CERTIFICATE OF AUTHENTICITY

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

BMP NUMBER: **YC031**

DATE VERIFIED: **January 10, 2013**

QUALITY ASSURANCE TECHNICIAN: **Leah Hardenbergh**

Leah Hardenbergh

LOCATION: WILLIAMSBURG, VIRGINIA

Stormwater Division

MEMORANDUM

DATE: March 13, 2010

TO: Michael J. Gillis, Virginia Correctional Enterprises Document Management Services

FROM: Jo Anna Ripley, Stormwater

PO: 270712

RE: Files Approved for Scanning

General File ID or BMP ID: YC031

PIN: 2341200001B

Subdivision, Tract, Business or Owner Name (if known): Colonial Heritage

Property Description: Open Space #1 Phase 1 Section 3A

Site Address:

(For internal use only) **Box** 24 **Drawer:** 9

Agreements: (in file as of scan date) **Y** **Book or Doc#:** 030017308 **Page:** 030000331

Comments

COPY

COUNTY OF JAMES CITY, VIRGINIA

DECLARATION OF COVENANTS

INSPECTION/MAINTENANCE OF DRAINAGE SYSTEM

THIS DECLARATION, made this 4TH day of JUNE, 2003, between COLONIAL HERITAGE LLC, and all successors in interest, ("COVENANTOR(S),") owner(s) of the following property: COLONIAL HERITAGE, PHASE I SECTION 3 & 3A, project name, COLONIAL HERITAGE, Document No. 030000331, Deed Book _____, Page No. _____; 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 # 030017308

Recorded on June 11, 2003

Revised 01/02

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 Michael Gillaas Vice President

ATTEST:

COVENANTOR(S)

Print Name/Title

ATTEST:

COMMONWEALTH OF VIRGINIA
CITY/COUNTY OF James City

I hereby certify that on this 4 day of June, 20 03, before the subscribed, a Notary Public of the State of Virginia, and for the City/County of James City, aforesaid personally appeared Michael Dullard and did acknowledge the aforegoing instrument to be their Act.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal this 4 day of June, 20 03.

Pamela D. Callis
Notary Public

My Commission expires: 8/31/06

PAMELA D. CALLIS
COMMONWEALTH OF VIRGINIA
NOTARY PUBLIC

Approved as to form:

Leo P. Rogers
County Attorney

This Declaration of Covenants prepared by:

Brian J. Rettman
(Print Name)

Construction Manager
(Title)

6895 Richmond Road
(Address)

Williamsburg VA 23188
(City) (State) (Zip)

drainage.pre

ENVIRONMENTAL – STORMWATER TRANSMITTAL

PROTECTING RESOURCES PRIDE IN DELICATE ENVIRONMENTS

James City County Jamestown 1607

COUNTY PLAN NO: S-073-02

BMP ID CODE: YC-031

WATERSHED: Yarmouth Creek

- [x] **ENTIRE RECORD FILE**
- [x] **ASBUILTS**
- [x] **CONSTRUCTION CERTIFICATION**
- [x] **COMPUTATIONS**
- [ ] **OTHER:** _____

NAME: Mike Majdeski

SIGNATURE: Mike P. Maj

DATE: 6/13/2008

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

Project Name: COLONIAL HERITAGE P1 S3 POND 3 2
County Plan No.: S-073-02
Stormwater Management Facility: DRY DETENTION BASIN
BMP Phase #: ☑ I ☐ II ☐ III
☑ Information Package Received. Date/By: 8/27/04 / SJT
☑ Completeness Check:
- ☑ Record Drawing Date/By: 9/12/07 / MM
- ☑ Construction Certification Date/By: 10/20/07 / MM
- ☑ RD/CC Standard Forms (Required for all BMPs after Feb 1st 2001Only)
- ☑ Insp/Maint Agreement # / Date: 03000031 / 6/4/2003
- ☑ BMP Maintenance Plan Location: ON ASBUILT DRAWINGS
- ☐ Other:

☑ Standard E&SC Note on Approved Plan Requiring RD/CC or County comment in plan review
- ☑ Yes ☐ No Location: AS-BUILT DRAWINGS / APPROVED PLAN

☑ Assign **County BMP ID Code #**: Code: YC-031
☑ Preliminary Input/Log into Division's "As-Built Tracking Log"
☐ Add Location to GIS Map. Obtain basic site information (GPIN, Owner, Address, etc.)
☑ Preliminary Log into Access Database (BMP ID #, Plan No., GPIN, Project Name, etc.)
☑ Active Project File Review (correspondence, H&H, design computations, etc.).
☑ Initial As-Built File setup (File label, folder, copy plan/details/design information, etc.).
☑ Inspector Check of RD/CC (forward to Inspector using transmittal for cursory review).
☑ Pre-Inspection Drawing Review of Approved Plan (Quick look prior to Field Inspection).
☑ Final Inspection (FI) Performed Date: 9/13/07
☑ Record Drawing (RD) Review Date: 9/13/07
☑ Construction Certification (CC) Review Date: 9/13/07
☑ Actions:
- ☐ No comments.
- ☑ Comments. Letter Forwarded. Date: 1/22/2007
- ☑ Record Drawing (RD)
- ☑ Construction Certification (CC) – NEEDS OFFICIAL SEALS-OK AS OF 10/5/07
- ☑ Construction-Related (CR)
- ☐ Site Issues (SI)
- ☐ Other :

☑ Second Submission: SEALS OK AS OF 10-5-07
☐ Reinspection (if necessary):
☑ Acceptable for SWM Purposes (RD/CC/CR/Other). Ok to proceed with bond release.
☑ Complete "Surety Request Form".
☑ Check/Clean active file of any remaining material and finish "As-Built" file.
☒ Add to County BMP Inventory/Inspection schedule (Phase I, II or III).
☒ Copy Final Inspection Report into County BMP Inspection Program file.
☑ Obtain Digital Photographs of BMP and save into County BMP Inventory.
☑ Request mylar/reproducible from As-Built plan preparer. 10/16/07 – OK
☑ Complete "As-built Tracking Log".
☐ Last check of BMP Access Database (County BMP Inventory).
☒ Add BMP to JCC Hydrology & Hydraulic database (optional).
☒ Add BMP to Municipal BMP list (if a County-owned facility)
☑ Add BMP to PRIDE BMP ratings database.

Final Sign-Off

Plan Reviewer: [signature] Date: 10/10/07

*** See separate checklist, if needed.

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: Colonial Heritage Phase I - Section 3
Structure/BMP Name: JCC# YC-031 (WEG SWMP #13 - AES BMP# 3.2)
Project Location: Colonial Heritage
BMP Location: Phase I - Section 3
County Plan No.: S-73-02 - SP-104-02 -

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

Tax Map/Parcel No.: (24-3)(1-32)
BMP ID Code (if known): JCC# YC-031
Zoning District: Stonehouse District
Land Use: Mixed Use (MU with proffers)
Site Area (sf or acres): 9.1 Acres

Brief Description of Stormwater Management/BMP Facility: James City County Extended Dry Detention Type F-2

Nearest Visible Landmark to SWM/BMP Facility: Williamsburg Dodge 7277 Richmond Road / Williamsburg Pottery Factory P. O. Box 123 Lightfoot, Va 23090

Nearest Vertical Ground Control (if known):
☒ JCC Geodetic Ground Control ☐ USGS ☐ Temporary ☐ Arbitrary ☐ Other
Station Number or Name:
Datum or Reference Elevation:
Control Description:
Control Location from Subject Facility:

Section 2 – Stormwater Management / BMP Facility Construction Information:

PreConstruction Meeting Held for Construction of SWM/BMP Facility: ☒ Yes ☐ No ☐ Unknown
Approx. Construction Start Date for SWM/BMP Facility: _____
Facility Monitored by County Representative during Construction: ☒ Yes ☐ No ☐ Unknown
Name of Site Work Contractor Who Constructed Facility: Jack L. Massie Contractors
Name of Professional Firm Who Routinely Monitored Construction: ECS, Ltd.
Date of Completion for SWM/BMP Facility: 5/28/04
Date of Record Drawing/Construction Certification Submittal: 8/27/04

(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: U.S. Homes Corp.
Mailing Address: 6895 Richmond Road
Williamsburg, Virginia 23188
Business Phone: 757-258-2705 Fax: 757-258-0516
Contact Person: Mr. Don Fink 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 Consulting Engineers
Mailing Address: 5284 Olde Towne Road
Suite 1
Business Phone: 757-253-0040
Fax: 757-253-8994
Responsible Plan Preparer: George Archer Marston, III, P.E.
Title: Vice President
Plan Name: Colonial Heritage Phase 1- Section 3
Firm's Project No. 8881-09
Plan Date: 8/13/02
Sheet No.'s Applicable to SWM/BMP Facility: 21 / 24 / _____ / _____ / _____

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

Name: Jack L. Massie Contractors
Mailing Address: 3900 Cokes Lane
Williamsburg, VA 23188-7010
Business Phone: (757) 566-8643
Fax: (757) 566-8566
Contact Person: Mr. Steve Massie
Site Foreman/Supervisor: Mr. Scott Massie
Specialty Subcontractors & Purpose (for BMP Construction Only):

Section 4 – Professional Certifications:

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

Record Drawing and Construction Certifications for Stormwater Management / BMP Facilities

Record Drawing Certification

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

Name: George Archer Marston, III, P.E.
Title: Vice President
Signature:
Date: 9/25/07

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

COMMONWEALTH OF VIRGINIA
G. ARCHER MARSTON, III
Lic. No. 018232
9/25/07
PROFESSIONAL ENGINEER

_____ (Seal)

Virginia Registered Professional Engineer
Or Certified Land Surveyor

Construction Certification

Firm Name: ECS, Ltd.
Mailing Address: 108 Ingram Road, Unit 1
Williamsburg, VA 23188
Business Phone: (757) 229-6677
Fax: (757) 229-9978

Name: Michael J. Galli, P.E.
Title: Project Manager
Signature:
Date: 9/28/07

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

COMMONWEALTH OF VIRGINIA
MICHAEL J. GALLI
Lic. No. 030684
9/28/07
PROFESSIONAL ENGINEER

_____ (Seal)

Virginia Registered
Professional Engineer

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

- ❑ PreConstruction Meeting – Provides an opportunity to review SWM / BMP facility construction, maintenance and operation plans and address any questions regarding construction and/or monitoring of the structure. The design engineer, certifying professionals (if different), Owner/Applicant, Contractor and County representative(s) are encouraged to attend the preconstruction meeting. Advanced notice to the Environmental Division is requested. Usually, this requirement can be met simultaneously with Erosion and Sediment Control preconstruction meetings held for the project.

- ❑ A fully completed ***STORMWATER MANAGEMENT / BMP FACILITIES, RECORD DRAWING and CONSTRUCTION CERTIFICATION FORM*** **and** ***RECORD DRAWING CHECKLIST***. All applicable sections shall be completed in their entirety and certification statements signed and sealed by the registered professional responsible for individual record drawing and/or construction certification.

- ❑ The Record Drawing shall be prepared by a Registered Professional Engineer or Certified Land Surveyor for the drainage system of the project including any Best Management Practices.

- ❑ Construction Certification. Construction of Stormwater Management / BMP facilities which contain impoundments, embankments and related engineered appurtenances including subgrade preparation, compacted soils, structural fills, liners, geosynthetics, filters, seepage controls, cutoffs, toe drains, hydraulic flow control structures, etc. shall be visually observed and monitored by a Registered Professional Engineer or his/her authorized representative. The Engineer must certify that the structure, embankment and associated appurtenances were built in accordance with the approved design plan, specifications and stormwater management plan and standard accepted construction practice and shall submit a written certification and/or drawings to the Environmental Division as required. Soil and compaction test reports, concrete test reports, inspection reports, logs and other required construction material or installation documentation may be required by the Environmental Division to substantiate the certification, if specifically requested. The Engineer shall have the authority and responsibility to make minor changes to the approved plan, in coordination with the assigned County inspector, in order to compensate for unsafe or unusual conditions encountered during construction such as those related to bedrock, soils, groundwater, topography, etc. as long as changes do not adversely affect the integrity of the structure(s). Major changes to the approved design plan or structure must be reviewed and approved by the original design professional and the James City County Environmental Division.

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

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

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

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

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

- ❑ Record Drawings shall provide, at a minimum, all information as shown within these requirements and the attached **RECORD DRAWING CHECKLIST** specific to the type of SWM/BMP facility being constructed. Other additional record data may be formally requested by the James City County Environmental Division. *(Note: Refer to the current edition of the James City County Guidelines for Design and Construction of Stormwater Management BMP's manual for a complete list of acceptable BMP's. Currently there are over 20 acceptable water quality type BMP's accepted by the County.)*

- ❑ Record Drawings shall consist of blue/black line prints and a reproducible (mylar, sepia, diazo, etc.) set of the approved stormwater management plan including applicable plan views, profiles, sections, details, maintenance plans, etc. as related to the subject SWM / BMP facility. The set shall indicate "**RECORD DRAWING**" in large text in the lower right hand corner of each sheet with record elevations, dimensions and data drawn in a clearly annotated format and/or boxed beside design values. Approved design plan values, dimensions and data shall not be removed or erased. Drawing sheet revision blocks shall be modified as required to indicate record drawing status. Elevations to the nearest 0.1' are sufficiently accurate except where higher accuracy is needed to show positive drainage. Certification statements as shown in Section 4 of the Record Drawing and Construction Certification Form, ***or similar forms thereof***, and professional signatures and seals, with dates matching that of the record drawing status in the revision or title block, are also required on all associated record drawing plans, prints or reproducibles.

- ❑ Submission Requirements. Initial and subsequent submissions for review shall consist of a minimum of one (1) blue/black line set for record drawings and one copy of the construction certification documents with appropriate transmittal. Under certain circumstances, it is understood that the record drawing and construction certification submissions may be performed by different professional firms. Therefore, record drawing submission may be in advance of construction certification or vice versa. Upon approval and prior to release of bond/surety, final submission shall include one (1) reproducible set of the record drawings, one (1) blue/black line set of the record drawings and one (1) copy of the construction certification. Also for current and/or future incorporation into the County BMP database and GIS system, it is requested that the record drawings also be submitted to the Environmental Division on a diskette or CD-ROM in an acceptable electronic file format such as *.dxf, *.dwg, etc. or in a standard scanned and readable format. The electronic file requirement can be discussed and coordinated with Environmental Division staff at the time of final submission.

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

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

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

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

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

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

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

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

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

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

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.
XX	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.
Inc	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.**
Inc	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.
XX	17.	BMP interior and periphery landscaping zones conform with arrangements and requirements of the approved design plan.
XX	18.	Maintenance plan taken from approved design plan transposed onto record drawing set.
N/A	19.	Fencing location and type, if applicable to facility.
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)

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

N/A A1. All requirements of Section II, Minimum Standards, apply to Group A facilities.

N/A A2. Principal spillway consists of reinforced concrete pipe with O-Ring gaskets for watertight joint construction.

N/A A3. Sediment forebays or pretreatment devices provided at inlets to pond. Generally 4 to 6 ft. deep.

N/A A4. Access for maintenance and equipment is provided to the forebay(s). Access corridors are at least 12 ft. wide, have a maximum slope of 15 percent and are adequately stabilized to withstand heavy equipment or vehicle use.

N/A A5. Adequate fixed vertical sediment depth markers installed in the forebay(s) for future sediment monitoring purposes.

N/A A6. Pond liner (if required) provided. Either clay liners, polyliners, bentonite liners or use of chemical soil additives based on requirements of the approved plan.

N/A A7. Minimum 6 percent slope safety bench extending a minimum of 15 feet outward from normal pool edge and/or an aquatic bench extending a minimum of 10 feet inward from the normal shoreline with a maximum depth of 12 inches below the normal pool elevation, if applicable, per the approved design plans. (Note: Safety benches may be waived if pond side slopes are no steeper than 4H:1V).

N/A A8. No trees are present within a zone 15 feet around the embankment toe and 25 feet from the principal spillway structure.

N/A A9. Wet permanent pool, typically 3 to 6 feet deep, is provided and maintains level within facility.

N/A A10. Low flow orifice has a non-clogging mechanism.

N/A A11. A pond drain pipe with valve was provided.

N/A A12. Pond side slopes are not steeper than 3H:1V, unless approved plan allowed for steeper slope.

N/A A13. End walls above barrels (outlet pipe) greater than 48 inch in diameter are fenced to prevent a fall hazard.

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

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

N/A B1. Same requirements as Group A Wet Ponds.

N/A B2. Minimum 2:1 length to width flow path provided across the facility.

N/A B3. Micropool provided at or around outlet from BMP (generally 3 to 6 ft. deep).

N/A B4. Wetland type landscaping provided in accordance with approved plan. Includes correct pondscaping zones, plant species, planting arrangements, wetland beds, etc. Wetland plants include 5 to 7 emergent wetland species. Individual plants at 18 inches on center in clumps.

N/A B5. Adequate wetland buffer provided (Typically 25 ft. outward from maximum design water surface elevation and 15 ft. setback to structures).

N/A B6. No more than one-half (½) of the wetland surface area is planted.

N/A B7. Topsoil or wetland mulch provided to support vigorous growth of wetland plants.

N/A B8. Planting zones staked or flagged in field and locations subsequently established by appropriate field surveying methods for record drawing presentation.

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

V. Group C – Infiltration Practices *(Includes C-1 Infiltration Trench; C-2 Infiltration Trench; C-3 Infiltration Basin; and C-4 Infiltration Basin)*

N/A C1. All requirements of Section II, Minimum Standards, apply to Group C facilities as applicable.

N/A C2. Facility is not located on fill slopes or on natural ground in excess of six (6) percent.

N/A C3. Pretreatment devices provided prior to entry into the infiltration facility. Acceptable pretreatment devices include sediment forebays, sediment basins, sediment traps, sump pits or inlets, grass channels, plunge pools or other acceptable measures.

N/A C4. Three (3) or more of the following pretreatment devices provided to protect long term integrity of structure: grass channel; grass filter strip; bottom sand layer; upper filter fabric layer; use of washed bank run gravel aggregate.

N/A C5. Sides of infiltration practice lined with filter fabric.

N/A C6. Facility was not used for erosion and sediment control purposes and sediment was prevented from entering the facility to the greatest extent possible during construction.

N/A C7. Stabilization and acceptable vegetative cover established over contributing drainage area prior to conveyance of stormwater to the facility.

N/A C8. Minimum one hundred (100) foot separation horizontally from any known water supply well and minimum one hundred (100) foot separation upslope from any building.

N/A C9. Minimum twenty-five (25) foot separation down gradient from any structure.

N/A C10. Stormwater outfalls provided for overflow associated with larger design storms.

N/A C11. No visual signs of erosion or channel degradation immediately downstream of facility.

N/A C12. Facility does not currently cause any apparent surface or subsurface water problems to downgrade properties.

N/A C13. Observation well provided.

N/A C14. Adequate, direct access provided to the facility for future maintenance, operation and inspection.

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

VI. Group D – Filtering Systems *Includes D-1 Bioretention Cells; D-2 Surface Sand Filters; D-3 Underground Sand Filters; D-4 Perimeter Sand Filters; D-5 Organic Filters; and D-6 Pocket Sand Filters)*

N/A D1. All requirements of Section II, Minimum Standards, apply to Group D facilities.

N/A D2. Sediment pretreatment devices provided.

N/A D3. For D-1 BMPs (Bioretention Cells), pretreatment consisting of a grass filter strip below level spreader (deflector); a gravel diaphragm; and mulch and planting soil layers were provided.

N/A D4. For D-1 BMPs (Bioretention Cells), plantings consist of native plant species; vegetation provided was based on zones of hydric tolerances; trees and understory of shrubs and herbaceous materials were provided; woody vegetation is absent from inflow locations; and trees are located around facility perimeter.

N/A D5. Facility was not used for erosion and sediment control purposes and sediment was prevented from entering the facility to the greatest extent possible during construction.

N/A D6. No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed.

N/A D7. Filtering system is off-line from storm drainage conveyance system.

N/A D8. Overflow outlet has adequate erosion protection.

N/A D9. Deflector, diversion, flow splitter or regulator structure provided to divert the water quality volume to the filtering structure.

N/A D10. Minimum four (4) inch perforated underdrain provided in a clean aggregate envelope layer beneath the facility.

N/A D11. Minimum fifty (50) foot separation from any slope fifteen (15) percent or greater. Minimum one hundred (100) foot separation horizontally from any known water supply well. Minimum one hundred (100) foot separation upslope and twenty-five (25) foot separation downslope from any building.

N/A D12. Stabilization and acceptable vegetative cover established over contributing drainage area prior to conveyance of stormwater to the facility.

N/A D13. No visual signs of erosion or channel degradation immediately downstream of facility.

N/A D14. Adequate, direct access provided to the pretreatment area and/or filter bed for future maintenance.

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

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

N/A E1. All requirements of Section II, Minimum Standards, apply to Group E facilities as applicable.

N/A E2. Open channel system has constructed longitudinal slope of less than four (4) percent.

N/A E3. No visual signs of erosion in the open channel system's soil and/or vegetative cover.

N/A E4. Open channel side slopes are no steeper than 2H:1V at any location. Preferred channel sideslope is 3H:1V or flatter.

N/A E5. No visual signs of ponding are present at any location in the open channel system, except at rock check dam locations for E-1 systems (Wet Swales).

N/A E6. For E-2 BMPs (Dry Swales), an underdrain system was provided.

N/A E7. Treated timber or rock check dams provided as pretreatment devices for the open channel system.

N/A E8. Gravel diaphrahm provided in areas where lateral sheet flow from impervious surgaces are directly connected to the open channel system.

N/A E9. Grass cover/stabilization in the open channel system appears adaptable to the specific soils and hydric conditions for the site and along the channel system.

N/A E10. Open channel system areas with grass covers higher than four (4) to six (6) inches were properly mowed.

N/A E11. Facility was not used for erosion and sediment control purposes and sediment was prevented from entering the facility to the greatest extent possible during construction.

N/A E12. No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed and no adverse affects to the function of the facility are anticipated.

N/A E13. For E-3 BMPs (Biofilters), the bottom width is six (6) feet maximum at any location.

N/A E14. For E-3 BMPs (Biofilters), sideslopes are 3H:1V maximum at any location.

N/A E15. For E-3 BMPs (Biofilters), the constructed channel slope is less than or equal to three (3) percent at any location.

N/A E16. For E-3 BMPs (Biofilters), the constructed grass channel is approximately equivalent to the constructed roadway length.

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

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

XX	F1.	All requirements of Section II, Minimum Standards, apply to Group F facilities.
XX	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.)
XX	F4.	Forebay provided approximately 20 ft. upstream of the facility. Forebays generally 4 to 6 feet in depth.
XX	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.
XX	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.
XX	F16.	No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed and no adverse affects to the function of the facility are anticipated.

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

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

XX G1. All requirements of Section II, Minimum Standards, apply to Group G facilities as applicable.

XX G2. Constructed impervious areas appear to conform with locations indicated on the approved plan and appear less than sixty (60) percent impervious in accordance with the requirements of the James City County Chesapeake Bay Preservation Ordinance.

XX G3. Dedicated open space areas are in undisturbed common areas, conservation easements or are protected by other enforceable instruments that ensures perpetual protection.

XX G4. Provisions included to clearly specify how the natural vegetated areas utilized as dedicated open space will be managed and field identified (marked).

XX G5. Adequate protection measures were implemented during construction to protect the defined dedicated open space areas.

XX G6. Dedicated open space areas were not disturbed during construction (ie. cleared, grubbed or graded).

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

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

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

XX SD1. All requirements of Section II, Minimum Standards, apply to Storm Drainage Systems.

XX SD2. Horizontal location of all pipe and structures relative to the SWM/BMP facility.

XX SD3. Type, top elevation and invert elevation of all access type structures (inlets, manholes, etc.).

XX SD4. Material type, size or diameter, class, invert elevations, lengths and slopes for all pipe segments.

XX SD5. Class, length, width and depth of riprap and outlet protections or dimensions of special energy dissipation structures.

XII. Other Systems

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

N/A O1. All requirements of Section II, Minimum Standards, apply to this section.

N/A O2. Certification criteria to be determined on a case-by-case basis by the Environmental Division specific to the proposed SWM/BMP facility.

STORMWATER MANAGEMENT / BMP FACILITIES
RECORD DRAWING CHECKLIST

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

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

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James City County, Virginia
Environmental Division

Stormwater Management / BMP Facilities Record Drawing and Construction Certification

Standard Forms & Instructions

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Issue Date
February 1, 2001

Colonial Heritage
Phase 1, Section 3

Colonial Heritage

BMP 3.2
As-Built Report

James City County Environmental

June 13, 2006

RECEIVED
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ENVIRONMENTAL DIVISION

S-73-02 YC030 #12 3.1
YC031 #13 3.2

RECORD DRAWING–5/21/04

No.	DATE	REVISION / COMMENT / NOTE	BY
7	5/21/04	RECORD DRAWING (BMPS)	JFS

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ENVIRONMENTAL DIVISION

COMMONWEALTH OF VIRGINIA
G. ARCHER MARSTON, III
No. 016232
7/31/04
REGISTERED PROFESSIONAL ENGINEER

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

DRAINAGE, GRADING AND EROSION-SEDIMENT CONTROL PLAN PHASE I, SECTION 3 & 3A COLONIAL HERITAGE

OWNER/DEVELOPER: COLONIAL HERITAGE LLC

STONEHOUSE — JAMES CITY COUNTY — VIRGINIA

Designed HWP/RDS	Drawn RMS/HEB
Scale 1"=30'	Date 8/13/02
Project No. 8881-09	
Drawing No. 18	

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No.	DATE	REVISION / COMMENT / NOTE	BY
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5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(757) 253-0040
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CONSULTING ENGINEERS

DRAINAGE, GRADING AND EROSION-SEDIMENT CONTROL PLAN PHASE I, SECTION 3 & 3A COLONIAL HERITAGE

OWNER/DEVELOPER: COLONIAL HERITAGE LLC

STONEHOUSE — JAMES CITY COUNTY — VIRGINIA

Designed	Drawn
HWP/RDS	RMS/HEB
Scale	Date
1"=30'	8/13/02

Project No. 8881-09

Drawing No. 19

RECORD DRAWING–5/21/04

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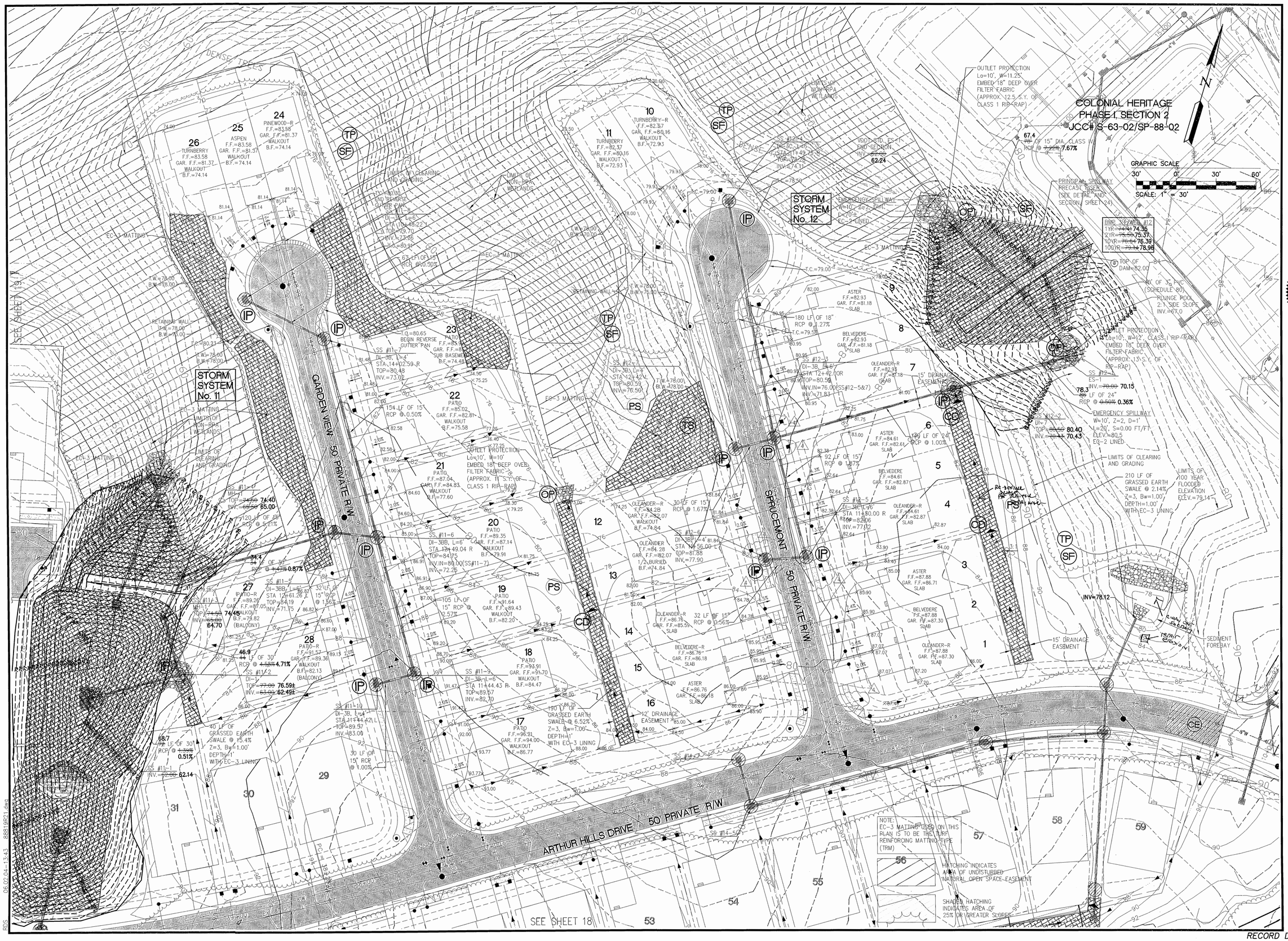

No.	DATE	REVISION / COMMENT / NOTE	BY
7	5/21/04	RECORD DRAWING (BMPS)	JFS

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

COMMONWEALTH OF VIRGINIA
G. ARCHER MARSTON, III
No. 018232
1/29/04
PROFESSIONAL ENGINEER

DRAINAGE, GRADING AND EROSION-SEDIMENT CONTROL PLAN PHASE I, SECTION 3 & 3A COLONIAL HERITAGE

OWNER/DEVELOPER: COLONIAL HERITAGE LLC

STONEHOUSE — JAMES CITY COUNTY — VIRGINIA

Designed	Drawn
HWP/RDS	RMS/HEB
Scale	Date
1"=30'	8/13/02
Project No.	
8881-09	
Drawing No.	
21	

RECORD DRAWING-5/21/04

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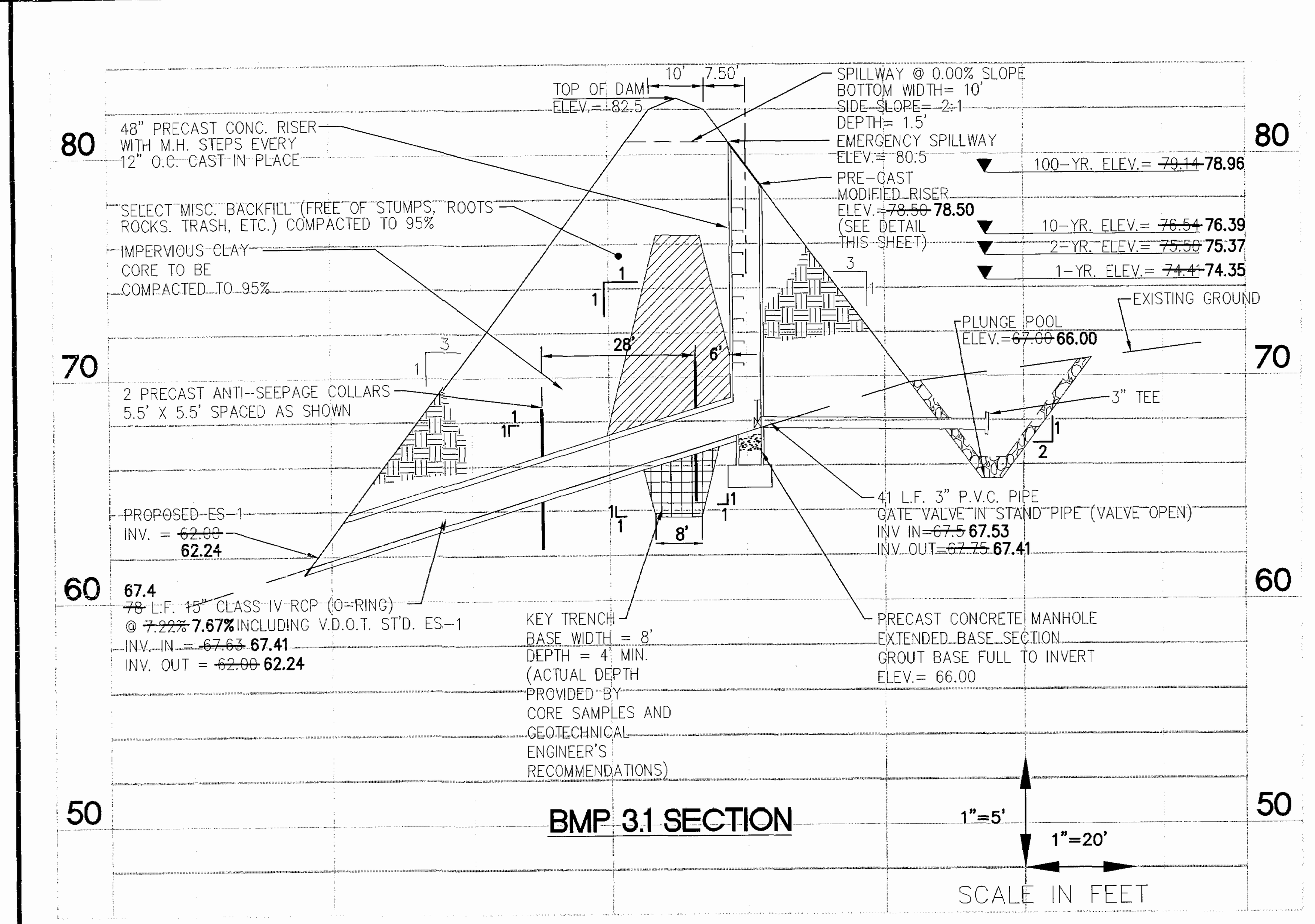
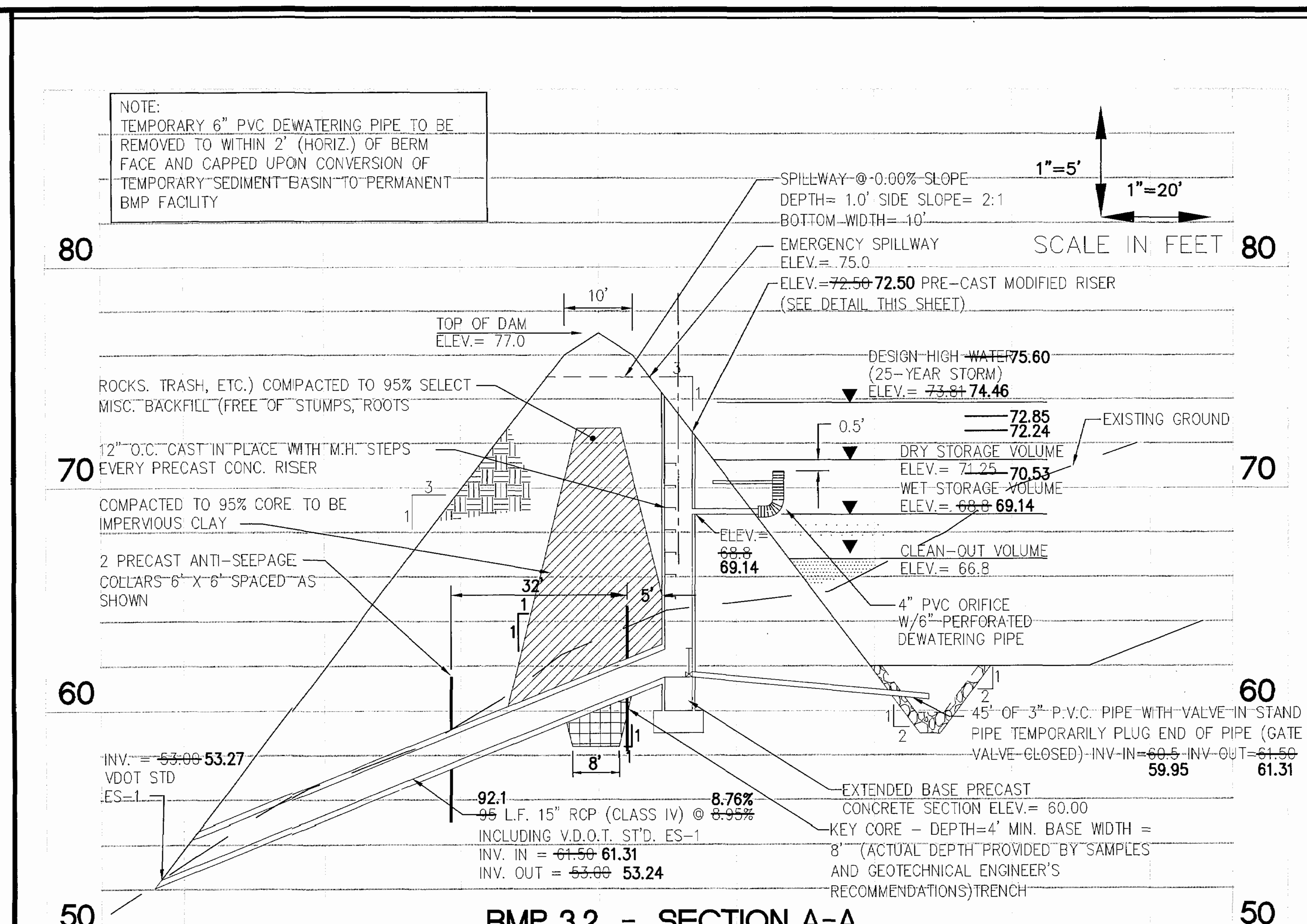


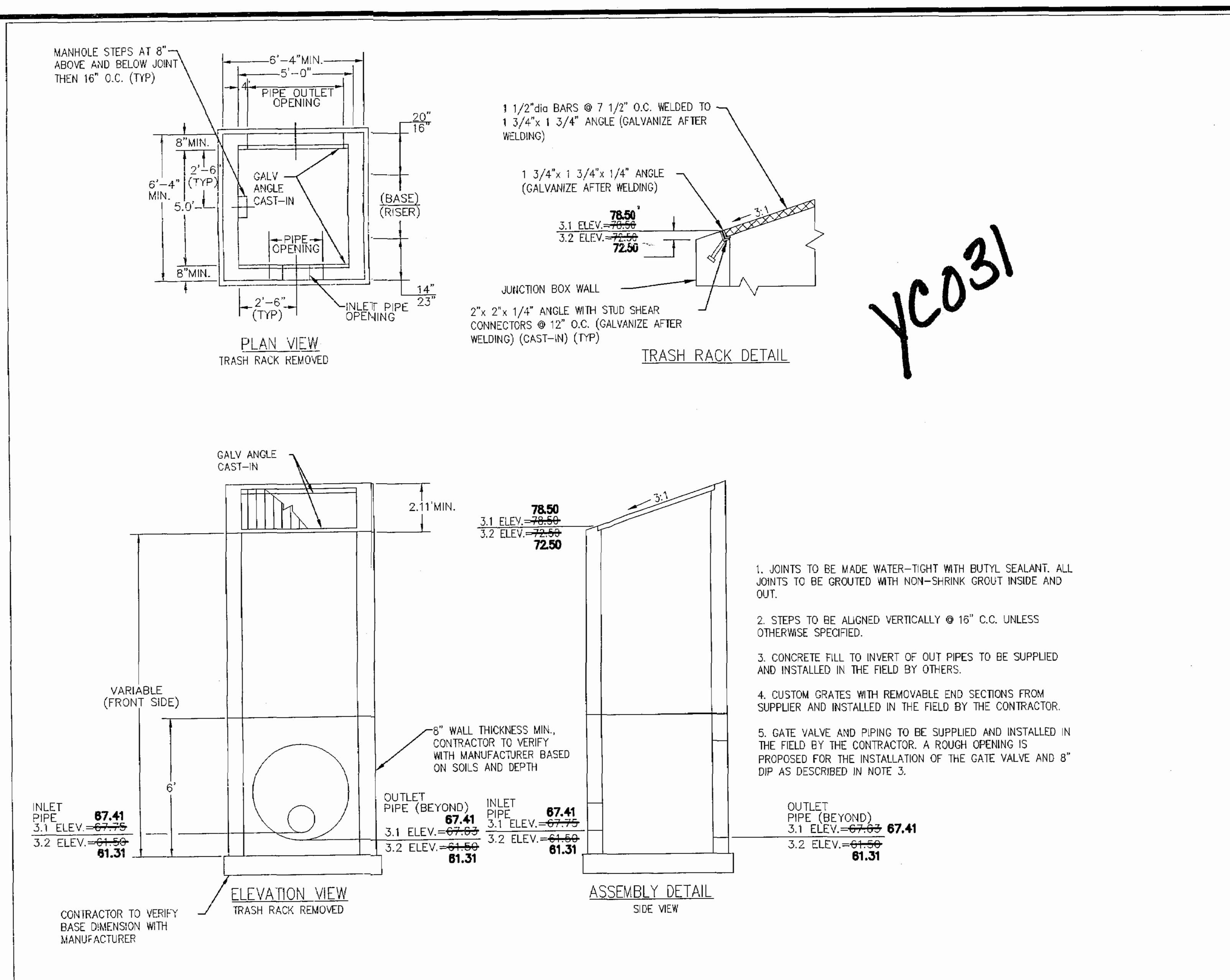
BMP 3.1 SECTION



BMP 3.2 - SECTION A-A

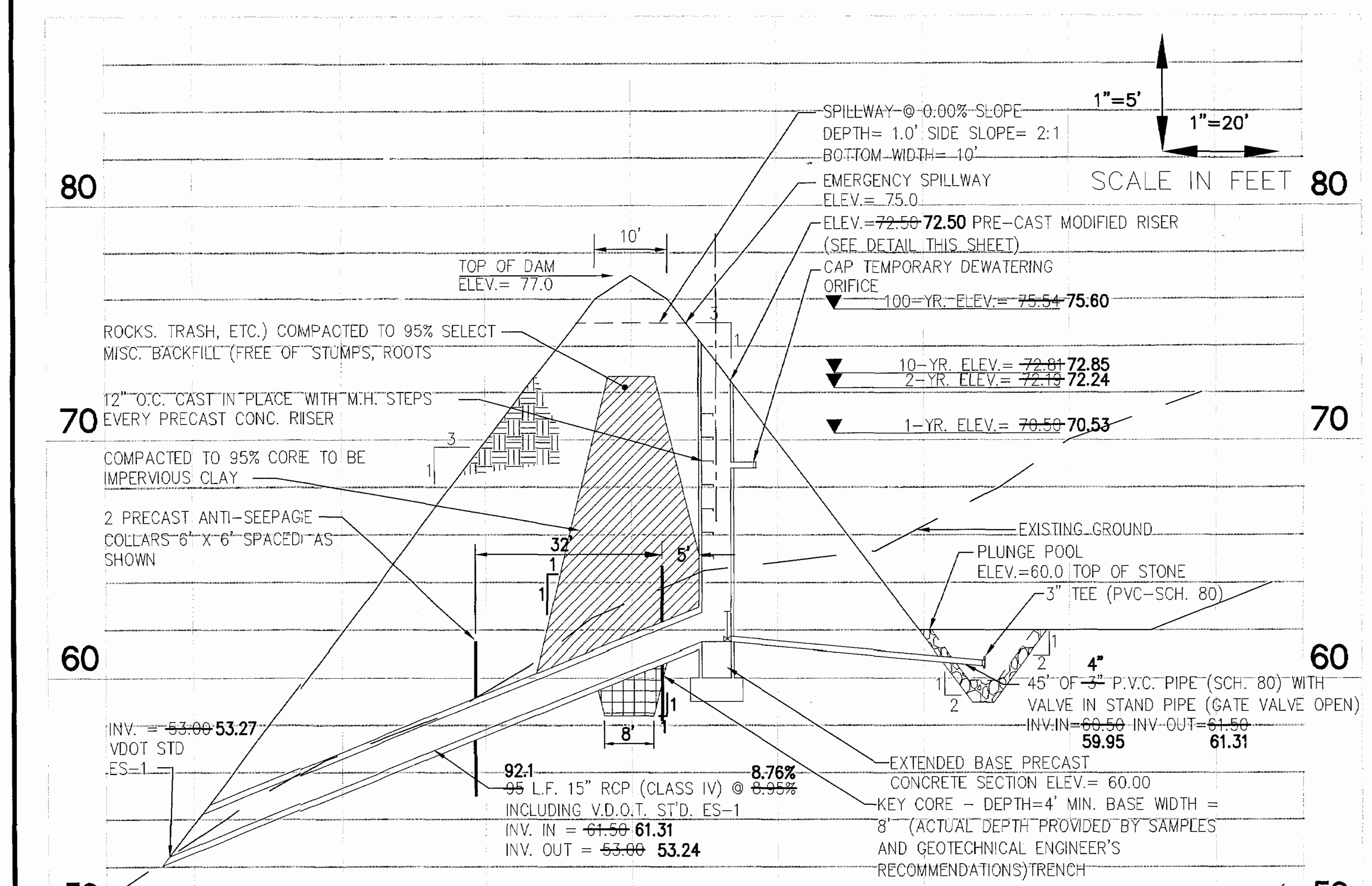
TEMPORARY SEDIMENT BASIN

NOT TO SCALE



PRE-CAST MODIFIED RISER

NOT TO SCALE



BMP 3.2 - SECTION A-A

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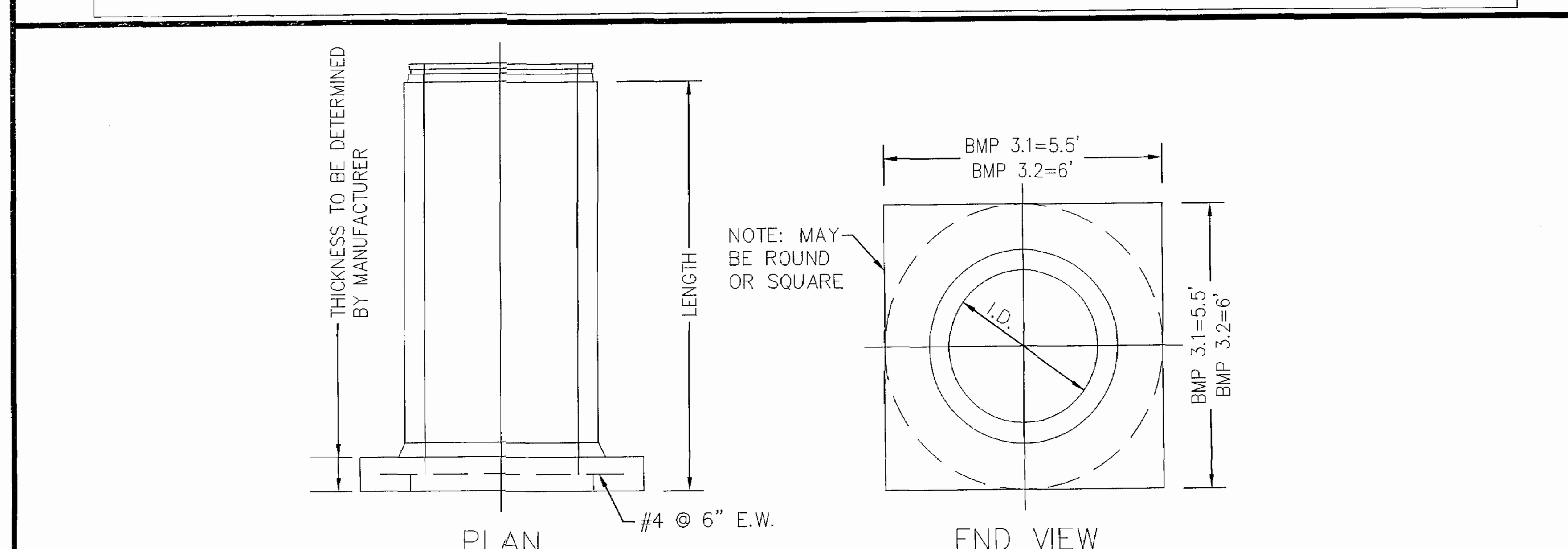

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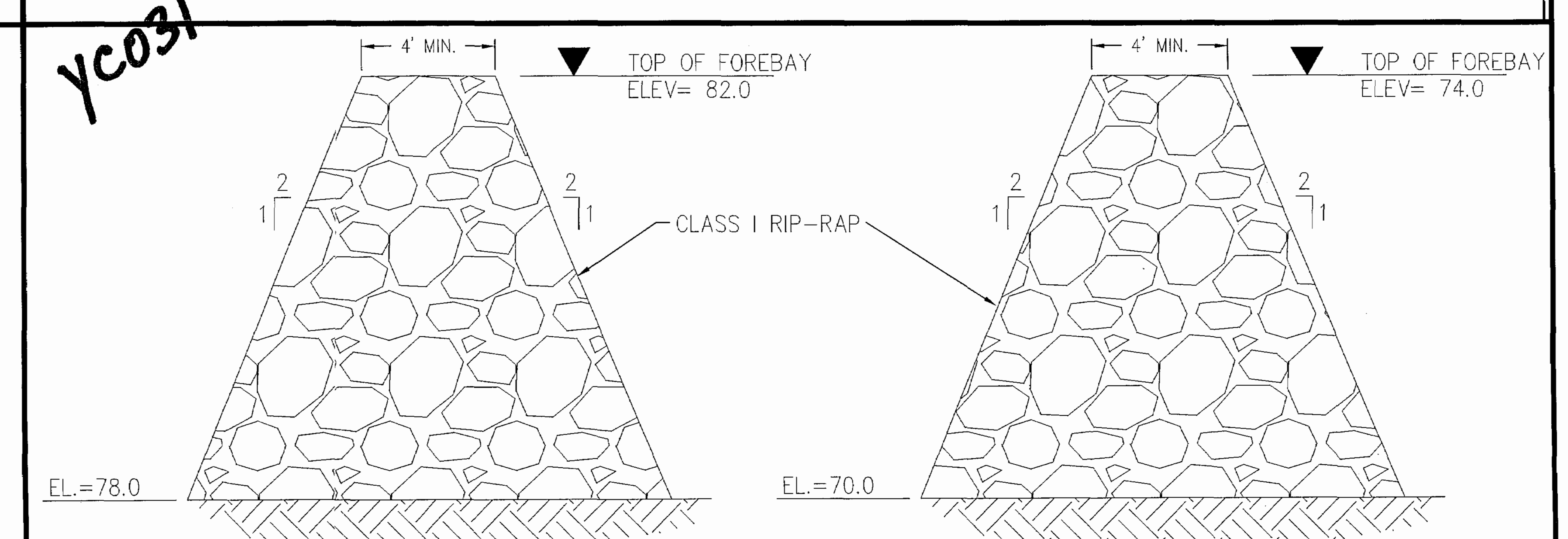
PRE-CAST CONCRETE ANTI-SEEP COLLAR

N.T.S.



SEDIMENT FOREBAY BMP 3.1 SECTION

N.T.S.

SEDIMENT FOREBAY BMP 3.2 SECTION

N.T.S.

STORMWATER MANAGEMENT/ BMP FACILITY MAINTENANCE PLAN

PROPER MAINTENANCE OF THIS FACILITY IS ENCOURAGED TO PREVENT THE INTRODUCTION OF DEBRIS AND SEDIMENT IN TO THE FACTILITY, 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 OF THESE NEWLY DISTRIBUTED AREAS AS WELL AS INSPECTIONS FOR ACCUMULATED SEDIMENTS AT TWO BMP FACILITY.

A DESIGNATED REPRESENTATIVE OF THE OWNER WILL INSPECT THE BMP 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. 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. SEDIMENT REMOVAL IS REQUIRED USING A RUBBER-WHEELED BACKHOE. AT THE SAME TIME, OR AT LEAST ONCE PER YEAR, THE RISER BOTTOM AND OUTLET PIPE SHALL BE CLEANED OF ACCUMULATED SEDIMENTS. DISPOSE OF SEDIMENTS REMOVED FROM THE FACILITY AT AN ACCEPTABLE DISPOSAL AREA. SEDIMENT SHALL NOT BE ALLOWED TO ACCUMULATE IN DEPTHS GREATER THAN 1-FOOT. NO SEDIMENT SHALL BE ALLOWED TO ACCUMULATE TO PREVENT THE PROPER FUNCTION OF ANY PIPE OR CULVERT.

2. PERFORM MAINTENANCE MOWING OF GRASSED AREAS 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 BMP 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 BMP AREAS, IF VEGETATION COVERS LESS THAN 40% OF SOIL SURFACES, LIME, FERTILIZE AND SEIED 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 RELEASE STRUCTURES, 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. DURING QUARTERLY INSPECTIONS, THE POND DRAIN VALVE, USUALLY LEFT IN THE VALVE "CLOSED" POSITION, SHALL BE INSPECTED AND OPERATED THROUGH TWO COMPLETE FULL-OPEN TO FULL--CLOSE TO FULL-OPEN CYCLES.

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 CONTINUED INTEGRITY OF THE STRUCTURE.

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

8. RECORD KEEPING. THE LANDOWNER OR DESIGNATED REPRESENTATIVE SHALL KEEP REASONABLE, ACCURATE WRITTEN RECORDS OF INSPECTIONS PERFORMED ON THE STRUCTURE. RECORDS SHALL DOCUMENT ROUTINE MAINTENANCE AND/ 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.

GENERAL NOTES FOR CONSTRUCTION OF STORMWATER BASINS

1. THE CONTRACTOR SHALL PROVIDE ALL WORK AND MATERIALS NEEDED TO CONSTRUCT THE STORMWATER BASIN, STORMWATER MANAGEMENT PONDS, BEST MANAGEMENT PRACTICES, SEDIMENT BASINS AND SEDIMENT TRAPS. THE WORK SHALL INCLUDE ALL LABOR, MATERIALS, EQUIPMENT AND MATERIALS NEEDED FOR THE COMPLETION OF GRADING AND EARTHWORK ASSOCIATED WITH THE CONSTRUCTION.

2. THE CONTRACTOR SHALL CONSULT AND PROVIDE FOR THE SERVICES OF A GEOTECHNICAL ENGINEER. THE GEOTECHNICAL ENGINEER SHALL PROVIDE TEST RESULTS ON PLACED DAM MATERIALS, IDENTIFYING SOIL CLASSIFICATION, PERMEABILITY, PLASTICITY INDEX, AND COMPACTION. ALL TESTS SHALL BE IN CONFORMANCE WITH ASTM STANDARDS. THE COST OF THE SERVICES OF THE GEOTECHNICAL ENGINEER SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. SATISFACTORY GEOTECHNICAL RESULTS ARE NEEDED PRIOR TO FINAL APPROVAL.

3. ALL INSPECTIONS REQUIRED FOR THE WORK SHALL BE PERFORMED BY A GEOTECHNICAL ENGINEER AT THE EXPENSE OF THE GENERAL CONTRACTOR.

4. ON-SITE EXCAVATED MATERIAL, IF DETERMINED SUITABLE FOR USE IN DAM CONSTRUCTION BY A GEOTECHNICAL ENGINEER, MAY BE USED FOR DAM CONSTRUCTION. SHOULD ADDITIONAL MATERIAL BE REQUIRED, THE CONTRACTOR SHALL IDENTIFY THE NEED FOR MATERIAL TO THE OWNER, AS ADDITIONAL BORROW MATERIAL MAY BE AVAILABLE ON THE PROPERTY. ALL EXCAVATED MATERIAL DETERMINED BY THE GEOTECHNICAL ENGINEER TO BE UNSUITABLE SHALL BE DISPOSED OF PROPERLY AT THE CONTRACTOR'S EXPENSE. ALL EXCAVATED MATERIAL NOT REQUIRED FOR BACKFILLING SHALL EITHER BE DEPOSITED ON SITE AND SPREAD BY THE CONTRACTOR, OR SHALL BE DEPOSITED IN AN AREA ON THE PROPERTY AS DIRECTED BY THE OWNER. THE CONTRACTOR SHALL PROVIDE PROPER STABILIZATION, AND EROSION AND SEDIMENT CONTROL MEASURES NEEDED TO CONTROL AS PER THE VESCH THIRD EDITION.

5. UNDERCUT FOR THE FOUNDATION OF THE DAM EMBANKMENT SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEER'S RECOMMENDATION. THE FOUNDATION SHALL BE BACKFILLED WITH SOILS CLASSIFIED AS SM, SC, OR CL UNDER THE UNIFIED SOIL CLASSIFICATION SYSTEM. SOILS SHALL HAVE A MINIMUM OF 15% BY WEIGHT FINES, HAVING A PLASTICITY INDEX OF 30% AND A PERMEABILITY OF 0.0004 IN./SEC. OR LESS. FILL SHALL BE COMPACTED IN 12-INCH LIFTS, OR AS DIRECTED BY THE GEOTECHNICAL ENGINEER, TO A DRY DENSITY OF 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D-698). EXCAVATION FOR THE DAM KEY SHALL BE IN ACCORDANCE TO THE GEOTECHNICAL ENGINEER'S RECOMMENDATION. HEIGHT, DEPTH, AND WIDTH OF THE KEY SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS. THE KEY SHALL BE FORMED USING SOILS CLASSIFIED AS SC OR CL, WITH A PERMEABILITY OF 0.0004 IN./SEC. OR LESS.

6. THE DAM CORE SHALL BE AS CONSTRUCTED WITH NON-EXPANSIVE SC OR CL CLAYEY MATERIAL WITH PERMEABILITY OF 0.0004 IN./SEC. OR LESS. THE FILL OF THE CORE SHALL BE MADE IN 12-INCH LIFTS, OR AS DIRECTED BY THE GEOTECHNICAL ENGINEER, TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D-698). SIZE, SHAPE, WIDTH, DEPTH, AND HEIGHT OF THE DAM CORE SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS. TO COVER THE DAM CORE, A SILTY FINE SAND OR CLAYEY SOIL (SM, SC, OR CL) SHALL BE PLACED. A VEGETATIVE COVER USING VDOT EC-2 EROSION CONTROL BLANKETS SHALL BE PLACED ON DAM SLOPES AND CREST TO PREVENT EROSION.

7. THE STORMWATER MANAGEMENT / BMP FACILITIES SHOWN ON THESE PLANS REQUIRE THE SUBMISSION, REVIEW AND APPROVAL OF RECORD DRAWING(S) AND CONSTRUCTION CERTIFICATION PRIOR TO RELEASE OF THE POSTED BOND / SURETY. THE GEOTECHNICAL ENGINEER IS TO ENSURE THAT HIS / HER INSPECTION OF THE SWM / BMP CONSTRUCTION ACTIVITY IS PERFORMED DURING AND FOLLOWING CONSTRUCTION OF THE SWM / BMP IN ACCORDANCE WITH THE JAMES CITY COUNTY ENVIRONMENTAL DIVISION STORMWATER MANAGEMENT / BMP FACILITIES, RECORD DRAWING AND CONSTRUCTION CERTIFICATION, STANDARD FORMS AND INSTRUCTIONS.

8. THE CONTRACTOR SHALL PROVIDE INTERIM CERTIFICATION OF TEMPORARY SEDIMENT BASIN IN ACCORDANCE WITH SECTION 5 OF THE JAMES CITY COUNTY ENVIRONMENTAL DIVISION STORMWATER MANAGEMENT / BMP FACILITIES, RECORD DRAWING AND CONSTRUCTION CERTIFICATION, STANDARD FORMS AND INSTRUCTIONS.

No.	DATE	REVISION / COMMENT / NOTE	BY
7	5/21/04	RECORD DRAWING (BMPS)	JFS

COMMONWEALTH OF VIRGINIA — G. ARCHER MARSTON, III — No. 018232 — 7/29/04 — PROFESSIONAL ENGINEER

AES CONSULTING ENGINEERS

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

STORMWATER MANAGEMENT SECTIONS AND NOTES
PHASE I, SECTION 3 & 3A
COLONIAL HERITAGE
OWNER/DEVELOPER: COLONIAL HERITAGE LLC
STONEHOUSE — JAMES CITY COUNTY — VIRGINIA

Designed	Drawn
JAG	ARH
Scale	Date
NONE	8/13/02

Project No. 8881-09

Drawing No. 24

RECORD DRAWING-5/21/04

YC031

S:\Jobs\8881\09-Phase 1 Section 3\dwg\Cad\AS-BUILTS\BMP As-built\8881-9R24.dwg, 7/6/2006 1:20:32 PM, hwb

YC031_COLONIAL_HERITAGE_P1_S3_DRY_POND - 029

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	-------	3.21	5.93	-------	-------	9.22	16.81	-------	28.82	SEDIMENT BASIN 3.2 - PRE-DEV
3	SCS Runoff	-------	14.98	21.30	-------	-------	28.25	42.53	-------	63.05	SEDIMENT BASIN 3.2 - POST-DEV
10	Reservoir	3	0.73	4.57	-------	-------	12.76	20.68	-------	40.54	BMP 3.2 POST-DEV. RTD.

Proj. file: SED-BSN-3.2 AS-BUILT 6-13-04.gpw | Tuesday, Jun 13 2006, 1:50 PM

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	3.21	2	724	10,606	----	------	------	SEDIMENT BASIN 3.2 - PRE-DEV
3	SCS Runoff	14.98	2	724	46,965	----	------	------	SEDIMENT BASIN 3.2 - POST-DEV
10	Reservoir	0.73	2	858	44,341	3	72.34	43,308	BMP 3.2 POST-DEV. RTD.

SED-BSN-3.2 AS-BUILT 6-13-04.gpw Return Period: 1 Year | Tuesday, Jun 13 2006, 1:50 PM

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	5.93	2	724	17,894	----	------	------	SEDIMENT BASIN 3.2 - PRE-DEV
3	SCS Runoff	21.30	2	724	66,607	----	------	------	SEDIMENT BASIN 3.2 - POST-DEV
10	Reservoir	4.57	2	746	63,984	3	72.92	49,203	BMP 3.2 POST-DEV. RTD.

SED-BSN-3.2 AS-BUILT 6-13-04.gpw Return Period: 2 Year | Tuesday, Jun 13 2006, 1:50 PM

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	9.22	2	724	26,860	----	------	------	SEDIMENT BASIN 3.2 - PRE-DEV
3	SCS Runoff	28.25	2	724	88,607	----	------	------	SEDIMENT BASIN 3.2 - POST-DEV
10	Reservoir	12.76	2	738	85,984	3	73.41	54,773	BMP 3.2 POST-DEV. RTD.

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	28.82	2	722	80,794	----	------	------	SEDIMENT BASIN 3.2 - PRE-DEV
3	SCS Runoff	63.05	2	724	203,649	----	------	------	SEDIMENT BASIN 3.2 - POST-DEV
10	Reservoir	40.54	2	734	201,025	3	75.80	86,700	BMP 3.2 POST-DEV. RTD.

SED-BSN-3.2 AS-BUILT 6-13-04.gpw Return Period: 100 Year Tuesday, Jun 13 2006, 1:50 PM

Pond Report

Hydraflow Hydrographs by Intelisolve — Tuesday, Jun 13 2006, 1:50 PM

Pond No. 1 - SEDIMENT BASIN 3.2

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	60.00	00	0	0
1.00	61.00	81	41	41
2.00	62.00	387	234	275
3.00	63.00	808	598	872
4.00	64.00	1,314	1,061	1,933
5.00	65.00	1,900	1,607	3,540
6.00	66.00	2,555	2,228	5,768
7.00	67.00	3,307	2,931	8,699
8.00	68.00	4,329	3,818	12,517
9.00	69.00	5,394	4,862	17,378
10.00	70.00	6,827	6,111	23,489
11.00	71.00	8,149	7,488	30,977
12.00	72.00	9,501	8,825	39,802
13.00	73.00	10,918	10,210	50,011
14.00	74.00	12,396	11,657	61,668
15.00	75.00	13,967	13,182	74,850
16.00	76.00	15,656	14,812	89,661

Culvert / Orifice Structures

	[A]	[B]	[C]	[D]
Rise (in)	= 15.00	4.00	0.00	0.00
Span (in)	= 15.00	4.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 61.31	69.14	0.00	0.00
Length (ft)	= 92.10	45.00	0.00	0.00
Slope (%)	= 8.76	0.00	0.00	0.00
N-Value	= .013	.013	.000	.000
Orif. Coeff.	= 0.60	0.60	0.00	0.00
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 4.13	10.00	0.00	0.00
Crest El. (ft)	= 72.50	75.00	0.00	0.00
Weir Coeff.	= 3.33	2.60	0.00	0.00
Weir Type	= Riser	Broad	---	---
Multi-Stage	= Yes	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice 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	Exfil cfs	Total cfs
0.00	0	60.00	0.00	0.00	---	---	0.00	0.00	---	---	---	0.00
1.00	41	61.00	0.00	0.00	---	---	0.00	0.00	---	---	---	0.00
2.00	275	62.00	0.00	0.00	---	---	0.00	0.00	---	---	---	0.00
3.00	872	63.00	0.00	0.00	---	---	0.00	0.00	---	---	---	0.00
4.00	1,933	64.00	0.00	0.00	---	---	0.00	0.00	---	---	---	0.00
5.00	3,540	65.00	0.00	0.00	---	---	0.00	0.00	---	---	---	0.00
6.00	5,768	66.00	0.00	0.00	---	---	0.00	0.00	---	---	---	0.00
7.00	8,699	67.00	0.00	0.00	---	---	0.00	0.00	---	---	---	0.00
8.00	12,517	68.00	0.00	0.00	---	---	0.00	0.00	---	---	---	0.00
9.00	17,378	69.00	0.00	0.00	---	---	0.00	0.00	---	---	---	0.00
10.00	23,489	70.00	0.35	0.35	---	---	0.00	0.00	---	---	---	0.35
11.00	30,977	71.00	0.56	0.55	---	---	0.00	0.00	---	---	---	0.55
12.00	39,802	72.00	0.70	0.69	---	---	0.00	0.00	---	---	---	0.69
13.00	50,011	73.00	5.67	0.81	---	---	4.86	0.00	---	---	---	5.67
14.00	61,668	74.00	20.02	0.32	---	---	19.70	0.00	---	---	---	20.02
15.00	74,850	75.00	21.24	0.16	---	---	21.07	0.00	---	---	---	21.23
16.00	89,661	76.00	22.11	0.10	---	---	22.00	26.00	---	---	---	48.11

Hydrograph Plot

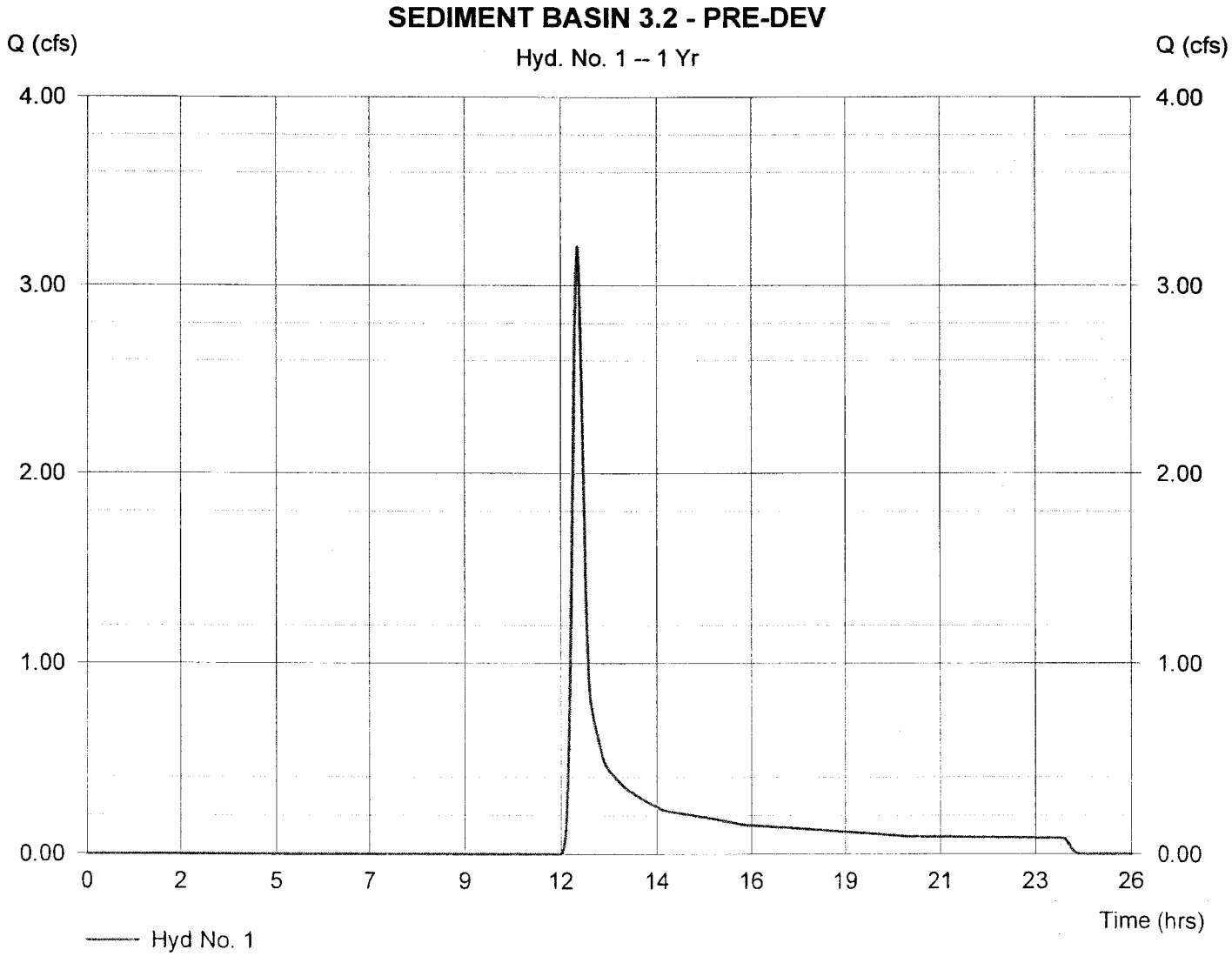
Hydraflow Hydrographs by Intelisolve | Tuesday, Jun 13 2006, 1:50 PM

Hyd. No. 1

SEDIMENT BASIN 3.2 - PRE-DEV

Hydrograph type	= SCS Runoff	Peak discharge	= 3.21 cfs
Storm frequency	= 1 yrs	Time interval	= 2 min
Drainage area	= 5.30 ac	Curve number	= 69
Basin Slope	= 6.0 %	Hydraulic length	= 300 ft
Tc method	= USER	Time of conc. (Tc)	= 14 min
Total precip.	= 2.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 10,606 cuft



Hydrograph Plot

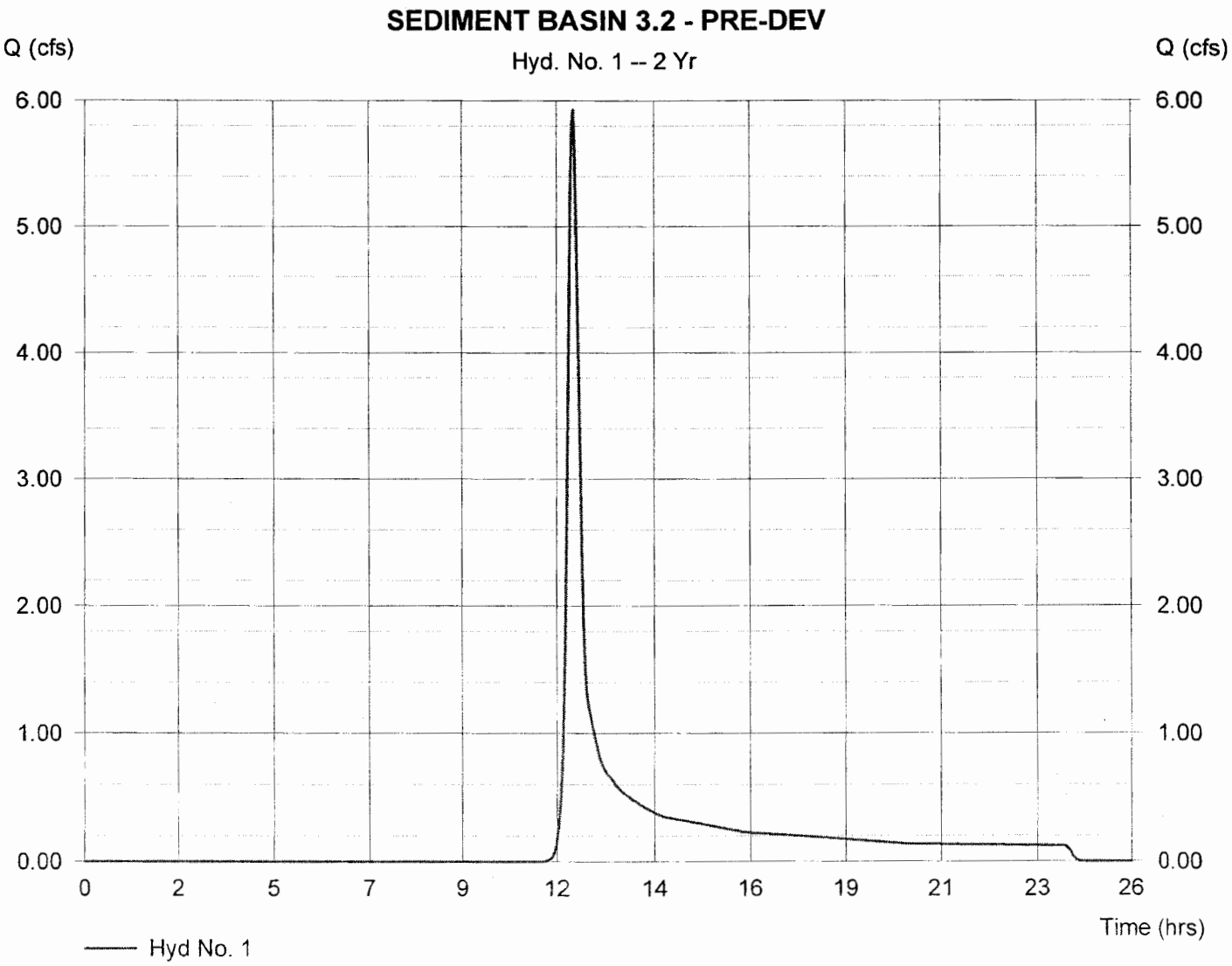
Hydraflow Hydrographs by Intelisolve | Tuesday, Jun 13 2006, 1:50 PM

Hyd. No. 1

SEDIMENT BASIN 3.2 - PRE-DEV

Hydrograph type	= SCS Runoff	Peak discharge	= 5.93 cfs
Storm frequency	= 2 yrs	Time interval	= 2 min
Drainage area	= 5.30 ac	Curve number	= 69
Basin Slope	= 6.0 %	Hydraulic length	= 300 ft
Tc method	= USER	Time of conc. (Tc)	= 14 min
Total precip.	= 3.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 17,894 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

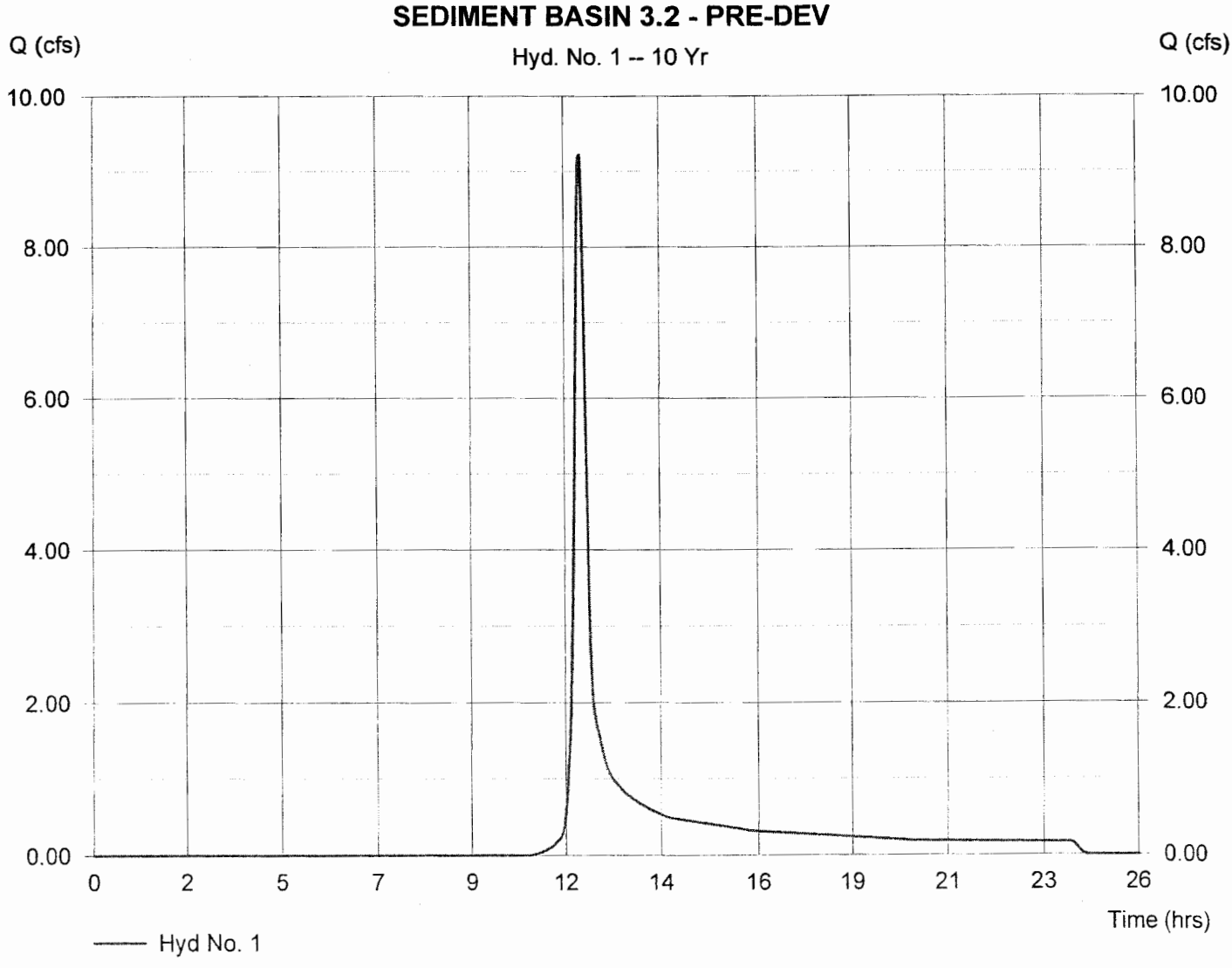
Tuesday, Jun 13 2006, 1:50 PM

Hyd. No. 1

SEDIMENT BASIN 3.2 - PRE-DEV

Hydrograph type	= SCS Runoff	Peak discharge	= 9.22 cfs
Storm frequency	= 10 yrs	Time interval	= 2 min
Drainage area	= 5.30 ac	Curve number	= 69
Basin Slope	= 6.0 %	Hydraulic length	= 300 ft
Tc method	= USER	Time of conc. (Tc)	= 14 min
Total precip.	= 4.25 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 26,860 cuft



Hydrograph Plot

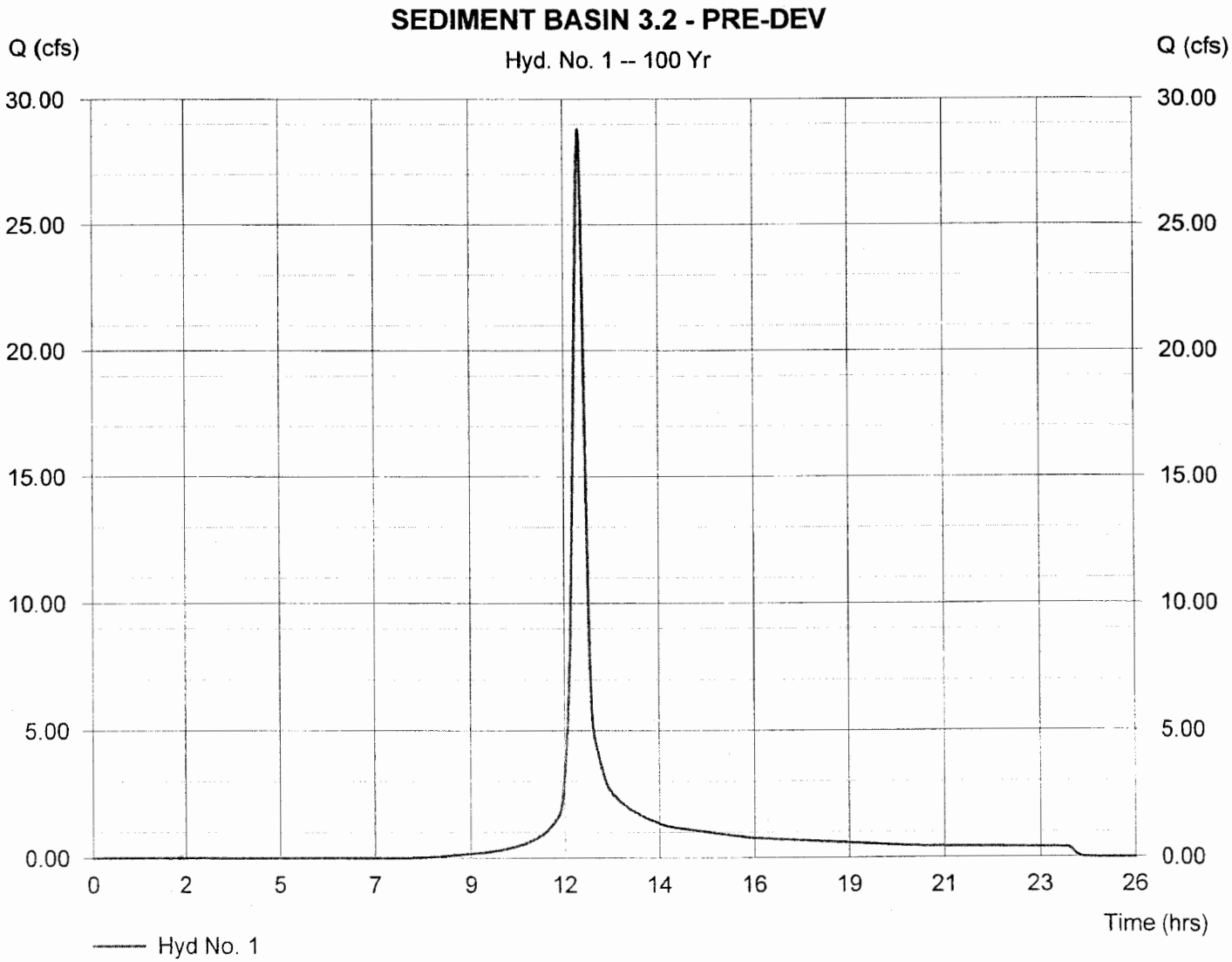
Hydraflow Hydrographs by Intelisolve — Tuesday, Jun 13 2006, 1:50 PM

Hyd. No. 1

SEDIMENT BASIN 3.2 - PRE-DEV

Hydrograph type	= SCS Runoff	Peak discharge	= 28.82 cfs
Storm frequency	= 100 yrs	Time interval	= 2 min
Drainage area	= 5.30 ac	Curve number	= 69
Basin Slope	= 6.0 %	Hydraulic length	= 300 ft
Tc method	= USER	Time of conc. (Tc)	= 14 min
Total precip.	= 7.95 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 80,794 cuft



Hydrograph Plot

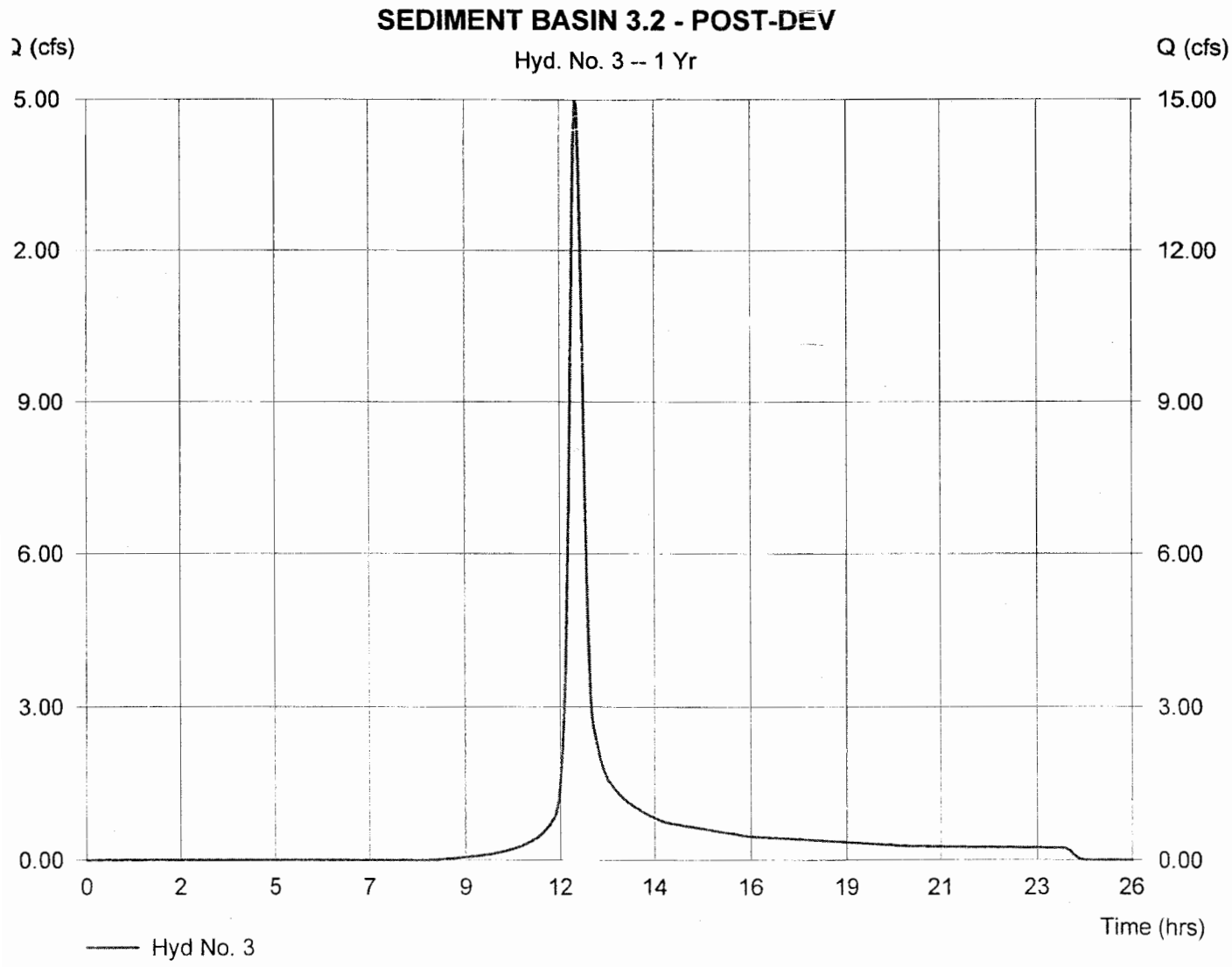
Hydraflow Hydrographs by Intelisolve — Tuesday, Jun 13 2006, 1:50 PM

Hyd. No. 3

SEDIMENT BASIN 3.2 - POST-DEV

Hydrograph type	= SCS Runoff	Peak discharge	= 14.98 cfs
Storm frequency	= 1 yrs	Time interval	= 2 min
Drainage area	= 9.10 ac	Curve number	= 85
Basin Slope	= 6.0 %	Hydraulic length	= 300 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

Hydrograph Volume = 46,965 cuft



Hydrograph Plot

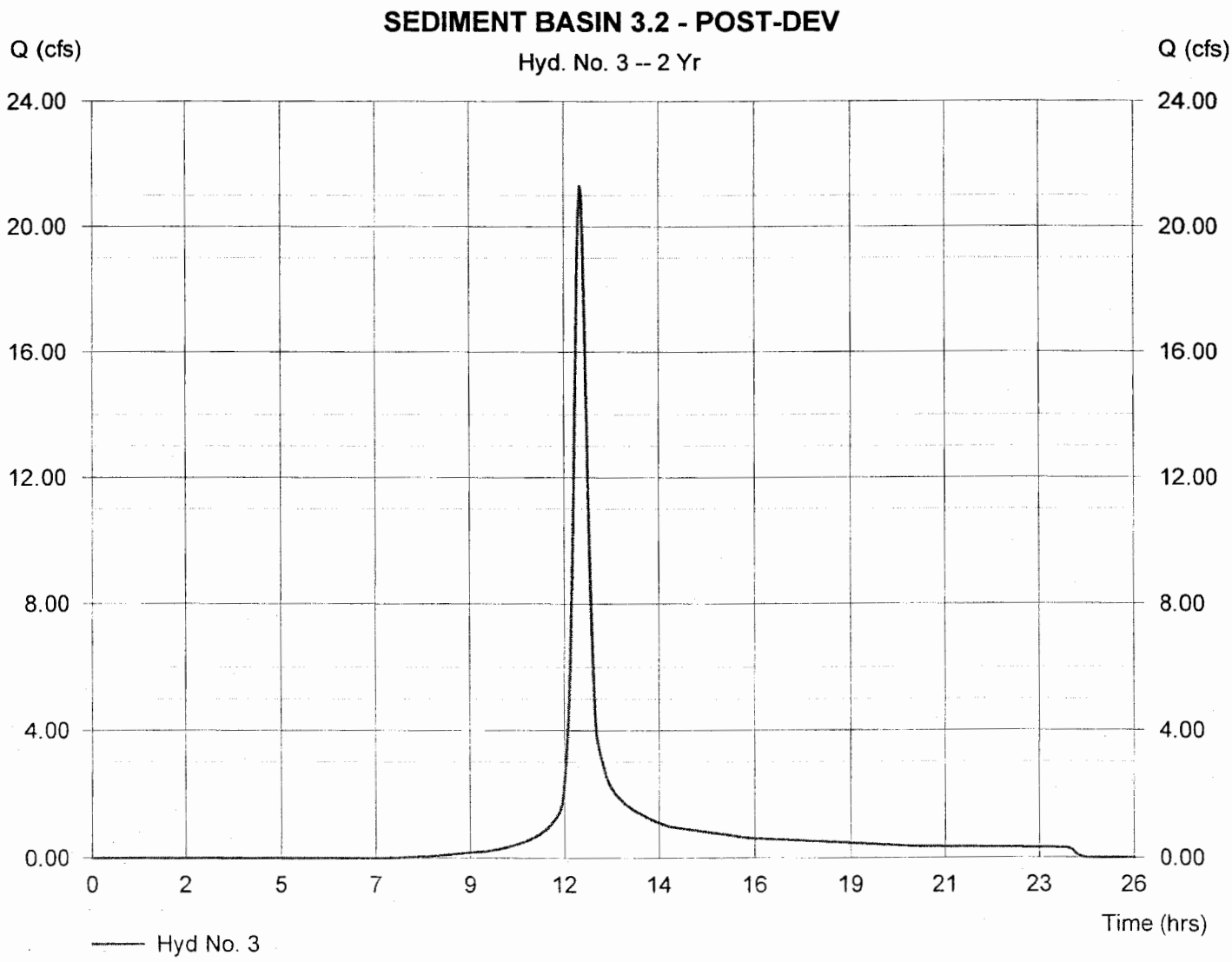
Hydraflow Hydrographs by Intelisolve | Tuesday, Jun 13 2006, 1:50 PM

Hyd. No. 3

SEDIMENT BASIN 3.2 - POST-DEV

Hydrograph type	= SCS Runoff	Peak discharge	= 21.30 cfs
Storm frequency	= 2 yrs	Time interval	= 2 min
Drainage area	= 9.10 ac	Curve number	= 85
Basin Slope	= 6.0 %	Hydraulic length	= 300 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

Hydrograph Volume = 66,607 cuft



Hydrograph Plot

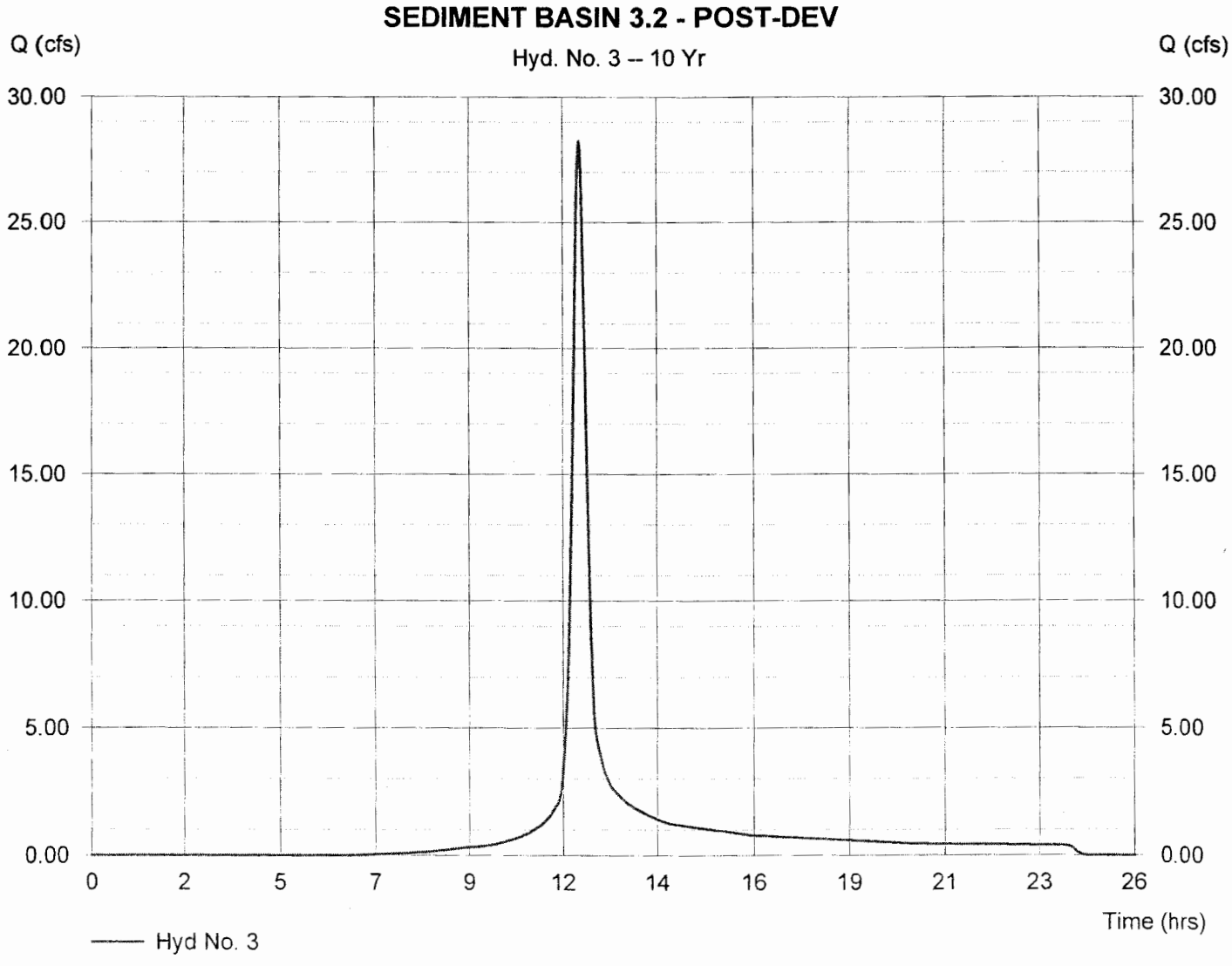
Hydraflow Hydrographs by Intelisolve | Tuesday, Jun 13 2006, 1:50 PM

Hyd. No. 3

SEDIMENT BASIN 3.2 - POST-DEV

Hydrograph type	= SCS Runoff	Peak discharge	= 28.25 cfs
Storm frequency	= 10 yrs	Time interval	= 2 min
Drainage area	= 9.10 ac	Curve number	= 85
Basin Slope	= 6.0 %	Hydraulic length	= 300 ft
Tc method	= USER	Time of conc. (Tc)	= 20 min
Total precip.	= 4.25 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 88,607 cuft



Hydrograph Plot

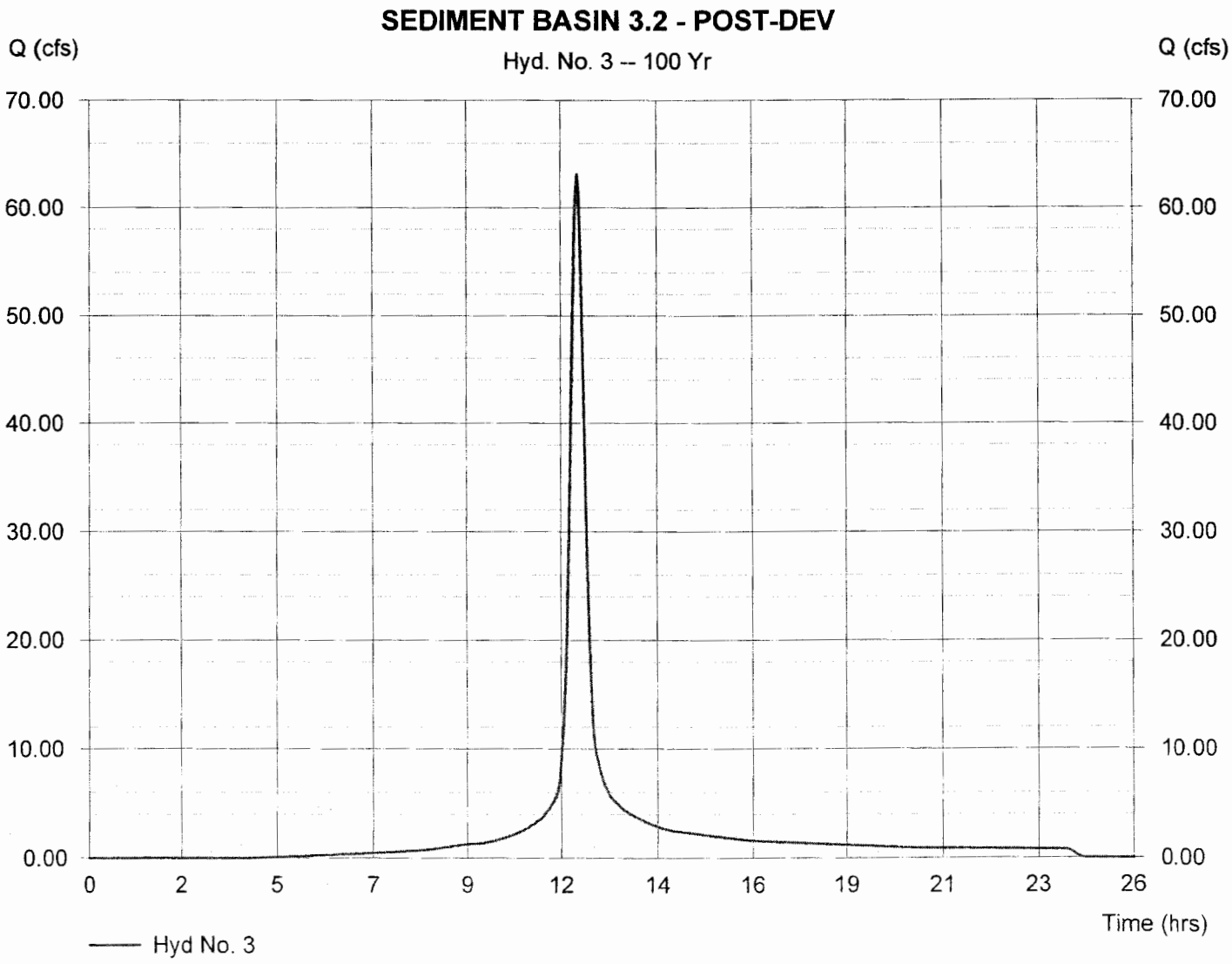
Hydraflow Hydrographs by Intelisolve | Tuesday, Jun 13 2006, 1:50 PM

Hyd. No. 3

SEDIMENT BASIN 3.2 - POST-DEV

Hydrograph type	= SCS Runoff	Peak discharge	= 63.05 cfs
Storm frequency	= 100 yrs	Time interval	= 2 min
Drainage area	= 9.10 ac	Curve number	= 85
Basin Slope	= 6.0 %	Hydraulic length	= 300 ft
Tc method	= USER	Time of conc. (Tc)	= 20 min
Total precip.	= 7.95 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 203,649 cuft



Hydrograph Plot

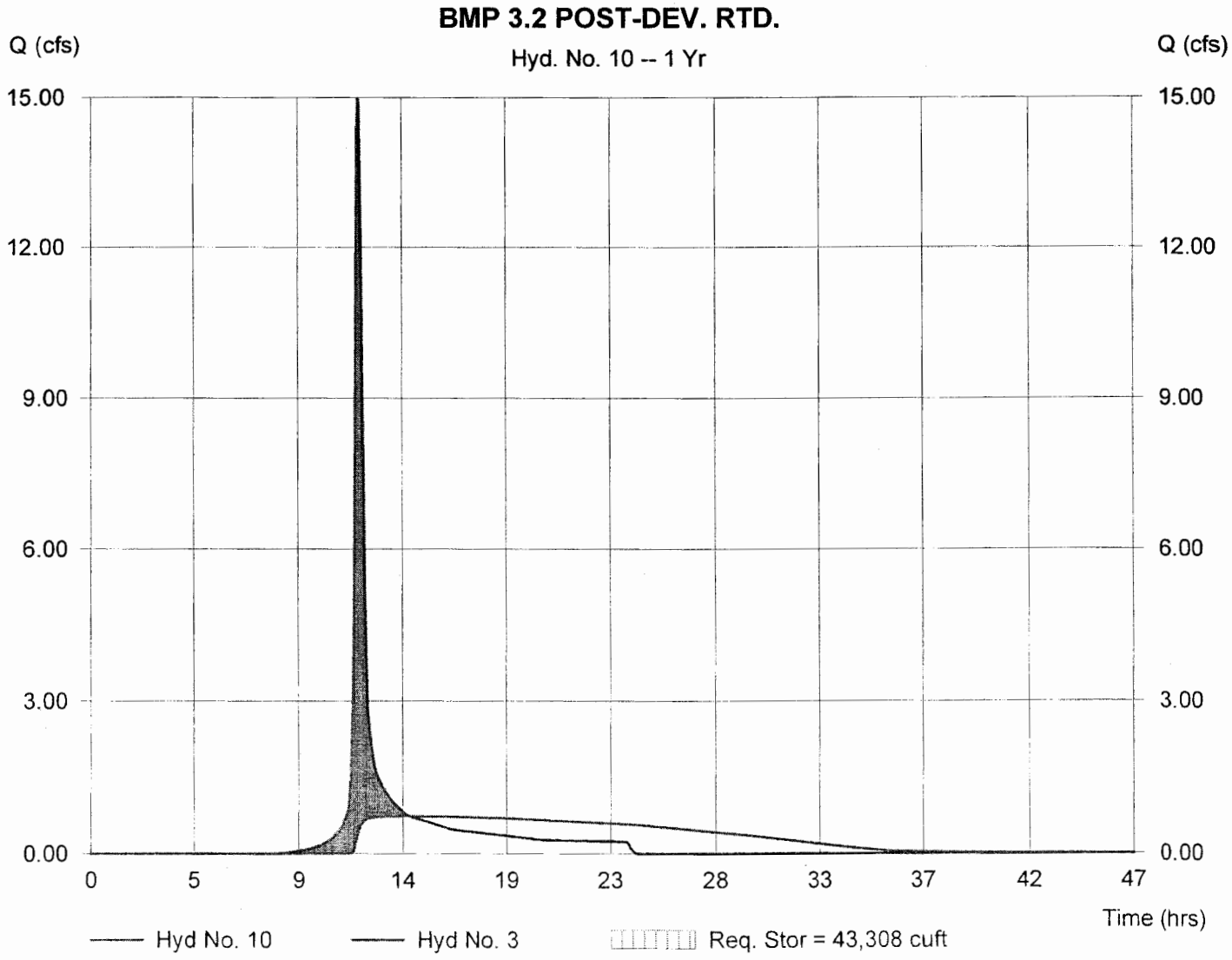
Hydraflow Hydrographs by Intelisolve | Tuesday, Jun 13 2006, 1:51 PM

Hyd. No. 10

BMP 3.2 POST-DEV. RTD.

Hydrograph type	= Reservoir	Peak discharge	= 0.73 cfs
Storm frequency	= 1 yrs	Time interval	= 2 min
Inflow hyd. No.	= 3	Max. Elevation	= 72.34 ft
Reservoir name	= SEDIMENT BASIN 3.2	Max. Storage	= 43,308 cuft

Storage Indication method used. Wet pond routing start elevation = 68.60 ft. | Hydrograph Volume = 44,341 cuft



Hydrograph Plot

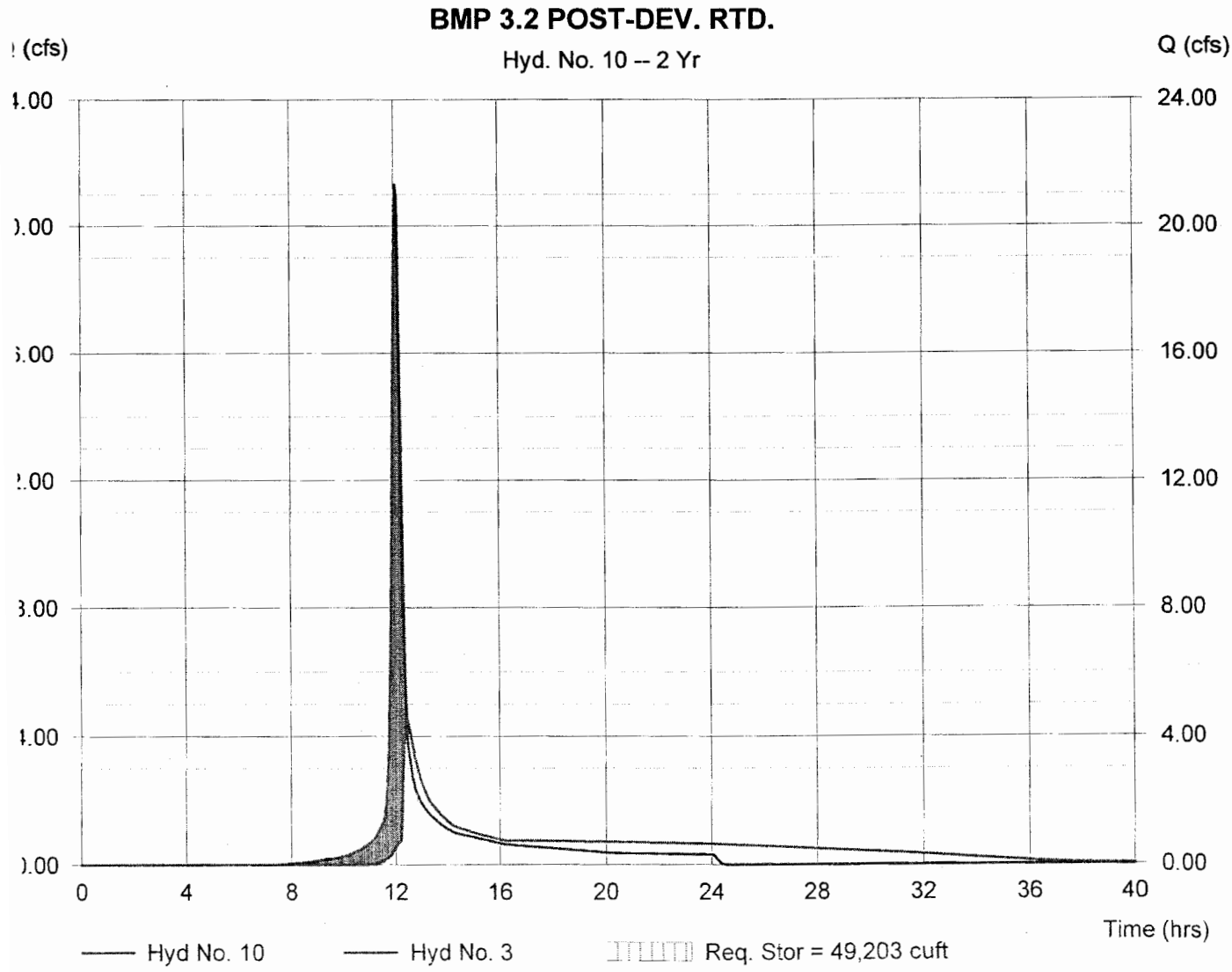
Hydraflow Hydrographs by Intelisolve — Tuesday, Jun 13 2006, 1:51 PM

Hyd. No. 10

BMP 3.2 POST-DEV. RTD.

Hydrograph type	= Reservoir	Peak discharge	= 4.57 cfs
Storm frequency	= 2 yrs	Time interval	= 2 min
Inflow hyd. No.	= 3	Max. Elevation	= 72.92 ft
Reservoir name	= SEDIMENT BASIN 3.2	Max. Storage	= 49,203 cuft

Storage Indication method used. Wet pond routing start elevation = 68.60 ft. — Hydrograph Volume = 63,984 cuft



Hydrograph Plot

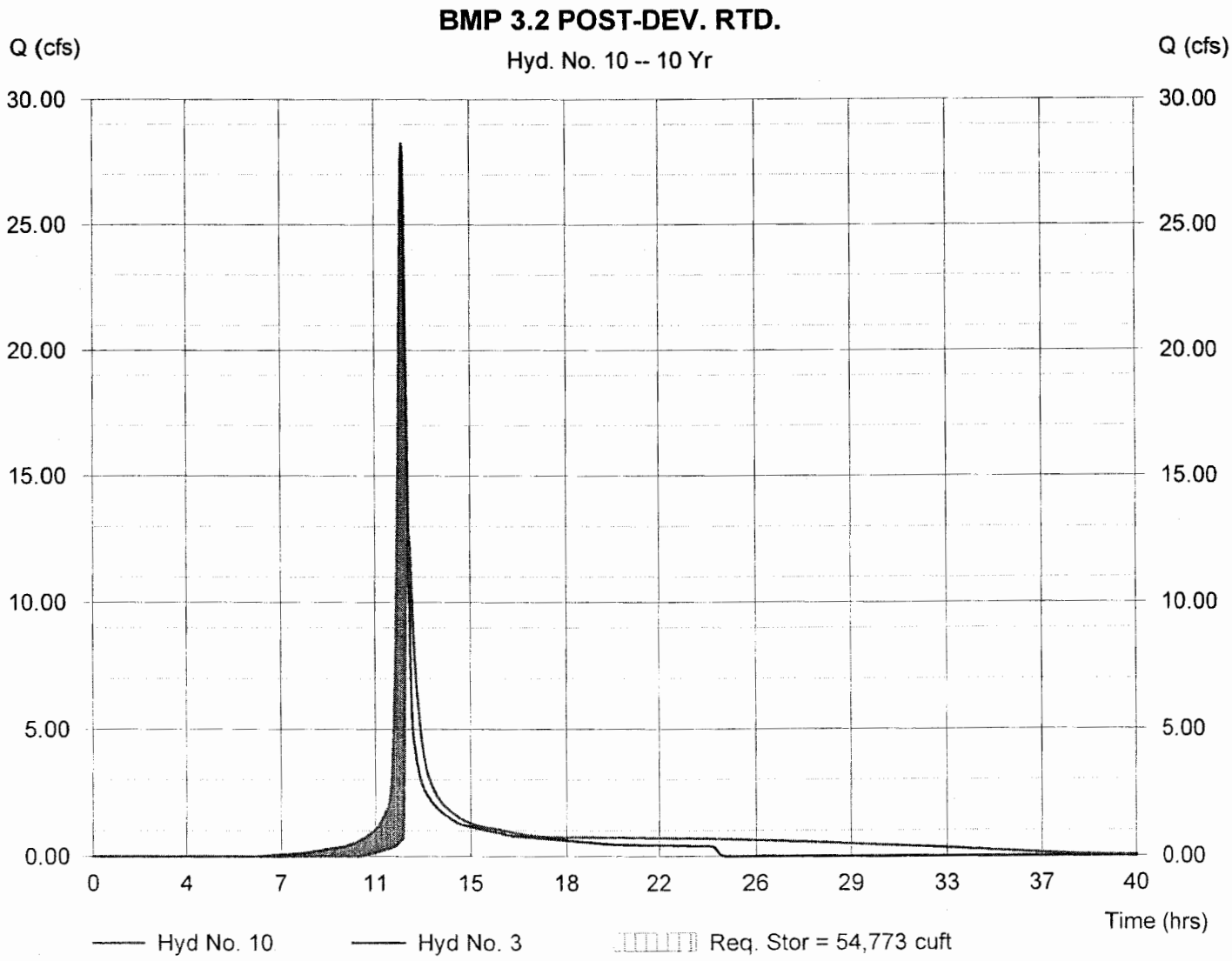
Hydraflow Hydrographs by Intelisolve | Tuesday, Jun 13 2006, 1:51 PM

Hyd. No. 10

BMP 3.2 POST-DEV. RTD.

Hydrograph type	= Reservoir	Peak discharge	= 12.76 cfs
Storm frequency	= 10 yrs	Time interval	= 2 min
Inflow hyd. No.	= 3	Max. Elevation	= 73.41 ft
Reservoir name	= SEDIMENT BASIN 3.2	Max. Storage	= 54,773 cuft

Storage Indication method used. Wet pond routing start elevation = 68.60 ft. | Hydrograph Volume = 85,984 cuft



Hydrograph Plot

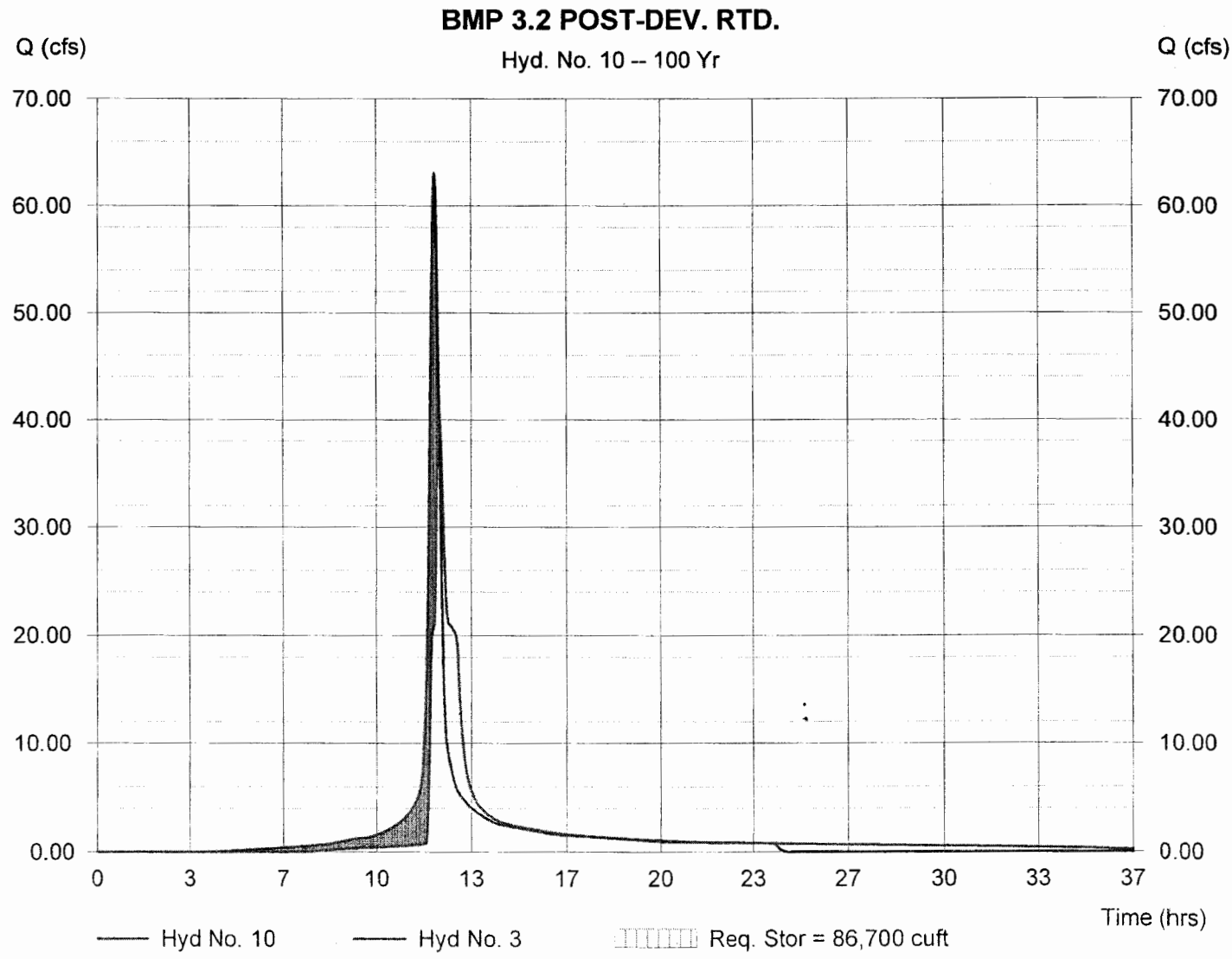
Hydraflow Hydrographs by Intelisolve | Tuesday, Jun 13 2006, 1:51 PM

Hyd. No. 10

BMP 3.2 POST-DEV. RTD.

Hydrograph type	= Reservoir	Peak discharge	= 40.54 cfs
Storm frequency	= 100 yrs	Time interval	= 2 min
Inflow hyd. No.	= 3	Max. Elevation	= 75.80 ft
Reservoir name	= SEDIMENT BASIN 3.2	Max. Storage	= 86,700 cuft

Storage Indication method used. Wet pond routing start elevation = 68.60 ft. | Hydrograph Volume = 201,025 cuft



ENGINEERING CONSULTING SERVICES, LTD.
Geotechnical • Construction Materials • Environmental

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FEB 11 2003
AES CONSULTING ENGINEERS

February 10, 2003

Mr. Brian Rettman
U.S. Home Corporation
6920 Netherstone Court
Gainsville, Virginia 20155

ECS Project No. 07:5867

Re: Addendum No. 1
Subsurface Exploration and Geotechnical Engineering Analysis
Colonial Heritage Phase I – Sections 2, 3, and 3A
BMP Evaluation
Richmond Road
James City County, Virginia

Dear Mr. Rettman:

Engineering Consulting Services, Ltd. completed a subsurface exploration and engineering evaluation of the planned Stormwater Management/BMP Facilities, No. 3.1 and No. 3.2, of Phase I, Sections 3 and 3A of the above referenced project and a report was issued dated October 18, 2002. We have been requested to respond to Item 38 as listed in a letter from James City County Environmental Division, which addresses questions of dam stability and barrel seepage control. Of primary concern is the fact that BMP No. 3.2 will act as a temporary sediment basin with a wet pool about 6 feet deep, prior to conversion to a dry pond.

Comment #38 ENV DIV 11/22/02

We have reviewed the project plans for the two BMP facilities prepared by AES Consulting Engineers dated August 13, 2002 in response to this inquiry. Both BMP facilities will require the construction of earthen embankments constructed between two slopes with existing grades of about 2 horizontal to 1 vertical at the steepest points near the bottom of the ravine. As the slopes extend outward, the grades lessen to more moderate slopes of about 3 horizontal to 1 vertical. The earthen embankments are expected to be about 20 feet in height. The project plans indicate the dam embankments are to be constructed with 3 horizontal to 1 vertical side slopes and have a dam key trench. Also, the project plans reveal the construction of the principal spillway pipe with two anti-seep collars along the length of the pipe through the dam.

We understand BMP No. 3.2 will initially be used as a temporary sediment basin with a normal pool about 6 feet deep prior to eventual conversion to a dry pond after the Phase I construction is completed. Of primary concern is the dam stability during both services phases. In order for the dam embankments to be constructed and tied into the existing slopes, we recommended the embankments be constructed with a key trench. The key trench will help "lock" the dam between the two slopes. Our initial recommendations are for the key trench to be excavated a minimum of 4 feet deep and 8 feet wide.

108 Ingram Road, Unit 1, Williamsburg, Virginia 23188 • (757) 229-6677 • Fax (757) 229-9978
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However, the key trench may extend deeper if the underlying soils are not considered suitable at the time of construction. The key trench should extend along the bottom of the ravine and up the side slopes to the full height of the embankment. Also, the dam embankment should also be constructed with side slopes no greater than 3 horizontal to 1 vertical for global slope stability concerns.

To minimize seepage through the dam structure, we recommend on an impervious clay material be utilized in the dam core. Also, we understand anti-seep collars are proposed along the principle spillway pipe. To prevent barrel seepage along the pipe, compaction against the pipe and around the anti-seep collars will be critical during construction. Compaction along the bottom half of the barrel is the most difficult to obtain and the most critical to limit seepage. Therefore, we recommend only small compaction equipment be utilized for fill placed along the lower half of the pipe and at the seepage collars to ensure the soil is compacted against the barrel and anti-seep collars to the specified moisture and density requirements to minimize seepage along the length of the pipe.

General Comments

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

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

Respectfully,

ENGINEERING CONSULTING SERVICES, LTD.

Michael J. Galli, P.E.
Geotechincal Engineer

Maureen Mallory for
Gary R. Witsman, P.E.
Principal Engineer

COMMONWEALTH OF VIRGINIA
MICHAEL J. GALLI
No. 030084
PROFESSIONAL ENGINEER

Copies: (2) U.S. Homes Corporation (Mr. Brian Rettman)
(1) AES Consulting Engineers (Mr. Howard Price)

I:letters/mjg/5867-add.doc

ENGINEERING CONSULTING SERVICES, LTD.
Geotechnical • Construction Materials • Environmental

October 18, 2002

Mr. Brian Rettman
U.S. Home Corporation
6920 Netherstone Court
Gainsville, Virginia 20155

ECS Project No. 07:5867

Re: Subsurface Exploration and Geotechnical Engineering Analysis
Colonial Heritage Phase I - Section 2, 3, and 3A
BMP Evaluation
Richmond Road
James City County, Virginia

RECEIVED
OCT 18 2002
AES CONSULTING ENGINEERS

Dear Mr. Rettman:

Engineering Consulting Services, Ltd. has completed a subsurface exploration of the above referenced project. This report presents the results of our subsurface exploration program on this site and provides engineering and earthwork recommendations for the proposed stormwater management pond facilities. During this study, we also performed subsurface explorations within the proposed roadways and collected samples of the soil subgrade to perform California Bearing Ratio testing for use in pavement design recommendations. These tests are in progress. A separate report discussing our roadway recommendations will be issued once this testing is completed.

Introduction

Design for Colonial Heritage Phase I, Sections 2, 3, and 3A are underway. This stage of the project will consist of the development of the planned roadways and stormwater management pond facilities. Currently, there are four (4) BMP facilities proposed. Two are located in Section 2, with one each in Sections 3 and 3A. We understand each of the facilities will require an earth berm constructed between 10 to 20 feet in height to form a dry pond detention basin.

The purposes of this exploration were to explore the soil and groundwater conditions at the sites and to develop soils-related engineering recommendations to guide design and construction of the earth berms. We accomplished these purposes by drilling soil borings to explore the subsurface soil and groundwater conditions, performing a site reconnaissance to observe general

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topography, and analyzing field data to develop appropriate geotechnical engineering recommendations regarding the proposed construction. A Boring Location Diagram is included in Enclosure 1.

Field Exploration Procedures:

The soil test borings were performed with an ATV-mounted auger drill rig utilizing continuous flight, hollow stem augers to advance the borehole. Drilling fluid was not used in this process.

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

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

Subsurface Conditions:

Experienced personnel from our office classified each splitspoon soil sample on the basis of texture and plasticity in accordance with the Unified Soil Classification System (USCS). The group symbols for each soil type are indicated in parentheses following the soil descriptions on the boring logs. The geotechnical engineer grouped the various soil types into the major zones noted on the boring logs. The stratification lines designating the interfaces between earth materials on the boring logs are approximate; in situ, the transitions may be gradual. A brief explanation of the USCS and Reference Notes for Boring Logs are provided in Enclosure 3 of this report.

Our subsurface exploration and site reconnaissance determined that the surface of the site is generally covered with about 2 to 4 inches of topsoil. Underlying the surficial topsoil, we encountered mixed deposits of medium stiff consistency Sandy and Silty CLAY (CL) and loose to medium dense density Clayey and Silty SAND (SC and SM) that extended to depths of about 12 feet below the existing site grades, except at Boring B-26, where these interbedded layers extended to the depth of the boring at 20 feet below grade. The Standard Penetration Test (SPT)

N-values recorded within these layers varied from 3 to 11 blows-per-foot (BPF).

Underlying the mixed deposits in Borings B-24, B-25, and B-27, we encountered medium stiff consistency Sandy and Silty CLAY (CL) and medium dense density Clayey SAND (SC) with marine shell fragments extending to the depth of these borings at 20 feet (boring termination). SPT N-values recorded within this stratum were 9 or 10 BPF.

We encountered the groundwater during drilling of the Borings B-24 and B-25 at depths of 12.5 to 13 feet below the ground surface. Please note that groundwater levels are influenced by seasonal conditions and by periods of significant precipitation or prolonged drought. Additionally, a perched water table could be encountered due to the near-surface fine-grained layers. If groundwater is encountered during the construction of excavations, it should be pumped from sumps excavated adjacent to the construction excavations.

Earthen Embankments and Slope Stability

We understand the stormwater management basins will require earth berms varying from 10 to 20 feet in height. These basins currently are planned to be used as dry ponds for temporary detention of stormwater runoff. Based on the planned construction, we recommend the berms be constructed with an 8-foot wide key trench excavated to a minimum depth of about 4 feet below the stripped subgrades. The key trench may extend deeper if the underlying soils are not considered suitable for support of the fill at the time of construction. The subgrades should be stripped of all organics and soft soils and be observed by the geotechnical engineer prior to the placement of compacted structural fill.

Please note, we encountered the groundwater table at 12.5 and 13 feet below site grades at two of the boring locations at the time of our subsurface exploration. However, we do not believe the ground water table will impact construction.

The near-surface soils located within the basin areas generally consisted of Silty and Clayey SAND (SC and SM) soils. We also encountered mixed deposits of fine- and coarse-grained soils at varying locations and depths across the project site. Generally, any type of clayey soils would be considered suitable as core material. The soil test borings for the roadways should be reviewed with respect to planned cuts across the site to evaluate a potential borrow source for suitable core material. Boring logs for the roadway borings will be included in a separate report once that phase of testing is complete. Suitable core material would be classified as SC, CL, or CH material. This material should be placed in horizontal lifts not exceeding 8 inches in loose thickness, moisture conditioned to within -1% to +3% of the optimum moisture content, and compacted to a minimum 95% of the maximum dry density obtained in accordance with ASTM Specification D-698, Standard Proctor method. Slopes should be constructed no greater than 3 horizontal to 1 vertical. Also, the side slopes should be seeded to promote vegetation growth and further add to the stability of the slopes.

Construction Considerations

Exposure to the environment may weaken the soils at the bearing level if the excavations remain open for too long a time. Therefore, excavations should be backfilled the same day that excavations are made. If the bearing soils are softened by surface water intrusion or exposure, the softened soils must be removed immediately prior to placement of the next lift.

Proper compaction control of fill is an important aspect of this project. All fill materials should be placed, compacted and tested in accordance with the recommendations contained in this report. We recommend that all cut and fill operations be observed full-time by a qualified Soil Technician to determine if minimum earthwork and compaction requirements are being met.

In a dry and undisturbed state, the subgrade soils at the site will provide adequate subgrade support for fill placement and construction operations. When over optimum moisture, the moisture sensitive subgrade soils may degrade quickly with disturbance from contractor operations. Therefore, good site drainage should be maintained during earthwork operations so as to help maintain the stability of the soil.

General Comments

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

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

Respectfully,

ENGINEERING CONSULTING SERVICES, LTD.

Michael J. Galli, P.E.
Geotechnical Engineer

Maureen E Mallory for

Gary R. Witsman, P.E.
Principal Engineer

COMMONWEALTH OF VIRGINIA
MICHAEL J. GALLI
No. 030684
PROFESSIONAL ENGINEER

Enclosures:
- Location Plan
- Boring Logs
- Unified Soil Classification System and Reference Notes for Boring Logs

Copies: (2) U.S. Homes Corporation (Mr. Brian Rettman)
(2) AES Consulting Engineers (Mr. Howard Price)

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LEGEND:

⊕ –APPROX. BORING LOCATION

REVISIONS	COLONIAL HERITAGE PHASE 1 SECTION 2 RICHMOND ROAD WILLIAMSBURG, VIRGINIA	ECS ENGINEERING CONSULTING	FIGURE 1 BORING LOCATION PLAN ECS PROJECT NO. 07:5867

ECS LTD

LEGEND:
⊕ –APPROX. BORING LOCATION

REVISIONS

COLONIAL HERITAGE
PHASE 1
SECTION 2
RICHMOND ROAD
WILLIAMSBURG, VIRGINIA

ECS and ENGINEERING CONSULTING

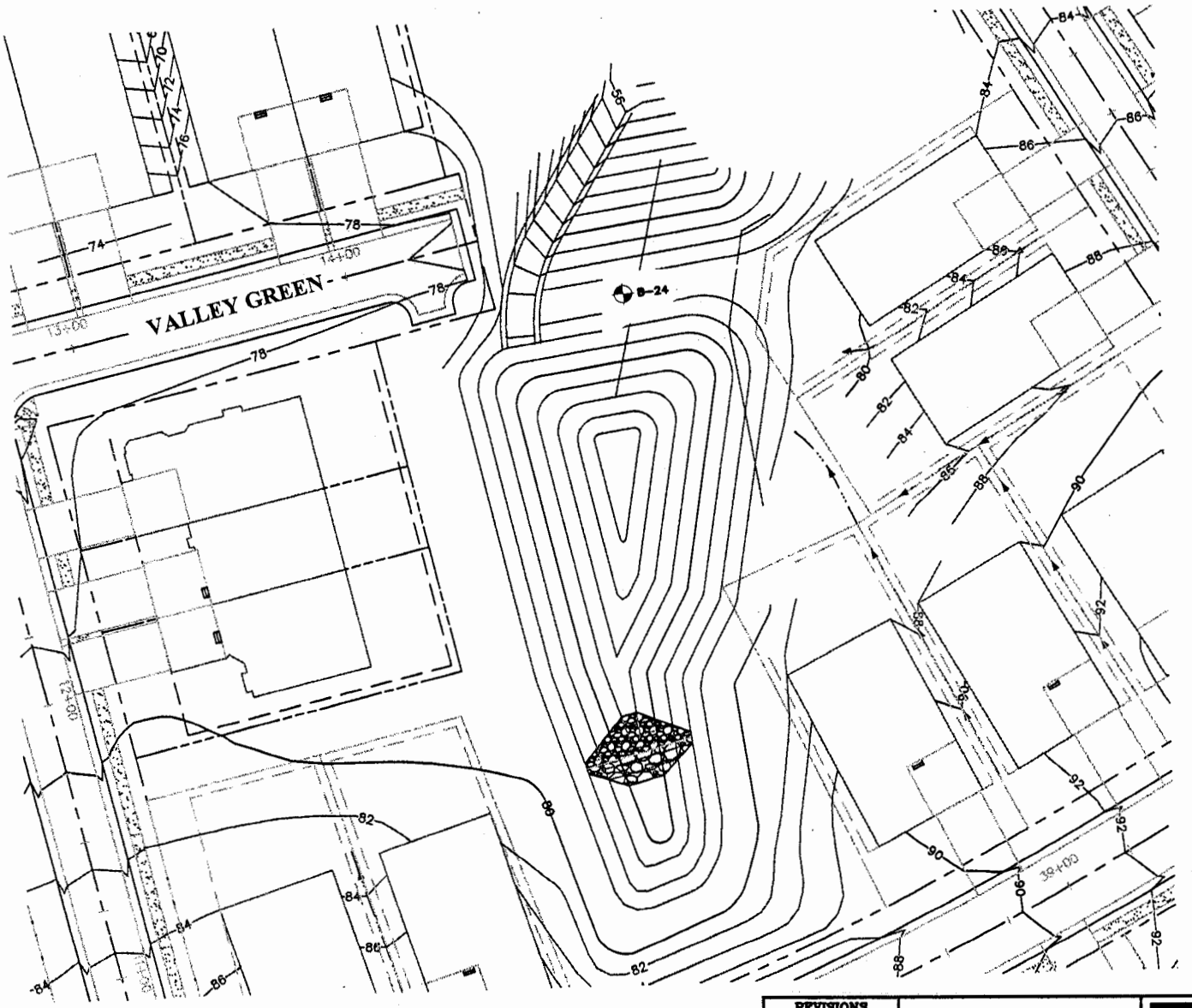
FIGURE 2

BORING LOCATION PLAN

ECS PROJECT NO. 07:5867

YC031_COLONIAL_HERITAGE_P1_S3_DRY_POND - 056

ECS LTD



LEGEND:

⊕ –APPROX. BORING LOCATION

REVISIONS

COLONIAL HERITAGE
PHASE 1
SECTION 3 and 3A
RICHMOND ROAD
WILLIAMSBURG, VIRGINIA

ECS
ENGINEERING CONSULTING SERVICES LTD

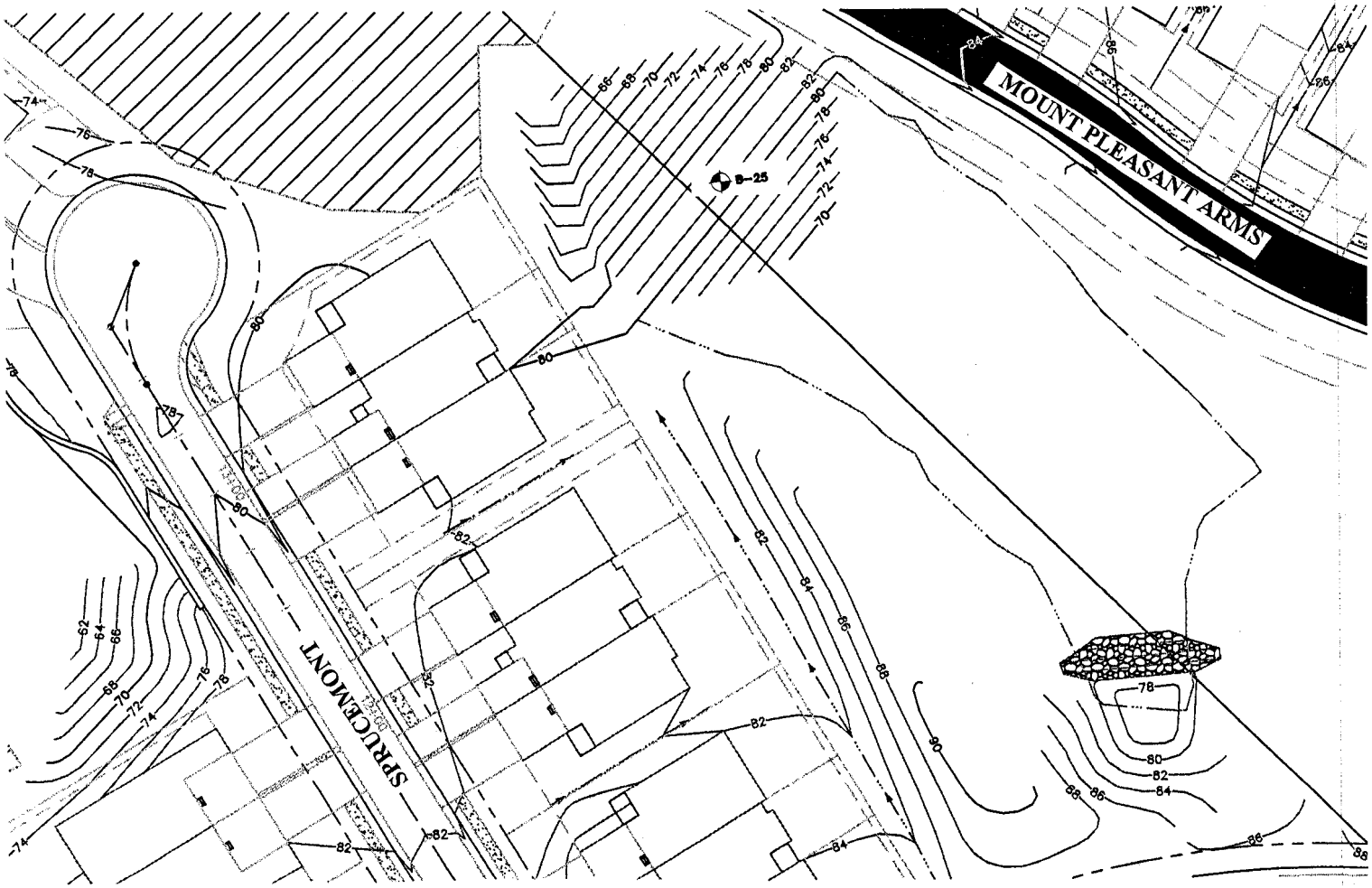
FIGURE 3

BORING LOCATION PLAN

ECS PROJECT NO. 07:5867

YC031_COLONIAL_HERITAGE_P1_S3_DRY_POND - 057

ECS LTD



LEGEND:

⊕ –APPROX. BORING LOCATION

REVISIONS

COLONIAL HERITAGE
PHASE 1
SECTION 3 and 3A
RICHMOND ROAD
WILLIAMSBURG, VIRGINIA

ECS ENGINEERING CONSULTING SERVICES LTD

FIGURE 4

BORING LOCATION PLAN

ECS PROJECT NO. 07:5867

YC031_COLONIAL_HERITAGE_P1_S3_DRY_POND - 058

CLIENT	JOB #	BORING #	SHEET
U. S. HOME CORPORATION	07:5867	B-24	1 OF 1

PROJECT NAME COLONIAL HERITAGE PHASE I, SECTS. 2, 3, AND 3A

ARCHITECT-ENGINEER AES CONSULTING ENGINEERS

SITE LOCATION ROUTE 60, JAMES CITY COUNTY, VIRGINIA

CALIBRATED PENETROMETER TONS/FT.^{2} 1 2 3 4 5+

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

10 20 30 40 50+

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

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL (ENGLISH UNITS; SURFACE ELEVATION)	STANDARD PENETRATION BLOWS/FT.
0	1	SS	24	24	TOPSOIL DEPTH 2"	3
	2	SS	24	24	Fine Silty SAND, With Roots, Medium Brown, Moist, Very Loose to Loose, (SM)	6
5	3	SS	24	24		8
	4	SS	24	24	Fine Sandy CLAY, Orangish Brown, Moist, Medium Stiff, (CL)	9
	5	SS	24	24	Fine Silty SAND, Orangish Brown, Moist, Loose, (SM)	9
10						
	6	SS	24	24	Fine Clayey SAND, With Marine Shell Fragments, Greenish Brown, Moist to Saturated, Medium Dense, (SC)	10
15						
	7	SS	24	24		10
20					END OF BORING @ 20.00'	
25						
30						

WATER LEVELS ELEVATION (FT)

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

▽WL 13' WS OR WD	BORING STARTED 09-12-02	
▽WL(AB) ▽WL(AC)	BORING COMPLETED 09-12-02	CAVE IN DEPTH ● 19.5'
▽WL	RIG ATV FOREMAN SDS	DRILLING METHOD HSA

CLIENT	JOB #	BORING #	SHEET
U. S. HOME CORPORATION	07:5867	B-25	1 OF 1

PROJECT NAME: COLONIAL HERITAGE PHASE I, SECTS. 2, 3, AND 3A

ARCHITECT-ENGINEER: AES CONSULTING ENGINEERS

SITE LOCATION: ROUTE 60, JAMES CITY COUNTY, VIRGINIA

ECS LTD

CALIBRATED PENETROMETER TONS/FT.^{2}: 1, 2, 3, 4, 5+

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ: 10, 20, 30, 40, 50+

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

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL (ENGLISH UNITS / SURFACE ELEVATION)	STANDARD PENETRATION BLOWS/FT.
0	1	SS	24	24	TOPSOIL DEPTH 2"	3
	2	SS	24	24	Fine Silty SAND, With Roots, Light Brown, Moist, Very Loose to Loose, (SM)	5
5	3	SS	24	24	Fine Sandy CLAY, Orangish Brown, Moist, Stiff, (CL)	12
	4	SS	24	24	Fine Silty SAND, Tan, Moist, Medium Dense, (SM)	12
	5	SS	24	24	Fine Sandy CLAY, Orangish Brown, Moist, Stiff, (CL)	11
10					Fine Sandy CLAY, With Marine Shell Fragments, Orangish Brown, Moist to Saturated, Medium Stiff, (CL)	
	6	SS	24	24		10
15						
	7	SS	24	24		10
20					END OF BORING @ 20.00'	
25						
30						

WATER LEVELS / ELEVATION (FT)

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

▽WL 12.5' (WS) OR WD	BORING STARTED 09-12-02	
▽WL(AB) ▽WL(AC)	BORING COMPLETED 09-12-02	CAVE IN DEPTH ● 18.5'
▽WL 12' after 2 hrs.	RIG ATV FOREMAN SDS	DRILLING METHOD HSA

CLIENT	JOB #	BORING #	SHEET
U. S. HOME CORPORATION	07:5867	B-26	1 OF 1

PROJECT NAME COLONIAL HERITAGE PHASE I, SECTS. 2, 3, AND 3A

ARCHITECT-ENGINEER AES CONSULTING ENGINEERS

ECS LTD

SITE LOCATION ROUTE 60, JAMES CITY COUNTY, VIRGINIA

CALIBRATED PENETROMETER TONS/FT.^{2} (1, 2, 3, 4, 5+)

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ (10, 20, 30, 40, 50+)

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

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL (ENGLISH UNITS / SURFACE ELEVATION)	WATER LEVELS ELEVATION (FT)	STANDARD PENETRATION BLOWS/FT.
0	1	SS	24	24	TOPSOIL DEPTH 2"		4
	2	SS	24	24	Fine Silty SAND, Light Brown, Dry to Moist, Loose, (SM)		7
5	3	SS	24	24	Fine Clayey SAND, Orangish Brown, Moist, Loose, (SC)		9
	4	SS	24	24	Silty CLAY, With Fine Sand Seams, Gray and Tan, Moist, Medium Stiff, (CL)		8
	5	SS	24	24	Fine Silty SAND, With Clay Seams, Tan and Gray, Moist, Loose, (SM-SC)		9
10					Silty CLAY, With Fine Sand Seams, Gray, Tan and Orangish Brown, Moist, Medium Stiff to Stiff, (CL)		
	6	SS	24	24			10
15							
	7	SS	24	24			12
20					END OF BORING @ 20.00'		
25							
30							

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

▽WL DRY (WS OR WD)	BORING STARTED 09-13-02	
▼WL(AB) ▼WL(AC)	BORING COMPLETED 09-13-02	CAVE IN DEPTH ● 16'
▽WL	RIG ATV FOREMAN SDS	DRILLING METHOD HSA

CLIENT	JOB #	BORING #	SHEET
U. S. HOME CORPORATION	07:5867	B-27	1 OF 1

PROJECT NAME COLONIAL HERITAGE PHASE I, SECTS. 2, 3, AND 3A

ARCHITECT-ENGINEER AES CONSULTING ENGINEERS

ECS LTD

SITE LOCATION ROUTE 60, JAMES CITY COUNTY, VIRGINIA

CALIBRATED PENETROMETER TONS/FT.^{2} (1, 2, 3, 4, 5+)

PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % Δ (10, 20, 30, 40, 50+)

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

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL (ENGLISH UNITS; SURFACE ELEVATION)	STANDARD PENETRATION BLOWS/FT.
0	1	SS	24	24	TOPSOIL DEPTH 4"	7
	2	SS	24	24	Fine Clayey SAND, Tan, Moist, Loose, (SC)	8
5	3	SS	24	24	Fine Sandy CLAY, Orange and Red, Moist, Medium Stiff, (CL)	10
	4	SS	24	24	Fine Silty SAND, With Clay Lenses, Orange, Moist, Medium Dense, (SM)	11
10	5	SS	24	24	Silty CLAY, With Fine Sand Seams, Light Gray and Tan, Moist, Stiff, (CL)	11
15	6	SS	24	24	Fine Sandy CLAY, With Marine Shell Fragments, Orangish Brown, Wet to Saturated, Medium Stiff, (CL)	9
20	7	SS	24	24		10
25					END OF BORING @ 20.00'	
30						

WATER LEVELS ELEVATION (FT)

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

▽WL DRY (WS) OR WD	BORING STARTED 09-13-02	
▽WL(AB) ▽WL(AC)	BORING COMPLETED 09-13-02	CAVE IN DEPTH ● 17'
▽WL	RIG ATV FOREMAN SDS	DRILLING METHOD HSA

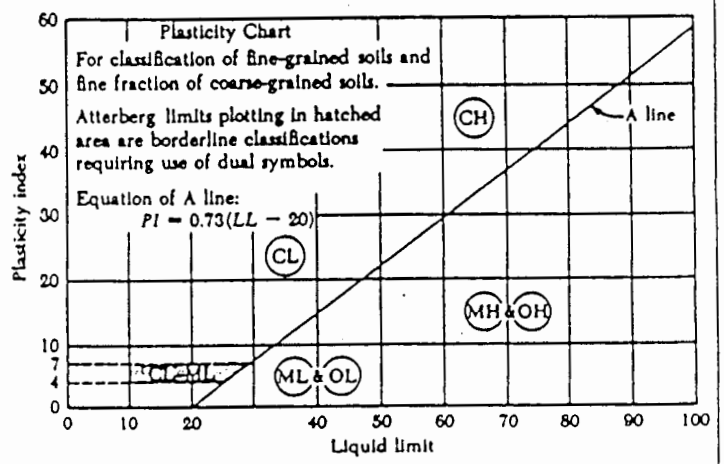
UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

Table Unified System of Classification

Major divisions			Group symbols	Typical names
Coarse-Grained Soils More than 50% retained on No. 200 sieve	Gravels 50% or more of coarse fraction retained on No. 4 sieve	Clean Gravels	GW	Well-graded gravels and gravel-sand mixtures, little or no fines
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines
		Gravels with Fines	GM	Silty gravels, gravel-sand-silt mixtures
			GC	Clayey gravels, gravel-sand-clay mixtures
	Sands More than 50% of coarse fraction passes No. 4 sieve	Clean Sands	SW	Well-graded sands and gravelly sands, little or no fines
			SP	Poorly graded sands and gravelly sands, little or no fines
		Sands with Fines	SM	Silty sands, sand-silt mixtures
			SC	Clayey sands, sand-clay mixtures
Fine-Grained Soils 50% or more passes No. 200 sieve	Silts and Clays Liquid limit 50% or less		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
			OL	Organic silts and organic silty clays of low plasticity
	Silts and Clays Liquid limit greater than 50%		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity
Highly Organic Soils			PT	Peat, muck, and other highly organic soils

Table (Continued)

Classification criteria		
Classification on basis of percentage of fines: Less than 5% pass No. 200 sieve — GW, GP, SW, SP; More than 12% pass No. 200 sieve — GM, GC, SM, SC; 5% to 12% pass No. 200 sieve — Borderline classification requiring use of dual symbols	$C_u = D_{60}/D_{10}$ Greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3	
	Not meeting both criteria for GW	
	Atterberg limits plot below "A" line or plasticity index less than 4	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
	Atterberg limits plot above "A" line and plasticity index greater than 7	
	$C_u = D_{60}/D_{10}$ Greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3	
	Not meeting both criteria for SW	
	Atterberg limits plot below "A" line or plasticity index less than 4	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
	Atterberg limits plot above "A" line and plasticity index greater than 7	



Visual-manual identification, see ASTM Designation D2488.

REFERENCE NOTES FOR BORING LOGS

I. Drilling and Sampling Symbols:

SS - Split Spoon Sampler
ST - Shelby Tube Sampler
RC - Rock Core: NX, BX, AX
PM - Pressuremeter
DC - Dutch Cone Penetrometer

RB - Rock Bit Drilling
BS - Bulk Sample of Cuttings
PA - Power Auger (no sample)
HSA - Hollow Stem Auger
WS - Wash Sample

Standard Penetration (Blows/Ft) refers to the blows per foot of a 140 lb. hammer falling 30 inches on a 2 in. O.D. splitspoon sampler, as specified in ASTM D-1586. The blow count is commonly referred to as the N value.

II. Correlation of Penetration Resistances to Soil Properties:

Relative Density-Sands, Silts

SPT-N	Relative Density
0 - 3	Very Loose
4 - 9	Loose
10 - 29	Medium Dense
30 - 49	Dense
50 - 80	Very Dense
over 80	Extremely Dense

Consistency of Cohesive Soils

Unconfined Compressive Strength, Qp, tsf	Consistency
Under 0.25	Very Soft
0.25 - 0.49	Soft
0.50 - 0.99	Firm
1.00 - 1.99	Stiff
2.00 - 3.99	Very Stiff
4.00 - 8.00	Hard
over 8.00	Very Hard

III. Unified Soil Classification Symbols:

GP - Poorly Graded Gravel
GW - Well Graded Gravel
GM - Silty Gravel
GC - Clayey Gravels
SP - Poorly Graded Sands
SW - Well Graded Sands
SM - Silty Sands
SC - Clayey Sands

ML - Low Plasticity Silts
MH - High Plasticity Silts
CL - Low Plasticity Clays
CH - High Plasticity Clays
OL - Low Plasticity Organics
OH - High Plasticity Organics
CL-ML - Dual Classification (Typical)

IV. Water Level Measurement Symbols:

WL - Water Level
WS - While Sampling
WD - While Drilling

BCR - Before Casing Removal
ACR - After Casing Removal
WCI - Wet Cave In
DCI - Dry Cave In

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

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

County BMP ID Code (if known): YC-031

Name of Facility: COLONIAL HERITAGE DRY POND P1-S3 BMP No.: 1 of 2 Date: 9/13/07

Location: COLONIAL HERITAGE - ADJACENT TO ARTHUR HILLS DR.

Name of Owner: COLONIAL HERITAGE - LENNAR

Name of Inspector: M. MASDESKI

Type of Facility: DRY POND

Weather Conditions: SUNNY 71° Type: ☑ Final Inspection ☐ County BMP Inspection Program ☐ Owner Inspection

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

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

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

Facility Item	O.K.	Routine	Urgent	Comments
Embankments and Side Slopes:				
Grass Height	✓			
Vegetation Condition	✓			
Tree Growth	✓			
Erosion	✓			
Trash & Debris	✓			
Seepage	✓			
Fencing or Benches				
Interior Landscaping/Planted Areas: ☐ None ☐ Constructed Wetland/Shallow Marsh ☑ Naturally Established Vegetation				
Vegetated Conditions	✓			
Trash & Debris	✓			
Floating Material	✓			
Erosion		✓		MINOR EROSION ON SW SIDE OF SLOPES NEEDS REPAIR
Sediment	✓			
Dead Plant	✓			
Aesthetics	✓			
Other				
Notes:				

Facility Item	O.K.	Routine	Urgent	Comments
Water Pools: ❒ Permanent Pool (Retention Basin) ❒ Shallow Marsh (Detention Basin) ☑ None, Dry (Detention Basin)				
Shoreline Erosion	✓			
Algae	✓			
Trash & Debris	✓			
Sediment	✓			
Aesthetics	✓			
Other				
Inflows (Describe Types/Locations):				
Condition of Structure	✓			
Erosion	✓			[illegible]
Trash and Debris	✓			
Sediment	✓			
Outlet Protection	✓			
Other				
Principal Flow Control Structure - Riser, Intake, etc. (Describe Type):				
Condition of Structure	✓			
Corrosion	✓			
Trash and Debris	✓			
Sediment	✓			
Vegetation	✓			
Other		✓		REPAIR EROSION ON LOWER SIDE OF INLET
Principal Outlet Structure - Barrel, Conduit, etc. :				
Condition of Structure	✓			
Settlement	✓			
Trash & Debris		✓		REMOVE TRAIN + DEBRIS FROM OP
Erosion/Sediment		✓		REPAIR EROSION BELOW OUTFALL STRUCTURE
Outlet Protection	✓			
Other				
Emergency Spillway (Overflow):				
Vegetation		✓		RE-STABILIZE UPPER AREA OF ES
Lining	✓			
Erosion	✓			
Trash & Debris	✓			
Other				
Notes:				

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

Remarks:

- SEDIMENT FOREBAY NEEDS CLEANED OUT
- RE-STABILIZE AREAS ON SOUTH FACING SLOPES

Overall Environmental Division Internal Rating: 3/5

Signature: [signature] **Date:** 9/13/07

Title: ENV. INSPECTOR

SWMProg\BMP\CoInspProg\InspForms\DetRet.wpd

Date Record Created:

Created By:

WS_BMPNO: YC031

Print Form

PRINTED ON:
Saturday, March 13, 2010
3:25:08 PM

WATERSHED	YC
BMP ID NO	031
PLAN NO	S-73-02
TAX PARCEL	(24-3)(1-32)
PIN NO	2430100032
CONSTRUCTION DATE	5/28/2004
PROJECT NAME	Colonial Heritage Ph 1 Sec 3/3a
FACILITY LOCATION	Adjacent to Arthur Hills Dr.
CITY-STATE	Williamsburg, VA
CURRENT OWNER	US Homes Corp.
OWNER ADDRESS	6895 Richmond Rd
OWNER ADDRESS 2	
CITY-STATE-ZIP CODE	Williamsburg VA 23188
OWNER PHONE	757-258-2705
MAINT AGREEMENT	Yes
EMERG ACTION PLAN	No

Get Last BMP No

Return to Menu

MAINTENANCE PLAN	No
SITE AREA acre	9.1
LAND USE	Mixed Use
old BMP TYP	Dry Pond
JCC BMP CODE	F2 Dry ED with forebay
POINT VALUE	4
SVC DRAIN AREA acres	6.9
SERVICE AREA DESCRI	Residential
IMPERV AREA acres	0.00
RECV STREAM	
EXT DET-WQ-CTRL	No
WTR QUAL VOL acre-ft	
CHAN PROT CTRL	No
CHAN PROT VOL acre-ft	
SW/FLOOD CONTROL	No
GEOTECH REPORT	Yes

CTRL STRUC DESC	
CTRL STRUC SIZE inches	4
OTLT BARRL DESC	
OTLT BARRL SIZE inch	15
EMERG SPILLWAY	No
DESIGN HW ELEV	75.60
PERM POOL ELEV	0
2-YR OUTFLOW cfs	4.57
10-YR OUTFLOW cfs	12.76
REC DRAWING	Yes
CONSTR CERTIF	Yes

LAST INSP DATE 10/30/2007 Inspected by:

INTERNAL RATING 3/5

MISC/COMMENTS

Master plan pond # 13

Additional Comments: