

Stormwater Division

MEMORANDUM

DATE: March 12, 2010
TO: Michael J. Gillis, Virginia Correctional Enterprises Document Management Services
FROM: Tina Cantwell, Stormwater
PO: 270712
RE: Files Approved for Scanning

General File ID or BMP ID: WC069

PIN: 0530100017

Subdivision, Tract, Business or Owner

Name (if known):

Association at Stonehouse, Inc. (The)
NE intersection of Mill Pond Road and Fieldstone
Park

Property Description:

Site Address:

Stonehouse Subdivision

(For internal use only)

Box 13

Drawer: 8

Agreements: (in file as of scan date) N

Book or Doc#:

Page:

Comments

WC050
WC069
TOR1
253 0040



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.

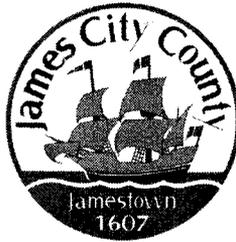
BMP NUMBER: WC069

DATE VERIFIED: October 15, 2012

QUALITY ASSURANCE TECHNICIAN: Leah Hardenbergh

Leah Hardenbergh

LOCATION: WILLIAMSBURG, VIRGINIA



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: Stonehouse Development Area One, Phase I
Structure/BMP Name: Dry Pond
Project Location: Stonehouse Subdivision
BMP Location: Behind Stonehouse Community Center/ Sales Center
County Plan No.: _____

Project Type: Residential Business Tax Map/Parcel No.: 0530100017
 Commercial Office BMP ID Code (if known): JCC BMP # WC069
 Institutional Industrial Zoning District: PR
 Public Roadway Land Use: _____
 Other Mixed Use Site Area (sf or acres): 1.65 Ac.

Brief Description of Stormwater Management/BMP Facility: Dry Pond

Nearest Visible Landmark to SWM/BMP Facility: Golf Maintenance Facility

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: Unknown
Facility Monitored by County Representative during Construction: Yes No Unknown
Name of Site Work Contractor Who Constructed Facility: Unknown
Name of Professional Firm Who Routinely Monitored Construction: Unknown
Date of Completion for SWM/BMP Facility: Unknown
Date of Record Drawing/Construction Certification Submittal: 05/16/05

(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: Stonehouse Development Company, L.L.C.
Mailing Address: 9701 Mill Pond Run
Toano, VA 23168-9606
Business Phone: (757) 234-5000 Fax: (757) 234-5091
Contact Person: Cynthia Cloughly Title: Project Administrator

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: Landmark Design Group
Mailing Address: 4029 Ironbound Road, Suite 100
Williamsburg, VA 23188-2549
Business Phone: (757) 253-2975
Fax: (757) 229-0049
Responsible Plan Preparer: Landmark Design Group
Title: _____
Plan Name: _____
Firm's Project No. _____
Plan Date: _____
Sheet No.'s Applicable to SWM/BMP Facility: _____ / _____ / _____ / _____ / _____

BMP Contractor: *(Note: Site Work Contractor directly responsible for construction of the Stormwater Management / BMP facility.)*
Name: Unknown
Mailing Address: _____
Business Phone: _____
Fax: _____
Contact Person: _____
Site Foreman/Supervisor: _____
Specialty Subcontractors & Purpose (for BMP Construction Only):

Section 4 – Professional Certifications:

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

Record Drawing and Construction Certifications for Stormwater Management / BMP Facilities

Record Drawing Certification

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

Name: V. Marc Bennett
Title: Senior Project Manager

Signature: 
Date: 12/15/05

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.~~

NOTE: AES Consulting Engineers was not the original design professional for this specific BMP Facility.

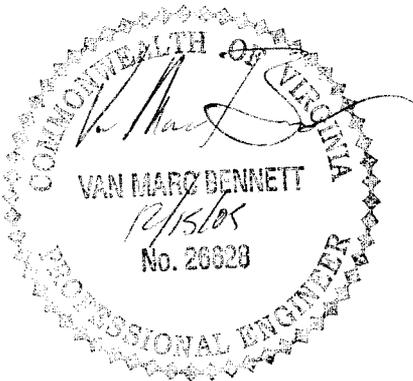
Construction Certification

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

Name: _____
Title: _____

Signature: _____
Date: _____

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



(Seal)

Virginia Registered Professional Engineer
Or Certified Land Surveyor

(Seal)

Virginia Registered
Professional Engineer

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.)*

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Construction Certification

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

Name: _____
Title: _____

Signature: _____
Date: _____

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

? NEED ASBUILT CERT.

(Seal)
Virginia Registered Professional Engineer
Or Certified Land Surveyor

(Seal)
Virginia Registered
Professional Engineer

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

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

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

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

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

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

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

STORMWATER MANAGEMENT / BMP FACILITIES RECORD DRAWING CHECKLIST

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

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

- N/A 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.
- N/A 4. Top widths, berm widths and embankment side slopes.
- XX 5. Show length, width and depth of facility or grading, contours or spot elevations as required to verify permanent pool and design storage volumes were met or were reasonably close to the approved design. Evaluation of as-built grading, contours, spot elevations, or cross-sections, may be necessary by the professional to ensure approved design configurations, depths and volumes were closely maintained. If grading or elevations are significantly different from the approved plan, the Environmental Division shall be contacted immediately to determine whether the variation is acceptable or whether further evidence will be required. Facilities which do not closely resemble approved plan grades, elevations or configurations may require regrading by the Contractor; check volumetric computations; and/or a check hydraulic routing to ensure approved design water surface elevations, discharges or freeboard were closely maintained.
- N/A 6. Cross-section of the embankment through the principal spillway or outlet barrel. Must extend at least 100 ft. downstream of the pipe outlet or to recorded site property line, whichever is closer. Proper correlation is required between principal spillway (control structure) crest, emergency spillway crest, orifice and weirs and the top of the dam or facility. All elevations and dimensions must reasonably match the design plan or be sequentially relative to each other and the facility must reflect the required design storage volume(s) and/or design depth.
- N/A 7. Profile or elevations along the entire centerline of the emergency spillway. Emergency spillway may be steeper, but no flatter or narrower than design.
- 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.
- N/A 12. Type, location, size and number of anti-seep collars or documentation of other methods utilized for seepage control. **May need to obtain this information during construction.**
- N/A 13. Top of impervious core embankment, core trench limits and elevation of cut-off trench bottom. **May need to obtain this information during construction.**
- XX 14. Elevation of the principal spillway barrel (outlet pipe) inlet and outlet invert.
- XX 15. Outlet barrel diameter, length, slope, type and thickness class of material and type of flared end sections, headwall or endwall.
- XX 16. Outfall protection dimension, type and depth of rock and if underlain filter fabric is present.
- N/A 17. BMP interior and periphery landscaping zones conform with arrangements and requirements of the approved design plan.
- N/A 18. Maintenance plan taken from approved design plan transposed onto record drawing set.
- N/A 19. Fencing location and type, if applicable to facility.
- XX 20. BMP vicinity properly cleaned of stockpiles and construction debris.
- XX 21. No visual signs of erosion or channel degradation immediately downstream of facility.
- 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.)

- | | | |
|------------|------|--|
| <u>N/A</u> | A1. | All requirements of Section II, Minimum Standards, apply to Group A facilities. |
| <u>N/A</u> | A2. | Principal spillway consists of reinforced concrete pipe with O-Ring gaskets for watertight joint construction. |
| <u>N/A</u> | A3. | Sediment forebays or pretreatment devices provided at inlets to pond. Generally 4 to 6 ft. deep. |
| <u>N/A</u> | 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. |
| <u>N/A</u> | A5. | Adequate fixed vertical sediment depth markers installed in the forebay(s) for future sediment monitoring purposes. |
| <u>N/A</u> | 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. |
| <u>N/A</u> | 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). |
| <u>N/A</u> | A8. | No trees are present within a zone 15 feet around the embankment toe and 25 feet from the principal spillway structure. |
| <u>N/A</u> | A9. | Wet permanent pool, typically 3 to 6 feet deep, is provided and maintains level within facility. |
| <u>N/A</u> | A10. | Low flow orifice has a non-clogging mechanism. |
| <u>N/A</u> | A11. | A pond drain pipe with valve was provided. |
| <u>N/A</u> | A12. | Pond side slopes are not steeper than 3H:1V, unless approved plan allowed for steeper slope. |
| <u>N/A</u> | 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 diaphragm provided in areas where lateral sheet flow from impervious surfaces are directly connected to the open channel system.
 - N/A E9. Grass cover/stabilization in the open channel system appears adaptable to the specific soils and hydric conditions for the site and along the channel system.
 - N/A E10. Open channel system areas with grass covers higher than four (4) to six (6) inches were properly mowed.
 - N/A E11. Facility was not used for erosion and sediment control purposes and sediment was prevented from entering the facility to the greatest extent possible during construction.
 - N/A E12. No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed and no adverse affects to the function of the facility are anticipated.
 - N/A E13. For E-3 BMPs (Biofilters), the bottom width is six (6) feet maximum at any location.
 - N/A E14. For E-3 BMPs (Biofilters), sideslopes are 3H:1V maximum at any location.
 - N/A E15. For E-3 BMPs (Biofilters), the constructed channel slope is less than or equal to three (3) percent at any location.
 - N/A E16. For E-3 BMPs (Biofilters), the constructed grass channel is approximately equivalent to the constructed roadway length.

STORMWATER MANAGEMENT / BMP FACILITIES RECORD DRAWING CHECKLIST

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

- VIII. Group F – Extended Dry Detention** *(Includes F-1 Timber Walls; and F-2 Dry Extended Detention with Forebay)*
- 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.)
 - N/A 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
 - Inc F6. Principal spillway and outlet barrel provided consisting of reinforced concrete pipe with O-Ring gaskets for watertight joint construction.
 - XX 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.
 - XX 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)*
- N/A G1. All requirements of Section II, Minimum Standards, apply to Group G facilities as applicable.
- N/A G2. Constructed impervious areas appear to conform with locations indicated on the approved plan and appear less than sixty (60) percent impervious in accordance with the requirements of the James City County Chesapeake Bay Preservation Ordinance.
- N/A G3. Dedicated open space areas are in undisturbed common areas, conservation easements or are protected by other enforceable instruments that ensures perpetual protection.
- N/A G4. Provisions included to clearly specify how the natural vegetated areas utilized as dedicated open space will be managed and field identified (marked).
- N/A G5. Adequate protection measures were implemented during construction to protect the defined dedicated open space areas.
- N/A G6. Dedicated open space areas were not disturbed during construction (ie. cleared, grubbed or graded).

STORMWATER MANAGEMENT / BMP FACILITIES RECORD DRAWING CHECKLIST

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

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

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

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

XII. Other Systems

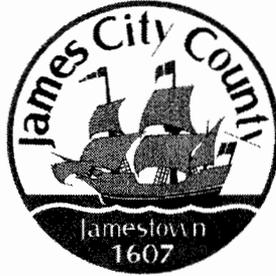
(Includes any non-typical, specialty, manufactured or innovative stormwater management/BMP practices or systems generally accepted for use as or in conjunction with other acceptable stormwater management / BMP practices. Requires evidence of prior satisfactory industry use and prior Environmental Division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

- 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.



**James City County, Virginia
Environmental Division**

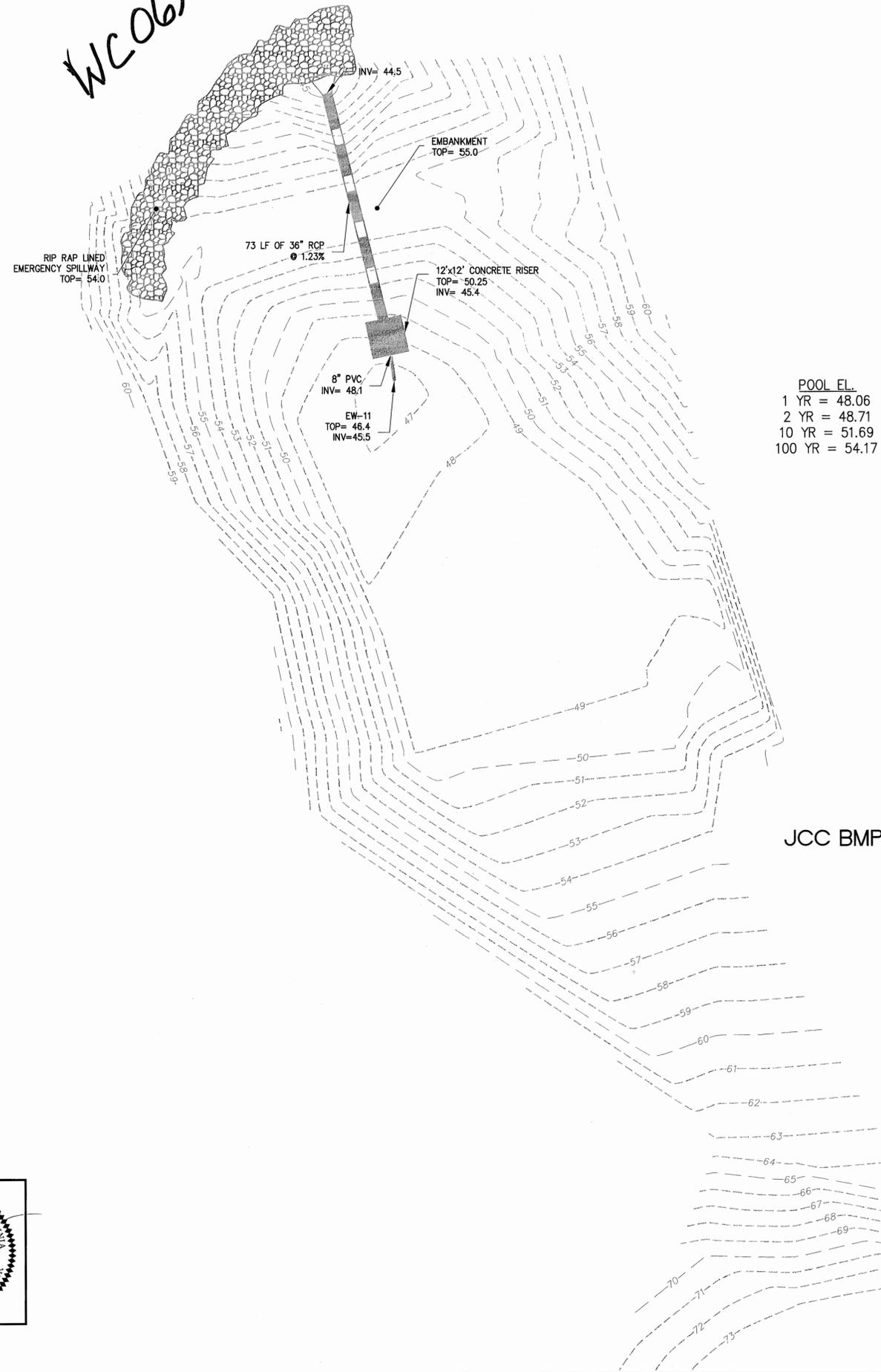
**Stormwater Management / BMP Facilities
Record Drawing and Construction Certification**

Standard Forms & Instructions

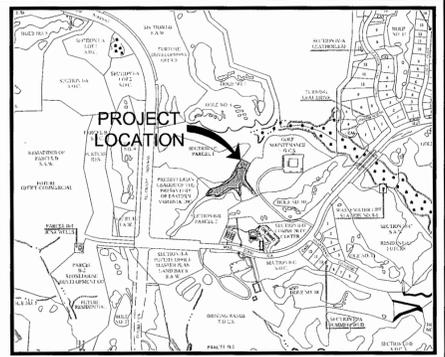
<u>Contents</u>		Page
Record Drawing and Construction Certification Forms		
	Section 1 – Site Information	1
	Section 2 – Construction Information	2
	Section 3 – Owner / Designer / Contractor Information	2
	Section 4 – Professional Certifications	3
	Section 5 – Certification Requirements and Instructions	4
Record Drawing Checklist		
I.	Methods and Presentation (Required for All Facilities)	6
II.	Minimum Standards (Required for All Facilities)	6
III.	Group A – Wet Ponds	8
IV.	Group B – Wetlands	9
V.	Group C – Infiltration Practices	10
VI.	Group D – Filtering Systems	11
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*Issue Date
February 1, 2001*

WC069



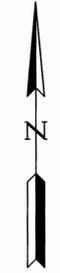
JCC BMP ID# WC069



VICINITY MAP
SCALE 1"=1000'

POOL EL.

1 YR	= 48.06
2 YR	= 48.71
10 YR	= 51.69
100 YR	= 54.17



I HEREBY CERTIFY TO THE BEST OF MY JUDGEMENT, KNOWLEDGE, AND BELIEF THAT THIS RECORD DRAWING REPRESENTS THE CONDITIONS OF THE SITE ON THE DATE IT WAS SURVEYED.

NOTE: AES CONSULTING ENGINEERS WAS NOT THE ORIGINAL DESIGN PROFESSIONAL FOR THIS SPECIFIC BMP FACILITY.



No.	DATE	REVISION / COMMENT / NOTE

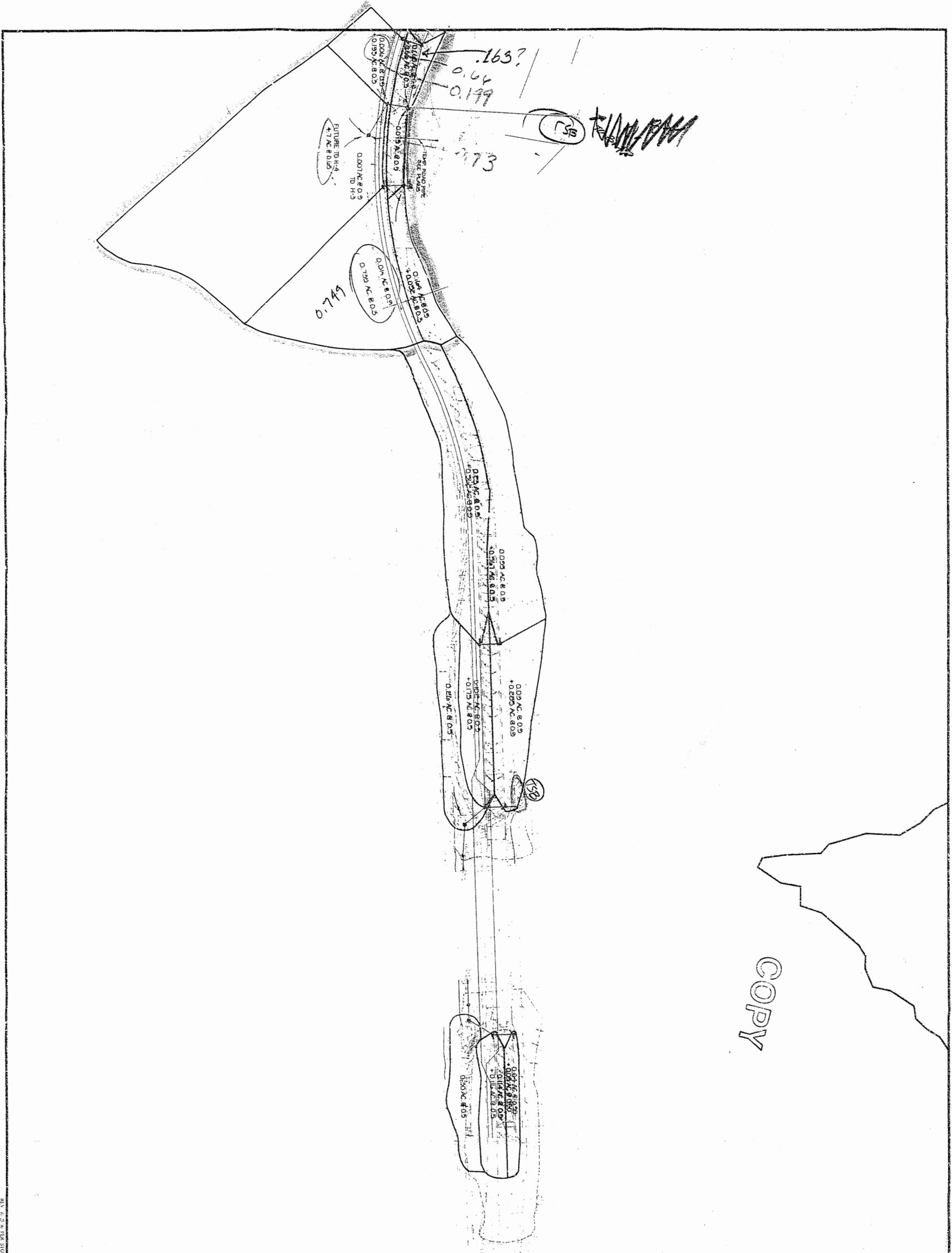
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(757) 253-0040
Fax (757) 220-8994



RECORD DRAWING OF JCC BMP ID# WC069
AT
STONEHOUSE
DEVELOPMENT AREA ONE, PHASE 1
STONEHOUSE DISTRICT

Designed	000	Drawn	000
Scale	1"=20'	Date	5/16/05
Project No.	8851-01B		
Drawing No.	1 OF 1		

JAMES CITY COUNTY VIRGINIA



COPY

MILL POND RUN
 (FORMERLY "CLUBHOUSE ROAD")
 AT STONEHOUSE
 FOR
 STONEHOUSE L.L.C.
 DRAINAGE AREAS

STONEHOUSE DISTRICT
 JAMES CITY COUNTY

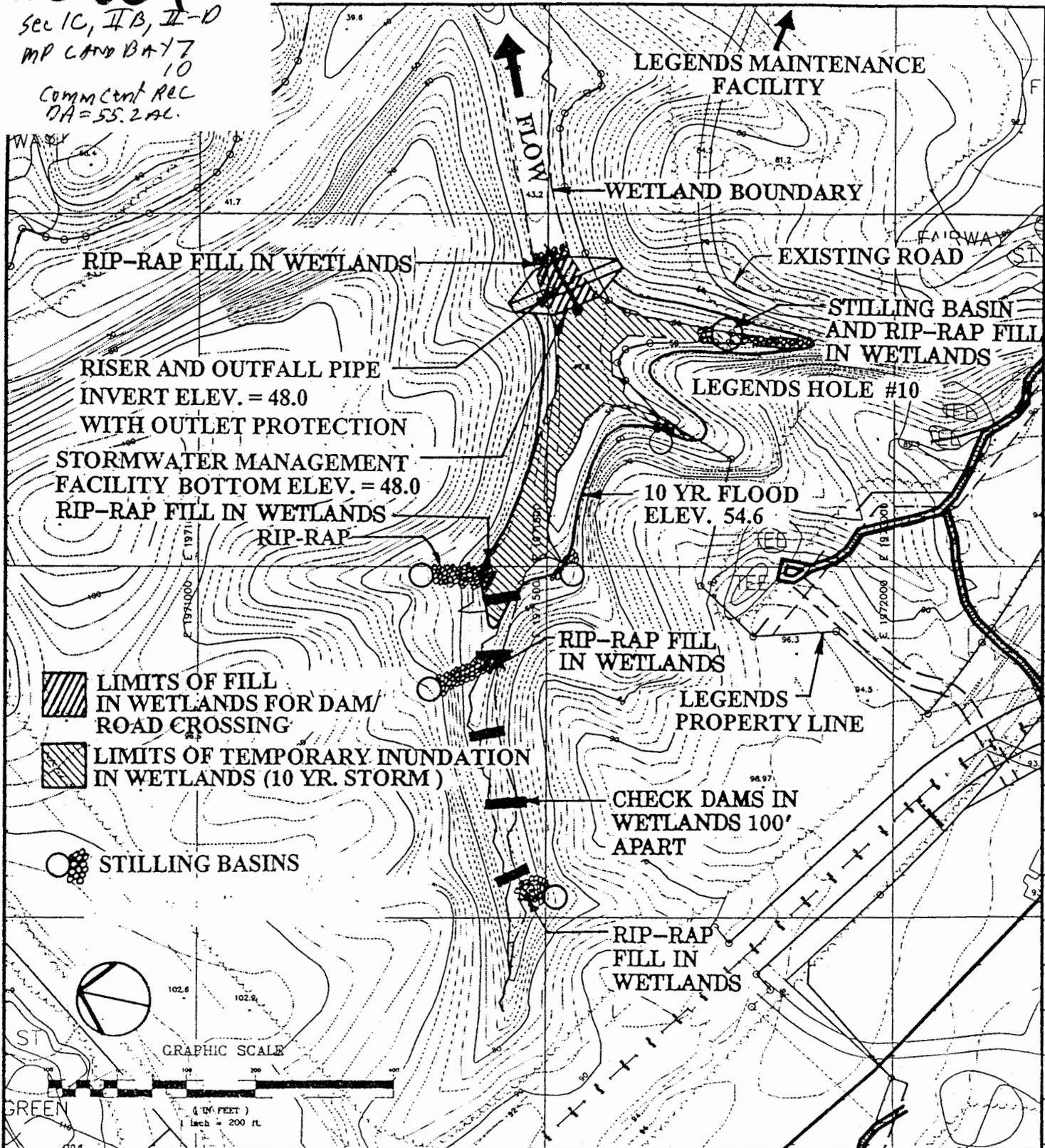
1" = 20' SCALE
 1" = 40' SCALE
 1" = 80' SCALE
 1" = 160' SCALE

DESIGNED BY	JLH
CHECKED BY	JAM
DATE	MAY, 1996

Langley and McDonald, P.C.



WC069
 sec 1C, II B, II-D
 MP LAND BAY 7
 10
 Comment REC
 DA=55.2AL



PURPOSE:
 DATUM: NAD 1983
 ADJACENT PROPERTY OWNERS

1.	
2.	
3.	
4.	
5.	

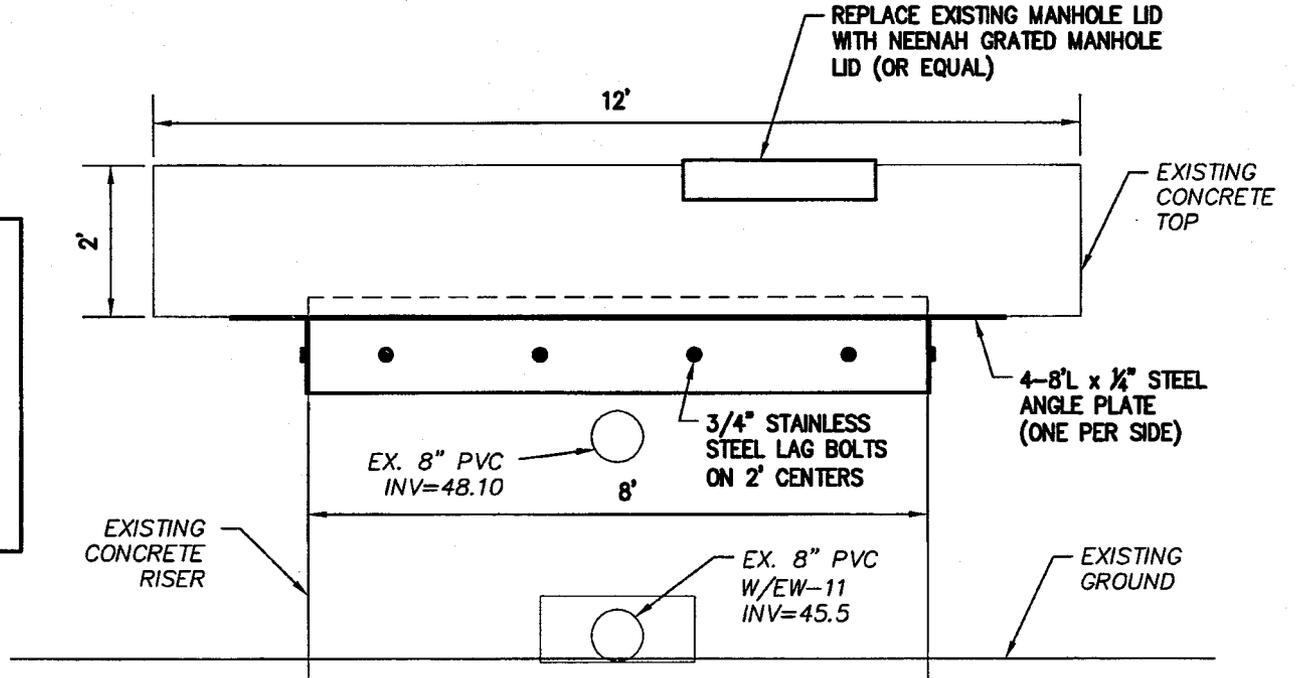
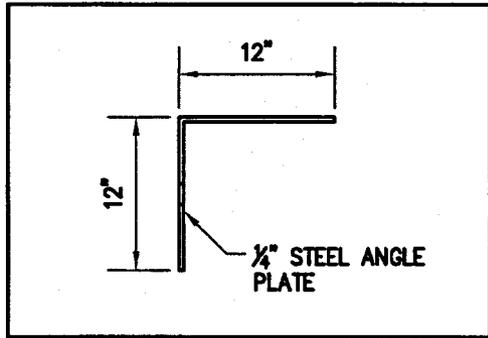
FEB 14 1997

PLAN VIEW

STORMWATER MANAGEMENT FACILITY AND PATH SECTION IC/IB

Langley and McDonald
 A PROFESSIONAL CORPORATION
 ENGINEERS - PLANNERS - SURVEYORS
 VIRGINIA BEACH - WILLIAMSBURG, VIRGINIA

IN: Un-named Tributary
 AT: Mill Swamp
 CITY/COUNTY: James City County
 APPLICATION BY: Stonehouse L.L.C.
 SCALE: 1"=200'
 DATE: SHEET 11 OF 16



NOTE: STEEL PLATES TO BE INSTALLED TO LIMIT FLOW OVER WIERS.

BMP MODIFICATIONS

N.T.S.

CLUBHOUSE POINT
CALCULATION FOR SCS HYDROGRAPH GENERATION AND CHANNEL PROTECTION
FOR

8851-01
 12/20/2004
 Revision Date

I. PRE-DEVELOPMENT CONDITIONS TO POINT OF CONCERN

- A. Pre-Development Drainage Area to Point of Concern = 65.01 Acres
 B. Pre-development Land Use, Soil Classification and Calculation of Composite Curve Number

Soil Type	Soil Hydrologic Group	Pre-Development Land Use	Area of Land Use (in Acres)	Curve Number for Land Use (CN)	Adjusted (CN)
1) 31-B Suffolk	B	Open Space - Woods	29.53	55	1,624
2) Composite C-Soils	C	Open Space - Woods	35.48	70	2,484
Totals =			65.01		4,108
Composite CN =					63

C. Pre-Development Time of Concentration Calculations

- 1) Overland Flow (maximum 300 feet)
 - Surface description (table 5-7) Woods (light underbrush)
 - Manning's roughness coefficient, n (table 5-7) 0.25
 - Length of overland flow, L 300 Feet
 - 2-year 24-hour rainfall, P2 3.6 inches
 - Average slope of overland flow, s 0.023333 feet per foot
 - Travel time, $T_t = (0.007 * (n * L)^{0.8}) / (P2^{0.5} * s^{0.4})$ 0.52 hours

 - 2) Shallow concentrated flow (maximum 300 feet)
 - Surface description, paved or unpaved unpaved
 - Length of shallow concentrated flow, L 300 Feet
 - Average slope of shallow concentrated flow, s 0.013333 feet per foot
 - Average velocity, v 1.8 feet per second
 - Travel time, $T_t = L / (3600 * v)$ 0.05 hours

 - 3) Channel or Pipe Flow
 - Length of channel flow, L 1869 Feet
 - Average velocity of channel flow, v 2.5 feet per second
 - Travel time, $T_t = L / (3600 * v)$ 0.21 hours
- Total Time of Concentration = 1.01 hours
 or 61 minutes

II. POST-DEVELOPMENT CONDITIONS TO POINT OF CONCERN (for total site)

A. Post-Development Drainage Area to Point of Concern =

55.48 Acres

B. Post-development Land Use, Soil Classification and Calculation of Composite Curve Number

	Soil Type	Soil Hydrologic Group	Post-Development Land Use	Area of Land Use (in Acres)	Curve Number for Land Use (CN)	Adjusted (CN)
1)	31-B Suffolk	B	Office (60% Impervious)	0.85	85	72
2)	Composite C-Soils	C	Office (60% Impervious)	6.99	90	629
3)	31-B Suffolk	B	Church (60% Impervious)	2.38	85	202
4)	Composite C-Soils	C	Church (60% Impervious)	4.44	90	400
5)	31-B Suffolk	B	Residential District (1/2 acre)	3.39	70	237
6)	Composite C-Soils	C	Residential District (1/2 acre)	4.15	80	332
7)	31-B Suffolk	B	Residential District (1/8 acre)	3.41	85	290
8)	Composite C-Soils	C	Residential District (1/8 acre)	0.48	90	43
10)	Composite C-Soils	C	Residential District (1/8 acre)	5.33	90	480
11)	31-B Suffolk	B	Open Space - Woods	3.62	55	199
12)	Composite C-Soils	C	Open Space - Woods	3.44	70	241
13)	31-B Suffolk	B	Rec. Center	5.37	85	456
14)	Composite C-Soils	C	Rec. Center	2.43	90	219
15)	31-B Suffolk	B	Golf Course	0.91	61	56
16)	Composite C-Soils	C	Golf Course	3.00	74	222
16)	Composite C-Soils	C	BMP	2.30	74	170
17)			Roadway (Pavement)	2.89	98	0
Total Adjusted CN =				55.38		4,248
Composite CN =						77

C. Post-Development Time of Concentration Calculations

1) Overland Flow (maximum 300 feet)

Surface description (table 5-7)

Woods (light underbrush)

Manning's roughness coefficient, n (table 5-7)

0.15

Length of overland flow, L

300 Feet

25-year 24-hour rainfall, P25

6.5 inches

Average slope of overland flow, s

0.03 feet per foot

Travel time, $T_t = (0.007 * (n * L)^{0.8}) / (P^{2 * 0.5 * s^{0.4}})$

0.23 hours

2) Shallow concentrated flow (maximum 300 feet)

Surface description, paved or unpaved

unpaved

Length of shallow concentrated flow, L

300 Feet

Average slope of shallow concentrated flow, s

0.073333 feet per foot

Average velocity, v

4.4 feet per second

Travel time, $T_t = L / (3600 * v)$

0.02 hours

3) Channel or Pipe Flow

Length of channel flow, L

750 Feet

Average velocity of channel flow, v

2.5 feet per second

Travel time, $T_t = L / (3600 * v)$

0.08 hours

Total Time of Concentration =

0.62 hours

or

37 minutes

Hydrograph Plot

REVISED CALCULATIONS FOR

Hydraflow Hydrographs by Intelisolve

JCC BMP WCO69

Monday, Jan 24 2005, 2:22 PM

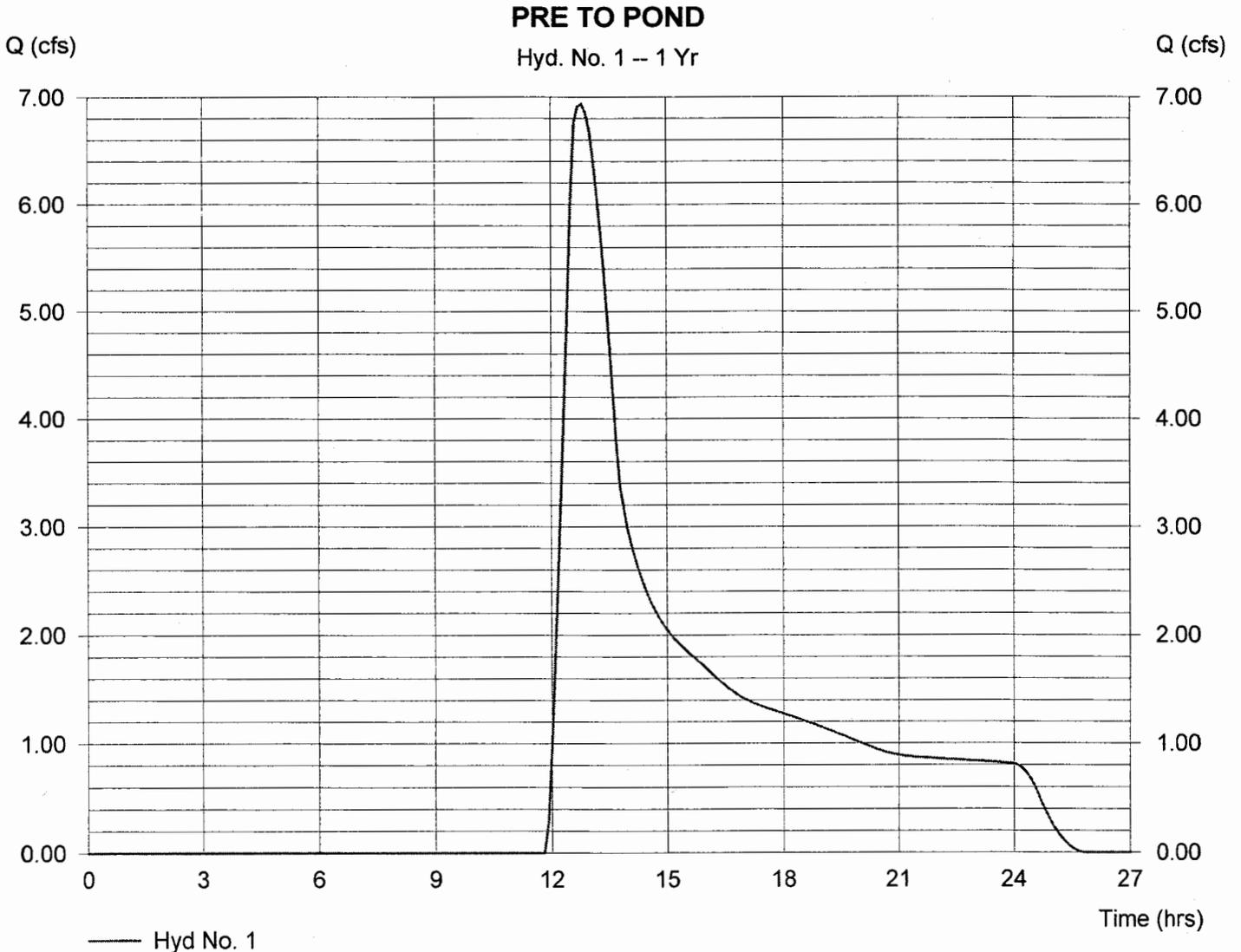
Hyd. No. 1

PRE TO POND (UNDEVELOPED)

Hydrograph type = SCS Runoff
Storm frequency = 1 yrs
Drainage area = 65.01 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 2.80 in
Storm duration = 24 hrs

Peak discharge = 6.94 cfs
Time interval = 6 min
Curve number = 63
Hydraulic length = 0 ft
Time of conc. (Tc) = 61 min
Distribution = Type II
Shape factor = 484

Hydrograph Volume = 84,589 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Jan 24 2005, 2:22 PM

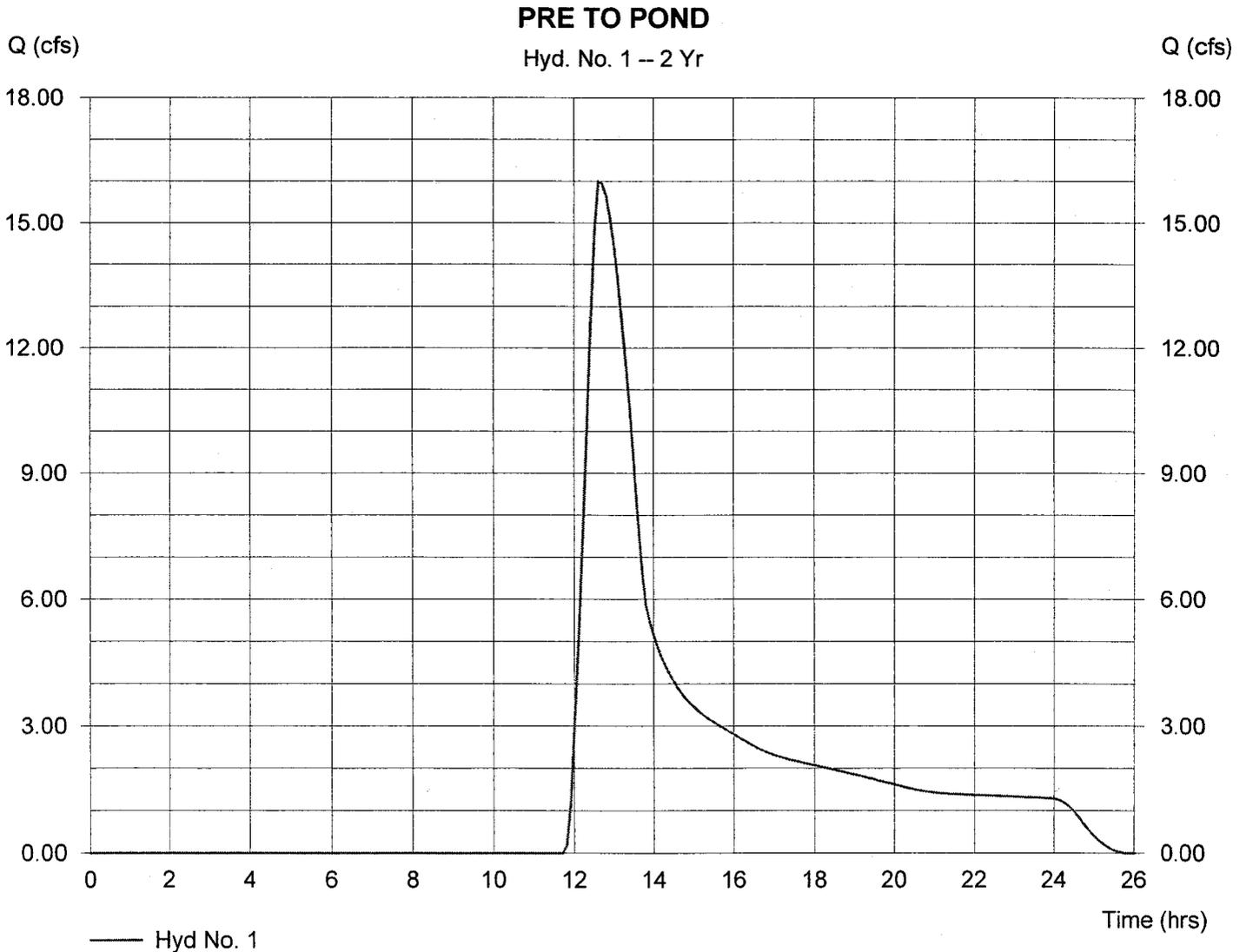
Hyd. No. 1

PRE TO POND (UNDEVELOPED)

Hydrograph type = SCS Runoff
Storm frequency = 2 yrs
Drainage area = 65.01 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 3.50 in
Storm duration = 24 hrs

Peak discharge = 16.01 cfs
Time interval = 6 min
Curve number = 63
Hydraulic length = 0 ft
Time of conc. (Tc) = 61 min
Distribution = Type II
Shape factor = 484

Hydrograph Volume = 158,256 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Jan 24 2005, 2:22 PM

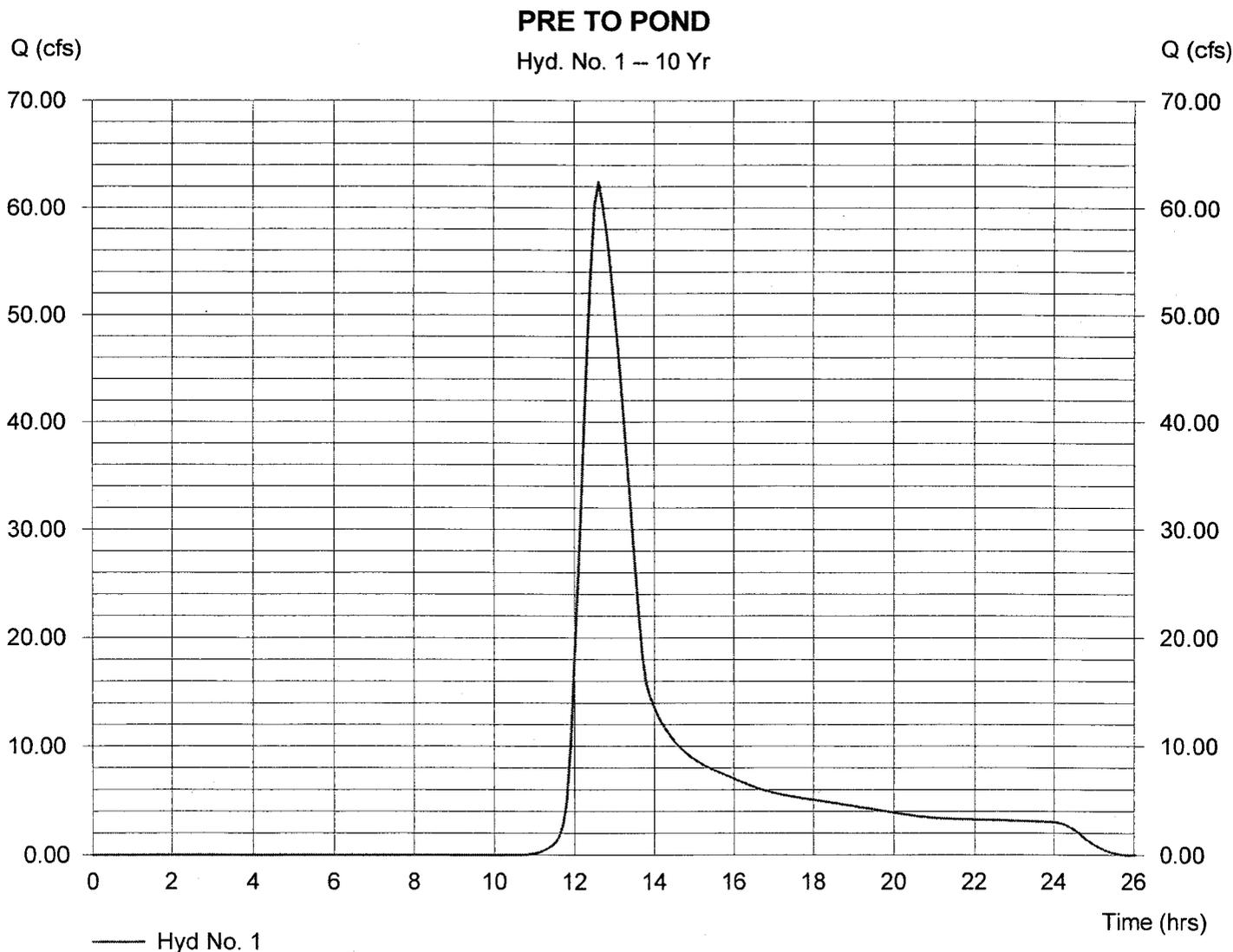
Hyd. No. 1

PRE TO POND (UNDEVELOPED)

Hydrograph type = SCS Runoff
Storm frequency = 10 yrs
Drainage area = 65.01 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 5.80 in
Storm duration = 24 hrs

Peak discharge = 62.42 cfs
Time interval = 6 min
Curve number = 63
Hydraulic length = 0 ft
Time of conc. (Tc) = 61 min
Distribution = Type II
Shape factor = 484

Hydrograph Volume = 489,492 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Jan 24 2005, 2:22 PM

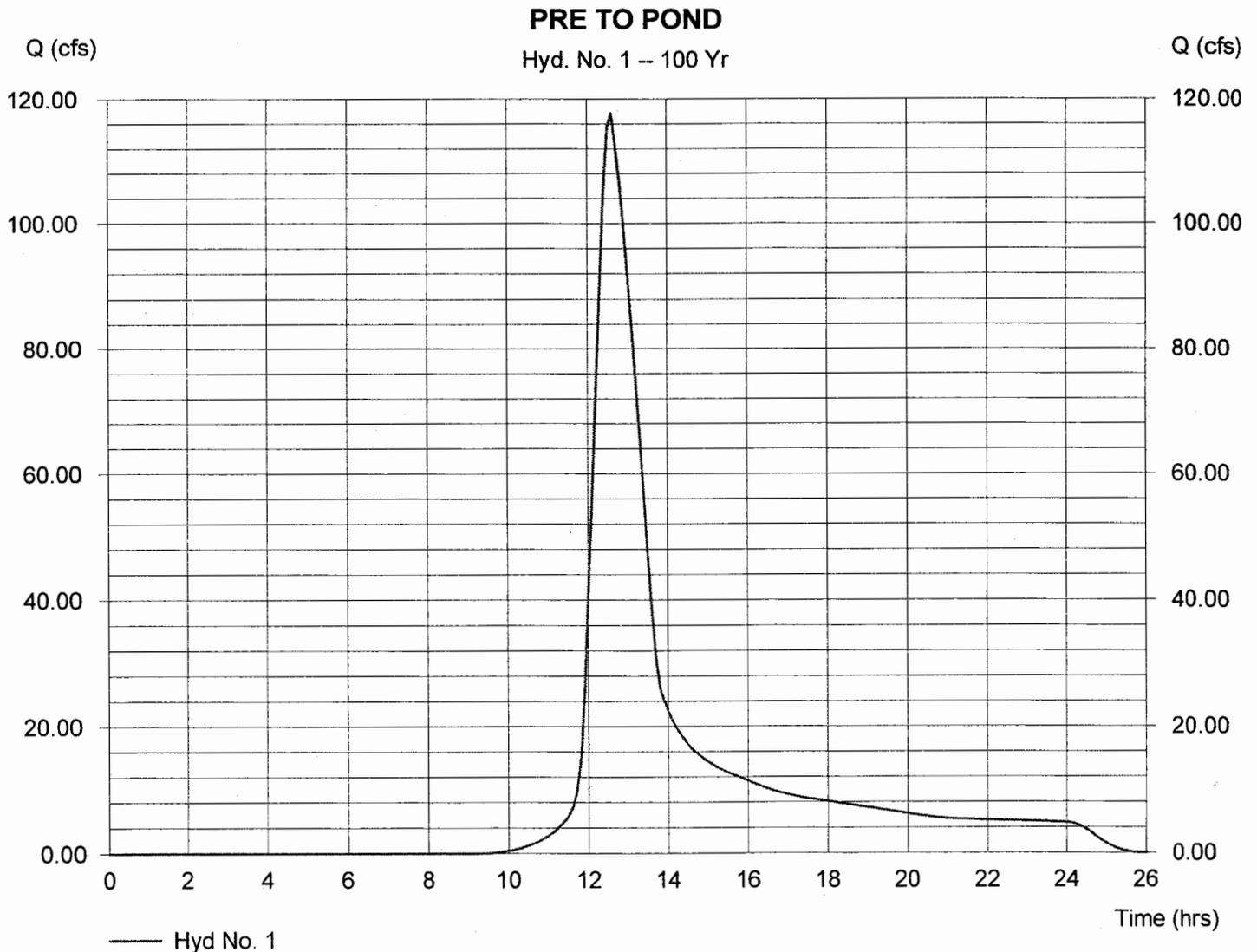
Hyd. No. 1

PRE TO POND (UNDEVELOPED)

Hydrograph type = SCS Runoff
Storm frequency = 100 yrs
Drainage area = 65.01 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 8.00 in
Storm duration = 24 hrs

Peak discharge = 117.72 cfs
Time interval = 6 min
Curve number = 63
Hydraulic length = 0 ft
Time of conc. (Tc) = 61 min
Distribution = Type II
Shape factor = 484

Hydrograph Volume = 881,211 cuft



Hydrograph Plot

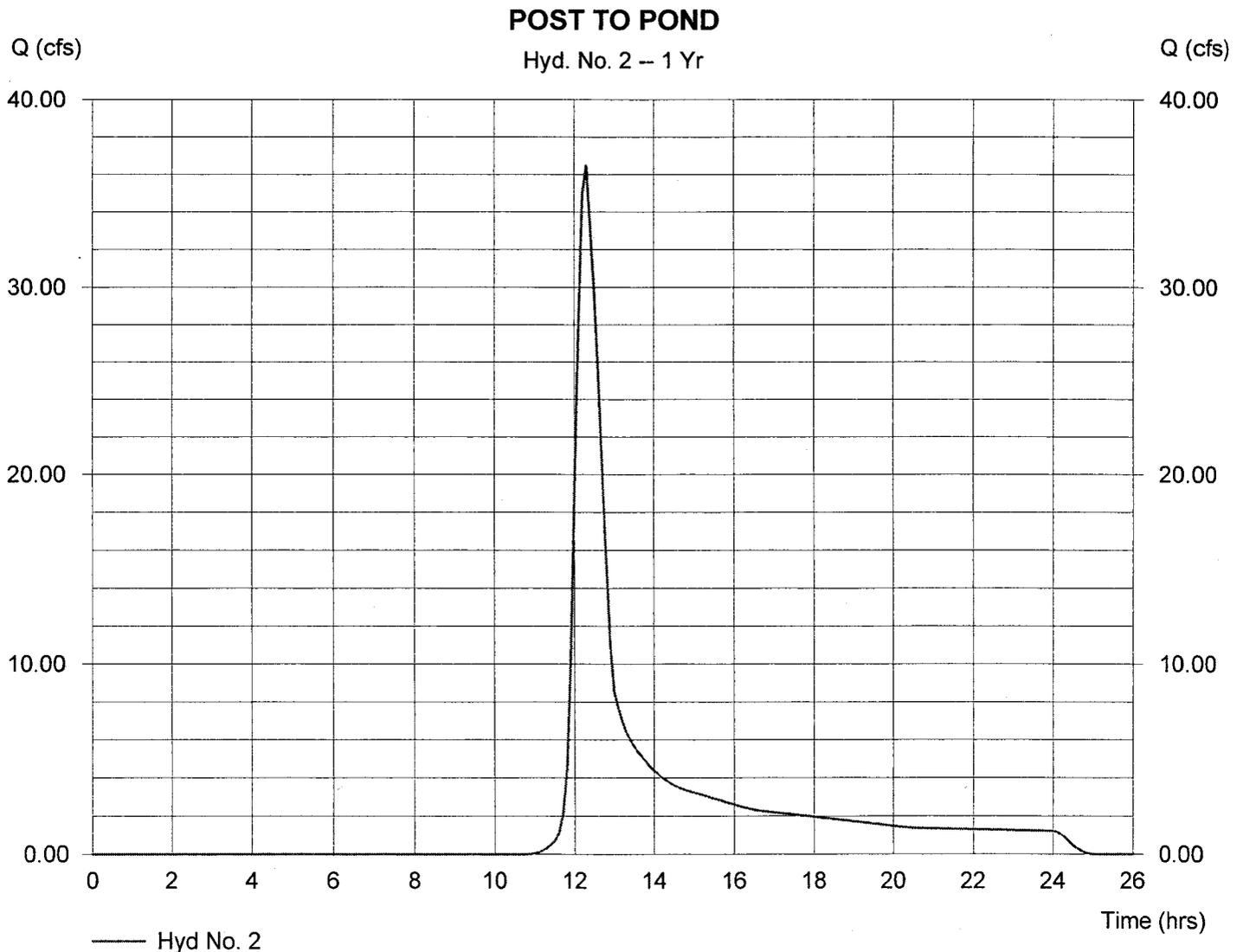
Hyd. No. 2

POST TO POND (TOTAL BUILDOUT)

Hydrograph type = SCS Runoff
Storm frequency = 1 yrs
Drainage area = 55.48 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 2.80 in
Storm duration = 24 hrs

Peak discharge = 36.48 cfs
Time interval = 6 min
Curve number = 77
Hydraulic length = 0 ft
Time of conc. (Tc) = 37 min
Distribution = Type II
Shape factor = 484

Hydrograph Volume = 194,150 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Jan 24 2005, 2:22 PM

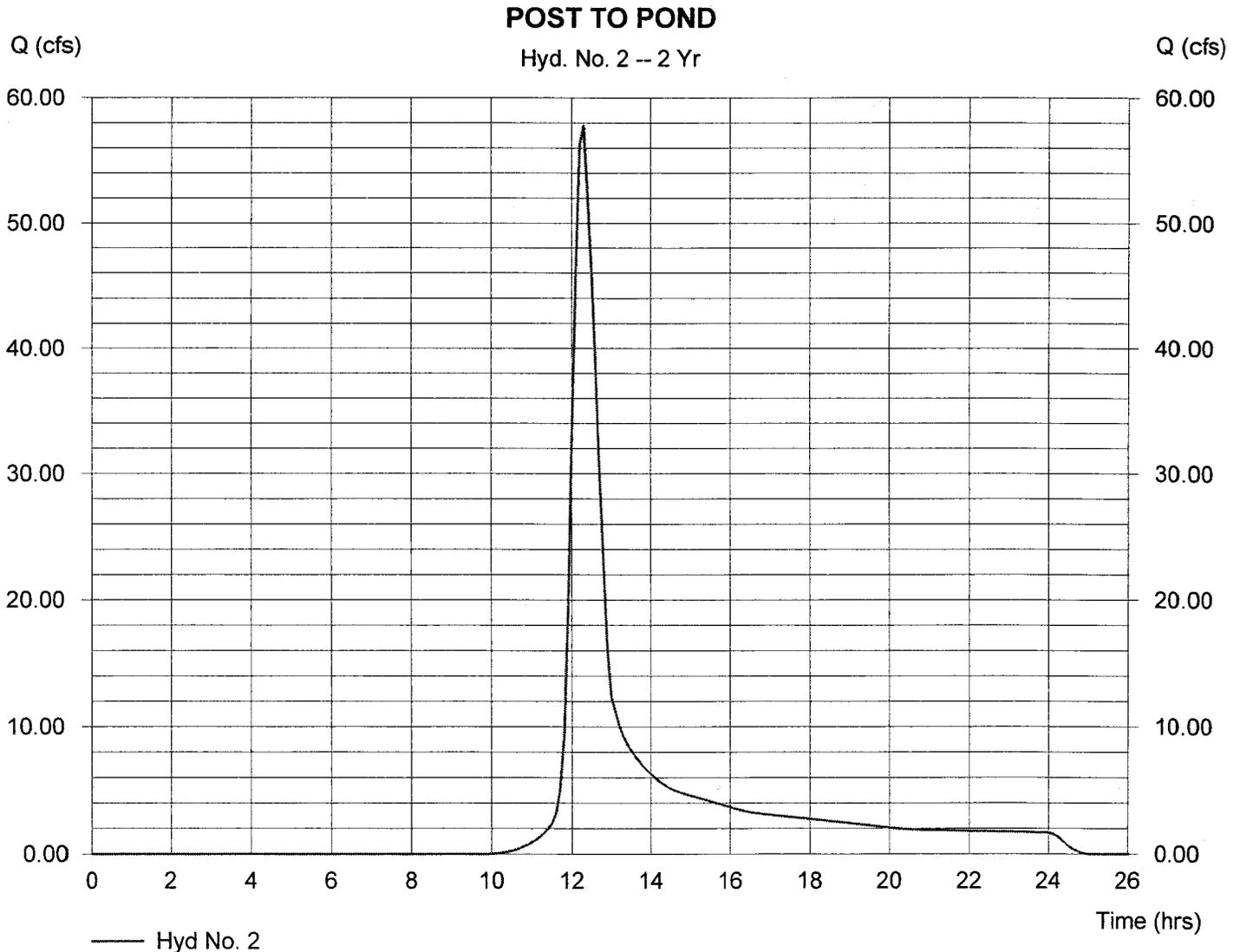
Hyd. No. 2

POST TO POND (TOTAL BUILDOUT)

Hydrograph type = SCS Runoff
Storm frequency = 2 yrs
Drainage area = 55.48 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 3.50 in
Storm duration = 24 hrs

Peak discharge = 57.78 cfs
Time interval = 6 min
Curve number = 77
Hydraulic length = 0 ft
Time of conc. (Tc) = 37 min
Distribution = Type II
Shape factor = 484

Hydrograph Volume = 297,093 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Jan 24 2005, 2:23 PM

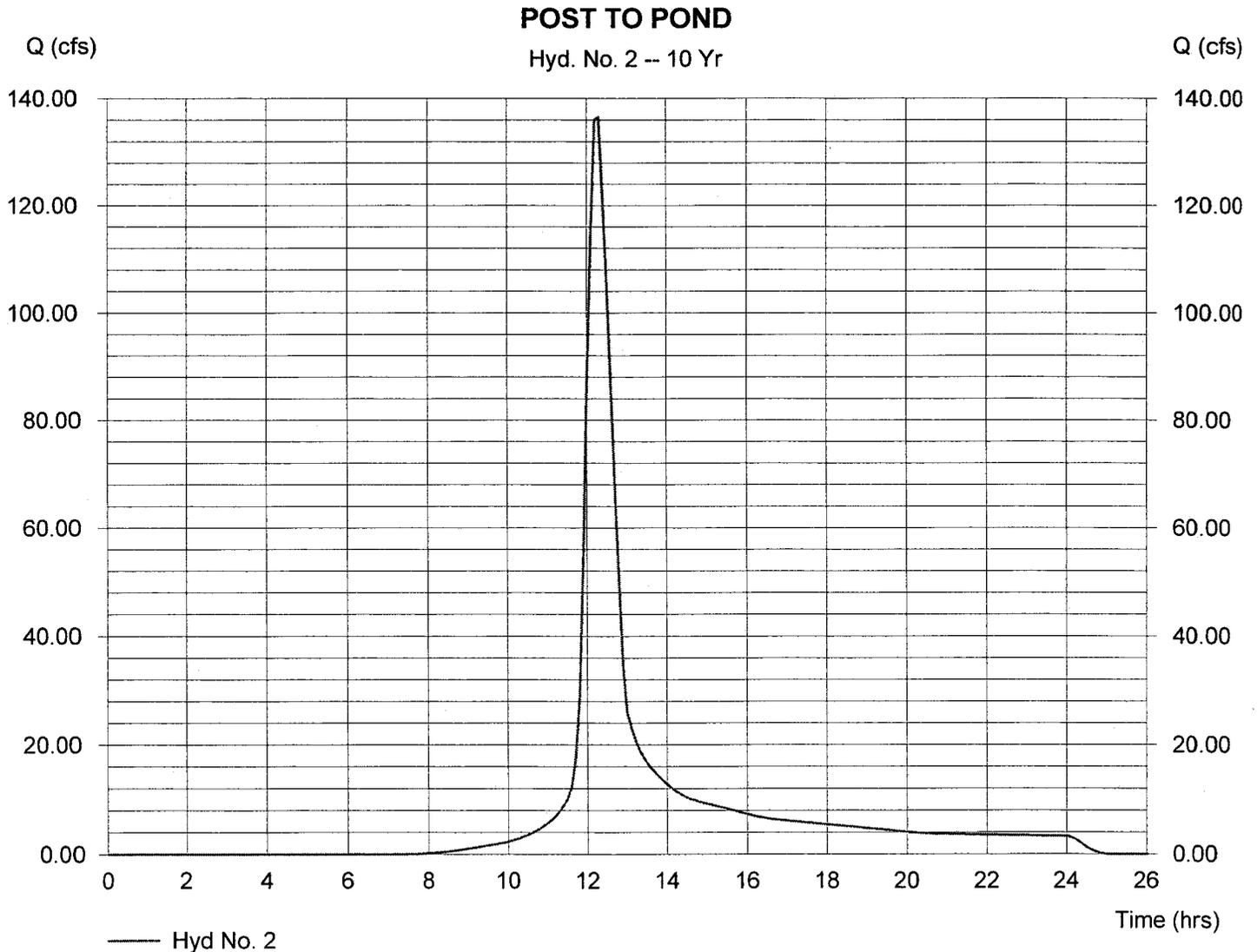
Hyd. No. 2

POST TO POND (TOTAL BUILDOUT)

Hydrograph type = SCS Runoff
Storm frequency = 10 yrs
Drainage area = 55.48 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 5.80 in
Storm duration = 24 hrs

Peak discharge = 136.54 cfs
Time interval = 6 min
Curve number = 77
Hydraulic length = 0 ft
Time of conc. (Tc) = 37 min
Distribution = Type II
Shape factor = 484

Hydrograph Volume = 686,411 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Jan 24 2005, 2:23 PM

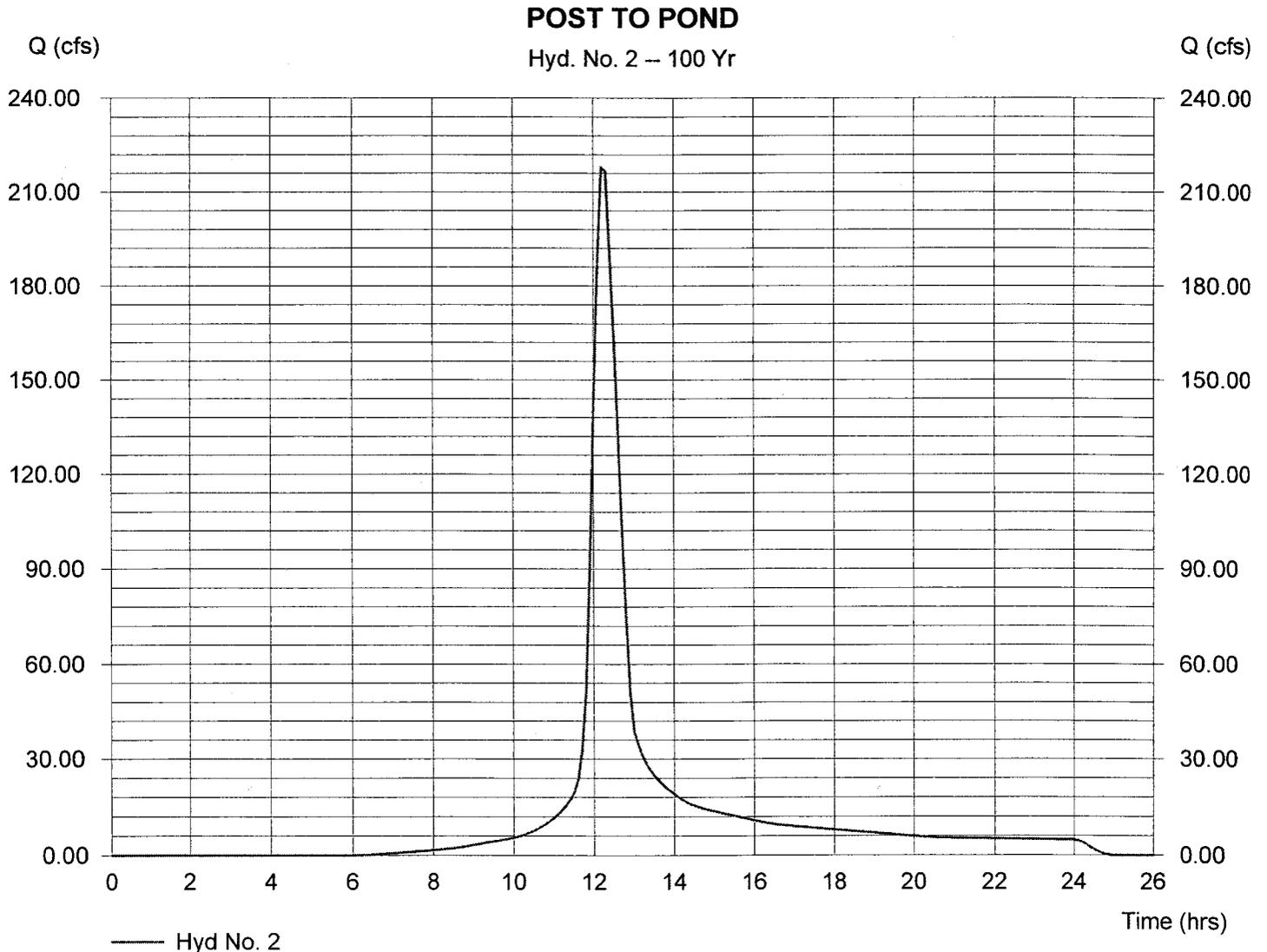
Hyd. No. 2

POST TO POND (TOTAL BUILDOUT)

Hydrograph type = SCS Runoff
Storm frequency = 100 yrs
Drainage area = 55.48 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 8.00 in
Storm duration = 24 hrs

Peak discharge = 217.96 cfs
Time interval = 6 min
Curve number = 77
Hydraulic length = 0 ft
Time of conc. (Tc) = 37 min
Distribution = Type II
Shape factor = 484

Hydrograph Volume = 1,095,408 cuft



Pond Report

Hydraflow Hydrographs by Intelisolve

Tuesday, Jan 25 2005, 11:24 AM

Pond No. 1 - Existing JCC BMP

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	46.00	1,690	0	0
2.00	48.00	17,392	19,082	19,082
4.00	50.00	37,985	55,377	74,459
6.00	52.00	53,365	91,350	165,809
8.00	54.00	72,767	126,132	291,941
10.00	56.00	80,000	152,767	444,708

Culvert / Orifice Structures

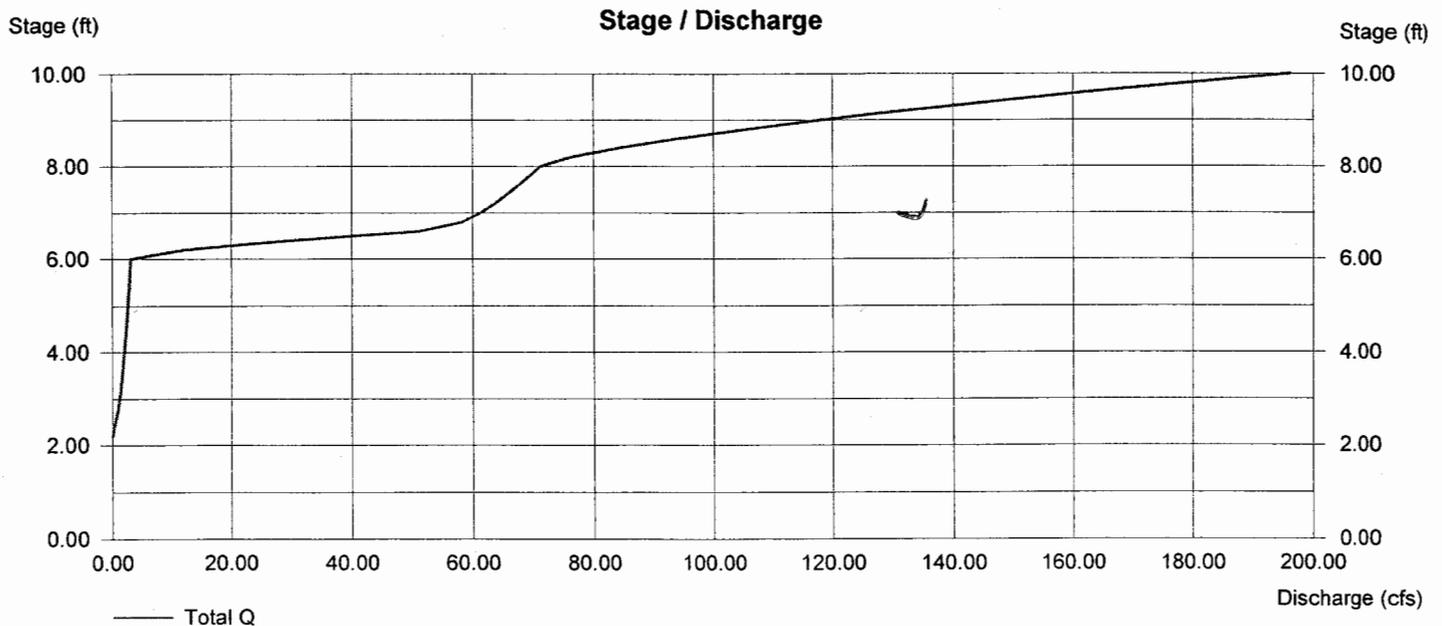
	[A]	[B]	[C]	[D]
Rise (in)	= 36.00	8.00	0.00	0.00
Span (in)	= 36.00	8.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 48.10	48.10	0.00	0.00
Length (ft)	= 73.00	8.00	0.00	0.00
Slope (%)	= 4.90	0.00	0.00	0.00
N-Value	= .013	.013	.000	.000
Orif. Coeff.	= 0.60	0.60	0.00	0.00
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 32.00	15.00	0.00	0.00
Crest El. (ft)	= 52.00	54.00	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. = 47.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Jan 24 2005, 2:23 PM

Hyd. No. 3

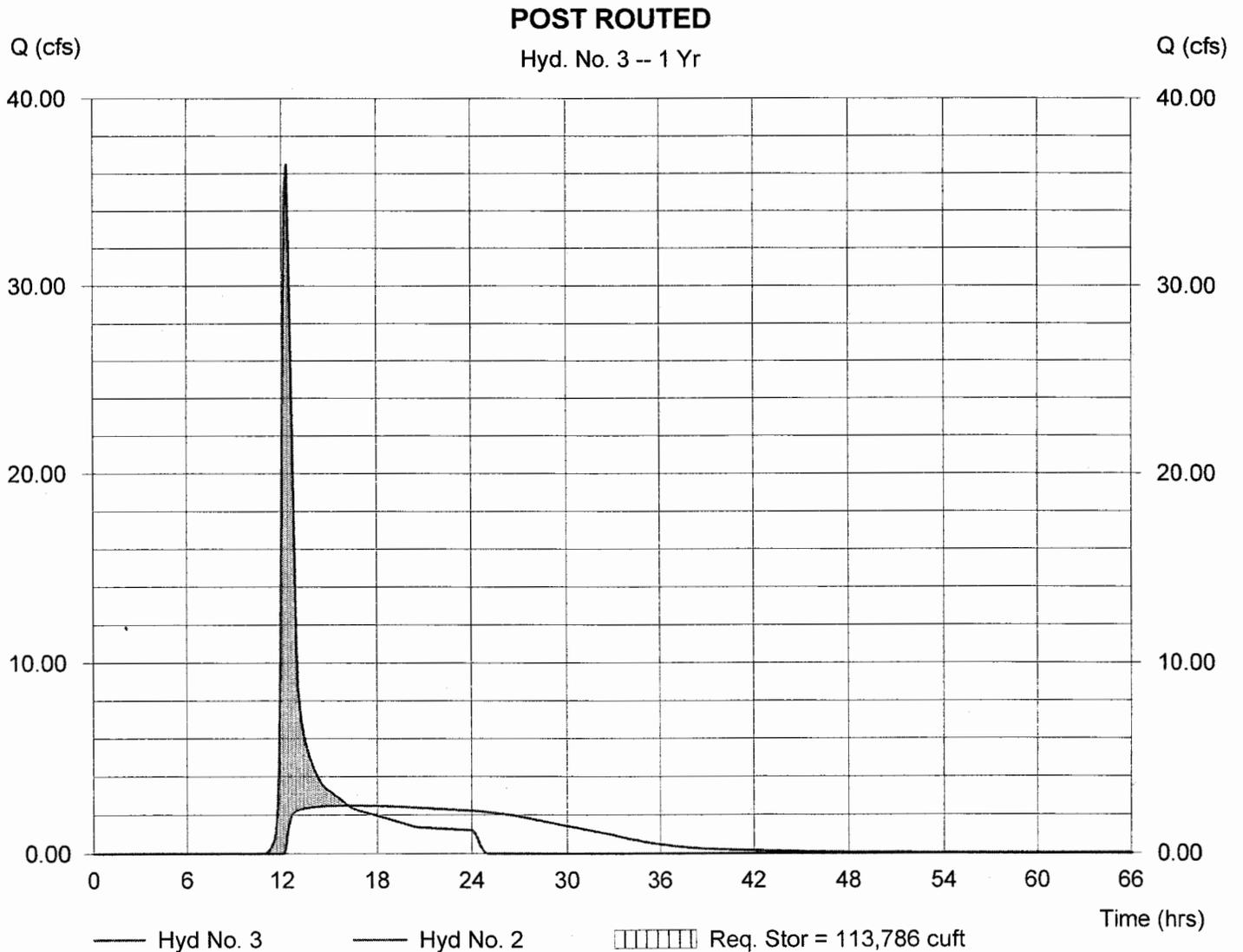
POST ROUTED

Hydrograph type = Reservoir
Storm frequency = 1 yrs
Inflow hyd. No. = 2
Reservoir name = Existing JCC BMP

Peak discharge = 2.49 cfs
Time interval = 6 min
Max. Elevation = 50.86 ft
Max. Storage = 113,786 cuft

Storage Indication method used.

Hydrograph Volume = 174,898 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Jan 24 2005, 2:23 PM

Hyd. No. 3

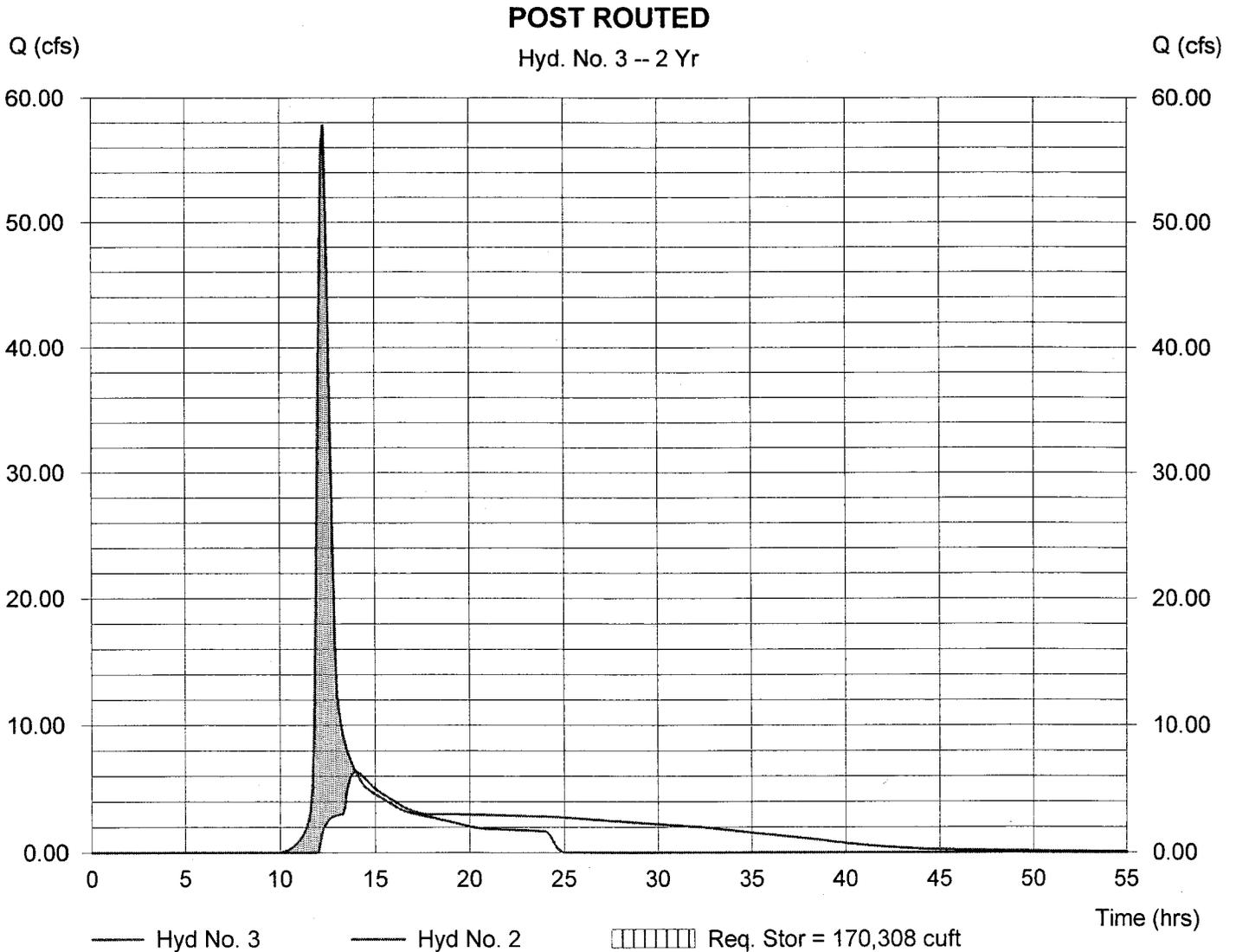
POST ROUTED

Hydrograph type = Reservoir
Storm frequency = 2 yrs
Inflow hyd. No. = 2
Reservoir name = Existing JCC BMP

Peak discharge = 6.35 cfs
Time interval = 6 min
Max. Elevation = 52.07 ft
Max. Storage = 170,308 cuft

Storage Indication method used.

Hydrograph Volume = 277,841 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Jan 24 2005, 2:23 PM

Hyd. No. 3

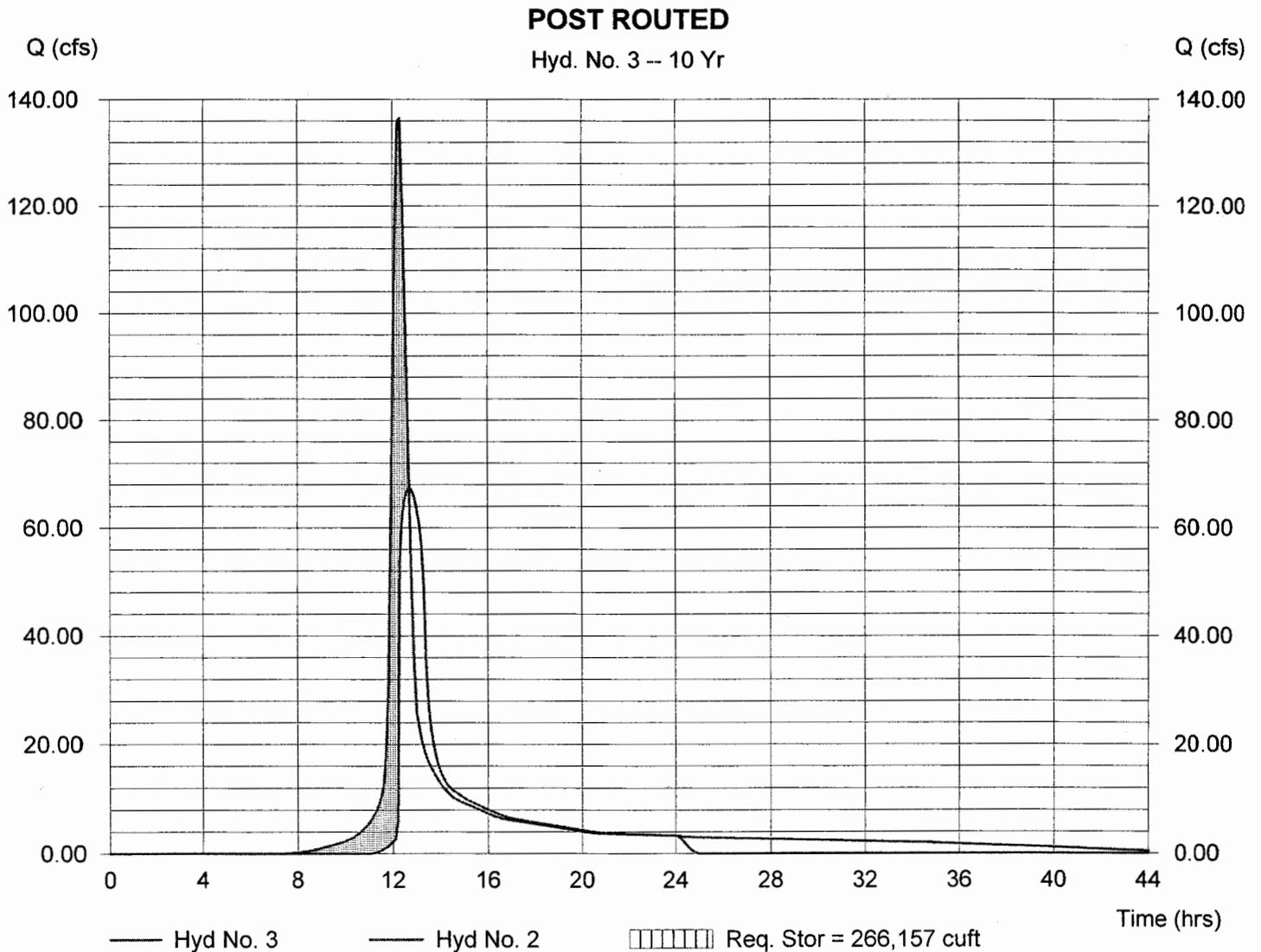
POST ROUTED

Hydrograph type = Reservoir
Storm frequency = 10 yrs
Inflow hyd. No. = 2
Reservoir name = Existing JCC BMP

Peak discharge = 67.50 cfs
Time interval = 6 min
Max. Elevation = 53.59 ft
Max. Storage = 266,157 cuft

Storage Indication method used.

Hydrograph Volume = 667,158 cuft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Monday, Jan 24 2005, 2:23 PM

Hyd. No. 3

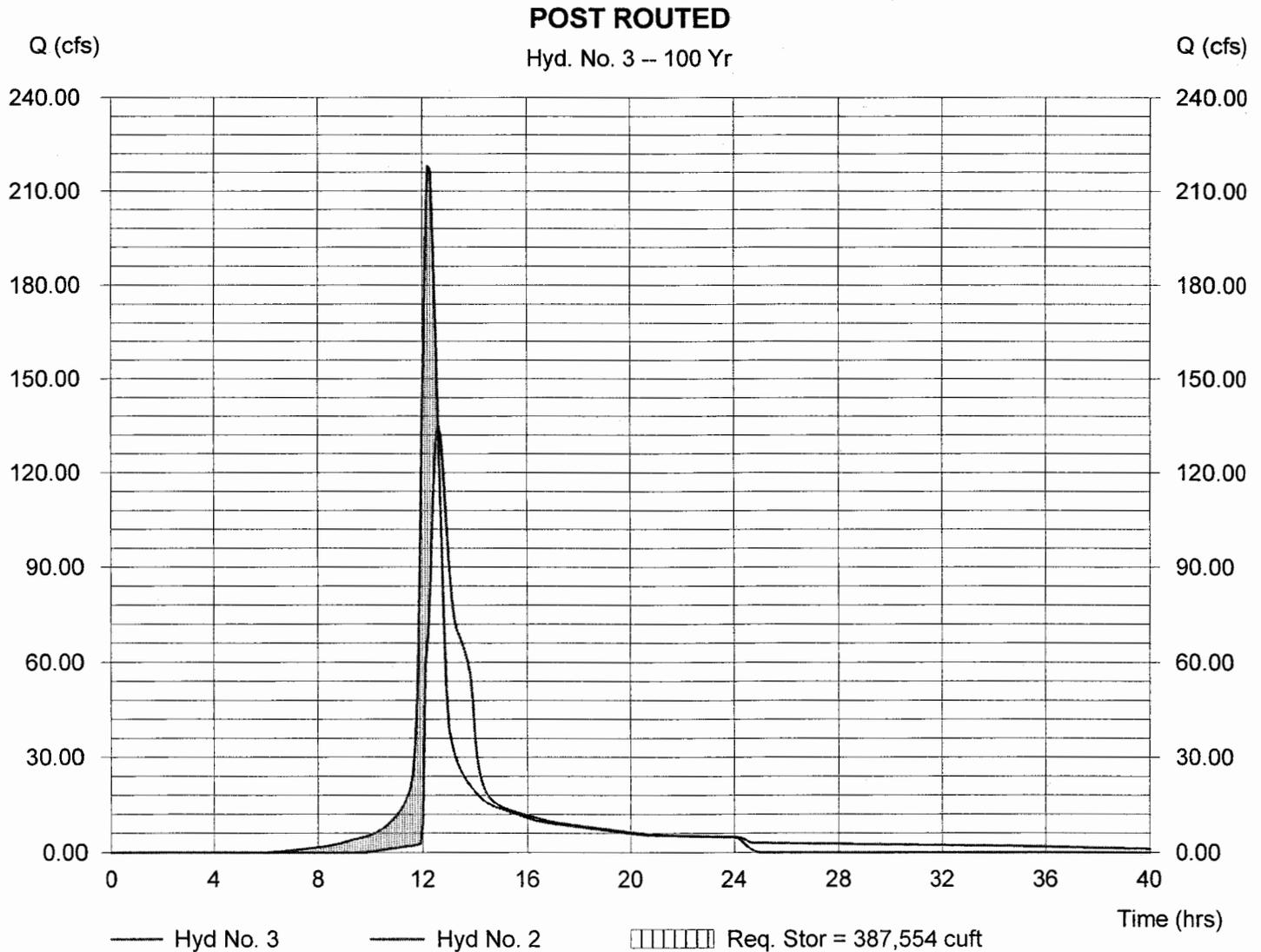
POST ROUTED

Hydrograph type = Reservoir
Storm frequency = 100 yrs
Inflow hyd. No. = 2
Reservoir name = Existing JCC BMP

Peak discharge = 135.32 cfs
Time interval = 6 min
Max. Elevation = 55.25 ft
Max. Storage = 387,554 cuft

Storage Indication method used.

Hydrograph Volume = 1,076,154 cuft



Scott Thomas

From: Jason Grimes [jgrimes@aesva.com]
Sent: Friday, July 15, 2005 4:34 PM
To: Scott Thomas
Subject: Stonehouse- Clubhouse Point

Scott

I've been looking at modifying the BMP out at Stonehouse (which we visited in the field a couple of weeks ago). It appears that if we were able to cut-off the flow through the weir we would successfully lower the 2 and 10-year storms below predevelopment levels. However I'm concerned about the feasibility of and long term maintenance problems of the modifications (steel will rust, stainless creates an extremely high cost, clogging of grated manhole lid, and constructability. Please look over the attached pdf showing the proposed modifications and feel free to provide any suggestions to better block flow from the weir.

Predevelopment Flows to BMP = 17.25 cfs (2 year); 67.07 cfs (10 year)
Routed BMP (no modification) = 18.94 cfs (2 year); 76.86 cfs (10 year)
Routed BMP (weirs completely blocked) = 6.20 (2 year); 60.92 (10 year) – Possible to Block???

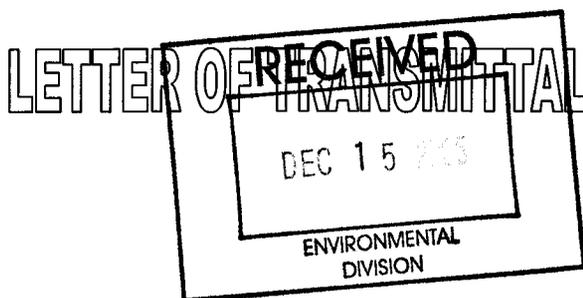
Jason A. Grimes, P.E.
Project Engineer

AES Consulting Engineers
Williamsburg | Richmond
(757) 253-0040
www.aesva.com

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

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



ATTN: **Scott Thomas**

CO.: JCC Environmental

Address: _____

cc: _____

DATE 12/15/05	JOB NO. 8851-02
FROM: Victoria Bains	
RE BMP Record Drawing for WC069	

WE ARE SENDING YOU THE FOLLOWING ITEMS:

- Attached
 Under separate cover via

- Original(s) Print(s) Plan(s) Specification(s) Change Order
 Copy of letter(s) Other:

COPIES	DATE	No. of Pages	DESCRIPTION
1	5/16/05	1	Record Drawing
1	12/15/05	17	Record Drawing and Construction Certification

THESE ARE TRANSMITTED as checked below:

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

REMARKS:

Scott,

From my e-mails and voicemails that I left you, AES does not have the design documents for this facility. Therefore, AES cannot certify that the facility was built to design. Please let me know if JCC Environmental has any other requirements that arise from this review or if you have any questions or concerns.

Tory

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



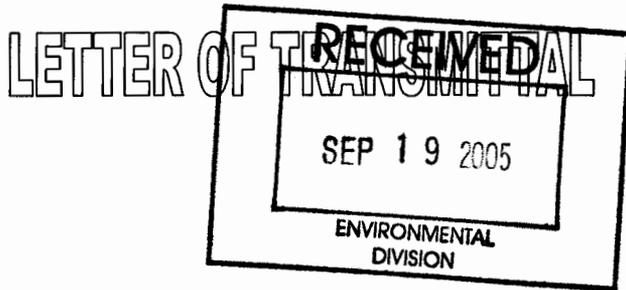
~~10/06/05
Date House
C-25-05~~

LOG IN?

This is an old one,
not bond release but
required due to U/S
Plan Rev.

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

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



ATTN: **Scott Thomas**

CO.: **JCC Environmental**

Address:

cc:

DATE 9/19/05	JOB NO. 8851-02
FROM: Victoria Bains	
RE BMP Record Drawing for WC069 <i>(Stonehouse)</i>	

WE ARE SENDING YOU THE FOLLOWING ITEMS:

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

COPIES	DATE	No. of Pages	DESCRIPTION
1	5/16/05	1	Record Drawing
1	5/16/05	17	Record Drawing and Construction Certification

SP-6-05
 CLUBHOUSE
 THE FAIRWAYS

THESE ARE TRANSMITTED as checked below:

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

REMARKS:

Scott,

From my e-mails and voicemails that I left you, AES does not have the design documents for this facility. Therefore, AES cannot certify that the facility was built to design. Please let me know if JCC Environmental has any other requirements that arise from this review or if you have any questions or concerns.

Tory

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



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

County BMP ID Code (if known): WC069 3/17/05 *ST*
 Name of Facility: Stonehouse Golf Course *PHASE I* BMP No.: _____ of _____ Date: 11/13/05
 Location: Near Fieldstone Run - Mill Pond Run Intersection Area
 Name of Owner: Stonehouse Golf Course
 Name of Inspector: SJ Thomas, Tori Bains AES
 Type of Facility: Dry Pond
 Weather Conditions: Sunny, 60's 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.

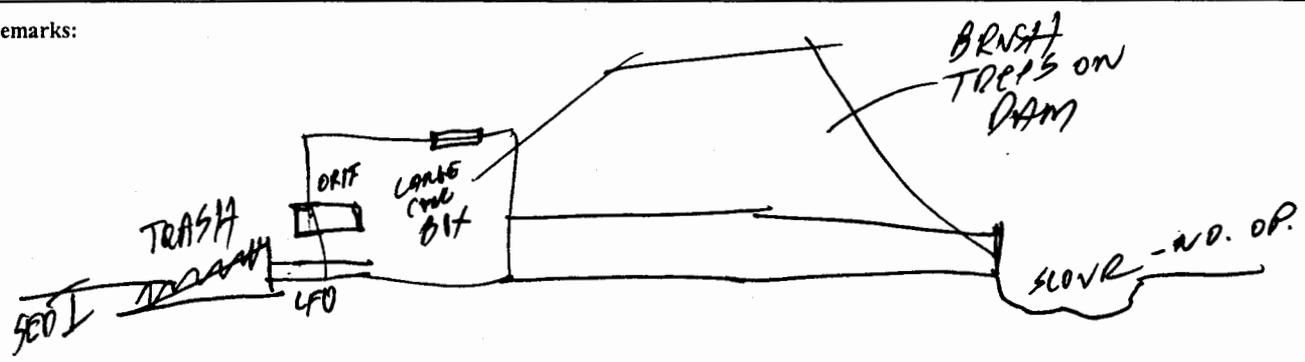
Provide an explanation and details in the comment column, if routine or urgent are marked.

Facility Item	O.K.	Routine	Urgent	Comments
Embankments and Side Slopes:				<i>Earth dam 15' W 2.5H:1V SS 10-15'H.</i>
Grass Height	✓			
Vegetation Condition		✓		<i>Trees on dam</i>
Tree Growth		✓		
Erosion				
Trash & Debris				
Seepage				
Fencing or Benches				
Interior Landscaping/Planted Areas:				<input type="checkbox"/> None <input type="checkbox"/> Constructed Wetland/Shallow Marsh <input checked="" type="checkbox"/> Naturally Established Vegetation
Vegetated Conditions		✓		
Trash & Debris				<i>Dead wood, logs, etc.</i>
Floating Material				
Erosion				
Sediment				
Dead Plant				
Aesthetics				
Other				
Notes:	<i>Phase 1 area. Road, clubhouse, golf course, etc.</i>			

Priority Item	O.K.	Routine	Urgent	Comments
Water Pools: <input type="checkbox"/> Permanent Pool (Retention Basin) <input type="checkbox"/> Shallow Marsh (Detention Basin) <input checked="" type="checkbox"/> None, Dry (Detention Basin)				
Shoreline Erosion	✓			S.M. 2-3"
Algae	✓			
Trash & Debris		✓		
Sediment	✓			
Aesthetics	✓			
Other	✓			
Inflows (Describe Types/Locations): <i>Natural Ravine No s.p. Pipes</i>				
Condition of Structure	✓			
Erosion	✓			
Trash and Debris	✓			
Sediment	✓			
Outlet Protection	✓			
Other				
Principal Flow Control Structure - Riser, Intake, etc. (Describe Type): <i>Large Con. Box w/EW-11; 8-12" PIPE</i>				
Condition of Structure	✓			<i>Screen on EW-11</i>
Corrosion	✓			<i>8-12" PVC below R.C.</i>
Trash and Debris		✓		
Sediment	✗	✓		<i>sed 1' deep around EW-11</i>
Vegetation	✓			
Other				
Principal Outlet Structure - Barrel, Conduit, etc. : <i>30" DEP</i>				
Condition of Structure				
Settlement				
Trash & Debris				
Erosion/Sediment				
Outlet Protection		✓		<i>needs op.</i>
Other				
Emergency Spillway (Overflow): <i>Large ES @ west end Grass to RR</i>				
Vegetation		✓		
Lining	✓			
Erosion	✓			
Trash & Debris	✓			
Other				
Notes:				

Item	O.K.	Routine	Urgent	Comments
Inspection Type Conditions:				
Mosquito Breeding	✓			
Animal Burrows	✓			
Graffiti	✓			
Other	✓			
Surrounding Perimeter Conditions: <i>Remote Location</i>				
Land Uses	✓			
Vegetation	✓			
Trash & Debris	✓			
Aesthetics	✓			
Access /Maintenance Roads or Paths				<i>From G.C. Maint Facility Access Road</i>
Other				

Remarks:



Overall Environmental Division Internal Rating: 2/3

*REINSPECT 3/17/05
Punch list items done
BMP LOOKS GOOD.*

Signature: *[Signature]* P.E.
Title: *Senior Engineer ENV DIV*

Date: *1/13/05* *3/17/05*
[Signature]

Date Record Created:

WS_BMPNO:

Print Record

Created By:

WC069

**PRINTED ON
Friday, March 12, 2010
10:25:03 AM**

WATERSHED WC
 BMP ID NO 069
 PLAN NO
 TAX PARCEL
 PIN NO
 CONSTRUCTION DATE
 PROJECT NAME Stonehouse Golf Course Phase 1
 FACILITY LOCATION NE of Intx Mill Pond Run & Fieldstone Pk
 CITY-STATE Toano, Va. 23168
 CURRENT OWNER Stonehouse Dev Co LLC
 OWNER ADDRESS 9701 Mill Pond Run
 OWNER ADDRESS 2
 CITY-STATE-ZIP CODE Toano, Va. 23168
 OWNER PHONE
 MAINT AGREEMENT No
 EMERG ACTION PLAN No

Get Last BMP No

Return to Menu

MAINTENANCE PLAN

No
 SITE AREA acre 55.4
 LAND USE
 old BMP TYP Dry Pond
 JCC BMP CODE F2 Dry ED with forebay
 POINT VALUE

SVC DRAIN AREA acres 55.2

SERVICE AREA DESCRI

IMPERV AREA acres 0.00
 RECV STREAM UT of Ware Creek
 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 No

CTRL STRUC DESC multi-stage
 CTRL STRUC SIZE inches 10X10
 OTLT BARRL DESC RCP
 OTLT BARRL SIZE inch 30
 EMERG SPILLWAY Yes
 DESIGN HW ELEV
 PERM POOL ELEV
 2-YR OUTFLOW cfs 0.00
 10-YR OUTFLOW cfs 0.00
 REC DRAWING No

CONSTR CERTIF No

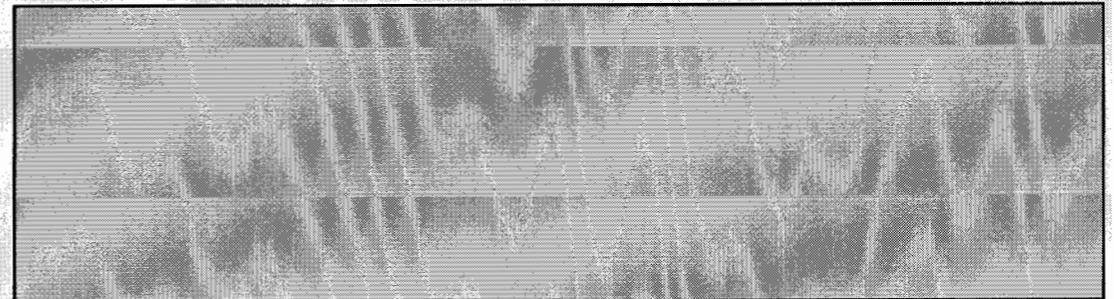
LAST INSP DATE 3/17/2005 Inspected by:

INTERNAL RATING 3

MISC/COMMENTS

NE of Fieldstone-Mill Pond Intx behind church area and near maintenance shed.

Additional Comments:



APPENDIX P -- IMPOUNDMENTS/DAMS- SWMF Section IC/IIA

PLEASE COMPLETE THE CHECKLIST AND ANSWER THE QUESTIONS. THE DRAWINGS MUST CONTAIN THE FOLLOWING INFORMATION OR THEY WILL BE RETURNED AS INCOMPLETE:

Plan View Drawing

- north arrow
- waterway name
- existing and proposed structures
- dimensions of structure and benchmarks showing distances to fixed points of reference
- ordinary high water line
- location of vegetated wetlands at the project site
- shoreline, property lines, and location of adjacent property owners
- direction of flow
- width of the waterway (measuring from ordinary high water to ordinary high water)
- risers
- emergency spillway, if applicable

Cross Section Drawing (Stream)- See Typical Design figure (Sheet 8 of _____)

- _____ base width and height of structure
- _____ existing contours of the bottom
- _____ normal pool elevation and design high and low water elevations, for dams with fluctuating water levels (e.g. hydropower or water supply reservoirs)
- _____ risers
- _____ emergency spillway, if applicable

- Vicinity Map Including the name of the map from which the vicinity map was taken and the exact location of the project site.
- map showing the area to be flooded (U.S.G.S. quad sheet or other topographic map is preferred).

1. Materials to be used for construction (earth, rock, concrete, etc.)? Earthen
2. What will be the impoundment's: a) storage capacity: 14.5 acre-feet b) surface area: X acres
3. What is the: a) current average flow? 0.08 cfs b) proposed outflow? X cfs
c. will the impoundment structure be designed to pass a minimum flow at all times? X Yes ___ No
If "Yes", what will be the minimum rate of flow? ** cfs
4. What is the drainage area of the water body upstream of the proposed impoundment? 0.076 square miles
5. Does your project comply with State Dam Safety Criteria? X Yes ___ No If your answer is "No" or "Uncertain", contact the Bureau of Flood Plain Protection at telephone (804) 371-6095.
6. a. What will be the area of waters or wetlands affected/flooded by the impoundment? *** acres
b. How much of impoundment structure will be located on the stream bed? 141 square feet
7. Are fish ladders being proposed to accommodate the passage of fish? ___ Yes X No

THE DEPARTMENT OF ENVIRONMENTAL QUALITY REQUIRES APPLICANTS TO SUBMIT THE ADDENDUM LOCATED AT THE END OF THIS APPLICATION

* = These are dry detention basin/facilities. Outflow varies by storm event. No permanent impoundment will occur.

** = Minimum rate will equal that of stream prior to construction. Some streams are intermittent. Rate of flow will depend on storm events.

*** = Only permanent disturbance = area of dam (0.46 acres), 0.88 acres temporarily inundated but not considered adverse.

ADDITIONAL INFO