CERTIFICATE OF AUTHENTICITY

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

BMP NUMBER: **PC087**

DATE VERIFIED: **May 31, 2012**

QUALITY ASSURANCE TECHNICIAN: **Leah Hardenbergh**

Leah Hardenbergh

LOCATION: WILLIAMSBURG, VIRGINIA

Stormwater Division

MEMORANDUM

DATE: February 24, 2010

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

FROM: Jo Anna Ripley, Stormwater

PO: 270712

RE: Files Approved for Scanning

BMP ID or General File ID PC087

PIN: 3140200002

Subdivision, Tract, Business or Owner

Name (if known): Fords Colony

Property Description: Marsh Hawk Course Holes 1-18

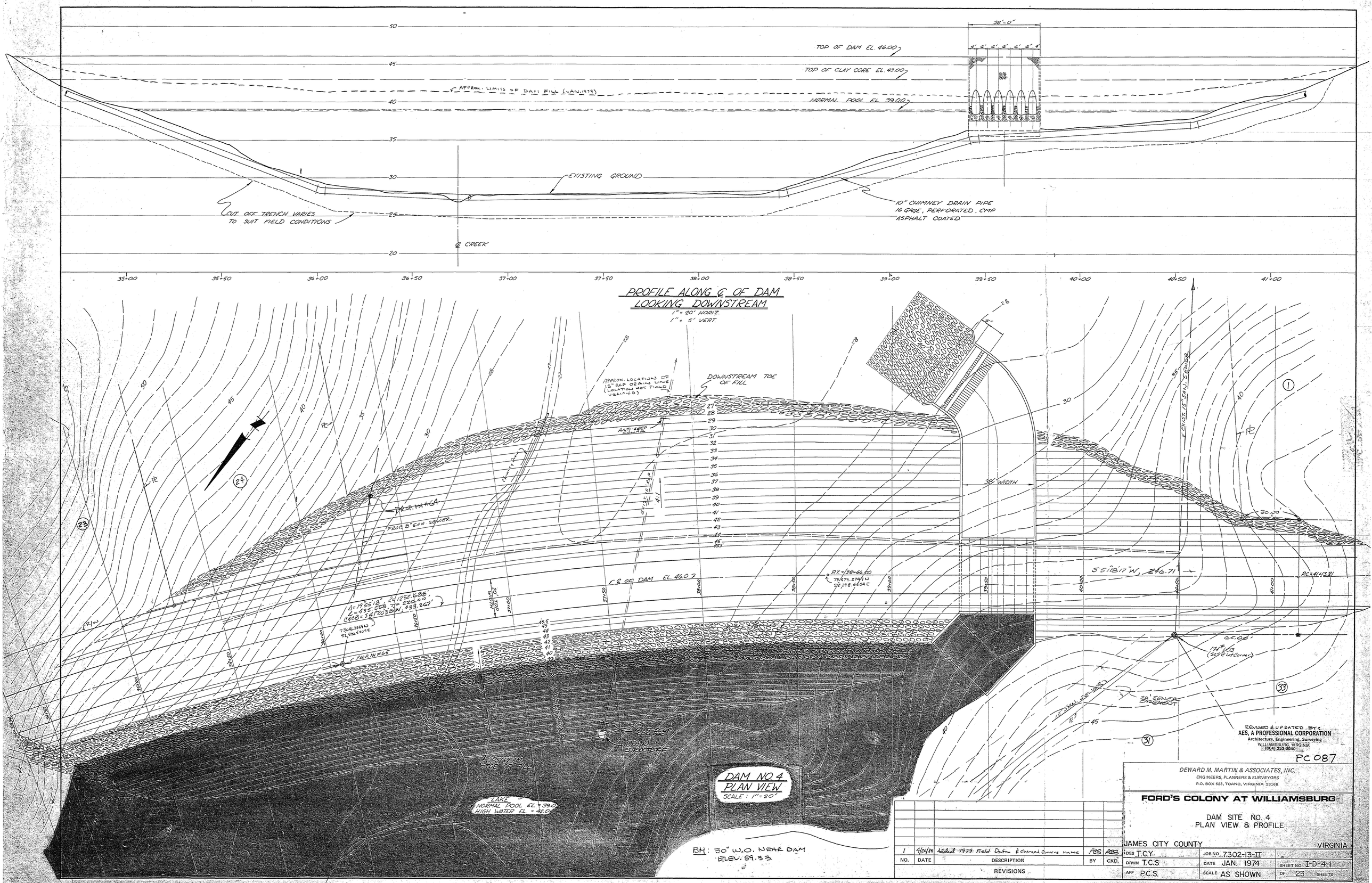
Site Address: 4157 Longhill Road

(For internal use only) **Box:** FC001 **Drawer:** 1

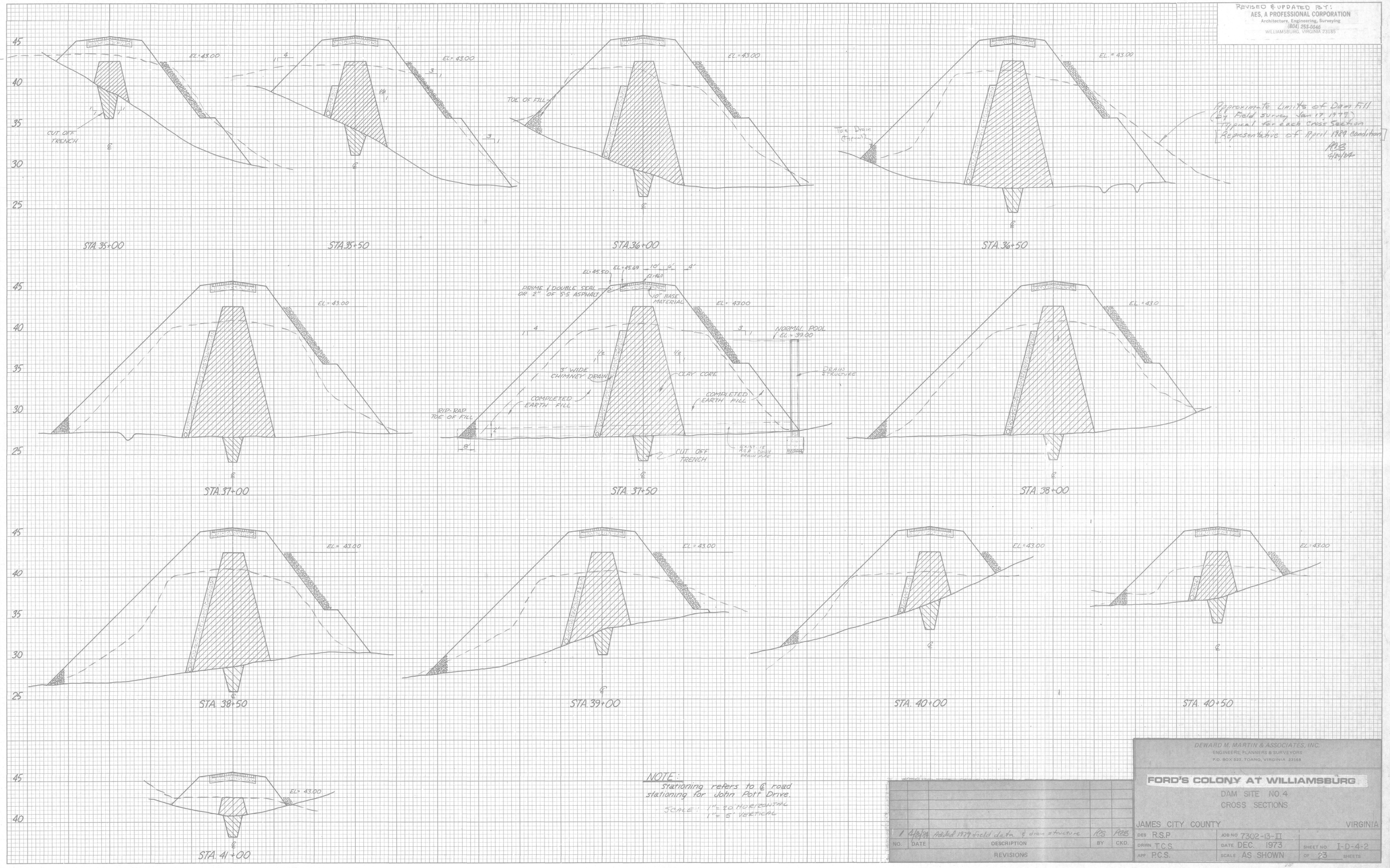
Agreements: (in file as of scan date) **N** **Book or Doc#:** **Page:**

Comments:

Insert plan pages here.


TOP OF DAM EL. 46.00
TOP OF CLAY CORE EL. 43.00
APPROX. LIMITS OF DAM FILL (JAN. 1979)
NORMAL POOL EL. 39.00
38'-0"
4' 6' 6' 6' 6' 6' 4'
EXISTING GROUND
CUT OFF TRENCH VARIES TO SUIT FIELD CONDITIONS
10" CHIMNEY DRAIN PIPE 16 GAGE, PERFORATED, CMP ASPHALT COATED
℄ CREEK
35+00 35+50 36+00 36+50 37+00 37+50 38+00 38+50 39+00 39+50 40+00 40+50 41+00
PROFILE ALONG ℄ OF DAM
LOOKING DOWNSTREAM
1" = 20' HORIZ.
1" = 5' VERT.
APPROX. LOCATION OF 15" RCP DRAIN LINE (LOCATION NOT FIELD VERIFIED)
DOWNSTREAM TOE OF FILL
ANTI-SEEP COLLAR
PROP. IN #64
PROP. 8" SAN. SEWER
℄ OF DAM EL. 46.0
38' WIDTH
S 51°18'17" W, 246.71'
PC 5+41.13
30.00'
65.00'
14" ⌀ (Set ℄ at Corner)
DAM STRUCTURE
UPSTREAM TOE OF FILL
LAKE
NORMAL POOL EL. = 39.0
HIGH WATER EL. = 42.0
DAM NO. 4
PLAN VIEW
SCALE: 1" = 20'
BM: 30" W.O. NEAR DAM
ELEV. 59.33
REVISED & UPDATED BY:
AES, A PROFESSIONAL CORPORATION
Architecture, Engineering, Surveying
WILLIAMSBURG, VIRGINIA
(804) 253-0040
PC 087
DEWARD M. MARTIN & ASSOCIATES, INC.
ENGINEERS, PLANNERS & SURVEYORS
P.O. BOX 523, TOANO, VIRGINIA 23168
FORD'S COLONY AT WILLIAMSBURG
DAM SITE NO. 4
PLAN VIEW & PROFILE
JAMES CITY COUNTY
VIRGINIA
DES T.C.Y.
DRWN T.C.S
APP P.C.S.
JOB NO. 7302-13-II
DATE JAN. 1974
SCALE AS SHOWN
SHEET NO. I-D-4-1
OF 23 SHEETS
NO. DATE DESCRIPTION BY CKD.
1 4/20/84 Added 1979 Field Data & changed owners name PGB RBB
REVISIONS

REVISED & UPDATED BY:
AES, A PROFESSIONAL CORPORATION
Architecture, Engineering, Surveying
(804) 253-0040
WILLIAMSBURG, VIRGINIA 23185



NOTE:
Stationing refers to ℄ road stationing for John Pott Drive.
SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL

FINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
TRIANGULATE		
NOTE BOOK AREAS		
NO. AREAS CHECKED		

ORIGINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
TRIANGULATE		
NOTE BOOK AREAS		
NO. AREAS CHECKED		

NO.	DATE	DESCRIPTION	BY	CKD.
1	4/9/84	Added 1979 field data & drain structure	RCS	RBB

REVISIONS

DEWARD M. MARTIN & ASSOCIATES, INC.
ENGINEERS, PLANNERS & SURVEYORS
P.O. BOX 523, TOANO, VIRGINIA 23168

FORD'S COLONY AT WILLIAMSBURG

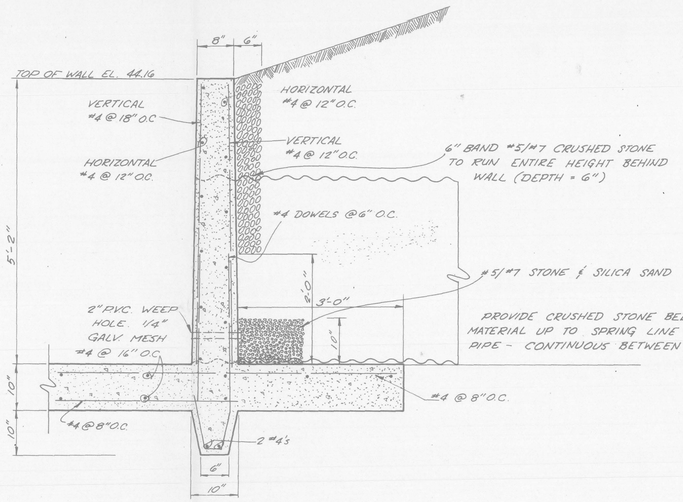
DAM SITE NO. 4
CROSS SECTIONS

JAMES CITY COUNTY — VIRGINIA

DES R.S.P.	JOB NO 7302-13-II	
DRWN T.C.S.	DATE DEC. 1973	SHEET NO I-D-4-2
APP. R.C.S.	SCALE AS SHOWN	OF 23 SHEETS

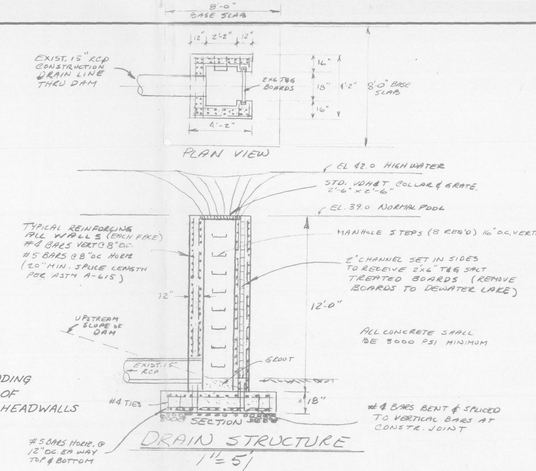
K+E PLATE 3, CROSS SECTION
KEUFFEL & ESSER CO.

48 7072 MADE IN U.S.A.



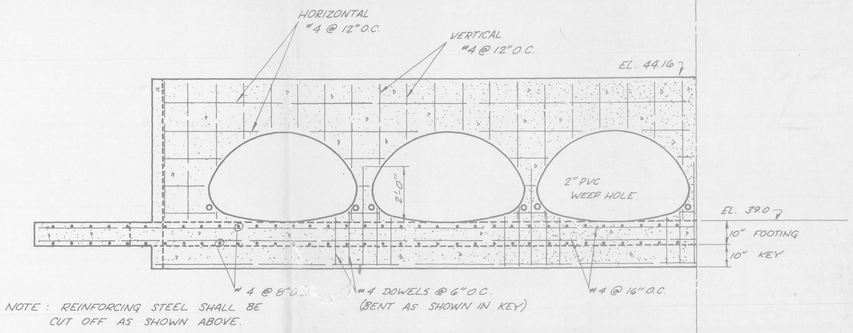
UPSTREAM HEADWALL SECTION A-A

SCALE: 3/4" = 1'-0"



DRAIN STRUCTURE

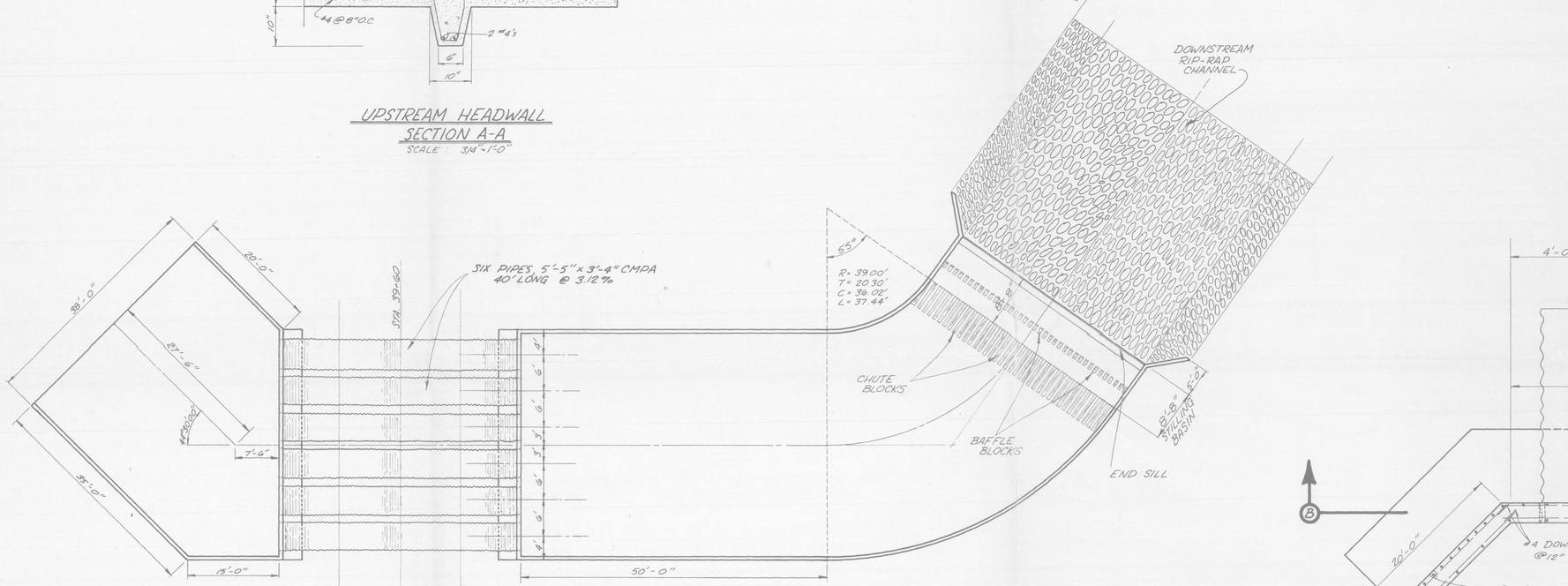
1" = 5'



NOTE: REINFORCING STEEL SHALL BE CUT OFF AS SHOWN ABOVE.

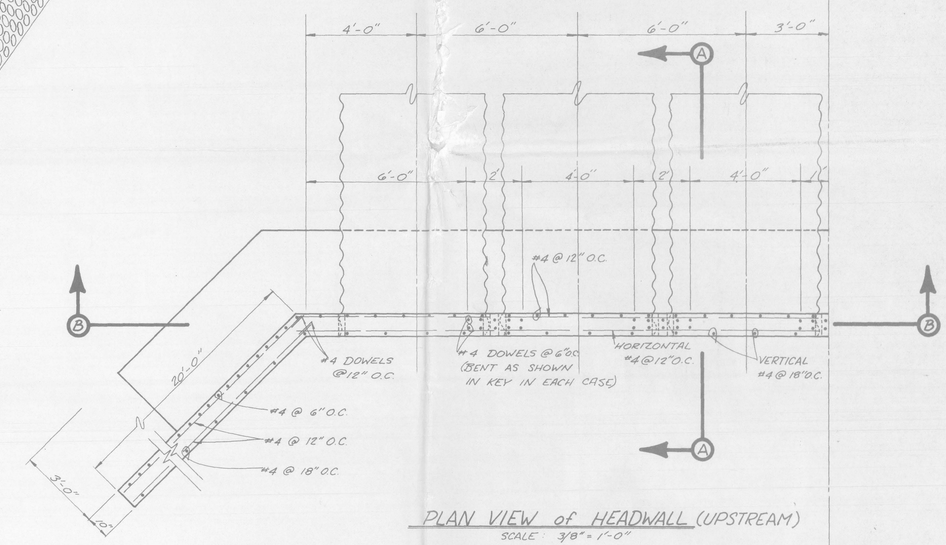
SECTION B-B of HEADWALL

SCALE: 3/8" = 1'-0"



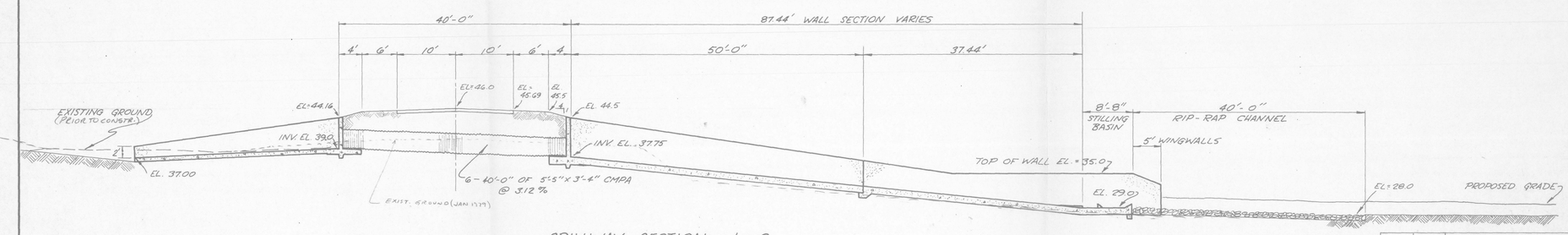
PLAN VIEW of SPILLWAY

SCALE: 3/32" = 1'-0"



PLAN VIEW of HEADWALL (UPSTREAM)

SCALE: 3/8" = 1'-0"



SPILLWAY SECTION at ℄

SCALE: 3/32" = 1'-0"

REVISED & UPDATED BY:

AES, A PROFESSIONAL CORPORATION
Architecture, Engineering, Surveying
WILLIAMSBURG, VIRGINIA
(804) 253-0040

PC087 DAM #4;

DEWARD M. MARTIN & ASSOCIATES, INC.
ENGINEERS, PLANNERS & SURVEYORS
P.O. BOX 523, TOANO, VIRGINIA 23168

FORD'S COLONY AT WILLIAMSBURG

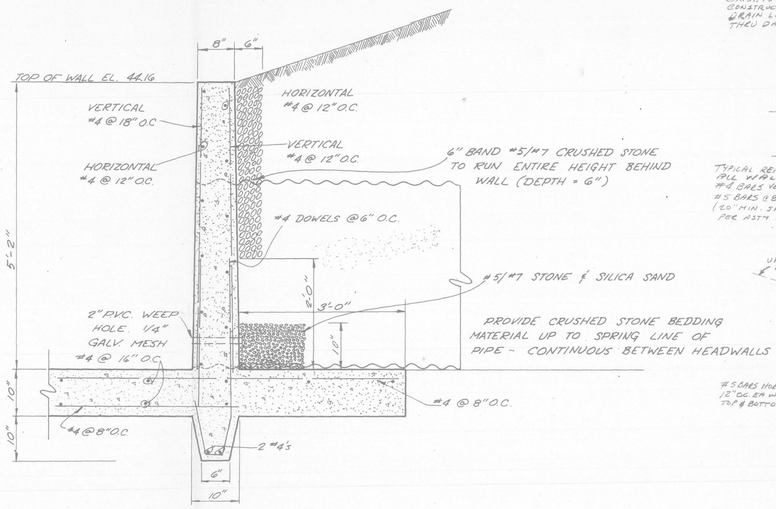
DAM SITE NO. 4
SPILLWAY PLAN & SECTION
UPSTREAM HEADWALL DETAILS

JAMES CITY COUNTY — VIRGINIA

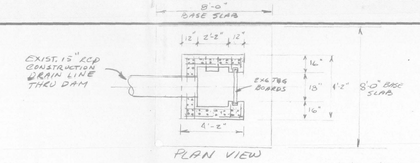
NO.	DATE	DESCRIPTION	BY	CKD.
1	4/20/84	Added 1979 Field Data & Drain Structure	PES	PES

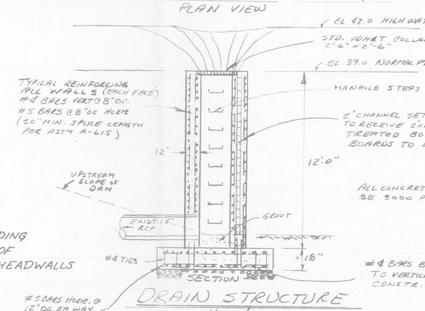
REVISIONS

DES T.C.Y.	JOB NO 7302-13-II	
DRWN T.C.S.	DATE JAN. 1974	SHEET NO I-D-4-3
APP P.C.S.	SCALE AS SHOWN	OF 23 SHEETS

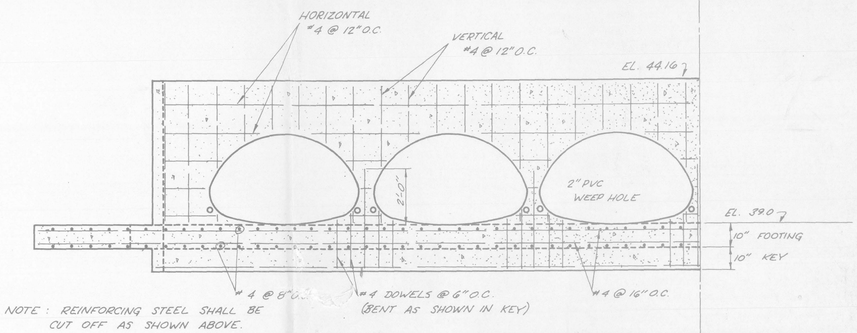


UPSTREAM HEADWALL
SECTION A-A
SCALE: 3/4" = 1'-0"



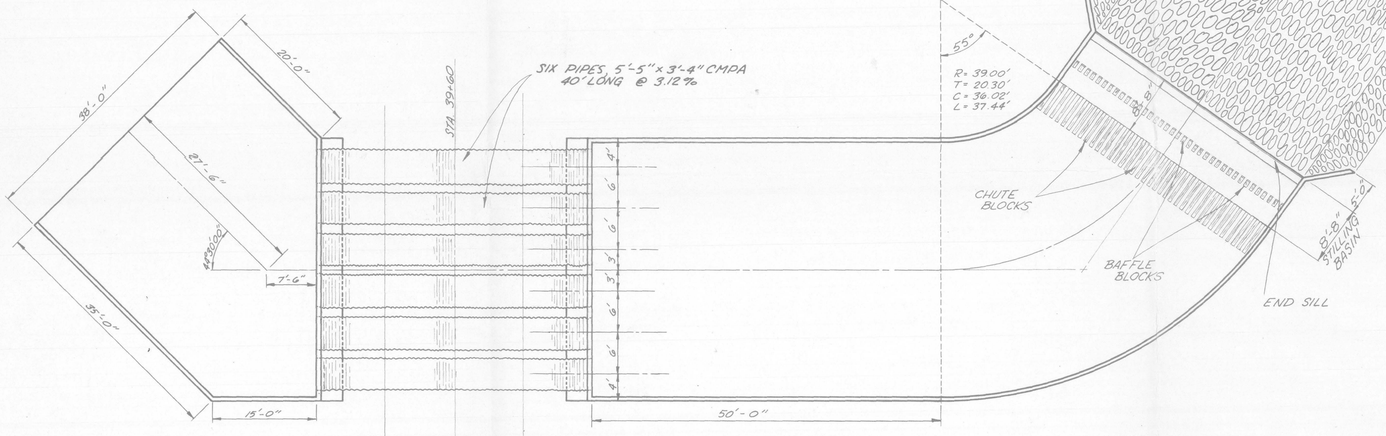


DRAIN STRUCTURE
1" = 5'

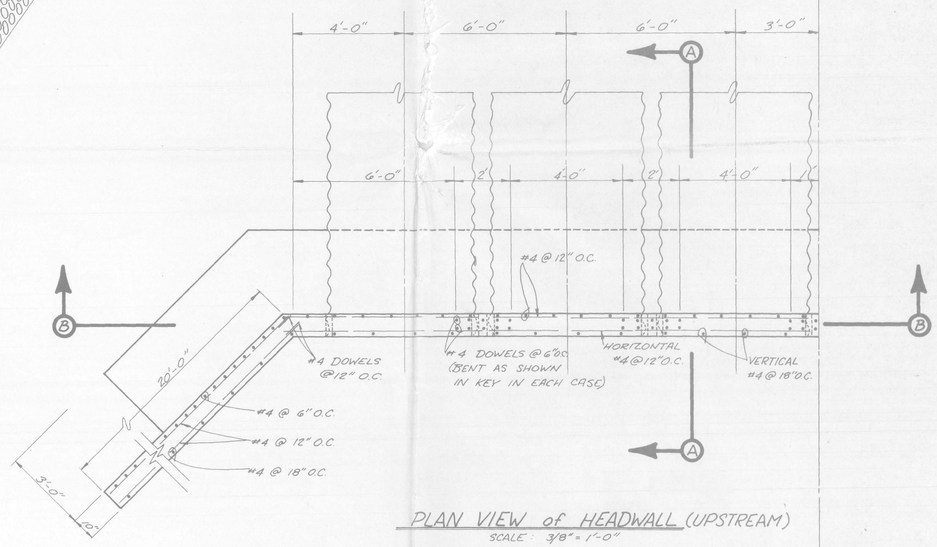


NOTE: REINFORCING STEEL SHALL BE CUT OFF AS SHOWN ABOVE.

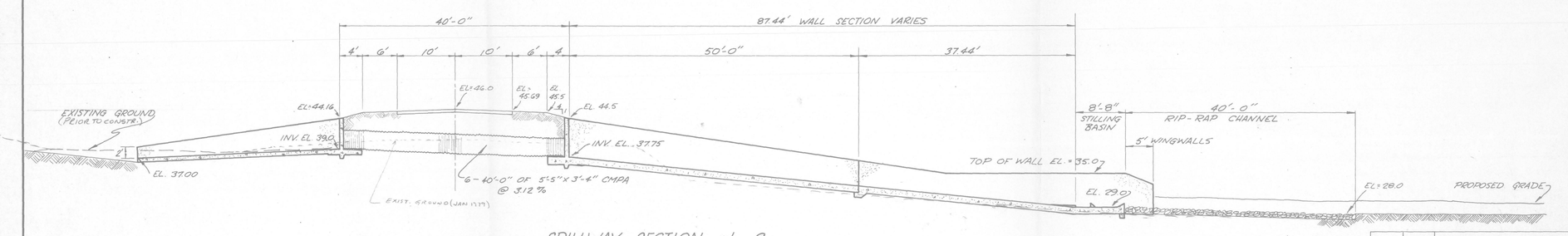
SECTION B-B of HEADWALL
SCALE: 3/8" = 1'-0"



PLAN VIEW of SPILLWAY
SCALE: 3/32" = 1'-0"



PLAN VIEW of HEADWALL (UPSTREAM)
SCALE: 3/8" = 1'-0"



SPILLWAY SECTION at ℄
SCALE: 3/32" = 1'-0"

NO.	DATE	DESCRIPTION	BY	CKD.
1	4/20/84	Added 1979 Field Data & Drain Structure	PES	PES

REVISIONS

REVISED & UPDATED BY:
AES, A PROFESSIONAL CORPORATION
Architecture, Engineering, Surveying
WILLIAMSBURG, VIRGINIA
(804) 253-0040

PC087 DAM #4;

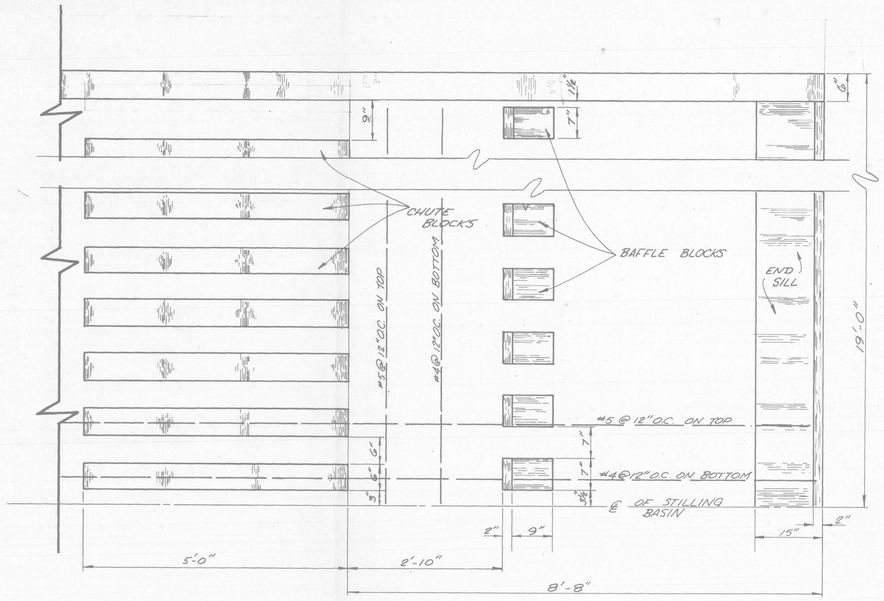
DEWARD M. MARTIN & ASSOCIATES, INC.
ENGINEERS, PLANNERS & SURVEYORS
P.O. BOX 523, TOANO, VIRGINIA 23168

FORD'S COLONY AT WILLIAMSBURG

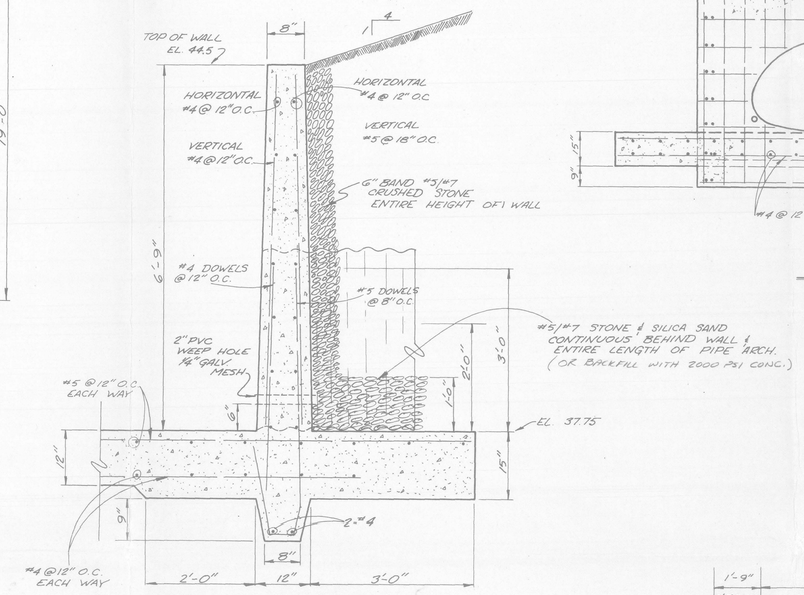
DAM SITE NO. 4
SPILLWAY PLAN & SECTION
UPSTREAM HEADWALL DETAILS

JAMES CITY COUNTY — VIRGINIA

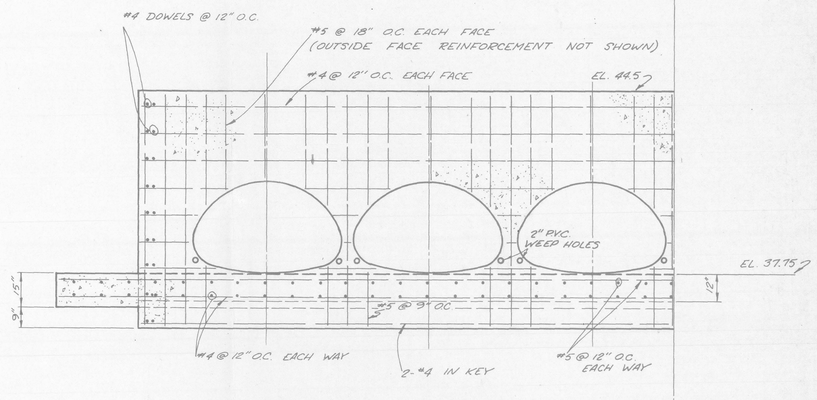
DES T.C.Y.	JOB NO 7302-13-II		
DRWN T.C.S.	DATE JAN. 1974	SHEET NO I-D-4-3	
APP P.C.S.	SCALE AS SHOWN	OF 23 SHEETS	



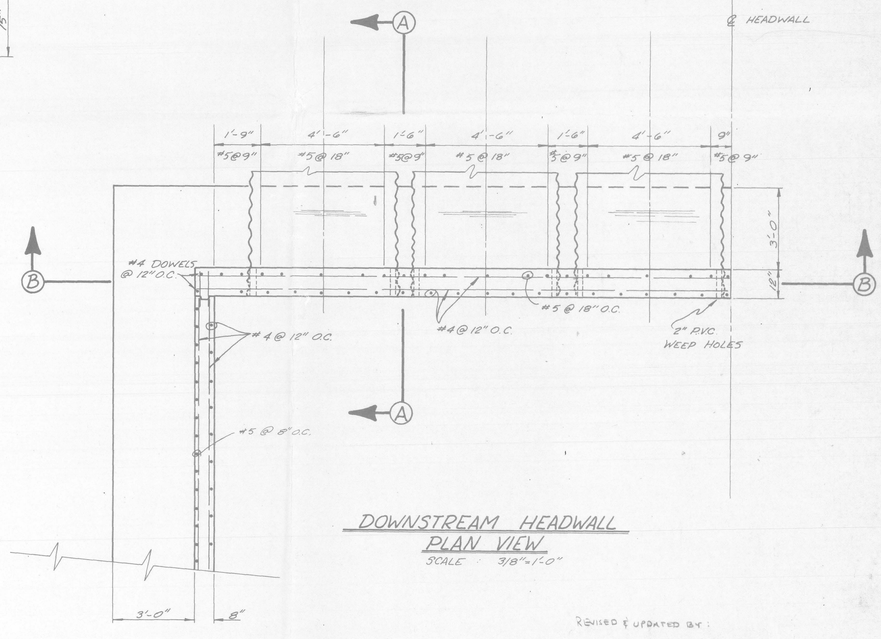
STILLING BASIN
PLAN VIEW
SCALE : 3/4"=1'-0"



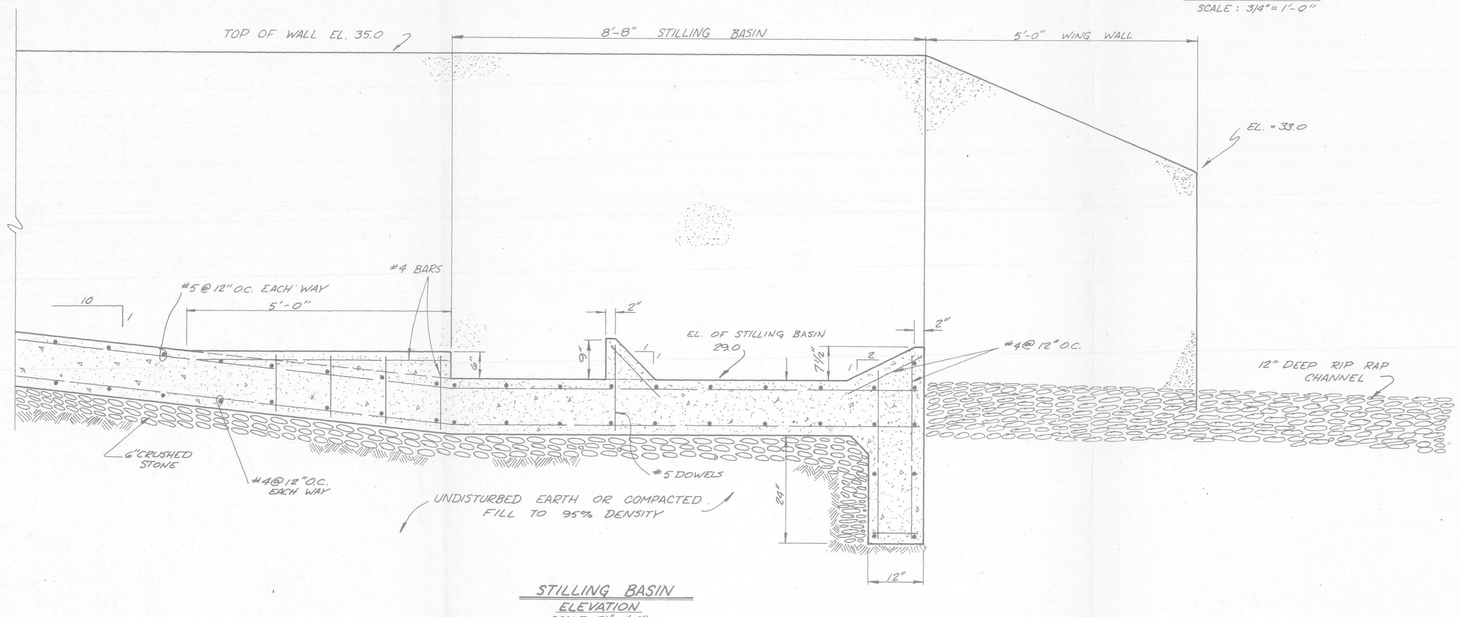
DOWNSTREAM HEADWALL
SECTION A-A
SCALE : 3/4"=1'-0"



DOWNSTREAM HEADWALL
SECTION B-B
SCALE : 3/8"=1'-0"



DOWNSTREAM HEADWALL
PLAN VIEW
SCALE 3/8"=1'-0"



STILLING BASIN
ELEVATION
SCALE : 3/4"=1'-0"

REVISED & UPDATED BY:

AES, A PROFESSIONAL CORPORATION
Architecture, Engineering, Surveying
WILLIAMSBURG, VIRGINIA
(804) 253-0040

NO.	DATE	DESCRIPTION	BY	CKD.
1	4/10/84	Changed Downstream name		

REVISIONS

DEWARD M. MARTIN & ASSOCIATES, INC.
ENGINEERS, PLANNERS & SURVEYORS
P.O. BOX 523, TOANO, VIRGINIA 23168

FORD'S COLONY AT WILLIAMSBURG

DAM SITE NO. 4
DOWNSTREAM HEADWALL & STILLING BASIN DETAILS

JAMES CITY COUNTY — VIRGINIA

DES T.C.Y.	JOB NO 7302-13-II	
DRWN T.C.S.	DATE JAN. 1974	SHEET NO I-D-4-4
APP P.C.S.	SCALE AS SHOWN	OF 23 SHEETS

Simmons Engineering, Inc.
Civil Engineering Design and Consulting
5000 New Point Road, Suite 2201
Williamsburg, VA 23188
(757) 258-5000 Fax (757) 258-5950

APR 2003
RECEIVED
ENVIRONMENTAL DIVISION

PC 087

April 15, 2003

Mr. Daryl Cook, PE
Environmental Division
James City County
101-E Mounts Bay Road
Williamsburg, VA 23187

re: **Request for Waiver of Pond Buffer**
Simmons Gazebo @ 5 Minor Court
Permit # 03-1049
Project # 02-247

Dear Mr. Cook:

Request waiver of the requirement to provide a 25-foot buffer from design high water surface elevation of the proposed Simmons Gazebo as stated in the comment letter from your Divisions Review of April 4, 2003.

The subject pond buffer is depicted is less than 25 feet to the gazebo. Moving it further from the buffer will place it in the JCSA easement. The elevation difference between high water and the finish floor of the gazebo 2 ± feet. The gazebo is not likely to be in use during extreme storm events.

I request that the buffer requirements be waived. Please call me with questions.

Sincerely,

Ralph C. Simmons, P.E.

President

cc: JCC Code Compliance @ 259-4038

APPROVED
James City County
Environmental Division
By: _____
Date: 4-24-03

Use native trees, shrubs and ground cover in disturbed D.H.W and Buffer areas to the greatest extent possible for stabilization. SJT

F:\SEI Documents\project documents 2002\02-247 gazebo\02-247 ltr to jcc env for pond buffer4-15-03.doc

Simmons Engineering, Inc.
Civil Engineering Design and Consulting
5000 New Point Road, Suite 2201
Williamsburg, VA 23188
(757) 258-5000 Fax (757) 258-5950

April 22, 2003

Mr. Daryl Cook, PE
Environmental Division
James City County
101-E Mounts Bay Road
Williamsburg, VA 23187

re: **Request for Waiver of Pond Buffer (Revised)**
Simmons Gazebo @ 5 Minor Court
Permit # 03-1049
Project # 02-247

Dear Mr. Cook:

Request waiver of the requirement to provide a 25-foot buffer from design high water surface elevation of the proposed Simmons Gazebo as stated in the comment letter from your Division's Review of April 4, 2003.

The gazebo is actually within the design high water and pond buffer. Moving it out of the design high water and further from the buffer will place it in the JCSA easement. The elevation difference between high water and the finish floor of the gazebo 2 ± feet. The gazebo is not likely to be in use during extreme storm events.

I request that the buffer requirements be waived. Please call me with questions.

Sincerely,

Ralph C. Simmons, P.E.
President

Scott - 4/25
I assume you're handling this.
Daryl

FAGEI Documents\project documents 2002\02-247 gazebo\02-247 ltr to jcc

James City County
Environmental Division
Single Family Plan Submittal - Miscellaneous

Lot 30, Section 1, Ford's Colony (5 Minor Court)

Permanent structures (gazebo and brick paver surfacing) as proposed are shown within both the design high water elevation and pond setback/buffer as required per page 38 of the James City County BMP manual. A pond buffer should be provided that extends 25 feet outward from the maximum water surface elevation of the pond. Based on information as available in our record files, it appears the 100-year design high water surface elevation for the adjacent stormwater management facility (Dam No. 4, County BMP ID Code: PC 087) is at Elevation 42.0.

Efforts should be made to preserve existing trees and vegetation in the buffer during construction and to manage the buffer as meadow or forested area.

Label and delineate the design high water elevation (El. 42) and the location of the subsequent 25 ft. buffer/setback on the plan. Reconfigure the footprint of the structure to first avoid design high water and second to avoid the pond setback/buffer; or alternatively, submit a written request for waiver to the Environmental Division with supporting information to include: reasons why the structure needs to be situated within the design high water elevation; a statement that the structure will have no adverse impact on the storage volume or function of the stormwater management facility; and stabilization or landscaping plan to restore disturbed buffer area back to meadow or forest condition using native trees, shrubs or ground cover to the greatest extent possible. The variance request needs to be from the owner or tenant, current or future, rather than the builder or contractor.

PC087_FORDS_COLONY_SEC_1_JOHN_POTT_DR_DAM_4 - 007

Simmons Engineering, Inc.
Civil Engineering Design and Consulting
5000 New Point Road, Suite 2201
Williamsburg, VA 23188
(757) 258-5000 Fax (757) 258-5950

APR 2003
RECEIVED
ENVIRONMENTAL DIVISION

PC087

April 15, 2003

Mr. Daryl Cook, PE
Environmental Division
James City County
101-E Mounts Bay Road
Williamsburg, VA 23187

re: **Request for Waiver of Pond Buffer**
Simmons Gazebo @ 5 Minor Court
Permit # 03-1049
Project # 02-247

Dear Mr. Cook:

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Sincerely,

Ralph C. Simmons, P.E.

President

cc: JCC Code Compliance @ 259-4038

APPROVED
James City County
Environmental Division
By: _____
Date: 4-24-03

Use native trees, shrubs and ground cover in disturbed D.H.W and Buffer areas to the greatest extent possible for stabilization. SMT

F:\SEI Documents\project documents 2002\02-247 gazebo\02-247 ltr to jcc env for pond buffer4-15-03.doc

James City County
Environmental Division
Single Family Plan Submittal - Miscellaneous

Lot 30, Section 1, Ford's Colony (5 Minor Court)

Permanent structures (gazebo and brick paver surfacing) as proposed are shown within both the design high water elevation and pond setback/buffer as required per page 38 of the James City County BMP manual. A pond buffer should be provided that extends 25 feet outward from the maximum water surface elevation of the pond. Based on information as available in our record files, it appears the 100-year design high water surface elevation for the adjacent stormwater management facility (Dam No. 4, County BMP ID Code: PC 087) is at Elevation 42.0.

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Scott - 4/25

I assume you're handling this.

Darryl

Simmons Engineering, Inc.
Civil Engineering Design and Consulting
5000 New Point Road, Suite 2201
Williamsburg, VA 23188
(757) 258-5000 Fax (757) 258-5950

April 22, 2003

Mr. Daryl Cook, PE
Environmental Division
James City County
101-E Mounts Bay Road
Williamsburg, VA 23187

re: **Request for Waiver of Pond Buffer (Revised)**
Simmons Gazebo @ 5 Minor Court
Permit # 03-1049
Project # 02-247

Dear Mr. Cook:

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Sincerely,

Ralph C. Simmons, P.E.

President

F:\SEI Documents\project documents 2002\02-247 gazebo\02-247 ltr to jcc env for pond buffer4-15-03.doc

PC087

CERTIFICATE OF AUTHENTICITY

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

BMP NUMBER: **PC154**

DATE VERIFIED: **May 31, 2012**

QUALITY ASSURANCE TECHNICIAN: **Leah Hardenbergh**

Leah Hardenbergh

LOCATION: WILLIAMSBURG, VIRGINIA

Stormwater Division

MEMORANDUM

DATE: February 24, 2010

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

FROM: Jo Anna Ripley, Stormwater

PO: 270712

RE: Files Approved for Scanning

BMP ID or General File ID PC154

PIN: 3810100002

Subdivision, Tract, Business or Owner

Name (if known): Fords Colony

Property Description: Meadowfield

Site Address:

(For internal use only) **Box:** FC001 **Drawer:** 1

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

Comments:

11/16/86

PC154

Analysis and Design of

Hole #5 Pond downslope of 5th Green vicinity of lots 143 & 233

(This is the cut pond downstream of the Hole #6 pond)

1. **Drainage Area** = 16.23 Acres — From the North (lots 129, 130, & 141)
   + 10.36 Acres — Below Hole #6 Pond
   ST 26.59 Acres

(Pond receives outflow of 17.7 cfs from Hole #6 Pond .... This is about half of Q_2 for the 37.17 Acres tributary to Hole #6 pond

2. **Stormflows**: $C = 0.35$, $t_c = 25$ min, $I_2 = 3.0$, $I_{10} = 4.0$, $I_{100} = 5.8$

(use Rational Formula) $Q = CIA$

Post-Development

$Q_2 = 0.35(3.0)(26.59) + 17.7 = 27.92 + 17.7 = 45.6$ cfs

$Q_{10} = .35(4.0)(26.59) + 17.7 = 37.23 + 17.7 = 54.9$ cfs

$Q_{100} = .35(5.8)(26.59) + 17.7 = 53.98 + 17.7 = 71.7$ cfs

$Q_{2\ \text{pre-dev}} = 0.2(3.0)(26.59 + 37.17) = 38.26$ cfs

3. **Runoff Volumes**: assume simple unit hydrograph where length of storm = 3 tc and neglect outflow ..... This is a very conservative assumption.

Vol of 2 yr storm, $Vol_2 = \frac{1}{2} Q_2 (3t_c)(60) = 90\, Q_2 t_c = 90(45.6)(25) = 102{,}600$ c.f.

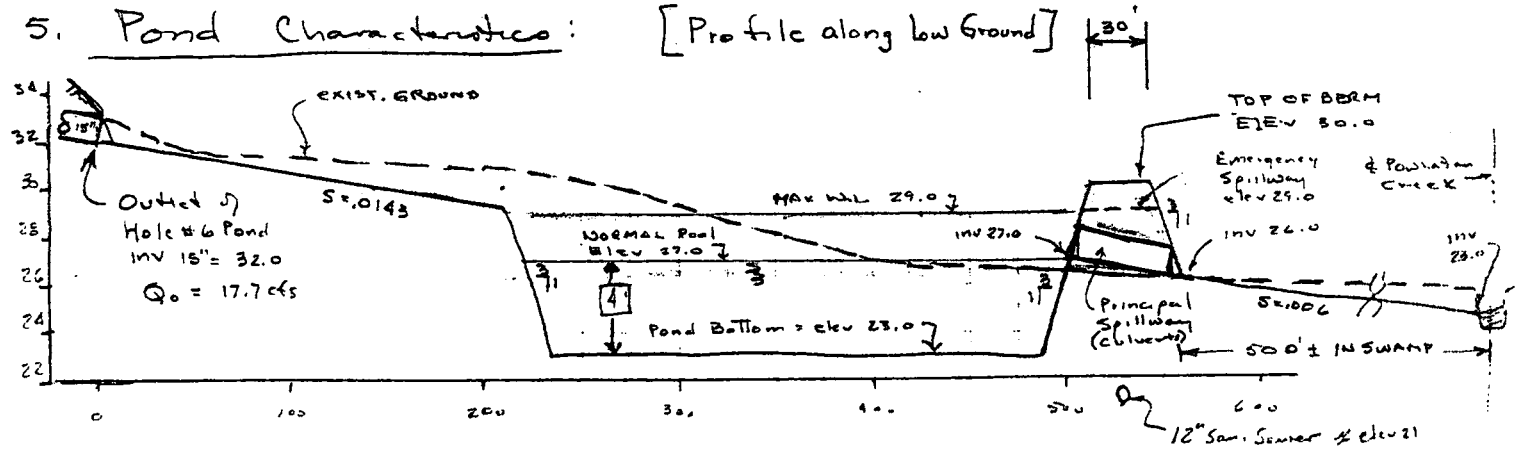
Vol of 10 yr storm, $Vol_{10} = 90(54.9)(25) = 123{,}525$ c.f.

Vol of 100 yr storm, $Vol_{100} = 90(71.7)(25) = 161{,}325$ c.f.

4. **Req'd Sediment Volume**: assume sediment for Hole #6 pond is entirely trapped by same.

Req'd Sed. Vol. = 67 cy/Ac × 26.59 Ac = 1782 c.y. = 48,101 c.f.

5. **Pond Characteristics**: [Profile along low Ground]



5. Pond Characteristics (Con't)

elev	Area	Avg Area	d	Δ vol
23	54,700 sf	63100	4'	252,400 cf
27	71,500 sf	73810	1'	73,810 cf
28	76,120 sf	78520	1'	78,520 cf
29	80,920 sf			

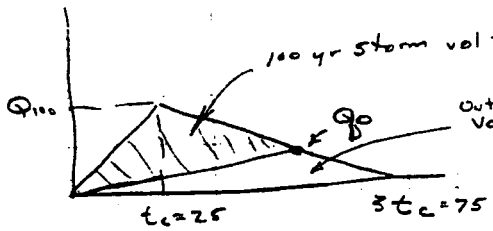
> sum = 152,330 cf

a. Req'd sediment vol is contained within the first foot

b. volume between normal pool (elev 27) and emergency spillway (elev 29) = 152,330 cf
volume of 100 yr storm = 161,325 c.f. or 6% more (about 9000 cf)

thus, if outflow during 100 yr storm event equals or exceeds 9000 cf, then the 100 yr storm will be stored between elev 27 and elev 29.

c. Back calculation of minimum release rate:



Outflow Volume = Pond vol. deficit = 9000 cf = $(1/2)q_o(3t_c)60$

$$q_o = \frac{9000}{1/2 \cdot 3(25)60} = 4 \text{ cfs} \quad \left(\text{minimum release rate}\right)$$

6. Check Critical Storm: (T_c for two year event)

$$T_c = \sqrt{\frac{2CA\,a(b - t_c/4)}{q_o}} - b$$

$C = 0.35$
$A = 16.23$ Acres
$a_2 = 126.3$ Norfolk
$b_2 = 17.3$ Norfolk

$t_c = 25$ min
$q_o = 15.95$ = Q2 pre-c from 16.23Ac

$$= \sqrt{\frac{2(0.35)(16.23)(126.3)(17.3 - 25/4)}{15.95}} - 17.3$$

$$= \sqrt{994} - 17.3 = 31.5 - 17.3 = 14.2 \text{ min} \qquad \text{let } T_c = 25 \text{ min}$$

i.e. Critical Storm is peak design storm as assumed

The same will hold for the 100 yr storm event

7. <u>Principal Spillway</u>: Use a culvert type design

<u>Note:</u> Predevelopment Q_2 from incremental DA of 26.59 Ac $= 0.2(3.0)(26.59) = 15.95$ cfs
Add release rate from upstream pond $\Rightarrow q_o = 16.0 + 17.7 = 33.7$ cfs
Check against Q_2 pre-development for entire basin (DA = 26.59 + 37.17 = 63.76 Ac)

$$Q_{2,\text{entire basin}} = 0.2(3.0)(63.76) = 38.26 \text{ cfs}$$

a. Select a culvert that will pass at least 4.0 cfs, but no more than 38.26 cfs.

b. Try a 15" RCP with inlet control and AHW = 2.0' $\Rightarrow$ HW/D = 2.0/1.25 = 1.6
From Chart 2 VDH&T, Q = 7.6 cfs (greater than 4.0 but less than 38.3)

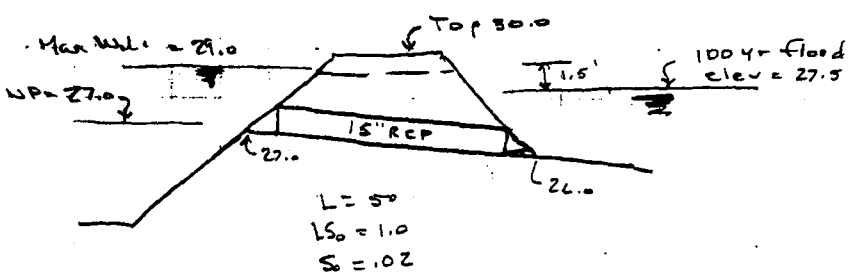
c. Check outlet control: L = 50', $K_e = 0.5$, $S_o = .02$, $LS_o = 1.0$

$$h_o = \frac{d_c + D}{2} = \frac{1.1 + 1.25}{2} = 1.18' \qquad H = HW - h_o + LS_o = 2.0 - 1.18 + 1.0 = 1.82$$

From Chart 9 VDH&T d = 15", H = 1.82 $\Rightarrow$ Q = 9.5 cfs

d. Thus, inlet controls and Q = 7.6 cfs

e. Check submerged inlet & outlet condition



$$V = \sqrt{\frac{h}{\frac{1+K_e}{2g} + \frac{n^2 L}{2.21(R_H)^{4/3}}}} \qquad R_H = \frac{D}{4} = 1.25/4 = 0.31' \qquad n = .012 \text{ concrete pipe}$$

$$= \sqrt{\frac{1.5}{\frac{1+.5}{2(32.2)} + \frac{(.012)^2 50}{2.21(.31)^{4/3}}}} = \sqrt{\frac{1.5}{0.0233 + .0154}} = \sqrt{38.81} = 6.23 \text{ fps}$$

$$Q = AV = \frac{\pi(1.25)^2}{4}(6.23) = 7.64 \text{ cfs} \quad \text{(inlet still controls)}$$

f. Provide a Triple line of 15" culverts Q all three = 7.6 x 3 = 22.8 cfs

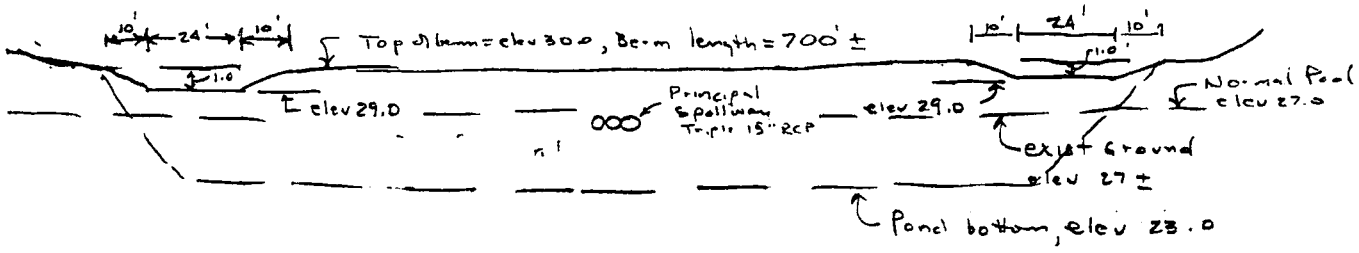
This will assure adequate outflow capacity as a precaution against clogging and it will keep water level fluctuations to a minimum. Outlet capacity is still less than predevelopment Q_2 by about 15.5 cfs and is about 1/2 of post development Q_2.

8. <u>Emergency Spillway</u>: Since pond will store the 100 year peak design storm, a minimum grass emergency spillway to protect against overtopping is in order. Design spillway to operate on a frequency of once every 10 years and ignore storage.

Design for Q_{10} = 54.9 cfs − 22.8 cfs = 32.1 cfs

a 24' bottom width spillway with 2:1 side slopes will pass 17 cfs with about 0.5' of head at a velocity 2.7 fps if it has an exit channel of 33' on a 3.8% slope.

Provide <u>two of these</u> at each end of the pond (ΣQ = 34 cfs) flatten side slopes to 10:1 so that a vehicle can drive across the dam with a minimum of ease.



Profile along Dam Looking Upstream.

9. Check size of inlet channel (ditch between ponds)

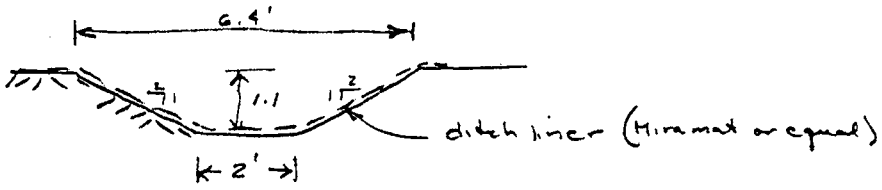
$$S = \frac{32.0 - 29.0}{210} = \frac{3'}{210'} = .0143$$

Q = 17.7 cfs + 1/4 of Q_{10} from 10.4 Ac
= 17.7 cfs + 1/4 (.35)(4.0)(10.4) =
= 17.7 + 3.64 = 21.34 cfs

use trapezoidal section b = 2.0', S.S. = 2:1 and n = 0.03

with Q = 21.3 cfs from Fig 2.8.51 (VDHBT) ⇒ D = 1.1', V = 4.6 fps

Line ditch with Mira mat (good for 3.5 to 10.0 fps)

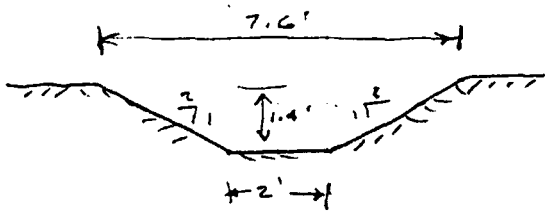


10. Check size of Pond Outlet ditch to Powhatan Creek

$S = 3/500 = .006$, $Q = 22.8$ cfs (from triple 15" RCP), $n = .03$

Use trapezoidal ditch w/ 2' bottom and 2:1 side slopes

From Fig 2.8.51, $D = 1.4'$, Vel = 3.4 fps (No Liner req'd)



CUT POND
FILL
FILL

RISER OVERFLOW = ELEV. 43.0 (NORMAL POOL)
INV. 15" RELEASE TUBE AT RISER = ELEV 33.5
INV 12" POND DRAIN = ELEV 34.50
INV 15" RELEASE TUBE AT OUTLET = ELEV 32.0
BASE OF RISER = ELEV 31.0 (BACKFILL RISER TO ELEV 33.5 WITH MASS CONCRETE TO PREVENT FLOATATION).

2. EARTH FILL DAM:
USE LOCALLY OBTAINED SELECT MAT'L FOR DAM CORE & FILL.
20' TOP WIDTH @ ELEV. 46.50 (TOP)
14.5' HIGH x 340' LONG, 3:1 SIDE SLOPES,
BOTTOM OF CORE KEY = ELEV 30.0
WIDTH OF CLAY CORE @ ELEV 32.0 = 34'
WIDTH OF CLAY CORE @ ELEV 44.0 = 10'
SIDE SLOPES FOR CLAY CORE = 4:1
(SEE DETAIL AT UPPER LEFT CORNER)

RR
6'×40' APRON
9 C.Y. REQ'D

POWHATAN CREEK

PAVED "FLAT BOTTOM

SEE SHEET #17 FOR TYPICAL DITCH EROSION CONTROL MEASURES.

EXCEPT WHERE OTHERWISE NOTED, ALL CULVERTS / STORM TO BE FULLY COATED, CORRUGATED METAL PIPE (GALVAN ALUMINIZED OR ALUMINUM) OR CONCRETE IN ACCORDAN VDOT.

FORD'S

ALPHABET DESIGNATION

A B C D E F G H I J K L M N O P Q R S T U V W X Y

INLET PROTECTION

CULVERT #35
348' OF 24" RCCMP
@ 0.40%

EMERGENCY SPILLWAY #2
(SAME AS #1)

OUTLET CHANNEL TO CREEK
2' BOTTOM WIDTH, 2:1 SIDE SLOPES
1.4' DEEP, SLOPE = 0.006 FT/FT
APPROX. 300' LONG STABILIZED WITH GRASS
MEANDER CHANNEL TO AVOID LARGE TREES WHERE POSSIBLE

PRINCIPAL SPILLWAY OUTLET STRUCTURE
TRIPLE LINE OF 15" RCP x 50' LONG @ 2.0% (FALL = 1.0')
WITH 15" ES-1 END SECTIONS EACH END (6 REQ'D)
INV IN = 27.00, INV OUT = 26.00
EC-1 TYPE A EROSION CONTROL STONE @ OUTLET (APPROX 7 CY. REQ'D)

SF INSTALL SILT FENCE AT FIELD DETERMINED OUTLET LOCATION OF HOLE #5 POND AS IT EXISTS IN FIELD CURRENTLY.

CULVERT #36
240' OF 15" RCCMP @ 1.5%
IN/OUT: 26.7

DI-1
TOP @ 1.0
INV 29.35

IP INLET PROTECTION

10'×30' RIP RAP APRON

FAIRWAY

30' WIDE DAM (BERM)
3' TO 4' HIGH ALONG 12" SANITARY SEWER
3:1 SIDE SLOPES
APPROX. 300' LONG
(USE LOCALLY OBTAINED SELECT MAT'L FOR DAM FILL)

OUTFALL INTO FUTURE POND BOTTOM

• PC154

HOLE #5 POND
NORMAL POOL ELEV = 27.0
EXCAVATE TO ELEV 28.0
POND AREA = 1.64 ACRES
(4' MINIMUM DEPTH)

EMERGENCY SPILLWAY #1
24' x 36' CREST SECTION @ ELEV. 29.0
EXIT SLOPE = 3.8%, SIDE SLOPE 10:1
STABILIZE WITH GRASS
TWO REQ'D (ONE ON EACH SIDE OF DAM)

TEMPORARY DIVERSION DITCH DV
DIRECTS DRAINAGE INTO FUTURE POND AREA

FILL BERM ON LOTS 128 & 129 AS SHOWN

EMERGENCY SPILLWAY
20 x 20' CONTROL SECTION @ ELEV 46.0
EXIT CHANNEL: 20' WIDE, 1' DEEP, 3:1 SS, 10% SLOPE
WITH LINE, CREST & CHANNEL WITH "MIRAFAY" EROSION CONTROL FABRIC OR EQUAL
PROVIDE 30' x 60' APRON OR ES-1 TYPE A EROSION CONTROL STONE AT END OF EXIT CHANNEL (APPROX 80 CY. REQ'D)

OUTLET/INLET CHANNEL
2' BOTTOM WIDTH, 2:1 SIDE SLOPES
1.1' DEEP, SLOPE = 0.043 FT/FT

CD ROCK CHECK DAMS TO BE LINED WITH "MIRAFAY" EROSION CONTROL FABRIC OR EQUAL @ 100' INTERVALS

PRINCIPAL SPILLWAY (SEE NOTE 1 AT TOP OF PAGE)

CD ST

FLAT BOTTOM

SEDIMENT BASIN INFO

48" CMP RISER WITH ANTI-VORTEX COLLAR (72" ϕ, 12 GAUGE, 21" HIGH) WITH TOP INLET @ ELEVATION 42.0. PROVIDE 60' OF 36" ϕ B OUTLET WITH ES-2 END SECTION. INV @ RISER = 38.0, INV OUT = 37.4. TOP OF DAM HIGH WATER = 43.1. PROVIDE 4" DEWATERIN INLET @ ELEV. 40.0. PROVIDE 10' x 40' RIP RAP APRON @ END SECTION.

243 242 239 240 238 237 236 143 142 129 128 141 130 145