Stormwater Division

MEMORANDUM

DATE: March 9, 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: PC056

PIN: 3240100026C

Subdivision, Tract, Business or Owner Name (if known): Williamsburg Plantation and Regency at Longhill Apartments

Property Description: Timeshare and Apartment Complex

Site Address: 4870 Longhill Road

(For internal use only) **Box** 7 **Drawer:** 4

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

Comments

Date Record Created:

Created By:

WS_BMPNO: PC056

Print Record

PRINTED ON
Tuesday, March 09, 2010
2:04:27 PM

WATERSHED	PC
BMP ID NO	056
PLAN NO	SP-145-98
TAX PARCEL	(32-4)(1-26A)
PIN NO	32401000026A
CONSTRUCTION DATE	1/12/1994
PROJECT NAME	Wmsburg Plantation/Regency Ph 2
FACILITY LOCATION	4870 Longhill Road
CITY-STATE	Williamsburg, Va. 23188
CURRENT OWNER	Williamsburg Plantation, Inc.
OWNER ADDRESS	610 West Rio Road
OWNER ADDRESS 2	P.O. Box 6006
CITY-STATE-ZIP CODE	Charlottesville, Va 22606
OWNER PHONE	
MAINT AGREEMENT	Yes
EMERG ACTION PLAN	No

Get Last BMP No

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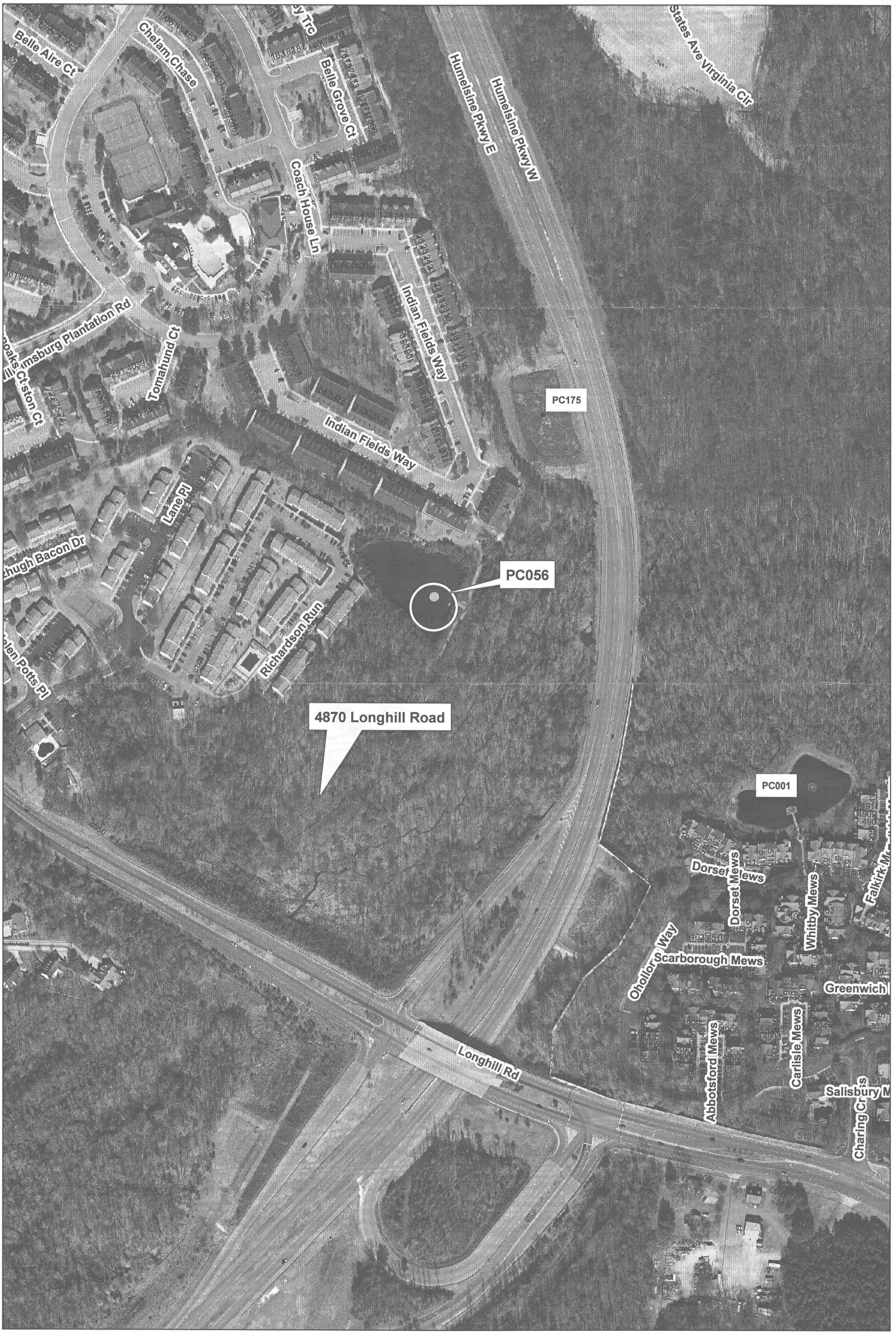
MAINTENANCE PLAN	No
SITE AREA acre	77
LAND USE	Multi-Fam Resid
old BMP TYP	Wet Pond
JCC BMP CODE	A2 Wet Pond
POINT VALUE	10
SVC DRAIN AREA acres	33.97
SERVICE AREA DESCRI	Williamsburg Plantation & Regency II
IMPERV AREA acres	
RECV STREAM	UT of Powhatan Creek
EXT DET-WQ-CTRL	No
WTR QUAL VOL acre-ft	4.34
CHAN PROT CTRL	No
CHAN PROT VOL acre-ft	1.15
SW/FLOOD CONTROL	Yes
GEOTECH REPORT	No

CTRL STRUC DESC	RCP Riser
CTRL STRUC SIZE inches	48
OTLT BARRL DESC	RCP
OTLT BARRL SIZE inch	18
EMERG SPILLWAY	Yes
DESIGN HW ELEV	58.11
PERM POOL ELEV	54.9
2-YR OUTFLOW cfs	28.00
10-YR OUTFLOW cfs	84.00
REC DRAWING	Yes
CONSTR CERTIF	Yes
LAST INSP DATE	12/19/2000
Inspected by:	
INTERNAL RATING	3

MISC/COMMENTS

Shared facility. Pond expansion for Regency at Longhill Ph 2 (1999).

Additional Comments:


Belle Aire Ct
Chelam Chase
Belle Grove Ct
Coach House Ln
Humelsine Pkwy E
Humelsine Pkwy W
States Ave Virginia Cir
Indian Fields Way
Tomahund Ct
Indian Fields Way
Lane Pl
Richardson Run
PC175
PC056
4870 Longhill Road
PC001
Dorset Mews
Whitby Mews
Scarborough Mews
Abbotsford Mews
Carlisle Mews
Longhill Rd

WATERSHED	PC	MAINTENANCE PLAN	No	CTRL STRUC DESC	RCP Riser
BMP ID NO	056	SITE AREA acre	77	CTRL STRUC SIZE inches	48
PLAN NO	SP-145-98	LAND USE	Multi-Fam Resid	OTLT BARRL DESC	RCP
TAX PARCEL	(32-4)(1-26A)	old BMP TYP	Wet Pond	OTLT BARRL SIZE inch	18
PIN NO	32401000026A	JCC BMP CODE			
CONSTRUCTION DATE	1/12/1994	POINT VALUE	10	EMERG SPILLWAY	Yes
PROJECT NAME	Wmsburg Plantation/Regency Ph 2			DESIGN HW ELEV	58.11
FACILITY LOCATION	4870 Longhill Road			PERM POOL ELE	54.9
CITY-STATE	Williamsburg, Va. 23188	SVC DRAIN AREA acres	33.97	2-YR OUTFLOW cfs	28.00
CURRENT OWNER	Williamsburg Plantation, Inc.			10-YR OUTFLOW cfs	84.00
OWNER ADDRESS	610 West Rio Road			REC DRAWING	Yes
OWNER ADDRESS 2	P.O. Box 6006	SERVICE AREA DESCRI	Williamsburg Plantation & Regency II		
CITY-STATE-ZIP CODE	Charlottesville, Va 22606	IMPERV AREA acres		CONSTR CERTI	Yes
OWNER PHONE		RECV STREAM	UT of Powhatan Creek		
MAINT AGREEMENT	Yes	EXT DET-WQ-CTRL	No	LAST INSP DATE	12/19/2000
EMERG ACTION PLAN	No	WTR QUAL VOL acre-ft	4.34	INTERNAL RATING	3
		CHAN PROT CTRL	No	MISC/COMMENTS	
		CHAN PROT VOL acre-ft	1.15	Shared facility. Pond expansion for Regency at Longhill Ph 2 (1999).	
		SW/FLOOD CONTROL	Yes		
		GEOTECH REPORT	No		

Get Last BMP No

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WILLIAMSBURG PLANTATION - OVERALL COMPLIANCE 4/17/00

Table 2

Worksheet for BMP Point System

A. STRUCTURAL BMP POINT ALLOCATION

BMP	BMP Points		Fraction of Site Served by BMP		Weighted BMP Points
EX. WET POND	10	x	27.25+6.72 / 75.65	=	4.49
DRY POND (W/ VDOT)	9	x	19.66+27.34/75.65	=	5.59 2.34
		x		=	
DRY POND	4	x	19.03/75.65	=	1.01

TOTAL WEIGHTED STRUCTURAL BMP POINTS: 11.09 7.84

B. NATURAL OPEN SPACE CREDIT

Fraction of Site		Natural Open Space Credit		Points for Natural Open Space
14.5/75.65	x	0.1 (0.1 per 1%)	=	1.92
	x	(0.15 per 1%)	=	

TOTAL NATURAL OPEN SPACE CREDIT: 1.92

C. TOTAL WEIGHTED POINTS

11.09	+	1.92	=	9.76 13.01
Structural BMP Points		Natural Open Space Points		Total

*SEE ATTACHED NOTES

BMP Point Tabulation for Williamsburg Plantation
3/22/00

Notes:

1. The total site area of Williamsburg Plantation is 75.65 AC following the condemnation of 1.43 AC by VDOT for the construction of Route 199.

2. During the development of Regency at Longhill II, adjacent to Williamsburg Plantation, the existing wet pond was enlarged and redesigned to accommodate additional flow from Regency. The total drainage area to the 10 point wet pond is 33.97 AC (as approved with the Regency development), of which 27.25 AC is on-site and 6.72 is off-site contribution.

3. The dry pond shared with VDOT was redesigned (and approved) in the spring of 1999 to provide water quality and attenuation for both the VDOT and Plantation drainage areas. The total drainage area to this 9-point facility is 47 AC, of which 19.66 is on-site and 27.34 is off-site contribution.

4. The open space quantity has been revised to reflect the 1.43 AC loss. Additionally, the 0.5 AC area just north of Section 3 has been removed from the open space number. This area is contains many dead trees and bushes. The developer wishes to landscape it during a future submittal. The revised open space number is 14.5 AC.

5. The future BMP is to be a dry pond. Conservatively, this pond is estimated at 4 points.

WILLIAMSBURG PLANTATION
BMP MASTER PLAN

DALLYG
cook

1)

TOTAL SITE AREA = 80.5 Ac±

WET POND #1

D.A. = 29.95 Ac± (24.25 Ac ON SITE)
10 PT POND WITH VOLUME OF NORMAL POOL = 10 V

$\frac{29.95}{80.5}$ (10) = 3.72 PTS

DRY POND (PHASE II)

D.A. = 19.03 Ac± (17.17 Ac ON SITE)
9 PT POND

$\frac{19.03}{80.5}$ (9) = 2.13 PTS

DRY POND (PHASE III)

D.A. = 21.09 Ac±
9 PT POND

$\frac{21.09}{80.5}$ (9) = 2.36 PTS

STRUCTURAL = 3.72 + 2.13 + 2.36 = 8.21 PTS

NATURAL OPEN SPACE

PHASE I → ~~3.37 Ac±~~ 1.88 Ac±
LONGHILL SWAMP = 9.95 Ac± ✓
150' BUFFER BETWEEN PONDS #2 & #3 = 2.75 Ac± ✓
PHASE III = ~~1.05~~ Ac± 0.83 Ac±
PHASE II = ~~0.79~~ Ac± 0.15 Ac±
REC. SITE = 0.21 Ac± ✓

TOTAL NATURAL OPEN SPACE = 18.12 Ac±
15.77 $\frac{18.12}{80.5}$ = ~~22.5%~~ 19.59% × .1 = ~~2.25~~ 1.96 PTS

TOTAL BMP = 8.21 STRUCTURAL PTS + ~~2.25~~ 1.96 OPEN SPACE PTS
= ~~10.46~~ 10.17 PTS

WILLIAMSBURG PLANTATION

- Detention Basin Efficiency

1. Drainage Area = 30 ac

$R_v = 0.05 + 0.009(I) = .05 + .009(35) = 0.365$

Basin Volume = 96,771 cf.

Surface Area = 31,800 ft^2

Avg Depth = 3.0'

		mean	CV
Volume - (V)	inch	0.40	1.57
Intensity (I)	in/hr	.101	1.37
Duration (D)	hr	4.2	1.09
Interval (Δ)	hr	77	1.08

2. Compute

$\underline{QR} = I \times R_v \times Area \times \frac{43,560}{12}$

$= .101 \times .365 \times 30 \times 3630 = 4015$ CFH

$\underline{VR}$ $V \times R_v \times Area \times 43560/12$

$= .4 \times .365 \times 30 \times 3630 = 15,900$ CF

$CV_q = 1.37$ $CV_v = 1.57$

3. Removal under DYNAMIC Conditions

$\frac{QR}{A} = \frac{4015}{31,800} = 0.126 \frac{ft}{hr}$

WILL. PLANT - BASIN EFFIC.

Size Fraction	Avg Settling Velocity ft/hr	Rm % Fig 8
1	0.03	30
2	0.3	85
3	1.5	100
4	7.0	100
5	65.0	100

$\Sigma = 415/5 = 83\%$

fraction not removed $f_D = (100-83)/100 = .17$

4. Removal under Quiescent Conditions

Basin Volume Ratio (V_B/V_R)

$$\frac{V_B}{V_R} = \frac{96,771}{15,900} = 6.1$$

Use V_E/V_R $\quad E = \Delta \times \Omega / V_R$ $\quad \Delta = 77$

$= 77 \times$ $\quad \Omega = V_s A$

Size Fraction	V_s	Ω (= $V_s A$)	E (= $\Delta\Omega/V_R$)	V_E/V_R Fig 4 (same as V_B/V_R)	REM %
1	.03	954	4.62	6.1	94
					100 %
					2-5
					$494/5 = 99$

fraction not removed

$f_Q = (100-99)/100 = .01$

5. % overall removal =

$$[1 - (f_Q \cdot f_V)] \cdot 100\% = 1 - (.17 \cdot .01) \cdot 100 = 98\%$$

Recommend - raising normal pool to 54 -

$A_B/A_w = 3\%$ $\quad V_B/V_R = 10$

WMBG PLANTATION, PHASE 1

Option 1 STAGE / STORAGE TABLE R to reset

1. RESERVOIR No = 1. 2. RESERVOIR NAME = DRY POND #1.
3. S = Ks * Z^b

Ks = 0..... b = 0.....
START ELEV = 0..... INCREMENT = 0...

	STAGE ft	ELEVATION ft	CO AREA sq ft	INC STORAGE cu ft	TOT STORAGE cu ft	
4	0.00	47.00.	0.....	0	0	
5	1.00	48.00.	8951....	4475	4475	
6	3.00	50.00.	25777...	34728	39203	
7	5.00	52.00.	31791...	57568	96771	
8	7.00	54.00.	37208... 3%	68999	165770	10(VR)
9	9.00	56.00.	42580...	79788	245558	
10	11.00	58.00.	48405...	90985	336543	
11	13.00	60.00.	66000...	114405	450948	
12	0.00	0.00.	0.....	0	0	
13	0.00	0.00.	0.....	0	0	
14	0.00	0.00.	0.....	0	0	

Change item number: 0
DY to cont

Reservoir No. 1 OUTLET STRUCTURES

CULVERT STRUC A. Q=CoA[2gh/k]^.5

1. WIDTH (in) = 18.
2. HEIGHT (in) = 18.
3. No. BARRELS = 1..
4. INVERT ELEV. = 47.25....
5. Co = 0.60
6. CULVERT LENGTH (ft) = 68..
7. CULVERT SLOPE (%) = 3...
8. MANNING'S N-VALUE = .013

OUT PIPE

CULVERT STRUC B. Q=CoA[2gh/k]^.5

9. WIDTH (in) = 0..
10. HEIGHT (in) = 0..
11. No. BARRELS = 0..
12. INVERT ELEV. = 0.....
13. Co = 0.60
14. CULVERT LENGTH (ft) = 0...
15. CULVERT SLOPE (%) = 0...
16. MANNING'S N-VALUE = .013
17. MULTI-STAGE OPTION ? (Y/N) N

WEIR STRUCTURE A. Q=CwLH^EXP

18. CREST LENGTH (ft) = 12.5664
19. CREST ELEVATION = 52.....
20. Cw = 3.00
21. EXP = 1.50
22. MULTI-STAGE OPTION ? (Y/N) Y

SOL PIPE

WEIR STRUCTURE B. Q=CwLH^EXP

EM. SPILLWAY

23. CREST LENGTH (ft) = 6.....
24. CREST ELEVATION = 55.4...
25. Cw = 3.00
26. EXP = 1.50
27. MULTI-STAGE OPTION ? (Y/N) N

Change item number: 0
DY to cont

HYDROLOGIC REPORT FOR

WILLIAMSBURG PLANTATION

JOB NO 7555

WET POND #1

PHASE 1

~~Need Hydrograph #2 for Hy. routing~~

~~Need Sed basin calcs~~ ~~dewatering device needs to be~~ modified

~~Certification of dam~~

~~Look @ Check shut for basin~~

~~Need Inlet calcs for roads - not pk lot~~

prepared by:

AES CONSULTING ENGINEERS

5248 Olde Towne Rd,Suite 1

Williamsburg, VA. 23188

REVISED DATE: 03/10/92

WILLIAMSBURG PLANTATION #7555
DRY POND (PHASE I)
WET

PRE-DEVELOPMENT

P.A = 18.83 Ac.

5.80 Ac	STRAIGHT ROW CROPS	SOIL GROUP B	CN = 81
1.83 Ac	STRAIGHT ROW CROPS	SOIL GROUP C	CN = 88
2.38 Ac	WOODS	SOIL GROUP B	CN = 60
4.35 Ac	WOODS	SOIL GROUP C	CN = 73
1.00 Ac	APARTMENTS	SOIL GROUP B	CN = 85
3.47 Ac	APARTMENTS	SOIL GROUP C	CN = 90

$$CN = \frac{(5.80)(81) + (1.83)(88) + (2.38)(60) + (4.35)(73) + (1.00)(85) + (3.47)(90)}{18.83} = 79.05$$

CN = 79

POST-DEVELOPMENT

P.A. = 29.95 Ac

1.00 Ac	APARTMENTS	SOIL GROUP B	CN = 85
1.47 Ac	APARTMENTS	SOIL GROUP C	CN = 90
0.56 Ac	WOODS	SOIL GROUP B	CN = 60
5.57 Ac	WOODS	SOIL GROUP C	CN = 73
14.76 Ac	TIMES SHARES	SOIL GROUP B	CN = 85
6.59 Ac	TIMES SHARES	SOIL GROUP C	CN = 90

$$CN = \frac{(1.00)(85) + (1.47)(90) + (0.56)(60) + (5.57)(73) + (14.76)(85) + (6.59)(90)}{29.95} = 83.65$$

CN = 84

DESIGN TYPE 7A (10 AT POND)

VOL. OF POOL = 10 V_r (½"/ACRE) (D.A.)

½"/AC = MEAN STORM RUNOFF

ON SITE

V_r = 0.05 + (0.009) (% IMPERVIOUS AREA)
= 0.05 + (0.009) (35)
= 0.365

OFF SITE

V_r = 0.05 + 0.009 (% IMPERVIOUS AREA)
= 0.05 + 0.009 (25%)
= 0.275

VOL. = 10 (0.365) (½") (1'/12") (24.25 Ac) (43,560 SF/Ac) = 160,650 CU. FT ±
+ 10 (0.275) (½") (1'/12") (5.70 Ac) (43,560 SF/Ac) = 28,450 CU. FT ±
= 189,100 CU. FT ± ≈ ELEV. 54.9'

SET NORMAL POOL @ ELEV. = 54.90

EMERGENCY SPILLWAY IS SET @ 10 YR STORM ELEV. = 56.02

HYDROLOGIC REPORT

PRE-DEVELOPMENT.....
2 YR. STORM.....
.....

Hyd. No. 1

Hydrograph type	= S.C.S. RUNOFF	Peak discharge	= 24.82 cfs
Storm frequency	= 2 yr	Time interval	= 10 min
Basin area	= 18.83 ac	Basin curve No.	= 79
Ave basin slope	= 4 %	Hydraulic len	= 1300 ft
Basin lag	= 12.1 min	Time of concen	= 20.25 min
Total precip.	= 3.50 in	Distribution	= S.C.S. II

HYDROGRAPH DISCHARGE TABLE

TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfS)	
11.50	1.24	11.67	2.46	11.83	7.48	12.00	18.90
12.17	24.82	12.33	18.20	12.50	10.84	12.67	5.07
12.83	4.03	13.00	3.37	13.17	2.96	13.33	2.67
13.50	2.44	13.67	2.24	13.83	2.07	14.00	1.92
14.17	1.78	14.33	1.68	14.50	1.60	14.67	1.55
14.83	1.50	15.00	1.45	15.17	1.40	15.33	1.36
15.50	1.31	15.67	1.26	15.83	1.20	16.00	1.15
16.17	1.11	16.33	1.07	16.50	1.04	16.67	1.02
16.83	1.00	17.00	0.99	17.17	0.97	17.33	0.95

HYDROLOGIC REPORT

POST-DEV.....
10 YR. STORM ....
CROSS COUNTRY.....

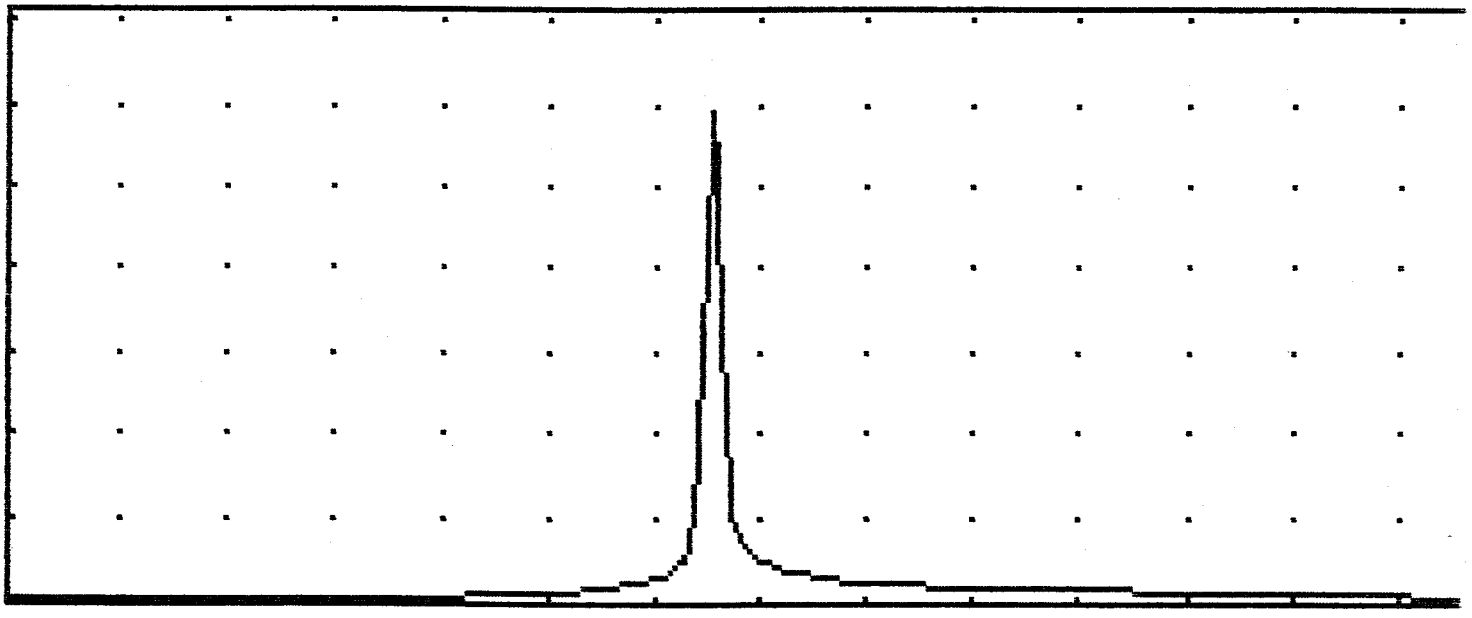
Hyd. No. 3

Hydrograph type	= S.C.S. RUNOFF	Peak discharge	= 59.01 cfs
Storm frequency	= 10 yr	Time interval	= 10 min
Basin area	= 10.76 ac	Basin curve No.	= 84
Ave basin slope	= 4.15 %	Hydraulic len	= 650 ft
Basin lag	= 5.8 min	Time of concen	= 9.72 min
Total precip.	= 5.70 in	Distribution	= S.C.S. II

HYDROGRAPH DISCHARGE TABLE

TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfS)	
9.50	0.86	9.67	0.91	9.83	1.01	10.00	1.13
10.17	1.27	10.33	1.44	10.50	1.63	10.67	1.87
10.83	2.17	11.00	2.50	11.17	2.82	11.33	3.61
11.50	4.52	11.67	11.55	11.83	32.73	12.00	59.01
12.17	29.98	12.33	9.60	12.50	7.31	12.67	5.59
12.83	4.77	13.00	4.25	13.17	3.80	13.33	3.47
13.50	3.19	13.67	2.93	13.83	2.71	14.00	2.50
14.17	2.34	14.33	2.25	14.50	2.18	14.67	2.11
14.83	2.03	15.00	1.96	15.17	1.89	15.33	1.82
15.50	1.74	15.67	1.67	15.83	1.60	16.00	1.53
16.17	1.47	16.33	1.43	16.50	1.41	16.67	1.38
16.83	1.36	17.00	1.33	17.17	1.31	17.33	1.28
17.50	1.25	17.67	1.23	17.83	1.20	18.00	1.18
18.17	1.15	18.33	1.12	18.50	1.10	18.67	1.07
18.83	1.04	19.00	1.02	19.17	0.99	19.33	0.96

Qp = 59.0 S.C.S. RUNOFF To = 0



HGU = 110 min 3 VGU = 10.0 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Men

[F5] S dn [F6] S up [F7] Enl [F8] Re

HYDROLOGIC REPORT

where is Hyd. 2?

POST-DEVELOPMENT.....
10 YR. STORM.....
TO POND.#1.....

Hyd. No. 4

Hydrograph type = COMBINED
Storm frequency = 10 yr
Inflow hyd no's = 2 & 3

Peak discharge = 88.00 cfs
Time interval = 10 min

HYDROGRAPH DISCHARGE TABLE

TIME hrs	INFLOW cfs	HYDROGRAPHS cfs	OUTFLOW HYDROGRAPH cfs
8.33	0.58	0.45	1.03
8.50	0.64	0.51	1.15
8.67	0.71	0.58	1.29
8.83	0.79	0.64	1.44
9.00	0.89	0.72	1.60
9.17	0.99	0.78	1.77
9.33	1.09	0.82	1.91
9.50	1.18	0.86	2.04
9.67	1.26	0.91	2.18
9.83	1.35	1.01	2.37
10.00	1.46	1.13	2.60
10.17	1.60	1.27	2.87
10.33	1.77	1.44	3.22
10.50	1.99	1.63	3.62
10.67	2.24	1.87	4.11
10.83	2.55	2.17	4.72
11.00	2.92	2.50	5.42
11.17	3.34	2.82	6.16
11.33	3.90	3.61	7.51
11.50	4.65	4.52	9.17
11.67	6.87	11.55	18.42
11.83	13.89	32.73	46.61
12.00	28.99	59.01	88.00
12.17	42.59	29.98	72.57
12.33	48.76	9.60	58.36
12.50	41.72	7.31	49.02
12.67	33.31	5.59	38.91
12.83	24.03	4.77	28.80

HYDROGRAPH DISCHARGE TABLE Cont'd

TIME hrs	INFLOW cfs	HYDROGRAPHS cfs	OUTFLOW HYDROGRAPH cfs
13.00	15.09	4.25	19.33
13.17	8.84	3.80	12.64
13.33	7.44	3.47	10.91
13.50	6.47	3.19	9.66
13.67	5.80	2.93	8.73
13.83	5.28	2.71	7.99
14.00	4.84	2.50	7.34
14.17	4.46	2.34	6.80
14.33	4.14	2.25	6.39
14.50	3.88	2.18	6.06
14.67	3.68	2.11	5.78
14.83	3.52	2.03	5.55
15.00	3.38	1.96	5.34
15.17	3.26	1.89	5.15
15.33	3.15	1.82	4.96
15.50	3.03	1.74	4.78
15.67	2.92	1.67	4.59
15.83	2.80	1.60	4.40
16.00	2.69	1.53	4.21
16.17	2.58	1.47	4.04
16.33	2.47	1.43	3.91
16.50	2.38	1.41	3.79
16.67	2.31	1.38	3.70
16.83	2.26	1.36	3.61
17.00	2.21	1.33	3.54
17.17	2.17	1.31	3.47
17.33	2.12	1.28	3.40
17.50	2.08	1.25	3.34
17.67	2.04	1.23	3.27
17.83	2.00	1.20	3.20
18.00	1.96	1.18	3.13
18.17	1.92	1.15	3.07
18.33	1.88	1.12	3.00
18.50	1.84	1.10	2.93
18.67	1.79	1.07	2.86
18.83	1.75	1.04	2.80
19.00	1.71	1.02	2.73
19.17	1.67	0.99	2.66
19.33	1.63	0.96	2.59
19.50	1.59	0.94	2.52
19.67	1.54	0.91	2.45
19.83	1.50	0.89	2.39
20.00	1.46	0.86	2.32
20.17	1.42	0.84	2.26
20.33	1.38	0.83	2.21
20.50	1.35	0.83	2.18

HYDROLOGIC REPORT

POST-DEVELOPMENT.....
10 YR. STORM.THRU ....
STRUCTURE @ POND #1...

Hyd. No. 5

Hydrograph type = RESERVOIR ROUTE Peak discharge = 24.25 cfs
Storm frequency = 10 yr Time interval = 10 min
Inflow hyd. no. = 4 Reservoir no. = 1

HYDROGRAPH DISCHARGE TABLE

TIME hrs	INFLOW (i) cfs	INFLOW (j) cfs	2S/dt-O (i) cfs	2S/dt+O (j) cfs	OUTFLOW cfs
8.33	1.03	1.15	15.51	15.51	0.00
8.50	1.15	1.29	17.69	17.69	0.00
8.67	1.29	1.44	20.13	20.13	0.00
8.83	1.44	1.60	22.86	22.86	0.00
9.00	1.60	1.77	25.90	25.90	0.00
9.17	1.77	1.91	29.27	29.27	0.00
9.33	1.91	2.04	32.95	32.95	0.00
9.50	2.04	2.18	36.89	36.89	0.00
9.67	2.18	2.37	41.11	41.11	0.00
9.83	2.37	2.60	45.66	45.66	0.00
10.00	2.60	2.87	50.62	50.62	0.00
10.17	2.87	3.22	56.09	56.09	0.00
10.33	3.22	3.62	62.19	62.19	0.00
10.50	3.62	4.11	69.03	69.03	0.00
10.67	4.11	4.72	76.76	76.76	0.00
10.83	4.72	5.42	85.58	85.58	0.00
11.00	5.42	6.16	95.72	95.72	0.00
11.17	6.16	7.51	107.30	107.30	0.00
11.33	7.51	9.17	120.97	120.97	0.00
11.50	9.17	18.42	137.66	137.66	0.00
11.67	18.42	46.61	165.24	165.24	0.00
11.83	46.61	88.00	230.27	230.27	0.00
12.00	88.00	72.57	364.89	364.89	0.00
12.17	72.57	58.36	525.46	525.46	0.00
12.33	58.36	49.02	652.12	656.39	2.13

HYDROGRAPH DISCHARGE TABLE Cont'd

TIME hrs	INFLOW (i) cfs	INFLOW (j) cfs	2S/dt-O (i) cfs	2S/dt+O (j) cfs	OUTFLOW cfs
12.50	49.02	38.91	715.23	759.51	22.14
12.67	38.91	28.80	755.36	803.16	23.90
12.83	28.80	19.33	774.57	823.07	24.25
13.00	19.33	12.64	774.23	822.70	24.24
13.17	12.64	10.91	758.34	806.21	23.93
13.33	10.91	9.66	735.18	781.90	23.36
13.50	9.66	8.73	712.84	755.75	21.46
13.67	8.73	7.99	699.62	731.22	15.80
13.83	7.99	7.34	691.31	716.33	12.51
14.00	7.34	6.80	685.42	706.63	10.61
14.17	6.80	6.39	681.12	699.56	9.22
14.33	6.39	6.06	677.93	694.31	8.19
14.50	6.06	5.78	675.54	690.37	7.41
14.67	5.78	5.55	673.73	687.38	6.83
14.83	5.55	5.34	672.31	685.06	6.37
15.00	5.34	5.15	671.09	683.21	6.06
15.17	5.15	4.96	669.95	681.59	5.82
15.33	4.96	4.78	668.87	680.07	5.60
15.50	4.78	4.59	667.85	678.62	5.38
15.67	4.59	4.40	666.86	677.22	5.18
15.83	4.40	4.21	665.89	675.85	4.98
16.00	4.21	4.04	664.94	674.51	4.78
16.17	4.04	3.91	664.01	673.20	4.59
16.33	3.91	3.79	663.14	671.96	4.41
16.50	3.79	3.70	662.35	670.84	4.25
16.67	3.70	3.61	661.64	669.84	4.10
16.83	3.61	3.54	661.01	668.95	3.97
17.00	3.54	3.47	660.45	668.16	3.86
17.17	3.47	3.40	659.95	667.46	3.75
17.33	3.40	3.34	659.51	666.83	3.66
17.50	3.34	3.27	659.10	666.25	3.58
17.67	3.27	3.20	658.71	665.70	3.50
17.83	3.20	3.13	658.34	665.18	3.42
18.00	3.13	3.07	657.99	664.68	3.35
18.17	3.07	3.00	657.64	664.19	3.27
18.33	3.00	2.93	657.30	663.71	3.20
18.50	2.93	2.86	656.96	663.23	3.13
18.67	2.86	2.80	656.63	662.76	3.06
18.83	2.80	2.73	656.29	662.29	3.00
19.00	2.73	2.66	655.96	661.82	2.93
19.17	2.66	2.59	655.63	661.35	2.86
19.33	2.59	2.52	655.30	660.88	2.79

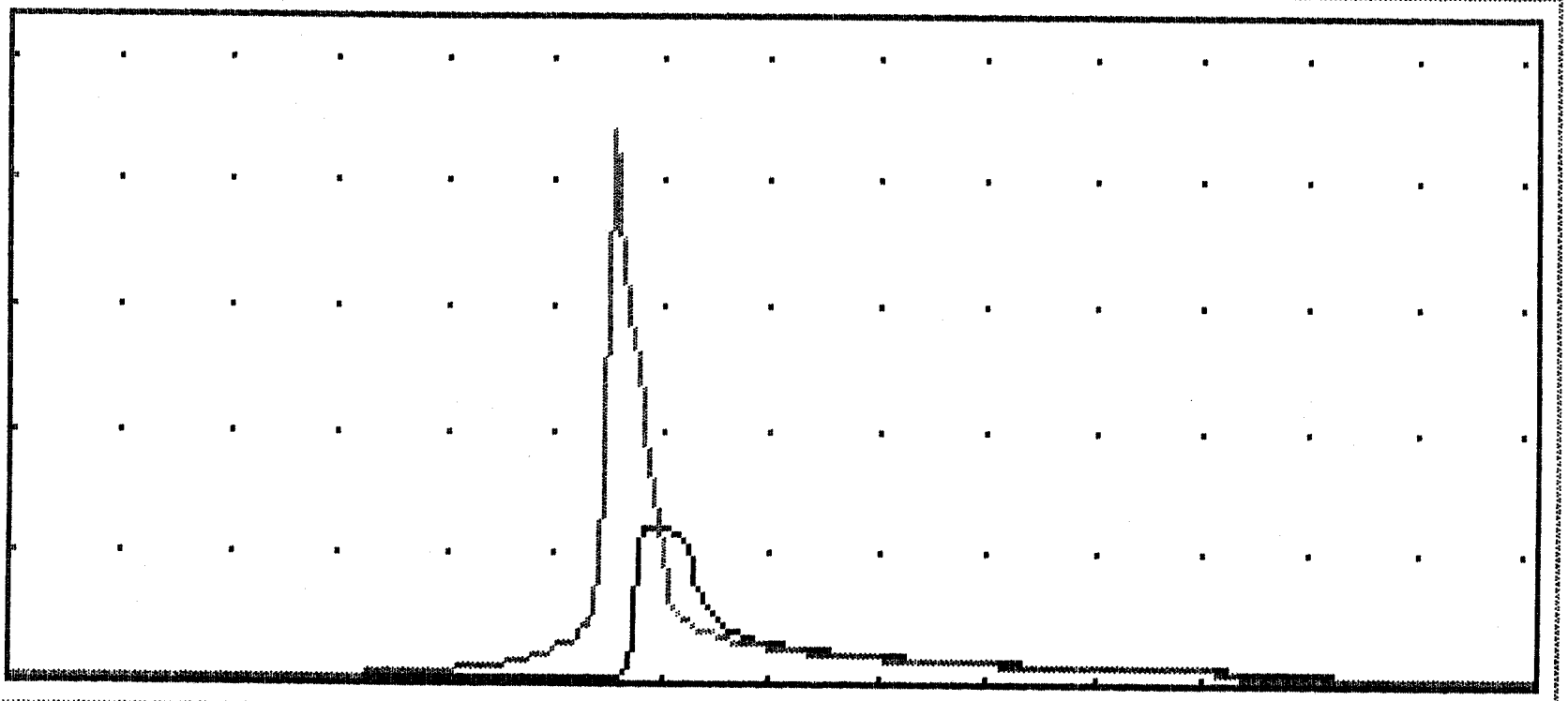
HYDROGRAPH DISCHARGE TABLE Cont'd

TIME hrs	INFLOW (i) cfs	INFLOW (j) cfs	2S/dt-O (i) cfs	2S/dt+O (j) cfs	OUTFLOW cfs
19.50	2.52	2.45	654.97	660.42	2.72
19.67	2.45	2.39	654.64	659.95	2.65
19.83	2.39	2.32	654.31	659.48	2.59
20.00	2.32	2.26	653.98	659.01	2.52
20.17	2.26	2.21	653.65	658.56	2.45
20.33	2.21	2.18	653.35	658.13	2.39
20.50	2.18	2.15	653.08	657.74	2.33
20.67	2.15	2.13	652.84	657.41	2.28
20.83	2.13	2.11	652.64	657.13	2.24
21.00	2.11	2.10	652.47	656.89	2.21
21.17	2.10	2.09	652.33	656.69	2.18
21.33	2.09	2.07	652.21	656.52	2.15
21.50	2.07	2.06	652.11	656.37	2.13
21.67	2.06	2.05	652.02	656.24	2.11
21.83	2.05	2.03	651.94	656.13	2.10
22.00	2.03	2.02	651.86	656.01	2.08
22.17	2.02	2.01	651.78	655.91	2.06
22.33	2.01	1.99	651.71	655.81	2.05
22.50	1.99	1.98	651.64	655.71	2.03
22.67	1.98	1.97	651.57	655.61	2.02
22.83	1.97	1.95	651.51	655.52	2.01
23.00	1.95	1.94	651.44	655.42	1.99
23.17	1.94	1.93	651.37	655.33	1.98
23.33	1.93	1.91	651.31	655.24	1.97
23.50	1.91	1.90	651.24	655.15	1.95
23.67	1.90	1.89	651.18	655.05	1.94
23.83	1.89	1.87	651.11	654.96	1.92
24.00	1.87	1.29	651.05	654.87	1.91
24.17	1.29	0.86	650.58	654.21	1.81
24.33	0.86	0.57	649.53	652.73	1.60
24.50	0.57	0.34	648.28	650.96	1.34
24.67	0.34	0.17	646.87	649.19	1.16
24.83	0.17	0.06	645.20	647.38	1.09
25.00	0.06	0.00	643.40	645.43	1.01

Maximum outflow (cfs) = 24.25 < 24.52 cfs (2 yr. pre) 10 < 2yr pre
Maximum storage (cu ft) = 239646
Maximum elevation (ft) = 56.02 - ovr. spillway elev.

10 YR POST-DEV. THRU AND

Qp = 24.3 RESERVOIR ROUTE To = 0



HGU = 130 min 5 VGU = 20.0 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Menu

[F5] S dn [F6] S up [F7] Enl [F8] Red

HYDROLOGIC REPORT

POST-DEVELOPMENT.....
100 YR. STORM.....
THRU SYSTEM #1.....

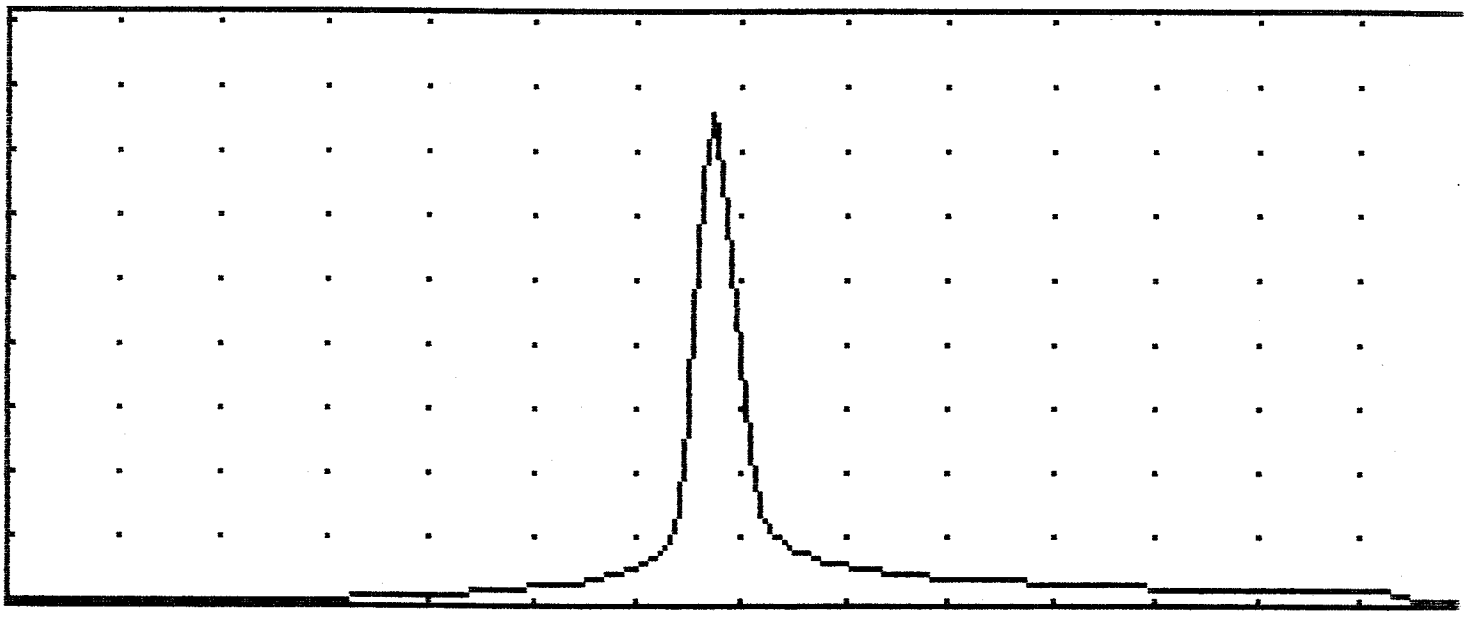
Hyd. No. 7

Hydrograph type	= S.C.S. RUNOFF	Peak discharge	= 75.99 cfs
Storm frequency	= 100 yr	Time interval	= 10 min
Basin area	= 19.19 ac	Basin curve No.	= 84
Ave basin slope	= 2.1 %	Hydraulic len	= 2150 ft
Basin lag	= 21.3 min	Time of concen	= 35.57 min
Total precip.	= 8.10 in	Distribution	= S.C.S. II

HYDROGRAPH DISCHARGE TABLE

TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfS)	
7.50	1.02	7.67	1.09	7.83	1.16	8.00	1.22
8.17	1.29	8.33	1.38	8.50	1.48	8.67	1.61
8.83	1.77	9.00	1.94	9.17	2.12	9.33	2.29
9.50	2.44	9.67	2.57	9.83	2.71	10.00	2.89
10.17	3.12	10.33	3.41	10.50	3.77	10.67	4.20
10.83	4.72	11.00	5.33	11.17	6.03	11.33	6.95
11.50	8.16	11.67	11.80	11.83	23.00	12.00	46.44
12.17	67.16	12.33	75.99	12.50	64.62	12.67	51.27
12.83	36.67	13.00	22.76	13.17	13.22	13.33	11.11
13.50	9.64	13.67	8.63	13.83	7.86	14.00	7.19
14.17	6.62	14.33	6.14	14.50	5.76	14.67	5.45
14.83	5.21	15.00	5.01	15.17	4.83	15.33	4.66
15.50	4.49	15.67	4.32	15.83	4.15	16.00	3.98
16.17	3.81	16.33	3.65	16.50	3.52	16.67	3.42
16.83	3.33	17.00	3.26	17.17	3.20	17.33	3.13
17.50	3.07	17.67	3.01	17.83	2.95	18.00	2.89
18.17	2.83	18.33	2.77	18.50	2.70	18.67	2.64
18.83	2.58	19.00	2.52	19.17	2.46	19.33	2.40
19.50	2.33	19.67	2.27	19.83	2.21	20.00	2.15
20.17	2.09	20.33	2.03	20.50	1.99	20.67	1.96
20.83	1.93	21.00	1.92	21.17	1.90	21.33	1.89
21.50	1.88	21.67	1.87	21.83	1.86	22.00	1.84
22.17	1.83	22.33	1.82	22.50	1.81	22.67	1.79
22.83	1.78	23.00	1.77	23.17	1.76	23.33	1.74
23.50	1.73	23.67	1.72	23.83	1.71	24.00	1.70
24.17	1.55	24.33	1.26	24.50	0.84	24.67	0.50

Qp = 76.0 S.C.S. RUNOFF To = 0



HGU = 110 min 7 VGU = 10.0 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Men

[F5] S dn [F6] S up [F7] Enl [F8] Re

HYDROLOGIC REPORT

POST-DEV.....
100 YR. STORM ...
CROSS COUNTRY.....

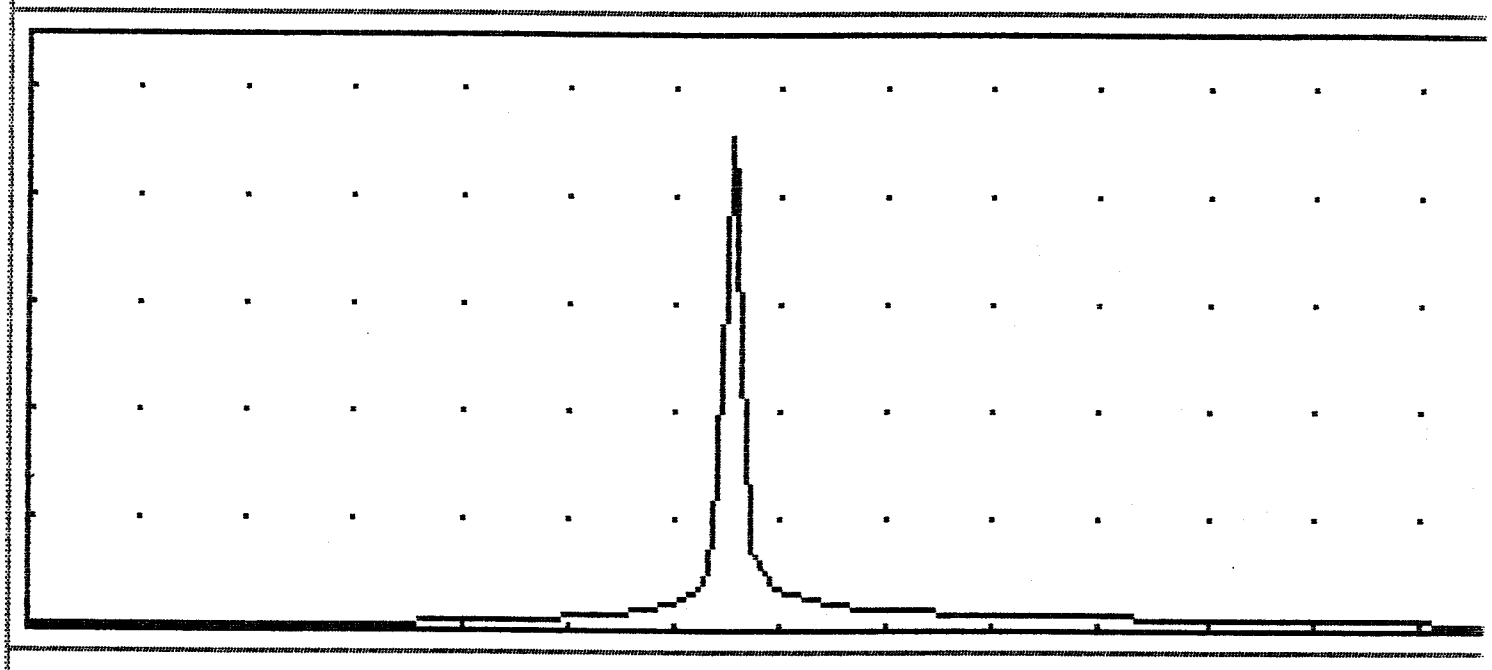
Hyd. No. 8

Hydrograph type	= S.C.S. RUNOFF	Peak discharge	= 91.17 cfs
Storm frequency	= 100 yr	Time interval	= 10 min
Basin area	= 10.76 ac	Basin curve No.	= 84
Ave basin slope	= 4.15 %	Hydraulic len	= 650 ft
Basin lag	= 5.8 min	Time of concen	= 9.72 min
Total precip.	= 8.10 in	Distribution	= S.C.S. II

HYDROGRAPH DISCHARGE TABLE

TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfS)	
8.17	0.93	8.33	1.03	8.50	1.14	8.67	1.25
8.83	1.37	9.00	1.50	9.17	1.60	9.33	1.66
9.50	1.71	9.67	1.80	9.83	1.97	10.00	2.18
10.17	2.41	10.33	2.70	10.50	3.02	10.67	3.41
10.83	3.90	11.00	4.45	11.17	4.96	11.33	6.25
11.50	7.73	11.67	19.26	11.83	52.49	12.00	91.17
12.17	45.68	12.33	14.41	12.50	10.94	12.67	8.36
12.83	7.12	13.00	6.33	13.17	5.66	13.33	5.17
13.50	4.74	13.67	4.35	13.83	4.02	14.00	3.72
14.17	3.47	14.33	3.33	14.50	3.23	14.67	3.12
14.83	3.01	15.00	2.90	15.17	2.80	15.33	2.69
15.50	2.58	15.67	2.47	15.83	2.36	16.00	2.25
16.17	2.17	16.33	2.12	16.50	2.08	16.67	2.04
16.83	2.00	17.00	1.96	17.17	1.93	17.33	1.89
17.50	1.85	17.67	1.81	17.83	1.77	18.00	1.73
18.17	1.69	18.33	1.65	18.50	1.62	18.67	1.58
18.83	1.54	19.00	1.50	19.17	1.46	19.33	1.42
19.50	1.38	19.67	1.34	19.83	1.30	20.00	1.26
20.17	1.23	20.33	1.22	20.50	1.21	20.67	1.21
20.83	1.20	21.00	1.19	21.17	1.18	21.33	1.18
21.50	1.17	21.67	1.16	21.83	1.15	22.00	1.14
22.17	1.14	22.33	1.13	22.50	1.12	22.67	1.11
22.83	1.11	23.00	1.10	23.17	1.09	23.33	1.08
23.50	1.07	23.67	1.07	23.83	1.06	24.00	1.05

Qp = 91.2 S.C.S. RUNOFF To = 0



HGU = 110 min 8 VGU = 20.0 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Men

[F5] S dn [F6] S up [F7] Enl [F8] Re

HYDROLOGIC REPORT

POST-DEVELOPMENT.....
100 YR. STORM ..
TO POND #1.....

Hyd. No. 9

Hydrograph type = COMBINED
Storm frequency = 100 yr
Inflow hyd no's = 7 & 8

Peak discharge = 137.60 cfs
Time interval = 10 min

HYDROGRAPH DISCHARGE TABLE

TIME hrs	INFLOW cfs	HYDROGRAPHS cfs	OUTFLOW HYDROGRAPH cfs
6.33	0.58	0.46	1.04
6.50	0.64	0.50	1.14
6.67	0.70	0.54	1.24
6.83	0.77	0.58	1.34
7.00	0.83	0.62	1.44
7.17	0.89	0.66	1.55
7.33	0.96	0.70	1.66
7.50	1.02	0.74	1.76
7.67	1.09	0.79	1.87
7.83	1.16	0.83	1.98
8.00	1.22	0.87	2.09
8.17	1.29	0.93	2.23
8.33	1.38	1.03	2.41
8.50	1.48	1.14	2.62
8.67	1.61	1.25	2.87
8.83	1.77	1.37	3.14
9.00	1.94	1.50	3.43
9.17	2.12	1.60	3.72
9.33	2.29	1.66	3.95
9.50	2.44	1.71	4.15
9.67	2.57	1.80	4.37
9.83	2.71	1.97	4.69
10.00	2.89	2.18	5.07
10.17	3.12	2.41	5.53
10.33	3.41	2.70	6.11
10.50	3.77	3.02	6.79
10.67	4.20	3.41	7.61
10.83	4.72	3.90	8.62

HYDROGRAPH DISCHARGE TABLE Cont'd

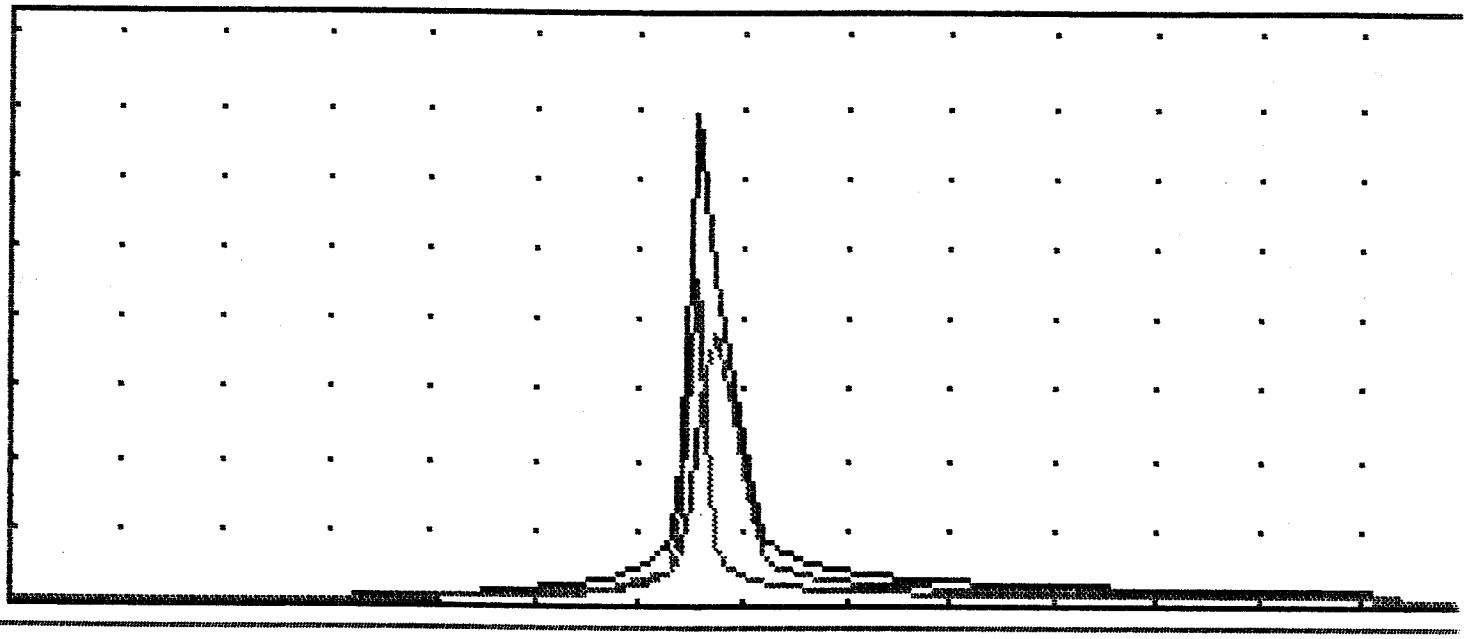
TIME hrs	INFLOW cfs	HYDROGRAPHS cfs	OUTFLOW HYDROGRAPH cfs
11.00	5.33	4.45	9.78
11.17	6.03	4.96	10.99
11.33	6.95	6.25	13.20
11.50	8.16	7.73	15.90
11.67	11.80	19.26	31.06
11.83	23.00	52.49	75.49
12.00	46.44	91.17	137.60
12.17	67.16	45.68	112.85
12.33	75.99	14.41	90.40
12.50	64.62	10.94	75.56
12.67	51.27	8.36	59.63
12.83	36.67	7.12	43.79
13.00	22.76	6.33	29.10
13.17	13.22	5.66	18.88
13.33	11.11	5.17	16.28
13.50	9.64	4.74	14.38
13.67	8.63	4.35	12.99
13.83	7.86	4.02	11.88
14.00	7.19	3.72	10.91
14.17	6.62	3.47	10.10
14.33	6.14	3.33	9.48
14.50	5.76	3.23	8.98
14.67	5.45	3.12	8.57
14.83	5.21	3.01	8.23
15.00	5.01	2.90	7.92
15.17	4.83	2.80	7.63
15.33	4.66	2.69	7.35
15.50	4.49	2.58	7.07
15.67	4.32	2.47	6.79
15.83	4.15	2.36	6.51
16.00	3.98	2.25	6.23
16.17	3.81	2.17	5.98
16.33	3.65	2.12	5.77
16.50	3.52	2.08	5.60
16.67	3.42	2.04	5.46
16.83	3.33	2.00	5.34
17.00	3.26	1.96	5.22
17.17	3.20	1.93	5.12
17.33	3.13	1.89	5.02
17.50	3.07	1.85	4.92
17.67	3.01	1.81	4.82
17.83	2.95	1.77	4.72
18.00	2.89	1.73	4.62
18.17	2.83	1.69	4.52
18.33	2.77	1.65	4.42
18.50	2.70	1.62	4.32

HYDROGRAPH DISCHARGE TABLE Cont'd

TIME hrs	INFLOW cfs	HYDROGRAPHS cfs	OUTFLOW HYDROGRAPH cfs
18.67	2.64	1.58	4.22
18.83	2.58	1.54	4.12
19.00	2.52	1.50	4.02
19.17	2.46	1.46	3.92
19.33	2.40	1.42	3.82
19.50	2.33	1.38	3.71
19.67	2.27	1.34	3.61
19.83	2.21	1.30	3.51
20.00	2.15	1.26	3.41
20.17	2.09	1.23	3.32
20.33	2.03	1.22	3.26
20.50	1.99	1.21	3.20
20.67	1.96	1.21	3.16
20.83	1.93	1.20	3.13
21.00	1.92	1.19	3.11
21.17	1.90	1.18	3.09
21.33	1.89	1.18	3.07
21.50	1.88	1.17	3.05
21.67	1.87	1.16	3.03
21.83	1.86	1.15	3.01
22.00	1.84	1.14	2.99
22.17	1.83	1.14	2.97
22.33	1.82	1.13	2.95
22.50	1.81	1.12	2.93
22.67	1.79	1.11	2.91
22.83	1.78	1.11	2.89
23.00	1.77	1.10	2.87
23.17	1.76	1.09	2.85
23.33	1.74	1.08	2.83
23.50	1.73	1.07	2.81
23.67	1.72	1.07	2.79
23.83	1.71	1.06	2.77
24.00	1.70	1.05	2.75
24.17	1.55	0.35	1.90
24.33	1.26	0.00	1.26

100 yr POST-DEV.

Qp = 137.6 COMBINED To = 0



HGU = 110 min 9 VGU = 20.0 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Men

[F5] S dn [F6] S up [F7] Enl [F8] Re

HYDROLOGIC REPORT

POST-DEVELOPMENT.....
100 YR THRU.STRUCTURE.
NO EMERGENCY SPILLWAY.

Hyd. No. 10

Hydrograph type = RESERVOIR ROUTE
Storm frequency = 100 yr
Inflow hyd. no. = 9

Peak discharge = 27.94 cfs
Time interval = 10 min
Reservoir no. = 1

HYDROGRAPH DISCHARGE TABLE

TIME hrs	INFLOW (i) cfs	INFLOW (j) cfs	2S/dt-O (i) cfs	2S/dt+O (j) cfs	OUTFLOW cfs
6.33	1.04	1.14	12.19	12.19	0.00
6.50	1.14	1.24	14.37	14.37	0.00
6.67	1.24	1.34	16.74	16.74	0.00
6.83	1.34	1.44	19.32	19.32	0.00
7.00	1.44	1.55	22.11	22.11	0.00
7.17	1.55	1.66	25.10	25.10	0.00
7.33	1.66	1.76	28.31	28.31	0.00
7.50	1.76	1.87	31.73	31.73	0.00
7.67	1.87	1.98	35.37	35.37	0.00
7.83	1.98	2.09	39.23	39.23	0.00
8.00	2.09	2.23	43.30	43.30	0.00
8.17	2.23	2.41	47.63	47.63	0.00
8.33	2.41	2.62	52.26	52.26	0.00
8.50	2.62	2.87	57.29	57.29	0.00
8.67	2.87	3.14	62.78	62.78	0.00
8.83	3.14	3.43	68.78	68.78	0.00
9.00	3.43	3.72	75.35	75.35	0.00
9.17	3.72	3.95	82.50	82.50	0.00
9.33	3.95	4.15	90.17	90.17	0.00
9.50	4.15	4.37	98.26	98.26	0.00
9.67	4.37	4.69	106.78	106.78	0.00
9.83	4.69	5.07	115.84	115.84	0.00
10.00	5.07	5.53	125.59	125.59	0.00
10.17	5.53	6.11	136.19	136.19	0.00
10.33	6.11	6.79	147.84	147.84	0.00

HYDROGRAPH DISCHARGE TABLE Cont'd

TIME hrs	INFLOW (i) cfs	INFLOW (j) cfs	2S/dt-O (i) cfs	2S/dt+O (j) cfs	OUTFLOW cfs
17.50	4.92	4.82	668.11	678.98	5.44
17.67	4.82	4.72	667.31	677.85	5.27
17.83	4.72	4.62	666.60	676.85	5.13
18.00	4.62	4.52	665.95	675.94	4.97
18.17	4.52	4.42	665.36	675.10	4.87
18.33	4.42	4.32	664.79	674.30	4.75
18.50	4.32	4.22	664.25	673.53	4.64
18.67	4.22	4.12	663.73	672.79	4.53
18.83	4.12	4.02	663.21	672.06	4.42
19.00	4.02	3.92	662.70	671.35	4.32
19.17	3.92	3.82	662.20	670.64	4.22
19.33	3.82	3.71	661.71	669.94	4.11
19.50	3.71	3.61	661.21	669.24	4.01
19.67	3.61	3.51	660.72	668.54	3.91
19.83	3.51	3.41	660.23	667.84	3.81
20.00	3.41	3.32	659.73	667.15	3.71
20.17	3.32	3.26	659.26	666.47	3.61
20.33	3.26	3.20	658.80	665.83	3.53
20.50	3.20	3.16	658.40	665.26	3.47
20.67	3.16	3.13	658.05	664.77	3.40
20.83	3.13	3.11	657.75	664.35	3.35
21.00	3.11	3.09	657.50	663.99	3.30
21.17	3.09	3.07	657.29	663.70	3.25
21.33	3.07	3.05	657.12	663.45	3.17
21.50	3.05	3.03	656.96	663.23	3.13
21.67	3.03	3.01	656.83	663.04	3.10
21.83	3.01	2.99	656.70	662.86	3.08
22.00	2.99	2.97	656.58	662.70	3.06
22.17	2.97	2.95	656.47	662.54	3.03
22.33	2.95	2.93	656.37	662.39	3.00
22.50	2.93	2.91	656.26	662.24	2.97
22.67	2.91	2.89	656.16	662.10	2.95
22.83	2.89	2.87	656.06	661.96	2.92
23.00	2.87	2.85	655.96	661.82	2.91
23.17	2.85	2.83	655.86	661.68	2.89
23.33	2.83	2.81	655.76	661.54	2.87
23.50	2.81	2.79	655.67	661.40	2.85
23.67	2.79	2.77	655.57	661.26	2.83
23.83	2.77	2.75	655.47	661.12	2.81
24.00	2.75	1.90	655.37	660.99	2.81
24.17	1.90	1.26	654.69	660.02	2.65
24.33	1.26	0.84	653.15	657.84	2.35

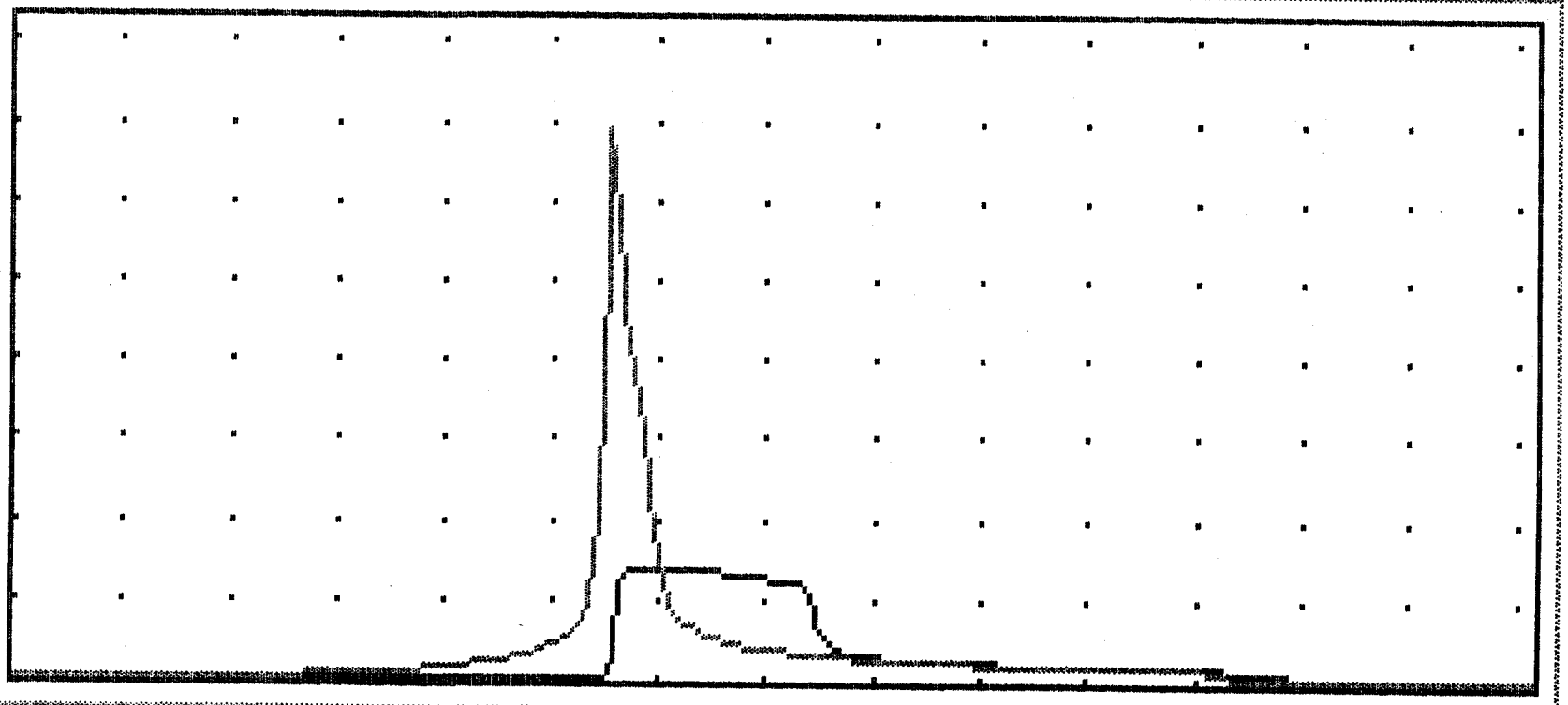
HYDROGRAPH DISCHARGE TABLE Cont'd

TIME hrs	INFLOW (i) cfs	INFLOW (j) cfs	2S/dt-O (i) cfs	2S/dt+O (j) cfs	OUTFLOW cfs
24.50	0.84	0.50	651.31	655.25	1.97
24.67	0.50	0.25	649.48	652.65	1.59
24.83	0.25	0.08	647.76	650.23	1.23
25.00	0.08	0.00	645.86	648.10	1.12
25.17	0.00	0.00	643.87	645.94	1.03

Maximum outflow (cfs) = 27.94
Maximum storage (cu ft) = 385445
Maximum elevation (ft) = 58.78 — TOO HIGH, NEED OVR. SPILLWAY

100 YR POST-DEV. (NO DAM. SPILLWAY)

Qp = 27.9 RESERVOIR ROUTE To = 0



HGU = 130 min 10 VGU = 20.0 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Menu

[F5] S dn [F6] S up [F7] Enl [F8] Red

HYDROLOGIC REPORT

POST-DEVELOPMENT.....
100 YR. THRU STRUCTURE
W/EMERGENCY SPILLWAY..

Hyd. No. 11

Hydrograph type = RESERVOIR ROUTE
Storm frequency = 100 yr
Inflow hyd. no. = 9

Peak discharge = 62.53 cfs
Time interval = 10 min
Reservoir no. = 1

HYDROGRAPH DISCHARGE TABLE

TIME hrs	INFLOW (i) cfs	INFLOW (j) cfs	2S/dt-O (i) cfs	2S/dt+O (j) cfs	OUTFLOW cfs
6.33	1.04	1.14	12.19	12.19	0.00
6.50	1.14	1.24	14.37	14.37	0.00
6.67	1.24	1.34	16.74	16.74	0.00
6.83	1.34	1.44	19.32	19.32	0.00
7.00	1.44	1.55	22.11	22.11	0.00
7.17	1.55	1.66	25.10	25.10	0.00
7.33	1.66	1.76	28.31	28.31	0.00
7.50	1.76	1.87	31.73	31.73	0.00
7.67	1.87	1.98	35.37	35.37	0.00
7.83	1.98	2.09	39.23	39.23	0.00
8.00	2.09	2.23	43.30	43.30	0.00
8.17	2.23	2.41	47.63	47.63	0.00
8.33	2.41	2.62	52.26	52.26	0.00
8.50	2.62	2.87	57.29	57.29	0.00
8.67	2.87	3.14	62.78	62.78	0.00
8.83	3.14	3.43	68.78	68.78	0.00
9.00	3.43	3.72	75.35	75.35	0.00
9.17	3.72	3.95	82.50	82.50	0.00
9.33	3.95	4.15	90.17	90.17	0.00
9.50	4.15	4.37	98.26	98.26	0.00
9.67	4.37	4.69	106.78	106.78	0.00
9.83	4.69	5.07	115.84	115.84	0.00
10.00	5.07	5.53	125.59	125.59	0.00
10.17	5.53	6.11	136.19	136.19	0.00
10.33	6.11	6.79	147.84	147.84	0.00

HYDROGRAPH DISCHARGE TABLE Cont'd

TIME hrs	INFLOW (i) cfs	INFLOW (j) cfs	2S/dt-O (i) cfs	2S/dt+O (j) cfs	OUTFLOW cfs
10.50	6.79	7.61	160.74	160.74	0.00
10.67	7.61	8.62	175.14	175.14	0.00
10.83	8.62	9.78	191.37	191.37	0.00
11.00	9.78	10.99	209.76	209.76	0.00
11.17	10.99	13.20	230.53	230.53	0.00
11.33	13.20	15.90	254.71	254.71	0.00
11.50	15.90	31.06	283.81	283.81	0.00
11.67	31.06	75.49	330.76	330.76	0.00
11.83	75.49	137.60	437.30	437.30	0.00
12.00	137.60	112.85	647.88	650.39	1.22
12.17	112.85	90.40	838.88	898.33	29.73
12.33	90.40	75.56	944.92	1042.12	48.60
12.50	75.56	59.63	991.11	1110.88	59.88
12.67	59.63	43.79	1001.24	1126.30	62.53
12.83	43.79	29.10	987.00	1104.66	58.83
13.00	29.10	18.88	957.01	1059.89	51.44
13.17	18.88	16.28	918.92	1004.99	43.03
13.33	16.28	14.38	881.76	954.08	36.16
13.50	14.38	12.99	849.93	912.42	31.24
13.67	12.99	11.88	821.81	877.30	27.75
13.83	11.88	10.91	795.89	846.67	25.39
14.00	10.91	10.10	770.55	818.67	24.06
14.17	10.10	9.48	743.99	791.55	23.78
14.33	9.48	8.98	718.85	763.56	22.36
14.50	8.98	8.57	702.90	737.31	17.21
14.67	8.57	8.23	693.81	720.46	13.32
14.83	8.23	7.92	687.84	710.61	11.38
15.00	7.92	7.63	683.80	703.98	10.09
15.17	7.63	7.35	680.99	699.35	9.18
15.33	7.35	7.07	678.94	695.97	8.51
15.50	7.07	6.79	677.36	693.37	8.00
15.67	6.79	6.51	676.06	691.22	7.58
15.83	6.51	6.23	674.93	689.36	7.22
16.00	6.23	5.98	673.90	687.67	6.88
16.17	5.98	5.77	672.95	686.11	6.58
16.33	5.77	5.60	672.10	684.70	6.30
16.50	5.60	5.46	671.29	683.48	6.10
16.67	5.46	5.34	670.49	682.35	5.93
16.83	5.34	5.22	669.74	681.29	5.77
17.00	5.22	5.12	669.04	680.30	5.63
17.17	5.12	5.02	668.39	679.38	5.50
17.33	5.02	4.92	667.79	678.53	5.37

HYDROGRAPH DISCHARGE TABLE Cont'd

TIME hrs	INFLOW (i) cfs	INFLOW (j) cfs	2S/dt-O (i) cfs	2S/dt+O (j) cfs	OUTFLOW cfs
17.50	4.92	4.82	667.22	677.73	5.26
17.67	4.82	4.72	666.68	676.97	5.14
17.83	4.72	4.62	666.16	676.22	5.03
18.00	4.62	4.52	665.64	675.50	4.93
18.17	4.52	4.42	665.14	674.78	4.82
18.33	4.42	4.32	664.64	674.08	4.72
18.50	4.32	4.22	664.14	673.38	4.62
18.67	4.22	4.12	663.65	672.68	4.52
18.83	4.12	4.02	663.16	671.99	4.41
19.00	4.02	3.92	662.67	671.29	4.31
19.17	3.92	3.82	662.18	670.60	4.21
19.33	3.82	3.71	661.69	669.91	4.11
19.50	3.71	3.61	661.20	669.22	4.01
19.67	3.61	3.51	660.71	668.53	3.91
19.83	3.51	3.41	660.22	667.83	3.81
20.00	3.41	3.32	659.73	667.14	3.71
20.17	3.32	3.26	659.25	666.46	3.61
20.33	3.26	3.20	658.80	665.83	3.51
20.50	3.20	3.16	658.40	665.26	3.43
20.67	3.16	3.13	658.05	664.77	3.36
20.83	3.13	3.11	657.75	664.35	3.30
21.00	3.11	3.09	657.50	663.99	3.25
21.17	3.09	3.07	657.29	663.70	3.20
21.33	3.07	3.05	657.12	663.45	3.17
21.50	3.05	3.03	656.96	663.23	3.13
21.67	3.03	3.01	656.83	663.04	3.11
21.83	3.01	2.99	656.70	662.86	3.08
22.00	2.99	2.97	656.58	662.70	3.06
22.17	2.97	2.95	656.47	662.54	3.03
22.33	2.95	2.93	656.37	662.39	3.01
22.50	2.93	2.91	656.26	662.24	2.99
22.67	2.91	2.89	656.16	662.10	2.97
22.83	2.89	2.87	656.06	661.96	2.95
23.00	2.87	2.85	655.96	661.82	2.93
23.17	2.85	2.83	655.86	661.68	2.91
23.33	2.83	2.81	655.76	661.54	2.89
23.50	2.81	2.79	655.67	661.40	2.87
23.67	2.79	2.77	655.57	661.26	2.85
23.83	2.77	2.75	655.47	661.12	2.83
24.00	2.75	1.90	655.37	660.99	2.81
24.17	1.90	1.26	654.69	660.02	2.66
24.33	1.26	0.84	653.15	657.84	2.35

HYDROGRAPH DISCHARGE TABLE Cont'd

TIME hrs	INFLOW (i) cfs	INFLOW (j) cfs	2S/dt-O (i) cfs	2S/dt+O (j) cfs	OUTFLOW cfs
24.50	0.84	0.50	651.31	655.25	1.97
24.67	0.50	0.25	649.48	652.65	1.59
24.83	0.25	0.08	647.76	650.23	1.23
25.00	0.08	0.00	645.86	648.10	1.12
25.17	0.00	0.00	643.87	645.94	1.03

Maximum outflow (cfs) = 62.53 — INCLUDES FLOW THRU EM. SPILLWAY
Maximum storage (cu ft) = 319131
Maximum elevation (ft) = 57.61

24.25 CFS FLOWS THROUGH PRINCIPALS SPILLWAY.

THEREFORE, 38.28 CFS MUST GO THROUGH EMERGENCY SPILLWAY.

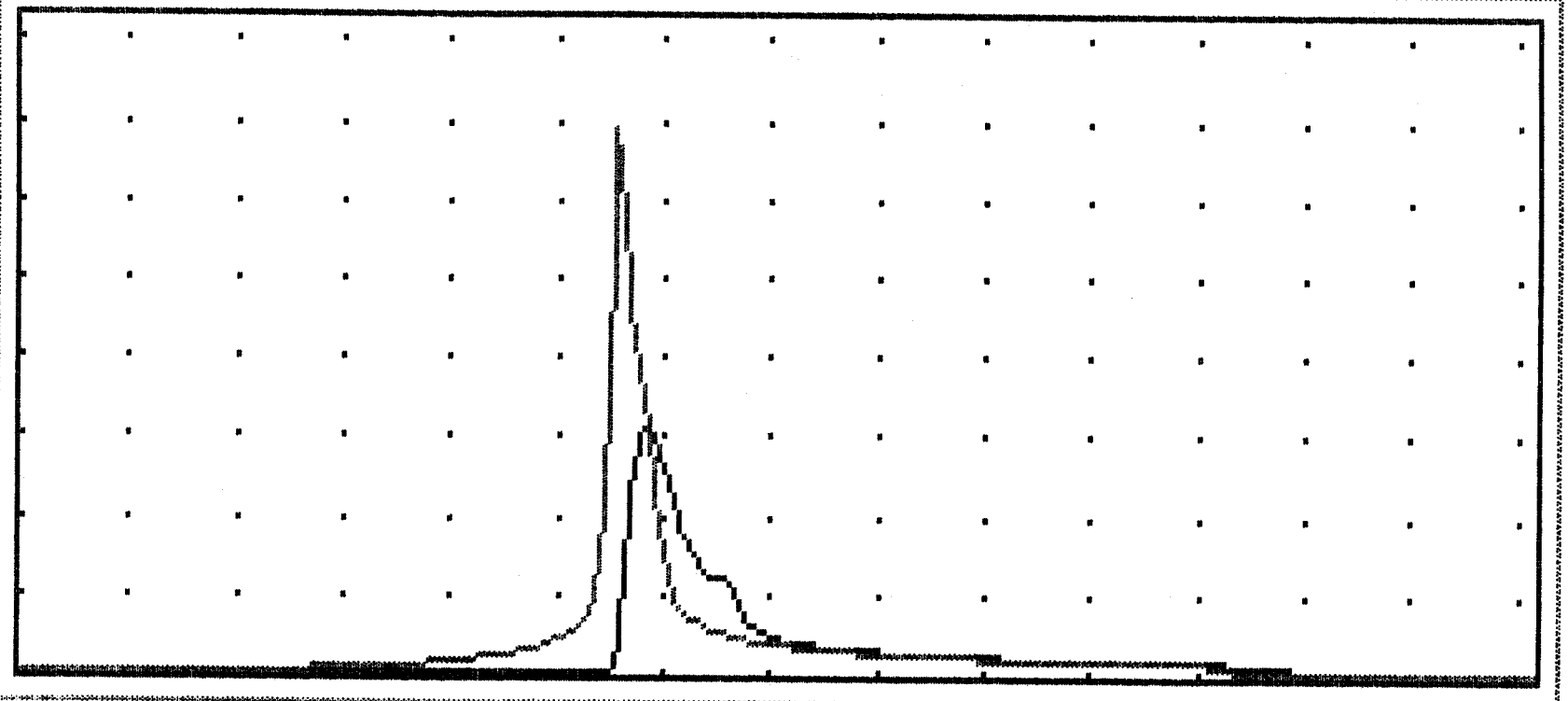
WE HAVE 6' WIDE TRAPEZOIDAL DITCH, 1.5' DEEP @ TOP.

TRANSITION TO 30% SLOPE (USE TRAPEZOIDAL DITCH, 3' BOTTOM, 1:1 SS AND 1' DEEP WILL CARRY 52 CFS ±)

check flow thru control section.

100 yr POST-DAM w/out. SPILLWAY

Qp = 62.5 RESERVOIR ROUTE To = 0



HGU = 130 min 11 VGU = 20.0 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Menu

[F5] S dn [F6] S up [F7] Enl [F8] Red

Option 1 STAGE / STORAGE TABLE R to res

1. RESERVOIR No = 1. 2. RESERVOIR NAME = DRY POND #1.
3. S = Ks * Z^b
Ks = 0..... b = 0.....
START ELEV = 0..... INCREMENT = 0...

	STAGE ft	ELEVATION ft	CO AREA sq ft	INC STORAGE cu ft	TOT STORAGE cu ft
4	0.00	47.00.	0.....	0	0
5	1.00	48.00.	6500....	3250	3250
6	3.00	50.00.	22775...	29275	32525
7	5.00	52.00.	27233...	50008	82533 −57,500
8	7.00	54.00.	41058...	68291	150824 −108,400
9	9.00	56.00.	46550...	87608	238432
10	11.00	58.00.	53600...	100150	338582
11	13.00	60.00.	66000...	114405	452987
12	0.00	0.00.	0.....	0	0
13	0.00	0.00.	0.....	0	0
14	0.00	0.00.	0.....	0	0

10 V = 189,100 ft3 ≈ 54.90'

Change item number: 0 DY to cor

Reservoir No. 1 OUTLET STRUCTURES

CULVERT STRUC A. Q=CoA[2gh/k]^.5

OUTLET PIPE

1. WIDTH (in) = 18.
2. HEIGHT (in) = 18.
3. No. BARRELS = 1..
4. INVERT ELEV. = 47.25....
5. Co = 0.60
6. CULVERT LENGTH (ft) = 88..
7. CULVERT SLOPE (%) = 2.33
8. MANNING'S N-VALUE = .013

CULVERT STRUC B. Q=CoA[2gh/k]^.5

9. WIDTH (in) = 0..
10. HEIGHT (in) = 0..
11. No. BARRELS = 0..
12. INVERT ELEV. = 0.....
13. Co = 0.60
14. CULVERT LENGTH (ft) = 0...
15. CULVERT SLOPE (%) = 0...
16. MANNING'S N-VALUE = .013
17. MULTI-STAGE OPTION ? (Y/N) N

WEIR STRUCTURE A. Q=CwLH^EXP

SPILLWAY (PRINCIPLE)

18. CREST LENGTH (ft) = 12.5664
19. CREST ELEVATION = 54.9...
20. Cw = 3.00
21. EXP = 1.50
22. MULTI-STAGE OPTION ? (Y/N) Y

WEIR STRUCTURE B. Q=CwLH^EXP

EM. SPILLWAY

23. CREST LENGTH (ft) = 6.....
24. CREST ELEVATION = 56.03..
25. Cw = 3.00
26. EXP = 1.50
27. MULTI-STAGE OPTION ? (Y/N) N

Change item number: 0 DY to cor

STORM SEWER DESIGN / ANALYSIS

Return Period = 10 Yrs
Rainfall file: JCC

Run Date: 10-16-1995
File: c:WPPH1-3.ST3

LINE 1 / Q = 43.60 / HT = 30 / WID = 30 / N = .013 / L = 89 / JLC = 0

ES-1 TO 1-11 / Outfall

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	56.74	20.90	55.00	11.94	58.96	27.58	-2.5	3.65
UPSTRM	58.24	20.90	56.50	11.94	60.46	27.58	3.2	3.65

Drainage area (ac) =	0.00	Slope of invert (%) =	1.6854
Runoff coefficient =	0.00	Slope energy grade line (%) =	1.6854
Time of conc (min) =	34.79	Critical depth (in) =	27.02
Inlet time (min) =	0.00	Natural ground elev. (ft) =	62.20
Intensity (in/hr) =	3.32	Upstream surcharge (ft) =	0.00
Cumulative C*A =	13.13	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	43.60	Line capacity (cfs) =	53.24
Q catchment (cfs) =	0.00	Inlet length (ft) =	0.00
Q carryover (cfs) =	0.00	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	0.00	Ponding width (ft) =	N/A

Note: Normal depth assumed

LINE 2 / Q = 43.92 / HT = 30 / WID = 30 / N = .013 / L = 82 / JLC = 0

1-11 TO 1-13 / DNLN = 1

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	58.03	18.41	56.50	13.91	61.04	29.22	3.2	3.16
UPSTRM	60.03	18.41	58.50	13.91	63.04	29.22	4.44	3.16

Drainage area (ac) =	0.55	Slope of invert (%) =	2.4390
Runoff coefficient =	0.75	Slope energy grade line (%) =	2.4390
Time of conc (min) =	34.34	Critical depth (in) =	27.02
Inlet time (min) =	5.00	Natural ground elev. (ft) =	65.45
Intensity (in/hr) =	3.34	Upstream surcharge (ft) =	0.00
Cumulative C*A =	13.13	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	43.92	Line capacity (cfs) =	64.05
Q catchment (cfs) =	2.89	Inlet length (ft) =	46.84
Q carryover (cfs) =	0.00	Gutter slope (ft/ft) =	0.0372
Q captured (cfs) =	2.89	Cross slope (ft/ft) =	0.0208
Q bypassed (cfs) =	0.00	Ponding width (ft) =	N/A

Note: Normal depth assumed

Line 1 → Line 18
ok 1-11 → (1-26)-(1-2

LINE 3 / Q = 1.10 / HT = 15 / WID = 15 / N = .013 / L = 102 / JLC = 0

1-12 TO 1-13 / DNLN = 2

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	60.08	3.93	59.75	4.30	60.36	13.19	4.44	0.26
UPSTRM	61.61	3.93	61.28	4.30	61.89	13.19	4.22	0.26

Drainage area (ac) = 0.21
Runoff coefficient = 0.75
Time of conc (min) = 5.00
Inlet time (min) = 5.00
Intensity (in/hr) = 7.00
Cumulative C*A = 0.16
Q = CA * I (cfs) = 1.10

Q catchment (cfs) = 1.10
Q carryover (cfs) = 0.00
Q captured (cfs) = 1.10
Q bypassed (cfs) = 0.00
Note: Normal depth assumed

Slope of invert (%) = 1.5000
Slope energy grade line (%) = 1.5000
Critical depth (in) = 5.04
Natural ground elev. (ft) = 66.75
Upstream surcharge (ft) = 0.00
Additional Q (cfs) = 0.00
Line capacity (cfs) = 7.91

Inlet length (ft) = 28.45
Gutter slope (ft/ft) = 0.0250
Cross slope (ft/ft) = 0.0208
Ponding width (ft) = N/A

LINE 4 / Q = 42.57 / HT = 30 / WID = 30 / N = .013 / L = 144 / JLC = 0

1-13 TO 1-14 / DNLN = 2

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	60.00	18.04	58.50	13.80	62.96	29.38	4.44	3.08
UPSTRM	63.50	18.04	62.00	13.80	66.46	29.38	3.48	3.08

Drainage area (ac) = 0.27
Runoff coefficient = 0.86
Time of conc (min) = 33.54
Inlet time (min) = 5.00
Intensity (in/hr) = 3.39
Cumulative C*A = 12.56
Q = CA * I (cfs) = 42.57

Q catchment (cfs) = 1.59
Q carryover (cfs) = 1.21
Q captured (cfs) = 2.81
Q bypassed (cfs) = 0.00
Note: Normal depth assumed

Slope of invert (%) = 2.4306
Slope energy grade line (%) = 2.4306
Critical depth (in) = 26.55
Natural ground elev. (ft) = 67.98
Upstream surcharge (ft) = 0.00
Additional Q (cfs) = 0.00
Line capacity (cfs) = 63.94

Inlet length (ft) = 42.42
Gutter slope (ft/ft) = 0.0174
Cross slope (ft/ft) = 0.0208
Ponding width (ft) = N/A

LINE 5 / Q = 42.18 / HT = 24 / WID = 24 / N = .013 / L = 100 / JLC = 0

1-14 TO 1-15 / DNLN = 4

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	64.47	23.65	62.50	13.47	67.29	23.83	3.48	3.13
UPSTRM	67.81	24.00	64.00	13.43	70.61	0.00	5.19	3.14

Drainage area (ac)	=	0.42
Runoff coefficient	=	0.72
Time of conc (min)	=	32.98
Inlet time (min)	=	5.00
Intensity (in/hr)	=	3.42
Cumulative C*A	=	12.34
Q = CA * I (cfs)	=	42.18
Q catchment (cfs)	=	2.14
Q carryover (cfs)	=	3.56
Q captured (cfs)	=	4.48
Q bypassed (cfs)	=	1.21

Slope of invert (%)	=	1.5000
Slope energy grade line (%)	=	3.3181
Critical depth (in)	=	23.65
Natural ground elev. (ft)	=	71.20
Upstream surcharge (ft)	=	1.81
Additional Q (cfs)	=	0.00
Line capacity (cfs)	=	27.70
Inlet length (ft)	=	29.34
Gutter slope (ft/ft)	=	0.0260
Cross slope (ft/ft)	=	0.0208
Ponding width (ft)	=	N/A

LINE 6 / Q = 41.65 / HT = 24 / WID = 24 / N = .013 / L = 133 / JLC = 0

1-15 TO 1-16 / DNLN = 5

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	67.81	24.00	64.00	13.26	70.54	0.00	5.19	3.14
UPSTRM	72.32	24.00	68.00	13.26	75.05	0.00	4.65	3.14

Drainage area (ac)	=	0.34
Runoff coefficient	=	0.80
Time of conc (min)	=	32.24
Inlet time (min)	=	5.00
Intensity (in/hr)	=	3.46
Cumulative C*A	=	12.03
Q = CA * I (cfs)	=	41.65
Q catchment (cfs)	=	1.90
Q carryover (cfs)	=	8.02
Q captured (cfs)	=	6.36
Q bypassed (cfs)	=	3.56

Slope of invert (%)	=	3.0075
Slope energy grade line (%)	=	3.3922
Critical depth (in)	=	23.65
Natural ground elev. (ft)	=	74.65
Upstream surcharge (ft)	=	2.32
Additional Q (cfs)	=	0.00
Line capacity (cfs)	=	39.22
Inlet length (ft)	=	27.91
Gutter slope (ft/ft)	=	0.0260
Cross slope (ft/ft)	=	0.0208
Ponding width (ft)	=	N/A

LINE 7 / Q = 41.09 / HT = 24 / WID = 24 / N = .013 / L = 97 / JLC = 0

1-16 TO 1-17 / DNLN = 6

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	72.32	24.00	68.00	13.08	74.98	0.00	4.65	3.14
UPSTRM	75.52	24.00	70.50	13.08	78.18	0.00	4.05	3.14

Drainage area (ac) =	0.42	Slope of invert (%) =	2.5773
Runoff coefficient =	0.78	Slope energy grade line (%) =	3.3010
Time of conc (min) =	31.71	Critical depth (in) =	23.65
Inlet time (min) =	5.00	Natural ground elev. (ft) =	76.56
Intensity (in/hr) =	3.49	Upstream surcharge (ft) =	3.02
Cumulative C*A =	11.76	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	41.09	Line capacity (cfs) =	36.31
Q catchment (cfs) =	2.29	Inlet length (ft) =	33.46
Q carryover (cfs) =	17.40	Gutter slope (ft/ft) =	0.0255
Q captured (cfs) =	11.67	Cross slope (ft/ft) =	0.0208
Q bypassed (cfs) =	8.02	Ponding width (ft) =	N/A

LINE 8 / Q = 40.58 / HT = 24 / WID = 24 / N = .013 / L = 164 / JLC = 0

1-17 TO 1-18 / DNLN = 7

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	75.52	24.00	70.50	12.92	78.11	0.00	4.05	3.14
UPSTRM	80.80	24.00	75.21	12.92	83.39	0.00	5.11	3.14

Drainage area (ac) =	0.07	Slope of invert (%) =	2.8689
Runoff coefficient =	0.90	Slope energy grade line (%) =	3.2196
Time of conc (min) =	30.79	Critical depth (in) =	23.65
Inlet time (min) =	5.00	Natural ground elev. (ft) =	82.32
Intensity (in/hr) =	3.55	Upstream surcharge (ft) =	3.60
Cumulative C*A =	11.43	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	40.58	Line capacity (cfs) =	38.31
Q catchment (cfs) =	0.44	Inlet length (ft) =	17.65
Q carryover (cfs) =	24.36	Gutter slope (ft/ft) =	0.0303
Q captured (cfs) =	7.39	Cross slope (ft/ft) =	0.0208
Q bypassed (cfs) =	17.40	Ponding width (ft) =	N/A

LINE 9 / Q = 30.12 / HT = 24 / WID = 24 / N = .013 / L = 132 / JLC = 0

1-18 TO 1-20 / DNLN = 8

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	80.80	24.00	75.21	9.59	82.23	0.00	5.11	3.14
UPSTRM	83.18	22.58	81.30	9.82	84.68	11.33	2.69	3.07

?

Drainage area (ac)	= 1.00	Slope of invert (%)	= 4.6174
Runoff coefficient	= 0.90	Slope energy grade line (%)	= 1.8559
Time of conc (min)	= 26.39	Critical depth (in)	= 22.58
Inlet time (min)	= 5.00	Natural ground elev. (ft)	= 86.00
Intensity (in/hr)	= 3.85	Upstream surcharge (ft)	= 0.00
Cumulative C*A	= 7.82	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 30.12	Line capacity (cfs)	= 48.60
Q catchment (cfs)	= 6.30	Inlet length (ft)	= 15.44
Q carryover (cfs)	= 13.27	Gutter slope (ft/ft)	= 0.0282
Q captured (cfs)	= 5.77	Cross slope (ft/ft)	= 0.0208
Q bypassed (cfs)	= 13.80	Ponding width (ft)	= N/A

LINE 10 / Q = 12.64 / HT = 24 / WID = 24 / N = .013 / L = 45 / JLC = 0

1-18 TO 1-19 / DNLN = 8

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	80.80	24.00	75.71	4.02	81.05	0.00	4.61	3.14
UPSTRM	80.94	24.00	76.18	4.02	81.19	0.00	3.25	3.14

?

Drainage area (ac)	= 2.90	Slope of invert (%)	= 1.0444
Runoff coefficient	= 0.68	Slope energy grade line (%)	= 0.3123
Time of conc (min)	= 30.54	Critical depth (in)	= 15.10
Inlet time (min)	= 10.00	Natural ground elev. (ft)	= 81.43
Intensity (in/hr)	= 3.57	Upstream surcharge (ft)	= 2.76
Cumulative C*A	= 3.54	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 12.64	Line capacity (cfs)	= 23.11
Q catchment (cfs)	= 11.45	Inlet length (ft)	= 25.90
Q carryover (cfs)	= 8.32	Gutter slope (ft/ft)	= 0.0282
Q captured (cfs)	= 9.22	Cross slope (ft/ft)	= 0.0208
Q bypassed (cfs)	= 10.55	Ponding width (ft)	= N/A

LINE 11 / Q = 27.14 / HT = 24 / WID = 24 / N = .013 / L = 165 / JLC = 0

1-20 TO 1-22 / DNLN = 9

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	83.18	22.58	81.30	8.85	84.40	23.28	2.69	3.07
UPSTRM	85.45	24.00	82.25	8.64	86.61	0.00	6.15	3.14

Drainage area (ac)	= 0.10	Slope of invert (%)	= 0.5758
Runoff coefficient	= 0.70	Slope energy grade line (%)	= 1.3421
Time of conc (min)	= 25.47	Critical depth (in)	= 21.96
Inlet time (min)	= 5.00	Natural ground elev. (ft)	= 90.40
Intensity (in/hr)	= 3.92	Upstream surcharge (ft)	= 1.20
Cumulative C*A	= 6.92	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 27.14	Line capacity (cfs)	= 17.16
Q catchment (cfs)	= 0.49	Inlet length (ft)	= 28.52
Q carryover (cfs)	= 26.32	Gutter slope (ft/ft)	= 0.0186
Q captured (cfs)	= 13.53	Cross slope (ft/ft)	= 0.0208
Q bypassed (cfs)	= 13.27	Ponding width (ft)	= N/A

LINE 12 / Q = 11.42 / HT = 24 / WID = 24 / N = .013 / L = 50 / JLC = 0

1-22 TO 1-21 / DNLN = 11

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	85.45	24.00	82.25	3.64	85.66	0.00	6.15	3.14
UPSTRM	85.58	24.00	82.75	3.63	85.79	0.00	5.62	3.14

Drainage area (ac)	= 1.70 ?	Slope of invert (%)	= 1.0000
Runoff coefficient	= 0.60	Slope energy grade line (%)	= 0.2550
Time of conc (min)	= 7.57	Critical depth (in)	= 14.36
Inlet time (min)	= 5.00	Natural ground elev. (ft)	= 90.38
Intensity (in/hr)	= 6.32	Upstream surcharge (ft)	= 0.83
Cumulative C*A	= 1.81	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 11.42	Line capacity (cfs)	= 22.62
Q catchment (cfs)	= 7.14	Inlet length (ft)	= 25.79
Q carryover (cfs)	= 5.50	Gutter slope (ft/ft)	= 0.0323
Q captured (cfs)	= 6.65	Cross slope (ft/ft)	= 0.0208
Q bypassed (cfs)	= 5.99	Ponding width (ft)	= N/A

LINE 13 / Q = 20.21 / HT = 24 / WID = 24 / N = .013 / L = 192 / JLC = 0

1-22 TO 1-23 / DNLN = 11

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	85.45	24.00	82.26	6.44	86.10	0.00	6.14	3.14
UPSTRM	86.99	24.00	84.25	6.43	87.63	0.00	3.15	3.14

Drainage area (ac) =	2.50 ?	Slope of invert (%)	= 1.0368
Runoff coefficient =	0.70	Slope energy grade line (%)	= 0.7989
Time of conc (min) =	24.41	Critical depth (in)	= 19.10
Inlet time (min) =	5.00	Natural ground elev. (ft)	= 89.40
Intensity (in/hr) =	4.01	Upstream surcharge (ft)	= 0.74
Cumulative C*A =	5.05	Additional Q (cfs)	= 0.00
Q = CA * I (cfs) =	20.21	Line capacity (cfs)	= 23.03
Q catchment (cfs) =	12.25	Inlet length (ft)	= 0.00
Q carryover (cfs) =	8.08	Gutter slope (ft/ft)	= 0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft)	= 0.0000
Q bypassed (cfs) =	20.33	Ponding width (ft)	= N/A

LINE 14 / Q = 9.68 / HT = 15 / WID = 15 / N = .013 / L = 70 / JLC = 0

1-23 TO 1-24 / DNLN = 13

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	86.99	15.00	84.25	7.89	87.95	0.00	3.9	1.23
UPSTRM	88.56	15.00	85.00	7.89	89.53	0.00	5.09	1.23

Drainage area (ac) =	1.30 0.97	Slope of invert (%)	= 1.0714
Runoff coefficient =	0.37	Slope energy grade line (%)	= 2.2474
Time of conc (min) =	24.02	Critical depth (in)	= 14.28
Inlet time (min) =	17.00	Natural ground elev. (ft)	= 91.35
Intensity (in/hr) =	4.04	Upstream surcharge (ft)	= 2.31
Cumulative C*A =	2.40	Additional Q (cfs)	= 0.00
Q = CA * I (cfs) =	9.68	Line capacity (cfs)	= 6.68
Q catchment (cfs) =	2.26	Inlet length (ft)	= 0.00
Q carryover (cfs) =	0.61	Gutter slope (ft/ft)	= 0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft)	= 0.0000
Q bypassed (cfs) =	2.86	Ponding width (ft)	= N/A

LINE 15 / Q = 7.80 / HT = 15 / WID = 15 / N = .013 / L = 48 / JLC = 0

1-24 TO 1-25 / DNLN = 14

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	88.56	15.00	85.50	6.36	89.19	0.00	4.59	1.23
UPSTRM	89.26	15.00	86.00	6.36	89.89	0.00	4.33	1.23

Drainage area (ac)	= 1.40 ?	Slope of invert (%)	= 1.0417
Runoff coefficient	= 0.45	Slope energy grade line (%)	= 1.4600
Time of conc (min)	= 23.75	Critical depth (in)	= 13.51
Inlet time (min)	= 5.00	Natural ground elev. (ft)	= 91.58
Intensity (in/hr)	= 4.06	Upstream surcharge (ft)	= 2.01
Cumulative C*A	= 1.92	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 7.80	Line capacity (cfs)	= 6.59
Q catchment (cfs)	= 4.41	Inlet length (ft)	= 24.01
Q carryover (cfs)	= 0.01	Gutter slope (ft/ft)	= 0.0116
Q captured (cfs)	= 3.81	Cross slope (ft/ft)	= 0.0208
Q bypassed (cfs)	= 0.61	Ponding width (ft)	= N/A

LINE 16 / Q = 5.35 / HT = 15 / WID = 15 / N = .013 / L = 170 / JLC = 0

1-25 TO 1-26 / DNLN = 15

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	89.26	15.00	86.00	4.36	89.56	0.00	4.33	1.23
UPSTRM	90.43	15.00	87.75	4.36	90.72	0.00	1.16	1.23

Drainage area (ac)	= 0.65 ✓	Slope of invert (%)	= 1.0294
Runoff coefficient	= 0.45	Slope energy grade line (%)	= 0.6864
Time of conc (min)	= 22.81	Critical depth (in)	= 11.10
Inlet time (min)	= 15.00	Natural ground elev. (ft)	= 90.17
Intensity (in/hr)	= 4.14	Upstream surcharge (ft)	= 1.43
Cumulative C*A	= 1.29	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 5.35	Line capacity (cfs)	= 6.55
Q catchment (cfs)	= 1.47	Inlet length (ft)	= 30.75
Q carryover (cfs)	= 0.48	Gutter slope (ft/ft)	= 0.0266
Q captured (cfs)	= 1.93	Cross slope (ft/ft)	= 0.0208
Q bypassed (cfs)	= 0.01	Ponding width (ft)	= N/A

LINE 17 / Q = 1.97 / HT = 15 / WID = 15 / N = .013 / L = 145 / JLC = 0

1-26 TO 1-27 / DNLN = 16

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	90.43	15.00	87.75	1.60	90.47	0.00	1.16	1.23
UPSTRM	94.56	6.73	94.00	3.68	94.77	14.92	3.37	0.53

Drainage area (ac)	= 1.04	Slope of invert (%)	= 4.3103
Runoff coefficient	= 0.45	Slope energy grade line (%)	= 2.9670
Time of conc (min)	= 22.00	Critical depth (in)	= 6.73
Inlet time (min)	= 22.00	Natural ground elev. (ft)	= 98.63
Intensity (in/hr)	= 4.21	Upstream surcharge (ft)	= 0.00
Cumulative C*A	= 0.47	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 1.97	Line capacity (cfs)	= 13.41
Q catchment (cfs)	= 1.97	Inlet length (ft)	= 23.39
Q carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.0139
Q captured (cfs)	= 1.91	Cross slope (ft/ft)	= 0.0208
Q bypassed (cfs)	= 0.05	Ponding width (ft)	= N/A

LINE 18 / Q = 3.72 / HT = 15 / WID = 15 / N = .013 / L = 72 / JLC = 0

1-26 TO 1-28 / DNLN = 16

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	90.43	15.00	87.75	3.03	90.57	0.00	1.16	1.23
UPSTRM	90.87	9.26	90.10	4.68	91.21	14.58	3.34	0.80

Drainage area (ac)	= 0.76 .48	Slope of invert (%)	= 3.2639
Runoff coefficient	= 0.70	Slope energy grade line (%)	= 0.8881
Time of conc (min)	= 5.00	Critical depth (in)	= 9.26
Inlet time (min)	= 5.00	Natural ground elev. (ft)	= 94.70
Intensity (in/hr)	= 7.00	Upstream surcharge (ft)	= 0.00
Cumulative C*A	= 0.53	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 3.72	Line capacity (cfs)	= 11.67
Q catchment (cfs)	= 3.72	Inlet length (ft)	= 29.17
Q carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.0243
Q captured (cfs)	= 3.29	Cross slope (ft/ft)	= 0.0208
Q bypassed (cfs)	= 0.43	Ponding width (ft)	= N/A

LINE 19 / Q = 5.10 / HT = 18 / WID = 18 / N = .013 / L = 125 / JLC = 0

EX TO 30 / DNLN = 12

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	85.58	18.00	82.75	2.89	85.71	0.00	6.12	1.77
UPSTRM	88.86	10.34	88.00	4.86	89.23	17.80	5.08	1.05

Drainage area (ac)	= 0.17	Slope of invert (%)	= 4.2000
Runoff coefficient	= 0.45	Slope energy grade line (%)	= 2.8138
Time of conc (min)	= 6.88	Critical depth (in)	= 10.34
Inlet time (min)	= 5.00	Natural ground elev. (ft)	= 94.59
Intensity (in/hr)	= 6.49	Upstream surcharge (ft)	= 0.00
Cumulative C*A	= 0.79	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 5.10	Line capacity (cfs)	= 21.52
Q catchment (cfs)	= 0.54	Inlet length (ft)	= 0.00
Q carryover (cfs)	= 4.97	Gutter slope (ft/ft)	= 0.0000
Q captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.0000
Q bypassed (cfs)	= 5.50	Ponding width (ft)	= N/A

LINE 20 / Q = 4.72 / HT = 18 / WID = 18 / N = .013 / L = 115 / JLC = 0

30 TO 31 / DNLN = 19

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	88.86	10.34	88.00	4.49	89.18	13.65	5.08	1.05
UPSTRM	95.83	9.95	95.00	4.71	96.17	17.90	3.25	1.00

Drainage area (ac)	= 0.20	Slope of invert (%)	= 6.0870
Runoff coefficient	= 0.55	Slope energy grade line (%)	= 6.0856
Time of conc (min)	= 6.24	Critical depth (in)	= 9.95
Inlet time (min)	= 5.00	Natural ground elev. (ft)	= 99.75
Intensity (in/hr)	= 6.65	Upstream surcharge (ft)	= 0.00
Cumulative C*A	= 0.71	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 4.72	Line capacity (cfs)	= 25.91
Q catchment (cfs)	= 0.77	Inlet length (ft)	= 0.00
Q carryover (cfs)	= 4.20	Gutter slope (ft/ft)	= 0.0000
Q captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.0000
Q bypassed (cfs)	= 4.97	Ponding width (ft)	= N/A

LINE 21 / Q = 1.12 / HT = 15 / WID = 15 / N = .013 / L = 38 / JLC = 0

31 TO 32 / DNLN = 20

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	95.83	9.95	95.00	1.30	95.86	12.22	3.5	0.86
UPSTRM	96.42	5.08	96.00	3.06	96.57	14.20	2.5	0.37

Drainage area (ac) =	0.32	Slope of invert (%) =	2.6316
Runoff coefficient =	0.50	Slope energy grade line (%) =	1.8773
Time of conc (min) =	5.00	Critical depth (in) =	5.08
Inlet time (min) =	5.00	Natural ground elev. (ft) =	99.75
Intensity (in/hr) =	7.00	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.16	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	1.12	Line capacity (cfs) =	10.48
Q catchment (cfs) =	1.12	Inlet length (ft) =	0.00
Q carryover (cfs) =	0.00	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	1.12	Ponding width (ft) =	N/A

LINE 22 / Q = 3.05 / HT = 15 / WID = 15 / N = .013 / L = 185 / JLC = 0

31 TO 33 / DNLN = 20

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	95.83	9.95	95.00	3.53	96.02	12.22	3.5	0.86
UPSTRM	98.70	8.39	98.00	4.32	98.99	14.89	4.69	0.71

Drainage area (ac) =	0.10	Slope of invert (%) =	1.6216
Runoff coefficient =	0.90	Slope energy grade line (%) =	1.6035
Time of conc (min) =	5.21	Critical depth (in) =	8.39
Inlet time (min) =	5.00	Natural ground elev. (ft) =	103.95
Intensity (in/hr) =	6.94	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.44	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	3.05	Line capacity (cfs) =	8.22
Q catchment (cfs) =	0.63	Inlet length (ft) =	0.00
Q carryover (cfs) =	2.45	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	3.08	Ponding width (ft) =	N/A

LINE 23 / Q = 2.45 / HT = 15 / WID = 15 / N = .013 / L = 38 / JLC = 0

33 TO 34 / DNLN = 22

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	98.70	8.39	98.00	3.47	98.89	11.22	4.69	0.71
UPSTRM	99.63	7.51	99.00	3.98	99.87	15.00	3.69	0.62

Drainage area (ac)	= 0.70	Slope of invert (%)	= 2.6316
Runoff coefficient	= 0.50	Slope energy grade line (%)	= 2.5960
Time of conc (min)	= 5.00	Critical depth (in)	= 7.51
Inlet time (min)	= 5.00	Natural ground elev. (ft)	= 103.95
Intensity (in/hr)	= 7.00	Upstream surcharge (ft)	= 0.00
Cumulative C*A	= 0.35	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 2.45	Line capacity (cfs)	= 10.48
Q catchment (cfs)	= 2.45	Inlet length (ft)	= 0.00
Q carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.0000
Q captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.0000
Q bypassed (cfs)	= 2.45	Ponding width (ft)	= N/A

LINE 24 / Q = 5.63 / HT = 24 / WID = 24 / N = .013 / L = 38 / JLC = 0

EX TO 35 / DNLN = 10

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	80.94	24.00	76.18	1.79	80.99	0.00	3.25	3.14
UPSTRM	84.84	10.08	84.00	4.49	85.15	23.69	2.5	1.25

Drainage area (ac)	= 0.19	Slope of invert (%)	=20.5789
Runoff coefficient	= 0.85	Slope energy grade line (%)	=10.9494
Time of conc (min)	= 30.33	Critical depth (in)	= 10.08
Inlet time (min)	= 5.00	Natural ground elev. (ft)	= 88.50
Intensity (in/hr)	= 3.58	Upstream surcharge (ft)	= 0.00
Cumulative C*A	= 1.57	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 5.63	Line capacity (cfs)	= 102.60
Q catchment (cfs)	= 1.13	Inlet length (ft)	= 0.00
Q carryover (cfs)	= 7.19	Gutter slope (ft/ft)	= 0.0000
Q captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.0000
Q bypassed (cfs)	= 8.32	Ponding width (ft)	= N/A

LINE 25 / Q = 5.09 / HT = 18 / WID = 18 / N = .013 / L = 82 / JLC = 0

35 TO 36 / DNLN = 24

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	84.53	6.38	84.00	9.09	85.81	17.22	3	0.56
UPSTRM	87.53	6.38	87.00	9.09	88.81	17.22	2.86	0.56

Drainage area (ac) =	0.20	Slope of invert (%) =	3.6585
Runoff coefficient =	0.85	Slope energy grade line (%) =	3.6585
Time of conc (min) =	29.88	Critical depth (in) =	10.33
Inlet time (min) =	5.00	Natural ground elev. (ft) =	91.36
Intensity (in/hr) =	3.61	Upstream surcharge (ft) =	0.00
Cumulative C*A =	1.41	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	5.09	Line capacity (cfs) =	20.09
Q catchment (cfs) =	1.19	Inlet length (ft) =	0.00
Q carryover (cfs) =	6.00	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	7.19	Ponding width (ft) =	N/A

Note: Normal depth assumed

LINE 26 / Q = 4.54 / HT = 15 / WID = 15 / N = .013 / L = 133 / JLC = 0

36 TO 37 / DNLN = 25

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	87.67	8.09	87.00	6.72	88.38	14.95	3.11	0.68
UPSTRM	89.80	8.09	89.13	6.72	90.51	14.95	3.62	0.68

Drainage area (ac) =	0.00	Slope of invert (%) =	1.6015
Runoff coefficient =	0.00	Slope energy grade line (%) =	1.6015
Time of conc (min) =	29.14	Critical depth (in) =	10.23
Inlet time (min) =	0.00	Natural ground elev. (ft) =	94.00
Intensity (in/hr) =	3.66	Upstream surcharge (ft) =	0.00
Cumulative C*A =	1.24	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	4.54	Line capacity (cfs) =	8.17
Q catchment (cfs) =	0.00	Inlet length (ft) =	0.00
Q carryover (cfs) =	6.00	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	6.00	Ponding width (ft) =	N/A

Note: Normal depth assumed

LINE 27 / Q = 4.59 / HT = 15 / WID = 15 / N = .013 / L = 110 / JLC = 0

37 TO 38 / DNLN = 26

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	89.95	9.57	89.15	5.55	90.43	14.42	3.59	0.83
UPSTRM	91.03	9.57	90.23	5.55	91.51	14.42	4.01	0.83

Drainage area (ac) =	0.13	Slope of invert (%) =	0.9818
Runoff coefficient =	0.90	Slope energy grade line (%) =	0.9818
Time of conc (min) =	28.53	Critical depth (in) =	10.28
Inlet time (min) =	5.00	Natural ground elev. (ft) =	95.50
Intensity (in/hr) =	3.70	Upstream surcharge (ft) =	0.00
Cumulative C*A =	1.24	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	4.59	Line capacity (cfs) =	6.40
Q catchment (cfs) =	0.82	Inlet length (ft) =	0.00
Q carryover (cfs) =	5.18	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	6.00	Ponding width (ft) =	N/A

Note: Normal depth assumed

LINE 28 / Q = 4.18 / HT = 15 / WID = 15 / N = .013 / L = 50 / JLC = 0

38 TO 39 / DNLN = 27

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	90.78	6.41	90.25	8.35	91.87	14.84	4	0.50
UPSTRM	92.28	6.41	91.75	8.35	93.37	14.84	3	0.50

Drainage area (ac) =	0.26	Slope of invert (%) =	3.0000
Runoff coefficient =	0.40	Slope energy grade line (%) =	3.0000
Time of conc (min) =	28.25	Critical depth (in) =	9.81
Inlet time (min) =	5.00	Natural ground elev. (ft) =	96.00
Intensity (in/hr) =	3.72	Upstream surcharge (ft) =	0.00
Cumulative C*A =	1.12	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	4.18	Line capacity (cfs) =	11.18
Q catchment (cfs) =	0.73	Inlet length (ft) =	0.00
Q carryover (cfs) =	4.46	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	5.18	Ponding width (ft) =	N/A

Note: Normal depth assumed

LINE 29 / Q = 3.80 / HT = 15 / WID = 15 / N = .013 / L = 25 / JLC = 0

39 TO 40 / DNLN = 28

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	92.28	15.00	90.75	3.10	92.43	0.00	4	1.23
UPSTRM	92.37	15.00	91.00	3.10	92.52	0.00	4.93	1.23

Drainage area (ac) =	0.19	Slope of invert (%) =	1.0000
Runoff coefficient =	0.90	Slope energy grade line (%) =	0.3465
Time of conc (min) =	28.11	Critical depth (in) =	9.36
Inlet time (min) =	5.00	Natural ground elev. (ft) =	97.18
Intensity (in/hr) =	3.73	Upstream surcharge (ft) =	0.12
Cumulative C*A =	1.02	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	3.80	Line capacity (cfs) =	6.46
Q catchment (cfs) =	1.20	Inlet length (ft) =	0.00
Q carryover (cfs) =	3.26	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	4.46	Ponding width (ft) =	N/A

LINE 30 / Q = 3.18 / HT = 15 / WID = 15 / N = .013 / L = 55 / JLC = 0

40 to 41 / DNLN = 29

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	92.37	15.00	91.00	2.59	92.48	0.00	4.93	1.23
UPSTRM	92.46	10.91	91.55	3.33	92.63	13.36	3.39	0.96

Drainage area (ac) =	0.02	Slope of invert (%) =	1.0000
Runoff coefficient =	0.45	Slope energy grade line (%) =	0.2835
Time of conc (min) =	27.81	Critical depth (in) =	8.56
Inlet time (min) =	5.00	Natural ground elev. (ft) =	96.20
Intensity (in/hr) =	3.75	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.85	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	3.18	Line capacity (cfs) =	6.46
Q catchment (cfs) =	0.06	Inlet length (ft) =	0.00
Q carryover (cfs) =	3.20	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	3.26	Ponding width (ft) =	N/A

LINE 31 / Q = 3.20 / HT = 15 / WID = 15 / N = .013 / L = 145 / JLC = 0

41 to 42 / DNLN = 30

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	92.46	10.91	91.55	3.34	92.63	12.79	3.39	0.96
UPSTRM	93.72	8.58	93.00	4.40	94.02	14.84	2.25	0.73

Drainage area (ac) =	1.40	Slope of invert (%) =	1.0000
Runoff coefficient =	0.60	Slope energy grade line (%) =	0.9541
Time of conc (min) =	27.00	Critical depth (in) =	8.58
Inlet time (min) =	27.00	Natural ground elev. (ft) =	96.50
Intensity (in/hr) =	3.80	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.84	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	3.20	Line capacity (cfs) =	6.46
Q catchment (cfs) =	3.20	Inlet length (ft) =	0.00
Q carryover (cfs) =	0.00	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	3.20	Ponding width (ft) =	N/A

LINE 32 / Q = 4.89 / HT = 24 / WID = 24 / N = .013 / L = 95 / JLC = 0

EX TO PH2-1 / DNLN = 13

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	86.99	24.00	84.93	1.56	87.03	0.00	2.47	3.14
UPSTRM	87.02	20.53	85.31	1.71	87.07	16.87	4.99	2.86

Drainage area (ac) =	0.00	Slope of invert (%) =	0.4000
Runoff coefficient =	0.00	Slope energy grade line (%) =	0.0430
Time of conc (min) =	12.09	Critical depth (in) =	9.39
Inlet time (min) =	0.00	Natural ground elev. (ft) =	92.30
Intensity (in/hr) =	5.43	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.90	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	4.89	Line capacity (cfs) =	14.30
Q catchment (cfs) =	0.00	Inlet length (ft) =	0.00
Q carryover (cfs) =	5.22	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	5.22	Ponding width (ft) =	N/A

LINE 33 / Q = 5.02 / HT = 15 / WID = 15 / N = .013 / L = 155 / JLC = 0

PH2-1 TO PH2-2 / DNLN = 32

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	87.02	15.00	85.31	4.09	87.28	0.00	5.74	1.23
UPSTRM	87.96	15.00	86.03	4.09	88.22	0.00	3.27	1.23

Drainage area (ac) =	0.56	Slope of invert (%) =	0.4645
Runoff coefficient =	0.65	Slope energy grade line (%) =	0.6044
Time of conc (min) =	11.23	Critical depth (in) =	10.76
Inlet time (min) =	10.00	Natural ground elev. (ft) =	90.55
Intensity (in/hr) =	5.58	Upstream surcharge (ft) =	0.68
Cumulative C*A =	0.90	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	5.02	Line capacity (cfs) =	4.40
Q catchment (cfs) =	2.11	Inlet length (ft) =	0.00
Q carryover (cfs) =	3.11	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	5.22	Ponding width (ft) =	N/A

LINE 34 / Q = 3.03 / HT = 15 / WID = 15 / N = .013 / L = 87 / JLC = 0

PH2-2 TO PH2-3 / DNLN = 33

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	87.96	15.00	86.03	2.47	88.05	0.00	3.27	1.23
UPSTRM	88.15	15.00	86.62	2.47	88.25	0.00	4.8	1.23

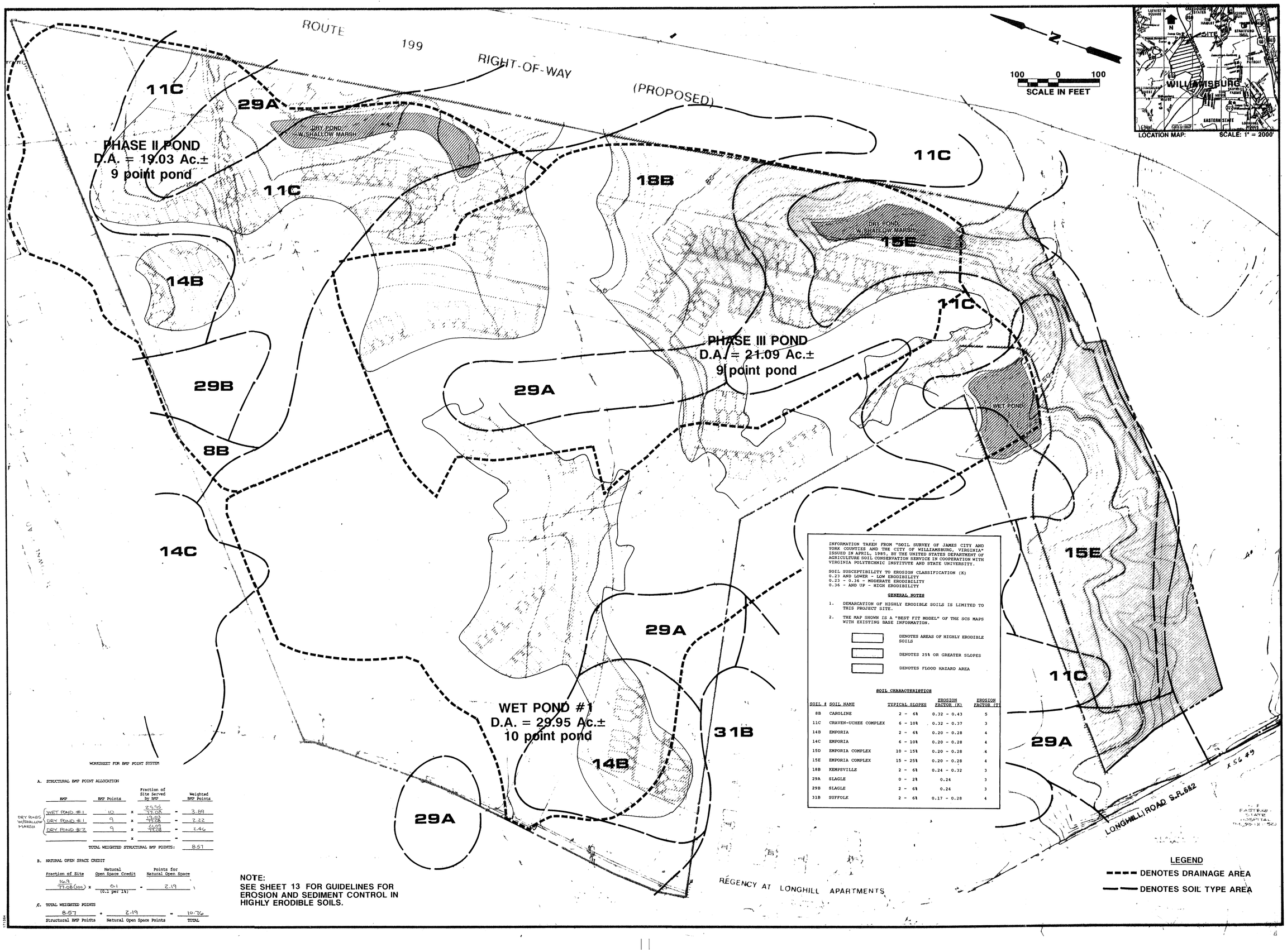
Drainage area (ac) =	0.49	Slope of invert (%) =	0.6782
Runoff coefficient =	0.65	Slope energy grade line (%) =	0.2209
Time of conc (min) =	10.74	Critical depth (in) =	8.36
Inlet time (min) =	10.00	Natural ground elev. (ft) =	92.68
Intensity (in/hr) =	5.67	Upstream surcharge (ft) =	0.28
Cumulative C*A =	0.54	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	3.03	Line capacity (cfs) =	5.32
Q catchment (cfs) =	1.85	Inlet length (ft) =	0.00
Q carryover (cfs) =	1.26	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	3.11	Ponding width (ft) =	N/A

LINE 35 / Q = 1.26 / HT = 15 / WID = 15 / N = .013 / L = 134 / JLC = 0

PH2-3 TO PH2-4 / DNLN = 34

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	88.15	15.00	86.62	1.03	88.17	0.00	4.8	1.23
UPSTRM	88.20	10.86	87.29	1.32	88.22	13.41	4.13	0.95

Drainage area (ac)	= 0.62	Slope of invert (%)	= 0.5000
Runoff coefficient	= 0.35	Slope energy grade line (%)	= 0.0416
Time of conc (min)	= 10.00	Critical depth (in)	= 5.39
Inlet time (min)	= 10.00	Natural ground elev. (ft)	= 92.68
Intensity (in/hr)	= 5.81	Upstream surcharge (ft)	= 0.00
Cumulative C*A	= 0.22	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 1.26	Line capacity (cfs)	= 4.57
Q catchment (cfs)	= 1.26	Inlet length (ft)	= 0.00
Q carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.0000
Q captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.0000
Q bypassed (cfs)	= 1.26	Ponding width (ft)	= N/A



INFORMATION TAKEN FROM "SOIL SURVEY OF JAMES CITY AND YORK COUNTIES AND THE CITY OF WILLIAMSBURG, VIRGINIA" ISSUED IN APRIL, 1985, BY THE UNITED STATES DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE IN COOPERATION WITH VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY.

SOIL SUSCEPTIBILITY TO EROSION CLASSIFICATION (K)
0.23 AND LOWER - LOW ERODIBILITY
0.23 - 0.36 - MODERATE ERODIBILITY
0.36 - AND UP - HIGH ERODIBILITY

GENERAL NOTES

1. DEMARCATION OF HIGHLY ERODIBLE SOILS IS LIMITED TO THIS PROJECT SITE.
2. THE MAP SHOWN IS A "BEST FIT MODEL" OF THE SCS MAPS WITH EXISTING BASE INFORMATION.

DENOTES AREAS OF HIGHLY ERODIBLE SOILS

DENOTES 25% OR GREATER SLOPES

DENOTES FLOOD HAZARD AREA

SOIL CHARACTERISTICS

SOIL #	SOIL NAME	TYPICAL SLOPES	EROSION FACTOR (K)	EROSION FACTOR (T)
8B	CAROLINE	2 - 6%	0.32 - 0.43	5
11C	CRAVEN-UCHEE COMPLEX	6 - 10%	0.32 - 0.37	3
14B	EMPORIA	2 - 6%	0.20 - 0.28	4
14C	EMPORIA	6 - 10%	0.20 - 0.28	4
15D	EMPORIA COMPLEX	10 - 15%	0.20 - 0.28	4
15E	EMPORIA COMPLEX	15 - 25%	0.20 - 0.28	4
18B	KEMPSVILLE	2 - 6%	0.24 - 0.32	3
29A	SLAGLE	0 - 2%	0.24	3
29B	SLAGLE	2 - 6%	0.24	3
31B	SUFFOLK	2 - 6%	0.17 - 0.28	4

WORKSHEET FOR BMP POINT SYSTEM

A. STRUCTURAL BMP POINT ALLOCATION

	BMP	BMP Points		Fraction of Site Served by BMP		Weighted BMP Points
DRY PONDS W/SHALLOW MARSH	WET POND #1	10	x	29.95 / 77.08	=	3.89
	DRY POND #1	9	x	19.03 / 77.08	=	2.22
	DRY POND #2	9	x	21.09 / 77.08	=	2.46
			x		=	
				TOTAL WEIGHTED STRUCTURAL BMP POINTS:		8.57

B. NATURAL OPEN SPACE CREDIT

Fraction of Site		Natural Open Space Credit		Points for Natural Open Space
16.9 / 77.08 (100)	x	0.1 (0.1 per 1%)	=	2.19

C. TOTAL WEIGHTED POINTS

8.57	+	2.19	=	10.76
Structural BMP Points		Natural Open Space Points		TOTAL

NOTE:
SEE SHEET 13 FOR GUIDELINES FOR EROSION AND SEDIMENT CONTROL IN HIGHLY ERODIBLE SOILS.

No.	DATE	REVISION / COMMENT / NOTE	BY
3	4/6/94	REVISED PER COUNTY COMMENTS	EAG
2	3/1/94	REVISED PER J.C.C. COMMENTS	EAG

COMMONWEALTH OF VIRGINIA
G. ARCHER MARSTON III
No. 011232
PROFESSIONAL ENGINEER
3/10/94

5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
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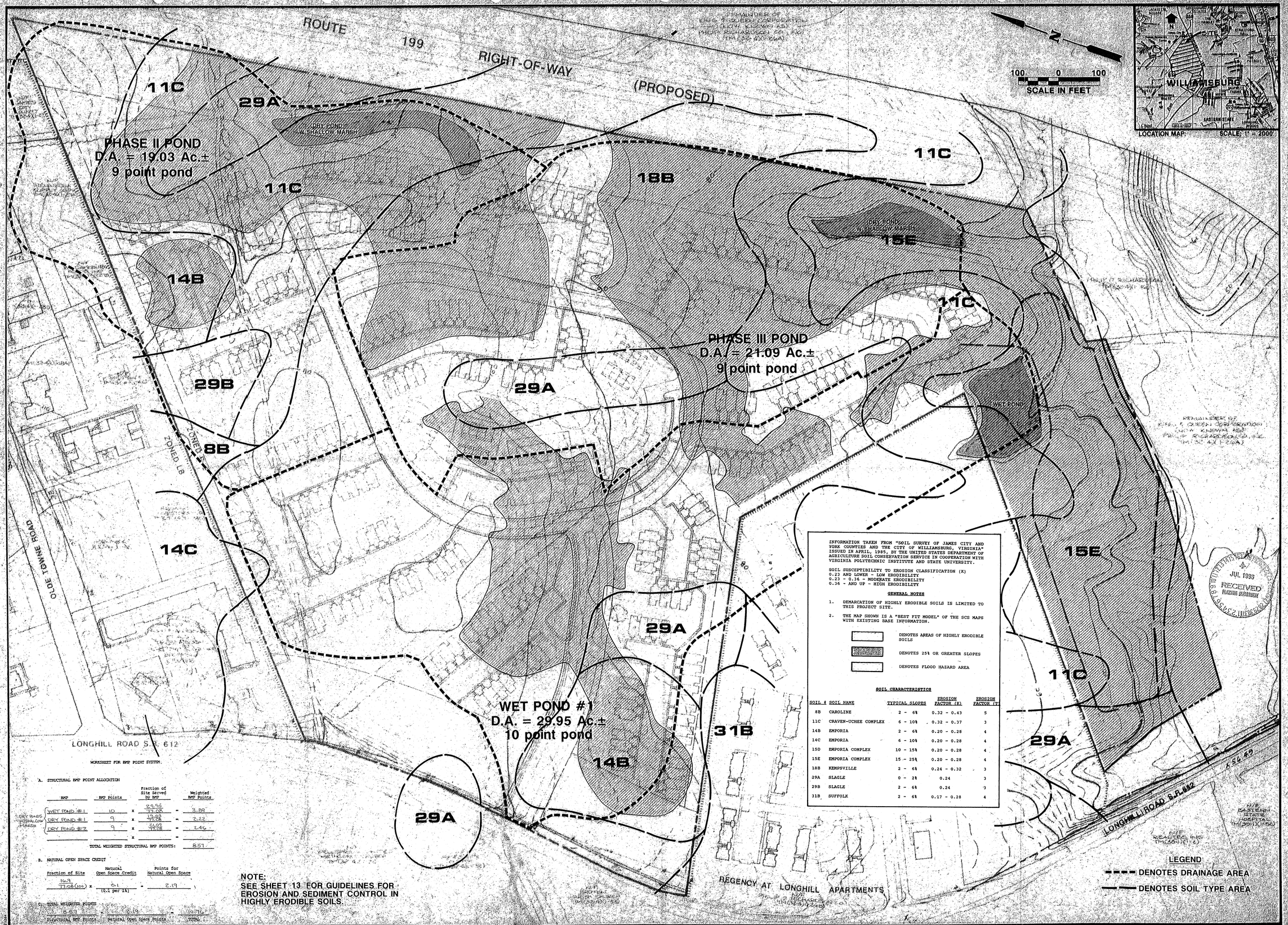
CONSULTING ENGINEERS

ENVIRONMENTAL INVENTORY
WILLIAMSBURG PLANTATION

OWNER/DEVELOPER: WILLIAMSBURG PLANTATION, INC.

BERKELEY DISTRICT — JAMES CITY COUNTY — VIRGINIA

Designed GAM/HWP/EMG	Drawn RMJ/EAW
Scale 1"=100'	Date JAN.1994
Project No. 7555	
Drawing No. 2	



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SOIL SUSCEPTIBILITY TO EROSION CLASSIFICATION (K)
0.23 AND LOWER - LOW ERODIBILITY
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GENERAL NOTES

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2. THE MAP SHOWN IS A "BEST FIT MODEL" OF THE SCS MAPS WITH EXISTING BASE INFORMATION.

DENOTES AREAS OF HIGHLY ERODIBLE SOILS

DENOTES 25% OR GREATER SLOPES

DENOTES FLOOD HAZARD AREA

SOIL CHARACTERISTICS

SOIL #	SOIL NAME	TYPICAL SLOPES	EROSION FACTOR (K)	EROSION FACTOR (T)
8B	CAROLINE	2 - 6%	0.32 - 0.43	5
11C	CRAVEN-UCHEE COMPLEX	6 - 10%	0.32 - 0.37	3
14B	EMPORIA	2 - 6%	0.20 - 0.28	4
14C	EMPORIA	6 - 10%	0.20 - 0.28	4
15D	EMPORIA COMPLEX	10 - 15%	0.20 - 0.28	4
15E	EMPORIA COMPLEX	15 - 25%	0.20 - 0.28	4
18B	KEMPSVILLE	2 - 6%	0.24 - 0.32	3
29A	SLAGLE	0 - 2%	0.24	3
29B	SLAGLE	2 - 6%	0.24	3
31B	SUFFOLK	2 - 6%	0.17 - 0.28	4

WORKSHEET FOR BMP POINT SYSTEM.

A. STRUCTURAL BMP POINT ALLOCATION

BMP	BMP Points		Fraction of Site Served by BMP		Weighted BMP Points
WET POND #1	10	x	29.95 / 77.08	=	3.89
DRY POND #1 (DRY PONDS W/SHALLOW MARSH)	9	x	19.03 / 77.08	=	2.22
DRY POND #2 (DRY PONDS W/SHALLOW MARSH)	9	x	6.09 / 77.08	=	2.46
		x		=	
			TOTAL WEIGHTED STRUCTURAL BMP POINTS:		8.57

B. NATURAL OPEN SPACE CREDIT

Fraction of Site		Natural Open Space Credit		Points for Natural Open Space
16.9 / 77.08 (100)	x	0.1 (0.1 per 1%)	=	2.19

C. TOTAL WEIGHTED POINTS

Structural BMP Points		Natural Open Space Points	=	TOTAL
8.57		2.19	=	10.76

NOTE:
SEE SHEET 13 FOR GUIDELINES FOR EROSION AND SEDIMENT CONTROL IN HIGHLY ERODIBLE SOILS.

LEGEND

DENOTES DRAINAGE AREA

DENOTES SOIL TYPE AREA

No.	DATE	REVISION / COMMENT / NOTE	BY
3	4/96	REVISED PER COUNTY COMMENTS	EAW
2	3/96	REVISED PER JCC COMMENTS	EAW

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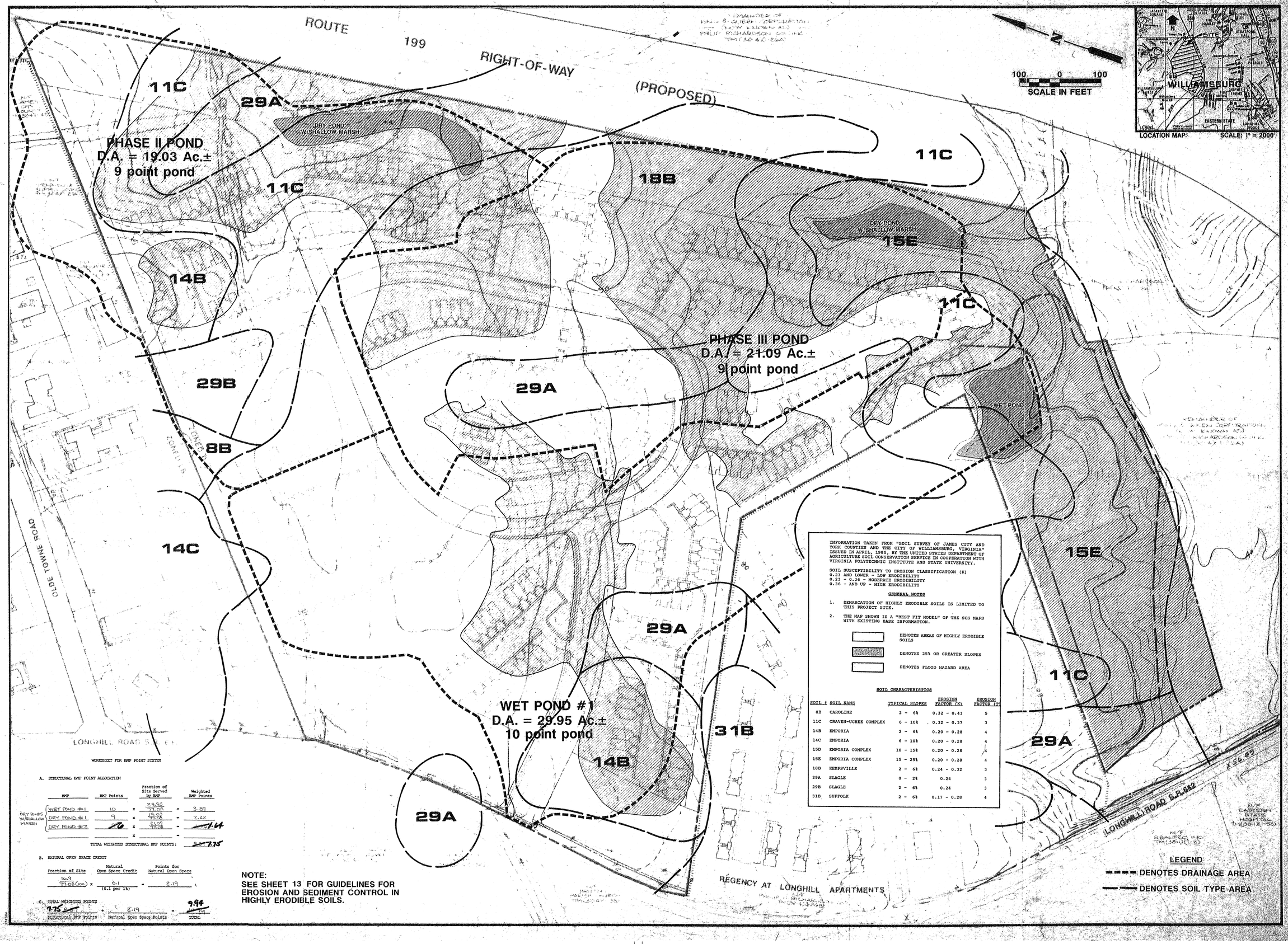
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(804) 253-0040
Fax (804) 220-8994

ENVIRONMENTAL INVENTORY
WILLIAMSBURG PLANTATION
OWNER/DEVELOPER: WILLIAMSBURG PLANTATION, INC.
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed GAM/HWP/ EMG	Drawn RMJ/EAW
Scale 1"=100'	Date JAN.1994
Project No. 7555	
Drawing No. 2	

SP-113-95



INFORMATION TAKEN FROM "SOIL SURVEY OF JAMES CITY AND YORK COUNTIES AND THE CITY OF WILLIAMSBURG, VIRGINIA" ISSUED IN APRIL, 1985, BY THE UNITED STATES DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE IN COOPERATION WITH VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY.

SOIL SUSCEPTIBILITY TO EROSION CLASSIFICATION (K)
0.23 AND LOWER - LOW ERODIBILITY
0.23 - 0.36 - MODERATE ERODIBILITY
0.36 - AND UP - HIGH ERODIBILITY

GENERAL NOTES

1. DEMARCATION OF HIGHLY ERODIBLE SOILS IS LIMITED TO THIS PROJECT SITE.
2. THE MAP SHOWN IS A "BEST FIT MODEL" OF THE SCS MAPS WITH EXISTING BASE INFORMATION.

DENOTES AREAS OF HIGHLY ERODIBLE SOILS

DENOTES 25% OR GREATER SLOPES

DENOTES FLOOD HAZARD AREA

SOIL CHARACTERISTICS

SOIL #	SOIL NAME	TYPICAL SLOPES	EROSION FACTOR (K)	EROSION FACTOR (T)
8B	CAROLINE	2 - 6%	0.32 - 0.43	5
11C	CRAVEN-UCHEE COMPLEX	6 - 10%	0.32 - 0.37	3
14B	EMPORIA	2 - 6%	0.20 - 0.28	4
14C	EMPORIA	6 - 10%	0.20 - 0.28	4
15D	EMPORIA COMPLEX	10 - 15%	0.20 - 0.28	4
15E	EMPORIA COMPLEX	15 - 25%	0.20 - 0.28	4
18B	KEMPSVILLE	2 - 6%	0.24 - 0.32	3
29A	SLAGLE	0 - 2%	0.24	3
29B	SLAGLE	2 - 6%	0.24	3
31B	SUFFOLK	2 - 6%	0.17 - 0.28	4

WORKSHEET FOR BMP POINT SYSTEM

A. STRUCTURAL BMP POINT ALLOCATION

	BMP	BMP Points		Fraction of Site Served by BMP		Weighted BMP Points
DRY PONDS W/SHALLOW MARSH	WET POND #1	10	x	29.95 / 77.08	=	3.89
	DRY POND #1	9	x	19.03 / 77.08	=	2.22
	DRY POND #2	~~10~~	x	6.09 / 77.08	=	~~1.58~~ 1.64
			x		=	
	TOTAL WEIGHTED STRUCTURAL BMP POINTS:					~~8.69~~ 7.75

B. NATURAL OPEN SPACE CREDIT

Fraction of Site		Natural Open Space Credit		Points for Natural Open Space
16.9 / 77.08 (100)	x	0.1 (0.1 per 1%)	=	2.19

C. TOTAL WEIGHTED POINTS

Structural BMP Points	+	Natural Open Space Points	=	TOTAL
~~7.75~~ 7.75	+	2.19	=	~~10~~ 9.94

NOTE:
SEE SHEET 13 FOR GUIDELINES FOR EROSION AND SEDIMENT CONTROL IN HIGHLY ERODIBLE SOILS.

LEGEND

DENOTES DRAINAGE AREA

DENOTES SOIL TYPE AREA

No.	DATE	REVISION / COMMENT / NOTE	BY
3	4/96	REVISED PER COUNTY COMMENTS	EAG
2	9/1/94	REVISED PER J.C.C. COMMENTS	EAG

COMMONWEALTH OF VIRGINIA
C. ARCHER MARSTON III
No. 016232
PROFESSIONAL ENGINEER
3/10/94

5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(804) 253-0040
Fax (804) 220-8994
CONSULTING ENGINEERS

ENVIRONMENTAL INVENTORY
WILLIAMSBURG PLANTATION
OWNER/DEVELOPER: WILLIAMSBURG PLANTATION, INC.
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed GAM/AWF/EMG	Drawn RMJ/EAW
Scale 1"=100'	Date JAN.1994
Project No. 7555	
Drawing No. 2	

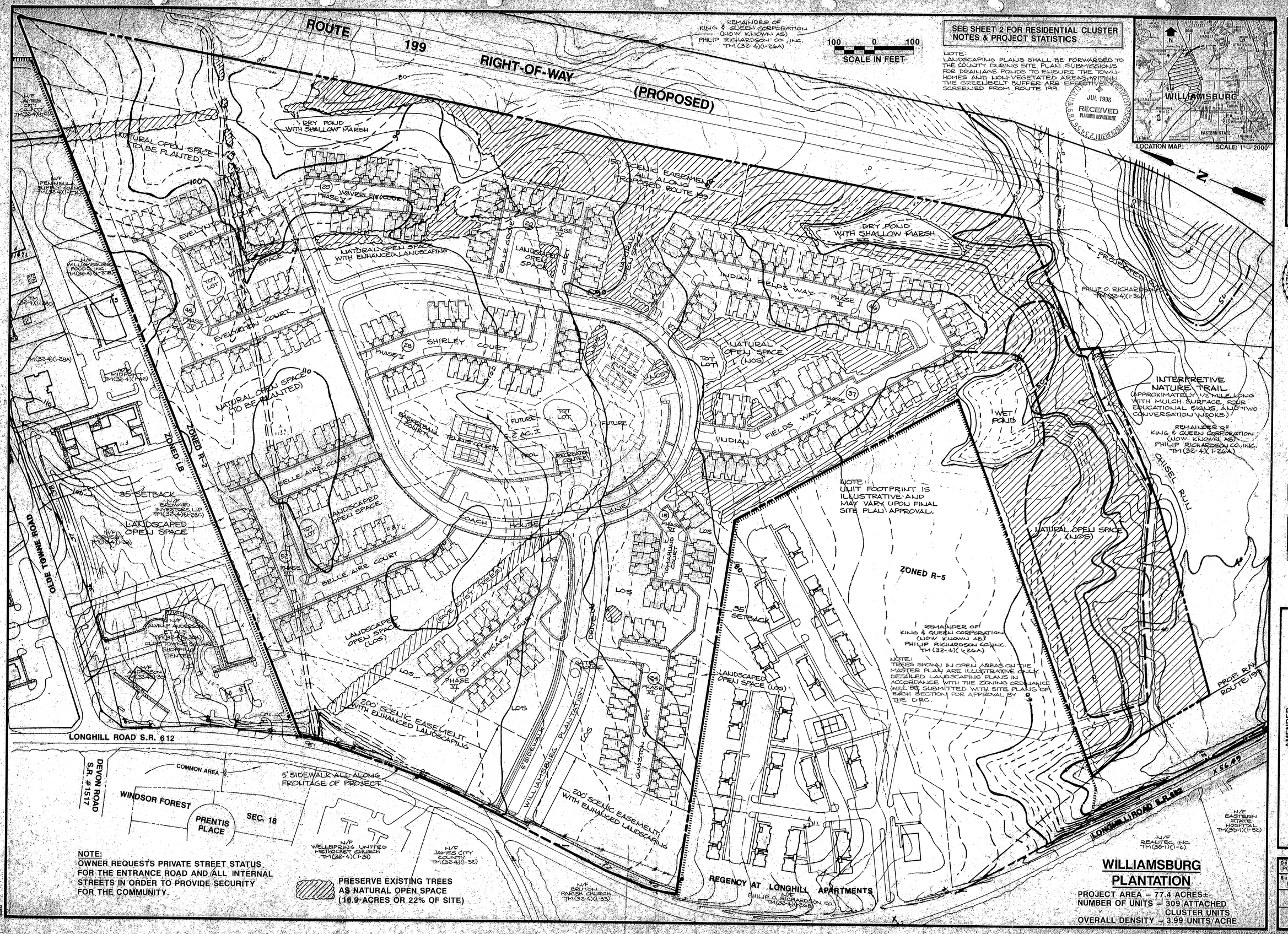
SEE SHEET 2 FOR RESIDENTIAL CLUSTER NOTES & PROJECT STATISTICS

NOTE:
LANDSCAPING PLANS SHALL BE FORWARDED TO THE COUNTY DURING SITE PLAN SUBMISSIONS FOR DRAINAGE PONDS TO ENSURE THE TOWNHOMES AND NON-VEGETATED AREAS WITHIN THE GREENBELT BUFFER ARE EFFECTIVELY SCREENED FROM ROUTE 199.

JUL 1996
RECEIVED
PLANNING DEPARTMENT

SCALE IN FEET: 100 0 100

LOCATION MAP: SCALE: 1" = 2000'



NOTE:
OWNER REQUESTS PRIVATE STREET STATUS FOR THE ENTRANCE ROAD AND ALL INTERNAL STREETS IN ORDER TO PROVIDE SECURITY FOR THE COMMUNITY.

PRESERVE EXISTING TREES AS NATURAL OPEN SPACE (16.9 ACRES OR 22% OF SITE)

WILLIAMSBURG PLANTATION

PROJECT AREA = 77.4 ACRES±
NUMBER OF UNITS = 309 ATTACHED CLUSTER UNITS
OVERALL DENSITY = 3.99 UNITS/ACRE

No.	DATE	REVISION / COMMENT / NOTE	BY

COMMONWEALTH OF VIRGINIA
PAUL C. SMALL
CERTIFICATE NO. 04267
CERTIFIED PROFESSIONAL ENGINEER

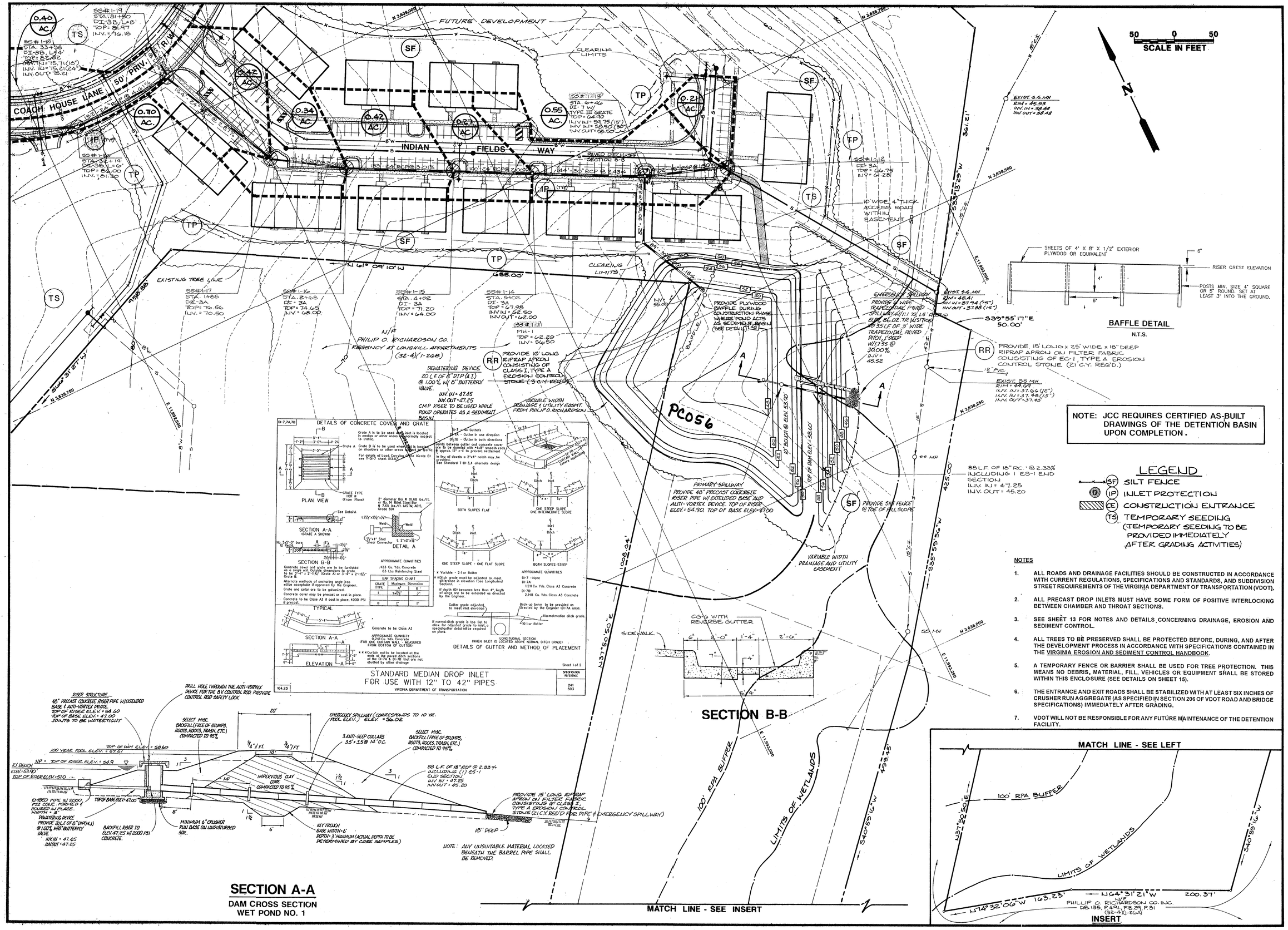
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(804) 253-0040
Fax (804) 220-8994

CONSULTING ENGINEERS

AMENDED
OVERALL PLAN OF DEVELOPMENT
WILLIAMSBURG PLANTATION
A RESIDENTIAL CLUSTER DEVELOPMENT
BY: WILLIAMSBURG PLANTATION, INC.
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed PCS	Drawn EAW
Scale 1"=100'	Date 9/1/93
Project No. 7555	
Drawing No. 1	

SP-113-93



NOTE: JCC REQUIRES CERTIFIED AS-BUILT DRAWINGS OF THE DETENTION BASIN UPON COMPLETION.

LEGEND

- SF — SILT FENCE
- IP — INLET PROTECTION
- CE — CONSTRUCTION ENTRANCE
- TS — TEMPORARY SEEDING (TEMPORARY SEEDING TO BE PROVIDED IMMEDIATELY AFTER GRADING ACTIVITIES)

NOTES

1. ALL ROADS AND DRAINAGE FACILITIES SHOULD BE CONSTRUCTED IN ACCORDANCE WITH CURRENT REGULATIONS, SPECIFICATIONS AND STANDARDS, AND SUBDIVISION STREET REQUIREMENTS OF THE VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT).
2. ALL PRECAST DROP INLETS MUST HAVE SOME FORM OF POSITIVE INTERLOCKING BETWEEN CHAMBER AND THROAT SECTIONS.
3. SEE SHEET 13 FOR NOTES AND DETAILS CONCERNING DRAINAGE, EROSION AND SEDIMENT CONTROL.
4. ALL TREES TO BE PRESERVED SHALL BE PROTECTED BEFORE, DURING, AND AFTER THE DEVELOPMENT PROCESS IN ACCORDANCE WITH SPECIFICATIONS CONTAINED IN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK.
5. A TEMPORARY FENCE OR BARRIER SHALL BE USED FOR TREE PROTECTION. THIS MEANS NO DEBRIS, MATERIAL, FILL, VEHICLES OR EQUIPMENT SHALL BE STORED WITHIN THIS ENCLOSURE (SEE DETAILS ON SHEET 15).
6. THE ENTRANCE AND EXIT ROADS SHALL BE STABILIZED WITH AT LEAST SIX INCHES OF CRUSHER RUN AGGREGATE (AS SPECIFIED IN SECTION 206 OF VDOT ROAD AND BRIDGE SPECIFICATIONS) IMMEDIATELY AFTER GRADING.
7. VDOT WILL NOT BE RESPONSIBLE FOR ANY FUTURE MAINTENANCE OF THE DETENTION FACILITY.

No.	DATE	REVISION / COMMENT / NOTE	BY
1	3/11/94	REVISED PER J.C.C.	EMG

COMMONWEALTH OF VIRGINIA — G. ARCHER MARSTON III — No. 012022 — PROFESSIONAL ENGINEER — 3/10/94

5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(804) 253-0040
Fax (804) 220-8994
CONSULTING ENGINEERS

DRAINAGE, EROSION & SEDIMENT CONTROL PLAN
WILLIAMSBURG PLANTATION
PHASE I

OWNER/DEVELOPER : WILLIAMSBURG PLANTATION, INC.

BERKELEY DISTRICT — JAMES CITY COUNTY — VIRGINIA

Designed HWP/GAM/EMG	Drawn GBB/CAN/EAW
Scale 1"=50'	Date JAN, 1994
Project No. 7555	
Drawing No. 8	

ROUTE 199

RIGHT-OF-WAY

N/F KING & QUEEN CORP. (32-4)(1-26A)

N/F KING & QUEEN CORP. (32-4)(1-26)

N/F JAMES CITY CO. (32-4)(1-27)

N/F PENINSULA SUPPLY COMPANY, INC. (32-4)(1-27A)

N/F WILLIAMSBURG FOODS, INC. (32-4)(1-27B)

N/F MIDPOINT (32-4)(1-42)

N/F BROWARD INVESTORS (32-4)(1-28C)

N/F PHILIP O. RICHARDSON CO. (32-4)(1-36)

N/F EASTERN STATE HOSPITAL (38-1)(1-52)

N/F REALTEC, INC. (38-1)(1-2)

N/F JAMES CITY COUNTY (32-4)(1-32)

N/F BRUTON PARISH CHURCH (32-4)(1-33)

REGENCY AT LONGHILL APARTMENTS

PHILIP O. RICHARDSON CO. (32-4)(1-36B)

OLD TOWNE ROAD S.R. 658

LONGHILL ROAD S.R. 612

LONGHILL ROAD S.R. 612

ZONED LB

ZONED R-2

ZONED R-3

ZONED R-5

35' SETBACK

150' SETBACK

150'/SETBACK

LANDSCAPE BUFFER

LANDSCAPE BUFFER

LANDSCAPE BUFFER

FUTURE

DRY POND

DRY POND

DRY POND

DRY POND

PHASE III

PHASE II

PHASE I

PHASE II
PHASE I

PHASE II
PHASE I

TOT LOT

TOT LOT

POOL

TENNIS

PHASE II POND
D.A. = 19.03 Ac.±
9 point pond

PHASE III POND
D.A. = 21.09 Ac.±
9 point pond

WET POND #1
D.A. = 29.95 Ac.±
10 point pond

PC056

DENOTES LIMITS OF WETLANDS

INTERMITTANT STREAM

PERENNIAL STREAM

100 0 100
SCALE IN FEET

N

LOCATION MAP
SCALE: 1" = 2000'

LAFAYETTE SQUARE
GREYHOUND ESTATES
CHISEL RUN
THE HAMLET
STRATFORD HALL
WINDSOR FOREST
THE PATRIOT
SKIPWITH FARMS
THE MEWS
SITE
WILLIAMSBURG WEST
Human Resources Center
James City Co. Courts
Jamestown Apartments
Williamsburg West GC
Jamestown Beach Park
Jamestown Ferry
Colonial Parkway
Yorktown Battlefield
Yorktown
Jamestown
Williamsburg
James City
Williamsburg
658
612
199
60
645
922
31
Rt. 199
Rt. 31
Rt. 60
Rt. 658
Rt. 612
Rt. 922
Rt. 645

LEGEND

DENOTES WETLANDS

DENOTES NATURAL OPEN SPACE IN CONSERVATION EASEMENT

NOTE: WETLANDS SHALL BE INCLUDED AS PART OF NATURAL OPEN SPACE.

WORKSHEET FOR BMP POINT SYSTEM

WILLIAMSBURG PLANTATION "SEES OVERALL STORMWATER MANAGEMENT"

A. STRUCTURAL BMP POINT ALLOCATION

BMP	BMP Points		Fraction of Site Served by BMP		Weighted BMP Points
WET POND #1	10	x	29.95 / 49.07	=	6.10
PHASE II POND	9	x	19.03 / 49.07	=	3.5
PHASE III POND	9	x	21.09 / 49.07	=	3.86
		x		=	
		x		=	

TOTAL WEIGHTED STRUCTURAL BMP POINTS: 13.51

B. NATURAL OPEN SPACE CREDIT

Fraction of Site		Natural Open Space Credit		Points for Natural Open Space
18.15 / 49.07 (.37)	x	6 / (0.1 per 1%)	=	2.25

C. TOTAL WEIGHTED POINTS

13.51	+	2.25	=	15.76
Structural BMP Points		Natural Open Space Points		TOTAL

No.	DATE	REVISION / COMMENT / NOTE	BY

COMMONWEALTH OF VIRGINIA
G. ARCHER MARSTON III
No. 018232
PROFESSIONAL ENGINEER

5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(804) 253-0040
Fax (804) 220-8994

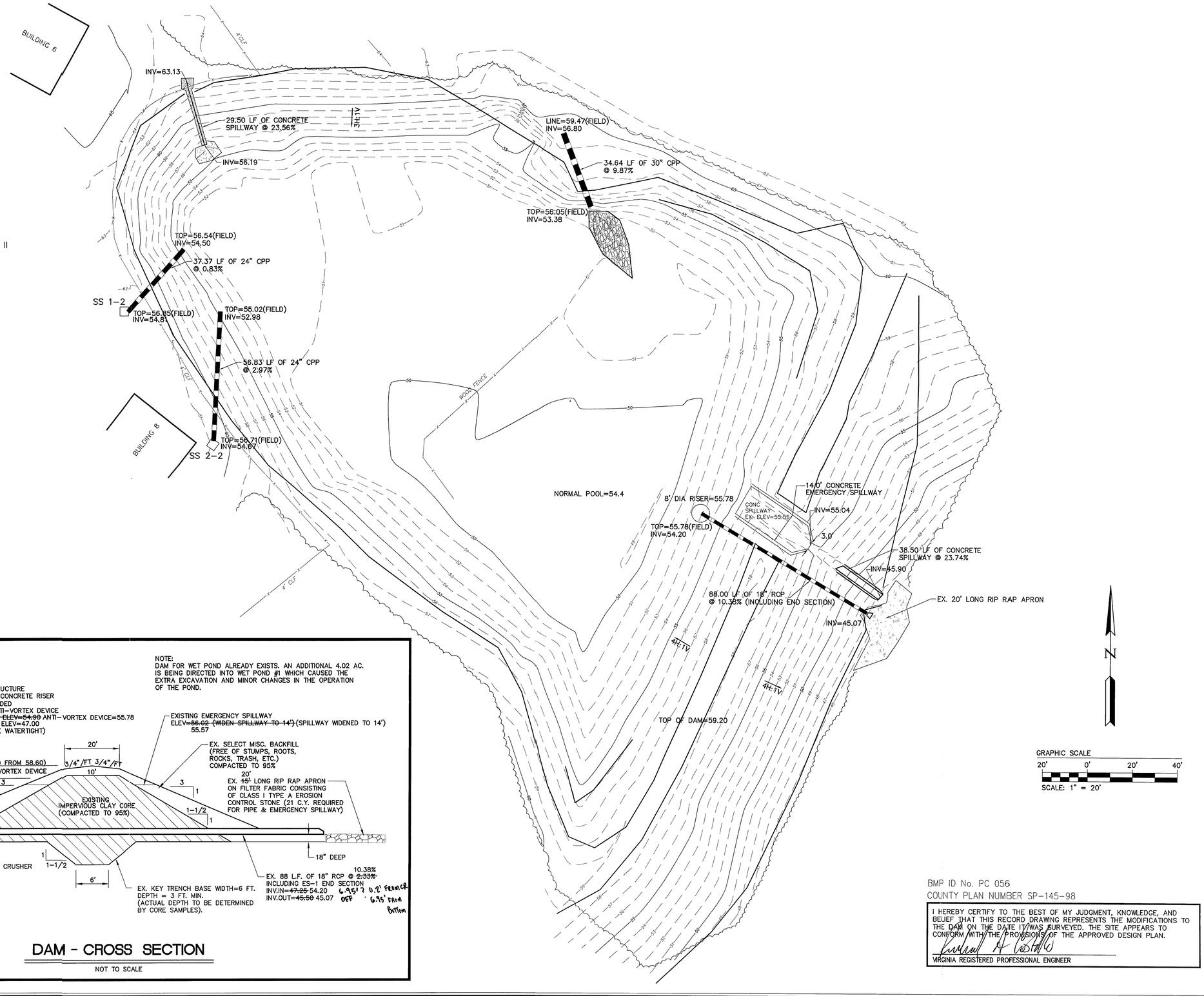
CONSULTING ENGINEERS

OVERALL STORMWATER MANAGEMENT PLAN
WILLIAMSBURG PLANTATION
PHASE I

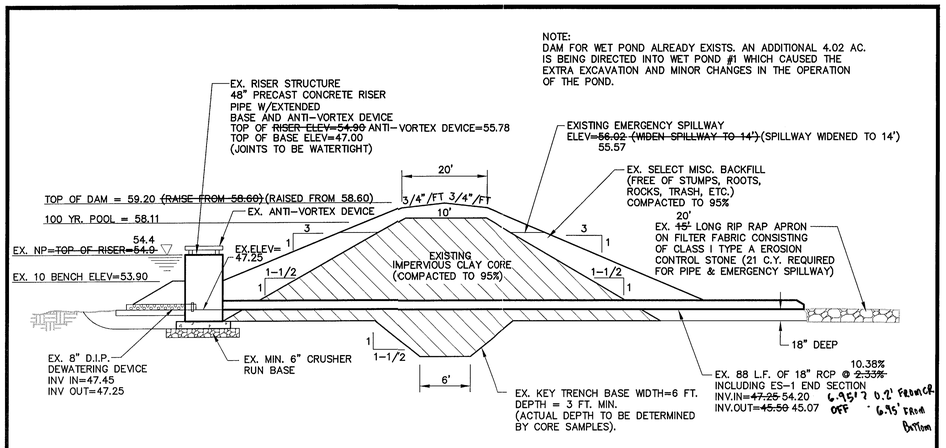
OWNER/DEVELOPER : WILLIAMSBURG PLANTATION, INC.

BERKELEY DISTRICT — JAMES CITY COUNTY — VIRGINIA

Designed	Drawn
GAM/HWP	RMJ
Scale	Date
1"=100'	SEPT., 1991
Project No.	
7555	
Drawing No.	
1 of 1	



NOTE:
DAM FOR WET POND ALREADY EXISTS. AN ADDITIONAL 4.02 AC. IS BEING DIRECTED INTO WET POND #1 WHICH CAUSED THE EXTRA EXCAVATION AND MINOR CHANGES IN THE OPERATION OF THE POND.



DAM - CROSS SECTION

NOT TO SCALE

BMP ID No. PC 056
COUNTY PLAN NUMBER SP-145-98

I HEREBY CERTIFY TO THE BEST OF MY JUDGMENT, KNOWLEDGE, AND BELIEF THAT THIS RECORD DRAWING REPRESENTS THE MODIFICATIONS TO THE DAM ON THE DATE IT WAS SURVEYED. THE SITE APPEARS TO CONFORM WITH THE PROVISIONS OF THE APPROVED DESIGN PLAN.

VIRGINIA REGISTERED PROFESSIONAL ENGINEER

SITE REVIEW SET

No.	DATE	REVISION / COMMENT / NOTE	BY
2	7/20/01	REVISED PER JCC COMMENTS	HWP
1	11/28/00	RECORD DRAWING	HWP

COMMONWEALTH OF VIRGINIA
CERTIFIED PROFESSIONAL ENGINEER
RICHARD A. CASTILLO
CERTIFICATE NO. 013250
7/20/01

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

POND PLAN OF
REGENCY AT LONGHILL II
OWNER/DEVELOPER: PHIL RICHARDSON
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

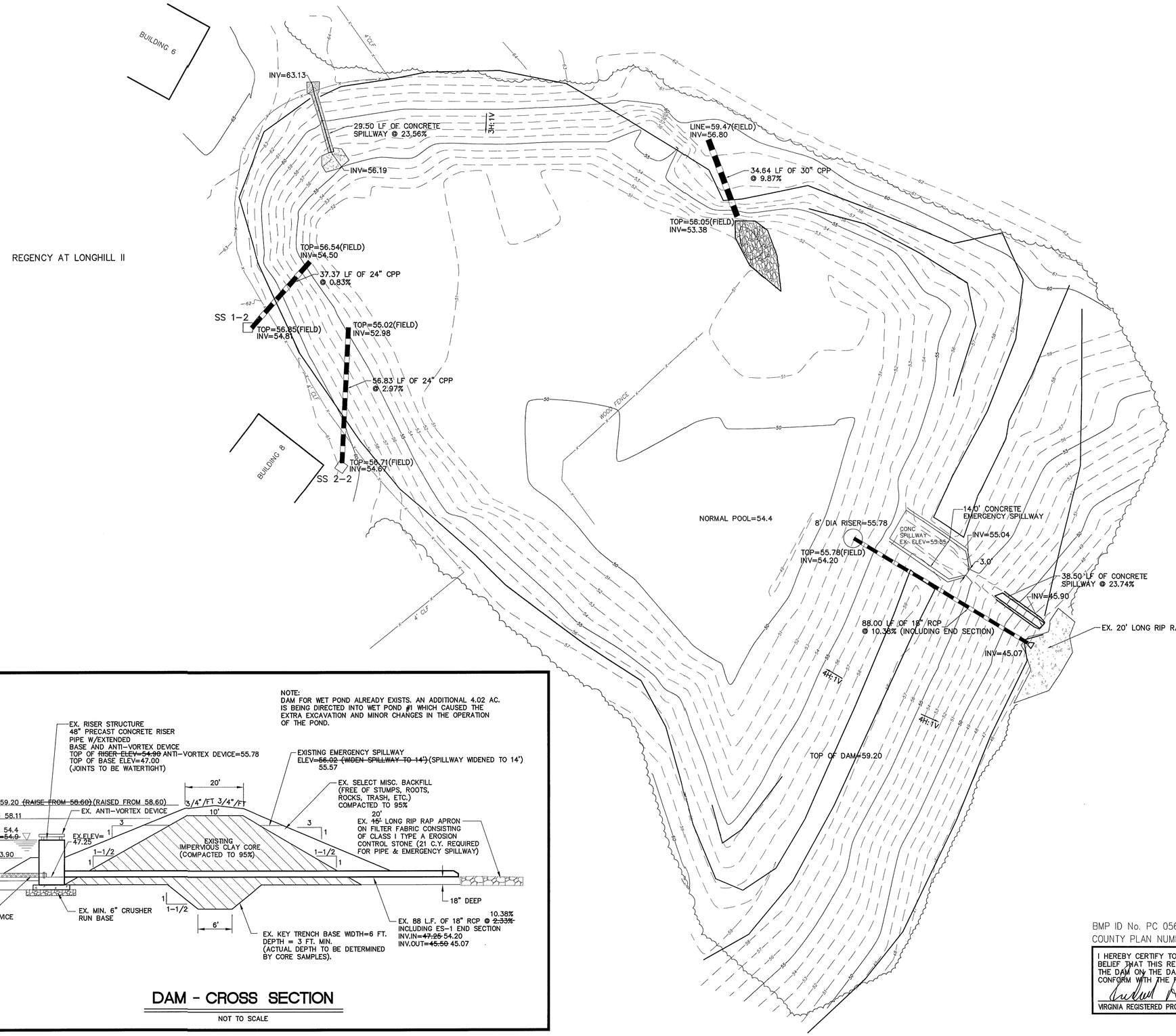
Designed	Drawn
HWP	EAW
Scale	Date
1"=20'	6/25/97

Project No. 8170-2
Drawing No. 1 OF 1

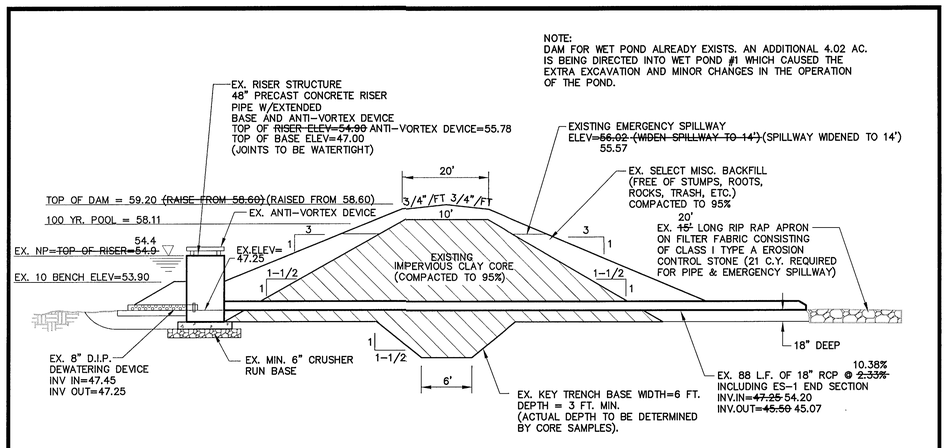
PC 056; SP-145-97

RECORD DRAWING-11/28/00

8170dpPOND.dwg 11-28-00-14:01 HBK



NOTE:
DAM FOR WET POND ALREADY EXISTS. AN ADDITIONAL 4.02 AC. IS BEING DIRECTED INTO WET POND #1 WHICH CAUSED THE EXTRA EXCAVATION AND MINOR CHANGES IN THE OPERATION OF THE POND.



DAM - CROSS SECTION

NOT TO SCALE

BMP ID No. PC 056
COUNTY PLAN NUMBER SP-145-98

I HEREBY CERTIFY TO THE BEST OF MY JUDGMENT, KNOWLEDGE, AND BELIEF THAT THIS RECORD DRAWING REPRESENTS THE MODIFICATIONS TO THE DAM ON THE DATE IT WAS SURVEYED. THE SITE APPEARS TO CONFORM WITH THE PROVISIONS OF THE APPROVED DESIGN PLAN.

VIRGINIA REGISTERED PROFESSIONAL ENGINEER

No.	DATE	REVISION / COMMENT / NOTE	BY
2	7/20/01	REVISED PER JCC COMMENTS	HWP
1	11/28/00	RECORD DRAWING	HWP

COMMONWEALTH OF VIRGINIA
RICHARD A. COSTELLO
CERTIFICATE NO. 013250
CERTIFIED PROFESSIONAL ENGINEER
7/20/01

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

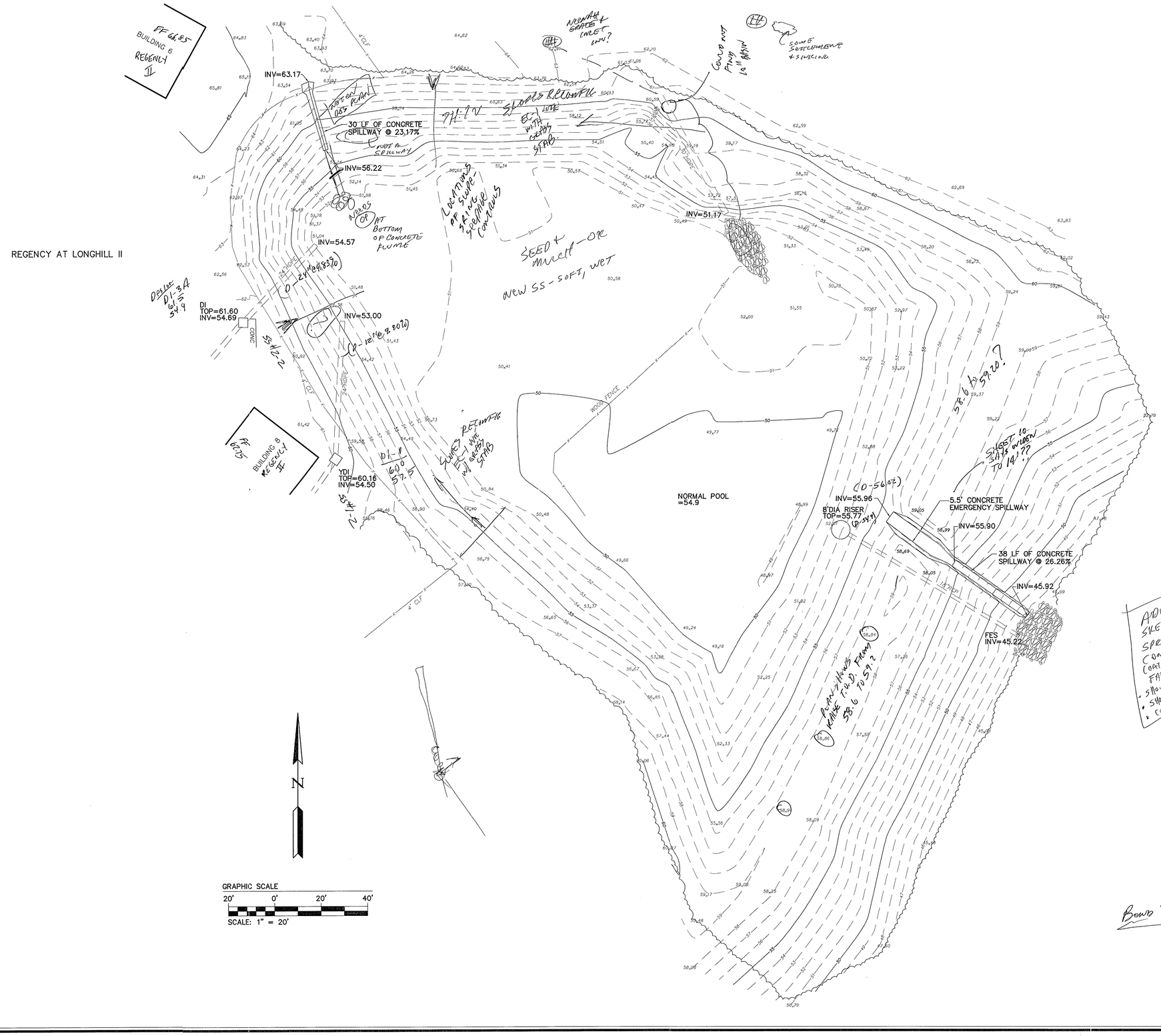
POND PLAN OF
REGENCY AT LONGHILL II
OWNER/DEVELOPER: PHIL RICHARDSON
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
HWP	EAW
Scale	Date
1"=20'	6/25/97

Project No. 8170-2
Drawing No. 1 OF 1

RECORD DRAWING-11/28/00

11.28.00-14:01 8170abPOND.dwg
HBK



ADD SKETCH DETAIL SPRING SEEPAGE CONTROLS (CONFRO 9/15/00) FABRIC + #1 STONE
• SHOW APPROX LOCATION
• SHOW DETAIL
• CONST CERT. BY P.E.

STAMP & SEAL FOR AS-BUILT STATUS 11-28-00

SHOW DAM Y-SECT FROM SHEET 10 OF 13

CONST CERT FOR SEEPAGE SLOPE SEEPAGE CONTROLS (DCS MODIF)

Bond $29,000

PC 056
SP-145-98
AMENDED SP-76-97

PC 056
SHARED WITH WBG. PLANT.

SIT REVIEW SET - FIELD INSPECTION

No.	DATE	REVISION / COMMENT / NOTE	BY
1	11/28/00	RECORD DRAWING	HWP

SP-76-97
AMEND SP-145-98

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

POND PLAN OF
REGENCY AT LONGHILL II
OWNER/DEVELOPER: PHIL RICHARDSON
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
HWP	EAW
Scale	Date
1"=20'	6/25/97
Project No.	
8170-2	
Drawing No.	
1 OF 1	

RECORD DRAWING-11/28/00

HBK 11/28/00-14:01 B170bPOND.dwg

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

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

LETTER OF TRANSMITTAL

DATE	JOB NO.
10/9/01	8170-2

ATTENTION: Scott Thomas

RE:

OCT 2001
RECEIVED
ENVIRONMENTAL DIVISION

TO JCC ENVIRONMENTAL

WE ARE SENDING YOU ☐ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
1			mylar
1			blue print

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval

☐ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution

☒ As requested ☐ Returned for corrections ☐ Return _____ corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS

COPY TO _____ SIGNED: Howard Price

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

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

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

LETTER OF TRANSMITTAL

DATE	JOB NO.
7/20/01	8170-2

ATTENTION: SCOTT THOMAS

RE: COUNTY DAM

TO: JCC
ENVIRONMENTAL DIVISION

JUL 2001
RECEIVED
ENVIRONMENTAL DIVISION

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☒ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
2		1SET.	

THESE ARE TRANSMITTED as checked below:

☒ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval

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☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS

COPY TO _____ SIGNED: _____

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

Post-it® Fax Note 7671	Date 9/18	# of pages ▸ 2
To PAT Menichino	From RICH COSTELLO	
Co./Dept.	Co.	
Phone # 259-4032	Phone # 253-0040	
Fax #	Fax #	

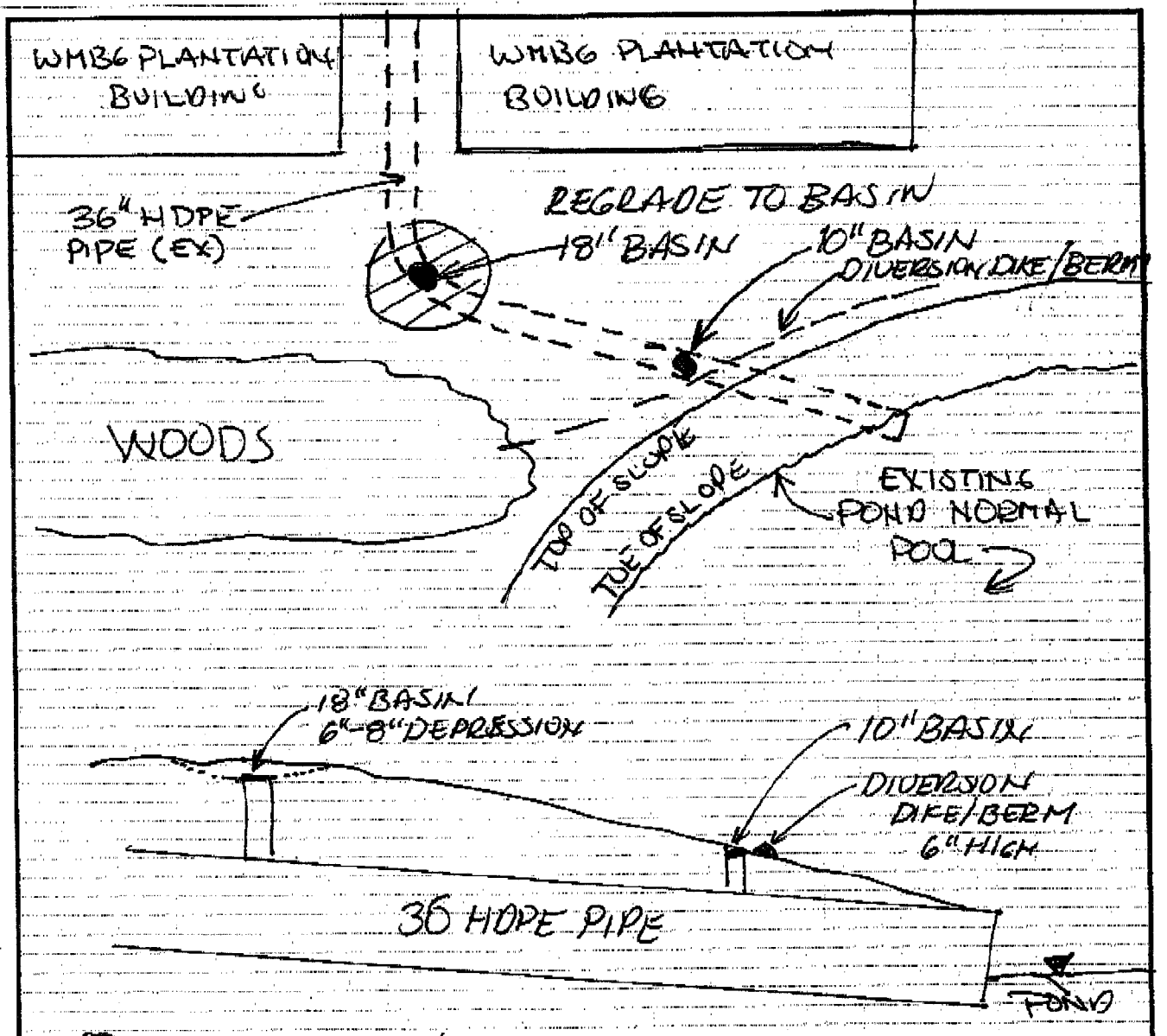
PROJECT [illegible]

PROJECT NO. 8170

SUBJECT SLOPE REPAIRS

SHEET NO. 1 OF 2

CALCULATED BY RAR DATE 9/15/00



1. INSTALL BASINS
2. REGRADE @ BASINS
3. FIX SLOPES TO POND / 3:1 MAX SLOPE
4. FIX SPRINGS IN SLOPES - SEE PAGE 2
5. JUTE MAT POND SLOPE
6. SEED ENTIRE AREA

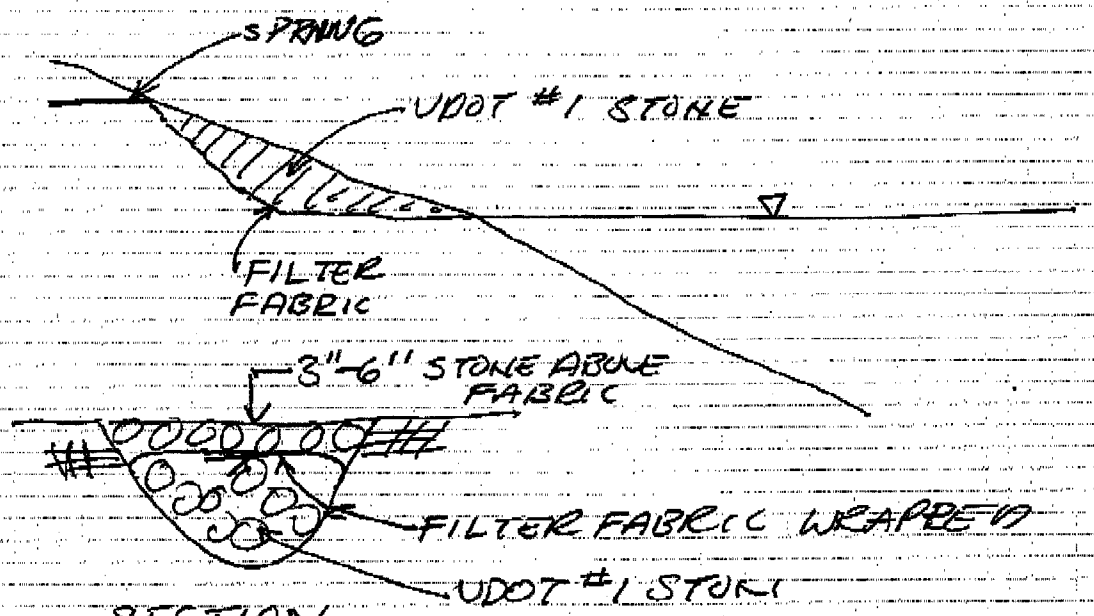
FILE

Regency @ Longhill II

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

PROJECT CHOENUT IT
PROJECT NO. 8170
SUBJECT SLOPE REPAIRS
SHEET NO. 2 OF 2
CALCULATED BY RAC DATE 9/15/00

SPRINGS IN SLOPES



SECTION
LOOKING UPSLOPE

TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET

(with or without an emergency spillway)

Project REGENCY AT LONGHILL II

Basin # 1 Location NORTHEAST CORNER OF SITE ADJACENT TO WAGG PLANTATION

Total area draining to basin: 5.60 acres.

Basin Volume Design

Wet Storage:

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

   67 cu. yds. x 5.60 acres = 375 cu. yds.

2. Available basin volume = 0 cu. yds. at elevation _____. (From storage - elevation curve)

3. Excavate 375 cu. yds. to obtain required volume*.

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

4. Available volume before cleanout required.

   33 cu. yds. x 5.60 acres = 185 cu. yds.

5. Elevation corresponding to cleanout level = 54.05.

   (From Storage - Elevation Curve)

6. Distance from invert of the dewatering orifice to cleanout level = 1.95 ft. (Min. = 1.0 ft.)

Dry Storage:

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

   67 cu. yds. x 5.60 acres = 375 cu. yds.

8. Total available basin volume at crest of riser* = 761 cu. yds. at elevation 58.00. (From Storage - Elevation Curve)

* Minimum = 134 cu. yds./acre of total drainage area.

9. Diameter of dewatering orifice = 3.50 in.

10. Diameter of flexible tubing = NONE in. (diameter of dewatering orifice plus 2 inches).

Preliminary Design Elevations

11. Crest of Riser = NONE ORIFICE @ 56.00 (SAME AS EM SPILLWAY IN EX. POND)

Top of Dam = 58.00

Design High Water = _____

Upstream Toe of Dam = _____

Basin Shape

12. Length of Flow / Effective Width — $\frac{L}{We}$ = _____

If > 2, baffles are not required _____

If < 2, baffles are required _____

Runoff

13. Q_2 = _____ cfs (From Chapter 5)

14. Q_{25} = _____ cfs (From Chapter 5)

Principal Spillway Design

15. With emergency spillway, required spillway capacity $Q_p = Q_2$ = _____ cfs. (riser and barrel)

Without emergency spillway, required spillway capacity $Q_p = Q_{25}$ = _____ cfs. (riser and barrel)

HYDROLOGIC REPORT FOR

WILLIAMSBURG PLANTATION

REVISED WET POND #1

FOR REGENCY @ LONGHILL II

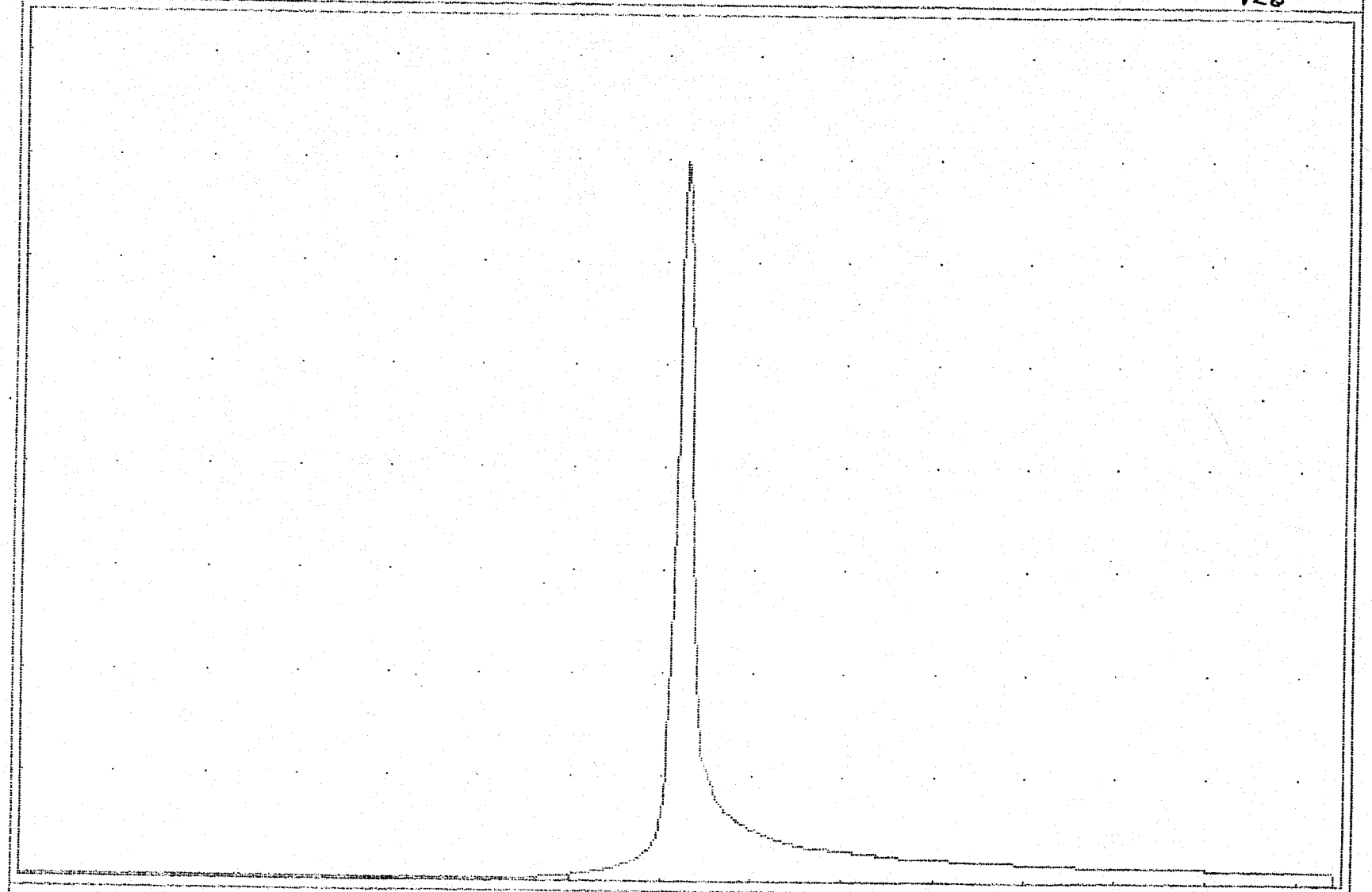
JOB NO. 8170-1

prepared by:

AES CONSULTING ENGINEERS
5248 OLDE TOWNE RD.,SUITE 1
WILLIAMSBURG, VA. 23188

REVISED DATE: 11/13/97

PC5



HGU = 100 min 9 VGU = 10.0 cfs

VOL = (cuft/acft) = 195999 / 4.500

HYDROLOGIC REPORT

2 YR POST-DEV.....
.....
.....

Hyd. No. 5

Hydrograph type	= S.C.S. RUNOFF	Peak discharge	= 82.35 cfs
Storm frequency	= 2 yr	Time interval	= 5 min
Basin area	= 27.97 ac	Basin curve No.	= 84
Ave. basin slope	= 0 %	Hydraulic len	= 1000 ft
Basin lag	= 7.5 min	Time of concen	= 12.50 min
Total precip.	= 3.80 in	Distribution	= S.C.S. II

HYDROGRAPH DISCHARGE TABLE

TIME (hrs	OUTFLOW cfs)	TIME (hrs	OUTFLOW cfs)	TIME (hrs	OUTFLOW cfs)	TIME (hrs	OUTFLOW cfs)
10.00	0.54	10.17	1.01	10.25	1.10	10.33	1.20
10.08	0.60	10.50	1.40	10.58	1.52	10.42	1.25
10.17	0.80	10.50	1.99	10.92	1.77	11.00	1.37
10.25	1.01	11.07	2.70	11.14	2.41	11.22	2.47
10.33	1.19	11.50	4.60	11.38	3.32	11.47	3.47
10.42	1.37	11.92	7.70	11.65	5.02	11.75	6.21
10.50	1.52	12.33	12.55	11.92	9.47	12.08	12.18
10.58	1.67	12.75	19.54	12.25	16.10	12.33	18.23
10.67	1.80	13.17	26.88	12.58	22.88	12.67	25.02
10.75	1.92	13.58	32.88	12.92	29.58	13.00	31.58
10.83	2.04	14.00	37.58	13.25	35.88	13.33	36.88
10.92	2.15	14.42	40.88	13.58	41.58	13.67	40.88
11.00	2.25	14.83	43.58	13.92	45.88	14.00	43.58
11.08	2.35	15.25	45.88	14.25	48.58	14.33	45.88
11.17	2.45	15.67	47.58	14.58	50.88	14.67	47.58
11.25	2.55	16.08	48.88	14.92	52.58	15.00	48.88
11.33	2.65	16.50	49.58	15.25	53.88	15.33	49.58
11.42	2.75	16.92	49.88	15.58	54.58	15.67	49.88
11.50	2.85	17.33	49.58	15.92	54.88	16.00	49.58
11.58	2.95	17.75	48.88	16.25	54.58	16.33	48.88
11.67	3.05	18.17	47.58	16.58	53.88	16.67	47.58
11.75	3.15	18.58	45.88	16.92	52.58	17.00	45.88
11.83	3.25	19.00	43.58	17.25	50.88	17.33	43.58
11.92	3.35	19.42	40.88	17.58	48.58	17.67	40.88
12.00	3.45	19.83	37.58	17.92	45.88	18.00	37.58
12.08	3.55	20.25	33.88	18.25	42.58	18.33	33.88
12.17	3.65	20.67	29.58	18.58	38.88	18.67	29.58
12.25	3.75	21.08	24.88	18.92	34.58	19.00	24.88
12.33	3.85	21.50	20.58	19.25	29.88	19.33	20.58
12.42	3.95	21.92	16.88	19.58	25.58	19.67	16.88
12.50	4.05	22.33	13.58	19.92	21.88	20.00	13.58
12.58	4.15	22.75	10.88	20.25	18.58	20.33	10.88
12.67	4.25	23.17	8.58	20.58	15.88	20.67	8.58
12.75	4.35	23.58	6.88	20.92	13.58	21.00	6.88
12.83	4.45	24.00	5.58	21.25	11.88	21.33	5.58
12.92	4.55	24.42	4.88	21.58	10.58	21.67	4.88
13.00	4.65	24.83	4.58	21.92	9.88	22.00	4.58
13.08	4.75	25.25	4.88	22.25	9.58	22.33	4.88
13.17	4.85	25.67	5.58	22.58	9.88	22.67	5.58
13.25	4.95	26.08	6.88	22.92	10.58	23.00	6.88
13.33	5.05	26.50	8.58	23.25	11.88	23.33	8.58
13.42	5.15	26.92	10.88	23.58	13.58	23.67	10.88
13.50	5.25	27.33	13.58	23.92	15.88	24.00	13.58
13.58	5.35	27.75	16.88	24.25	18.58	24.33	16.88
13.67	5.45	28.17	19.58	24.58	21.88	24.67	19.58
13.75	5.55	28.58	22.88	24.92	24.58	25.00	22.88
13.83	5.65	29.00	25.58	25.25	27.88	25.33	25.58
13.92	5.75	29.42	27.88	25.58	30.58	25.67	27.88
14.00	5.85	29.83	29.58	25.92	32.88	26.00	29.58
14.08	5.95	30.25	30.88	26.25	34.58	26.33	30.88
14.17	6.05	30.67	31.58	26.58	35.88	26.67	31.58
14.25	6.15	31.08	31.88	26.92	36.58	27.00	31.88
14.33	6.25	31.50	31.58	27.25	36.88	27.33	31.58
14.42	6.35	31.92	30.88	27.58	36.58	27.67	30.88
14.50	6.45	32.33	29.58	27.92	35.88	28.00	29.58
14.58	6.55	32.75	27.88	28.25	34.58	28.33	27.88
14.67	6.65	33.17	25.58	28.58	32.88	28.67	25.58
14.75	6.75	33.58	22.88	28.92	30.58	29.00	22.88
14.83	6.85	34.00	19.58	29.25	27.88	29.33	19.58
14.92	6.95	34.42	16.88	29.58	24.58	29.67	16.88
15.00	7.05	34.83	13.58	29.92	20.88	30.00	13.58
15.08	7.15	35.25	10.88	30.25	17.58	30.33	10.88
15.17	7.25	35.67	8.58	30.58	14.88	30.67	8.58
15.25	7.35	36.08	6.88	30.92	12.58	31.00	6.88
15.33	7.45	36.50	5.58	31.25	10.88	31.33	5.58
15.42	7.55	36.92	4.88	31.58	9.58	31.67	4.88
15.50	7.65	37.33	4.58	31.92	8.88	32.00	4.58
15.58	7.75	37.75	4.88	32.25	8.58	32.33	4.88
15.67	7.85	38.17	5.58	32.58	8.88	32.67	5.58
15.75	7.95	38.58	6.88	32.92	9.58	33.00	6.88
15.83	8.05	39.00	8.58	33.25	10.88	33.33	8.58
15.92	8.15	39.42	10.88	33.58	12.58	33.67	10.88
16.00	8.25	39.83	13.58	33.92	14.88	34.00	13.58
16.08	8.35	40.25	16.88	34.25	17.58	34.33	16.88
16.17	8.45	40.67	19.58	34.58	20.88	34.67	19.58
16.25	8.55	41.08	22.88	34.92	23.58	35.00	22.88
16.33	8.65	41.50	25.58	35.25	26.88	35.33	25.58
16.42	8.75	41.92	27.88	35.58	29.58	35.67	27.88
16.50	8.85	42.33	29.58	35.92	31.88	36.00	29.58
16.58	8.95	42.75	30.88	36.25	33.58	36.33	30.88
16.67	9.05	43.17	31.58	36.58	34.88	36.67	31.58
16.75	9.15	43.58	31.88	36.92	35.58	37.00	31.88
16.83	9.25	44.00	31.58	37.25	35.88	37.33	31.58
16.92	9.35	44.42	30.88	37.58	35.58	37.67	30.88
17.00	9.45	44.83	29.58	37.92	34.88	38.00	29.58
17.08	9.55	45.25	27.88	38.25	33.58	38.33	27.88
17.17	9.65	45.67	25.58	38.58	31.88	38.67	25.58
17.25	9.75	46.08	22.88	38.92	29.58	39.00	22.88
17.33	9.85	46.50	19.58	39.25	26.88	39.33	19.58
17.42	9.95	46.92	16.88	39.58	23.58	39.67	16.88

HYDROGRAPH DISCHARGE TABLE Cont'd

TIME (hrs	OUTFLOW cfs)	TIME (hrs	OUTFLOW cfs)	TIME (hrs	OUTFLOW cfs)	TIME (hrs	OUTFLOW cfs)
19.75	1.[illegible]	19.83	1.[illegible]	19.92	1.[illegible]	20.00	1.27
19.83	1.[illegible]	19.92	1.[illegible]	20.00	1.[illegible]	20.08	1.[illegible]
19.92	1.[illegible]	20.00	1.[illegible]	20.08	1.[illegible]	20.17	1.[illegible]
20.00	1.[illegible]	20.08	1.[illegible]	20.17	1.[illegible]	20.25	1.[illegible]
20.08	1.[illegible]	20.17	1.[illegible]	20.25	1.[illegible]	20.33	1.[illegible]
20.17	1.[illegible]	20.25	1.[illegible]	20.33	1.[illegible]	20.42	1.[illegible]
20.25	1.[illegible]	20.33	1.[illegible]	20.42	1.[illegible]	20.50	1.[illegible]
20.33	1.[illegible]	20.42	1.[illegible]	20.50	1.[illegible]	20.58	1.[illegible]
20.42	1.[illegible]	20.50	1.[illegible]	20.58	1.[illegible]	20.67	1.[illegible]
20.50	1.[illegible]	20.58	1.[illegible]	20.67	1.[illegible]	20.75	1.[illegible]
20.58	1.[illegible]	20.67	1.[illegible]	20.75	1.[illegible]	20.83	1.[illegible]
20.67	1.[illegible]	20.75	1.[illegible]	20.83	1.[illegible]	20.92	1.[illegible]
20.75	1.[illegible]	20.83	1.[illegible]	20.92	1.[illegible]	21.00	1.[illegible]
20.83	1.[illegible]	20.92	1.[illegible]	21.00	1.[illegible]	21.08	1.[illegible]
20.92	1.[illegible]	21.00	1.[illegible]	21.08	1.[illegible]	21.17	1.[illegible]
21.00	1.[illegible]	21.08	1.[illegible]	21.17	1.[illegible]	21.25	1.[illegible]
21.08	1.[illegible]	21.17	1.[illegible]	21.25	1.[illegible]	21.33	1.[illegible]
21.17	1.[illegible]	21.25	1.[illegible]	21.33	1.[illegible]	21.42	1.[illegible]
21.25	1.[illegible]	21.33	1.[illegible]	21.42	1.[illegible]	21.50	1.[illegible]
21.33	1.[illegible]	21.42	1.[illegible]	21.50	1.[illegible]	21.58	1.[illegible]
21.42	1.[illegible]	21.50	1.[illegible]	21.58	1.[illegible]	21.67	1.[illegible]
21.50	1.[illegible]	21.58	1.[illegible]	21.67	1.[illegible]	21.75	1.[illegible]
21.58	1.[illegible]	21.67	1.[illegible]	21.75	1.[illegible]	21.83	1.[illegible]
21.67	1.[illegible]	21.75	1.[illegible]	21.83	1.[illegible]	21.92	1.[illegible]
21.75	1.[illegible]	21.83	1.[illegible]	21.92	1.[illegible]	22.00	1.[illegible]
21.83	1.[illegible]	21.92	1.[illegible]	22.00	1.[illegible]	22.08	1.[illegible]
21.92	1.[illegible]	22.00	1.[illegible]	22.08	1.[illegible]	22.17	1.[illegible]
22.00	1.[illegible]	22.08	1.[illegible]	22.17	1.[illegible]	22.25	1.[illegible]

HYDROLOGICAL REPORT

2 YR THRU POND.....
.....
.....
HYD. No. 6

Hydrograph type = RESERVOIR ROUTE
Storm frequency = 2 yr
Inflow hyd. no. = 5

Peak discharge = 27.76 cfs
Time interval = 5 min
Reservoir no. = 1

TIME hrs	INFLOW (i) cfs	INFLOW (j) cfs	2S/dt-O (i) cfs	2S/dt+O (j) cfs	OUTFLOW cfs
8.17	0.10	0.12	0.66	0.66	0.[illegible]
8.25	0.12	0.12	0.80	0.82	0.[illegible]
8.33	0.13	0.13	1.15	1.18	0.[illegible]
8.42	0.12	0.12	1.45	1.47	0.[illegible]
8.50	0.12	0.12	1.75	1.78	0.[illegible]
8.58	0.12	0.12	2.05	2.08	0.[illegible]
8.67	0.12	0.12	2.35	2.38	0.[illegible]
8.75	0.12	0.12	2.65	2.68	0.[illegible]
8.83	0.31	0.32	3.00	3.17	0.[illegible]

[DY] to continue [Esc] to cancel

HYDROGRAPH DISCHARGE TABLE Cont'd

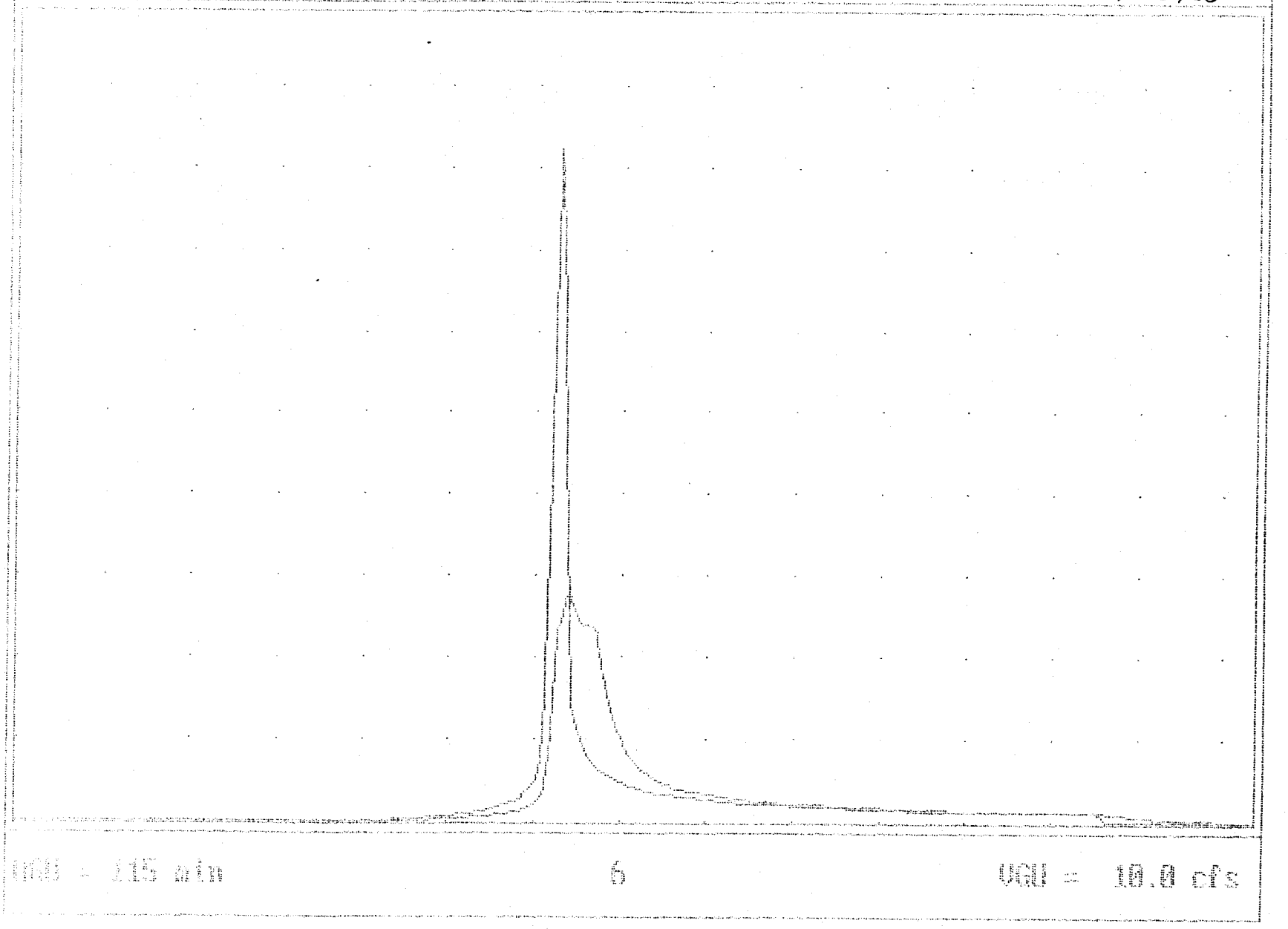
TIME hrs	INFLOW (i) cfs	INFLOW (j) cfs	2S/dt-O (i) cfs	2S/dt+O (j) cfs	OUTFLOW cfs
26.25	0.00	0.00	7.72	8.[illegible]	0.[illegible]
26.33	0.00	0.00	7.[illegible]	7.[illegible]	0.[illegible]
26.42	0.00	0.00	6.[illegible]	7.[illegible]	0.[illegible]
26.50	0.00	0.00	6.66	6.97	0.[illegible]
26.58	0.00	0.00	6.[illegible]	6.[illegible]	0.[illegible]
26.67	0.00	0.00	6.[illegible]	6.[illegible]	0.[illegible]
26.75	0.00	0.00	6.[illegible]	6.[illegible]	0.[illegible]
26.83	0.00	0.00	5.[illegible]	5.[illegible]	0.[illegible]
26.92	0.00	0.00	5.[illegible]	5.[illegible]	0.[illegible]
27.00	0.00	0.00	4.[illegible]	4.[illegible]	0.[illegible]
27.08	0.00	0.00	4.[illegible]	4.[illegible]	0.[illegible]

Maximum outflow (cfs) = 27.76
Maximum storage (cu. ft) = 77,[illegible]
Maximum elevation (ft) = 62.21

[DY] to continue [Esc] to can

WP = 27.8 RESERVOIR ROUTE 2 Yr

KOUTGO



WGB = 115 min VGB = 10.0 cfs

MAX STORAGE = 73041

MAX ELEVATION = 56.21

HYDROLOGIC REPORT

10 YR POST-DEV.....
.....
.....

Hyd. No. 1

Hydrograph type	= S.C.S. RUNOFF	Peak discharge	= 164.17 cfs
Storm frequency	= 10 yr	Time interval	= 5 min
Basin area	= 37.97 ac	Basin curve No.	= 84
Ave basin slope	= 5 %	Hydraulic len	= 1000 ft
Basin lag	= 7.5 min	Time of concen	= 12.20 min
Total precip.	= 5.70 in	Distribution	= S.C.S. II

HYDROGRAPH DISCHARGE TABLE

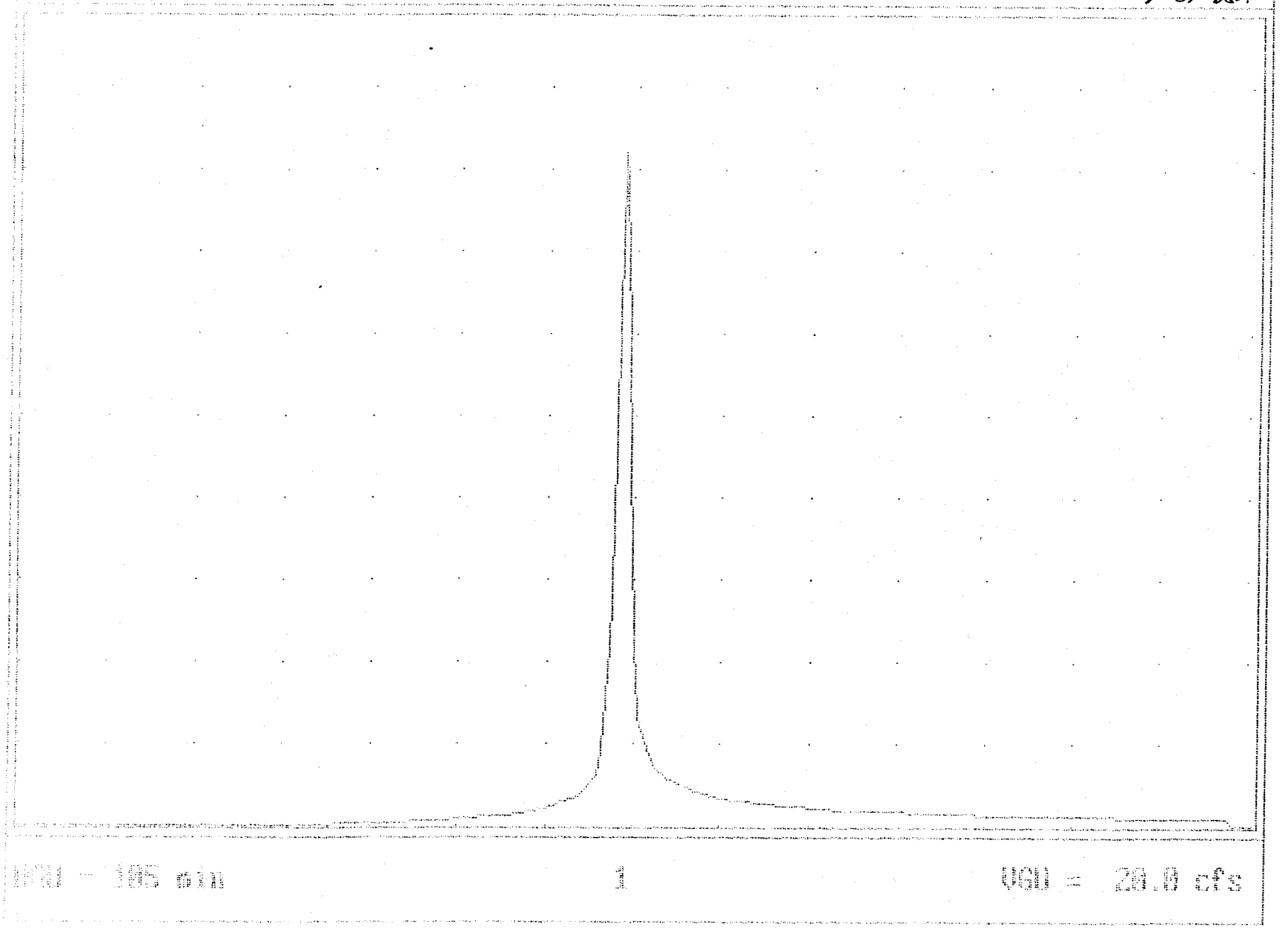
TIME (hrs	OUTFLOW cfs)	TIME (hrs	OUTFLOW cfs)	TIME (hrs	OUTFLOW cfs)	TIME (hrs	OUTFLOW cfs)
8.08	1.00	8.17	1.05	8.25	1.11	8.33	1.18
8.42	1.06	8.50	1.34	8.58	1.42	8.67	1.50
8.75	1.26	8.83	1.68	8.92	1.77	9.00	1.87
9.08	1.76	9.17	2.04	9.25	2.10	9.33	2.17
9.42	2.20	9.50	2.24	9.58	2.30	9.67	2.37
9.75	2.50	9.83	2.64	9.92	2.80	10.00	2.96
10.08	3.13	10.17	3.31	10.25	3.49	10.33	3.68
10.42	3.88	10.50	4.25	10.58	4.44	10.67	4.63
10.75	4.83	10.83	5.03	10.92	5.23	11.00	5.43
11.08	5.63	11.17	5.83	11.25	6.03	11.33	6.23
11.42	6.43	11.50	6.63	11.58	6.83	11.67	7.03
11.75	7.23	11.83	7.43	11.92	7.63	12.00	7.83
12.08	8.03	12.17	8.23	12.25	8.43	12.33	8.63
12.42	8.83	12.50	9.03	12.58	9.23	12.67	9.43
12.75	9.63	12.83	9.83	12.92	10.03	13.00	10.23
13.08	10.43	13.17	10.63	13.25	10.83	13.33	11.03
13.42	11.23	13.50	11.43	13.58	11.63	13.67	11.83
13.75	12.03	13.83	12.23	13.92	12.43	14.00	12.63
14.08	12.83	14.17	13.03	14.25	13.23	14.33	13.43
14.42	13.63	14.50	13.83	14.58	14.03	14.67	14.23
14.75	14.43	14.83	14.63	14.92	14.83	15.00	15.03
15.08	15.23	15.17	15.43	15.25	15.63	15.33	15.83
15.42	16.03	15.50	16.23	15.58	16.43	15.67	16.63
15.75	16.83	15.83	17.03	15.92	17.23	16.00	17.43
16.08	17.63	16.17	17.83	16.25	18.03	16.33	18.23
16.42	18.43	16.50	18.63	16.58	18.83	16.67	19.03
16.75	19.23	16.83	19.43	16.92	19.63	17.00	19.83
17.08	20.03	17.17	20.23	17.25	20.43	17.33	20.63
17.42	20.83	17.50	21.03	17.58	21.23	17.67	21.43

HYDROGRAPH DISCHARGE TABLE Cont'd

TIME (hrs	OUTFLOW cfs)	TIME (hrs	OUTFLOW cfs)	TIME (hrs	OUTFLOW cfs)	TIME (hrs	OUTFLOW cfs)
17.75	4.20	17.85	4.17	17.95	4.15	18.05	4.10
18.05	4.08	18.15	4.05	18.25	4.02	18.35	3.99
18.35	3.96	18.45	3.93	18.55	3.90	18.65	3.88
18.65	3.85	18.75	3.82	18.85	3.79	18.95	3.76
18.95	3.74	19.05	3.71	19.15	3.68	19.25	3.65
19.25	3.63	19.35	3.60	19.45	3.57	19.55	3.54
19.55	3.51	19.65	3.48	19.75	3.45	19.85	3.42
19.85	3.39	19.95	3.36	20.05	3.33	20.15	3.30
20.15	3.27	20.25	3.24	20.35	3.21	20.45	3.18
20.45	3.15	20.55	3.12	20.65	3.09	20.75	3.06
20.75	3.03	20.85	3.00	20.95	2.97	21.05	2.94
21.05	2.91	21.15	2.88	21.25	2.85	21.35	2.82
21.35	2.79	21.45	2.76	21.55	2.73	21.65	2.70
21.65	2.67	21.75	2.64	21.85	2.61	21.95	2.58
21.95	2.55	22.05	2.52	22.15	2.49	22.25	2.46
22.25	2.43	22.35	2.40	22.45	2.37	22.55	2.34
22.55	2.31	22.65	2.28	22.75	2.25	22.85	2.22
22.85	2.19	22.95	2.16	23.05	2.13	23.15	2.10
23.15	2.07	23.25	2.04	23.35	2.01	23.45	1.98
23.45	1.95	23.55	1.92	23.65	1.89	23.75	1.86
23.75	1.83	23.85	1.80	23.95	1.77	24.05	1.74
24.05	1.71	24.15	1.68	24.25	1.65	24.35	1.62
24.35	1.59	24.45	1.56	24.55	1.53	24.65	1.50

Qp = 107.2 S.C.S. RUNOFF 10 Yr

POST-DEV.



WRD = 185 min 1 VOD = 28.8 cfs

Vol. = (cuft/ac(t)) = 452767 / 10.394

HYDROLOGICAL REPORT

10 YR THRU POND.....
.....
.....
HYD. No. 2

Hydrograph type = RESERVOIR ROUTE
Storm frequency = 10 yr
Inflow hyd. no. = 1

Peak discharge = 83.57 cfs
Time interval = 5 min
Reservoir no. = 1

TIME hrs	INFLOW (i) cfs	INFLOW (j) cfs	2S/dt-O (i) cfs	2S/dt+O (j) cfs	OUTFLOW cfs
5.75	0.11	0.14	0.51	0.51	0.00
5.83	0.14	0.17	0.76	0.76	0.00
5.92	0.17	0.19	1.06	1.06	0.00
6.00	0.19	0.22	1.43	1.43	0.00
6.08	0.22	0.25	1.82	1.84	0.01
6.17	0.25	0.28	2.37	2.37	0.02
6.25	0.28	0.31	2.74	2.80	0.03
6.33	0.31	0.34	3.23	3.27	0.05
6.42	0.34	0.37	3.78	3.87	0.07

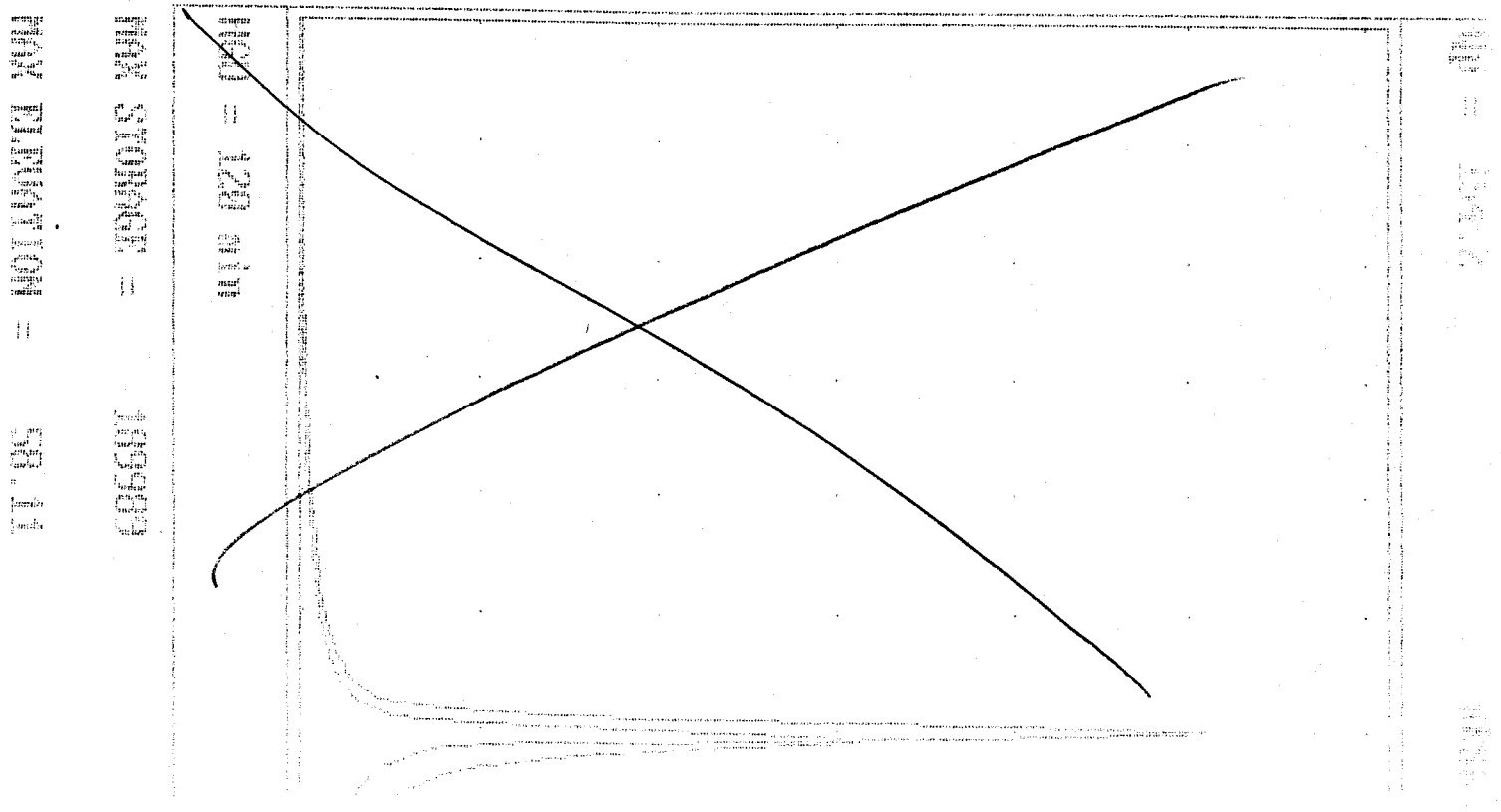
[DY] to continue [Esc] to cancel

HYDROGRAPH DISCHARGE TABLE Cont'd

TIME hrs	INFLOW (i) cfs	INFLOW (j) cfs	2S/dt-O (i) cfs	2S/dt+O (j) cfs	OUTFLOW cfs
26.50	0.00	0.00	8.97	9.47	0.25
26.58	0.00	0.00	8.40	8.97	0.28
26.67	0.00	0.00	8.07	8.40	0.16
26.75	0.00	0.00	7.66	8.07	0.20
26.83	0.00	0.00	7.33	7.66	0.16
26.92	0.00	0.00	7.00	7.33	0.16
27.00	0.00	0.00	6.68	7.00	0.16
27.08	0.00	0.00	6.36	6.68	0.16
27.17	0.00	0.00	6.05	6.36	0.16
27.25	0.00	0.00	5.75	6.05	0.15
27.33	0.00	0.00	5.46	5.75	0.14
27.42	0.00	0.00	5.18	5.46	0.14
27.50	0.00	0.00	4.92	5.18	0.13
27.58	0.00	0.00	4.79	5.00	0.10

Maximum outflow (cfs) = 83.57
Maximum storage (cu ft) = 137139
Maximum elevation (ft) = 57.25

[DY] to continue [Esc] to cancel



HYDROLOGIC REPORT

100 YR POST.....
.....
.....

Hyd. No. 3

Hydrograph type	= S.C.S. RUNOFF	Peak discharge	= 254.34 cfs
Storm frequency	= 100 yr	Time interval	= 5 min
Basin area	= 33.97 ac	Basin curve No.	= 84
Ave basin slope	= 5 %	Hydraulic len	= 1000 ft
Basin lag	= 7.5 min	Time of concen	= 12.50 min
Total precip.	= 8.10 in	Distribution	= S.C.S. II

HYDROGRAPH DISCHARGE TABLE

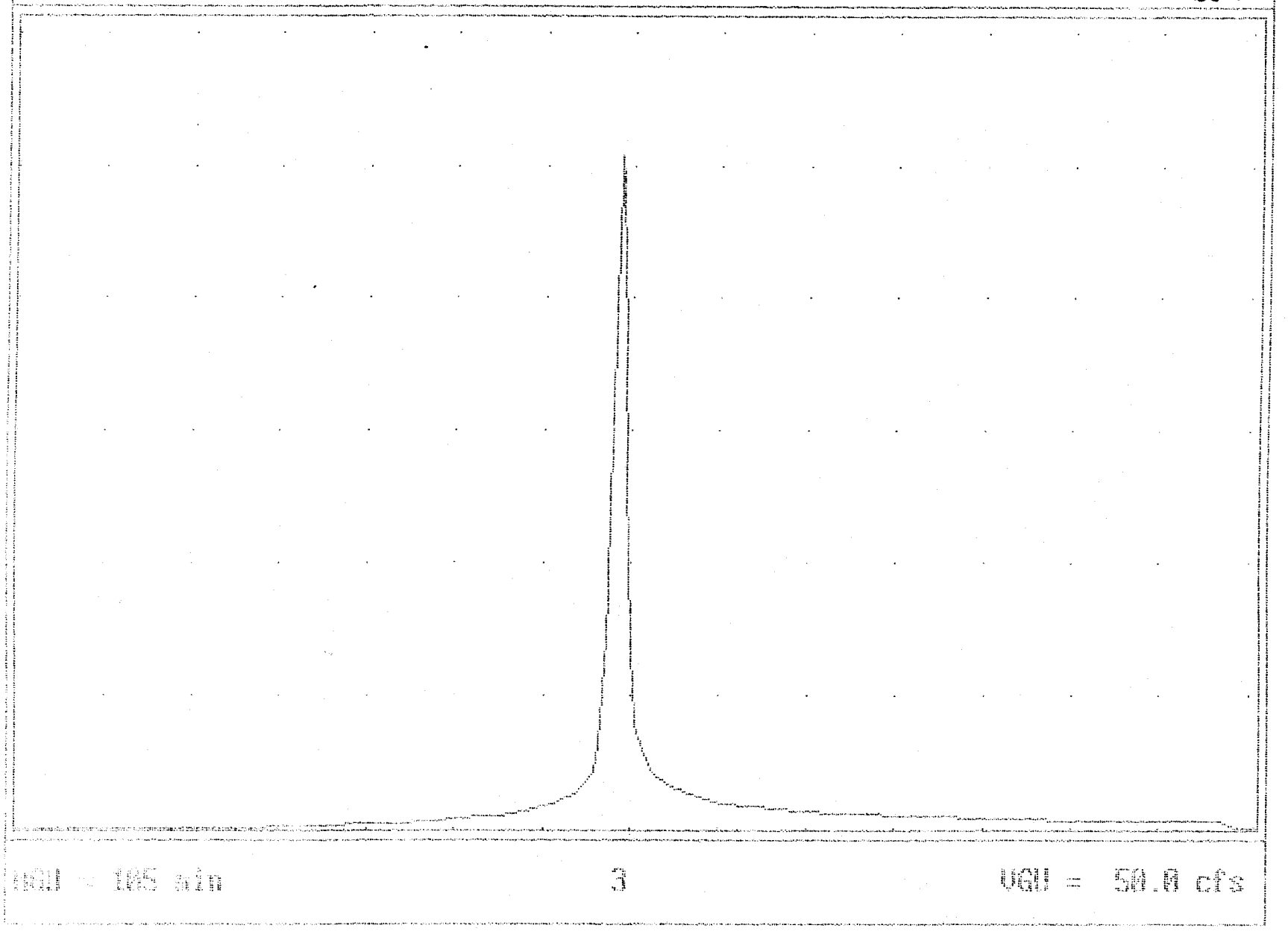
TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)	
6.08	1.04	6.17	1.09	6.25	1.14	6.33	1.19
6.42	1.24	6.50	1.29	6.58	1.35	6.67	1.40
6.75	1.46	6.83	1.51	6.92	1.56	7.00	1.61
7.08	1.67	7.17	1.72	7.25	1.78	7.33	1.83
7.42	1.89	7.50	1.94	7.58	2.00	7.67	2.06
7.75	2.11	7.83	2.17	7.92	2.23	8.00	2.28
8.08	2.33	8.17	2.44	8.25	2.55	8.33	2.68
8.42	2.82	8.50	2.97	8.58	3.11	8.67	3.27
8.75	3.42	8.83	3.58	8.92	3.74	9.00	3.91
9.08	4.07	9.17	4.20	9.25	4.29	9.33	4.36
9.42	4.42	9.50	4.48	9.58	4.56	9.67	4.70
9.75	4.90	9.83	5.14	9.92	5.41	10.00	5.63
10.08	5.96	10.17	6.28	10.25	6.68	10.33	7.04
10.42	7.45	10.50	7.87	10.58	8.32	10.67	8.85
10.75	9.47	10.83	10.15	10.92	10.85	11.00	11.58
11.08	11.97	11.17	12.63	11.25	14.32	11.33	16.24
11.42	18.25	11.50	20.04	11.58	26.11	11.67	43.75
11.75	75.15	11.83	124.57	11.92	203.19	12.00	254.34
12.08	210.05	12.17	125.81	12.25	62.70	12.33	39.66
12.42	34.10	12.50	29.58	12.58	25.33	12.67	22.17
12.75	20.19	12.83	18.72	12.92	17.58	13.00	16.63
13.08	15.84	13.17	14.98	13.25	14.29	13.33	13.70
13.42	13.13	13.50	12.57	13.58	12.02	13.67	11.52
13.75	11.07	13.83	10.66	13.92	10.28	14.00	9.84
14.08	9.47	14.17	9.17	14.25	8.95	14.33	8.60
14.42	8.66	14.50	8.81	14.58	8.57	14.67	8.33
14.75	8.09	14.83	7.95	14.92	7.81	15.00	7.67
15.08	7.82	15.17	7.38	15.25	7.24	15.33	7.10
15.42	6.78	15.50	6.81	15.58	6.67	15.67	6.53

HYDROGRAPH DISCHARGE TABLE Cont'd

TIME--OUTFLOW (hrs	cfs)	TIME--OUTFLOW (hrs	cfs)	TIME--OUTFLOW (hrs	cfs)	TIME--OUTFLOW (hrs	cfS)
15.75	6.38	15.83	6.24	15.92	6.10	16.00	5.96
16.08	5.82	16.17	5.71	16.25	5.64	16.33	5.58
16.42	5.53	16.50	5.48	16.58	5.43	16.67	5.38
16.75	5.33	16.83	5.28	16.92	5.23	17.00	5.18
17.08	5.13	17.17	5.08	17.25	5.02	17.33	4.97
17.42	4.92	17.50	4.87	17.58	4.82	17.67	4.77
17.75	4.72	17.83	4.67	17.92	4.62	18.00	4.57
18.08	4.51	18.17	4.46	18.25	4.41	18.33	4.36
18.42	4.31	18.50	4.26	18.58	4.21	18.67	4.16
18.75	4.10	18.83	4.05	18.92	4.00	19.00	3.95
19.08	3.90	19.17	3.85	19.25	3.80	19.33	3.74
19.42	3.69	19.50	3.64	19.58	3.59	19.67	3.54
19.75	3.49	19.83	3.44	19.92	3.35	20.00	3.33
20.08	3.28	20.17	3.25	20.25	3.23	20.33	3.22
20.42	3.21	20.50	3.20	20.58	3.19	20.67	3.18
20.75	3.17	20.83	3.15	20.92	3.14	21.00	3.13
21.08	3.12	21.17	3.11	21.25	3.10	21.33	3.09
21.42	3.08	21.50	3.07	21.58	3.06	21.67	3.05
21.75	3.04	21.83	3.03	21.92	3.02	22.00	3.01
22.08	3.00	22.17	2.99	22.25	2.98	22.33	2.97
22.42	2.96	22.50	2.95	22.58	2.94	22.67	2.93
22.75	2.92	22.83	2.91	22.92	2.90	23.00	2.89
23.08	2.88	23.17	2.87	23.25	2.86	23.33	2.85
23.42	2.84	23.50	2.83	23.58	2.82	23.67	2.81
23.75	2.80	23.83	2.79	23.92	2.78	24.00	2.77
24.08	2.21	24.17	1.10	24.25	0.37	24.33	0.00

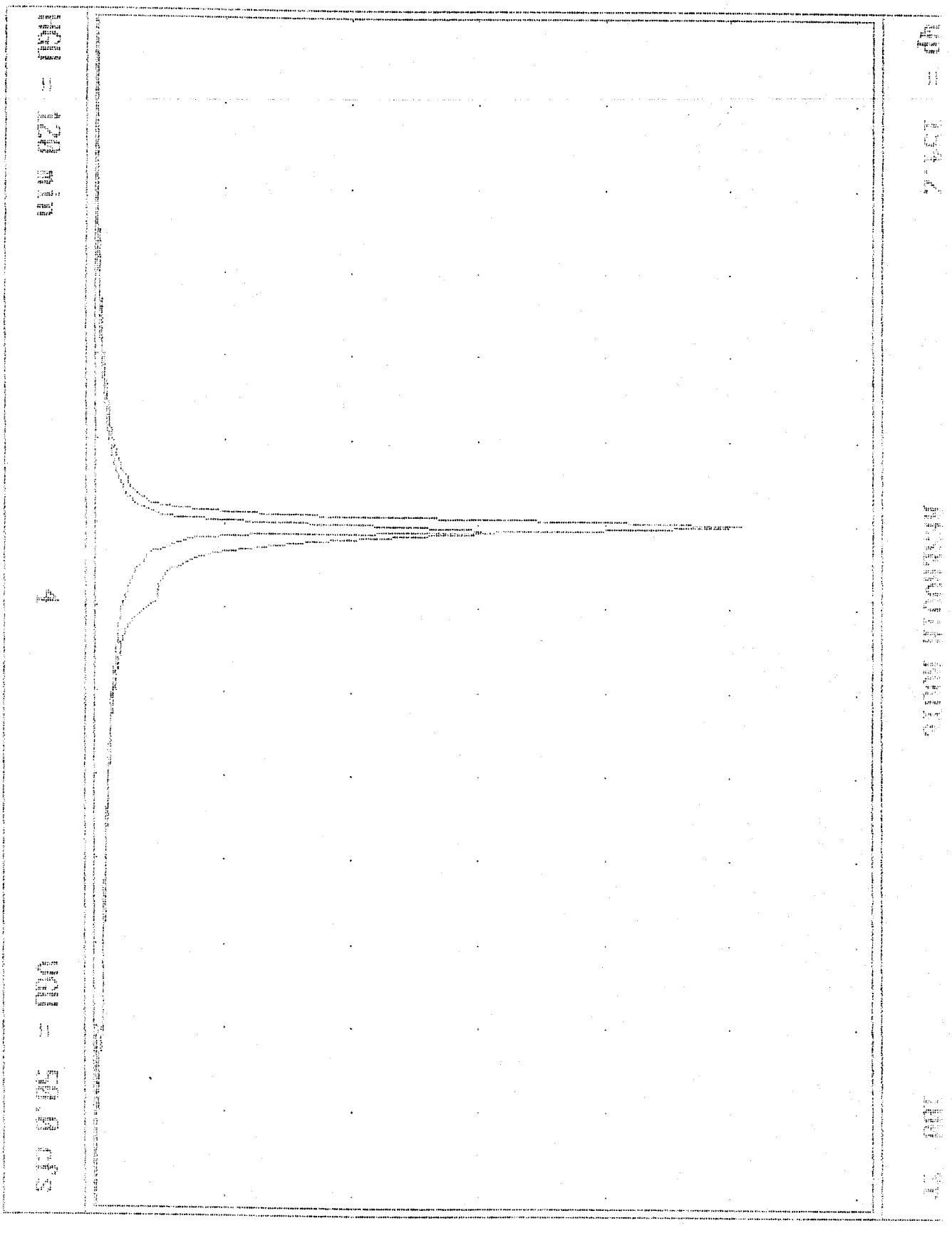
Qp = 251.3 S.C.S. RUNOFF 100 Yr

Post-Dev.



tQU = 185 min 3 VQU = 50.0 cfs

VOL = (cuft/acft) = 715738 / 16.431



HYDROLOGICAL REPORT

100 YR POST.....
THRU PONS.....
HYD. NO. 4

Hydrograph type = RESERVOIR ROUTE
Storm frequency = 100 yr
Time step, min = 3

Peak discharge = 154.23 cfs
Time interval = 7 min
Reservoir max = 1

TIME hrs	INFLOW (i) cfs	INFLOW (j) cfs	2S/dt-O (i) cfs	2S/dt+O (j) cfs	OUTFLO cfs
4.33	0.11	0.15	0.37	0.37	0.0
4.42	0.15	0.19	0.63	0.63	0.0
4.50	0.19	0.23	0.96	0.96	0.0
4.58	0.23	0.27	1.37	1.37	0.0
4.67	0.27	0.31	1.86	1.87	0.0
4.75	0.31	0.35	2.40	2.44	0.0
4.83	0.35	0.39	2.97	3.05	0.0
4.92	0.39	0.43	3.58	3.71	0.0
5.00	0.43	0.48	4.24	4.41	0.0

[DY] to continue [Esc] to cancel

HYDROGRAPH DISCHARGE TABLE Cont'd

TIME hrs	INFLOW (i) cfs	INFLOW (j) cfs	2S/dt-O (i) cfs	2S/dt+O (j) cfs	OUTFLO cfs
27.75	0.00	0.00	5.03	5.25	0.1
27.83	0.00	0.00	4.82	5.03	0.1

Maximum outflow (cfs) = 154.23
Maximum storage (cu ft) = 189987
Maximum elevation (ft) = 58.11

[DY] to continue [Esc] to ca

nce1

Option 1 STAGE / STORAGE TABLE R to res

1. RESERVOIR No = 1. 2. RESERVOIR NAME = WET POND 1..
3. S = Ks * Z^b
Ks = 0..... b = 0.....
START ELEV = 0..... INCREMENT = 0...

	STAGE ft	ELEVATION ft	CO AREA sq ft	INC STORAGE cu ft	TOT STORAGE cu ft
4	0.00	47.00.	.0000001	0	0
5	7.89	54.89.	.0000001	0	0
6	7.90	54.90.	54530...	272	272
7	9.00	56.00.	56880...	61275	61547
8	11.00	58.00.	63675...	120555	182102
9	14.00	60.00.	77420...	141095	323197
10	0.00	0.00.	0.....	0	0
11	0.00	0.00.	0.....	0	0
12	0.00	0.00.	0.....	0	0
13	0.00	0.00.	0.....	0	0
14	0.00	0.00.	0.....	0	0

Change item number: 0 DY to cc

Reservoir No. 1 OUTLET STRUCTURES

CULVERT STRUC A. Q=CoA[2gh/k]^.5

1. WIDTH (in) = 18.
2. HEIGHT (in) = 18.
3. No. BARRELS = 1.
4. INVERT ELEV. = 47.25....
5. Co = 0.60
6. CULVERT LENGTH (ft) = 98..
7. CULVERT SLOPE (%) = 2.34
8. MANNING'S N-VALUE = .013

CULVERT STRUC B. Q=CoA[2gh/k]^.5

9. WIDTH (in) = 0..
10. HEIGHT (in) = 0..
11. No. BARRELS = 0..
12. INVERT ELEV. = 0.....
13. Co = 0.60
14. CULVERT LENGTH (ft) = 0...
15. CULVERT SLOPE (%) = 0...
16. MANNING'S N-VALUE = .013
17. MULTI-STAGE OPTION ? (Y/N) N

WEIR STRUCTURE A. Q=CwLH^EXP

18. CREST LENGTH (ft) = 12.5664
19. CREST ELEVATION = 54.9...
20. Cw = 3.00
21. EXP = 1.50
22. MULTI-STAGE OPTION ? (Y/N) Y

WEIR STRUCTURE B. Q=CwLH^EXP

23. CREST LENGTH (ft) = 14.....
24. CREST ELEVATION = 52.02..
25. Cw = 3.00
26. EXP = 1.50
27. MULTI-STAGE OPTION ? (Y/N) N

Change item number: 0 DY t

Option 1 STAGE / STORAGE TABLE R to res

1. RESERVOIR No = 1. 2. RESERVOIR NAME = TEMP BASIN..
3. S = Ks * Z^b
Ks = 0..... b = 0.....
START ELEV = 0..... INCREMENT = 0...

	STAGE ft	ELEVATION ft	CO AREA sq ft	INC STORAGE cu ft	TOT STORAGE cu ft
4	0.00	50.00.	525.....	0	0
5	2.00	52.00.	1075....	1600	1600
6	4.00	54.00.	2175....	3250	4850
7	6.00	56.00.	3825....	6000	10850
8	8.00	58.00.	5575....	9700	20550
9	0.00	0.00.	0.....	0	0
10	0.00	0.00.	0.....	0	0
11	0.00	0.00.	0.....	0	0
12	0.00	0.00.	0.....	0	0
13	0.00	0.00.	0.....	0	0
14	0.00	0.00.	0.....	0	0

Change item number: 0 DY to cor

6 HR DRAW DOWN

$$\frac{9700 \text{ CU. FT}}{(6 \text{ HRS})(60 \text{ min/HR})(60 \text{ sec/min})} = 0.4491 \text{ CFS} = q_0$$

SIZE ORIFICE

$q_0 = C a \sqrt{2gh}$

$C = 0.6$
$g = 32.2 \text{ FT/SEC}^2$
$h = 2.0 \text{ FT}$

$0.4491 = 0.6a \sqrt{2(32.2)(2.0)}$

$a = 0.066 = \frac{\pi d^2}{4}$ $d = 0.2898 = \underline{3.48 \text{ INCHES}}$

USE 8" PVC WITH CAP/CONNECT 4" PERFORATED POLYETHYLENE PIPE INTO CAP WITH 3.5 INCH ORIFICE.

HYDRAULIC REPORT FOR

REGENCY @ LONGHILL II

APARTMENTS

JOB NO. 8170

STORM SYSTEM #2

prepared by:

AES CONSULTING ENGINEERS

5248 OLDE TOWNE RD,SUITE 1

WILLIAMSBURG, VA. 23188

REVISED DATE: 09/08/97

Return Period = 10 Yrs
Rainfall file: JCCN

Run Date: 09-09-1997
File: 8170-2.ST3

LINE 1 / Q = 4.13 / HT = 15 / WID = 15 / N = .013 / L = 60 / JLC = .9

SS#2-1 SS#2-2 / Outfall

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	56.02	15.00	52.00	3.36	56.20	0.00	-1.25	1.23
UPSTRM	60.90	9.75	59.75	4.89	61.27	14.31	2.75	0.84

Drainage area (ac)	=	0.74
Runoff coefficient	=	0.80
Time of conc (min)	=	5.00
Inlet time (min)	=	5.00
Intensity (in/hr)	=	6.97
Cumulative C*A	=	0.59
Q = CA * I (cfs)	=	4.13
Q catchment (cfs)	=	4.13
Q carryover (cfs)	=	0.00
Q captured (cfs)	=	0.00
Q bypassed (cfs)	=	4.13

Slope of invert (%)	=	12.9167
Slope energy grade line (%)	=	7.8962
Critical depth (in)	=	9.75
Natural ground elev. (ft)	=	63.75
Upstream surcharge (ft)	=	0.00
Additional Q (cfs)	=	0.00
Line capacity (cfs)	=	23.21
Inlet length (ft)	=	0.00
Gutter slope (ft/ft)	=	0.0000
Cross slope (ft/ft)	=	0.0000
Ponding width (ft)	=	N/A

HYDRAULIC REPORT FOR

REGENCY @ LONGHILL II

APARTMENTS

JOB NO. 8170

STORM SYSTEM #1

prepared by:

AES CONSULTING ENGINEERS

5248 OLDE TOWNE RD,SUITE 1

WILLIAMSBURG, VA. 23188

REVISED DATE: 09/08/97

Return Period = 10 Yrs
Rainfall file: JCCN

Run Date: 09-09-1997
File: 8170-1.ST3

LINE 1 / Q = 12.48 / HT = 24 / WID = 24 / N = .013 / L = 48 / JLC = 1.1

SS#1-1 SS#1-2 / Outfall

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	56.02	24.00	52.00	3.97	56.27	0.00	-2	3.14
UPSTRM	56.15	15.01	54.90	6.04	56.72	23.23	5.09	2.07

Drainage area (ac) = 0.05
Runoff coefficient = 0.70
Time of conc (min) = 22.98
Inlet time (min) = 5.00
Intensity (in/hr) = 4.06
Cumulative C*A = 3.09
Q = CA * I (cfs) = 12.48

Q catchment (cfs) = 0.24
Q carryover (cfs) = 19.17
Q captured (cfs) = 0.00
Q bypassed (cfs) = 19.41

Slope of invert (%) = 6.0417
Slope energy grade line (%) = 0.9413
Critical depth (in) = 15.01
Natural ground elev. (ft) = 62.00
Upstream surcharge (ft) = 0.00
Additional Q (cfs) = 0.00
Line capacity (cfs) = 55.59

Inlet length (ft) = 0.00
Gutter slope (ft/ft) = 0.0000
Cross slope (ft/ft) = 0.0000
Ponding width (ft) = N/A

LINE 2 / Q = 12.51 / HT = 24 / WID = 24 / N = .013 / L = 175 / JLC = 1

SS#1-2 SS#1-3 / DNLN = 1

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	56.77	22.48	54.90	4.09	57.03	23.23	5.09	3.06
UPSTRM	57.20	18.02	55.70	4.95	57.58	20.77	4.79	2.53

Drainage area (ac) = 0.09
Runoff coefficient = 0.70
Time of conc (min) = 22.33
Inlet time (min) = 5.00
Intensity (in/hr) = 4.11
Cumulative C*A = 3.04
Q = CA * I (cfs) = 12.51

Q catchment (cfs) = 0.44
Q carryover (cfs) = 18.73
Q captured (cfs) = 0.00
Q bypassed (cfs) = 19.17

Slope of invert (%) = 0.4571
Slope energy grade line (%) = 0.3129
Critical depth (in) = 15.03
Natural ground elev. (ft) = 62.50
Upstream surcharge (ft) = 0.00
Additional Q (cfs) = 0.00
Line capacity (cfs) = 15.29

Inlet length (ft) = 0.00
Gutter slope (ft/ft) = 0.0000
Cross slope (ft/ft) = 0.0000
Ponding width (ft) = N/A

LINE 3 / Q = 9.84 / HT = 24 / WID = 24 / N = .013 / L = 180 / JLC = 1.1

SS#1-3 SS#1-4 / DNLN = 2

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	57.58	22.57	55.70	3.21	57.74	23.28	4.79	3.07
UPSTRM	57.85	16.24	56.50	4.35	58.15	22.45	1.25	2.26

Drainage area (ac)	= 0.10	Slope of invert (%)	= 0.4444
Runoff coefficient	= 0.60	Slope energy grade line (%)	= 0.2256
Time of conc (min)	= 21.54	Critical depth (in)	= 13.33
Inlet time (min)	= 5.00	Natural ground elev. (ft)	= 59.75
Intensity (in/hr)	= 4.19	Upstream surcharge (ft)	= 0.00
Cumulative C*A	= 2.35	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 9.84	Line capacity (cfs)	= 15.08
Q catchment (cfs)	= 0.42	Inlet length (ft)	= 0.00
Q carryover (cfs)	= 14.19	Gutter slope (ft/ft)	= 0.0000
Q captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.0000
Q bypassed (cfs)	= 14.61	Ponding width (ft)	= N/A

LINE 4 / Q = 9.65 / HT = 24 / WID = 24 / N = .013 / L = 65 / JLC = 1.1

SS#1-4 SS#1-5 / DNLN = 3

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	58.13	20.12	56.50	3.43	58.36	21.98	1.25	2.81
UPSTRM	58.26	17.01	56.83	4.06	58.50	21.81	2.66	2.38

Drainage area (ac)	= 0.23	Slope of invert (%)	= 0.5077
Runoff coefficient	= 0.80	Slope energy grade line (%)	= 0.2198
Time of conc (min)	= 21.25	Critical depth (in)	= 13.20
Inlet time (min)	= 5.00	Natural ground elev. (ft)	= 61.50
Intensity (in/hr)	= 4.21	Upstream surcharge (ft)	= 0.00
Cumulative C*A	= 2.29	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 9.65	Line capacity (cfs)	= 16.12
Q catchment (cfs)	= 1.28	Inlet length (ft)	= 0.00
Q carryover (cfs)	= 12.91	Gutter slope (ft/ft)	= 0.0000
Q captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.0000
Q bypassed (cfs)	= 14.19	Ponding width (ft)	= N/A

LINE 5 / Q = 8.92 / HT = 18 / WID = 18 / N = .013 / L = 56 / JLC = 1.1

SS#1-5 SS#1-6 / DNLN = 4

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	58.53	18.00	56.83	5.05	58.92	0.00	3.16	1.77
UPSTRM	58.93	18.00	57.33	5.05	59.33	0.00	2.66	1.77

Drainage area (ac) = 0.60
Runoff coefficient = 0.60
Time of conc (min) = 21.06
Inlet time (min) = 10.00
Intensity (in/hr) = 4.23
Cumulative C*A = 2.11
Q = CA * I (cfs) = 8.92

Q catchment (cfs) = 2.06
Q carryover (cfs) = 10.85
Q captured (cfs) = 0.00
Q bypassed (cfs) = 12.91

Slope of invert (%) = 0.8929
Slope energy grade line (%) = 0.7210
Critical depth (in) = 13.67
Natural ground elev. (ft) = 61.50
Upstream surcharge (ft) = 0.10
Additional Q (cfs) = 0.00
Line capacity (cfs) = 9.92

Inlet length (ft) = 0.00
Gutter slope (ft/ft) = 0.0000
Cross slope (ft/ft) = 0.0000
Ponding width (ft) = N/A

LINE 6 / Q = 7.46 / HT = 15 / WID = 15 / N = .013 / L = 144 / JLC = 1.2

SS#1-6 SS#1-7 / DNLN = 5

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	59.37	15.00	57.33	6.08	59.94	0.00	2.91	1.23
UPSTRM	61.86	13.28	60.75	6.49	62.51	9.57	3.5	1.15

Drainage area (ac) = 0.42
Runoff coefficient = 0.80
Time of conc (min) = 20.68
Inlet time (min) = 5.00
Intensity (in/hr) = 4.27
Cumulative C*A = 1.75
Q = CA * I (cfs) = 7.46

Q catchment (cfs) = 2.34
Q carryover (cfs) = 8.50
Q captured (cfs) = 0.00
Q bypassed (cfs) = 10.85

Slope of invert (%) = 2.3750
Slope energy grade line (%) = 1.7848
Critical depth (in) = 13.28
Natural ground elev. (ft) = 65.50
Upstream surcharge (ft) = 0.00
Additional Q (cfs) = 0.00
Line capacity (cfs) = 9.95

Inlet length (ft) = 0.00
Gutter slope (ft/ft) = 0.0000
Cross slope (ft/ft) = 0.0000
Ponding width (ft) = N/A

LINE 7 / Q = 4.74 / HT = 15 / WID = 15 / N = .013 / L = 142 / JLC = .9

SS#1-7 SS#1-8 / DNLN = 6

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	62.64	15.00	60.75	3.86	62.87	0.00	3.5	1.23
UPSTRM	63.62	12.07	62.33	4.48	63.93	11.90	2.66	1.06

Drainage area (ac)	=	0.85
Runoff coefficient	=	0.80
Time of conc (min)	=	5.00
Inlet time (min)	=	5.00
Intensity (in/hr)	=	6.97
Cumulative C*A	=	0.68
Q = CA * I (cfs)	=	4.74
Q catchment (cfs)	=	4.74
Q carryover (cfs)	=	0.00
Q captured (cfs)	=	0.00
Q bypassed (cfs)	=	4.74

Slope of invert (%)	=	1.1127
Slope energy grade line (%)	=	0.7428
Critical depth (in)	=	10.45
Natural ground elev. (ft)	=	66.25
Upstream surcharge (ft)	=	0.04
Additional Q (cfs)	=	0.00
Line capacity (cfs)	=	6.91
Inlet length (ft)	=	0.00
Gutter slope (ft/ft)	=	0.0000
Cross slope (ft/ft)	=	0.0000
Ponding width (ft)	=	N/A

LINE 8 / Q = 2.20 / HT = 15 / WID = 15 / N = .013 / L = 115 / JLC = .9

SS#1-7 SS#1-9 / DNLN = 6

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	62.64	15.00	60.75	1.79	62.69	0.00	3.5	1.23
UPSTRM	66.40	7.12	65.60	3.83	66.63	14.98	1.25	0.57

Drainage area (ac)	=	1.27
Runoff coefficient	=	0.40
Time of conc (min)	=	20.00
Inlet time (min)	=	20.00
Intensity (in/hr)	=	4.33
Cumulative C*A	=	0.51
Q = CA * I (cfs)	=	2.20
Q catchment (cfs)	=	2.20
Q carryover (cfs)	=	0.00
Q captured (cfs)	=	0.00
Q bypassed (cfs)	=	2.20

Slope of invert (%)	=	4.2174
Slope energy grade line (%)	=	3.4223
Critical depth (in)	=	7.12
Natural ground elev. (ft)	=	68.10
Upstream surcharge (ft)	=	0.00
Additional Q (cfs)	=	0.00
Line capacity (cfs)	=	13.26
Inlet length (ft)	=	0.00
Gutter slope (ft/ft)	=	0.0000
Cross slope (ft/ft)	=	0.0000
Ponding width (ft)	=	N/A

LINE 9 / Q = 3.41 / HT = 15 / WID = 15 / N = .013 / L = 50 / JLC = .9

SS#1-3 SS#1-10 / DNLN = 2

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	57.58	15.00	55.70	2.78	57.70	0.00	5.54	1.23
UPSTRM	58.74	8.87	58.00	4.52	59.06	14.75	4.04	0.76

Drainage area (ac)	=	0.31
Runoff coefficient	=	0.80
Time of conc (min)	=	11.45
Inlet time (min)	=	5.00
Intensity (in/hr)	=	5.46
Cumulative C*A	=	0.63
Q = CA * I (cfs)	=	3.41
Q catchment (cfs)	=	1.73
Q carryover (cfs)	=	2.39
Q captured (cfs)	=	0.00
Q bypassed (cfs)	=	4.12

Slope of invert (%)	=	4.6000
Slope energy grade line (%)	=	2.7096
Critical depth (in)	=	8.87
Natural ground elev. (ft)	=	63.30
Upstream surcharge (ft)	=	0.00
Additional Q (cfs)	=	0.00
Line capacity (cfs)	=	13.85
Inlet length (ft)	=	0.00
Gutter slope (ft/ft)	=	0.0000
Cross slope (ft/ft)	=	0.0000
Ponding width (ft)	=	N/A

LINE 10 / Q = 2.10 / HT = 15 / WID = 15 / N = .013 / L = 85 / JLC = 1.1

SS#1-10 SS#1-11 / DNLN = 9

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	59.02	12.29	58.00	1.95	59.08	13.58	4.04	1.08
UPSTRM	59.12	7.47	58.50	3.43	59.31	15.00	2.75	0.61

Drainage area (ac)	=	0.23
Runoff coefficient	=	0.80
Time of conc (min)	=	10.92
Inlet time (min)	=	5.00
Intensity (in/hr)	=	5.58
Cumulative C*A	=	0.38
Q = CA * I (cfs)	=	2.10
Q catchment (cfs)	=	1.28
Q carryover (cfs)	=	1.11
Q captured (cfs)	=	0.00
Q bypassed (cfs)	=	2.39

Slope of invert (%)	=	0.5882
Slope energy grade line (%)	=	0.2615
Critical depth (in)	=	6.95
Natural ground elev. (ft)	=	62.50
Upstream surcharge (ft)	=	0.00
Additional Q (cfs)	=	0.00
Line capacity (cfs)	=	4.95
Inlet length (ft)	=	0.00
Gutter slope (ft/ft)	=	0.0000
Cross slope (ft/ft)	=	0.0000
Ponding width (ft)	=	N/A

LINE 11 / Q = 1.11 / HT = 15 / WID = 15 / N = .013 / L = 120 / JLC = .9

SS#1-11 SS#1-12 / DNLN = 10

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	59.32	9.89	58.50	1.29	59.35	12.18	2.75	0.86
UPSTRM	63.55	5.05	63.00	3.05	63.70	14.18	1.25	0.36

Drainage area (ac)	=	0.43
Runoff coefficient	=	0.45
Time of conc (min)	=	10.00
Inlet time (min)	=	10.00
Intensity (in/hr)	=	5.72
Cumulative C*A	=	0.19
Q = CA * I (cfs)	=	1.11
Q catchment (cfs)	=	1.11
Q carryover (cfs)	=	0.00
Q captured (cfs)	=	0.00
Q bypassed (cfs)	=	1.11

Slope of invert (%)	=	3.7500
Slope energy grade line (%)	=	3.6214
Critical depth (in)	=	5.05
Natural ground elev. (ft)	=	65.50
Upstream surcharge (ft)	=	0.00
Additional Q (cfs)	=	0.00
Line capacity (cfs)	=	12.50
Inlet length (ft)	=	0.00
Gutter slope (ft/ft)	=	0.0000
Cross slope (ft/ft)	=	0.0000
Ponding width (ft)	=	N/A

LINE 12 / Q = 1.56 / HT = 15 / WID = 15 / N = .013 / L = 50 / JLC = .9

SS#1-7 SS#1-13 / DNLN = 6

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	62.64	15.00	60.75	1.27	62.67	0.00	3.5	1.23
UPSTRM	62.69	15.00	61.25	1.27	62.72	0.00	2.75	1.23

Drainage area (ac)	=	0.28
Runoff coefficient	=	0.80
Time of conc (min)	=	5.00
Inlet time (min)	=	5.00
Intensity (in/hr)	=	6.97
Cumulative C*A	=	0.22
Q = CA * I (cfs)	=	1.56
Q catchment (cfs)	=	1.56
Q carryover (cfs)	=	0.00
Q captured (cfs)	=	0.00
Q bypassed (cfs)	=	1.56

Slope of invert (%)	=	1.0000
Slope energy grade line (%)	=	0.0535
Critical depth (in)	=	6.00
Natural ground elev. (ft)	=	65.25
Upstream surcharge (ft)	=	0.19
Additional Q (cfs)	=	0.00
Line capacity (cfs)	=	6.46
Inlet length (ft)	=	0.00
Gutter slope (ft/ft)	=	0.0000
Cross slope (ft/ft)	=	0.0000
Ponding width (ft)	=	N/A

TABLE 3

WORKSHEET FOR BMP POINT SYSTEM

A. STRUCTURAL BMP POINT ALLOCATION

BMP	BMP Points		Fraction of Site Served by BMP		Weighted BMP Points
DESIGN TYPE 7A	10	x	6.87 / 7.40	=	9.28
		x		=	
		x		=	
		x		=	

TOTAL WEIGHTED STRUCTURAL BMP POINTS: 9.28

B. NATURAL OPEN SPACE CREDIT

Fraction of Site		Natural Open Space Credit		Points for Natural Open Space
0.59 / 7.40 (100)	x	0.1 (0.1 per 1%)	=	~~0.82~~ 0.80

C. TOTAL WEIGHTED POINTS

9.28	+	0.80 ~~0.82~~	=	10.08 ~~10.10~~ OK
Structural BMP Points		Natural Open Space Points		TOTAL

NOTE: 0.68 AC OF THE 6.87 AC IS OFFSITE DRAINAGE WITH SAME LAND USE TYPE.

TABLE 3

WORKSHEET FOR BMP POINT SYSTEM

A. STRUCTURAL BMP POINT ALLOCATION

BMP	BMP Points		Fraction of Site Served by BMP		Weighted BMP Points
DESIGN TYPE 7A	10	x	6.87 / 7.40	=	9.28
		x		=	
		x		=	
		x		=	

TOTAL WEIGHTED STRUCTURAL BMP POINTS: 9.28

B. NATURAL OPEN SPACE CREDIT

Fraction of Site		Natural Open Space Credit		Points for Natural Open Space
0.61 / 7.40 (100)	x	0.1 (0.1 per 1%)	=	0.82

C. TOTAL WEIGHTED POINTS

9.28	+	0.82	=	10.10
Structural BMP Points		Natural Open Space Points		TOTAL

NOTE: 0.68 AC OF THE 6.87 AC IS OFFSITE DRAINING WITH SAME LAND USE TYPE.

RSS 104 @ LONGMILL II T5120-1 6/25/97
HNP

WET POND - @ NMBG LANDING

DESIGN TYPE 7A (10 AT POND)

VOL = 10 V_R D.A 1/2'/Ac V_R = 0.05 + (0.009)(35%)
= 0.365
D.A. = 33.97 Ac

= 10 (0.37) (33.97) (43,560 SF/Ac) (1/2"/Ac) (1'/12")

VOL = 225 043 CF STORAGE VOLUME

EX. POND HAS 201,675 CF STOR VOLUME

ADD 23,368 CF OF VOLUME WITH NA = 54.9

BMP CALCULATIONS

$\frac{6.72}{10.56}$ x 10 (WET POND #1) = 6.36 ATS

REGENCY @ LONGHILL II

9/10/97
HWD

SWALE BEHIND BUILDINGS 1, 3, 5

D.A. = 1.27 Ac C = 0.40

T_c = 20 min. I_2 = 3.5 in/Hr
I_{10} = 4.0 in/Hr.

Q_2 = (0.40)(3.5)(1.27) = 1.78 CFS

Q_{10} = (0.40)(4.0)(1.27) = 2.03 CFS

V_2 = 1.60 FPS D_{10} = 5.2" (SEE ATTACHED CHART)

WET POND

DESIGN TYPE 7A (10 YR POND)

VOL. = 10 V_R D.A. 1/2"/Ac V_R = 0.05 + (0.009)(35%)
= 0.365
D.A. = 33.97 Ac

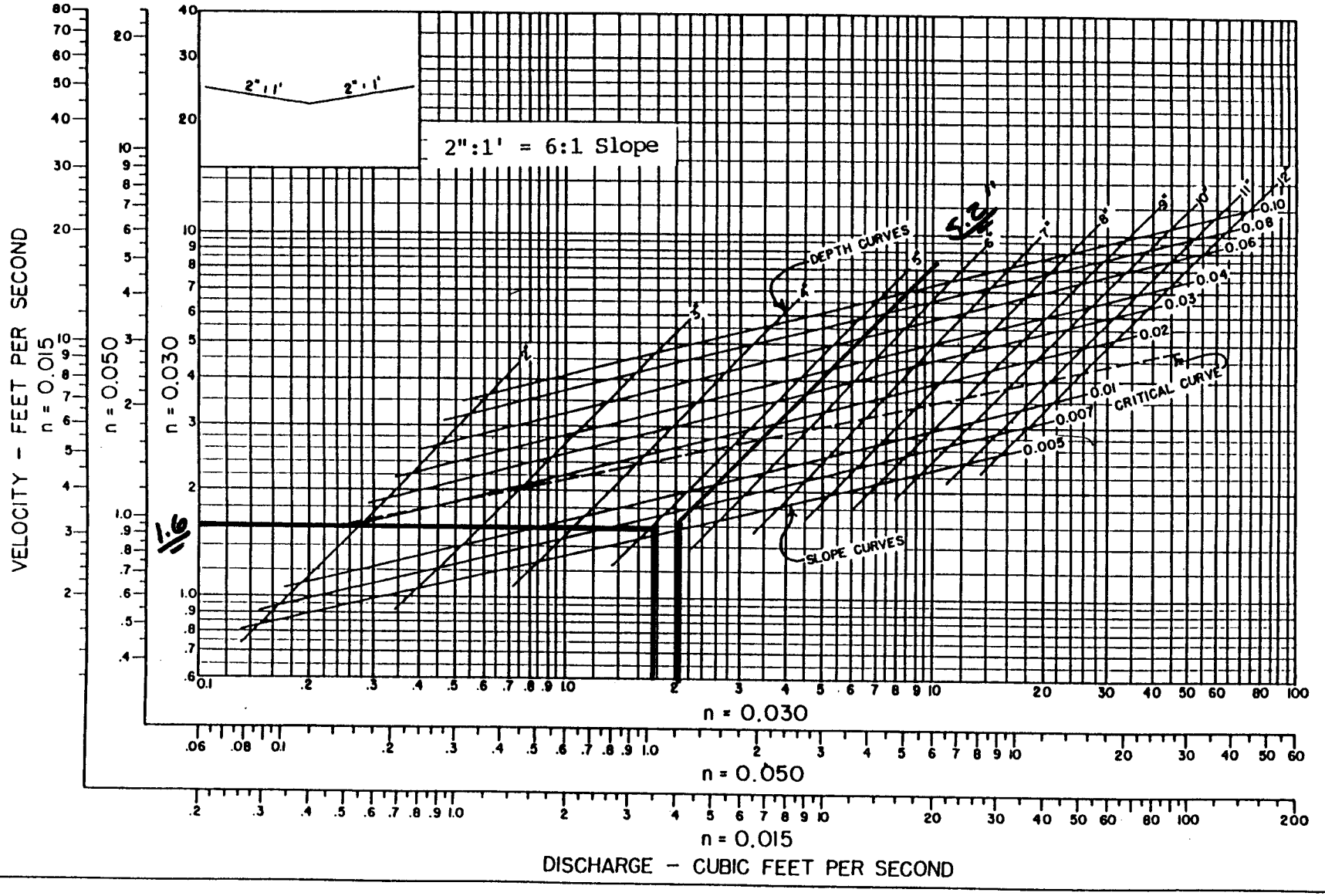
VOL. = 10 (0.365)(33.97 Ac)(43,560 SF/Ac)(1/2"/Ac)(1'/12")

= 225,043 CF STORAGE VOLUME

EXISTING POND HAS 201,675 CF

ADD 23,368 CF OF VOLUME WITH HP = 54.9.

SEE ATTACHED WORKSHEET FOR POINTS



TRIANGULAR MEDIAN DITCH

SWALE
D.A. = 1.27 AC.
SLOPE = 0.53%

FIG. 2.8.20

CONSULTING ENGINEERS

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

June 25, 1997

Mr. Doug Murrow
Director of Code Compliance
James City County
P.O. Box 8784
Williamsburg, Virginia 23187-8784

RE: Regency at Longhill II
AES Project No. 8170

Dear Mr. Murrow:

This letter is to request a waiver for the procedural 10 point system that the County requires. Our site consists of 10.56 acres, yet only 6.72 acres drain into the wet pond. By following the Counties 10 point procedure, we obtain only 6.36 points by using the 10 point wet pond, however, all of our impervious area drains to an approved BMP which meets the intent of the Chesapeake Bay Act.

If you have any questions, please advise.

Not Approved -
Plan has been revised.
DEC 10/16/97

Very truly yours,

AES Consulting Engineers

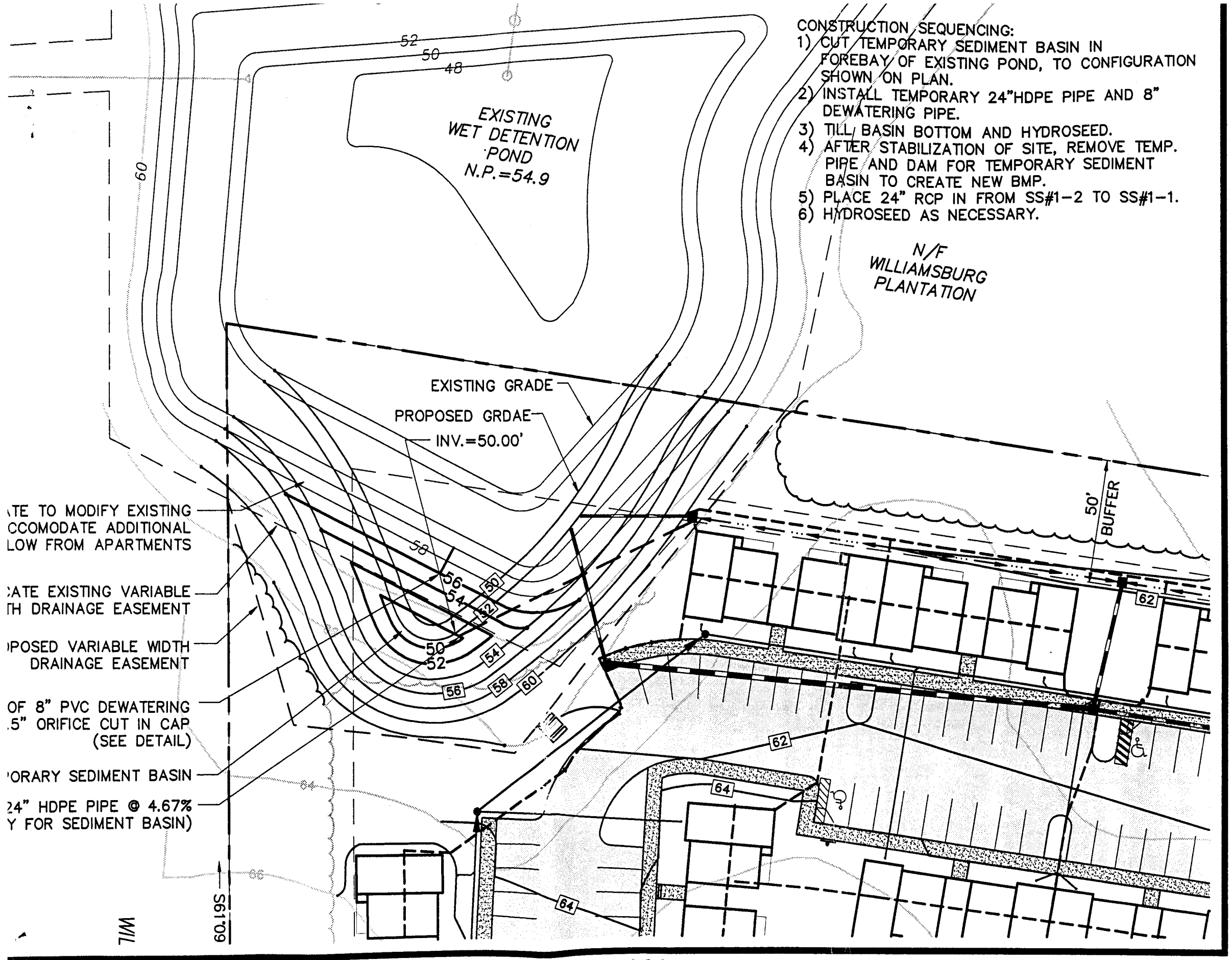
Howard W. Price
Project Engineer

8170\01\WORDPROC\DOCUMENT\81700l02.doc

Scott Thomas

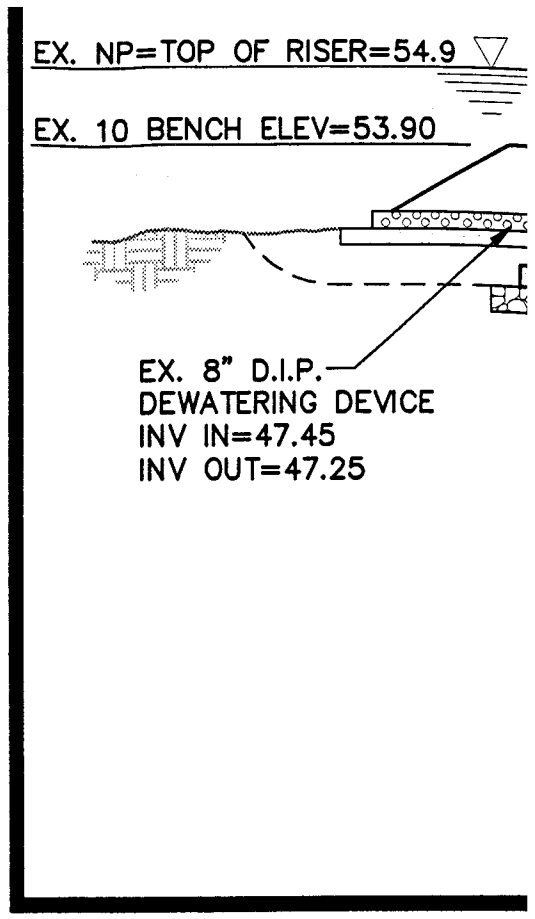
Cromwell
Ridge

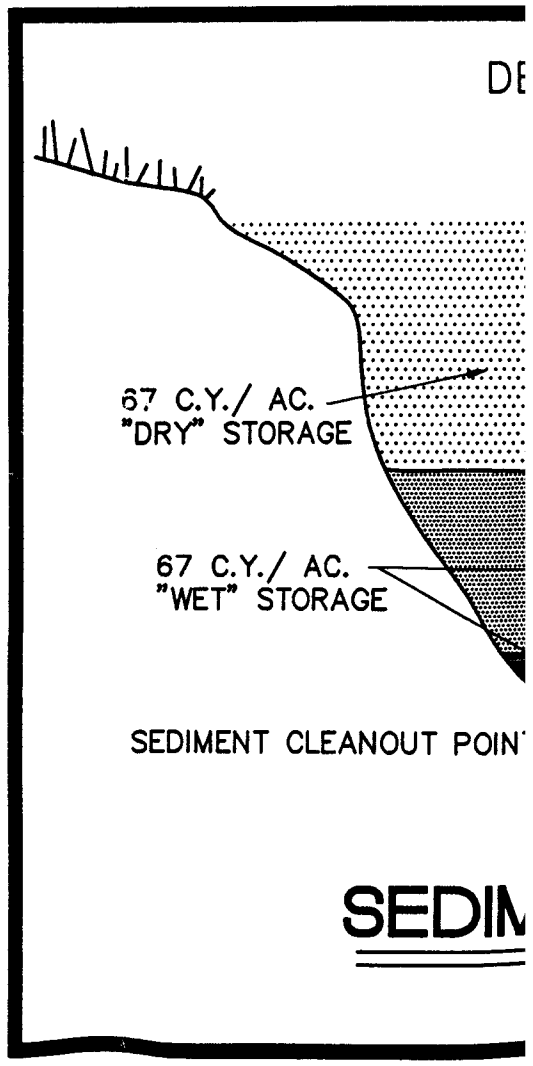
CONSTRUCTION SEQUENCING:
1) CUT TEMPORARY SEDIMENT BASIN IN FOREBAY OF EXISTING POND, TO CONFIGURATION SHOWN ON PLAN.
2) INSTALL TEMPORARY 24"HDPE PIPE AND 8" DEWATERING PIPE.
3) TILL BASIN BOTTOM AND HYDROSEED.
4) AFTER STABILIZATION OF SITE, REMOVE TEMP. PIPE AND DAM FOR TEMPORARY SEDIMENT BASIN TO CREATE NEW BMP.
5) PLACE 24" RCP IN FROM SS#1-2 TO SS#1-1.
6) HYDROSEED AS NECESSARY.



POND PLAN

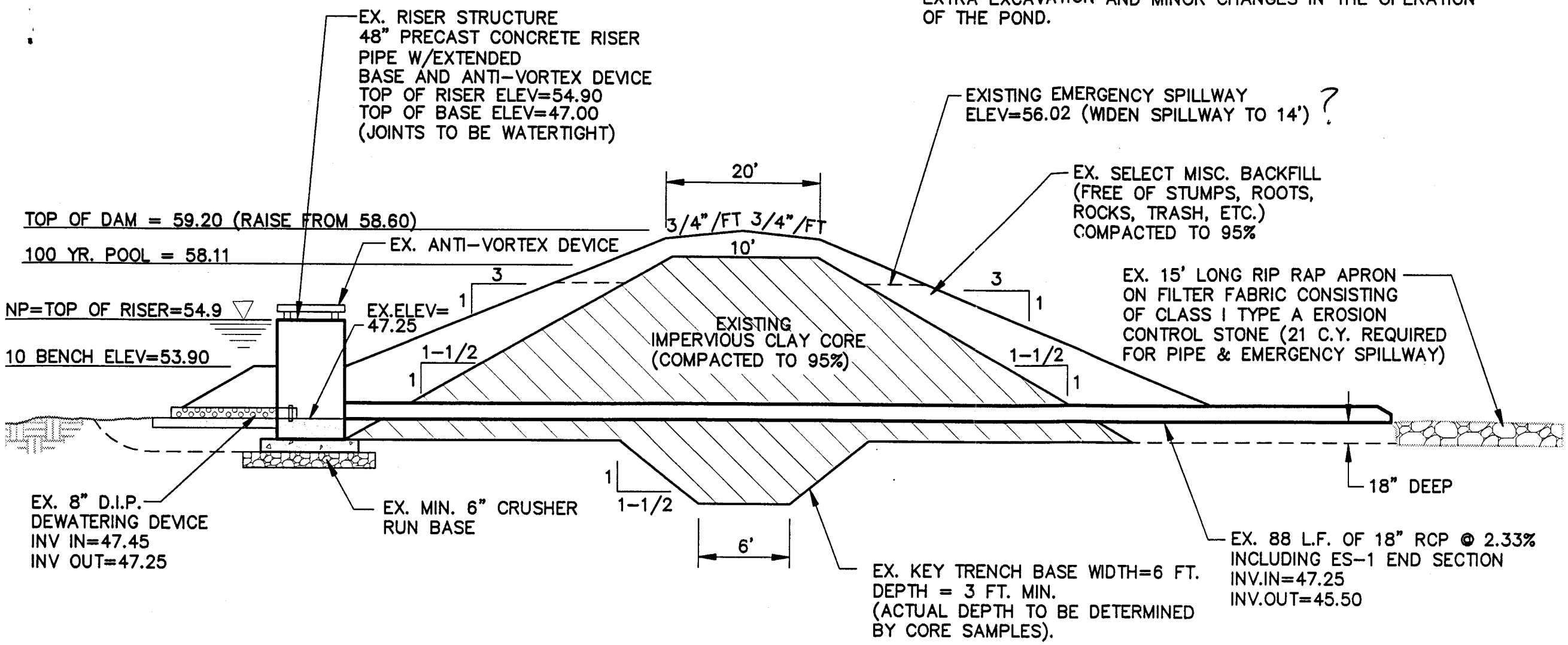
SCALE: 1"=40'





GPIN 324 01 000 264

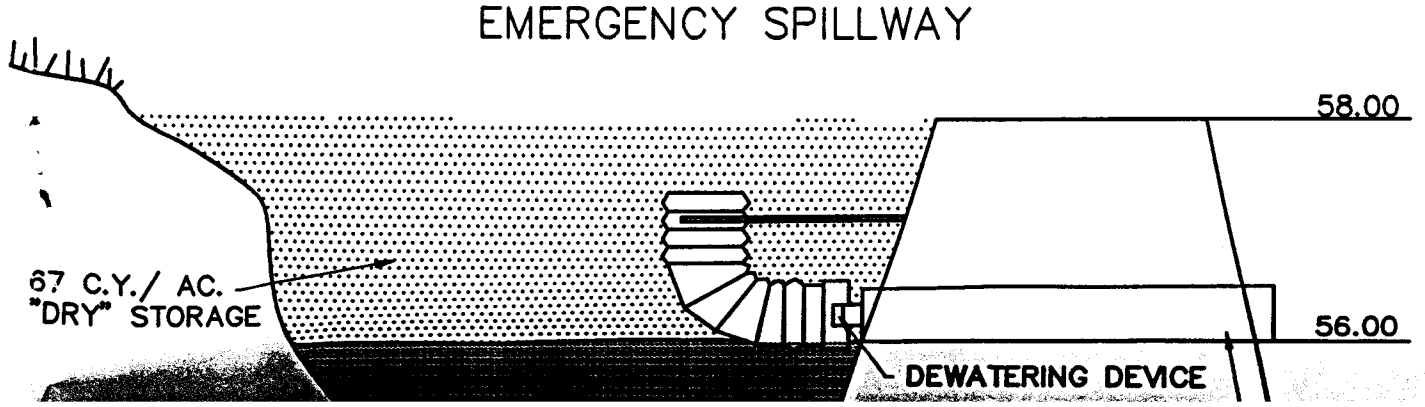
NOTE:
DAM FOR WET POND ALREADY EXISTS. AN ADDITIONAL 4.02 AC. IS BEING DIRECTED INTO WET POND #1 WHICH CAUSED THE EXTRA EXCAVATION AND MINOR CHANGES IN THE OPERATION OF THE POND.



DAM - CROSS SECTION

NOT TO SCALE

DESIGN ELEVATIONS WITHOUT EMERGENCY SPILLWAY



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