

# Stormwater Division

## MEMORANDUM

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

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**General File ID or BMP ID:** JR054

**PIN:** 4320400001B

**Subdivision, Tract, Business or Owner**

**Name (if known):**

Governors Land

**Property Description:**

Major Open Space 8 Fowlers Lake

**Site Address:**

1905 North Fowlers Close

**(For internal use only)**

**Box** 16

**Drawer:** 7

**Agreements: (in file as of scan date)**

N

**Book or Doc#:**

**Page:**

Comments

JP-054

**Contents for Stormwater Management Facilities As-built Files**

Each file is to contain:

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

James City County, Virginia  
Environmental Division

4320400001B  
1905 N FOWLERS LANE  
(north of 5216 FOWLERS LANE)  
GOV LAND FUND  
2700 TWO ROCKS RD.  
WMAB VA 23185  
R4

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

County Plan No.: S-110-98  
Project Name: GOVERNORS LAND  
Stormwater Management Facility: FOWLERS LAKE BLOCK B (TIMBERCREEK)

Phase:  I  II  III  
 Information Received. Date: MARCH 27 2002 AES  
 Administrative Check.  
 Record Drawing Date: 3/15/02 (CERT); 3/13/02 DWG.  
 Construction Certification Date: ? NONE.  
 RD/CC Standard Forms (Required after Feb 1<sup>st</sup> 2001 Only)  
 Insp/Maint Agreement Info: 1/m # 990015847; 7-25-99  
 BMP Maintenance Plan Location: NONE  
 Other:

Standard E&SC Note on Approved Plan Requiring RD/CC or County comment in plan review file. Note # 18  
 Yes  No Location: DRAWING NO. 8 PARA 18 sheet 8  
 Assign County BMP ID Code Code: JR 054

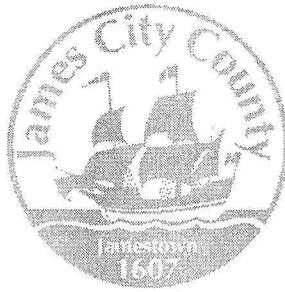
Log into Division's "As-Built" Tracking Log  
 Add Location to GIS Database Map. Obtain GIS site information (GPIN, Owner, Site Area, Address, etc.)  
 Preliminary Log into BMP Database (BMP ID #, Site Plan #, GPIN, Project Name)  
 Active Project File Review (correspondence, H&H, etc.)  
 Initial As-Built File setup (label, copy hydraulics, BMP information, etc.)  
 Inspector Check of RD/CC.  
 Pre-Inspection Drawing Review - Approved Plan (Quick look prior to field inspection).  
 Final Inspection (FI) Performed Date: 11/22/02  
 Record Drawing (RD) Review Date: 11/20/02 R.H.  
 Construction Certification (CC) Review Date: \_\_\_\_\_

Actions:  
 No comments.  
 Comments. Letter Forwarded. Date: Dec 9 2002  
 Record Drawing (RD)  
 Construction Certification (CC)  
 Construction-Related (CR)  
 Site Issues (SI)  
 Other:

Second Submission: AB MAY 16 02 AES; CC 3/28/03  
 Third Submission:  
 Acceptable for stormwater management facility purposes (RD/CC/CR/Other). Proceed with bond release.  
 Notify Darryl/Joan/Pat of acceptability using email (preferred), form or verbal.  
 Check/Clean active file of any remaining material and finish "As-Built" file.  
 Add to County BMP Inventory/Inspection schedule (Phase I, II or III).  
 Copy Final Inspection Report into County BMP Inspection Program file.  
 Digital Photographs obtained.  
 Add to JCC Hydrology & Hydraulic database (optional).

*(Handwritten note in a circle)*  
 MICRO RD  
 SAVED TO  
 RPAV TO AES  
 6-15-02 (R.H.)

BMP Certification Information Acceptable  
 Plan Reviewer: [Signature] Date: 6/18/03



James City County, Virginia  
Environmental Division

Stormwater Management / BMP Facilities  
Record Drawing and Construction Certification Forms

( Note: In accordance with the requirements of the Chesapeake Bay Preservation Ordinance, Chapter 23, Section 23-10(4), BMP's shall be designed and constructed in accordance with the manual entitled James City County Guidelines for Design and Construction of Stormwater Management BMP's. Erosion and sediment control policy and approved plans generally require that at the completion of the project and prior to release of surety, an "as-built" plan prepared by a registered Professional Engineer or Certified Land Surveyor must be provided for the drainage system for the project, including any Best Management Practice (BMP) facilities. In addition, for BMP facilities involving the construction of an impounding structure or dam embankment, certification is required by a Professional Engineer who has inspected the structure during its construction. Currently there are over 20 water quality type BMP's accepted by the County. )

Section 1 - Site Information:

Project Name: GOVERNOR'S LAND AT TWO RIVERS - FOWLER'S LAKE - BLOCK B  
Structure/BMP Name: TIMBER WEIR STRUCTURE No. 10  
Project Location: 360  
BMP Location: 360 FEET NORTH OF INTERSECTION OF NORTH FOWLER'S CLOSE  
County Plan No.: S - 110 - 98 AND FOWLER'S LAKE ROAD

Project Type:  Residential  Business  Commercial  Office  Institutional  Industrial  Public  Roadway  Other  
Tax Map/Parcel No.: \_\_\_\_\_  
BMP ID Code (if known): J12054  
Zoning District: POWHATAN DISTRICT  
Land Use: RESIDENTIAL  
Site Area (sf or acres): \_\_\_\_\_

Brief Description of Stormwater Management/BMP Facility: TIMBER STRUCTURE FOR STORMWATER ~~AND~~ ATTENUATION

Nearest Visible Landmark to SWM/BMP Facility: RESIDENTIAL STRUCTURE ON LOT 1A OF FOWLER'S LAKE, AND NORTH FOWLER'S CLOSE

Nearest Vertical Ground Control ( if known ):  
 JCC Geodetic Ground Control  USGS  Temporary  Arbitrary  Other  
Station Number or Name: 348  
Datum or Reference Elevation: 12.74  
Control Description: JCC MAIN STATION  
Control Location from Subject Facility: APPROXIMATELY 5500' NW OF 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: AUGUST 1999  
Facility Monitored by County Representative during Construction:  Yes  No  Unknown  
Name of Site Work Contractor Who Constructed Facility: HENDERSON, INC.  
Name of Professional Firm Who Routinely Monitored Construction: \_\_\_\_\_  
Date of Completion for SWM/BMP Facility: SEPTEMBER 1999  
Date of Record Drawing/Construction Certification Submittal: MARCH 2002

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

**Section 3 - Owner / Designer / Contractor Information:**

Owner/Developer: *(Note: Site Owner or Applicant responsible for development of the project.)*

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

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

Firm Name: AES CONSULTING ENGINEERS  
Mailing Address: 5248 OLDE TOWNE ROAD, SUITE 1  
WILLIAMSBURG, VIRGINIA 23188  
Business Phone: 757-253-0040  
Fax: 757-220-8994  
Responsible Plan Preparer: V. MARC BENNETT  
Title: SENIOR PROJECT MANAGER  
Plan Name: FAWLER'S LAKE - BLOCK B  
Firm's Project No. 7173-6-1  
Plan Date: OCTOBER 13, 1998  
Sheet No.'s Applicable to SWM/BMP Facility: 5 / 8 / 1 / 1 / 1

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

Name: HENDERSON, INC.  
Mailing Address: 580 MOOREHEAD ROAD  
WILLIAMSBURG, VIRGINIA 23188  
Business Phone: 757-565-1090  
Fax: \_\_\_\_\_  
Contact Person: PEPE HENDERSON  
Site Foreman/Supervisor: \_\_\_\_\_  
Specialty Subcontractors & Purpose (for BMP Construction Only): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Section 4 - Professional Certifications:**

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

**Record Drawing and Construction Certifications for Stormwater Management / BMP Facilities**

**Record Drawing Certification**

Firm Name: AES CONSULTING ENGINEERS  
Mailing Address: 5248 OLDE TOWNE RD, SUITE 1  
WILLIAMSBURG, VIRGINIA 23108  
Business Phone: 757-253-0040  
Fax: 757-220-8994

Name: V. MARC BENNETT  
Title: SENIOR PROJECT MANAGER

Signature: *V. Marc Bennett*  
Date: 3/19/02

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

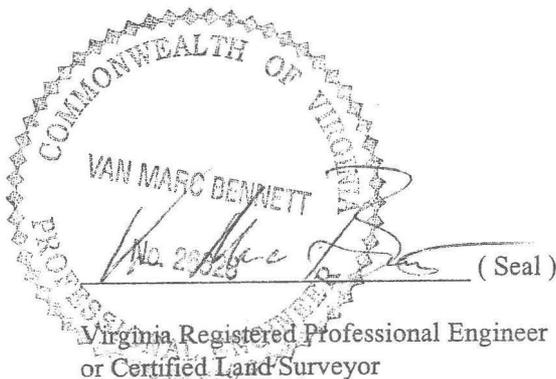
**Construction Certification**

Firm Name: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
Business Phone: \_\_\_\_\_  
Fax: \_\_\_\_\_

Name: \_\_\_\_\_  
Title: \_\_\_\_\_

Signature: \_\_\_\_\_  
Date: \_\_\_\_\_

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



\_\_\_\_\_  
( Seal )

Virginia Registered  
Professional Engineer

## Section 5 - Record Drawing and Construction Certification Requirements and Instructions:

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

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

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

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

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

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

**STORMWATER MANAGEMENT / BMP FACILITIES  
RECORD DRAWING CHECKLIST**

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

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

- XX 1.     All constructed facilities meet approved design plans, unless otherwise shown. Record information or deviations from approved design plan shown in clearly annotated format and/or boxed beside design values.
- XX 2.     Elevations to the nearest 0.1' unless higher accuracy is needed to show positive drainage.
- XX 3.     All plan sheets labeled with "RECORD DRAWING" in large text in lower right hand corner (Approved County Plan Number and BMP ID Code can be included if known).
- XX 4.     All plan sheet revision blocks modified to indicate date and record drawing status.
- XX 5.     All plan sheets have certification statements and certifying professional's signature and seal.

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

- XX 1.     All requirements of Section I (Methods and Presentation) apply to this section.
- XX 2.     Plan Views: Show general location, arrangement and dimensions. Location and alignment shall generally match approved design plans.
- XX 3.     Profile or elevations along top or berm of the facility. At a minimum, elevations are required at each end, at intervals not to exceed 50 feet and where low spots may be present. Top of embankment or berm elevations must be no less than design elevation plus any settlement allowances.
- 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.
- 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.
- 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.

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.
- X4 10. Dimensions, locations and elevations of outlet orifices, weirs, slots and drains.
- N/A 11. Type and size of anti-vortex and trash rack device. Height, diameter, dimensions, bar spacings (if applicable) and elevations relative to the principal spillway crest. Indicate if lockable hatch is present or not.
- N/A 12. Type, location, size and number of anti-seep collars or documentation of other methods utilized for seepage control. **May need to obtain this information during construction.**
- N/A 13. Top of impervious core embankment, core trench limits and elevation of cut-off trench bottom. **May need to obtain this information during construction.**
- X4 14. Elevation of the principal spillway barrel (outlet pipe) inlet and outlet invert.
- N/A 15. Outlet barrel diameter, length, slope, type and thickness class of material and type of flared end sections, headwall or endwall.
- N/A 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.
- X4 20. BMP vicinity properly cleaned of stockpiles and construction debris.
- X4 21. No visual signs of erosion or channel degradation immediately downstream of facility.
- X4 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.
- A2.    Principal spillway consists of reinforced concrete pipe with O-Ring gaskets for watertight joint construction.
- A3.    Sediment forebays or pretreatment devices provided at inlets to pond. Generally 4 to 6 ft. deep.
- 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.
- A5.    Adequate fixed vertical sediment depth markers installed in the forebay(s) for future sediment monitoring purposes.
- 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.
- 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).
- A8.    No trees are present within a zone 15 feet around the embankment toe and 25 feet from the principal spillway structure.
- A9.    Wet permanent pool, typically 3 to 6 feet deep, is provided and maintains level within facility.
- A10.    Low flow orifice has a non-clogging mechanism.
- A11.    A pond drain pipe with valve was provided.
- 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.
- \_\_\_\_\_ B2.    Minimum 2:1 length to width flow path provided across the facility.
- \_\_\_\_\_ B3.    Micropool provided at or around outlet from BMP (generally 3 to 6 ft. deep).
- \_\_\_\_\_ B4.    Wetland type landscaping provided in accordance with approved plan. Includes correct pondscaping zones, plant species, planting arrangements, wetland beds, etc. Wetland plants include 5 to 7 emergent wetland species. Individual plants at 18 inches on center in clumps.
- \_\_\_\_\_ B5.    Adequate wetland buffer provided (Typically 25 ft. outward from maximum design water surface elevation and 15 ft. setback to structures).
- \_\_\_\_\_ B6.    No more than one-half (1/2) of the wetland surface area is planted.
- \_\_\_\_\_ B7.    Topsoil or wetland mulch provided to support vigorous growth of wetland plants.
- 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.
- \_\_\_\_\_ D2.    Sediment pretreatment devices provided.
- \_\_\_\_\_ D3.    For D-1 BMPs (Bioretention Cells), pretreatment consisting of a grass filter strip below level spreader (deflector); a gravel diaphragm; and mulch and planting soil layers were provided.
- \_\_\_\_\_ D4.    For D-1 BMPs (Bioretention Cells), plantings consist of native plant species; vegetation provided was based on zones of hydric tolerances; trees and understory of shrubs and herbaceous materials were provided; woody vegetation is absent from inflow locations; and trees are located around facility perimeter.
- \_\_\_\_\_ D5.    Facility was not used for erosion and sediment control purposes and sediment was prevented from entering the facility to the greatest extent possible during construction.
- \_\_\_\_\_ D6.    No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed .
- \_\_\_\_\_ D7.    Filtering system is off-line from storm drainage conveyance system.
- \_\_\_\_\_ D8.    Overflow outlet has adequate erosion protection.
- \_\_\_\_\_ D9.    Deflector, diversion, flow splitter or regulator structure provided to divert the water quality volume to the filtering structure.
- \_\_\_\_\_ D10.    Minimum four (4) inch perforated underdrain provided in a clean aggregate envelope layer beneath the facility.
- \_\_\_\_\_ D11.    Minimum fifty (50) foot separation from any slope fifteen (15) percent or greater. Minimum one hundred (100) foot separation horizontally from any known water supply well. Minimum one hundred (100) foot separation upslope and twenty-five (25) foot separation downslope from any building.
- \_\_\_\_\_ D12.    Stabilization and acceptable vegetative cover established over contributing drainage area prior to conveyance of stormwater to the facility.
- \_\_\_\_\_ D13.    No visual signs of erosion or channel degradation immediately downstream of facility.
- N/A D14.    Adequate, direct access provided to the pretreatment area and/or filter bed for future maintenance.

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

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

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

- N/A E1.    All requirements of Section II, Minimum Standards, apply to Group E facilities as applicable.
- E2.    Open channel system has constructed longitudinal slope of less than four (4) percent.
- E3.    No visual signs of erosion in the open channel system's soil and/or vegetative cover.
- E4.    Open channel side slopes are no steeper than 2H:1V at any location. Preferred channel sideslope is 3H:1V or flatter.
- E5.    No visual signs of ponding are present at any location in the open channel system, except at rock check dam locations for E-1 systems (Wet Swales).
- E6.    For E-2 BMPs (Dry Swales), an underdrain system was provided.
- E7.    Treated timber or rock check dams provided as pretreatment devices for the open channel system.
- E8.    Gravel diaphragm provided in areas where lateral sheet flow from impervious surfaces are directly connected to the open channel system.
- E9.    Grass cover/stabilization in the open channel system appears adaptable to the specific soils and hydric conditions for the site and along the channel system.
- E10.    Open channel system areas with grass covers higher than four (4) to six (6) inches were properly mowed.
- E11.    Facility was not used for erosion and sediment control purposes and sediment was prevented from entering the facility to the greatest extent possible during construction.
- E12.    No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed and no adverse affects to the function of the facility are anticipated.
- E13.    For E-3 BMPs (Biofilters), the bottom width is six (6) feet maximum at any location.
- E14.    For E-3 BMPs (Biofilters), sideslopes are 3H:1V maximum at any location.
- E15.    For E-3 BMPs (Biofilters), the constructed channel slope is less than or equal to three (3) percent at any location.
- N/A E16.    For E-3 BMPs (Biofilters), the constructed grass channel is approximately equivalent to the constructed roadway length.

**STORMWATER MANAGEMENT / BMP FACILITIES  
RECORD DRAWING CHECKLIST**

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

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

- INC 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.
- XX F3. Timber wall BMP used in intermittent stream only. (ie. Prohibited in perennial streams.)
- N/A F4. Forebay provided approximately 20 ft. upstream of the facility. Forebays generally 4 to 6 feet in depth.
- N/A F5. A reverse slope pipe, vertical stand pipe or mini-barrel and riser was provided to prevent clogging.
- N/A F6. Principal spillway and outlet barrel provided consisting of reinforced concrete pipe with O-Ring gaskets for watertight joint construction.
- N/A F7. Mini-barrel and riser, if used, contains a removable trash rack to reduce clogging.
- 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.
- INC F9. Timbers properly reinforced or concrete footing provided if soil conditions were prohibitive.
- INC 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.
- N/A F12. Stilling basin or standard outlet protection provided at principal spillway outlet.
- N/A F13. Adequate, direct access provided to the facility. Access corridor to facility is at least ten (10) feet wide, slope is less than twenty (20) percent and appropriate stabilization provided for equipment and vehicle use. Access extends to forebay, standpipe and timber wall, as applicable.
- 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.
- INC F16. No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed and no adverse affects to the function of the facility are anticipated.

**STORMWATER MANAGEMENT / BMP FACILITIES  
RECORD DRAWING CHECKLIST**

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

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

- |            |     |   |
|------------|-----|---|
| <u>N/A</u> | G1. | All requirements of Section II, Minimum Standards, apply to Group G facilities as applicable.   |
|            | G2. | Constructed impervious areas appear to conform with locations indicated on the approved plan and appear less than sixty (60) percent impervious in accordance with the requirements of the James City County Chesapeake Bay Preservation Ordinance. |
|            | G3. | Dedicated open space areas are in undisturbed common areas, conservation easements or are protected by other enforceable instruments that ensures perpetual protection.   |
|            | G4. | Provisions included to clearly specify how the natural vegetated areas utilized as dedicated open space will be managed and field identified (marked).  |
|            | G5. | Adequate protection measures were implemented during construction to protect the defined dedicated open space areas.  |
| <u>N/A</u> | G6. | Dedicated open space areas were not disturbed during construction (ie. cleared, grubbed or graded).   |

**STORMWATER MANAGEMENT / BMP FACILITIES  
RECORD DRAWING CHECKLIST**

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

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

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

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

Insert as-built  
pages here.

(JR018)

BMP #5 (JR054)  
TIMBER STRUCTURE  
RECORD DRAWING  
PREPARED: 3/02

BMP #13 (JR022)  
HORNE'S LAKE  
RECORD DRAWING  
PREPARED:

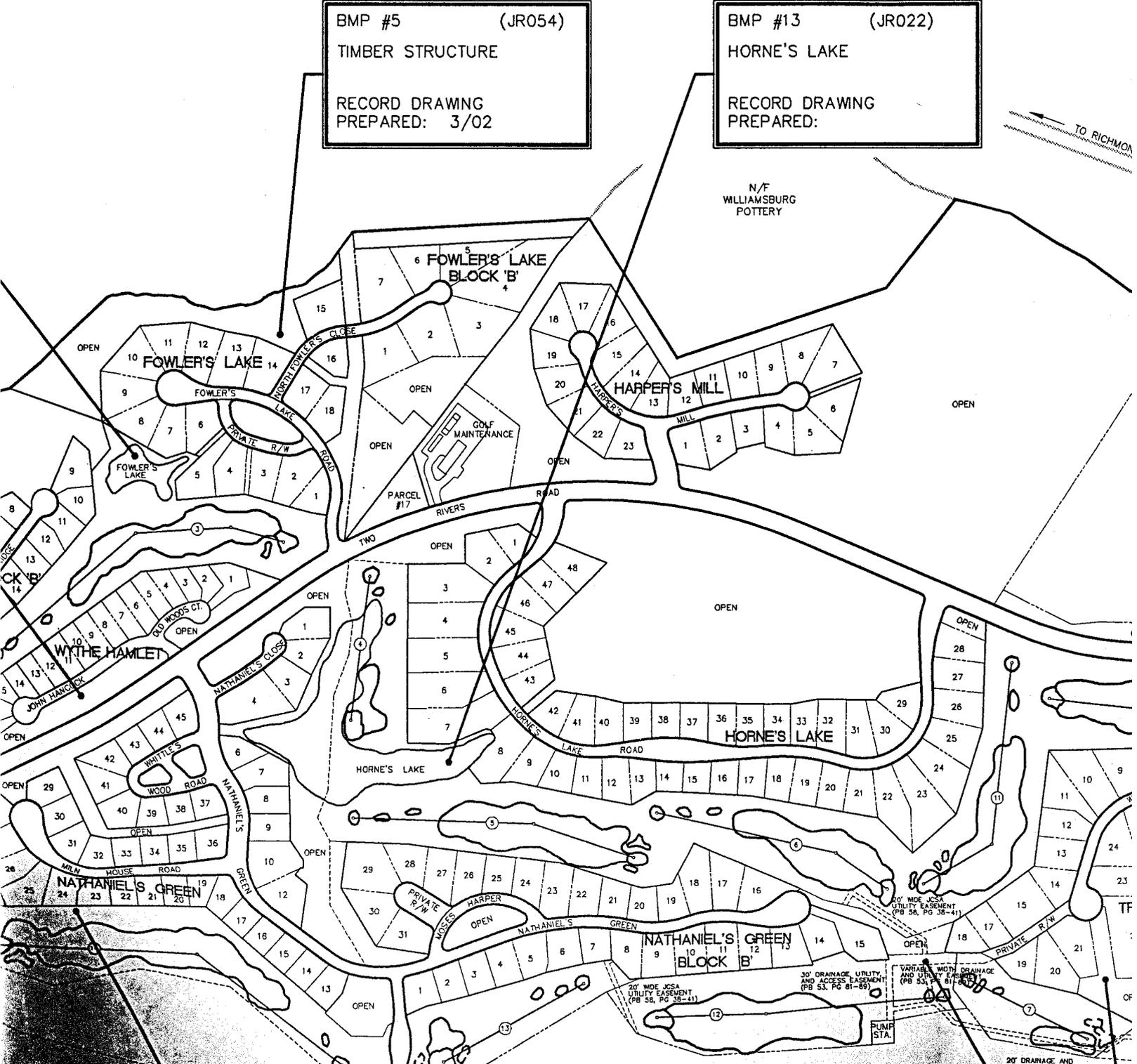


BMP #5 (JR054)  
 TIMBER STRUCTURE  
 RECORD DRAWING  
 PREPARED: 3/02

BMP #13 (JR022)  
 HORNE'S LAKE  
 RECORD DRAWING  
 PREPARED:

TO RICHMOND

N/F  
 WILLIAMSBURG  
 POTTERY

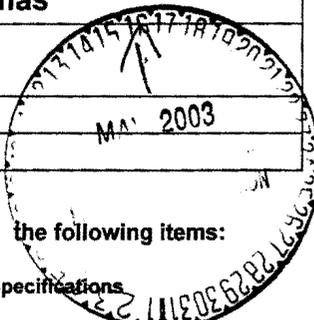


# AES CONSULTING ENGINEERS

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

## LETTER OF TRANSMITTAL

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

DATE: 16-May-03	JOB NO. 7173-09
ATTENTION: Scott Thomas	
RE: Governor's Land	
	

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

Shop drawings     Prints     Plans     Samples     Specifications  
 Copy of letter     Change order     Other    Construction Certification

COPIES	DATE	NO.	DESCRIPTION
1	5-15-03		As-Built drawing (Mylar) – Founder's Hill Timber Wall JR030
1	5-15-03		As-Built drawing (Black line) – Founder's Hill Timber Wall JR030
1	5-15-03		Memo responding to letter from County – Founder's Hill Timber Wall JR030
1	5-15-03		As-Built drawing (Mylar) – Fowler's Lake Block "B" Timber Wall JR054
1	5-15-03		As-Built drawing (Black line) – Fowler's Lake Block "B" Timber Wall JR054
1	5-15-03		Memo responding to letter from County – Fowler's Lake Block "B" Timber Wall JR054
1	5-15-03		As-Built drawing (Mylar) – The Harbor @ Two Rivers JR033
1	5-15-03		As-Built drawing (Black line) – The Harbor @ Two Rivers JR033
1	5-15-03		Memo responding to letter from County – The Harbor @ Two Rivers JR033
1	5-15-03		As-Built drawing (Mylar) – River Oaks North BMP JR034
1	5-15-03		As-Built drawing (Black line) – River Oaks North BMP JR034
1	5-15-03		Memo responding to letter from County – River Oaks North BMP JR034
1	5-16-03		As-Built drawing (Mylar) – Bennett's Pond JR021
1	5-16-03		As-Built drawing (Black line) – Bennett's Pond JR021
1	5-16-03		Memo responding to letter from County – Bennett's Pond JR021

THESE ARE TRANSMITTED as checked below:

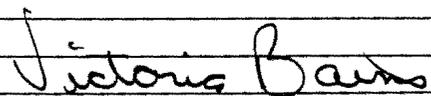
- |  |   |   |
|--|---|---|
| <input checked="" type="checkbox"/> For Approval | <input type="checkbox"/> Approved as submitted            | <input type="checkbox"/> Resubmit _____ copies for approval   |
| <input type="checkbox"/> For your use            | <input type="checkbox"/> Approved as noted                | <input type="checkbox"/> Submit _____ copies for distribution |
| <input type="checkbox"/> As requested            | <input type="checkbox"/> Returned for corrections         | <input type="checkbox"/> Return _____ Corrected prints        |
| <input type="checkbox"/> For review and comment  | <input type="checkbox"/> For Signature                    |   |
| <input type="checkbox"/> FOR BIDS DUE _____      | <input type="checkbox"/> PRINTS RETURNED AFTER LOAN TO US |   |

REMARKS:

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

COPIES TO: file

SIGNED:

  
 Victoria Bains



COUNTY OF JAMES CITY  
FINAL SUBDIVISION

APPROVALS	DATE
JD (initials)	11/2/98
W (initials)	10/22/98
RCB (initials)	6/9/99
TR (initials)	10/29/99
DEC (initials)	6/22/99
JCD (initials)	10/29/99
LNB (initials)	10/13/99

S-110-98  
JR054

SITE of

FOWLER'S LAKE

TH  
GOVERNOR  
*At Two*

LEGEND

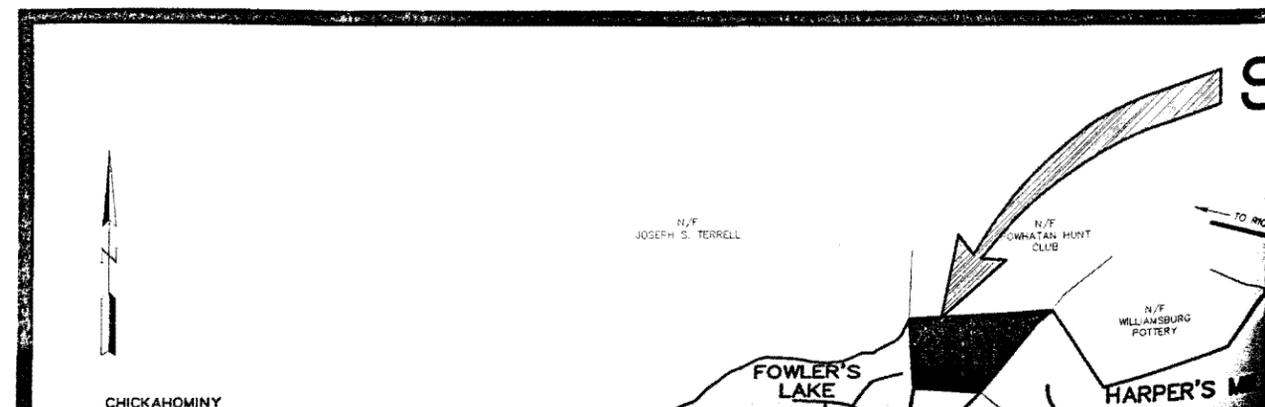
EXISTING

- EX. W —
- EX. S —
- EX. FM —
- 
- 

- WATER
- SANITARY SEWER
- STORM SEWER
- FORCE MAIN
- MANHOLE
- CURB DROP INLET

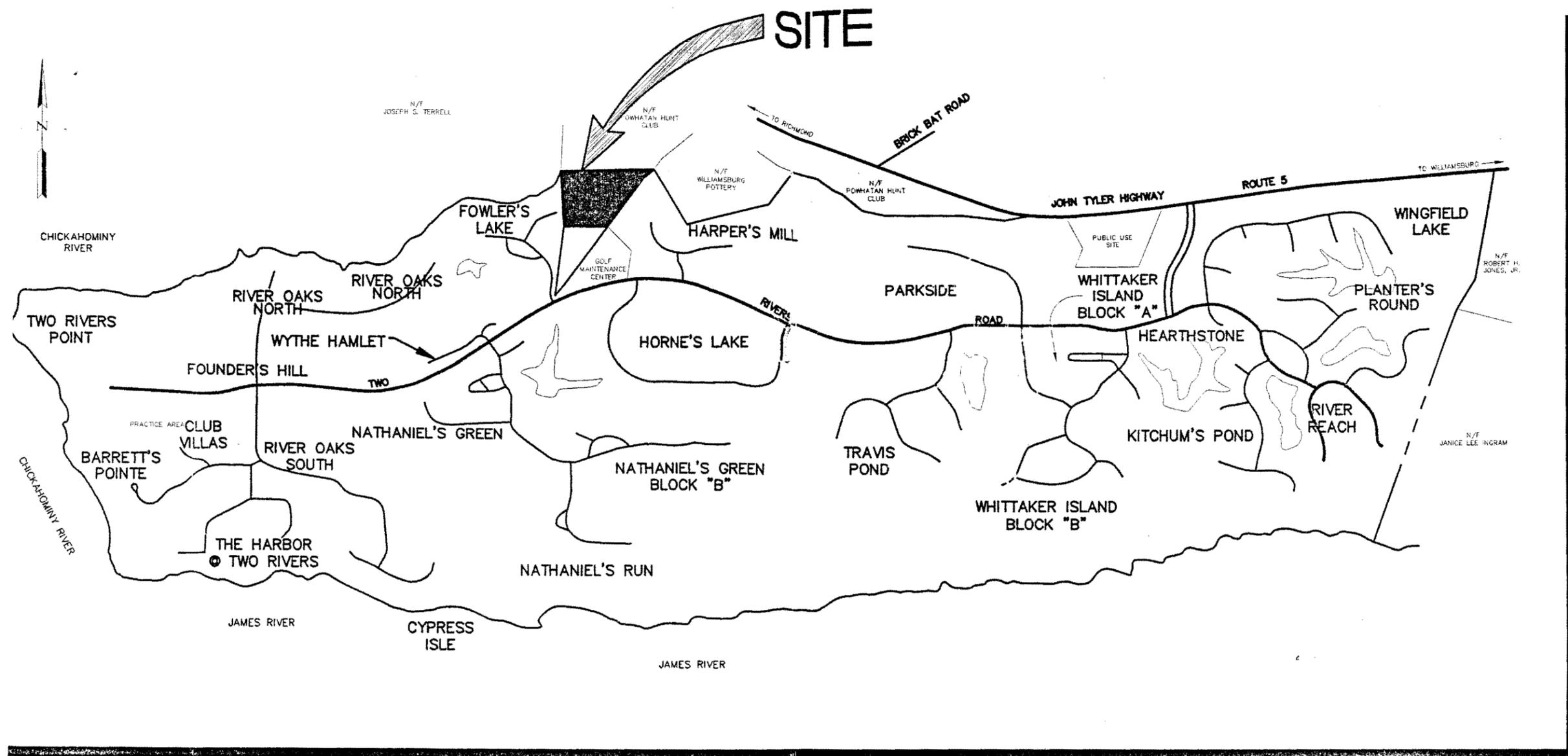
PROPOSED

- W —
- S —
- F.M. —
- 
- 



- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8

SD-3e  
SD-4a  
SD-4b



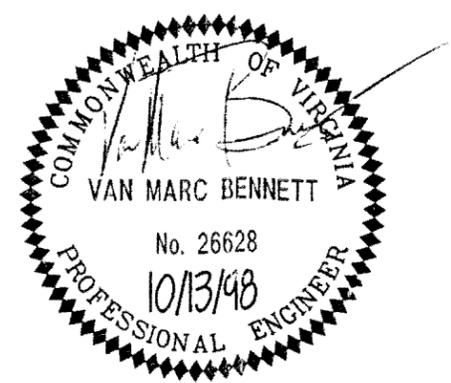
VICINITY MAP

SCALE: 1" = 1500'

DEVELOP

GOVERNOR'S L  
2700 TWO RIV.  
WILLIAMSBURG  
(757) 258-460  
CONTACT: MR.

OCTOBER, 1998



ALL ARCHAELOGICAL SITES IDENTIFIED ON THE PROPERTY SHALL BE HANDLED PURSUANT TO THE MEMORANDUM OF AGREEMENT DATED AUGUST 16, 1991, BETWEEN GOVERNOR'S LAND ASSOCIATES AND JAMES CITY COUNTY AND ASSOCIATES AND JAMES CITY COUNTY AND JAMES CITY HISTORICAL JAMES CITY HISTORICAL COMMISSION," PER PROFFER #6 OF THE GOVERNOR'S LAND PROFFER AGREEMENT.

(X.X') DENOTES DISTANCE FROM PROPERTY CORNER TO EASEMENT LINE.

- SETBACK LINES FOR INDIVIDUAL LOTS WILL BE ESTABLISHED BY THE DECLARATION OF PROTECTIVE COVENANTS FOR THE GOVERNOR'S LAND AT TWO RIVERS AND WILL BE SHOWN ON THE RECORD PLAT. SETBACKS AS A MINIMUM ARE:

FRONT: 30' MINIMUM  
 SIDES: 5' MINIMUM  
 REAR: 30' MINIMUM

SETBACKS, AS WILL BE ESTABLISHED, MAY BE MORE RESTRICTIVE. VARIANCES TO THE ESTABLISHED SETBACK MAY BE GRANTED ON A CASE BY CASE BASIS BY THE ARCHITECTURAL REVIEW BOARD OF THE GOVERNOR'S LAND, BUT IN NO CASE WILL VARIANCES BE GRANTED FOR SETBACKS LESS THAN THE AFOREMENTIONED MINIMUMS.

- MAJOR OPEN SPACES AND ADDITIONAL OPEN SPACES WILL BE SHOWN AND DESCRIBED ON THE FINAL PLAT. MAJOR OPEN SPACE AREAS SHALL BE UNDISTURBED AND EXCLUSIVE OF ANY LOTS, EXCEPT FOR GOLF FAIRWAYS, UTILITIES, DRAINAGE IMPROVEMENTS, ROADS AS SHOWN GENERALLY ON THE MASTER PLAN, JOGGING, NATURE, OR GOLF TRAILS OR BRIDGES, AND SIGNAGE APPROVED BY THE PLANNING COMMISSION.
- ALL UTILITIES ARE TO BE PLACED UNDERGROUND.
- UNLESS OTHERWISE NOTED, ALL DRAINAGE EASEMENTS DESIGNATED ON THIS PLAT SHALL REMAIN PRIVATE, AND BE DEDICATED TO THE GOVERNOR'S LAND FOUNDATION (HOA).
- VDOT WILL NOT BE RESPONSIBLE FOR THE MAINTENANCE AND/OR REPAIR OF ANY POND OR ITS STRUCTURES.
- THE CONTRACTOR IS TO HAVE ALL UNDERGROUND UTILITIES LOCATED PRIOR TO THE COMMENCEMENT OF ANY LAND DISTURBING ACTIVITIES.
- STREETLIGHT RENTAL FOR PROPOSED STREETLIGHTS SHALL BE PAID PRIOR TO THE RECORDATION OF THE SUBDIVISION PLAT.
- ANY OLD WELLS THAT MAY BE ON THE PROPERTY THAT WILL NOT BE USED MUST BE PROPERLY ABANDONED IN ACCORDANCE TO PRIVATE WELL REGULATIONS.
- ON SEPTEMBER 2, 1998, THE PLANNING COMMISSION APPROVED THE CLEARING AND GRADING PLANS, IN ACCORDANCE WITH THE GOVERNOR'S LAND PROFFERS.
- VDOT SHALL NOT BE HELD RESPONSIBLE FOR ANY STORMWATER MANAGEMENT FACILITY OR ITS APPURTENANCE.
- AN EXCEPTION REQUEST HAS BEEN APPROVED FOR THIS SUBDIVISION FOR CONSTRUCTION OF A TIMBER STRUCTURE BMP WITHIN THE BUFFER OF THE RPA WETLAND.
- VDOT WILL NOT BE RESPONSIBLE FOR REPAIR OF POND OR ITS STRUCTURES.

NF  
 JOSEPH S. TERRELL

AREA OF FIELD VERIFIED NON-RPA WETLANDS

FUTURE  
 MAJOR OPEN SPACE #45  
 23,392 SF / 0.54

CENTERLINE OF CREEK IS PROPERTY LINE

AREA OF FIELD VERIFIED NON-RPA WETLANDS

LIMITS OF 100' WETLANDS BUFFER PER PLAT

MAJOR OPEN SPACE #8

LOT 15  
 (1909 North Fowlers CLOSE)

HIGH WATER ELEV. 19.87 (100 YEAR STORM)

UNIMPROVED PRIVATE R/W UTILIZED AS A COMMON ACCESS EASEMENT TO LOTS 15 & 16 TO BE USED AS PUBLIC RIGHT-OF-WAY AND DEDICATED TO VDOT

EXISTING 20' H.O.A DRAINAGE AND UTILITY EASEMENT

EXIST. TEMPORARY TURN-AROUND

AREA OF FIELD VERIFIED NON-RPA WETLANDS

PERIMETER OF STORMWATER MANAGEMENT MAINTENANCE EASEMENT (MIN. 15' HORIZ. DISTANCE, MEASURED FROM HIGH WATER ELEVATION OF 100 YEAR STORM FOR SWM).

BEGIN NEW N. FOWER'S CLOSE EXTENSION PC STA 13+23.98

EXIST. DRIVEWAY TO REMAIN

EXISTING VARIABLE WIDTH DRAINAGE AND UTILITY EASEMENT

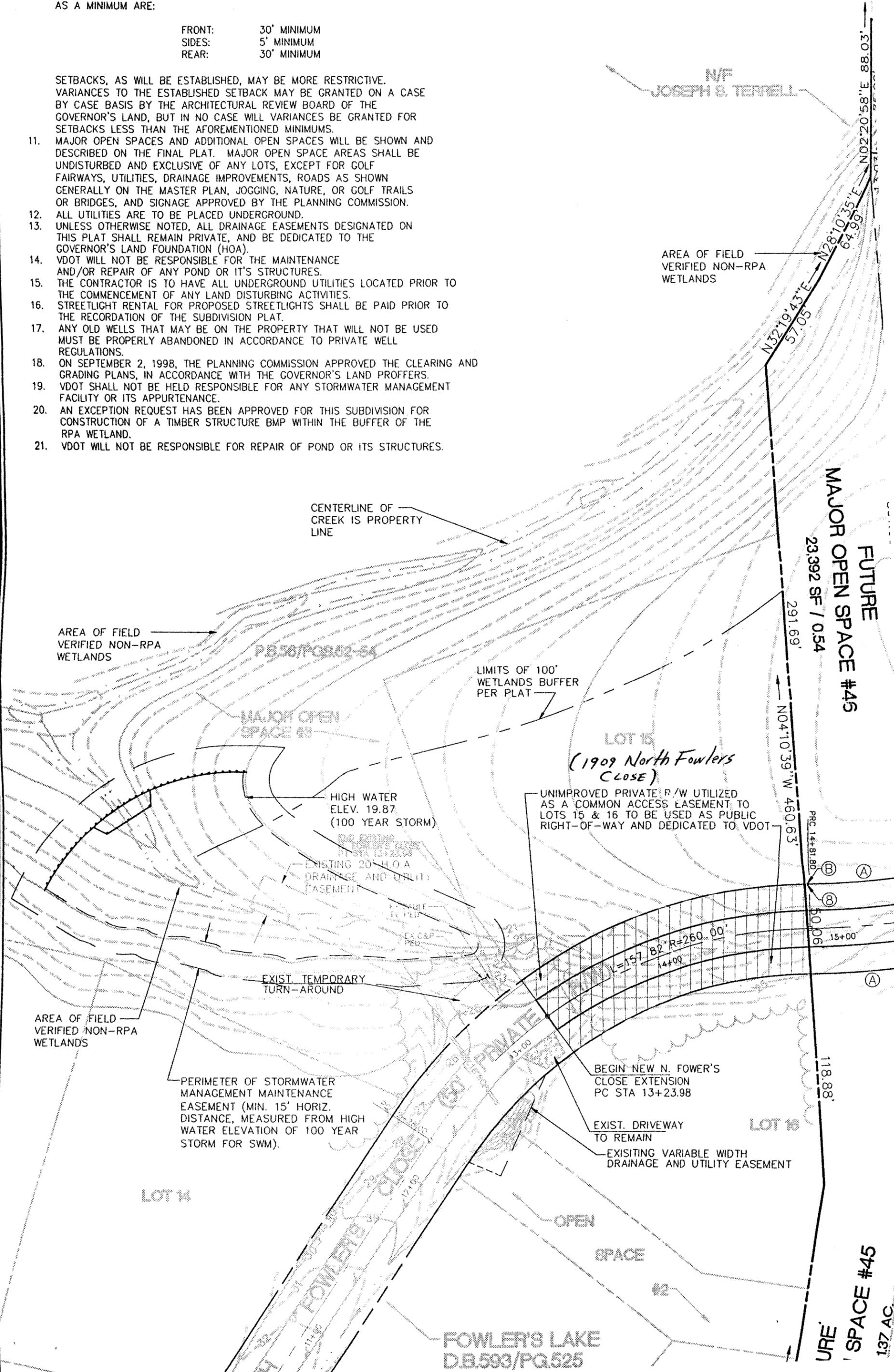
LOT 14

LOT 16

OPEN SPACE #2

FOWLER'S LAKE  
 D.B.593/PQ.525

URE  
 SPACE #45  
 137 AC



THE SITE IS FORESTED WITH MATURE HARDWOOD TREES. RUNOFF FROM THE SITE FOLLOWS NATURAL DRAINWAYS WESTWARD TO AN EXISTING CREEK (ALSO A BOUNDARY BETWEEN THIS PROPERTY AND ADJACENT PROPERTIES).

TIMBER WEIR STRUCTURE, MAY BE COMPLETED AND BE REMOVED AND PROPERLY DISPOSED.

**ADJACENT PROPERTY DESCRIPTION**

TO THE NORTH OF THIS PROJECT IS LOCATED A LARGE RELATIVELY FLAT UNDEVELOPED PARCEL OWNED BY ATLANTIC VENTURES. TO THE WEST IS LOCATED THE EXISTING SUBDIVISION OF FOWLER'S LAKE; TO THE EAST IS LOCATED THE SINGLE-FAMILY SUBDIVISION OF HARPER'S MILL. DUE SOUTH OF THIS PROJECT IS AN RV PARKING AREA AND THE GOLF MAINTENANCE AREA OF THE TWO RIVERS COUNTRY CLUB.

AS A FINAL STEP TO THE CONSTRUCTION PROJECT, THE TIMBER WEIR SHALL BE REMOVED.

**CONSTRUCTION SEQUENCE AND EROSION CONTROL MANAGEMENT**

PRIOR TO THE PRE-CONSTRUCTION MEETING FOR THIS SITE'S CONSTRUCTION ACTIVITIES, LIMITS OF CLEARING WILL BE ESTABLISHED AND CHECKED BY CONTRACTOR FOR CONFORMANCE TO CLEARING LIMITS SHOWN ON THE APPROVED PLANS. SILT FENCE AND CULVERT INLET PROTECTION AT THE EXISTING CROSS-CULVERT SHALL BE INSTALLED PRIOR TO ANY CONSTRUCTION ACTIVITIES.

AFTER THE PRE-CONSTRUCTION MEETING, THE CONSTRUCTION ENTRANCE SHALL BE PROVIDED AT THE END OF THE CURRENT PAVED ROADWAY SURFACE. AFTER THE ESTABLISHMENT OF THE CONSTRUCTION ENTRANCE, THE TEMPORARY SEDIMENT BASIN SHALL BE CREATED. EARTHEN MATERIAL REQUIRED FOR EXCAVATION TO FORM SEDIMENT BASIN SHALL BE USED TO FORM SEDIMENT BASIN EMBANKMENT, OR TRANSPORTED TO CLEARED AREA ON LOT 4.

CONTRACTOR SHALL MONITOR THE PERFORMANCE OF THE SEDIMENT TRAP FREQUENTLY. WHEN STORED SEDIMENT REACHES AN ELEVATION OF 17.5, ALL ACCUMULATED SEDIMENT SHALL BE REMOVED AND PROPERLY DISPOSED. CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF DEPOSITED SEDIMENT IN ADJACENT WETLAND AREAS, AND IF NECESSARY, RE-ESTABLISHMENT OF WETLANDS SHOULD WETLAND DAMAGE OCCUR.

CLEARING OPERATIONS CAN COMMENCE, INCLUDING CLEARING OF THE RIGHT-OF-WAY AND PARTIAL CLEARING OF LOT 4 FOR CONSTRUCTION STAKING, AND A TOPSOIL STOCKPILE SITE. ULTIMATELY, THE SITE SHALL BE FINE GRADED WITH EXCESS EXCAVATED MATERIAL TO ESTABLISH MORE RELIEF TO THE LOT.

N/F  
JOSEPH S. TERRELL

AREA OF FIELD  
VERIFIED WETLANDS

**TIMBER WEIR STRUCTURE No. 10**  
(DESIGN TYPE 2) 140' LONG  
SEE DETAIL SHEET 8  
TOP ELEV. OF PRIMARY WEIR= 19.80 (140' WIDE)  
TOP ELEV. OF SECONDARY WEIR= 19.3 (30' WIDE)  
MAXIMUM HEIGHT= 4.8'  
2 YEAR STORM ELEV.= 18.95  
10 YEAR STORM ELEV.= 19.8  
100 YEAR STORM ELEV.= 19.9  
ACTUAL LOCATION OF TIMBER  
STRUCTURE AND THE CONSTRUCTION  
ACCESS TO SAME SHALL BE  
APPROVED BY THE ENVIRONMENTAL  
DIVISION PRIOR TO CONSTRUCTION

PROVIDE CONCRETE LINED ROADSIDE DITCH  
STA. 12+75 TO STA. 16+00 (LEFT SIDE)  
STA. 14+25 TO STA. 16+00 (RIGHT SIDE)  
PAVED DITCHES TO BE 12" DEEP WITH 3:1  
SIDE SLOPES. TOTAL DITCH DEPTH SHALL  
BE 18" DEEP

MAJOR OPEN  
SPACE #8  
LIMIT OF 100'  
RPA BUFFER

REFER TO SHEET 7  
FOR INFORMATION ON  
TEMPORARY SEDIMENT  
BASIN IN THIS AREA

PROVIDE 15' LONG,  
5' WIDE RIP-RAP APRON  
USE d50= 1.0 RIP-RAP  
RIP-RAP TO BE PLACED OVER  
FILTER CLOTH. APPROX.  
4 CY REQ'D.

PAVED "V"- DITCH  
12" DEEP, 2:1 SIDE SLOPE  
AVERAGE SLOPE= 2.5%  
INV. @ RIP-RAP= 21.0±

REMOVE APPROX.  
20' OF EXIST. 18" RCP  
NEW INV.= 22.38  
LOT 14

EX. SAN MH  
RIM= 33.58  
INV. IN (8")= 25.39  
INV. OUT (8")= 24.77  
INV. IN (4")= 24.82  
INV. IN (2" FM)= 29.08

SS #83-1  
INV.= 22.0

72' OF 15" RCP  
@ 1.85%

EX. CABLE  
TV PED  
EX. C&P  
PED

EXISTING 20' H.O.A  
DRAINAGE AND UTILITY  
EASEMENT

18" RCP  
INV. OUT= 22.08

18" RCP  
INV. IN= 28.28

18" RCP  
INV. IN= 28.80

SF

CIP

CD

CE

IP

SF

CD

CIP

IP

SF

CD

OPEN

SPACE

#2

0.2  
AC

DRAIN  
AREA  
DI

NOTE: FINISHED CONTOURS  
SHOWN IN THIS AREA  
SEE SHEET 7 FOR ADDITIONAL  
DETAIL IN THIS AREA AND FOR  
DETAIL ON TEMPORARY SEDIMENT  
TRAP IN THIS AREA

LOT 18

LOT 17

LOT 15

15+00

14+00

13+00

12+00

11+00

10+00

9+00

8+00

7+00

6+00

5+00

4+00

3+00

2+00

1+00

0+00

15+00

14+00

13+00

12+00

11+00

10+00

9+00

8+00

7+00

6+00

5+00

4+00

3+00

2+00

1+00

0+00

15+00

14+00

13+00

12+00

11+00

10+00

9+00

8+00

7+00

6+00

5+00

4+00

3+00

2+00

1+00

0+00

15+00

14+00

13+00

12+00

11+00

10+00

9+00

8+00

7+00

6+00

5+00

4+00

3+00

2+00

1+00

0+00

15+00

14+00

13+00

12+00

11+00

10+00

9+00

8+00

7+00

6+00

5+00

4+00

3+00

2+00

1+00

0+00

15+00

14+00

13+00

12+00

11+00

10+00

9+00

8+00

7+00

6+00

5+00

4+00

3+00

2+00

1+00

0+00

15+00

14+00

13+00

12+00

11+00

10+00

9+00

8+00

7+00

6+00

5+00

4+00

3+00

2+00

1+00

0+00

15+00

14+00

13+00

12+00

11+00

10+00

9+00

8+00

7+00

6+00

5+00

4+00

3+00

2+00

1+00

0+00

15+00

14+00

13+00

12+00

11+00

10+00

9+00

8+00

7+00

6+00

5+00

4+00

3+00

2+00

1+00

0+00

15+00

14+00

13+00

12+00

11+00

10+00

9+00

8+00

7+00

6+00

5+00

4+00

3+00

2+00

1+00

0+00

15+00

14+00

13+00

12+00

11+00

10+00

9+00

8+00

7+00

6+00

5+00

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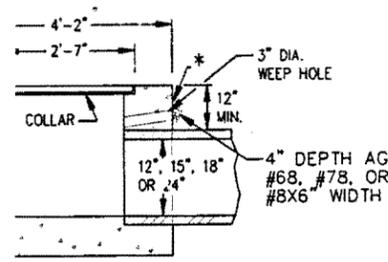
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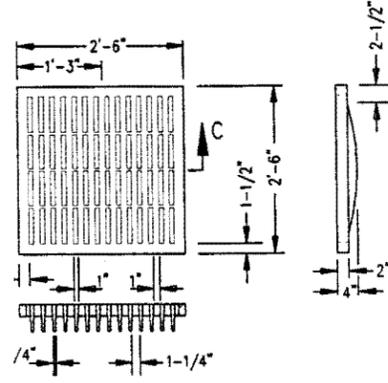
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SECTION A-A  
12"  
CONCRETE QUANTITIES FOR MIN. DEPTH:  
12" CONC. PIPE - 1.440 CU. YDS. CONCRETE  
15" CONC. PIPE - 1.528 CU. YDS. CONCRETE  
18" CONC. PIPE - 1.620 CU. YDS. CONCRETE  
24" CONC. PIPE - 1.817 CU. YDS. CONCRETE  
ADD 0.469 CU. YDS. PER ADDITIONAL FOOT OF DEPTH.



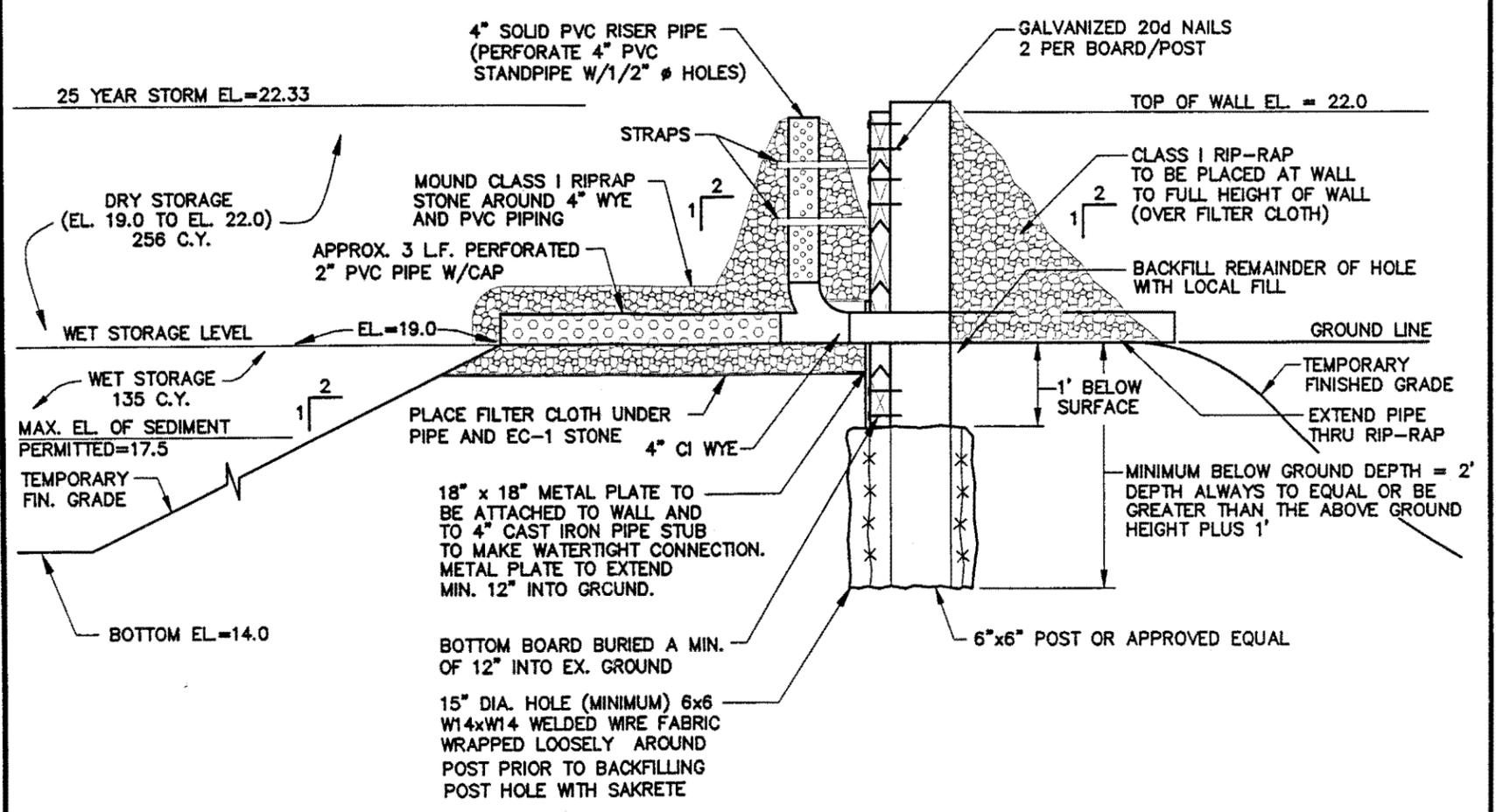
SECTION C-C  
APPROXIMATE WEIGHT  
CAST IRON GRATE:  
363 ± 18 LBS.

**RD DROP INLET**  
MAXIMUM DEPTH (H)=10'  
N.T.S.

**NOTES:**  
MAXIMUM DEPTH (H) TO BE 10'. FOR GREATER DEPTH USE STANDARD DI-1A.  
WHEN SPECIFIED ON PLANS THE INVERT IS TO BE SHAPED IN ACCORDANCE WITH STANDARD PLAN IS-1. THE COST OF FURNISHING AND PLACING ALL MATERIALS INCIDENTAL TO THE SHAPING IS TO BE INCLUDED IN THE PRICE BID FOR THE DROP INLET COMPLETE.  
THIS ITEM MAY BE PRECAST OR CAST IN PLACE.  
ALL CAST IN PLACE CONCRETE TO BE CLASS A3. FOR PRECAST SEE SHEET 103.03.  
THE "H" DIMENSIONS SHOWN ON THE STANDARDS AND SPECIFIED ON THE PLANS WILL BE MEASURED FROM THE INVERT OF THE OUTFALL PIPE TO THE TOP OF THE STRUCTURE. PLAN "H" DIMENSIONS ARE APPROXIMATE ONLY FOR ESTIMATING PURPOSES AND THE ACTUAL DIMENSIONS SHALL BE DETERMINED BY THE CONTRACTOR FROM FIELD CONDITIONS.  
IN THE EVENT THE INVERT OF THE OUTFALL PIPE IS HIGHER THAN THE BOTTOM OF THE STRUCTURE THE INVERT OF THE STRUCTURE SHALL BE SHAPED WITH CEMENT MORTAR TO PREVENT STANDING OR PONDING OF WATER IN THE STRUCTURE. THE COST FOR INVERT SHAPING SHALL BE INCLUDED IN THE PRICE BID FOR THE STRUCTURE.

**NOTES:**  
ANY ALTERNATE METHODS OF ANCHORAGE, MEETING THE APPROVAL OF THE ENGINEER, MAY BE SUBSTITUTED FOR THE CAST IRON LUGS AS SHOWN HEREON.

DI-1



**TEMPORARY SEDIMENT BASIN RELEASE STRUCTURE DETAIL**  
NOT TO SCALE

DI-1

No.	DATE	REVISION / COMMENT / NOTE	BY
3	9/99	REVISION TO STORM SEWER (THIS SHEET CHANGED)	VMB
2	8/99	REVISION TO DETENTION STRUCTURE (THIS SHEET CHANGED)	VMB
1	5/99	REVISIONS AS PER JAMES CITY CO. REVIEW DATED 12/19/98	VMB



101 Road, Suite 1  
Virginia 23188  
-0040  
20-8994

E COUNTY, THE DEVELOPER, THE PROJECT DISTURBING PERMIT. THE COUNTY FOR APPROVAL PRIOR TO THE ENVIRONMENTAL DIVISION WITH THE NAME OF THE OF INSTALLED MEASURES ON A DAILY BASIS.

S AND OTHER MEASURES INTENDED EP IN GRADING AND BE MADE ARTHEN STRUCTURES SUCH AS DAMS, Y AFTER INSTALLATION. PERIODIC TO ASSESS THEIR CONDITION. ANY ED IMMEDIATELY UPON NOTIFICATION BY ED BY ANY SUBCONTRACTOR INCLUDING

D BY EITHER REDIRECTING FLOWS FROM ; TO SAFELY LOWER WATER DOWNSLOPE (SPEC. 3.10) SHALL BE INSTALLED

ENTS AT TIME OF CONSTRUCTION TO AL DIVISION APPROVAL WILL BE

IS SHOWN ON THIS PLAN OR AS DIRECTED DETECTED WITH SEDIMENT TRAPPING OVED BY THE ENVIRONMENTAL Y WASTE TO OR FROM THE PROJECT SITE.

4 DAYS FOLLOWING COMPLETION OF ATION OF DRAINAGE FACILITIES SHALL ITCHES FROM DRAINAGE STRUCTURES SHALL INCLUDES INSTALLATION OF EROSION AGE OUTFALLS REQUIRED FOR A STREET ATION BEGINS.

TO ALL DENUED AREAS WITHIN 7 DAYS SOIL STABILIZATION MUST ALSO BE APPLIED L REMAIN DORMANT (UNDISTURBED) FOR VEGETATIVE ESTABLISHMENT, MULCHING AS TO BE PAVED.

ATERLINES, OR UNDERGROUND UTILITY LINES / PORTION OF THESE ITEMS, ALL SAME DAY).

G THE MONTHS OF DECEMBER, NGING IN ACCORDANCE WITH SPECIFICATION I PERMITS.

ON THIS SITE PLAN SHALL MEAN THE SS COVER FROM A PROPERLY PREPARED D FERTILIZER IN ACCORDANCE WITH REQUIRED AS NECESSARY TO ENSURE

SION CONTROL BLANKETS SUCH AS EXCELSIOR R. INSTALLATION SHALL BE IN ACCORDANCE UCTIONS. NO SLOPES SHALL BE CREATED

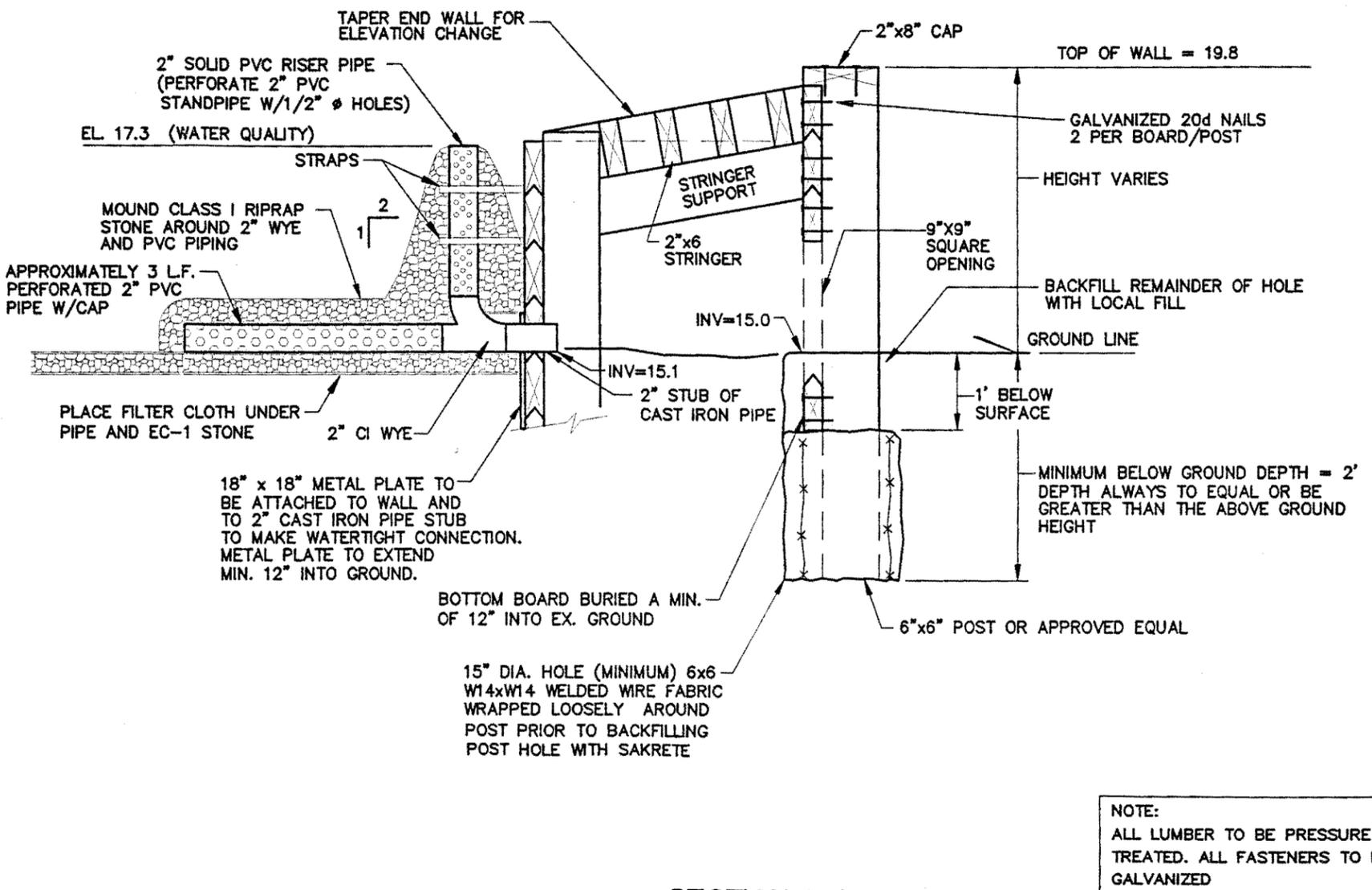
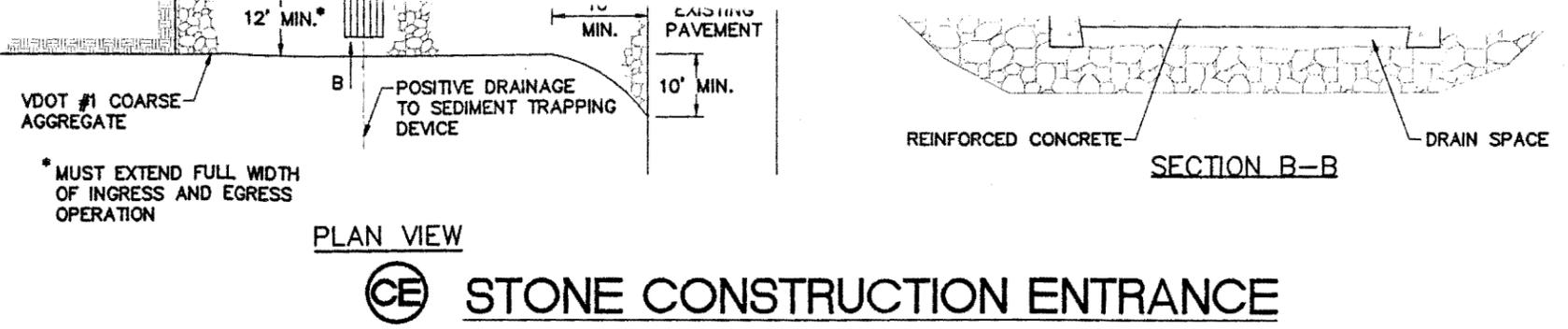
LL BE PROVIDED FOR ALL STORM DRAIN ME.

PROVIDED FOR ALL PAVED DITCHES UNTIL

ENT. PARTICULAR ATTENTION SHALL BE

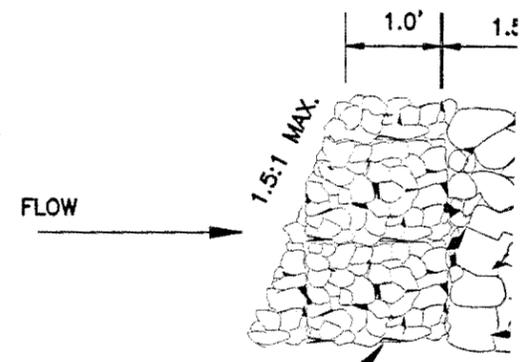
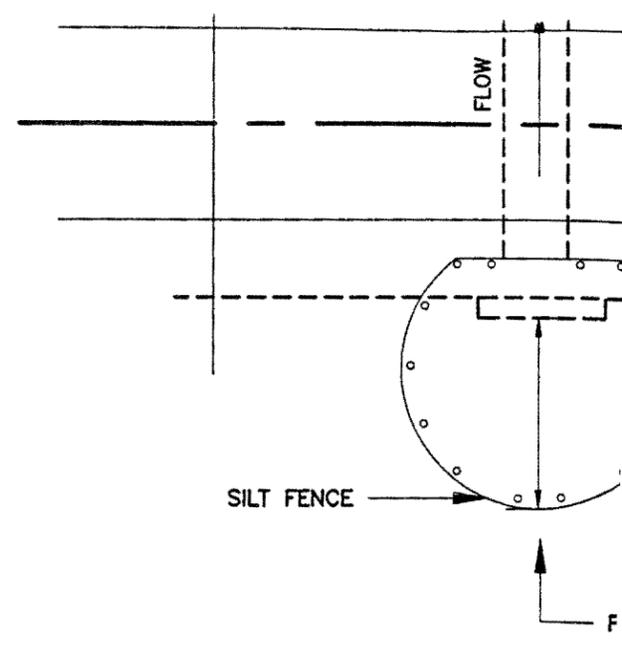
VED UNTIL ALL DISTURBED AREAS ARE SHALL BE REMOVED WITHIN 30 DAYS.

IP FACILITIES. ALSO UPON COMPLETION, E CERTIFIED BY A PROFESSIONAL ENGINEER RTIFICATION SHALL STATE THAT TO THE BEST E WAS CONSTRUCTED IN ACCORDANCE WITH



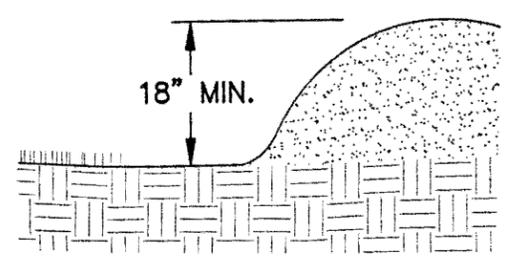
**PRESSURE TREATED WOOD DRY DETENTION STRUCTURE**  
NOT TO SCALE

D-WDS-3

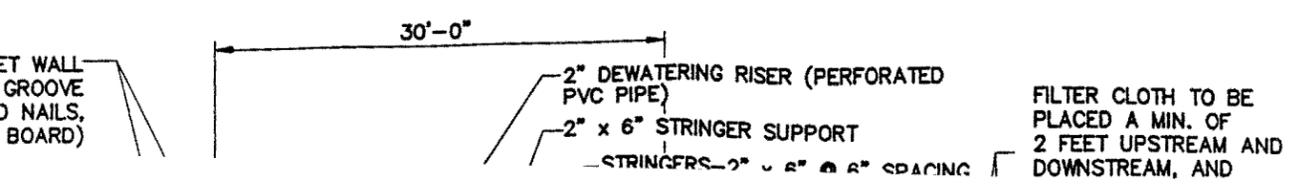


\*VDOT #3, #357, #5, #56 OR #57 COARSE AGGREGATE TO REPLACE SILT FENCE IN "HORSESHOE" WHEN HIGH VELOCITY OF FLOW IS EXPECTED

SOURCE: ADAPTED from VDOT Standard Sheets and Va. DSWC



**DD TEMPORARY**  
NC

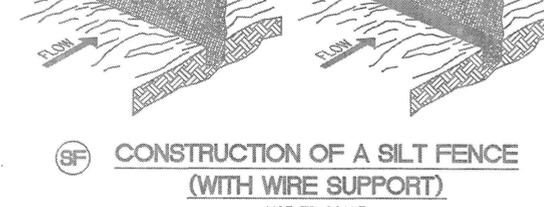
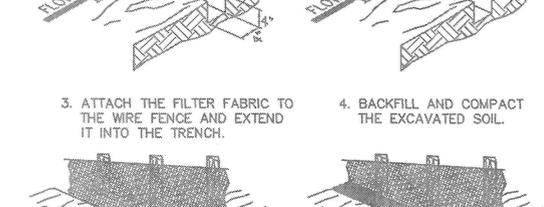
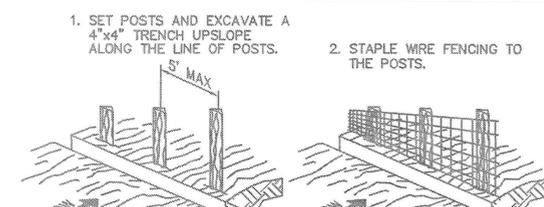
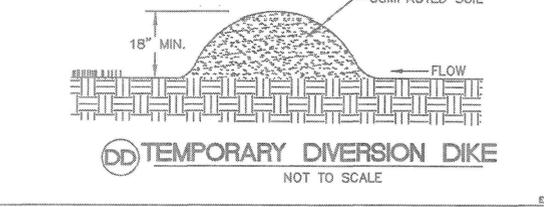
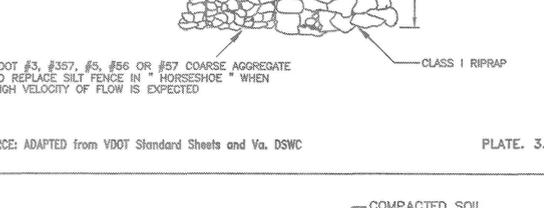
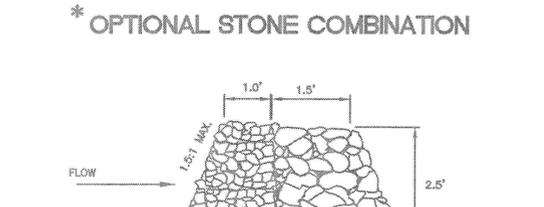
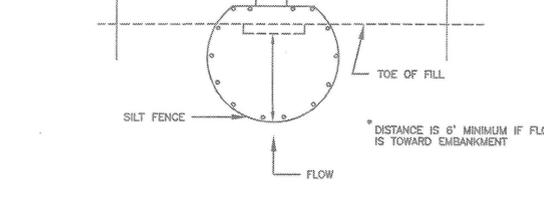
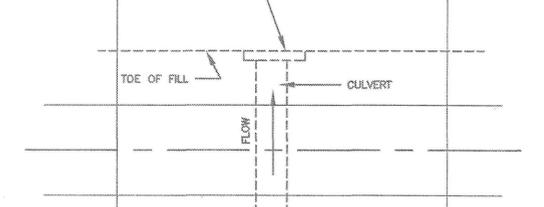
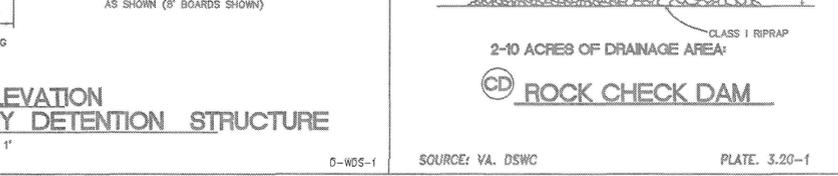
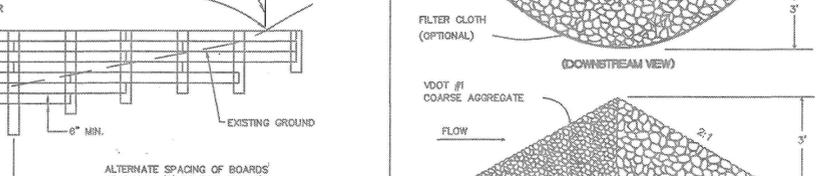
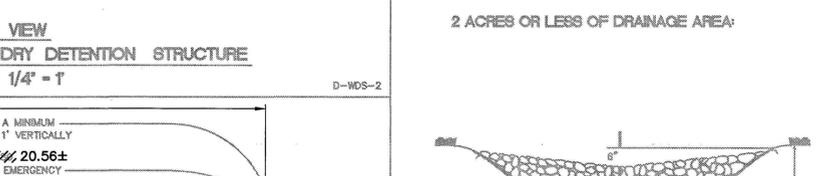
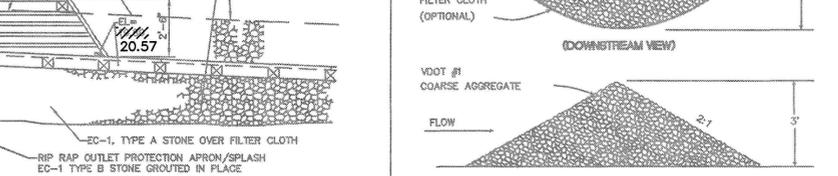
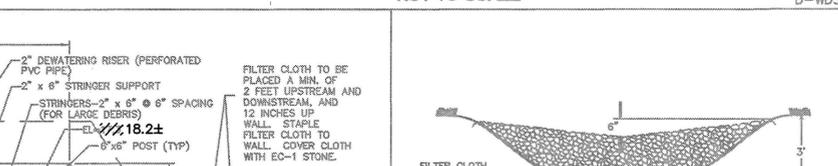
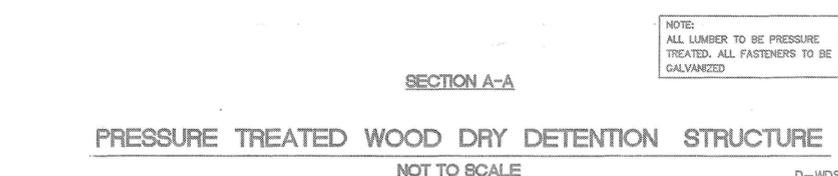
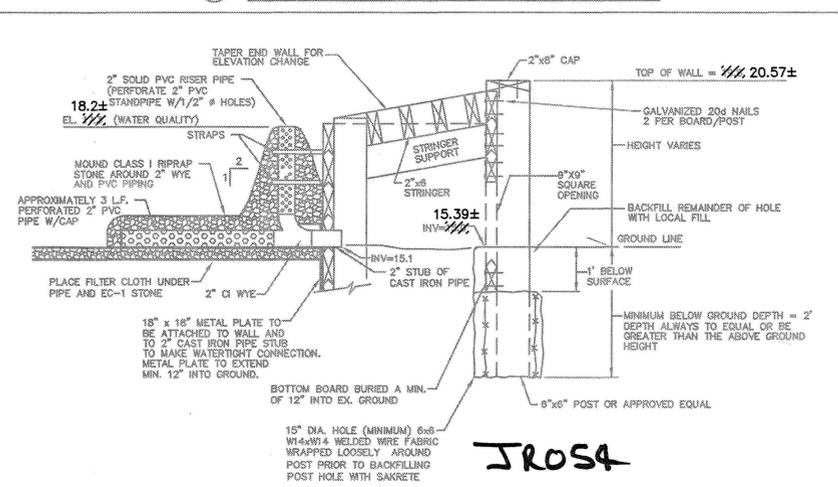
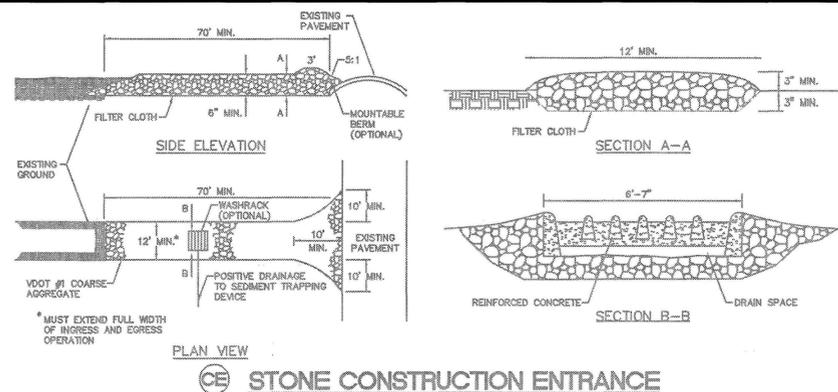




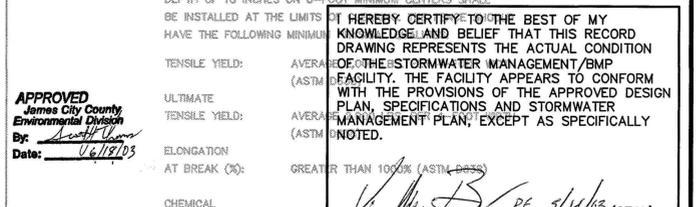
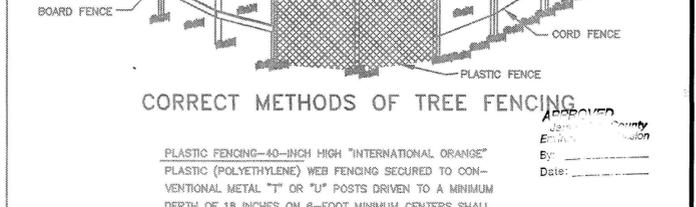
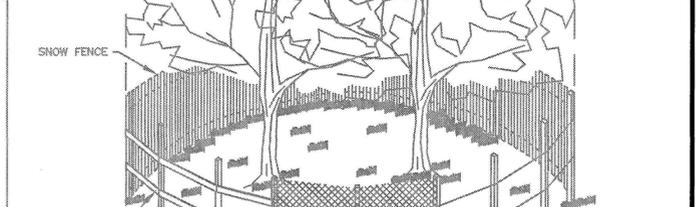
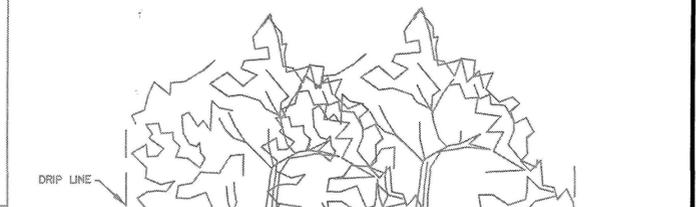
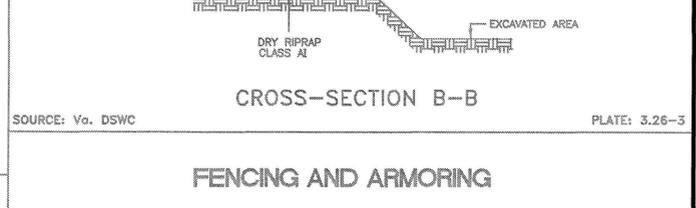
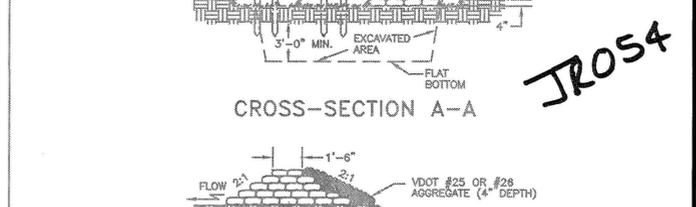
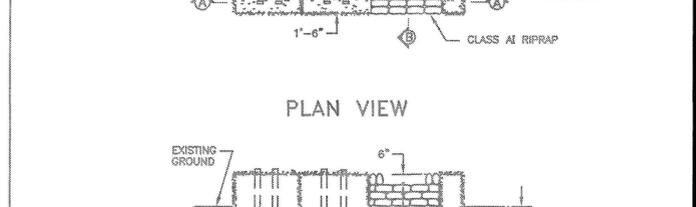
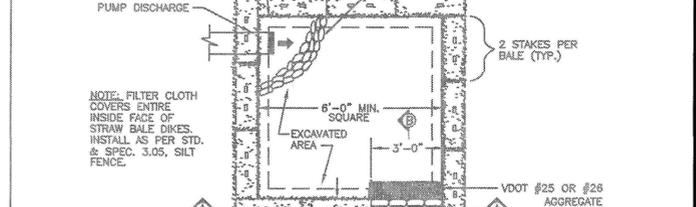
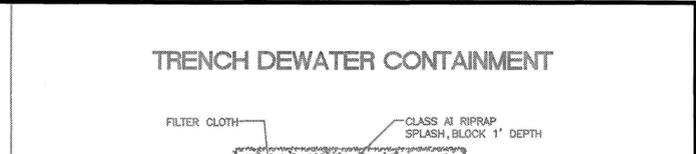
**STANDARD EROSION AND SEDIMENT CONTROL NOTES FOR JAMES CITY COUNTY, VIRGINIA**  
REVISED 4/1/97

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

- ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK. THE CONTRACTOR SHALL BE THOROUGHLY FAMILIAR WITH ALL APPLICABLE MEASURES CONTAINED THEREIN WHICH MAY BE PERTINENT TO THIS PROJECT.
- ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS SHALL BE PROTECTED BY A TEMPORARY CONSTRUCTION ENTRANCE TO PREVENT TRACKING OF MUD ONTO PUBLIC RIGHT-OF-WAYS. AN ENTRANCE PERMIT FROM VDOT IS REQUIRED PRIOR TO ANY CONSTRUCTION ACTIVITIES WITHIN STATE RIGHTS-OF-WAYS. WHERE SEDIMENT IS TRANSPORTED ONTO A PUBLIC ROAD SURFACE, THE ROAD SHALL BE THOROUGHLY CLEANED AT THE END OF EACH DAY.
- A PRECONSTRUCTION MEETING SHALL BE HELD ON SITE BETWEEN THE COUNTY, THE DEVELOPER, THE PROJECT ENGINEER, AND THE CONTRACTOR PRIOR TO ISSUANCE OF THE LAND DISTURBING PERMIT. THE CONTRACTOR SHALL SUBMIT A SEQUENCE OF CONSTRUCTION TO THE COUNTY FOR APPROVAL PRIOR TO THE PRECONSTRUCTION MEETING. THE CONTRACTOR WILL SUPPLY THE ENVIRONMENTAL DIVISION WITH THE NAME OF THE INDIVIDUAL WHO WILL BE RESPONSIBLE FOR ENSURING MAINTENANCE OF INSTALLED MEASURES ON A DAILY BASIS.
- SEDIMENT BASINS AND TRAPS, PERIMETER DIKES, SEDIMENT BARRIERS AND OTHER MEASURES INTENDED TO TRAP SEDIMENT ON-SITE MUST BE CONSTRUCTED AS A FIRST STEP IN GRADING AND BE MADE FUNCTIONAL BEFORE UPRISPE LAND DISTURBANCE TAKES PLACE. EARTHEN STRUCTURES SUCH AS DAMS, DIKES, AND DIVERSIONS MUST BE SEEDED AND MULCHED IMMEDIATELY AFTER INSTALLATION. PERIODIC INSPECTIONS OF THE EROSION CONTROL MEASURES SHALL BE MADE TO ASSESS THEIR CONDITION. ANY NECESSARY MAINTENANCE OF THE MEASURES SHALL BE ACCOMPLISHED IMMEDIATELY UPON NOTIFICATION BY THE COUNTY AND SHALL INCLUDE THE REPAIR OF MEASURES DAMAGED BY ANY SUBCONTRACTOR INCLUDING THOSE OF THE PUBLIC UTILITY COMPANIES.
- SURFACE FLOWS OVER CUT AND FILL SLOPES SHALL BE CONTROLLED BY EITHER REDIRECTING FLOWS FROM TRANSFERING THE SLOPES OR BY INSTALLING MECHANICAL DEVICES TO SAFELY LOWER WATER DOWNSLOPE WITHOUT CAUSING EROSION. A TEMPORARY FILL DIVERSION (STD. & SPEC. 3.10) SHALL BE INSTALLED PRIOR TO THE END OF EACH WORKING DAY.
- SEDIMENT CONTROL MEASURES MAY REQUIRE MINOR FIELD ADJUSTMENTS AT TIME OF CONSTRUCTION TO INSURE THEIR INTENDED PURPOSE IS ACCOMPLISHED. ENVIRONMENTAL DIVISION APPROVAL WILL BE REQUIRED FOR OTHER DEVIATIONS FROM THE APPROVED PLANS.
- THE CONTRACTOR SHALL PLACE SOIL STOCKPILES AT THE LOCATIONS SHOWN ON THIS PLAN OR AS DIRECTED BY THE ENGINEER. SOIL STOCKPILES SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. OFF-SITE WASTE OR BORROW AREAS SHALL BE APPROVED BY THE ENVIRONMENTAL DIVISION PRIOR TO THE IMPORT OR EXPORT OF ANY WASTE TO OR FROM THE PROJECT SITE.
- THE CONTRACTOR SHALL COMPLETE DRAINAGE FACILITIES WITHIN 30 DAYS FOLLOWING COMPLETION OF ROUGH GRADING AT ANY POINT WITHIN THE PROJECT. THE INSTALLATION OF DRAINAGE FACILITIES SHALL TAKE PRECEDENCE OVER ALL UNDERGROUND UTILITIES. OUTFALL DITCHES FROM DRAINAGE STRUCTURES SHALL BE STABILIZED IMMEDIATELY AFTER CONSTRUCTION OF SAME. THIS INCLUDES INSTALLATION OF EROSION CONTROL STRUCTURE OR PAVED DITCHES WHERE REQUIRED. ANY DRAINAGE OUTFALLS REQUIRED FOR A STREET MUST BE COMPLETED BEFORE STREET GRADING OR UTILITY INSTALLATION BEGINS.
- PERMANENT OR TEMPORARY SOIL STABILIZATION MUST BE APPLIED TO ALL BENEDED AREAS WITHIN 7 DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. SOIL STABILIZATION MUST ALSO BE APPLIED TO BENEDED AREAS WHICH MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT (UNDISTURBED) FOR LONGER THAN 30 DAYS. SOIL STABILIZATION MEASURES INCLUDE VEGETATIVE ESTABLISHMENT, MULCHING AND THE EARLY APPLICATION OF GRAVEL BASE MATERIAL ON AREAS TO BE PAVED.
- NO MORE THAN 300 FEET OF SANITARY SEWER, STORM SEWER, WATERLINES, OR UNDERGROUND UTILITY LINES ARE TO BE OPEN AT ONE TIME. FOLLOWING INSTALLATION OF ANY PORTION OF THESE ITEMS, ALL DISTURBED AREAS ARE TO BE IMMEDIATELY STABILIZED (I.E., THE SAME DAY).
- IF DISTURBED AREA STABILIZATION IS TO BE ACCOMPLISHED DURING THE MONTHS OF DECEMBER, JANUARY, OR FEBRUARY, STABILIZATION SHALL CONSIST OF MULCHING IN ACCORDANCE WITH SPECIFICATION 3.35. SEEDING WILL THEN TAKE PLACE AS SOON AS THE SEASON PERMITS.
- THE TERM SEEDING, FINAL VEGETATIVE COVER OR STABILIZATION, ON THIS SITE PLAN SHALL MEAN THE SUCCESSFUL GERMINATION AND ESTABLISHMENT OF A STABLE GRASS COVER FROM A PROPERLY PREPARED SEEDBED CONTAINING THE SPECIFIC SEEDING INSTRUCTIONS. SEEDING SHALL BE ACCOMPLISHED IN ACCORDANCE WITH SPECIFICATION 3.32, PERMANENT SEEDING. IRRIGATION SHALL BE REQUIRED AS NECESSARY TO ENSURE ESTABLISHMENT OF GRASS COVER.
- ALL SLOPES STEEPER THAN 3:1 SHALL REQUIRE THE USE OF EROSION CONTROL BLANKETS SUCH AS EROSION BLANKETS TO AID IN THE ESTABLISHMENT OF A VEGETATIVE COVER. INSTALLATION SHALL BE IN ACCORDANCE WITH SPECIFICATION 3.30, MULCHING AND MANUFACTURER'S INSTRUCTIONS. NO SLOPES SHALL BE CREATED STEEPER THAN 2:1.
- INLET PROTECTION IN ACCORDANCE WITH SPECIFICATION 3.07 SHALL BE PROVIDED FOR ALL STORM DRAIN INLETS AS SOON AS PRACTICAL FOLLOWING CONSTRUCTION OF SAME.
- TEMPORARY LINERS, SUCH AS POLYETHYLENE SHEETS, SHALL BE PROVIDED FOR ALL PAVED DITCHES UNTIL THE PERMANENT CONCRETE LINER IS INSTALLED.
- PAVED DITCHES SHALL BE REQUIRED WHEREVER EROSION IS EVIDENT. PARTICULAR ATTENTION SHALL BE PAID TO THOSE AREAS WHERE GRADES EXCEED 3 PERCENT.
- TEMPORARY EROSION CONTROL MEASURES ARE NOT TO BE REMOVED UNTIL ALL DISTURBED AREAS ARE STABILIZED. AFTER STABILIZATION IS COMPLETE, ALL MEASURES SHALL BE REMOVED WITHIN 30 DAYS. TRAPPED SEDIMENT SHALL BE SPREAD AND SEEDING.
- AS-BUILT DRAWINGS MUST BE PROVIDED FOR ALL DETENTION/BMP FACILITIES. ALSO UPON COMPLETION, THE CONSTRUCTION OF ALL DETENTION/BMP FACILITIES SHALL BE CERTIFIED BY A PROFESSIONAL ENGINEER WHO INSPECTED THE STRUCTURE DURING CONSTRUCTION. THE CERTIFICATION SHALL STATE THAT TO THE BEST OF HIS/HER JUDGMENT, KNOWLEDGE, AND BELIEF, THE STRUCTURE WAS CONSTRUCTED IN ACCORDANCE WITH THE APPROVAL PLANS AND SPECIFICATIONS.



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



RECORD DRAWING: 3/13/02

RECORD DRAWING	DATE
REVISION TO STORM SEWER (THIS SHEET UNCHANGED)	
REVISION TO DETENTION STRUCTURE (THIS SHEET CHANGED)	
REVISIONS AS PER JAMES CITY CO. REVIEW DATED 12/19/98	
NO. DATE	

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

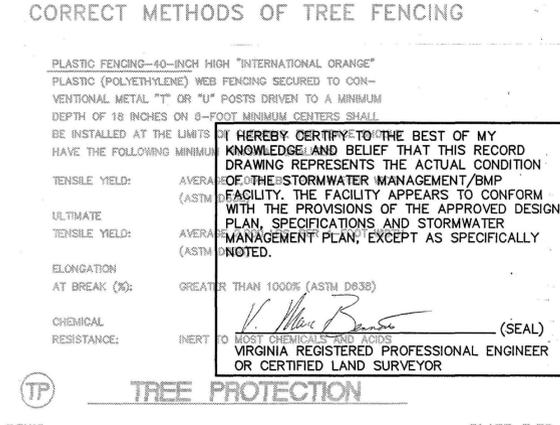
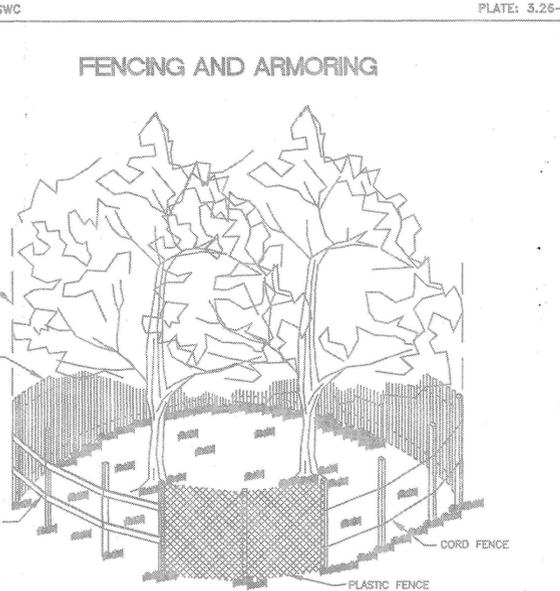
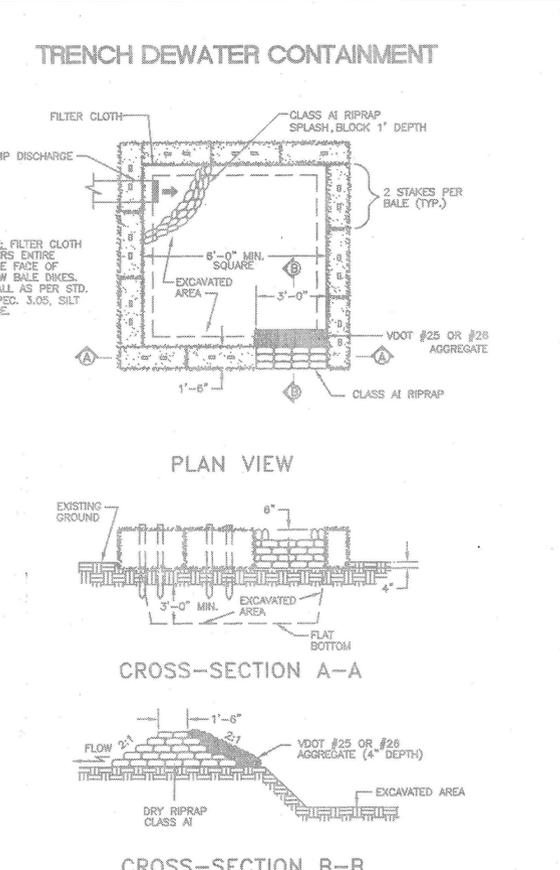
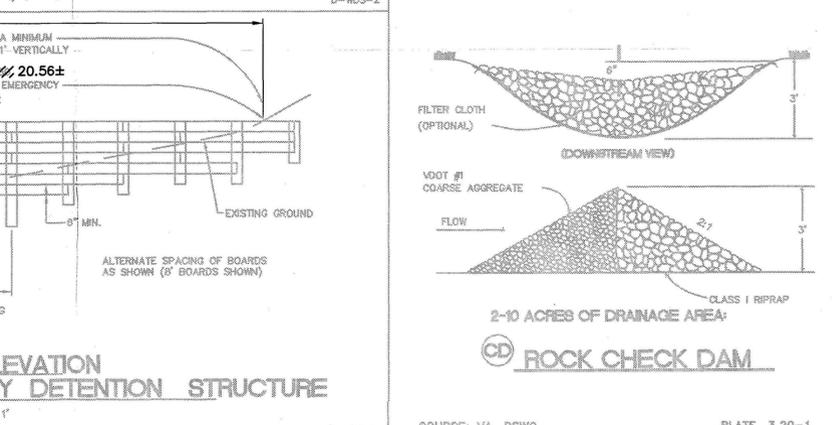
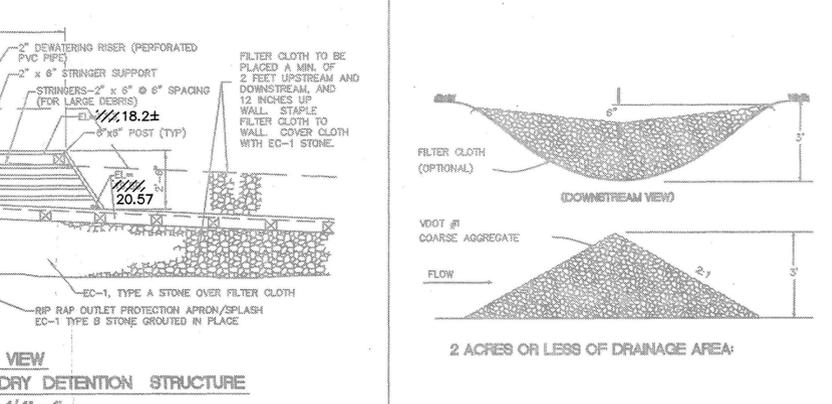
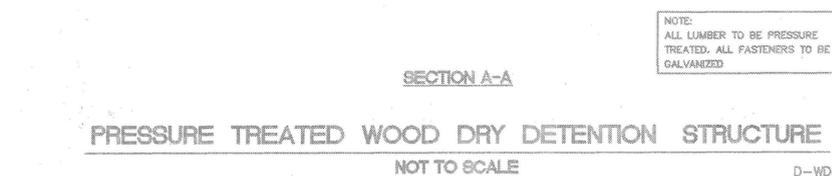
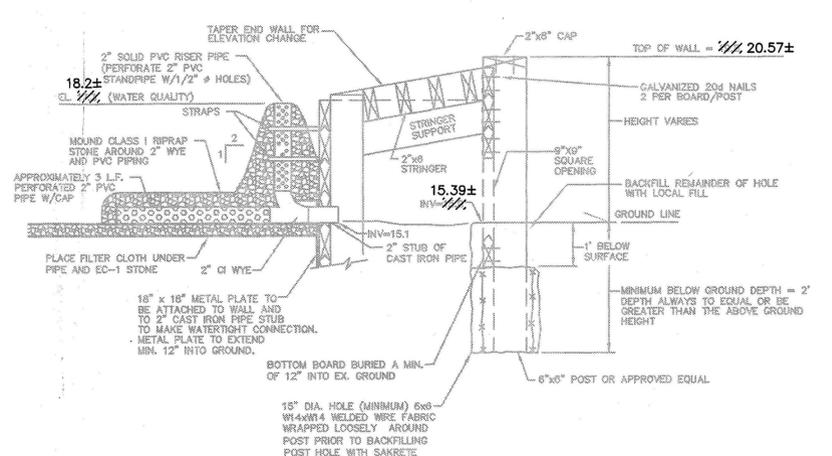
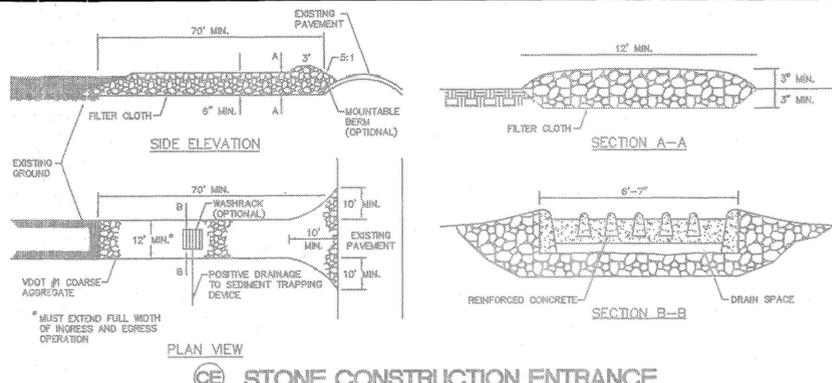


DESIGNED	DRAWN
SCALE	DATE
PROJECT NO.	DRAWING NO.
8	

**STANDARD EROSION AND SEDIMENT CONTROL NOTES FOR JAMES CITY COUNTY, VIRGINIA**  
REVISED 4/17/97

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

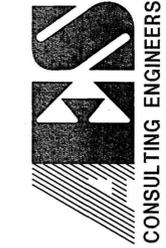
1. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK". THE CONTRACTOR SHALL BE THOROUGHLY FAMILIAR WITH ALL APPLICABLE MEASURES CONTAINED THEREIN WHICH MAY BE PERTINENT TO THIS PROJECT.
2. ALL POINTS OF CONSTRUCTION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



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

NO.	DATE	REVISION / COMMENT / NOTE
1	5/98	REVISIONS AS PER JAMES CITY CO. REVIEW DATED 12/19/98
2	8/99	REVISION TO DETENTION STRUCTURE (THIS SHEET CHANGED)
3	9/99	REVISION TO STORM SEWER (THIS SHEET UNCHANGED)
4	1/13/02	RECORD DRAWING

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



EROSION AND SEDIMENT CONTROL NOTES AND DETAILS  
FOWLER'S LAKE BLOCK "B"  
THE GOVERNOR'S LAND  
M. Tino Rivers  
JAMES CITY COUNTY  
POWhatan DISTRICT  
DESIGNED: VMB, DRAWN: AES, SCALE: AS NOTED, DATE: 10/13/98, PROJECT NO.: 7173-6-1, DRAWING NO.: 8

**FOWLER'S LAKE - BLOCK 'B'**  
**PROJECT NARRATIVE**

**PROJECT DESCRIPTION**  
THE PROJECT CONSISTS OF A SEVEN (7) LOT RESIDENTIAL SUBDIVISION OF THE GOVERNOR'S LAND PROJECT, INCLUDED WITH THE CONSTRUCTION OF THIS PROJECT ARE: THE INSTALLATION OF APPROXIMATELY 692 LINEAR FEET OF SANITARY FORCE MAIN; (GRINDER PUMP SYSTEM) THE INSTALLATION OF APPROXIMATELY 910 LINEAR FEET OF WATER MAIN; THE INSTALLATION OF TIMBER WEIR STRUCTURE FOR WATER QUALITY AND STORMWATER RUNOFF CONTROL; AND THE CONSTRUCTION OF APPROXIMATELY 880 LINEAR FEET OF ROADWAY (WITH OPEN DITCH SECTION).  
THE SITE IS LOCATED IMMEDIATELY NORTHEAST OF THE EXISTING FOWLER'S LAKE SUBDIVISION, APPROXIMATELY 1/8 ACRES OF THE SITE WILL BE DISTURBED DURING CONSTRUCTION.

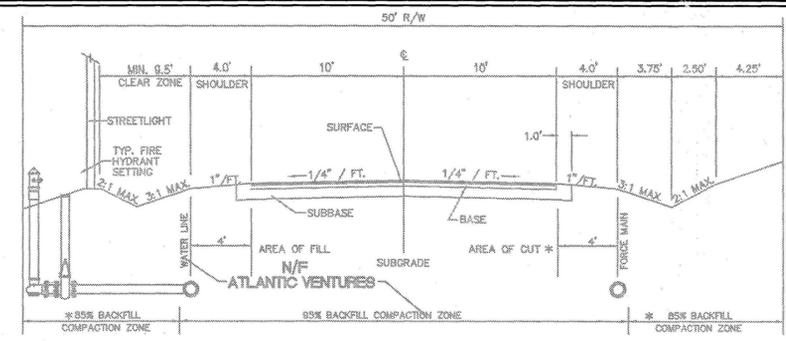
**EXISTING CONDITIONS**  
THE PROPOSED SITE CAN BE DEFINED AS ROLLING, TO NEARLY FLAT, WITH ONE MAIN DRAINWAY. THE SITE IS FORESTED WITH MATURE HARDWOOD TREES. RUNOFF FROM THE SITE FOLLOWS NATURAL DRAINWAYS WESTWARD TO AN EXISTING CREEK (ALSO A BOUNDARY BETWEEN THIS PROPERTY AND ADJACENT PROPERTIES).

**ADJACENT PROPERTY DESCRIPTION**  
TO THE NORTH OF THIS PROJECT IS LOCATED A LARGE RELATIVELY FLAT UNDEVELOPED PARCEL OWNED BY ATLANTIC VENTURES. TO THE WEST IS LOCATED THE EXISTING SUBDIVISION OF FOWLER'S LAKE, TO THE EAST IS LOCATED THE SINGLE-FAMILY SUBDIVISION OF HARPER'S MILL. DUE SOUTH OF THIS PROJECT IS AN RV PARKING AREA AND THE GOLF MAINTENANCE AREA OF THE TWO RIVERS COUNTRY CLUB.

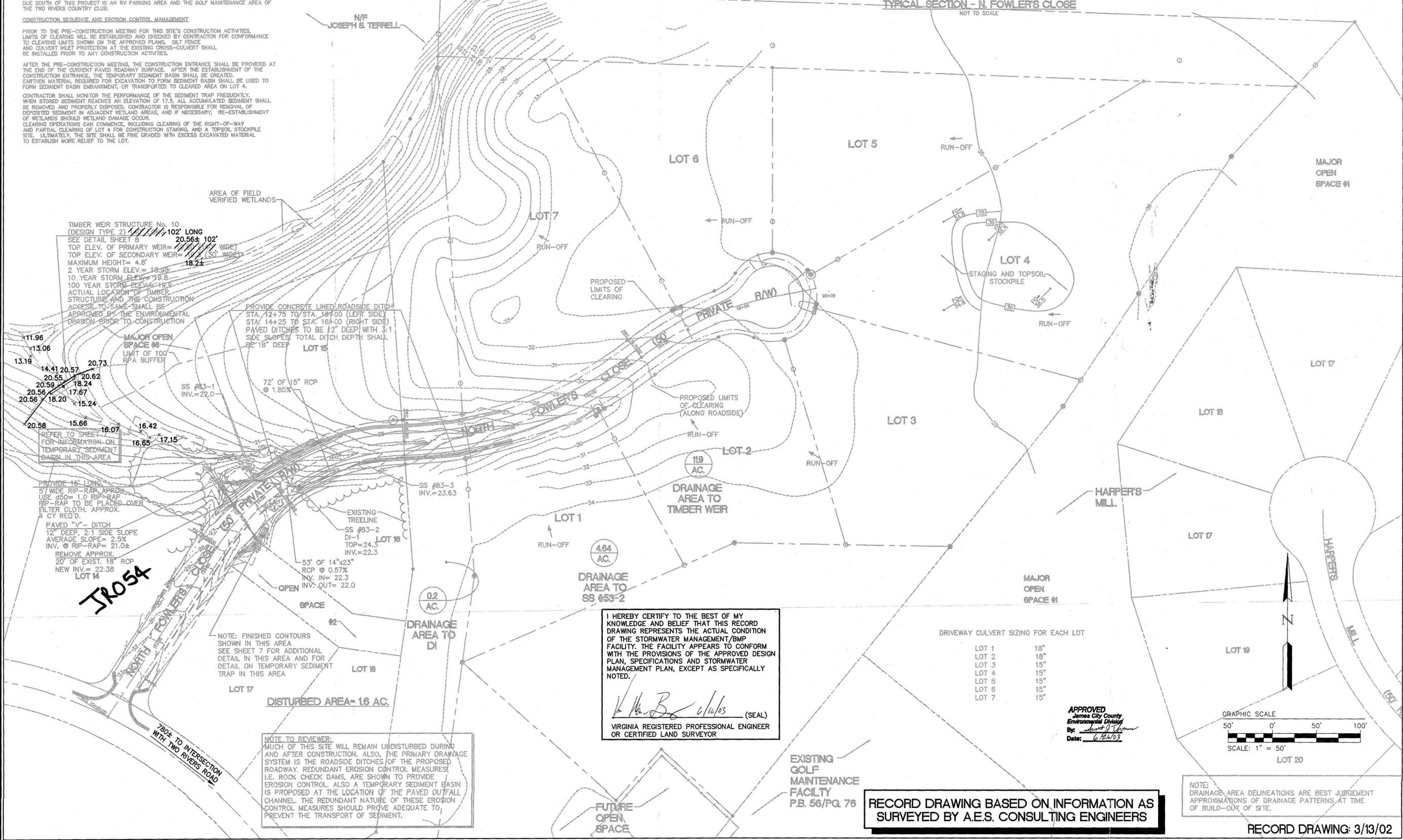
**CONSTRUCTION SEQUENCE AND EROSION CONTROL MANAGEMENT**  
PRIOR TO THE PRE-CONSTRUCTION MEETING FOR THIS SITE'S CONSTRUCTION ACTIVITIES, LIMITS OF CLEARING WILL BE ESTABLISHED AND CHECKED BY CONTRACTOR FOR CONFORMANCE TO CLEARING LIMITS SHOWN ON THE APPROVED PLANS. SILT FENCE AND CULVERT INLET PROTECTION AT THE EXISTING CROSS-CULVERT SHALL BE INSTALLED PRIOR TO ANY CONSTRUCTION ACTIVITIES.

AFTER THE PRE-CONSTRUCTION MEETING, THE CONSTRUCTION ENTRANCE SHALL BE PROVIDED AT THE END OF THE CURRENT PAVED ROADWAY SURFACE. AFTER THE ESTABLISHMENT OF THE CONSTRUCTION ENTRANCE, THE TEMPORARY SEDIMENT BASIN SHALL BE CREATED. EARTHEN MATERIAL REQUIRED FOR EXCAVATION TO FORM SEDIMENT BASIN SHALL BE USED TO FORM SEDIMENT BASIN EMBANKMENT, OR TRANSPORTED TO CLEARED AREA ON LOT 4. CONTRACTOR SHALL MONITOR THE PERFORMANCE OF THE SEDIMENT TRAP FREQUENTLY. WHEN STORED SEDIMENT REACHES AN ELEVATION OF 17.5, ALL ACCUMULATED SEDIMENT SHALL BE REMOVED AND PROPERLY DISPOSED. CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF DEPOSITED SEDIMENT IN ADJACENT WETLAND AREAS, AND IF NECESSARY, RE-ESTABLISHMENT OF WETLANDS SHOULD WETLAND DAMAGE OCCUR. CLEARING OPERATIONS CAN COMMENCE, INCLUDING CLEARING OF THE RIGHT-OF-WAY AND PARTIAL CLEARING OF LOT 4 FOR CONSTRUCTION STAGING, AND A TOPSOIL STOCKPILE SITE. ULTIMATELY, THE SITE SHALL BE FINE GRADED WITH EXCESS EXCAVATED MATERIAL TO ESTABLISH MORE RELIEF TO THE LOT.

AFTER SITE CLEARING, ADDITIONAL EROSION CONTROL, SUCH AS SILT FENCE MEASURES SHALL BE PROVIDED TO CONTROL SEDIMENT FROM DENUDATED AREAS.  
GRADING OPERATIONS SHALL BEGIN WITH ROUGH GRADING OF ROADBED, AND OUTFALL AND ROADSIDE DITCHES. UPON COMPLETION OF ROUGH GRADING, ROCK CHECK DAMS SHALL BE PLACED IN ALL ROADSIDE DITCHES AT 100-FOOT INTERVALS.  
CROSS-CULVERT AND UTILITY INSTALLATION SHALL COMMENCE AT COMPLETION OF ROUGH GRADING. CONTRACTOR SHALL CHECK AND MAINTAIN ALL EROSION CONTROL ITEMS FOR PROPER INSTALLATION AND ACCUMULATED SEDIMENT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSURE THESE ITEMS ARE PERFORMING ADEQUATELY.  
AT COMPLETION OF UTILITY INSTALLATION, FINAL GRADING OF ROADBED, ROADSIDE DITCHES, AND LOT 4 SHALL BE COMPLETED. CHECK DAMS SHALL BE INSPECTED. CONTRACTOR SHALL CONSTRUCT PAVED DITCHES IN DESIGNATED AREAS.  
TOPSOIL SHALL BE SPREAD ON ALL DENUDATED AREAS INCLUDING LOT CLEARING AREAS. SEEDING AREAS WILL BE CHECKED REGULARLY TO ENSURE A GOOD STAND IS MAINTAINED. AREAS MAY REQUIRE FERTILIZATION AND RE-SEED TO PROVIDE A GOOD GROUND COVER.  
UPON COMPLETION OF SITE STABILIZATION WITH PERMANENT GROUND COVERS, FINAL OUTFALL DITCH CHANNEL IMPROVEMENTS, INCLUDING THE INSTALLATION OF TIMBER WEIR STRUCTURE, MAY BE COMPLETED. ALL ACCUMULATED SEDIMENT SHALL BE REMOVED AND PROPERLY DISPOSED.  
AS A FINAL STEP TO THE CONSTRUCTION ACTIVITIES, ALL EROSION CONTROL MEASURES SHALL BE REMOVED.



NOTE:  
ANY OFF-SITE LAND DISTURBANCE AREAS FOR DEPOSITION OF EXCESS EARTHEN MATERIAL SHALL BE IDENTIFIED TO THE ENVIRONMENTAL DIVISION OF JAMES CITY COUNTY, AND SHALL BE ADEQUATELY PROTECTED TO PREVENT EROSION AND TO CONTROL THE TRANSPORT OF SEDIMENT.



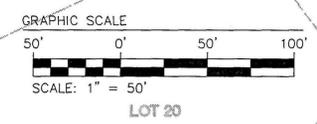
I HEREBY CERTIFY TO THE BEST OF MY KNOWLEDGE AND BELIEF THAT THIS RECORD DRAWING REPRESENTS THE ACTUAL CONDITION OF THE STORMWATER MANAGEMENT/BMP FACILITY. THE FACILITY APPEARS TO CONFORM WITH THE PROVISIONS OF THE APPROVED DESIGN PLAN, SPECIFICATIONS AND STORMWATER MANAGEMENT PLAN, EXCEPT AS SPECIFICALLY NOTED.

*[Signature]* (SEAL)  
VIRGINIA REGISTERED PROFESSIONAL ENGINEER OR CERTIFIED LAND SURVEYOR

DRIVEWAY CULVERT SIZING FOR EACH LOT

LOT 1	18"
LOT 2	18"
LOT 3	15"
LOT 4	15"
LOT 5	15"
LOT 6	15"
LOT 7	15"

APPROVED  
James City County  
Environmental Division  
By: *[Signature]*  
Date: 6/26/03



**RECORD DRAWING BASED ON INFORMATION AS SURVEYED BY A.E.S. CONSULTING ENGINEERS**

RECORD DRAWING: 3/13/02

5	5/13/02	RECORD DRAWINGS	BY
4	9/99	REVISION TO STORM SEWER (THIS SHEET CHANGED)	BY
3	8/99	REVISION TO DETENTION STRUCTURE (THIS SHEET CHANGED)	BY
2	8/99	REVISED PER VDOT	BY
1	5/99	REVISIONS AS PER JAMES CITY CO. REVIEW DATED 12/19/98	BY
No.	DATE	REVISION / COMMENT / NOTE	BY

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



DESIGNED, DRAINAGE & EROSION AND SEDIMENT CONTROL  
FOWLER'S LAKE BLOCK 'B'  
THE  
GOVERNOR'S LAND  
At Two Rivers  
JAMES CITY COUNTY  
FOWKATAN DISTRICT

Designed	Drawn
VMB/RDS	RDS
Scale	Date
1"=50'	10/13/98
Project No.	
7173-6-1	
Drawing No.	
5	



**CALCULATIONS FOR BMP SIZING**  
**FOWLER'S LAKE - BLOCK 'B'**  
 AES Project No.: 7173-6-1  
 October 7, 1998

I. AREA OF SITE TO POINT OF CONCERN

11.90 Acres

II. PROPOSED ESTIMATED POND(S) VOLUME BY ELEVATION

<u>Elevation</u>	<u>Depth</u>	<u>Area</u> (sq. ft.)	<u>Volume</u> (cu. ft.)	<u>Volume</u> (cu. yd.)	<u>Sum</u> <u>Volume</u> (cu. ft.)	<u>Sum</u> <u>Volume</u> (cu. yd.)
15	0	0				
16	1	875	438	16	438	16
17	1	3366	2121	79	2558	95
18	1	5833	4600	170	7158	265
19	1	9633	7733	286	14891	552
20	1	16167	12900	478	27791	1029

SP-110-98  
 JR054

III. DETERMINING VOLUME OF 0.5-INCH AND 1.0-INCH STORM RUNOFF

Volume of 0.5-inch storm runoff  $= (0.5"/12") * (\text{Drainage Area in square feet}) * V_r$

Volume of 1.0-inch storm runoff  $= (1"/12") * (\text{Drainage Area in square feet}) * V_r$

$V_r = 0.05 + (0.009) * (\% \text{ of impervious post development area})$

Impervious post development area

Impervious building coverage	0.83 Ac.
Impervious pavement coverage	0.86 Ac.

Total impervious area	1.69 Ac.
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% impervious post development area =	14.2 %
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$V_r = 0.18$

Volume of 0.50-inch storm runoff ( mean storm runoff) =	0.09 Ac. ft.
	3836 cu. ft.
	142 cu. yd.

Volume of 1.0-inch storm runoff =	0.18 Ac. ft.
	7671 cu. ft.
	284 cu. yd.

Elevation of pool associated with required volume	
For Volume of 0.5-inch storm	EL 17.3
For Volume of 1.0-inch storm	EL 18.1

**VI. DETERMINING RELEASE RATE FOR 24-HOUR RELEASE DURATION OF 1" STORM**

Average Release Rate = Vol. of 1.0-inch storm runoff / (24 hours \* 60 min. \* 60 sec.)

Ave. Release Rate = 0.09 cfs

**VII. SIZING ORIFICE FOR PROPER RELEASE RATE FOR 24-HOUR RELEASE DURATION**

Using orifice equation

<u>Average Amount of Head (feet)</u>	<u>Required Area of orifice (sq. ft.)</u>	<u>Area of orifice (sq. in.)</u>	<u>Size of orifice diameter in inches</u>	
1.5	0.021	3.07	1.98	<-- use 2" diameter

**VIII. DETERMINING RELEASE RATE FOR 12-HOUR RELEASE DURATION OF 1/2" STORM**

Average Release Rate = Vol. of 0.50-inch storm runoff / (12 hours \* 60 min. \* 60 sec.)

Ave. Release Rate = 0.09 cfs

**IX. SIZING ORIFICE FOR PROPER RELEASE RATE FOR 24-HOUR RELEASE DURATION OF 1/2" STORM**

Using orifice equation

<u>Average Amount of Head (feet)</u>	<u>Required Area of orifice (sq. ft.)</u>	<u>Area of orifice (sq. in.)</u>	<u>Size of orifice diameter in inches</u>	
1.15	0.024	3.50	2.11	<-- use 2" diameter

# Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Return period (yrs)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
30	Rational	5.1	1	86	45,751	2	---	---	---	FOWLER'S LAKE - B
31	Rational	5.9	1	86	52,837	5	---	---	---	FOWLER'S LAKE - B,
32	Rational	7.2	1	86	65,415	10	---	---	---	FOWLER'S LAKE - B,
33	Rational	7.9	1	86	71,145	25	---	---	---	FOWLER'S LAKE - B,
34	Rational	8.8	1	86	79,263	50	---	---	---	FOWLER'S LAKE - B,
35	Rational	9.9	1	86	89,177	100	---	---	---	FOWLER'S LAKE - B,
40	Rational	7.9	1	66	54,801	2	---	---	---	FOWLER'S LAKE - B
41	Rational	9.3	1	66	64,172	5	---	---	---	FOWLER'S LAKE - B,
42	Rational	11.2	1	66	77,630	10	---	---	---	FOWLER'S LAKE - B,
43	Rational	12.5	1	66	86,594	25	---	---	---	FOWLER'S LAKE - B,
44	Rational	13.9	1	66	96,292	50	---	---	---	FOLWER'S LAKE - B,
45	Rational	15.7	1	66	108,948	100	---	---	---	FOWLER'S LAKE - B,
50	Reservoir	4.9	1	128	54,713	2	40	18.95	14,526	RAT., 2-YR POST RO
51	Reservoir	5.2	1	138	64,084	5	41	19.37	19,639	RAT., 5-YR POST RO
52	Reservoir	7.7	1	118	77,543	10	42	19.82	25,424	RAT., 10-YR POST R
53	Reservoir	9.9	1	100	86,506	25	43	19.83	25,642	RAT. 25-YR POST RO
54	Reservoir	11.9	1	90	96,204	50	44	19.85	25,832	RAT., 50-YR POST R
55	Reservoir	14.3	1	81	108,861	100	45	19.87	26,060	RAT., 100-YR ROUTE

Proj. file: 7173pond.gpw

IDF file: jcc.IDF

Run date: 10-05-1998

# Hydrograph Report

## Hyd. No. 30

### FOWLER'S LAKE -B, 2-YR PRE-DEVELOPMENT

Hydrograph type = Rational  
Storm frequency = 2 yrs  
Drainage area = 11.9 ac  
Intensity = 1.42 in  
I-D-F Curve = jcc.IDF

Peak discharge = 5.07 cfs  
Time interval = 1 min  
Runoff coeff. = 0.3  
Time of conc. (Tc) = 86 min  
Reced. limb factor = 2.5

Total Volume = 45,751 cuft

### Hydrograph Discharge Table

Time (min)	Outflow (cfs)						
18	1.06	50	2.95	82	4.83	114	4.41
19	1.12	51	3.00	83	4.89	115	4.38
20	1.18	52	3.06	84	4.95	116	4.36
21	1.24	53	3.12	85	5.01	117	4.34
22	1.30	54	3.18	86	5.07 <<	118	4.31
23	1.36	55	3.24	87	5.04	119	4.29
24	1.41	56	3.30	88	5.02	120	4.27
25	1.47	57	3.36	89	5.00	121	4.24
26	1.53	58	3.42	90	4.97	122	4.22
27	1.59	59	3.48	91	4.95	123	4.19
28	1.65	60	3.53	92	4.93	124	4.17
29	1.71	61	3.59	93	4.90	125	4.15
30	1.77	62	3.65	94	4.88	126	4.12
31	1.83	63	3.71	95	4.85	127	4.10
32	1.89	64	3.77	96	4.83	128	4.08
33	1.94	65	3.83	97	4.81	129	4.05
34	2.00	66	3.89	98	4.78	130	4.03
35	2.06	67	3.95	99	4.76	131	4.01
36	2.12	68	4.01	100	4.74	132	3.98
37	2.18	69	4.07	101	4.71	133	3.96
38	2.24	70	4.12	102	4.69	134	3.94
39	2.30	71	4.18	103	4.67	135	3.91
40	2.36	72	4.24	104	4.64	136	3.89
41	2.42	73	4.30	105	4.62	137	3.86
42	2.47	74	4.36	106	4.60	138	3.84
43	2.53	75	4.42	107	4.57	139	3.82
44	2.59	76	4.48	108	4.55	140	3.79
45	2.65	77	4.54	109	4.52	141	3.77
46	2.71	78	4.60	110	4.50	142	3.75
47	2.77	79	4.65	111	4.48	143	3.72
48	2.83	80	4.71	112	4.45	144	3.70
49	2.89	81	4.77	113	4.43	145	3.68

Continues on next page...

**Hydrograph Discharge Table**

<b>Time -- Outflow</b> <b>(min cfs)</b>	<b>Time -- Outflow</b> <b>(min cfs)</b>	<b>Time -- Outflow</b> <b>(min cfs)</b>			
146	3.65	195	2.50	244	1.34
147	3.63	196	2.47	245	1.32
148	3.61	197	2.45	246	1.30
149	3.58	198	2.43	247	1.27
150	3.56	199	2.40	248	1.25
151	3.53	200	2.38	249	1.23
152	3.51	201	2.36	250	1.20
153	3.49	202	2.33	251	1.18
154	3.46	203	2.31	252	1.15
155	3.44	204	2.29	253	1.13
156	3.42	205	2.26	254	1.11
157	3.39	206	2.24	255	1.08
158	3.37	207	2.22	256	1.06
159	3.35	208	2.19	257	1.04
160	3.32	209	2.17		
161	3.30	210	2.14		
162	3.28	211	2.12	...End	
163	3.25	212	2.10		
164	3.23	213	2.07		
165	3.20	214	2.05		
166	3.18	215	2.03		
167	3.16	216	2.00		
168	3.13	217	1.98		
169	3.11	218	1.96		
170	3.09	219	1.93		
171	3.06	220	1.91		
172	3.04	221	1.89		
173	3.02	222	1.86		
174	2.99	223	1.84		
175	2.97	224	1.81		
176	2.95	225	1.79		
177	2.92	226	1.77		
178	2.90	227	1.74		
179	2.87	228	1.72		
180	2.85	229	1.70		
181	2.83	230	1.67		
182	2.80	231	1.65		
183	2.78	232	1.63		
184	2.76	233	1.60		
185	2.73	234	1.58		
186	2.71	235	1.56		
187	2.69	236	1.53		
188	2.66	237	1.51		
189	2.64	238	1.48		
190	2.62	239	1.46		
191	2.59	240	1.44		
192	2.57	241	1.41		
193	2.55	242	1.39		
194	2.52	243	1.37		

# Hydrograph Report

## Hyd. No. 31

### FOWLER'S LAKE - B, 5-YR PRE-DEVELOPMENT

Hydrograph type = Rational  
Storm frequency = 5 yrs  
Drainage area = 11.9 ac  
Intensity = 1.64 in  
I-D-F Curve = jcc.IDF

Peak discharge = 5.85 cfs  
Time interval = 1 min  
Runoff coeff. = 0.3  
Time of conc. (Tc) = 86 min  
Reced. limb factor = 2.5

Total Volume = 52,837 cuft

### Hydrograph Discharge Table

| Time -- Outflow<br>(min cfs) |
|------------------------------|------------------------------|------------------------------|------------------------------|
| 18 1.22                      | 50 3.40                      | 82 5.58                      | 114 5.09                     |
| 19 1.29                      | 51 3.47                      | 83 5.65                      | 115 5.06                     |
| 20 1.36                      | 52 3.54                      | 84 5.72                      | 116 5.03                     |
| 21 1.43                      | 53 3.61                      | 85 5.78                      | 117 5.01                     |
| 22 1.50                      | 54 3.67                      | 86 5.85 <<                   | 118 4.98                     |
| 23 1.56                      | 55 3.74                      | 87 5.82                      | 119 4.95                     |
| 24 1.63                      | 56 3.81                      | 88 5.80                      | 120 4.93                     |
| 25 1.70                      | 57 3.88                      | 89 5.77                      | 121 4.90                     |
| 26 1.77                      | 58 3.95                      | 90 5.74                      | 122 4.87                     |
| 27 1.84                      | 59 4.01                      | 91 5.72                      | 123 4.84                     |
| 28 1.91                      | 60 4.08                      | 92 5.69                      | 124 4.82                     |
| 29 1.97                      | 61 4.15                      | 93 5.66                      | 125 4.79                     |
| 30 2.04                      | 62 4.22                      | 94 5.63                      | 126 4.76                     |
| 31 2.11                      | 63 4.29                      | 95 5.61                      | 127 4.74                     |
| 32 2.18                      | 64 4.35                      | 96 5.58                      | 128 4.71                     |
| 33 2.25                      | 65 4.42                      | 97 5.55                      | 129 4.68                     |
| 34 2.31                      | 66 4.49                      | 98 5.52                      | 130 4.65                     |
| 35 2.38                      | 67 4.56                      | 99 5.50                      | 131 4.63                     |
| 36 2.45                      | 68 4.63                      | 100 5.47                     | 132 4.60                     |
| 37 2.52                      | 69 4.69                      | 101 5.44                     | 133 4.57                     |
| 38 2.59                      | 70 4.76                      | 102 5.42                     | 134 4.54                     |
| 39 2.65                      | 71 4.83                      | 103 5.39                     | 135 4.52                     |
| 40 2.72                      | 72 4.90                      | 104 5.36                     | 136 4.49                     |
| 41 2.79                      | 73 4.97                      | 105 5.33                     | 137 4.46                     |
| 42 2.86                      | 74 5.03                      | 106 5.31                     | 138 4.44                     |
| 43 2.93                      | 75 5.10                      | 107 5.28                     | 139 4.41                     |
| 44 2.99                      | 76 5.17                      | 108 5.25                     | 140 4.38                     |
| 45 3.06                      | 77 5.24                      | 109 5.23                     | 141 4.35                     |
| 46 3.13                      | 78 5.31                      | 110 5.20                     | 142 4.33                     |
| 47 3.20                      | 79 5.37                      | 111 5.17                     | 143 4.30                     |
| 48 3.27                      | 80 5.44                      | 112 5.14                     | 144 4.27                     |
| 49 3.33                      | 81 5.51                      | 113 5.12                     | 145 4.25                     |

Continues on next page...

**Hydrograph Discharge Table**

<b>Time -- Outflow</b> <b>(min cfs)</b>	<b>Time -- Outflow</b> <b>(min cfs)</b>	<b>Time -- Outflow</b> <b>(min cfs)</b>			
146	4.22	195	2.88	244	1.55
147	4.19	196	2.86	245	1.52
148	4.16	197	2.83	246	1.50
149	4.14	198	2.80	247	1.47
150	4.11	199	2.78	248	1.44
151	4.08	200	2.75	249	1.42
152	4.06	201	2.72	250	1.39
153	4.03	202	2.69	251	1.36
154	4.00	203	2.67	252	1.33
155	3.97	204	2.64	253	1.31
156	3.95	205	2.61	254	1.28
157	3.92	206	2.59	255	1.25
158	3.89	207	2.56	256	1.22
159	3.86	208	2.53	257	1.20
160	3.84	209	2.50	258	1.17
161	3.81	210	2.48		
162	3.78	211	2.45		
163	3.76	212	2.42	...End	
164	3.73	213	2.39		
165	3.70	214	2.37		
166	3.67	215	2.34		
167	3.65	216	2.31		
168	3.62	217	2.29		
169	3.59	218	2.26		
170	3.57	219	2.23		
171	3.54	220	2.20		
172	3.51	221	2.18		
173	3.48	222	2.15		
174	3.46	223	2.12		
175	3.43	224	2.10		
176	3.40	225	2.07		
177	3.37	226	2.04		
178	3.35	227	2.01		
179	3.32	228	1.99		
180	3.29	229	1.96		
181	3.27	230	1.93		
182	3.24	231	1.91		
183	3.21	232	1.88		
184	3.18	233	1.85		
185	3.16	234	1.82		
186	3.13	235	1.80		
187	3.10	236	1.77		
188	3.08	237	1.74		
189	3.05	238	1.71		
190	3.02	239	1.69		
191	2.99	240	1.66		
192	2.97	241	1.63		
193	2.94	242	1.61		
194	2.91	243	1.58		

# Hydrograph Report

## Hyd. No. 32

### FOWLER'S LAKE - B, 10-YR PRE-DEVELOPMENT

Hydrograph type = Rational  
Storm frequency = 10 yrs  
Drainage area = 11.9 ac  
Intensity = 2.03 in  
I-D-F Curve = jcc.IDF

Peak discharge = 7.24 cfs  
Time interval = 1 min  
Runoff coeff. = 0.3  
Time of conc. (Tc) = 86 min  
Reced. limb factor = 2.5

Total Volume = 65,415 cuft

### Hydrograph Discharge Table

| Time -- Outflow<br>(min cfs) |
|------------------------------|------------------------------|------------------------------|------------------------------|
| 18 1.52                      | 50 4.21                      | 82 6.91                      | 114 6.30                     |
| 19 1.60                      | 51 4.30                      | 83 6.99                      | 115 6.27                     |
| 20 1.68                      | 52 4.38                      | 84 7.08                      | 116 6.23                     |
| 21 1.77                      | 53 4.46                      | 85 7.16                      | 117 6.20                     |
| 22 1.85                      | 54 4.55                      | 86 7.24 <<                   | 118 6.17                     |
| 23 1.94                      | 55 4.63                      | 87 7.21                      | 119 6.13                     |
| 24 2.02                      | 56 4.72                      | 88 7.18                      | 120 6.10                     |
| 25 2.11                      | 57 4.80                      | 89 7.14                      | 121 6.06                     |
| 26 2.19                      | 58 4.89                      | 90 7.11                      | 122 6.03                     |
| 27 2.27                      | 59 4.97                      | 91 7.08                      | 123 6.00                     |
| 28 2.36                      | 60 5.05                      | 92 7.04                      | 124 5.96                     |
| 29 2.44                      | 61 5.14                      | 93 7.01                      | 125 5.93                     |
| 30 2.53                      | 62 5.22                      | 94 6.97                      | 126 5.90                     |
| 31 2.61                      | 63 5.31                      | 95 6.94                      | 127 5.86                     |
| 32 2.70                      | 64 5.39                      | 96 6.91                      | 128 5.83                     |
| 33 2.78                      | 65 5.48                      | 97 6.87                      | 129 5.80                     |
| 34 2.86                      | 66 5.56                      | 98 6.84                      | 130 5.76                     |
| 35 2.95                      | 67 5.64                      | 99 6.81                      | 131 5.73                     |
| 36 3.03                      | 68 5.73                      | 100 6.77                     | 132 5.69                     |
| 37 3.12                      | 69 5.81                      | 101 6.74                     | 133 5.66                     |
| 38 3.20                      | 70 5.90                      | 102 6.71                     | 134 5.63                     |
| 39 3.29                      | 71 5.98                      | 103 6.67                     | 135 5.59                     |
| 40 3.37                      | 72 6.06                      | 104 6.64                     | 136 5.56                     |
| 41 3.45                      | 73 6.15                      | 105 6.60                     | 137 5.53                     |
| 42 3.54                      | 74 6.23                      | 106 6.57                     | 138 5.49                     |
| 43 3.62                      | 75 6.32                      | 107 6.54                     | 139 5.46                     |
| 44 3.71                      | 76 6.40                      | 108 6.50                     | 140 5.42                     |
| 45 3.79                      | 77 6.49                      | 109 6.47                     | 141 5.39                     |
| 46 3.87                      | 78 6.57                      | 110 6.44                     | 142 5.36                     |
| 47 3.96                      | 79 6.65                      | 111 6.40                     | 143 5.32                     |
| 48 4.04                      | 80 6.74                      | 112 6.37                     | 144 5.29                     |
| 49 4.13                      | 81 6.82                      | 113 6.33                     | 145 5.26                     |

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### Hydrograph Discharge Table

Time (min)	Outflow (cfs)	Time (min)	Outflow (cfs)	Time (min)	Outflow (cfs)
146	5.22	195	3.57	244	1.92
147	5.19	196	3.54	245	1.89
148	5.16	197	3.50	246	1.85
149	5.12	198	3.47	247	1.82
150	5.09	199	3.44	248	1.79
151	5.05	200	3.40	249	1.75
152	5.02	201	3.37	250	1.72
153	4.99	202	3.34	251	1.68
154	4.95	203	3.30	252	1.65
155	4.92	204	3.27	253	1.62
156	4.89	205	3.23	254	1.58
157	4.85	206	3.20	255	1.55
158	4.82	207	3.17	256	1.52
159	4.78	208	3.13	257	1.48
160	4.75	209	3.10		
161	4.72	210	3.07		
162	4.68	211	3.03	...End	
163	4.65	212	3.00		
164	4.62	213	2.97		
165	4.58	214	2.93		
166	4.55	215	2.90		
167	4.51	216	2.86		
168	4.48	217	2.83		
169	4.45	218	2.80		
170	4.41	219	2.76		
171	4.38	220	2.73		
172	4.35	221	2.70		
173	4.31	222	2.66		
174	4.28	223	2.63		
175	4.25	224	2.59		
176	4.21	225	2.56		
177	4.18	226	2.53		
178	4.14	227	2.49		
179	4.11	228	2.46		
180	4.08	229	2.43		
181	4.04	230	2.39		
182	4.01	231	2.36		
183	3.98	232	2.32		
184	3.94	233	2.29		
185	3.91	234	2.26		
186	3.87	235	2.22		
187	3.84	236	2.19		
188	3.81	237	2.16		
189	3.77	238	2.12		
190	3.74	239	2.09		
191	3.71	240	2.06		
192	3.67	241	2.02		
193	3.64	242	1.99		
194	3.61	243	1.95		

# Hydrograph Report

## Hyd. No. 40

### FOWLER'S LAKE -B, 2-YR POST-DEVELOPMENT

Hydrograph type = Rational  
Storm frequency = 2 yrs  
Drainage area = 11.9 ac  
Intensity = 1.62 in  
I-D-F Curve = jcc.IDF

Peak discharge = 7.91 cfs  
Time interval = 1 min  
Runoff coeff. = 0.41  
Time of conc. (Tc) = 66 min  
Reced. limb factor = 2.5

Total Volume = 54,801 cuft

### Hydrograph Discharge Table

| Time -- Outflow<br>(min cfs) |
|------------------------------|------------------------------|------------------------------|------------------------------|
| 14 1.68                      | 46 5.51                      | 78 7.33                      | 110 5.80                     |
| 15 1.80                      | 47 5.63                      | 79 7.28                      | 111 5.75                     |
| 16 1.92                      | 48 5.75                      | 80 7.24                      | 112 5.70                     |
| 17 2.04                      | 49 5.87                      | 81 7.19                      | 113 5.66                     |
| 18 2.16                      | 50 5.99                      | 82 7.14                      | 114 5.61                     |
| 19 2.28                      | 51 6.11                      | 83 7.09                      | 115 5.56                     |
| 20 2.40                      | 52 6.23                      | 84 7.05                      | 116 5.51                     |
| 21 2.52                      | 53 6.35                      | 85 7.00                      | 117 5.46                     |
| 22 2.64                      | 54 6.47                      | 86 6.95                      | 118 5.42                     |
| 23 2.76                      | 55 6.59                      | 87 6.90                      | 119 5.37                     |
| 24 2.88                      | 56 6.71                      | 88 6.85                      | 120 5.32                     |
| 25 3.00                      | 57 6.83                      | 89 6.81                      | 121 5.27                     |
| 26 3.12                      | 58 6.95                      | 90 6.76                      | 122 5.22                     |
| 27 3.24                      | 59 7.07                      | 91 6.71                      | 123 5.18                     |
| 28 3.35                      | 60 7.19                      | 92 6.66                      | 124 5.13                     |
| 29 3.47                      | 61 7.31                      | 93 6.61                      | 125 5.08                     |
| 30 3.59                      | 62 7.43                      | 94 6.57                      | 126 5.03                     |
| 31 3.71                      | 63 7.55                      | 95 6.52                      | 127 4.98                     |
| 32 3.83                      | 64 7.67                      | 96 6.47                      | 128 4.94                     |
| 33 3.95                      | 65 7.79                      | 97 6.42                      | 129 4.89                     |
| 34 4.07                      | 66 7.91 <<                   | 98 6.37                      | 130 4.84                     |
| 35 4.19                      | 67 7.86                      | 99 6.33                      | 131 4.79                     |
| 36 4.31                      | 68 7.81                      | 100 6.28                     | 132 4.74                     |
| 37 4.43                      | 69 7.76                      | 101 6.23                     | 133 4.70                     |
| 38 4.55                      | 70 7.72                      | 102 6.18                     | 134 4.65                     |
| 39 4.67                      | 71 7.67                      | 103 6.13                     | 135 4.60                     |
| 40 4.79                      | 72 7.62                      | 104 6.09                     | 136 4.55                     |
| 41 4.91                      | 73 7.57                      | 105 6.04                     | 137 4.51                     |
| 42 5.03                      | 74 7.52                      | 106 5.99                     | 138 4.46                     |
| 43 5.15                      | 75 7.48                      | 107 5.94                     | 139 4.41                     |
| 44 5.27                      | 76 7.43                      | 108 5.89                     | 140 4.36                     |
| 45 5.39                      | 77 7.38                      | 109 5.85                     | 141 4.31                     |

Continues on next page...

**Hydrograph Discharge Table**

<b>Time -- Outflow</b> <b>(min cfs)</b>	<b>Time -- Outflow</b> <b>(min cfs)</b>
142 4.27	191 1.92
143 4.22	192 1.87
144 4.17	193 1.82
145 4.12	194 1.77
146 4.07	195 1.73
147 4.03	196 1.68
148 3.98	197 1.63
149 3.93	
150 3.88	
151 3.83	...End
152 3.79	
153 3.74	
154 3.69	
155 3.64	
156 3.59	
157 3.55	
158 3.50	
159 3.45	
160 3.40	
161 3.35	
162 3.31	
163 3.26	
164 3.21	
165 3.16	
166 3.12	
167 3.07	
168 3.02	
169 2.97	
170 2.92	
171 2.88	
172 2.83	
173 2.78	
174 2.73	
175 2.68	
176 2.64	
177 2.59	
178 2.54	
179 2.49	
180 2.44	
181 2.40	
182 2.35	
183 2.30	
184 2.25	
185 2.20	
186 2.16	
187 2.11	
188 2.06	
189 2.01	
190 1.96	

# Hydrograph Report

## Hyd. No. 41

### FOWLER'S LAKE - B, 5-YR POST-DEVELOPMENT

Hydrograph type = Rational  
Storm frequency = 5 yrs  
Drainage area = 11.9 ac  
Intensity = 1.90 in  
I-D-F Curve = jcc.IDF

Peak discharge = 9.26 cfs  
Time interval = 1 min  
Runoff coeff. = 0.41  
Time of conc. (Tc) = 66 min  
Reced. limb factor = 2.5

Total Volume = 64,172 cuft

### Hydrograph Discharge Table

| Time -- Outflow<br>(min cfs) |
|------------------------------|------------------------------|------------------------------|------------------------------|
| 14 1.96                      | 46 6.45                      | 78 8.59                      | 110 6.79                     |
| 15 2.10                      | 47 6.59                      | 79 8.53                      | 111 6.73                     |
| 16 2.24                      | 48 6.73                      | 80 8.47                      | 112 6.68                     |
| 17 2.39                      | 49 6.87                      | 81 8.42                      | 113 6.62                     |
| 18 2.53                      | 50 7.02                      | 82 8.36                      | 114 6.57                     |
| 19 2.67                      | 51 7.16                      | 83 8.31                      | 115 6.51                     |
| 20 2.81                      | 52 7.30                      | 84 8.25                      | 116 6.45                     |
| 21 2.95                      | 53 7.44                      | 85 8.19                      | 117 6.40                     |
| 22 3.09                      | 54 7.58                      | 86 8.14                      | 118 6.34                     |
| 23 3.23                      | 55 7.72                      | 87 8.08                      | 119 6.29                     |
| 24 3.37                      | 56 7.86                      | 88 8.03                      | 120 6.23                     |
| 25 3.51                      | 57 8.00                      | 89 7.97                      | 121 6.17                     |
| 26 3.65                      | 58 8.14                      | 90 7.91                      | 122 6.12                     |
| 27 3.79                      | 59 8.28                      | 91 7.86                      | 123 6.06                     |
| 28 3.93                      | 60 8.42                      | 92 7.80                      | 124 6.00                     |
| 29 4.07                      | 61 8.56                      | 93 7.74                      | 125 5.95                     |
| 30 4.21                      | 62 8.70                      | 94 7.69                      | 126 5.89                     |
| 31 4.35                      | 63 8.84                      | 95 7.63                      | 127 5.84                     |
| 32 4.49                      | 64 8.98                      | 96 7.58                      | 128 5.78                     |
| 33 4.63                      | 65 9.12                      | 97 7.52                      | 129 5.72                     |
| 34 4.77                      | 66 9.26 <<                   | 98 7.46                      | 130 5.67                     |
| 35 4.91                      | 67 9.20                      | 99 7.41                      | 131 5.61                     |
| 36 5.05                      | 68 9.15                      | 100 7.35                     | 132 5.56                     |
| 37 5.19                      | 69 9.09                      | 101 7.30                     | 133 5.50                     |
| 38 5.33                      | 70 9.04                      | 102 7.24                     | 134 5.44                     |
| 39 5.47                      | 71 8.98                      | 103 7.18                     | 135 5.39                     |
| 40 5.61                      | 72 8.92                      | 104 7.13                     | 136 5.33                     |
| 41 5.75                      | 73 8.87                      | 105 7.07                     | 137 5.28                     |
| 42 5.89                      | 74 8.81                      | 106 7.02                     | 138 5.22                     |
| 43 6.03                      | 75 8.75                      | 107 6.96                     | 139 5.16                     |
| 44 6.17                      | 76 8.70                      | 108 6.90                     | 140 5.11                     |
| 45 6.31                      | 77 8.64                      | 109 6.85                     | 141 5.05                     |

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**Hydrograph Discharge Table**

<b>Time -- Outflow (min cfs)</b>	<b>Time -- Outflow (min cfs)</b>
142 4.99	191 2.24
143 4.94	192 2.19
144 4.88	193 2.13
145 4.83	194 2.08
146 4.77	195 2.02
147 4.71	196 1.96
148 4.66	197 1.91
149 4.60	198 1.85
150 4.55	
151 4.49	
152 4.43	...End
153 4.38	
154 4.32	
155 4.27	
156 4.21	
157 4.15	
158 4.10	
159 4.04	
160 3.98	
161 3.93	
162 3.87	
163 3.82	
164 3.76	
165 3.70	
166 3.65	
167 3.59	
168 3.54	
169 3.48	
170 3.42	
171 3.37	
172 3.31	
173 3.26	
174 3.20	
175 3.14	
176 3.09	
177 3.03	
178 2.97	
179 2.92	
180 2.86	
181 2.81	
182 2.75	
183 2.69	
184 2.64	
185 2.58	
186 2.53	
187 2.47	
188 2.41	
189 2.36	
190 2.30	

# Hydrograph Report

## Hyd. No. 42

### FOWLER'S LAKE - B, 10-YR POST-DEVELOPMENT

Hydrograph type	= Rational	Peak discharge	= 11.20 cfs
Storm frequency	= 10 yrs	Time interval	= 1 min
Drainage area	= 11.9 ac	Runoff coeff.	= 0.41
Intensity	= 2.30 in	Time of conc. (Tc)	= 66 min
I-D-F Curve	= jcc.IDF	Reced. limb factor	= 2.5

Total Volume = 77,630 cuft

### Hydrograph Discharge Table

Time (min)	Outflow (cfs)						
14	2.38	46	7.81	78	10.39	110	8.21
15	2.55	47	7.98	79	10.32	111	8.15
16	2.72	48	8.15	80	10.25	112	8.08
17	2.89	49	8.32	81	10.18	113	8.01
18	3.06	50	8.49	82	10.12	114	7.94
19	3.22	51	8.66	83	10.05	115	7.88
20	3.39	52	8.83	84	9.98	116	7.81
21	3.56	53	9.00	85	9.91	117	7.74
22	3.73	54	9.17	86	9.84	118	7.67
23	3.90	55	9.34	87	9.78	119	7.60
24	4.07	56	9.50	88	9.71	120	7.54
25	4.24	57	9.67	89	9.64	121	7.47
26	4.41	58	9.84	90	9.57	122	7.40
27	4.58	59	10.01	91	9.50	123	7.33
28	4.75	60	10.18	92	9.44	124	7.26
29	4.92	61	10.35	93	9.37	125	7.20
30	5.09	62	10.52	94	9.30	126	7.13
31	5.26	63	10.69	95	9.23	127	7.06
32	5.43	64	10.86	96	9.17	128	6.99
33	5.60	65	11.03	97	9.10	129	6.92
34	5.77	66	11.20 <<	98	9.03	130	6.86
35	5.94	67	11.13	99	8.96	131	6.79
36	6.11	68	11.07	100	8.89	132	6.72
37	6.28	69	11.00	101	8.83	133	6.65
38	6.45	70	10.93	102	8.76	134	6.59
39	6.62	71	10.86	103	8.69	135	6.52
40	6.79	72	10.79	104	8.62	136	6.45
41	6.96	73	10.73	105	8.55	137	6.38
42	7.13	74	10.66	106	8.49	138	6.31
43	7.30	75	10.59	107	8.42	139	6.25
44	7.47	76	10.52	108	8.35	140	6.18
45	7.64	77	10.46	109	8.28	141	6.11

Continues on next page...

**Hydrograph Discharge Table**

<b>Time -- Outflow (min cfs)</b>	<b>Time -- Outflow (min cfs)</b>
142 6.04	191 2.72
143 5.97	192 2.65
144 5.91	193 2.58
145 5.84	194 2.51
146 5.77	195 2.44
147 5.70	196 2.38
148 5.63	197 2.31
149 5.57	198 2.24
150 5.50	
151 5.43	
152 5.36	...End
153 5.30	
154 5.23	
155 5.16	
156 5.09	
157 5.02	
158 4.96	
159 4.89	
160 4.82	
161 4.75	
162 4.68	
163 4.62	
164 4.55	
165 4.48	
166 4.41	
167 4.35	
168 4.28	
169 4.21	
170 4.14	
171 4.07	
172 4.01	
173 3.94	
174 3.87	
175 3.80	
176 3.73	
177 3.67	
178 3.60	
179 3.53	
180 3.46	
181 3.39	
182 3.33	
183 3.26	
184 3.19	
185 3.12	
186 3.06	
187 2.99	
188 2.92	
189 2.85	
190 2.78	

# Hydrograph Report

## Hyd. No. 50

RAT., 2-YR POST ROUTED

Hydrograph type = Reservoir  
 Storm frequency = 2 yrs  
 Inflow hyd. No. = 40  
 Max. Elevation = 18.95 ft

Peak discharge = 4.94 cfs  
 Time interval = 1 min  
 Reservoir name = TIMBER WIER  
 Max. Storage = 14,526 cuft

Storage Indication method used.

Total Volume = 54,713 cuft

### Hydrograph Discharge Table

Time (min)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
35	4.19	17.35	3.65	0.14	----	----	1.40	----	----	----	1.54
36	4.31	17.38	3.68	0.14	----	----	2.25	----	----	----	2.39
37	4.43	17.40	3.70	0.14	----	----	2.89	----	----	----	3.00
38	4.55	17.42	3.72	0.14	----	----	3.85	----	----	----	3.15
39	4.67	17.44	3.73	0.13	----	----	4.80	----	----	----	3.29
40	4.79	17.46	3.75	0.12	----	----	5.73	----	----	----	3.43
41	4.91	17.47	3.77	0.11	----	----	6.65	----	----	----	3.57
42	5.03	17.49	3.78	0.10	----	----	7.55	----	----	----	3.71
43	5.15	17.51	3.80	0.09	----	----	8.58	----	----	----	3.80
44	5.27	17.53	3.81	0.07	----	----	9.81	----	----	----	3.81
45	5.39	17.55	3.83	0.05	----	----	11.14	----	----	----	3.83
46	5.51	17.57	3.85	0.03	----	----	12.55	----	----	----	3.85
47	5.63	17.59	3.87	0.01	----	----	14.06	----	----	----	3.87
48	5.75	17.61	3.89	----	----	----	15.81	----	----	----	3.89
49	5.87	17.64	3.91	----	----	----	17.79	----	----	----	3.91
50	5.99	17.66	3.94	----	----	----	19.88	----	----	----	3.94
51	6.11	17.69	3.96	----	----	----	22.07	----	----	----	3.96
52	6.23	17.72	3.98	----	----	----	24.57	----	----	----	3.98
53	6.35	17.75	4.01	----	----	----	27.28	----	----	----	4.01
54	6.47	17.78	4.04	----	----	----	30.10	----	----	----	4.04
55	6.59	17.81	4.06	----	----	----	33.15	----	----	----	4.06
56	6.71	17.85	4.09	----	----	----	36.51	----	----	----	4.09
57	6.83	17.88	4.12	----	----	----	39.98	----	----	----	4.12
58	6.95	17.92	4.15	----	----	----	43.73	----	----	----	4.15
59	7.07	17.95	4.18	----	----	----	47.76	----	----	----	4.18
60	7.19	17.99	4.21	----	----	----	51.92	----	----	----	4.21
61	7.31	18.02	4.24	----	----	----	54.95	----	----	----	4.24
62	7.43	18.04	4.26	----	----	----	57.78	----	----	----	4.26
63	7.55	18.07	4.28	----	----	----	60.70	----	----	----	4.28
64	7.67	18.09	4.30	----	----	----	63.71	----	----	----	4.30
65	7.79	18.12	4.32	----	----	----	66.97	----	----	----	4.32
66	7.91 <<	18.15	4.34	----	----	----	70.37	----	----	----	4.34
67	7.86	18.18	4.36	----	----	----	73.78	----	----	----	4.36
68	7.81	18.20	4.38	----	----	----	77.14	----	----	----	4.38
69	7.76	18.23	4.40	----	----	----	80.61	----	----	----	4.40
70	7.72	18.25	4.42	----	----	----	84.01	----	----	----	4.42

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**Hydrograph Discharge Table**

Time (min)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
71	7.67	18.28	4.44	---	---	---	87.33	---	---	---	4.44
72	7.62	18.30	4.46	---	---	---	90.62	---	---	---	4.46
73	7.57	18.33	4.48	---	---	---	93.97	---	---	---	4.48
74	7.52	18.35	4.50	---	---	---	97.26	---	---	---	4.50
75	7.48	18.38	4.52	---	---	---	100.47	---	---	---	4.52
76	7.43	18.40	4.53	---	---	---	103.61	---	---	---	4.53
77	7.38	18.42	4.55	---	---	---	106.81	---	---	---	4.55
78	7.33	18.44	4.57	---	---	---	109.96	---	---	---	4.57
79	7.28	18.46	4.58	---	---	---	113.03	---	---	---	4.58
80	7.24	18.48	4.60	---	---	---	116.03	---	---	---	4.60
81	7.19	18.50	4.61	---	---	---	118.98	---	---	---	4.61
82	7.14	18.52	4.63	---	---	---	121.96	---	---	---	4.63
83	7.09	18.54	4.64	---	---	---	124.86	---	---	---	4.64
84	7.05	18.56	4.66	---	---	---	127.70	---	---	---	4.66
85	7.00	18.58	4.67	---	---	---	130.46	---	---	---	4.67
86	6.95	18.60	4.68	---	---	---	133.15	---	---	---	4.68
87	6.90	18.62	4.70	---	---	---	135.86	---	---	---	4.70
88	6.85	18.63	4.71	---	---	---	138.50	---	---	---	4.71
89	6.81	18.65	4.72	---	---	---	141.08	---	---	---	4.72
90	6.76	18.66	4.73	---	---	---	143.58	---	---	---	4.73
91	6.71	18.68	4.74	---	---	---	146.01	---	---	---	4.74
92	6.66	18.70	4.75	---	---	---	148.36	---	---	---	4.75
93	6.61	18.71	4.77	---	---	---	150.70	---	---	---	4.77
94	6.57	18.72	4.78	---	---	---	153.00	---	---	---	4.78
95	6.52	18.74	4.79	---	---	---	155.22	---	---	---	4.79
96	6.47	18.75	4.79	---	---	---	157.37	---	---	---	4.79
97	6.42	18.76	4.80	---	---	---	159.45	---	---	---	4.80
98	6.37	18.78	4.81	---	---	---	161.45	---	---	---	4.81
99	6.33	18.79	4.82	---	---	---	163.39	---	---	---	4.82
100	6.28	18.80	4.83	---	---	---	165.25	---	---	---	4.83
101	6.23	18.81	4.84	---	---	---	167.10	---	---	---	4.84
102	6.18	18.82	4.84	---	---	---	168.88	---	---	---	4.84
103	6.13	18.83	4.85	---	---	---	170.59	---	---	---	4.85
104	6.09	18.84	4.86	---	---	---	172.22	---	---	---	4.86
105	6.04	18.85	4.87	---	---	---	173.79	---	---	---	4.87
106	5.99	18.86	4.87	---	---	---	175.28	---	---	---	4.87
107	5.94	18.87	4.88	---	---	---	176.71	---	---	---	4.88
108	5.89	18.88	4.88	---	---	---	178.06	---	---	---	4.88
109	5.85	18.88	4.89	---	---	---	179.35	---	---	---	4.89
110	5.80	18.89	4.89	---	---	---	180.56	---	---	---	4.89
111	5.75	18.90	4.90	---	---	---	181.71	---	---	---	4.90
112	5.70	18.90	4.90	---	---	---	182.80	---	---	---	4.90
113	5.66	18.91	4.91	---	---	---	183.84	---	---	---	4.91
114	5.61	18.92	4.91	---	---	---	184.82	---	---	---	4.91
115	5.56	18.92	4.92	---	---	---	185.72	---	---	---	4.92
116	5.51	18.93	4.92	---	---	---	186.55	---	---	---	4.92
117	5.46	18.93	4.92	---	---	---	187.31	---	---	---	4.92
118	5.42	18.93	4.92	---	---	---	188.01	---	---	---	4.92
119	5.37	18.94	4.93	---	---	---	188.63	---	---	---	4.93

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**Hydrograph Discharge Table**

Time (min)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
120	5.32	18.94	4.93	----	----	----	189.19	----	----	----	4.93
121	5.27	18.94	4.93	----	----	----	189.69	----	----	----	4.93
122	5.22	18.95	4.93	----	----	----	190.11	----	----	----	4.93
123	5.18	18.95	4.93	----	----	----	190.47	----	----	----	4.93
124	5.13	18.95	4.94	----	----	----	190.76	----	----	----	4.94
125	5.08	18.95	4.94	----	----	----	190.99	----	----	----	4.94
126	5.03	18.95	4.94	----	----	----	191.15	----	----	----	4.94
127	4.98	18.95	4.94	----	----	----	191.24	----	----	----	4.94
128	4.94	18.95 <<	4.94	----	----	----	191.27	----	----	----	4.94 <<
129	4.89	18.95	4.94	----	----	----	191.24	----	----	----	4.94
130	4.84	18.95	4.94	----	----	----	191.14	----	----	----	4.94
131	4.79	18.95	4.94	----	----	----	190.98	----	----	----	4.94
132	4.74	18.95	4.94	----	----	----	190.76	----	----	----	4.94
133	4.70	18.95	4.93	----	----	----	190.47	----	----	----	4.93
134	4.65	18.95	4.93	----	----	----	190.12	----	----	----	4.93
135	4.60	18.94	4.93	----	----	----	189.70	----	----	----	4.93
136	4.55	18.94	4.93	----	----	----	189.23	----	----	----	4.93
137	4.51	18.94	4.93	----	----	----	188.69	----	----	----	4.93
138	4.46	18.93	4.92	----	----	----	188.09	----	----	----	4.92
139	4.41	18.93	4.92	----	----	----	187.43	----	----	----	4.92
140	4.36	18.93	4.92	----	----	----	186.71	----	----	----	4.92
141	4.31	18.92	4.92	----	----	----	185.93	----	----	----	4.92
142	4.27	18.92	4.91	----	----	----	185.09	----	----	----	4.91
143	4.22	18.91	4.91	----	----	----	184.19	----	----	----	4.91
144	4.17	18.91	4.91	----	----	----	183.23	----	----	----	4.91
145	4.12	18.90	4.90	----	----	----	182.21	----	----	----	4.90
146	4.07	18.89	4.90	----	----	----	181.17	----	----	----	4.90
147	4.03	18.89	4.89	----	----	----	180.06	----	----	----	4.89
148	3.98	18.88	4.89	----	----	----	178.91	----	----	----	4.89
149	3.93	18.87	4.88	----	----	----	177.69	----	----	----	4.88
150	3.88	18.87	4.88	----	----	----	176.42	----	----	----	4.88
151	3.83	18.86	4.87	----	----	----	175.10	----	----	----	4.87
152	3.79	18.85	4.87	----	----	----	173.72	----	----	----	4.87
153	3.74	18.84	4.86	----	----	----	172.28	----	----	----	4.86
154	3.69	18.83	4.85	----	----	----	170.80	----	----	----	4.85
155	3.64	18.82	4.85	----	----	----	169.25	----	----	----	4.85
156	3.59	18.81	4.84	----	----	----	167.66	----	----	----	4.84
157	3.55	18.80	4.83	----	----	----	166.01	----	----	----	4.83
158	3.50	18.79	4.83	----	----	----	164.34	----	----	----	4.83
159	3.45	18.78	4.82	----	----	----	162.64	----	----	----	4.82
160	3.40	18.77	4.81	----	----	----	160.89	----	----	----	4.81
161	3.35	18.76	4.80	----	----	----	159.09	----	----	----	4.80
162	3.31	18.75	4.79	----	----	----	157.24	----	----	----	4.79
163	3.26	18.74	4.79	----	----	----	155.34	----	----	----	4.79
164	3.21	18.73	4.78	----	----	----	153.38	----	----	----	4.78
165	3.16	18.71	4.77	----	----	----	151.39	----	----	----	4.77
166	3.12	18.70	4.76	----	----	----	149.34	----	----	----	4.76
167	3.07	18.69	4.75	----	----	----	147.30	----	----	----	4.75
168	3.02	18.68	4.74	----	----	----	145.23	----	----	----	4.74

*Continues on next page...*

### Hydrograph Discharge Table

Time (min)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
169	2.97	18.66	4.73	---	---	---	143.12	---	---	---	4.73
170	2.92	18.65	4.72	---	---	---	140.95	---	---	---	4.72
171	2.88	18.63	4.71	---	---	---	138.74	---	---	---	4.71
172	2.83	18.62	4.70	---	---	---	136.49	---	---	---	4.70
173	2.78	18.61	4.69	---	---	---	134.19	---	---	---	4.69
174	2.73	18.59	4.68	---	---	---	131.90	---	---	---	4.68
175	2.68	18.57	4.67	---	---	---	129.60	---	---	---	4.67
176	2.64	18.56	4.65	---	---	---	127.26	---	---	---	4.65
177	2.59	18.54	4.64	---	---	---	124.87	---	---	---	4.64
178	2.54	18.53	4.63	---	---	---	122.44	---	---	---	4.63
179	2.49	18.51	4.62	---	---	---	119.97	---	---	---	4.62
180	2.44	18.49	4.61	---	---	---	117.50	---	---	---	4.61
181	2.40	18.48	4.59	---	---	---	115.05	---	---	---	4.59
182	2.35	18.46	4.58	---	---	---	112.56	---	---	---	4.58
183	2.30	18.44	4.57	---	---	---	110.03	---	---	---	4.57
184	2.25	18.43	4.55	---	---	---	107.47	---	---	---	4.55
185	2.20	18.41	4.54	---	---	---	104.86	---	---	---	4.54
186	2.16	18.39	4.53	---	---	---	102.29	---	---	---	4.53
187	2.11	18.37	4.51	---	---	---	99.73	---	---	---	4.51
188	2.06	18.35	4.50	---	---	---	97.13	---	---	---	4.50
189	2.01	18.33	4.48	---	---	---	94.50	---	---	---	4.48
190	1.96	18.31	4.47	---	---	---	91.83	---	---	---	4.47
191	1.92	18.29	4.45	---	---	---	89.17	---	---	---	4.45
192	1.87	18.27	4.44	---	---	---	86.56	---	---	---	4.44
193	1.82	18.25	4.42	---	---	---	83.92	---	---	---	4.42
194	1.77	18.23	4.41	---	---	---	81.25	---	---	---	4.41
195	1.73	18.21	4.39	---	---	---	78.54	---	---	---	4.39
196	1.68	18.19	4.37	---	---	---	75.86	---	---	---	4.37
197	1.63	18.17	4.36	---	---	---	73.24	---	---	---	4.36
198	1.58	18.15	4.34	---	---	---	70.59	---	---	---	4.34
199	1.53	18.13	4.32	---	---	---	67.92	---	---	---	4.32
200	1.49	18.11	4.31	---	---	---	65.21	---	---	---	4.31
201	1.44	18.08	4.29	---	---	---	62.59	---	---	---	4.29
202	1.39	18.06	4.27	---	---	---	59.99	---	---	---	4.27
203	1.34	18.04	4.25	---	---	---	57.36	---	---	---	4.25
204	1.29	18.02	4.23	---	---	---	54.71	---	---	---	4.23
205	1.25	17.99	4.21	---	---	---	51.64	---	---	---	4.21
206	1.20	17.95	4.18	---	---	---	47.42	---	---	---	4.18
207	1.15	17.91	4.15	---	---	---	43.18	---	---	---	4.15
208	1.10	17.87	4.12	---	---	---	39.15	---	---	---	4.12
209	1.05	17.83	4.08	---	---	---	35.20	---	---	---	4.08
210	1.01	17.79	4.05	---	---	---	31.30	---	---	---	4.05
211	0.96	17.75	4.01	---	---	---	27.70	---	---	---	4.01
212	0.91	17.71	3.98	---	---	---	24.08	---	---	---	3.98
213	0.86	17.67	3.95	---	---	---	20.72	---	---	---	3.95
214	0.81	17.63	3.91	---	---	---	17.51	---	---	---	3.91
215	0.77	17.59	3.87	0.01	---	---	14.36	---	---	---	3.87
216	0.72	17.55	3.84	0.04	---	---	11.62	---	---	---	3.84
217	0.67	17.51	3.80	0.08	---	---	8.88	---	---	---	3.80

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**Hydrograph Discharge Table**

<b>Time (min)</b>	<b>Inflow cfs</b>	<b>Elevation ft</b>	<b>Clv A cfs</b>	<b>Clv B cfs</b>	<b>Clv C cfs</b>	<b>Clv D cfs</b>	<b>Wr A cfs</b>	<b>Wr B cfs</b>	<b>Wr C cfs</b>	<b>Wr D cfs</b>	<b>Outflow cfs</b>
218	0.62	17.47	3.76	0.11	----	----	6.63	----	----	----	3.57
219	0.58	17.44	3.73	0.13	----	----	4.71	----	----	----	3.28
220	0.53	17.40	3.70	0.14	----	----	2.95	----	----	----	3.01
221	0.48	17.37	3.67	0.14	----	----	2.11	----	----	----	2.26
222	0.43	17.35	3.65	0.14	----	----	1.55	----	----	----	1.69
223	0.38	17.34	3.64	0.14	----	----	1.15	----	----	----	1.29
224	0.34	17.33	3.63	0.14	----	----	0.86	----	----	----	1.00

*...End*

# Reservoir Report

## Reservoir No. 1 - TIMBER WIER

### Pond Data

Pond storage is based on known contour areas

### Stage / Storage Table

Stage ft	Elevation ft	Contour area sqft	Incr. Storage cuft	Total storage cuft
0.00	15.00	00	0	0
1.00	16.00	875	438	438
2.00	17.00	3,366	2,121	2,559
3.00	18.00	5,833	4,600	7,159
4.00	19.00	9,633	7,733	14,892
5.00	20.00	16,167	12,900	27,792

### Culvert / Orifice Structures

	[A]	[B]	[C]	[D]
Rise in	= 10.0	2.0	0.0	0.0
Span in	= 10.0	2.0	0.0	0.0
No. Barrels	= 1	1	0	0
Invert El. ft	= 15.00	15.20	0.00	0.00
Length ft	= 1.0	0.5	0.0	0.0
Slope %	= 0.40	0.00	0.00	0.00
N-Value	= .013	.013	.000	.000
Orif. Coeff.	= 0.60	0.60	0.00	0.00
Multi-Stage	= ---	Yes	No	No

### Weir Structures

	[A]	[B]	[C]	[D]
Crest Len ft	= 30.0	140.0	0.0	0.0
Crest El. ft	= 17.30	19.80	0.00	0.00
Weir Coeff.	= 3.00	3.00	0.00	0.00
Eqn. Exp.	= 1.50	1.50	0.00	0.00
Multi-Stage	= Yes	No	No	No

Tailwater Elevation = 0.00 ft

Note: All outflows have been analyzed under inlet and outlet control.

### Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Discharge cfs
0.00	0	15.00	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.10	44	15.10	0.02	0.00	---	---	0.00	0.00	---	---	0.00
0.20	88	15.20	0.04	0.00	---	---	0.00	0.00	---	---	0.00
0.30	131	15.30	0.07	0.02	---	---	0.00	0.00	---	---	0.02
0.40	175	15.40	0.11	0.02	---	---	0.00	0.00	---	---	0.02
0.50	219	15.50	0.14	0.05	---	---	0.00	0.00	---	---	0.05
0.60	263	15.60	0.17	0.06	---	---	0.00	0.00	---	---	0.06
0.70	307	15.70	0.20	0.07	---	---	0.00	0.00	---	---	0.07
0.80	350	15.80	0.22	0.08	---	---	0.00	0.00	---	---	0.08
0.90	394	15.90	0.94	0.08	---	---	0.00	0.00	---	---	0.08
1.00	438	16.00	1.46	0.09	---	---	0.00	0.00	---	---	0.09

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**Stage / Storage / Discharge Table**

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Discharge cfs
1.10	650	16.10	1.84	0.09	---	---	0.00	0.00	---	---	0.09
1.20	862	16.20	2.15	0.10	---	---	0.00	0.00	---	---	0.10
1.30	1,074	16.30	2.42	0.10	---	---	0.00	0.00	---	---	0.10
1.40	1,286	16.40	2.60	0.11	---	---	0.00	0.00	---	---	0.11
1.50	1,498	16.50	2.73	0.11	---	---	0.00	0.00	---	---	0.11
1.60	1,711	16.60	2.86	0.11	---	---	0.00	0.00	---	---	0.11
1.70	1,923	16.70	2.97	0.12	---	---	0.00	0.00	---	---	0.12
1.80	2,135	16.80	3.09	0.12	---	---	0.00	0.00	---	---	0.12
1.90	2,347	16.90	3.20	0.13	---	---	0.00	0.00	---	---	0.13
2.00	2,559	17.00	3.30	0.13	---	---	0.00	0.00	---	---	0.13
2.10	3,019	17.10	3.41	0.13	---	---	0.00	0.00	---	---	0.13
2.20	3,479	17.20	3.51	0.14	---	---	0.00	0.00	---	---	0.14
2.30	3,939	17.30	3.60	0.14	---	---	0.00	0.00	---	---	0.14
2.40	4,399	17.40	3.70	0.15	---	---	2.85	0.00	---	---	2.99
2.50	4,859	17.50	3.79	0.09	---	---	8.05	0.00	---	---	3.79
2.60	5,319	17.60	3.88	0.00	---	---	14.79	0.00	---	---	3.88
2.70	5,779	17.70	3.97	0.00	---	---	22.77	0.00	---	---	3.97
2.80	6,239	17.80	4.05	0.00	---	---	31.82	0.00	---	---	4.05
2.90	6,699	17.90	4.14	0.00	---	---	41.83	0.00	---	---	4.14
3.00	7,159	18.00	4.22	0.00	---	---	52.71	0.00	---	---	4.22
3.10	7,932	18.10	4.30	0.00	---	---	64.40	0.00	---	---	4.30
3.20	8,706	18.20	4.38	0.00	---	---	76.84	0.00	---	---	4.38
3.30	9,479	18.30	4.46	0.00	---	---	90.00	0.00	---	---	4.46
3.40	10,252	18.40	4.54	0.00	---	---	103.83	0.00	---	---	4.54
3.50	11,025	18.50	4.61	0.00	---	---	118.31	0.00	---	---	4.61
3.60	11,799	18.60	4.68	0.00	---	---	133.40	0.00	---	---	4.68
3.70	12,572	18.70	4.76	0.00	---	---	149.09	0.00	---	---	4.76
3.80	13,345	18.80	4.83	0.00	---	---	165.34	0.00	---	---	4.83
3.90	14,119	18.90	4.90	0.00	---	---	182.15	0.00	---	---	4.90
4.00	14,892	19.00	4.97	0.00	---	---	199.49	0.00	---	---	4.97
4.10	16,182	19.10	5.04	0.00	---	---	217.35	0.00	---	---	5.04
4.20	17,472	19.20	5.11	0.00	---	---	235.71	0.00	---	---	5.11
4.30	18,762	19.30	5.17	0.00	---	---	254.56	0.00	---	---	5.17
4.40	20,052	19.40	5.24	0.00	---	---	273.89	0.00	---	---	5.24
4.50	21,342	19.50	5.31	0.00	---	---	293.68	0.00	---	---	5.31
4.60	22,632	19.60	5.37	0.00	---	---	313.93	0.00	---	---	5.37
4.70	23,922	19.70	5.43	0.00	---	---	334.63	0.00	---	---	5.43
4.80	25,212	19.80	5.50	0.00	---	---	355.76	0.00	---	---	5.50
4.90	26,502	19.90	5.56	0.00	---	---	377.31	13.28	---	---	18.84
5.00	27,792	20.00	5.62	0.00	---	---	399.29	37.57	---	---	43.19

...End

# Hydrograph Report

## Hyd. No. 51

### RAT., 5-YR POST ROUTED

Hydrograph type = Reservoir  
 Storm frequency = 5 yrs  
 Inflow hyd. No. = 41  
 Max. Elevation = 19.37 ft

Peak discharge = 5.22 cfs  
 Time interval = 1 min  
 Reservoir name = TIMBER WIER  
 Max. Storage = 19,639 cuft

Storage Indication method used.

Total Volume = 64,084 cuft

### Hydrograph Discharge Table

Time (min)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
32	4.49	17.34	3.64	0.14	----	----	1.07	----	----	----	1.21
33	4.63	17.37	3.67	0.14	----	----	2.12	----	----	----	2.26
34	4.77	17.40	3.70	0.14	----	----	2.92	----	----	----	3.00
35	4.91	17.42	3.72	0.13	----	----	4.10	----	----	----	3.18
36	5.05	17.45	3.74	0.12	----	----	5.26	----	----	----	3.36
37	5.19	17.47	3.76	0.11	----	----	6.40	----	----	----	3.54
38	5.33	17.49	3.78	0.10	----	----	7.51	----	----	----	3.71
39	5.47	17.51	3.80	0.08	----	----	8.80	----	----	----	3.80
40	5.61	17.53	3.82	0.06	----	----	10.32	----	----	----	3.82
41	5.75	17.56	3.84	0.04	----	----	11.95	----	----	----	3.84
42	5.89	17.58	3.87	0.02	----	----	13.68	----	----	----	3.87
43	6.03	17.61	3.89	----	----	----	15.64	----	----	----	3.89
44	6.17	17.64	3.91	----	----	----	17.93	----	----	----	3.91
45	6.31	17.67	3.94	----	----	----	20.34	----	----	----	3.94
46	6.45	17.70	3.97	----	----	----	22.89	----	----	----	3.97
47	6.59	17.73	4.00	----	----	----	25.89	----	----	----	4.00
48	6.73	17.77	4.03	----	----	----	29.02	----	----	----	4.03
49	6.87	17.81	4.06	----	----	----	32.33	----	----	----	4.06
50	7.02	17.84	4.09	----	----	----	36.08	----	----	----	4.09
51	7.16	17.88	4.12	----	----	----	39.96	----	----	----	4.12
52	7.30	17.92	4.16	----	----	----	44.18	----	----	----	4.16
53	7.44	17.96	4.19	----	----	----	48.71	----	----	----	4.19
54	7.58	18.00	4.22	----	----	----	53.15	----	----	----	4.22
55	7.72	18.03	4.24	----	----	----	56.24	----	----	----	4.24
56	7.86	18.06	4.27	----	----	----	59.45	----	----	----	4.27
57	8.00	18.09	4.29	----	----	----	62.76	----	----	----	4.29
58	8.14	18.12	4.31	----	----	----	66.29	----	----	----	4.31
59	8.28	18.15	4.34	----	----	----	70.03	----	----	----	4.34
60	8.42	18.18	4.36	----	----	----	73.89	----	----	----	4.36
61	8.56	18.21	4.39	----	----	----	77.93	----	----	----	4.39
62	8.70	18.24	4.41	----	----	----	82.24	----	----	----	4.41
63	8.84	18.27	4.44	----	----	----	86.68	----	----	----	4.44
64	8.98	18.31	4.47	----	----	----	91.29	----	----	----	4.47
65	9.12	18.34	4.49	----	----	----	96.19	----	----	----	4.49
66	9.26 <<	18.38	4.52	----	----	----	101.22	----	----	----	4.52
67	9.20	18.42	4.55	----	----	----	106.37	----	----	----	4.55

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### Hydrograph Discharge Table

Time (min)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
68	9.15	18.45	4.58	----	----	----	111.55	----	----	----	4.58
69	9.09	18.49	4.60	----	----	----	116.64	----	----	----	4.60
70	9.04	18.52	4.63	----	----	----	121.78	----	----	----	4.63
71	8.98	18.56	4.65	----	----	----	126.90	----	----	----	4.65
72	8.92	18.59	4.68	----	----	----	131.91	----	----	----	4.68
73	8.87	18.62	4.70	----	----	----	136.97	----	----	----	4.70
74	8.81	18.65	4.72	----	----	----	142.00	----	----	----	4.72
75	8.75	18.69	4.75	----	----	----	146.92	----	----	----	4.75
76	8.70	18.72	4.77	----	----	----	151.85	----	----	----	4.77
77	8.64	18.75	4.79	----	----	----	156.75	----	----	----	4.79
78	8.59	18.78	4.81	----	----	----	161.56	----	----	----	4.81
79	8.53	18.81	4.83	----	----	----	166.30	----	----	----	4.83
80	8.47	18.83	4.85	----	----	----	171.07	----	----	----	4.85
81	8.42	18.86	4.87	----	----	----	175.74	----	----	----	4.87
82	8.36	18.89	4.89	----	----	----	180.32	----	----	----	4.89
83	8.31	18.92	4.91	----	----	----	184.87	----	----	----	4.91
84	8.25	18.94	4.93	----	----	----	189.39	----	----	----	4.93
85	8.19	18.97	4.95	----	----	----	193.81	----	----	----	4.95
86	8.14	18.99	4.97	----	----	----	198.13	----	----	----	4.97
87	8.08	19.01	4.98	----	----	----	201.25	----	----	----	4.98
88	8.03	19.02	4.99	----	----	----	203.80	----	----	----	4.99
89	7.97	19.04	5.00	----	----	----	206.30	----	----	----	5.00
90	7.91	19.05	5.01	----	----	----	208.74	----	----	----	5.01
91	7.86	19.07	5.02	----	----	----	211.13	----	----	----	5.02
92	7.80	19.08	5.02	----	----	----	213.46	----	----	----	5.02
93	7.74	19.09	5.03	----	----	----	215.74	----	----	----	5.03
94	7.69	19.10	5.04	----	----	----	217.98	----	----	----	5.04
95	7.63	19.12	5.05	----	----	----	220.22	----	----	----	5.05
96	7.58	19.13	5.06	----	----	----	222.40	----	----	----	5.06
97	7.52	19.14	5.07	----	----	----	224.52	----	----	----	5.07
98	7.46	19.15	5.07	----	----	----	226.59	----	----	----	5.07
99	7.41	19.16	5.08	----	----	----	228.60	----	----	----	5.08
100	7.35	19.17	5.09	----	----	----	230.56	----	----	----	5.09
101	7.30	19.18	5.10	----	----	----	232.47	----	----	----	5.10
102	7.24	19.19	5.10	----	----	----	234.32	----	----	----	5.10
103	7.18	19.20	5.11	----	----	----	236.13	----	----	----	5.11
104	7.13	19.21	5.12	----	----	----	237.92	----	----	----	5.12
105	7.07	19.22	5.12	----	----	----	239.66	----	----	----	5.12
106	7.02	19.23	5.13	----	----	----	241.34	----	----	----	5.13
107	6.96	19.24	5.13	----	----	----	242.97	----	----	----	5.13
108	6.90	19.25	5.14	----	----	----	244.54	----	----	----	5.14
109	6.85	19.25	5.14	----	----	----	246.06	----	----	----	5.14
110	6.79	19.26	5.15	----	----	----	247.53	----	----	----	5.15
111	6.73	19.27	5.15	----	----	----	248.94	----	----	----	5.15
112	6.68	19.28	5.16	----	----	----	250.30	----	----	----	5.16
113	6.62	19.28	5.16	----	----	----	251.60	----	----	----	5.16
114	6.57	19.29	5.17	----	----	----	252.86	----	----	----	5.17
115	6.51	19.30	5.17	----	----	----	254.05	----	----	----	5.17
116	6.45	19.30	5.18	----	----	----	255.22	----	----	----	5.18

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**Hydrograph Discharge Table**

Time (min)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
117	6.40	19.31	5.18	----	----	----	256.34	----	----	----	5.18
118	6.34	19.31	5.18	----	----	----	257.41	----	----	----	5.18
119	6.29	19.32	5.19	----	----	----	258.42	----	----	----	5.19
120	6.23	19.32	5.19	----	----	----	259.38	----	----	----	5.19
121	6.17	19.33	5.19	----	----	----	260.29	----	----	----	5.19
122	6.12	19.33	5.20	----	----	----	261.14	----	----	----	5.20
123	6.06	19.34	5.20	----	----	----	261.94	----	----	----	5.20
124	6.00	19.34	5.20	----	----	----	262.69	----	----	----	5.20
125	5.95	19.35	5.20	----	----	----	263.38	----	----	----	5.20
126	5.89	19.35	5.21	----	----	----	264.03	----	----	----	5.21
127	5.84	19.35	5.21	----	----	----	264.62	----	----	----	5.21
128	5.78	19.35	5.21	----	----	----	265.16	----	----	----	5.21
129	5.72	19.36	5.21	----	----	----	265.64	----	----	----	5.21
130	5.67	19.36	5.21	----	----	----	266.08	----	----	----	5.21
131	5.61	19.36	5.22	----	----	----	266.46	----	----	----	5.22
132	5.56	19.36	5.22	----	----	----	266.79	----	----	----	5.22
133	5.50	19.36	5.22	----	----	----	267.07	----	----	----	5.22
134	5.44	19.37	5.22	----	----	----	267.30	----	----	----	5.22
135	5.39	19.37	5.22	----	----	----	267.47	----	----	----	5.22
136	5.33	19.37	5.22	----	----	----	267.60	----	----	----	5.22
137	5.28	19.37	5.22	----	----	----	267.68	----	----	----	5.22
138	5.22	19.37 <<	5.22	----	----	----	267.70	----	----	----	5.22 <<
139	5.16	19.37	5.22	----	----	----	267.68	----	----	----	5.22
140	5.11	19.37	5.22	----	----	----	267.60	----	----	----	5.22
141	5.05	19.37	5.22	----	----	----	267.47	----	----	----	5.22
142	4.99	19.37	5.22	----	----	----	267.30	----	----	----	5.22
143	4.94	19.36	5.22	----	----	----	267.07	----	----	----	5.22
144	4.88	19.36	5.22	----	----	----	266.80	----	----	----	5.22
145	4.83	19.36	5.22	----	----	----	266.47	----	----	----	5.22
146	4.77	19.36	5.21	----	----	----	266.10	----	----	----	5.21
147	4.71	19.36	5.21	----	----	----	265.68	----	----	----	5.21
148	4.66	19.36	5.21	----	----	----	265.20	----	----	----	5.21
149	4.60	19.35	5.21	----	----	----	264.68	----	----	----	5.21
150	4.55	19.35	5.21	----	----	----	264.11	----	----	----	5.21
151	4.49	19.35	5.21	----	----	----	263.49	----	----	----	5.21
152	4.43	19.34	5.20	----	----	----	262.82	----	----	----	5.20
153	4.38	19.34	5.20	----	----	----	262.11	----	----	----	5.20
154	4.32	19.34	5.20	----	----	----	261.35	----	----	----	5.20
155	4.27	19.33	5.19	----	----	----	260.53	----	----	----	5.19
156	4.21	19.33	5.19	----	----	----	259.67	----	----	----	5.19
157	4.15	19.32	5.19	----	----	----	258.77	----	----	----	5.19
158	4.10	19.32	5.19	----	----	----	257.81	----	----	----	5.19
159	4.04	19.31	5.18	----	----	----	256.81	----	----	----	5.18
160	3.98	19.31	5.18	----	----	----	255.76	----	----	----	5.18
161	3.93	19.30	5.17	----	----	----	254.66	----	----	----	5.17
162	3.87	19.29	5.17	----	----	----	253.54	----	----	----	5.17
163	3.82	19.29	5.17	----	----	----	252.38	----	----	----	5.17
164	3.76	19.28	5.16	----	----	----	251.18	----	----	----	5.16
165	3.70	19.28	5.16	----	----	----	249.92	----	----	----	5.16

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## Hydrograph Discharge Table

Time (min)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
166	3.65	19.27	5.15	----	----	----	248.63	----	----	----	5.15
167	3.59	19.26	5.15	----	----	----	247.28	----	----	----	5.15
168	3.54	19.25	5.14	----	----	----	245.90	----	----	----	5.14
169	3.48	19.25	5.14	----	----	----	244.46	----	----	----	5.14
170	3.42	19.24	5.13	----	----	----	242.99	----	----	----	5.13
171	3.37	19.23	5.13	----	----	----	241.46	----	----	----	5.13
172	3.31	19.22	5.12	----	----	----	239.90	----	----	----	5.12
173	3.26	19.21	5.12	----	----	----	238.29	----	----	----	5.12
174	3.20	19.20	5.11	----	----	----	236.63	----	----	----	5.11
175	3.14	19.20	5.10	----	----	----	234.96	----	----	----	5.10
176	3.09	19.19	5.10	----	----	----	233.26	----	----	----	5.10
177	3.03	19.18	5.09	----	----	----	231.52	----	----	----	5.09
178	2.97	19.17	5.09	----	----	----	229.74	----	----	----	5.09
179	2.92	19.16	5.08	----	----	----	227.91	----	----	----	5.08
180	2.86	19.15	5.07	----	----	----	226.05	----	----	----	5.07
181	2.81	19.14	5.06	----	----	----	224.14	----	----	----	5.06
182	2.75	19.13	5.06	----	----	----	222.19	----	----	----	5.06
183	2.69	19.12	5.05	----	----	----	220.20	----	----	----	5.05
184	2.64	19.10	5.04	----	----	----	218.17	----	----	----	5.04
185	2.58	19.09	5.03	----	----	----	216.13	----	----	----	5.03
186	2.53	19.08	5.03	----	----	----	214.07	----	----	----	5.03
187	2.47	19.07	5.02	----	----	----	211.97	----	----	----	5.02
188	2.41	19.06	5.01	----	----	----	209.83	----	----	----	5.01
189	2.36	19.05	5.00	----	----	----	207.66	----	----	----	5.00
190	2.30	19.03	4.99	----	----	----	205.44	----	----	----	4.99
191	2.24	19.02	4.98	----	----	----	203.18	----	----	----	4.98
192	2.19	19.01	4.98	----	----	----	200.89	----	----	----	4.98
193	2.13	18.99	4.96	----	----	----	197.98	----	----	----	4.96
194	2.08	18.97	4.95	----	----	----	194.14	----	----	----	4.95
195	2.02	18.95	4.93	----	----	----	190.25	----	----	----	4.93
196	1.96	18.92	4.92	----	----	----	186.30	----	----	----	4.92
197	1.91	18.90	4.90	----	----	----	182.30	----	----	----	4.90
198	1.85	18.88	4.88	----	----	----	178.37	----	----	----	4.88
199	1.80	18.85	4.87	----	----	----	174.39	----	----	----	4.87
200	1.74	18.83	4.85	----	----	----	170.35	----	----	----	4.85
201	1.68	18.81	4.83	----	----	----	166.27	----	----	----	4.83
202	1.63	18.78	4.82	----	----	----	162.24	----	----	----	4.82
203	1.57	18.76	4.80	----	----	----	158.20	----	----	----	4.80
204	1.52	18.73	4.78	----	----	----	154.10	----	----	----	4.78
205	1.46	18.71	4.76	----	----	----	149.96	----	----	----	4.76
206	1.40	18.68	4.74	----	----	----	145.89	----	----	----	4.74
207	1.35	18.65	4.72	----	----	----	141.80	----	----	----	4.72
208	1.29	18.63	4.70	----	----	----	137.67	----	----	----	4.70
209	1.23	18.60	4.69	----	----	----	133.49	----	----	----	4.69
210	1.18	18.57	4.67	----	----	----	129.43	----	----	----	4.67
211	1.12	18.55	4.65	----	----	----	125.32	----	----	----	4.65
212	1.07	18.52	4.62	----	----	----	121.18	----	----	----	4.62
213	1.01	18.49	4.60	----	----	----	117.04	----	----	----	4.60
214	0.95	18.46	4.58	----	----	----	112.99	----	----	----	4.58

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## Hydrograph Discharge Table

Time (min)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
215	0.90	18.43	4.56	----	----	----	108.89	----	----	----	4.56
216	0.84	18.41	4.54	----	----	----	104.76	----	----	----	4.54
217	0.79	18.38	4.52	----	----	----	100.73	----	----	----	4.52
218	0.73	18.35	4.50	----	----	----	96.70	----	----	----	4.50
219	0.67	18.32	4.47	----	----	----	92.64	----	----	----	4.47
220	0.62	18.29	4.45	----	----	----	88.62	----	----	----	4.45
221	0.56	18.26	4.43	----	----	----	84.69	----	----	----	4.43
222	0.51	18.23	4.40	----	----	----	80.72	----	----	----	4.40
223	0.45	18.20	4.38	----	----	----	76.73	----	----	----	4.38
224	0.39	18.17	4.36	----	----	----	72.92	----	----	----	4.36
225	0.34	18.14	4.33	----	----	----	69.08	----	----	----	4.33
226	0.28	18.11	4.31	----	----	----	65.21	----	----	----	4.31
227	0.22	18.08	4.28	----	----	----	61.49	----	----	----	4.28
228	0.17	18.04	4.26	----	----	----	57.80	----	----	----	4.26
229	0.11	18.01	4.23	----	----	----	54.08	----	----	----	4.23
230	0.06	17.97	4.19	----	----	----	49.00	----	----	----	4.19
231	0.00	17.91	4.15	----	----	----	43.12	----	----	----	4.15
232	0.00	17.86	4.10	----	----	----	37.63	----	----	----	4.10
233	0.00	17.80	4.06	----	----	----	32.30	----	----	----	4.06
234	0.00	17.75	4.01	----	----	----	27.49	----	----	----	4.01
235	0.00	17.70	3.97	----	----	----	22.78	----	----	----	3.97
236	0.00	17.65	3.92	----	----	----	18.67	----	----	----	3.92
237	0.00	17.60	3.88	0.00	----	----	14.64	----	----	----	3.88
238	0.00	17.55	3.83	0.05	----	----	11.25	----	----	----	3.83
239	0.00	17.50	3.79	0.09	----	----	7.94	----	----	----	3.77
240	0.00	17.45	3.75	0.12	----	----	5.51	----	----	----	3.40
241	0.00	17.41	3.71	0.14	----	----	3.31	----	----	----	3.06
242	0.00	17.37	3.67	0.14	----	----	2.11	----	----	----	2.26
243	0.00	17.35	3.65	0.14	----	----	1.41	----	----	----	1.55
244	0.00	17.33	3.63	0.14	----	----	0.92	----	----	----	1.06

...End

# Reservoir Report

## Reservoir No. 1 - TIMBER WIER

English

### Pond Data

Pond storage is based on known contour areas

### Stage / Storage Table

Stage ft	Elevation ft	Contour area sqft	Incr. Storage cuft	Total storage cuft
0.00	15.00	00	0	0
1.00	16.00	875	438	438
2.00	17.00	3,366	2,121	2,559
3.00	18.00	5,833	4,600	7,159
4.00	19.00	9,633	7,733	14,892
5.00	20.00	16,167	12,900	27,792

### Culvert / Orifice Structures

	[A]	[B]	[C]	[D]
Rise in	= 10.0	2.0	0.0	0.0
Span in	= 10.0	2.0	0.0	0.0
No. Barrels	= 1	1	0	0
Invert El. ft	= 15.00	15.20	0.00	0.00
Length ft	= 1.0	0.5	0.0	0.0
Slope %	= 0.40	0.00	0.00	0.00
N-Value	= .013	.013	.000	.000
Orif. Coeff.	= 0.60	0.60	0.00	0.00
Multi-Stage	= ----	Yes	No	No

### Weir Structures

	[A]	[B]	[C]	[D]
Crest Len ft	= 30.0	140.0	0.0	0.0
Crest El. ft	= 17.30	19.80	0.00	0.00
Weir Coeff.	= 3.00	3.00	0.00	0.00
Eqn. Exp.	= 1.50	1.50	0.00	0.00
Multi-Stage	= Yes	No	No	No
Tailwater Elevation = 0.00 ft				

### Stage / Storage / Discharge Table

Note: All outflows have been analyzed under inlet and outlet control.

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Discharge cfs
0.00	0	15.00	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.10	44	15.10	0.02	0.00	---	---	0.00	0.00	---	---	0.00
0.20	88	15.20	0.04	0.00	---	---	0.00	0.00	---	---	0.00
0.30	131	15.30	0.07	0.02	---	---	0.00	0.00	---	---	0.02
0.40	175	15.40	0.11	0.02	---	---	0.00	0.00	---	---	0.02
0.50	219	15.50	0.14	0.05	---	---	0.00	0.00	---	---	0.05
0.60	263	15.60	0.17	0.06	---	---	0.00	0.00	---	---	0.06
0.70	307	15.70	0.20	0.07	---	---	0.00	0.00	---	---	0.07
0.80	350	15.80	0.22	0.08	---	---	0.00	0.00	---	---	0.08
0.90	394	15.90	0.94	0.08	---	---	0.00	0.00	---	---	0.08
1.00	438	16.00	1.46	0.09	---	---	0.00	0.00	---	---	0.09

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**Stage / Storage / Discharge Table**

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Discharge cfs
1.10	650	16.10	1.84	0.09	---	---	0.00	0.00	---	---	0.09
1.20	862	16.20	2.15	0.10	---	---	0.00	0.00	---	---	0.10
1.30	1,074	16.30	2.42	0.10	---	---	0.00	0.00	---	---	0.10
1.40	1,286	16.40	2.60	0.11	---	---	0.00	0.00	---	---	0.11
1.50	1,498	16.50	2.73	0.11	---	---	0.00	0.00	---	---	0.11
1.60	1,711	16.60	2.86	0.11	---	---	0.00	0.00	---	---	0.11
1.70	1,923	16.70	2.97	0.12	---	---	0.00	0.00	---	---	0.12
1.80	2,135	16.80	3.09	0.12	---	---	0.00	0.00	---	---	0.12
1.90	2,347	16.90	3.20	0.13	---	---	0.00	0.00	---	---	0.13
2.00	2,559	17.00	3.30	0.13	---	---	0.00	0.00	---	---	0.13
2.10	3,019	17.10	3.41	0.13	---	---	0.00	0.00	---	---	0.13
2.20	3,479	17.20	3.51	0.14	---	---	0.00	0.00	---	---	0.14
2.30	3,939	17.30	3.60	0.14	---	---	0.00	0.00	---	---	0.14
2.40	4,399	17.40	3.70	0.15	---	---	2.85	0.00	---	---	2.99
2.50	4,859	17.50	3.79	0.09	---	---	8.05	0.00	---	---	3.79
2.60	5,319	17.60	3.88	0.00	---	---	14.79	0.00	---	---	3.88
2.70	5,779	17.70	3.97	0.00	---	---	22.77	0.00	---	---	3.97
2.80	6,239	17.80	4.05	0.00	---	---	31.82	0.00	---	---	4.05
2.90	6,699	17.90	4.14	0.00	---	---	41.83	0.00	---	---	4.14
3.00	7,159	18.00	4.22	0.00	---	---	52.71	0.00	---	---	4.22
3.10	7,932	18.10	4.30	0.00	---	---	64.40	0.00	---	---	4.30
3.20	8,706	18.20	4.38	0.00	---	---	76.84	0.00	---	---	4.38
3.30	9,479	18.30	4.46	0.00	---	---	90.00	0.00	---	---	4.46
3.40	10,252	18.40	4.54	0.00	---	---	103.83	0.00	---	---	4.54
3.50	11,025	18.50	4.61	0.00	---	---	118.31	0.00	---	---	4.61
3.60	11,799	18.60	4.68	0.00	---	---	133.40	0.00	---	---	4.68
3.70	12,572	18.70	4.76	0.00	---	---	149.09	0.00	---	---	4.76
3.80	13,345	18.80	4.83	0.00	---	---	165.34	0.00	---	---	4.83
3.90	14,119	18.90	4.90	0.00	---	---	182.15	0.00	---	---	4.90
4.00	14,892	19.00	4.97	0.00	---	---	199.49	0.00	---	---	4.97
4.10	16,182	19.10	5.04	0.00	---	---	217.35	0.00	---	---	5.04
4.20	17,472	19.20	5.11	0.00	---	---	235.71	0.00	---	---	5.11
4.30	18,762	19.30	5.17	0.00	---	---	254.56	0.00	---	---	5.17
4.40	20,052	19.40	5.24	0.00	---	---	273.89	0.00	---	---	5.24
4.50	21,342	19.50	5.31	0.00	---	---	293.68	0.00	---	---	5.31
4.60	22,632	19.60	5.37	0.00	---	---	313.93	0.00	---	---	5.37
4.70	23,922	19.70	5.43	0.00	---	---	334.63	0.00	---	---	5.43
4.80	25,212	19.80	5.50	0.00	---	---	355.76	0.00	---	---	5.50
4.90	26,502	19.90	5.56	0.00	---	---	377.31	13.28	---	---	18.84
5.00	27,792	20.00	5.62	0.00	---	---	399.29	37.57	---	---	43.19

...End

# Hydrograph Report

## Hyd. No. 52

### RAT., 10-YR POST ROUTE

Hydrograph type = Reservoir  
Storm frequency = 10 yrs  
Inflow hyd. No. = 42  
Max. Elevation = 19.82 ft

Peak discharge = 7.69 cfs  
Time interval = 1 min  
Reservoir name = TIMBER WIER  
Max. Storage = 25,424 cuft

Storage Indication method used.

Total Volume = 77,543 cuft

### Hydrograph Discharge Table

Time (min)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
30	5.09	17.38	3.68	0.14	----	----	2.21	----	----	----	2.36
31	5.26	17.41	3.71	0.14	----	----	3.36	----	----	----	3.07
32	5.43	17.44	3.73	0.13	----	----	4.83	----	----	----	3.30
33	5.60	17.47	3.76	0.11	----	----	6.26	----	----	----	3.52
34	5.77	17.49	3.78	0.10	----	----	7.66	----	----	----	3.73
35	5.94	17.52	3.81	0.07	----	----	9.38	----	----	----	3.81
36	6.11	17.55	3.83	0.05	----	----	11.32	----	----	----	3.83
37	6.28	17.58	3.86	0.02	----	----	13.38	----	----	----	3.86
38	6.45	17.61	3.89	----	----	----	15.71	----	----	----	3.89
39	6.62	17.65	3.92	----	----	----	18.45	----	----	----	3.92
40	6.79	17.68	3.95	----	----	----	21.33	----	----	----	3.95
41	6.96	17.72	3.98	----	----	----	24.57	----	----	----	3.98
42	7.13	17.76	4.02	----	----	----	28.16	----	----	----	4.02
43	7.30	17.80	4.05	----	----	----	31.92	----	----	----	4.05
44	7.47	17.84	4.09	----	----	----	36.24	----	----	----	4.09
45	7.64	17.89	4.13	----	----	----	40.74	----	----	----	4.13
46	7.81	17.94	4.17	----	----	----	45.72	----	----	----	4.17
47	7.98	17.98	4.21	----	----	----	50.97	----	----	----	4.21
48	8.15	18.02	4.24	----	----	----	55.08	----	----	----	4.24
49	8.32	18.05	4.26	----	----	----	58.70	----	----	----	4.26
50	8.49	18.08	4.29	----	----	----	62.44	----	----	----	4.29
51	8.66	18.12	4.31	----	----	----	66.43	----	----	----	4.31
52	8.83	18.15	4.34	----	----	----	70.70	----	----	----	4.34
53	9.00	18.19	4.37	----	----	----	75.09	----	----	----	4.37
54	9.17	18.22	4.40	----	----	----	79.79	----	----	----	4.40
55	9.34	18.26	4.43	----	----	----	84.73	----	----	----	4.43
56	9.50	18.30	4.46	----	----	----	89.81	----	----	----	4.46
57	9.67	18.34	4.49	----	----	----	95.29	----	----	----	4.49
58	9.84	18.38	4.52	----	----	----	100.93	----	----	----	4.52
59	10.01	18.42	4.55	----	----	----	106.85	----	----	----	4.55
60	10.18	18.46	4.58	----	----	----	113.07	----	----	----	4.58
61	10.35	18.51	4.62	----	----	----	119.48	----	----	----	4.62
62	10.52	18.55	4.65	----	----	----	126.28	----	----	----	4.65
63	10.69	18.60	4.68	----	----	----	133.24	----	----	----	4.68
64	10.86	18.65	4.72	----	----	----	140.62	----	----	----	4.72
65	11.03	18.69	4.75	----	----	----	148.18	----	----	----	4.75

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**Hydrograph Discharge Table**

Time (min)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
66	11.20 <<	18.74	4.79	---	---	---	156.15	---	---	---	4.79
67	11.13	18.79	4.82	---	---	---	164.18	---	---	---	4.82
68	11.07	18.84	4.86	---	---	---	172.30	---	---	---	4.86
69	11.00	18.89	4.89	---	---	---	180.33	---	---	---	4.89
70	10.93	18.94	4.93	---	---	---	188.41	---	---	---	4.93
71	10.86	18.98	4.96	---	---	---	196.42	---	---	---	4.96
72	10.79	19.02	4.98	---	---	---	202.46	---	---	---	4.98
73	10.73	19.04	5.00	---	---	---	207.25	---	---	---	5.00
74	10.66	19.07	5.02	---	---	---	211.98	---	---	---	5.02
75	10.59	19.10	5.04	---	---	---	216.62	---	---	---	5.04
76	10.52	19.12	5.05	---	---	---	221.31	---	---	---	5.05
77	10.46	19.15	5.07	---	---	---	225.95	---	---	---	5.07
78	10.39	19.17	5.09	---	---	---	230.51	---	---	---	5.09
79	10.32	19.20	5.10	---	---	---	235.00	---	---	---	5.10
80	10.25	19.22	5.12	---	---	---	239.51	---	---	---	5.12
81	10.18	19.24	5.14	---	---	---	243.98	---	---	---	5.14
82	10.12	19.27	5.15	---	---	---	248.36	---	---	---	5.15
83	10.05	19.29	5.17	---	---	---	252.68	---	---	---	5.17
84	9.98	19.31	5.18	---	---	---	256.98	---	---	---	5.18
85	9.91	19.33	5.20	---	---	---	261.26	---	---	---	5.20
86	9.84	19.36	5.21	---	---	---	265.46	---	---	---	5.21
87	9.78	19.38	5.23	---	---	---	269.59	---	---	---	5.23
88	9.71	19.40	5.24	---	---	---	273.64	---	---	---	5.24
89	9.64	19.42	5.25	---	---	---	277.71	---	---	---	5.25
90	9.57	19.44	5.27	---	---	---	281.71	---	---	---	5.27
91	9.50	19.46	5.28	---	---	---	285.64	---	---	---	5.28
92	9.44	19.48	5.29	---	---	---	289.49	---	---	---	5.29
93	9.37	19.50	5.30	---	---	---	293.27	---	---	---	5.30
94	9.30	19.52	5.32	---	---	---	297.05	---	---	---	5.32
95	9.23	19.53	5.33	---	---	---	300.77	---	---	---	5.33
96	9.17	19.55	5.34	---	---	---	304.41	---	---	---	5.34
97	9.10	19.57	5.35	---	---	---	307.97	---	---	---	5.35
98	9.03	19.59	5.36	---	---	---	311.46	---	---	---	5.36
99	8.96	19.60	5.37	---	---	---	314.90	---	---	---	5.37
100	8.89	19.62	5.38	---	---	---	318.32	---	---	---	5.38
101	8.83	19.64	5.39	---	---	---	321.66	---	---	---	5.39
102	8.76	19.65	5.40	---	---	---	324.92	---	---	---	5.40
103	8.69	19.67	5.41	---	---	---	328.11	---	---	---	5.41
104	8.62	19.68	5.42	---	---	---	331.23	---	---	---	5.42
105	8.55	19.70	5.43	---	---	---	334.27	---	---	---	5.43
106	8.49	19.71	5.44	---	---	---	337.29	0.00	---	---	5.44
107	8.42	19.73	5.45	---	---	---	340.25	0.00	---	---	5.45
108	8.35	19.74	5.46	---	---	---	343.13	0.00	---	---	5.46
109	8.28	19.75	5.47	---	---	---	345.93	0.00	---	---	5.47
110	8.21	19.77	5.48	---	---	---	348.66	0.00	---	---	5.48
111	8.15	19.78	5.48	---	---	---	351.31	0.00	---	---	5.48
112	8.08	19.79	5.49	---	---	---	353.89	0.00	---	---	5.49
113	8.01	19.80	5.50	---	---	---	356.26	0.31	---	---	5.81
114	7.94	19.81	5.50	---	---	---	357.92	1.33	---	---	6.83

Continues on next page...

**Hydrograph Discharge Table**

Time (min)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
115	7.88	19.81	5.51	----	----	----	358.74	1.84	----	----	7.34
116	7.81	19.82	5.51	----	----	----	359.12	2.07	----	----	7.58
117	7.74	19.82	5.51	----	----	----	359.27	2.16	----	----	7.67
118	7.67	19.82 <<	5.51	----	----	----	359.30	2.18	----	----	7.69 <<
119	7.60	19.82	5.51	----	----	----	359.26	2.16	----	----	7.66
120	7.54	19.82	5.51	----	----	----	359.19	2.11	----	----	7.62
121	7.47	19.82	5.51	----	----	----	359.09	2.06	----	----	7.56
122	7.40	19.82	5.51	----	----	----	359.00	2.00	----	----	7.50
123	7.33	19.81	5.51	----	----	----	358.89	1.93	----	----	7.44
124	7.26	19.81	5.51	----	----	----	358.78	1.87	----	----	7.37
125	7.20	19.81	5.51	----	----	----	358.68	1.80	----	----	7.30
126	7.13	19.81	5.51	----	----	----	358.57	1.73	----	----	7.24
127	7.06	19.81	5.51	----	----	----	358.46	1.66	----	----	7.17
128	6.99	19.81	5.51	----	----	----	358.35	1.60	----	----	7.10
129	6.92	19.81	5.50	----	----	----	358.24	1.53	----	----	7.03
130	6.86	19.81	5.50	----	----	----	358.13	1.46	----	----	6.97
131	6.79	19.81	5.50	----	----	----	358.02	1.39	----	----	6.90
132	6.72	19.81	5.50	----	----	----	357.91	1.33	----	----	6.83
133	6.65	19.81	5.50	----	----	----	357.80	1.26	----	----	6.76
134	6.59	19.81	5.50	----	----	----	357.69	1.19	----	----	6.69
135	6.52	19.81	5.50	----	----	----	357.58	1.12	----	----	6.63
136	6.45	19.81	5.50	----	----	----	357.47	1.06	----	----	6.56
137	6.38	19.81	5.50	----	----	----	357.36	0.99	----	----	6.49
138	6.31	19.81	5.50	----	----	----	357.25	0.92	----	----	6.42
139	6.25	19.81	5.50	----	----	----	357.14	0.85	----	----	6.36
140	6.18	19.81	5.50	----	----	----	357.03	0.79	----	----	6.29
141	6.11	19.81	5.50	----	----	----	356.92	0.72	----	----	6.22
142	6.04	19.80	5.50	----	----	----	356.81	0.65	----	----	6.15
143	5.97	19.80	5.50	----	----	----	356.70	0.58	----	----	6.08
144	5.91	19.80	5.50	----	----	----	356.59	0.52	----	----	6.02
145	5.84	19.80	5.50	----	----	----	356.48	0.45	----	----	5.95
146	5.77	19.80	5.50	----	----	----	356.38	0.38	----	----	5.88
147	5.70	19.80	5.50	----	----	----	356.27	0.31	----	----	5.81
148	5.63	19.80	5.50	----	----	----	356.16	0.25	----	----	5.74
149	5.57	19.80	5.50	----	----	----	356.05	0.18	----	----	5.68
150	5.50	19.80	5.50	----	----	----	355.94	0.11	----	----	5.61
151	5.43	19.80	5.50	----	----	----	355.83	0.04	----	----	5.54
152	5.36	19.80	5.50	----	----	----	355.71	0.00	----	----	5.50
153	5.30	19.80	5.50	----	----	----	355.54	0.00	----	----	5.50
154	5.23	19.80	5.50	----	----	----	355.31	0.00	----	----	5.50
155	5.16	19.80	5.50	----	----	----	355.01	0.00	----	----	5.50
156	5.09	19.79	5.49	----	----	----	354.65	0.00	----	----	5.49
157	5.02	19.79	5.49	----	----	----	354.22	0.00	----	----	5.49
158	4.96	19.79	5.49	----	----	----	353.73	0.00	----	----	5.49
159	4.89	19.79	5.49	----	----	----	353.17	0.00	----	----	5.49
160	4.82	19.78	5.49	----	----	----	352.55	0.00	----	----	5.49
161	4.75	19.78	5.49	----	----	----	351.86	0.00	----	----	5.49
162	4.68	19.78	5.48	----	----	----	351.10	0.00	----	----	5.48
163	4.62	19.77	5.48	----	----	----	350.29	0.00	----	----	5.48

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## Hydrograph Discharge Table

Time (min)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
164	4.55	19.77	5.48	---	---	---	349.40	0.00	---	---	5.48
165	4.48	19.77	5.48	---	---	---	348.46	0.00	---	---	5.48
166	4.41	19.76	5.47	---	---	---	347.45	0.00	---	---	5.47
167	4.35	19.76	5.47	---	---	---	346.38	0.00	---	---	5.47
168	4.28	19.75	5.47	---	---	---	345.24	0.00	---	---	5.47
169	4.21	19.74	5.46	---	---	---	344.04	0.00	---	---	5.46
170	4.14	19.74	5.46	---	---	---	342.78	0.00	---	---	5.46
171	4.07	19.73	5.45	---	---	---	341.45	0.00	---	---	5.45
172	4.01	19.73	5.45	---	---	---	340.06	0.00	---	---	5.45
173	3.94	19.72	5.45	---	---	---	338.61	0.00	---	---	5.45
174	3.87	19.71	5.44	---	---	---	337.10	0.00	---	---	5.44
175	3.80	19.70	5.44	---	---	---	335.52	0.00	---	---	5.44
176	3.73	19.70	5.43	---	---	---	333.90	---	---	---	5.43
177	3.67	19.69	5.43	---	---	---	332.23	---	---	---	5.43
178	3.60	19.68	5.42	---	---	---	330.51	---	---	---	5.42
179	3.53	19.67	5.42	---	---	---	328.72	---	---	---	5.42
180	3.46	19.66	5.41	---	---	---	326.88	---	---	---	5.41
181	3.39	19.65	5.40	---	---	---	324.97	---	---	---	5.40
182	3.33	19.64	5.40	---	---	---	323.01	---	---	---	5.40
183	3.26	19.63	5.39	---	---	---	320.98	---	---	---	5.39
184	3.19	19.62	5.39	---	---	---	318.90	---	---	---	5.39
185	3.12	19.61	5.38	---	---	---	316.76	---	---	---	5.38
186	3.06	19.60	5.37	---	---	---	314.56	---	---	---	5.37
187	2.99	19.59	5.37	---	---	---	312.33	---	---	---	5.37
188	2.92	19.58	5.36	---	---	---	310.06	---	---	---	5.36
189	2.85	19.57	5.35	---	---	---	307.74	---	---	---	5.35
190	2.78	19.56	5.34	---	---	---	305.35	---	---	---	5.34
191	2.72	19.55	5.34	---	---	---	302.91	---	---	---	5.34
192	2.65	19.53	5.33	---	---	---	300.42	---	---	---	5.33
193	2.58	19.52	5.32	---	---	---	297.87	---	---	---	5.32
194	2.51	19.51	5.31	---	---	---	295.26	---	---	---	5.31
195	2.44	19.49	5.30	---	---	---	292.62	---	---	---	5.30
196	2.38	19.48	5.29	---	---	---	289.96	---	---	---	5.29
197	2.31	19.47	5.28	---	---	---	287.25	---	---	---	5.28
198	2.24	19.45	5.28	---	---	---	284.48	---	---	---	5.28
199	2.17	19.44	5.27	---	---	---	281.66	---	---	---	5.27
200	2.10	19.42	5.26	---	---	---	278.78	---	---	---	5.26
201	2.04	19.41	5.25	---	---	---	275.85	---	---	---	5.25
202	1.97	19.39	5.24	---	---	---	272.89	---	---	---	5.24
203	1.90	19.38	5.23	---	---	---	269.93	---	---	---	5.23
204	1.83	19.36	5.22	---	---	---	266.91	---	---	---	5.22
205	1.77	19.35	5.21	---	---	---	263.85	---	---	---	5.21
206	1.70	19.33	5.20	---	---	---	260.73	---	---	---	5.20
207	1.63	19.32	5.18	---	---	---	257.56	---	---	---	5.18
208	1.56	19.30	5.17	---	---	---	254.34	---	---	---	5.17
209	1.49	19.28	5.16	---	---	---	251.15	---	---	---	5.16
210	1.43	19.26	5.15	---	---	---	247.91	---	---	---	5.15
211	1.36	19.25	5.14	---	---	---	244.62	---	---	---	5.14
212	1.29	19.23	5.13	---	---	---	241.28	---	---	---	5.13

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## Hydrograph Discharge Table

Time (min)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
213	1.22	19.21	5.12	---	---	---	237.89	---	---	---	5.12
214	1.15	19.19	5.10	---	---	---	234.48	---	---	---	5.10
215	1.09	19.17	5.09	---	---	---	231.09	---	---	---	5.09
216	1.02	19.16	5.08	---	---	---	227.64	---	---	---	5.08
217	0.95	19.14	5.06	---	---	---	224.15	---	---	---	5.06
218	0.88	19.12	5.05	---	---	---	220.62	---	---	---	5.05
219	0.81	19.10	5.04	---	---	---	217.04	---	---	---	5.04
220	0.75	19.08	5.02	---	---	---	213.51	---	---	---	5.02
221	0.68	19.06	5.01	---	---	---	209.93	---	---	---	5.01
222	0.61	19.04	5.00	---	---	---	206.31	---	---	---	5.00
223	0.54	19.02	4.98	---	---	---	202.65	---	---	---	4.98
224	0.48	18.99	4.97	---	---	---	198.60	---	---	---	4.97
225	0.41	18.96	4.94	---	---	---	192.53	---	---	---	4.94
226	0.34	18.92	4.92	---	---	---	186.39	---	---	---	4.92
227	0.27	18.89	4.89	---	---	---	180.27	---	---	---	4.89
228	0.20	18.85	4.87	---	---	---	174.21	---	---	---	4.87
229	0.14	18.82	4.84	---	---	---	168.10	---	---	---	4.84
230	0.07	18.78	4.82	---	---	---	162.05	---	---	---	4.82
231	0.00	18.74	4.79	---	---	---	156.04	---	---	---	4.79
232	0.00	18.71	4.76	---	---	---	150.01	---	---	---	4.76
233	0.00	18.67	4.74	---	---	---	144.20	---	---	---	4.74
234	0.00	18.63	4.71	---	---	---	138.46	---	---	---	4.71
235	0.00	18.60	4.68	---	---	---	132.77	---	---	---	4.68
236	0.00	18.56	4.66	---	---	---	127.30	---	---	---	4.66
237	0.00	18.52	4.63	---	---	---	121.86	---	---	---	4.63
238	0.00	18.49	4.60	---	---	---	116.54	---	---	---	4.60
239	0.00	18.45	4.57	---	---	---	111.38	---	---	---	4.57
240	0.00	18.42	4.55	---	---	---	106.26	---	---	---	4.55
241	0.00	18.38	4.52	---	---	---	101.28	---	---	---	4.52
242	0.00	18.35	4.49	---	---	---	96.45	---	---	---	4.49
243	0.00	18.31	4.47	---	---	---	91.64	---	---	---	4.47
244	0.00	18.28	4.44	---	---	---	87.01	---	---	---	4.44
245	0.00	18.24	4.41	---	---	---	82.49	---	---	---	4.41
246	0.00	18.21	4.39	---	---	---	78.00	---	---	---	4.39
247	0.00	18.17	4.36	---	---	---	73.71	---	---	---	4.36
248	0.00	18.14	4.33	---	---	---	69.51	---	---	---	4.33
249	0.00	18.11	4.31	---	---	---	65.34	---	---	---	4.31
250	0.00	18.07	4.28	---	---	---	61.39	---	---	---	4.28
251	0.00	18.04	4.25	---	---	---	57.52	---	---	---	4.25
252	0.00	18.01	4.23	---	---	---	53.67	---	---	---	4.23
253	0.00	17.96	4.19	---	---	---	48.25	---	---	---	4.19
254	0.00	17.90	4.14	---	---	---	42.34	---	---	---	4.14
255	0.00	17.85	4.10	---	---	---	36.92	---	---	---	4.10
256	0.00	17.80	4.05	---	---	---	31.62	---	---	---	4.05
257	0.00	17.75	4.01	---	---	---	26.87	---	---	---	4.01
258	0.00	17.69	3.96	---	---	---	22.23	---	---	---	3.96
259	0.00	17.64	3.92	---	---	---	18.13	---	---	---	3.92
260	0.00	17.59	3.87	0.01	---	---	14.19	---	---	---	3.87
261	0.00	17.54	3.83	0.06	---	---	10.81	---	---	---	3.83

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**Hydrograph Discharge Table**

<b>Time (min)</b>	<b>Inflow cfs</b>	<b>Elevation ft</b>	<b>Clv A cfs</b>	<b>Clv B cfs</b>	<b>Clv C cfs</b>	<b>Clv D cfs</b>	<b>Wr A cfs</b>	<b>Wr B cfs</b>	<b>Wr C cfs</b>	<b>Wr D cfs</b>	<b>Outflow cfs</b>
262	0.00	17.49	3.78	0.10	----	----	7.62	----	----	----	3.72
263	0.00	17.45	3.74	0.12	----	----	5.21	----	----	----	3.35
264	0.00	17.40	3.70	0.14	----	----	3.05	----	----	----	3.02
265	0.00	17.37	3.67	0.14	----	----	2.00	----	----	----	2.14

...End

# Reservoir Report

## Reservoir No. 1 - TIMBER WIER

### Pond Data

Pond storage is based on known contour areas

### Stage / Storage Table

Stage ft	Elevation ft	Contour area sqft	Incr. Storage cuft	Total storage cuft
0.00	15.00	00	0	0
1.00	16.00	875	438	438
2.00	17.00	3,366	2,121	2,559
3.00	18.00	5,833	4,600	7,159
4.00	19.00	9,633	7,733	14,892
5.00	20.00	16,167	12,900	27,792

### Culvert / Orifice Structures

	[A]	[B]	[C]	[D]
Rise in	= 10.0	2.0	0.0	0.0
Span in	= 10.0	2.0	0.0	0.0
No. Barrels	= 1	1	0	0
Invert El. ft	= 15.00	15.20	0.00	0.00
Length ft	= 1.0	0.5	0.0	0.0
Slope %	= 0.40	0.00	0.00	0.00
N-Value	= .013	.013	.000	.000
Orif. Coeff.	= 0.60	0.60	0.00	0.00
Multi-Stage	= ---	Yes	No	No

### Weir Structures

	[A]	[B]	[C]	[D]
Crest Len ft	= 30.0	140.0	0.0	0.0
Crest El. ft	= 17.30	19.80	0.00	0.00
Weir Coeff.	= 3.00	3.00	0.00	0.00
Eqn. Exp.	= 1.50	1.50	0.00	0.00
Multi-Stage	= Yes	No	No	No

Tailwater Elevation = 0.00 ft

Note: All outflows have been analyzed under inlet and outlet control.

### Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Civ A cfs	Civ B cfs	Civ C cfs	Civ D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Discharge cfs
0.00	0	15.00	0.00	0.00	---	---	0.00	0.00	---	---	0.00
0.10	44	15.10	0.02	0.00	---	---	0.00	0.00	---	---	0.00
0.20	88	15.20	0.04	0.00	---	---	0.00	0.00	---	---	0.00
0.30	131	15.30	0.07	0.02	---	---	0.00	0.00	---	---	0.02
0.40	175	15.40	0.11	0.02	---	---	0.00	0.00	---	---	0.02
0.50	219	15.50	0.14	0.05	---	---	0.00	0.00	---	---	0.05
0.60	263	15.60	0.17	0.06	---	---	0.00	0.00	---	---	0.06
0.70	307	15.70	0.20	0.07	---	---	0.00	0.00	---	---	0.07
0.80	350	15.80	0.22	0.08	---	---	0.00	0.00	---	---	0.08
0.90	394	15.90	0.94	0.08	---	---	0.00	0.00	---	---	0.08
1.00	438	16.00	1.46	0.09	---	---	0.00	0.00	---	---	0.09

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**Stage / Storage / Discharge Table**

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Discharge cfs
1.10	650	16.10	1.84	0.09	---	---	0.00	0.00	---	---	0.09
1.20	862	16.20	2.15	0.10	---	---	0.00	0.00	---	---	0.10
1.30	1,074	16.30	2.42	0.10	---	---	0.00	0.00	---	---	0.10
1.40	1,286	16.40	2.60	0.11	---	---	0.00	0.00	---	---	0.11
1.50	1,498	16.50	2.73	0.11	---	---	0.00	0.00	---	---	0.11
1.60	1,711	16.60	2.86	0.11	---	---	0.00	0.00	---	---	0.11
1.70	1,923	16.70	2.97	0.12	---	---	0.00	0.00	---	---	0.12
1.80	2,135	16.80	3.09	0.12	---	---	0.00	0.00	---	---	0.12
1.90	2,347	16.90	3.20	0.13	---	---	0.00	0.00	---	---	0.13
2.00	2,559	17.00	3.30	0.13	---	---	0.00	0.00	---	---	0.13
2.10	3,019	17.10	3.41	0.13	---	---	0.00	0.00	---	---	0.13
2.20	3,479	17.20	3.51	0.14	---	---	0.00	0.00	---	---	0.14
2.30	3,939	17.30	3.60	0.14	---	---	0.00	0.00	---	---	0.14
2.40	4,399	17.40	3.70	0.15	---	---	2.85	0.00	---	---	2.99
2.50	4,859	17.50	3.79	0.09	---	---	8.05	0.00	---	---	3.79
2.60	5,319	17.60	3.88	0.00	---	---	14.79	0.00	---	---	3.88
2.70	5,779	17.70	3.97	0.00	---	---	22.77	0.00	---	---	3.97
2.80	6,239	17.80	4.05	0.00	---	---	31.82	0.00	---	---	4.05
2.90	6,699	17.90	4.14	0.00	---	---	41.83	0.00	---	---	4.14
3.00	7,159	18.00	4.22	0.00	---	---	52.71	0.00	---	---	4.22
3.10	7,932	18.10	4.30	0.00	---	---	64.40	0.00	---	---	4.30
3.20	8,706	18.20	4.38	0.00	---	---	76.84	0.00	---	---	4.38
3.30	9,479	18.30	4.46	0.00	---	---	90.00	0.00	---	---	4.46
3.40	10,252	18.40	4.54	0.00	---	---	103.83	0.00	---	---	4.54
3.50	11,025	18.50	4.61	0.00	---	---	118.31	0.00	---	---	4.61
3.60	11,799	18.60	4.68	0.00	---	---	133.40	0.00	---	---	4.68
3.70	12,572	18.70	4.76	0.00	---	---	149.09	0.00	---	---	4.76
3.80	13,345	18.80	4.83	0.00	---	---	165.34	0.00	---	---	4.83
3.90	14,119	18.90	4.90	0.00	---	---	182.15	0.00	---	---	4.90
4.00	14,892	19.00	4.97	0.00	---	---	199.49	0.00	---	---	4.97
4.10	16,182	19.10	5.04	0.00	---	---	217.35	0.00	---	---	5.04
4.20	17,472	19.20	5.11	0.00	---	---	235.71	0.00	---	---	5.11
4.30	18,762	19.30	5.17	0.00	---	---	254.56	0.00	---	---	5.17
4.40	20,052	19.40	5.24	0.00	---	---	273.89	0.00	---	---	5.24
4.50	21,342	19.50	5.31	0.00	---	---	293.68	0.00	---	---	5.31
4.60	22,632	19.60	5.37	0.00	---	---	313.93	0.00	---	---	5.37
4.70	23,922	19.70	5.43	0.00	---	---	334.63	0.00	---	---	5.43
4.80	25,212	19.80	5.50	0.00	---	---	355.76	0.00	---	---	5.50
4.90	26,502	19.90	5.56	0.00	---	---	377.31	13.28	---	---	18.84
5.00	27,792	20.00	5.62	0.00	---	---	399.29	37.57	---	---	43.19

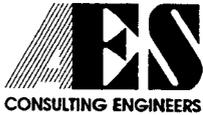
...End

**TEMPORARY SEDIMENT BASIN  
CALCULATIONS**

**THE GOVERNOR'S LAND  
FOWLER'S LAKE**

**AES PROJECT #7173-6-1**

Prepared By:  
AES Consulting Engineers  
5248 Olde Towne Road, Suite 1  
Williamsburg, Virginia 23188  
**Revised date: 5/21/1999**



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PROJECT GL: FOWLER'S LAKE  
PROJECT NO. 7173-6-1  
SUBJECT TEMP. SED. BASIN  
SHEET NO. 1 OF 2  
CALCULATED BY DPW DATE 5/99

## TEMPORARY SEDIMENT BASIN

DRAINAGE AREA TO FUTURE TIMBER BMP IS 11.9 AC. OF THIS, ONLY 1.0 AC IS TO BE DISTURBED DURING CONSTRUCTION ACTIVITIES. AS THIS SITE IS IN CLOSE PROXIMITY TO WETLAND AREAS, EXISTING HOMES, AND THE EXISTING ROAD, EVERY EFFORT HAS BEEN EXPLORED TO PROVIDE THE GREATEST BASIN AREA.

BY VESCH 3.14 STANDARDS, THE REQUIRED WET & DRY STORAGE VOLUMES ARE:

$$(11.9 \text{ AC}) (67 \text{ CY}) = 797 \text{ CY} = 21,527 \text{ CF (EACH)}$$

THE WET STORAGE LEVEL HAS BEEN SET AT EL 21.00, WHICH PROVIDES 12,958 CF OF STORAGE. THIS WILL SERVE APPROX. 7.2 AC OF THE 11.9 AC.

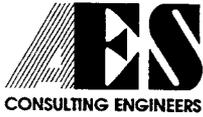
ANY ADDITIONAL AREA ADDED TO THE BASIN WOULD RESULT IN DISTURBANCE OF THE WETLANDS.

THE FOLLOWING INFORMATION DETAILS THE ROUTINGS OF THE 2, 10, AND 25-YR STORMS THROUGH THE BASIN'S RISER AND BARREL OUTLET STRUCTURES. PLEASE NOTE THAT WHILE THE STAGE/STORAGE TABLE BEGINS AT EL 14, THE ROUTING CALCULATIONS BEGIN AT EL 21.0.

AN EMERGENCY SPILLWAY IS PROVIDED; HOWEVER ALL STORMS ARE CONTROLLED BY THE PRINCIPAL SPILLWAY. FOR THIS REASON EMERGENCY SPILLWAY CALCS ARE NOT NECESSARY. AS THE ENTIRE EMERG. SPWY IS NOT LOCATED IN CUT, IT IS NOTED TO BE SODDED.

→ BASE

RISER < 10' HEIGHT ∴ NO BUOYANCY CALCS REQD



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PROJECT GL: FOWLER'S LAKE  
PROJECT NO. 7173-6-1  
SUBJECT TEMP SED BASIN  
SHEET NO. 2 OF 2  
CALCULATED BY DPW DATE 5/99

→ ANTI-SEEP COLLARS

$$L_s = Y(Z+4) \left(1 + \frac{S}{0.25-S}\right)$$
$$= (21.3-14)(2+4) \left(1 + \frac{.0212}{.25-.0212}\right)$$
$$= 47.8'$$

USE 48'

FOR 2 COLLARS:

4' x 4' FROM PLATE 3.14-12  
W/ MIN. 14' SPACING

→ RIP RAP

MINIMUM TAILWATER CONDITION W/  $Q_{10} = 10.9$  CFS

∴ LENGTH OF APRON = 12' (PLATE 3.18-3)

W/  $d_{50} = 6''$  → CLASS A1

WIDTH OF APRON ⇒ 3(15") @ PIPE OUTLET = 3.75' ~ 4'

⇒ 15" + 12' @ DNSTREAM END = 13.25' ~ 13.5'

PROVIDE 12' LONG, 1' DEEP APRON OF CLASS A1

RIP RAP OVER FILTER FABRIC, APRON

SHALL BE 4' WIDE AT UPSTREAM END AND

13.5' WIDE AT DOWNSTREAM END.

# Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Return period (yrs)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	Rational	5.1	1	86	45,751	2	---	---	---	FOWLER'S LAKE - B. <i>2 yr pre</i>
2	Rational	5.9	1	86	52,837	5	---	---	---	FOWLER'S LAKE - B.
3	Rational	7.2	1	86	65,415	10	---	---	---	FOWLER'S LAKE - B. <i>10 yr pre</i>
4	Rational	7.9	1	86	71,145	25	---	---	---	FOWLER'S LAKE - B. <i>25 yr pre</i>
5	Rational	8.8	1	86	79,263	50	---	---	---	FOWLER'S LAKE - B.
6	Rational	9.9	1	86	89,177	100	---	---	---	FOWLER'S LAKE - B.
9	Rational	7.9	1	66	54,801	2	---	---	---	FOWLER'S LAKE - B. <i>2 yr post</i>
10	Rational	9.3	1	66	64,172	5	---	---	---	FOWLER'S LAKE - B.
11	Rational	11.2	1	66	77,630	10	---	---	---	FOWLER'S LAKE - B. <i>10 yr post</i>
12	Rational	12.5	1	66	86,594	25	---	---	---	FOWLER'S LAKE - B. <i>25 yr post</i>
13	Rational	13.9	1	66	96,292	50	---	---	---	FOLWER'S LAKE - B.
14	Rational	15.7	1	66	108,948	100	---	---	---	FOWLER'S LAKE - B.
17	Reservoir	7.8	1	69	53,446	2	9	21.65	15,881	2 YR POST ROUTED
18	Reservoir	10.9	1	71	76,276	10	11	21.77	16,453	10 YR POST ROUTED
19	Reservoir	11.5	1	79	85,240	25	12	21.92	17,112	25 YR POST ROUTED

Proj. file: 7173TEMPBAS.gpw

IDF file: jcc.IDF

Run date: 05-20-1999

# Reservoir Report

## Reservoir No. 1 - TEMP BASIN

### Pond Data

Pond storage is based on known contour areas

### Stage / Storage Table

Stage ft	Elevation ft	Contour area sqft	Incr. Storage cuft	Total storage cuft
0.00	14.00	280	0	0
1.00	15.00	585	433	433
2.00	16.00	961	773	1,206
3.00	17.00	1,434	1,198	2,404
4.00	18.00	1,929	1,682	4,086
5.00	19.00	2,445	2,187	6,273
6.00	20.00	3,391	2,918	9,191
7.00	21.00	4,143	3,767	12,958
8.00	22.00	4,886	4,515	17,473
9.00	23.00	6,358	5,622	23,095

### Culvert / Orifice Structures

	[A]	[B]	[C]	[D]
Rise in	= 15.0	0.0	0.0	0.0
Span in	= 15.0	0.0	0.0	0.0
No. Barrels	= 1	0	0	0
Invert El. ft	= 17.50	0.00	0.00	0.00
Length ft	= 33.0	0.0	0.0	0.0
Slope %	= 2.12	0.00	0.00	0.00
N-Value	= .013	.000	.000	.000
Orif. Coeff.	= 0.60	0.00	0.00	0.00
Multi-Stage	= ----	No	No	No

### Weir Structures

	[A]	[B]	[C]	[D]
Crest Len ft	= 12.6	12.0	0.0	0.0
Crest El. ft	= 21.30	22.50	0.00	0.00
Weir Coeff.	= 3.00	3.00	0.00	0.00
Eqn. Exp.	= 1.50	1.50	0.00	0.00
Multi-Stage	= Yes	No	No	No

Tailwater Elevation = 0.00 ft

Note: All outflows have been analyzed under inlet and outlet control.

### Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Discharge cfs
0.00	0	14.00	0.00	---	---	---	0.00	0.00	---	---	0.00
0.10	43	14.10	0.00	---	---	---	0.00	0.00	---	---	0.00
0.20	87	14.20	0.00	---	---	---	0.00	0.00	---	---	0.00
0.30	130	14.30	0.00	---	---	---	0.00	0.00	---	---	0.00
0.40	173	14.40	0.00	---	---	---	0.00	0.00	---	---	0.00
0.50	217	14.50	0.00	---	---	---	0.00	0.00	---	---	0.00
0.60	260	14.60	0.00	---	---	---	0.00	0.00	---	---	0.00
0.70	303	14.70	0.00	---	---	---	0.00	0.00	---	---	0.00
0.80	346	14.80	0.00	---	---	---	0.00	0.00	---	---	0.00
0.90	390	14.90	0.00	---	---	---	0.00	0.00	---	---	0.00
1.00	433	15.00	0.00	---	---	---	0.00	0.00	---	---	0.00

Continues on next page...

**Stage / Storage / Discharge Table**

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Discharge cfs
1.10	510	15.10	0.00	---	---	---	0.00	0.00	---	---	0.00
1.20	588	15.20	0.00	---	---	---	0.00	0.00	---	---	0.00
1.30	665	15.30	0.00	---	---	---	0.00	0.00	---	---	0.00
1.40	742	15.40	0.00	---	---	---	0.00	0.00	---	---	0.00
1.50	819	15.50	0.00	---	---	---	0.00	0.00	---	---	0.00
1.60	897	15.60	0.00	---	---	---	0.00	0.00	---	---	0.00
1.70	974	15.70	0.00	---	---	---	0.00	0.00	---	---	0.00
1.80	1,051	15.80	0.00	---	---	---	0.00	0.00	---	---	0.00
1.90	1,129	15.90	0.00	---	---	---	0.00	0.00	---	---	0.00
2.00	1,206	16.00	0.00	---	---	---	0.00	0.00	---	---	0.00
2.10	1,326	16.10	0.00	---	---	---	0.00	0.00	---	---	0.00
2.20	1,446	16.20	0.00	---	---	---	0.00	0.00	---	---	0.00
2.30	1,565	16.30	0.00	---	---	---	0.00	0.00	---	---	0.00
2.40	1,685	16.40	0.00	---	---	---	0.00	0.00	---	---	0.00
2.50	1,805	16.50	0.00	---	---	---	0.00	0.00	---	---	0.00
2.60	1,925	16.60	0.00	---	---	---	0.00	0.00	---	---	0.00
2.70	2,045	16.70	0.00	---	---	---	0.00	0.00	---	---	0.00
2.80	2,164	16.80	0.00	---	---	---	0.00	0.00	---	---	0.00
2.90	2,284	16.90	0.00	---	---	---	0.00	0.00	---	---	0.00
3.00	2,404	17.00	0.00	---	---	---	0.00	0.00	---	---	0.00
3.10	2,572	17.10	0.00	---	---	---	0.00	0.00	---	---	0.00
3.20	2,740	17.20	0.00	---	---	---	0.00	0.00	---	---	0.00
3.30	2,909	17.30	0.00	---	---	---	0.00	0.00	---	---	0.00
3.40	3,077	17.40	0.00	---	---	---	0.00	0.00	---	---	0.00
3.50	3,245	17.50	0.00	---	---	---	0.00	0.00	---	---	0.00
3.60	3,413	17.60	0.05	---	---	---	0.00	0.00	---	---	0.00
3.70	3,581	17.70	0.19	---	---	---	0.00	0.00	---	---	0.00
3.80	3,750	17.80	0.46	---	---	---	0.00	0.00	---	---	0.00
3.90	3,918	17.90	0.75	---	---	---	0.00	0.00	---	---	0.00
4.00	4,086	18.00	1.11	---	---	---	0.00	0.00	---	---	0.00
4.10	4,305	18.10	1.54	---	---	---	0.00	0.00	---	---	0.00
4.20	4,523	18.20	2.09	---	---	---	0.00	0.00	---	---	0.00
4.30	4,742	18.30	2.59	---	---	---	0.00	0.00	---	---	0.00
4.40	4,961	18.40	3.09	---	---	---	0.00	0.00	---	---	0.00
4.50	5,180	18.50	3.62	---	---	---	0.00	0.00	---	---	0.00
4.60	5,398	18.60	4.09	---	---	---	0.00	0.00	---	---	0.00
4.70	5,617	18.70	4.52	---	---	---	0.00	0.00	---	---	0.00
4.80	5,836	18.80	4.85	---	---	---	0.00	0.00	---	---	0.00
4.90	6,054	18.90	5.20	---	---	---	0.00	0.00	---	---	0.00
5.00	6,273	19.00	5.53	---	---	---	0.00	0.00	---	---	0.00
5.10	6,565	19.10	5.83	---	---	---	0.00	0.00	---	---	0.00
5.20	6,857	19.20	6.13	---	---	---	0.00	0.00	---	---	0.00
5.30	7,148	19.30	6.40	---	---	---	0.00	0.00	---	---	0.00
5.40	7,440	19.40	6.67	---	---	---	0.00	0.00	---	---	0.00
5.50	7,732	19.50	6.93	---	---	---	0.00	0.00	---	---	0.00
5.60	8,024	19.60	7.18	---	---	---	0.00	0.00	---	---	0.00
5.70	8,316	19.70	7.41	---	---	---	0.00	0.00	---	---	0.00
5.80	8,607	19.80	7.65	---	---	---	0.00	0.00	---	---	0.00
5.90	8,899	19.90	7.87	---	---	---	0.00	0.00	---	---	0.00
6.00	9,191	20.00	8.09	---	---	---	0.00	0.00	---	---	0.00
6.10	9,568	20.10	8.30	---	---	---	0.00	0.00	---	---	0.00
6.20	9,944	20.20	8.51	---	---	---	0.00	0.00	---	---	0.00
6.30	10,321	20.30	8.71	---	---	---	0.00	0.00	---	---	0.00

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**Stage / Storage / Discharge Table**

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Discharge cfs
6.40	10,698	20.40	8.91	---	---	---	0.00	0.00	---	---	0.00
6.50	11,075	20.50	9.11	---	---	---	0.00	0.00	---	---	0.00
6.60	11,451	20.60	9.29	---	---	---	0.00	0.00	---	---	0.00
6.70	11,828	20.70	9.48	---	---	---	0.00	0.00	---	---	0.00
6.80	12,205	20.80	9.66	---	---	---	0.00	0.00	---	---	0.00
6.90	12,581	20.90	9.84	---	---	---	0.00	0.00	---	---	0.00
7.00	12,958	21.00	10.02	---	---	---	0.00	0.00	---	---	0.00
7.10	13,410	21.10	10.19	---	---	---	0.00	0.00	---	---	0.00
7.20	13,861	21.20	10.36	---	---	---	0.00	0.00	---	---	0.00
7.30	14,313	21.30	10.53	---	---	---	0.00	0.00	---	---	0.00
7.40	14,764	21.40	10.69	---	---	---	1.19	0.00	---	---	1.19
7.50	15,216	21.50	10.85	---	---	---	3.37	0.00	---	---	3.37
7.60	15,667	21.60	11.01	---	---	---	6.19	0.00	---	---	6.19
7.70	16,119	21.70	11.17	---	---	---	9.53	0.00	---	---	9.53
7.80	16,570	21.80	11.33	---	---	---	13.32	0.00	---	---	11.33
7.90	17,022	21.90	11.48	---	---	---	17.51	0.00	---	---	11.48
8.00	17,473	22.00	11.63	---	---	---	22.07	0.00	---	---	11.63
8.10	18,035	22.10	11.78	---	---	---	26.96	0.00	---	---	11.78
8.20	18,597	22.20	11.93	---	---	---	32.17	0.00	---	---	11.93
8.30	19,160	22.30	12.07	---	---	---	37.68	0.00	---	---	12.07
8.40	19,722	22.40	12.22	---	---	---	43.47	0.00	---	---	12.22
8.50	20,284	22.50	12.36	---	---	---	49.53	0.00	---	---	12.36
8.60	20,846	22.60	12.50	---	---	---	55.85	1.14	---	---	13.64
8.70	21,408	22.70	12.64	---	---	---	62.42	3.22	---	---	15.86
8.80	21,971	22.80	12.77	---	---	---	69.22	5.92	---	---	18.69
8.90	22,533	22.90	12.91	---	---	---	76.26	9.11	---	---	22.02
9.00	23,095	23.00	13.04	---	---	---	83.52	12.73	---	---	25.77

...End

# Hydrograph Report

## Hyd. No. 1

### FOWLER'S LAKE -B, 2-YR PRE-DEVELOPMENT

Hydrograph type = Rational  
Storm frequency = 2 yrs  
Drainage area = 11.9 ac  
Intensity = 1.42 in  
I-D-F Curve = jcc.IDF

Peak discharge = 5.07 cfs  
Time interval = 1 min  
Runoff coeff. = 0.3  
Time of conc. (Tc) = 86 min  
Reced. limb factor = 2.5

Total Volume = 45,751 cuft

### Hydrograph Discharge Table

Time (hrs)	Outflow (cfs)						
0.22	0.77	0.75	2.65	1.28	4.54	1.82	4.52
0.23	0.82	0.77	2.71	1.30	4.60	1.83	4.50
0.25	0.88	0.78	2.77	1.32	4.65	1.85	4.48
0.27	0.94	0.80	2.83	1.33	4.71	1.87	4.45
0.28	1.00	0.82	2.89	1.35	4.77	1.88	4.43
0.30	1.06	0.83	2.95	1.37	4.83	1.90	4.41
0.32	1.12	0.85	3.00	1.38	4.89	1.92	4.38
0.33	1.18	0.87	3.06	1.40	4.95	1.93	4.36
0.35	1.24	0.88	3.12	1.42	5.01	1.95	4.34
0.37	1.30	0.90	3.18	1.43	5.07 <<	1.97	4.31
0.38	1.36	0.92	3.24	1.45	5.04	1.98	4.29
0.40	1.41	0.93	3.30	1.47	5.02	2.00	4.27
0.42	1.47	0.95	3.36	1.48	5.00	2.02	4.24
0.43	1.53	0.97	3.42	1.50	4.97	2.03	4.22
0.45	1.59	0.98	3.48	1.52	4.95	2.05	4.19
0.47	1.65	1.00	3.53	1.53	4.93	2.07	4.17
0.48	1.71	1.02	3.59	1.55	4.90	2.08	4.15
0.50	1.77	1.03	3.65	1.57	4.88	2.10	4.12
0.52	1.83	1.05	3.71	1.58	4.85	2.12	4.10
0.53	1.89	1.07	3.77	1.60	4.83	2.13	4.08
0.55	1.94	1.08	3.83	1.62	4.81	2.15	4.05
0.57	2.00	1.10	3.89	1.63	4.78	2.17	4.03
0.58	2.06	1.12	3.95	1.65	4.76	2.18	4.01
0.60	2.12	1.13	4.01	1.67	4.74	2.20	3.98
0.62	2.18	1.15	4.07	1.68	4.71	2.22	3.96
0.63	2.24	1.17	4.12	1.70	4.69	2.23	3.94
0.65	2.30	1.18	4.18	1.72	4.67	2.25	3.91
0.67	2.36	1.20	4.24	1.73	4.64	2.27	3.89
0.68	2.42	1.22	4.30	1.75	4.62	2.28	3.86
0.70	2.47	1.23	4.36	1.77	4.60	2.30	3.84
0.72	2.53	1.25	4.42	1.78	4.57	2.32	3.82
0.73	2.59	1.27	4.48	1.80	4.55	2.33	3.79

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## Hydrograph Discharge Table

Time -- Outflow (hrs cfs)	Time -- Outflow (hrs cfs)	Time -- Outflow (hrs cfs)
2.35	3.77	3.17
2.37	3.75	3.18
2.38	3.72	3.20
2.40	3.70	3.22
2.42	3.68	3.23
2.43	3.65	3.25
2.45	3.63	3.27
2.47	3.61	3.28
2.48	3.58	3.30
2.50	3.56	3.32
2.52	3.53	3.33
2.53	3.51	3.35
2.55	3.49	3.37
2.57	3.46	3.38
2.58	3.44	3.40
2.60	3.42	3.42
2.62	3.39	3.43
2.63	3.37	3.45
2.65	3.35	3.47
2.67	3.32	3.48
2.68	3.30	3.50
2.70	3.28	3.52
2.72	3.25	3.53
2.73	3.23	3.55
2.75	3.20	3.57
2.77	3.18	3.58
2.78	3.16	3.60
2.80	3.13	3.62
2.82	3.11	3.63
2.83	3.09	3.65
2.85	3.06	3.67
2.87	3.04	3.68
2.88	3.02	3.70
2.90	2.99	3.72
2.92	2.97	3.73
2.93	2.95	3.75
2.95	2.92	3.77
2.97	2.90	3.78
2.98	2.87	3.80
3.00	2.85	3.82
3.02	2.83	3.83
3.03	2.80	3.85
3.05	2.78	3.87
3.07	2.76	3.88
3.08	2.73	3.90
3.10	2.71	3.92
3.12	2.69	3.93
3.13	2.66	3.95
3.15	2.64	3.97
		3.98
		4.00
		4.02
		4.03
		4.05
		4.07
		4.08
		4.10
		4.12
		4.13
		4.15
		4.17
		4.18
		4.20
		4.22
		4.23
		4.25
		4.27
		4.28
		4.30
		4.32
		4.33
		4.35
		4.37
		4.38
		4.40
		4.42
		4.43
		4.45
		4.47
		1.46
		1.44
		1.41
		1.39
		1.37
		1.34
		1.32
		1.30
		1.27
		1.25
		1.23
		1.20
		1.18
		1.15
		1.13
		1.11
		1.08
		1.06
		1.04
		1.01
		0.99
		0.97
		0.94
		0.92
		0.90
		0.87
		0.85
		0.82
		0.80
		0.78
		...End

# Hydrograph Report

## Hyd. No. 3

### FOWLER'S LAKE - B, 10-YR PRE-DEVELOPMENT

Hydrograph type = Rational  
Storm frequency = 10 yrs  
Drainage area = 11.9 ac  
Intensity = 2.03 in  
I-D-F Curve = jcc.IDF

Peak discharge = 7.24 cfs  
Time interval = 1 min  
Runoff coeff. = 0.3  
Time of conc. (Tc) = 86 min  
Reced. limb factor = 2.5

Total Volume = 65,415 cuft

### Hydrograph Discharge Table

| Time -- Outflow<br>(hrs cfs) |
|------------------------------|------------------------------|------------------------------|------------------------------|
| 0.22 1.10                    | 0.75 3.79                    | 1.28 6.49                    | 1.82 6.47                    |
| 0.23 1.18                    | 0.77 3.87                    | 1.30 6.57                    | 1.83 6.44                    |
| 0.25 1.26                    | 0.78 3.96                    | 1.32 6.65                    | 1.85 6.40                    |
| 0.27 1.35                    | 0.80 4.04                    | 1.33 6.74                    | 1.87 6.37                    |
| 0.28 1.43                    | 0.82 4.13                    | 1.35 6.82                    | 1.88 6.33                    |
| 0.30 1.52                    | 0.83 4.21                    | 1.37 6.91                    | 1.90 6.30                    |
| 0.32 1.60                    | 0.85 4.30                    | 1.38 6.99                    | 1.92 6.27                    |
| 0.33 1.68                    | 0.87 4.38                    | 1.40 7.08                    | 1.93 6.23                    |
| 0.35 1.77                    | 0.88 4.46                    | 1.42 7.16                    | 1.95 6.20                    |
| 0.37 1.85                    | 0.90 4.55                    | 1.43 7.24 <<                 | 1.97 6.17                    |
| 0.38 1.94                    | 0.92 4.63                    | 1.45 7.21                    | 1.98 6.13                    |
| 0.40 2.02                    | 0.93 4.72                    | 1.47 7.18                    | 2.00 6.10                    |
| 0.42 2.11                    | 0.95 4.80                    | 1.48 7.14                    | 2.02 6.06                    |
| 0.43 2.19                    | 0.97 4.89                    | 1.50 7.11                    | 2.03 6.03                    |
| 0.45 2.27                    | 0.98 4.97                    | 1.52 7.08                    | 2.05 6.00                    |
| 0.47 2.36                    | 1.00 5.05                    | 1.53 7.04                    | 2.07 5.96                    |
| 0.48 2.44                    | 1.02 5.14                    | 1.55 7.01                    | 2.08 5.93                    |
| 0.50 2.53                    | 1.03 5.22                    | 1.57 6.97                    | 2.10 5.90                    |
| 0.52 2.61                    | 1.05 5.31                    | 1.58 6.94                    | 2.12 5.86                    |
| 0.53 2.70                    | 1.07 5.39                    | 1.60 6.91                    | 2.13 5.83                    |
| 0.55 2.78                    | 1.08 5.48                    | 1.62 6.87                    | 2.15 5.80                    |
| 0.57 2.86                    | 1.10 5.56                    | 1.63 6.84                    | 2.17 5.76                    |
| 0.58 2.95                    | 1.12 5.64                    | 1.65 6.81                    | 2.18 5.73                    |
| 0.60 3.03                    | 1.13 5.73                    | 1.67 6.77                    | 2.20 5.69                    |
| 0.62 3.12                    | 1.15 5.81                    | 1.68 6.74                    | 2.22 5.66                    |
| 0.63 3.20                    | 1.17 5.90                    | 1.70 6.71                    | 2.23 5.63                    |
| 0.65 3.29                    | 1.18 5.98                    | 1.72 6.67                    | 2.25 5.59                    |
| 0.67 3.37                    | 1.20 6.06                    | 1.73 6.64                    | 2.27 5.56                    |
| 0.68 3.45                    | 1.22 6.15                    | 1.75 6.60                    | 2.28 5.53                    |
| 0.70 3.54                    | 1.23 6.23                    | 1.77 6.57                    | 2.30 5.49                    |
| 0.72 3.62                    | 1.25 6.32                    | 1.78 6.54                    | 2.32 5.46                    |
| 0.73 3.71                    | 1.27 6.40                    | 1.80 6.50                    | 2.33 5.42                    |

Continues on next page...

**Hydrograph Discharge Table**

Time -- Outflow (hrs cfs)	Time -- Outflow (hrs cfs)	Time -- Outflow (hrs cfs)
2.35 5.39	3.17 3.74	3.98 2.09
2.37 5.36	3.18 3.71	4.00 2.06
2.38 5.32	3.20 3.67	4.02 2.02
2.40 5.29	3.22 3.64	4.03 1.99
2.42 5.26	3.23 3.61	4.05 1.95
2.43 5.22	3.25 3.57	4.07 1.92
2.45 5.19	3.27 3.54	4.08 1.89
2.47 5.16	3.28 3.50	4.10 1.85
2.48 5.12	3.30 3.47	4.12 1.82
2.50 5.09	3.32 3.44	4.13 1.79
2.52 5.05	3.33 3.40	4.15 1.75
2.53 5.02	3.35 3.37	4.17 1.72
2.55 4.99	3.37 3.34	4.18 1.68
2.57 4.95	3.38 3.30	4.20 1.65
2.58 4.92	3.40 3.27	4.22 1.62
2.60 4.89	3.42 3.23	4.23 1.58
2.62 4.85	3.43 3.20	4.25 1.55
2.63 4.82	3.45 3.17	4.27 1.52
2.65 4.78	3.47 3.13	4.28 1.48
2.67 4.75	3.48 3.10	4.30 1.45
2.68 4.72	3.50 3.07	4.32 1.42
2.70 4.68	3.52 3.03	4.33 1.38
2.72 4.65	3.53 3.00	4.35 1.35
2.73 4.62	3.55 2.97	4.37 1.31
2.75 4.58	3.57 2.93	4.38 1.28
2.77 4.55	3.58 2.90	4.40 1.25
2.78 4.51	3.60 2.86	4.42 1.21
2.80 4.48	3.62 2.83	4.43 1.18
2.82 4.45	3.63 2.80	4.45 1.15
2.83 4.41	3.65 2.76	4.47 1.11
2.85 4.38	3.67 2.73	
2.87 4.35	3.68 2.70	
2.88 4.31	3.70 2.66	...End
2.90 4.28	3.72 2.63	
2.92 4.25	3.73 2.59	
2.93 4.21	3.75 2.56	
2.95 4.18	3.77 2.53	
2.97 4.14	3.78 2.49	
2.98 4.11	3.80 2.46	
3.00 4.08	3.82 2.43	
3.02 4.04	3.83 2.39	
3.03 4.01	3.85 2.36	
3.05 3.98	3.87 2.32	
3.07 3.94	3.88 2.29	
3.08 3.91	3.90 2.26	
3.10 3.87	3.92 2.22	
3.12 3.84	3.93 2.19	
3.13 3.81	3.95 2.16	
3.15 3.77	3.97 2.12	

# Hydrograph Report

## Hyd. No. 4

### FOWLER'S LAKE - B, 25-YR PRE-DEVELOPMENT

Hydrograph type = Rational  
Storm frequency = 25 yrs  
Drainage area = 11.9 ac  
Intensity = 2.21 in  
I-D-F Curve = jcc.IDF

Peak discharge = 7.88 cfs  
Time interval = 1 min  
Runoff coeff. = 0.3  
Time of conc. (Tc) = 86 min  
Reced. limb factor = 2.5

Total Volume = 71,145 cuft

### Hydrograph Discharge Table

| Time -- Outflow<br>(hrs cfs) |
|------------------------------|------------------------------|------------------------------|------------------------------|
| 0.22 1.19                    | 0.75 4.12                    | 1.28 7.05                    | 1.82 7.04                    |
| 0.23 1.28                    | 0.77 4.21                    | 1.30 7.15                    | 1.83 7.00                    |
| 0.25 1.37                    | 0.78 4.31                    | 1.32 7.24                    | 1.85 6.96                    |
| 0.27 1.47                    | 0.80 4.40                    | 1.33 7.33                    | 1.87 6.93                    |
| 0.28 1.56                    | 0.82 4.49                    | 1.35 7.42                    | 1.88 6.89                    |
| 0.30 1.65                    | 0.83 4.58                    | 1.37 7.51                    | 1.90 6.85                    |
| 0.32 1.74                    | 0.85 4.67                    | 1.38 7.60                    | 1.92 6.82                    |
| 0.33 1.83                    | 0.87 4.76                    | 1.40 7.70                    | 1.93 6.78                    |
| 0.35 1.92                    | 0.88 4.86                    | 1.42 7.79                    | 1.95 6.74                    |
| 0.37 2.02                    | 0.90 4.95                    | 1.43 7.88 <<                 | 1.97 6.71                    |
| 0.38 2.11                    | 0.92 5.04                    | 1.45 7.84                    | 1.98 6.67                    |
| 0.40 2.20                    | 0.93 5.13                    | 1.47 7.81                    | 2.00 6.63                    |
| 0.42 2.29                    | 0.95 5.22                    | 1.48 7.77                    | 2.02 6.60                    |
| 0.43 2.38                    | 0.97 5.31                    | 1.50 7.73                    | 2.03 6.56                    |
| 0.45 2.47                    | 0.98 5.41                    | 1.52 7.70                    | 2.05 6.52                    |
| 0.47 2.57                    | 1.00 5.50                    | 1.53 7.66                    | 2.07 6.49                    |
| 0.48 2.66                    | 1.02 5.59                    | 1.55 7.62                    | 2.08 6.45                    |
| 0.50 2.75                    | 1.03 5.68                    | 1.57 7.59                    | 2.10 6.41                    |
| 0.52 2.84                    | 1.05 5.77                    | 1.58 7.55                    | 2.12 6.38                    |
| 0.53 2.93                    | 1.07 5.86                    | 1.60 7.51                    | 2.13 6.34                    |
| 0.55 3.02                    | 1.08 5.95                    | 1.62 7.48                    | 2.15 6.30                    |
| 0.57 3.11                    | 1.10 6.05                    | 1.63 7.44                    | 2.17 6.27                    |
| 0.58 3.21                    | 1.12 6.14                    | 1.65 7.40                    | 2.18 6.23                    |
| 0.60 3.30                    | 1.13 6.23                    | 1.67 7.37                    | 2.20 6.19                    |
| 0.62 3.39                    | 1.15 6.32                    | 1.68 7.33                    | 2.22 6.16                    |
| 0.63 3.48                    | 1.17 6.41                    | 1.70 7.29                    | 2.23 6.12                    |
| 0.65 3.57                    | 1.18 6.50                    | 1.72 7.26                    | 2.25 6.08                    |
| 0.67 3.66                    | 1.20 6.60                    | 1.73 7.22                    | 2.27 6.05                    |
| 0.68 3.76                    | 1.22 6.69                    | 1.75 7.18                    | 2.28 6.01                    |
| 0.70 3.85                    | 1.23 6.78                    | 1.77 7.15                    | 2.30 5.97                    |
| 0.72 3.94                    | 1.25 6.87                    | 1.78 7.11                    | 2.32 5.94                    |
| 0.73 4.03                    | 1.27 6.96                    | 1.80 7.07                    | 2.33 5.90                    |

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**Hydrograph Discharge Table**

<b>Time -- Outflow (hrs cfs)</b>	<b>Time -- Outflow (hrs cfs)</b>	<b>Time -- Outflow (hrs cfs)</b>
2.35 5.86	3.17 4.07	3.98 2.27
2.37 5.83	3.18 4.03	4.00 2.24
2.38 5.79	3.20 3.99	4.02 2.20
2.40 5.75	3.22 3.96	4.03 2.16
2.42 5.72	3.23 3.92	4.05 2.13
2.43 5.68	3.25 3.88	4.07 2.09
2.45 5.64	3.27 3.85	4.08 2.05
2.47 5.61	3.28 3.81	4.10 2.02
2.48 5.57	3.30 3.77	4.12 1.98
2.50 5.53	3.32 3.74	4.13 1.94
2.52 5.50	3.33 3.70	4.15 1.91
2.53 5.46	3.35 3.66	4.17 1.87
2.55 5.42	3.37 3.63	4.18 1.83
2.57 5.39	3.38 3.59	4.20 1.80
2.58 5.35	3.40 3.55	4.22 1.76
2.60 5.31	3.42 3.52	4.23 1.72
2.62 5.28	3.43 3.48	4.25 1.69
2.63 5.24	3.45 3.44	4.27 1.65
2.65 5.20	3.47 3.41	4.28 1.61
2.67 5.17	3.48 3.37	4.30 1.58
2.68 5.13	3.50 3.33	4.32 1.54
2.70 5.09	3.52 3.30	4.33 1.50
2.72 5.06	3.53 3.26	4.35 1.47
2.73 5.02	3.55 3.22	4.37 1.43
2.75 4.98	3.57 3.19	4.38 1.39
2.77 4.95	3.58 3.15	4.40 1.36
2.78 4.91	3.60 3.11	4.42 1.32
2.80 4.87	3.62 3.08	4.43 1.28
2.82 4.84	3.63 3.04	4.45 1.25
2.83 4.80	3.65 3.00	4.47 1.21
2.85 4.76	3.67 2.97	
2.87 4.73	3.68 2.93	
2.88 4.69	3.70 2.89	...End
2.90 4.65	3.72 2.86	
2.92 4.62	3.73 2.82	
2.93 4.58	3.75 2.79	
2.95 4.54	3.77 2.75	
2.97 4.51	3.78 2.71	
2.98 4.47	3.80 2.68	
3.00 4.43	3.82 2.64	
3.02 4.40	3.83 2.60	
3.03 4.36	3.85 2.57	
3.05 4.32	3.87 2.53	
3.07 4.29	3.88 2.49	
3.08 4.25	3.90 2.46	
3.10 4.21	3.92 2.42	
3.12 4.18	3.93 2.38	
3.13 4.14	3.95 2.35	
3.15 4.10	3.97 2.31	

# Hydrograph Report

## Hyd. No. 9

### FOWLER'S LAKE -B, 2-YR POST-DEVELOPMENT

Hydrograph type	= Rational	Peak discharge	= 7.91 cfs
Storm frequency	= 2 yrs	Time interval	= 1 min
Drainage area	= 11.9 ac	Runoff coeff.	= 0.41
Intensity	= 1.62 in	Time of conc. (Tc)	= 66 min
I-D-F Curve	= jcc.IDF	Reced. limb factor	= 2.5

Total Volume = 54,801 cuft

### Hydrograph Discharge Table

Time -- Outflow	Time -- Outflow	Time -- Outflow	Time -- Outflow
(hrs cfs)	(hrs cfs)	(hrs cfs)	(hrs cfs)
0.17 1.20	0.70 5.03	1.23 7.52	1.77 5.99
0.18 1.32	0.72 5.15	1.25 7.48	1.78 5.94
0.20 1.44	0.73 5.27	1.27 7.43	1.80 5.89
0.22 1.56	0.75 5.39	1.28 7.38	1.82 5.85
0.23 1.68	0.77 5.51	1.30 7.33	1.83 5.80
0.25 1.80	0.78 5.63	1.32 7.28	1.85 5.75
0.27 1.92	0.80 5.75	1.33 7.24	1.87 5.70
0.28 2.04	0.82 5.87	1.35 7.19	1.88 5.66
0.30 2.16	0.83 5.99	1.37 7.14	1.90 5.61
0.32 2.28	0.85 6.11	1.38 7.09	1.92 5.56
0.33 2.40	0.87 6.23	1.40 7.05	1.93 5.51
0.35 2.52	0.88 6.35	1.42 7.00	1.95 5.46
0.37 2.64	0.90 6.47	1.43 6.95	1.97 5.42
0.38 2.76	0.92 6.59	1.45 6.90	1.98 5.37
0.40 2.88	0.93 6.71	1.47 6.85	2.00 5.32
0.42 3.00	0.95 6.83	1.48 6.81	2.02 5.27
0.43 3.12	0.97 6.95	1.50 6.76	2.03 5.22
0.45 3.24	0.98 7.07	1.52 6.71	2.05 5.18
0.47 3.35	1.00 7.19	1.53 6.66	2.07 5.13
0.48 3.47	1.02 7.31	1.55 6.61	2.08 5.08
0.50 3.59	1.03 7.43	1.57 6.57	2.10 5.03
0.52 3.71	1.05 7.55	1.58 6.52	2.12 4.98
0.53 3.83	1.07 7.67	1.60 6.47	2.13 4.94
0.55 3.95	1.08 7.79	1.62 6.42	2.15 4.89
0.57 4.07	1.10 7.91 <<	1.63 6.37	2.17 4.84
0.58 4.19	1.12 7.86	1.65 6.33	2.18 4.79
0.60 4.31	1.13 7.81	1.67 6.28	2.20 4.74
0.62 4.43	1.15 7.76	1.68 6.23	2.22 4.70
0.63 4.55	1.17 7.72	1.70 6.18	2.23 4.65
0.65 4.67	1.18 7.67	1.72 6.13	2.25 4.60
0.67 4.79	1.20 7.62	1.73 6.09	2.27 4.55
0.68 4.91	1.22 7.57	1.75 6.04	2.28 4.51

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## Hydrograph Discharge Table

Time -- Outflow (hrs cfs)	Time -- Outflow (hrs cfs)
2.30	4.46
2.32	4.41
2.33	4.36
2.35	4.31
2.37	4.27
2.38	4.22
2.40	4.17
2.42	4.12
2.43	4.07
2.45	4.03
2.47	3.98
2.48	3.93
2.50	3.88
2.52	3.83
2.53	3.79
2.55	3.74
2.57	3.69
2.58	3.64
2.60	3.59
2.62	3.55
2.63	3.50
2.65	3.45
2.67	3.40
2.68	3.35
2.70	3.31
2.72	3.26
2.73	3.21
2.75	3.16
2.77	3.12
2.78	3.07
2.80	3.02
2.82	2.97
2.83	2.92
2.85	2.88
2.87	2.83
2.88	2.78
2.90	2.73
2.92	2.68
2.93	2.64
2.95	2.59
2.97	2.54
2.98	2.49
3.00	2.44
3.02	2.40
3.03	2.35
3.05	2.30
3.07	2.25
3.08	2.20
3.10	2.16
	3.12 2.11
	3.13 2.06
	3.15 2.01
	3.17 1.96
	3.18 1.92
	3.20 1.87
	3.22 1.82
	3.23 1.77
	3.25 1.73
	3.27 1.68
	3.28 1.63
	3.30 1.58
	3.32 1.53
	3.33 1.49
	3.35 1.44
	3.37 1.39
	3.38 1.34
	3.40 1.29
	3.42 1.25
	3.43 1.20
	...End

# Hydrograph Report

## Hyd. No. 11

### FOWLER'S LAKE - B, 10-YR POST-DEVELOPMENT

Hydrograph type	= Rational	Peak discharge	= 11.20 cfs
Storm frequency	= 10 yrs	Time interval	= 1 min
Drainage area	= 11.9 ac	Runoff coeff.	= 0.41
Intensity	= 2.30 in	Time of conc. (Tc)	= 66 min
I-D-F Curve	= jcc.IDF	Reced. limb factor	= 2.5

Total Volume = 77,630 cuft

### Hydrograph Discharge Table

| Time -- Outflow<br>(hrs      cfs) |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| 0.17    1.70                      | 0.70    7.13                      | 1.23    10.66                     | 1.77    8.49                      |
| 0.18    1.87                      | 0.72    7.30                      | 1.25    10.59                     | 1.78    8.42                      |
| 0.20    2.04                      | 0.73    7.47                      | 1.27    10.52                     | 1.80    8.35                      |
| 0.22    2.21                      | 0.75    7.64                      | 1.28    10.46                     | 1.82    8.28                      |
| 0.23    2.38                      | 0.77    7.81                      | 1.30    10.39                     | 1.83    8.21                      |
| 0.25    2.55                      | 0.78    7.98                      | 1.32    10.32                     | 1.85    8.15                      |
| 0.27    2.72                      | 0.80    8.15                      | 1.33    10.25                     | 1.87    8.08                      |
| 0.28    2.89                      | 0.82    8.32                      | 1.35    10.18                     | 1.88    8.01                      |
| 0.30    3.06                      | 0.83    8.49                      | 1.37    10.12                     | 1.90    7.94                      |
| 0.32    3.22                      | 0.85    8.66                      | 1.38    10.05                     | 1.92    7.88                      |
| 0.33    3.39                      | 0.87    8.83                      | 1.40    9.98                      | 1.93    7.81                      |
| 0.35    3.56                      | 0.88    9.00                      | 1.42    9.91                      | 1.95    7.74                      |
| 0.37    3.73                      | 0.90    9.17                      | 1.43    9.84                      | 1.97    7.67                      |
| 0.38    3.90                      | 0.92    9.34                      | 1.45    9.78                      | 1.98    7.60                      |
| 0.40    4.07                      | 0.93    9.50                      | 1.47    9.71                      | 2.00    7.54                      |
| 0.42    4.24                      | 0.95    9.67                      | 1.48    9.64                      | 2.02    7.47                      |
| 0.43    4.41                      | 0.97    9.84                      | 1.50    9.57                      | 2.03    7.40                      |
| 0.45    4.58                      | 0.98    10.01                     | 1.52    9.50                      | 2.05    7.33                      |
| 0.47    4.75                      | 1.00    10.18                     | 1.53    9.44                      | 2.07    7.26                      |
| 0.48    4.92                      | 1.02    10.35                     | 1.55    9.37                      | 2.08    7.20                      |
| 0.50    5.09                      | 1.03    10.52                     | 1.57    9.30                      | 2.10    7.13                      |
| 0.52    5.26                      | 1.05    10.69                     | 1.58    9.23                      | 2.12    7.06                      |
| 0.53    5.43                      | 1.07    10.86                     | 1.60    9.17                      | 2.13    6.99                      |
| 0.55    5.60                      | 1.08    11.03                     | 1.62    9.10                      | 2.15    6.92                      |
| 0.57    5.77                      | 1.10    11.20 <<                  | 1.63    9.03                      | 2.17    6.86                      |
| 0.58    5.94                      | 1.12    11.13                     | 1.65    8.96                      | 2.18    6.79                      |
| 0.60    6.11                      | 1.13    11.07                     | 1.67    8.89                      | 2.20    6.72                      |
| 0.62    6.28                      | 1.15    11.00                     | 1.68    8.83                      | 2.22    6.65                      |
| 0.63    6.45                      | 1.17    10.93                     | 1.70    8.76                      | 2.23    6.59                      |
| 0.65    6.62                      | 1.18    10.86                     | 1.72    8.69                      | 2.25    6.52                      |
| 0.67    6.79                      | 1.20    10.79                     | 1.73    8.62                      | 2.27    6.45                      |
| 0.68    6.96                      | 1.22    10.73                     | 1.75    8.55                      | 2.28    6.38                      |

Continues on next page...

**Hydrograph Discharge Table**

<b>Time -- Outflow (hrs cfs)</b>	<b>Time -- Outflow (hrs cfs)</b>
2.30 6.31	3.12 2.99
2.32 6.25	3.13 2.92
2.33 6.18	3.15 2.85
2.35 6.11	3.17 2.78
2.37 6.04	3.18 2.72
2.38 5.97	3.20 2.65
2.40 5.91	3.22 2.58
2.42 5.84	3.23 2.51
2.43 5.77	3.25 2.44
2.45 5.70	3.27 2.38
2.47 5.64	3.28 2.31
2.48 5.57	3.30 2.24
2.50 5.50	3.32 2.17
2.52 5.43	3.33 2.10
2.53 5.36	3.35 2.04
2.55 5.30	3.37 1.97
2.57 5.23	3.38 1.90
2.58 5.16	3.40 1.83
2.60 5.09	3.42 1.77
2.62 5.02	3.43 1.70
2.63 4.96	
2.65 4.89	
2.67 4.82	...End
2.68 4.75	
2.70 4.68	
2.72 4.62	
2.73 4.55	
2.75 4.48	
2.77 4.41	
2.78 4.35	
2.80 4.28	
2.82 4.21	
2.83 4.14	
2.85 4.07	
2.87 4.01	
2.88 3.94	
2.90 3.87	
2.92 3.80	
2.93 3.73	
2.95 3.67	
2.97 3.60	
2.98 3.53	
3.00 3.46	
3.02 3.39	
3.03 3.33	
3.05 3.26	
3.07 3.19	
3.08 3.12	
3.10 3.06	

# Hydrograph Report

## Hyd. No. 12

### FOWLER'S LAKE - B, 25-YR POST-DEVELOPMENT

Hydrograph type	= Rational	Peak discharge	= 12.50 cfs
Storm frequency	= 25 yrs	Time interval	= 1 min
Drainage area	= 11.9 ac	Runoff coeff.	= 0.41
Intensity	= 2.56 in	Time of conc. (Tc)	= 66 min
I-D-F Curve	= jcc.IDF	Reced. limb factor	= 2.5

Total Volume = 86,594 cuft

### Hydrograph Discharge Table

| Time -- Outflow<br>(hrs      cfs) |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| 0.17    1.89                      | 0.70    7.95                      | 1.23    11.89                     | 1.77    9.47                      |
| 0.18    2.08                      | 0.72    8.14                      | 1.25    11.81                     | 1.78    9.39                      |
| 0.20    2.27                      | 0.73    8.33                      | 1.27    11.74                     | 1.80    9.31                      |
| 0.22    2.46                      | 0.75    8.52                      | 1.28    11.66                     | 1.82    9.24                      |
| 0.23    2.65                      | 0.77    8.71                      | 1.30    11.59                     | 1.83    9.16                      |
| 0.25    2.84                      | 0.78    8.90                      | 1.32    11.51                     | 1.85    9.09                      |
| 0.27    3.03                      | 0.80    9.09                      | 1.33    11.44                     | 1.87    9.01                      |
| 0.28    3.22                      | 0.82    9.28                      | 1.35    11.36                     | 1.88    8.94                      |
| 0.30    3.41                      | 0.83    9.47                      | 1.37    11.28                     | 1.90    8.86                      |
| 0.32    3.60                      | 0.85    9.66                      | 1.38    11.21                     | 1.92    8.78                      |
| 0.33    3.79                      | 0.87    9.84                      | 1.40    11.13                     | 1.93    8.71                      |
| 0.35    3.98                      | 0.88    10.03                     | 1.42    11.06                     | 1.95    8.63                      |
| 0.37    4.17                      | 0.90    10.22                     | 1.43    10.98                     | 1.97    8.56                      |
| 0.38    4.35                      | 0.92    10.41                     | 1.45    10.91                     | 1.98    8.48                      |
| 0.40    4.54                      | 0.93    10.60                     | 1.47    10.83                     | 2.00    8.41                      |
| 0.42    4.73                      | 0.95    10.79                     | 1.48    10.75                     | 2.02    8.33                      |
| 0.43    4.92                      | 0.97    10.98                     | 1.50    10.68                     | 2.03    8.25                      |
| 0.45    5.11                      | 0.98    11.17                     | 1.52    10.60                     | 2.05    8.18                      |
| 0.47    5.30                      | 1.00    11.36                     | 1.53    10.53                     | 2.07    8.10                      |
| 0.48    5.49                      | 1.02    11.55                     | 1.55    10.45                     | 2.08    8.03                      |
| 0.50    5.68                      | 1.03    11.74                     | 1.57    10.38                     | 2.10    7.95                      |
| 0.52    5.87                      | 1.05    11.93                     | 1.58    10.30                     | 2.12    7.88                      |
| 0.53    6.06                      | 1.07    12.12                     | 1.60    10.22                     | 2.13    7.80                      |
| 0.55    6.25                      | 1.08    12.31                     | 1.62    10.15                     | 2.15    7.72                      |
| 0.57    6.44                      | 1.10    12.50 <<                  | 1.63    10.07                     | 2.17    7.65                      |
| 0.58    6.63                      | 1.12    12.42                     | 1.65    10.00                     | 2.18    7.57                      |
| 0.60    6.82                      | 1.13    12.34                     | 1.67    9.92                      | 2.20    7.50                      |
| 0.62    7.01                      | 1.15    12.27                     | 1.68    9.84                      | 2.22    7.42                      |
| 0.63    7.19                      | 1.17    12.19                     | 1.70    9.77                      | 2.23    7.35                      |
| 0.65    7.38                      | 1.18    12.12                     | 1.72    9.69                      | 2.25    7.27                      |
| 0.67    7.57                      | 1.20    12.04                     | 1.73    9.62                      | 2.27    7.19                      |
| 0.68    7.76                      | 1.22    11.97                     | 1.75    9.54                      | 2.28    7.12                      |

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## Hydrograph Discharge Table

Time -- Outflow (hrs cfs)	Time -- Outflow (hrs cfs)
2.30	7.04
2.32	6.97
2.33	6.89
2.35	6.82
2.37	6.74
2.38	6.66
2.40	6.59
2.42	6.51
2.43	6.44
2.45	6.36
2.47	6.29
2.48	6.21
2.50	6.13
2.52	6.06
2.53	5.98
2.55	5.91
2.57	5.83
2.58	5.76
2.60	5.68
2.62	5.60
2.63	5.53
2.65	5.45
2.67	5.38
2.68	5.30
2.70	5.23
2.72	5.15
2.73	5.07
2.75	5.00
2.77	4.92
2.78	4.85
2.80	4.77
2.82	4.70
2.83	4.62
2.85	4.54
2.87	4.47
2.88	4.39
2.90	4.32
2.92	4.24
2.93	4.17
2.95	4.09
2.97	4.01
2.98	3.94
3.00	3.86
3.02	3.79
3.03	3.71
3.05	3.64
3.07	3.56
3.08	3.48
3.10	3.41
	3.33
	3.26
	3.18
	3.10
	3.03
	2.95
	2.88
	2.80
	2.73
	2.65
	2.57
	2.50
	2.42
	2.35
	2.27
	2.20
	2.12
	2.04
	1.97
	1.89
	...End

# Hydrograph Report

## Hyd. No. 17

### 2 YR POST ROUTED

Hydrograph type = Reservoir  
 Storm frequency = 2 yrs  
 Inflow hyd. No. = 9  
 Max. Elevation = 21.65 ft

Peak discharge = 7.77 cfs  
 Time interval = 1 min  
 Reservoir name = TEMP BASIN  
 Max. Storage = 15,881 cuft

Storage Indication method used.

Total Volume = 53,446 cuft

### Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
0.40	2.88	21.41	10.71	----	----	----	1.48	----	----	----	1.48
0.42	3.00	21.43	10.74	----	----	----	1.85	----	----	----	1.85
0.43	3.12	21.44	10.76	----	----	----	2.15	----	----	----	2.15
0.45	3.24	21.46	10.78	----	----	----	2.41	----	----	----	2.41
0.47	3.35	21.47	10.80	----	----	----	2.63	----	----	----	2.63
0.48	3.47	21.48	10.81	----	----	----	2.83	----	----	----	2.83
0.50	3.59	21.48	10.83	----	----	----	3.01	----	----	----	3.01
0.52	3.71	21.49	10.84	----	----	----	3.17	----	----	----	3.17
0.53	3.83	21.50	10.85	----	----	----	3.32	----	----	----	3.32
0.55	3.95	21.50	10.86	----	----	----	3.49	----	----	----	3.49
0.57	4.07	21.51	10.87	----	----	----	3.66	----	----	----	3.66
0.58	4.19	21.52	10.88	----	----	----	3.81	----	----	----	3.81
0.60	4.31	21.52	10.89	----	----	----	3.95	----	----	----	3.95
0.62	4.43	21.53	10.89	----	----	----	4.08	----	----	----	4.08
0.63	4.55	21.53	10.90	----	----	----	4.21	----	----	----	4.21
0.65	4.67	21.53	10.91	----	----	----	4.34	----	----	----	4.34
0.67	4.79	21.54	10.92	----	----	----	4.46	----	----	----	4.46
0.68	4.91	21.54	10.92	----	----	----	4.59	----	----	----	4.59
0.70	5.03	21.55	10.93	----	----	----	4.71	----	----	----	4.71
0.72	5.15	21.55	10.94	----	----	----	4.83	----	----	----	4.83
0.73	5.27	21.56	10.94	----	----	----	4.95	----	----	----	4.95
0.75	5.39	21.56	10.95	----	----	----	5.07	----	----	----	5.07
0.77	5.51	21.56	10.96	----	----	----	5.19	----	----	----	5.19
0.78	5.63	21.57	10.96	----	----	----	5.31	----	----	----	5.31
0.80	5.75	21.57	10.97	----	----	----	5.43	----	----	----	5.43
0.82	5.87	21.58	10.98	----	----	----	5.55	----	----	----	5.55
0.83	5.99	21.58	10.98	----	----	----	5.67	----	----	----	5.67
0.85	6.11	21.59	10.99	----	----	----	5.79	----	----	----	5.79
0.87	6.23	21.59	11.00	----	----	----	5.91	----	----	----	5.91
0.88	6.35	21.59	11.00	----	----	----	6.03	----	----	----	6.03
0.90	6.47	21.60	11.01	----	----	----	6.15	----	----	----	6.15
0.92	6.59	21.60	11.02	----	----	----	6.28	----	----	----	6.28
0.93	6.71	21.61	11.02	----	----	----	6.42	----	----	----	6.42
0.95	6.83	21.61	11.03	----	----	----	6.54	----	----	----	6.54
0.97	6.95	21.61	11.04	----	----	----	6.67	----	----	----	6.67
0.98	7.07	21.62	11.04	----	----	----	6.79	----	----	----	6.79

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### Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
1.00	7.19	21.62	11.05	----	----	----	6.92	----	----	----	6.92
1.02	7.31	21.63	11.05	----	----	----	7.04	----	----	----	7.04
1.03	7.43	21.63	11.06	----	----	----	7.16	----	----	----	7.16
1.05	7.55	21.63	11.06	----	----	----	7.28	----	----	----	7.28
1.07	7.67	21.64	11.07	----	----	----	7.40	----	----	----	7.40
1.08	7.79	21.64	11.08	----	----	----	7.52	----	----	----	7.52
1.10	7.91 <<	21.64	11.08	----	----	----	7.64	----	----	----	7.64
1.12	7.86	21.65	11.09	----	----	----	7.73	----	----	----	7.73
1.13	7.81	21.65	11.09	----	----	----	7.77	----	----	----	7.77
1.15	7.76	21.65 <<	11.09	----	----	----	7.77	----	----	----	7.77 <<
1.17	7.72	21.65	11.09	----	----	----	7.76	----	----	----	7.76
1.18	7.67	21.65	11.09	----	----	----	7.74	----	----	----	7.74
1.20	7.62	21.65	11.08	----	----	----	7.70	----	----	----	7.70
1.22	7.57	21.64	11.08	----	----	----	7.66	----	----	----	7.66
1.23	7.52	21.64	11.08	----	----	----	7.62	----	----	----	7.62
1.25	7.48	21.64	11.08	----	----	----	7.58	----	----	----	7.58
1.27	7.43	21.64	11.08	----	----	----	7.53	----	----	----	7.53
1.28	7.38	21.64	11.07	----	----	----	7.49	----	----	----	7.49
1.30	7.33	21.64	11.07	----	----	----	7.44	----	----	----	7.44
1.32	7.28	21.64	11.07	----	----	----	7.39	----	----	----	7.39
1.33	7.24	21.63	11.07	----	----	----	7.34	----	----	----	7.34
1.35	7.19	21.63	11.07	----	----	----	7.30	----	----	----	7.30
1.37	7.14	21.63	11.06	----	----	----	7.25	----	----	----	7.25
1.38	7.09	21.63	11.06	----	----	----	7.20	----	----	----	7.20
1.40	7.05	21.63	11.06	----	----	----	7.15	----	----	----	7.15
1.42	7.00	21.63	11.06	----	----	----	7.11	----	----	----	7.11
1.43	6.95	21.63	11.05	----	----	----	7.06	----	----	----	7.06
1.45	6.90	21.62	11.05	----	----	----	7.01	----	----	----	7.01
1.47	6.85	21.62	11.05	----	----	----	6.96	----	----	----	6.96
1.48	6.81	21.62	11.05	----	----	----	6.91	----	----	----	6.91
1.50	6.76	21.62	11.05	----	----	----	6.87	----	----	----	6.87
1.52	6.71	21.62	11.04	----	----	----	6.82	----	----	----	6.82
1.53	6.66	21.62	11.04	----	----	----	6.77	----	----	----	6.77
1.55	6.61	21.62	11.04	----	----	----	6.72	----	----	----	6.72
1.57	6.57	21.61	11.04	----	----	----	6.67	----	----	----	6.67
1.58	6.52	21.61	11.03	----	----	----	6.63	----	----	----	6.63
1.60	6.47	21.61	11.03	----	----	----	6.58	----	----	----	6.58
1.62	6.42	21.61	11.03	----	----	----	6.53	----	----	----	6.53
1.63	6.37	21.61	11.03	----	----	----	6.48	----	----	----	6.48
1.65	6.33	21.61	11.02	----	----	----	6.43	----	----	----	6.43
1.67	6.28	21.61	11.02	----	----	----	6.39	----	----	----	6.39
1.68	6.23	21.60	11.02	----	----	----	6.34	----	----	----	6.34
1.70	6.18	21.60	11.02	----	----	----	6.29	----	----	----	6.29
1.72	6.13	21.60	11.02	----	----	----	6.24	----	----	----	6.24
1.73	6.09	21.60	11.01	----	----	----	6.19	----	----	----	6.19
1.75	6.04	21.60	11.01	----	----	----	6.15	----	----	----	6.15
1.77	5.99	21.60	11.01	----	----	----	6.11	----	----	----	6.11
1.78	5.94	21.60	11.01	----	----	----	6.06	----	----	----	6.06
1.80	5.89	21.59	11.00	----	----	----	6.02	----	----	----	6.02

Continues on next page...

## Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
1.82	5.85	21.59	11.00	----	----	----	5.97	----	----	----	5.97
1.83	5.80	21.59	11.00	----	----	----	5.92	----	----	----	5.92
1.85	5.75	21.59	11.00	----	----	----	5.88	----	----	----	5.88
1.87	5.70	21.59	10.99	----	----	----	5.83	----	----	----	5.83
1.88	5.66	21.59	10.99	----	----	----	5.78	----	----	----	5.78
1.90	5.61	21.58	10.99	----	----	----	5.73	----	----	----	5.73
1.92	5.56	21.58	10.98	----	----	----	5.69	----	----	----	5.69
1.93	5.51	21.58	10.98	----	----	----	5.64	----	----	----	5.64
1.95	5.46	21.58	10.98	----	----	----	5.59	----	----	----	5.59
1.97	5.42	21.58	10.98	----	----	----	5.54	----	----	----	5.54
1.98	5.37	21.58	10.97	----	----	----	5.50	----	----	----	5.50
2.00	5.32	21.57	10.97	----	----	----	5.45	----	----	----	5.45
2.02	5.27	21.57	10.97	----	----	----	5.40	----	----	----	5.40
2.03	5.22	21.57	10.97	----	----	----	5.35	----	----	----	5.35
2.05	5.18	21.57	10.96	----	----	----	5.30	----	----	----	5.30
2.07	5.13	21.57	10.96	----	----	----	5.26	----	----	----	5.26
2.08	5.08	21.57	10.96	----	----	----	5.21	----	----	----	5.21
2.10	5.03	21.56	10.96	----	----	----	5.16	----	----	----	5.16
2.12	4.98	21.56	10.95	----	----	----	5.11	----	----	----	5.11
2.13	4.94	21.56	10.95	----	----	----	5.06	----	----	----	5.06
2.15	4.89	21.56	10.95	----	----	----	5.02	----	----	----	5.02
2.17	4.84	21.56	10.94	----	----	----	4.97	----	----	----	4.97
2.18	4.79	21.55	10.94	----	----	----	4.92	----	----	----	4.92
2.20	4.74	21.55	10.94	----	----	----	4.87	----	----	----	4.87
2.22	4.70	21.55	10.94	----	----	----	4.82	----	----	----	4.82
2.23	4.65	21.55	10.93	----	----	----	4.78	----	----	----	4.78
2.25	4.60	21.55	10.93	----	----	----	4.73	----	----	----	4.73
2.27	4.55	21.55	10.93	----	----	----	4.68	----	----	----	4.68
2.28	4.51	21.54	10.93	----	----	----	4.63	----	----	----	4.63
2.30	4.46	21.54	10.92	----	----	----	4.58	----	----	----	4.58
2.32	4.41	21.54	10.92	----	----	----	4.54	----	----	----	4.54
2.33	4.36	21.54	10.92	----	----	----	4.49	----	----	----	4.49
2.35	4.31	21.54	10.91	----	----	----	4.44	----	----	----	4.44
2.37	4.27	21.54	10.91	----	----	----	4.39	----	----	----	4.39
2.38	4.22	21.53	10.91	----	----	----	4.35	----	----	----	4.35
2.40	4.17	21.53	10.91	----	----	----	4.30	----	----	----	4.30
2.42	4.12	21.53	10.90	----	----	----	4.25	----	----	----	4.25
2.43	4.07	21.53	10.90	----	----	----	4.20	----	----	----	4.20
2.45	4.03	21.53	10.90	----	----	----	4.15	----	----	----	4.15
2.47	3.98	21.53	10.90	----	----	----	4.11	----	----	----	4.11
2.48	3.93	21.52	10.89	----	----	----	4.06	----	----	----	4.06
2.50	3.88	21.52	10.89	----	----	----	4.01	----	----	----	4.01
2.52	3.83	21.52	10.89	----	----	----	3.96	----	----	----	3.96
2.53	3.79	21.52	10.88	----	----	----	3.91	----	----	----	3.91
2.55	3.74	21.52	10.88	----	----	----	3.87	----	----	----	3.87
2.57	3.69	21.52	10.88	----	----	----	3.82	----	----	----	3.82
2.58	3.64	21.51	10.88	----	----	----	3.77	----	----	----	3.77
2.60	3.59	21.51	10.87	----	----	----	3.72	----	----	----	3.72
2.62	3.55	21.51	10.87	----	----	----	3.67	----	----	----	3.67

Continues on next page...

## Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
2.63	3.50	21.51	10.87	----	----	----	3.63	----	----	----	3.63
2.65	3.45	21.51	10.87	----	----	----	3.58	----	----	----	3.58
2.67	3.40	21.51	10.86	----	----	----	3.53	----	----	----	3.53
2.68	3.35	21.50	10.86	----	----	----	3.48	----	----	----	3.48
2.70	3.31	21.50	10.86	----	----	----	3.43	----	----	----	3.43
2.72	3.26	21.50	10.85	----	----	----	3.39	----	----	----	3.39
2.73	3.21	21.50	10.85	----	----	----	3.35	----	----	----	3.35
2.75	3.16	21.50	10.85	----	----	----	3.31	----	----	----	3.31
2.77	3.12	21.50	10.85	----	----	----	3.26	----	----	----	3.26
2.78	3.07	21.49	10.84	----	----	----	3.22	----	----	----	3.22
2.80	3.02	21.49	10.84	----	----	----	3.18	----	----	----	3.18
2.82	2.97	21.49	10.84	----	----	----	3.13	----	----	----	3.13
2.83	2.92	21.49	10.83	----	----	----	3.08	----	----	----	3.08
2.85	2.88	21.48	10.83	----	----	----	3.04	----	----	----	3.04
2.87	2.83	21.48	10.83	----	----	----	2.99	----	----	----	2.99
2.88	2.78	21.48	10.82	----	----	----	2.94	----	----	----	2.94
2.90	2.73	21.48	10.82	----	----	----	2.90	----	----	----	2.90
2.92	2.68	21.48	10.82	----	----	----	2.85	----	----	----	2.85
2.93	2.64	21.47	10.81	----	----	----	2.80	----	----	----	2.80
2.95	2.59	21.47	10.81	----	----	----	2.75	----	----	----	2.75
2.97	2.54	21.47	10.80	----	----	----	2.71	----	----	----	2.71
2.98	2.49	21.47	10.80	----	----	----	2.66	----	----	----	2.66
3.00	2.44	21.47	10.80	----	----	----	2.61	----	----	----	2.61
3.02	2.40	21.46	10.79	----	----	----	2.56	----	----	----	2.56
3.03	2.35	21.46	10.79	----	----	----	2.51	----	----	----	2.51
3.05	2.30	21.46	10.79	----	----	----	2.47	----	----	----	2.47
3.07	2.25	21.46	10.78	----	----	----	2.42	----	----	----	2.42
3.08	2.20	21.45	10.78	----	----	----	2.37	----	----	----	2.37
3.10	2.16	21.45	10.78	----	----	----	2.32	----	----	----	2.32
3.12	2.11	21.45	10.77	----	----	----	2.27	----	----	----	2.27
3.13	2.06	21.45	10.77	----	----	----	2.23	----	----	----	2.23
3.15	2.01	21.45	10.77	----	----	----	2.18	----	----	----	2.18
3.17	1.96	21.44	10.76	----	----	----	2.13	----	----	----	2.13
3.18	1.92	21.44	10.76	----	----	----	2.08	----	----	----	2.08
3.20	1.87	21.44	10.75	----	----	----	2.03	----	----	----	2.03
3.22	1.82	21.44	10.75	----	----	----	1.99	----	----	----	1.99
3.23	1.77	21.43	10.75	----	----	----	1.94	----	----	----	1.94
3.25	1.73	21.43	10.74	----	----	----	1.89	----	----	----	1.89
3.27	1.68	21.43	10.74	----	----	----	1.84	----	----	----	1.84
3.28	1.63	21.43	10.74	----	----	----	1.80	----	----	----	1.80
3.30	1.58	21.43	10.73	----	----	----	1.75	----	----	----	1.75
3.32	1.53	21.42	10.73	----	----	----	1.70	----	----	----	1.70
3.33	1.49	21.42	10.73	----	----	----	1.65	----	----	----	1.65
3.35	1.44	21.42	10.72	----	----	----	1.60	----	----	----	1.60
3.37	1.39	21.42	10.72	----	----	----	1.56	----	----	----	1.56
3.38	1.34	21.41	10.72	----	----	----	1.51	----	----	----	1.51
3.40	1.29	21.41	10.71	----	----	----	1.46	----	----	----	1.46
3.42	1.25	21.41	10.71	----	----	----	1.41	----	----	----	1.41
3.43	1.20	21.41	10.70	----	----	----	1.36	----	----	----	1.36

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**Hydrograph Discharge Table**

<b>Time (hrs)</b>	<b>Inflow cfs</b>	<b>Elevation ft</b>	<b>Clv A cfs</b>	<b>Clv B cfs</b>	<b>Clv C cfs</b>	<b>Clv D cfs</b>	<b>Wr A cfs</b>	<b>Wr B cfs</b>	<b>Wr C cfs</b>	<b>Wr D cfs</b>	<b>Outflow cfs</b>
3.45	1.15	21.41	10.70	----	----	----	1.32	----	----	----	1.32
3.47	1.10	21.40	10.70	----	----	----	1.27	----	----	----	1.27
3.48	1.05	21.40	10.69	----	----	----	1.22	----	----	----	1.22
3.50	1.01	21.40	10.69	----	----	----	1.18	----	----	----	1.18

*...End*

# Hydrograph Report

## Hyd. No. 18

10 YR POST ROUTED

Hydrograph type = Reservoir  
Storm frequency = 10 yrs  
Inflow hyd. No. = 11  
Max. Elevation = 21.77 ft

Peak discharge = 10.86 cfs  
Time interval = 1 min  
Reservoir name = TEMP BASIN  
Max. Storage = 16,453 cuft

Storage Indication method used.

Total Volume = 76,276 cuft

### Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
0.35	3.56	21.44	10.75	----	----	----	2.00	----	----	----	2.00
0.37	3.73	21.46	10.78	----	----	----	2.42	----	----	----	2.42
0.38	3.90	21.47	10.81	----	----	----	2.77	----	----	----	2.77
0.40	4.07	21.49	10.83	----	----	----	3.08	----	----	----	3.08
0.42	4.24	21.50	10.85	----	----	----	3.35	----	----	----	3.35
0.43	4.41	21.51	10.87	----	----	----	3.66	----	----	----	3.66
0.45	4.58	21.52	10.89	----	----	----	3.92	----	----	----	3.92
0.47	4.75	21.53	10.90	----	----	----	4.16	----	----	----	4.16
0.48	4.92	21.54	10.91	----	----	----	4.37	----	----	----	4.37
0.50	5.09	21.54	10.92	----	----	----	4.57	----	----	----	4.57
0.52	5.26	21.55	10.93	----	----	----	4.76	----	----	----	4.76
0.53	5.43	21.56	10.94	----	----	----	4.95	----	----	----	4.95
0.55	5.60	21.56	10.95	----	----	----	5.13	----	----	----	5.13
0.57	5.77	21.57	10.96	----	----	----	5.30	----	----	----	5.30
0.58	5.94	21.57	10.97	----	----	----	5.48	----	----	----	5.48
0.60	6.11	21.58	10.98	----	----	----	5.65	----	----	----	5.65
0.62	6.28	21.59	10.99	----	----	----	5.82	----	----	----	5.82
0.63	6.45	21.59	11.00	----	----	----	5.99	----	----	----	5.99
0.65	6.62	21.60	11.01	----	----	----	6.16	----	----	----	6.16
0.67	6.79	21.60	11.02	----	----	----	6.36	----	----	----	6.36
0.68	6.96	21.61	11.03	----	----	----	6.54	----	----	----	6.54
0.70	7.13	21.62	11.04	----	----	----	6.73	----	----	----	6.73
0.72	7.30	21.62	11.05	----	----	----	6.90	----	----	----	6.90
0.73	7.47	21.63	11.06	----	----	----	7.08	----	----	----	7.08
0.75	7.64	21.63	11.06	----	----	----	7.25	----	----	----	7.25
0.77	7.81	21.64	11.07	----	----	----	7.42	----	----	----	7.42
0.78	7.98	21.64	11.08	----	----	----	7.59	----	----	----	7.59
0.80	8.15	21.65	11.09	----	----	----	7.76	----	----	----	7.76
0.82	8.32	21.65	11.10	----	----	----	7.93	----	----	----	7.93
0.83	8.49	21.66	11.10	----	----	----	8.10	----	----	----	8.10
0.85	8.66	21.66	11.11	----	----	----	8.27	----	----	----	8.27
0.87	8.83	21.67	11.12	----	----	----	8.44	----	----	----	8.44
0.88	9.00	21.67	11.13	----	----	----	8.61	----	----	----	8.61
0.90	9.17	21.68	11.14	----	----	----	8.78	----	----	----	8.78
0.92	9.34	21.68	11.14	----	----	----	8.95	----	----	----	8.95
0.93	9.50	21.69	11.15	----	----	----	9.12	----	----	----	9.12

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**Hydrograph Discharge Table**

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
0.95	9.67	21.69	11.16	----	----	----	9.29	----	----	----	9.29
0.97	9.84	21.70	11.17	----	----	----	9.46	----	----	----	9.46
0.98	10.01	21.70	11.18	----	----	----	9.66	----	----	----	9.59
1.00	10.18	21.71	11.19	----	----	----	9.88	----	----	----	9.70
1.02	10.35	21.72	11.20	----	----	----	10.14	----	----	----	9.82
1.03	10.52	21.72	11.21	----	----	----	10.42	----	----	----	9.95
1.05	10.69	21.73	11.22	----	----	----	10.71	----	----	----	10.09
1.07	10.86	21.74	11.23	----	----	----	11.02	----	----	----	10.24
1.08	11.03	21.75	11.24	----	----	----	11.34	----	----	----	10.39
1.10	11.20 <<	21.76	11.26	----	----	----	11.67	----	----	----	10.54
1.12	11.13	21.76	11.27	----	----	----	11.95	----	----	----	10.68
1.13	11.07	21.77	11.28	----	----	----	12.14	----	----	----	10.77
1.15	11.00	21.77	11.28	----	----	----	12.26	----	----	----	10.82
1.17	10.93	21.77	11.29	----	----	----	12.32	----	----	----	10.85
1.18	10.86	21.77 <<	11.29	----	----	----	12.34	----	----	----	10.86 <<
1.20	10.79	21.77	11.29	----	----	----	12.33	----	----	----	10.86
1.22	10.73	21.77	11.28	----	----	----	12.29	----	----	----	10.84
1.23	10.66	21.77	11.28	----	----	----	12.22	----	----	----	10.80
1.25	10.59	21.77	11.28	----	----	----	12.14	----	----	----	10.77
1.27	10.52	21.77	11.27	----	----	----	12.05	----	----	----	10.72
1.28	10.46	21.76	11.27	----	----	----	11.94	----	----	----	10.67
1.30	10.39	21.76	11.26	----	----	----	11.83	----	----	----	10.62
1.32	10.32	21.76	11.26	----	----	----	11.71	----	----	----	10.56
1.33	10.25	21.75	11.25	----	----	----	11.58	----	----	----	10.50
1.35	10.18	21.75	11.25	----	----	----	11.46	----	----	----	10.44
1.37	10.12	21.75	11.24	----	----	----	11.32	----	----	----	10.38
1.38	10.05	21.74	11.24	----	----	----	11.19	----	----	----	10.32
1.40	9.98	21.74	11.23	----	----	----	11.05	----	----	----	10.25
1.42	9.91	21.74	11.23	----	----	----	10.92	----	----	----	10.19
1.43	9.84	21.73	11.22	----	----	----	10.78	----	----	----	10.12
1.45	9.78	21.73	11.22	----	----	----	10.64	----	----	----	10.06
1.47	9.71	21.73	11.21	----	----	----	10.50	----	----	----	9.99
1.48	9.64	21.72	11.20	----	----	----	10.35	----	----	----	9.92
1.50	9.57	21.72	11.20	----	----	----	10.21	----	----	----	9.85
1.52	9.50	21.71	11.19	----	----	----	10.07	----	----	----	9.79
1.53	9.44	21.71	11.19	----	----	----	9.93	----	----	----	9.72
1.55	9.37	21.71	11.18	----	----	----	9.79	----	----	----	9.65
1.57	9.30	21.70	11.18	----	----	----	9.64	----	----	----	9.58
1.58	9.23	21.70	11.17	----	----	----	9.51	----	----	----	9.51
1.60	9.17	21.70	11.16	----	----	----	9.39	----	----	----	9.39
1.62	9.10	21.69	11.16	----	----	----	9.30	----	----	----	9.30
1.63	9.03	21.69	11.16	----	----	----	9.21	----	----	----	9.21
1.65	8.96	21.69	11.15	----	----	----	9.13	----	----	----	9.13
1.67	8.89	21.69	11.15	----	----	----	9.06	----	----	----	9.06
1.68	8.83	21.68	11.15	----	----	----	8.99	----	----	----	8.99
1.70	8.76	21.68	11.14	----	----	----	8.92	----	----	----	8.92
1.72	8.69	21.68	11.14	----	----	----	8.85	----	----	----	8.85
1.73	8.62	21.68	11.14	----	----	----	8.78	----	----	----	8.78
1.75	8.55	21.68	11.13	----	----	----	8.71	----	----	----	8.71

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## Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
1.77	8.49	21.67	11.13	----	----	----	8.64	----	----	----	8.64
1.78	8.42	21.67	11.13	----	----	----	8.57	----	----	----	8.57
1.80	8.35	21.67	11.12	----	----	----	8.50	----	----	----	8.50
1.82	8.28	21.67	11.12	----	----	----	8.44	----	----	----	8.44
1.83	8.21	21.67	11.12	----	----	----	8.37	----	----	----	8.37
1.85	8.15	21.66	11.11	----	----	----	8.30	----	----	----	8.30
1.87	8.08	21.66	11.11	----	----	----	8.23	----	----	----	8.23
1.88	8.01	21.66	11.11	----	----	----	8.16	----	----	----	8.16
1.90	7.94	21.66	11.10	----	----	----	8.10	----	----	----	8.10
1.92	7.88	21.65	11.10	----	----	----	8.03	----	----	----	8.03
1.93	7.81	21.65	11.10	----	----	----	7.96	----	----	----	7.96
1.95	7.74	21.65	11.09	----	----	----	7.89	----	----	----	7.89
1.97	7.67	21.65	11.09	----	----	----	7.82	----	----	----	7.82
1.98	7.60	21.65	11.09	----	----	----	7.76	----	----	----	7.76
2.00	7.54	21.64	11.08	----	----	----	7.69	----	----	----	7.69
2.02	7.47	21.64	11.08	----	----	----	7.62	----	----	----	7.62
2.03	7.40	21.64	11.08	----	----	----	7.55	----	----	----	7.55
2.05	7.33	21.64	11.07	----	----	----	7.49	----	----	----	7.49
2.07	7.26	21.64	11.07	----	----	----	7.42	----	----	----	7.42
2.08	7.20	21.63	11.07	----	----	----	7.35	----	----	----	7.35
2.10	7.13	21.63	11.06	----	----	----	7.28	----	----	----	7.28
2.12	7.06	21.63	11.06	----	----	----	7.21	----	----	----	7.21
2.13	6.99	21.63	11.06	----	----	----	7.15	----	----	----	7.15
2.15	6.92	21.63	11.06	----	----	----	7.08	----	----	----	7.08
2.17	6.86	21.62	11.05	----	----	----	7.01	----	----	----	7.01
2.18	6.79	21.62	11.05	----	----	----	6.94	----	----	----	6.94
2.20	6.72	21.62	11.05	----	----	----	6.87	----	----	----	6.87
2.22	6.65	21.62	11.04	----	----	----	6.81	----	----	----	6.81
2.23	6.59	21.62	11.04	----	----	----	6.74	----	----	----	6.74
2.25	6.52	21.61	11.04	----	----	----	6.67	----	----	----	6.67
2.27	6.45	21.61	11.03	----	----	----	6.60	----	----	----	6.60
2.28	6.38	21.61	11.03	----	----	----	6.53	----	----	----	6.53
2.30	6.31	21.61	11.03	----	----	----	6.47	----	----	----	6.47
2.32	6.25	21.61	11.02	----	----	----	6.40	----	----	----	6.40
2.33	6.18	21.60	11.02	----	----	----	6.33	----	----	----	6.33
2.35	6.11	21.60	11.02	----	----	----	6.26	----	----	----	6.26
2.37	6.04	21.60	11.01	----	----	----	6.20	----	----	----	6.20
2.38	5.97	21.60	11.01	----	----	----	6.14	----	----	----	6.14
2.40	5.91	21.60	11.01	----	----	----	6.07	----	----	----	6.07
2.42	5.84	21.59	11.00	----	----	----	6.01	----	----	----	6.01
2.43	5.77	21.59	11.00	----	----	----	5.95	----	----	----	5.95
2.45	5.70	21.59	11.00	----	----	----	5.88	----	----	----	5.88
2.47	5.64	21.59	10.99	----	----	----	5.81	----	----	----	5.81
2.48	5.57	21.58	10.99	----	----	----	5.75	----	----	----	5.75
2.50	5.50	21.58	10.98	----	----	----	5.68	----	----	----	5.68
2.52	5.43	21.58	10.98	----	----	----	5.61	----	----	----	5.61
2.53	5.36	21.58	10.98	----	----	----	5.54	----	----	----	5.54
2.55	5.30	21.57	10.97	----	----	----	5.48	----	----	----	5.48
2.57	5.23	21.57	10.97	----	----	----	5.41	----	----	----	5.41

Continues on next page...

## Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
2.58	5.16	21.57	10.97	----	----	----	5.34	----	----	----	5.34
2.60	5.09	21.57	10.96	----	----	----	5.27	----	----	----	5.27
2.62	5.02	21.57	10.96	----	----	----	5.20	----	----	----	5.20
2.63	4.96	21.56	10.95	----	----	----	5.14	----	----	----	5.14
2.65	4.89	21.56	10.95	----	----	----	5.07	----	----	----	5.07
2.67	4.82	21.56	10.95	----	----	----	5.00	----	----	----	5.00
2.68	4.75	21.56	10.94	----	----	----	4.93	----	----	----	4.93
2.70	4.68	21.55	10.94	----	----	----	4.87	----	----	----	4.87
2.72	4.62	21.55	10.93	----	----	----	4.80	----	----	----	4.80
2.73	4.55	21.55	10.93	----	----	----	4.73	----	----	----	4.73
2.75	4.48	21.55	10.93	----	----	----	4.66	----	----	----	4.66
2.77	4.41	21.54	10.92	----	----	----	4.59	----	----	----	4.59
2.78	4.35	21.54	10.92	----	----	----	4.53	----	----	----	4.53
2.80	4.28	21.54	10.92	----	----	----	4.46	----	----	----	4.46
2.82	4.21	21.54	10.91	----	----	----	4.39	----	----	----	4.39
2.83	4.14	21.53	10.91	----	----	----	4.32	----	----	----	4.32
2.85	4.07	21.53	10.90	----	----	----	4.25	----	----	----	4.25
2.87	4.01	21.53	10.90	----	----	----	4.19	----	----	----	4.19
2.88	3.94	21.53	10.90	----	----	----	4.12	----	----	----	4.12
2.90	3.87	21.52	10.89	----	----	----	4.05	----	----	----	4.05
2.92	3.80	21.52	10.89	----	----	----	3.98	----	----	----	3.98
2.93	3.73	21.52	10.88	----	----	----	3.92	----	----	----	3.92
2.95	3.67	21.52	10.88	----	----	----	3.85	----	----	----	3.85
2.97	3.60	21.51	10.88	----	----	----	3.78	----	----	----	3.78
2.98	3.53	21.51	10.87	----	----	----	3.71	----	----	----	3.71
3.00	3.46	21.51	10.87	----	----	----	3.64	----	----	----	3.64
3.02	3.39	21.51	10.87	----	----	----	3.58	----	----	----	3.58
3.03	3.33	21.50	10.86	----	----	----	3.51	----	----	----	3.51
3.05	3.26	21.50	10.86	----	----	----	3.44	----	----	----	3.44
3.07	3.19	21.50	10.85	----	----	----	3.37	----	----	----	3.37
3.08	3.12	21.50	10.85	----	----	----	3.32	----	----	----	3.32
3.10	3.06	21.49	10.85	----	----	----	3.26	----	----	----	3.26
3.12	2.99	21.49	10.84	----	----	----	3.20	----	----	----	3.20
3.13	2.92	21.49	10.84	----	----	----	3.14	----	----	----	3.14
3.15	2.85	21.49	10.83	----	----	----	3.07	----	----	----	3.07
3.17	2.78	21.48	10.83	----	----	----	3.01	----	----	----	3.01
3.18	2.72	21.48	10.82	----	----	----	2.94	----	----	----	2.94
3.20	2.65	21.48	10.82	----	----	----	2.88	----	----	----	2.88
3.22	2.58	21.47	10.81	----	----	----	2.81	----	----	----	2.81
3.23	2.51	21.47	10.81	----	----	----	2.74	----	----	----	2.74
3.25	2.44	21.47	10.80	----	----	----	2.68	----	----	----	2.68
3.27	2.38	21.47	10.80	----	----	----	2.61	----	----	----	2.61
3.28	2.31	21.46	10.79	----	----	----	2.54	----	----	----	2.54
3.30	2.24	21.46	10.79	----	----	----	2.47	----	----	----	2.47
3.32	2.17	21.46	10.78	----	----	----	2.41	----	----	----	2.41
3.33	2.10	21.45	10.78	----	----	----	2.34	----	----	----	2.34
3.35	2.04	21.45	10.77	----	----	----	2.27	----	----	----	2.27
3.37	1.97	21.45	10.77	----	----	----	2.20	----	----	----	2.20
3.38	1.90	21.44	10.76	----	----	----	2.14	----	----	----	2.14

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**Hydrograph Discharge Table**

<b>Time (hrs)</b>	<b>Inflow cfs</b>	<b>Elevation ft</b>	<b>Clv A cfs</b>	<b>Clv B cfs</b>	<b>Clv C cfs</b>	<b>Clv D cfs</b>	<b>Wr A cfs</b>	<b>Wr B cfs</b>	<b>Wr C cfs</b>	<b>Wr D cfs</b>	<b>Outflow cfs</b>
3.40	1.83	21.44	10.76	----	----	----	2.07	----	----	----	2.07
3.42	1.77	21.44	10.75	----	----	----	2.00	----	----	----	2.00
3.43	1.70	21.43	10.75	----	----	----	1.93	----	----	----	1.93
3.45	1.63	21.43	10.74	----	----	----	1.86	----	----	----	1.86
3.47	1.56	21.43	10.74	----	----	----	1.80	----	----	----	1.80
3.48	1.49	21.42	10.73	----	----	----	1.73	----	----	----	1.73
3.50	1.43	21.42	10.73	----	----	----	1.66	----	----	----	1.66

*...End*

# Hydrograph Report

## Hyd. No. 19

### 25 YR POST ROUTED

Hydrograph type = Reservoir  
 Storm frequency = 25 yrs  
 Inflow hyd. No. = 12  
 Max. Elevation = 21.92 ft

Peak discharge = 11.51 cfs  
 Time interval = 1 min  
 Reservoir name = TEMP BASIN  
 Max. Storage = 17,112 cuft

Storage Indication method used.

Total Volume = 85,240 cuft

### Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
0.33	3.79	21.44	10.76	----	----	----	2.11	----	----	----	2.11
0.35	3.98	21.46	10.79	----	----	----	2.56	----	----	----	2.56
0.37	4.17	21.48	10.82	----	----	----	2.94	----	----	----	2.94
0.38	4.35	21.50	10.85	----	----	----	3.27	----	----	----	3.27
0.40	4.54	21.51	10.87	----	----	----	3.62	----	----	----	3.62
0.42	4.73	21.52	10.89	----	----	----	3.94	----	----	----	3.94
0.43	4.92	21.53	10.90	----	----	----	4.22	----	----	----	4.22
0.45	5.11	21.54	10.92	----	----	----	4.47	----	----	----	4.47
0.47	5.30	21.55	10.93	----	----	----	4.70	----	----	----	4.70
0.48	5.49	21.56	10.94	----	----	----	4.92	----	----	----	4.92
0.50	5.68	21.56	10.95	----	----	----	5.13	----	----	----	5.13
0.52	5.87	21.57	10.97	----	----	----	5.33	----	----	----	5.33
0.53	6.06	21.58	10.98	----	----	----	5.53	----	----	----	5.53
0.55	6.25	21.58	10.99	----	----	----	5.73	----	----	----	5.73
0.57	6.44	21.59	11.00	----	----	----	5.92	----	----	----	5.92
0.58	6.63	21.60	11.01	----	----	----	6.12	----	----	----	6.12
0.60	6.82	21.60	11.02	----	----	----	6.32	----	----	----	6.32
0.62	7.01	21.61	11.03	----	----	----	6.54	----	----	----	6.54
0.63	7.19	21.62	11.04	----	----	----	6.74	----	----	----	6.74
0.65	7.38	21.62	11.05	----	----	----	6.94	----	----	----	6.94
0.67	7.57	21.63	11.06	----	----	----	7.14	----	----	----	7.14
0.68	7.76	21.63	11.07	----	----	----	7.33	----	----	----	7.33
0.70	7.95	21.64	11.08	----	----	----	7.52	----	----	----	7.52
0.72	8.14	21.65	11.09	----	----	----	7.71	----	----	----	7.71
0.73	8.33	21.65	11.09	----	----	----	7.90	----	----	----	7.90
0.75	8.52	21.66	11.10	----	----	----	8.09	----	----	----	8.09
0.77	8.71	21.66	11.11	----	----	----	8.28	----	----	----	8.28
0.78	8.90	21.67	11.12	----	----	----	8.47	----	----	----	8.47
0.80	9.09	21.67	11.13	----	----	----	8.66	----	----	----	8.66
0.82	9.28	21.68	11.14	----	----	----	8.85	----	----	----	8.85
0.83	9.47	21.69	11.15	----	----	----	9.04	----	----	----	9.04
0.85	9.66	21.69	11.16	----	----	----	9.23	----	----	----	9.23
0.87	9.84	21.70	11.17	----	----	----	9.42	----	----	----	9.42
0.88	10.03	21.70	11.17	----	----	----	9.63	----	----	----	9.58
0.90	10.22	21.71	11.18	----	----	----	9.87	----	----	----	9.69
0.92	10.41	21.72	11.20	----	----	----	10.16	----	----	----	9.83

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## Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
0.93	10.60	21.72	11.21	----	----	----	10.46	----	----	----	9.97
0.95	10.79	21.73	11.22	----	----	----	10.79	----	----	----	10.13
0.97	10.98	21.74	11.24	----	----	----	11.13	----	----	----	10.29
0.98	11.17	21.75	11.25	----	----	----	11.48	----	----	----	10.46
1.00	11.36	21.76	11.27	----	----	----	11.85	----	----	----	10.63
1.02	11.55	21.77	11.28	----	----	----	12.22	----	----	----	10.80
1.03	11.74	21.78	11.30	----	----	----	12.60	----	----	----	10.98
1.05	11.93	21.79	11.31	----	----	----	12.98	----	----	----	11.16
1.07	12.12	21.80	11.33	----	----	----	13.38	----	----	----	11.33
1.08	12.31	21.81	11.35	----	----	----	13.86	----	----	----	11.35
1.10	12.50 <<	21.83	11.37	----	----	----	14.44	----	----	----	11.37
1.12	12.42	21.84	11.39	----	----	----	15.05	----	----	----	11.39
1.13	12.34	21.85	11.41	----	----	----	15.59	----	----	----	11.41
1.15	12.27	21.87	11.43	----	----	----	16.09	----	----	----	11.43
1.17	12.19	21.88	11.44	----	----	----	16.53	----	----	----	11.44
1.18	12.12	21.89	11.46	----	----	----	16.92	----	----	----	11.46
1.20	12.04	21.89	11.47	----	----	----	17.26	----	----	----	11.47
1.22	11.97	21.90	11.48	----	----	----	17.56	----	----	----	11.48
1.23	11.89	21.91	11.49	----	----	----	17.83	----	----	----	11.49
1.25	11.81	21.91	11.50	----	----	----	18.05	----	----	----	11.50
1.27	11.74	21.92	11.50	----	----	----	18.22	----	----	----	11.50
1.28	11.66	21.92	11.51	----	----	----	18.33	----	----	----	11.51
1.30	11.59	21.92	11.51	----	----	----	18.40	----	----	----	11.51
1.32	11.51	21.92 <<	11.51	----	----	----	18.43	----	----	----	11.51 <<
1.33	11.44	21.92	11.51	----	----	----	18.41	----	----	----	11.51
1.35	11.36	21.92	11.51	----	----	----	18.34	----	----	----	11.51
1.37	11.28	21.92	11.50	----	----	----	18.23	----	----	----	11.50
1.38	11.21	21.91	11.50	----	----	----	18.08	----	----	----	11.50
1.40	11.13	21.91	11.49	----	----	----	17.88	----	----	----	11.49
1.42	11.06	21.90	11.48	----	----	----	17.64	----	----	----	11.48
1.43	10.98	21.90	11.47	----	----	----	17.37	----	----	----	11.47
1.45	10.91	21.89	11.46	----	----	----	17.08	----	----	----	11.46
1.47	10.83	21.88	11.45	----	----	----	16.75	----	----	----	11.45
1.48	10.75	21.87	11.44	----	----	----	16.39	----	----	----	11.44
1.50	10.68	21.86	11.42	----	----	----	15.99	----	----	----	11.42
1.52	10.60	21.85	11.41	----	----	----	15.56	----	----	----	11.41
1.53	10.53	21.84	11.39	----	----	----	15.09	----	----	----	11.39
1.55	10.45	21.83	11.37	----	----	----	14.60	----	----	----	11.37
1.57	10.38	21.82	11.35	----	----	----	14.07	----	----	----	11.35
1.58	10.30	21.80	11.33	----	----	----	13.51	----	----	----	11.33
1.60	10.22	21.79	11.31	----	----	----	12.99	----	----	----	11.17
1.62	10.15	21.78	11.29	----	----	----	12.55	----	----	----	10.96
1.63	10.07	21.77	11.28	----	----	----	12.17	----	----	----	10.78
1.65	10.00	21.76	11.27	----	----	----	11.83	----	----	----	10.62
1.67	9.92	21.75	11.25	----	----	----	11.53	----	----	----	10.48
1.68	9.84	21.75	11.24	----	----	----	11.27	----	----	----	10.35
1.70	9.77	21.74	11.23	----	----	----	11.02	----	----	----	10.24
1.72	9.69	21.73	11.22	----	----	----	10.79	----	----	----	10.13
1.73	9.62	21.73	11.21	----	----	----	10.58	----	----	----	10.03

Continues on next page...

## Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
1.75	9.54	21.72	11.21	----	----	----	10.38	----	----	----	9.93
1.77	9.47	21.72	11.20	----	----	----	10.19	----	----	----	9.84
1.78	9.39	21.71	11.19	----	----	----	10.00	----	----	----	9.75
1.80	9.31	21.71	11.18	----	----	----	9.82	----	----	----	9.67
1.82	9.24	21.70	11.18	----	----	----	9.64	----	----	----	9.58
1.83	9.16	21.70	11.17	----	----	----	9.48	----	----	----	9.48
1.85	9.09	21.69	11.16	----	----	----	9.35	----	----	----	9.35
1.87	9.01	21.69	11.16	----	----	----	9.24	----	----	----	9.24
1.88	8.94	21.69	11.15	----	----	----	9.15	----	----	----	9.15
1.90	8.86	21.69	11.15	----	----	----	9.06	----	----	----	9.06
1.92	8.78	21.68	11.14	----	----	----	8.97	----	----	----	8.97
1.93	8.71	21.68	11.14	----	----	----	8.89	----	----	----	8.89
1.95	8.63	21.68	11.14	----	----	----	8.81	----	----	----	8.81
1.97	8.56	21.68	11.13	----	----	----	8.73	----	----	----	8.73
1.98	8.48	21.67	11.13	----	----	----	8.65	----	----	----	8.65
2.00	8.41	21.67	11.13	----	----	----	8.58	----	----	----	8.58
2.02	8.33	21.67	11.12	----	----	----	8.50	----	----	----	8.50
2.03	8.25	21.67	11.12	----	----	----	8.43	----	----	----	8.43
2.05	8.18	21.66	11.12	----	----	----	8.35	----	----	----	8.35
2.07	8.10	21.66	11.11	----	----	----	8.27	----	----	----	8.27
2.08	8.03	21.66	11.11	----	----	----	8.20	----	----	----	8.20
2.10	7.95	21.66	11.10	----	----	----	8.12	----	----	----	8.12
2.12	7.88	21.66	11.10	----	----	----	8.05	----	----	----	8.05
2.13	7.80	21.65	11.10	----	----	----	7.97	----	----	----	7.97
2.15	7.72	21.65	11.09	----	----	----	7.90	----	----	----	7.90
2.17	7.65	21.65	11.09	----	----	----	7.82	----	----	----	7.82
2.18	7.57	21.65	11.09	----	----	----	7.74	----	----	----	7.74
2.20	7.50	21.64	11.08	----	----	----	7.67	----	----	----	7.67
2.22	7.42	21.64	11.08	----	----	----	7.59	----	----	----	7.59
2.23	7.35	21.64	11.08	----	----	----	7.52	----	----	----	7.52
2.25	7.27	21.64	11.07	----	----	----	7.44	----	----	----	7.44
2.27	7.19	21.64	11.07	----	----	----	7.37	----	----	----	7.36
2.28	7.12	21.63	11.07	----	----	----	7.29	----	----	----	7.29
2.30	7.04	21.63	11.06	----	----	----	7.21	----	----	----	7.21
2.32	6.97	21.63	11.06	----	----	----	7.14	----	----	----	7.14
2.33	6.89	21.63	11.05	----	----	----	7.06	----	----	----	7.06
2.35	6.82	21.62	11.05	----	----	----	6.99	----	----	----	6.99
2.37	6.74	21.62	11.05	----	----	----	6.91	----	----	----	6.91
2.38	6.66	21.62	11.04	----	----	----	6.83	----	----	----	6.83
2.40	6.59	21.62	11.04	----	----	----	6.76	----	----	----	6.76
2.42	6.51	21.61	11.04	----	----	----	6.68	----	----	----	6.68
2.43	6.44	21.61	11.03	----	----	----	6.61	----	----	----	6.61
2.45	6.36	21.61	11.03	----	----	----	6.53	----	----	----	6.53
2.47	6.29	21.61	11.03	----	----	----	6.46	----	----	----	6.46
2.48	6.21	21.61	11.02	----	----	----	6.38	----	----	----	6.38
2.50	6.13	21.60	11.02	----	----	----	6.30	----	----	----	6.30
2.52	6.06	21.60	11.02	----	----	----	6.23	----	----	----	6.23
2.53	5.98	21.60	11.01	----	----	----	6.16	----	----	----	6.16
2.55	5.91	21.60	11.01	----	----	----	6.09	----	----	----	6.09

Continues on next page...

## Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Outflow cfs
2.57	5.83	21.59	11.00	----	----	----	6.02	----	----	----	6.02
2.58	5.76	21.59	11.00	----	----	----	5.95	----	----	----	5.95
2.60	5.68	21.59	11.00	----	----	----	5.88	----	----	----	5.88
2.62	5.60	21.59	10.99	----	----	----	5.80	----	----	----	5.80
2.63	5.53	21.58	10.99	----	----	----	5.73	----	----	----	5.73
2.65	5.45	21.58	10.98	----	----	----	5.65	----	----	----	5.65
2.67	5.38	21.58	10.98	----	----	----	5.58	----	----	----	5.58
2.68	5.30	21.58	10.97	----	----	----	5.50	----	----	----	5.50
2.70	5.23	21.57	10.97	----	----	----	5.43	----	----	----	5.43
2.72	5.15	21.57	10.97	----	----	----	5.35	----	----	----	5.35
2.73	5.07	21.57	10.96	----	----	----	5.28	----	----	----	5.28
2.75	5.00	21.56	10.96	----	----	----	5.20	----	----	----	5.20
2.77	4.92	21.56	10.95	----	----	----	5.12	----	----	----	5.12
2.78	4.85	21.56	10.95	----	----	----	5.05	----	----	----	5.05
2.80	4.77	21.56	10.94	----	----	----	4.97	----	----	----	4.97
2.82	4.70	21.55	10.94	----	----	----	4.90	----	----	----	4.90
2.83	4.62	21.55	10.94	----	----	----	4.82	----	----	----	4.82
2.85	4.54	21.55	10.93	----	----	----	4.75	----	----	----	4.75
2.87	4.47	21.55	10.93	----	----	----	4.67	----	----	----	4.67
2.88	4.39	21.54	10.92	----	----	----	4.59	----	----	----	4.59
2.90	4.32	21.54	10.92	----	----	----	4.52	----	----	----	4.52
2.92	4.24	21.54	10.91	----	----	----	4.44	----	----	----	4.44
2.93	4.17	21.54	10.91	----	----	----	4.37	----	----	----	4.37
2.95	4.09	21.53	10.91	----	----	----	4.29	----	----	----	4.29
2.97	4.01	21.53	10.90	----	----	----	4.22	----	----	----	4.22
2.98	3.94	21.53	10.90	----	----	----	4.14	----	----	----	4.14
3.00	3.86	21.52	10.89	----	----	----	4.06	----	----	----	4.06
3.02	3.79	21.52	10.89	----	----	----	3.99	----	----	----	3.99
3.03	3.71	21.52	10.88	----	----	----	3.91	----	----	----	3.91
3.05	3.64	21.52	10.88	----	----	----	3.84	----	----	----	3.84
3.07	3.56	21.51	10.88	----	----	----	3.76	----	----	----	3.76
3.08	3.48	21.51	10.87	----	----	----	3.69	----	----	----	3.69
3.10	3.41	21.51	10.87	----	----	----	3.61	----	----	----	3.61
3.12	3.33	21.51	10.86	----	----	----	3.53	----	----	----	3.53
3.13	3.26	21.50	10.86	----	----	----	3.46	----	----	----	3.46
3.15	3.18	21.50	10.85	----	----	----	3.38	----	----	----	3.38
3.17	3.10	21.50	10.85	----	----	----	3.32	----	----	----	3.32
3.18	3.03	21.49	10.85	----	----	----	3.26	----	----	----	3.26
3.20	2.95	21.49	10.84	----	----	----	3.19	----	----	----	3.19
3.22	2.88	21.49	10.84	----	----	----	3.12	----	----	----	3.12
3.23	2.80	21.49	10.83	----	----	----	3.05	----	----	----	3.05
3.25	2.73	21.48	10.82	----	----	----	2.98	----	----	----	2.98
3.27	2.65	21.48	10.82	----	----	----	2.90	----	----	----	2.90
3.28	2.57	21.48	10.81	----	----	----	2.83	----	----	----	2.83
3.30	2.50	21.47	10.81	----	----	----	2.76	----	----	----	2.76
3.32	2.42	21.47	10.80	----	----	----	2.68	----	----	----	2.68
3.33	2.35	21.46	10.80	----	----	----	2.61	----	----	----	2.61
3.35	2.27	21.46	10.79	----	----	----	2.53	----	----	----	2.53
3.37	2.20	21.46	10.79	----	----	----	2.46	----	----	----	2.46

Continues on next page...

**Hydrograph Discharge Table**

<b>Time (hrs)</b>	<b>Inflow cfs</b>	<b>Elevation ft</b>	<b>Civ A cfs</b>	<b>Civ B cfs</b>	<b>Civ C cfs</b>	<b>Civ D cfs</b>	<b>Wr A cfs</b>	<b>Wr B cfs</b>	<b>Wr C cfs</b>	<b>Wr D cfs</b>	<b>Outflow cfs</b>
3.38	2.12	21.45	10.78	----	----	----	2.38	----	----	----	2.38
3.40	2.04	21.45	10.77	----	----	----	2.31	----	----	----	2.31
3.42	1.97	21.45	10.77	----	----	----	2.23	----	----	----	2.23
3.43	1.89	21.44	10.76	----	----	----	2.15	----	----	----	2.15
3.45	1.82	21.44	10.76	----	----	----	2.08	----	----	----	2.08
3.47	1.74	21.44	10.75	----	----	----	2.00	----	----	----	2.00
3.48	1.67	21.43	10.75	----	----	----	1.93	----	----	----	1.93
3.50	1.59	21.43	10.74	----	----	----	1.85	----	----	----	1.85
3.52	1.51	21.43	10.74	----	----	----	1.78	----	----	----	1.78

*...End*

## TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET

(with or without an emergency spillway)

Project GOVERNOR'S LAND : FOWLER'S LAKE AES # 7173-6-2

Basin # 1 Location ALONG ROADWAY

Total area draining to basin: 11.9 acres.

### Basin Volume Design

#### Wet Storage:

1. Minimum required volume = 67 cu. yds. x Total Drainage Area (acres).

$$67 \text{ cu. yds.} \times \underline{11.9} \text{ acres} = \underline{797} \text{ cu. yds.}$$

2. Available basin volume = 480 cu. yds. at elevation 21. (From storage - elevation curve)

\* SEE HANDWRITTEN  
CALCS

3. Excavate \_\_\_\_\_ cu. yds. to obtain required volume\*.

\* Elevation corresponding to required volume = invert of the dewatering orifice.

4. Available volume before cleanout required.

$$33 \text{ cu. yds.} \times \underline{11.9} \text{ acres} = \underline{393} \text{ cu. yds.}$$

5. Elevation corresponding to cleanout level = 20.4.

(From Storage - Elevation Curve)

USE 20.5

6. Distance from invert of the dewatering orifice to cleanout level = N/A ft.  
(Min. = 1.0 ft.)

#### Dry Storage:

7. Minimum required volume = 67 cu. yds. x Total Drainage Area (acres).

$$67 \text{ cu. yds.} \times \underline{11.9} \text{ acres} = \underline{797} \text{ cu. yds.}$$

16. With emergency spillway:

Assumed available head (h) = 1.2 ft. (Using Q<sub>2</sub>)

h = Crest of Emergency Spillway Elevation - Crest of Riser Elevation  
22.5 - 21.3

Without emergency spillway:

Assumed available head (h) = \_\_\_\_\_ ft. (Using Q<sub>25</sub>)

h = Design High Water Elevation - Crest of Riser Elevation

17. Riser diameter (D<sub>r</sub>) = 48 in. Actual head (h) = .35 ft.

(From Plate 3.14-8.)

Note: Avoid orifice flow conditions. ✓

18. Barrel length (l) = 33 ft.

Head (H) on barrel through embankment = 5.7 ft.  
22.5 - 16.8

(From Plate 3.14-7).

19. Barrel diameter = 15 in.

(From Plate 3.14-B [concrete pipe] or Plate 3.14-A [corrugated pipe]).

20. Trash rack and anti-vortex device

Diameter = 72 inches.

Height = 21 inches.

(From Table 3.14-D).

Emergency Spillway Design

21. Required spillway capacity Q<sub>e</sub> = Q<sub>25</sub> - Q<sub>p</sub> = 4.6 cfs.

12.5 - 7.9  
~~11.5 - 7.0~~

22. Bottom width (b) = 12 ft.; the slope of the exit channel (s) = ~~0.5~~ ft./foot; and the minimum length of the exit channel (x) = \_\_\_\_\_ ft.

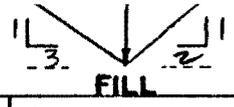
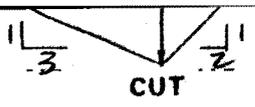
N/A

(From Table 3.14-C).

25 yr controlled by prin. splwy



LANE  
LEFT SIDE



PROJECT POWELL'S LANE - 13  
BY \_\_\_\_\_ DATE 9/25/98

STA. TO STA.	FLOW	C	A	C A		Tc	I <sub>2</sub>	Q <sub>2</sub>	C or F	Slope Ft-Ft	ALLOW VEL	Earth	Protective			Lining		I <sub>10</sub>	Q <sub>10</sub>	DEP.	REMARKS
				n=03	n=.05							n=0.15									
				INCR.	ACC.							VEL.	Qn	VEL.	DEP.	Qn	DEP.				
END 19+00	↓	0.4	1.4	0.56	0.56	17	3.3	1.8	C	0.004	2.5			1.4	8.5"			4.4	2.5	12"	GRASS ✓
19+00 18+00	↓	0.45	0.36	0.16	0.72		3.2	2.3	C	0.009	2.5			1.7	9"			4.3	3.1	10"	GRASS ✓
18+00 17+00	↓	0.45	0.28	0.13	0.85		3.1	2.6	C	0.016	2.5			2.2	8"			4.2	3.6	9"	GRASS ✓
17+00 16+00	↓	0.45	0.29	0.13	0.98		3.0	2.9	C	0.02	2.5			2.4	8"			4.1	4.0	9"	GRASS ✓
16+00 15+00	↓	0.55	0.18	0.1	1.08		2.9	3.1	L	0.023	2.5			2.6	8"	5"	4.0	4.3	6"	CONC ✓	
15+00 14+00	↓	0.55	0.20	0.11	1.19		2.8	3.3	L	0.012	2.5			2.1	9.5	6"	3.9	4.6	7"	CONC ✓	
14+00 13+25	↓	0.6	0.20	0.12	1.31		2.7	3.5	L	0.004	2.5			1.4	12"	7.5"	3.7	4.8	8.5"	CONC	
13+25	↓	0.7	0.1	0.07	1.38		2.6	3.6	L	0.004	2.5					11"	3.6	12.3	12.5"	CONC	

2-27

15

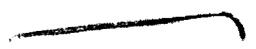
LANE  
RIGHT SIDE



PROJECT FOURTH LANE  
BY \_\_\_\_\_ DATE 9/25/98

STA. TO STA.		FLOW	C	A	C A		Tc	I <sub>2</sub>	Q <sub>2</sub>	C or F	Slope Ft-Ft	ALLOW VEL	Earth			Protective			Lining		REMARKS		
					INCR.	ACC.							n=.03	n=.05	n=.015	I <sub>10</sub>	Q <sub>10</sub>	DEP.	On	VEL.		DEP.	On
EHD	19+00	↓	0.35	0.40	0.13	0.13	17	3.3	0.6	C	0.006	2.5				0.09	5			4.4	0.8	6.5	GRASS ✓
	19+00	↓	0.4	0.91	0.36	0.54		3.2	1.7	C	0.009	2.5				1.6	8			4.3	2.3	9"	GRASS ✓
	18+00	↓	0.35	1.8	0.63	1.17		3.1	3.6	C	0.016	2.5				2.4	8			4.2	4.9	10.5"	GRASS ✓
	17+00	↓	0.4	0.78	0.31	1.48		3.0	4.4	C	0.02	2.5				2.8	9.5	6"		4.1	6.1	7"	CONC. ✓
	16+00	↓	0.45	0.46	0.21	1.69		2.9	4.9	C	0.023	2.5				3	16"	6.5"		4.0	6.8	7"	CONC. ✓
	15+00	↓	0.5	0.21	0.80	1.79		2.8	5.0	C	0.012	2.5				2.3	11	7"		3.9	6.9	8"	CONC. ✓
	14+00	↓	0.6	0.2	0.12	1.91		2.7	5.2	C	0.004	2.5				1.5	13.5	9"		3.8	7.3	10"	CONC. ✓

2-27



**WORKSHEET FOR BMP POINT SYSTEM AS OF OCTOBER 1998  
GOVERNOR'S LAND AT TWO RIVERS**

**A. STRUCTURAL BMP POINT ALLOCATION (EXISTING STRUCTURES)**

ITEM	BMP DESIGN TYPE	FACILITY NAME	BMP POINTS		FRACTION OF SITE SERVED BY BMP	WEIGHTED BMP POINTS
WET PONDS	DESIGN TYPE 3 ON DESIGN TYPE 7	TRAVIS POND	11.0	X	436.04 =	3.27
		WINGFIELD LAKE FOWLER'S LAKE WHITTAKER LAKE KITCHUM'S POND BENNETT'S POND HORNE'S LAKE			<u>1465.22</u>	
	DESIGN TYPE 7	BARRETT'S POINTE	9.0	X	3.94 =	0.02
					<u>1465.22</u>	
DRY PONDS	DESIGN TYPE 3	DRY POND #1	6.0	X	140.34 =	0.57
		DRY POND #2 TIMBER STRUCT. #8			<u>1465.22</u>	
DRY PONDS	DESIGN TYPE 2 (TIMBER)	TIMBER STRUCT. #5	4.0	X	56.30 =	0.15
		TIMBER STRUCT. #9 TIMBER STRUCT. #10 (NEW ENTRY)			<u>1465.22</u>	
		TIMBER STRUCTURES				
		TIMBER STRUCT. #1	2.0	X	43.40 =	0.06
		TIMBER STRUCT. #2 TIMBER STRUCT. #3 TIMBER STRUCT. #4			<u>1465.22</u>	
	MARSH AUGMENTED BMP	MARSH AUGM. BMP #1 MARSH AUGM. BMP #2 MARSH AUGM. BMP #2	9.0	X	15.80 =	0.10
					<u>1465.22</u>	
DRY PONDS	DESIGN TYPE 3	DRY POND #1	2.0	X	78.05 =	0.11
		DRY POND #2			<u>1465.22</u>	
	TIMBER STRUCTURES WITH MARSH AUGMENTED	TIMBER STRUCT. #6 TIMBER STRUCT. #7	6.0	X	40.38 =	0.17
					<u>1465.22</u>	
	GOLF COURSE INFILTRATION TRENCHES		10.0	X	121.20 =	0.83
					<u>1465.22</u>	
					SUBTOTAL	5.28

**WORKSHEET FOR BMP POINT SYSTEM AS OF OCTOBER 1998  
GOVERNOR'S LAND AT TWO RIVERS  
(CONTINUED)**

<b>B.</b>	<b><u>STRUCTURAL BMP POINT ALLOCATION (PROPOSED STRUCTURES)</u></b>		
<b>DRY POND</b>	SEE DRY PONDS ABOVE - TIMBER STRUCTURE #10		0.00
		SUBTOTAL	0.00
	<b>TOTAL WEIGHTED STRUCTURAL BMP POINTS</b>		<u>5.28</u>

<b>C.</b>	<b><u>NATURAL OPEN SPACE CREDIT</u></b> (SEE ATTACHED SHEETS OF MAJOR OPEN SPACE AND OPEN SPACE TABULATIONS)		
	<b><u>FRACTION OF SITE</u></b>	<b><u>NATURAL OPEN SPACE CREDIT</u></b>	<b>POINTS FOR NATURAL OPEN SPACE</b>
	$\frac{645.71}{1465.22}$	X 100%	0.1/1% =
			4.41

<b>D.</b>	<b><u>TOTAL WEIGHTED POINTS</u></b>		
	<b><u>STRUCTURAL BMP POINTS</u></b>	<b><u>NATURAL OPEN SPACE POINTS</u></b>	<b><u>TOTAL BMP POINTS</u></b>
	5.28	+ 4.41 =	<u>9.69</u>

**WORKSHEET FOR BMP POINT SYSTEM AS OF OCTOBER 1998  
GOVERNOR'S LAND AT TWO RIVERS**

MAJOR OPEN SPACE AND NATURAL OPEN SPACE TABULATION

I. MAJOR OPEN SPACE (AS NUMBERED ON BMP PLAN WITH CIRCLE)

	<u>ACRES</u>
1	22.74
2	0.50
3	29.38
4	2.03
5	1.15
6	0.66
7	1.46
8	5.74
9	24.21
10	3.94
11	2.57
12	1.72
13	1.95
14	3.18
15	0.29
16	1.63
17	10.14
18	4.17
19	1.27
20	0.96
21	1.76
22	4.13
23	12.41
24	25.58
25	1.71
26	0.55
27	1.28
28	11.89
29	8.23
30	1.95
31	3.31
32	3.17
33	0.87
34	7.57
35	7.10
36	17.85
37	4.57
38	9.48
39	6.92
40	4.80
41	7.18
42	7.97
43 (formerly part of Future Major Open Space #20)	1.17
44 (formerly part of Future Major Open Space #19)	2.06
45 (formerly part of Future Major Open Space #9)	1.30
46 (formerly part of Future Major Open Space #20)	0.54
THE POINT	7.47
<b>SUBTOTAL</b>	<b>282.50 AC.+/-</b>

II. SUBDIVISION OPEN SPACES (AS NUMBERED ON BMP PLAN WITH SQUARES)

BAY 1, POD 1 (TRAVIS POND)	5.66
BAY 1, POD 2 (WHITTAKER ISLAND, BLOCK A)	5.80
BAY 1, POD 3 (WHITTAKER ISLAND, BLOCK B)	1.43
BAY 1, POD 4 (PARKSIDE)	5.64
<b>TOTAL BAY 1</b>	<b>18.53 AC.+/-</b>
BAY 2, POD 1 (HORNE'S LAKE)	4.87
BAY 2, POD 2 (HARPER'S MILL)	12.72
BAY 2, POD 3 (NATHANIEL'S GREEN)	4.27
BAY 2, POD 4 (NATHANIEL'S GREEN, BLOCK "B")	1.15
BAY 2, POD 5 (NATHANIEL'S RUN)	1.60
<b>TOTAL BAY 2</b>	<b>24.61 AC.+/-</b>
BAY 3, POD 1 (FOWLER'S LAKE)	1.04
BAY 3, POD 2A (RIVER OAKS NORTH - BLOCK B)	0.00
BAY 3, POD 2B	4.48
BAY 3, POD 3A (FOUNDER'S HILL)	2.37
BAY 3, POD 3B (FOUNDER'S HILL)	0.97
BAY 3, POD 4 (RIVER OAKS NORTH)	-0-
<b>TOTAL BAY 3</b>	<b>8.86 AC.+/-</b>
BAY 4, POD 1 (THE HARBOR AT TWO RIVERS)	0.11
BAY 4, POD 2 (CYPRESS ISLE)	1.06
BAY 4, POD 3 (BARRET'S POINTE)	1.16
(CLUB VILLAS)	0.28
BAY 4, POD 4 (TWO RIVERS POINT)	-0-
<b>TOTAL BAY 4</b>	<b>2.61 AC.+/-</b>
BAY 5, POD 1 (WINGFIELD LAKE)	5.37
BAY 5, POD 2 (HEARTHSTONE, KITCHUM'S POND, BLOCK A AND PLANTER'S ROUND)	1.76
BAY 5, POD 3 (KITCHUM POND, BLOCK "B")	0.96
BAY 5, POD 4	0.96
<b>TOTAL BAY 5</b>	<b>9.05 AC.+/-</b>
<b>BAY 6, POD 1</b>	<b>0.00</b>
BAY 6, POD 2 ( KITCHUM'S POND - BLOCK 'C')	0.23
<b>TOTAL BAY 6</b>	<b>0.23 AC.+/-</b>
<b>SUBTOTAL OF OPEN AREAS IN SUBDIVISIONS</b>	<b>88.50 AC.+/-</b>

III. PARK EAST (RECREATIONAL SITE)

POOL AREA	3.79 AC.+/-
TENNIS FACILITY	1.47 AC.+/-
<b>SUBTOTAL</b>	<b>5.26 AC.+/-</b>

IV. GOLF COURSE 20.00 AC.+/-

V. CONSERVATION EASEMENT 201.00 AC.+/-

VI. FUTURE OPEN AREA (AS NUMBERED ON BMP PLAN WITH HEXAGON)

	ACRES	
1.		32.69
2.		5.90
3.	DELETE	
4.	DELETE	
5.	DELETE	
6.	DELETE	
7.		0.31
8.	DELETE	
9.	DELETE - now listed as Major Open Space #45)	
10.		
11.	DELETE	
12.	DELETE	
13.	DELETED - NOW LISTED AS MAJOR OPEN SPACE #39 & 40	
14.	DELETE	
15.	DELETED - NOW LISTED AS MAJOR OPEN SPACE #41	
16.	DELETE	
17.	DELETED - NOW LISTED AS MAJOR OPEN SPACE #42	
18.		7.13
19.	Revised area of Residual Parcel	2.42
20.	DELETE - now listed as Major Open Space #43)	
SUBTOTAL		48.45 AC.+/-

VII. TOTAL NATURAL OPEN SPACE 645.71 AC.+/-

# Hydraflow Storm Sewer Tabulation

Station		Len (ft)	Drng Area		Rnoff coeff (C)	Area x C		Tc		Rain (l) (in/hr)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr (ac)	Total (ac)		Incr	Total	Inlet (min)	Syst (min)					Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	53.0	0.20	4.84	0.60	0.12	1.88	5.0	18.4	4.1	7.73 ✓	8.85 ✓	4.40	14 23 e	0.57	22.30	22.00	23.47	23.17	24.50	22.00	SS#83-1 - SS#83-2
2	1	72.0	4.64	4.64	0.38	1.76	1.76	18.0	18.0	4.1	7.31 ✓	8.78 ✓	6.21	15	1.85	23.63	22.30	24.71	23.92	23.63	24.50	SS#83-2 - SS#83-3

Project File: system83.stm	I-D-F File: Jcc.IDF	Total number of lines: 2	Run Date: 09-27-1999
----------------------------	---------------------	--------------------------	----------------------

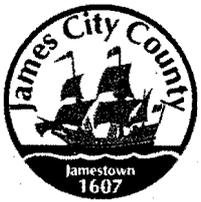
NOTES: Intensity = 17.05 / (Tc + 1.50) ^ 0.48; Return period = 10 Yrs. ; Initial tailwater elevation = 23.17 (ft)

# Hydraflow Storm Sewer Tabulation

Station		Len (ft)	Drng Area		Rnoff coeff (C)	Area x C		Tc		Rain (l) (in/hr)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr (ac)	Total (ac)		Incr	Total	Inlet (min)	Syst (min)					Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	53.0	0.20	4.84	0.60	0.12	1.88	5.0	18.4	4.1	7.73 ✓	8.85 ✓	4.40	14 23 e	0.57	22.30	22.00	23.47	23.17	24.50	22.00	SS#83-1 - SS#83-2
2	1	72.0	4.64	4.64	0.38	1.76	1.76	18.0	18.0	4.1	7.31 ✓	8.78 ✓	6.21	15	1.85	23.63	22.30	24.71	23.92	23.63	24.50	SS#83-2 - SS#83-3
Project File: system83.stm								I-D-F File: Jcc.IDF						Total number of lines: 2				Run Date: 09-27-1999				

NOTES: Intensity = 17.05 / (Tc + 1.50) ^ 0.48; Return period = 10 Yrs. ; Initial tailwater elevation = 23.17 (ft)

AB File



# DEVELOPMENT MANAGEMENT

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

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(757) 253-6626  
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ENVIRONMENTAL DIVISION  
(757) 253-6670  
environ@james-city.va.us

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

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

December 9, 2002

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

Re: Governor's Land - Fowlers Lake Block B  
County Plan No. S-110-98  
County BMP ID Code: JR 054

Dear Mr. Bennett:

The Environmental Division has reviewed a record drawing as submitted to our office on March 27<sup>th</sup> 2002 for the BMP at the above referenced project. The record drawing provides as-built information for a timber crib wall situated approximately 250 ft. west (downstream) of North Fowler's Close.

Based on our review of the project and a concurrent field inspection as performed on November 22<sup>nd</sup> 2002, the following items must be addressed prior to release of the developer's surety instrument for the stormwater management/BMP facility at the site:

**Construction Certification:**

1. In accordance with the Note # 18 on Sheet 8 of the approved plan, construction certification for the stormwater management/BMP facility is required. None was provided. The certification can be in letter format or by use of the certification statement in Section 4 of the *James City County, Stormwater Management / BMP Facilities, Record Drawing and Construction Certification, Standard Forms & Instructions.*

**Record Drawing:**

2. The record drawing set dated March 13<sup>th</sup> 2002 is **satisfactory**. Please forward one reproducible and one blue/black line set of the record drawings to our office.

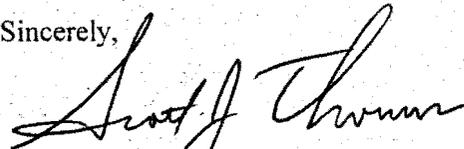
**Construction - Related Items:**

3. Clear debris (mainly organic and leave matter) from around the perforated pipe and stone extended detention pipe system and within the enclosed tapered end wall at the upstream end of the square 9" x 9" orifice through the wall. Flow through flow control structures shall not be obstructed by sediment, debris or vegetation.

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

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

Sincerely,

A handwritten signature in black ink, appearing to read "Scott J. Thomas". The signature is fluid and cursive, with the first name "Scott" being the most prominent.

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

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

G:\AsBuilts\S11098.jr054

## Construction Certification for Stormwater Management/BMP Facilities

Governors Land BMP Facility #12 (Fowler's Lake)  
James City County, Virginia

Prepared By:

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

Prepared For:

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

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

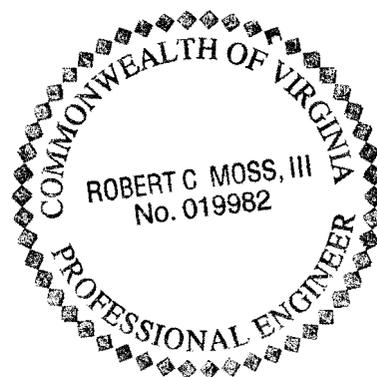
This certification pertains to the embedment and stability of the facility's timber posts, whose construction was not monitored but was later investigated by an engineer utilizing test pits to ascertain post embedment, soil support, and concrete encasement of posts.

No exceptions made.

By:



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



Dated: 3/28/03

# Memorandum

**DATE:** May 14, 2003  
**TO:** Scott Thomas  
**FROM:** Victoria Bains  
**SUBJECT:** Fowler's Lake Block "B" Timber Structure, County BMP ID Code: JR054

---

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

**Construction Certification:**

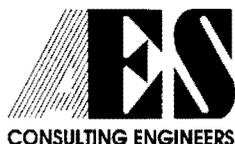
Being provided by Earthworks Consulting Engineers, Inc.

**Record Drawings:**

No further action required.

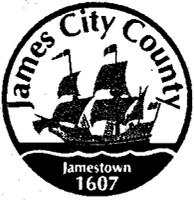
**Construction – Related Items:**

Sediment, debris and organic matter have been cleared and removed from facility. The stone located next to the timber wall has been cleared of any debris and more stone has been added per design of approved plans.



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

SJT File



# DEVELOPMENT MANAGEMENT

101-E MOUNTS BAY ROAD, P.O. BOX 8784, WILLIAMSBURG, VIRGINIA 23187-8784  
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COUNTY ENGINEER  
(757) 253-6678  
INTEGRATED PEST MANAGEMENT  
(757) 253-2620

December 9, 2002

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

*Reinspect  
6-2-03*

Re: Governor's Land - Fowlers Lake Block B  
County Plan No. S-110-98  
County BMP ID Code: JR 054

Dear Mr. Bennett:

The Environmental Division has reviewed a record drawing as submitted to our office on March 27<sup>th</sup> 2002 for the BMP at the above referenced project. The record drawing provides as-built information for a timber crib wall situated approximately 250 ft. west (downstream) of North Fowler's Close.

Based on our review of the project and a concurrent field inspection as performed on November 22<sup>nd</sup> 2002, the following items must be addressed prior to release of the developer's surety instrument for the stormwater management/BMP facility at the site:

**Construction Certification:**

*OK  
3/29/03  
ECC/ML*

1. In accordance with the Note # 18 on Sheet 8 of the approved plan, construction certification for the stormwater management/BMP facility is required. None was provided. The certification can be in letter format or by use of the certification statement in Section 4 of the *James City County, Stormwater Management / BMP Facilities, Record Drawing and Construction Certification, Standard Forms & Instructions.*

**Record Drawing:**

*✓*

2. The record drawing set dated March 13<sup>th</sup> 2002 is **satisfactory**. Please forward one reproducible and one blue/black line set of the record drawings to our office.

**Construction - Related Items:**

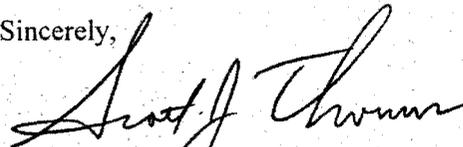
*✓  
OK  
6-2-03*

3. Clear debris (mainly organic and leave matter) from around the perforated pipe and stone extended detention pipe system and within the enclosed tapered end wall at the upstream end of the square 9" x 9" orifice through the wall. Flow through flow control structures shall not be obstructed by sediment, debris or vegetation.

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

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

Sincerely,



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

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

G:\AsBuilts\11098.jr054

**Record Drawing/Construction Certification Submittal for a BMP Facility**

Date: Apr 30<sup>th</sup> 2002

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

Project: SAIDAPB GOVERNORSLAND  
BMP Facility: FOWLERS LAKE BLOCK B (TIMBER CRIB)  
Plan No. S-110-98  
BMP ID Code: JR054

I have received a transmittal for a  Record Drawing and  Construction Certification for the above referenced facility on March 27 2002. Prior to full engineering review of these items and a field inspection, I am first forwarding the items to you to cursory review in case any major field changes were performed that I should be aware of and/or to ensure the record drawing accurately portrays what you saw in the field. Please review the drawing and return to me promptly so I can proceed with the review for certification purposes.

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

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

Scott



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

County BMP ID Code (if known): IR-054  
 Name of Facility: Fowler's Lake Block B BMP No.: 1 of 1 Date: 11/22/02  
 Location: Governor's Land - Fowler Close  
 Name of Owner: Governors Land Foundation  
 Name of Inspector: Rick Hall  
 Type of Facility: Timber crib wall  
 Weather Conditions: Cloudy 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
<b>Embankments and Side Slopes:</b>				
Grass Height	✓			
Vegetation Condition	✓			
Tree Growth	✓			
Erosion	✓			
Trash & Debris	✓			
Seepage				
Fencing or Benches				
<b>Interior Landscaping/Planted Areas:</b> <input checked="" type="checkbox"/> None <input type="checkbox"/> Constructed Wetland/Shallow Marsh <input type="checkbox"/> Naturally Established Vegetation				
Vegetated Conditions				
Trash & Debris				
Floating Material				
Erosion				
Sediment				
Dead Plant				
Aesthetics				
Other				
Notes:				

Facility Item	O.K.	Routine	Urgent	Comments
<b>Water Pools:</b> <input type="checkbox"/> Permanent Pool (Retention Basin) <input type="checkbox"/> Shallow Marsh (Detention Basin) <input checked="" type="checkbox"/> None, Dry (Detention Basin)				
Shoreline Erosion				
Algae				
Trash & Debris				
Sediment				
Aesthetics				
Other				
<b>Inflows (Describe Types/Locations):</b> <i>NATURAL SEALE FROM ROAD PIPES</i>				
Condition of Structure	✓			
Erosion	✓			
Trash and Debris	✓			
Sediment	✓			
Outlet Protection	<i>NA</i>			
Other				
<b>Principal Flow Control Structure - Riser, Intake, etc. (Describe Type):</b> <i>TIMBER CRIB WALL</i>				
Condition of Structure	✓			
Corrosion	✓			
Trash and Debris		✓		<i>LEAVES</i>
Sediment	✓			
Vegetation	✓			
Other				
<b>Principal Outlet Structure - Barrel, Conduit, etc.:</b> <i>OPENING IN WALL</i>				
Condition of Structure	✓			
Settlement	✓			
Trash & Debris		✓		<i>LEAVES</i>
Erosion/Sediment	✓			
Outlet Protection	✓			
Other				
<b>Emergency Spillway (Overflow):</b> <i>NONE</i>				
Vegetation				
Lining				
Erosion				
Trash & Debris				
Other				
Notes:				

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

**Remarks:**

MAINLY LEAVES, need cleared from low flow ED orifice and square slot

Overall Environmental Division Internal Rating: 4

Signature: *Paul Spell* *SA*  
12-9-02 Date: 11/22/02  
Title: Envir. Specialist

**AES CONSULTING ENGINEERS**

Engineering, Surveying and Planning

5248 Olde Towne Road, Suite 1  
WILLIAMSBURG, VIRGINIA 23188

**LETTER OF TRANSMITTAL**

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

TO James City County Environmental

DATE <u>March 21, 2002</u>	JOB NO. <u>7173-00</u>
ATTENTION <u>Mr. Mike Watson</u>	
RE: <u>Governor's Land BMP</u>	



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

- Shop drawings   
  Prints   
  Plans   
  Samples   
  Specifications  
 Copy of letter   
  Change order   
  \_\_\_\_\_

COPIES	DATE	NO.	DESCRIPTION
<u>1 set</u>			<u>BMP RECORD DOCUMENTS FOR TIMBER WEAIR STRUCTURE #10 (FOWLER'S LAKE - BLOCK B)</u>
<u>1</u>			<u>COPY OF UPDATE OVERALL BMP MAP</u>

THESE ARE TRANSMITTED as checked below:

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

REMARKS

COPY TO \_\_\_\_\_

SIGNED: V. Mac B...

Date Record Created:

WS\_BMPNO:

Print Record

Created By:

JR054

PRINTED ON  
Thursday, March 11, 2010  
2:51:35 PM

WATERSHED JR  
 BMP ID NO 054  
 PLAN NO S-110-98  
 TAX PARCEL (43-2)(4-1B)  
 PIN NO 4320400001B  
 CONSTRUCTION DATE 1/1/1999  
 PROJECT NAME Governors Land-Fowlers Lake Block B  
 FACILITY LOCATION Near (north of) 3220 Fowlers Lake Rd.  
 CITY-STATE Williamsburg, Va. 23185  
 CURRENT OWNER Governors Land Foundation  
 OWNER ADDRESS 2700 Two Rivers Road  
 OWNER ADDRESS 2  
 CITY-STATE-ZIP CODE Williamsburg, Va. 23185  
 OWNER PHONE 258-4600  
 MAINT AGREEMENT Yes  
 EMERG ACTION PLAN No

Get Last BMP No

Return to Menu

MAINTENANCE PLAN

SITE AREA acre

No  
15.56

LAND USE

R4 Res Planned Co  
Timber Crib Wall

old BMP TYP

F1 Timber Walls

JCC BMP CODE

POINT VALUE

4

SVC DRAIN AREA acres

11.9

SERVICE AREA DESCR

SF Lots & Roads

IMPERV AREA acres

1.69

RECV STREAM

UT of James River

EXT DET-WQ-CTRL

Yes

WTR QUAL VOL acre-ft

0.18

CHAN PROT CTRL

No

CHAN PROT VOL acre-ft

0

SW/FLOOD CONTROL

Yes

GEOTECH REPORT

No

CTRL STRUC DESC

Sq Orif

CTRL STRUC SIZE inches

9 x 9

OTLT BARRL DESC

Square Orif

OTLT BARRL SIZE inch

9

EMERG SPILLWAY

No

DESIGN HW ELEV

19.9

PERM POOL ELEV

na

2-YR OUTFLOW cfs

4.90

10-YR OUTFLOW cfs

7.70

REC DRAWING

Yes

CONSTR CERTIF

No

LAST INSP DATE 11/22/2002

Inspected by:

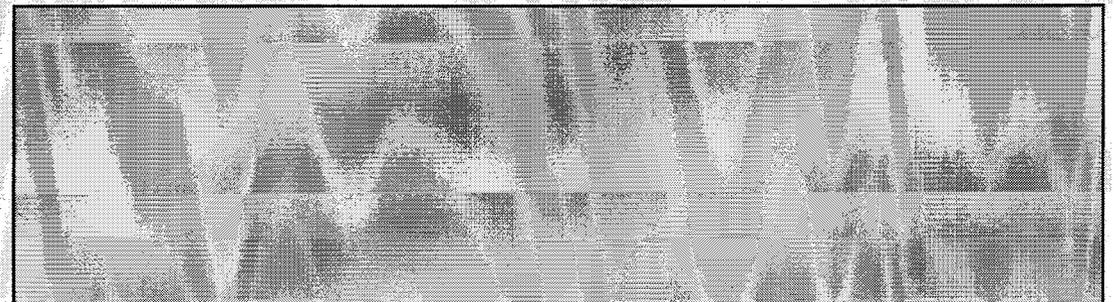
INTERNAL RATING

4

MISC/COMMENTS

2" perf PVC ED orif. TW El. 20.56.

Additional Comments:



ENVIRONMENTAL DIVISION REVIEW COMMENTS  
GOVERNOR'S LAND  
FOWLER'S LAKE-BLOCK B  
PLAN NO. S-110-98  
November 24, 1998

*MCE/DEC*

1. A Land Disturbing Permit and Siltation Agreement, with surety, are required for this project.
2. A Subdivision Agreement, with surety, shall be executed with the County prior to recordation of lots.
3. Water and sewer inspection fees must be paid prior to the issuance of a Land Disturbing Permit.
4. As-built drawings must be provided for the detention basin on completion. Also, a note shall be provided on the plan stating that upon completion, the construction of the basin will be certified by a professional engineer who has inspected the structure during construction.
5. Provide an alternate location for the staging and topsoil stockpile location. Clearing and filling of lots is to be used as a last resort method for stockpiling.
6. Submit a Sediment Basin Design Data Sheet for all sediment basins proposed to ensure design is in accordance with the 1992 VESCH criteria.
7. Revise the sediment trap to a basin with a pipe outlet and increase its size volume of storage to more closely match the drainage area. The drainage area to the trap exceeds the three acre limit for a trap. The volume of storage should be increased as much as possible without impacting wetlands. A baffle needs to be included. The pipe outlet needs to be designed for the drainage area, not disturbed area. The sediment basin will need to remain in place throughout most of the single family house construction phase.
8. Provide conservation easements for all Natural Open Space areas claimed in the BMP worksheet.
9. Provide stormwater management facility (drainage) easement on the adjacent lots as necessary to provide a 15-foot wide maintenance easement above the 100-year storm elevation.
10. Provide evidence that any required wetlands permits have been obtained.
11. Revise the timber basin's pipe outlet structure to be the same as used on the Kingsmill Community Center plan. Andy Herr revised the connection through the wall to be with a metal plate and ductile iron pipe with a horizontal as well as vertical release pipe. The timber structures installed in Governor's Land all have had failures of this outlet structure.
12. Add a note to the plan that the location of the timber structure and construction access will be approved by the Environmental Division prior to construction.



