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: **PC073**

DATE VERIFIED: **October 9, 2012**

QUALITY ASSURANCE TECHNICIAN: **Leah Hardenbergh**

Leah Hardenbergh

LOCATION: WILLIAMSBURG, VIRGINIA

Stormwater Division

MEMORANDUM

DATE: March 13, 2010

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

FROM: Jo Anna Ripley, Stormwater

PO: 270712

RE: Files Approved for Scanning

General File ID or BMP ID: PC073

PIN: 3740800001A

Subdivision, Tract, Business or Owner Name (if known): Powhatan Secondary

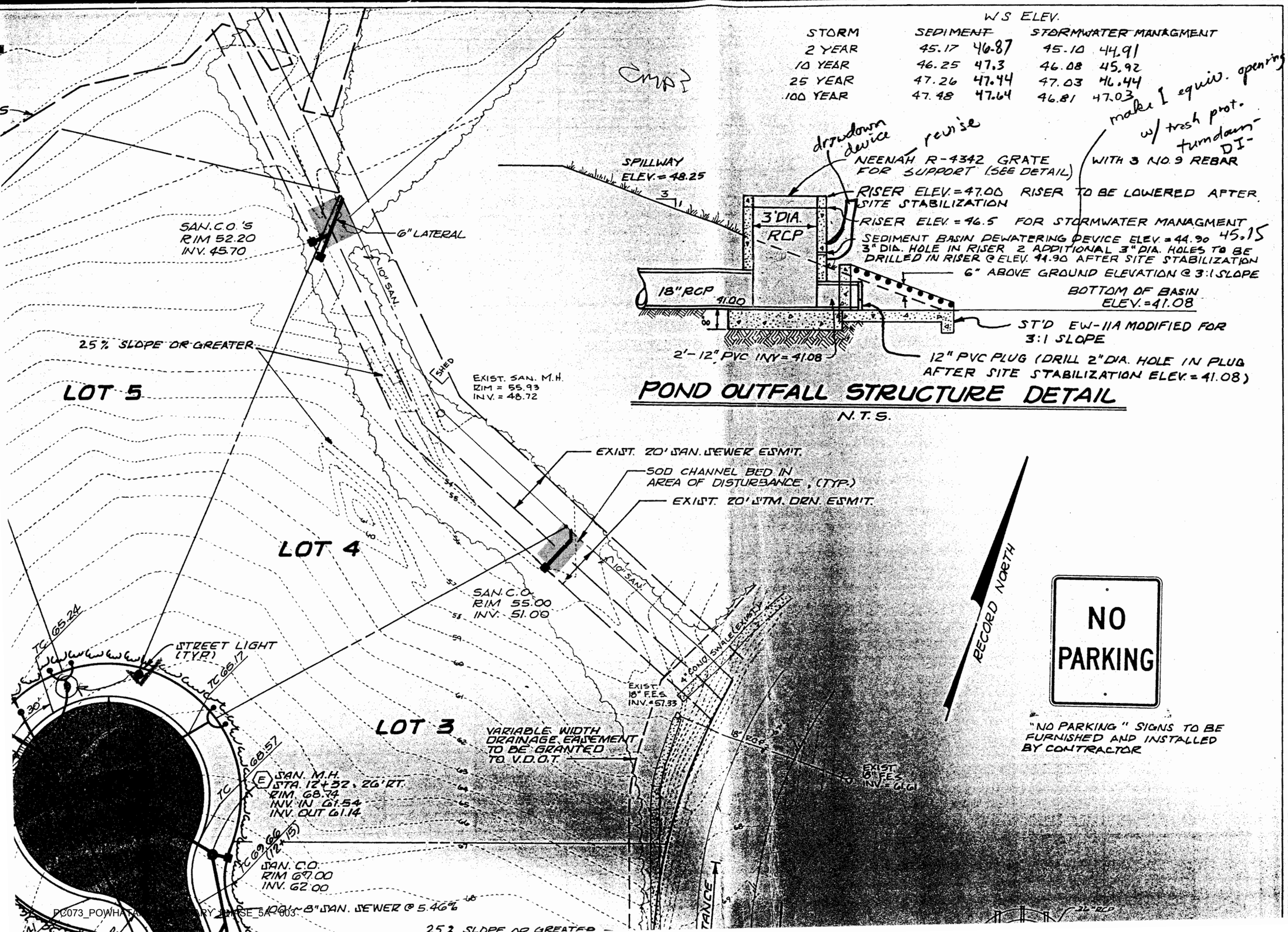
Property Description: Common Area Phase 5A

Site Address:

(For internal use only) **Box** 4 **Drawer:** 3

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

Comments



STORM	SEDIMENT		STORMWATER MANAGMENT	
	W.S. ELEV.			
2 YEAR	45.17	46.87	45.10	44.91
10 YEAR	46.25	47.3	46.08	45.92
25 YEAR	47.26	47.44	47.03	46.44
100 YEAR	47.48	47.64	46.81	47.03

drawdown device — revise

make 1 equiv. opening w/ trash prot. turndown DI-

SPILLWAY
ELEV. = 48.25
3 : 1

NEENAH R-4342 GRATE WITH 3 NO. 9 REBAR
FOR SUPPORT (SEE DETAIL)

RISER ELEV. = 47.00 RISER TO BE LOWERED AFTER
SITE STABILIZATION

3' DIA.
RCP

RISER ELEV. = 46.5 FOR STORMWATER MANAGMENT

SEDIMENT BASIN DEWATERING DEVICE ELEV. = 44.90 45.15
3" DIA. HOLE IN RISER 2 ADDITIONAL 3" DIA. HOLES TO BE
DRILLED IN RISER @ ELEV. 44.90 AFTER SITE STABILIZATION

6" ABOVE GROUND ELEVATION @ 3:1 SLOPE

18" RCP

41.00

BOTTOM OF BASIN
ELEV. = 41.08

ST'D EW-11A MODIFIED FOR
3:1 SLOPE

2'-12" PVC INV = 41.08

12" PVC PLUG (DRILL 2" DIA. HOLE IN PLUG
AFTER SITE STABILIZATION ELEV. = 41.08)

POND OUTFALL STRUCTURE DETAIL

N.T.S.

COMMONWEALTH OF VIRGINIA
STEPHEN A. ROMEO
No. 1448-B
LAND SURVEYOR

Langley and McDonald

A PROFESSIONAL CORPORATION

ENGINEERS • PLANNERS • SURVEYORS

VIRGINIA BEACH – WILLIAMSBURG, VIRGINIA

DESIGN DATA
Q_{10} = 0.87 CFS D = 0.27'
S_o = 1.31% V = 1.17 F/S
n = 0.05

RIP RAP
d_{50} = 0.5'
2'
FILTER FABRIC

OUTFALL DITCH

NOTE: DETENTION BASIN MUST BE CONSTRUCTED PRIOR TO PERFORMING ANY OTHER CONSTRUCTION ACTIVITIES ON SITE

LIMITS OF WETLANDS

10' SAN. SEWER EASEMENT

(10) 18" F.E.S. INV 41.18

(5F)

(C) SAN. M.H. RIM 46.00 INV. IN 36.97 INV. OUT 36.87 INV. IN (6") 39.10

SAN. C.O. RIM 45.50 INV. 39.40

100'-6" SAN. SEWER @ 6.00%

148'-8" SAN. SEWER @ 3.60%

(7) STM. M.H. RIM 49.50 INV. IN 44.45 INV. OUT 42.90

(9) 3' DIA. MANHOLE INV. 42.00 (SEE DETAIL THIS SHEET)

4'-12" PVC INV 41.08

60'-18" RCP @ 0.20% STM

SAN. C.O. RIM 53.40 INV. 45.40

(D) SAN. M.H. RIM 50.00 INV. IN (E) 42.40 INV. IN (S) 42.40 INV. OUT 42.30

25% SL

LOT 5

PC 073 DETENTION BASIN

(8) 18" FES-1 INV. 42.00

3 CU. YD. RIP-RAP

10' SAN. SEWER EASMT. TO JCSA

284'-8" SAN. SEWER @ 6.50%

LOT 6

SAN. C.O. RIM 52.60 INV. 48.60

SAN. C.O. RIM 58.80 INV. 50.20

(5) 18" FES-1 INV. 42.00

174'-15" RCP STM.

SAN. C.O. RIM 53.50 INV. 46.50

BLOW-OFF VALVE

20' STM. DRAIN. EASEMENT

LIMITS OF CLEARING

LOT 7

174'-8" SAN. SEWER @ 3.45%

10' SAN. SEWER EASEMENT

(4) STM. M.H. RIM 54.00 INV. IN 48.25 INV. OUT 43.40

(6) D.I.-3 RIM 64.80 INV. OUT 59.00

10' TRANSITION FROM ROLL TOP CURB TO CG-7 OVER 10'

(G) SAN. M.H. RIM 55.40 INV. IN 48.50 INV. OUT 48.40

SAN. C.O. RIM 55.60 INV. 49.20

SAN. C.O. RIM 55.40 INV. 49.20

FUTURE ℄

(3) DI-3C-L-6 RIM 62.67 INV. IN 56.90 INV. OUT 56.80

TEMP. LEVEL SPREADER L=10'

8" PLUG

2'-8" STUB FOR FUTURE CONN.

167' SAN. SEW. @ 3.05

STA. 16+34.26 END CURB & GUTTER RT. 20' STM. DRN. EDM.

125'-8" SAN. SEWER

164'-15" RCP STM.

16+03.37

LOT 10

(H) SAN. M.H. STA. 16+20 25' RT.

LOT 9

SAN. C.O. RIM 71.20 INV. 65.10

TC 65.24

TC 68.41

TC 70.41

POWHATAN SECONDARY PHASE V-A

TEMPORARY SEDIMENT BASIN

STORMWATER MANAGEMENT

August 16, 1993

POWHATAN SECONDARY PHASE V-A

PREDEVELOPMENT CONDITIONS

AREA	=	7.59 ACRES
C	=	0.25
CA	=	1.90
T_c	=	21. MI. – how determined

i_2	=	3.5	Q_2	=	6.65 cfs
i_{10}	=	4.6	Q_{10}	=	8.74 cfs
i_{25}	=	5.9	Q_{25}	=	11.21 cfs
i_{100}	=	7.0	Q_{100}	=	13.30 cfs

POWHATAN SECONDARY PHASE V-A

SEDIMENT BASIN REQUIREMENTS

7.59 AC. @ 134 CU.YDS./AC. = 27,460 CU.FT.
7.59 AC. @ 67 CU.YDS./AC. = 13,730 CU.FT.

B.M.P. REQUIREMENTS

6 POINT BMP

$$\frac{(1'')\,[0.05 + 0.009(30)]\,(7.59)}{12} = 0.202 \text{ AC.FT.} = 8{,}817 \text{ CU.FT.}$$

STORAGE = 13,645 CU.FT
AVERAGE OUT FLOW (2" ORIFICE) = 0.12 C.F.S.

DRAWDOWN TIME = 31.6 HRS.

POWHATAN SECONDARY PHASE V-A
POND OUTFALL CONFIGURATION

Temporary Sediment Basin

Elevation of "Wet" Storage	44.90	13,645 cu.ft.
Elevation of "Dry" Storage	47.00	28,314 cu.f.
36" Riser Elevation	47.00	
25 Year Water Surface Elevation	47.21	
Crest of Emergency Spillway	48.25	

Detention Pond

2" Diameter Orifice Elevation	41.50
3 - 3" Diameter Orifice Elevation	44.90
36" Riser Elevation	46.50
Crest of Emergency Spillway	48.25

Phase IA basin

STORM	Q_{IN}	Q_{OUT}	V_S
2	13.0	8.6	13,905
10	28.0	23.5	19,303
100	45.0	48.0	22,810

DA = 7.59 RCN = 80

Pre Dev = RCN ⇒ 70 (Good Woods)

Phase 5A basin - (same as above)

STORM	Q_{in}	Q_{OUT}	V_S	$Q_{in\,max}$
2	8.8	5.9	5947	10.4
10	10.2	8.0	8246	13.9
25	10.6	9.3	12,217	17.6
100	17.5	13.9	15,043	24.0

DA = 7.59 ac C = 0.39 T_c = 20 min

T_c - From TR-55

$$Tc = \frac{[0.007 (.4)(200)]^{0.8}}{(3.5)^{1/2}(.025)^{0.4}} = .54\text{ hr} + \frac{350'}{4'/\text{sec}} + \frac{200}{3'/\text{sec}}$$

$$.54 + .024 + .019 = .58\text{ hr} = 35\text{ min}$$

POND-2 Version: 5.17
S/N: 1295130250

POWHATAN PHASE 5A
SEDIMENT BASIN &
STORMWATER MANAGEMENT

CALCULATED 08-03-1993 23:56:53
DISK FILE: b:POW5A .VOL

Planimeter scale: 1 inch = 40 ft.

Elevation (ft)	Planimeter (sq.in.)	Area (sq.ft)	A1+A2+sqr(A1*A2) (sq.ft)	* Volume (cubic-ft)	Volume Sum (cubic-ft)
41.50	0.00	0	0	0	0
42.00	2.00	3,200	3,200	533	533
44.00	3.16	5,056	12,278	8,186	8,719
46.00	4.39	7,024	18,039	12,026	20,745
47.00	5.08	8,128	22,708	7,569	28,314
48.00	5.75	9,200	25,975	8,658	36,973
48.25	5.94	9,504	28,055	2,338	39,311
49.25	6.74	10,784	30,412	10,137	49,448

Elevations With Areas Interpolated From
The Closest Two Planimeter Readings

44.90	-----	5,902	16,420	4,926	13,645
46.50	-----	7,566	21,880	3,647	24,392

IA = (sq.rt(Area1) + ((Ei-E1)/(E2-E1))*(sq.rt(Area2)-sq.rt(Area1)))^2

where: E1, E2 = Closest two elevations with planimeter data
Ei = Elevation at which to interpolate area
Area1,Area2 = Areas computed for E1, E2, respectively
IA = Interpolated area for Ei

* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 10:00:18 08-04-1993

```
*****************************************************************************
*****************************************************************************
*                                                                           *
*                                                                           *
*                          MODIFIED RATIONAL METHOD                         *
*              ---- Grand Summary For All Storm Frequencies ----            *
*                                                                           *
*                                                                           *
*****************************************************************************
*****************************************************************************
```

First peak outflow point assumed to occur at inflow recession leg.

POWHATAN PHASE 5A
SEDIMENT BASIN &
STORMWATER MANAGEMENT

Area = 7.59 acres Tc = 17.00 minutes

Frequency (years)	Adjusted 'C'	Duration minutes	Intens. in/hr	Qpeak cfs	Allowable cfs	VOLUMES Inflow (cu.ft.)	Storage (cu.ft.)
2	0.390	26	3.050	9.03	6.65	14,084	5,506
10	0.390	34	3.510	10.39	8.74	21,196	7,823
25	0.429	28	4.600	14.98	11.21	25,163	10,030
100	0.487	38	4.650	17.21	13.30	39,229	17,284

SWM Design

Storm	Q_{pre}	Q_{post}	Q_{out}	Elev	V_s
2-24	3.2	6.4	0.7	46.6	0.6
2-6	3.1	8.6	0.6	46.0	0.5
10-24	7.6	12.0	6.1	47.6	0.8
25-24	11.2	16.2	13.7	47.8	0.8
100-24	15.7	21.1	21.9	48.1	0.9

Outlet Structure File: POW5A .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
POWHATAN 5A
SEDIMENT BASIN DESIGN

****

***** COMPOSITE OUTFLOW SUMMARY ****

Elevation (ft)	Q (cfs)	Contributing Structures
41.50	0.0	
41.70	0.0	
41.90	0.0	
42.10	0.0	
42.30	0.0	
42.50	0.0	
42.70	0.0	
42.90	0.0	
43.10	0.0	
43.30	0.0	
43.50	0.0	
43.70	0.0	
43.90	0.0	
44.10	0.0	
44.30	0.0	
44.50	0.0	
44.70	0.0	
44.90	0.0	
45.10	0.0	
45.30	0.1	4 - orifice
45.50	0.2	4
45.70	0.2	4
45.90	0.2	4
46.10	0.2	4
46.30	0.3	4
46.50	0.3	4
46.70	0.3	4
46.90	0.3	4
47.10	1.3	4 +2 - Prin.
47.30	5.5	4 +2
47.50	11.5	4 +2
47.70	18.8	4 +2
47.90	27.2	4 +2
48.10	36.1	4 +2
48.30	41.8	4 +2 +3 - E.S.
48.50	71.5	4 +2 +3
48.70	116.2	4 +2 +3
48.90	171.9	4 +2 +3
49.10	237.2	4 +2 +3
49.25	291.7	4 +2 +3

Outlet Structure File: POW5A .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
POWHATAN 5A
SEDIMENT BASIN DESIGN

****

Outlet Structure File: b:POW5A .STR
Planimeter Input File: b:POW5A .VOL
Rating Table Output File: b:POW5A .PND

Min. Elev.(ft) = 41.5 Max. Elev.(ft) = 49.25 Incr.(ft) = .2

Additional elevations (ft) to be included in table:
* *

****
SYSTEM CONNECTIVITY
****

Structure	No.	Q Table		Q Table
ORIFICE-VC	4		->	4
STAND PIPE	2		->	2
WEIR-XY	3		->	3

Outflow rating table summary was stored in file:
b:POW5A .PND

Outlet Structure File: POW5A .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
POWHATAN 5A
SEDIMENT BASIN DESIGN

****

>>>>>> Structure No. 4 <<<<<<
(Input Data)

ORIFICE-VC
Orifice - Vertical Circular

E1 elev.(ft)?	45.1500
E2 elev.(ft)?	49.251
Orifice coeff.?	.6
Invert elev.(ft)?	44.90
Datum elev.(ft)?	45.025
Diameter (ft)?	.25 - 3"

Outlet Structure File: POW5A .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
POWHATAN 5A
SEDIMENT BASIN DESIGN

****

>>>>>> Structure No. 2 <<<<<<
(Input Data)

STAND PIPE
Stand Pipe with weir or orifice flow

E1 elev.(ft)?	47.00
E2 elev.(ft)?	49.251
Crest elev.(ft)?	47.00
Diameter (ft)?	3.0
Weir coefficient?	3.33
Orifice coefficient?	.6
Start transition elev.(ft) @ ?	
Transition height (ft)?	

Outlet Structure File: POW5A .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
POWHATAN 5A
SEDIMENT BASIN DESIGN

****

>>>>>> Structure No. 3 <<<<<<
(Input Data)

WEIR-XY
Weir - Defined by X, Y Coordinates
E1 (ft) =48.25 E2 (ft) = 49.251

X dist.(ft)	Y elev.(ft)
0	49.25
3	48.25
73	48.25
76	49.25

Outlet Structure File: POW5A .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
POWHATAN 5A
SEDIMENT BASIN DESIGN

****

Outflow Rating Table for Structure #4
ORIFICE-VC Orifice - Vertical Circular

Elevation (ft)	Q (cfs)	Computation Messages
41.50	0.0	E < E1=45.1500
41.70	0.0	E < E1=45.1500
41.90	0.0	E < E1=45.1500
42.10	0.0	E < E1=45.1500
42.30	0.0	E < E1=45.1500
42.50	0.0	E < E1=45.1500
42.70	0.0	E < E1=45.1500
42.90	0.0	E < E1=45.1500
43.10	0.0	E < E1=45.1500
43.30	0.0	E < E1=45.1500
43.50	0.0	E < E1=45.1500
43.70	0.0	E < E1=45.1500
43.90	0.0	E < E1=45.1500
44.10	0.0	E < E1=45.1500
44.30	0.0	E < E1=45.1500
44.50	0.0	E < E1=45.1500
44.70	0.0	E < E1=45.1500
44.90	0.0	E < E1=45.1500
45.10	0.0	E < E1=45.1500
45.30	0.1	H =.275
45.50	0.2	H =.475
45.70	0.2	H =.675
45.90	0.2	H =.875
46.10	0.2	H =1.075
46.30	0.3	H =1.275
46.50	0.3	H =1.475
46.70	0.3	H =1.675
46.90	0.3	H =1.875
47.10	0.3	H =2.075
47.30	0.4	H =2.275
47.50	0.4	H =2.475
47.70	0.4	H =2.675
47.90	0.4	H =2.875
48.10	0.4	H =3.075

Outlet Structure File: POW5A .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

>>>>> CONTINUED from previous page <<<<<

Outflow Rating Table for Structure #4
ORIFICE-VC Orifice - Vertical Circular

Elevation (ft)	Q (cfs)	Computation Messages
48.30	0.4	H =3.275
48.50	0.4	H =3.475
48.70	0.5	H =3.675
48.90	0.5	H =3.875
49.10	0.5	H =4.075
49.25	0.5	H =4.225

C = .6 A = 4.908739E-02 sq.ft.
H (ft) = Table elev. - Datum elev. (45.025 ft)
Q (cfs) = C * A * sqr(2g * H)

Outlet Structure File: POW5A .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
POWHATAN 5A
SEDIMENT BASIN DESIGN

****

Outflow Rating Table for Structure #2
STAND PIPE Stand Pipe with weir or orifice flow

***** INLET CONTROL ASSUMED *****

Elevation (ft)	Q (cfs)	Computation Messages
41.50	0.0	E < Inv.El.= 47
41.70	0.0	E < El=47.00
41.90	0.0	E < El=47.00
42.10	0.0	E < El=47.00
42.30	0.0	E < El=47.00
42.50	0.0	E < El=47.00
42.70	0.0	E < El=47.00
42.90	0.0	E < El=47.00
43.10	0.0	E < El=47.00
43.30	0.0	E < El=47.00
43.50	0.0	E < El=47.00
43.70	0.0	E < El=47.00
43.90	0.0	E < El=47.00
44.10	0.0	E < El=47.00
44.30	0.0	E < El=47.00
44.50	0.0	E < El=47.00
44.70	0.0	E < El=47.00
44.90	0.0	E < El=47.00
45.10	0.0	E < El=47.00
45.30	0.0	E < El=47.00
45.50	0.0	E < El=47.00
45.70	0.0	E < El=47.00
45.90	0.0	E < El=47.00
46.10	0.0	E < El=47.00
46.30	0.0	E < El=47.00
46.50	0.0	E < El=47.00
46.70	0.0	E < El=47.00
46.90	0.0	E < El=47.00
47.10	1.0	Weir: H =.1
47.30	5.2	Weir: H =.3
47.50	11.1	Weir: H =.5
47.70	18.4	Weir: H =.7

Outlet Structure File: POW5A .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

>>>>> CONTINUED from previous page <<<<<

Outflow Rating Table for Structure #2
STAND PIPE Stand Pipe with weir or orifice flow

***** INLET CONTROL ASSUMED *****

Elevation (ft)	Q (cfs)	Computation	Messages
47.90	26.8	Weir:	H =.9
48.10	35.7	Orifice:	H =1.1
48.30	38.8	Orifice:	H =1.3
48.50	41.7	Orifice:	H =1.5
48.70	44.4	Orifice:	H =1.7
48.90	46.9	Orifice:	H =1.9
49.10	49.3	Orifice:	H =2.1
49.25	51.1	Orifice:	H =2.25

Weir Cw = 3.33 Weir length = 9.424779 ft
Orifice Co = .6 Orifice area = 7.068584 sq.ft.
Q (cfs) = (Cw * L * H**1.5) or (Co * A * sqr(2*g*H))
No transition used, transition height = 0.0
Weir equation = Orifice equation @ elev.= 48.08445 ft

Outlet Structure File: POW5A .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
POWHATAN 5A
SEDIMENT BASIN DESIGN

****

Outflow Rating Table for Structure #3
WEIR-XY Weir - Defined by X, Y Coordinates

***** INLET CONTROL ASSUMED *****

Elevation (ft)	Q (cfs)	Computation Messages	
41.50	0.0	E < Y min= 48.25	
41.70	0.0	E < Y min= 48.25	
41.90	0.0	E < Y min= 48.25	
42.10	0.0	E < Y min= 48.25	
42.30	0.0	E < Y min= 48.25	
42.50	0.0	E < Y min= 48.25	
42.70	0.0	E < Y min= 48.25	
42.90	0.0	E < Y min= 48.25	
43.10	0.0	E < Y min= 48.25	
43.30	0.0	E < Y min= 48.25	
43.50	0.0	E < Y min= 48.25	
43.70	0.0	E < Y min= 48.25	
43.90	0.0	E < Y min= 48.25	
44.10	0.0	E < Y min= 48.25	
44.30	0.0	E < Y min= 48.25	
44.50	0.0	E < Y min= 48.25	
44.70	0.0	E < Y min= 48.25	
44.90	0.0	E < Y min= 48.25	
45.10	0.0	E < Y min= 48.25	
45.30	0.0	E < Y min= 48.25	
45.50	0.0	E < Y min= 48.25	
45.70	0.0	E < Y min= 48.25	
45.90	0.0	E < Y min= 48.25	
46.10	0.0	E < Y min= 48.25	
46.30	0.0	E < Y min= 48.25	
46.50	0.0	E < Y min= 48.25	
46.70	0.0	E < Y min= 48.25	
46.90	0.0	E < Y min= 48.25	
47.10	0.0	E < E1=48.25	
47.30	0.0	E < E1=48.25	
47.50	0.0	E < E1=48.25	
47.70	0.0	E < E1=48.25	
47.90	0.0	E < E1=48.25	
48.10	0.0	E < E1=48.25	
48.30	2.6	W(ft)=70.3	Max. D(ft)=.05
48.50	29.4	W(ft)=71.5	Max. D(ft)=.25
48.70	71.3	W(ft)=72.7	Max. D(ft)=.45

Outlet Structure File: POW5A .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

>>>>> CONTINUED from previous page <<<<<

Outflow Rating Table for Structure #3
WEIR-XY Weir - Defined by X, Y Coordinates

***** INLET CONTROL ASSUMED *****

Elevation (ft)	Q (cfs)	Computation Messages	
48.90	124.6	W(ft)=73.9	Max. D(ft)=.65
49.10	187.4	W(ft)=75.100	Max. D(ft)=.85
49.25	240.2	W(ft)=76.0	Max. D(ft)=1.0

Outlet Structure File: POW5A 2 .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
POWHATAN 5A
STORMWATER MANAGEMENT

****

***** COMPOSITE OUTFLOW SUMMARY ****

Elevation (ft)	Q (cfs)	Contributing Structures
41.50	0.0	
41.75	0.0	1
42.00	0.1	1
42.25	0.1	1
42.50	0.1	1
42.75	0.1	1
43.00	0.1	1
43.25	0.1	1
43.50	0.1	1
43.75	0.2	1
44.00	0.2	1
44.25	0.2	1
44.50	0.2	1
44.75	0.2	1
45.00	0.2	1
45.25	0.5	7 +5 +2 +1
45.50	0.7	7 +5 +2 +1
45.75	0.8	7 +5 +2 +1
46.00	0.9	7 +5 +2 +1
46.25	1.0	7 +5 +2 +1
46.50	1.1	3 +7 +5 +2 +1
46.75	5.1	3 +7 +5 +2 +1
47.00	12.3	3 +7 +5 +2 +1
47.25	21.7	3 +7 +5 +2 +1
47.50	32.8	3 +7 +5 +2 +1
47.75	39.5	3 +7 +5 +2 +1
48.00	43.2	3 +7 +5 +2 +1
48.25	46.6	4 +3 +7 +5 +2 +1
48.50	79.1	4 +3 +7 +5 +2 +1
48.75	136.4	4 +3 +7 +5 +2 +1
49.00	210.4	4 +3 +7 +5 +2 +1
49.25	298.4	4 +3 +7 +5 +2 +1

Outlet Structure File: POW5A 2 .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
POWHATAN 5A
STORMWATER MANAGEMENT

****

Outlet Structure File: b:POW5A 2 .STR
Planimeter Input File: b:POW5A .VOL
Rating Table Output File: b:POW5A 2 .PND

Min. Elev.(ft) = 41.5 Max. Elev.(ft) = 49.25 Incr.(ft) = .25

Additional elevations (ft) to be included in table:
* *

****
SYSTEM CONNECTIVITY
****

Structure	No.	Q Table		Q Table
WEIR-XY	4		->	4
STAND PIPE	3		->	3
ORIFICE-VC	7		->	7
ORIFICE-VC	5		->	5
ORIFICE-VC	2		->	2
ORIFICE-VC	1		->	1

Outflow rating table summary was stored in file:
b:POW5A 2 .PND

Outlet Structure File: POW5A 2 .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
POWHATAN 5A
STORMWATER MANAGEMENT

****

>>>>>> Structure No. 4 <<<<<<
(Input Data)

WEIR-XY
Weir - Defined by X, Y Coordinates
E1 (ft) =48.25 E2 (ft) = 49.251

X dist.(ft)	Y elev.(ft)
0	49.25
3	48.25
73	48.25
76	49.25

Outlet Structure File: POW5A 2 .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
POWHATAN 5A
STORMWATER MANAGEMENT

****

>>>>>> Structure No. 3 <<<<<<
(Input Data)

STAND PIPE
Stand Pipe with weir or orifice flow

E1 elev.(ft)?	46.50
E2 elev.(ft)?	49.251
Crest elev.(ft)?	46.50
Diameter (ft)?	3.0
Weir coefficient?	3.33
Orifice coefficient?	.6
Start transition elev.(ft) @ ?	
Transition height (ft)?	

Outlet Structure File: POW5A 2 .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
POWHATAN 5A
STORMWATER MANAGEMENT

****

>>>>>> Structure No. 7 <<<<<<
(Input Data)

ORIFICE-VC
Orifice - Vertical Circular

E1 elev.(ft)?	45.025
E2 elev.(ft)?	49.251
Orifice coeff.?	.6
Invert elev.(ft)?	44.90
Datum elev.(ft)?	45.025
Diameter (ft)?	.25

Outlet Structure File: POW5A 2 .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
POWHATAN 5A
STORMWATER MANAGEMENT

****

>>>>>> Structure No. 5 <<<<<<
(Input Data)

ORIFICE-VC
Orifice - Vertical Circular

E1 elev.(ft)?	45.025
E2 elev.(ft)?	49.251
Orifice coeff.?	.6
Invert elev.(ft)?	44.90
Datum elev.(ft)?	45.025
Diameter (ft)?	.25

Outlet Structure File: POW5A 2 .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
POWHATAN 5A
STORMWATER MANAGEMENT

****

>>>>>> Structure No. 2 <<<<<<
(Input Data)

ORIFICE-VC
Orifice - Vertical Circular

E1 elev.(ft)?	45.025
E2 elev.(ft)?	49.251
Orifice coeff.?	.6
Invert elev.(ft)?	44.90
Datum elev.(ft)?	45.025
Diameter (ft)?	.25

Outlet Structure File: POW5A 2 .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
POWHATAN 5A
STORMWATER MANAGEMENT

****

>>>>>> Structure No. 1 <<<<<<
(Input Data)

ORIFICE-VC
Orifice - Vertical Circular

E1 elev.(ft)?	41.667
E2 elev.(ft)?	49.251
Orifice coeff.?	.6
Invert elev.(ft)?	41.50
Datum elev.(ft)?	41.5833
Diameter (ft)?	.167

Outlet Structure File: POW5A 2 .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
POWHATAN 5A
STORMWATER MANAGEMENT

****

Outflow Rating Table for Structure #4
WEIR-XY Weir - Defined by X, Y Coordinates

***** INLET CONTROL ASSUMED *****

Elevation (ft)	Q (cfs)	Computation Messages	
41.50	0.0	E < Y min= 48.25	
41.75	0.0	E < E1=48.25	
42.00	0.0	E < E1=48.25	
42.25	0.0	E < E1=48.25	
42.50	0.0	E < E1=48.25	
42.75	0.0	E < E1=48.25	
43.00	0.0	E < E1=48.25	
43.25	0.0	E < E1=48.25	
43.50	0.0	E < E1=48.25	
43.75	0.0	E < E1=48.25	
44.00	0.0	E < E1=48.25	
44.25	0.0	E < E1=48.25	
44.50	0.0	E < E1=48.25	
44.75	0.0	E < E1=48.25	
45.00	0.0	E < E1=48.25	
45.25	0.0	E < E1=48.25	
45.50	0.0	E < E1=48.25	
45.75	0.0	E < E1=48.25	
46.00	0.0	E < E1=48.25	
46.25	0.0	E < E1=48.25	
46.50	0.0	E < E1=48.25	
46.75	0.0	E < E1=48.25	
47.00	0.0	E < E1=48.25	
47.25	0.0	E < E1=48.25	
47.50	0.0	E < E1=48.25	
47.75	0.0	E < E1=48.25	
48.00	0.0	E < E1=48.25	
48.25	0.0	E = Y min= 48.25	
48.50	29.4	W(ft)=71.5	Max. D(ft)=.25
48.75	83.7	W(ft)=73.0	Max. D(ft)=.5
49.00	154.8	W(ft)=74.5	Max. D(ft)=.750
49.25	240.2	W(ft)=76.0	Max. D(ft)=1.0

Outlet Structure File: POW5A 2 .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
POWHATAN 5A
STORMWATER MANAGEMENT

****

Outflow Rating Table for Structure #3
STAND PIPE Stand Pipe with weir or orifice flow

***** INLET CONTROL ASSUMED *****

Elevation (ft)	Q (cfs)	Computation Messages
41.50	0.0	E < Inv.El.= 46.5
41.75	0.0	E < El=46.50
42.00	0.0	E < El=46.50
42.25	0.0	E < El=46.50
42.50	0.0	E < El=46.50
42.75	0.0	E < El=46.50
43.00	0.0	E < El=46.50
43.25	0.0	E < El=46.50
43.50	0.0	E < El=46.50
43.75	0.0	E < El=46.50
44.00	0.0	E < El=46.50
44.25	0.0	E < El=46.50
44.50	0.0	E < El=46.50
44.75	0.0	E < El=46.50
45.00	0.0	E < El=46.50
45.25	0.0	E < El=46.50
45.50	0.0	E < El=46.50
45.75	0.0	E < El=46.50
46.00	0.0	E < El=46.50
46.25	0.0	E < El=46.50
46.50	0.0	Weir: H =0.0
46.75	3.9	Weir: H =.25
47.00	11.1	Weir: H =.5
47.25	20.4	Weir: H =.750
47.50	31.4	Weir: H =1.0
47.75	38.1	Orifice: H =1.25
48.00	41.7	Orifice: H =1.5
48.25	45.0	Orifice: H =1.75
48.50	48.1	Orifice: H =2.0
48.75	51.1	Orifice: H =2.25
49.00	53.8	Orifice: H =2.5
49.25	56.4	Orifice: H =2.75

Weir Cw = 3.33 Weir length = 9.424779 ft
Orifice Co = .6 Orifice area = 7.068584 sq.ft.
Q (cfs) = (Cw * L * H**1.5) or (Co * A * sqr(2*g*H))
No transition used, transition height = 0.0
Weir equation = Orifice equation @ elev.= 47.58445 ft

Outlet Structure File: POW5A 2 .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
POWHATAN 5A
STORMWATER MANAGEMENT

****

Outflow Rating Table for Structure #7
ORIFICE-VC Orifice - Vertical Circular

Elevation (ft)	Q (cfs)	Computation Messages
41.50	0.0	E < E1=45.025
41.75	0.0	E < E1=45.025
42.00	0.0	E < E1=45.025
42.25	0.0	E < E1=45.025
42.50	0.0	E < E1=45.025
42.75	0.0	E < E1=45.025
43.00	0.0	E < E1=45.025
43.25	0.0	E < E1=45.025
43.50	0.0	E < E1=45.025
43.75	0.0	E < E1=45.025
44.00	0.0	E < E1=45.025
44.25	0.0	E < E1=45.025
44.50	0.0	E < E1=45.025
44.75	0.0	E < E1=45.025
45.00	0.0	E < E1=45.025
45.25	0.1	H =.225
45.50	0.2	H =.475
45.75	0.2	H =.725
46.00	0.2	H =.975
46.25	0.3	H =1.225
46.50	0.3	H =1.475
46.75	0.3	H =1.725
47.00	0.3	H =1.975
47.25	0.4	H =2.225
47.50	0.4	H =2.475
47.75	0.4	H =2.725
48.00	0.4	H =2.975
48.25	0.4	H =3.225
48.50	0.4	H =3.475
48.75	0.5	H =3.725
49.00	0.5	H =3.975
49.25	0.5	H =4.225

C = .6 A = 4.908739E-02 sq.ft.
H (ft) = Table elev. - Datum elev. (45.025 ft)
Q (cfs) = C * A * sqr(2g * H)

Outlet Structure File: POW5A 2 .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
POWHATAN 5A
STORMWATER MANAGEMENT

****

Outflow Rating Table for Structure #5
ORIFICE-VC Orifice - Vertical Circular

Elevation (ft)	Q (cfs)	Computation Messages
41.50	0.0	E < E1=45.025
41.75	0.0	E < E1=45.025
42.00	0.0	E < E1=45.025
42.25	0.0	E < E1=45.025
42.50	0.0	E < E1=45.025
42.75	0.0	E < E1=45.025
43.00	0.0	E < E1=45.025
43.25	0.0	E < E1=45.025
43.50	0.0	E < E1=45.025
43.75	0.0	E < E1=45.025
44.00	0.0	E < E1=45.025
44.25	0.0	E < E1=45.025
44.50	0.0	E < E1=45.025
44.75	0.0	E < E1=45.025
45.00	0.0	E < E1=45.025
45.25	0.1	H =.225
45.50	0.2	H =.475
45.75	0.2	H =.725
46.00	0.2	H =.975
46.25	0.3	H =1.225
46.50	0.3	H =1.475
46.75	0.3	H =1.725
47.00	0.3	H =1.975
47.25	0.4	H =2.225
47.50	0.4	H =2.475
47.75	0.4	H =2.725
48.00	0.4	H =2.975
48.25	0.4	H =3.225
48.50	0.4	H =3.475
48.75	0.5	H =3.725
49.00	0.5	H =3.975
49.25	0.5	H =4.225

C = .6 A = 4.908739E-02 sq.ft.
H (ft) = Table elev. - Datum elev. (45.025 ft)
Q (cfs) = C * A * sqr(2g * H)

Outlet Structure File: POW5A 2 .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
POWHATAN 5A
STORMWATER MANAGEMENT

****

Outflow Rating Table for Structure #2
ORIFICE-VC Orifice - Vertical Circular

Elevation (ft)	Q (cfs)	Computation Messages
41.50	0.0	E < E1=45.025
41.75	0.0	E < E1=45.025
42.00	0.0	E < E1=45.025
42.25	0.0	E < E1=45.025
42.50	0.0	E < E1=45.025
42.75	0.0	E < E1=45.025
43.00	0.0	E < E1=45.025
43.25	0.0	E < E1=45.025
43.50	0.0	E < E1=45.025
43.75	0.0	E < E1=45.025
44.00	0.0	E < E1=45.025
44.25	0.0	E < E1=45.025
44.50	0.0	E < E1=45.025
44.75	0.0	E < E1=45.025
45.00	0.0	E < E1=45.025
45.25	0.1	H =.225
45.50	0.2	H =.475
45.75	0.2	H =.725
46.00	0.2	H =.975
46.25	0.3	H =1.225
46.50	0.3	H =1.475
46.75	0.3	H =1.725
47.00	0.3	H =1.975
47.25	0.4	H =2.225
47.50	0.4	H =2.475
47.75	0.4	H =2.725
48.00	0.4	H =2.975
48.25	0.4	H =3.225
48.50	0.4	H =3.475
48.75	0.5	H =3.725
49.00	0.5	H =3.975
49.25	0.5	H =4.225

C = .6 A = 4.908739E-02 sq.ft.
H (ft) = Table elev. - Datum elev. (45.025 ft)
Q (cfs) = C * A * sqr(2g * H)

Outlet Structure File: POW5A 2 .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
POWHATAN 5A
STORMWATER MANAGEMENT

****

Outflow Rating Table for Structure #1
ORIFICE-VC Orifice - Vertical Circular

Elevation (ft)	Q (cfs)	Computation Messages
41.50	0.0	E < E1=41.667
41.75	0.0	H =.167
42.00	0.1	H =.417
42.25	0.1	H =.667
42.50	0.1	H =.917
42.75	0.1	H =1.167
43.00	0.1	H =1.417
43.25	0.1	H =1.667
43.50	0.1	H =1.917
43.75	0.2	H =2.167
44.00	0.2	H =2.417
44.25	0.2	H =2.667
44.50	0.2	H =2.917
44.75	0.2	H =3.167
45.00	0.2	H =3.417
45.25	0.2	H =3.667
45.50	0.2	H =3.917
45.75	0.2	H =4.167
46.00	0.2	H =4.417
46.25	0.2	H =4.667
46.50	0.2	H =4.917
46.75	0.2	H =5.167
47.00	0.2	H =5.417
47.25	0.3	H =5.667
47.50	0.3	H =5.917
47.75	0.3	H =6.167
48.00	0.3	H =6.417
48.25	0.3	H =6.667
48.50	0.3	H =6.917
48.75	0.3	H =7.167
49.00	0.3	H =7.417
49.25	0.3	H =7.667

C = .6 A = 2.190397E-02 sq.ft.
H (ft) = Table elev. - Datum elev. (41.5833 ft)
Q (cfs) = C * A * sqr(2g * H)

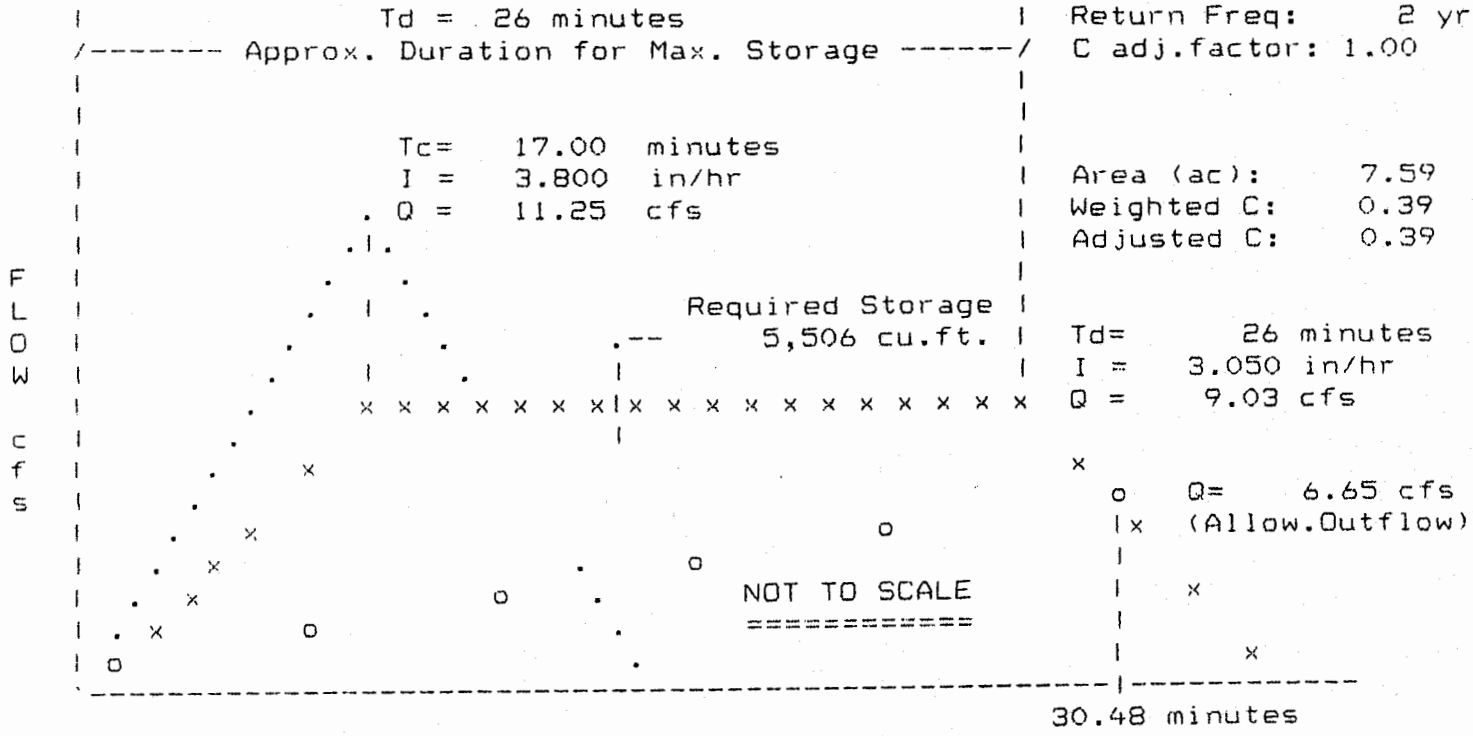
Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 10:00:18 08-04-1993

MODIFIED RATIONAL METHOD
---- Graphical Summary for Maximum Required Storage ----

First peak outflow point assumed to occur at inflow recession leg.

POWHATAN PHASE 5A
SEDIMENT BASIN &
STORMWATER MANAGEMENT

RETURN FREQUENCY: 2 yr	Allowable Outflow: 6.65 cfs
'C' Adjustment: 1.000	Required Storage: 5,506 cu.ft.
Peak Inflow: 9.03 cfs	Inflow .HYD stored: 2-IN .HYD



Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 10:00:18 08-04-1993

POWHATAN PHASE 5A
SEDIMENT BASIN &
STORMWATER MANAGEMENT

**** Modified Rational Hydrograph *****

Weighted C = 0.390 Area= 7.590 acres Tc = 17.00 minutes

Adjusted C = 0.390 Td= 26.00 min. I= 3.05 in/hr Qp= 9.03 cfs

RETURN FREQUENCY: 2 year storm Adj.factor = 1.00
Output file: 2-IN .HYD

HYDROGRAPH FOR MAXIMUM STORAGE
For the 2 Year Storm

Time increment = 1.00 Minutes
Time on left represents time for first Q in each row.

Time Minutes							
0.00	0.00	0.53	1.06	1.59	2.12	2.66	3.19
7.00	3.72	4.25	4.78	5.31	5.84	6.37	6.90
14.00	7.44	7.97	8.50	9.03	9.03	9.03	9.03
21.00	9.03	9.03	9.03	9.03	9.03	9.03	8.50
28.00	7.97	7.44	6.90	6.37	5.84	5.31	4.78
35.00	4.25	3.72	3.19	2.66	2.12	1.59	1.06
42.00	0.53	0.00					

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 10:00:18 08-04-1993

POWHATAN PHASE 5A
SEDIMENT BASIN &
STORMWATER MANAGEMENT

* * * * * * SUMMARY OF RATIONAL METHOD PEAK DISCHARGES * * * * * *

Q = adj * C * I * A
Where: Q=cfs, C=Weighted Runoff Coefficient, I=in/hour, A=acres
adj = 'C' adjustment factor for each return frequency

RETURN FREQUENCY = 2 years
'C' adjustment, k = 1
Adj. 'C' = Wtd.'C' x 1

Subarea Descr.	Runoff 'C'	Area acres	Tc (min)	Wtd. 'C'	Adj. 'C'	I in/hr	Total acres	Peak Q (cfs)
	0.390	7.59						
			17.00	0.390	0.390	3.800	7.59	11.25

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 10:00:18 08-04-1993

MODIFIED RATIONAL METHOD
---- Summary for Single Storm Frequency ----

First peak outflow point assumed to occur at inflow recession leg.

POWHATAN PHASE 5A
SEDIMENT BASIN &
STORMWATER MANAGEMENT

RETURN FREQUENCY: 2 yr 'C' Adjustment = 1.000 Allowable Q = 6.65 cfs

Hydrograph file duration= 26.00 minutes
Hydrograph file: 2-IN .HYD Tc = 17.00 minutes

Weighted 'C'	Adjusted 'C'	Duration minutes	Intens. in/hr	Areas acres	Qpeak cfs	VOLUMES Inflow (cu.ft.)	Storage (cu.ft.)
0.390	0.390	17	3.800	7.59	11.25	11,473	4,690
0.390	0.390	20	3.500	7.59	10.36	12,432	5,051
********** Storage Maximum							
0.390	0.390	26	3.050	7.59	9.03	14,084	5,506
0.390	0.390	30	2.750	7.59	8.14	14,652	5,276
0.390	0.390	40	2.250	7.59	6.66	15,985	4,613
0.390	0.390	50	2.000	7.59	5.92	Qpeak < Qallow	

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**********************
*                    *
*  POWHATAN PHASE 5A *
*   SEDIMENT BASIN   *
*                    *
*                    *
*                    *
**********************
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Inflow Hydrograph: b:2-IN .HYD
Rating Table file: b:POW5A .PND

----INITIAL CONDITIONS----
Elevation = 44.90 ft
Outflow = 0.00 cfs
Storage = 13,645 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
41.50	0.0	0
41.70	0.0	34
41.90	0.0	273
42.10	0.0	857
42.30	0.0	1,531
42.50	0.0	2,238
42.70	0.0	2,981
42.90	0.0	3,759
43.10	0.0	4,574
43.30	0.0	5,427
43.50	0.0	6,318
43.70	0.0	7,248
43.90	0.0	8,218
44.10	0.0	9,229
44.30	0.0	10,277
44.50	0.0	11,361
44.70	0.0	12,484
44.90	0.0	13,645
45.10	0.0	14,845
45.30	0.1	16,085
45.50	0.2	17,364
45.70	0.2	18,685
45.90	0.2	20,048
46.10	0.2	21,453
46.30	0.3	22,900
46.50	0.3	24,392
46.70	0.3	25,927
46.90	0.3	27,507
47.10	1.3	29,132
47.30	5.5	30,800
47.50	11.5	32,510

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
1.1	1.1
9.1	9.1
28.6	28.6
51.0	51.0
74.6	74.6
99.3	99.3
125.3	125.3
152.4	152.4
180.9	180.9
210.6	210.6
241.5	241.5
273.9	273.9
307.6	307.6
342.5	342.5
378.6	378.6
416.0	416.0
454.7	454.7
494.7	494.7
536.0	536.1
578.7	578.9
622.7	622.9
668.1	668.3
715.0	715.2
763.2	763.5
812.9	813.2
864.1	864.4
916.7	917.0
970.9	972.2
1026.5	1032.0
1083.4	1094.9

GIVEN POND DATA			INTERMEDIATE ROUTING COMPUTATIONS	
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)	2S/t (cfs)	2S/t + O (cfs)
47.70	18.8	34,262	1141.8	1160.6
47.90	27.2	36,059	1201.7	1228.9
48.10	36.1	37,899	1263.0	1299.1
48.30	41.8	39,788	1326.0	1367.8
48.50	71.5	41,726	1390.6	1462.1
48.70	116.2	43,714	1456.8	1573.0
48.90	171.9	45,754	1524.8	1696.7
49.10	237.2	47,845	1594.5	1831.7
49.25	291.7	49,448	1647.9	1939.6

Time increment (t) = 1.0 min.

Pond File: b:POW5A .PND
Inflow Hydrograph: b:2-IN .HYD
Outflow Hydrograph: b:2 OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	-----	454.7	454.7	0.00	44.90
1.0	0.53	0.5	455.3	455.3	0.00	44.90
2.0	1.06	1.6	456.9	456.9	0.00	44.91
3.0	1.59	2.7	459.5	459.5	0.00	44.92
4.0	2.12	3.7	463.2	463.2	0.00	44.94
5.0	2.66	4.8	468.0	468.0	0.00	44.97
6.0	3.19	5.9	473.8	473.8	0.00	45.00
7.0	3.72	6.9	480.8	480.8	0.00	45.03
8.0	4.25	8.0	488.7	488.7	0.00	45.07
9.0	4.78	9.0	497.7	497.8	0.01	45.11
10.0	5.31	10.1	507.8	507.8	0.03	45.16
11.0	5.84	11.2	518.8	518.9	0.06	45.22
12.0	6.37	12.2	530.8	531.0	0.09	45.28
13.0	6.90	13.3	543.9	544.1	0.12	45.34
14.0	7.44	14.3	557.9	558.2	0.15	45.40
15.0	7.97	15.4	572.9	573.3	0.19	45.47
16.0	8.50	16.5	589.0	589.4	0.20	45.55
17.0	9.03	17.5	606.1	606.5	0.20	45.63
18.0	9.03	18.1	623.8	624.2	0.20	45.71
19.0	9.03	18.1	641.5	641.9	0.20	45.78
20.0	9.03	18.1	659.1	659.5	0.20	45.86
21.0	9.03	18.1	676.8	677.2	0.20	45.94
22.0	9.03	18.1	694.4	694.8	0.20	46.01
23.0	9.03	18.1	712.1	712.5	0.20	46.09
24.0	9.03	18.1	729.7	730.2	0.23	46.16
25.0	9.03	18.1	747.2	747.8	0.27	46.23
26.0	9.03	18.1	764.7	765.3	0.30	46.31
27.0	8.50	17.5	781.6	782.2	0.30	46.38
28.0	7.97	16.5	797.5	798.1	0.30	46.44
29.0	7.44	15.4	812.3	812.9	0.30	46.50
30.0	6.90	14.3	826.0	826.6	0.30	46.55
31.0	6.37	13.3	838.7	839.3	0.30	46.60
32.0	5.84	12.2	850.3	850.9	0.30	46.65
33.0	5.31	11.2	860.9	861.5	0.30	46.69
34.0	4.78	10.1	870.4	871.0	0.30	46.73
35.0	4.25	9.0	878.8	879.4	0.30	46.76
36.0	3.72	8.0	886.2	886.8	0.30	46.79
37.0	3.19	6.9	892.5	893.1	0.30	46.81
38.0	2.66	5.9	897.7	898.3	0.30	46.83
39.0	2.12	4.8	901.9	902.5	0.30	46.84
40.0	1.59	3.7	905.0	905.6	0.30	46.86
41.0	1.06	2.7	907.1	907.7	0.30	46.86
42.0	0.53	1.6	908.0	908.6	0.30	46.87
43.0	0.00	0.5	908.0	908.6	0.30	46.87

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: b:POW5A .PND
Inflow Hydrograph: b:2-IN .HYD
Outflow Hydrograph: b:2 OUT .HYD

Starting Pond W.S. Elevation = 44.90 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow = 9.03 cfs
Peak Outflow = 0.30 cfs
Peak Elevation = 46.87 ft

***** Summary of Approximate Peak Storage *****

Initial Storage = 13,645 cu-ft
Peak Storage From Storm = 13,611 cu-ft

Total Storage in Pond = 27,256 cu-ft

```
*************************
*                       *
*      POWHATAN 5A      *
*  STORMWATER MANAGEMENT *
*                       *
*                       *
*                       *
*************************
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Inflow Hydrograph: b:2-IN .HYD
Rating Table file: b:POW5A 2 .PND

----INITIAL CONDITIONS----
Elevation = 41.50 ft
Outflow = 0.00 cfs
Storage = 0 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
41.50	0.0	0
41.75	0.0	67
42.00	0.1	533
42.25	0.1	1,360
42.50	0.1	2,238
42.75	0.1	3,172
43.00	0.1	4,162
43.25	0.1	5,210
43.50	0.1	6,318
43.75	0.2	7,487
44.00	0.2	8,719
44.25	0.2	10,011
44.50	0.2	11,361
44.75	0.2	12,770
45.00	0.2	14,240
45.25	0.5	15,771
45.50	0.7	17,364
45.75	0.8	19,022
46.00	0.9	20,745
46.25	1.0	22,534
46.50	1.1	24,392
46.75	5.1	26,318
47.00	12.3	28,314
47.25	21.7	30,379
47.50	32.8	32,510
47.75	39.5	34,707
48.00	43.2	36,973
48.25	46.6	39,311
48.50	79.1	41,726
48.75	136.4	44,219
49.00	210.4	46,793

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
2.2	2.2
17.8	17.9
45.3	45.4
74.6	74.7
105.7	105.8
138.7	138.8
173.6	173.7
210.6	210.7
249.5	249.7
290.6	290.8
333.6	333.8
378.6	378.8
425.6	425.8
474.6	474.8
525.6	526.1
578.7	579.4
633.9	634.7
691.4	692.3
751.0	752.0
812.9	814.0
877.1	882.2
943.6	955.9
1012.4	1034.1
1083.4	1116.2
1156.7	1196.2
1232.2	1275.4
1310.1	1356.7
1390.6	1469.7
1473.7	1610.1
1559.5	1769.9

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
49.25	298.4	49,448

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
1647.9	1946.3

Time increment (t) = 1.0 min.

EXECUTED: 08-04-1993 09:29:24 Return Freq: 2 years

Pond File: b:POW5A 2 .PND
Inflow Hydrograph: b:2-IN .HYD
Outflow Hydrograph: b:2 OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	-----	0.0	0.0	0.00	41.50
1.0	0.53	0.5	0.5	0.5	0.00	41.56
2.0	1.06	1.6	2.1	2.1	0.00	41.74
3.0	1.59	2.7	4.7	4.8	0.02	41.79
4.0	2.12	3.7	8.4	8.4	0.04	41.85
5.0	2.66	4.8	13.0	13.1	0.07	41.92
6.0	3.19	5.9	18.7	18.9	0.10	42.01
7.0	3.72	6.9	25.4	25.6	0.10	42.07
8.0	4.25	8.0	33.1	33.3	0.10	42.14
9.0	4.78	9.0	42.0	42.2	0.10	42.22
10.0	5.31	10.1	51.9	52.1	0.10	42.31
11.0	5.84	11.2	62.8	63.0	0.10	42.40
12.0	6.37	12.2	74.8	75.0	0.10	42.50
13.0	6.90	13.3	87.9	88.1	0.10	42.61
14.0	7.44	14.3	102.0	102.2	0.10	42.72
15.0	7.97	15.4	117.2	117.4	0.10	42.84
16.0	8.50	16.5	133.5	133.7	0.10	42.96
17.0	9.03	17.5	150.8	151.0	0.10	43.09
18.0	9.03	18.1	168.7	168.9	0.10	43.22
19.0	9.03	18.1	186.6	186.8	0.10	43.34
20.0	9.03	18.1	204.4	204.6	0.10	43.46
21.0	9.03	18.1	222.2	222.5	0.13	43.58
22.0	9.03	18.1	239.9	240.3	0.18	43.69
23.0	9.03	18.1	257.6	258.0	0.20	43.80
24.0	9.03	18.1	275.2	275.6	0.20	43.91
25.0	9.03	18.1	292.9	293.3	0.20	44.01
26.0	9.03	18.1	310.6	311.0	0.20	44.12
27.0	8.50	17.5	327.7	328.1	0.20	44.22
28.0	7.97	16.5	343.8	344.2	0.20	44.31
29.0	7.44	15.4	358.8	359.2	0.20	44.39
30.0	6.90	14.3	372.7	373.1	0.20	44.47
31.0	6.37	13.3	385.6	386.0	0.20	44.54
32.0	5.84	12.2	397.4	397.8	0.20	44.60
33.0	5.31	11.2	408.1	408.5	0.20	44.66
34.0	4.78	10.1	417.8	418.2	0.20	44.71
35.0	4.25	9.0	426.5	426.9	0.20	44.76
36.0	3.72	8.0	434.0	434.4	0.20	44.79
37.0	3.19	6.9	440.5	440.9	0.20	44.83
38.0	2.66	5.9	446.0	446.4	0.20	44.86
39.0	2.12	4.8	450.4	450.8	0.20	44.88
40.0	1.59	3.7	453.7	454.1	0.20	44.89
41.0	1.06	2.7	455.9	456.3	0.20	44.91
42.0	0.53	1.6	457.1	457.5	0.20	44.91
43.0	0.00	0.5	457.3	457.7	0.20	44.91

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: b:POW5A 2 .PND
Inflow Hydrograph: b:2-IN .HYD
Outflow Hydrograph: b:2 OUT .HYD

Starting Pond W.S. Elevation = 41.50 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow = 9.03 cfs
Peak Outflow = 0.20 cfs
Peak Elevation = 44.91 ft

***** Summary of Approximate Peak Storage *****

Initial Storage = 0 cu-ft
Peak Storage From Storm = 13,726 cu-ft

Total Storage in Pond = 13,726 cu-ft

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 10:00:18 08-04-1993

MODIFIED RATIONAL METHOD
---- Graphical Summary for Maximum Required Storage ----

First peak outflow point assumed to occur at inflow recession leg.

POWHATAN PHASE 5A
SEDIMENT BASIN &
STORMWATER MANAGEMENT

```
*****************************************************************
*  RETURN FREQUENCY:  10 yr      |  Allowable Outflow:     8.74 cfs    *
*  'C' Adjustment: 1.000         |  Required Storage:    7,823 cu.ft. *
*---------------------------------------------------------------*
*  Peak Inflow:   10.39 cfs        Inflow .HYD stored: 10-IN   .HYD   *
*****************************************************************
```

```
|                Td =  34 minutes                    |  Return Freq:     10 yr
/------- Approx. Duration for Max. Storage ------/  C adj.factor: 1.00
|                                                   |
|                                                   |
|                Tc=   17.00  minutes               |
|                I =   5.030  in/hr                 |  Area (ac):       7.59
|              . Q =   14.89  cfs                   |  Weighted C:      0.39
|            .|.                                    |  Adjusted C:      0.39
F |          .   .                                  |
L |         .  |  .              Required Storage   |
O |       .       .         .--      7,823 cu.ft.   |  Td=       34 minutes
W |      .    |    .        |                      |  I =    3.510 in/hr
  |     .     x x x x x x x|x x x x x x x x x x x   |  Q =    10.39 cfs
c |    .                   |
f |   .    x                                        x
s |  .                                                o   Q=     8.74 cfs
  | .   x                                o           |x  (Allow.Outflow)
  | .  x                       .     o               |
  | . x                 o     .       NOT TO SCALE    |   x
  | . x       o                .      ============    |
  | o                          .                      |       x
  ----------------------------------------------------|------------
                                                     36.70 minutes
```

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 10:00:18 08-04-1993

POWHATAN PHASE 5A
SEDIMENT BASIN &
STORMWATER MANAGEMENT

**** Modified Rational Hydrograph *****

Weighted C = 0.390 Area= 7.590 acres Tc = 17.00 minutes

Adjusted C = 0.390 Td= 34.00 min. I= 3.51 in/hr Qp= 10.39 cfs

RETURN FREQUENCY: 10 year storm Adj.factor = 1.00
Output file: 10-IN .HYD

HYDROGRAPH FOR MAXIMUM STORAGE
For the 10 Year Storm

Time increment = 1.00 Minutes
Time on left represents time for first Q in each row.

Time Minutes							
0.00	0.00	0.61	1.22	1.83	2.44	3.06	3.67
7.00	4.28	4.89	5.50	6.11	6.72	7.33	7.95
14.00	8.56	9.17	9.78	10.39	10.39	10.39	10.39
21.00	10.39	10.39	10.39	10.39	10.39	10.39	10.39
28.00	10.39	10.39	10.39	10.39	10.39	10.39	10.39
35.00	9.78	9.17	8.56	7.95	7.33	6.72	6.11
42.00	5.50	4.89	4.28	3.67	3.06	2.44	1.83
49.00	1.22	0.61	0.00				

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 10:00:18 08-04-1993

POWHATAN PHASE 5A
SEDIMENT BASIN &
STORMWATER MANAGEMENT

* * * * * * SUMMARY OF RATIONAL METHOD PEAK DISCHARGES * * * * * *

Q = adj * C * I * A
Where: Q=cfs, C=Weighted Runoff Coefficient, I=in/hour, A=acres
adj = 'C' adjustment factor for each return frequency

RETURN FREQUENCY = 10 years
'C' adjustment, k = 1
Adj. 'C' = Wtd.'C' x 1

Subarea Descr.	Runoff 'C'	Area acres	Tc (min)	Wtd. 'C'	Adj. 'C'	I in/hr	Total acres	Peak Q (cfs)
	0.390	7.59						
			17.00	0.390	0.390	5.030	7.59	14.89

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 10:00:18 08-04-1993

MODIFIED RATIONAL METHOD
---- Summary for Single Storm Frequency ----

First peak outflow point assumed to occur at inflow recession leg.

POWHATAN PHASE 5A
SEDIMENT BASIN &
STORMWATER MANAGEMENT

RETURN FREQUENCY: 10 yr 'C' Adjustment = 1.000 Allowable Q = 8.74 cfs

Hydrograph file duration= 34.00 minutes
Hydrograph file: 10-IN .HYD Tc = 17.00 minutes

Weighted 'C'	Adjusted 'C'	Duration minutes	Intens. in/hr	Areas acres	Qpeak cfs	VOLUMES Inflow (cu.ft.)	Storage (cu.ft.)
0.390	0.390	17	5.030	7.59	14.89	15,187	6,272
0.390	0.390	20	4.700	7.59	13.91	16,695	6,994
0.390	0.390	30	3.750	7.59	11.10	19,981	7,657
********** Storage Maximum							
0.390	0.390	34	3.510	7.59	10.39	21,196	7,823
0.390	0.390	40	3.150	7.59	9.32	22,378	7,433
0.390	0.390	50	2.750	7.59	8.14	Qpeak < Qallow	

```
**********************
*                    *
*  POWHATAN PHASE 5A *
*   SEDIMENT BASIN   *
*                    *
*                    *
*                    *
**********************
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Inflow Hydrograph: b:10-IN .HYD
Rating Table file: b:POW5A .PND

----INITIAL CONDITIONS----
Elevation = 44.90 ft
Outflow = 0.00 cfs
Storage = 13,645 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
41.50	0.0	0
41.70	0.0	34
41.90	0.0	273
42.10	0.0	857
42.30	0.0	1,531
42.50	0.0	2,238
42.70	0.0	2,981
42.90	0.0	3,759
43.10	0.0	4,574
43.30	0.0	5,427
43.50	0.0	6,318
43.70	0.0	7,248
43.90	0.0	8,218
44.10	0.0	9,229
44.30	0.0	10,277
44.50	0.0	11,361
44.70	0.0	12,484
44.90	0.0	13,645
45.10	0.0	14,845
45.30	0.1	16,085
45.50	0.2	17,364
45.70	0.2	18,685
45.90	0.2	20,048
46.10	0.2	21,453
46.30	0.3	22,900
46.50	0.3	24,392
46.70	0.3	25,927
46.90	0.3	27,507
47.10	1.3	29,132
47.30	5.5	30,800
47.50	11.5	32,510

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
1.1	1.1
9.1	9.1
28.6	28.6
51.0	51.0
74.6	74.6
99.3	99.3
125.3	125.3
152.4	152.4
180.9	180.9
210.6	210.6
241.5	241.5
273.9	273.9
307.6	307.6
342.5	342.5
378.6	378.6
416.0	416.0
454.7	454.7
494.7	494.7
536.0	536.1
578.7	578.9
622.7	622.9
668.1	668.3
715.0	715.2
763.2	763.5
812.9	813.2
864.1	864.4
916.7	917.0
970.9	972.2
1026.5	1032.0
1083.4	1094.9

GIVEN POND DATA			INTERMEDIATE ROUTING COMPUTATIONS	
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)	2S/t (cfs)	2S/t + O (cfs)
47.70	18.8	34,262	1141.8	1160.6
47.90	27.2	36,059	1201.7	1228.9
48.10	36.1	37,899	1263.0	1299.1
48.30	41.8	39,788	1326.0	1367.8
48.50	71.5	41,726	1390.6	1462.1
48.70	116.2	43,714	1456.8	1573.0
48.90	171.9	45,754	1524.8	1696.7
49.10	237.2	47,845	1594.5	1831.7
49.25	291.7	49,448	1647.9	1939.6

Time increment (t) = 1.0 min.

Pond File: b:POW5A .PND
Inflow Hydrograph: b:10-IN .HYD
Outflow Hydrograph: b:10 OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	-----	454.7	454.7	0.00	44.90
1.0	0.61	0.6	455.3	455.3	0.00	44.90
2.0	1.22	1.8	457.2	457.2	0.00	44.91
3.0	1.83	3.1	460.2	460.2	0.00	44.93
4.0	2.44	4.3	464.5	464.5	0.00	44.95
5.0	3.06	5.5	470.0	470.0	0.00	44.98
6.0	3.67	6.7	476.7	476.7	0.00	45.01
7.0	4.28	8.0	484.7	484.7	0.00	45.05
8.0	4.89	9.2	493.8	493.8	0.00	45.10
9.0	5.50	10.4	504.2	504.2	0.02	45.15
10.0	6.11	11.6	515.7	515.8	0.05	45.20
11.0	6.72	12.8	528.4	528.5	0.08	45.26
12.0	7.33	14.1	542.2	542.4	0.11	45.33
13.0	7.95	15.3	557.2	557.5	0.15	45.40
14.0	8.56	16.5	573.3	573.7	0.19	45.48
15.0	9.17	17.7	590.6	591.0	0.20	45.56
16.0	9.78	19.0	609.2	609.6	0.20	45.64
17.0	10.39	20.2	628.9	629.3	0.20	45.73
18.0	10.39	20.8	649.3	649.7	0.20	45.82
19.0	10.39	20.8	669.7	670.1	0.20	45.91
20.0	10.39	20.8	690.1	690.5	0.20	45.99
21.0	10.39	20.8	710.5	710.9	0.20	46.08
22.0	10.39	20.8	730.8	731.2	0.23	46.17
23.0	10.39	20.8	751.0	751.6	0.28	46.25
24.0	10.39	20.8	771.2	771.8	0.30	46.33
25.0	10.39	20.8	791.4	792.0	0.30	46.41
26.0	10.39	20.8	811.6	812.2	0.30	46.50
27.0	10.39	20.8	831.7	832.3	0.30	46.57
28.0	10.39	20.8	851.9	852.5	0.30	46.65
29.0	10.39	20.8	872.1	872.7	0.30	46.73
30.0	10.39	20.8	892.3	892.9	0.30	46.81
31.0	10.39	20.8	912.5	913.1	0.30	46.88
32.0	10.39	20.8	932.0	933.2	0.59	46.96
33.0	10.39	20.8	950.9	952.8	0.95	47.03
34.0	10.39	20.8	969.1	971.7	1.29	47.10
35.0	9.78	20.2	984.3	989.3	2.50	47.16
36.0	9.17	19.0	996.3	1003.2	3.48	47.20
37.0	8.56	17.7	1005.5	1014.0	4.24	47.24
38.0	7.95	16.5	1012.4	1022.0	4.80	47.27
39.0	7.33	15.3	1017.3	1027.7	5.20	47.29
40.0	6.72	14.1	1020.4	1031.4	5.46	47.30
41.0	6.11	12.8	1022.0	1033.3	5.63	47.30
42.0	5.50	11.6	1022.3	1033.6	5.66	47.31
43.0	4.89	10.4	1021.6	1032.7	5.57	47.30
44.0	4.28	9.2	1019.9	1030.7	5.41	47.30

EXECUTED: 08-04-1993 10:42:26 Return Freq: 10 years

Pond File: b:POW5A .PND
Inflow Hydrograph: b:10-IN .HYD
Outflow Hydrograph: b:10 OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
45.0	3.67	8.0	1017.4	1027.9	5.21	47.29
46.0	3.06	6.7	1014.3	1024.2	4.95	47.27
47.0	2.44	5.5	1010.5	1019.8	4.64	47.26
48.0	1.83	4.3	1006.2	1014.7	4.29	47.24
49.0	1.22	3.1	1001.4	1009.2	3.90	47.22
50.0	0.61	1.8	996.3	1003.2	3.48	47.20
51.0	0.00	0.6	990.8	996.9	3.04	47.18

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: b:POW5A .PND
Inflow Hydrograph: b:10-IN .HYD
Outflow Hydrograph: b:10 OUT .HYD

Starting Pond W.S. Elevation = 44.90 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow = 10.39 cfs
Peak Outflow = 5.66 cfs
Peak Elevation = 47.31 ft

***** Summary of Approximate Peak Storage *****

Initial Storage = 13,645 cu-ft
Peak Storage From Storm = 17,201 cu-ft

Total Storage in Pond = 30,845 cu-ft

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***************************
*                         *
*       POWHATAN 5A       *
*   STORMWATER MANAGEMENT *
*                         *
*                         *
*                         *
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Inflow Hydrograph: b:10-IN .HYD
Rating Table file: b:POW5A 2 .PND

----INITIAL CONDITIONS----
Elevation = 41.50 ft
Outflow = 0.00 cfs
Storage = 0 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
41.50	0.0	0
41.75	0.0	67
42.00	0.1	533
42.25	0.1	1,360
42.50	0.1	2,238
42.75	0.1	3,172
43.00	0.1	4,162
43.25	0.1	5,210
43.50	0.1	6,318
43.75	0.2	7,487
44.00	0.2	8,719
44.25	0.2	10,011
44.50	0.2	11,361
44.75	0.2	12,770
45.00	0.2	14,240
45.25	0.5	15,771
45.50	0.7	17,364
45.75	0.8	19,022
46.00	0.9	20,745
46.25	1.0	22,534
46.50	1.1	24,392
46.75	5.1	26,318
47.00	12.3	28,314
47.25	21.7	30,379
47.50	32.8	32,510
47.75	39.5	34,707
48.00	43.2	36,973
48.25	46.6	39,311
48.50	79.1	41,726
48.75	136.4	44,219
49.00	210.4	46,793

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
2.2	2.2
17.8	17.9
45.3	45.4
74.6	74.7
105.7	105.8
138.7	138.8
173.6	173.7
210.6	210.7
249.5	249.7
290.6	290.8
333.6	333.8
378.6	378.8
425.6	425.8
474.6	474.8
525.6	526.1
578.7	579.4
633.9	634.7
691.4	692.3
751.0	752.0
812.9	814.0
877.1	882.2
943.6	955.9
1012.4	1034.1
1083.4	1116.2
1156.7	1196.2
1232.2	1275.4
1310.1	1356.7
1390.6	1469.7
1473.7	1610.1
1559.5	1769.9

GIVEN POND DATA			INTERMEDIATE ROUTING COMPUTATIONS	
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)	2S/t (cfs)	2S/t + O (cfs)
49.25	298.4	49,448	1647.9	1946.3

Time increment (t) = 1.0 min.

Pond File: b:POW5A 2 .PND
Inflow Hydrograph: b:10-IN .HYD
Outflow Hydrograph: b:10 OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	-----	0.0	0.0	0.00	41.50
1.0	0.61	0.6	0.6	0.6	0.00	41.57
2.0	1.22	1.8	2.4	2.4	0.00	41.75
3.0	1.83	3.1	5.4	5.5	0.02	41.80
4.0	2.44	4.3	9.6	9.7	0.05	41.87
5.0	3.06	5.5	15.0	15.1	0.08	41.96
6.0	3.67	6.7	21.5	21.7	0.10	42.03
7.0	4.28	8.0	29.2	29.4	0.10	42.10
8.0	4.89	9.2	38.2	38.4	0.10	42.19
9.0	5.50	10.4	48.4	48.6	0.10	42.28
10.0	6.11	11.6	59.8	60.0	0.10	42.37
11.0	6.72	12.8	72.4	72.6	0.10	42.48
12.0	7.33	14.1	86.3	86.5	0.10	42.59
13.0	7.95	15.3	101.4	101.6	0.10	42.72
14.0	8.56	16.5	117.7	117.9	0.10	42.84
15.0	9.17	17.7	135.2	135.4	0.10	42.97
16.0	9.78	19.0	154.0	154.2	0.10	43.11
17.0	10.39	20.2	173.9	174.1	0.10	43.25
18.0	10.39	20.8	194.5	194.7	0.10	43.39
19.0	10.39	20.8	215.1	215.3	0.11	43.53
20.0	10.39	20.8	235.5	235.8	0.16	43.66
21.0	10.39	20.8	255.9	256.3	0.20	43.79
22.0	10.39	20.8	276.3	276.7	0.20	43.91
23.0	10.39	20.8	296.7	297.1	0.20	44.04
24.0	10.39	20.8	317.0	317.4	0.20	44.15
25.0	10.39	20.8	337.4	337.8	0.20	44.27
26.0	10.39	20.8	357.8	358.2	0.20	44.39
27.0	10.39	20.8	378.2	378.6	0.20	44.50
28.0	10.39	20.8	398.6	399.0	0.20	44.61
29.0	10.39	20.8	418.9	419.3	0.20	44.72
30.0	10.39	20.8	439.3	439.7	0.20	44.82
31.0	10.39	20.8	459.7	460.1	0.20	44.93
32.0	10.39	20.8	480.0	480.5	0.23	45.03
33.0	10.39	20.8	500.1	500.8	0.35	45.13
34.0	10.39	20.8	519.9	520.9	0.47	45.22
35.0	9.78	20.2	539.0	540.1	0.55	45.32
36.0	9.17	19.0	556.7	557.9	0.62	45.40
37.0	8.56	17.7	573.1	574.4	0.68	45.48
38.0	7.95	16.5	588.1	589.6	0.72	45.55
39.0	7.33	15.3	601.9	603.4	0.74	45.61
40.0	6.72	14.1	614.5	616.0	0.77	45.67
41.0	6.11	12.8	625.7	627.3	0.79	45.72
42.0	5.50	11.6	635.7	637.3	0.80	45.76
43.0	4.89	10.4	644.5	646.1	0.82	45.80
44.0	4.28	9.2	652.0	653.6	0.83	45.83

Pond File: b:POW5A 2 .PND
Inflow Hydrograph: b:10-IN .HYD
Outflow Hydrograph: b:10 OUT .HYD

INFLOW HYDROGRAPH / ROUTING COMPUTATIONS

TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
45.0	3.67	8.0	658.2	659.9	0.84	45.86
46.0	3.06	6.7	663.3	665.0	0.85	45.88
47.0	2.44	5.5	667.0	668.8	0.86	45.90
48.0	1.83	4.3	669.6	671.3	0.86	45.91
49.0	1.22	3.1	670.9	672.6	0.87	45.91
50.0	0.61	1.8	671.0	672.7	0.87	45.92
51.0	0.00	0.6	669.9	671.6	0.86	45.91

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: b:POW5A 2 .PND
Inflow Hydrograph: b:10-IN .HYD
Outflow Hydrograph: b:10 OUT .HYD

Starting Pond W.S. Elevation = 41.50 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow = 10.39 cfs
Peak Outflow = 0.87 cfs
Peak Elevation = 45.92 ft

***** Summary of Approximate Peak Storage *****

Initial Storage = 0 cu-ft
Peak Storage From Storm = 20,160 cu-ft

Total Storage in Pond = 20,160 cu-ft

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 10:00:18 08-04-1993

MODIFIED RATIONAL METHOD
---- Graphical Summary for Maximum Required Storage ----

First peak outflow point assumed to occur at inflow recession leg.

POWHATAN PHASE 5A
SEDIMENT BASIN &
STORMWATER MANAGEMENT

```
*****************************************************************
*  RETURN FREQUENCY:  25 yr      |  Allowable Outflow:    11.21 cfs    *
*  'C' Adjustment: 1.100         |  Required Storage:    10,030 cu.ft. *
*---------------------------------------------------------------*
*  Peak Inflow:    14.98 cfs        Inflow .HYD stored: 25-IN    .HYD   *
*****************************************************************
```

```
|                Td =  28 minutes                    |  Return Freq:     25 yr
/------- Approx. Duration for Max. Storage ------/  C adj.factor: 1.10
|                                                   |
|                                                   |
|                Tc=    17.00  minutes              |
|                I =    5.760  in/hr                |  Area (ac):       7.59
|              . Q =    18.76  cfs                  |  Weighted C:      0.39
|            .|.                                    |  Adjusted C:      0.43
F |          .   .                                  |
L |         .  |  .              Required Storage   |
O |       .       .         .--     10,030 cu.ft.   |  Td=       28 minutes
W |      .    |    .        |                      |  I =    4.600 in/hr
  |     .     x x x x x x x|x x x x x x x x x x x   Q =    14.98 cfs
c |    .                   .|
f |   .    x                                        x
s |  .                                                o   Q=    11.21 cfs
  | .   x                                   o        |x  (Allow.Outflow)
  | .  x                     .     o                 |
  | . x              o     .       NOT TO SCALE       |   x
  | . x       o                .   ============       |
  | o                            .                    |       x
  `-------------------------------------------------|------------
                                                   32.28 minutes
```

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 10:00:18 08-04-1993

POWHATAN PHASE 5A
SEDIMENT BASIN &
STORMWATER MANAGEMENT

**** Modified Rational Hydrograph *****

Weighted C = 0.390 Area= 7.590 acres Tc = 17.00 minutes

Adjusted C = 0.429 Td= 28.00 min. I= 4.60 in/hr Qp= 14.98 cfs

RETURN FREQUENCY: 25 year storm Adj.factor = 1.10
Output file: 25-IN .HYD

HYDROGRAPH FOR MAXIMUM STORAGE
For the 25 Year Storm

Time increment = 1.00 Minutes
Time on left represents time for first Q in each row.

Time Minutes							
0.00	0.00	0.88	1.76	2.64	3.52	4.41	5.29
7.00	6.17	7.05	7.93	8.81	9.69	10.57	11.45
14.00	12.33	13.22	14.10	14.98	14.98	14.98	14.98
21.00	14.98	14.98	14.98	14.98	14.98	14.98	14.98
28.00	14.98	14.10	13.22	12.33	11.45	10.57	9.69
35.00	8.81	7.93	7.05	6.17	5.29	4.41	3.52
42.00	2.64	1.76	0.88	0.00			

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 10:00:18 08-04-1993

POWHATAN PHASE 5A
SEDIMENT BASIN &
STORMWATER MANAGEMENT

* * * * * * SUMMARY OF RATIONAL METHOD PEAK DISCHARGES * * * * * *

Q = adj * C * I * A
Where: Q=cfs, C=Weighted Runoff Coefficient, I=in/hour, A=acres
adj = 'C' adjustment factor for each return frequency

RETURN FREQUENCY = 25 years
'C' adjustment, k = 1.1
Adj. 'C' = Wtd.'C' x 1.1

Subarea Descr.	Runoff 'C'	Area acres	Tc (min)	Wtd. 'C'	Adj. 'C'	I in/hr	Total acres	Peak Q (cfs)
	0.390	7.59						
			17.00	0.390	0.429	5.760	7.59	18.76

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 10:00:18 08-04-1993

MODIFIED RATIONAL METHOD
---- Summary for Single Storm Frequency ----

First peak outflow point assumed to occur at inflow recession leg.

POWHATAN PHASE 5A
SEDIMENT BASIN &
STORMWATER MANAGEMENT

RETURN FREQUENCY: 25 yr 'C' Adjustment = 1.100 Allowable Q = 11.21 cfs

Hydrograph file duration= 28.00 minutes
Hydrograph file: 25-IN .HYD Tc = 17.00 minutes

Weighted 'C'	Adjusted 'C'	Duration minutes	Intens. in/hr	Areas acres	Qpeak cfs	VOLUMES Inflow (cu.ft.)	Storage (cu.ft.)
0.390	0.429	17	5.760	7.59	18.76	19,130	7,696
0.390	0.429	20	5.400	7.59	17.58	21,100	8,656
********** Storage Maximum							
0.390	0.429	28	4.600	7.59	14.98	25,163	10,030
**********							
0.390	0.429	30	4.400	7.59	14.33	25,788	9,982
0.390	0.429	40	3.600	7.59	11.72	28,133	8,964
0.390	0.429	50	3.250	7.59	10.58	Qpeak < Qallow	

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*                    *
*  POWHATAN PHASE 5A *
*   SEDIMENT BASIN   *
*                    *
*                    *
*                    *
**********************
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Inflow Hydrograph: b:25-IN .HYD
Rating Table file: b:POW5A .PND

----INITIAL CONDITIONS----
Elevation = 44.90 ft
Outflow = 0.00 cfs
Storage = 13,645 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
41.50	0.0	0
41.70	0.0	34
41.90	0.0	273
42.10	0.0	857
42.30	0.0	1,531
42.50	0.0	2,238
42.70	0.0	2,981
42.90	0.0	3,759
43.10	0.0	4,574
43.30	0.0	5,427
43.50	0.0	6,318
43.70	0.0	7,248
43.90	0.0	8,218
44.10	0.0	9,229
44.30	0.0	10,277
44.50	0.0	11,361
44.70	0.0	12,484
44.90	0.0	13,645
45.10	0.0	14,845
45.30	0.1	16,085
45.50	0.2	17,364
45.70	0.2	18,685
45.90	0.2	20,048
46.10	0.2	21,453
46.30	0.3	22,900
46.50	0.3	24,392
46.70	0.3	25,927
46.90	0.3	27,507
47.10	1.3	29,132
47.30	5.5	30,800
47.50	11.5	32,510

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
1.1	1.1
9.1	9.1
28.6	28.6
51.0	51.0
74.6	74.6
99.3	99.3
125.3	125.3
152.4	152.4
180.9	180.9
210.6	210.6
241.5	241.5
273.9	273.9
307.6	307.6
342.5	342.5
378.6	378.6
416.0	416.0
454.7	454.7
494.7	494.7
536.0	536.1
578.7	578.9
622.7	622.9
668.1	668.3
715.0	715.2
763.2	763.5
812.9	813.2
864.1	864.4
916.7	917.0
970.9	972.2
1026.5	1032.0
1083.4	1094.9

GIVEN POND DATA			INTERMEDIATE ROUTING COMPUTATIONS	
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)	2S/t (cfs)	2S/t + O (cfs)
47.70	18.8	34,262	1141.8	1160.6
47.90	27.2	36,059	1201.7	1228.9
48.10	36.1	37,899	1263.0	1299.1
48.30	41.8	39,788	1326.0	1367.8
48.50	71.5	41,726	1390.6	1462.1
48.70	116.2	43,714	1456.8	1573.0
48.90	171.9	45,754	1524.8	1696.7
49.10	237.2	47,845	1594.5	1831.7
49.25	291.7	49,448	1647.9	1939.6

Time increment (t) = 1.0 min.

Pond File: b:POW5A .PND
Inflow Hydrograph: b:25-IN .HYD
Outflow Hydrograph: b:25 OUT .HYD

INFLOW HYDROGRAPH / ROUTING COMPUTATIONS

TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	-----	454.7	454.7	0.00	44.90
1.0	0.88	0.9	455.6	455.6	0.00	44.90
2.0	1.76	2.6	458.3	458.3	0.00	44.92
3.0	2.64	4.4	462.7	462.7	0.00	44.94
4.0	3.52	6.2	468.8	468.8	0.00	44.97
5.0	4.41	7.9	476.7	476.7	0.00	45.01
6.0	5.29	9.7	486.4	486.4	0.00	45.06
7.0	6.17	11.5	497.9	497.9	0.01	45.12
8.0	7.05	13.2	511.0	511.1	0.04	45.18
9.0	7.93	15.0	525.9	526.0	0.08	45.25
10.0	8.81	16.7	542.4	542.6	0.12	45.33
11.0	9.69	18.5	560.6	560.9	0.16	45.42
12.0	10.57	20.3	580.4	580.8	0.20	45.51
13.0	11.45	22.0	602.0	602.4	0.20	45.61
14.0	12.33	23.8	625.4	625.8	0.20	45.71
15.0	13.22	25.6	650.6	651.0	0.20	45.82
16.0	14.10	27.3	677.5	677.9	0.20	45.94
17.0	14.98	29.1	706.2	706.6	0.20	46.06
18.0	14.98	30.0	735.6	736.1	0.24	46.19
19.0	14.98	30.0	765.0	765.6	0.30	46.31
20.0	14.98	30.0	794.4	795.0	0.30	46.43
21.0	14.98	30.0	823.7	824.3	0.30	46.54
22.0	14.98	30.0	853.1	853.7	0.30	46.66
23.0	14.98	30.0	882.4	883.0	0.30	46.77
24.0	14.98	30.0	911.8	912.4	0.30	46.88
25.0	14.98	30.0	940.3	941.8	0.75	46.99
26.0	14.98	30.0	967.7	970.2	1.26	47.09
27.0	14.98	30.0	991.5	997.7	3.09	47.19
28.0	14.98	30.0	1011.9	1021.4	4.76	47.26
29.0	14.10	29.1	1028.3	1041.0	6.36	47.33
30.0	13.22	27.3	1040.1	1055.6	7.75	47.38
31.0	12.33	25.6	1048.2	1065.6	8.71	47.41
32.0	11.45	23.8	1053.4	1072.0	9.31	47.43
33.0	10.57	22.0	1056.1	1075.4	9.64	47.44
34.0	9.69	20.3	1056.9	1076.4	9.73	47.44
35.0	8.81	18.5	1056.1	1075.4	9.64	47.44
36.0	7.93	16.7	1054.1	1072.9	9.40	47.43
37.0	7.05	15.0	1051.0	1069.1	9.03	47.42
38.0	6.17	13.2	1047.1	1064.2	8.57	47.40
39.0	5.29	11.5	1042.5	1058.5	8.03	47.38
40.0	4.41	9.7	1037.3	1052.2	7.42	47.36
41.0	3.52	7.9	1031.7	1045.2	6.77	47.34
42.0	2.64	6.2	1025.7	1037.9	6.06	47.32
43.0	1.76	4.4	1019.4	1030.1	5.37	47.29
44.0	0.88	2.6	1012.4	1022.0	4.80	47.27

Pond File: b:POW5A .PND
Inflow Hydrograph: b:25-IN .HYD
Outflow Hydrograph: b:25 OUT .HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
45.0	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.9	1004.9	1013.3	4.19	47.24

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: b:POW5A .PND
Inflow Hydrograph: b:25-IN .HYD
Outflow Hydrograph: b:25 OUT .HYD

Starting Pond W.S. Elevation = 44.90 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow = 14.98 cfs
Peak Outflow = 9.73 cfs
Peak Elevation = 47.44 ft

***** Summary of Approximate Peak Storage *****

Initial Storage = 13,645 cu-ft
Peak Storage From Storm = 18,361 cu-ft

Total Storage in Pond = 32,006 cu-ft

```
***************************
*                         *
*       POWHATAN 5A       *
*   STORMWATER MANAGEMENT *
*                         *
*                         *
*                         *
***************************
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Inflow Hydrograph: b:25-IN .HYD
Rating Table file: b:POW5A 2 .PND

----INITIAL CONDITIONS----
Elevation = 41.50 ft
Outflow = 0.00 cfs
Storage = 0 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
41.50	0.0	0
41.75	0.0	67
42.00	0.1	533
42.25	0.1	1,360
42.50	0.1	2,238
42.75	0.1	3,172
43.00	0.1	4,162
43.25	0.1	5,210
43.50	0.1	6,318
43.75	0.2	7,487
44.00	0.2	8,719
44.25	0.2	10,011
44.50	0.2	11,361
44.75	0.2	12,770
45.00	0.2	14,240
45.25	0.5	15,771
45.50	0.7	17,364
45.75	0.8	19,022
46.00	0.9	20,745
46.25	1.0	22,534
46.50	1.1	24,392
46.75	5.1	26,318
47.00	12.3	28,314
47.25	21.7	30,379
47.50	32.8	32,510
47.75	39.5	34,707
48.00	43.2	36,973
48.25	46.6	39,311
48.50	79.1	41,726
48.75	136.4	44,219
49.00	210.4	46,793

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
2.2	2.2
17.8	17.9
45.3	45.4
74.6	74.7
105.7	105.8
138.7	138.8
173.6	173.7
210.6	210.7
249.5	249.7
290.6	290.8
333.6	333.8
378.6	378.8
425.6	425.8
474.6	474.8
525.6	526.1
578.7	579.4
633.9	634.7
691.4	692.3
751.0	752.0
812.9	814.0
877.1	882.2
943.6	955.9
1012.4	1034.1
1083.4	1116.2
1156.7	1196.2
1232.2	1275.4
1310.1	1356.7
1390.6	1469.7
1473.7	1610.1
1559.5	1769.9

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
49.25	298.4	49,448

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
1647.9	1946.3

Time increment (t) = 1.0 min.

Pond File: b:POW5A 2 .PND
Inflow Hydrograph: b:25-IN .HYD
Outflow Hydrograph: b:25 OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	-----	0.0	0.0	0.00	41.50
1.0	0.88	0.9	0.9	0.9	0.00	41.60
2.0	1.76	2.6	3.5	3.5	0.01	41.77
3.0	2.64	4.4	7.8	7.9	0.04	41.84
4.0	3.52	6.2	13.8	14.0	0.08	41.94
5.0	4.41	7.9	21.6	21.8	0.10	42.04
6.0	5.29	9.7	31.1	31.3	0.10	42.12
7.0	6.17	11.5	42.3	42.5	0.10	42.22
8.0	7.05	13.2	55.4	55.6	0.10	42.34
9.0	7.93	15.0	70.1	70.3	0.10	42.46
10.0	8.81	16.7	86.7	86.9	0.10	42.60
11.0	9.69	18.5	105.0	105.2	0.10	42.74
12.0	10.57	20.3	125.0	125.2	0.10	42.90
13.0	11.45	22.0	146.9	147.1	0.10	43.06
14.0	12.33	23.8	170.4	170.6	0.10	43.23
15.0	13.22	25.6	195.8	196.0	0.10	43.40
16.0	14.10	27.3	222.8	223.1	0.13	43.58
17.0	14.98	29.1	251.5	251.9	0.20	43.76
18.0	14.98	30.0	281.1	281.5	0.20	43.94
19.0	14.98	30.0	310.6	311.0	0.20	44.12
20.0	14.98	30.0	340.2	340.6	0.20	44.29
21.0	14.98	30.0	369.8	370.2	0.20	44.45
22.0	14.98	30.0	399.3	399.7	0.20	44.61
23.0	14.98	30.0	428.9	429.3	0.20	44.77
24.0	14.98	30.0	458.4	458.8	0.20	44.92
25.0	14.98	30.0	487.8	488.4	0.28	45.07
26.0	14.98	30.0	516.9	517.8	0.45	45.21
27.0	14.98	30.0	545.7	546.9	0.58	45.35
28.0	14.98	30.0	574.3	575.7	0.69	45.48
29.0	14.10	29.1	601.9	603.4	0.74	45.61
30.0	13.22	27.3	627.6	629.2	0.79	45.72
31.0	12.33	25.6	651.5	653.2	0.83	45.83
32.0	11.45	23.8	673.5	675.3	0.87	45.93
33.0	10.57	22.0	693.8	695.6	0.91	46.01
34.0	9.69	20.3	712.1	714.0	0.94	46.09
35.0	8.81	18.5	728.7	730.6	0.96	46.16
36.0	7.93	16.7	743.5	745.5	0.99	46.22
37.0	7.05	15.0	756.4	758.5	1.01	46.28
38.0	6.17	13.2	767.6	769.7	1.03	46.32
39.0	5.29	11.5	777.0	779.1	1.04	46.36
40.0	4.41	9.7	784.6	786.7	1.06	46.39
41.0	3.52	7.9	790.4	792.5	1.07	46.41
42.0	2.64	6.2	794.4	796.5	1.07	46.43
43.0	1.76	4.4	796.6	798.8	1.08	46.44
44.0	0.88	2.6	797.1	799.3	1.08	46.44

Pond File: b:POW5A 2 .PND
Inflow Hydrograph: b:25-IN .HYD
Outflow Hydrograph: b:25 OUT .HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
45.0	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.9	795.8	798.0	1.07	46.44

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: b:POW5A 2 .PND
Inflow Hydrograph: b:25-IN .HYD
Outflow Hydrograph: b:25 OUT .HYD

Starting Pond W.S. Elevation = 41.50 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow = 14.98 cfs
Peak Outflow = 1.08 cfs
Peak Elevation = 46.44 ft

***** Summary of Approximate Peak Storage *****

Initial Storage = 0 cu-ft
Peak Storage From Storm = 23,950 cu-ft

Total Storage in Pond = 23,950 cu-ft

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 10:00:18 08-04-1993

MODIFIED RATIONAL METHOD
---- Graphical Summary for Maximum Required Storage ----

First peak outflow point assumed to occur at inflow recession leg.

POWHATAN PHASE 5A
SEDIMENT BASIN &
STORMWATER MANAGEMENT

```
*****************************************************************************
*  RETURN FREQUENCY: 100 yr      |  Allowable Outflow:     13.30 cfs      *
*  'C' Adjustment: 1.250         |  Required Storage:    17,284 cu.ft.   *
*---------------------------------------------------------------------------*
*  Peak Inflow:    17.21 cfs        Inflow .HYD stored: 100-IN  .HYD      *
*****************************************************************************
```

```
|                Td =  38 minutes                    |  Return Freq:    100 yr
/------- Approx. Duration for Max. Storage ------/  C adj.factor: 1.25
|                                                   |
|                                                   |
|                Tc=    17.00  minutes              |
|                I =    6.920  in/hr                |  Area (ac):      7.59
|              . Q =    25.60  cfs                  |  Weighted C:     0.39
|             .|.                                   |  Adjusted C:     0.49
F |            .   .                                 |
L |          .  |  .              Required Storage  |
O |        .        .         .--    17,284 cu.ft.  |  Td=       38 minutes
W |      .    |     .        |                      |  I =    4.650 in/hr
  |     .     x x x x x x x |x x x x x x x x x x x  Q =    17.21 cfs
c |    .                     |
f |   .    x                                         x
s |  .                                                 o   Q=    13.30 cfs
  | .   x                                   o        |x  (Allow.Outflow)
  | .  x                     .     o                 |
  | . x                 o    .       NOT TO SCALE    |   x
  | . x        o                .      ============  |
  | o                           .                    |       x
  `-----------------------------------------------------|------------
                                                   41.86 minutes
```

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 10:00:18 08-04-1993

POWHATAN PHASE 5A
SEDIMENT BASIN &
STORMWATER MANAGEMENT

**** Modified Rational Hydrograph *****

Weighted C = 0.390 Area= 7.590 acres Tc = 17.00 minutes

Adjusted C = 0.487 Td= 38.00 min. I= 4.65 in/hr Qp= 17.21 cfs

RETURN FREQUENCY: 100 year storm Adj.factor = 1.25
Output file: 100-IN .HYD

HYDROGRAPH FOR MAXIMUM STORAGE
For the 100 Year Storm

Time increment = 1.00 Minutes
Time on left represents time for first Q in each row.

Time Minutes							
0.00	0.00	1.01	2.02	3.04	4.05	5.06	6.07
7.00	7.08	8.10	9.11	10.12	11.13	12.15	13.16
14.00	14.17	15.18	16.19	17.21	17.21	17.21	17.21
21.00	17.21	17.21	17.21	17.21	17.21	17.21	17.21
28.00	17.21	17.21	17.21	17.21	17.21	17.21	17.21
35.00	17.21	17.21	17.21	17.21	16.19	15.18	14.17
42.00	13.16	12.15	11.13	10.12	9.11	8.10	7.08
49.00	6.07	5.06	4.05	3.04	2.02	1.01	0.00

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 10:00:18 08-04-1993

POWHATAN PHASE 5A
SEDIMENT BASIN &
STORMWATER MANAGEMENT

* * * * * * SUMMARY OF RATIONAL METHOD PEAK DISCHARGES * * * * * *

Q = adj * C * I * A
Where: Q=cfs, C=Weighted Runoff Coefficient, I=in/hour, A=acres
adj = 'C' adjustment factor for each return frequency

RETURN FREQUENCY = 100 years
'C' adjustment, k = 1.25
Adj. 'C' = Wtd.'C' x 1.25

Subarea Descr.	Runoff 'C'	Area acres	Tc (min)	Wtd. 'C'	Adj. 'C'	I in/hr	Total acres	Peak Q (cfs)
	0.390	7.59						
			17.00	0.390	0.487	6.920	7.59	25.60

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 10:00:18 08-04-1993

MODIFIED RATIONAL METHOD
---- Summary for Single Storm Frequency ----

First peak outflow point assumed to occur at inflow recession leg.

POWHATAN PHASE 5A
SEDIMENT BASIN &
STORMWATER MANAGEMENT

RETURN FREQUENCY: 100 yr 'C' Adjustment = 1.250 Allowable Q = 13.30 cfs

Hydrograph file duration= 38.00 minutes
Hydrograph file: 100-IN .HYD Tc = 17.00 minutes

Weighted 'C'	Adjusted 'C'	Duration minutes	Intens. in/hr	Areas acres	Qpeak cfs	VOLUMES Inflow (cu.ft.)	Storage (cu.ft.)
0.390	0.487	17	6.920	7.59	25.60	26,117	12,551
0.390	0.487	20	6.500	7.59	24.05	28,861	14,098
0.390	0.487	30	5.250	7.59	19.43	34,966	16,213
********** Storage Maximum							
0.390	0.487	38	4.650	7.59	17.21	39,229	17,284
0.390	0.487	40	4.500	7.59	16.65	39,961	17,218
0.390	0.487	50	3.800	7.59	14.06	42,181	15,448
0.390	0.487	60	3.400	7.59	12.58	Qpeak < Qallow	

```
**********************
*                    *
*  POWHATAN PHASE 5A *
*   SEDIMENT BASIN   *
*                    *
*                    *
*                    *
**********************
```

Inflow Hydrograph: b:100-IN .HYD
Rating Table file: b:POW5A .PND

----INITIAL CONDITIONS----
Elevation = 44.90 ft
Outflow = 0.00 cfs
Storage = 13,645 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
41.50	0.0	0
41.70	0.0	34
41.90	0.0	273
42.10	0.0	857
42.30	0.0	1,531
42.50	0.0	2,238
42.70	0.0	2,981
42.90	0.0	3,759
43.10	0.0	4,574
43.30	0.0	5,427
43.50	0.0	6,318
43.70	0.0	7,248
43.90	0.0	8,218
44.10	0.0	9,229
44.30	0.0	10,277
44.50	0.0	11,361
44.70	0.0	12,484
44.90	0.0	13,645
45.10	0.0	14,845
45.30	0.1	16,085
45.50	0.2	17,364
45.70	0.2	18,685
45.90	0.2	20,048
46.10	0.2	21,453
46.30	0.3	22,900
46.50	0.3	24,392
46.70	0.3	25,927
46.90	0.3	27,507
47.10	1.3	29,132
47.30	5.5	30,800
47.50	11.5	32,510

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
1.1	1.1
9.1	9.1
28.6	28.6
51.0	51.0
74.6	74.6
99.3	99.3
125.3	125.3
152.4	152.4
180.9	180.9
210.6	210.6
241.5	241.5
273.9	273.9
307.6	307.6
342.5	342.5
378.6	378.6
416.0	416.0
454.7	454.7
494.7	494.7
536.0	536.1
578.7	578.9
622.7	622.9
668.1	668.3
715.0	715.2
763.2	763.5
812.9	813.2
864.1	864.4
916.7	917.0
970.9	972.2
1026.5	1032.0
1083.4	1094.9

GIVEN POND DATA			INTERMEDIATE ROUTING COMPUTATIONS	
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)	2S/t (cfs)	2S/t + O (cfs)
47.70	18.8	34,262	1141.8	1160.6
47.90	27.2	36,059	1201.7	1228.9
48.10	36.1	37,899	1263.0	1299.1
48.30	41.8	39,788	1326.0	1367.8
48.50	71.5	41,726	1390.6	1462.1
48.70	116.2	43,714	1456.8	1573.0
48.90	171.9	45,754	1524.8	1696.7
49.10	237.2	47,845	1594.5	1831.7
49.25	291.7	49,448	1647.9	1939.6

Time increment (t) = 1.0 min.

Pond File: b:POW5A .PND
Inflow Hydrograph: b:100-IN .HYD
Outflow Hydrograph: b:100 OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	-----	454.7	454.7	0.00	44.90
1.0	1.01	1.0	455.7	455.7	0.00	44.91
2.0	2.02	3.0	458.8	458.8	0.00	44.92
3.0	3.04	5.1	463.8	463.8	0.00	44.95
4.0	4.05	7.1	470.9	470.9	0.00	44.98
5.0	5.06	9.1	480.0	480.0	0.00	45.03
6.0	6.07	11.1	491.2	491.2	0.00	45.08
7.0	7.08	13.2	504.3	504.3	0.02	45.15
8.0	8.10	15.2	519.3	519.4	0.06	45.22
9.0	9.11	17.2	536.3	536.5	0.10	45.30
10.0	10.12	19.2	555.3	555.6	0.15	45.39
11.0	11.13	21.3	576.1	576.5	0.19	45.49
12.0	12.15	23.3	599.0	599.4	0.20	45.59
13.0	13.16	25.3	623.9	624.3	0.20	45.71
14.0	14.17	27.3	650.9	651.3	0.20	45.82
15.0	15.18	29.4	679.8	680.2	0.20	45.95
16.0	16.19	31.4	710.8	711.2	0.20	46.08
17.0	17.21	33.4	743.7	744.2	0.26	46.22
18.0	17.21	34.4	777.5	778.1	0.30	46.36
19.0	17.21	34.4	811.3	811.9	0.30	46.49
20.0	17.21	34.4	845.1	845.7	0.30	46.63
21.0	17.21	34.4	878.9	879.5	0.30	46.76
22.0	17.21	34.4	912.8	913.4	0.30	46.89
23.0	17.21	34.4	945.5	947.2	0.85	47.01
24.0	17.21	34.4	976.2	979.9	1.84	47.13
25.0	17.21	34.4	1002.6	1010.6	4.00	47.23
26.0	17.21	34.4	1025.1	1037.1	5.99	47.32
27.0	17.21	34.4	1043.3	1059.5	8.12	47.39
28.0	17.21	34.4	1058.0	1077.7	9.86	47.45
29.0	17.21	34.4	1069.9	1092.4	11.26	47.49
30.0	17.21	34.4	1079.2	1104.3	12.54	47.53
31.0	17.21	34.4	1086.5	1113.6	13.58	47.56
32.0	17.21	34.4	1092.1	1120.9	14.38	47.58
33.0	17.21	34.4	1096.5	1126.6	15.01	47.60
34.0	17.21	34.4	1099.9	1130.9	15.50	47.61
35.0	17.21	34.4	1102.6	1134.4	15.88	47.62
36.0	17.21	34.4	1104.7	1137.0	16.18	47.63
37.0	17.21	34.4	1106.3	1139.1	16.41	47.63
38.0	17.21	34.4	1107.5	1140.7	16.58	47.64
39.0	16.19	33.4	1107.7	1140.9	16.61	47.64
40.0	15.18	31.4	1106.3	1139.1	16.40	47.63
41.0	14.17	29.4	1103.6	1135.6	16.02	47.62
42.0	13.16	27.3	1099.9	1130.9	15.50	47.61
43.0	12.15	25.3	1095.5	1125.2	14.87	47.59
44.0	11.13	23.3	1090.5	1118.8	14.15	47.57

Pond File: b:POW5A .PND
Inflow Hydrograph: b:100-IN .HYD
Outflow Hydrograph: b:100 OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
45.0	10.12	21.3	1085.0	1111.7	13.37	47.55
46.0	9.11	19.2	1079.2	1104.2	12.53	47.53
47.0	8.10	17.2	1073.1	1096.4	11.66	47.50
48.0	7.08	15.2	1066.5	1088.2	10.86	47.48
49.0	6.07	13.2	1059.6	1079.7	10.04	47.45
50.0	5.06	11.1	1052.3	1070.7	9.19	47.42
51.0	4.05	9.1	1044.8	1061.4	8.31	47.39
52.0	3.04	7.1	1037.1	1051.9	7.40	47.36
53.0	2.02	5.1	1029.2	1042.2	6.47	47.33
54.0	1.01	3.0	1021.2	1032.3	5.53	47.30
55.0	0.00	1.0	1012.6	1022.2	4.81	47.27

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: b:POW5A .PND
Inflow Hydrograph: b:100-IN .HYD
Outflow Hydrograph: b:100 OUT .HYD

Starting Pond W.S. Elevation = 44.90 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow = 17.21 cfs
Peak Outflow = 16.61 cfs
Peak Elevation = 47.64 ft

***** Summary of Approximate Peak Storage *****

Initial Storage = 13,645 cu-ft
Peak Storage From Storm = 20,092 cu-ft

Total Storage in Pond = 33,736 cu-ft

```
*************************
*                       *
*      POWHATAN 5A      *
*   STORMWATER MANAGEMENT *
*                       *
*                       *
*                       *
*************************
```

Inflow Hydrograph: b:100-IN .HYD
Rating Table file: b:POW5A 2 .PND

----INITIAL CONDITIONS----
Elevation = 41.50 ft
Outflow = 0.00 cfs
Storage = 0 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
41.50	0.0	0
41.75	0.0	67
42.00	0.1	533
42.25	0.1	1,360
42.50	0.1	2,238
42.75	0.1	3,172
43.00	0.1	4,162
43.25	0.1	5,210
43.50	0.1	6,318
43.75	0.2	7,487
44.00	0.2	8,719
44.25	0.2	10,011
44.50	0.2	11,361
44.75	0.2	12,770
45.00	0.2	14,240
45.25	0.5	15,771
45.50	0.7	17,364
45.75	0.8	19,022
46.00	0.9	20,745
46.25	1.0	22,534
46.50	1.1	24,392
46.75	5.1	26,318
47.00	12.3	28,314
47.25	21.7	30,379
47.50	32.8	32,510
47.75	39.5	34,707
48.00	43.2	36,973
48.25	46.6	39,311
48.50	79.1	41,726
48.75	136.4	44,219
49.00	210.4	46,793

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
2.2	2.2
17.8	17.9
45.3	45.4
74.6	74.7
105.7	105.8
138.7	138.8
173.6	173.7
210.6	210.7
249.5	249.7
290.6	290.8
333.6	333.8
378.6	378.8
425.6	425.8
474.6	474.8
525.6	526.1
578.7	579.4
633.9	634.7
691.4	692.3
751.0	752.0
812.9	814.0
877.1	882.2
943.6	955.9
1012.4	1034.1
1083.4	1116.2
1156.7	1196.2
1232.2	1275.4
1310.1	1356.7
1390.6	1469.7
1473.7	1610.1
1559.5	1769.9

GIVEN POND DATA			INTERMEDIATE ROUTING COMPUTATIONS	
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)	2S/t (cfs)	2S/t + O (cfs)
49.25	298.4	49,448	1647.9	1946.3

Time increment (t) = 1.0 min.

POND-2 Version: 5.17 S/N: 1295130250
EXECUTED: 08-04-1993 09:43:47

Return Freq: 100 years

Pond File: b:POW5A 2 .PND
Inflow Hydrograph: b:100-IN .HYD
Outflow Hydrograph: b:100 OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	-----	0.0	0.0	0.00	41.50
1.0	1.01	1.0	1.0	1.0	0.00	41.61
2.0	2.02	3.0	4.0	4.0	0.01	41.78
3.0	3.04	5.1	9.0	9.1	0.04	41.86
4.0	4.05	7.1	15.9	16.1	0.09	41.97
5.0	5.06	9.1	24.8	25.0	0.10	42.06
6.0	6.07	11.1	35.7	35.9	0.10	42.16
7.0	7.08	13.2	48.7	48.9	0.10	42.28
8.0	8.10	15.2	63.7	63.9	0.10	42.41
9.0	9.11	17.2	80.7	80.9	0.10	42.55
10.0	10.12	19.2	99.7	99.9	0.10	42.70
11.0	11.13	21.3	120.8	121.0	0.10	42.86
12.0	12.15	23.3	143.8	144.0	0.10	43.04
13.0	13.16	25.3	169.0	169.2	0.10	43.22
14.0	14.17	27.3	196.1	196.3	0.10	43.40
15.0	15.18	29.4	225.2	225.4	0.14	43.59
16.0	16.19	31.4	256.1	256.5	0.20	43.79
17.0	17.21	33.4	289.1	289.5	0.20	43.99
18.0	17.21	34.4	323.1	323.5	0.20	44.19
19.0	17.21	34.4	357.2	357.6	0.20	44.38
20.0	17.21	34.4	391.2	391.6	0.20	44.57
21.0	17.21	34.4	425.2	425.6	0.20	44.75
22.0	17.21	34.4	459.2	459.6	0.20	44.92
23.0	17.21	34.4	493.0	493.6	0.31	45.09
24.0	17.21	34.4	526.4	527.4	0.51	45.26
25.0	17.21	34.4	559.6	560.9	0.63	45.41
26.0	17.21	34.4	592.6	594.0	0.73	45.57
27.0	17.21	34.4	625.4	627.0	0.79	45.71
28.0	17.21	34.4	658.1	659.8	0.84	45.86
29.0	17.21	34.4	690.8	692.6	0.90	46.00
30.0	17.21	34.4	723.3	725.2	0.96	46.14
31.0	17.21	34.4	755.7	757.7	1.01	46.27
32.0	17.21	34.4	788.0	790.1	1.06	46.40
33.0	17.21	34.4	819.2	822.4	1.59	46.53
34.0	17.21	34.4	846.8	853.6	3.42	46.65
35.0	17.21	34.4	871.1	881.2	5.04	46.75
36.0	17.21	34.4	890.8	905.5	7.38	46.83
37.0	17.21	34.4	906.6	925.2	9.30	46.90
38.0	17.21	34.4	919.3	941.0	10.84	46.95
39.0	16.19	33.4	928.8	952.7	11.99	46.99
40.0	15.18	31.4	934.5	960.1	12.80	47.01
41.0	14.17	29.4	937.4	963.9	13.25	47.03
42.0	13.16	27.3	938.0	964.7	13.35	47.03
43.0	12.15	25.3	936.9	963.3	13.19	47.02
44.0	11.13	23.3	934.6	960.2	12.81	47.01

Pond File: b:POW5A 2 .PND
Inflow Hydrograph: b:100-IN .HYD
Outflow Hydrograph: b:100 OUT .HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
45.0	10.12
46.0	9.11
47.0	8.10
48.0	7.08
49.0	6.07
50.0	5.06
51.0	4.05
52.0	3.04
53.0	2.02
54.0	1.01
55.0	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
21.3	931.2	955.8	12.29	47.00
19.2	926.9	950.5	11.77	46.98
17.2	921.8	944.1	11.15	46.96
15.2	916.1	937.0	10.45	46.94
13.2	909.9	929.3	9.70	46.91
11.1	903.2	921.0	8.89	46.88
9.1	896.2	912.3	8.04	46.85
7.1	889.0	903.3	7.16	46.82
5.1	881.5	894.1	6.26	46.79
3.0	873.9	884.6	5.33	46.76
1.0	865.6	874.9	4.67	46.72

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: b:POW5A 2 .PND
Inflow Hydrograph: b:100-IN .HYD
Outflow Hydrograph: b:100 OUT .HYD

Starting Pond W.S. Elevation = 41.50 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	17.21 cfs
Peak Outflow	=	13.35 cfs
Peak Elevation	=	47.03 ft

***** Summary of Approximate Peak Storage *****

Initial Storage	=	0 cu-ft
Peak Storage From Storm	=	28,546 cu-ft
Total Storage in Pond	=	28,546 cu-ft

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

Subject POWHATAN PHASE V-A

Computed By SAR Checked By

Project No. 78041
Client BEAMER CONST
Date 6/15/93 Sheet No. 1

SEDIMENT BASIN VOLUME REQ'D = 7.59 AC X 134 CY/AC = 27,460 CF
CORRESPONDING POND ELEVATION = 47.03
WET STORAGE @ 67 CY/AC = 13,230 CF
CORRESPONDING POND ELEVATION = 44.90

VOLUME REQUIRED TO PROVIDE WATER QUALITY BMP IN ADDITIO
TO FLOW ATTENUATION = $\left(\frac{1}{12}\right)(0.32)(7.59)(43,560) = 8,817$ CF —
@ POINT BMP
CORRESPONDING POND ELEVATION = 44.12 (USE 44.90 - SAME
ELEV. AS DEWATERING ORIFICE FOR SED. BASIN).

USING A 2" Ø ORIFICE @ POND BOTTOM DRAWDOWN @ ± 26.5 HR

need 0.1 cfs release

JUN 1993
RECEIVED
PLANNING DEPARTMENT

Date Record Created: [redacted]

Created By: [redacted]

WS_BMPNO: PC073

PRINTED ON
Thursday, March 04, 2010
2:15:15 PM

WATERSHED	PC
BMP ID NO	073
PLAN NO	S-89-92
TAX PARCEL	(37-4)(8-1A)
PIN NO	3740800001A
CONSTRUCTION DATE	1/1/1996
PROJECT NAME	Powhatan Secondary Phase 5-A
FACILITY LOCATION	Behind 216 Charter House Lane
CITY-STATE	Williamsburg, Va. 23188
CURRENT OWNER	Powhatan Enterprises Incorp.
OWNER ADDRESS	13441 Warwick Blvd.
OWNER ADDRESS 2	
CITY-STATE-ZIP CODE	Newport News, Va. 23602
OWNER PHONE	
MAINT AGREEMENT	Yes
EMERG ACTION PLAN	No

MAINTENANCE PLAN	No
SITE AREA acre	6.5
LAND USE	SF Residential
old BMP TYP	Dry Pond
JCC BMP CODE	F2 Dry ED with forebay
POINT VALUE	6
SVC DRAIN AREA acres	7.59
SERVICE AREA DESCRI	SF Lots & Roadways
IMPERV AREA acres	2.28
RECV STREAM	UT of Powhatan Creek
EXT DET-WQ-CTRL	Yes
WTR QUAL VOL acre-ft	0.3132
CHAN PROT CTRL	No
CHAN PROT VOL acre-ft	0
SW/FLOOD CONTROL	Yes
GEOTECH REPORT	No

CTRL STRUC DESC	RCP Riser
CTRL STRUC SIZE inches	36
OTLT BARRL DESC	RCP Barrel
OTLT BARRL SIZE inch	18
EMERG SPILLWAY	Yes
DESIGN HW ELEV	47.64
PERM POOL ELEV	n/a
2-YR OUTFLOW cfs	0.20
10-YR OUTFLOW cfs	0.87
REC DRAWING	No
CONSTR CERTIF	No
LAST INSP DATE	9/20/2000
Inspected by:	[redacted]
INTERNAL RATING	4
MISC/COMMENTS	BMP # 5A.

Get Last BMP No | Return to Menu | Print Record

Additional Comments: [redacted]

R-4340 Series
Round Beehive Grates

um Duty — For Ditch Drainage Construction

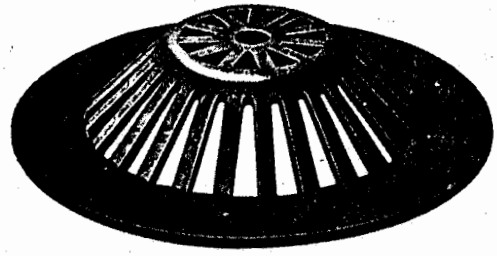
be used in vitrified clay pipe bell, on a concrete catch sin, or in a cast iron frame as shown below. Effective e debris may interfere with drainage, such as at a road- or in a median strip.

nd spigot vitrified clay and concrete pipe are made der many specifications and dimensions vary. Check the te sizes in the table to be sure they will fit the pipe you sing.

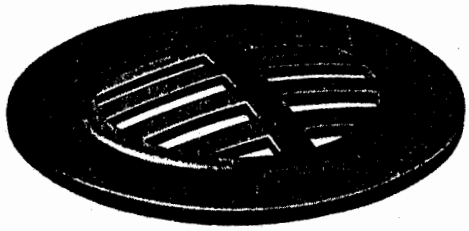
fy:

Catalog number.

ast iron frame if required.



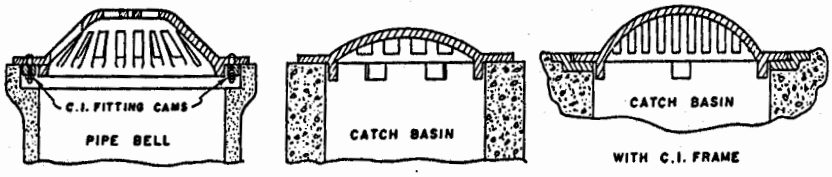
Illustrating R-4340-A



Illustrating R-4340-B

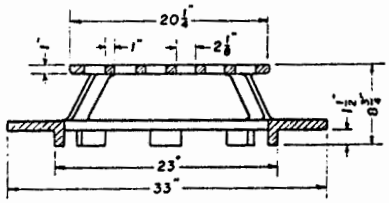
talog No.	Dimensions in inches								Wt. Lbs.
	O. Dia.	O.D. Lugs	Dia. Bhv	Ht. Bhv	No. Lugs	Size Bars	Size Op.	Pipe Size	
340-A	34	26¼	23⅞	6	•	1	1½	24	*220
40-B	33	23	23	3	6	1½	2	24	200
0-C	33	29	23	5¾	4	1¼	1	24	210
340-F	33	28	25	5	4	1	1	24	160
340-F1	25½	21¾	17	3	4	1	1	18	80
40-G	28	18	19	3	3	2	1¾	15	100
40-H	25	15	17	3	3	1¾	1⅝	12	70

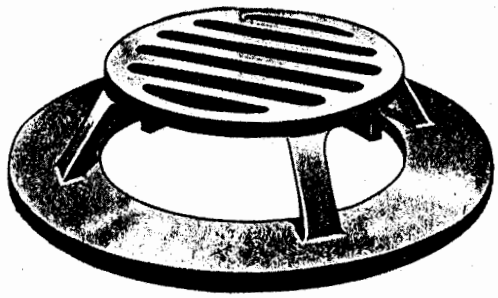
usting cams furnished only when specified.
urnished with ring instead of lugs.



R-4341-A Ditch Grate, Stool Type

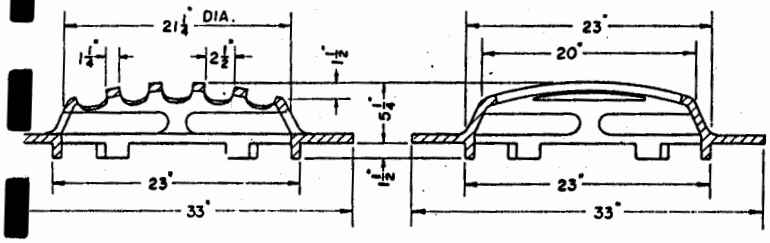
vy Duty Total Weight 230 Pounds

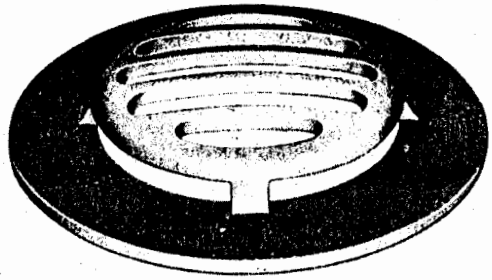




R-4342 Ditch Grate, Stool Type

edium Duty Total Weight 205 Pounds





NEENAH FOUNDRY COMPANY