF TRENCH/KEY TRENCH:
THE TRENCH SHALL BE EXCAVATED ALONG THE CENTERLINE OF THE DAM. THE MINIMUM DEPTH SHALL BE AS SHOWN ON THE PLANS AND SHALL EXTEND UP BOTH ABUTMENTS. THE BOTTOM WIDTH SHALL BE WIDE ENOUGH TO PERMIT OPERATION OF COMPACTING EQUIPMENT. THE SIDE SLOPES SHALL BE NO STEEPER THAN 1:1. COMPACTING REQUIREMENTS SHALL BE THE SAME AS THOSE FOR EMBANKMENT. THE TRENCH SHALL BE KEPT DRAINED DURING THE BACKFILLING – COMPACTING OPERATIONS.

5. PRINCIPAL SPILLWAY:
THE BOTTOM OF THE SPILLWAY RISER FOUNDATION BASE EXCAVATION SHALL BE OBSERVED BY THE GEOTECHNICAL ENGINEER TO ENSURE THAT ALL UNSUITABLE AND LOOSE MATERIALS ARE REMOVED AND THAT ACCEPTABLE BEARING CONDITIONS EXIST IN THE FOUNDATION'S BASE. ALL JOINTS IN THE PRINCIPAL SPILLWAY STRUCTURE SHALL BE WATERTIGHT CONSTRUCTION. PERVIOUS MATERIALS SUCH AS SAND, GRAVEL OR CRUSHED STONE SHALL NOT BE USED AS BACKFILL AROUND THE BARREL OR ANTI-SEEP COLLAR. FILL MATERIAL SHALL BE PLACED AROUND THE PIPE IN 4 INCH LAYERS AND COMPACTED BY HAND TO THE SAME DENSITY AS THE EMBANKMENT. AMINIMUM OF TWO FEET OF FILL SHALL BE HAND-COMPACTED OVER THE BARREL BEFORE CROSSING IT WITH CONSTRUCTION EQUIPMENT.

6. VEGETATIVE STABILIZATION:
FINAL VEGETATIVE COVER (STABILIZATION) SHALL CONSIST OF TOP SOILING, LIMING, FERTILIZING, SEEDING, AND MULCHING TO ASSURE A FIRM STAND OF GRASS AS SOON AS PRACTICAL. SEDIMENT BASINS AND OTHER TEMPORARY EROSION CONTROL MEASURES ARE TO BE REMOVED ONLY WHEN STABILIZATION IS COMPLETE. FINAL VEGETAL COVER SHALL BE PROVIDED IN ACCORDANCE WITH THE FOLLOWING:

TOPSOIL:	AT LEAST 4" THICKNESS OBTAINED FROM STOCKPILES ON SITE, FREE OF LARGE DEBRIS.
LIME:	4,000#/ACRE (90#/1,000 S.F.)
SEED:	KENTUCKY 31 TALL FESCUE 250#/ACRE (6#/1,000 S.F.)
FERTILIZER:	10/10/10 MIX, 1,000#/ACRE FALL (23#/1,000 S.F.)
MULCH:	STRAW OR HAY (LOCALLY OBTAINED) 4,000#/ACRE (90#/1,000 S.F.)

NOTE:
VDOT DOES NOT ASSUME RESPONSIBILITY FOR MAINTENANCE OF THE DETENTION/RETENTION POND OR ITS STRUCTURES, AND SHALL BE SAVED HARMLESS FROM ANY DAMAGE.

INSPECTION PERSONNEL UPON REQUEST.

INSPECTION AND MAINTENANCE OF THE FA CONSIST OF THE FOLLOWING ADDITIONAL MEASURES:

1. THE INSPECTION FOR SEDIMENT BUILDUP WILL BE PERFORMED BY VISUAL INSPECTION AND A PHYSICAL DET STORAGE AREA. IF THE DEPTH OF SEDIMENT REACHES THE DEPTH OF 1 FT. ABOVE THE BOTTOM OF SEDIME IS REQUIRED USING A RUBBER-WHEELED BACKHOE. AT THE SAME TIME OF AT LEAST ONCE PER YEAR, CLEA ACCUMULATED SEDIMENTS. DISPOSE OF SEDIMENTS REMOVED FROM THE FACILITY AT AN ACCEPTABLE DISPOS

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3. PERFORM SOIL SAMPLING ON STABILIZED POND SOIL AREAS ONCE EVERY FOUR (4) YEARS. SOIL SAMPLIN QUALIFIED INDEPENDENT TESTING LABORATORY. APPLY ADDITIONAL LIME AND FERTILIZER IN ACCORDANCE WIT

4. IN STABILIZED POND AREAS, IF VEGETATION COVERS LESS THAN 40% OF SOIL SURFACES, LIME FERTILIZE RECOMMENDATIONS FOR NEW SEEDLINGS, AS LISTED IN DAM CONSTRUCTION NOTES. IF VEGETATION COVERS M SURFACES, LIME FERTILIZE AND OVERSEED IN ACCORDANCE WITH CURRENT SEEDLING RECOMMENDATIONS.

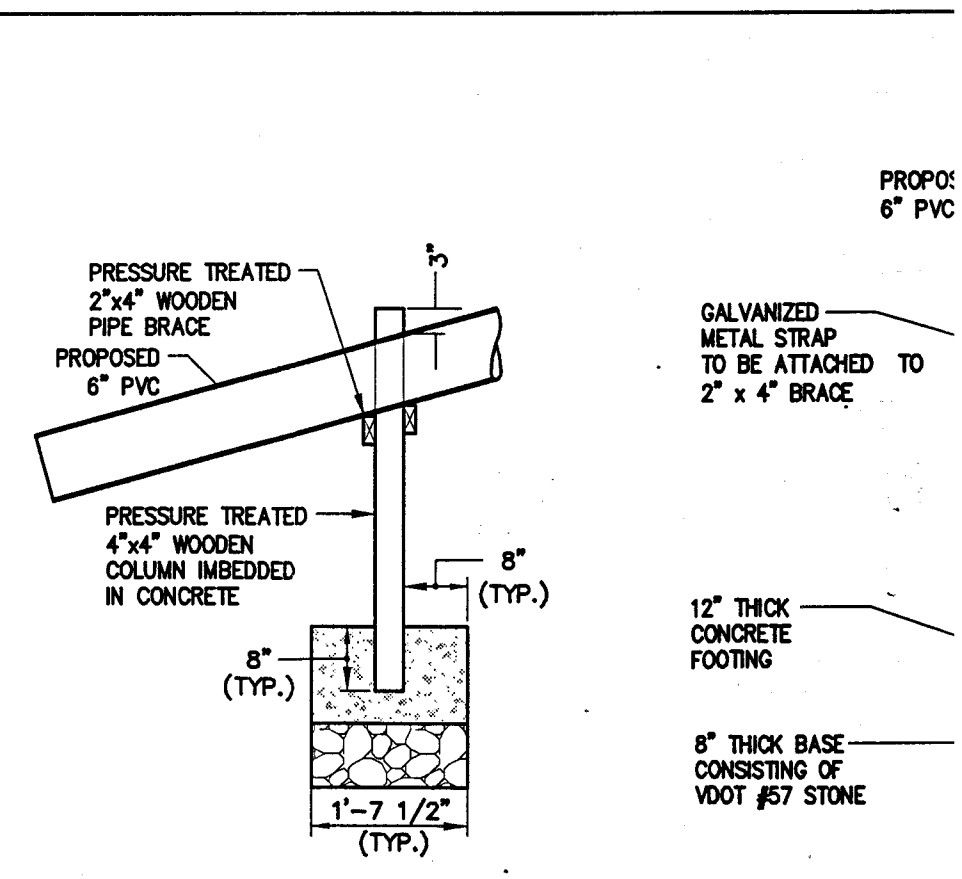
5. PERFORM QUARTERLY INSPECTIONS OF THE RISER SECTION AND CREST OF SPILLWAY FOR THE OBSERVANC REMOVE ANY DEBRIS TO MAINTAIN THE INTEGRITY OF THE STRUCTURE AND PROVIDE AN ATTRACTIVE APPEARA

6. PERFORM YEARLY STRUCTURAL INSPECTIONS OF THE FACILITY FOR DAMAGE. STRUCTURAL INSPECTION SH ANTI-VORTEX DEVICE, TRASH RACK, ORIFICE/ WEIR(S), OUTLET BARREL AND POND EMBANKMENT. IF DAMAGE PROFESSIONAL ENGINEER MAY BE REQUIRED TO ASSESS THE INTEGRITY OF THE STRUCTURE.

7. PERFORM QUARTERLY INSPECTIONS OF THE GRADED SIDE SLOPES OF THE DETENTION FACILITY FOR SIGNS EROSION. IMMEDIATELY PERFORM NECESSARY REPAIRS, REFILLING OR RESEEDING AS APPROPRIATE.

8. RECORD KEEPING. THE OWNER OR DESIGNATED REPRESENTATIVE SHALL KEEP REASONABLE, ACCURATE W PERFORMED FOR THE STRUCTURE. RECORDS SHALL DOCUMENT OR REPAIRS PERFORMED. COPIES SHALL BE REQUEST.

9. THE FACILITY SHALL NOT BE MODIFIED IN ANY WAY WITHOUT PRIOR CONSENT/ APPROVAL OF THE COUNT



PIPE SUPPORT DETA

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THICKNESS OBTAINED FROM STOCKPILES ON SITE, FREE OF LARGE DEBRIS.
(90#/1,000 S.F.)
1 TALL FESCUE 250#/ACRE (6#/1,000 S.F.)
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2. PERFORM MAINTENANCE MOWING OF POND GRASSES AT LEAST TWICE EACH YEAR. GRASSES SUCH AS TALL FESCUE SHOULD BE MOWED IN EARLY SUMMER AFTER EMERGENCE OF THE HEADS ON COOL SEASON GRASSES AND IN LATE FALL TO PREVENT SEEDS OF ANNUAL WEEDS FROM MATURING. MOWING OF LEGUMES CAN BE LESS FREQUENT TREES AND SHRUBS SHOULD NOT BE PERMITTED TO GROW ON ANY PART OF THE GRADED EMBANKMENT.

3. PERFORM SOIL SAMPLING ON STABILIZED POND SOIL AREAS ONCE EVERY FOUR (4) YEARS. SOIL SAMPLING AND TESTING SHOULD BE PERFORMED BY A QUALIFIED INDEPENDENT TESTING LABORATORY. APPLY ADDITIONAL LIME AND FERTILIZER IN ACCORDANCE WITH TEST RECOMMENDATIONS.

4. IN STABILIZED POND AREAS, IF VEGETATION COVERS LESS THAN 40% OF SOIL SURFACES, LIME FERTILIZE AND SEED IN ACCORDANCE WITH RECOMMENDATIONS FOR NEW SEEDLINGS, AS LISTED IN DAM CONSTRUCTION NOTES. IF VEGETATION COVERS MORE THAN 40% BUT LESS THAN 70% OF SOIL SURFACES, LIME FERTILIZE AND OVERSEED IN ACCORDANCE WITH CURRENT SEEDLING RECOMMENDATIONS.

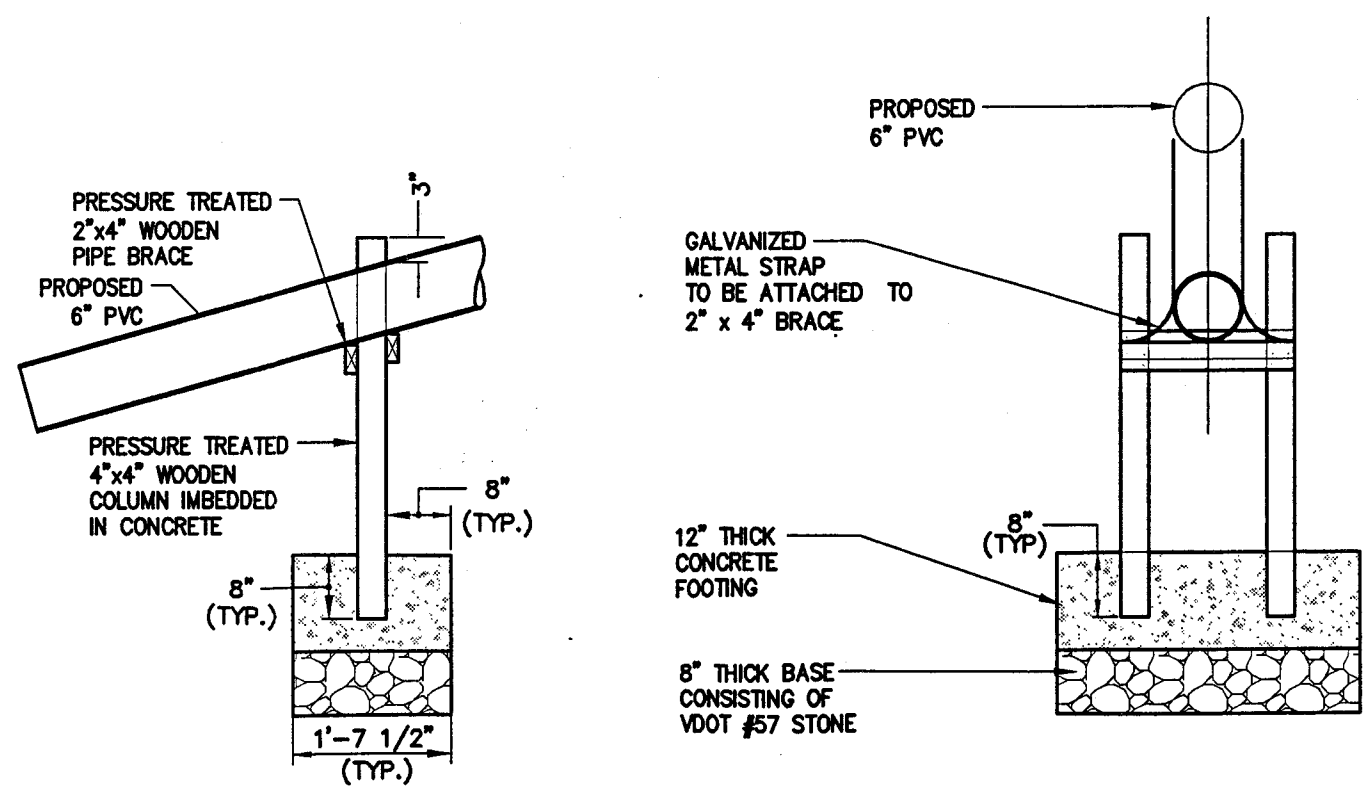
5. PERFORM QUARTERLY INSPECTIONS OF THE RISER SECTION AND CREST OF SPILLWAY FOR THE OBSERVANCE OF COLLECTED DEBRIS. IMMEDIATELY REMOVE ANY DEBRIS TO MAINTAIN THE INTEGRITY OF THE STRUCTURE AND PROVIDE AN ATTRACTIVE APPEARANCE.

6. PERFORM YEARLY STRUCTURAL INSPECTIONS OF THE FACILITY FOR DAMAGE. STRUCTURAL INSPECTION SHALL BE PERFORMED ON THE CONCRETE RISER, ANTI-VORTEX DEVICE, TRASH RACK, ORIFICE/ WEIR(S), OUTLET BARREL AND POND EMBANKMENT. IF DAMAGE IS EVIDENT, FURTHER INVESTIGATION BY A PROFESSIONAL ENGINEER MAY BE REQUIRED TO ASSESS THE INTEGRITY OF THE STRUCTURE.

7. PERFORM QUARTERLY INSPECTIONS OF THE GRADED SIDE SLOPES OF THE DETENTION FACILITY FOR SIGNS OF ANIMAL/ RODENT BORROWS OR SLOPE EROSION. IMMEDIATELY PERFORM NECESSARY REPAIRS, REFILLING OR RESEEDING AS APPROPRIATE.

8. RECORD KEEPING. THE OWNER OR DESIGNATED REPRESENTATIVE SHALL KEEP REASONABLE, ACCURATE WRITTEN RECORDS OR INSPECTIONS PERFORMED FOR THE STRUCTURE. RECORDS SHALL DOCUMENT OR REPAIRS PERFORMED. COPIES SHALL BE PROVIDED TO THE COUNTY UPON REQUEST.

9. THE FACILITY SHALL NOT BE MODIFIED IN ANY WAY WITHOUT PRIOR CONSENT/ APPROVAL OF THE COUNTY.



PIPE SUPPORT DETAIL

N.T.S.

CONSULTING ENGINEER

NOTES AND DETAILS

WILLIAMSBURG PLANTATION

ROAD DESIGN

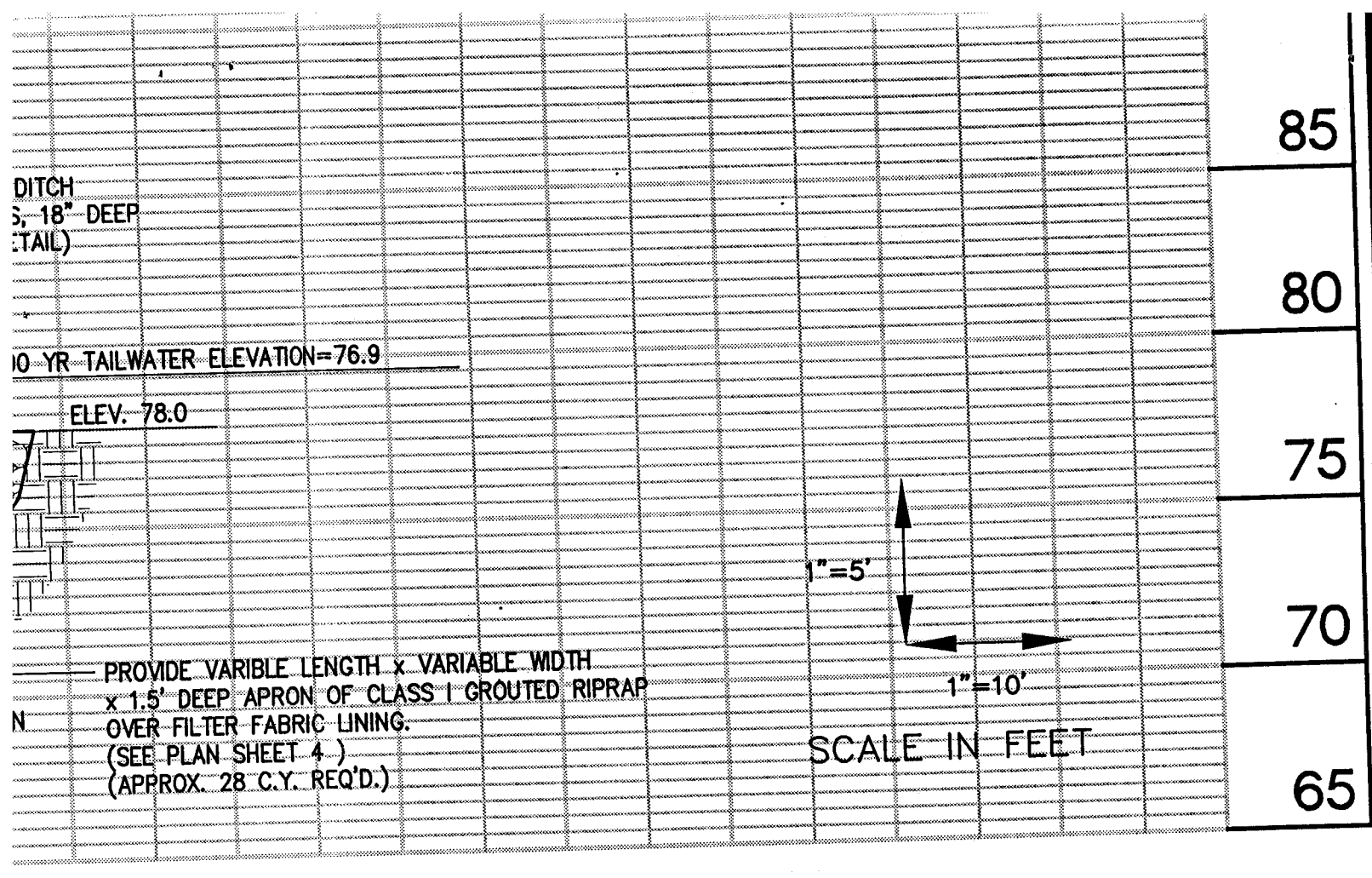
OWNER/DEVELOPER: WILLIAMSBURG PLANTATION, INC.

BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
DPW/CBR	DPW
Scale	Date
AS NOTED	9/11/00

Project No. 7555-14

Drawing No. 8



No.	DATE
3	1/12/01
2	12/5/00
1	11/6/00

COMMONWEALTH OF VIRGINIA
CERTIFIED PROFESSIONAL ENGINEER
RICHARD A. COSTELLO
CERTIFICATE NO.
013250
1/12/01

STORMWATER MANAGEMENT/ BMP FACILITY MAINTENANCE PLAN

ROPER MAINTENANCE OF THIS FACILITY IS ENCOURAGED TO PREVENT THE INTRODUCTION OF DEBRIS AND SEDIMENT IN TO THE FACILITY, SPILLWAY(S) AND OWNSTREAM WATERWAYS. FOLLOWING INSTALLATION OF THE FACILITY AND ESTABLISHMENT OF VEGETATION IN DISTURBED AREAS, INSPECTIONS FOR EDIMENT BUILDUPS WILL BE PERFORMED AT LEAST QUARTERLY. IT IS ANTICIPATED THAT UNDER NORMAL CONDITIONS, SEDIMENT REMOVAL FROM THE ACILITY WILL BE REQUIRED ONCE EVERY 10 YEARS. IF OTHER CONSTRUCTION OR RELATED ACTIVITIES ARE PERFORMED ON UPSLOPE PARCELS, ADEQUATE ROTECTION SHOULD BE PROVIDED AND INSPECTIONS PERFORMED AT LEAST ONCE WEEKLY.

DESIGNATED REPRESENTATIVE OF THE OWNER WILL INSPECT THE SWM STRUCTURE AFTER EACH SIGNIFICANT RAINFALL EVENT OR THE FOLLOWING WORKING AY IF A WEEKEND OR HOLIDAY OCCURS. A SIGNIFICANT RAINFALL FOR THIS STRUCTURE IS DEFINED AS ONE (1) INCH OR MORE OF GAUGED RAINFALL ITHIN A 24 HOUR PERIOD. ONCE PER YEAR, A REPRESENTATIVE OF THE COUNTY MAY JOINTLY INSPECT THE STRUCTURE. APPROPRIATE ACTION, ERFORMED AT THE COST OF THE OWNER, WILL BE TAKEN TO ENSURE APPROPRIATE MAINTENANCE. WHERE STRUCTURES ARE TO BE MAINTAINED JOINTLY, LLOCATION OF MAINTENANCE COSTS WILL BE IN ACCORDANCE WITH THE TERMS ESTABLISHED IN MAINTENANCE AGREEMENTS. KEYS TO LOCKED ACCESS OINTS SHALL BE MADE AVAILABLE TO COUNTY INSPECTION PERSONNEL UPON REQUEST.

NSPECTION AND MAINTENANCE OF THE FACILITY WILL CONSIST OF THE FOLLOWING ADDITIONAL MEASURES:

. THE INSPECTION FOR SEDIMENT BUILDUP WILL BE PERFORMED BY VISUAL INSPECTION AND A PHYSICAL DETERMINATION OF SEDIMENT DEPTH WITHIN THE TORAGE AREA. IF THE DEPTH OF SEDIMENT REACHES THE DEPTH OF 1.0 ft. ABOVE THE BOTTOM OF SEDIMENT FOREBAY (i.e. CLEANOUT ELEVATION 79.0), REMOVAL S REQUIRED USING A RUBBER-WHEELED BACKHOE. AT THE SAME TIME, OR AT LEAST ONCE PER YEAR, CLEAN THE RISER BOTTOM AND OUTLET PIPE OF CCUMULATED SEDIMENTS. DISPOSE OF SEDIMENTS REMOVED FROM THE FACILITY AT AN ACCEPTABLE DISPOSAL AREA.

2. PERFORM MAINTENANCE MOWING OF POND GRASSES AT LEAST TWICE EACH YEAR. GRASSES SUCH AS TALL FESCUE SHOULD BE MOWED IN EARLY UMMER AFTER EMERGENCE OF THE HEADS ON COOL SEASON GRASSES AND IN LATE FALL TO PREVENT SEEDS OF ANNUAL WEEDS FROM MATURING. MOWING F LEGUMES CAN BE LESS FREQUENT TREES AND SHRUBS SHOULD NOT BE PERMITTED TO GROW ON ANY PART OF THE GRADED EMBANKMENT.

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4. IN STABILIZED POND AREAS, IF VEGETATION COVERS LESS THAN 40% OF SOIL SURFACES, LIME FERTILIZE AND SEED IN ACCORDANCE WITH RECOMMENDATIONS FOR NEW SEEDLINGS, AS LISTED IN DAM CONSTRUCTION NOTES. IF VEGETATION COVERS MORE THAN 40% BUT LESS THAN 70% OF SOIL SURFACES, LIME FERTILIZE AND OVERSEED IN ACCORDANCE WITH CURRENT SEEDLING RECOMMENDATIONS.

5. PERFORM QUARTERLY INSPECTIONS OF THE RISER SECTION AND CREST OF SPILLWAY FOR THE OBSERVANCE OF COLLECTED DEBRIS. IMMEDIATELY REMOVE ANY DEBRIS TO MAINTAIN THE INTEGRITY OF THE STRUCTURE AND PROVIDE AN ATTRACTIVE APPEARANCE.

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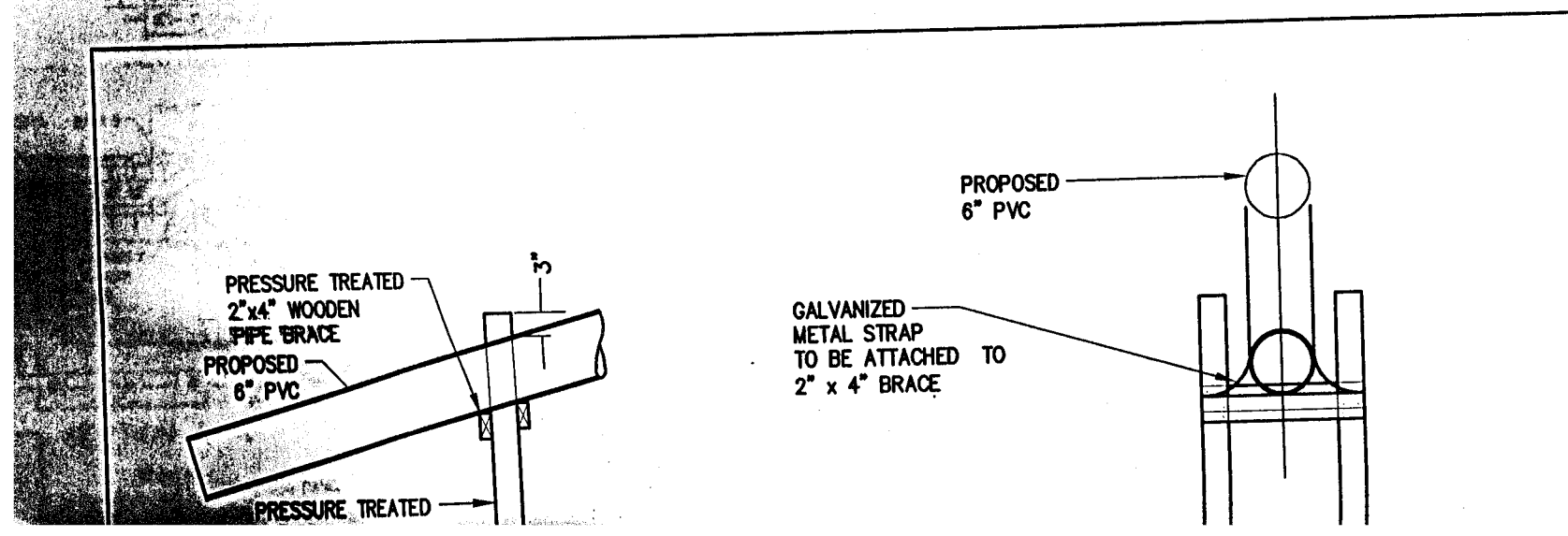


5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(757) 253-0040
Fax (757) 220-8994
CONSULTING ENGINEERS

NOTES AND DETAILS
WILLIAMSBURG PLANTATION
ROAD DESIGN
OWNER/DEVELOPER: WILLIAMSBURG PLANTATION, INC.
KELEY DISTRICT JAMES CITY COUNTY VIRGINIA

STANDARD
EROSION AND SEDIMENT CONTROL NOTES
FOR JAMES CITY COUNTY, VIRGINIA
REVISED 5/5/99

THE PURPOSE OF THE EROSION CONTROL MEASURES SHOWN ON THESE PLANS SHALL BE TO PRECLUDE THE TRANSPORT OF ALL WATERBORNE SEDIMENTS RESULTING FROM CONSTRUCTION ACTIVITIES FROM ENTERING ONTO ADJACENT PROPERTIES OR STATE WATERS. IF FIELD INSPECTION REVEALS THE INADEQUACY OF THE PLAN TO CONFINE SEDIMENT TO THE PROJECT SITE, APPROPRIATE MODIFICATIONS WILL BE MADE TO CORRECT ANY PLAN DEFICIENCIES. IN ADDITION TO THESE NOTES, ALL PROVISIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS SHALL APPLY TO THIS PROJECT.

1. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK". THE CONTRACTOR SHALL BE THOROUGHLY FAMILIAR WITH ALL APPLICABLE MEASURES CONTAINED THEREIN WHICH MAY BE PERTINENT TO THIS PROJECT.

2. ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS SHALL BE PROTECTED BY A TEMPORARY CONSTRUCTION ENTRANCE TO PREVENT TRACKING OF MUD ONTO PUBLIC RIGHT-OF-WAYS. AN ENTRANCE PERMIT FROM VDOT IS REQUIRED PRIOR TO ANY CONSTRUCTION ACTIVITIES WITHIN STATE RIGHTS-OF-WAYS. WHERE SEDIMENT IS TRANSPORTED ONTO A PUBLIC ROAD SURFACE, THE ROAD SHALL BE THOROUGHLY CLEANED AT THE END OF EACH DAY.

3. A PRECONSTRUCTION MEETING SHALL BE HELD ON SITE BETWEEN THE COUNTY, THE DEVELOPER, THE PROJECT ENGINEER, AND THE CONTRACTOR PRIOR TO ISSUANCE OF THE LAND DISTURBING PERMIT. THE CONTRACTOR SHALL SUBMIT A SEQUENCE OF CONSTRUCTION TO THE COUNTY FOR APPROVAL PRIOR TO THE PRECONSTRUCTION MEETING. THE CONTRACTOR WILL SUPPLY THE ENVIRONMENTAL DIVISION WITH THE NAME OF THE INDIVIDUAL WHO WILL BE RESPONSIBLE FOR ENSURING MAINTENANCE OF INSTALLED MEASURES ON A DAILY BASIS.

4. SEDIMENT BASINS AND TRAPS, PERIMETER DIKES, SEDIMENT BARRIERS AND OTHER MEASURES INTENDED TO TRAP SEDIMENT ON-SITE MUST BE CONSTRUCTED AS A FIRST STEP IN GRADING AND BE MADE FUNCTIONAL BEFORE UPSLOPE LAND DISTURBANCE TAKES PLACE. EARTHEN STRUCTURES SUCH AS DAMS, DIKES, AND DIVERSIONS MUST BE SEEDED AND MULCHED IMMEDIATELY AFTER INSTALLATION. PERIODIC INSPECTIONS OF THE EROSION CONTROL MEASURES SHALL BE MADE TO ASSESS THEIR CONDITION. ANY NECESSARY MAINTENANCE OF THE MEASURES SHALL BE ACCOMPLISHED IMMEDIATELY UPON NOTIFICATION BY THE COUNTY AND SHALL INCLUDE THE REPAIR OF MEASURES DAMAGED BY ANY SUBCONTRACTOR INCLUDING THOSE OF THE PUBLIC UTILITY COMPANIES.

5. SURFACE FLOWS OVER CUT AND FILL SLOPES SHALL BE CONTROLLED BY EITHER REDIRECTING FLOWS FROM TRANSVERSING THE SLOPES OR BY INSTALLING MECHANICAL DEVICES TO SAFELY LOWER WATER DOWNSLOPE WITHOUT CAUSING EROSION. A TEMPORARY FILL DIVERSION (STD. & SPEC. 3.10) SHALL BE INSTALLED PRIOR TO THE END OF EACH WORKING DAY.

6. SEDIMENT CONTROL MEASURES MAY REQUIRE MINOR FIELD ADJUSTMENTS AT TIME OF CONSTRUCTION TO INSURE THEIR INTENDED PURPOSE IS ACCOMPLISHED. ENVIRONMENTAL DIVISION APPROVAL WILL BE REQUIRED FOR OTHER DEVIATIONS FROM THE APPROVED PLANS.

7. THE CONTRACTOR SHALL PLACE SOIL STOCKPILES AT THE LOCATIONS SHOWN ON THIS PLAN OR AS DIRECTED BY THE ENGINEER. SOIL STOCKPILES SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. OFF-SITE WASTE OR BORROW AREAS SHALL BE APPROVED BY THE ENVIRONMENTAL DIVISION PRIOR TO THE IMPORT OF ANY BORROW OR EXPORT OF ANY WASTE TO OR FROM THE PROJECT SITE.

8. THE CONTRACTOR SHALL COMPLETE DRAINAGE FACILITIES WITHIN 30 DAYS FOLLOWING COMPLETION OF ROUGH GRADING AT ANY POINT WITHIN THE PROJECT. THE INSTALLATION OF DRAINAGE FACILITIES SHALL TAKE PRECEDENCE OVER ALL UNDERGROUND UTILITIES. OUTFALL DITCHES FROM DRAINAGE STRUCTURES SHALL BE STABILIZED IMMEDIATELY AFTER CONSTRUCTION OF SAME. THIS INCLUDES INSTALLATION OF EROSION CONTROL STONE OR PAVED DITCHES WHERE REQUIRED. ANY DRAINAGE OUTFALLS REQUIRED FOR A STREET MUST BE COMPLETED BEFORE STREET GRADING OR UTILITY INSTALLATION BEGINS.

9. PERMANENT OR TEMPORARY SOIL STABILIZATION MUST BE APPLIED TO ALL DENUDED AREAS WITHIN 7 DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. SOIL STABILIZATION MUST ALSO BE APPLIED TO DENUDED AREAS WHICH MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT (UNDISTURBED) FOR LONGER THAN 30 DAYS. SOIL STABILIZATION MEASURES INCLUDE VEGETATIVE ESTABLISHMENT, MULCHING AND THE EARLY APPLICATION OF GRAVEL BASE MATERIAL ON AREAS TO BE PAVED.

10. NO MORE THAN 300 FEET OF SANITARY SEWER, STORM SEWER, WATERLINES, OR UNDERGROUND UTILITY LINES ARE TO BE OPEN AT ONE TIME. FOLLOWING INSTALLATION OF ANY PORTION OF THESE ITEMS, ALL DISTURBED AREAS ARE TO BE IMMEDIATELY STABILIZED (I.E., THE SAME DAY).

11. IF DISTURBED AREA STABILIZATION IS TO BE ACCOMPLISHED DURING THE MONTHS OF DECEMBER, JANUARY, OR FEBRUARY, STABILIZATION SHALL CONSIST OF MULCHING IN ACCORDANCE WITH SPECIFICATION 3.35. SEEDING WILL THEN TAKE PLACE AS SOON AS THE SEASON PERMITS.

12. THE TERM SEEDING, FINAL VEGETATIVE COVER OR STABILIZATION, ON THIS SITE PLAN SHALL MEAN THE SUCCESSFUL GERMINATION AND ESTABLISHMENT OF A STABLE GRASS COVER FROM A PROPERLY PREPARED SEEDBED CONTAINING THE SPECIFIED AMOUNTS OF SEED, LIME, AND FERTILIZER IN ACCORDANCE WITH SPECIFICATION 3.32, PERMANENT SEEDING. IRRIGATION SHALL BE REQUIRED AS NECESSARY TO ENSURE ESTABLISHMENT OF GRASS COVER.

13. ALL SLOPES STEEPER THAN 3:1 SHALL REQUIRE THE USE OF EROSION CONTROL BLANKETS SUCH AS EXCELSIOR BLANKETS TO AID IN THE ESTABLISHMENT OF A VEGETATIVE COVER. INSTALLATION SHALL BE IN ACCORDANCE WITH SPECIFICATION 3.35, MULCHING AND MANUFACTURER'S INSTRUCTIONS. NO SLOPES SHALL BE CREATED STEEPER THAN 2:1.

14. INLET PROTECTION IN ACCORDANCE WITH SPECIFICATION 3.07 SHALL BE PROVIDED FOR ALL STORM DRAIN INLETS AS SOON AS PRACTICAL FOLLOWING CONSTRUCTION OF SAME.

15. TEMPORARY LINERS, SUCH AS POLYETHYLENE SHEETS, SHALL BE PROVIDED FOR ALL PAVED DITCHES UNTIL THE PERMANENT CONCRETE LINER IS INSTALLED.

16. PAVED DITCHES SHALL BE REQUIRED WHEREVER EROSION IS EVIDENT. PARTICULAR ATTENTION SHALL BE PAID TO THOSE AREAS WHERE GRADES EXCEED 3 PERCENT.

17. TEMPORARY EROSION CONTROL MEASURES SUCH AS SILT FENCE ARE NOT TO BE REMOVED UNTIL ALL DISTURBED AREAS ARE STABILIZED. AFTER STABILIZATION IS COMPLETE, MEASURES SHALL BE REMOVED WITHIN 30 DAYS. TRAPPED SEDIMENT SHALL BE SPREAD AND SEEDED.

18. ALL SEDIMENT TRAPS AND BASINS SHALL REMAIN IN PLACE UNTIL THE MAJORITY OF THE SINGLE-FAMILY HOUSES HAVE BEEN CONSTRUCTED AND SHALL NOT BE REMOVED WITHOUT AUTHORIZATION FROM THE JAMES CITY COUNTY ENVIRONMENTAL DIVISION.

19. AS-BUILT DRAWINGS MUST BE PROVIDED FOR ALL DETENTION/BMP FACILITIES. ALSO UPON COMPLETION, THE CONSTRUCTION OF ALL DETENTION/BMP FACILITIES SHALL BE CERTIFIED BY A PROFESSIONAL ENGINEER WHO INSPECTED THE STRUCTURE DURING CONSTRUCTION. THE CERTIFICATION SHALL STATE THAT TO THE BEST OF HIS/HER JUDGMENT, KNOWLEDGE, AND BELIEF, THE STRUCTURE WAS CONSTRUCTED IN ACCORDANCE WITH THE APPROVAL PLANS AND SPECIFICATIONS.

GENERAL NOTES - WATER DISTRIBUTION MAINS

1. ALL COMPONENTS OF THE WATER DISTRIBUTION SYSTEM SHALL BE INSTALLED AND TESTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AUTHORITY STANDARDS SPECIFICATIONS FOR WATER DISTRIBUTION SYSTEMS AND THE COMMONWEALTH OF VIRGINIA WATERWORKS REGULATION.

No.	DATE	REVISION / COMMENT / NOTE	BY
3	1/12/01	REVISED PER JCC ENVIRONMENTAL DIVISION COMMENTS	CBR
2	12/5/00	REVISED PER VDOT COMMENTS	CBR
1	11/6/00	REVISED PER JCC REVIEW COMMENTS	CBR

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

CONSULTING ENGINEERS

, INC.
VIRGINIA

ENVIRONMENTAL DIVISION REVIEW COMMENTS
WILLIAMSBURG PLANTATION, SECTIONS 9, 10 & 11, UNITS 184 - 251
COUNTY PLAN NO. SP - 019 - 02
March 19, 2002

MDW/SJT

General Comments:

1. A Land Disturbing Permit and Siltation Agreement, with surety, are required for this project.

2. Responsible Land-Disturber Notification. Provide the name of an individual who will be in charge of and responsible for carrying out the land-disturbing activity. Permits or plans without this information are deemed incomplete and not approved until proper notification is received.

3. Plan Features. For clarity purposes, label Sections 9, 10 & 11 with large bold text on Sheet 3. Add a label to the existing BMP on Sheet 3 indicating "SWMF G", County Plan No. SP-103-00. Also label, if an existing feature, the access road to the BMP and the approximate location of the existing sediment trap (placed previously) at the end of Waverly Court. *(Note: The sequence of construction mentions this trap to remain in place during the life of this project.)*

4. VPDES. It appears land disturbance for this portion of the project, in combination with other portions, may exceed five (5) acres. Therefore, it is the owners responsibility to register for a General Virginia Pollutant Discharge Elimination System (VPDES) Permit for Discharges of Stormwater from Construction Activities, in accordance with current requirements of the Virginia Department of Environmental Quality and 9 VAC 25-180-10 et seq.

Erosion & Sediment Control Plan:

5. Design Checklist. Provide a standard James City County Erosion and Sediment Control and Stormwater Management Design Plan Checklist, specific for the Section 9, 10 & 11 sites.

6. Construction Entrances. Provide rock construction entrances at anticipated entrance(s) off of Coach House Lane (North).

7. Limits of Work. Show a distinct limit of work around the Section 9, 10 & 11 site periphery, to including work areas associated with grading, storm drains, utility connections and erosion and sediment control measures.

8. Sediment Filter Bag. Provide a general note; or alternatively, add Note # 22 to the list of erosion and sediment control notes on Sheet 8 to state that sediment filter bag installation and maintenance shall be in accordance with the provisions of the plan and manufacturers specifications.

9. Offsite Basin. The drainage report states that the existing offsite BMP (SWMF G, SP-103-00) was designed to function as a sediment basin for control of Sections 9, 10 & 11. Include provisions on this plan for proper coordination with work being performed on related sections, mainly Section 5 (County Plan No. SP-103-00) and proposed plans for Sections 7 & 8 so that the sediment basin is not prematurely converted from temporary sediment basin mode to final BMP mode until all contributory sections are complete and in an acceptable stabilized condition. If the offsite basin is converted to final BMP mode prior to completion of land-disturbing activities on Sections 9, 10 & 11, then provisions will need to be included on this E&SC plan of the contractor to monitor the existing offsite BMP for signs of sedimentation, specifically during or as a result of construction on this site. Additional onsite or offsite controls may be necessary to protect the BMP from degradation. This may include additional E&SC measures, sediment removal, cleaning and coordination with the owner, engineer or the County.

Stormwater Management/Drainage:

10. Stormwater Conveyance Channels. Provide stormwater conveyance channel computations to show the grass lining, as called for all onsite channel sections per the detail on Sheet 8, is sufficient for erosion resistance for all onsite channel segments. *(Note: computations can be simple in nature based on maximum flow and slope for all channel segments.)*

11. Stormwater Conveyance Channels. There are five (5) areas where onsite stormwater conveyance channels outlet directly onto fill slopes, pond slopes or at locations where there are no existing drainage (channel) features are present. These scenarios are not consistent with the provisions of Minimum Standard # 8, # 11 and # 19 of the Virginia Erosion and Sediment Control regulations. The locations are as follows: North of Unit 216; North of Unit 213; the onsite channel between Units 211 and 212; the onsite channel between Units 207 and 208; the onsite channel north of Unit 199; and the onsite channel between Units 195 and 196. Reconfiguration of the surface drainage plan at these locations is required; or alternatively, submit proper computations showing slope and/or channel adequacy for erosion resistance and capacity between where the channel outlets to existing ground location and the BMP facility.

DRAINAGE CALCULATIONS

FOR

WILLIAMSBURG PLANTATION
Section 10: Units 236-251

Site Plan Amendment #1

Longhill Road
Williamsburg, Virginia 23188

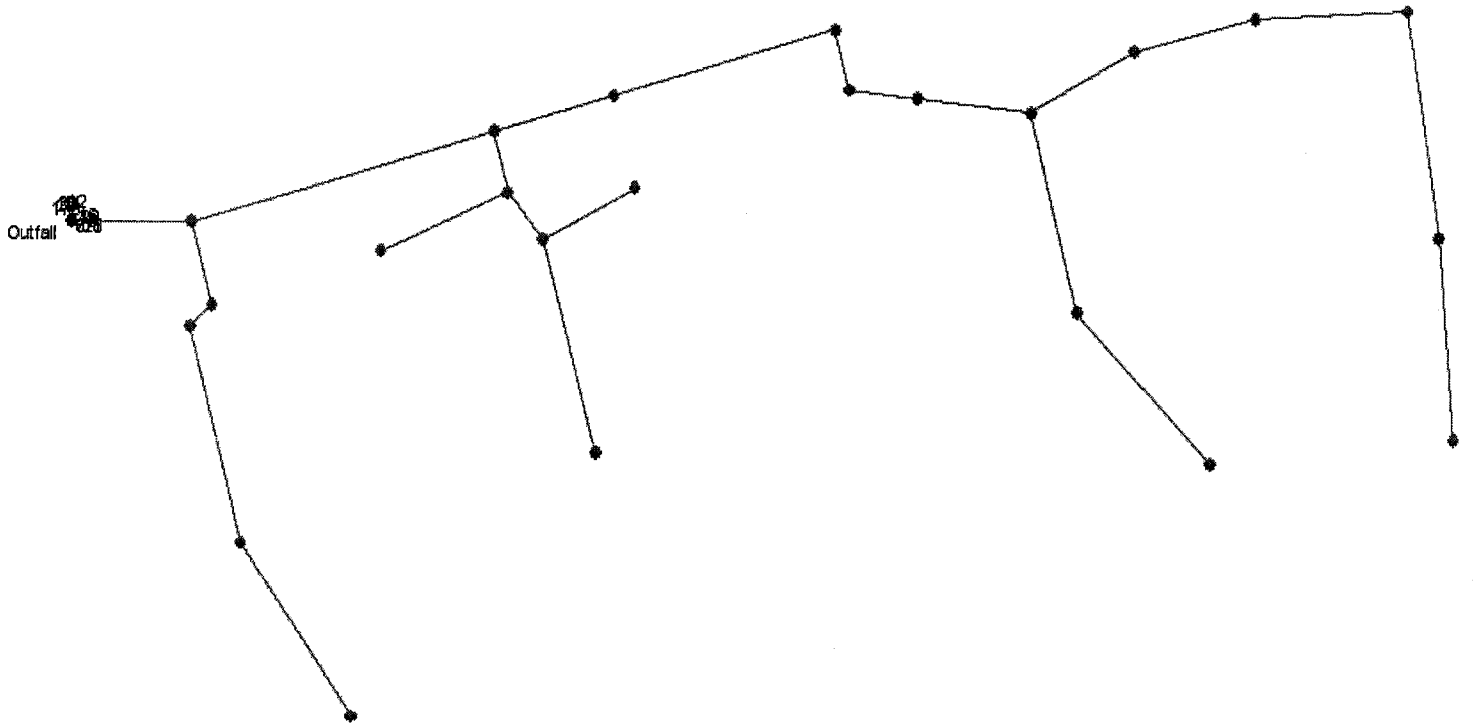
SP-26-05

Prepared By:

AES Consulting Engineers
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
AES Project No. 7555-17
February 28, 2005

CONSULTING ENGINEERS

Hydraflow Plan View



Project File: 755517sys2.stm	No. Lines: 23	02-28-2005

Hydraflow Storm Sewers 2005

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	90.0	0.0	MH	0.00	0.26	0.70	8.0	83.55	2.21	85.54	30	Cir	0.013	0.97	95.63	2-2 TO 2-1
2	1	235.0	-15.0	MH	0.00	0.02	0.90	5.0	85.54	2.96	92.50	24	Cir	0.013	1.00	100.09	2-3 TO 2-2
3	2	94.0	0.0	MH	0.00	0.18	0.65	5.0	92.50	1.38	93.80	24	Cir	0.013	0.15	101.42	2-4 TO 2-3
4	3	175.0	0.0	MH	0.00	0.09	0.90	5.0	93.80	1.49	96.40	24	Cir	0.013	1.00	103.98	2-5 TO 2-4
5	4	42.0	90.0	MH	0.00	0.21	0.70	10.0	96.40	1.43	97.00	24	Cir	0.013	0.95	103.98	2-6 TO 2-5
6	5	52.0	-69.0	MH	0.00	0.75	0.45	10.0	97.00	0.96	97.50	24	Cir	0.013	0.15	105.30	2-7 TO 2-6
7	1	60.0	75.0	MH	0.00	0.36	0.84	7.0	85.54	4.32	88.13	18	Cir	0.013	0.93	94.82	2-2A TO 2-2
8	2	42.0	90.0	MH	0.00	0.38	0.60	8.0	92.50	1.81	93.26	24	Cir	0.013	0.99	100.11	2-3A TO 2-3
9	6	87.0	0.0	MH	0.00	0.50	0.75	7.0	97.50	1.03	98.40	24	Cir	0.013	0.95	106.30	2-8 TO 2-7
10	9	89.0	-34.0	MH	0.00	0.00	0.00	0.0	98.40	0.79	99.10	18	Cir	0.013	0.29	107.00	2-9 TO 2-8
11	10	95.0	14.0	MH	0.00	0.90	0.50	15.0	99.10	0.95	100.00	18	Cir	0.013	0.23	105.00	2-10 TO 2-9
12	11	115.0	11.0	MH	0.00	0.46	0.73	7.0	100.00	0.87	101.00	18	Cir	0.013	1.00	106.50	2-11 TO 2-10
13	12	155.0	84.0	MH	0.00	0.39	0.76	6.0	101.00	0.97	102.50	15	Cir	0.013	0.15	107.70	2-12 TO 2-11
14	13	138.0	4.0	MH	0.00	0.50	0.68	7.0	102.50	1.09	104.00	15	Cir	0.013	1.00	108.00	2-13 TO 2-12
15	9	140.0	69.0	MH	0.00	0.32	0.78	7.0	101.00	1.07	102.50	15	Cir	0.013	0.56	107.55	2-8A TO 2-8
16	15	145.0	-30.0	MH	0.00	0.52	0.68	7.0	102.50	1.03	104.00	15	Cir	0.013	1.00	108.00	2- 8B TO 2-8A
17	7	21.0	66.0	MH	0.00	0.49	0.65	7.0	88.13	11.29	90.50	18	Cir	0.013	0.93	95.20	2-2B TO 2-2A
18	17	153.0	-66.0	MH	0.00	0.54	0.73	8.0	90.50	2.09	93.70	15	Cir	0.013	0.41	98.70	2-2C TO 2-2B
19	18	145.0	-21.0	MH	0.00	0.15	0.79	7.0	93.70	1.76	96.25	15	Cir	0.013	1.00	102.60	2-2D TO 2-2C
20	8	42.0	-25.0	MH	0.00	0.49	0.75	7.0	93.41	0.69	93.70	24	Cir	0.013	0.98	100.55	2-3B TO 2-3A
21	20	151.0	24.0	MH	0.00	0.78	0.72	8.0	93.70	0.86	95.00	15	Cir	0.013	1.00	101.80	2-3C TO 2-3B

Project File: 755517sys2.stm | Number of lines: 23 | Date: 02-28-2005

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
22	20	78.0	-77.0	MH	0.00	1.72	0.41	12.0	93.70	1.54	94.90	12	Cir	0.013	1.00	99.90	2-3E TO 2-3B
23	8	104.0	82.0	MH	0.00	0.89	0.45	12.0	93.41	1.14	94.60	12	Cir	0.013	1.00	97.10	2-3D TO 2-3A

Project File: 755517sys2.stm | Number of lines: 23 | Date: 02-28-2005

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	90.0	0.26	10.90	0.70	0.18	6.68	8.0	17.9	4.8	31.78	60.98	7.24	30	2.21	85.54	83.55	87.42	87.02	95.63	85.80	2-2 TO 2-1
2	1	235.0	0.02	9.10	0.90	0.02	5.36	5.0	17.5	4.8	25.84	38.92	8.57	24	2.96	92.50	85.54	94.29	87.42	100.09	95.63	2-3 TO 2-2
3	2	94.0	0.18	4.82	0.65	0.12	3.08	5.0	17.1	4.9	14.98	26.60	5.14	24	1.38	93.80	92.50	95.42	95.12	101.42	100.09	2-4 TO 2-3
4	3	175.0	0.09	4.64	0.90	0.08	2.97	5.0	16.5	4.9	14.65	27.57	5.67	24	1.49	96.40	93.80	97.76	95.62	103.98	101.42	2-5 TO 2-4
5	4	42.0	0.21	4.55	0.70	0.15	2.88	10.0	16.3	5.0	14.31	27.03	5.74	24	1.43	97.00	96.40	98.34	98.08	103.98	103.98	2-6 TO 2-5
6	5	52.0	0.75	4.34	0.45	0.34	2.74	10.0	16.1	5.0	13.66	22.18	5.56	24	0.96	97.50	97.00	98.81	98.68	105.30	103.98	2-7 TO 2-6
7	1	60.0	0.36	1.54	0.84	0.30	1.13	7.0	11.9	5.6	6.38	21.82	4.46	18	4.32	88.13	85.54	89.09	88.22	94.82	95.63	2-2A TO 2-2
8	2	42.0	0.38	4.26	0.60	0.23	2.26	8.0	12.6	5.5	12.46	30.43	3.97	24	1.81	93.26	92.50	95.34	95.21	100.11	100.09	2-3A TO 2-3
9	6	87.0	0.50	3.59	0.75	0.38	2.40	7.0	15.7	5.0	12.10	23.00	5.12	24	1.03	98.40	97.50	99.63	99.19	106.30	105.30	2-8 TO 2-7
10	9	89.0	0.00	2.25	0.00	0.00	1.42	0.0	15.4	5.1	7.24	9.31	4.53	18	0.79	99.10	98.40	100.25	99.92	107.00	106.30	2-9 TO 2-8
11	10	95.0	0.90	2.25	0.50	0.45	1.42	15.0	15.0	5.1	7.31	10.22	4.97	18	0.95	100.00	99.10	101.03	100.48	105.00	107.00	2-10 TO 2-9
12	11	115.0	0.46	1.35	0.73	0.34	0.97	7.0	9.0	6.2	5.99	9.79	4.38	18	0.87	101.00	100.00	101.93	101.35	106.50	105.00	2-11 TO 2-10
13	12	155.0	0.39	0.89	0.76	0.30	0.64	6.0	8.3	6.3	4.03	6.35	4.09	15	0.97	102.50	101.00	103.30	102.18	107.70	106.50	2-12 TO 2-11
14	13	138.0	0.50	0.50	0.68	0.34	0.34	7.0	7.0	6.6	2.25	6.73	2.90	15	1.09	104.00	102.50	104.60	103.61	108.00	107.70	2-13 TO 2-12
15	9	140.0	0.32	0.84	0.78	0.25	0.60	7.0	8.3	6.3	3.81	6.68	5.17	15	1.07	102.50	101.00	103.28	101.68	107.55	106.30	2-8A TO 2-8
16	15	145.0	0.52	0.52	0.68	0.35	0.35	7.0	7.0	6.6	2.34	6.57	3.00	15	1.03	104.00	102.50	104.61	103.57	108.00	107.55	2- 8B TO 2-8A
17	7	21.0	0.49	1.18	0.65	0.32	0.83	7.0	11.7	5.7	4.70	35.28	3.80	18	11.29	90.50	88.13	91.33	89.42	95.20	94.82	2-2B TO 2-2A
18	17	153.0	0.54	0.69	0.73	0.39	0.51	8.0	10.8	5.8	2.98	9.34	3.47	15	2.09	93.70	90.50	94.39	91.58	98.70	95.20	2-2C TO 2-2B
19	18	145.0	0.15	0.15	0.79	0.12	0.12	7.0	7.0	6.6	0.78	8.56	1.75	15	1.76	96.25	93.70	96.60	94.67	102.60	98.70	2-2D TO 2-2C
20	8	42.0	0.49	2.99	0.75	0.37	1.63	7.0	12.3	5.6	9.09	18.79	2.89	24	0.69	93.70	93.41	95.77	95.70	100.55	100.11	2-3B TO 2-3A
21	20	151.0	0.78	0.78	0.72	0.56	0.56	8.0	8.0	6.4	3.58	5.99	2.92	15	0.86	95.00	93.70	96.36	95.89	101.80	100.55	2-3C TO 2-3B

Project File: 755517sys2.stm | Number of lines: 23 | Run Date: 02-28-2005

NOTES: Intensity = 143.72 / (Inlet time + 19.20) ^ 0.94; Return period = 10 Yrs.

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
22	20	78.0	1.72	1.72	0.41	0.71	0.71	12.0	12.0	5.6	3.95	4.42	5.04	12	1.54	94.90	93.70	96.85	95.89	99.90	100.55	2-3E TO 2-3B
23	8	104.0	0.89	0.89	0.45	0.40	0.40	12.0	12.0	5.6	2.25	3.81	2.86	12	1.14	94.60	93.41	96.11	95.70	97.10	100.11	2-3D TO 2-3A

Project File: 755517sys2.stm | Number of lines: 23 | Run Date: 02-28-2005

NOTES: Intensity = 143.72 / (Inlet time + 19.20) ^ 0.94; Return period = 10 Yrs.

Record Drawing / Construction Certification Submittal for a BMP

Date: 3-28-03

Inspector:
- ☑ Pat Menichino => GERRY OR BETH ?
- ☐ Joe Buchite
- ☐ Beth Davis
- ☐ Gerry Lewis
- ☐ Jim Rudnicky
- ☐ Other: _____

Project: SP-111-00 WILLIAMSBURG PLANTATION COACH HOUSE ROAD EXTENSION
BMP Facility: DRY POND BMP #3
Plan No.:
Assigned County BMP ID Code: PC 185

I have received a transmittal for a ☑ Record Drawing and ☑ Construction Certification for the above referenced facility on MARCH 29 2003. Prior to full engineering review of these items and a field inspection, I am first forwarding the items to you to cursory review in case any major field changes were performed that I should be aware of and/or to ensure the record drawing accurately portrays what you saw in the field. Please review the drawing and return to me promptly so I can proceed with the review for certification purposes.

During my review, I will look at issues related to the BMP and its primary inflow and outflow conveyance systems, and may make comment in the following areas: Inspection/Maintenance agreement, Record Drawings (RD), Construction Certification (CC) and Construction-Related (CR) field items as it pertains to the BMP. If you have any other related non-BMP site issues such as site erosion, stabilization, removal of erosion & sediment controls, etc. that are not related to the BMP, you must proceed with closing out these items on your own accord. If needed, I can easily add these items to any comment letter that I may generate the Owner/Engineer for the BMP. Let me know if I need to add items for site issues to my process.

Scott

AsBuilts\Admin\z-inspector

4-3-03

SCOTT,

I DID NOT AUTHORIZE ANY CHANGES IN THE BMP'S

Gerry

FEB 2002
RECEIVED
ENVIRONMENTAL DIVISION

TRANSMITTAL

DATE: February 21, 2002

TO: **ENVIRONMENTAL**, COUNTY ENGINEER, JCSA, FIRE, REA, Lee S.

FROM: Paul Holt, Planner

SP-019-02

SUBJECT: Williamsburg Plantation, Sec 9, 10, 11 - Units 184-251

ITEMS ATTACHED: Site Plans and:
JCSA: water/sewer data sheets, water demand calcs
ENV: drainage calcs

INSTRUCTIONS: Please review and comment

RETURN BY: March 7, 2002

AGENCY COMMENTS:

MAR 0 5 2002
DVE MAR 15

Is this development served by Newport News Water Works? _____ (JCSA please check if yes)

If checked, PLANNER, please fax copy of preliminary approval letter with Fire Department comments, and the JCSA completed water data sheet to Newport News Water Works as soon as all three are available.
(757) 247-2334 ATTN: CHIEF ENGINEER

3/4/02

Scott
Comments in SP-019-02
Mike

DRAINAGE CALCULATIONS

FOR

WILLIAMSBURG PLANTATION
Section 9: Units 184-199
Section 10: Units 204-251
Section 11: Units 200-203

Longhill Road
Williamsburg, Virginia 23188

Prepared By:

AES Consulting Engineers
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
AES Project No. 7555-18
February 20, 2002

CONSULTING ENGINEERS

NARRATIVE

This project encompasses the construction of roadway, water and sanitary utilities, and storm water drainage systems associated with 68 townhouse-style timeshare units in the Williamsburg Plantation, James City County, Virginia. A best management practice (BMP) facility is not included with this project. A majority of the drainage from this section flows to an existing BMP facility which will be reconstructed as part of the Section 5 project (SP-103-00). The Section 5 project was approved and began construction this year. Additionally, the existing BMP facility was designed to function as a temporary sediment basin for this development.

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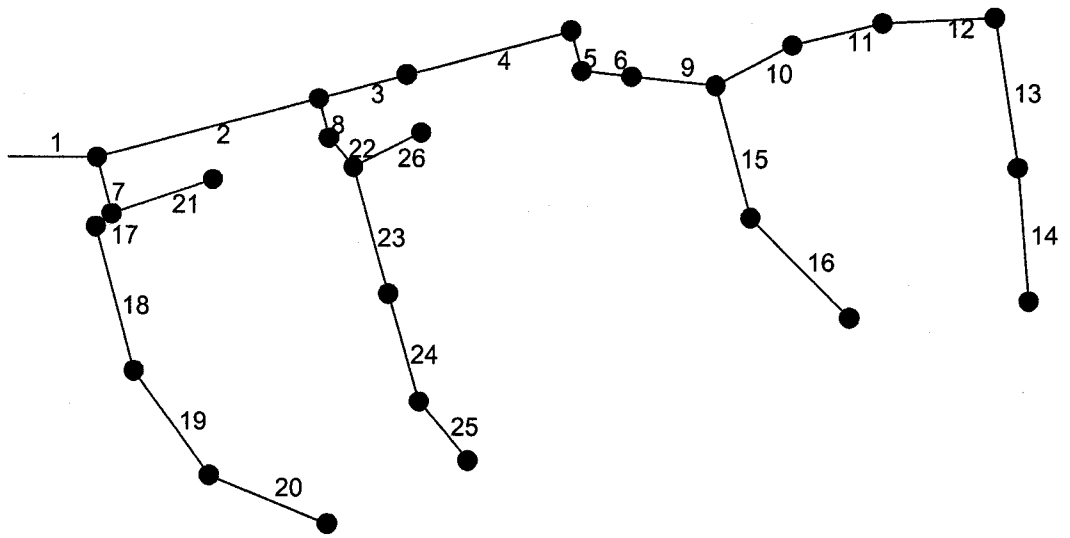
The Erosion and Sediment Control plan for this site utilizes silt fence and diversion dikes to minimize the potential of downstream erosion and siltation in areas that are not currently draining to the existing temporary sediment basin. The Erosion and Sediment Control Plan also utilizes Siltsacks for structures which ultimately drain to the temporary sediment basin in an effort to eliminate silt entering the storm system. Please see the sequence of construction for further details on the Erosion and Sediment Control Plan.

Please find calculations attached for the proposed storm sewer system and conveyance swales.

Storm Sewer System

Hydraflow Plan View



Project file: 755517sys2.stm	IDF file: JCCstormsewer.IDF	No. Lines: 26	02-13-2002

Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	End	90.0	0.29	11.03	0.70	0.20	6.54	8.0	18.0	4.8	31.05	60.98	7.12	30	2.21	85.54	83.55	87.40	87.02	95.63	85.80	2-1
2	1	235.0	0.02	8.07	0.90	0.02	4.79	5.0	17.5	4.8	23.07	38.92	7.70	24	2.96	92.50	85.54	94.21	88.23	100.09	95.63	3-2
3	2	94.0	0.10	4.74	0.90	0.09	3.06	5.0	17.1	4.9	14.85	26.60	4.91	24	1.38	93.80	92.50	95.55	95.22	101.42	100.09	4-3
4	3	175.0	0.09	4.64	0.90	0.08	2.97	5.0	16.5	4.9	14.65	27.57	5.68	24	1.49	96.40	93.80	97.76	95.61	103.98	101.42	5-4
5	4	42.0	0.21	4.55	0.70	0.15	2.88	10.0	16.3	5.0	14.31	27.03	5.46	24	1.43	97.00	96.40	98.34	98.41	103.98	103.98	6-5
6	5	52.0	0.75	4.34	0.45	0.34	2.74	10.0	16.1	5.0	13.66	22.18	5.25	24	0.96	97.50	97.00	98.85	98.88	105.30	103.98	7-6
7	1	60.0	0.34	2.67	0.60	0.20	1.54	10.0	13.8	5.3	8.21	21.82	5.30	18	4.32	88.13	85.54	89.22	88.23	94.82	95.63	2A-2
8	2	42.0	0.53	3.31	0.60	0.32	1.72	10.0	15.6	5.1	8.67	30.43	2.76	24	1.81	93.26	92.50	95.26	95.22	100.11	100.09	3A-3
9	6	87.0	0.50	3.59	0.75	0.38	2.40	7.0	15.7	5.0	12.10	23.00	5.48	24	1.03	98.40	97.50	99.63	98.94	106.30	105.30	8-7
10	9	89.0	0.00	2.25	0.00	0.00	1.42	0.0	15.4	5.1	7.24	9.31	4.18	18	0.79	99.10	98.40	100.47	100.10	107.00	106.30	9-8
11	10	95.0	0.90	2.25	0.50	0.45	1.42	15.0	15.0	5.1	7.31	10.22	4.89	18	0.95	100.00	99.10	101.03	100.60	105.00	107.00	10-9
12	11	115.0	0.46	1.35	0.73	0.34	0.97	7.0	9.0	6.2	5.99	9.79	4.49	18	0.87	101.00	100.00	101.93	101.25	106.50	105.00	11-10
13	12	155.0	0.39	0.89	0.76	0.30	0.64	6.0	8.3	6.3	4.03	6.35	4.06	15	0.97	102.50	101.00	103.30	102.35	107.70	106.50	12-11
14	13	138.0	0.50	0.50	0.68	0.34	0.34	7.0	7.0	6.6	2.25	6.73	3.18	15	1.09	104.00	102.50	104.60	103.36	108.00	107.70	13-12
15	9	140.0	0.32	0.84	0.78	0.25	0.60	7.0	8.3	6.3	3.81	6.68	5.11	15	1.07	102.50	101.00	103.28	101.69	107.55	106.30	8A-8
16	15	145.0	0.52	0.52	0.68	0.35	0.35	7.0	7.0	6.6	2.34	6.57	3.14	15	1.03	104.00	102.50	104.61	103.44	108.00	107.55	8B-8A
17	7	21.0	0.46	1.47	0.70	0.32	0.95	7.0	13.8	5.3	5.08	6.61	4.14	15	1.05	88.35	88.13	89.90	89.77	95.20	94.82	2B-2A
18	17	153.0	0.48	1.01	0.65	0.31	0.63	8.0	12.9	5.5	3.44	6.91	3.67	15	1.14	90.10	88.35	90.84	90.13	98.70	95.20	2C-2B
19	18	132.0	0.27	0.53	0.75	0.20	0.32	7.0	11.6	5.7	1.81	7.33	2.77	15	1.29	91.80	90.10	92.34	90.99	102.00	98.70	2D-2C
20	19	131.0	0.26	0.26	0.45	0.12	0.12	8.0	8.0	6.4	0.75	12.87	1.95	15	3.97	97.00	91.80	97.35	92.43	104.10	102.00	2E-2D
21	7	109.0	0.86	0.86	0.45	0.39	0.39	12.0	12.0	5.6	2.17	6.40	2.41	15	0.98	89.20	88.13	89.90	89.77	97.40	94.82	2F-2A

Project File: 755517sys2.stm | IDF File: JCCstormsewer.IDF | Total number of lines: 26 | Run Date: 02-20-2002

NOTES: Intensity = 143.72 / (Inlet time + 19.20) ^ 0.94; Return period = 10 Yrs. ; Initial tailwater elevation = 87.02 (ft)

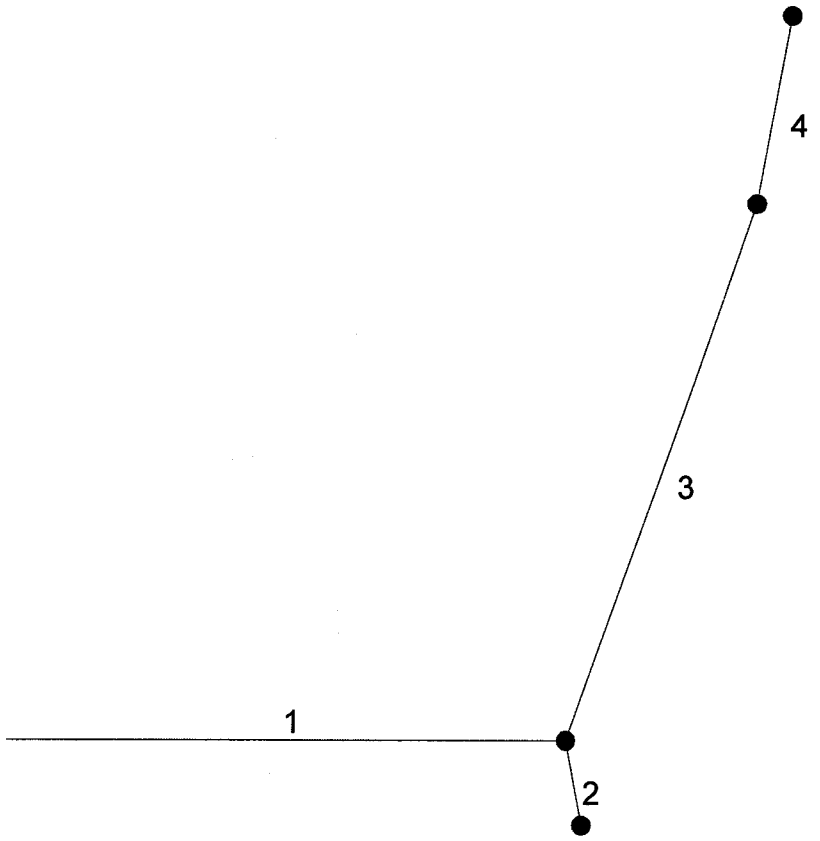
Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
22	8	39.0	0.26	2.78	0.75	0.19	1.40	7.0	15.5	5.1	7.10	9.06	4.02	18	0.74	93.70	93.41	95.49	95.31	100.30	100.11	3B-3A
23	22	135.0	0.35	0.87	0.70	0.24	0.54	8.0	12.2	5.6	3.02	7.25	3.35	15	1.26	95.40	93.70	96.10	95.74	101.75	100.30	3C-3B
24	23	114.0	0.25	0.52	0.65	0.16	0.30	8.0	10.9	5.8	1.72	6.63	2.89	15	1.05	96.60	95.40	97.13	96.15	103.00	101.75	3D-3C
25	24	79.0	0.27	0.27	0.50	0.14	0.14	9.0	9.0	6.2	0.83	7.62	2.09	15	1.39	97.70	96.60	98.07	97.21	104.00	103.00	3E-3D
26	22	78.0	1.65	1.65	0.40	0.66	0.66	15.0	15.0	5.1	3.39	6.54	2.77	15	1.03	94.50	93.70	95.96	95.74	100.30	100.30	3F-3B

Project File: 755517sys2.stm | IDF File: JCCstormsewer.IDF | Total number of lines: 26 | Run Date: 02-20-2002

NOTES: Intensity = 143.72 / (Inlet time + 19.20)^ 0.94; Return period = 10 Yrs. ; Initial tailwater elevation = 87.02 (ft)

Hydraflow Plan View



Project file: 755517sys3.stm	IDF file: JCCstormsewer.IDF	No. Lines: 4	02-19-2002

Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	End	132.0	0.00	1.31	0.00	0.00	0.90	0.0	11.7	5.7	5.07	15.83	3.00	18	2.27	86.00	83.00	87.29	87.02	95.90	84.50	5-Out
2	1	17.0	0.46	0.46	0.75	0.34	0.34	9.0	9.0	6.2	2.13	15.66	2.76	15	5.88	87.00	86.00	87.58	87.44	96.20	95.90	6-5
3	1	115.0	0.66	0.85	0.65	0.43	0.55	11.0	11.0	5.8	3.19	6.32	3.50	15	0.96	87.10	86.00	87.82	87.44	94.06	95.90	7-5
4	3	38.0	0.19	0.19	0.65	0.12	0.12	9.0	9.0	6.2	0.76	6.63	1.80	15	1.05	87.50	87.10	87.86	87.86	91.50	94.06	8-7

Project File: 755517sys3.stm | IDF File: JCCstormsewer.IDF | Total number of lines: 4 | Run Date: 02-20-2002

NOTES: Intensity = 143.72 / (Inlet time + 19.20) ^ 0.94; Return period = 10 Yrs. ; Initial tailwater elevation = 87.02 (ft)

Ditch Calculations

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

PROJECT: Williamsburg Plantation Sections 9,10,11: Units 184-251
PROJECT NO.: 7555-17
SUBJECT: Ditch Calculations
SHEET NO.: 1
DATE: 02/12/2002
BY: CCH

ROADSIDE DITCH DESIGN COMPUTATIONS

INLET Number	INLET Station	From Station	To Station	Side	Area (ac)	C	CA	CA Cumula.	Tc (min)	I-2 in/hr	I-10 in/hr	S Ditch Slope (ft/ft)	Q-2 (CFS)	Act Vel-2 (FPS)	Allow Vel-2 (FPS)	Lining Type	Q-10 (CFS)	Act Vel-10 (FPS)	Depth of Flow10 (in.)	Remark
Evelynton Court																				n=0.030
N/A	N/A	HIGH POINT	Manhole 3F	N/A	1.65	0.4	0.66	0.66	15	3.9	5.2	0.0100	2.57	2.20	2.5		3.43	2.4	8.3	3:1 SS, Grass-lined
N/A	N/A	HIGH POINT	Manhole 3E	N/A	0.27	0.5	0.135	0.135	9	4.8	6.3	0.0100	0.65	1.60	2.5		0.85	1.7	4.9	3:1 SS, Grass-lined
N/A	N/A	HIGH POINT	Manhole 2E	N/A	0.26	0.45	0.117	0.117	8	5.1	6.3	0.0100	0.60	1.50	2.5		0.74	1.6	4.7	3:1 SS, Grass-lined
N/A	N/A	Units 212-215	Existing BMP	N/A	0.29	0.55	0.16	0.16	7	5.3	6.8	0.0100	0.85	1.70	2.5		1.08	1.8	5.4	3:1 SS, Grass-lined
N/A	N/A	Units 212-213	Existing BMP	N/A	0.09	0.6	0.054	0.054	6	5.5	6.8	0.0100	0.30	1.30	2.5		0.37	1.4	3.6	3:1 SS, Grass-lined
N/A	N/A	Courtyard	Manhole 2F	N/A	0.86	0.45	0.387	0.387	12	4.3	5.7	0.0200	1.66	2.50	2.5		2.21	2.8	6.0	3:1 SS, Grass-lined
Waverly Court																				
N/A	N/A	Units 200-203	Existing BMP	N/A	0.17	0.5	0.085	0.085	7	5.3	6.8	0.0100	0.45	1.40	2.5		0.58	1.5	4.3	3:1 SS, Grass-lined
N/A	N/A	@ Units 195-1	Units 256-255	N/A	0.05	0.35	0.018	0.018	6	5.5	6.8	0.0100	0.10	0.98	2.5		0.12	1.0	2.4	3:1 SS, Grass-lined
N/A	N/A	Units 190-191	Existing BMP	N/A	0.10	0.6	0.06	0.06	7	5.3	6.8	0.0100	0.32	1.30	2.5		0.41	1.4	3.8	3:1 SS, Grass-lined

CONSULTING ENGINEERS

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

February 20, 2002

Mr. Darryl E. Cook, P.E.
Director of Environmental Division
James City County
101-E Mounts Bay Road
Williamsburg, VA 23187

RE: Williamsburg Plantation, Sections 7-11: Units 134-251
AES Project No. 7555-17 and 7555-18

Dear Mr. Cook:

AES Consulting Engineers, on behalf of Williamsburg Plantation, Inc., respectfully requests an exception to Section 19B-9 of the Chesapeake Bay Preservation Ordinance, to allow land disturbance on slopes of 25% or greater.

There are a few areas of proposed disturbance which are necessary for the construction of the above referenced sections of the development. Please see the environmental inventory maps which indicate the locations where these disturbances are to take place.

It is important to note that a large majority of the proposed disturbances will be taking place on *manmade* cut and fill slopes. All of these slopes were planned to be temporary in nature and regraded once each section was developed. There is only one area where there are natural 25% slopes. This area is an existing ditch and it is located in the interior of the Evelynton Court section of the project. The proposed regrading of this area is mainly due to the ditch no longer serving a purpose for site drainage.

Your review of this request is greatly appreciated. Please advise me of your decision on this exception at your earliest convenience.

Respectfully requested,

AES Consulting Engineers

Charles B. Records
Project Engineer

OK

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DRAINAGE CALCULATIONS

FOR

WILLIAMSBURG PLANTATION
Section 9: Units 184-199
Section 10: Units 204-251
Section 11: Units 200-203

Longhill Road
Williamsburg, Virginia 23188

Prepared By:

AES Consulting Engineers
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
AES Project No. 7555-18
February 20, 2002

CONSULTING ENGINEERS

NARRATIVE

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The Erosion and Sediment Control plan for this site utilizes silt fence and diversion dikes to minimize the potential of downstream erosion and siltation in areas that are not currently draining to the existing temporary sediment basin. The Erosion and Sediment Control Plan also utilizes Siltsacks for structures which ultimately drain to the temporary sediment basin in an effort to eliminate silt entering the storm system. Please see the sequence of construction for further details on the Erosion and Sediment Control Plan.

Please find calculations attached for the proposed storm sewer system and conveyance swales.

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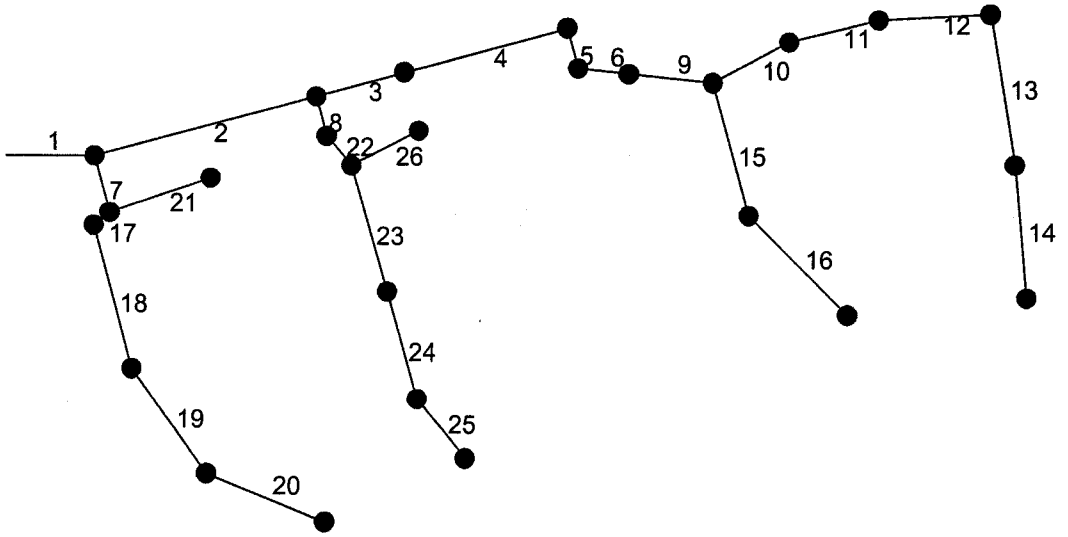
Hydraflow Plan View



Project file: 755517sys2.stm	IDF file: JCCstormsewer.IDF	No. Lines: 26	02-13-2002

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Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	End	90.0	0.29	11.03	0.70	0.20	6.54	8.0	18.0	4.8	31.05	60.98	7.12	30	2.21	85.54	83.55	87.40	87.02	95.63	85.80	2-1
2	1	235.0	0.02	8.07	0.90	0.02	4.79	5.0	17.5	4.8	23.07	38.92	7.70	24	2.96	92.50	85.54	94.21	88.23	100.09	95.63	3-2
3	2	94.0	0.10	4.74	0.90	0.09	3.06	5.0	17.1	4.9	14.85	26.60	4.91	24	1.38	93.80	92.50	95.55	95.22	101.42	100.09	4-3
4	3	175.0	0.09	4.64	0.90	0.08	2.97	5.0	16.5	4.9	14.65	27.57	5.68	24	1.49	96.40	93.80	97.76	95.61	103.98	101.42	5-4
5	4	42.0	0.21	4.55	0.70	0.15	2.88	10.0	16.3	5.0	14.31	27.03	5.46	24	1.43	97.00	96.40	98.34	98.41	103.98	103.98	6-5
6	5	52.0	0.75	4.34	0.45	0.34	2.74	10.0	16.1	5.0	13.66	22.18	5.25	24	0.96	97.50	97.00	98.85	98.88	105.30	103.98	7-6
7	1	60.0	0.34	2.67	0.60	0.20	1.54	10.0	13.8	5.3	8.21	21.82	5.30	18	4.32	88.13	85.54	89.22	88.23	94.82	95.63	2A-2
8	2	42.0	0.53	3.31	0.60	0.32	1.72	10.0	15.6	5.1	8.67	30.43	2.76	24	1.81	93.26	92.50	95.26	95.22	100.11	100.09	3A-3
9	6	87.0	0.50	3.59	0.75	0.38	2.40	7.0	15.7	5.0	12.10	23.00	5.48	24	1.03	98.40	97.50	99.63	98.94	106.30	105.30	8-7
10	9	89.0	0.00	2.25	0.00	0.00	1.42	0.0	15.4	5.1	7.24	9.31	4.18	18	0.79	99.10	98.40	100.47	100.10	107.00	106.30	9-8
11	10	95.0	0.90	2.25	0.50	0.45	1.42	15.0	15.0	5.1	7.31	10.22	4.89	18	0.95	100.00	99.10	101.03	100.60	105.00	107.00	10-9
12	11	115.0	0.46	1.35	0.73	0.34	0.97	7.0	9.0	6.2	5.99	9.79	4.49	18	0.87	101.00	100.00	101.93	101.25	106.50	105.00	11-10
13	12	155.0	0.39	0.89	0.76	0.30	0.64	6.0	8.3	6.3	4.03	6.35	4.06	15	0.97	102.50	101.00	103.30	102.35	107.70	106.50	12-11
14	13	138.0	0.50	0.50	0.68	0.34	0.34	7.0	7.0	6.6	2.25	6.73	3.18	15	1.09	104.00	102.50	104.60	103.36	108.00	107.70	13-12
15	9	140.0	0.32	0.84	0.78	0.25	0.60	7.0	8.3	6.3	3.81	6.68	5.11	15	1.07	102.50	101.00	103.28	101.69	107.55	106.30	8A-8
16	15	145.0	0.52	0.52	0.68	0.35	0.35	7.0	7.0	6.6	2.34	6.57	3.14	15	1.03	104.00	102.50	104.61	103.44	108.00	107.55	8B-8A
17	7	21.0	0.46	1.47	0.70	0.32	0.95	7.0	13.8	5.3	5.08	6.61	4.14	15	1.05	88.35	88.13	89.90	89.77	95.20	94.82	2B-2A
18	17	153.0	0.48	1.01	0.65	0.31	0.63	8.0	12.9	5.5	3.44	6.91	3.67	15	1.14	90.10	88.35	90.84	90.13	98.70	95.20	2C-2B
19	18	132.0	0.27	0.53	0.75	0.20	0.32	7.0	11.6	5.7	1.81	7.33	2.77	15	1.29	91.80	90.10	92.34	90.99	102.00	98.70	2D-2C
20	19	131.0	0.26	0.26	0.45	0.12	0.12	8.0	8.0	6.4	0.75	12.87	1.95	15	3.97	97.00	91.80	97.35	92.43	104.10	102.00	2E-2D
21	7	109.0	0.86	0.86	0.45	0.39	0.39	12.0	12.0	5.6	2.17	6.40	2.41	15	0.98	89.20	88.13	89.90	89.77	97.40	94.82	2F-2A

Project File: 755517sys2.stm | IDF File: JCCstormsewer.IDF | Total number of lines: 26 | Run Date: 02-20-2002

NOTES: Intensity = 143.72 / (Inlet time + 19.20) ^ 0.94; Return period = 10 Yrs. ; Initial tailwater elevation = 87.02 (ft)

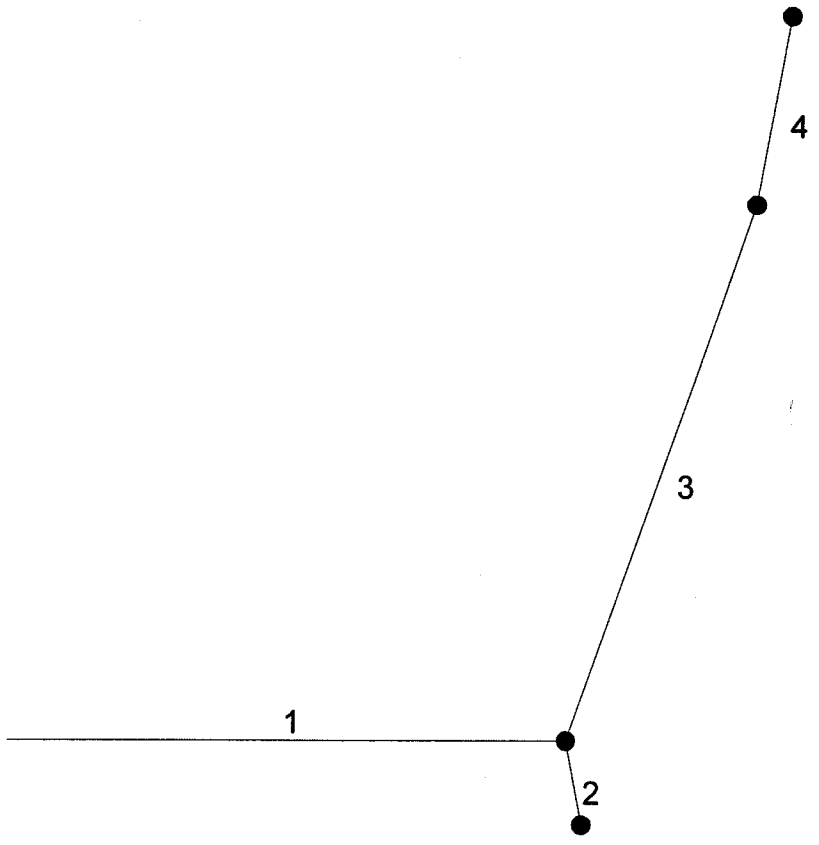
Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
22	8	39.0	0.26	2.78	0.75	0.19	1.40	7.0	15.5	5.1	7.10	9.06	4.02	18	0.74	93.70	93.41	95.49	95.31	100.30	100.11	3B-3A
23	22	135.0	0.35	0.87	0.70	0.24	0.54	8.0	12.2	5.6	3.02	7.25	3.35	15	1.26	95.40	93.70	96.10	95.74	101.75	100.30	3C-3B
24	23	114.0	0.25	0.52	0.65	0.16	0.30	8.0	10.9	5.8	1.72	6.63	2.89	15	1.05	96.60	95.40	97.13	96.15	103.00	101.75	3D-3C
25	24	79.0	0.27	0.27	0.50	0.14	0.14	9.0	9.0	6.2	0.83	7.62	2.09	15	1.39	97.70	96.60	98.07	97.21	104.00	103.00	3E-3D
26	22	78.0	1.65	1.65	0.40	0.66	0.66	15.0	15.0	5.1	3.39	6.54	2.77	15	1.03	94.50	93.70	95.96	95.74	100.30	100.30	3F-3B

Project File: 755517sys2.stm | IDF File: JCCstormsewer.IDF | Total number of lines: 26 | Run Date: 02-20-2002

NOTES: Intensity = 143.72 / (Inlet time + 19.20) ^ 0.94; Return period = 10 Yrs. ; Initial tailwater elevation = 87.02 (ft)

Hydraflow Plan View



Project file: 755517sys3.stm	IDF file: JCCstormsewer.IDF	No. Lines: 4	02-19-2002

Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	End	132.0	0.00	1.31	0.00	0.00	0.90	0.0	11.7	5.7	5.07	15.83	3.00	18	2.27	86.00	83.00	87.29	87.02	95.90	84.50	5-Out
2	1	17.0	0.46	0.46	0.75	0.34	0.34	9.0	9.0	6.2	2.13	15.66	2.76	15	5.88	87.00	86.00	87.58	87.44	96.20	95.90	6-5
3	1	115.0	0.66	0.85	0.65	0.43	0.55	11.0	11.0	5.8	3.19	6.32	3.50	15	0.96	87.10	86.00	87.82	87.44	94.06	95.90	7-5
4	3	38.0	0.19	0.19	0.65	0.12	0.12	9.0	9.0	6.2	0.76	6.63	1.80	15	1.05	87.50	87.10	87.86	87.86	91.50	94.06	8-7

Project File: 755517sys3.stm | IDF File: JCCstormsewer.IDF | Total number of lines: 4 | Run Date: 02-20-2002

NOTES: Intensity = 143.72 / (Inlet time + 19.20) ^ 0.94; Return period = 10 Yrs. ; Initial tailwater elevation = 87.02 (ft)

Ditch Calculations

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

PROJECT: Williamsburg Plantation Sections 9,10,11: Units 184-251
PROJECT NO.: 7555-17
SUBJECT: Ditch Calculations
SHEET NO.: 1
DATE: 02/12/2002
BY: CCH

ROADSIDE DITCH DESIGN COMPUTATIONS

INLET Number	INLET Station	From Station	To Station	Side	Area (ac)	C	CA	CA Cumula.	Tc (min)	I-2 in/hr	I-10 in/hr	S Ditch Slope (ft/ft)	Q-2 (CFS)	Act Vel-2 (FPS)	Allow Vel-2 (FPS)	Lining Type	Q-10 (CFS)	Act Vel-10 (FPS)	Depth of Flow10 (in.)	Remark
																				n=0.030
Evelynton Court																				
N/A	N/A	HIGH POINT	Manhole 3F	N/A	1.65	0.4	0.66	0.66	15	3.9	5.2	0.0100	2.57	2.20	2.5		3.43	2.4	8.3	3:1 SS, Grass-lined
N/A	N/A	HIGH POINT	Manhole 3E	N/A	0.27	0.5	0.135	0.135	9	4.8	6.3	0.0100	0.65	1.60	2.5		0.85	1.7	4.9	3:1 SS, Grass-lined
N/A	N/A	HIGH POINT	Manhole 2E	N/A	0.26	0.45	0.117	0.117	8	5.1	6.3	0.0100	0.60	1.50	2.5		0.74	1.6	4.7	3:1 SS, Grass-lined
N/A	N/A	Units 212-215	Existing BMP	N/A	0.29	0.55	0.16	0.16	7	5.3	6.8	0.0100	0.85	1.70	2.5		1.08	1.8	5.4	3:1 SS, Grass-lined
N/A	N/A	Units 212-213	Existing BMP	N/A	0.09	0.6	0.054	0.054	6	5.5	6.8	0.0100	0.30	1.30	2.5		0.37	1.4	3.6	3:1 SS, Grass-lined
N/A	N/A	Courtyard	Manhole 2F	N/A	0.86	0.45	0.387	0.387	12	4.3	5.7	0.0200	1.66	2.50	2.5		2.21	2.8	6.0	3:1 SS, Grass-lined
Waverly Court																				
N/A	N/A	Units 200-203	Existing BMP	N/A	0.17	0.5	0.085	0.085	7	5.3	6.8	0.0100	0.45	1.40	2.5		0.58	1.5	4.3	3:1 SS, Grass-lined
N/A	N/A	@ Units 195-1	Units 256-255	N/A	0.05	0.35	0.018	0.018	6	5.5	6.8	0.0100	0.10	0.98	2.5		0.12	1.0	2.4	3:1 SS, Grass-lined
N/A	N/A	Units 190-191	Existing BMP	N/A	0.10	0.6	0.06	0.06	7	5.3	6.8	0.0100	0.32	1.30	2.5		0.41	1.4	3.8	3:1 SS, Grass-lined

CONSULTING ENGINEERS

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

February 20, 2002

Mr. Darryl E. Cook, P.E.
Director of Environmental Division
James City County
101-E Mounts Bay Road
Williamsburg, VA 23187

RE: Williamsburg Plantation, Sections 7-11: Units 134-251
AES Project No. 7555-17 and 7555-18

Dear Mr. Cook:

AES Consulting Engineers, on behalf of Williamsburg Plantation, Inc., respectfully requests an exception to Section 19B-9 of the Chesapeake Bay Preservation Ordinance, to allow land disturbance on slopes of 25% or greater.

There are a few areas of proposed disturbance which are necessary for the construction of the above referenced sections of the development. Please see the environmental inventory maps which indicate the locations where these disturbances are to take place.

It is important to note that a large majority of the proposed disturbances will be taking place on *manmade* cut and fill slopes. All of these slopes were planned to be temporary in nature and regraded once each section was developed. There is only one area where there are natural 25% slopes. This area is an existing ditch and it is located in the interior of the Evelynton Court section of the project. The proposed regrading of this area is mainly due to the ditch no longer serving a purpose for site drainage.

Your review of this request is greatly appreciated. Please advise me of your decision on this exception at your earliest convenience.

Respectfully requested,

AES Consulting Engineers

Charles B. Records
Project Engineer

S:\jobs\7555\18\Wordproc\Document\755518L02.cbr.doc

APR 2003
RECEIVED
ENVIRONMENTAL DIVISION

TRANSMITTAL

DATE: April 3, 2003

TO: Environmental Department
Fire
JCSA
Lee Schnappinger

FROM: Karen Drake, Planning

SP-19-02?

SUBJECT: S-19-02. Williamsburg Plantation Section 9, 10 & 11

ITEMS ATTACHED: Revised Site Plans
Comment Letter from AES
Drainage Calculations (Environmental & JCSA)

DRC

INSTRUCTIONS: Please review and comment on the revised plans. Note that Preliminary Approval has expired for this project and must go back to the **DRC for preliminary approval on April 30th.**

RETURN BY: **April 18, 2003**

Approved 4/18/03 DGC

RECEIVED APR 15 2003

DUE APR 28

ENVIRONMENTAL DIVISION REVIEW COMMENTS
WILLIAMSBURG PLANTATION, SECTIONS 9, 10 & 11, UNITS 184 - 251
COUNTY PLAN NO. SP - 019 - 02
March 19, 2002

MDW/SJT

General Comments:

1. A Land Disturbing Permit and Siltation Agreement, with surety, are required for this project.

2. Responsible Land-Disturber Notification. Provide the name of an individual who will be in charge of and responsible for carrying out the land-disturbing activity. Permits or plans without this information are deemed incomplete and not approved until proper notification is received.

3. Plan Features. For clarity purposes, label Sections 9, 10 & 11 with large bold text on Sheet 3. Add a label to the existing BMP on Sheet 3 indicating "SWMF G", County Plan No. SP-103-00. Also label, if an existing feature, the access road to the BMP and the approximate location of the existing sediment trap (placed previously) at the end of Waverly Court. *(Note: The sequence of construction mentions this trap to remain in place during the life of this project.)*

4. VPDES. It appears land disturbance for this portion of the project, in combination with other portions, may exceed five (5) acres. Now 1Ac. threshold. Therefore, it is the owners responsibility to register for a General Virginia Pollutant Discharge Elimination System (VPDES) Permit for Discharges of Stormwater from Construction Activities, in accordance with current requirements of the Virginia Department of Environmental Quality and 9 VAC 25-180-10 et seq. ACKNOWLEDGED

Erosion & Sediment Control Plan:

5. Design Checklist. Provide a standard James City County Erosion and Sediment Control and Stormwater Management Design Plan Checklist, specific for the Section 9, 10 & 11 sites.

6. Construction Entrances. Provide rock construction entrances at anticipated entrance(s) off of Coach House Lane (North). 3 CE's to work area.

7. Limits of Work. Show a distinct limit of work around the Section 9, 10 & 11 site periphery, to including work areas associated with grading, storm drains, utility connections and erosion and sediment control measures. include the area of the sediment trap to be removed.

8. Sediment Filter Bag. Provide a general note; or alternatively, add Note # 22 to the list of erosion and sediment control notes on Sheet 8 to state that sediment filter bag installation and maintenance shall be in accordance with the provisions of the plan and manufacturers specifications. Note 22 Sheet 8.

9. Offsite Basin. The drainage report states that the existing offsite BMP (SWMF G, SP-103-00) was designed to function as a sediment basin for control of Sections 9, 10 & 11. Include provisions on this plan for proper coordination with work being performed on related sections, mainly Section 5 (County Plan No. SP-103-00) and proposed plans for Sections 7 & 8 so that the sediment basin is not prematurely converted from temporary sediment basin mode to final BMP mode until all contributory sections are complete and in an acceptable stabilized condition. If the offsite basin is converted to final BMP mode prior to completion of land-disturbing activities on Sections 9, 10 & 11, then provisions will need to be included on this E&SC plan of the contractor to monitor the existing offsite BMP for signs of sedimentation, specifically during or as a result of construction on this site. Additional onsite or offsite controls may be necessary to protect the BMP from degradation. This may include additional E&SC measures, sediment removal, cleaning and coordination with the owner, engineer or the County.

Stormwater Management/Drainage:

3+8

10. Stormwater Conveyance Channels. Provide stormwater conveyance channel computations to show the grass lining, as called for all onsite channel sections per the detail on Sheet 8, is sufficient for erosion resistance for all onsite channel segments. *(Note: computations can be simple in nature based on maximum flow and slope for all channel segments.)*

11. Stormwater Conveyance Channels. There are five (5) areas where onsite stormwater conveyance channels outlet directly onto fill slopes, pond slopes or at locations where there are no existing drainage (channel) features are present. These scenarios are not consistent with the provisions of Minimum Standard # 8, # 11 and # 19 of the Virginia Erosion and Sediment Control regulations. The locations are as follows: North of Unit 216; North of Unit 213; the onsite channel between Units 211 and 212; the onsite channel between Units 207 and 208; the onsite channel north of Unit 199; and the onsite channel between Units 195 and 196. Reconfiguration of the surface drainage plan at these locations is required; or alternatively, submit proper computations showing slope and/or channel adequacy for erosion resistance and capacity between where the channel outlets to existing ground location and the BMP facility.

March 25, 2003

MAR 2003
RECEIVED
PLANNING DEPARTMENT

Ms. Karen Drake
Senior Planner
James City County
Development Management
101-E Mounts Bay Road
Williamsburg, Virginia. 23187-8784

RE: Williamsburg Plantation, Sections 9, 10 and 11: Units 184-251
AES Project No. 7555-17 / JCC Case No. SP-019-02

Dear Ms. Drake:

The following is an itemized letter of response to Mr. Paul Holt's correspondence dated March 8, 2002.

Planning:

1. Preliminary Approval was granted by the DRC on March 28, 2002.
2. The tax map ID has not been changed on the plans. It appears as though the Real Estate Assessment office was in error.
3. Please see the attached parking space calculation sheet. The required handicap parking is based on the overall project and not on each individual section. Therefore, since the overall project has 928 parking spaces, the required number of handicap parking spaces is 19 (2% of total). The overall development currently exceeds this requirement by providing 28 handicap spaces.
4. Per my previous conversations with Mr. Dave Anderson, Waverly Court has been changed to Townley Trace.
5. The planting chart has been revised in referring to the 50-foot buffer to the Northeast.
6. A note has been added to the Landscaping Plan which states that the ornamental trees shall be a minimum of 8' in height.
7. The Loblolly Pines on the Landscaping Plan that were not previously labeled now have been labeled.
8. Please see the attached calculation table, which indicates the most up to date density tabulation.
9. Please see Sheet 5A which indicates that these two areas will planted in accordance with the master plan. The berming will take place before the areas are planted and therefore would not appear to be an issue.

10. Details of the Tot Lot are not known at this time, as it will be designed by others. Section 6, which was approved April 2001, was handled in this same manner.
11. Please see the attached calculation table which indicates the most up to date open space tabulation.
12. The Zoning designation label in Note 1 on Sheet 1 has been changed to read "R-2, Cluster."

Fire:

1. The fire hydrant has been relocated from in front of Units 247 and 248 to the parking lot "island" just north of Unit 244.

JCSA:

General

1. Per my discussion with Ms. Marcy Garnett of the Virginia Department of Health, these construction plans do not require VDH approval since there are not any proposed mains that will be serving 100 units or more with this project.
2. A note stating, "Only JCSA personnel are authorized to operate valves on the existing water main" has been added to Note 13 on Sheet 1.
3. Please see the attached hydraulic analysis which was previously reviewed and approved for the overall development. The attached water model report includes various fire flow scenarios and results as it pertains to these sections of the development.
4. The easements proposed for dedication to JCSA have been labeled and dimensioned.

Sheet 2

1. The sanitary sewer laterals have been revised to show a single 6" cleanout for each building. The locations of the water meters and sanitary sewer cleanouts have also been revised along with the corresponding easements. The sanitary lateral at Units 200-203 has been revised as requested. Inverts have also been added to the plan.
2. All of the easements have been revised to have a minimum width of 20'. An easement at Units 196-199 has been provided.
3. All water and sanitary sewer lines have been revised to maintain a minimum horizontal separation of 10 feet.
4. All sanitary sewer laterals have been annotated as having a diameter of 6-inches.

5. All water service connections to the main are now shown simply as 1-½" or 2" corporation stops.
6. The water service connection for units 200-203 has been revised to connect to the existing water main in Coach House Lane (North).
7. The water service and sewer lateral for the future maintenance building have been deleted. The maintenance building is no longer proposed in this area.
8. The tie-in location for the 6" lateral, which previously tied into sanitary manhole #6, has been revised, eliminating the need for a 60" manhole and drop connection.
9. The location of sanitary manhole #7 has been shifted. The lateral for units 188-191 has been changed to directly tie-in to Sanitary Manhole #7.
10. The invert information for sanitary manhole #7 has been corrected.
11. The water line alignment along Townley Trace (previously Waverly Court) has been revised to the quarter point of the road as requested.
12. The water line data for each section has been updated.

Sheet 5

1. There are no longer any trees, shrubs, structures, fences or obstacles located within the proposed JCSA easements.

Sheet 7

1. A note has been added to all of the storm sewer pipe crossings indicating that a minimum 18" of vertical separation be maintained between the water and sanitary sewer lines.
2. Existing gate valves and other appurtenances have been annotated on the profiles.
3. The storm sewer crossing on Evelynton Court, Station 10+38 has been revised.
4. The rim and invert elevation of sanitary manhole #7 has been corrected to match the plan.
5. A 3' minimum cover dimension and 4" water line annotation has been added to the Townley Trace (previously Waverly Court) profile.
6. The storm sewer crossing on Evelynton Court, Station 10+49 has been revised.
7. The storm sewer crossing on Evelynton Court, Station 18+84 has been deleted entirely.
8. The storm sewer crossing on Evelynton Court, Station 10+46 has been corrected to show a 12" pipe.

Sheet 9

1. The Utility Notes have been removed entirely as the plans now refer to the HRPDC and JCSA standards and specifications.
2. The typical water service connection detail has been revised as requested.

Water Data Sheet

1. Please see the attached, most recent version of the Water Data Sheet.
2. Separate sheets for each section with revised quantities are enclosed.

Sewer Data Sheet

1. Separate sheets for each section with revised quantities are enclosed.

Environmental Division:

General Comments

1. A Land Disturbing Permit and Siltation Agreement, with surety, shall be provided to Ms. Joan Etchberger with the James City County Environmental Division prior to land disturbance or final site plan approval.
2. See the cover sheet which indicates that Richard Costello, P.E. will be the Responsible Land Disturber for this project.
3. For clarity, Sections 9, 10, and 11 have been labeled on Sheet 3. A label has been added to the existing BMP facility on Sheet 3 designating it as "Existing SWM / BMP Facility, JCC PLAN #SP-111-00". The access road to the BMP is not an existing feature and therefore has not been labeled as such. The location of the existing sediment trap at the end of Townley Trace (previously Waverly Court) has also been labeled and shown.
4. It is our understanding that, depending on phasing, a VPDES permit may need to be secured for this project.

Erosion and Sediment Control Plan

5. Please see the attached standard James City County Erosion and Sediment Control and Stormwater Management Design Plan Checklist.
6. Construction Entrances have been added to the plan at the anticipated entrances to the project.

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

7. Sheet 3 now indicates distinct limits of work around the peripheries of Sections 9, 10 and 11.

8. Note #22 has been added to the James City County Erosion and Sediment Control Notes on Sheet 8 which states "sediment filter bag installation and maintenance shall be in accordance with the provisions of the plan and manufacturers specifications."

9. The sequence of construction has been modified to include provisions to ensure the proper function of the existing temporary sediment basin, adjacent to Route 199, (Step 1); and provisions for the conversion of the existing temporary sediment basin to a permanent BMP facility (Step 12).

Stormwater Management/Drainage

10. Please see the attached stormwater conveyance channel calculations.

11. The five areas that discharged directly onto fill slopes have been revised. The areas north of Units 199, 213 and 216 have been regraded to show a permanent ditch that flows into a drop inlet. Drop inlets have been added between Units 211 and 212, 207 and 208 and Units 195 and 196. These inlets and their supporting storm sewer system discharge directly into the stormwater management / BMP facility.

AES Consulting Engineers hereby submits twelve sets of revised plans for final approval. If you have any questions or need any additional information, please give me a call.

Sincerely,

AES Consulting Engineers

Charles B. Records
Project Engineer

Attachments
cc: Corinna Caldwell, Williamsburg Plantation, Inc.

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WILLIAMSBURG PLANTATION LAND USE STATISTICS

Section	Total Land		Buildings		Impervious Area Parking/Sidewalks		Open Space Area		Building Units	Parking Spaces	HC parking Spaces
	(S.F.)	(Acres)	(S.F.)	(Acres)	(S.F.)	(Acres)	(S.F.)	(Acres)	(No. of)	(No. of)	(No. of)
Phase 1	919508	21.11	61636	1.41	108030	2.48	749842	17.21	38	114	0
*1/Rec	239834	5.51	15684	0.36	108729	2.50	115421	2.65	0	113	5
2	128502	2.95	37635	0.86	31642	0.73	59225	1.36	24	68	0
3	134699	3.09	29157	0.67	30820	0.71	74722	1.72	19	61	3
4	89772	2.06	22770	0.52	14973	0.34	52029	1.19	15	31	2
5	262667	6.03	46967	1.08	48238	1.11	167462	3.84	37	101	4
*6	348421	8.00	66840	1.53	64125	1.47	217456	4.99	52	133	6
*Road	65929	1.51	0	0.00	57910	1.33	8019	0.18	0	8	0
*7	150164	3.45	28532	0.66	33611	0.77	88021	2.02	28	71	4
*8	110612	2.54	28118	0.65	29890	0.69	52604	1.21	22	56	0
*9,10,11	506723	11.63	81547	1.87	88126	2.02	337050	7.74	68	164	4
199 Buffer/Pond	401917	9.23	0	0.00	0	0.00	401917	9.23	0	0	0
VDOT Take Longhill	13939	0.32	0	0.00	0	0.00	13939	0.32	0	0	0
VDOT Take 199	-62443	-1.43	0	0.00	0	0.00	-62443	-1.43	0	0	0
Total	3310244	75.99	418886	9.62	616094	14.14	2275264	52.23	303	920	28

Overall Density (Units/Acre) = 3.99

Notes:

*1/Rec	ERROR IN TOTAL LAND AREA BY 16,319 SF (SITE PLAN = 223,515 SF)
*6	1,549 SF ADDED FROM ROAD IMPERVIOUS AND 1,968 SF ADDED FOR DUMPSTER PADS. TOTAL OF 3,517 SF ADDED TO IMPERVIOUS AREA (PLAN 60,698 + 3,517 = 64,215)
*Road	20,267 SF DEDUCTED FROM ROAD IMPERVIOUS TO BE ADDED TO SECTIONS 6,7,8,9,10,AND 11 (PLAN 78,177 - 20,267 = 57,910)
*7	1,158 SF ADDED FROM ROAD IMPERVIOUS. TOTAL OF 1,158 SF ADDED TO IMPERVIOUS AREA (PLAN 32,453 + 1158 = 33,611)
*8	1,607 SF ADDED FROM ROAD IMPERVIOUS AND 1,811 SF ADDED FOR DUMPSTER PADS. TOTAL OF 3,418 SF ADDED TO IMPERVIOUS AREA (PLAN 26,472 + 3,418 = 29,890)
*9,10,11	15,953 SF ADDED FROM ROAD IMPERVIOUS AND 1,759 SF ADDED FOR DUMPSTER PADS. TOTAL OF 17,712 SF ADDED TO IMPERVIOUS AREA (PLAN 70,414 + 17,712 = 88,126)

James City County, Virginia
Environmental Division

Erosion and Sediment Control and Stormwater Management Design Plan Checklists

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GENERAL INFORMATION

Project Name: Williamsburg Plantation - Section 9, 10, 11.
Owner / Applicant: The Berkley Group
Plan Preparer: AES Consulting Engineers Email:
Project Location: 4870 Longhill Rd.
Tax Map / Parcel: Part of (32-4)(1-26 C)
County Plan No. (if known): SP-19-02
County BMP Type: N/A (-)

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

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

Issue Date
March 1, 2001

JAMES CITY COUNTY, VIRGINIA
ENVIRONMENTAL DIVISION

EROSION AND SEDIMENT CONTROL PLAN CHECKLIST

I. *GENERAL:*

Yes	No	N/A	
☑	☐	☐	*FAMILIARITY* with current versions of Chapter 8, Erosion and Sedimentation Control and Chapter 23, Chesapeake Bay Preservation ordinances of the Code of James City County, Virginia and the Virginia Erosion and Sediment Control Handbook (VESCH).
☑	☐	☐	*LAND DISTURBING PERMIT AND SILTATION AGREEMENT* with surety are required for the project.
☐	☐	☑	*VARIANCE* if necessary, requested in writing, for the plan approving authority to waive or modify any of the minimum standards and specifications of the VESCH deemed inappropriate based on site conditions specific to this review case only. Variances which are approved shall be properly documented in the plan and become part of the approved erosion and sediment control plan for the site.

II. *SITE PLAN:*

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

Yes	No	N/A	
☑	☐	☐	*EXISTING SITE FEATURES* including roads, buildings, homes, utilities, streams, fences, structures and other important surface features of the site.
☑	☐	☐	*SOILS MAP* with soil symbols, boundaries and legend in accordance with the current Soil Survey of James City and York Counties and the City of Williamsburg, Virginia.
☑	☐	☐	*ENVIRONMENTAL INVENTORY* in accordance with Section 23-10(2) of the Chesapeake Bay Preservation Ordinance of James City County. Inventory generally includes: tidal shores and wetlands, non-tidal wetlands, resource protection area, hydric soils and slopes steeper than 25 percent. For wetlands, provide a copy of issued permits or satisfactory evidence that appropriate permits are being pursued for the entire project.
☐	☐	☑	*100-YEAR FLOODPLAIN LIMITS* or any special flood hazard areas or flood zones based on appropriate Federal Management Agency Flood Insurance Rate Maps (FIRMs) or Flood Hazard Boundary Maps (FHBMs) of James City County, Virginia.
☑	☐	☐	*DRAINAGE AREAS* for offsite and onsite areas, existing or proposed as applicable. Include drainage divides and directional labels for all subareas at points of interest and size (in acres), weighted runoff coefficient or curve number and times of concentration for each subarea.
☑	☐	☐	*CRITICAL EROSION AREAS* which require special consideration or unique erosion and sediment control measures. Refer to the VESCH, Chapter 6 for criteria.
☑	☐	☐	*DEVELOPMENT PLAN* for the site showing all improvements such as buildings, structures, parking areas, access roadways, above and below ground utilities, stormwater management and drainage facilities, trails or sidewalks, proposed vegetation and landscaping, amenities, etc.
☑	☐	☐	*LOCATION OF PRACTICES* proposed for erosion and sediment control, tree protection and temporary stormwater management due to land disturbance activities at the site. Use standard abbreviations, labels and symbols consistent for plan views based on minimum standards and specifications in Chapter 3 of the VESCH.
☑	☐	☐	*TEMPORARY STOCKPILE AREAS* or staging and equipment storage areas as required for onsite or offsite construction activities or indicate that none are anticipated for this project.
☐	☐	☑	*OFFSITE LAND DISTURBING AREAS* including borrow sites, waste areas, utility extensions, etc. and required erosion and sediment controls. If none are anticipated for the project, then indicate on the plans by general or erosion and sediment control notes.
☑	☐	☐	*DETAILS* or alternately, appropriate reference to current minimum standards and specifications of the VESCH for each measure proposed for the project. Non-modified, standard duplicated details (silt fence, diversion dikes, etc.) may be referenced to the current version of the VESCH. Specific dimensional or modified standards (basins, traps, outlet protections, check dams, etc.) require presentation on detail sheets. Schedules or tables may be used for multiple site measures such as sediment traps, basins, channels, slope drains, etc. Any modification to standard details should be clearly defined, explained and illustrated.

Yes	No	N/A	
☑	☐	☐	*MAINTENANCE PLAN* or alternately, appropriate reference to current minimum standards and specifications of the VESCH, outlining the inspection frequency and maintenance requirements for all erosion and sediment control measures proposed for the project.
☐	☐	☑	*TRENCH DEWATERING* methods and erosion and sediment controls, if anticipated for the project.
☑	☐	☐	*CONSTRUCTION SEQUENCE* outlining the anticipated sequence for installation of erosion and sediment controls and site, grading and utility work to be performed for the project by the site contractor.
☐	☐	☑	*PHASING PLAN* if required for larger project sites that are to be developed in stages or phases.
☑	☐	☐	*STANDARD COUNTY NOTES* are required to be placed on the erosion and sediment control plan. Refer to the standard James City County Erosion and Sediment Control Notes dated May 5, 1999.
☑	☐	☐	*PROFESSIONAL SEAL AND SIGNATURE* required on final and complete approved plans, drawings, technical reports and specifications.

III. *NARRATIVE:*

Yes	No	N/A	
☑	☐	☐	*PROJECT DESCRIPTION* briefly describing the nature and purpose of the land disturbing activity and the acreage to be disturbed.
☑	☐	☐	*EXISTING SITE CONDITIONS* description of existing topography, land use, cover and drainage patterns at the site.
☑	☐	☐	*ADJACENT AREA* descriptions of neighboring onsite or offsite areas such as streams, lakes, property, roads, etc. and potential impacts due to concentrated flow or runoff from the land disturbing activity.
☐	☐	☑	*OFFSITE DISTURBED AREA* descriptions of proposed borrow sites, waste or surplus areas, utility extensions and erosion and sediment controls to be implemented.
☑	☐	☐	*SOILS DESCRIPTION* briefly summarizing site, disturbed area and drainage basin soils including name, unit, hydrologic soil group (HSG) classification, surface runoff potential, erodibility, permeability, depth, texture, structure, erosion hazards, shrink-swell potential, limitations for use and anticipated depths to bedrock and the seasonal water table, as applicable.
☑	☐	☐	*CRITICAL AREAS* on the site which many have potentially serious erosion and sediment control problems and special considerations required (ie. steep slopes, hydric soils, channels, springs, sinkholes, water supply reservoirs, groundwater recharge areas, etc.)

Yes	No	N/A	
☑	☐	☐	*PROPOSED EROSION & SEDIMENT CONTROL MEASURES* inclusive to the specific erosion and sediment control plan as proposed for the land disturbing activity. Measures should be consistent with those proposed on the site drawings. Address general use, installation, limitations, sequencing and maintenance requirements for each control measure.
☑	☐	☐	*STABILIZATION MEASURES* required for the site, either temporary or permanent, and during and following construction including temporary and permanent seeding and mulching, paving, stone, soil stabilization blankets and matting, sodding, landscaping or special stabilization techniques to be utilized at the site.
☐	☐	☑	*STORMWATER MANAGEMENT CONSIDERATIONS* for the site, either of temporary or permanent nature, and strategies, sequences and measures required for control. May reference the stormwater management plan for the site, if prepared, for permanent stormwater management facilities and control of drainage once the site is stabilized.

IV. *CALCULATIONS:*

Yes	No	N/A	
☑	☐	☐	*CALCULATIONS AND COMPUTATIONS* associated with hydrology, hydraulics and design of proposed temporary and permanent erosion and sediment control measures including: sediment traps and basins, diversions, stormwater conveyance channels, culverts, slope drains, outlet protections, etc. Computations are not required on the construction plan and may be attached in a supplemental erosion and sediment control plan design report, if presented in a clear and organized format.
☐	☐	☑	*TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET* submitted for each basin along with schematic or sketch cross-section showing applicable design and construction data, storage volumes (wet-dry), dimensions and elevations. Peak design runoff to be based on the 2- or 25-year design storm event based on maximum disturbed site conditions (existing, interim or proposed conditions) in accordance with Minimum Standard 3.14 of the VESCH.

JAMES CITY COUNTY, VIRGINIA
ENVIRONMENTAL DIVISION

STORMWATER MANAGEMENT DESIGN PLAN CHECKLIST

I. *GENERAL:*

Yes	No	N/A	
☑	☐	☐	*FAMILIARITY* with current versions of the James City County Guidelines for Design and Construction of Stormwater Management BMPs manual; Chapter 8, Erosion and Sediment Control and Chapter 23, Chesapeake Bay Preservation ordinances of the Code of James City County, Virginia; the Virginia Erosion and Sediment Control Handbook (VESCH); and the Virginia Stormwater Management Handbook (VSMH).
☐	☐	☑	*WAIVER OR EXCEPTION* if necessary, requested in writing, for the plan approving authority to waive or except the requirements of Chapter 23, Chesapeake Bay Preservation ordinance in accordance with procedure established in Sections 23-14 through 23-17 of the ordinance. Applies to this review case only.
☐	☐	☑	*VARIANCE REQUEST* if necessary, requested in writing for the plan approving authority to waive or modify any of the minimum standards and specifications of the VESCH deemed inappropriate based on site conditions specific to this review case only. Variances which are approved shall be properly documented in the plan and become part of the approved erosion and sediment control plan for the site.
☑	☐	☐	*PROFESSIONAL SEAL AND SIGNATURE* required on final and complete approved stormwater management plans, drawings, technical reports and specifications.
☐	☐	☑	*WORKSHEET FOR BMP POINT SYSTEM* to ensure the stormwater management plan for the project attains at least 10 BMP points (New Development) or traditional pollutant load reduction computations per the Chesapeake Bay Local Assistance Manual (Redevelopment Only).
☐	☐	☑	*PROPOSED CONSERVATION EASEMENT AREAS* for any natural open space points claimed in the BMP worksheet.
☐	☐	☑	*INSPECTION/MAINTENANCE AGREEMENT* is required to be prepared and executed with the County for the project.
☑	☐	☐	*FEMA FIRM PANEL* reference with designated special flood hazard areas or zone designations associated with the site, as applicable.
☑	☐	☐	*DRAINAGE AREA MAP* at a maximum scale of 1"=200' scale showing drainage area boundaries for pre- and postdevelopment conditions and associated time of concentration flow paths. Labels to include drainage area size, runoff coefficient or curve number and time of concentration for each subarea shown on the map.

Yes No N/A

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

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

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

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

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

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

- ☑ ☐ ☐ North arrow and plan legend.
- ☑ ☐ ☐ Property lines.
- ☑ ☐ ☐ Adjacent property information.
- ☑ ☐ ☐ Existing site features and existing impervious cover areas.
- ☑ ☐ ☐ Impervious cover tabulations.
- ☑ ☐ ☐ Existing drainage facilities (natural or manmade).
- ☑ ☐ ☐ Existing environmentally sensitive areas (RPA, wetlands, floodplain, steep slopes, critical soils, buffers, etc.).
- ☑ ☐ ☐ Existing and proposed contours (1' or 2' contour interval) and spot elevations as necessary to define high and low topography.
- ☑ ☐ ☐ Existing and proposed easement locations.

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

II. ***STORMWATER CONVEYANCE SYSTEMS:***

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

Yes No N/A

☑ ☐ ☐ *STORMWATER CONVEYANCE SYSTEM COMPUTATIONS*

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

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

Yes No N/A

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

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

☐ ☐ ☑ *FACILITY CONFIGURATION and MINIMUM SEPARATIONS*

- ☐ ☐ ☐ Screening and layout consistent with Section 24-98(d) of the Chapter 24 Zoning ordinance (landscaping, screening, visibility, etc.).
- ☐ ☐ ☐ Basic considerations for safety and unauthorized entry.
- ☐ ☐ ☐ Proper length to width ratio (Typically 2H:1V).
- ☐ ☐ ☐ Facilities with deep pools (4 feet or more in depth) provided with two benches. Fifteen (15) ft. safety bench outward from normal pool at maximum 6 percent slope and aquatic bench inward from normal shoreline below normal pool. Narrower widths may be considered on a case-by-case basis.
- ☐ ☐ ☐ Pond buffer minimum 25 feet outward from maximum design WSEL. Additional setbacks may be required to permanent structures.
- ☐ ☐ ☐ No trees, shrubs or woody plants within 15 feet of embankment toe or 25 feet from principal spillway structure.

Yes No N/A

☐ ☐ ☐ Infiltration and filtering system facilities generally located at least 100 feet horizontally from any water supply well; 100 feet from any downslope building; and 25 feet from any upslope buildings, unless site specific investigation allows for reduced separation.

Yes No N/A

☐ ☐ ☑ *HYDRAULIC COMPUTATIONS*

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

☐ ☐ ☑ *POND or RESERVOIR ROUTING*

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

☐ ☐ ☑ *MISCELLANEOUS COMPUTATIONS*

- ☐ ☐ ☐ Water quality volume for permanent pool based on selected BMP treatment volume (WQv).
- ☐ ☐ ☐ Water quality volume for extended detention based on selected BMP treatment volume (WQv) with drawdown computations.
- ☐ ☐ ☐ Drawdown computations for the 1-year, 24 hour detention for stream channel protection criteria.
- ☐ ☐ ☐ Pond drain computations (within 24 hours).
- ☐ ☐ ☐ Anti-seep collar design (concrete preferred) or match material type.
- ☐ ☐ ☐ Filter diaphragm design (or alternative method of controlling seepage).

Yes No N/A

☐ ☐ ☐ Riser / base structure flotation analyses. FS = 1.25 minimum.

☐ ☐ ☐ Downstream danger reach study and/or emergency action plan (if conditions warrant).

☐ ☐ ☐ Upstream backwater analyses onto offsite adjacent property (if conditions warrant).

☐ ☐ ☐ 100 year floodplain impacts (if conditions warrant).

Yes No N/A

☐ ☐ ☑ *GEOTECHNICAL REQUIREMENTS*

☐ ☐ ☐ Geotechnical Report with recommendations specific to BMP facility type selected. Report prepared by a registered professional engineer. Requires submission, review and approval prior to issuance of Land Disturbance Permit.

☐ ☐ ☐ Initial Feasibility Testing requirements satisfied as per Appendix E of the James City County Guidelines for Design and Construction of Stormwater Management BMPs manual. (Infiltration, Bioretention and Filtering System BMP types only).

☐ ☐ ☐ Concept Design Testing requirements satisfied as per Appendix E of the James City County Guidelines for Design and Construction of Stormwater Management BMPs manual. (Infiltration, Bioretention and Filtering System BMP types only).

☐ ☐ ☐ Minimum Boring locations: borrow area, pool area, principal control structure, top of facility near one abutment and emergency spillway if provided.

☐ ☐ ☐ Boring logs with Unified Soil Classification (ASTM D2487), soils descriptions and depths to bedrock and the seasonal water table indicated.

☐ ☐ ☐ Standard County Record Drawing/Construction Certification note provided on plan. *Note: It is understood that preparation of record drawings and construction certifications as required for project facilities may not necessarily be performed by the plan preparer. These components may be performed by others.*

☐ ☐ ☑ *PRINCIPAL SPILLWAY PROFILE AND ASSOCIATED DETAILS*

☐ ☐ ☐ *EXISTING GROUND AND PROPOSED GRADE*

☐ ☐ ☐ Embankment or excavation side slopes labeled (3H:1V maximum).

☐ ☐ ☐ Minimum top width labeled (per VESCH or VSMH requirements).

☐ ☐ ☐ Removal of unsuitable material under proposed facility (per Geotechnical Report requirements).

Yes No N/A

☐ ☐ ☐ *CORE TRENCH*

- ☐ ☐ ☐ Material (per plan or Geotechnical Report).
- ☐ ☐ ☐ Bottom width (4' minimum or greater as dictated by Geotechnical Report recommendations).
- ☐ ☐ ☐ Side slopes (1:1 maximum steepness)
- ☐ ☐ ☐ Depth (4' minimum or greater as dictated by Geotechnical Report).

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

- ☐ ☐ ☐ Durable, watertight, resistant material (concrete preferred).
- ☐ ☐ ☐ Riser diameter is at least 1.25 times larger than barrel diameter.
- ☐ ☐ ☐ All pertinent dimensions and elevations shown.
- ☐ ☐ ☐ Control orifice or weir dimensions and elevations shown.
- ☐ ☐ ☐ Trash rack - removable - for each release.
- ☐ ☐ ☐ Anti-vortex device, baffle or plate.
- ☐ ☐ ☐ Riser base structure with dimensions and embedment specifications (concrete preferred).
- ☐ ☐ ☐ Interior access (steps, ladders, etc.) for maintenance for structures over 4 feet in height. Excessively high risers may need some form of exterior access on top portion.
- ☐ ☐ ☐ Low flow orifice with trash rack device.

☐ ☐ ☐ *PRINCIPAL CONTROL STRUCTURE OUTLET BARREL*

- ☐ ☐ ☐ Material (ASTM C-361 reinforced concrete pipe) with watertightjoints. Prior approval required for all other pipe material (other RCP types, CMP, CPP, PVC, etc.).
- ☐ ☐ ☐ Support and bedding requirements for barrel - concrete cradles, etc. or as recommended by the Geotechnical Report.
- ☐ ☐ ☐ Pipe inverts, length, size, class and slope shown.
- ☐ ☐ ☐ Flared end section or endwall provided on barrel outlet.

☐ ☐ ☐ *SEEPAGE CONTROL*

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

☐ ☐ ☐ *ANTI-SEEP COLLARS*

- ☐ ☐ ☐ Anti-seep collar, concrete preferred.
- ☐ ☐ ☐ Size - 15 percent increase in length of saturation using outside pipe diameter.
- ☐ ☐ ☐ Spacing and location on barrel (located at least 2 feet from a pipe joint).

☐ ☐ ☐ *FILTER DIAPHRAGMS*

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

Yes No N/A

☐ ☐ ☐ *ELEVATION AND DIMENSIONAL DESIGN DATA*

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

☐ ☐ ☐ *CROSS SECTION THROUGH FACILITY*

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

☐ ☐ ☐ *EMERGENCY SPILLWAY PROFILE*

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

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

Yes No N/A

☐ ☐ ☐ *CONSTRUCTION SPECIFICATIONS and NOTES*

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

☐ ☐ ☐ *MAINTENANCE PROVISIONS*

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

IV. *OUTLET PROTECTIONS:*

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

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

Plan Preparer: Charles Pelozos

Date: 3/25/03

SWMProg/BMP/Checklist/ChkList

DRAINAGE CALCULATIONS

FOR

WILLIAMSBURG PLANTATION
Section 9: Units 184-199
Section 10: Units 204-251
Section 11: Units 200-203

Longhill Road
Williamsburg, Virginia 23188

Prepared By:

AES Consulting Engineers
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
AES Project No. 7555-17
February 20, 2002
Revised: March 25, 2003

CONSULTING ENGINEERS

NARRATIVE

This project encompasses the construction of roadway, water and sanitary utilities, and storm water drainage systems associated with 68 townhouse-style timeshare units in the Williamsburg Plantation, James City County, Virginia. A best management practice (BMP) facility is not included with this project. A majority of the drainage from this section flows to an existing BMP facility which was constructed as part of the Coach House Road Extension project (SP-111-00). Additionally, the existing BMP facility was designed to function as a temporary sediment basin for this development.

The proposed storm system (#3) for Sections 9 and 11 has been designed to convey flows from Townley Trace (formerly Waverly Court) to the existing BMP facility. There are two proposed storm sewer systems associated with Section 10. One of the systems (#2) connects into stubouts in the existing trunk line in North Coach House Lane. The other system (#4) conveys drainage from the rear of the buildings to the north. As stated above, all three of these systems discharge into an existing, previously approved BMP facility.

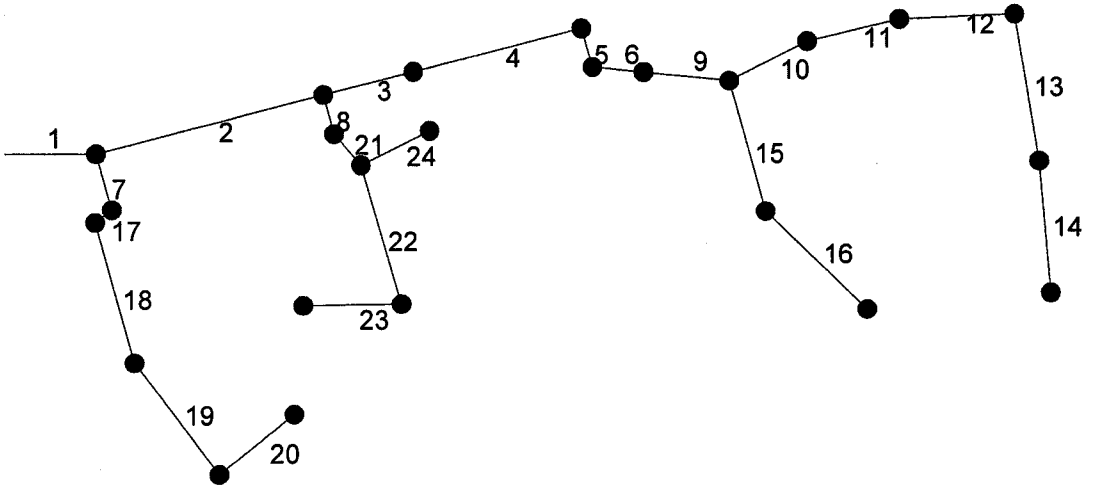
The Erosion and Sediment Control plan for this site utilizes silt fence and diversion dikes to minimize the potential of downstream erosion and siltation in areas that are not currently draining to the existing temporary sediment basin. The Erosion and Sediment Control Plan also utilizes Siltsacks for structures which ultimately drain to the temporary sediment basin in an effort to eliminate silt entering the storm system. Please see the sequence of construction for further details on the Erosion and Sediment Control Plan.

Please find calculations attached for the proposed storm sewer system and conveyance swales.

Storm Sewer System

Hydraflow Plan View

SYSTEM #2



Project file: 755517sys2.stm	IDF file: JCCstormsewer.IDF	No. Lines: 24	03-24-2003

Hydraflow Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	90.0	0.0	MH	0.00	0.26	0.70	8.0	83.55	2.21	85.54	30	Cir	0.013	0.85	95.63	2-2 TO 2-1
2	1	235.0	-15.0	MH	0.00	0.02	0.90	5.0	85.54	2.96	92.50	24	Cir	0.013	1.00	100.09	2-3 TO 2-2
3	2	94.0	0.0	MH	0.00	0.18	0.65	5.0	92.50	1.38	93.80	24	Cir	0.013	0.15	101.42	2-4 TO 2-3
4	3	175.0	0.0	MH	0.00	0.09	0.90	5.0	93.80	1.49	96.40	24	Cir	0.013	1.00	103.98	2-5 TO 2-4
5	4	42.0	90.0	MH	0.00	0.21	0.70	10.0	96.40	1.43	97.00	24	Cir	0.013	0.85	103.98	2-6 TO 2-5
6	5	52.0	-69.0	MH	0.00	0.75	0.45	10.0	97.00	0.96	97.50	24	Cir	0.013	0.15	105.30	2-7 TO 2-6
7	1	60.0	75.0	MH	0.00	0.46	0.60	10.0	85.54	4.32	88.13	18	Cir	0.013	0.85	94.82	2-2A TO 2-2
8	2	42.0	90.0	MH	0.00	0.38	0.60	8.0	92.50	1.81	93.26	24	Cir	0.013	0.45	100.11	2-3A TO 2-3
9	6	87.0	0.0	MH	0.00	0.50	0.75	7.0	97.50	1.03	98.40	24	Cir	0.013	0.85	106.30	2-8 TO 2-7
10	9	89.0	-34.0	MH	0.00	0.00	0.00	0.0	98.40	0.79	99.10	18	Cir	0.013	0.45	107.00	2-9 TO 2-8
11	10	95.0	14.0	MH	0.00	0.90	0.50	15.0	99.10	0.95	100.00	18	Cir	0.013	0.45	105.00	2-10 TO 2-9
12	11	115.0	11.0	MH	0.00	0.46	0.73	7.0	100.00	0.87	101.00	18	Cir	0.013	1.00	106.50	2-11 TO 2-10
13	12	155.0	84.0	MH	0.00	0.39	0.76	6.0	101.00	0.97	102.50	15	Cir	0.013	0.15	107.70	2-12 TO 2-11
14	13	138.0	4.0	MH	0.00	0.50	0.68	7.0	102.50	1.09	104.00	15	Cir	0.013	1.00	108.00	2-13 TO 2-12
15	9	140.0	69.0	MH	0.00	0.32	0.78	7.0	101.00	1.07	102.50	15	Cir	0.013	0.45	107.55	2-8A TO 2-8
16	15	145.0	-30.0	MH	0.00	0.52	0.68	7.0	102.50	1.03	104.00	15	Cir	0.013	1.00	108.00	2- 8B TO 2-8A
17	7	21.0	66.0	MH	0.00	0.49	0.65	7.0	88.13	11.29	90.50	18	Cir	0.013	0.85	95.20	2-2B TO 2-2A
18	17	153.0	-66.0	MH	0.00	0.56	0.71	8.0	90.50	2.09	93.70	15	Cir	0.013	0.45	98.70	2-2C TO 2-2B
19	18	145.0	-21.0	MH	0.00	0.15	0.79	7.0	93.70	1.76	96.25	15	Cir	0.013	1.00	102.60	2-2D TO 2-2C
20	19	98.0	-94.0	MH	0.00	0.29	0.50	8.0	96.25	1.02	97.25	12	Cir	0.013	1.00	100.75	2-2E TO 2-2D
21	8	42.0	-25.0	MH	0.00	0.50	0.76	7.0	93.41	0.69	93.70	24	Cir	0.013	1.00	100.55	2-3B TO 2-3A

Project File: 755517sys2.stm	IDF File: JCCstormsewer.IDF	Total number of lines: 24	Date: 03-24-2003

Hydraflow Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
22	21	151.0	24.0	MH	0.00	0.72	0.72	8.0	93.70	0.86	95.00	15	Cir	0.013	1.00	101.80	2-3C TO 2-3B
23	22	99.0	105.0	MH	0.00	0.53	0.55	8.0	95.00	1.01	96.00	12	Cir	0.013	1.00	99.50	2-3D TO 2-3C
24	21	78.0	-77.0	MH	0.00	1.72	0.41	12.0	93.70	1.54	94.90	12	Cir	0.013	1.00	99.90	2-3E TO 2-3B

Project File: 755517sys2.stm | IDF File: JCCstormsewer.IDF | Total number of lines: 24 | Date: 03-24-2003

Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	90.0	0.26	10.90	0.70	0.18	6.66	8.0	18.0	4.8	31.68	60.98	7.23	30	2.21	85.54	83.55	87.42	87.02	95.63	85.80	2-2 TO 2-1
2	1	235.0	0.02	8.69	0.90	0.02	5.22	5.0	17.5	4.8	25.17	38.92	8.28	24	2.96	92.50	85.54	94.27	88.27	100.09	95.63	2-3 TO 2-2
3	2	94.0	0.18	4.82	0.65	0.12	3.08	5.0	17.1	4.9	14.98	26.60	4.77	24	1.38	93.80	92.50	95.80	95.41	101.42	100.09	2-4 TO 2-3
4	3	175.0	0.09	4.64	0.90	0.08	2.97	5.0	16.5	4.9	14.65	27.57	5.56	24	1.49	96.40	93.80	97.76	95.85	103.98	101.42	2-5 TO 2-4
5	4	42.0	0.21	4.55	0.70	0.15	2.88	10.0	16.3	5.0	14.31	27.03	5.46	24	1.43	97.00	96.40	98.34	98.41	103.98	103.98	2-6 TO 2-5
6	5	52.0	0.75	4.34	0.45	0.34	2.74	10.0	16.1	5.0	13.66	22.18	5.25	24	0.96	97.50	97.00	98.85	98.88	105.30	103.98	2-7 TO 2-6
7	1	60.0	0.46	1.95	0.60	0.28	1.26	10.0	12.1	5.6	7.03	21.82	4.76	18	4.32	88.13	85.54	89.14	88.27	94.82	95.63	2-2A TO 2-2
8	2	42.0	0.38	3.85	0.60	0.23	2.12	8.0	12.5	5.5	11.74	30.43	3.74	24	1.81	93.26	92.50	95.52	95.41	100.11	100.09	2-3A TO 2-3
9	6	87.0	0.50	3.59	0.75	0.38	2.40	7.0	15.7	5.0	12.10	23.00	5.48	24	1.03	98.40	97.50	99.63	98.94	106.30	105.30	2-8 TO 2-7
10	9	89.0	0.00	2.25	0.00	0.00	1.42	0.0	15.4	5.1	7.24	9.31	4.18	18	0.79	99.10	98.40	100.47	100.10	107.00	106.30	2-9 TO 2-8
11	10	95.0	0.90	2.25	0.50	0.45	1.42	15.0	15.0	5.1	7.31	10.22	4.89	18	0.95	100.00	99.10	101.03	100.60	105.00	107.00	2-10 TO 2-9
12	11	115.0	0.46	1.35	0.73	0.34	0.97	7.0	9.0	6.2	5.99	9.79	4.49	18	0.87	101.00	100.00	101.93	101.25	106.50	105.00	2-11 TO 2-10
13	12	155.0	0.39	0.89	0.76	0.30	0.64	6.0	8.3	6.3	4.03	6.35	4.06	15	0.97	102.50	101.00	103.30	102.35	107.70	106.50	2-12 TO 2-11
14	13	138.0	0.50	0.50	0.68	0.34	0.34	7.0	7.0	6.6	2.25	6.73	3.18	15	1.09	104.00	102.50	104.60	103.36	108.00	107.70	2-13 TO 2-12
15	9	140.0	0.32	0.84	0.78	0.25	0.60	7.0	8.3	6.3	3.81	6.68	5.11	15	1.07	102.50	101.00	103.28	101.69	107.55	106.30	2-8A TO 2-8
16	15	145.0	0.52	0.52	0.68	0.35	0.35	7.0	7.0	6.6	2.34	6.57	3.14	15	1.03	104.00	102.50	104.61	103.44	108.00	107.55	2- 8B TO 2-8A
17	7	21.0	0.49	1.49	0.65	0.32	0.98	7.0	12.0	5.6	5.50	35.28	4.09	18	11.29	90.50	88.13	91.40	89.55	95.20	94.82	2-2B TO 2-2A
18	17	153.0	0.56	1.00	0.71	0.40	0.66	8.0	11.2	5.7	3.80	9.34	3.91	15	2.09	93.70	90.50	94.48	91.73	98.70	95.20	2-2C TO 2-2B
19	18	145.0	0.15	0.44	0.79	0.12	0.26	7.0	9.4	6.1	1.60	8.56	2.53	15	1.76	96.25	93.70	96.76	94.64	102.60	98.70	2-2D TO 2-2C
20	19	98.0	0.29	0.29	0.50	0.14	0.14	8.0	8.0	6.4	0.93	3.60	2.34	12	1.02	97.25	96.25	97.66	96.94	100.75	102.60	2-2E TO 2-2D
21	8	42.0	0.50	3.47	0.76	0.38	1.90	7.0	12.3	5.6	10.55	18.79	3.36	24	0.69	93.70	93.41	95.70	95.62	100.55	100.11	2-3B TO 2-3A

Project File: 755517sys2.stm | IDF File: JCCstormsewer.IDF | Total number of lines: 24 | Run Date: 03-24-2003

NOTES: Intensity = 143.72 / (Inlet time + 19.20) ^ 0.94; Return period = 10 Yrs. ; Initial tailwater elevation = 87.02 (ft)

Hydraflow Storm Sewer Tabulation

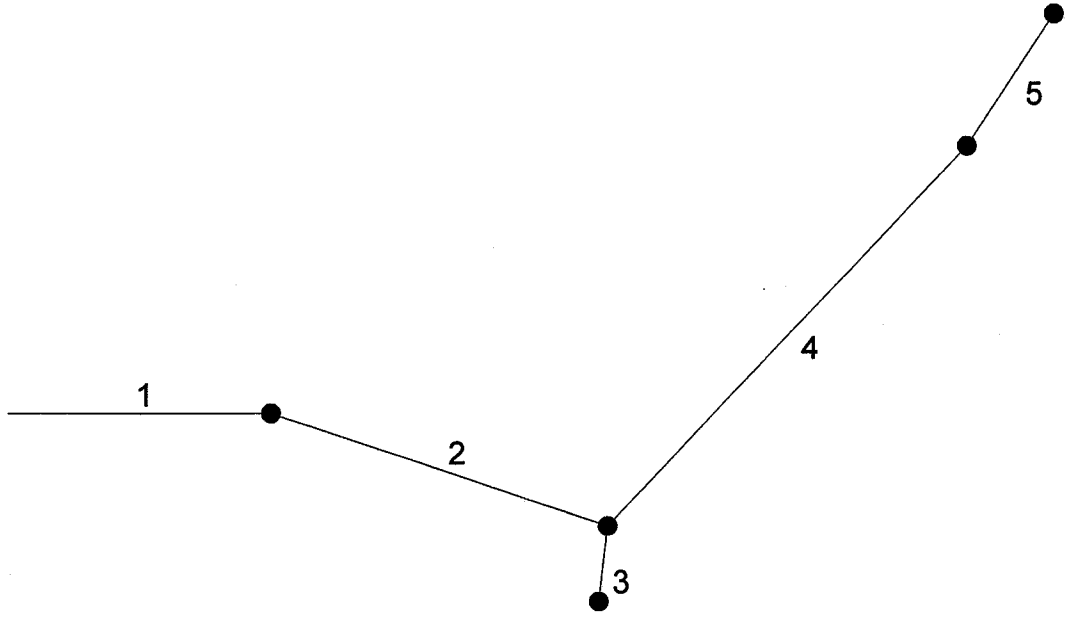
Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
22	21	151.0	0.72	1.25	0.72	0.52	0.81	8.0	8.7	6.2	5.05	5.99	4.11	15	0.86	95.00	93.70	96.80	95.87	101.80	100.55	2-3C TO 2-3B
23	22	99.0	0.53	0.53	0.55	0.29	0.29	8.0	8.0	6.4	1.86	3.58	2.37	12	1.01	96.00	95.00	97.33	97.06	99.50	101.80	2-3D TO 2-3C
24	21	78.0	1.72	1.72	0.41	0.71	0.71	12.0	12.0	5.6	3.95	4.42	5.04	12	1.54	94.90	93.70	96.84	95.87	99.90	100.55	2-3E TO 2-3B

Project File: 755517sys2.stm | IDF File: JCCstormsewer.IDF | Total number of lines: 24 | Run Date: 03-24-2003

NOTES: Intensity = 143.72 / (Inlet time + 19.20) ^ 0.94; Return period = 10 Yrs. ; Initial tailwater elevation = 87.02 (ft)

Hydraflow Plan View

SYSTEM #3



Project file: 755517sys3.stm	IDF file: JCCstormsewer.IDF	No. Lines: 5	03-24-2003

Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	56.0	0.29	1.66	0.56	0.16	1.06	8.0	11.1	5.8	6.11	12.89	4.98	15	3.98	85.23	83.00	87.52	87.02	93.50	84.50	3-1 TO 3-2
2	1	77.0	0.00	1.37	0.00	0.00	0.90	0.0	10.8	5.8	5.23	6.46	4.26	15	1.00	86.00	85.23	88.20	87.70	95.50	93.50	3-2 TO 3-3
3	2	17.0	0.54	0.54	0.71	0.38	0.38	7.0	7.0	6.6	2.53	3.86	4.81	12	1.18	91.80	91.60	92.48	92.20	95.30	95.50	3-3 TO 3-3A
4	2	115.0	0.51	0.83	0.70	0.36	0.51	10.0	10.0	6.0	3.07	6.32	2.50	15	0.96	87.10	86.00	88.74	88.48	94.05	95.50	3-3 TO 3-4
5	4	35.0	0.32	0.32	0.49	0.16	0.16	7.0	7.0	6.6	1.04	3.81	1.32	12	1.14	87.50	87.10	88.79	88.76	~~92.50~~ 93.50	94.05	3-4 TO 3-5

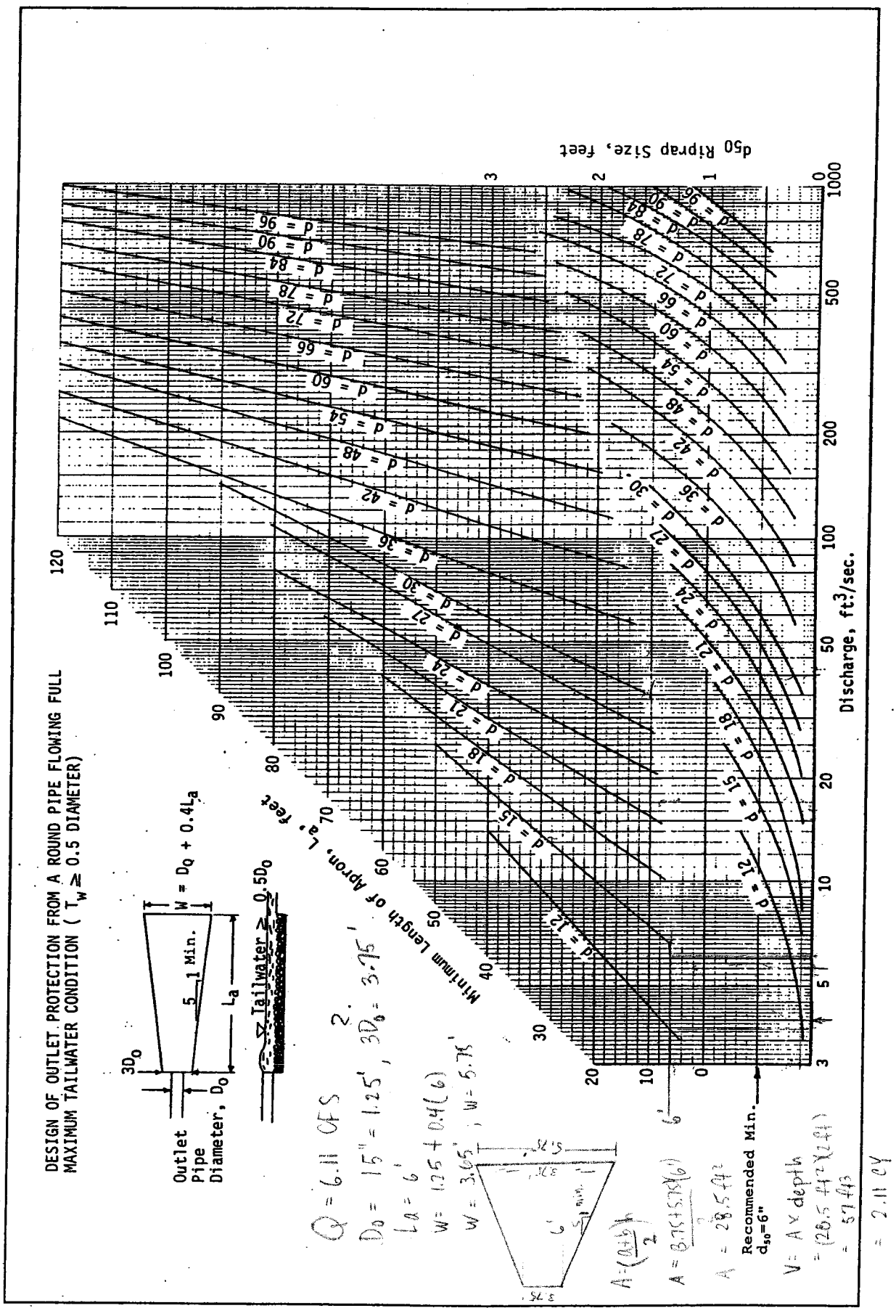
Project File: 755517sys3.stm | IDF File: JCCstormsewer.IDF | Total number of lines: 5 | Run Date: 03-24-2003

NOTES: Intensity = 143.72 / (Inlet time + 19.20) ^ 0.94; Return period = 10 Yrs. ; Initial tailwater elevation = 87.02 (ft)

Hydraflow Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	56.0	0.0	MH	0.00	0.29	0.56	8.0	83.00	3.98	85.23	15	Cir	0.013	0.45	93.50	3-1 TO 3-2
2	1	77.0	19.0	MH	0.00	0.00	0.00	0.0	85.23	1.00	86.00	15	Cir	0.013	1.00	95.50	3-2 TO 3-3
3	2	17.0	77.0	MH	0.00	0.54	0.71	7.0	91.60	1.18	91.80	12	Cir	0.013	1.00	95.30	3-3 TO 3-3A
4	2	115.0	-67.0	MH	0.00	0.51	0.70	10.0	86.00	0.96	87.10	15	Cir	0.013	0.15	94.05	3-3 TO 3-4
5	4	35.0	-10.0	MH	0.00	0.32	0.49	7.0	87.10	1.14	87.50	12	Cir	0.013	1.00	93.50 ~~92.50~~	3-4 TO 3-5

Project File: 755517sys3.stm | IDF File: JCCstormsewer.IDF | Total number of lines: 5 | Date: 03-24-2003



Project 7555-17
System #3

Q = 6.11 CFS
D_o = 15" = 1.25', $3D_o$ = 3.75'
L_a = 6'
W = 1.25 + 0.4(6)
W = 3.65', W = 6.75'

$A = \frac{(a+b)h}{2}$
$A = \frac{(6.75+3.75)(6)}{2}$
A = 28.5 ft²
V = A × depth
= (28.5 ft²)(2 ft)
= 57 ft³
= 2.11 cy

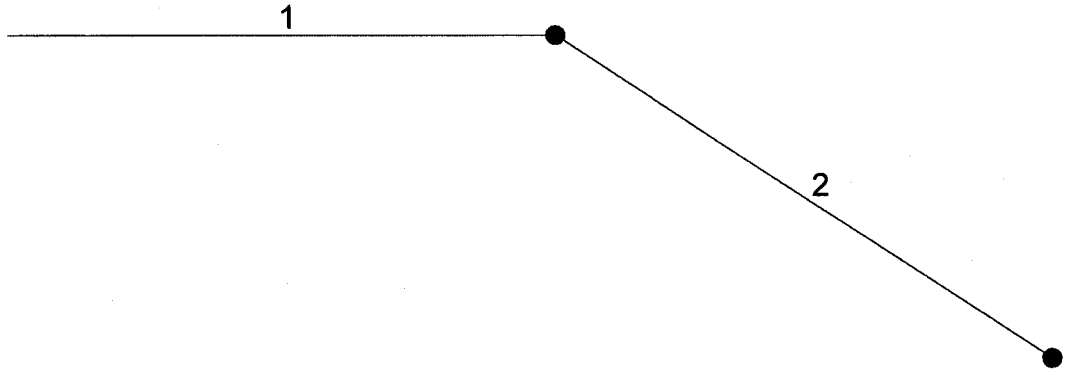
Class AI Riprap

Source: USDA-SCS

Plate 3.18-4

Hydraflow Plan View

SYSTEM #4



Project file: 755517sys4.stm	IDF file: JCCstormsewer.IDF	No. Lines: 2	03-25-2003

Hydraflow Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	124.0	0.0	MH	0.00	0.04	0.35	5.0	85.00	4.92	91.10	15	Cir	0.013	0.45	96.50	4-1 TO 4-2
2	1	136.0	34.0	MH	0.00	0.84	0.48	9.0	91.10	1.03	92.50	12	Cir	0.013	1.00	97.10	4-2 TO 4-3

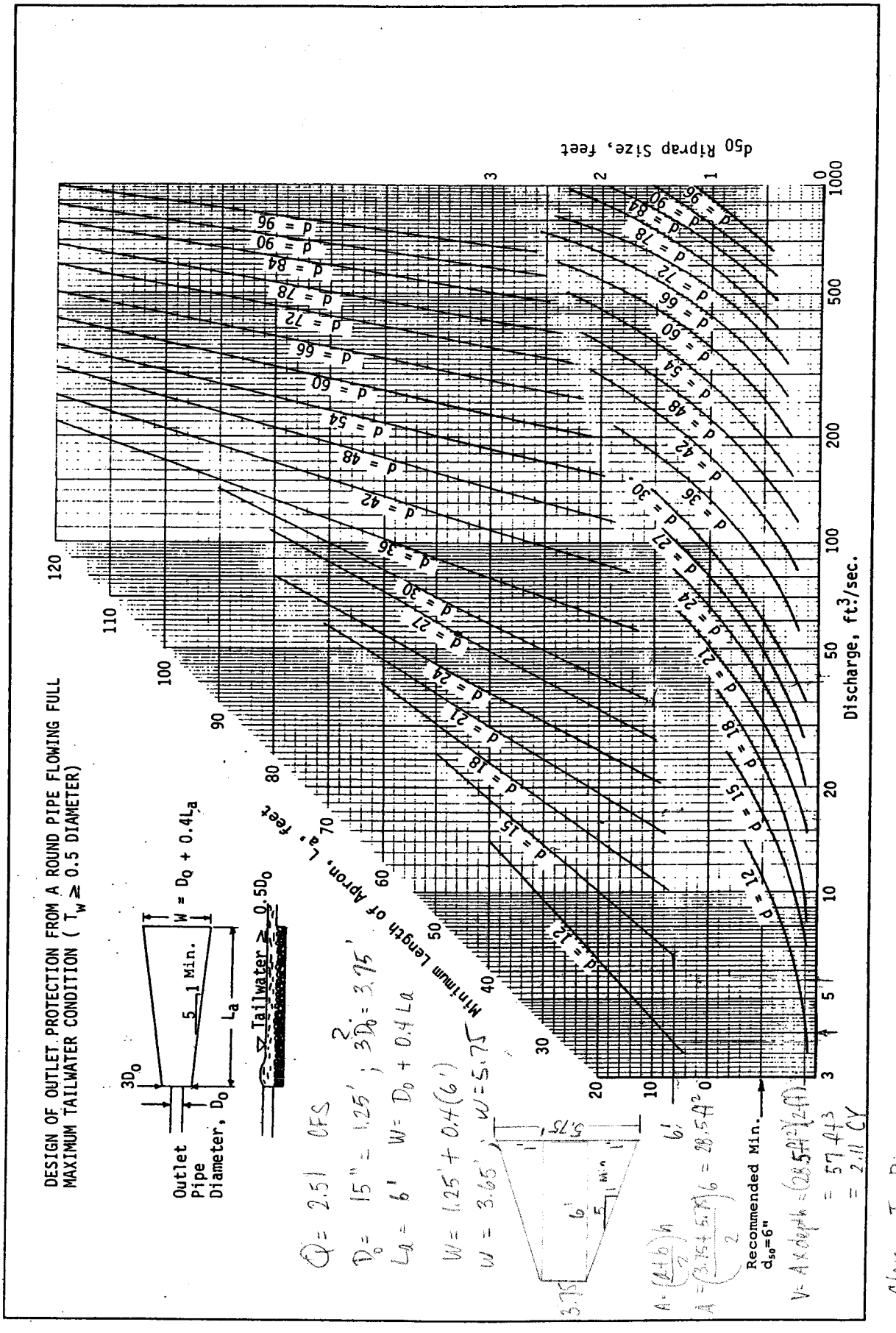
Project File: 755517sys4.stm	IDF File: JCCstormsewer.IDF	Total number of lines: 2	Date: 03-25-2003

Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	124.0	0.04	0.88	0.35	0.01	0.42	5.0	9.7	6.0	2.51	14.32	3.03	15	4.92	91.10	85.00	91.73	87.02	96.50	0.00	4-1 TO 4-2
2	1	136.0	0.84	0.84	0.48	0.40	0.40	9.0	9.0	6.2	2.49	3.61	4.20	12	1.03	92.50	91.10	93.17	91.85	97.10	96.50	4-2 TO 4-3

Project File: 755517sys4.stm | IDF File: JCCstormsewer.IDF | Total number of lines: 2 | Run Date: 03-25-2003

NOTES: Intensity = 143.72 / (Inlet time + 19.20) ^ 0.94; Return period = 10 Yrs. ; Initial tailwater elevation = 87.02 (ft)



Project 7553-17
System #4

Class I Riprap

Source: USDA-SCS

Plate 3.18-4

Ditch Calculations

Williamsburg Plantation
Sec. 9, 10, 11
Channel Computations

System #2

Total Flow path	=	**600**	**LF**
Overland flow	=	150	LF
Shallow Conc. flow	=	50	LF
Channelized flow	=	400	LF

Total T_c = Overland Flow T_c + Shallow Concentrated Flow T_c + Channelized Flow T_c

Overland Longitudinal Slope = (Remote Elevation - Low Elevation) / Overland flow path length
= (110.5 - 104.5)/150
= 0.0400
= 4.00%

C-Factor

Description	C	Area (Ac)	C x Area
Impervious	0.9	0.19	0.2
Grass	0.35	1.53	0.54
Total	=	1.72	0.7
$C_{weighted}$	=	0.41	

Overland Flow T_c = $0.225\ L^{0.42}S^{-0.19}C^{-1.0}$ (Seeyle Method - VESCH)
= 8.3 MIN.
≅ 9 MIN.

Shallow Concentrated. T_c = Flow Path / Velocity ; Shallow Concentrated Velocity = 1 fps
= 50 SEC
= 0.83 MIN.
≅ 1 MIN.

Channelized T_c = **Refer to VESCH Plate V-13 for channelized time of concentration**

Slope = (104-100)/400 = 0.01 = 1%
Height of most remote point above outlet = 4'

= 1 MIN.

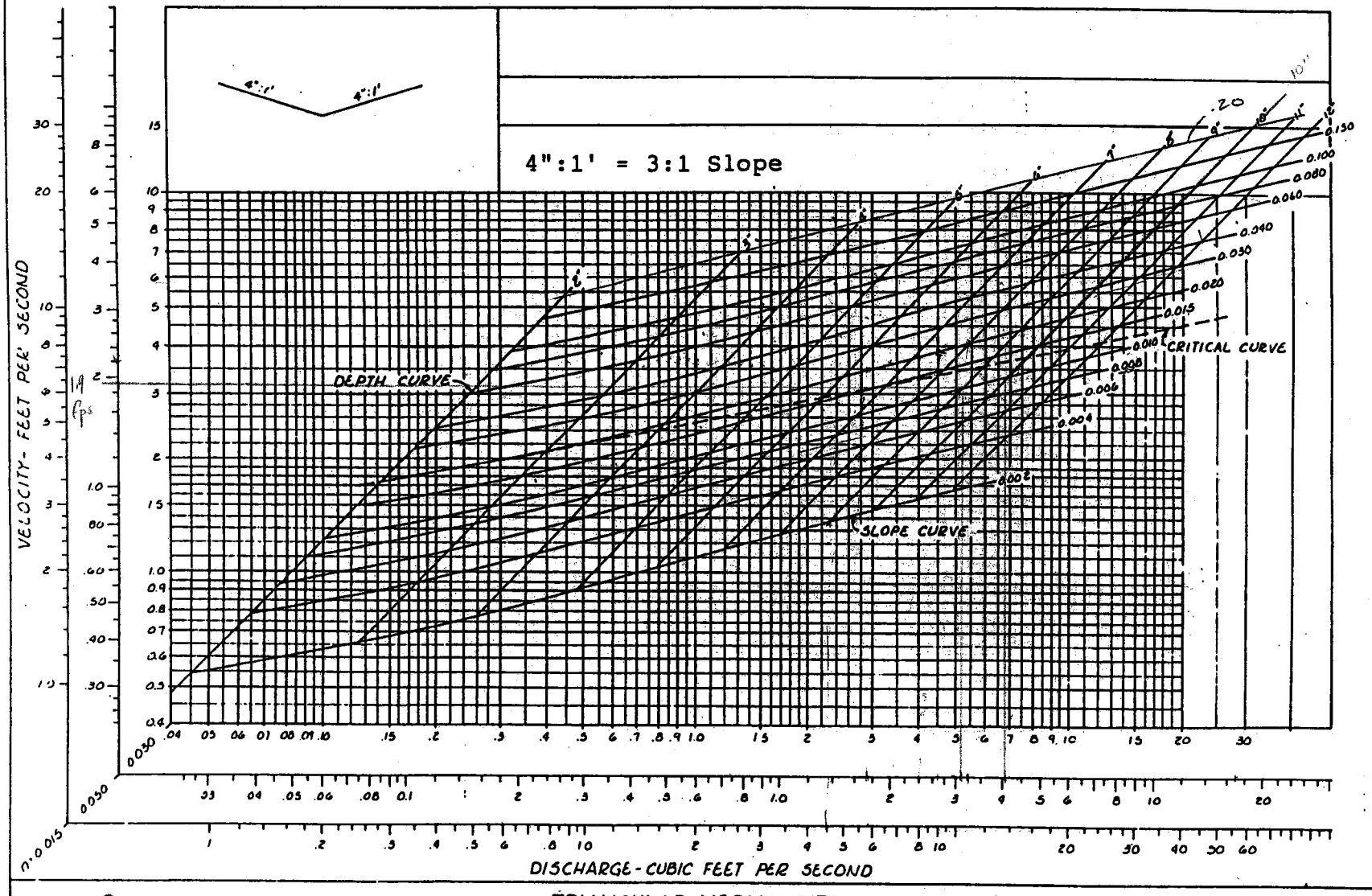
Total T_c = Overland Flow T_c + Shallow Concentrated Flow T_c + Channelized Flow T_c
Total T_c = 9 MIN. + 1 MIN. + 1 MIN.
Total T_c = 11 MIN.

I_2	=	4.41	MIN.	**See attached VDOT Drainage Plate 2 - 53 for 2-yr velocity.**
$Q_2 = CI_2A$	=	3.12	CFS	**(3:1 side slopes)**
I_{10}	=	5.73	MIN.	**See attached VDOT Drainage Plate 2 - 53 for 10-yr depth.**
$Q_{10} = CI_{10}A$	=	4.05	CFS	**(3:1 side slopes)**

REV. JULY '74

Project : 7555-17

System # 2



TRIANGULAR MEDIAN DITCH

Q_2 = 3.12 CFS V_2 = 1.9 fps

Q_{10} = 4.05 CFS d_{10} = 10"

n = 0.05

S_L =

FIG. 2.8.22

Williamsburg Plantation
Sec. 9, 10, 11
Channel Computations

System #4

Total Flow path	=	**285**	**LF**
Overland flow	=	150	LF
Shallow Conc. flow	=	70	LF
Channelized flow	=	65	LF

Total T_c = Overland Flow T_c + Shallow Concentrated Flow T_c + Channelized Flow T_c

Overland Longitudinal Slope = (Remote Elevation - Low Elevation) / Overland flow path length
= (113 - 102.5)/150
= 0.0700
= 7.00%

C-Factor

Description	C	Area (Ac)	C x Area
Impervious	0.9	0.20	0.2
Grass	0.35	0.64	0.22
Total	=	0.84	0.4
$C_{weighted}$	=	0.48	

Overland Flow T_c = $0.225\ L^{0.42}S^{-0.19}C^{-1.0}$ (Seeyle Method - VESCH)
= 6.4 MIN.
≅ 7 MIN.

Shallow Concentrated. T_c = Flow Path / Velocity ; Shallow Concentrated Velocity = 1 fps
= 70 SEC
= 1.17 MIN.
≅ 1 MIN.

Channelized T_c = **Refer to VESCH Plate V-13 for channelized time of concentration**

Slope = (98.75 - 97)/65 = 0.0269 = 2.7%
Height of most remote point above outlet = 1.75'

= 1 MIN.

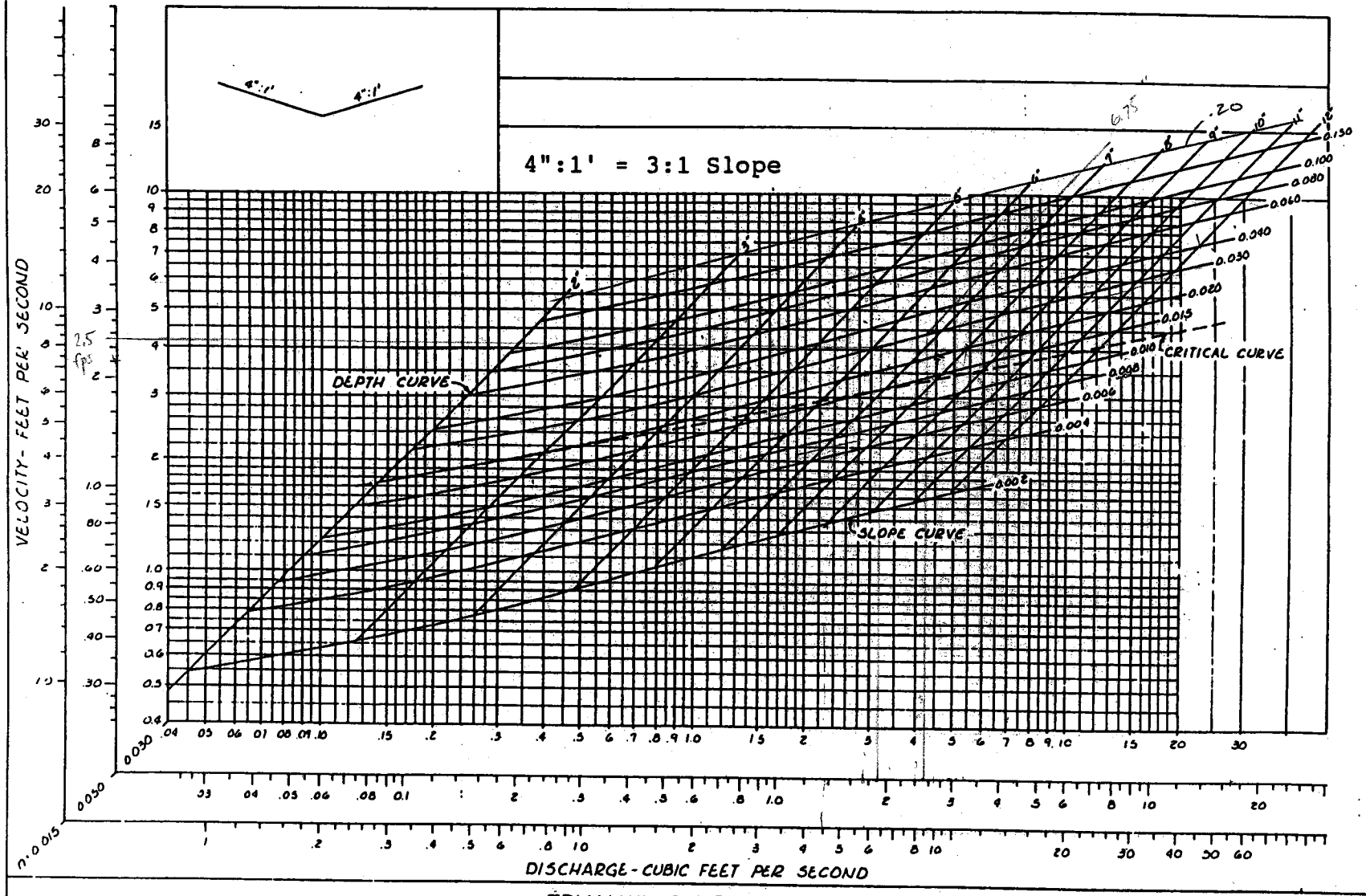
Total T_c = Overland Flow T_c + Shallow Concentrated Flow T_c + Channelized Flow T_c
Total T_c = 7 MIN. + 1 MIN. + 1 MIN.
Total T_c = 9 MIN.

I_2	=	4.77	MIN.	**See attached VDOT Drainage Plate 2 - 53 for 2-yr velocity.**
$Q_2 = CI_2A$	=	1.93	CFS	**(3:1 side slopes)**
I_{10}	=	6.11	MIN.	**See attached VDOT Drainage Plate 2 - 53 for 10-yr depth.**
$Q_{10} = CI_{10}A$	=	2.47	CFS	**(3:1 side slopes)**

REV. JULY '79

Project: 7555-17

System #4



TRIANGULAR MEDIAN DITCH

Q_2 = 1.93 CFS V_2 = 2.5 fps

Q_{10} = 2.47 CFS d_{10} = 6.75"

n = 0.05

S = 2.7%

FIG. 2.8.22

JORDAN

SURETY REQUEST FORM

Project Name: Williamsburg Plantation - Coach House Road

Requested By: PM

Scott,
Any BMP Issues?
This section has been complete for quite some time.
However there is a detetion pond in this section.
Jordan

1-25-05 Due 1-31-05

Requester Notified: _____

	Calculate	Reduce	Release
	☐	☐	☐

☐ JCSA $ _____
☐ Streetlights / Street Signs _____
☐ Street Dedication / VDOT _____

Surety Amount Needed $ _____

Comments _____

	Calculate	Reduce	Release
☒ Erosion Control Surety $25,000	☐	☐	☐

Checklist SP-111-00; PC185 Dry Pond #3

☐ BMP Certification / Record Drawings Got asbuilts + const. cert but have not reviewed or performed final inspection. Will try and complete ASAP. Keep the $25,000 until BMP review is done.

Surety Amount Needed $ _____

Comments _____

INDICATE YOUR APPROVAL BY INITIALING THE APPROPRIATE BLANK:

INSP. ____ DEC ____ ST SJ 1-28-05 PTM ____

AES CONSULTING ENGINEERS
Engineering, Surveying, and Planning
5248 Olde Towne Road, Suite 1
WILLIAMSBURG, VIRGINIA 23188

Phone: (757) 253-0040
Fax: (757) 220-8994

LETTER OF TRANSMITTAL

MAR 2003
RECEIVED
ENVIRONMENTAL DIVISION

ATTN: **Scott Thomas, P.E.**

CO.: JCC Enviromental Division

Address:

cc:

DATE	JOB NO.
3/27/03	7555-14

FROM: Bruce Abbott

RE
Williamsburg Plantation Road Extension
SWM/BMP#3
(COACH HOUSE ROAD Extension)
PC185; SP-111-00

WE ARE SENDING YOU THE FOLLOWING ITEMS: ☒ Attached ☐ Under separate cover via

☐ Original(s) ☒ Print(s) ☐ Plan(s) ☐ Specification(s) ☐ Change Order

☐ Copy of letter(s) ☒ Other: Construction Certification

COPIES	DATE	No. of Pages	DESCRIPTION
1		8	Construction Certification
1		3	Record Drawings

THESE ARE TRANSMITTED as checked below:

☒ For your approval ☐ For your signature ☐ For review and comment

☐ For your use ☐ As you requested ☐ As requested by:

☐ Other:

REMARKS:

3 2401 000 26C
4820 COWSHILL RD

WMBG PLANTATION INC
PO BOX 70070
OAKLAND PARK, FL
R2

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

CULVERT CALCULATIONS

JAN 2001
RECEIVED
ENVIRONMENTAL DIVISION

FOR

EXISTING CULVERT (ROUTE 199) AT PROPOSED DRY POND OUTFALL

WILLIAMSBURG PLANTATION ROAD EXTENSION

Longhill Road
Williamsburg, Virginia 23188

Prepared By:

AES Consulting Engineers
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
AES Project No. 7555-14
September 11, 2000
Revised: January 15, 2001

CONSULTING ENGINEERS

LD-269
Rev 3-83

EXISTING CULVERT

Project WILLIAMSBURG PLANTATION
COACH HOUSE ROAD EXTENSION

Plan Sheet No. 1 Designer CBR
Rev. Date _____ Date 1/15/01

Sheet 1 of 1

HYDROLOGICAL DATA:
D.A. = _____ AC.

POND OUTFALL PIPE FOR DRY POND #1/BMP#3
AT THE WILLIAMSBURG PLANTATION

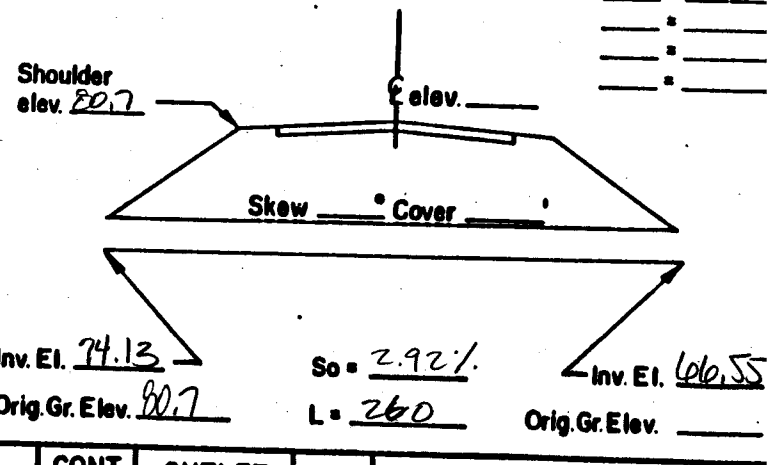
PER POND ROUTING CALCULATIONS

*FLOWRATES DETERMINED BY SCS

AHW Controls
100 yr. Flood plain _____ elev. _____
Design AHW depth _____ elev. _____
Structures _____ elev. _____

STATION _____

freq. TWele
_____ = _____
_____ = _____
_____ = _____
_____ = _____
_____ = _____



DISCHARGES USED
Q 10 = 31.3 CFS
Q 25 = 40.0 CFS
Q ____ = _____ CFS
Q ____ = _____ CFS
Q ____ = _____ CFS

RISK ASSESSMENT
ADT _____
Detours Available _____, Length _____
Overtopping Stage _____
Flood Plain Management _____
Criteria and Significant Impact _____

CULVERT TYPE & SIZE	Q	Q/B	HEADWATER COMPUTATIONS: INLET CONT. HW/D	INLET CONT. HW	OUTLET CONTROL Ke	dc	(dc+D)/2	ho	H	LSo	HW	CONT. HW. ELEV.	OUTLET VELOCITY C.M.	OUTLET VELOCITY Smooth	End Treat.	COMMENTS
36" RCP	31.3	.	0.87	2.61	0.5	1.75	2.38	2.38	1.0	7.59	—	76.74		12.5		EXISTING EC-1 STONE IS ADEQUATE DUE TO REDUCTION OF PROPOSED FLOWRATES WHEN COMPARED TO DESIGN FLOWRATES
36" RCP	40.0		1.02	3.06	0.5	2.0	2.5	2.5	1.65	7.59	—	77.19		12.7		

Design Flood Exceed Prob. _____ Elev _____

240 A

DESIGN CALCULATION

Post-it® Fax Note 7671	Date	# of pages ▶
To Charles Record	From P.R.	
Co./Dept. AES	Co. VDOT	
Phone #	Phone #	
Fax # 220-8794	Fax #	

MMM DESIGN GROUP
ARCHITECTS • ENGINEERS • PLANNERS

CULVERT ANALYSIS

Project: 0199-047-F03, C-501, RW-204
Job #: 6429.00
Plan Sheet : 17

Drainage Surface Area

		Area	C	C * A
Subarea 1	ZONE R-2	15.31	0.45	6.89
Subarea 2				
Subarea 3				
		Total C*A		6.89

Time of Concentration

Overland Flow: 1200 LF @ 1.83 % 19.5 min

Total time of concentration: 19.5 min

Discharge & Tailwater

YEAR	Cf	Tc	i	Q	TW EL
2	1.00	19	3.42	23.6	
5	1.00	19	4.14	28.5	
10	1.00	19	4.65	32.1	
25	1.10	19	5.43	41.1	
50	1.20	19	6.02	49.7	
100	1.25	19	6.61	56.9	

Pipe Information

Str. : 17-1 RTE 199 NBL STA. 296+65

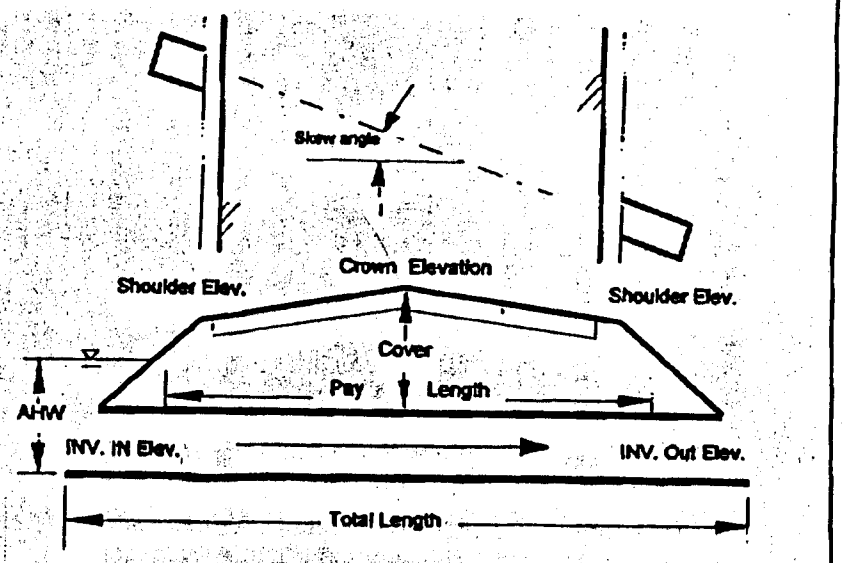
Total Length L (ft) =		254
Slope S =		0.0236
Crown Elev. =		80.6
AHW (ft) =	3.72	78.22
Skew =		45 deg
Cover =		6 ft

Inlet Parameter

Shoulder Elevation =	79.72
INV. In Elevation =	74.50
Ground Elevation =	82.0

Outlet Parameter

Shoulder Elevation =	78.80
INV. Out Elevation =	68.50
Ground Elevation =	70.5



Comments:

Type & size	Design Year	D Inch	n	Q CFS	Headwater Computations: Inlet Control Shape	HW/D	HWI	Outlet Control Ke	dc	ho	H	L * So	HWo	Contr. HW Elev.	Outlet Velocity FPS	End Treatment Inlet ES / EW	Outlet ES / EW	Comments
30 Dia. Conc. Pipe	10	30	0.012	32.1	1	1.34	[illegible]	0.5	1.93	2.21	2.31	6.00	-	77.84	13.66	EW	ES	Q/Qf=0.5 EC REQD
30 Dia. Conc. Pipe	25	30	0.012	41.1	1	1.78	[illegible]	0.5	2.15	2.33	3.81	6.00	0.13	78.94	14.53	EW	ES	Q/Qf=0.6 WSE>AHW EC REQ
30 Dia. C.M. Pipe	10	30	0.024	32.1	4	1.33	[illegible]	0.5	1.93	2.21	6.26	6.00	2.48	77.81	7.90	EW	ES	Q/Qf=0.9 EC REQD
30 Dia. C.M. Pipe	25	30	0.024	41.1	4	1.74	4.36	0.5	2.15	2.33	10.31	6.00	[illegible]	81.14	8.38	EW	ES	Q/Qf=1.2 WSE>AHW EC REQ
36 Dia. Conc. Pipe	10	36	0.012	32.1	1	0.93	[illegible]	0.5	1.84	2.42	0.98	6.00	-	77.28	13.56	EW	ES	Q/Qf=0.3 EC REQD
36 Dia. Conc. Pipe	25	36	0.012	41.1	1	1.11	[illegible]	0.5	2.09	2.54	1.61	6.00	-	77.84	14.51	EW	ES	Q/Qf=0.4 EC REQD
36 Dia. C.M. Pipe	10	36	0.024	32.1	4	0.91	[illegible]	0.5	1.84	2.42	2.47	6.00	-	77.24	8.12	EW	ES	Q/Qf=0.6 EC REQD
36 Dia. C.M. Pipe	25	36	0.024	41.1	4	1.09	[illegible]	0.5	2.09	2.54	4.07	6.00	0.61	77.77	8.58	EW	ES	Q/Qf=0.7 EC REQD

Summary & Recommendations:

Pipe: 246 ' Pay L.F. - 36 " PIPE REQD. INV. In Elevation = 74.50 INV. Out Elevation =68.50

End Treatment: 1 STD. ES-1 OR ES-2 END SECTION REQ'D &1 STD. EW-2 ENDWALL REQ'D

Erosion Control: TONS STD. EC-1 CLASS I REQ'D

Design Fld. Exceed. Prob. : _____ Elevation: _____
Overtop Fld. Exceed. Prob. : _____ Elevation: _____
Base Flood Exceed. Prob. : _____ Elevation: _____

171

AES CONSULTING ENGINEERS
Engineering, Surveying and Planning
5248 Olde Towne Road, Suite 1
WILLIAMSBURG, VIRGINIA 23188

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

LETTER OF TRANSMITTAL

DATE	JOB NO.
4/26/01	7555-14

ATTENTION: MR. DARRYL COOK

RE: WILLIAMSBURG PLANTATION ROAD EXTENSION SP-111-00

TO JCC ENVIRONMENTAL DIVISION

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

☐ Shop drawings ☒ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
2		1	FIELD CHANGE DRAWINGS OF CLAY CORE FOR SWM/BMP FACILITY #3

REVIEWED BY AT 05-02-01

MAY 2001 RECEIVED ENVIRONMENTAL DIVISION

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval

☒ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution

☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS

DARRYL,

PLEASE FIND ATTACHED THE FIELD CHANGE FOR THE CLAY CORE OF THE DAM FOR SWM/BMP FACILITY #3. IF YOU HAVE ANY QUESTIONS, PLEASE CALL.

THANKS,

KEN YERBY, ~~BUSCH~~ BUSH CONSTRUCTION

COPY TO RAY NICE, GEORGE NICE AND SONS SIGNED: Charles Records

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

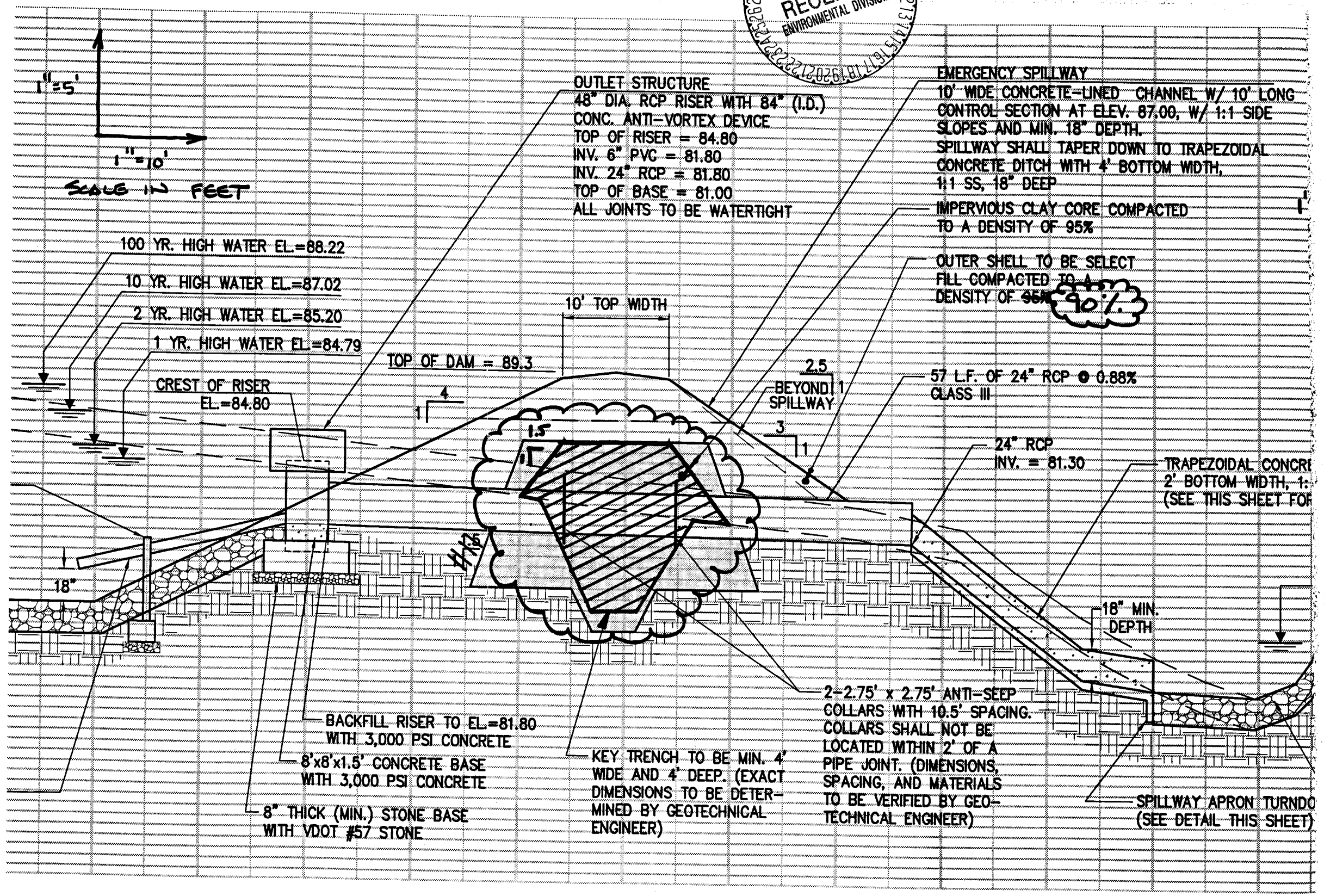
WILLIAMSBURG PLANTATION
ROAD EXTENSION OF
COACH HOUSE LANE

REVISION TO CLAY
CORE OF SWM/BMP
#3 FACILITY

SECTION A-A
FROM SHEET 8
OF CONSTRUCTION
PLANS

COMMONWEALTH OF VIRGINIA
RICHARD A. COSTELLO
CERTIFICATE NO.
013280
4/26/01
CERTIFIED PROFESSIONAL ENGINEER

DATE: 4/26/01



MAY 2001
RECEIVED
ENVIRONMENTAL DIVISION

Scott Thomas

From: Scott Thomas
Sent: Friday, May 04, 2001 11:01 AM
To: 'Richard Costello'
Subject: RE: Williamsburg Plantation Coach House Loop Road - REVISED

SP-111-00 Williamsburg Plantation Coach House Road Extension SWM/BMP # 3

In regards to our discussion on 5/04/01, a transmittal dated 4/26/01 and emails dated 5/2/2001 and 5/3/2001, revisions to SWM/BMP # 3 including the key trench, clay core, minimum fill compaction density and changes to the concrete riser structure, including use of 48-inch precast ASTM C478 with profile gaskets (in lieu of ASTM C 361 O-ring Pipe) and change of the concrete base from an 8' x 8' x 1.5' pad to a standard extended base are acceptable. We will red line our approved drawing set accordingly. Please ensure these corrections are adequately reflected on the record drawing for the facility if performed by your firm.

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

-----Original Message-----
From: Richard Costello [mailto:rcostello@aesva.com]
Sent: Thursday, May 03, 2001 1:20 PM
To: Scott Thomas
Cc: Ray Nice
Subject: Williamsburg Plantation Coach House Loop Road - REVISED

Scott,

The structure is 4' high on a 6.25' base so tipping is not a problem (the structure weights 13,000#). If you pour the concrete donut (12,000#) around the structure your soil loads are actually 10% higher so the is no point in doing it for settlement.

So I stand on my recommendation.

Richard Costello, P.E.
President
AES Consulting Engineers
ph 757.253.0040 fax 757.220.8994

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Engineering, Surveying and Planning
5248 Olde Towne Road, Suite 1
WILLIAMSBURG, VIRGINIA 23188

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

LETTER OF TRANSMITTAL

DATE	JOB NO.
4/26/01	7555-14

ATTENTION: MR. DARRYL COOK

RE: WILLIAMSBURG PLANTATION ROAD EXTENSION SP-111-00

TO ICC ENVIRONMENTAL DIVISION

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

☐ Shop drawings ☒ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
2		1	FIELD CHANGE DRAWINGS OF CLAY CORE FOR SWM/BMP FACILITY #3

REVIEWED BY SAT 05-02-01

MAY 2001 RECEIVED ENVIRONMENTAL DIVISION

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval

☒ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution

☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS

DARRYL,

PLEASE FIND ATTACHED THE FIELD CHANGE FOR THE CLAY CORE OF THE DAM FOR SWM/BMP FACILITY #3. IF YOU HAVE ANY QUESTIONS, PLEASE CALL.

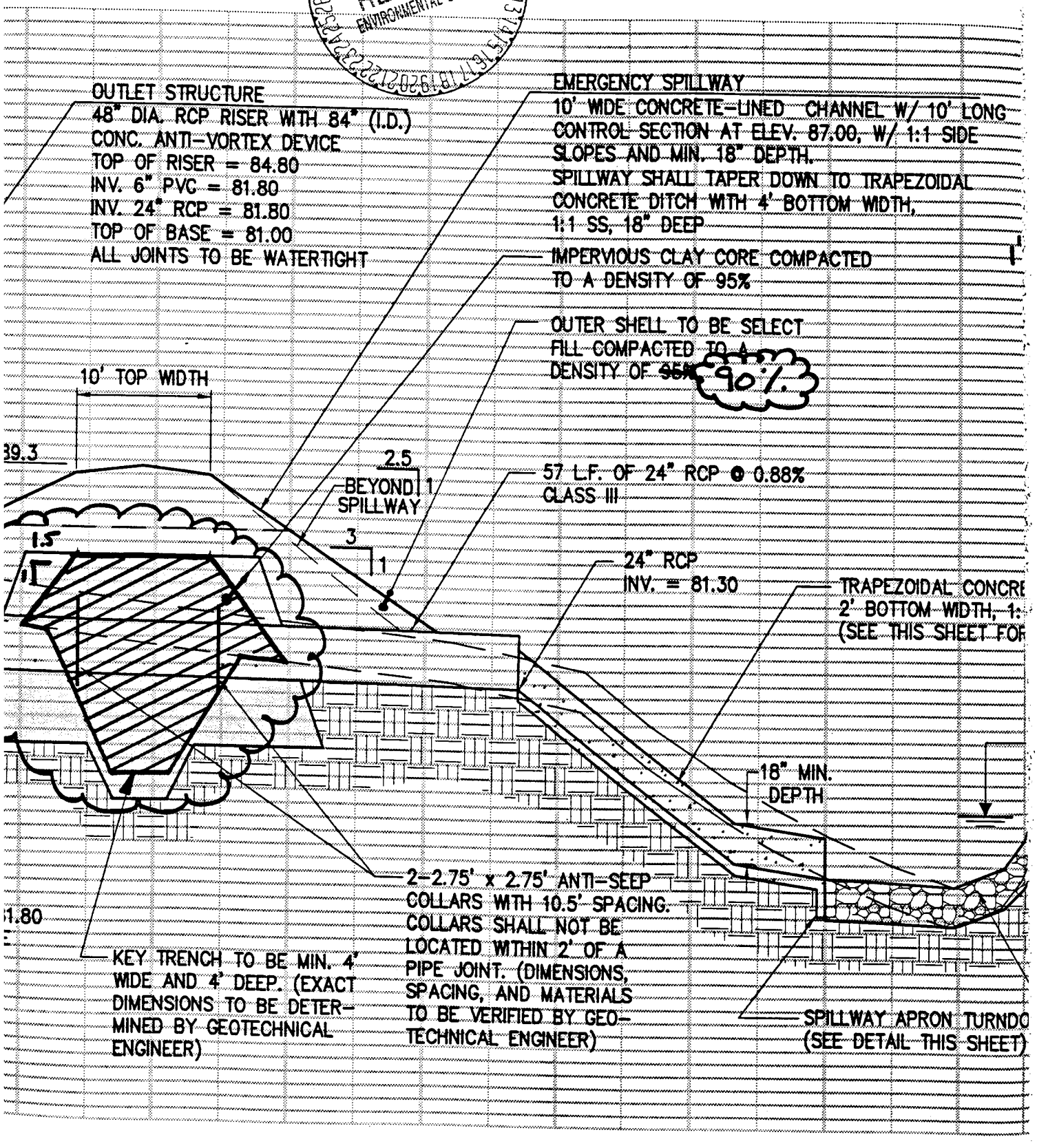
THANKS,

KEN YERBY, ~~BUSCH~~ BUSH CONSTRUCTION

COPY TO RAY NICE, GEORGE NICE AND SONS SIGNED: Charles Records

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

MAY 2001
RECEIVED
ENVIRONMENTAL DIVISION



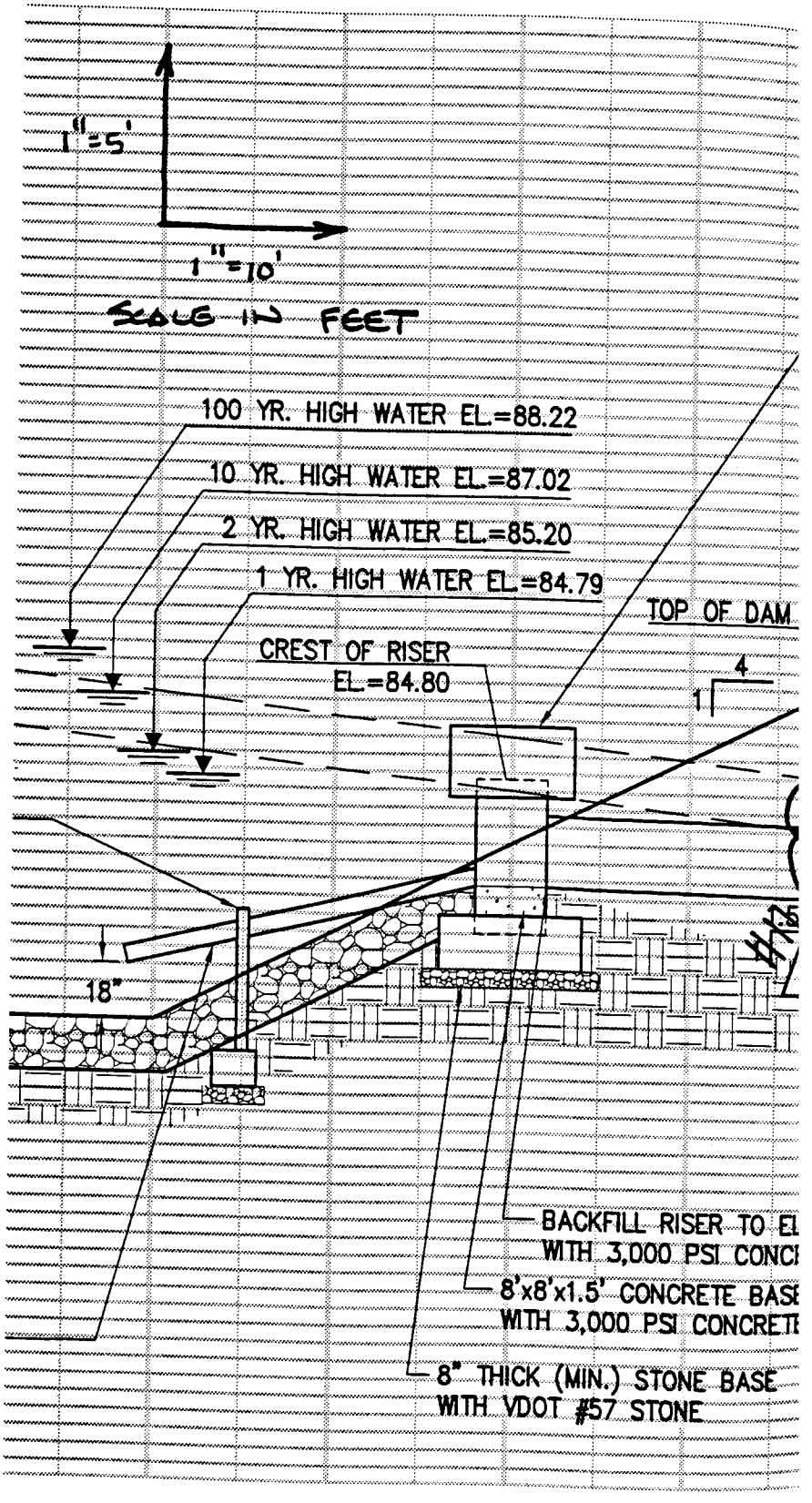
WILLIAMSBURG PLANTATION
ROAD EXTENSION OF
COACH HOUSE LANE

REVISION TO CLAY
CORE OF SWM/BMP
#3 FACILITY

SECTION A-A
FROM SHEET 8
OF CONSTRUCTION
PLANS

COMMONWEALTH OF VIRGINIA
RICHARD A. COSTELLO
CERTIFICATE NO.
012280
4/26/01
CERTIFIED PROFESSIONAL ENGINEER

DATE: 4/26/01



Scott Thomas

From: Joan Etchberger
Sent: Wednesday, May 02, 2001 4:38 PM
To: Darryl Cook; Scott Thomas
Subject: FW: Williamsburg Plantation Section 5

For your action.

-----Original Message-----
From: Richard Costello [mailto:rcostello@aesva.com]
Sent: Wednesday, May 02, 2001 4:15 PM
To: Joan Etchberger
Cc: Ray Nice; Ken Yerby
Subject: Williamsburg Plantation Section 5

(Joan please pass this onto the the appropriate reviewer and inspector)

I(have approved the following changes to our plans:(Job #1555-14 Sheet 8, SWM/BMP#3, Cross Section 48" Riser)

- Eliminate the fill concrete around the ~~exterior.~~ Not needed either for buoyancy nor is tipping a problem. A standard detail was used. ? WHY
- Eliminate the stone under the structure unless the subgrade is soft. Stone should still be used for leveling if needed.

Richard Costello, P.E.
President
AES Consulting Engineers
ph 757.253.0040 fax 757.220.8994

AES Consulting Engineers a Professional Corporation Confidentiality Note: This e-mail and any attachments are confidential and may be protected by legal privilege. If you are not the intended recipient, be aware that any disclosure, copying, distribution or use of this e-mail or any attachment is prohibited. If you have received this e-mail in error, please notify us immediately by returning it to the sender and delete this copy from your system. Thank you for your cooperation.

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Richard Costello, P.E.
President
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DRAINAGE CALCULATIONS

FOR

WILLIAMSBURG PLANTATION ROAD EXTENSION

Longhill Road
Williamsburg, Virginia 23188

Prepared By:

AES Consulting Engineers
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
AES Project No. 7555-14
September 11, 2000
Revised: November 9, 2000
DECEMBER 5, 2000

CONSULTING ENGINEERS

SJT Review set.

NARRATIVE

This project encompasses the construction of roadway, water and sanitary utilities, and storm water drainage associated with the extension of Coach House Lane in the Williamsburg Plantation, James City County, Virginia. A stormwater management/ best maintenance practice facility is included in this project.

The project area is mainly comprised of pasture-type grasses. The dry detention pond has been sized for an ultimate drainage area of 23.5 acres. The original stormwater master plan for this development estimated the drainage area to facility 3 as approximately 19.2 acres. However, the existing wet pond facility, adjacent to Regency at Longhill is experiencing bank stabilization problems. Therefore, approximately 4.3 acres of future drainage area from the wet pond has been diverted to proposed facility 3. This facility is rated at 4 points for water quality and provides channel protection for the one-year, twenty-four hour storm event. The riser elevation of 84.8 reflects the storage required for channel protection.

The storm system proposed with Section 5 is the trunk line for the system along Coach House Lane (E). This system discharges into shared Facility "G", located at the most southeastern corner of the Plantation property. System #2 is located along Coach House Lane (N) and directs flow into the proposed dry detention facility.

SPREAD CALCULATIONS

T = 9.5'
MAX ALLOW

n = 0.015

STORM WATER INLET COMPUTATIONS

FORM LD 204
REV 6-85

RTE [illegible]

PROJECT NAME WILLIAMSBURG [illegible]

DATE 1-6-00
AES PROJ # 7532-14

INLET NUMBER	TYPE	LENGTH (FT)	STATION	DRAINAGE AREA (AC)	C	CA	I (IN/HR)	Q INCR (CFS)	Q CARRY OVER (CFS)	Qt GUTTER FLOW (CFS)	S GUTTER SLOPE (FT/FT)	Sx CROSS SLOPE (FT/FT)	T SPREAD	W (FT)	W/T	Sw (FT/FT)	Sw/Sx	Eo (#10)	a	Sw = a/12W	Se = Sx+SwEo (FT/FT)	Lt (FT)	P EFFECT (FT)	L/Lt	d (FT)	E (#16)	h (FT)	Q: INTRCPT (CFS)	d/h	Qb: CARRY OVER (CFS)	T SPREAD @ SAG (FT)	REMARKS
G #15	3	E	6	13+62 R	.45	.56	[illegible]	1.0	—	1.0	.0193	[illegible]	4.0	[illegible]	.5	[illegible]	4	.97	3.5	.1458	0.10	9.1		0.66		85.7		0.86		Qb = 0.14		to #14
G #16	3	E	6	13+62 L	.45	.56	.25	1.0	1.0	—	1.0	.0193	[illegible]	4.0	[illegible]	.5	[illegible]	4	.97	3.5	.1458	.10	9.1		.66		85.7		0.86		Qb = 0.14		to #12
G #14	3	B	6	15+80 R	[illegible]	.61	.14	4.0	.56	.14	0.7	.0128	[illegible]	3.7	[illegible]	.54	[illegible]	4	.96	3.5	.1458	.1	6.9		.87		97.5		0.68		Qb = 0.02		to #13
G #13	3	E	4	[illegible] R	[illegible]	.60	.03	[illegible]	.12	.02	.14	.0123	[illegible]	1.4	[illegible]	1.43	[illegible]	4	1.0	3.5	.1458	.1	3.5		1.14		—		0.14		—		
G #12	3	B	6	[illegible] L	.18	.70	.13	4.0	.50	.14	0.64	[illegible]	[illegible]	3.2	[illegible]	0.63	[illegible]	4	.98	3.5	.1458	.1	6.7		.90		98.4		0.63		Qb = 0.01		to #7A SECT 5

T_{HAV} = 9.5' ALLOW. n = 0.015

STORM WATER INLET COMPUTATIONS

FORM LD 204
REV 6-85

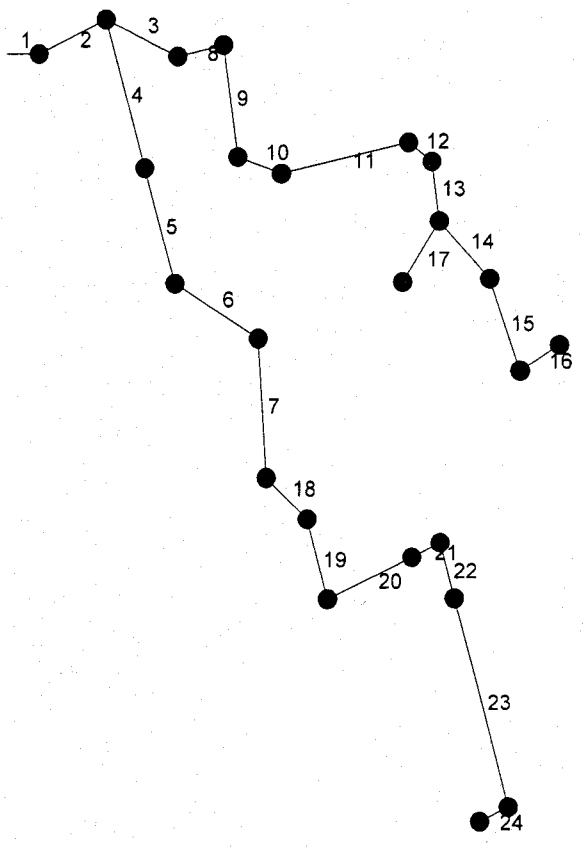
RTE COACH HOUSE LANE (N) PROJECT NAME WILLIAMSBURG PLANTATION

DATE 9-6-00
AES PROJ # 7555-14

INLET NUMBER	TYPE	LENGTH (FT)	STATION	DRAINAGE AREA (AC)	C	CA	I (IN/HR)	Q INCR (CFS)	Q CARRY OVER (CFS)	Qt GUTTER FLOW (CFS)	S GUTTER SLOPE (FT/FT)	Sx CROSS SLOPE (FT/FT)	T SPREAD	W (FT)	W/T	Sw (FT/FT)	Sw/Sx	Eo (#10)	a	Sw = a/12W	Se = Sx+SwEo (FT/FT)	Lt (FT)	P EFFECT (FT)	L/Lt	d (FT)	E (#16)	h (FT)	Q: INTRCPT (CFS)	d/h	Qb: CARRY OVER (CFS)	T SPREAD @ SAG (FT)	REMARKS
G #2-5	3	B	4	13+[illegible]R	.09	.7	[illegible]	4.0	.24	—	.24	.0145	.0208	1.55	2	1.29	.0833	4	1.0	3.5	.1458	.17	3.32	1.2	—			0.24		No Qb		
G #2-6	3	B	[illegible]	13+[illegible]L	.38	.5	.19	4.0	.76	—	.76	.0145	.0208	3.6	2	.56	.0833	4	.97	[illegible]	.1458	.16	5.60	1.1	—			0.76		No Qb		
G #2-4	3	B	4	15+63R	0.11	.7	.08	4.0	.32	—	.32	.0145	.0208	1.75	2	1.1	.0833	4	1.0	3.5	.1458	.17	3.76	1.06	—			0.32		No Qb		
G#2-3	3	B	4	16+57R	.02	.7	.02	4.0	.08	—	.08	.0145	.0208	1.4	2	1.4	.0833	4	1.0	3.5	.1458	.17	2.1	1.9	—			0.08		No Qb		
G#2-3A	3	B	6	16+57L	.74	.5	.37	4.0	1.48	—	1.48	.0145	.0208	5.7	2	.35	.0833	4	.83	3.5	.1458	.14	8.03	.75	.917			1.36		Qb = .12		to 2-2A
#2-2	3	A	2.5	19+19R	.30	.6	.18	4.0	.72	—	.72	.001	.0208	7.5✓			.0833						6.1	.14	.27			.52		T = 6.7		OK
#2 2A	3	A	2.5	19+19L	.30	.58	.17	4.0	.68	.12	.8	.001	.0208	8.5✓			.0833						6.1	.15	.27			.55		T = 7.2		OK

STORM SYSTEM CALCULATIONS

Hydraflow Plan View



Project file: 755514sys1.stm	IDF file: JCCstormsewer.IDF	No. Lines: 24	11-07-2000

Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	45.0	0.43	9.48	0.50	0.22	6.09	10.0	16.9	4.9	43.22	66.97	8.81	30	2.67	48.50	47.30	55.31	54.81	55.00	50.30	2-1
2	1	100.0	1.15	9.05	0.75	0.86	5.87	10.0	16.4	5.0	42.60	112.3	9.01	30	7.50	56.00	48.50	58.19	55.85	63.00	55.00	3-2
3	2	106.0	0.00	4.86	0.00	0.00	2.93	0.0	14.3	5.2	15.37	21.97	4.89	24	0.94	57.00	56.00	60.04	59.55	65.30	63.00	3A-3
4	2	157.0	0.31	3.04	0.75	0.23	2.08	5.0	15.5	5.1	24.06	34.49	7.97	24	2.32	59.65	56.00	61.39	59.55	68.70	63.00	4 - 3
5	4	123.0	0.48	2.73	0.75	0.36	1.85	5.0	14.8	5.2	23.06	43.26	7.76	24	3.66	64.15	59.65	65.86	61.55	74.05	68.70	5 - 4
6	5	128.0	0.35	2.25	0.75	0.26	1.49	5.0	14.1	5.3	21.35	46.46	7.28	24	4.22	69.55	64.15	71.19	66.62	80.40	74.05	6-5
7	6	138.0	0.31	1.90	0.55	0.17	1.23	10.0	13.3	5.4	20.11	35.76	6.96	24	2.50	73.00	69.55	74.59	71.98	80.00	80.40	7 - 6
8	3	65.0	1.67	4.86	0.55	0.92	2.93	10.0	13.9	5.3	15.53	44.36	5.79	24	3.85	59.50	57.00	60.90	60.20	63.00	65.30	3B-3A
9	8	113.0	0.73	3.19	0.50	0.37	2.01	10.0	13.3	5.4	10.85	20.96	6.50	18	3.98	64.00	59.50	65.26	61.58	68.00	63.00	3C-3B
10	9	63.0	0.00	2.46	0.00	0.00	1.64	0.0	12.9	5.5	8.97	34.65	5.64	18	10.89	70.86	64.00	72.00	65.88	74.50	68.00	3D-3C
11	10	179.0	0.18	2.46	0.90	0.16	1.64	5.0	11.9	5.6	9.24	15.54	5.83	18	2.19	74.78	70.86	75.94	72.27	79.79	74.50	4D-3D
12	11	38.0	0.51	2.28	0.75	0.38	1.48	5.0	11.7	5.7	8.38	6.95	6.83	15	1.16	75.22	74.78	77.04	76.40	79.98	79.79	4E-4D
13	12	60.0	0.32	1.77	0.70	0.22	1.10	5.0	11.4	5.7	6.28	7.36	5.12	15	1.30	76.00	75.22	78.16	77.59	82.84	79.98	4F-4E
14	13	90.0	0.27	0.99	0.60	0.16	0.53	5.0	10.9	5.8	3.08	17.35	3.42	15	7.22	82.50	76.00	83.20	78.46	86.50	82.84	4G-4F
15	14	100.0	0.18	0.72	0.40	0.07	0.37	5.0	10.3	5.9	2.18	6.46	3.16	15	1.00	83.50	82.50	84.09	83.33	87.50	86.50	4H-4G
16	15	60.0	0.54	0.54	0.55	0.30	0.30	10.0	10.0	6.0	1.77	4.57	2.62	15	0.50	83.80	83.50	84.38	84.32	87.50	87.50	4I-4H
17	13	80.0	0.46	0.46	0.75	0.34	0.34	5.0	5.0	7.1	2.46	10.21	2.99	15	2.50	78.00	76.00	78.63	78.46	81.67	82.84	4F1-4F
18	7	70.0	0.06	1.59	0.65	0.04	1.06	5.0	13.0	5.5	19.26	38.23	9.52	24	2.86	79.00	77.00	80.58	78.03	83.50	80.00	10-7
+6.0CFS [19]	18	85.0	0.00	1.53	0.00	0.00	1.02	0.0	12.5	5.5	19.12	25.73	6.71	24	1.29	80.10	79.00	81.65	81.19	87.00	83.50	11-10
20	19	124.0	0.18	1.53	0.90	0.16	1.02	5.0	11.8	5.6	13.24	23.16	4.97	24	1.05	81.40	80.10	82.78	82.48	88.92	87.00	12-11
21	20	42.0	0.09	1.35	0.60	0.05	0.86	5.0	11.6	5.7	12.36	24.68	5.53	24	1.19	81.90	81.40	83.15	82.85	88.92	88.92	13-12

[*] ACCOUNTS FOR FUTURE DEVELOPMENT

Project File: 755514sys1.stm | I-D-F File: JCCstormsewer.IDF | Total number of lines: 24 | Run Date: 11-07-2000

NOTES: Intensity = 143.72 / (Tc + 19.20) ^ 0.94; Return period = 10 Yrs. ; Initial tailwater elevation = 54.81 (ft)

Hydraflow Storm Sewer Tabulation

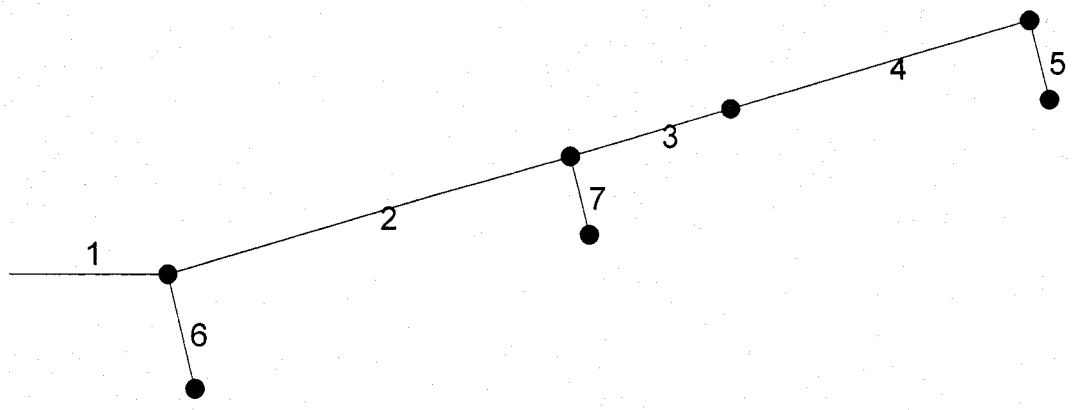
Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1.5cfs 22	21	59.0	0.35	1.26	0.61	0.21	0.80	10.0	11.2	5.7	12.10	22.81	5.01	24	1.02	82.50	81.90	83.73	83.71	90.16	88.92	14-13
23	22	222.0	0.68	0.91	0.56	0.38	0.59	10.0	10.0	6.0	3.51	8.99	3.71	15	1.94	86.80	82.50	87.55	83.81	94.14	90.16	15-14
24	23	42.0	0.23	0.23	0.90	0.21	0.21	5.0	5.0	7.1	1.47	15.75	2.33	15	5.95	89.30	86.80	89.79	87.87	94.14	94.14	16-15

* ACCOUNTS FOR FUTURE DEVELOPMENT

Project File: 755514sys1.stm | I-D-F File: JCCstormsewer.IDF | Total number of lines: 24 | Run Date: 11-07-2000

NOTES: Intensity = 143.72 / (Tc + 19.20) ^ 0.94; Return period = 10 Yrs. ; Initial tailwater elevation = 54.81 (ft)

Hydraflow Plan View



Project file: 755514sys2.stm	IDF file: JCCstormsewer.IDF	No. Lines: 7	11-07-2000

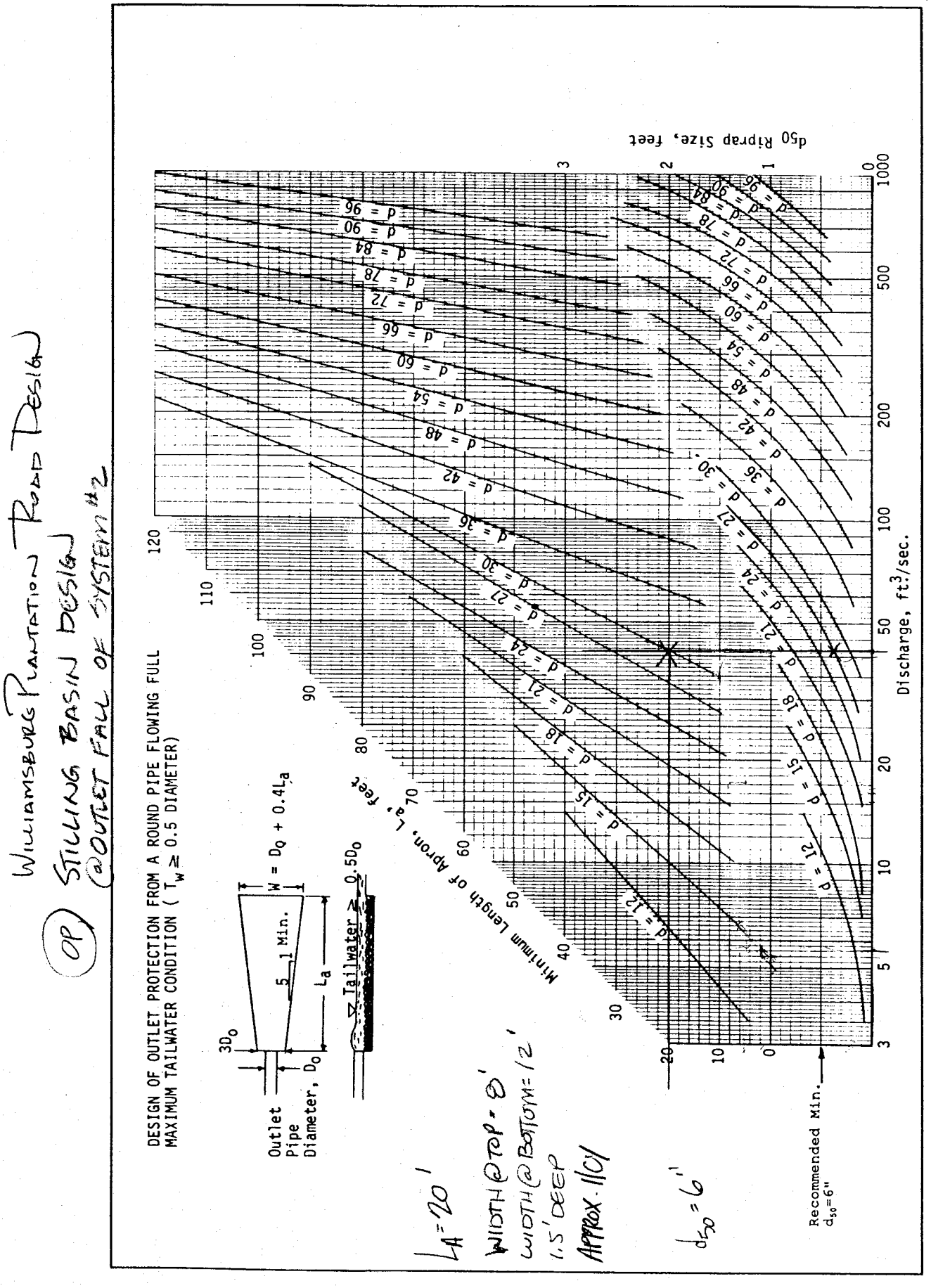
Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	End	90.0	0.29	2.06	0.70	0.20	1.20	8.0	18.5	4.7	41.61	62.65	8.84	30	2.33	85.60	83.50	87.77	87.02	95.64	85.80	2-1
2	1	235.0	0.02	1.47	0.90	0.02	0.82	5.0	17.2	4.8	31.47	38.47	10.13	24	2.89	92.40	85.60	94.29	88.89	100.07	95.64	3-2
3	2	94.0	0.10	0.57	0.90	0.09	0.36	5.0	14.2	5.3	18.90	27.60	6.02	24	1.49	93.80	92.40	96.58	95.92	101.42	100.07	4-3
4	3	175.0	0.09	0.47	0.90	0.08	0.27	5.0	13.2	5.4	18.47	27.57	6.54	24	1.49	96.40	93.80	97.92	96.66	103.98	101.42	5-4
+11.0 CFS [5]	4	42.0	0.38	0.38	0.50	0.19	0.19	13.0	13.0	5.4	18.03	27.03	5.74	24	1.43	97.00	96.40	98.98	98.73	103.38	103.98	6-5
+8.5 CFS [6]	1	60.0	0.30	0.30	0.58	0.17	0.17	10.0	10.0	6.0	9.54	21.00	5.70	18	4.00	88.00	85.60	89.26	88.89	94.75	95.64	2A-2
+10.5 CFS [7]	2	42.0	0.88	0.88	0.50	0.44	0.44	17.0	17.0	4.9	12.64	31.22	4.03	24	1.90	93.20	92.40	96.05	95.92	100.07	100.07	3A-3

[*] ACCOUNTS FOR FUTURE DEVELOPMENT

Project File: 755514sys2.stm | I-D-F File: JCCstormsewer.IDF | Total number of lines: 7 | Run Date: 11-07-2000

NOTES: Intensity = 143.72 / (Tc + 19.20) ^ 0.94; Return period = 10 Yrs. ; Initial tailwater elevation = 87.02 (ft)



WILLIAMSBURG PLANTATION ROAD DESIGN
(OP) STILLING BASIN DESIGN
@ OUTLET FALL OF SYSTEM #2

Source: USDA-SCS

Plate 3.18-4

SWM/ BMP CALCULATIONS

Table 2

Worksheet for BMP Point System

A. STRUCTURAL BMP POINT ALLOCATION

BMP	BMP Points		Fraction of Site Served by BMP		Weighted BMP Points
Ex. Wet Pond	10	x	25.25 + 6.72 / 75.65	=	4.23
Dry Pond (w/ UDET)	9	x	19.66 + 27.37 / 75.65	=	5.59
		x		=	
Dry Pond	4	x	23.30 / 75.65	=	1.24

TOTAL WEIGHTED STRUCTURAL BMP POINTS: 11.06

B. NATURAL OPEN SPACE CREDIT

Fraction of Site		Natural Open Space Credit		Points for Natural Open Space
14.5 / 75.65	x	0.1 (0.1 per 1%)	=	1.92
	x	(0.15 per 1%)	=	

TOTAL NATURAL OPEN SPACE CREDIT: 1.92

C. TOTAL WEIGHTED POINTS

11.06	+	1.92	=	12.98 ✓
Structural BMP Points		Natural Open Space Points		Total

BMP Point Tabulation for Williamsburg Plantation
3/22/00

Notes:

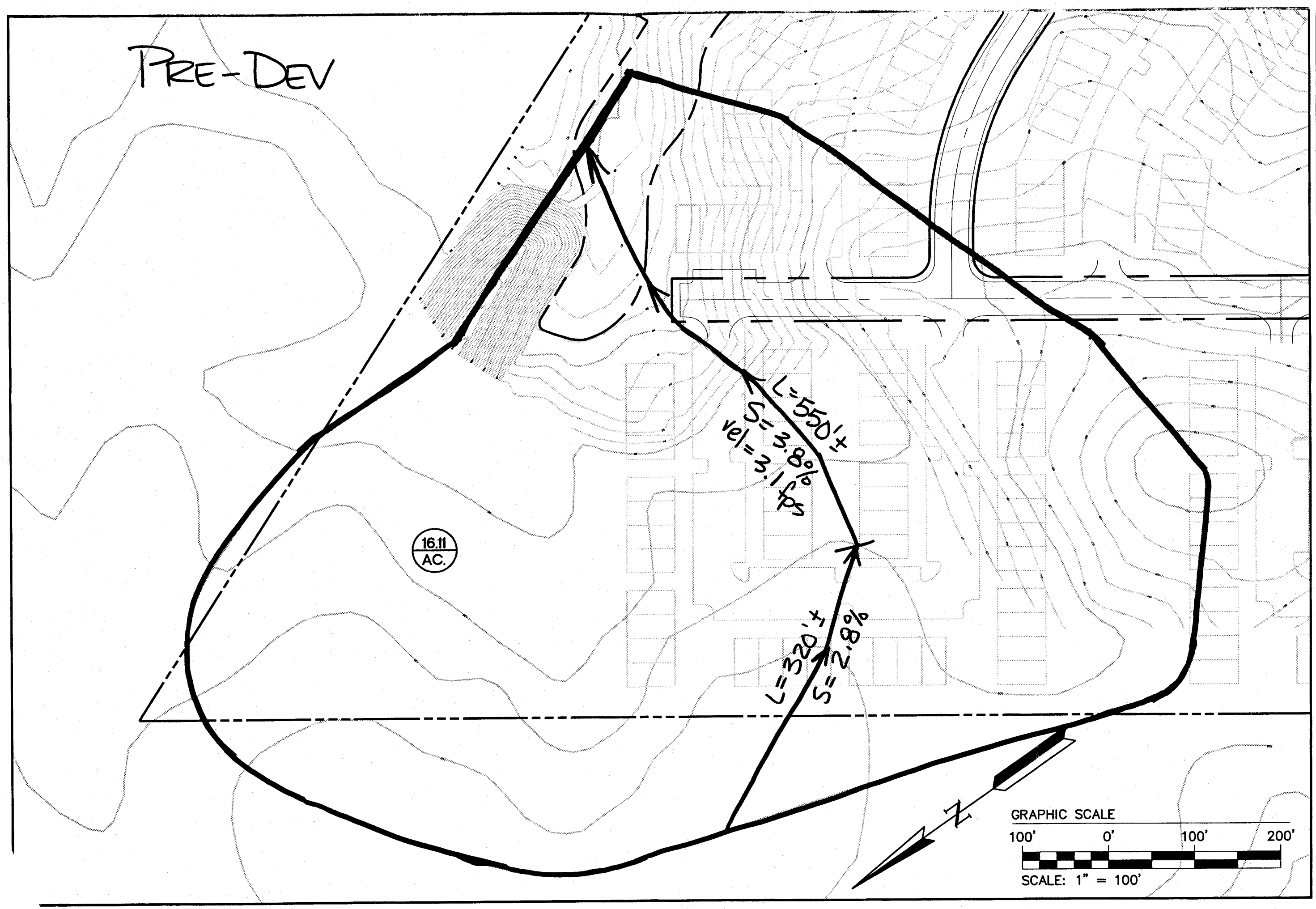
1. The total site area of Williamsburg Plantation is 75.65 AC following the condemnation of 1.43 AC by VDOT for the construction of Route 199.

2. During the development of Regency at Longhill II, adjacent to Williamsburg Plantation, the existing wet pond was enlarged and redesigned to accommodate additional flow from Regency. The total drainage area to the 10 point wet pond is 33.97 AC (as approved with the Regency development), of which ~~27.25~~ 25.25 AC is on-site and 6.72 is off-site contribution.

3. The dry pond shared with VDOT was redesigned (and approved) in the spring of 1999 to provide water quality and attenuation for both the VDOT and Plantation drainage areas. The total drainage area to this 9-point facility is 47 AC, of which 19.66 is on-site and 27.34 is off-site contribution.

4. The open space quantity has been revised to reflect the 1.43 AC loss. Additionally, the 0.5 AC area just north of Section 3 has been removed from the open space number. This area is contains many dead trees and bushes. The developer wishes to landscape it during a future submittal. The revised open space number is 14.5 AC.

5. The future BMP is to be a dry pond. Conservatively, this pond is estimated at 4 points.



No.	DATE	REVISION / COMMENT / NOTE	BY

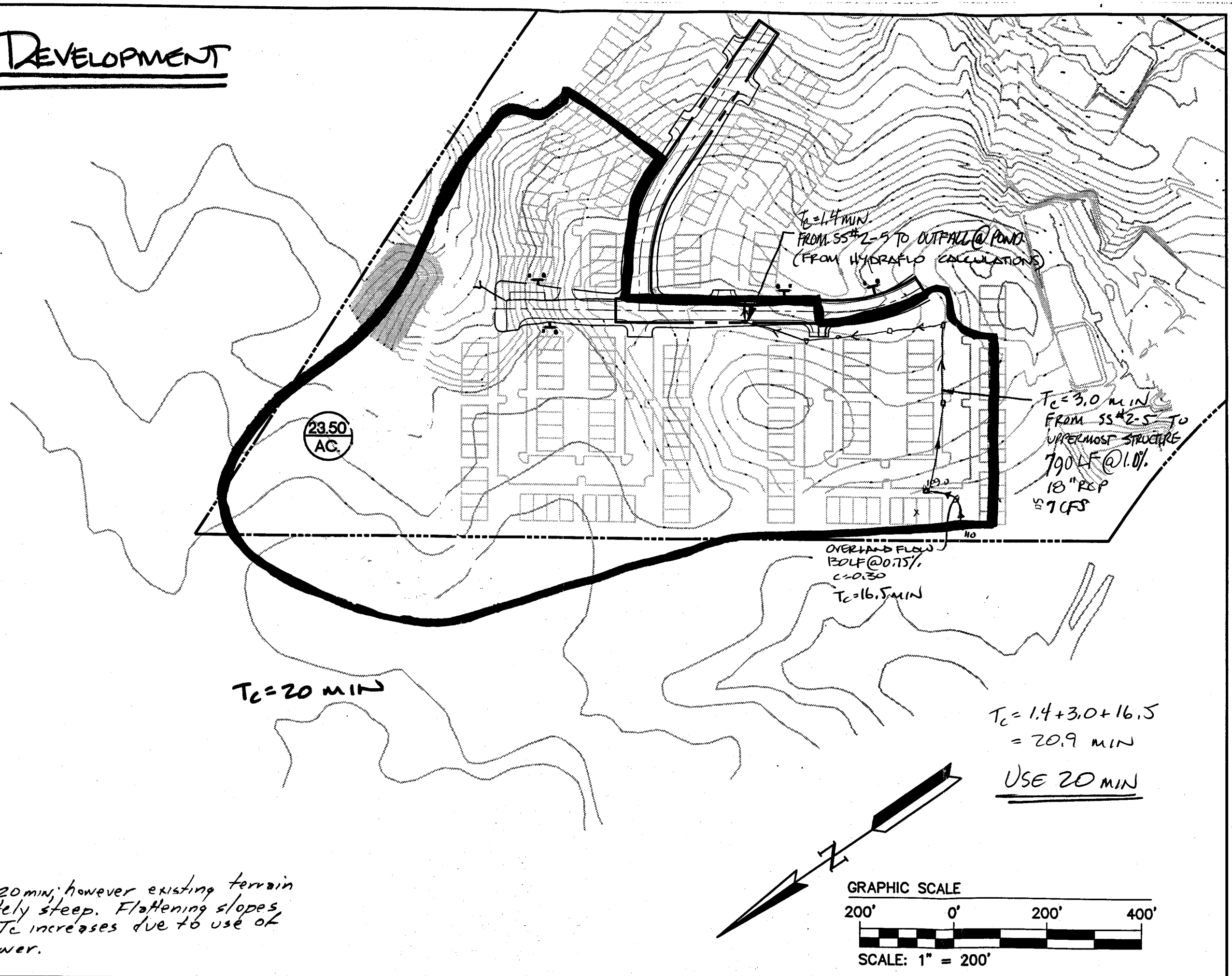
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(757) 253-0040
Fax (757) 220-8994
CONSULTING ENGINEERS

WILLIAMSBURG PLANTATION ROAD EXTENSION

BMP 3 PRE-DEVELOPMENT DRAINAGE AREA

Designed	Drawn DPW
Scale 1"=100'	Date 9/00
Project No. 7555-14	
Drawing No. 1 OF 2	

POST-DEVELOPMENT



NOTE: PREDEV = 20 MIN; however existing terrain is moderately steep. Flattening slopes negates Tc increases due to use of storm sewer.

No.	DATE	REVISION / COMMENT / NOTE	BY
	12/8	REVISED Tc PATH	CBZ

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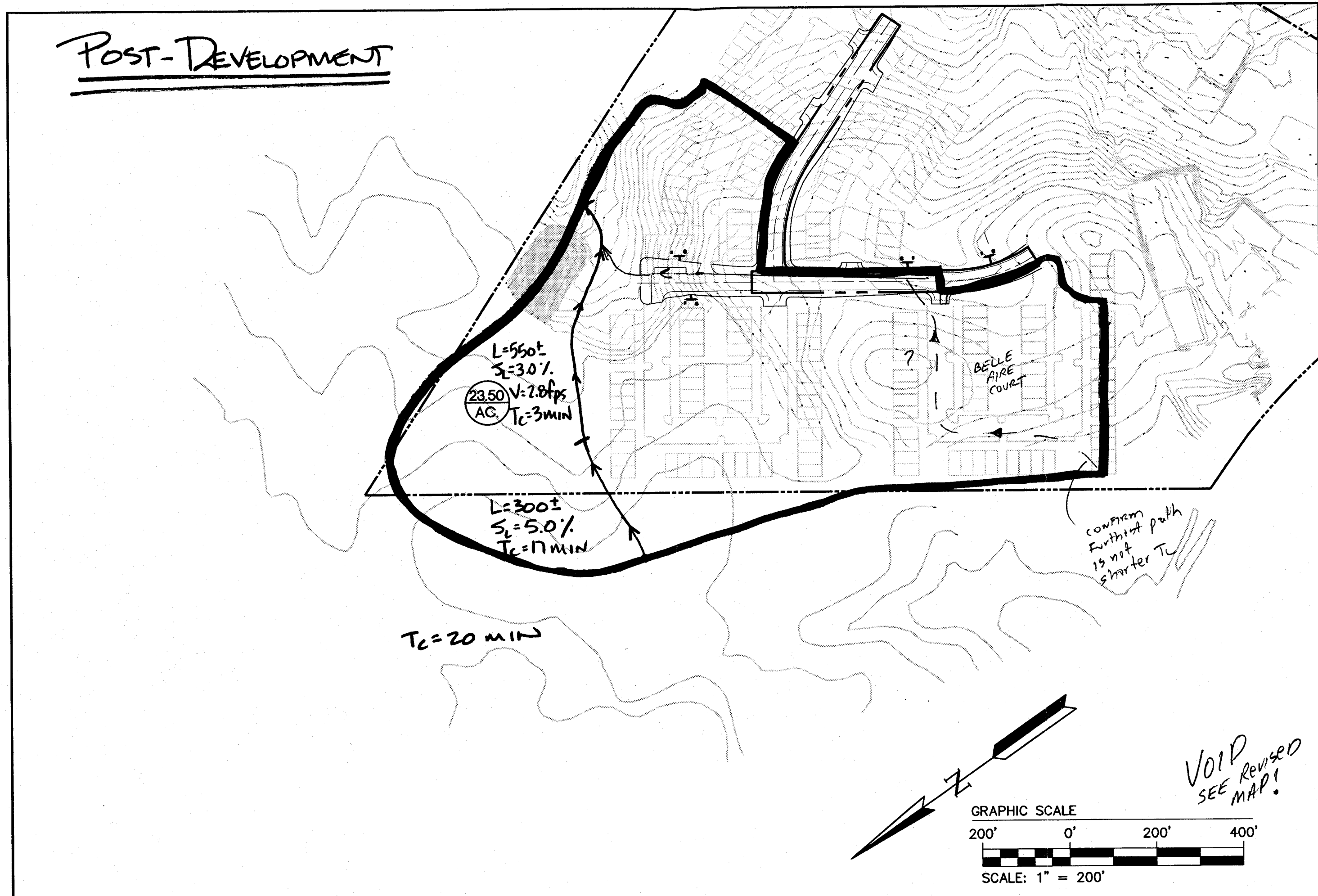
CONSULTING ENGINEERS

WILLIAMSBURG PLANTATION
ROAD EXTENSION
BMP 3 POST-DEVELOPMENT
DRAINAGE AREA

Designed	Drawn DPW
Scale 1"=100'	Date 9/00
Project No. 7555-14	
Drawing No. 2 OF 2	

POST-DEVELOPMENT



No.	DATE	REVISION / COMMENT / NOTE	BY

5248 Olde Towne Road, Suite 1
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(757) 253-0040
Fax (757) 220-8994
CONSULTING ENGINEERS

WILLIAMSBURG PLANTATION
ROAD EXTENSION
BMP 3 POST-DEVELOPMENT
DRAINAGE AREA

Designed	Drawn DPW
Scale 1"=100'	Date 9/00
Project No. 7555-14	
Drawing No. 2 OF 2	

AES CONSULTING ENGINEERS
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PROJECT W'MBG PLANT RD EXTEN
PROJECT NO. 7555-14
SUBJECT BMP # 3 - DRY POND
SHEET NO. 1 OF 4
CALCULATED BY DPW DATE 9-6-00

REVIEW OF SOILS IN DRAINAGE AREA

				HYDR. SOIL GRP
OPEN SPACE	8B	CAROLINE	2-6%	C
POND AREA / TOWNHMS	11C	CRAVEN-UCHEE	6-10%	D
TOWNHMS	14B	EMPORIA	2-6%	C
TOWNHMS / ROW	18B	KEMPSVILLE	2-6%	C
POND AREA / OPEN	29A	SLAGLE	0-2%	B
TOWNHMS / OPEN	29B	SLAGLE	2-6%	C

→ USE C AS AVG

PRE-DEVELOPMENT:

DA = 16.11 AC

CN = 74 FOR PASTURE / GRASSLAND (VESCH TBL 5-5)

T_c

OVERLAND FLOW → L = 320'

$S = \frac{114-105}{320} = 2.8\%$

$T_t = 17$ MIN

SHALLOW CONCENTR'D FLOW → L = 550'

$S = \frac{105-84}{550} = 3.8\%$

vel = 3.1 FPS

$T_t = \frac{550}{3.1(60)} = 3$ MIN

$T_c = 17 + 3 = 20$ MIN

PRE-DEV
DA = 16.11 AC
CN = 74
T_c = 20 MIN

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PROJECT W'MBRG PLANT RD EXTEN.
PROJECT NO. 7555-14
SUBJECT BMP#3 - DRY POND
SHEET NO. 2 OF 4
CALCULATED BY DPW DATE 9-6-00

POST-DEVELOPMENT

DA = ~~20.20 AC~~ 23.50 AC ✓

CN = 83 (BY RESIDENTIAL DISTRICT W/ 38% IMP. - VESCH)

T_c OVERLAND FLOW → L = 200'

$S = \frac{111-104}{200} = 3.5\%$

~~T_t = 10 MIN~~

SEE POST-DEVELOPMENT DRAINAGE AREA MAP FOR T_c CALCULATIONS

CHANNEL (PIPE) FLOW → L = 790' ±

$S = \frac{104-85}{790} = 2.4\%$ vel = 2.8 fps

$T_t = \frac{790}{2.8(60)}$ = ~~5 MIN~~

T_c = 10 + 5 = ~~15 MIN~~ 20 MIN ✓

POST-DEV 23.50
DA = ~~20.20~~ AC ✓
CN = 83
T_c = ~~15~~ 20 MIN

BMP CHOICE:

DRY DETENTION FACILITY (F-2) → 4 POINT FACILITY

WQv = 1" / IMP AC ✓ FOR 30% EFFICIENCY

IMPERV AREA 8.93 AC.

→ IMPERVIOUS PORTION OF DRAINAGE AREA

$\therefore WQ_v = (1'')\left(\frac{1'}{12''}\right)(\cancel{0.65 AC}\ 8.93)\left(43560\ SF/AC\right) = \cancel{24,140}\ 32,416\ CF$ ✓

→ DETER. VOL. RQD FOR CHANNEL PROTECTION - CP_v = 1 YR 24 HR POST-DEV

CP_v = ~~38,494~~ CF

109,815 CF (PER HYDROGRAPH 6)

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PROJECT W'MBG PLANT RD EXTEN.
PROJECT NO. 7555-14
SUBJECT BMP #3 - DRY POND
SHEET NO. 3 OF 4
CALCULATED BY DPW DATE 9-6-00

→ DETERMINE RELEASE RATE FOR 1" IMPAC

$$Q_R = \frac{\cancel{24,140}\ 32,416\ CF}{86,400\ s} = \cancel{0.28\ cfs}\ 0.37\ CFS$$

→ DETERMINE DIAMETER SIZE RQD FOR 24 HR RELEASE

EL OF WQ_V = ~~83.5~~ 83.0

$$Q_R = 0.6A\sqrt{2(32.2)\frac{(\cancel{83.5-82.3})\ 83.0-81.8}{2}}$$

$$A = \cancel{0.08}\ 0.10\ SF = \pi r^2$$

$$r = \cancel{0.16}\ 0.18 \text{ or } \cancel{1.9"}\ 2.13" \rightarrow \text{SAY } \cancel{8"}\ 4"\ \phi \text{ ORIFICE}$$

→ SET RISER AT CP_V EL = ~~86.1~~ 84.8 ← DETERMINED BY ROUTING CP_V ✓

CALC RQD ORIFICE TO ENSURE ~~2.0"~~ 4" ADEQUATE

EL 84.8
VOL 109815

$$Q_R = \frac{\cancel{88494}\ 109,815\ CF}{86400\ s} = \cancel{1.0}\ 1.27\ CFS$$

$$Q_R = 0.6A\sqrt{2(32.2)\frac{(\cancel{86.1-82.3})\ 85.7-81.8}{2}}$$

$$A = \cancel{0.15\ SF}\ 0.19\ SF\ \ 2.94"$$

$$r = \cancel{0.22'}\ 0.25' = \cancel{2.6"} \lesssim \cancel{2.4"}\ 3.0" \therefore \text{OK}$$

∴ **USE 6" ORIFICE**

DAM DESIGN

→ ANTI-SEEP COLLARS

$$L_s = Y(Z+4)\left[1 + \frac{S}{0.25-S}\right]$$

$$L_s = (4+4)\left[1 + \frac{.01}{.25-.01}\right] = 29'$$

29' (5%) → 31'

FROM PLT 3.14-12 → USE 2 COLLARS @ 2.75' x 2.75' EA W/ 10.5' MIN SPACING ✓

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PROJECT
PROJECT NO.
SUBJECT
SHEET NO. OF
CALCULATED BY DATE

ANTI VORTEX DEVICE

RISER Φ = 48"
∴ 84" I.D. CONC A.V. DEVICE

EMERGENCY SPILLWAY DESIGN

TOP OF DAM = 89.3 ✓
100 YR STORM ELEVATION = 88.22 ✓
→ 1.08' FREEBOARD ✓

10' WIDE TRAPEZOIDAL CONCRETE W/ 1:1 SS ← @ CONTROL SECTION

Q_{100} OVER SPILLWAY = 40.53 CFS @ 88.22

UPON EXITING CONTROL SECTION SPILLWAY SHALL TAPER DOWN TO CONCRETE TRAPEZOIDAL DITCH SECTION WITH A 4' BOTTOM WIDTH, 1:1 SS, 18" DEEP @ 20%.

FROM VDOT FIG 2.8.27 ✓
d < 0.4' ∴ OK

GROUTED CLASS I RIP-RAP OVER FILTER FABRIC ✓ SHALL BE PROVIDED FROM SPILLWAY APRON TO EX. 36" CULVERT UNDER RT 199.

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Return period (yrs)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	10.3	6	732	45,845	1	----	------	------	1 YR PRE
2	SCS Runoff	17.1	6	732	72,509	2	----	------	------	2 YR PRE PRE
3	SCS Runoff	43.1	6	726	176,457	10	----	------	------	10 YR PRE
4	SCS Runoff	71.1	6	726	288,050	100	----	------	------	100 YR PRE
6	SCS Runoff	26.5	6	732	109,815	1	----	------	------	1 YR POST
7	SCS Runoff	38.8	6	726	158,545	2	----	------	------	2 YR POST INFLOW
8	SCS Runoff	82.1	6	726	333,213	10	----	------	------	10 YR POST
9	SCS Runoff	93.6	6	726	380,805	25	----	------	------	25 YR POST
10	SCS Runoff	124.5	6	726	509,903	100	----	------	------	100 YR POST
12	Reservoir	1.5	6	912	109,814	1	6	84.79	75,914	1 YR ROUTE
13	Reservoir	11.1	6	756	158,544	2	7	85.20	87,878	2 YR ROUTE ROUTED
14	Reservoir	31.3	6	750	333,212	10	8	87.02	148,359	10 YR ROUTE
15	Reservoir	75.7	6	744	509,902	100	10	88.22 DHW	196,644	100 YR ROUTE
17	Reservoir	24.0	6	744	158,231	2	7	85.54	98,279	2 YR TEMP TSB
18	Reservoir	49.9	6	744	380,484	25	9	87.67	173,961	25 YR ROUTE TEMP
19	Reservoir	79.2	6	744	509,580	100	10	88.29 DHW	199,481	100 YR ROUTE

Proj. file: BMP3 DRY.GPW	IDF file: New JCC.IDF	Run date: 12-06-2000

Reservoir Report

English

Reservoir No. 1 - BMP 3

Pond Data

Pond storage is based on known contour areas

Stage / Storage Table

Stage ft	Elevation ft	Contour area sqft	Incr. Storage cuft	Total storage cuft
0.00	78.00	300	0	0
1.00	79.00	684	492	492
2.00	80.00	1,196	940	1,432
3.00	81.00	1,836	1,516	2,948
4.00	82.00	17,326	9,581	12,529
6.00	84.00	24,855	42,181	54,710
7.00	85.00	28,861	26,858	81,568
8.00	86.00	32,981	30,921	112,489
9.00	87.00	37,200	35,091	147,580
10.00	88.00	41,527	39,364	186,944
11.00	89.00 ✓	45,944	43,736	230,680

Culvert / Orifice Structures

	[A]	[B]	[C]	[D]
Rise in	= 24.0 ✓	6.0 ✓	0.0	0.0
Span in	= 24.0 ✓	6.0 ✓	0.0	0.0
No. Barrels	= 1	1	0	0
Invert El. ft	= 81.80 ✓	81.80 ✓	0.00	0.00
Length ft	= 57.0	0.5	0.0	0.0
Slope %	= 0.88 ✓	0.00	0.00	0.00
N-Value	= .013 ✓	.013 ✓	.000	.000
Orif. Coeff.	= 0.60 ✓	0.60 ✓	0.00	0.00
Multi-Stage	= -----	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len ft	= 12.6 ✓	10.0 ✓	0.0	0.0
Crest El. ft	= 84.80 ✓	87.00 ✓	0.00	0.00
Weir Coeff.	= 3.00 ✓	3.00 ✓	0.00	0.00
Eqn. Exp.	= 1.50 ✓	1.50 ✓	0.00	0.00
Multi-Stage	= Yes	No	No	No

Tailwater Elevation = 76.90 ft < 81.30 NO TW EFFECT

Note: All outflows have been analyzed under inlet and outlet control.

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Discharge cfs
0.00	0	78.00	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.10	49	78.10	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.20	98	78.20	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.30	148	78.30	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.40	197	78.40	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.50	246	78.50	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.60	295	78.60	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.70	344	78.70	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.80	394	78.80	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.90	443	78.90	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.00	492	79.00	0.00	0.00	---	---	0.00	0.00	---	---	0.00

Continues on next page...

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs (BARREL)	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs (BARREL)	Wr B cfs (RISER)	Wr C cfs	Wr D cfs	Discharge cfs
1.10	586	79.10	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.20	680	79.20	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.30	774	79.30	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.40	868	79.40	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.50	962	79.50	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.60	1,056	79.60	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.70	1,150	79.70	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.80	1,244	79.80	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.90	1,338	79.90	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.00	1,432	80.00	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.10	1,584	80.10	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.20	1,735	80.20	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.30	1,887	80.30	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.40	2,038	80.40	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.50	2,190	80.50	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.60	2,342	80.60	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.70	2,493	80.70	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.80	2,645	80.80	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.90	2,796	80.90	0.00	0.00	---	---	0.00	0.00	---	---	0.00
3.00	2,948	81.00	0.00	0.00	---	---	0.00	0.00	---	---	0.00
3.10	3,906	81.10	0.00	0.00	---	---	0.00	0.00	---	---	0.00
3.20	4,864	81.20	0.00	0.00	---	---	0.00	0.00	---	---	0.00
3.30	5,822	81.30	0.00	0.00	---	---	0.00	0.00	---	---	0.00
3.40	6,780	81.40	0.00	0.00	---	---	0.00	0.00	---	---	0.00
3.50	7,739	81.50	0.00	0.00	---	---	0.00	0.00	---	---	0.00
3.60	8,697	81.60	0.00	0.00	---	---	0.00	0.00	---	---	0.00
3.70	9,655	81.70	0.00	0.00	---	---	0.00	0.00	---	---	0.00
3.80	10,613	81.80	0.00	0.00	---	---	0.00	0.00	---	---	0.00
3.90	11,571	81.90	0.07	0.03	---	---	0.00	0.00	---	---	0.03
4.00	12,529	82.00	0.28	0.11	---	---	0.00	0.00	---	---	0.11
4.20	16,747	82.20	1.01	0.37	---	---	0.00	0.00	---	---	0.37
4.40	20,965	82.40	2.17	0.40	---	---	0.00	0.00	---	---	0.40
4.60	25,183	82.60	3.60	0.70	---	---	0.00	0.00	---	---	0.70
4.80	29,401	82.80	5.35	0.78	---	---	0.00	0.00	---	---	0.78
5.00	33,620	83.00	7.58	0.88	---	---	0.00	0.00	---	---	0.88
5.20	37,838	83.20	9.44	0.96	---	---	0.00	0.00	---	---	0.96
5.40	42,056	83.40	10.84	1.04	---	---	0.00	0.00	---	---	1.04
5.60	46,274	83.60	11.84	1.12	---	---	0.00	0.00	---	---	1.12
5.80	50,492	83.80	12.03	1.19	---	---	0.00	0.00	---	---	1.19
6.00	54,710	84.00	14.23	1.26	---	---	0.00	0.00	---	---	1.26
6.10	57,396	84.10	15.21	1.29	---	---	0.00	0.00	---	---	1.29
6.20	60,082	84.20	16.13	1.32	---	---	0.00	0.00	---	---	1.32
6.30	62,767	84.30	17.00	1.35	---	---	0.00	0.00	---	---	1.35
6.40	65,453	84.40	17.83	1.38	---	---	0.00	0.00	---	---	1.38
6.50	68,139	84.50	18.62	1.41	---	---	0.00	0.00	---	---	1.41
6.60	70,825	84.60	19.38	1.44	---	---	0.00	0.00	---	---	1.44
6.70	73,511	84.70	20.11	1.47	---	---	0.00	0.00	---	---	1.47
6.80	76,196	84.80 RISER CREST	20.82	1.50	---	---	0.00	0.00	---	---	1.50
6.90	78,882	84.90	21.50	1.53	---	---	1.19	0.00	---	---	2.72
7.00	81,568	85.00	22.16	1.50	---	---	3.37	0.00	---	---	4.87
7.10	84,660	85.10	22.80	1.45	---	---	6.20	0.00	---	---	7.65
7.20	87,752	85.20	23.43	1.40	---	---	9.54	0.00	---	---	10.94
7.30	90,844	85.30	23.91	1.30	---	---	13.33	0.00	---	---	14.63

Continues on next page...

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Discharge cfs
7.40	93,936	85.40	24.39	1.10	---	---	17.53	0.00	---	---	18.63
7.50	97,029	85.50	24.85	0.94	---	---	22.08	0.00	---	---	23.03
7.60	100,121	85.60	25.31	0.64	---	---	26.98	0.00	---	---	25.31
7.70	103,213	85.70	25.76	0.00	---	---	32.20	0.00	---	---	25.76
7.80	106,305	85.80	26.20	0.00	---	---	37.71	0.00	---	---	26.20
7.90	109,397	85.90	26.63	0.00	---	---	43.50	0.00	---	---	26.63
8.00	112,489	86.00	27.06	0.00	---	---	49.57	0.00	---	---	27.06
8.10	115,998	86.10	27.48	0.00	---	---	55.89	0.00	---	---	27.48
8.20	119,507	86.20	27.89	0.00	---	---	62.47	0.00	---	---	27.89
8.30	123,016	86.30	28.30	0.00	---	---	69.28	0.00	---	---	28.30
8.40	126,525	86.40	28.70	0.00	---	---	76.32	0.00	---	---	28.70
8.50	130,035	86.50	29.09	0.00	---	---	83.58	0.00	---	---	29.09
8.60	133,544	86.60	29.48	0.00	---	---	91.07	0.00	---	---	29.48
8.70	137,053	86.70	29.87	0.00	---	---	98.76	0.00	---	---	29.87
8.80	140,562	86.80	30.25	0.00	---	---	106.66	0.00	---	---	30.25
8.90	144,071	86.90	30.63	0.00	---	---	114.76	0.00	---	---	30.63
9.00	147,580	87.00	31.00	0.00	---	---	123.05	0.00	---	---	31.00
9.10	151,516	87.10	31.36	0.00	---	---	131.54	0.95	---	---	32.31
9.20	155,453	87.20	31.73	0.00	---	---	140.21	2.68	---	---	34.41
9.30	159,389	87.30	32.08	0.00	---	---	149.06	4.93	---	---	37.01
9.40	163,326	87.40	32.44	0.00	---	---	158.09	7.59	---	---	40.03
9.50	167,262	87.50	32.79	0.00	---	---	167.30	10.61	---	---	43.40
9.60	171,198	87.60	33.14	0.00	---	---	176.68	13.94	---	---	47.08
9.70	175,135	87.70	33.48	0.00	---	---	186.23	17.57	---	---	51.05
9.80	179,071	87.80	33.82	0.00	---	---	195.95	21.47	---	---	55.29
9.90	183,008	87.90	34.16	0.00	---	---	205.82	25.61	---	---	59.77
10.00	186,944	88.00	34.49	0.00	---	---	215.86	30.00	---	---	64.49
10.10	191,318	88.10	34.82	0.00	---	---	226.06	34.61	---	---	69.43
10.20	195,691	88.20	35.15	0.00	---	---	236.41	39.44	---	---	74.58
10.30	200,065	88.30	35.47	0.00	---	---	246.92	44.47	---	---	79.94
10.40	204,438	88.40	35.79	0.00	---	---	257.58	49.69	---	---	85.49
10.50	208,812	88.50	36.11	0.00	---	---	268.38	55.11	---	---	91.22
10.60	213,185	88.60	36.43	0.00	---	---	279.34	60.72	---	---	97.14
10.70	217,559	88.70	36.74	0.00	---	---	290.44	66.50	---	---	103.23
10.80	221,932	88.80	37.05	0.00	---	---	301.68	72.45	---	---	109.50
10.90	226,306	88.90	37.36	0.00	---	---	313.06	78.57	---	---	115.92
11.00	230,680	89.00	37.66	0.00	---	---	324.59	84.85	---	---	122.51

...End

Hydrograph Report

English

Hyd. No. 1

1 YR PRE

Hydrograph type	= SCS Runoff	Peak discharge	= 10.28 cfs
Storm frequency	= 1 yrs	Time interval	= 6 min
Drainage area	= 16.11 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 20 min
Total precip.	= 2.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Total Volume = 45,845 cuft

Hydrograph Discharge Table

Time -- (hrs	Outflow cfs)
11.80	1.22
11.90	3.49
12.00	6.88
12.10	9.69
12.20	10.28 <<
12.30	8.84
12.40	7.14
12.50	5.29
12.60	3.52
12.70	2.49
12.80	2.18
12.90	1.94
13.00	1.76
13.10	1.63
13.20	1.52
13.30	1.44
13.40	1.36
13.50	1.29
13.60	1.23
13.70	1.17
13.80	1.12
13.90	1.07

...End

Hydrograph Report

English

Hyd. No. 2

2 YR PRE

Hydrograph type	= SCS Runoff	Peak discharge	= 17.06 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Drainage area	= 16.11 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 20 min
Total precip.	= 3.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Total Volume = 72,509 cuft

Hydrograph Discharge Table

Time -- (hrs	Outflow cfs)
11.80	2.97
11.90	6.90
12.00	12.33
12.10	16.56
12.20	17.06 <<
12.30	14.39
12.40	11.38
12.50	8.24
12.60	5.36
12.70	3.75
12.80	3.27
12.90	2.91
13.00	2.63
13.10	2.42
13.20	2.26
13.30	2.13
13.40	2.02
13.50	1.91
13.60	1.82
13.70	1.73

...End

Hydrograph Report

English

Hyd. No. 3

10 YR PRE

Hydrograph type	= SCS Runoff	Peak discharge	= 43.12 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Drainage area	= 16.11 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 20 min
Total precip.	= 5.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Total Volume = 176,457 cuft

Hydrograph Discharge Table

Time -- (hrs	Outflow cfs)
11.70	5.69
11.80	10.52
11.90	20.87
12.00	33.88
12.10	43.12 <<
12.20	42.82
12.30	35.24
12.40	27.10
12.50	19.01
12.60	11.95
12.70	8.23
12.80	7.14
12.90	6.31
13.00	5.69
13.10	5.22
13.20	4.86
13.30	4.57

...End

Hydrograph Report

English

Hyd. No. 4

100 YR PRE

Hydrograph type	= SCS Runoff	Peak discharge	= 71.06 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 16.11 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 20 min
Total precip.	= 8.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Total Volume = 288,050 cuft

Hydrograph Discharge Table

Time -- (hrs	Outflow cfs)
11.70	10.76
11.80	19.13
11.90	36.24
12.00	56.97
12.10	71.06 <<
12.20	69.59
12.30	56.72
12.40	43.13
12.50	29.85
12.60	18.51
12.70	12.65
12.80	10.95
12.90	9.67
13.00	8.70
13.10	7.97
13.20	7.42

...End

Hydrograph Report

English

Hyd. No. 6

1 YR POST

Hydrograph type	= SCS Runoff	Peak discharge	= 26.54 cfs
Storm frequency	= 1 yrs	Time interval	= 6 min
Drainage area	= 23.50 ac	Curve number	= 83
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 20 min
Total precip.	= 2.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Total Volume = 109,815 cuft

Hydrograph Discharge Table

Time -- (hrs	Outflow cfs)
11.70	3.10
11.80	5.94
11.90	12.27
12.00	20.45
12.10	26.44
12.20	26.54 <<
12.30	22.00
12.40	17.07
12.50	12.09
12.60	7.68
12.70	5.32
12.80	4.62
12.90	4.09
13.00	3.69
13.10	3.39
13.20	3.16
13.30	2.97
13.40	2.81
13.50	2.66

...End

Hydrograph Report

English

Hyd. No. 7

2 YR POST

Hydrograph type	= SCS Runoff	Peak discharge	= 38.81 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Drainage area	= 23.50 ac	Curve number	= 83
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 20 min
Total precip.	= 3.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Total Volume = 158,545 cuft

Hydrograph Discharge Table

Time -- (hrs	Outflow cfs)
11.70	5.21
11.80	9.59
11.90	18.91
12.00	30.58
12.10	38.81 <<
12.20	38.48
12.30	31.63
12.40	24.29
12.50	17.01
12.60	10.68
12.70	7.34
12.80	6.37
12.90	5.63
13.00	5.07
13.10	4.66
13.20	4.34
13.30	4.07

...End

Hydrograph Report

English

Hyd. No. 8

10 YR POST

Hydrograph type	= SCS Runoff	Peak discharge	= 82.09 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Drainage area	= 23.50 ac	Curve number	= 83
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 20 min
Total precip.	= 5.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Total Volume = 333,213 cuft

Hydrograph Discharge Table

Time -- (hrs	Outflow cfs)
11.60	8.72
11.70	13.29
11.80	23.20
11.90	42.98
12.00	66.49
12.10	82.09 <<
12.20	79.82
12.30	64.73
12.40	48.92
12.50	33.63
12.60	20.69
12.70	14.09
12.80	12.19
12.90	10.74
13.00	9.66
13.10	8.85
13.20	8.23

...End

Hydrograph Report

English

Hyd. No. 9

25 YR POST

Hydrograph type	= SCS Runoff	Peak discharge	= 93.62 cfs
Storm frequency	= 25 yrs	Time interval	= 6 min
Drainage area	= 23.50 ac	Curve number	= 83
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 20 min
Total precip.	= 6.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Total Volume = 380,805 cuft

Hydrograph Discharge Table

Time -- (hrs	Outflow cfs)
11.60	10.26
11.70	15.55
11.80	26.96
11.90	49.52
12.00	76.13
12.10	93.62 <<
12.20	90.78
12.30	73.47
12.40	55.40
12.50	37.98
12.60	23.30
12.70	15.85
12.80	13.70
12.90	12.07
13.00	10.85
13.10	9.94

...End

Hydrograph Report

English

Hyd. No. 10

100 YR POST

Hydrograph type	= SCS Runoff	Peak discharge	= 124.45 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 23.50 ac	Curve number	= 83
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 20 min
Total precip.	= 8.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Total Volume = 509,903 cuft

Hydrograph Discharge Table

Time -- (hrs	Outflow cfs)
11.60	14.47
11.70	21.71
11.80	37.14
11.90	67.13
12.00	101.98
12.10	124.45 <<
12.20	120.03
12.30	96.77
12.40	72.63
12.50	49.54
12.60	30.22
12.70	20.51
12.80	17.71
12.90	15.60
13.00	14.01
13.10	12.82

...End

Hydrograph Report

English

Hyd. No. 12

1 YR ROUTE

Hydrograph type	= Reservoir	Peak discharge	= 1.50 cfs
Storm frequency	= 1 yrs	Time interval	= 6 min
Inflow hyd. No.	= 6	Reservoir name	= BMP 3
Max. Elevation	= 84.79 ft	Max. Storage	= 75,914 cuft

Storage Indication method used.

Total Volume = 109,814 cuft

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
11.50	1.40	82.04	0.44	0.17	-----	-----	-----	-----	-----	-----	0.17
11.60	1.88	82.07	0.53	0.20	-----	-----	-----	-----	-----	-----	0.20
11.70	3.10	82.11	0.67	0.25	-----	-----	-----	-----	-----	-----	0.25
11.80	5.94	82.18	0.93	0.34	-----	-----	-----	-----	-----	-----	0.34
11.90	12.27	82.33	1.76	0.39	-----	-----	-----	-----	-----	-----	0.39
12.00	20.45	82.60	3.60	0.69	-----	-----	-----	-----	-----	-----	0.69
12.10	26.44	82.99	7.43	0.87	-----	-----	-----	-----	-----	-----	0.87
12.20	26.54 <<	83.42	10.95	1.05	-----	-----	-----	-----	-----	-----	1.05
12.30	22.00	83.82	12.22	1.19	-----	-----	-----	-----	-----	-----	1.19
12.40	17.07	84.10	15.22	1.29	-----	-----	-----	-----	-----	-----	1.29
12.50	12.09	84.28	16.82	1.35	-----	-----	-----	-----	-----	-----	1.35
12.60	7.68	84.39	17.77	1.38	-----	-----	-----	-----	-----	-----	1.38
12.70	5.32	84.46	18.32	1.40	-----	-----	-----	-----	-----	-----	1.40
12.80	4.62	84.51	18.69	1.42	-----	-----	-----	-----	-----	-----	1.42
12.90	4.09	84.55	18.99	1.43	-----	-----	-----	-----	-----	-----	1.43
13.00	3.69	84.58	19.24	1.44	-----	-----	-----	-----	-----	-----	1.44
13.10	3.39	84.61	19.45	1.45	-----	-----	-----	-----	-----	-----	1.45
13.20	3.16	84.63	19.63	1.45	-----	-----	-----	-----	-----	-----	1.45
13.30	2.97	84.66	19.79	1.46	-----	-----	-----	-----	-----	-----	1.46
13.40	2.81	84.68	19.93	1.46	-----	-----	-----	-----	-----	-----	1.46
13.50	2.66	84.69	20.05	1.47	-----	-----	-----	-----	-----	-----	1.47
13.60	2.52	84.71	20.16	1.47	-----	-----	-----	-----	-----	-----	1.47
13.70	2.40	84.72	20.26	1.48	-----	-----	-----	-----	-----	-----	1.48
13.80	2.29	84.73	20.34	1.48	-----	-----	-----	-----	-----	-----	1.48
13.90	2.18	84.74	20.41	1.48	-----	-----	-----	-----	-----	-----	1.48
14.00	2.09	84.75	20.47	1.49	-----	-----	-----	-----	-----	-----	1.49
14.10	1.99	84.76	20.52	1.49	-----	-----	-----	-----	-----	-----	1.49
14.20	1.91	84.76	20.57	1.49	-----	-----	-----	-----	-----	-----	1.49
14.30	1.84	84.77	20.60	1.49	-----	-----	-----	-----	-----	-----	1.49
14.40	1.79	84.77	20.63	1.49	-----	-----	-----	-----	-----	-----	1.49
14.50	1.74	84.78	20.66	1.49	-----	-----	-----	-----	-----	-----	1.49
14.60	1.70	84.78	20.68	1.50	-----	-----	-----	-----	-----	-----	1.50
14.70	1.67	84.78	20.70	1.50	-----	-----	-----	-----	-----	-----	1.50
14.80	1.64	84.79	20.71	1.50	-----	-----	-----	-----	-----	-----	1.50
14.90	1.61	84.79	20.72	1.50	-----	-----	-----	-----	-----	-----	1.50
15.00	1.58	84.79	20.73	1.50	-----	-----	-----	-----	-----	-----	1.50

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
15.10	1.55	84.79	20.74	1.50	-----	-----	-----	-----	-----	-----	1.50
15.20	1.51	84.79 <<	20.74	1.50	-----	-----	-----	-----	-----	-----	1.50 <<
15.30	1.48	84.79	20.74	1.50	-----	-----	-----	-----	-----	-----	1.50
15.40	1.45	84.79	20.74	1.50	-----	-----	-----	-----	-----	-----	1.50
15.50	1.42	84.79	20.73	1.50	-----	-----	-----	-----	-----	-----	1.50
15.60	1.38	84.79	20.72	1.50	-----	-----	-----	-----	-----	-----	1.50
15.70	1.35	84.79	20.71	1.50	-----	-----	-----	-----	-----	-----	1.50
15.80	1.32	84.78	20.70	1.50	-----	-----	-----	-----	-----	-----	1.50
15.90	1.28	84.78	20.68	1.50	-----	-----	-----	-----	-----	-----	1.50
16.00	1.25	84.78	20.66	1.49	-----	-----	-----	-----	-----	-----	1.49
16.10	1.22	84.77	20.63	1.49	-----	-----	-----	-----	-----	-----	1.49
16.20	1.19	84.77	20.61	1.49	-----	-----	-----	-----	-----	-----	1.49
16.30	1.16	84.77	20.58	1.49	-----	-----	-----	-----	-----	-----	1.49
16.40	1.14	84.76	20.54	1.49	-----	-----	-----	-----	-----	-----	1.49
16.50	1.13	84.76	20.51	1.49	-----	-----	-----	-----	-----	-----	1.49
16.60	1.11	84.75	20.48	1.49	-----	-----	-----	-----	-----	-----	1.49
16.70	1.10	84.75	20.44	1.49	-----	-----	-----	-----	-----	-----	1.49
16.80	1.09	84.74	20.40	1.48	-----	-----	-----	-----	-----	-----	1.48
16.90	1.08	84.74	20.37	1.48	-----	-----	-----	-----	-----	-----	1.48
17.00	1.07	84.73	20.33	1.48	-----	-----	-----	-----	-----	-----	1.48
17.10	1.06	84.72	20.29	1.48	-----	-----	-----	-----	-----	-----	1.48
17.20	1.04	84.72	20.25	1.48	-----	-----	-----	-----	-----	-----	1.48
17.30	1.03	84.71	20.21	1.48	-----	-----	-----	-----	-----	-----	1.48
17.40	1.02	84.71	20.16	1.47	-----	-----	-----	-----	-----	-----	1.47
17.50	1.01	84.70	20.12	1.47	-----	-----	-----	-----	-----	-----	1.47
17.60	1.00	84.69	20.07	1.47	-----	-----	-----	-----	-----	-----	1.47
17.70	0.99	84.69	20.03	1.47	-----	-----	-----	-----	-----	-----	1.47
17.80	0.97	84.68	19.98	1.47	-----	-----	-----	-----	-----	-----	1.47
17.90	0.96	84.68	19.93	1.46	-----	-----	-----	-----	-----	-----	1.46
18.00	0.95	84.67	19.88	1.46	-----	-----	-----	-----	-----	-----	1.46
18.10	0.94	84.66	19.83	1.46	-----	-----	-----	-----	-----	-----	1.46
18.20	0.93	84.65	19.78	1.46	-----	-----	-----	-----	-----	-----	1.46
18.30	0.91	84.65	19.73	1.46	-----	-----	-----	-----	-----	-----	1.46
18.40	0.90	84.64	19.67	1.45	-----	-----	-----	-----	-----	-----	1.45
18.50	0.89	84.63	19.62	1.45	-----	-----	-----	-----	-----	-----	1.45
18.60	0.88	84.62	19.56	1.45	-----	-----	-----	-----	-----	-----	1.45
18.70	0.87	84.62	19.51	1.45	-----	-----	-----	-----	-----	-----	1.45
18.80	0.85	84.61	19.45	1.45	-----	-----	-----	-----	-----	-----	1.45
18.90	0.84	84.60	19.39	1.44	-----	-----	-----	-----	-----	-----	1.44
19.00	0.83	84.59	19.33	1.44	-----	-----	-----	-----	-----	-----	1.44
19.10	0.82	84.58	19.27	1.44	-----	-----	-----	-----	-----	-----	1.44
19.20	0.81	84.58	19.20	1.44	-----	-----	-----	-----	-----	-----	1.44
19.30	0.79	84.57	19.14	1.43	-----	-----	-----	-----	-----	-----	1.43
19.40	0.78	84.56	19.07	1.43	-----	-----	-----	-----	-----	-----	1.43
19.50	0.77	84.55	19.01	1.43	-----	-----	-----	-----	-----	-----	1.43
19.60	0.76	84.54	18.94	1.43	-----	-----	-----	-----	-----	-----	1.43
19.70	0.74	84.53	18.87	1.42	-----	-----	-----	-----	-----	-----	1.42
19.80	0.73	84.52	18.80	1.42	-----	-----	-----	-----	-----	-----	1.42
19.90	0.72	84.51	18.73	1.42	-----	-----	-----	-----	-----	-----	1.42

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Hydrograph Report

English

Hyd. No. 13

2 YR ~~TEMP~~ ROUTE

Hydrograph type	= Reservoir	Peak discharge	= 11.09 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hyd. No.	= 7	Reservoir name	= BMP 3
Max. Elevation	= 85.20 ft	Max. Storage	= 87,878 cuft

Storage Indication method used.

Total Volume = 158,544 cuft

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
12.10	38.81 <<	83.66	11.89	1.14	-----	-----	-----	-----	-----	-----	1.14
12.20	38.48	84.23	16.40	1.33	-----	-----	-----	-----	-----	-----	1.33
12.30	31.63	84.68	19.98	1.47	-----	-----	-----	-----	-----	-----	1.47
12.40	24.29	85.01	22.23	1.50	-----	-----	3.68	-----	-----	-----	5.18
12.50	17.01	85.16	23.20	1.42	-----	-----	8.35	-----	-----	-----	9.76
12.60	10.68	85.20 <<	23.45	1.40	-----	-----	9.69	-----	-----	-----	11.09 <<
12.70	7.34	85.18	23.32	1.41	-----	-----	9.00	-----	-----	-----	10.41
12.80	6.37	85.15	23.11	1.43	-----	-----	7.84	-----	-----	-----	9.27
12.90	5.63	85.12	22.91	1.44	-----	-----	6.77	-----	-----	-----	8.22
13.00	5.07	85.09	22.73	1.46	-----	-----	5.89	-----	-----	-----	7.34
13.10	4.66	85.06	22.57	1.47	-----	-----	5.19	-----	-----	-----	6.65
13.20	4.34	85.04	22.43	1.48	-----	-----	4.57	-----	-----	-----	6.05
13.30	4.07	85.02	22.31	1.49	-----	-----	4.05	-----	-----	-----	5.54
13.40	3.84	85.01	22.21	1.50	-----	-----	3.60	-----	-----	-----	5.10
13.50	3.64	84.99	22.12	1.50	-----	-----	3.23	-----	-----	-----	4.74
13.60	3.45	84.98	22.02	1.51	-----	-----	2.93	-----	-----	-----	4.44
13.70	3.28	84.97	21.94	1.51	-----	-----	2.66	-----	-----	-----	4.17
13.80	3.13	84.96	21.87	1.51	-----	-----	2.41	-----	-----	-----	3.92
13.90	2.98	84.95	21.80	1.52	-----	-----	2.19	-----	-----	-----	3.70
14.00	2.84	84.94	21.74	1.52	-----	-----	1.98	-----	-----	-----	3.50
14.10	2.72	84.93	21.68	1.52	-----	-----	1.80	-----	-----	-----	3.32
14.20	2.60	84.92	21.63	1.52	-----	-----	1.63	-----	-----	-----	3.15
14.30	2.51	84.91	21.58	1.53	-----	-----	1.48	-----	-----	-----	3.00
14.40	2.43	84.91	21.54	1.53	-----	-----	1.34	-----	-----	-----	2.87
14.50	2.37	84.90	21.51	1.53	-----	-----	1.22	-----	-----	-----	2.75
14.60	2.32	84.90	21.47	1.53	-----	-----	1.15	-----	-----	-----	2.68
14.70	2.27	84.89	21.44	1.53	-----	-----	1.09	-----	-----	-----	2.62
14.80	2.23	84.89	21.41	1.53	-----	-----	1.04	-----	-----	-----	2.56
14.90	2.18	84.88	21.38	1.52	-----	-----	0.98	-----	-----	-----	2.51
15.00	2.14	84.88	21.35	1.52	-----	-----	0.93	-----	-----	-----	2.46
15.10	2.10	84.87	21.32	1.52	-----	-----	0.88	-----	-----	-----	2.40
15.20	2.05	84.87	21.29	1.52	-----	-----	0.83	-----	-----	-----	2.35
15.30	2.01	84.87	21.27	1.52	-----	-----	0.79	-----	-----	-----	2.31
15.40	1.96	84.86	21.24	1.52	-----	-----	0.74	-----	-----	-----	2.26
15.50	1.92	84.86	21.21	1.52	-----	-----	0.69	-----	-----	-----	2.21
15.60	1.87	84.85	21.19	1.52	-----	-----	0.65	-----	-----	-----	2.16

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Hydrograph Report

English

Hyd. No. 14

10 YR ROUTE

Hydrograph type	= Reservoir	Peak discharge	= 31.26 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Inflow hyd. No.	= 8	Reservoir name	= BMP 3
Max. Elevation	= 87.02 ft	Max. Storage	= 148,359 cuft

Storage Indication method used.

Total Volume = 333,212 cuft

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
12.10	82.09 <<	85.59	25.26	0.68	-----	-----	26.43	-----	-----	-----	25.05
12.20	79.82	86.20	27.87	-----	-----	-----	62.24	-----	-----	-----	27.87
12.30	64.73	86.64	29.65	-----	-----	-----	94.38	-----	-----	-----	29.65
12.40	48.92	86.92	30.69	-----	-----	-----	116.13	-----	-----	-----	30.69
12.50	33.63	87.02 <<	31.07	-----	-----	-----	124.73	0.19	-----	-----	31.26 <<
12.60	20.69	86.98	30.93	-----	-----	-----	121.55	-----	-----	-----	30.93
12.70	14.09	86.85	30.42	-----	-----	-----	110.35	-----	-----	-----	30.42
12.80	12.19	86.67	29.76	-----	-----	-----	96.58	-----	-----	-----	29.76
12.90	10.74	86.49	29.04	-----	-----	-----	82.69	-----	-----	-----	29.04
13.00	9.66	86.30	28.29	-----	-----	-----	69.16	-----	-----	-----	28.29
13.10	8.85	86.11	27.50	-----	-----	-----	56.36	-----	-----	-----	27.50
13.20	8.23	85.91	26.65	-----	-----	-----	43.84	-----	-----	-----	26.65
13.30	7.71	85.69	25.73	0.04	-----	-----	31.85	-----	-----	-----	25.73
13.40	7.27	85.50	24.84	0.95	-----	-----	21.97	-----	-----	-----	22.92
13.50	6.87	85.35	24.15	1.20	-----	-----	15.41	-----	-----	-----	16.61
13.60	6.51	85.26	23.70	1.34	-----	-----	11.64	-----	-----	-----	12.98
13.70	6.18	85.19	23.37	1.40	-----	-----	9.26	-----	-----	-----	10.66
13.80	5.88	85.15	23.09	1.43	-----	-----	7.74	-----	-----	-----	9.17
13.90	5.60	85.11	22.88	1.44	-----	-----	6.63	-----	-----	-----	8.07
14.00	5.34	85.09	22.72	1.46	-----	-----	5.83	-----	-----	-----	7.29
14.10	5.10	85.07	22.59	1.47	-----	-----	5.25	-----	-----	-----	6.71
14.20	4.88	85.05	22.47	1.48	-----	-----	4.76	-----	-----	-----	6.23
14.30	4.70	85.03	22.38	1.48	-----	-----	4.35	-----	-----	-----	5.83
14.40	4.55	85.02	22.30	1.49	-----	-----	4.01	-----	-----	-----	5.50
14.50	4.43	85.01	22.24	1.50	-----	-----	3.72	-----	-----	-----	5.22
14.60	4.33	85.00	22.19	1.50	-----	-----	3.49	-----	-----	-----	4.98
14.70	4.24	85.00	22.14	1.50	-----	-----	3.30	-----	-----	-----	4.80
14.80	4.16	84.99	22.09	1.50	-----	-----	3.14	-----	-----	-----	4.65
14.90	4.08	84.98	22.05	1.51	-----	-----	3.01	-----	-----	-----	4.51
15.00	3.99	84.98	22.01	1.51	-----	-----	2.89	-----	-----	-----	4.39
15.10	3.91	84.97	21.98	1.51	-----	-----	2.77	-----	-----	-----	4.28
15.20	3.82	84.97	21.95	1.51	-----	-----	2.67	-----	-----	-----	4.18
15.30	3.74	84.96	21.91	1.51	-----	-----	2.57	-----	-----	-----	4.08
15.40	3.65	84.96	21.89	1.51	-----	-----	2.47	-----	-----	-----	3.98
15.50	3.57	84.95	21.86	1.51	-----	-----	2.37	-----	-----	-----	3.89
15.60	3.48	84.95	21.83	1.52	-----	-----	2.28	-----	-----	-----	3.80

Continues on next page...

Hydrograph Report

English

Hyd. No. 15

100 YR ROUTE

Hydrograph type	= Reservoir	Peak discharge	= 75.75 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hyd. No.	= 10	Reservoir name	= BMP 3
Max. Elevation	= 88.22 ft	Max. Storage	= 196,644 cuft

Storage Indication method used.

Total Volume = 509,902 cuft

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
11.90	67.13	85.40	24.40	1.10	-----	-----	17.60	-----	-----	-----	18.70
12.00	101.98	86.10	27.49	-----	-----	-----	56.11	-----	-----	-----	27.49
12.10	124.45 <<	86.97	30.87	-----	-----	-----	120.18	-----	-----	-----	30.87
12.20	120.03	87.71	33.52	-----	-----	-----	187.24	17.98	-----	-----	51.49
12.30	96.77	88.13	34.91	-----	-----	-----	228.96	35.96	-----	-----	70.87
12.40	72.63	88.22 <<	35.22	-----	-----	-----	238.70	40.53	-----	-----	75.75 <<
12.50	49.54	88.12	34.89	-----	-----	-----	228.37	35.69	-----	-----	70.58
12.60	30.22	87.90	34.17	-----	-----	-----	206.20	25.78	-----	-----	59.95
12.70	20.51	87.64	33.27	-----	-----	-----	180.43	15.36	-----	-----	48.64
12.80	17.71	87.41	32.46	-----	-----	-----	158.77	7.81	-----	-----	40.28
12.90	15.60	87.22	31.78	-----	-----	-----	141.65	3.05	-----	-----	34.83
13.00	14.01	87.05	31.17	-----	-----	-----	127.10	0.45	-----	-----	31.62
13.10	12.82	86.87	30.52	-----	-----	-----	112.52	-----	-----	-----	30.52
13.20	11.91	86.69	29.83	-----	-----	-----	97.96	-----	-----	-----	29.83
13.30	11.16	86.51	29.12	-----	-----	-----	84.01	-----	-----	-----	29.12
13.40	10.51	86.32	28.38	-----	-----	-----	70.82	-----	-----	-----	28.38
13.50	9.93	86.14	27.64	-----	-----	-----	58.48	-----	-----	-----	27.64
13.60	9.41	85.95	26.86	-----	-----	-----	46.75	-----	-----	-----	26.86
13.70	8.93	85.75	25.99	-----	-----	-----	35.10	-----	-----	-----	25.99
13.80	8.49	85.56	25.13	0.76	-----	-----	25.06	-----	-----	-----	24.41
13.90	8.09	85.41	24.41	1.09	-----	-----	17.77	-----	-----	-----	18.86
14.00	7.71	85.30	23.92	1.29	-----	-----	13.41	-----	-----	-----	14.70
14.10	7.35	85.23	23.59	1.37	-----	-----	10.80	-----	-----	-----	12.16
14.20	7.03	85.19	23.33	1.41	-----	-----	9.05	-----	-----	-----	10.45
14.30	6.77	85.15	23.12	1.42	-----	-----	7.89	-----	-----	-----	9.31
14.40	6.56	85.12	22.96	1.44	-----	-----	7.02	-----	-----	-----	8.46
14.50	6.38	85.11	22.83	1.45	-----	-----	6.37	-----	-----	-----	7.82

...End

TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET

(with or without an emergency spillway)

Project WILLIAMSBURG PLANTATION ROAD EXTENSION

Basin # _____ Location JCC

Total area draining to basin: 23.5 acres.

23.5 AC.

Basin Volume Design

Wet Storage:

1. Minimum required volume = 67 cu. yds. x Total Drainage Area (acres).

   67 cu. yds. x 23.5 acres = 1575 cu. yds.

2. Available basin volume = 1636 cu. yds. at elevation 83.5. (From storage - elevation curve)
   4% MORE THAN REQUIRED

3. Excavate — cu. yds. to obtain required volume*.

   * Elevation corresponding to required volume = invert of the dewatering orifice.

4. Available volume before cleanout required.

   33 cu. yds. x 23.5 acres = 776 cu. yds.

5. Elevation corresponding to cleanout level = 82.5.

   (From Storage - Elevation Curve)

6. Distance from invert of the dewatering orifice to cleanout level = 1 ft. (Min. = 1.0 ft.)

Dry Storage:

7. Minimum required volume = 67 cu. yds. x Total Drainage Area (acres).

   67 cu. yds. x 23.5 acres = 1575 cu. yds.

8. Total available basin volume at crest of riser* = 2822 cu. yds. at elevation 84.8. (From Storage - Elevation Curve)

75% OF REQUIRED DRY VOLUME
DEWATERING TIME HAS BEEN INCREASED TO ACCOMODATE REDUCED STORAGE VOLUME

* Minimum = 134 cu. yds./acre of total drainage area.

9. Diameter of dewatering orifice = 6 in. ←

10. Diameter of flexible tubing = 8 in. (diameter of dewatering orifice plus 2 inches).

Preliminary Design Elevations

11. Crest of Riser = 84.8 ✓

Top of Dam = 89.3 ✓

Design High Water = 88.22 ✓

Upstream Toe of Dam = 78.0 ✓

Basin Shape

12. Length of Flow / Effective Width $\frac{L}{We}$ = $\frac{270}{[22974/270]}$

If > 2, baffles are not required 3.17

If < 2, baffles are required _____

Runoff SEE ROUTINGS ⟸

13. Q_2 = 23.96 cfs (From Chapter 5)

14. Q_{25} = 49.87 cfs (From Chapter 5)

Principal Spillway Design

15. With emergency spillway, required spillway capacity $Q_p = Q_2$ = _____ cfs. (riser and barrel)

Without emergency spillway, required spillway capacity $Q_p = Q_{25}$ = _____ cfs. (riser and barrel)

16. With emergency spillway:

Assumed available head (h) = _____ ft. (Using Q_2)

h = Crest of Emergency Spillway Elevation - Crest of Riser Elevation

Without emergency spillway:

Assumed available head (h) = _____ ft. (Using Q_{25})

h = Design High Water Elevation - Crest of Riser Elevation

17. Riser diameter (D_r) = _____ in. Actual head (h) = _____ ft.

(From Plate 3.14-8.)

Note: Avoid orifice flow conditions.

18. Barrel length (l) = _____ ft.

Head (H) on barrel through embankment = _____ft.

(From Plate 3.14-7).

19. Barrel diameter = _____ in.

(From Plate 3.14-B [concrete pipe] or Plate 3.14-A [corrugated pipe]).

20. Trash rack and anti-vortex device

Diameter = _____ inches.

Height = _____ inches.

(From Table 3.14-D).

Emergency Spillway Design

21. Required spillway capacity $Q_e = Q_{25} - Q_p$ = _____cfs.

22. Bottom width (b) = _____ ft.; the slope of the exit channel (s) = _____ ft./foot; and the minimum length of the exit channel (x) = _____ ft.
(From Table 3.14-C).

Anti-Seep Collar Design

23. Depth of water at principal spillway crest (Y) = ____ ft.

Slope of upstream face of embankment (Z) = _____:1.

Slope of principal spillway barrel (S_b) = _____%

Length of barrel in saturated zone (L_s) = _____ ft.

24. Number of collars required = _____ dimensions = _____

(from Plate 3.14-12).

Final Design Elevations

25. Top of Dam = 89.3 ✓

Design High Water = 88.22 ✓

Emergency Spillway Crest = 87.0 ✓

Principal Spillway Crest = 84.8 ✓

Dewatering Orifice Invert = 83.5 ✓

Cleanout Elevation = 82.5

Elevation of Upstream Toe of Dam
or Excavated Bottom of "Wet Storage
Area" (if excavation was performed) = 78.0

Reservoir Report

English

Reservoir No. 2 - TEMPORARY SEDIMENT BASIN

Pond Data

Pond storage is based on known contour areas

Stage / Storage Table

Stage ft	Elevation ft	Contour area sqft	Incr. Storage cuft	Total storage cuft
0.00	78.00	300	0	0
1.00	79.00	684	492	492
2.00	80.00	1,196	940	1,432
3.00	81.00	1,836	1,516	2,948
4.00	82.00	17,326	9,581	12,529
6.00	84.00	24,855	42,181	54,710
7.00	85.00	28,861	26,858	81,568
8.00	86.00	32,981	30,921	112,489
9.00	87.00	37,200	35,091	147,580
10.00	88.00	41,527	39,364	186,944
11.00	89.00	45,944	43,736	230,680

Culvert / Orifice Structures

	[A]	[B]	[C]	[D]
Rise in	= 24.0	6.0	0.0	0.0
Span in	= 24.0	6.0	0.0	0.0
No. Barrels	= 1	1	0	0
Invert El. ft	= 81.80	83.50	0.00	0.00
Length ft	= 50.0	1.0	0.0	0.0
Slope %	= 1.00 0.88	0.00	0.00	0.00
N-Value	= .013	.013	.000	.000
Orif. Coeff.	= 0.60	0.60	0.00	0.00
Multi-Stage	= -----	Yes	No	No

Weir Structures

NO E.S. (10' WIDE)

	[A]	[B]	[C]	[D]
Crest Len ft	= 12.6	10.0	0.0	0.0
Crest El. ft	= 84.80	87.00	0.00	0.00
Weir Coeff.	= 3.00	3.00	0.00	0.00
Eqn. Exp.	= 1.50	1.50	0.00	0.00
Multi-Stage	= Yes	No	No	No

Tailwater Elevation = 79.60 ft

Note: All outflows have been analyzed under inlet and outlet control.

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Discharge cfs
0.00	0	78.00	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.00	492	79.00	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.00	1,432	80.00	0.00	0.00	---	---	0.00	0.00	---	---	0.00
3.00	2,948	81.00	0.00	0.00	---	---	0.00	0.00	---	---	0.00
4.00	12,529	82.00	0.28	0.00	---	---	0.00	0.00	---	---	0.00
6.00	54,710	84.00	14.50	0.47	---	---	0.00	0.00	---	---	0.47
7.00	81,568	85.00	22.43	1.06	---	---	3.37	0.00	---	---	4.43
8.00	112,489	86.00	27.06	0.00	---	---	49.57	0.00	---	---	27.06
9.00	147,580	87.00	31.00	0.00	---	---	123.05	0.00	---	---	31.00
10.00	186,944	88.00	34.49	0.00	---	---	215.86	30.00	---	---	64.49
11.00	230,680	89.00	37.66	0.00	---	---	324.59	84.85	---	---	122.51

Hydrograph Report

English

Hyd. No. 17

2 YR TEMP

Hydrograph type	= Reservoir	Peak discharge	= 23.96 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hyd. No.	= 7	Reservoir name	= TEMPORARY SEDIM
Max. Elevation	= 85.54 ft	Max. Storage	= 98,279 cuft

Storage Indication method used.

Total Volume = 158,231 cuft

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
12.10	38.81 <<	84.93	22.06	1.03	-----	-----	1.79	-----	-----	-----	2.82
12.20	38.48	85.29	23.86	1.17	-----	-----	12.90	-----	-----	-----	14.08
12.30	31.63	85.48	24.78	0.99	-----	-----	21.38	-----	-----	-----	22.37
12.40	24.29	85.54 <<	25.04	0.84	-----	-----	24.07	-----	-----	-----	23.96 <<
12.50	17.01	85.51	24.88	0.95	-----	-----	22.40	-----	-----	-----	23.19
12.60	10.68	85.42	24.48	1.09	-----	-----	18.40	-----	-----	-----	19.48
12.70	7.34	85.32	24.01	1.16	-----	-----	14.21	-----	-----	-----	15.38
12.80	6.37	85.24	23.63	1.15	-----	-----	11.07	-----	-----	-----	12.22
12.90	5.63	85.18	23.34	1.13	-----	-----	8.89	-----	-----	-----	10.02
13.00	5.07	85.14	23.11	1.11	-----	-----	7.37	-----	-----	-----	8.49
13.10	4.66	85.10	22.94	1.10	-----	-----	6.20	-----	-----	-----	7.29
13.20	4.34	85.07	22.80	1.09	-----	-----	5.41	-----	-----	-----	6.49
13.30	4.07	85.05	22.68	1.08	-----	-----	4.76	-----	-----	-----	5.84
13.40	3.84	85.03	22.59	1.07	-----	-----	4.23	-----	-----	-----	5.30
13.50	3.64	85.01	22.51	1.06	-----	-----	3.79	-----	-----	-----	4.86
13.60	3.45	85.00	22.44	1.06	-----	-----	3.42	-----	-----	-----	4.48
13.70	3.28	84.99	22.38	1.05	-----	-----	3.13	-----	-----	-----	4.19
13.80	3.13	84.98	22.32	1.05	-----	-----	2.88	-----	-----	-----	3.93
13.90	2.98	84.97	22.27	1.04	-----	-----	2.66	-----	-----	-----	3.70
14.00	2.84	84.96	22.22	1.04	-----	-----	2.46	-----	-----	-----	3.50
14.10	2.72	84.95	22.17	1.04	-----	-----	2.28	-----	-----	-----	3.31
14.20	2.60	84.94	22.13	1.03	-----	-----	2.11	-----	-----	-----	3.14
14.30	2.51	84.94	22.10	1.03	-----	-----	1.96	-----	-----	-----	2.99
14.40	2.43	84.93	22.07	1.03	-----	-----	1.83	-----	-----	-----	2.85
14.50	2.37	84.92	22.04	1.02	-----	-----	1.71	-----	-----	-----	2.74
14.60	2.32	84.92	22.02	1.02	-----	-----	1.61	-----	-----	-----	2.63
14.70	2.27	84.92	22.00	1.02	-----	-----	1.53	-----	-----	-----	2.55
14.80	2.23	84.91	21.98	1.02	-----	-----	1.45	-----	-----	-----	2.47
14.90	2.18	84.91	21.96	1.02	-----	-----	1.38	-----	-----	-----	2.40

...End

Hydrograph Report

English

Hyd. No. 18

25 YR ROUTE TEMP

Hydrograph type	= Reservoir	Peak discharge	= 49.87 cfs
Storm frequency	= 25 yrs	Time interval	= 6 min
Inflow hyd. No.	= 9	Reservoir name	= TEMPORARY SEDIM
Max. Elevation	= 87.67 ft	Max. Storage	= 173,961 cuft

Storage Indication method used.

Total Volume = 380,484 cuft

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
11.80	26.96	85.15	23.20	1.12	-----	-----	7.97	-----	-----	-----	9.09
11.90	49.52	85.43	24.52	1.07	-----	-----	18.86	-----	-----	-----	19.94
12.00	76.13	85.89	26.59	-----	-----	-----	42.92	-----	-----	-----	26.59
12.10	93.62 <<	86.49	29.05	-----	-----	-----	82.74	-----	-----	-----	29.05
12.20	90.78	87.11	31.39	-----	-----	-----	132.06	1.05	-----	-----	32.44
12.30	73.47	87.51	32.82	-----	-----	-----	168.13	10.90	-----	-----	43.72
12.40	55.40	87.67 <<	33.38	-----	-----	-----	183.38	16.49	-----	-----	49.87 <<
12.50	37.98	87.65	33.29	-----	-----	-----	181.03	15.60	-----	-----	48.89
12.60	23.30	87.50	32.80	-----	-----	-----	167.61	10.71	-----	-----	43.52
12.70	15.85	87.31	32.13	-----	-----	-----	150.18	5.26	-----	-----	37.39
12.80	13.70	87.13	31.46	-----	-----	-----	133.81	1.40	-----	-----	32.86
12.90	12.07	86.95	30.80	-----	-----	-----	118.68	-----	-----	-----	30.80
13.00	10.85	86.75	30.07	-----	-----	-----	102.92	-----	-----	-----	30.07
13.10	9.94	86.55	29.31	-----	-----	-----	87.68	-----	-----	-----	29.31
13.20	9.23	86.36	28.52	-----	-----	-----	73.25	-----	-----	-----	28.52
13.30	8.66	86.16	27.72	-----	-----	-----	59.81	-----	-----	-----	27.72
13.40	8.16	85.96	26.89	-----	-----	-----	47.21	-----	-----	-----	26.89
13.50	7.71	85.75	25.96	-----	-----	-----	34.72	-----	-----	-----	25.96
13.60	7.30	85.54	25.05	0.83	-----	-----	24.16	-----	-----	-----	24.01
13.70	6.94	85.38	24.30	1.13	-----	-----	16.75	-----	-----	-----	17.88
13.80	6.60	85.28	23.80	1.17	-----	-----	12.45	-----	-----	-----	13.62
13.90	6.28	85.21	23.47	1.14	-----	-----	9.86	-----	-----	-----	11.00
14.00	5.99	85.16	23.24	1.12	-----	-----	8.25	-----	-----	-----	9.37
14.10	5.71	85.13	23.07	1.11	-----	-----	7.10	-----	-----	-----	8.21
14.20	5.47	85.10	22.95	1.10	-----	-----	6.25	-----	-----	-----	7.35
14.30	5.26	85.08	22.85	1.09	-----	-----	5.68	-----	-----	-----	6.78
14.40	5.10	85.07	22.77	1.08	-----	-----	5.24	-----	-----	-----	6.32
14.50	4.97	85.05	22.70	1.08	-----	-----	4.87	-----	-----	-----	5.95
14.60	4.85	85.04	22.65	1.07	-----	-----	4.58	-----	-----	-----	5.65
14.70	4.76	85.03	22.61	1.07	-----	-----	4.34	-----	-----	-----	5.41
14.80	4.66	85.03	22.57	1.07	-----	-----	4.14	-----	-----	-----	5.21
14.90	4.57	85.02	22.54	1.07	-----	-----	3.97	-----	-----	-----	5.04

...End

Hydrograph Report

English

Hyd. No. 19

100 YR ROUTE

Hydrograph type	= Reservoir	Peak discharge	= 79.22 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hyd. No.	= 10	Reservoir name	= TEMPORARY SEDIM
Max. Elevation	= 88.29 ft	Max. Storage	= 199,481 cuft

Storage Indication method used.

Total Volume = 509,580 cuft

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
11.50	11.55	85.12	23.05	1.11	-----	-----	6.97	-----	-----	-----	8.07
11.60	14.47	85.17	23.29	1.13	-----	-----	8.57	-----	-----	-----	9.70
11.70	21.71	85.25	23.68	1.16	-----	-----	11.50	-----	-----	-----	12.65
11.80	37.14	85.41	24.43	1.10	-----	-----	17.96	-----	-----	-----	19.06
11.90	67.13	85.75	26.00	-----	-----	-----	35.18	-----	-----	-----	26.00
12.00	101.98	86.37	28.58	-----	-----	-----	74.27	-----	-----	-----	28.58
12.10	124.45 <<	87.19	31.68	-----	-----	-----	139.14	2.47	-----	-----	34.15
12.20	120.03	87.88	34.09	-----	-----	-----	203.87	24.79	-----	-----	58.88
12.30	96.77	88.23	35.24	-----	-----	-----	239.44	40.88	-----	-----	76.12
12.40	72.63	88.29 <<	35.43	-----	-----	-----	245.52	43.80	-----	-----	79.22 <<
12.50	49.54	88.16	35.03	-----	-----	-----	232.69	37.70	-----	-----	72.73
12.60	30.22	87.93	34.27	-----	-----	-----	209.22	27.10	-----	-----	61.37
12.70	20.51	87.66	33.34	-----	-----	-----	182.33	16.09	-----	-----	49.43
12.80	17.71	87.42	32.51	-----	-----	-----	160.08	8.24	-----	-----	40.75
12.90	15.60	87.23	31.82	-----	-----	-----	142.59	3.29	-----	-----	35.11
13.00	14.01	87.06	31.20	-----	-----	-----	127.86	0.54	-----	-----	31.74
13.10	12.82	86.88	30.56	-----	-----	-----	113.26	-----	-----	-----	30.56
13.20	11.91	86.70	29.86	-----	-----	-----	98.65	-----	-----	-----	29.86
13.30	11.16	86.51	29.15	-----	-----	-----	84.64	-----	-----	-----	29.15
13.40	10.51	86.33	28.42	-----	-----	-----	71.39	-----	-----	-----	28.42
13.50	9.93	86.15	27.67	-----	-----	-----	59.00	-----	-----	-----	27.67
13.60	9.41	85.96	26.89	-----	-----	-----	47.27	-----	-----	-----	26.89
13.70	8.93	85.76	26.02	-----	-----	-----	35.54	-----	-----	-----	26.02
13.80	8.49	85.57	25.16	0.75	-----	-----	25.39	-----	-----	-----	24.58
13.90	8.09	85.41	24.43	1.10	-----	-----	17.98	-----	-----	-----	19.08
14.00	7.71	85.31	23.94	1.17	-----	-----	13.55	-----	-----	-----	14.72
14.10	7.35	85.24	23.61	1.15	-----	-----	10.93	-----	-----	-----	12.08
14.20	7.03	85.19	23.38	1.13	-----	-----	9.20	-----	-----	-----	10.34
14.30	6.77	85.16	23.22	1.12	-----	-----	8.09	-----	-----	-----	9.21
14.40	6.56	85.13	23.09	1.11	-----	-----	7.26	-----	-----	-----	8.37

...End

James City County, Virginia
Environmental Division
Stormwater Management Program

Stormwater Management Design Plan
Staff "Quick" Review

Plan No. SP - 111 - 00 Date/Time: 10/16/00 9:15AM
Project Name: Williamsburg Plantation Coach House Extension
Rough Location: 2500' NW INTX US199 & SR 612 LONGHILL RD.
ADC Map: Sheet 5 Grid: G - 3 ☒ First Review
Flood Map / Zone: 510201- 00 35B Zone: A, AE, X ☐ Review
Description: A & AE SFHA 100-YR. / X Outside 500-YEAR
Drainage Area: ☒ Onsite Only ☐ Offsite Only ☐ Combination of Both PN 3240100026C
Submitted:

Y	N			
☐	☒	Demolition Plan (if applicable)	Sheets:	
☒	☐	Site, Geometric or Layout Plan	Sheets: 2,3	
☐	☒	Grading Plan	Sheets: 4	NO GRADING PLAN
☒	☐	Storm Drainage Plan	Sheets: 4	
☒	☐	E&SC Plan	Sheets: 4	
☐	☒	Profile (Storm)	Sheets:	NONE.
☐	☒	Environmental Inventory	Sheets:	NONE.
☒	☐	Note & Detail Sheets	Sheets: 7, 9	
☒	☐	Drainage Map(s)	Report & Sheet 4.	
☐	☒	Soils Map		
☐	☒	E&SC and SWM plan checklists.		
☐	☒	E&SC Design Report (Attachment).		
☒	☐	E&SC and/or Stormwater Management / Drainage Narratives.		
☒	☐	E&SC and/or Stormwater Management Design Report with Calculations(Attachment).		
☐	☒	Geotechnical Report (Attachment). None Needed Dry Basin w/ Low Flow orifice.		
☐	☐	Waivers, Variances, Exceptions included (Attachments in Writing).		
		☐ VESCH ☐ CBPO (RPA, Steep Slope) ☐ Other:		
☒	☐	Other (List): MP- 02-00; 150 R/W Buffer		

JCC GIS Database: Zoning: R - 2 Tax Parcel ID:
Receiving Water: UT CHISEL RUN Site Acreage: 67.385 acres / s.f.
~~*Other Known Approvals:*~~ The Berkeley Group (JP Ottino III)
Site Plan Information: Owner:
Zoning: R - 2 Description: Limited Residential
Site Area: 2.13 acres / s.f
Disturbed Area: 13.63 ~~6.0~~ 3.65 acres / s.f. (? %)
☐ Disturbance > 5 acres, VPDES Notice of Intent required.
Impervious Cover: ~~6.65~~ 1.79AC. acres / s.f. (? %)
☒ Less than or equal to 60 percent. Meets CBPO requirements.
☐ More than 60 percent. Does Not Meet CBPO requirements.
Open / Green Space: ? acres / s.f. (? %)

67.385 AC
75.65 AC TOTAL
303 Units
4 units/AC Density
19.2% NATURAL O.S.

Site Development Plan:
☒ Residential, Lots, etc. ☐ Commercial (B / O / R) ☐ Govern./Institutional ☐ Industrial
☒ Roadways or Entrances ☒ Parking or Loading ☒ Water ☒ Sanitary Sewer
☒ Landscaping ☒ SWM/BMP facilities ☒ Manmade Drainage ☐ Parks, Amenities
☐ Pump/Lift Station ☐ Dams (regulated) ☐ Other, Coach House Lane (East & North) SWM/BMP Facility

1571' OF ROAD x 39' = 1.40AC IMPERV.

AES Proj 7555-14

Soils Information: Site: 8B, 11C, 14B, 18B, 29A, 29B Hydric: ❒ Yes ❒ No
Soil Survey Sheet 17 DA: _____ HSG: _____
BMP: _____ Hydric: ❒ Yes ❒ No
Description of Soils at BMP: _____

BMP Control: ❒ None ☒ Onsite ❒ Offsite ❒ Previous Approved ❒ Manufactured BMP
BMP Types: 1- Name: DRY POND (JCC BMP Type F - 2), Points 4
2- Name: _____ (JCC BMP Type _____ - _____), Points _____
3- Name: _____ (JCC BMP Type _____ - _____), Points _____
OnSite Drainage Type: ☒ Reinforced Concrete Pipe ❒ Corrugated Metal Pipe ❒ Aluminum Type Pipe
❒ Corrugated Polyethylene Pipe ❒ PVC Type Pipe ❒ Open Channel Type
❒ Culverts Type: _____
❒ Other (Specify): _____

1. VDOT Standards & Specifications Referenced for work **within** R/W: ☒ Yes ❒ No
2. VDOT Standards & Specifications Referenced for work **outside** R/W: ☒ Yes ❒ No

Site Limitations: ? ❒ RPA ? ❒ RMA ? ❒ Steep Slopes ? ❒ Delineated Wetlands
❒ Hydric Soils ❒ Critical Soils ☒ Vegetated ☒ Buffers R/W
☒ Defined Natural Drainage Features onsite ☒ Downstream Storm/Culv. 36" VDOT
❒ Evidence of Downstream Channel Erosion (by Field Observation) _____
❒ Floodplain ❒ Problem Drainage Area ❒ Stormwater Hotspot
❒ Site Activities may warrant a General VPDES Permit for Discharge of Stormwater Associated with Industrial Activities (ie. process water, batch plants, etc.).
❒ Other (Specify): _____

Site Stormwater Management / BMP Control (Add sheets if necessary for Multiple Onsite Facilities):

☒ Yes ❒ No	# DRY POND					
Predev (Present) HSG C	DA = 16.11 ac.	C/CN = 74	Tc = 20	(min) / hrs.		
2-year	17.06	cfs				
10-year	43.12	cfs				
100-year	71.06	cfs				
PostDev w/o Detention (Inflow)	DA = ~~20.2~~ 23.5 ac.	C/CN = 83	Tc = ~~15~~ 20	(min) / hrs.		
2-year	~~41.4~~ 38.81	cfs				
10-year	~~87.1~~ 82.09	cfs				
100-year	~~131.1~~ 124.45	cfs				
PostDev with Detention (Routed)	DA = 20.2 ac.	C/CN = 83	Tc = 15	min / hrs.		
2-year	~~1.6~~ 11.09	cfs	at El.	~~86.27~~ 85.2		
10-year	~~13.1~~ 31.26	cfs	at El.	~~87.71~~ 87.02		
100-year (DHW)	~~87.4~~ 75.75	cfs	at El.	~~88.54~~ 88.22		

1-YR PRE 10.28CFS

1-YR POST 20.54CFS 109,815CF

1-YR 1.5CFS EL. 84.79

Downstream Tailwater Assumption for Pond Routing: (0.00 ft.)
Routed Peak Discharges (Outflows) from BMP meets Predevelopment Allowables: ☒ Yes ❒ No
Appears to Meet VESCH / E&SC Ordinance / CBP Ordinance Requirements: ❒ Yes ❒ No

TSB DESIGN
2-YR = 23.96CFS
25-YR = 49.87CFS
100-YR = ~~78~~.22CFS @ EL 88.29 T.O.D. 89.3 (1' FB) OK

Pond / BMP Design Data (Add Sheet If Necessary for Multiple Onsite Facilities):

☐ Check if None ☐ Provided: BMP # 3 Type: Dry Det Basin F-2 4PTS.

Y N * See Below for Pertinent Wqv/Stream CPv Design Information.

☒	☐	Top of Facility (Dam)	El. 89.3	
☒	☐	Design High Water (100-year)	El. 88.29 35'L	1H:1V
☒	☐	Emergency Spillway (ES) Crest	El. 87.0	BW: 10 W SS:
☐	☒	FreeBoard	1.08 / 1.01'	1 ft. or > with E.S.
		☐ Acceptable ☒ Not Acceptable.		2 ft. or > w/o E.S.
☒	☐	Principal Spillway (Riser) Crest	El. 84.8	Size/Type: RCP 48"
☒	☐	Principal Spillway Crest 1 ft. below Crest of Emergency Spillway.		☒ Yes ☐ No ☐ N/A 2.2'
☒	☐	Stage-Storage Curve or Data		
☒	☐	Outlet Rating Curve or Table (Discharge Structure Rating)		
☒	☐	1-year design storm	El. 84.8	or Volume 109815
☒	☐	1-year, 24 hour detention criteria for Stream Channel Protection.		☒ Yes ☐ No ☐ N/A
☒	☐	Extended Detention for WQ Provided (Min. 24 hours) EL 83.5		☒ Yes ☐ No ☐ N/A
☒	☐	Normal/Permanent Pool	El. None Dry	☐ N/A
☒	☐	Orifice/Weir #1 (highest El.)	El. 87	Type: ES 35'L x 10'L CONC.
☒	☐	Orifice/Weir #2	El. 84.8	Type: 48" RCP
☒	☐	Orifice/Weir #3	El. 81.8	Type: W8 EXT-DET 6"
☐	☐	Orifice/Weir #4	El.	Type:
☐	☐	Orifice/Weir #5 (lowest El.)	El.	Type:
☒	☐	Low Flow Orifice (ExDet, CPv)	El. 81.8	Type: 6" PVC
☐	☒	Pond Drain w/ Valve	El. N/A	Type: N/A
☐	☒	Pond Bottom	El. 78.0	Riser Height: 3.3'
☒	☐	Steps or Access Provided (for over 4 ft. depth)		☒ N/A
☒	☐	Riser Base	Bottom El. 80.0	Type: 8'x8'x1.5' CONC. ✓
☒	☐	Core Trench YES	☐ N/A	2@ 2.75' x 2.75' ✓
☒	☐	Anti-Seep Collars or other acceptable Seepage Control Method.		☐ N/A
☐	☐	Principal Spillway Anti-Vortex Device and Trash Rack.		Type: RCP 84" CAP
☐	☐	Low Flow Orifice Cage-Type Trash Rack. REV SLOPE PIPE		Type: REV SLOPE PIPE
☐	☐	Outlet Barrel:	Type/Class: RCP CL3	Size: 24"
			Inv. U/S: 81.8	Inv D/S: 81.3
			Slope: 0.88%	Length: 57 (ft.)
☒	☐	Flared End Section/Wingwalls. Matches Outlet Barrel material type.		
☒	☐	Outlet Protection.		
		☒ Standard Riprap Outlet Protection (OP)	Type: 12'L x 1.5' CLASS I	
		☒ Special Dissipator Structure (SDS)	Type: PAVED CHANNEL TO VDOT CULV RIPRAP.	
82±	☐ ☐	BMP Sediment / Cleanout Elevation	El.	or Depth 79.0/82.5
	☐ ☐	Adequate Channel Downstream of BMP:	☒ 1-year, 24-hour, or ☐ MS # 19 criteria.	

Sketch or Notes, If Necessary:

Perm BMP CO ELEV = 79.0
(AVG 10 @ 2590 WQV)

Needs FOREBAY!

* WQv / Stream CPv Design Summary

Imperv. Area	8.93AC.
WQTV (Per JCC Man)	1" PIA
WQ Vol. Required	32416 CF
WQ Vol. Provided	32416
1-yr SCPv Required	109,815 CF
1-yr SCPv Provided	109815 CF
Ext Det Orifice Size	6" PVC ORIF.

Sediment Trap & Basins

☐ Temporary Sediment Trap # 1 N/A DA = _____ < 3 acres

☐ Temporary Sediment Trap # 2 _____ DA = _____ < 3 acres

☒ Temporary Sediment Basin # 1 _____ DA = 23.5 ☐ BMP # 3 convert. CO 82.5

☐ Temporary Sediment Basin # 2 _____ DA = _____ ☐ BMP # ____ convert.

E&SC Plan Comments: TSB / BMP #3 dual purpose.

Plan Review Steps & Components:

Y	N	
☒	☐	First "Look-Thru". Quick look through plan for familiarity.
☒	☐	Miss Utility (1-800-552-7001) and standard utility protection notes.
☐	☒	Worksheet for BMP Point System. New Plan 10 point system or Redevelopment Pollutant Load method.
☒	☐	FEMA Special Flood Hazard Areas. Check against property, site and development.
☒	☐	Check JCC Tax Parcel Maps for RPA / RMA locations and parcel identification.
☐	☒	Stormwater hotspot, general screening, layout or separation distances (if any) satisfactory.
☐	☒	Environmental Inventory for Chesapeake Bay Ordinance requirements satisfactory. 25% i HTORIC
☒	☐	Highlight and check impact to environmental sensitive areas (wetlands, RPA, steep slope,etc.).
☐	☒	Demolition plan (if any) or offsite borrow, waste areas and onsite stockpiles.
☒	☐	Review existing topography to determine adequacy of E&SC plan (Phase I).
☒	☐	Review grading plan to check for conflicts (offsite grading, cut-fills, slopes,) & Phase II E&SC.
☒	☐	Review layout plan to check for conflicts (buildings, parking, buffers, etc.).
☒	☒	Highlight culverts and storm drains. Check pipe data, thickness and utility, cover conflicts.
☒	☐	Proper culvert and stormdrain specifications, notes, and details or reference to VDOT.
☒	☒	Review Sequence of Construction (for E&SC and SWM/BMP applicability to site work).
☒	☐	Review plan based on Chapter 19 Subdivision ordinance as it relates to SWM/BMP control.
☒	☐	Review plan based on Chapter 24 Zoning as it relates to SWM/BMP control.
☒	☐	Review plan based on Chapter 23 Chesapeake Bay ordinance requirements.
☒	☐	Review plan based on General Knowledge and Experience for Design/Construction.
☒	☐	Review plan based on JCC BMP manual for the BMP type selected for project.
☐	☒	Review plan based on JCC Stormwater Conveyance System D/C Guidelines (***Future***).
☒	☐	Review plan based on Virginia Erosion and Sediment Control Handbook (VESCH).
☒	☐	Review plan based on Virginia Stormwater Management Handbook (VSMH) for BMP type.
☐	☒	Review plan based on Hampton Roads BMP Design Guidance manual (***Optional***).
☐	☒	Review plan based on MWCOG, Controlling Urban Runoff BMP manual (***Optional***).
☐	☒	Review plan based on standard JCC E&SC and SWM Design Plan Checklists.
☐	☒	Review plan based on JCC BMP Construction Specifications (***Future***).
☒	☐	Review Maintenance Plan for SWM / BMP facility. Detailed and specific guidance.
☒	☐	Review BMP Landscaping Plan (deep pool, shallow water, shoreline fringes, etc.).
☐	☒	Review E&SC Plan Design Report and computations (Attached report).
☒	☐	Review SWM Design Report and computations (Attached Report).
☒	☐	Adequate Channels downstream of both uncontrolled or SWM/BMP areas. (MS-19 or 1-year criteria).
☐	☒	Adequate function, conversion of Temp Sed Basins (volume, discharge, WSELs) to BMP's.
☐	☒	Geotechnical. Information per App. E JCC BMP manual or to substantiate use of other BMPs.
☒	☐	Provisions on plan requiring proper Record Drawing and Const. Cert of facility. Note #19 Sheet 9.
☐	☒	Drainage and Open Space Easements, if necessary, appear satisfactory.
? ☐	☒	Wetland Permit if applicable required prior to LD or Final Site Plan approval. None shown.
☐	☐	Inclusion of H&H and SWM / BMP data into any JCC databases.
☐	☐	Other: _____

Prepared Environmental Division comments for the following categories based on above review areas:

☒	☐	***General Comments:***	☒	☐	***Erosion & Sediment Control Plan:***
☐	☐	***Floodplain:***	☒	☐	***Chesapeake Bay Preservation:***
☒	☐	***Stormwater Management / Drainage:***	☐	☐	***Other:***

Additional Notes & Comments: _____

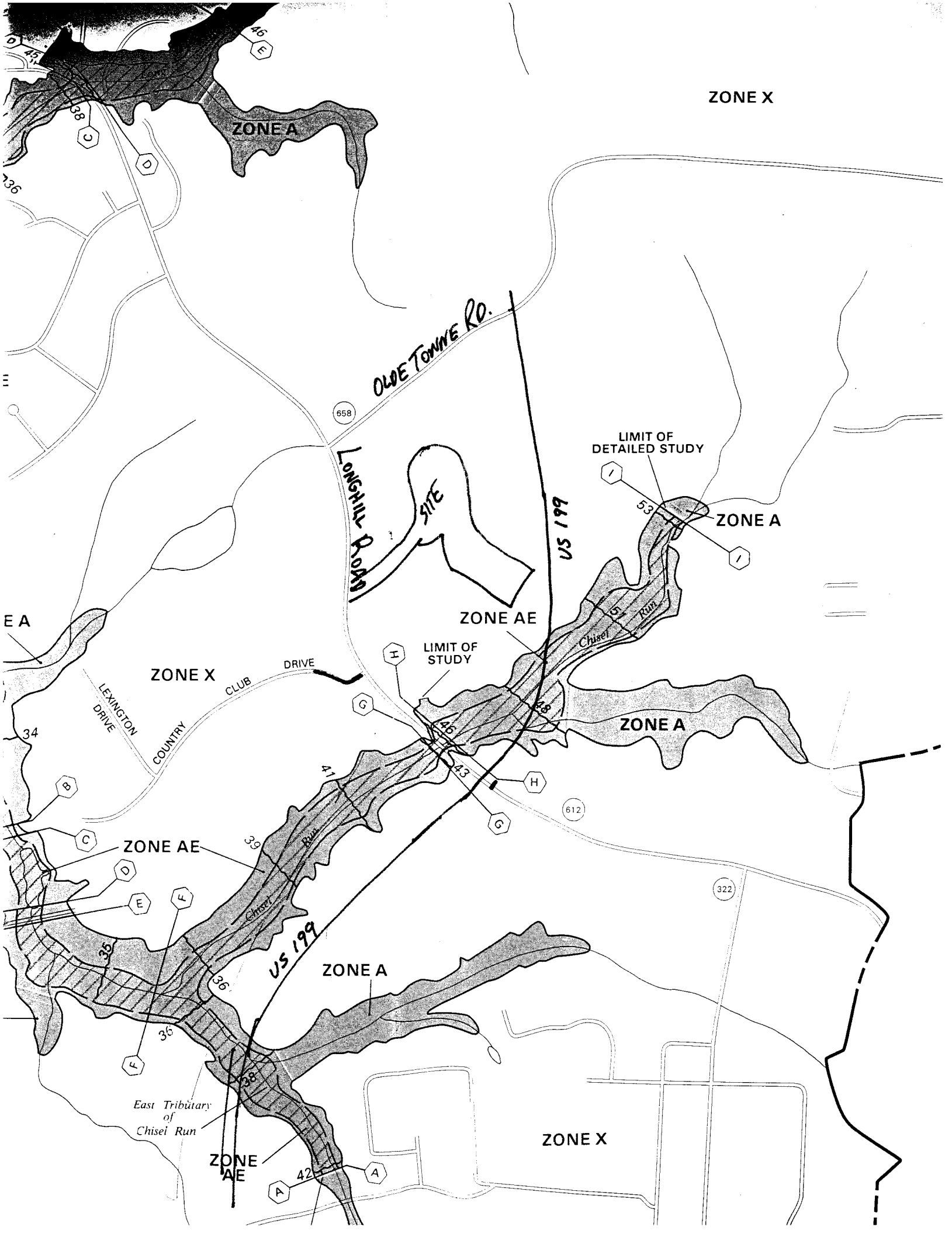
(Note: THIS FORM FOR COUNTY USE ONLY.)

☒ 1st Rev ☐ 2nd Rev ☐ 3rd Rev

☐ 4th Rev

Signature _____ Date _____

Signature _____ Date _____


ZONE X
ZONE A
OLDE TOWNE RD.
658
LONGHILL ROAD
SITE
US 199
LIMIT OF DETAILED STUDY
ZONE A
ZONE AE
LIMIT OF STUDY
Chisel Run
ZONE A
ZONE X
LEXINGTON DRIVE
COUNTRY CLUB DRIVE
612
ZONE AE
Chisel Run
US 199
ZONE A
322
East Tributary of Chisel Run
ZONE AE
ZONE X

CONSULTING ENGINEERS

AES Consulting Engineers Fax Memorandum

5248 Olde Towne Road, Suite 1 • Williamsburg, Virginia 23188
Telephone: (757) 253-0040 • *Facsimile:* (757) 220-8994 • *Email:* aes@aesva.com

To: Darryl Cook/ Scott Thomas	Org./Firm:
Fax Number: 259-4032	Date: 9/7/00
From: Deirdre Wells	Pages Including Cover Page: 2
cc:	cc Fax Number:
Subject: Williamsburg Plantation Road Extension and final BMP Design	

☐ *Urgent* ☐ *For Review* ☐ *Please Comment* ☐ *Please Reply*

Comments:

The plans for the road extension will include the design of the final BMP/ SWM facility, a dry detention pond rated at 4 points. The location of the pond indicated on the Master Plan of Development (first approved in the early '90's and recently amended) is presently the site of VDOT's sound barrier berm along Route 199. (see following drawing).

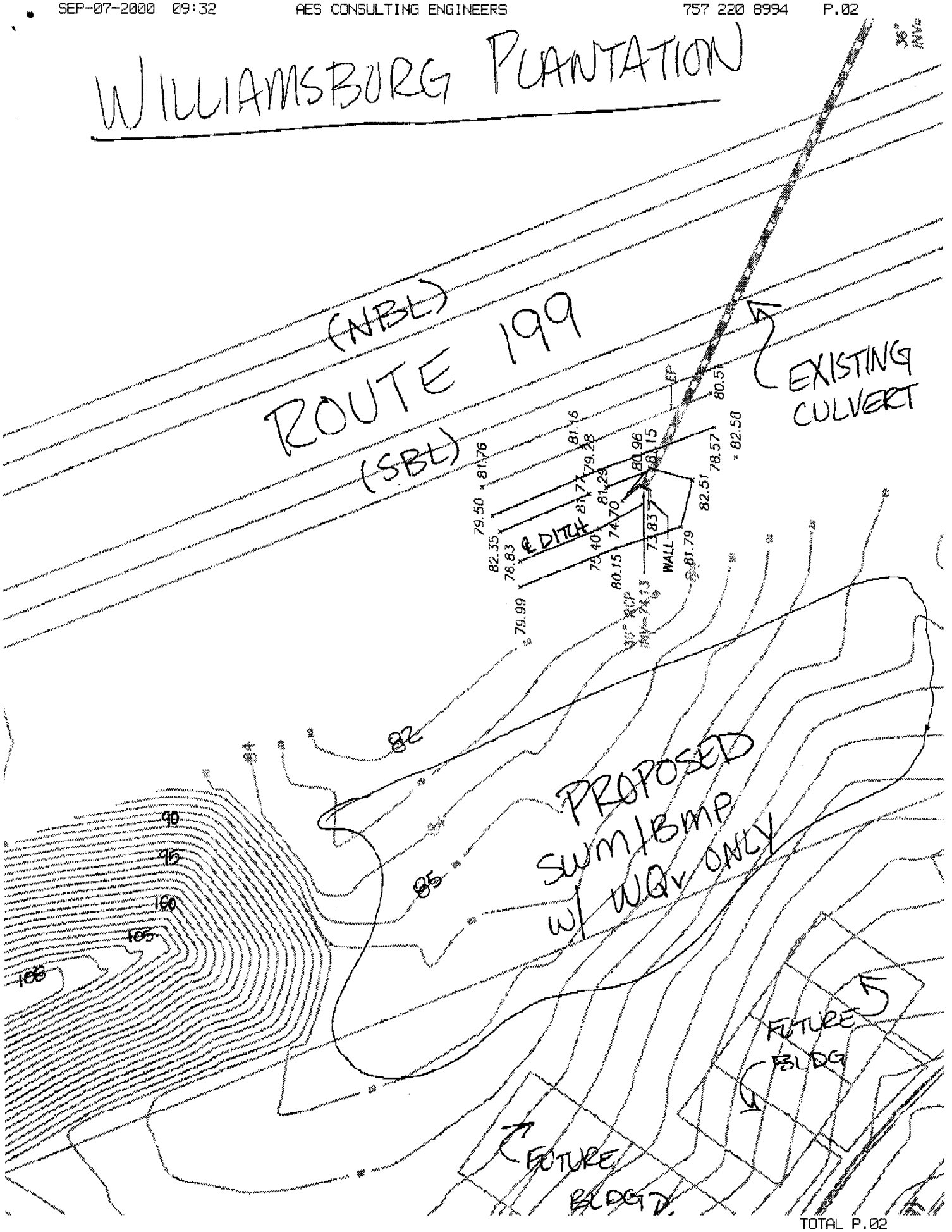
The pond will discharge into the manmade roadside ditch for Route 199, which flows to Chisel Run via an existing culvert (shown on drawing). The total drainage area to the pond is 20 acres. The water quality volume required for this pond is 24,140 CF, whereas the channel protection volume required is 102,600 CF – nearly 4.5 times greater than the WQv. As this pond will discharge into a manmade ditch and as the berm location hampers pond size, I propose sizing the pond for WQv. The release rates would be less than the pre-development rates and the channel between the pond outlet barrel and the existing culvert inlet would be paved.

Please call me today to discuss this issue, as the plans are presently under design. Your time and attention are appreciated.

Comps show sizing for both WQv & CP_v — SJT.

Confidentiality Note: The documents accompanying this fax may contain confidential information. This information is intended only for the use of the individual or entity named on the transmission sheet. If you are not the intended recipient, you are hereby notified that any disclosure, copying, distribution, or the taking of any action in reliance on the contents of this faxed information is strictly prohibited, and that the documents should be returned to AES Consulting Engineers. If you have received this fax in error, please notify us by telephone immediately at the number above so that we can arrange for the return of the original document at no cost to you.

WILLIAMSBURG PLANTATION



SP. 111.00

DRAINAGE CALCULATIONS

FOR

WILLIAMSBURG PLANTATION ROAD EXTENSION

Longhill Road
Williamsburg, Virginia 23188

FIRST SUB.

STAMPED-SEAL

Prepared By:

AES Consulting Engineers
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
AES Project No. 7555-14
September 11, 2000

CONSULTING ENGINEERS

NARRATIVE

This project encompasses the construction of roadway, water and sanitary utilities, and storm water drainage associated with the extension of Coach House Lane in the Williamsburg Plantation, James City County, Virginia. A stormwater management/ best maintenance practice facility is included in this project.

The project area is mainly comprised of pasture-type grasses. The dry detention pond has been sized for an ultimate drainage area of 20.2 acres. The original stormwater master plan for this development estimated the drainage area to facility 3 as approximately 19.2 acres. However, the existing wet pond facility, adjacent to Regency at Longhill is experiencing bank stabilization problems. Therefore, approximately one acre of future drainage area from the wet pond has been diverted to proposed facility 3. This facility is rated at 4 points for water quality and provides channel protection for the one-year, twenty-four hour storm event. The riser elevation of 86.1 reflects the storage required for channel protection.

The storm system proposed with Section 5 is the trunk line for the system along Coach House Lane (E). This system discharges into shared Facility "G", located at the most southeastern corner of the Plantation property. System #2 is located along Coach House Lane (N) and directs flow into the proposed dry detention facility.

what if the pond fails, ~~won't all~~
where will the ex. drainage go?

I thought it wasn't sized for CPv per letter/fax 9/7/00.
∴ Looks like Channel Protection Provided.

SPREAD CALCULATIONS

T = 9.5' MAX ALLOW.

n = 0.015

STORM WATER INLET COMPUTATIONS

FORM LD 204
REV 6-85

RTE COACH HOUSE LN (E)

PROJECT NAME WILLIAMSBURG PLANTATION

DATE 9-6-00
AES PROJ # 7555-14

INLET	NUMBER	TYPE	LENGTH (FT)	STATION	DRAINAGE AREA (AC)	C	CA	I (IN/HR)	Q INCR (CFS)	Q CARRY OVER (CFS)	Qt GUTTER FLOW (CFS)	S GUTTER SLOPE (FT/FT)	Sx CROSS SLOPE (FT/FT)	T SPREAD	W (FT)	W/T	Sw (FT/FT)	Sw/Sx	Eo (#10)	a	Sw = a/12W	Se = Sx+SwEo (FT/FT)	Lt (FT)	P EFFECT (FT)	L/Lt	d (FT)	E (#16)	h (FT)	Q: INTRCPT (CFS)	d/h	Qb: CARRY OVER (CFS)	T SPREAD @ SAG (FT)	REMARKS
G #15	3	B	6	13+62 R	.45	.56	.25	4.0	1.0	—	1.0	.0198	.0208	4.0	2	.5	.0833	4	.97	3.5	.1458	0.10	9.1		0.666		85.7		0.86		Qb = 0.14		to #14
G #16	3	B	6'	13+62 L	.45	.56	.25	4.0	1.0	—	1.0	.0198	.0208	4.0	2	.5	.0833	4	.97	3.5	.1458	.10	9.1		.666		85.7		0.86		Qb = 0.14		to #12
G #14	3	B	6	15+85 R	.23	.61	.14	4.0	.56	.14	0.7	.0128	.0208	3.7	2	.54	.0833	4	.96	3.5	.1458	.1	6.9		.87		97.5		0.68		Qb = 0.02		to #13
G #13	3	B	4'	16+45 R	.05	.60	.03	4.0	.12	.02	.14	.0128	.0208	1.4	2	1.43	.0833	4	1.0	3.5	.1458	.1	3.5		1.14		—		0.14		—		
G #12	3	B	6'	16+45 L	.18	.70	.13	4.0	.50	.14	0.64	.0128	.0208	3.2	2	0.63	.0833	4	.98	3.5	.1458	.1	6.7		.90		98.4		0.63		Qb = 0.01		to #7A SELT 5

T_{MAX} ALLOW. = 9.5' n = 0.015'

STORM WATER INLET COMPUTATIONS

FORM LD 204
REV 6-85

RTE COACH HOUSE LANE (N) PROJECT NAME WILLIAMSBURG PLANTATION

DATE 9-6-00
AES PROJ # 7555-14

INLET	NUMBER	TYPE	LENGTH (FT)	STATION	DRAINAGE AREA (AC)	C	CA	I (IN/HR)	Q INCR (CFS)	Q CARRY OVER (CFS)	Qt GUTTER FLOW (CFS)	S GUTTER SLOPE (FT/FT)	Sx CROSS SLOPE (FT/FT)	T SPREAD	W (FT)	W/T	Sw (FT/FT)	Sw/Sx	Eo (#10)	a	Sw = a/12W	Se = Sx+SwEo (FT/FT)	Lt (FT) / P EFFECT (FT)	L/Lt / d (FT)	E (#16) / h (FT)	Q: INTRCPT (CFS) / d/h	Qb: CARRY OVER (CFS)	T SPREAD @ SAG (FT)	REMARKS
G #2-5	3	B	4	13+87R	.09	.7	.06	4.0	.24	—	.24	.0145	.0208	1.55	2	1.29	.0833	4	1.0	3.5	.1458	.17	3.32	1.2	—	0.24	No Qb		
G #2-6	3	B	6	13+87L	.38	.5	.19	4.0	.76	—	.76	.0145	.0208	3.6	2	.56	.0833	4	.97	3.5	.1458	.16	5.60	1.1	—	0.76	No Qb		
G # 2-4	3	B	4	15+63R	0.11	.7	.08	4.0	.32	—	.32	.0145	.0208	1.75	2	1.1	.0833	4	1.0	3.5	.1458	.17	3.76	1.06	—	0.32	No Qb		
G#2-3	3	B	4	16+57R	.02	.7	.02	4.0	.08	—	.08	.0145	.0208	1.4	2	1.4	.0833	4	1.0	3.5	.1458	.17	2.1	1.9	—	0.08	No Qb		
G#2-3A	3	B	6	16+57L	.74	.5	.37	4.0	1.48	—	1.48	.0145	.0208	5.7	2	.35	.0833	4	.83	3.5	.1458	.14	8.03	.75	.917	1.36	Qb = .12		to 2-2A
G #2-2	3	A	2.5	19+19R	.30	.6	.18	4.0	.72	—	.72	.001	.0208	7.5			.0833						10.1	.14	.27	.52	T = 10.7		OK
G #2-2A	3	A	2.5	19+19L	.30	.58	.17	4.0	.68	.12	.8	.001	.0208	8.5			.0833						10.1	.15	.27	.55	T = 7.2		OK

STORM SYSTEM CALCULATIONS

Hydraflow Storm Sewer Tabulation

SYS 2 TO DRY DET. FACILITY

Station Line	Station To Line	Len (ft)	Drng Area Incr (ac)	Drng Area Total (ac)	Rnoff coeff (C)	Area x C Incr	Area x C Total	Tc Inlet (min)	Tc Syst (min)	Rain (I) (in/hr)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe Size (in)	Pipe Slope (%)	Invert Elev Up (ft)	Invert Elev Dn (ft)	HGL Elev Up (ft)	HGL Elev Dn (ft)	Grnd / Rim Elev Up (ft)	Grnd / Rim Elev Dn (ft)	Line ID
1	End	68.0	0.30	1.97	0.60 ? LOW	0.18	1.09	8.0	18.7	4.7	33.08	80.19	6.74	30 PLAN 24"	3.82	85.60	83.00	88.10	87.70	92.02	85.00	2-1
2	1	265.0	0.05	1.37	0.70 ? LOW	0.04	0.74	5.0	17.2	4.8	23.06	36.23	7.70	24	2.57	92.40	85.60	94.11	88.70	100.09	92.02	3-2
3	2	90.0	0.11	0.58	0.70 LOW	0.08	0.33	5.0	14.2	5.3	10.74	13.10	6.08	18	1.56 1.49%	93.80	92.40	96.06	95.12	101.40	100.09	4-3
4	3	175.0	0.09	0.47	0.70	0.06	0.25	5.0	13.2	5.4	10.37	12.80	6.15	18	1.49	96.40	93.80	97.69	96.15	103.38	101.40	5-4
5	4	42.0	0.38	0.38	0.50	0.19	0.19	13.0	13.0	5.4	10.03	12.55	5.68	18	1.43	97.00	96.40	98.71	98.33	103.38	103.38	6-5
6	1	42.0	0.30	0.30	0.58	0.17	0.17	10.0	10.0	6.0	9.54	22.07	3.04	24	0.95	86.00	85.60	88.77	88.70	92.02	92.02	2A-2
7	2	42.0	0.74	0.74	0.50	0.37	0.37	17.0	17.0	4.9	12.30	14.49	6.96	18	1.90	93.20	92.40	95.70	95.12	100.20	100.09	3A-3

18.7 min

OK

PLAN 18"

Project File: 755514sys2.stm | I-D-F File: JCCstormsewer.IDF | Total number of lines: 7 | Run Date: 09-12-2000

NOTES: Intensity = 143.72 / (Tc + 19.20) ^ 0.94; Return period = 10 Yrs. ; Initial tailwater elevation = 87.70 (ft) ✓ 10-YEAR POND WSEL

Hydraflow Storm Sewer Tabulation

SYS. 1 TO FACILITY G

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	50.0	0.43	9.41	0.40	0.17	5.91	10.0	16.9	4.9	42.36	63.54	8.63	30	2.40	48.50	47.30	55.34	54.81	55.00	50.30	1 - 2
2	1	110.0	0.48	8.98	0.75	0.36	5.73	5.0	16.3	5.0	41.97	80.71	8.55	30	3.87	52.76	48.50	57.02	55.87	63.00	55.00	2 - 4
3	2	96.0	0.36	0.56	0.75	0.27	0.42	5.0	6.0	6.9	2.88	11.86	2.35	15	3.38	56.00	52.76	58.35	58.15	64.00	63.00	4 - 3
4	3	88.0	0.04	0.04	0.75	0.03	0.03	5.0	5.0	7.1	0.21	3.56	2.19	12	1.00	60.84	59.96	61.04	60.13	65.80	64.00	3 - 3E
5	3	17.0	0.04	0.16	0.75	0.03	0.12	5.0	5.9	6.9	0.83	2.15	2.37	8	3.18	56.54	56.00	58.50	58.42	63.80	64.00	3 - 3A
6	5	83.0	0.02	0.12	0.75	0.01	0.09	5.0	5.4	7.0	0.63	1.78	2.18	8	2.17	58.34	56.54	58.79	58.54	64.00	63.80	3A - 3B
7	6	42.0	0.04	0.10	0.75	0.03	0.07	5.0	5.2	7.1	0.53	1.83	2.49	8	2.29	59.30	58.34	59.64	58.80	64.50	64.00	3B - 3C
8	7	35.0	0.06	0.06	0.75	0.04	0.04	5.0	5.0	7.1	0.32	1.71	2.05	8	2.00	60.00	59.30	60.27	59.66	64.80	64.50	3C - 3D
9	2	116.0	0.34	3.11	0.75	0.25	2.04	5.0	15.6	5.1	23.82	47.89	7.91	24	4.48	57.96	52.76	59.69	58.15	68.50	63.00	4 - 5
10	9	105.0	0.54	2.77	0.75	0.41	1.79	5.0	15.1	5.1	22.68	47.80	7.70	24	4.47	62.65	57.96	64.34	59.85	73.00	68.50	5 - 6
11	10	128.0	0.00	2.23	0.00	0.00	1.38	0.0	14.4	5.2	20.74	47.22	7.12	24	4.36	68.23	62.65	69.84	65.09	78.00	73.00	6 - 7
12	11	101.0	0.02	1.73	0.75	0.01	1.03	5.0	13.8	5.3	18.97	41.74	6.67	24	3.41	71.67	68.23	73.21	70.61	80.70	78.00	7 - 8
13	12	38.0	0.29	1.71	0.60	0.17	1.01	10.0	13.6	5.4	18.92	41.83	7.03	24	3.42	72.97	71.67	74.51	73.34	81.00	80.70	8 - 9
14	11	33.0	0.40	0.50	0.70	0.28	0.36	5.0	5.5	7.0	2.48	14.23	3.81	12	15.97	73.50	68.23	74.17	70.61	79.00	78.00	7 - 7A
15	14	11.0	0.05	0.10	0.75	0.04	0.08	5.0	5.4	7.0	0.53	1.86	1.51	8	2.36	73.76	73.50	74.50	74.48	78.80	79.00	7A - 7B
16	15	72.0	0.05	0.05	0.75	0.04	0.04	5.0	5.0	7.1	0.27	1.71	1.54	8	2.00	75.20	73.76	75.44	74.53	78.80	78.80	7B - 7C
17	2	147.0	1.61	4.83	0.55	0.89	2.91	10.0	14.0	5.3	15.37	23.30	8.80	18	4.93	60.00	52.76	61.41	58.15	65.00	63.00	4 - 4A
18	17	156.0	0.76	3.22	0.50	0.38	2.02	10.0	13.2	5.4	10.96	16.82	6.55	18	2.56	64.00	60.00	65.26	62.65	67.00	65.00	4A - 4B
19	18	46.0	0.00	2.46	0.00	0.00	1.64	0.0	12.9	5.5	8.97	40.55	5.64	18	14.91	70.86	64.00	72.00	65.89	74.40	67.00	4B - 4C
20	19	179.0	0.18	2.46	0.90	0.16	1.64	5.0	11.9	5.6	9.24	15.54	6.12	18	2.19	74.78	70.86	75.94	72.09	79.79	74.40	4C - 4D
21	20	38.0	0.51	2.28	0.75	0.38	1.48	5.0	11.7	5.7	8.38	6.95	6.83	15	1.16	75.22	74.78	77.04	76.40	79.98	79.79	4D - 4E

Project File: 755514sys1.stm | I-D-F File: JCCstormsewer.IDF | Total number of lines: 33 | Run Date: 09-12-2000

NOTES: Intensity = 143.72 / (Tc + 19.20) ^ 0.94; Return period = 10 Yrs. ; Initial tailwater elevation = 54.81 (ft)

Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Up	Dn	Up	Dn	Up	Dn	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
22	21	60.0	0.32	1.77	0.70	0.22	1.10	5.0	11.4	5.7	6.28	7.36	5.12	15	1.30	76.00	75.22	78.16	77.59	82.84	79.98	4E - 4F
23	22	90.0	0.27	0.99	0.60	0.16	0.53	5.0	10.9	5.8	3.08	17.35	3.42	15	7.22	82.50	76.00	83.20	78.46	86.50	82.84	4F - 4G
24	23	100.0	0.18	0.72	0.40	0.07	0.37	5.0	10.3	5.9	2.18	6.46	3.16	15	1.00	83.50	82.50	84.09	83.33	87.50	86.50	4G - 4H
25	24	60.0	0.54	0.54	0.55	0.30	0.30	10.0	10.0	6.0	1.77	4.57	2.62	15	0.50	83.80	83.50	84.38	84.32	87.50	87.50	4H - 4I
26	22	80.0	0.46	0.46	0.75	0.34	0.34	5.0	5.0	7.1	2.46	10.21	2.99	15	2.50	78.00	76.00	78.63	78.46	81.67	82.84	4F - 4F1
27	13	70.0	0.06	1.42	0.65	0.04	0.84	5.0	13.2	5.4	18.04	38.23	9.11	24	2.86	79.00	77.00	80.67	77.98	83.50	81.00	10-9
28	27	85.0	0.00	1.36	0.00	0.00	0.80	0.0	12.7	5.5	17.89	25.73	6.39	24	1.29	80.10	79.00	81.60	81.16	87.00	83.50	11-10
29	28	124.0	0.18	1.36	0.70 low	0.13	0.80	5.0	12.0	5.6	11.98	23.16	4.86	24	1.05	81.40	80.10	82.63	82.38	88.59	87.00	12-11
30	29	42.0	0.05	1.18	0.60	0.03	0.67	5.0	11.8	5.6	11.30	24.68	5.49	24	1.19	81.90	81.40	83.09	82.71	88.59	88.59	13-12
31	30	59.0	0.23	1.13	0.61 low	0.14	0.64	10.0	11.5	5.7	11.17	22.81	4.83	24	1.02	82.50	81.90	83.68	83.61	89.50	88.59	14-13
32	31	222.0	0.45	0.90	0.56 low	0.25	0.50	10.0	10.2	5.9	2.99	8.99	3.36	15	1.94	86.80	82.50	87.49	83.76	93.38	89.50	15-14
33	32	42.0	0.45	0.45	0.56 low	0.25	0.25	10.0	10.0	6.0	1.50	15.75	2.41	15	5.95	89.30	86.80	89.79	87.78	93.38	93.38	16-15

← NEW SYSTEM →

MOSTLY ROAD & BUILDING C = 0.90 ±

OK.

Project File: 755514sys1.stm	I-D-F File: JCCstormsewer.IDF	Total number of lines: 33	Run Date: 09-12-2000

NOTES: Intensity = 143.72 / (Tc + 19.20) ^ 0.94; Return period = 10 Yrs. ; Initial tailwater elevation = 54.81 (ft)

SWM/ BMP CALCULATIONS

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

PROJECT W'MBG PLANT RD EXTEN
PROJECT NO. 7555-14
SUBJECT BMP # 3 - DRY POND
SHEET NO. 1 OF 4
CALCULATED BY DPW DATE 9-6-00

REVIEW OF SOILS IN DRAINAGE AREA

				HYDR. SOIL GRP
OPEN SPACE	8B	CAROLINE	2-6%	C
POND AREA/TOWNHMS	11C	CRAVEN-UCHEE	6-10%	D
TOWNHMS	14B	EMPORIA	2-6%	C
TOWNHMS / ROW	18B	KEMPSVILLE	2-6%	C
POND AREA / OPEN	29A	SLAGLE	0-2%	B
TOWNHMS/OPEN	29B	SLAGLE	2-6%	C

→ USE C AS AVG ✓

PRE-DEVELOPMENT:

DA = 16.11 AC

CN = 74 FOR PASTURE / GRASSLAND (VESCH TBL 5-5)

T_c OVERLAND FLOW → L = 320' 200-300' MAX.

$S = \frac{114-105}{320} = 2.8\%$

$T_t = 17$ MIN

SHALLOW CONCENTR'D FLOW → L = 550'

$S = \frac{105-84}{550} = 3.8\%$

vel = 3.1 FPS

$T_t = \frac{550}{3.1(60)} = 3$ MIN

$T_c = 17 + 3 = 20$ MIN

PRE-DEV
DA = 16.11 AC ✓
CN = 74
T_c = 20 MIN

AES CONSULTING ENGINEERS
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PROJECT W'MBRG PLANT RD EXTEN.
PROJECT NO. 7555-14
SUBJECT BMP #3 - DRY POND
SHEET NO. 2 OF 4
CALCULATED BY DPW DATE 9-6-00

POST-DEVELOPMENT

DA = 20.20 AC

CN = 83 (BY RESIDENTIAL DISTRICT W/ 38% IMP. - VESCH)

T_c OVERLAND FLOW → L = 200'

$S = \frac{111-104}{200} = 3.5\%$ cover?

$T_t = 10$ MIN

CHANNEL (PIPE) FLOW → L = 790' ±

$S = \frac{104-85}{790} = 2.4\%$ vel = 2.8 fps

$T_t = \frac{790}{2.8(60)} = 5$ MIN

$T_c = 10 + 5 = 15$ MIN

16.9 via storm comp.

POST-DEV
DA = 20.20 AC
CN = 83
T_c = 15 MIN

BMP CHOICE:

DRY DETENTION FACILITY (F-2) → 4 POINT FACILITY

WQ_v = 1" / IMP AC FOR 30% EFFICIENCY

→ IMPERVIOUS PORTION OF DRAINAGE AREA

6.65 AC BASIS OF #? 20.2 × 0.38 = 7.67 AC → 6.65 AC.

$\therefore WQ_v = (1")\left(\frac{1'}{12"}\right)(6.65\,AC)\left(43560\,SF/AC\right) = 24{,}140$ CF WQV

→ DETER. VOL. RQD FOR CHANNEL PROTECTION - CP_v = 1 YR 24 HR POST-DEV

CP_v = 88,494 CF CV

PER ROUTING INFLOW W/O DET

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PROJECT W'MBG PLANT RD EXTEN.
PROJECT NO. 7555-14
SUBJECT BMP #3 - DRY POND
SHEET NO. 3 OF 4
CALCULATED BY DPW DATE 9-6-00

→ DETERMINE RELEASE RATE FOR 1" IMPAC

$$Q_R = \frac{24{,}140 \text{ CF}^{WQV}}{86{,}400 \text{ s}} = 0.28 \text{ AC}$$

→ DETERMINE DIAMETER SIZE RQD FOR 24 HR RELEASE

EL OF $WQ_V = 83.5$

$$Q_R = 0.6 A \sqrt{2(32.2)\frac{(83.5-82.3)}{2}}$$

$A = 0.08$ SF $= \pi r^2$

$r = 0.16$ OR $1.9''$ → SAY $2''$

→ SET RISER AT CP_V EL = 86.1

CALC RQD ORIFICE TO ENSURE 2.0" ADEQUATE

$$Q_R = \frac{88494 \text{ CF}}{86400 \text{ s}} = 1.0 \text{ CFS}$$

@EL 86.1
88,767.4

$$Q_R = 0.6 A \sqrt{2(32.2)\frac{(86.1-82.3)}{2}}$$

$A = 0.15$ SF

$r = 0.22' = 2.6'' > 2.0''$ ∴ OK

DAM DESIGN

→ ANTI-SEEP COLLARS

$$L_S = Y(Z+4)\left[1 + \frac{S}{0.25-S}\right]$$

$$L_S = (4+4)\left[1 + \frac{.01}{.25-.01}\right] = 29'$$

$29'$ (5%) → $31'$

FROM PLT 3.14-12 → USE 2 COLLARS @ 2.75' x 2.75' EA W/ 10.5' MIN SPACING ✓

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PROJECT W'MBG PLANT RD EXTEN
PROJECT NO. 7555-14
SUBJECT BMP #3 - DRY POND
SHEET NO. 4 OF 4
CALCULATED BY DPW DATE 9-6-00

→ ANTI-VORTEX DEVICE

RISER DIAMETER = 48" ✓

∴ 84" I.D. CONC. A-V DEVICE

→ EMERGENCY SPILLWAY DESIGN

TOP OF DAM ELEV = 89.5
100 YR STORM ELEV = 88.5
1' FREEBOARD ←

35' WIDE TRAP'L GRASSED SECTION W/ 4:1 SS & 6% SLOPE

Q_{100} = 68.2 CFS OVER SPILLWAY @ 88.5 ✓

FROM VDOT FIG 2.8.38 → depth = 0.5'
& 2.8.39 by interpolation USE MIN 1' DEPTH ←

→ RIP RAP @ BARREL OUTLET

15" DIA BARREL W/ Q_{10} = 13.2 CFS (PER ROUTING)
FROM VESCH 3.18

APRON LENGTH = 12 LF
WIDTH = 4 UPSTRM
10 DNSTRM

STONE SIZE:
d_{50} = 6"

TEMP SED. BASIN USE

DA = 20.2 AC

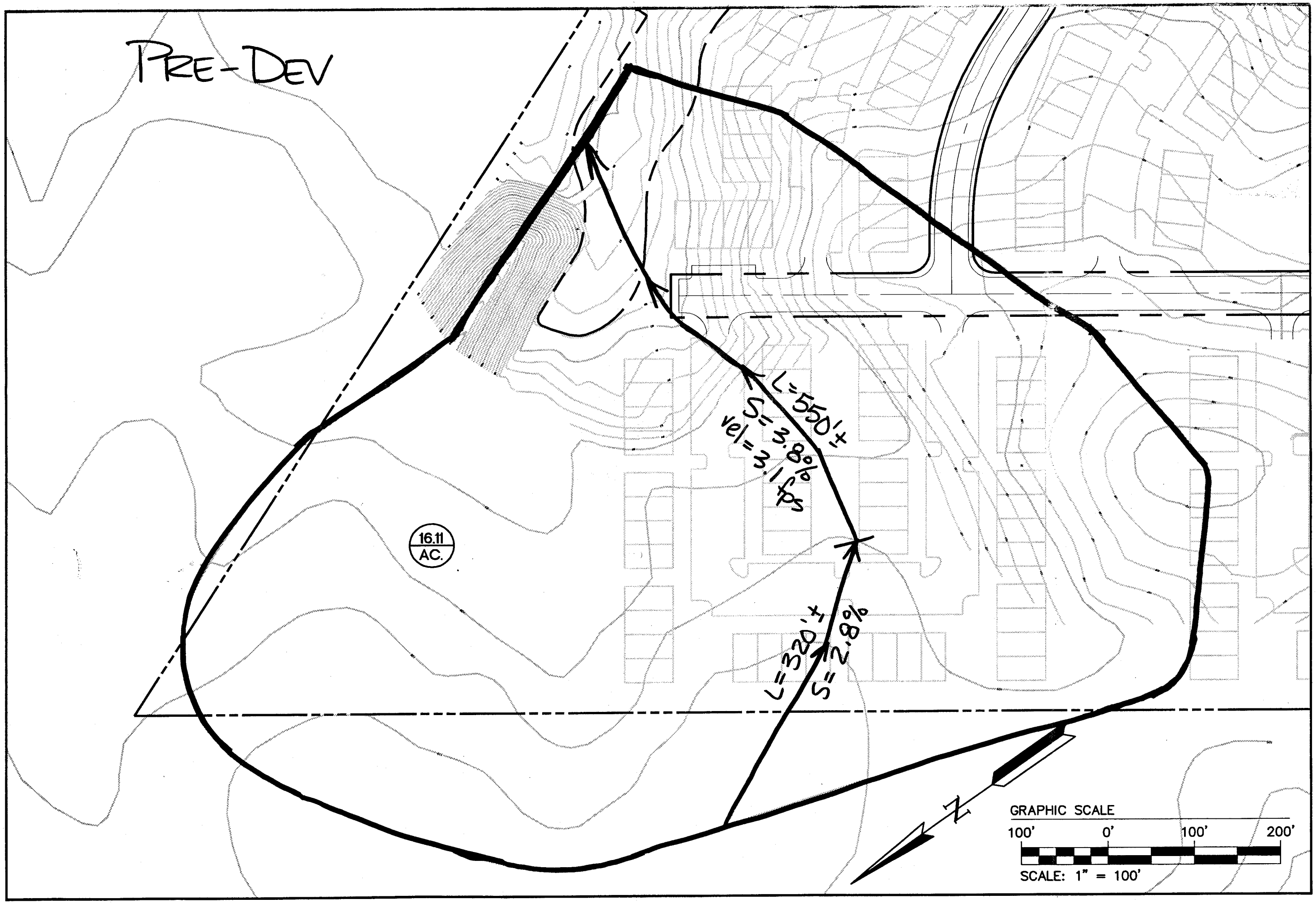
RQD VOL = 134 CY (20.2 AC) = 2707 CY = 73084 CF → @ EL 85.6

WET RQD = 36542 CF @ EL 84.14 SAY 84.2

6 HR DRAWDN OF 36542 CF = 4.3 CFS ∴ USE 6" ORIFICE

2 YR CONTROLLED BY RISER @ 8.84 CFS

∴ CAP LOW FLOW ORIFICE DURING CONSTRUCTION AND ADD 6" ORIFICE @ EL 84.2 UNTIL UPSTREAM AREAS FULLY BUILT OUT



No.	DATE	REVISION / COMMENT / NOTE	BY

5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(757) 253-0040
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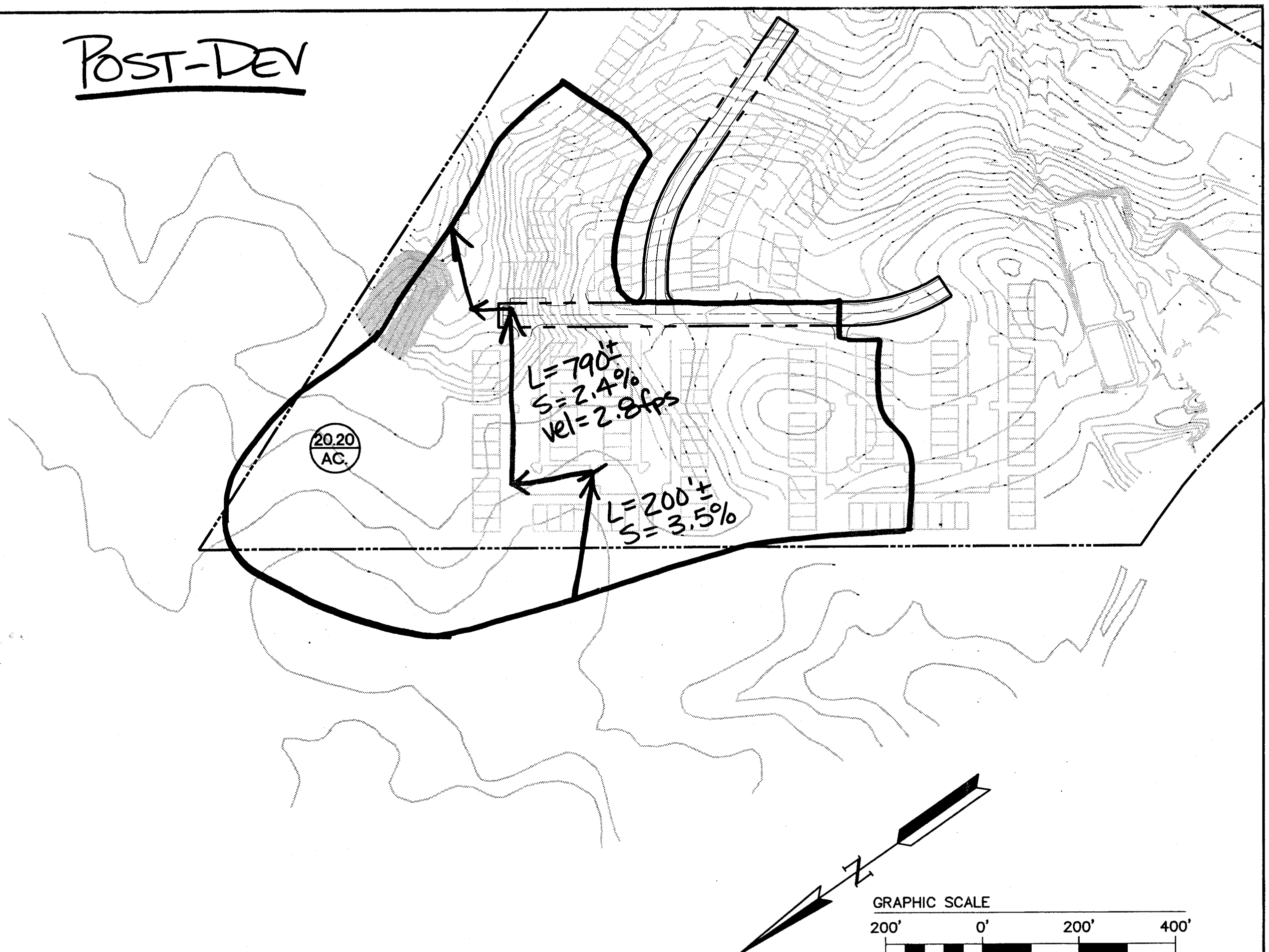
CONSULTING ENGINEERS

WILLIAMSBURG PLANTATION ROAD EXTENSION

BMP 3 PRE-DEVELOPMENT DRAINAGE AREA

Designed	Drawn
	DPW
Scale 1"=100'	Date 9/00
Project No. 7555-14	
Drawing No. 1 OF 2	

POST-DEV



No.	DATE	REVISION / COMMENT / NOTE	BY

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

WILLIAMSBURG PLANTATION
ROAD EXTENSION
BMP 3 POST-DEVELOPMENT
DRAINAGE AREA

Designed	Drawn DPW
Scale	Date 9/00
Project No. 7555-14	
Drawing No. 2 OF 2	

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Return period (yrs)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	17.1	6	732	72,509	2	---	-----	-----	2 YR PRE
2	SCS Runoff	43.1	6	726	176,457	10	---	-----	-----	10 YR PRE
3	SCS Runoff	71.1	6	726	288,050	100	---	-----	-----	100 YR PRE
5	SCS Runoff	41.4	6	720	127,764	2	---	-----	-----	2 YR POST
6	SCS Runoff	87.1	6	720	268,520	10	---	-----	-----	10 YR POST
7	SCS Runoff	131.7	6	720	410,906	100	---	-----	-----	100 YR POST
9	SCS Runoff	28.3	6	720	88,494 ✓	1	---	-----	-----	1 YR POST
11	Reservoir	1.6	6	918	105,790	2	5	86.21	92,270	2 YR ROUTE
12	Reservoir	13.1	6	750	246,373	10	6	87.71	144,417	10 YR ROUTE
13	Reservoir	87.4	6	732	388,680	100	7	88.54	177,310	100 YR ROUTE
15	SCS Runoff	99.2	6	720	306,872	25	---	-----	-----	25 YR POST
16	Reservoir	54.6	6	732	306,834	25	15	88.28	166,776	25 YR ROUTE
17	Reservoir	8.9	6	744	127,730	2	5	86.44	99,927	2 YR TEMP

VOL INCREASE (CF)
2 - 33,281 (45%)
10 - 69,916 (39%)
100 - 100,630 (74%)

CV = 88494 cf

Proj. file: BMP3 DRY.GPW	IDF file: New JCC.IDF	Run date: 09-12-2000

$$\frac{x - 85509}{118093 - 85509} = \frac{x}{118093} - 85509$$

$$\frac{x - 85509}{32584} = \frac{1}{0.9} = \frac{98 - 87}{98 - 9.98}$$

105059.4

~~87,44~~ 85509

~~8.6~~ 9.98 8.6.6

~~86~~ 98

87

9.98

Reservoir Report

English

Reservoir No. 1 - BMP 3

Pond Data

Pond storage is based on known contour areas

Stage / Storage Table

Stage ft	Elevation ft	Contour area sqft	Incr. Storage cuft	Total storage cuft
0.00	79.00	300	0	0
1.00	80.00	684	492	492
2.00	81.00	1,196	940	1,432
3.00	82.00	1,836	1,516	2,948
4.00	83.00	18,091	9,964	12,912
5.00	84.00	22,139	20,115	33,027
6.00	85.00	26,187	24,163	57,190
7.00	86.00	30,451	28,319	85,509
8.00	87.00	34,716	32,584	118,093
9.00	88.00 min.	39,206	36,961	155,054
10.00	89.00 89.5	43,696	41,451	196,505

Culvert / Orifice Structures

6" w/ 2" internal orif

	[A]	[B]	[C]	[D]
Rise in	= 15.0	2.0	0.0	0.0
Span in	= 15.0	2.0	0.0	0.0
No. Barrels	= 1	1	0	0
Invert El. ft	= 82.30	82.30	0.00	0.00
Length ft	= 52.0	0.5	0.0	0.0
Slope %	= 1.25	0.00	0.00	0.00
N-Value	= .013	.013	.000	.000
Orif. Coeff.	= 0.60	0.60	0.00	0.00
Multi-Stage	= -----	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len ft	= 12.6	35.0	0.0	0.0
Crest El. ft	= 86.10	87.75	0.00	0.00
Weir Coeff.	= 3.00	3.00	0.00	0.00
Eqn. Exp.	= 1.50	1.50	0.00	0.00
Multi-Stage	= Yes	No	No	No

Tailwater Elevation = 0.00 ft No TW

Note: All outflows have been analyzed under inlet and outlet control.

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Discharge cfs
0.00	0	79.00	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.10	49	79.10	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.20	98	79.20	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.30	148	79.30	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.40	197	79.40	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.50	246	79.50	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.60	295	79.60	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.70	344	79.70	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.80	394	79.80	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.90	443	79.90	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.00	492	80.00	0.00	0.00	---	---	0.00	0.00	---	---	0.00

Continues on next page...

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Discharge cfs
1.10	586	80.10	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.20	680	80.20	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.30	774	80.30	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.40	868	80.40	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.50	962	80.50	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.60	1,056	80.60	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.70	1,150	80.70	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.80	1,244	80.80	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.90	1,338	80.90	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.00	1,432	81.00	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.10	1,584	81.10	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.20	1,735	81.20	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.30	1,887	81.30	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.40	2,038	81.40	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.50	2,190	81.50	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.60	2,342	81.60	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.70	2,493	81.70	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.80	2,645	81.80	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.90	2,796	81.90	0.00	0.00	---	---	0.00	0.00	---	---	0.00
3.00	2,948	82.00	0.00	0.00	---	---	0.00	0.00	---	---	0.00
3.10	3,944	82.10	0.00	0.00	---	---	0.00	0.00	---	---	0.00
3.20	4,941	82.20	0.00	0.00	---	---	0.00	0.00	---	---	0.00
3.30	5,937	82.30	0.00	0.00	---	---	0.00	0.00	---	---	0.00
3.40	6,934	82.40	0.05	0.02	---	---	0.00	0.00	---	---	0.02
3.50	7,930	82.50	0.19	0.02	---	---	0.00	0.00	---	---	0.02
3.60	8,926	82.60	0.46	0.05	---	---	0.00	0.00	---	---	0.05
3.70	9,923	82.70	0.75	0.06	---	---	0.00	0.00	---	---	0.06
3.80	10,919	82.80	1.11	0.07	---	---	0.00	0.00	---	---	0.07
3.90	11,916	82.90	1.54	0.07	---	---	0.00	0.00	---	---	0.07
4.00	12,912	83.00	2.09	0.08	---	---	0.00	0.00	---	---	0.08
4.10	14,924	83.10	2.59	0.09	---	---	0.00	0.00	---	---	0.09
4.20	16,935	83.20	3.09	0.09	---	---	0.00	0.00	---	---	0.09
4.30	18,947	83.30	3.62	0.10	---	---	0.00	0.00	---	---	0.10
4.40	20,958	83.40	4.08	0.10	---	---	0.00	0.00	---	---	0.10
4.50	22,970	83.50	4.52	0.11	---	---	0.00	0.00	---	---	0.11
4.60	24,981	83.60	4.85	0.11	---	---	0.00	0.00	---	---	0.11
4.70	26,993	83.70	5.20	0.12	---	---	0.00	0.00	---	---	0.12
4.80	29,004	83.80	5.53	0.12	---	---	0.00	0.00	---	---	0.12
4.90	31,016	83.90	5.83	0.13	---	---	0.00	0.00	---	---	0.13
5.00	33,027	84.00	6.13	0.13	---	---	0.00	0.00	---	---	0.13
5.10	35,443	84.10	6.40	0.13	---	---	0.00	0.00	---	---	0.13
5.20	37,860	84.20	6.67	0.14	---	---	0.00	0.00	---	---	0.14
5.30	40,276	84.30	6.93	0.14	---	---	0.00	0.00	---	---	0.14
5.40	42,692	84.40	7.18	0.15	---	---	0.00	0.00	---	---	0.15
5.50	45,109	84.50	7.41	0.15	---	---	0.00	0.00	---	---	0.15
5.60	47,525	84.60	7.65	0.15	---	---	0.00	0.00	---	---	0.15
5.70	49,941	84.70	7.87	0.16	---	---	0.00	0.00	---	---	0.16
5.80	52,357	84.80	8.09	0.16	---	---	0.00	0.00	---	---	0.16
5.90	54,774	84.90	8.30	0.16	---	---	0.00	0.00	---	---	0.16
6.00	57,190	85.00	8.51	0.17	---	---	0.00	0.00	---	---	0.17
6.10	60,022	85.10	8.71	0.17	---	---	0.00	0.00	---	---	0.17
6.20	62,854	85.20	8.91	0.17	---	---	0.00	0.00	---	---	0.17
6.30	65,686	85.30	9.11	0.18	---	---	0.00	0.00	---	---	0.18

Continues on next page...

Stage / Storage / Discharge Table

BARREL BMP ORIF RISER ES

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Discharge cfs
6.40	68,518	85.40	9.29	0.18	---	---	0.00	0.00	---	---	0.18
6.50	71,349	85.50	9.48	0.18	---	---	0.00	0.00	---	---	0.18
6.60	74,181	85.60	9.66	0.19	---	---	0.00	0.00	---	---	0.19
6.70	77,013	85.70	9.84	0.19	---	---	0.00	0.00	---	---	0.19
6.80	79,845	85.80	10.02	0.19	---	---	0.00	0.00	---	---	0.19
6.90	82,677	85.90	10.19	0.19	---	---	0.00	0.00	---	---	0.19
7.00	85,509	86.00	10.36	0.20	---	---	0.00	0.00	---	---	0.20
7.10	88,767	86.10	10.53	0.20	---	---	0.00	0.00	---	---	0.20
7.20	92,026	86.20	10.69	0.20	---	---	1.19	0.00	---	---	1.39
7.30	95,284	86.30	10.85	0.19	---	---	3.37	0.00	---	---	3.57
7.40	98,543	86.40	11.01	0.19	---	---	6.20	0.00	---	---	6.38
7.50	101,801	86.50	11.17	0.16	---	---	9.54	0.00	---	---	9.70
7.60	105,059	86.60	11.33	0.10	---	---	13.33	0.00	---	---	11.33
7.70	108,318	86.70	11.48	0.00	---	---	17.53	0.00	---	---	11.48
7.80	111,576	86.80	11.63	0.00	---	---	22.08	0.00	---	---	11.63
7.90	114,835	86.90	11.78	0.00	---	---	26.98	0.00	---	---	11.78
8.00	118,093	87.00	11.93	0.00	---	---	32.20	0.00	---	---	11.93
8.10	121,789	87.10	12.07	0.00	---	---	37.71	0.00	---	---	12.07
8.20	125,485	87.20	12.22	0.00	---	---	43.51	0.00	---	---	12.22
8.30	129,181	87.30	12.36	0.00	---	---	49.57	0.00	---	---	12.36
8.40	132,877	87.40	12.50	0.00	---	---	55.89	0.00	---	---	12.50
8.50	136,574	87.50	12.64	0.00	---	---	62.47	0.00	---	---	12.64
8.60	140,270	87.60	12.77	0.00	---	---	69.28	0.00	---	---	12.77
8.70	143,966	87.70	12.91	0.00	---	---	76.32	0.00	---	---	12.91
8.80	147,662	87.80	13.04	0.00	---	---	83.58	1.17	---	---	14.22
8.90	151,358	87.90	13.18	0.00	---	---	91.07	6.10	---	---	19.28
9.00	155,054	88.00	13.31	0.00	---	---	98.76	13.13	---	---	26.43
9.10	159,199	88.10	13.44	0.00	---	---	106.66	21.74	---	---	35.18
9.20	163,344	88.20	13.57	0.00	---	---	114.76	31.70	---	---	45.27
9.30	167,489	88.30	13.70	0.00	---	---	123.05	42.83	---	---	56.53
9.40	171,634	88.40	13.82	0.00	---	---	131.54	55.02	---	---	68.85
9.50	175,779	88.50	13.95	0.00	---	---	140.21	68.20	---	---	82.15
9.60	179,925	88.60	14.07	0.00	---	---	149.06	82.28	---	---	96.36
9.70	184,070	88.70	14.20	0.00	---	---	158.09	97.22	---	---	111.42
9.80	188,215	88.80	14.32	0.00	---	---	167.30	112.97	---	---	127.29
9.90	192,360	88.90	14.44	0.00	---	---	176.68	129.49	---	---	143.93
10.00	196,505	89.00	14.56	0.00	---	---	186.23	146.74	---	---	161.30

...End

Reservoir Report

English

Reservoir No. 2 - TEMP BASIN

Pond Data

Pond storage is based on known contour areas

Stage / Storage Table

Stage ft	Elevation ft	Contour area sqft	Incr. Storage cuft	Total storage cuft
0.00	79.00	300	0	0
1.00	80.00	684	492	492
2.00	81.00	1,196	940	1,432
3.00	82.00	1,836	1,516	2,948
4.00	83.00	18,091	9,964	12,912
5.00	84.00	22,139	20,115	33,027
6.00	85.00	26,187	24,163	57,190
7.00	86.00	30,451	28,319	85,509
8.00	87.00	34,716	32,584	118,093
9.00	88.00	39,206	36,961	155,054
10.00	89.00	43,696	41,451	196,505

Culvert / Orifice Structures

	[A]	[B]	[C]	[D]
Rise in	= 15.0	6.0	0.0	0.0
Span in	= 15.0	6.0	0.0	0.0
No. Barrels	= 1	1	0	0
Invert El. ft	= 82.30	84.20	0.00	0.00
Length ft	= 52.0	0.5	0.0	0.0
Slope %	= 1.25	0.00	0.00	0.00
N-Value	= .013	.013	.000	.000
Orif. Coeff.	= 0.60	0.60	0.00	0.00
Multi-Stage	= -----	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len ft	= 12.6	35.0	0.0	0.0
Crest El. ft	= 86.10	87.75	0.00	0.00
Weir Coeff.	= 3.00	3.00	0.00	0.00
Eqn. Exp.	= 1.50	1.50	0.00	0.00
Multi-Stage	= Yes	No	No	No

Tailwater Elevation = 0.00 ft

Note: All outflows have been analyzed under inlet and outlet control.

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Discharge cfs
0.00	0	79.00	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.10	49	79.10	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.20	98	79.20	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.30	148	79.30	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.40	197	79.40	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.50	246	79.50	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.60	295	79.60	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.70	344	79.70	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.80	394	79.80	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.90	443	79.90	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.00	492	80.00	0.00	0.00	---	---	0.00	0.00	---	---	0.00

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Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Discharge cfs
1.10	586	80.10	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.20	680	80.20	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.30	774	80.30	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.40	868	80.40	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.50	962	80.50	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.60	1,056	80.60	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.70	1,150	80.70	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.80	1,244	80.80	0.00	0.00	---	---	0.00	0.00	---	---	0.00
1.90	1,338	80.90	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.00	1,432	81.00	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.10	1,584	81.10	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.20	1,735	81.20	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.30	1,887	81.30	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.40	2,038	81.40	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.50	2,190	81.50	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.60	2,342	81.60	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.70	2,493	81.70	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.80	2,645	81.80	0.00	0.00	---	---	0.00	0.00	---	---	0.00
2.90	2,796	81.90	0.00	0.00	---	---	0.00	0.00	---	---	0.00
3.00	2,948	82.00	0.00	0.00	---	---	0.00	0.00	---	---	0.00
3.10	3,944	82.10	0.00	0.00	---	---	0.00	0.00	---	---	0.00
3.20	4,941	82.20	0.00	0.00	---	---	0.00	0.00	---	---	0.00
3.30	5,937	82.30	0.00	0.00	---	---	0.00	0.00	---	---	0.00
3.40	6,934	82.40	0.05	0.00	---	---	0.00	0.00	---	---	0.00
3.50	7,930	82.50	0.19	0.00	---	---	0.00	0.00	---	---	0.00
3.60	8,926	82.60	0.46	0.00	---	---	0.00	0.00	---	---	0.00
3.70	9,923	82.70	0.75	0.00	---	---	0.00	0.00	---	---	0.00
3.80	10,919	82.80	1.11	0.00	---	---	0.00	0.00	---	---	0.00
3.90	11,916	82.90	1.54	0.00	---	---	0.00	0.00	---	---	0.00
4.00	12,912	83.00	2.09	0.00	---	---	0.00	0.00	---	---	0.00
4.10	14,924	83.10	2.59	0.00	---	---	0.00	0.00	---	---	0.00
4.20	16,935	83.20	3.09	0.00	---	---	0.00	0.00	---	---	0.00
4.30	18,947	83.30	3.62	0.00	---	---	0.00	0.00	---	---	0.00
4.40	20,958	83.40	4.08	0.00	---	---	0.00	0.00	---	---	0.00
4.50	22,970	83.50	4.52	0.00	---	---	0.00	0.00	---	---	0.00
4.60	24,981	83.60	4.85	0.00	---	---	0.00	0.00	---	---	0.00
4.70	26,993	83.70	5.20	0.00	---	---	0.00	0.00	---	---	0.00
4.80	29,004	83.80	5.53	0.00	---	---	0.00	0.00	---	---	0.00
4.90	31,016	83.90	5.83	0.00	---	---	0.00	0.00	---	---	0.00
5.00	33,027	84.00	6.13	0.00	---	---	0.00	0.00	---	---	0.00
5.10	35,443	84.10	6.40	0.00	---	---	0.00	0.00	---	---	0.00
5.20	37,860	84.20	6.67	0.00	---	---	0.00	0.00	---	---	0.00
5.30	40,276	84.30	6.93	0.03	---	---	0.00	0.00	---	---	0.03
5.40	42,692	84.40	7.18	0.11	---	---	0.00	0.00	---	---	0.11
5.50	45,109	84.50	7.41	0.24	---	---	0.00	0.00	---	---	0.24
5.60	47,525	84.60	7.65	0.37	---	---	0.00	0.00	---	---	0.37
5.70	49,941	84.70	7.87	0.47	---	---	0.00	0.00	---	---	0.47
5.80	52,357	84.80	8.09	0.56	---	---	0.00	0.00	---	---	0.56
5.90	54,774	84.90	8.30	0.57	---	---	0.00	0.00	---	---	0.57
6.00	57,190	85.00	8.51	0.70	---	---	0.00	0.00	---	---	0.70
6.10	60,022	85.10	8.71	0.76	---	---	0.00	0.00	---	---	0.76
6.20	62,854	85.20	8.91	0.82	---	---	0.00	0.00	---	---	0.82
6.30	65,686	85.30	9.11	0.87	---	---	0.00	0.00	---	---	0.87

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Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Discharge cfs
6.40	68,518	85.40	9.29	0.92	---	---	0.00	0.00	---	---	0.92
6.50	71,349	85.50	9.48	0.97	---	---	0.00	0.00	---	---	0.97
6.60	74,181	85.60	9.66	1.01	---	---	0.00	0.00	---	---	1.01
6.70	77,013	85.70	9.84	1.06	---	---	0.00	0.00	---	---	1.06
6.80	79,845	85.80	10.02	1.10	---	---	0.00	0.00	---	---	1.10
6.90	82,677	85.90	10.19	1.14	---	---	0.00	0.00	---	---	1.14
7.00	85,509	86.00	10.36	1.18	---	---	0.00	0.00	---	---	1.18
7.10	88,767	86.10	10.53	1.21	---	---	0.00	0.00	---	---	1.21
7.20	92,026	86.20	10.69	1.25	---	---	1.19	0.00	---	---	2.44
7.30	95,284	86.30	10.85	1.29	---	---	3.37	0.00	---	---	4.66
7.40	98,543	86.40	11.01	1.32	---	---	6.20	0.00	---	---	7.52
7.50	101,801	86.50	11.17	1.32	---	---	9.54	0.00	---	---	10.86
7.60	105,059	86.60	11.33	0.51	---	---	13.33	0.00	---	---	11.33
7.70	108,318	86.70	11.48	0.00	---	---	17.53	0.00	---	---	11.48
7.80	111,576	86.80	11.63	0.00	---	---	22.08	0.00	---	---	11.63
7.90	114,835	86.90	11.78	0.00	---	---	26.98	0.00	---	---	11.78
8.00	118,093	87.00	11.93	0.00	---	---	32.20	0.00	---	---	11.93
8.10	121,789	87.10	12.07	0.00	---	---	37.71	0.00	---	---	12.07
8.20	125,485	87.20	12.22	0.00	---	---	43.51	0.00	---	---	12.22
8.30	129,181	87.30	12.36	0.00	---	---	49.57	0.00	---	---	12.36
8.40	132,877	87.40	12.50	0.00	---	---	55.89	0.00	---	---	12.50
8.50	136,574	87.50	12.64	0.00	---	---	62.47	0.00	---	---	12.64
8.60	140,270	87.60	12.77	0.00	---	---	69.28	0.00	---	---	12.77
8.70	143,966	87.70	12.91	0.00	---	---	76.32	0.00	---	---	12.91
8.80	147,662	87.80	13.04	0.00	---	---	83.58	1.17	---	---	14.22
8.90	151,358	87.90	13.18	0.00	---	---	91.07	6.10	---	---	19.28
9.00	155,054	88.00	13.31	0.00	---	---	98.76	13.13	---	---	26.43
9.10	159,199	88.10	13.44	0.00	---	---	106.66	21.74	---	---	35.18
9.20	163,344	88.20	13.57	0.00	---	---	114.76	31.70	---	---	45.27
9.30	167,489	88.30	13.70	0.00	---	---	123.05	42.83	---	---	56.53
9.40	171,634	88.40	13.82	0.00	---	---	131.54	55.02	---	---	68.85
9.50	175,779	88.50	13.95	0.00	---	---	140.21	68.20	---	---	82.15
9.60	179,925	88.60	14.07	0.00	---	---	149.06	82.28	---	---	96.36
9.70	184,070	88.70	14.20	0.00	---	---	158.09	97.22	---	---	111.42
9.80	188,215	88.80	14.32	0.00	---	---	167.30	112.97	---	---	127.29
9.90	192,360	88.90	14.44	0.00	---	---	176.68	129.49	---	---	143.93
10.00	196,505	89.00	14.56	0.00	---	---	186.23	146.74	---	---	161.30

...End

Hydrograph Report

English

Hyd. No. 1

2 YR PRE

Hydrograph type	= SCS Runoff	Peak discharge	= 17.06 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Drainage area	= 16.11 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 20 min
Total precip.	= 3.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Total Volume = 72,509 cuft

Hydrograph Discharge Table

Time -- (hrs	Outflow cfs)
11.90	6.90
12.10	16.56
12.30	14.39
12.50	8.24
12.70	3.75

...End

Hydrograph Report

English

Hyd. No. 2

10 YR PRE

Hydrograph type	= SCS Runoff	Peak discharge	= 43.12 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Drainage area	= 16.11 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 20 min
Total precip.	= 5.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Total Volume = 176,457 cuft

Hydrograph Discharge Table

Time -- (hrs	Outflow cfs)
11.80	10.52
12.00	33.88
12.20	42.82
12.40	27.10
12.60	11.95

...End

Hydrograph Report

English

Hyd. No. 3

100 YR PRE

Hydrograph type	= SCS Runoff	Peak discharge	= 71.06 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 16.11 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 20 min
Total precip.	= 8.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Total Volume = 288,050 cuft

Hydrograph Discharge Table

Time -- (hrs	Outflow cfs)
11.80	19.13
12.00	56.97
12.20	69.59
12.40	43.13
12.60	18.51

...End

Hydrograph Report

English

Hyd. No. 9

1 YR POST

Hydrograph type	= SCS Runoff	Peak discharge	= 28.33 cfs
Storm frequency	= 1 yrs	Time interval	= 6 min
Drainage area	= 20.20 ac	Curve number	= 83
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15 min
Total precip.	= 2.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Total Volume = 88,494 cuft

CPv

Hydrograph Discharge Table

Time (hrs)	Outflow (cfs)
11.80	8.58
12.00	28.33 <<
12.20	17.71

...End

1-YR, 24 hour design volume for CPv

Hydrograph Report

English

Hyd. No. 5

2 YR POST

Hydrograph type	= SCS Runoff	Peak discharge	= 41.44 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Drainage area	= 20.20 ac	Curve number	= 83
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15 min
Total precip.	= 3.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Total Volume = 127,764 cuft

Hydrograph Discharge Table

Time -- (hrs	Outflow cfs)
11.80	13.57
12.00	41.44 <<
12.20	25.13

...End

Hydrograph Report

English

Hyd. No. 6

10 YR POST

Hydrograph type	= SCS Runoff	Peak discharge	= 87.11 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Drainage area	= 20.20 ac	Curve number	= 83
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15 min
Total precip.	= 5.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Total Volume = 268,520 cuft

Hydrograph Discharge Table

Time -- (hrs	Outflow cfs)
11.80	31.94
12.00	87.11 <<
12.20	50.29

...End

Hydrograph Report

English

Hyd. No. 15

25 YR POST

Hydrograph type	= SCS Runoff	Peak discharge	= 99.25 cfs
Storm frequency	= 25 yrs	Time interval	= 6 min
Drainage area	= 20.20 ac	Curve number	= 83
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15 min
Total precip.	= 6.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Total Volume = 306,872 cuft

Hydrograph Discharge Table

Time -- (hrs	Outflow cfs)
11.80	36.97
12.00	99.25 <<
12.20	56.90

...End

Hydrograph Report

English

Hyd. No. 7

100 YR POST

Hydrograph type	= SCS Runoff	Peak discharge	= 131.66 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 20.20 ac	Curve number	= 83
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15 min
Total precip.	= 8.00 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Total Volume = 410,906 cuft

Hydrograph Discharge Table

Time -- (hrs	Outflow cfs)
11.70	27.25
11.90	93.00
12.10	118.85
12.30	37.97

...End

Hydrograph Report

English

Hyd. No. 11

2 YR ROUTE

Hydrograph type	= Reservoir	Peak discharge	= 1.56 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hyd. No.	= 5	Reservoir name	= BMP 3
Max. Elevation	= 86.21 ft	Max. Storage	= 92,270 cuft

Storage Indication method used.

Total Volume = 105,790 cuft

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
14.00	2.15	86.12	10.56	0.20	-----	-----	0.23	-----	-----	-----	0.43
14.20	1.98	86.15	10.61	0.20	-----	-----	0.61	-----	-----	-----	0.81
14.40	1.89	86.17	10.65	0.20	-----	-----	0.87	-----	-----	-----	1.07
14.60	1.82	86.19	10.67	0.20	-----	-----	1.05	-----	-----	-----	1.25
14.80	1.75	86.20	10.69	0.20	-----	-----	1.17	-----	-----	-----	1.38
15.00	1.68	86.20	10.70	0.20	-----	-----	1.29	-----	-----	-----	1.49
15.20	1.61	86.21	10.70	0.20	-----	-----	1.35	-----	-----	-----	1.55
15.40	1.53	86.21	10.70	0.20	-----	-----	1.35	-----	-----	-----	1.56
15.60	1.46	86.21	10.70	0.20	-----	-----	1.33	-----	-----	-----	1.53
15.80	1.39	86.20	10.70	0.20	-----	-----	1.29	-----	-----	-----	1.49
16.00	1.32	86.20	10.70	0.20	-----	-----	1.23	-----	-----	-----	1.44
16.20	1.25	86.20	10.69	0.20	-----	-----	1.18	-----	-----	-----	1.38
16.40	1.22	86.20	10.69	0.20	-----	-----	1.15	-----	-----	-----	1.35
16.60	1.19	86.19	10.68	0.20	-----	-----	1.11	-----	-----	-----	1.32
16.80	1.17	86.19	10.68	0.20	-----	-----	1.08	-----	-----	-----	1.29
17.00	1.14	86.19	10.67	0.20	-----	-----	1.05	-----	-----	-----	1.26
17.20	1.12	86.19	10.67	0.20	-----	-----	1.02	-----	-----	-----	1.23
17.40	1.09	86.18	10.66	0.20	-----	-----	1.00	-----	-----	-----	1.20
17.60	1.07	86.18	10.66	0.20	-----	-----	0.97	-----	-----	-----	1.17
17.80	1.04	86.18	10.66	0.20	-----	-----	0.94	-----	-----	-----	1.14
18.00	1.01	86.18	10.65	0.20	-----	-----	0.91	-----	-----	-----	1.12
18.20	0.99	86.17	10.65	0.20	-----	-----	0.89	-----	-----	-----	1.09
18.40	0.96	86.17	10.65	0.20	-----	-----	0.86	-----	-----	-----	1.06
18.60	0.93	86.17	10.64	0.20	-----	-----	0.83	-----	-----	-----	1.04
18.80	0.91	86.17	10.64	0.20	-----	-----	0.81	-----	-----	-----	1.01
19.00	0.88	86.17	10.64	0.20	-----	-----	0.78	-----	-----	-----	0.98
19.20	0.85	86.16	10.63	0.20	-----	-----	0.75	-----	-----	-----	0.96
19.40	0.83	86.16	10.63	0.20	-----	-----	0.73	-----	-----	-----	0.93
19.60	0.80	86.16	10.62	0.20	-----	-----	0.70	-----	-----	-----	0.90
19.80	0.77	86.16	10.62	0.20	-----	-----	0.67	-----	-----	-----	0.88
20.00	0.75	86.15	10.62	0.20	-----	-----	0.65	-----	-----	-----	0.85
20.20	0.72	86.15	10.61	0.20	-----	-----	0.62	-----	-----	-----	0.82
20.40	0.72	86.15	10.61	0.20	-----	-----	0.60	-----	-----	-----	0.80
20.60	0.71	86.15	10.61	0.20	-----	-----	0.58	-----	-----	-----	0.78
20.80	0.71	86.15	10.60	0.20	-----	-----	0.56	-----	-----	-----	0.76
21.00	0.70	86.15	10.60	0.20	-----	-----	0.55	-----	-----	-----	0.75

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
21.20	0.70	86.14	10.60	0.20	-----	-----	0.54	-----	-----	-----	0.74
21.40	0.69	86.14	10.60	0.20	-----	-----	0.53	-----	-----	-----	0.73
21.60	0.69	86.14	10.60	0.20	-----	-----	0.52	-----	-----	-----	0.72
21.80	0.68	86.14	10.60	0.20	-----	-----	0.51	-----	-----	-----	0.71
22.00	0.68	86.14	10.60	0.20	-----	-----	0.50	-----	-----	-----	0.70
22.20	0.67	86.14	10.60	0.20	-----	-----	0.49	-----	-----	-----	0.70
22.40	0.66	86.14	10.59	0.20	-----	-----	0.49	-----	-----	-----	0.69
22.60	0.66	86.14	10.59	0.20	-----	-----	0.48	-----	-----	-----	0.68
22.80	0.65	86.14	10.59	0.20	-----	-----	0.48	-----	-----	-----	0.68
23.00	0.65	86.14	10.59	0.20	-----	-----	0.47	-----	-----	-----	0.67
23.20	0.64	86.14	10.59	0.20	-----	-----	0.46	-----	-----	-----	0.67
23.40	0.64	86.14	10.59	0.20	-----	-----	0.46	-----	-----	-----	0.66
23.60	0.63	86.14	10.59	0.20	-----	-----	0.45	-----	-----	-----	0.65
23.80	0.63	86.14	10.59	0.20	-----	-----	0.45	-----	-----	-----	0.65
24.00	0.62	86.14	10.59	0.20	-----	-----	0.44	-----	-----	-----	0.64
24.20	0.25	86.13	10.58	0.20	-----	-----	0.40	-----	-----	-----	0.60
24.40	0.00	86.12	10.57	0.20	-----	-----	0.28	-----	-----	-----	0.48
24.60	0.00	86.11	10.55	0.20	-----	-----	0.17	-----	-----	-----	0.37

...End

Hydrograph Report

English

Hyd. No. 12

10 YR ROUTE

Hydrograph type	= Reservoir	Peak discharge	= 13.07 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Inflow hyd. No.	= 6	Reservoir name	= BMP 3
Max. Elevation	= 87.71 ft	Max. Storage	= 144,417 cuft

Storage Indication method used.

Total Volume = 246,373 cuft

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
12.20	50.29	87.39	12.48	-----	-----	-----	55.13	-----	-----	-----	12.48
12.40	14.61	87.71	12.92	-----	-----	-----	76.85	0.09	-----	-----	13.01
12.60	10.46	87.70	12.91	-----	-----	-----	76.13	-----	-----	-----	12.91
12.80	8.02	87.62	12.81	-----	-----	-----	70.98	-----	-----	-----	12.81
13.00	6.91	87.52	12.67	-----	-----	-----	63.89	-----	-----	-----	12.67
13.20	6.03	87.40	12.50	-----	-----	-----	55.99	-----	-----	-----	12.50
13.40	5.42	87.27	12.32	-----	-----	-----	47.81	-----	-----	-----	12.32
13.60	4.88	87.13	12.12	-----	-----	-----	39.64	-----	-----	-----	12.12
13.80	4.43	86.99	11.91	-----	-----	-----	31.60	-----	-----	-----	11.91
14.00	4.04	86.82	11.66	-----	-----	-----	23.14	-----	-----	-----	11.66
14.20	3.71	86.65	11.41	0.05	-----	-----	15.51	-----	-----	-----	11.41
14.40	3.53	86.50	11.17	0.16	-----	-----	9.42	-----	-----	-----	9.58
14.60	3.40	86.40	11.01	0.19	-----	-----	6.19	-----	-----	-----	6.37
14.80	3.26	86.35	10.93	0.19	-----	-----	4.76	-----	-----	-----	4.95
15.00	3.13	86.32	10.89	0.19	-----	-----	3.94	-----	-----	-----	4.13
15.20	2.99	86.30	10.86	0.19	-----	-----	3.43	-----	-----	-----	3.63
15.40	2.85	86.29	10.84	0.20	-----	-----	3.15	-----	-----	-----	3.35
15.60	2.72	86.28	10.82	0.20	-----	-----	2.93	-----	-----	-----	3.13
15.80	2.58	86.27	10.81	0.20	-----	-----	2.75	-----	-----	-----	2.94
16.00	2.44	86.26	10.79	0.20	-----	-----	2.58	-----	-----	-----	2.78
16.20	2.32	86.26	10.78	0.20	-----	-----	2.42	-----	-----	-----	2.62

...End

Hydrograph Report

English

Hyd. No. 13

100 YR ROUTE

Hydrograph type	= Reservoir	Peak discharge	= 87.39 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hyd. No.	= 7	Reservoir name	= BMP 3
Max. Elevation	= 88.54 ft	Max. Storage	= 177,310 cuft

Storage Indication method used.

Total Volume = 388,680 cuft

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
12.20	74.46	88.54 <<	14.00	-----	-----	-----	143.48	73.40	-----	-----	87.39 <<
12.40	21.29	88.16	13.52	-----	-----	-----	111.70	27.93	-----	-----	41.45
12.60	15.21	87.94	13.24	-----	-----	-----	94.45	9.19	-----	-----	22.42

...End

Hydrograph Report

English

Hyd. No. 17

2 YR TEMP

Hydrograph type	= Reservoir	Peak discharge	= 8.94 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hyd. No.	= 5	Reservoir name	= TEMP BASIN
Max. Elevation	= 86.44 ft	Max. Storage	= 99,927 cuft

Storage Indication method used.

Total Volume = 127,729 cuft

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
12.20	25.13	86.28	10.82	1.28	-----	-----	2.92	-----	-----	-----	4.20
12.40	7.58	86.44 <<	11.08	1.32	-----	-----	7.62	-----	-----	-----	8.94 <<
12.60	5.47	86.40	11.02	1.32	-----	-----	6.29	-----	-----	-----	7.61
12.80	4.21	86.36	10.94	1.30	-----	-----	4.93	-----	-----	-----	6.24
13.00	3.64	86.32	10.88	1.29	-----	-----	3.84	-----	-----	-----	5.13
13.20	3.19	86.29	10.83	1.28	-----	-----	3.10	-----	-----	-----	4.38
13.40	2.87	86.26	10.79	1.27	-----	-----	2.58	-----	-----	-----	3.85
13.60	2.59	86.24	10.76	1.27	-----	-----	2.14	-----	-----	-----	3.41
13.80	2.36	86.23	10.74	1.26	-----	-----	1.78	-----	-----	-----	3.04
14.00	2.15	86.21	10.71	1.26	-----	-----	1.48	-----	-----	-----	2.73
14.20	1.98	86.20	10.69	1.25	-----	-----	1.22	-----	-----	-----	2.47
14.40	1.89	86.19	10.68	1.25	-----	-----	1.08	-----	-----	-----	2.33
14.60	1.82	86.18	10.66	1.24	-----	-----	0.97	-----	-----	-----	2.22
14.80	1.75	86.17	10.65	1.24	-----	-----	0.87	-----	-----	-----	2.11
15.00	1.68	86.17	10.63	1.24	-----	-----	0.78	-----	-----	-----	2.02
15.20	1.61	86.16	10.62	1.24	-----	-----	0.69	-----	-----	-----	1.93
15.40	1.53	86.15	10.61	1.23	-----	-----	0.61	-----	-----	-----	1.84

...End

Hydrograph Report

English

Hyd. No. 16

25 YR ROUTE

Hydrograph type	= Reservoir	Peak discharge	= 54.59 cfs
Storm frequency	= 25 yrs	Time interval	= 6 min
Inflow hyd. No.	= 15	Reservoir name	= TEMP BASIN
Max. Elevation	= 88.28 ft	Max. Storage	= 166,776 cuft

Storage Indication method used.

Total Volume = 306,834 cuft

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
12.00	99.25 <<	87.25	12.29	-----	-----	-----	46.83	-----	-----	-----	12.29
12.20	56.90	88.28 <<	13.68	-----	-----	-----	121.63	40.91	-----	-----	54.59 <<
12.40	16.44	88.07	13.40	-----	-----	-----	104.19	19.04	-----	-----	32.44
12.60	11.76	87.88	13.15	-----	-----	-----	89.46	5.04	-----	-----	18.19
12.80	9.01	87.77	13.01	-----	-----	-----	81.59	0.85	-----	-----	13.86
13.00	7.76	87.68	12.88	-----	-----	-----	74.64	-----	-----	-----	12.88
13.20	6.77	87.57	12.73	-----	-----	-----	67.09	-----	-----	-----	12.73
13.40	6.08	87.45	12.56	-----	-----	-----	58.94	-----	-----	-----	12.56
13.60	5.48	87.32	12.38	-----	-----	-----	50.58	-----	-----	-----	12.38
13.80	4.97	87.18	12.18	-----	-----	-----	42.24	-----	-----	-----	12.18
14.00	4.52	87.04	11.98	-----	-----	-----	34.14	-----	-----	-----	11.98
14.20	4.16	86.87	11.74	-----	-----	-----	25.69	-----	-----	-----	11.74
14.40	3.96	86.71	11.49	-----	-----	-----	17.82	-----	-----	-----	11.49
14.60	3.81	86.54	11.24	0.98	-----	-----	11.14	-----	-----	-----	11.06

...End

Record Drawing / Construction Certification Submittal for a BMP

Date: 3/28/03

Inspector:
- ☑ Pat Menichino => Gerry or Beth?
- ☐ Joe Buchite
- ☐ Beth Davis
- ☐ Gerry Lewis
- ☐ Jim Rudnicky
- ☐ Other: _____

Project: WILLIAMSBURG PLANTATION SEC 5
BMP Facility: VDOT FACILITY G
Plan No.: DRY POND
Assigned County BMP ID Code: SP-103-00
PC 175

I have received a transmittal for a ☑ Record Drawing and ☑ Construction Certification for the above referenced facility on MAR 28 2003. Prior to full engineering review of these items and a field inspection, I am first forwarding the items to you to cursory review in case any major field changes were performed that I should be aware of and/or to ensure the record drawing accurately portrays what you saw in the field. Please review the drawing and return to me promptly so I can proceed with the review for certification purposes.

During my review, I will look at issues related to the BMP and its primary inflow and outflow conveyance systems, and may make comment in the following areas: Inspection/Maintenance agreement, Record Drawings (RD), Construction Certification (CC) and Construction-Related (CR) field items as it pertains to the BMP. If you have any other related non-BMP site issues such as site erosion, stabilization, removal of erosion & sediment controls, etc. that are not related to the BMP, you must proceed with closing out these items on your own accord. If needed, I can easily add these items to any comment letter that I may generate the Owner/Engineer for the BMP. Let me know if I need to add items for site issues to my process.

Scott

AsBuilts\Admin\z-inspector

Tom Sublett

253-0040