CERTIFICATE OF AUTHENTICITY

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

BMP NUMBER: **PC085**

DATE VERIFIED: **May 24, 2012**

QUALITY ASSURANCE TECHNICIAN: **Leah Hardenbergh**

Leah Hardenbergh

LOCATION: WILLIAMSBURG, VIRGINIA

Stormwater Division

MEMORANDUM

DATE: February 24, 2010

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

FROM: Jo Anna Ripley, Stormwater

PO: 270712

RE: Files Approved for Scanning

BMP ID or General File ID PC085

PIN: 3131000001A

Subdivision, Tract, Business or Owner Name (if known): Fords Colony

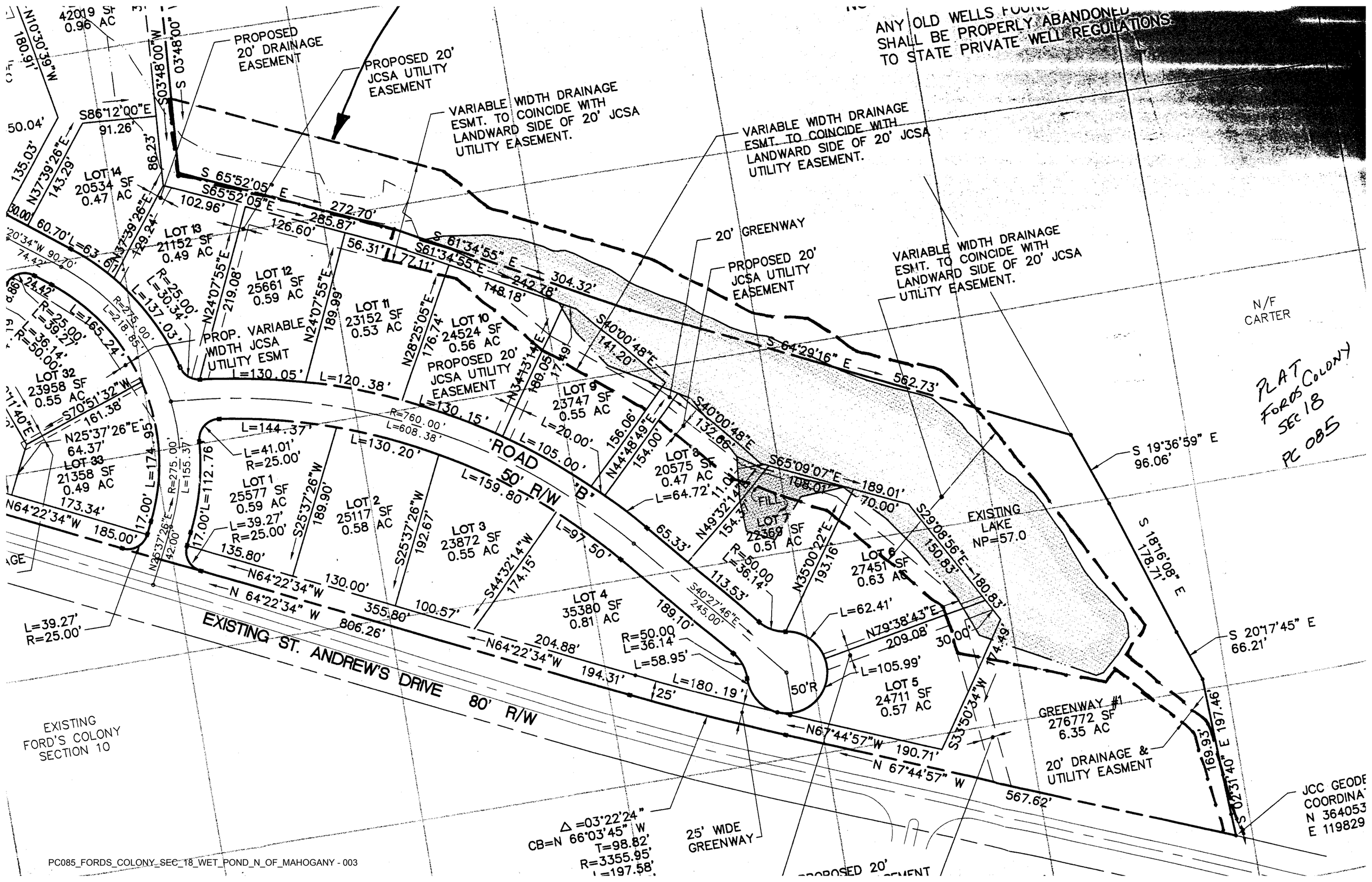
Property Description: Greenways Section 18

Site Address:

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

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

Comments:


ANY OLD WELLS FOUND SHALL BE PROPERLY ABANDONED TO STATE PRIVATE WELL REGULATIONS.
PROPOSED 20' DRAINAGE EASEMENT
PROPOSED 20' JCSA UTILITY EASEMENT
VARIABLE WIDTH DRAINAGE ESMT. TO COINCIDE WITH LANDWARD SIDE OF 20' JCSA UTILITY EASEMENT.
20' GREENWAY
N/F CARTER
PLAT FORDS COLONY SEC 18 PC 085
LOT 14 20534 SF 0.47 AC
LOT 13 21152 SF 0.49 AC
LOT 12 25661 SF 0.59 AC
LOT 11 23152 SF 0.53 AC
LOT 10 24524 SF 0.56 AC
LOT 9 23747 SF 0.55 AC
LOT 8 20575 SF 0.47 AC
LOT 7 22369 SF 0.51 AC
LOT 6 27451 SF 0.63 AC
LOT 5 24711 SF 0.57 AC
LOT 4 35380 SF 0.81 AC
LOT 3 23872 SF 0.55 AC
LOT 2 25117 SF 0.58 AC
LOT 1 25577 SF 0.59 AC
LOT 32 23958 SF 0.55 AC
LOT 33 21358 SF 0.49 AC
PROP. VARIABLE WIDTH JCSA UTILITY ESMT
'ROAD 'B' 50' R/W
EXISTING ST. ANDREW'S DRIVE 80' R/W
EXISTING FORD'S COLONY SECTION 10
EXISTING LAKE NP=57.0
GREENWAY #1 276772 SF 6.35 AC
20' DRAINAGE & UTILITY EASMENT
25' WIDE GREENWAY
JCC GEODE COORDINA N 364053 E 119829
S 19°36'59" E 96.06'
S 18°16'08" E 178.71'
S 20°17'45" E 66.21'
S 64°29'16" E 562.73'
S 65°52'05" E 272.70'
S 61°34'55" E 304.32'
N 64°22'34" W 806.26'
N 67°44'57" W 567.62'
Δ =03°22'24" CB=N 66°03'45" W T=98.82' R=3355.95' L=197.58'

PC 085 + SEC 18
STORM SYSTEM
BMP CHECK 5-32-96
(5-98-87)

FORDS COL - Sec 18

1. FC18. DAT

T_c = 45 min.

FORDS COLONY

SECTION 18

DETENTION BASIN

22" Riser with 54" Barrel

Vol Stor = 7.8 acft from elev 57-60

DA = 164.6 ac

57 - 0		
58 - 2 ac	2 ac ft	
59. -	4.9 ac ft	
60 -	7.8 ac ft	

RCN =

BLANK
ROUTE

ROUTING DATA BEGINS HERE
--- DETENTION BASIN

R 0 1

10	164.6	0.8	80	0	1000
99999	0	0	0	0	0

ROUTE

1 ROUTING DATA BEGINS HERE
2
3 --- DET. BASIN

R 0 1 1000 10 10 24

4 0 50 1

57.0 58.0 59.0 60.0

0 2 4.9 7.8

1 54 57.0 0.7 0 0 0 0 0

Result - 59.9 - max elev.

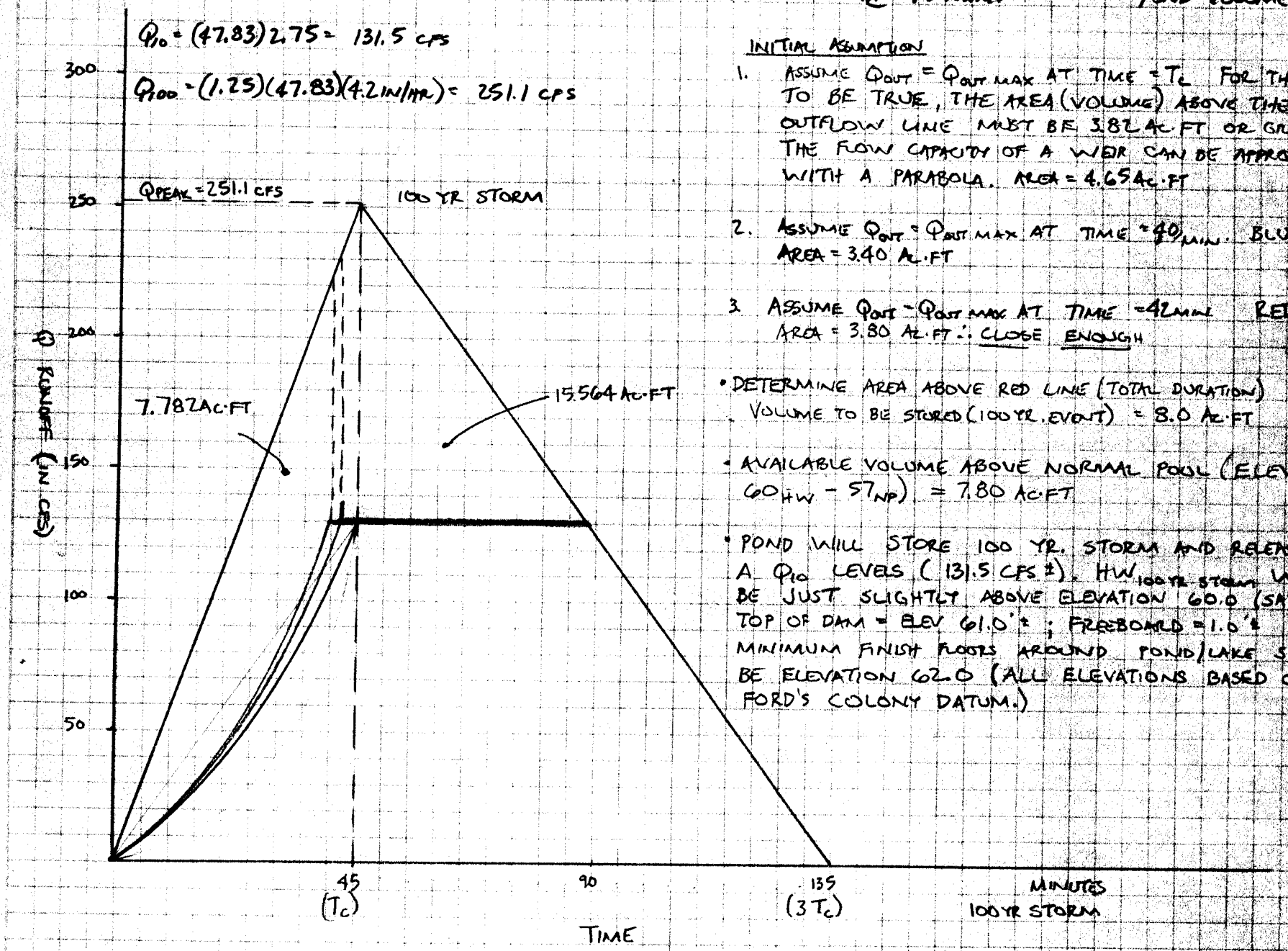
Release rate 87.2

FORD'S COLONY - SECTION 18
POND VOLUME/STORAGE CALC

$CA = 34.73 + 1.22 + 1.60 + 1.61 + 3.23 + 1.51 + 1.0 + 2.93 = 47.83$ $T_c = 45$ MIN.

$Q_{10} = (47.83)2.75 = 131.5$ CFS

$Q_{100} = (1.25)(47.83)(4.2\ IN/HR) = 251.1$ CFS



INITIAL ASSUMPTION

1. ASSUME $Q_{OUT} = Q_{OUT\ MAX}$ AT TIME $= T_c$ FOR THIS TO BE TRUE, THE AREA (VOLUME) ABOVE THE OUTFLOW LINE MUST BE 3.82 AC·FT OR GREATER. THE FLOW CAPACITY OF A WEIR CAN BE APPROXIMATED WITH A PARABOLA. AREA = 4.65 AC·FT

2. ASSUME $Q_{OUT} = Q_{OUT\ MAX}$ AT TIME = 40 MIN. BLUE AREA = 3.40 AC·FT

3. ASSUME $Q_{OUT} = Q_{OUT\ MAX}$ AT TIME = 42 MIN. RED AREA = 3.80 AC·FT ∴ CLOSE ENOUGH

- DETERMINE AREA ABOVE RED LINE (TOTAL DURATION)
  VOLUME TO BE STORED (100 YR. EVENT) = 8.0 AC·FT
- AVAILABLE VOLUME ABOVE NORMAL POOL (ELEVATION) $(60_{HW} - 57_{NP})$ = 7.80 AC·FT
- POND WILL STORE 100 YR. STORM AND RELEASE IT AT Q_{10} LEVELS (131.5 CFS ±). $HW_{100\ YR\ STORM}$ WILL BE JUST SLIGHTLY ABOVE ELEVATION 60.0 (SAY 60.1). TOP OF DAM = ELEV 61.0' ± ; FREEBOARD = 1.0' ±
  MINIMUM FINISH FLOORS AROUND POND/LAKE SHOULD BE ELEVATION 62.0 (ALL ELEVATIONS BASED ON FORD'S COLONY DATUM.)

FORDS COLONY - SECTION 18
DITCH CAPACITY

JHB 12/5/97
1/2

$A = bd + (3d)(d)$
$P = b + (2)(3.1623)(d)$
$TW = b + (2)(3)(d)$
$R = A/P$

$Q_{10} = 131.5$ CFS SLOPE = 0.625 %
$Q_2 = 95.6$ CFS

TRY b = 12', d = 1.5'

$A = (12)(1.5) + (3)(1.5)(1.5) = 24.75$ SF
$P = 12 + 2(3.1623)(1.5) = 21.49$ LF
$TW = 12 + 2(3)(1.5) = 21'$

$V = 1.486(A/P)^{2/3}(0.00625)^{1/2}(0.05)^{-1} = 2.58$ FPS
$Q = V \cdot A = (2.58)(24.75) = 63.9$ CFS

TRY b = 12', d = 1.75'

$A = (12)(1.75) + (3)(1.75)(1.75) = 30.19$ SF
$P = 12 + (2)(3.1623)(1.75) = 23.07$ LF
$TW = 12 + (2)(3)(1.75) = 22.5'$

$V = 1.486(R)^{2/3}(0.00625)^{1/2}(0.05)^{-1} = 2.81$ FPS
$Q = V \cdot A = (2.81)(30.19) = 84.87$ CFS

TRY b = 12', d = 2.0'

$A = (12)(2) + (3)(2)(2) = 36$ SF
$P = 12 + (2)(3.1623)(2) = 24.65$ LF
$TW = 12 + (2)(3)(2) = 24'$

$V = 1.486(R)^{2/3}(0.00625)^{1/2}(0.05)^{-1} = 3.02$ FPS
$Q = V \cdot A = (3.02)(36) = 108.9$ CFS

TRY b = 14', d = 1.75' > 2 YR

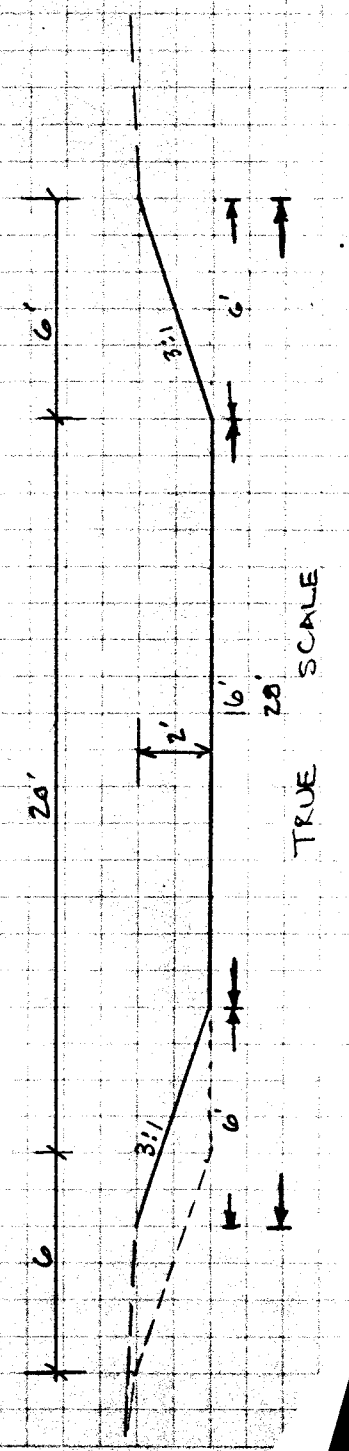
$A = (14)(1.75) + (3)(1.75)(1.75) = 33.68$ SF
$P = 14 + (2)(3.1623)(1.75) = 25.07$ LF
$TW = 14 + (2)(3)(1.75) = 24.5'$

$V = 1.486(R)^{2/3}(0.00625)^{1/2}(0.05)^{-1} = 2.86$ FPS
$Q = V \cdot A = (2.86)(33.69) = 96.39$ CFS > 95.6 (2 YR STORM)

TRY b = 14', d = 2.0' > 2 YR, ≈ 10 YR.

$A = (14)(2.0) + (3)(2)(2) = 40$ SF
$P = (14) + (2)(3.1623)(2) = 26.65$ LF
$TW = 14 + (2)(3)(2) = 26'$

$V = 1.486(R)^{2/3}(0.00625)^{1/2}(0.05)^{-1} = 3.08$ FPS
$Q = V \cdot A = (3.08)(40) = 123.2$ CFS



OVER

TRY $b = 20'$, $d = 1.5'$ > 2-YEAR

$A = (20)(1.5) + (3)(1.5)(1.5) = 36.75\ SF$

$P = 20 + (2)(3.1623)(1.5) = 29.49\ LF$

$TW = 20 + (2)(3)(1.5) = 29'$

$V = 1.486(R)^{2/3}(0.00625)^{1/2}(0.05)^{-1} = 2.72\ FPS$

$Q = V \cdot A = (36.75)(2.72) = 100.0\ CFS > 95.6$ (2 YR STORM)

TRY $b = 20'$ $d = 1.75'$

$A = (20)(1.75) + (3)(1.75)(1.75) = 44.19\ SF$

$P = 20 + (2)(3.1623)(1.75) = 31.07\ LF$

$TW = 20 + (2)(3)(1.75) = 30.5'$

$V = 1.486(R)^{2/3}(0.00625)^{1/2}(0.05)^{-1} = 2.97\ FPS$

$Q = V \cdot A = (2.97)(44.19) = 131.3\ CFS \approx 10$ YR STORM

PROVIDE TRAPEZOIDAL-SHAPED GRASS-LINED DITCH, 20' BOTTOM WIDTH, 3:1 SIDE SLOPES, 2' DEEP @ 0.625% SLOPE. LINE DITCH INITIALLY WITH EC-2 PROTECTIVE COVERING LINER DURING CONSTRUCTION. DESIGN ALLOWS FOR 3" FREEBOARD OR AN ADDITIONAL CAPACITY OF 35.1 CFS (OVER 25% SURPLUS)

$b = 20'$, $d = 2'$

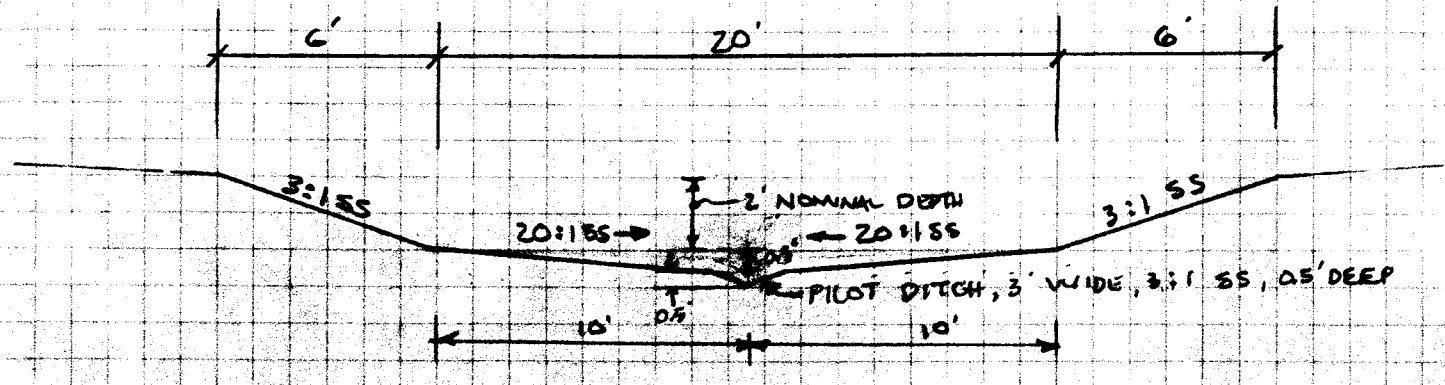
$A = (20)(2) + (3)(2)(2) = 52\ SF$

$P = 20 + (2)(3.1623)(2) = 32.65\ LF$

$TW = 20 + (2)(3)(2) = 32'$

$V = 1.486(R)^{2/3}(0.00625)^{1/2}(0.05)^{-1} = 3.20\ FPS$

$Q = V \cdot A = (3.20)(52) = 166.6\ CFS$



N.T.S.
ACTUAL DITCH/CHANNEL SECTION

STORM SEWER DESIGN COMPUTATIONS

L & D 229

ROUTE _____ PROJ. F.C. Sec 18
COUNTY _____ DISTRICT _____
DESCRIPTION _____

SHEET ____ OF ____

FROM POINT	TO POINT	AREA DRAIN. "A" ACRES	RUN-OFF COEF. C	CA INCRE-MENT	CA ACCUM-ULATED	INLET TIME MIN-UTES	RAIN FALL IN./HR.	RUNOFF Q C.F.S.	INVERT ELEVATIONS UPPER END	INVERT ELEVATIONS LOWER END	LENGTH FT.	SLOPE FT./FT.	DIA. IN.	CAPA-CITY C.F.S.	VEL. F.P.S.	FLOW TIME SEC.	REMARKS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
23	24	118.50	0.29	34.37	34.37	45	2.75	94.52	62.75	62.17	136	.0043	42	95.30			
24	25	0.869	0.29	0.25	34.62	45	2.75	95.19	62.17	62.07	24	.0043	42	95.50			n=.009
25	26	0.372	0.29	0.11	34.73	45	2.75	95.51	62.07	61.62	100	.0045	42	97.49		PVC	"
																	"
1	2	1.936	0.50	0.97	0.97	15	5.1	4.94	100.87'	100.56'	68	.0046	18	6.62			
2	3	0.343	0.50	0.17	1.14	15	5.1	5.82	100.46'	100.22'	52	.0046	18	6.62			n=.013
3	4	0.157	0.50	0.08	1.22	15	5.1	6.21	100.12'	99.80	68	.0047	18	6.69			"
																	"
5	6	0.75	0.50	0.38	1.60	15	5.1	8.16	67.11'	64.70'	110	.0219	15	9.56			
																	n=.013
7	8	0.364	0.50	0.18	0.18	10	6.0	1.09	103.20'	102.76'	22	.02	15	9.14			
8	9	0.207	0.50	0.10	0.28	10	6.0	1.70	102.66'	100.38'	114	.02	15	9.14			n=.013
9	10	0.634	0.50	0.32	0.60	10	6.0	3.60	100.28'	99.84'	22	.02	15	9.14			"
10	11	0.522	0.50	0.26	0.86	10	6.0	5.16	99.74'	82.70'	236	.0722	15	17.36			"
11	12	0.765	0.50	0.38	1.24	10	6.0	7.46	82.60'	82.16'	22	.02	15	9.14			"
12	13	0.388	0.50	0.19	1.43	10	6.0	8.58	82.06	70.48'	130	.0891	15	19.20			"
13	14	0.356	0.50	0.18	1.61	10	6.0	9.66	70.38	64.07	164	.0385	15	12.68			"
																	"
15	14	5.66	0.50	2.83	2.83	15	5.1	14.43	66.00	63.32	20	0.1340	24	67.29			n=0.013
14	16	1.07	0.50	0.54	4.98	15	5.1	25.40	62.97	62.57	32	0.0125	27	27.28			n=.0165
16	17	0.12	0.50	0.06	5.04	15	5.1	25.70	62.43	60.66	145	0.0125	27	27.28			n=0.0165
~~17~~	~~18~~	~~0.46~~	~~0.50~~	~~0.23~~	~~5.27~~	~~15~~	~~5.1~~	~~26.88~~	61.52	61.25	16	~~.0169~~	~~24~~	~~22.90~~			"
							47.39										
							43.84										

STORM SEWER DESIGN COMPUTATIONS

L & D 229

ROUTE _____ PROJ. F.C. SEC. 18
COUNTY _____ DISTRICT _____
DESCRIPTION _____

SHEET ____ OF ____

FROM POINT	TO POINT	AREA DRAIN. "A" ACRES	RUN-OFF COEF. C	CA INCRE-MENT	CA ACCUM-ULATED	INLET TIME MIN-UTES	RAIN FALL IN./HR.	RUNOFF Q C.F.S.	INVERT ELEVATIONS UPPER END	INVERT ELEVATIONS LOWER END	LENGTH FT.	SLOPE FT./FT.	DIA. IN.	CAPA-CITY C.F.S.	VEL. F.P.S.	FLOW TIME SEC.	REMARKS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
19	20	0.542	0.50	0.27	SEE 0.27	10	6.0	1.63	64.15	63.66	52	.01	15	6.46			n=.013
20	21	2.738	0.50	1.37	REVISED	6.0	9.84	43.50	63.41	63.01	36	.0125	18	10.91	CMP		n=.014
21	22	0.388	0.50	0.19	1.83	10	6.0	10.98	63.01	58.74	132	.0323	18	17.53			"
27	28	158.12	0.29	45.85	45.85	45	2.75	126.10	52.50	51.94	140	.004	48	131.23	PVC		n=.009
28	29	0.58	0.29	0.17	46.02	45	2.75	126.56	51.94	51.36	146	.004	48	131.23		"	"
29	30	0.22	0.29	SEE 0.06	46.08	45	2.75	126.72	51.36	50.92	110	.004	48	131.23		"	"
30	31	0.82	0.29	0.24	46.32	45	2.75	127.38	50.92	50.82	24	.004	48	131.23		"	"
31	32	0.71	0.29	0.21	46.53	45	2.75	127.96	50.82	50.54	70	.004	48	131.23		"	"
33	32	1.86	0.50	0.93	0.93	10	6.0	5.58	55.69	53.29	64	.0375	15	12.51		CMP	n=.013
32	34	0.226	0.29	0.07	47.13	45	2.75	129.61	50.54	49.88	164	.004	48	131.23		PVC	n=.009
34	35	1.03	0.29	0.30	47.43	45	2.75	130.43	49.88	49.08	200	.004	48	131.23			"
35	36	9.85	0.29	2.86	50.29	45	REVISED 2.75	138.29	49.08	48.29	138	.0057	48	156.66			"
36	37	—	—	—	50.29	45	2.75	138.29	48.29	47.74	96	.0057	48	156.66			"
37	38	—	—	—	50.29	45	2.75	138.29	47.74	47.65	15	.006	48	160.73			"
EXISTING	PIPES																
									47.65	46.60	120	.0088	48	87.59		CMP	n=.020
									47.65	46.23	120	.0118	48	101.43			"
														—			
		1.56	0.29	0.45	50.40	45	2.75	138.61						189.02			

PC085_FORDS_COLONY_SEC_18_WET_POND_N_OF_MAHOGANY_009

OVERALL OFFSITE DRAINAGE

0.29

$T_c = 45$ MIN $\quad I_{10} = 2.75$ IN/HR. $\quad C = 0.25$ (OFFSITE)

$C = 0.50$ (SITE)

$$C = \frac{(137.39)(0.25) + (27.19)(0.50)}{164.58} = \underline{0.29}$$

$$Q = (0.29)(2.75)(164.58) = \underline{137.25 \text{ CFS}}$$

DITCH

D.A. = 2.79 AC $\quad I_2 = 4.5$ IN/HR. $\quad I_{10} = 6.0$ IN/HR.

$Q_{10} = (2.79)(0.5)(6.0) = \underline{8.37 \text{ CFS}}$ $\quad$ 5718.

$Q_2 = (2.79)(0.5)(4.5) = \underline{6.28 \text{ CFS}}$

$V_2 = \underline{4.25 \text{ FPS}}$ $\quad V_{10} = \underline{4.50 \text{ FPS}}$

DEPTH = 9.8"

USE MIRAMAT "V" DITCH 18" DEEP w/3:1 SS

Project FORD'S COLONY SEC 18
CULVERT AT ENTRANCE TO SEC. 18 ON ROAD A

Plan Sheet No ____ Designer VMB
Rev. Date ____ Date ____

Sheet 1 of 1

HYDROLOGICAL DATA

D.A. = 1.09 AC.

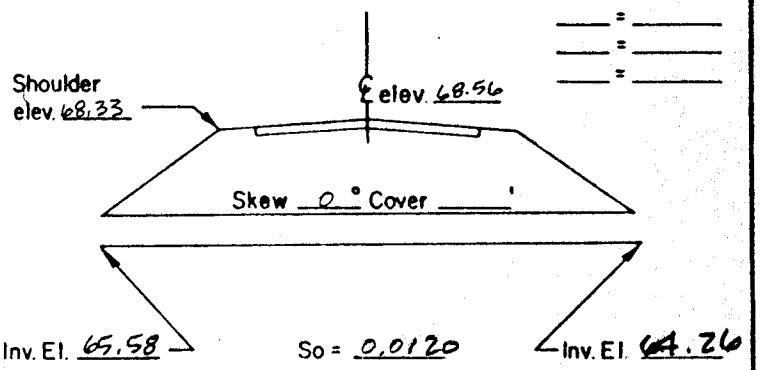
T_c = 7 MIN
I_{10} = 6.6 IN/HR
C = 0.5
Q = CIA
= 3.60 CFS

AHW Controls

STATION: ____

100 yr. Flood plain ____ elev. ____
Design AHW depth ____ elev. ____
Structures ____ elev. ____

freq. TW elev.
____ = ____
____ = ____
____ = ____
____ = ____
____ = ____



DISCHARGES USED

Q 10 = 3.60 CFS
Q ____ = ____ CFS
Q ____ = ____ CFS
Q ____ = ____ CFS
Q ____ = ____ CFS

RISK ASSESSMENT

ADT ____

Detours Available ____, Length ____
Overtopping Stage ____
Flood Plain Management ____
Criteria and Significant Impact ____

CULVERT TYPE & SIZE	Q	Q/B	HEADWATER COMPUTATIONS									CONT. HW. ELEV.	OUTLET VELOCITY		End Treat.	COMMENTS
			INLET CONT.		OUTLET CONTROL											
			HW/D	HW	Ke	dc	$\frac{dc+D}{2}$	ho	H	LSo	HW		C.M.	Smooth		
15" FCCMP W/ ES-2	3.60		.99	1.24	0.5	0.75	1	1	1.5	1.32	1.18	INLET 1.24				GOOD

Design Flood Exceed. Prob. ____ Elev. ____
Overtop Flood Exceed. Prob. ____ Elev. ____
Base Flood 1% Exceed. Prob. ____ Elev. ____

SUMMARY & RECOMMENDATIONS:

REVISE 12/4/87

STORM SEWER DESIGN COMPUTATIONS

L & D 229

ROUTE _____ PROJ. FORD'S COLONY SECTION 18
COUNTY JAMES CITY DISTRICT POWHATAN
DESCRIPTION _____

SHEET ____ OF ____

FROM POINT	TO POINT	AREA DRAIN. "A" ACRES	RUN-OFF COEF. C	CA INCRE-MENT	CA ACCUM-ULATED	INLET TIME MIN-UTES	RAIN FALL IN./HR.	RUNOFF Q C.F.S.	INVERT ELEVATIONS UPPER END	INVERT ELEVATIONS LOWER END	LENGTH FT.	SLOPE FT./FT.	DIA. IN.	CAPA-CITY C.F.S.	TRUE VEL. F.P.S.	FLOW TIME SEC.	REMARKS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
SS#19	SS#20	0.54	0.50	0.27	0.27	10	6.0	1.62	64.50	64.25	50	0.005	15	4.6	3.3		n=0.013
SS#20	SS#21	2.17	0.50	1.09	1.36	10	6.0	7.36	64.15	63.43	36	0.020	15	9.2	8.3		n=0.013
SS#21	SS#22	0.29	0.50	0.15	1.51	10	6.0	9.0	60.42	59.50	132	0.007	18	9.0	5.8		n=0.013
SS#28	SS#29	1.21	0.50	0.61	0.61	10	6.0	3.63	67.58	66.84	60	0.0123	15	7.3	5.9		n=0.013
SS#29	SS#30	0.25	0.50	0.13	0.74	10	6.0	4.44	66.74	66.56	36	0.005	15	4.7	4.0		n=0.013
SS#30	SS#31	0.11	0.50	0.06	0.80	10	6.0	4.80	66.46	54.75	160	0.0732	15	18.0	11.7		n=0.013
SS#32	SS#33	1.30	0.50	0.65	0.65	10	6.0	3.90	62.31	62.19	24	0.005	15	4.7	4.2		n=0.013
SS#33	SS#34	0.25	0.50	0.13	0.78	10	6.0	4.68	62.09	54.75	155	0.0474	15	14	9.9		n=0.013

LD- 7

HYDRAULIC GRADE LINE

PROJECT FORD'S COLONY SECTION 18

INLET	Outlet Water Surface Elev.	D_o	Q_o	L_o	S_{f_o} %	H_f	JUNCTION LOSS												Final H	Inlet Water Surface Elev.	Rim Elev.
							V_o	H_o	Q_i	V_i	Q_iV_i	$\frac{V_i^2}{2g}$	H_i	Angle	H_Δ	H_t	$1.3\ H_t$	$0.5\ H_t$			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)		(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
SS#21	60.70	18"	8.7	132	0.70	0.91	5.8	0.13	7.36	8.3	61.1	1.07	0.37	0°	0	0.50	0.65		1.56	62.26	67.00
SS#20	62.26	15"	7.4	36	1.31	0.47	8.3	0.27	1.62	3.3	5.35	0.17	0.06	90	0.12	0.45	0.59		1.06	63.32	66.83
SS#19	63.32	15"	1.62	50	0.06	0.03	3.3	0.17	0	0	0	0	0	0	0	0.17	0.22		0.25	63.57	66.92
SS#30	58.0	15"	4.8	160	0.55	0.88	11.7	0.53	4.44	4	17.8	0.25	0.09	15°	0.03	0.65	0.85		1.73	59.73	69.70
SS#29	59.73	15"	4.44	36	0.47	0.17	4.0	0.06	3.63	5.9	21.4	0.54	0.19	90°	0.37	0.62	0.81		0.98	60.71	69.25
SS#28	60.71	15"	3.63	60	0.32	0.19	5.9	0.14	0	0	0	0	0	0	0	0.14	0.18		0.37	61.08	70.00
SS#33	58.0	15"	4.68	155	0.52	0.81	9.9	0.39	3.90	4.2	16.4	0.27	0.10	0	0	0.48	0.62		1.43	59.43	64.73
SS#32	59.43	15"	3.9	24	0.36	0.09	4.2	0.07	0	0	0	0	0	0	0	0.07	0.09		0.18	59.61	64.73

$H_i = 0.35 \frac{V_i^2}{2g}$ $H_o = 0.25 \frac{V_o^2}{2g}$ $H_\Delta = K \frac{V_i^2}{2g}$

FINAL $H = H_f + H_t$

$H_t = H_o + H_i + H_\Delta$

SEE LD-72(D)67

90° K = 0.70	50° K = 0.47	20° K = 0.16
80° K = 0.66	40° K = 0.38	15° K = 0.10
70° K = 0.61	30° K = 0.28	
60° K = 0.55	25° K = 0.22	

SEWER DATA SHEET

APPENDIX "B"

DATE 1/14/88

I. PROJECT NAME FORD'S COLONY, SECTION XVIII

II. PROJECT LOCATION NORTH OF ST. ANDREW'S DRIVE OPPOSITE SECTION X

III. ENGINEER AES, a professional corporation

IV. POINT OF CONNECTION TO AUTHORITY SYSTEM EXISTING SEWER LINE ALONG ST. ANDREWS DRIVE OPPOSITE "ALWOODLEY" ROAD

V. DESIGN POPULATION (NUMBER AND TYPE OF DWELLINGS) 71 SINGLE FAMILY

VI. AVERAGE DESIGN FLOW 300 TO 400 GPD

VII. PEAK DESIGN FLOW 750 TO 1000 GPD

VIII. PIPE MATERIAL PVC (POLYVINYL CHLORIDE)

IX. PIPE DIAMETER

(INCHES)	LENGTH (FEET)	
4" (laterals)	1420	
6"	391	$ 195.50
8"	4,589	$ 2294.50
10"		$ 2,490.00
12"		
15"		
18"		
21"		
24"		
	TOTAL FEET	6,400

X. MANHOLES (A) STANDARD 26 (NUMBER) AVERAGE DEPTH 6.5'

(B) DROP _____ (NUMBER) AVERAGE DEPTH _____

XI. (A) PUMP STATIONS SIZE _____ (GPM)

(B) FORCE MAIN (SIZE LENGTH) _____ (FEET)

WATER DATA SHEET

APPENDIX "B"

DATE 1/14/88

I. PROJECT NAME FORD'S COLONY, SECTION XVIII

II. PROJECT LOCATION NORTH OF ST. ANDREW'S DRIVE OPPOSITE SECTION X

III. ENGINEER AES, a professional corporation

IV. SOURCE OF WATER JCSA - 12" WATER LINE IN ST. ANDREW'S DRIVE

V. DESIGN POPULATION (NUMBER AND TYPE OF DWELLINGS) 71 SINGLE FAMILY

VI. HYDRAULIC CAPACITY UNKNOWN BUT ADEQUATE

VII. PIPE MATERIAL PVC (POLYVINYL CHLORIDE)

VIII. PIPE DIAMETER

(INCHES)	LENGTH (FEET)
4"	2094
6"	
8"	2221
10"	
12"	

TOTAL = 4,315' $2,157.50

IX. FIRE HYDRANT ASSEMBLIES 3 (NUMBER)

X. VALVES (A) GATE 3-8", 7-4" (NUMBER)

(B) AIR RELIEF 3 (NUMBER)

XI. FITTINGS (A) CROSS — (NUMBER) (E) 22½° 2 (NUMBER)

(B) TEE 12 (NUMBER) (F) REDUCER — (NUMBER)

(C) 90° ELL 2 (NUMBER) (G) BLOW-OFF ASSEMBLIES 2 (NUMBER)

(D) 45° BEND 5 (NUMBER) H 11¼° 1 (NUMBER)

X. WATER METER ASSEMBLIES 71 (NUMBER)

X. SERVICE CONNECTION PIPE

DIAMETER 3/4 (INCHES)

TYPE K COPPER

LENGTH 1,775 (FEET)

FORD'S COLONY, SECTION XVIII

REVISION CHECKLIST

JAMES CITY CODE COMPLIANCE (JCCC)

1. LAND DISTURBING PERMIT (LDP) AND SILTATION AGREEMENT (SA) HAVE ALREADY BEEN COMPLETED AND DELIVERED. SURETY FROM DOMINION BANK WILL BE DELIVERED AS SOON AS IT IS RECEIVED ($810,000)
2. WATER AND SEWER DATA SHEETS ARE ATTACHED. FEES WILL BE PAID PRIOR TO RECEIVING AN LDP. WATER = $2,157.50 SEWER = $2,490.00 TOTAL = $4,647.50
3. SUBDIVISION AGREEMENT WILL BE SUBMITTED WITH RECORD PLAT. SEE NOTE #1 FOR INFORMATION CONCERNING SURETY.
4. THE EROSION CONTROL REVIEW FEE OF $300 IS ATTACHED.
5. DRAINAGE AREAS WERE CHECKED AND REVISED IN THE CALCULATIONS. THE REVISED STORM SEWER IS ON SHEET 15 AND REVISED CALCULATIONS ARE ATTACHED.
6. A NOTE CERTIFYING EC-3 LINING HAS BEEN ADDED TO SHEET 15.
7. PILOT CHANNEL IN MAJOR DRAINAGE CHANNEL HAS BEEN ADDED VIA A CROSS-SECTIONAL DETAIL ON SHEET #14.
8. EMERGENCY SPILLWAY DEEMED NOT NECESSARY SINCE POND WILL STORE 100 YEAR STORM EVENT WHILE PASSING THE 10 YEAR STORM. CALCULATIONS ARE ATTACHED.
9. CROSS-SECTION OF DAM ADDED TO SHEET 14.
10. EC-3 LINED GRASS DITCH PROVIDED FROM ST. ANDREW'S DRIVE TO DS-15. DITCH SECTION HAS BEEN INCREASED TO INCLUDE 1' FLAT BOTTOM. SEE SHEET #15.
11. NOTE HAS BEEN ADDED TO PLAN CONCERNING USE OF POND AS A SEDIMENT BASIN. SEE SHEET #14.
12. A 54" SPIRAL RIBBED SMOOTH-FLOW ALUMINUM PIPE FROM DAM TO TIE INTO EXISTING STRUCTURE IS NOW SPECIFIED IN LIEU OF 48" RIBBED PVC STORM DRAIN DUE TO ITS UNAVAILIBILITY. SEE SHEET #14.
13. DONE.

SHOULD YOU HAVE ANY QUESTIONS REGARDING ANY OF THESE REVISIONS, PLEASE CALL ME AT YOUR EARLIEST CONVENIENCE.

SINCERELY,

James H Bennett

JAMES H. BENNETT
AES 253-0040

FORDS COLONY SECTION 18 #5652-18 12/27/95

STORM WATER INLET CALCS SYSTEM #1

① SS#1-4 STA 17+50 (RIGHT) ROAD "B"

$T = 1.4$ ft $E_o = 1.0$ $V = 1.1$ ft/s $R_f = 1.0$ $R_s = 0.40$

$Q = 0.21$ CFS $Q_i = 0.21\,(1.0(1.0) + 0.40(1-1)) = 0.21$ cfs

$Q_b = 0.21 - 0.21 =$ 0 CFS ←

---

② SS#1-3 STA 17+50 (LEFT) ROAD "B"

$T = 1.5$ ft $E_o = 1.0$ $V = 1.2$ ft/s $R_f = 1.0$ $R_s = 0.40$

$Q = 0.32$ CFS $Q_i = 0.32\,(1.0(1.0) + 0.40(1-1)) = 0.32$ cfs

$Q_b = 0.32 - 0.32 =$ 0 CFS ←

---

③ SS#1-2 STA 19+15 ROAD "B"

$Q = 0.63$ cfs $T = 8$ ft < 10 ft ✓ GRADE

$Q = 0.44$ cfs $T = 6.5$ ft < 10 ft ✓ GRADE

$Q_{TOTAL} = 1.07$ cfs $d = 0.15$

SUMP $= T = d/S_x = 0.15/0.0208 = 7.2' < 10'$ ✓ OK

FORDS COLONY SECTION 18 #5652-18 12/27/95

STORM WATER INLET CALCS SYSTEM #2

① SS# 2-3B STA 14+50 (LEFT) ROAD "B"

$T = 3ft$ $E_o = 0.99$ $V = 2.5 ft/s$ $R_f = 1.0$ $R_s = 0.15$

$Q = 0.95 cfs$ $Q_i = 0.95(1.0(0.99) + 0.15(1-0.99)) = 0.94 cfs$

$Q_b = 0.95 - 0.94 = \underline{0.01 CFS}$ ←

---

② SS# 2-3A STA 15+00 (LEFT) ROAD "B"

$T = 1.7 ft$ $E_o = 1.0$ $V = 1.25 ft/s$ $R_f = 1.0$ $R_s = 0.35$

$Q = 0.37 cfs$ $Q_i = 0.37(1.0(1.0) + 0.35(1-1)) = 0.37 cfs$

$Q_b = 0.37 - 0.37 = \underline{0 CFS}$ ←

---

③ SS# 2-3 STA 15+39 (RIGHT) ROAD "B"

$Q = 0.28 cfs$ $T = 5ft < 6.75ft$ ✓ GRADE

$Q = 0.48 cfs$ $T = 6.6ft < 6.75ft$ ✓ GRADE

$Q_{TOTAL} = 0.76 cfs$ $d = 0.12$

SUMP $T = d/S_x = 0.12/0.0208 = 5.8ft < 6.75 ft$ ✓ OK

---

④ SS# 2-2 STA 15+39 (LEFT) ROAD "B"

$Q = 0.42 cfs$ $T = 6.4ft < 6.75ft$ ✓ GRADE

$Q = 0.15 cfs$ $T = 3.5ft < 6.75ft$ ✓ GRADE

$Q_{TOTAL} = 0.57 cfs$ $d = 0.115$

SUMP $T = d/S_x = 0.115/0.0208 = 5.5ft < 6.75ft$ ✓ OK

FORD'S COLONY SECTION 18 #5652-18 12/27/95

STORM WATER INLET CALCS **SYSTEM #3**

---

① SS# 3-8A STA 17+10 (RIGHT) ROAD "A"

T=5.5 ft (CHART 3) E_o=0.85 (CHART 10A)

V= 5 ft/s (CHART 11) R_f = 0.95 (CHART 12)

R_s = 0.04 (CHART 13) Q = 2.53 cfs

$Q_i = Q_T(R_f E_o + R_s(1-E_o)) = 2.53(0.95(0.85) + 0.04(1-0.85)) = 2.06$

$Q_b = Q_T - Q_i$ $Q_b = 2.53 - 2.06 =$ 0.47 CFS ←

---

② SS# 3-8 STA 17+10 (LEFT) ROAD "A"

T= 4.2 ft E_o=0.95 Q= 1.92 cfs

V= 4.25 ft/s Rf = 0.98 R_s = 0.055

$Q_i = 1.92(0.98(0.95) + 0.055(1-0.95)) = 1.79$ cfs

$Q_b = 1.92 - 1.79 =$ 0.13 CFS ←

---

③ SS# 3-7A STA 15+55 ROAD "A" (RIGHT) Q= 0.88 cfs

T= 3 ft E_o= 0.98 V= 2.4 ft/s Rf = 1.0 R_s = 0.14

$Q_i = 0.88(1.0(0.98) + 0.14(1-0.98)) = 0.865$ cfs

$Q_b = 0.88 - 0.865 =$ 0.015 cfs ←

---

④ SS# 3-7 STA 15+55 ROAD "A" (LEFT) Q= 0.54 cfs

T= 1.7 ft E_o= 1.0 V= 1.6 ft/s Rf = 1.0 R_s = 0.28

$Q_i = 0.54(1.0(1.0) + 0.28(1-1)) = 0.54$ cfs

$Q_b = 0.54 - 0.54 =$ 0 cfs ←

SYSTEM #3 CALCS CONT

12/27/95
FC SECT 18
#5652-18

(5) SS# 3-6A STA 10+75 (RIGHT) ROAD "C"

T = 5.8 ft $E_o = 0.83$ V = 4.5 ft/s $R_f = 0.95$ $R_s = 0.045$

Q = 2.6 CFS

$Q_i = 2.6(0.95(0.83) + 0.045(1-0.83)) = 2.1$ CFS

$Q_b = 2.6 - 2.1 =$ 0.5 CFS ←

---

(6) SS# 3-6 STA 10+35 (RIGHT) ROAD "C"

Q = 0.15 CFS T = 3.5 ft < 6.75 ft GRADE

Q = 0.50 CFS T = 6.7 ft < 6.75 ft GRADE

d = 0.11 Q_{TOTAL} = 0.65 CFS

SUMP $T = d/S_x = 0.11/0.0208 = 5.31 < 6.75'$ ✓ OK

---

(7) SS# 3-5A STA 10+35 (LEFT) ROAD "C"

Q = 1.1 CFS T = 4.2 ft $E_o = 0.95$ V = 2.3 ft/s

$R_f = 1.0$ $R_s = 0.15$

$Q_i = 1.1(1.0(0.95) + 0.15(1-0.95)) = 1.07$ CFS

$Q_b = 1.1 - 1.07 =$ 0.04 CFS ←

---

(8) SS# 3-2B STA 12+45 (LEFT) ROAD "A"

Q = 0.49 CFS T = 1.5 ft $E_o = 1.0$ V = 1.8 ft/s

$R_f = 1.0$ $R_s = 0.29$ $Q_i = 0.49[(1.0)(1.0) + 0.29(1-1)] = 0.49$

$Q_b = 0.49 - 0.49 =$ 0 CFS ←

---

(9) SS# 3-2A STA 12+45 (RIGHT) ROAD "A"

Q = 0.48 CFS T = 1.5 ft $E_o = 1.0$ V = 1.8 ft/s

$R_f = 1.0$ $R_s = 0.28$ $Q_i = 0.48[(1.0)(1.0) + 0.28(1-1)] = 0.48$

$Q_b = 0.48 - 0.48 =$ 0 CFS ←

SYSTEM #3 CALCS CONT

12/27/95
FC SECT 18
#5652-18

(10) SS# 3-2 STA. 13+80 (RIGHT) ROAD "A"

$Q = 0.23$ CFS $T = 1.7$ ft $E_o = 1.0$ $V = 0.7$ ft/s

$R_f = 1.0$ $R_s = 0.8$ $Q_i = 0.23[(1.0)(1.0) + 0.8(1-1)] = 0.23$

$Q_b = 0.23 - 0.23 = \underline{0 \text{ CFS}}$ ←

---

(11) SS# 3-2D STA. 11+00 (RIGHT) ROAD "B"

$Q = 1.25$ CFS $T = 4.5$ ft $E_o = 0.90$ $V = 2.5$ ft/s

$R_f = 1.0$ $R_s = 0.045$ $Q_i = 1.25(1.0(0.90) + 0.045(1-0.9)) = 1.13$

$Q_b = 1.25 - 1.13 = \underline{0.12 \text{ CFS}}$ ←

---

(12) SS# 3-5 STA 14+75 (LEFT) ROAD "A"

$Q = 0.16$ CFS $T = 1.5$ ft $E_o = 1.0$ $V = 0.5$ ft/s

$R_f = 1.0$ $R_s = 0.8$ $Q_i = 0.16(1.0(1.0) + 0.80(1-1)) = 0.16$

$Q_b = 0.16 - 0.16 = \underline{0 \text{ CFS}}$ ←

---

(13) SS# 3-AA STA. 13+80 (LEFT) ROAD "A"

$Q = 0.48$ $T = 3.7$ ft $E_o = 0.98$ $V = 1.3$ ft/s

$R_f = 1.0$ $R_s = 0.3$ $Q_i = 0.48(1.0(0.98) + 0.3(1-0.98)) = 0.47$

$Q_b = 0.48 - 0.47 = \underline{0.01 \text{ CFS}}$ ←

---

(14) SS# 3-4 STA 14+04 (LEFT) ROAD "A"

$Q = 0.45$ cfs $T = 6.4$ ft < 6.75 ✓ GRADE

$Q = 0.29$ cfs $T = 5.5$ ft < 6.75 ✓ GRADE

$d = 0.12$ $Q_{TOTAL} = 0.74$ cfs

SUMP $T = d/S_x = 0.12/0.0208 = 5.8' < 6.75'$ ✓ OK

SYSTEM #3 CALCS CONT

12/27/95
FC SECT 18
#5652-18

(15) SS#3-3 STA 14+04 (RIGHT) ROAD "A"

Q = 0.06 cfs T = <1' < 6.75' ✓ GRADE

Q = 0.34 cfs T = 5.8' < 6.75' ✓ GRADE

Q_{TOTAL} = 0.40 d = 0.08

SUMP $T = d/S_X = 0.08/0.0208 = 3.8' < 6.75'$ ✓ OK

---

(16) SS#3-2C STA 10+51 (RIGHT) ROAD "B"

Q = 0.40 cfs T = 6.3' < 6.75' ✓ GRADE

Q = 0.47 cfs T = 6.6' < 6.75' ✓ GRADE

Q_{TOTAL} = 0.87 cfs d = 0.14

SUMP $T = d/S_X = 0.14/0.0208 = 6.7' < 6.75'$ ✓ OK

ALLOWABLE SPREAD = 13.5/2 = 6.75'

STORM WATER INLET COMPUTATIONS

Form LD 204
Rev 6-85

SYSTEM #3

RTE ROAD "A", "B" & "C" PROJ FORD'S COLONY SECTION 18 DATE 12/27/95

INLET NUMBER	TYPE	LENGTH (FT)	STATION	DRAINAGE AREA (AC)	C	CA	Σ CA	I IN/HR	Q INCR (CFS)	Q CARRY-OVER (CFS)	Q_T GUTTER FLOW	S GUTTER SLOPE (FT/FT)	Sx CROSS SLOPE (FT/FT)	T(SPREAD)	W(FT)	W/T	Sw(FT/FT)	Sw/Sx	Eo(#10)	a	Sw=a/(12W)	Se(FT/FT)=Sx + SwEo	L_T(FT)15 P EFFEC LENGTH FT L/L_T	d(FT)	E(#16)	h(FT)	Q; INTERCEPTED CFS d/h	Qb CARRY-OVER CFS	T SPREAD @ SAG FT	SHEET ___ OF ___ REMARK
8A	CI	2	17+10 (R)	1.81	0.40	0.72		3.5	2.53	—	2.53	0.10	0.0208	5.5	2	0.36	0.0833	4	0.85									Qb= 0.47cfs		SS#3-8A
8	CI	2	17+10 (L)	1.37	0.40	0.55		3.5	1.92	—	1.92	0.10	0.0208	4.2	2	0.48	0.0833	4	0.95									Qb= 0.13cfs		SS#3-8
7A	CI	2	15+55 (R)	0.29	0.40	0.12		3.5	0.41	0.47	0.88	0.05	0.0208	3	2	0.67	0.0833	4	0.98									Qb=0.01cfs		SS#3-7A
7	CI	2	15+55 (L)	0.30	0.40	0.12		3.5	0.41	0.13	0.54	0.05	0.0208	1.7	2	1.18	0.0833	4	1.0									Qb=0cfs		SS#3-7
6A	CI	2	10+75 (R)	2.13	0.35	0.75		3.5	2.6	—	2.6	0.073	0.0208	5.8	2	0.34	0.0833	4	0.83									Qb=0.50cfs		SS#3-6A
SUMP — 6	CI	2	10+35 (R)	0.06	0.70	0.04		3.5	0.15	—	0.15	0.001	0.0208	3.5✓																
SUMP 6	CI	2	10+35 (R)	—	—	—			0.50	—	0.50	0.001	0.0208	6.7✓																
TOTAL 6	CI	2	10+35 (R)	—	—	—			—	—	0.65	0.001	0.0208	5.3✓														5.3<6.75		SS#3-6
5	CI	2	14+75 (L)	0.05	0.70	0.04		3.5	0.12	0.04	0.16	0.01	0.0208	1.5	2	1.33	0.0833	4	1.0									Qb=0CFS		SS#3-5
2B	CI	2	12+45 (L)	0.35	0.40	0.14		3.5	0.49	—	0.49	0.08	0.0208	1.5	2	1.33	0.0833	4	1.0									Qb=0CFS		SS#3-2B
5A	CI	2	10+35 (L)	0.90	0.35	0.32		3.5	1.1	—	1.1	0.03	0.0208	4.2	2	0.48	0.0833	4	0.95									Qb=0.04CFS		SS#3-5A
2A	CI	2	12+45 (R)	0.23	0.60	0.14		3.5	0.48	—	0.48	0.08	0.0208	1.5	2	1.33	0.0833	4	1.0									Qb=0CFS		SS#3-2A
2	CI	2	13+80 (R)	0.11	0.60	0.07		3.5	0.23	—	0.23	0.01	0.0208	1.7	2	1.18	0.0833	4	1.0									Qb=0CFS		SS#3-2
4A	CI	2	13+80 (L)	0.34	0.40	0.14		3.5	0.48	—	0.48	0.01	0.0208	3.7	2	0.54	0.0833	4	0.98									Qb=0.01CFS		SS#3-4A
SUMP — 4	CI	2	14+04 (L)	0.32	0.40	0.13		3.5	0.45	—	0.45	0.001	0.0208	6.4✓																
SUMP 4	CI	2	14+04 (L)	0.20	0.40	0.08		3.5	0.28	0.01	0.29	0.001	0.0208	5.5✓																
TOTAL 4	CI	2	14+04 (L)								0.74	0.001	0.0208	5.8✓														5.8<6.75		SS#3-4
SUMP 3	CI	2	14+04 (R)	0.03	0.60	0.02		3.5	0.06	—	0.06	0.001	0.0208	<1✓																
SUMP 3	CI	2	14+04 (R)	0.15	0.60	0.09		3.5	0.32	0.02	0.34	0.001	0.0208	3.8✓																
TOTAL 3	CI	2	14+04 (R)								0.40	0.001	0.0208	3.8✓														3.8<6.75		SS#3-3
2D	CI	2	11+00 (R)	0.89	0.40	0.36		3.5	1.25	—	1.25	0.03	0.0208	4.5	2	0.44	0.0833	4	0.90									Qb=0.12CFS		SS#3-2D
SUMP 2C	CI	2	10+51 (R)	0.23	0.50	0.12		3.5	0.40	—	0.40	0.001	0.0208	6.3✓																
SUMP 2C	CI	2	10+51 (R)	0.25	0.40	0.10		3.5	0.35	0.12	0.47	0.001	0.0208	6.6✓																
TOTAL 2C	CI	2	10+51 (R)								0.87	0.001	0.0208	6.7✓														6.7<6.75		SS#3-2C

4-74

ALLOWABLE SPREAD = 13.5'/2 = 6.75'

STORM WATER INLET COMPUTATIONS

Form LD 204
Rev 6-85

SYSTEM #2

RTE ROAD "B" PROJ FORD'S COLONY SECTION 18 DATE 12/27/95

	INLET NUMBER	TYPE	LENGTH (FT)	STATION	DRAINAGE AREA (AC)	C	CA	Σ CA	I IN/HR	Q INCR (CFS)	Q CARRY-OVER (CFS)	Q_T GUTTER FLOW	S GUTTER SLOPE (FT/FT)	Sx CROSS SLOPE (FT/FT)	T (SPREAD)	W (FT)	W/T	Sw (FT/FT)	Sw/Sx	Eo (#10)	a	Sw=a/(12W)	Se(FT/FT)= Sx + SwEo	Li(FT)15 P EFFEC LENGTH FT L/Lt	d (FT)	E (#16)	h (FT)	Q: INTERCEPTED CFS d/h	Qb CARRY-OVER CFS	T SPREAD @ SAG FT	SHEET ___ OF ___ REMARKS
	3B	CI	2	14+50(L)	0.67	0.40	0.27		3.5	0.95	—	0.95	0.055	0.0208	3.0	2.0	0.67	0.0833	4	0.99										Qb=0.01 cfs		SS#2-3B
	3A	CI	2	15+00(R)	0.26	0.40	0.1		3.5	0.36	0.01	0.37	0.03	0.0208	1.7	2.0	1.2	0.0833	4	1.0										Qb = 0 cfs		SS#2-3A
SUMP	3	CI	2	15+39 (R)	0.20	0.40			3.5	0.28	—	0.28	0.001	0.0208	5.1 ✓																
SUMP	3	CI	2	15+39 (R)	0.34	0.40			3.5	0.48	—	0.48	0.001	0.0208	6.6 ✓																
TOTAL	3	CI	2	15+39(R)								0.76	0.001	0.0208	5.8 ✓														5.8' < 6.75'		SS#2-3
SUMP	2	CI	2	15+39(L)	0.17	0.70			3.5	0.42	—	0.42	0.001	0.0208	6.4 ✓																
SUMP	2	CI	2	15+39(L)	0.06	0.70			3.5	0.15	—	0.15	0.001	0.0208	3.5 ✓																
TOTAL	2	CI	2	15+39(L)								0.57	0.001	0.0208	5.5 ✓														5.5' < 6.75'		SS#2-2

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ALLOWABLE SPREAD = 13.5'/2 = 6.75'

CUL-DE-SAC MAX SPREAD = 10'

STORM WATER INLET COMPUTATIONS

Form LD 204
Rev 6-85

SYSTEM #1

RTE ROAD "B" PROJ FORD'S COLONY SECTION 18 DATE 12/27/95

	INLET NUMBER	INLET TYPE	INLET LENGTH (FT)	STATION	DRAINAGE AREA (AC)	C	CA	Σ CA	I IN/HR	Q INCR (CFS)	Q CARRY-OVER (CFS)	Q_T GUTTER FLOW	S GUTTER SLOPE (FT/FT)	Sx CROSS SLOPE (FT/FT)	T (SPREAD)	W (FT)	W/T	Sw (FT/FT)	Sw/Sx	Eo (#10)	a	Sw=a/(12W)	Se(FT/FT)= Sx + SwEo	Lt(FT) 15 P EFFEC LENGTH FT	L/Lt	d (FT)	E (#16)	h (FT)	Q: INTERCEPTED CFS	d/h	Qb CARRY-OVER CFS	T SPREAD @ SAG FT	REMARKS
	4	CI	2	17+50(R)	0.15	0.40	0.06		3.5	0.21	—	0.21	0.045	0.0208	1.4	2	1.4	0.0833	4	1.0											Qb=0		SS#1-4
	3	CI	2	17+50(L)	0.13	0.70	0.09		3.5	0.32	—	0.32	0.045	0.0208	1.5	2	1.3	0.0833	4	1.0											Qb=0		SS#1-3
SUMP	2	CI	2	19+15	0.45	0.40	0.18		3.5	0.63	—	0.63	0.001	0.0208	8 ✓																		
SUMP	2	CI	2	19+15	0.18	0.70	0.13		3.5	0.44	—	0.44	0.001	0.0208	6.5 ✓																		
TOTAL	2	CI	2	19+15								1.07	0.001	0.0208	7.2 ✓																7.2'<10'		SS#1-2

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HYDRAULIC REPORT FOR

FORD'S COLONY

SECTION 18

SYSTEM #3

JOB #5652-18

AES CONSULTING ENGINEERS

5248 OLDE TOWNE ROAD

WILLIAMSBURG, VA. 23188

12/27/95

REVISED 5/18/96

Return Period = 10 Yrs
Rainfall file: JCC

Run Date: 05-18-1996
File: f:FC18-3.ST3

LINE 1 / Q = 17.89 / HT = 24 / WID = 24 / N = .013 / L = 65 / JLC = 1

SS#3-2 - SS#3-1 / Outfall

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	65.18	14.14	64.00	9.29	66.52	23.62	-2	1.93
UPSTRM	66.18	14.14	65.00	9.29	67.52	23.62	3.33	1.93

Drainage area (ac)	= 0.11	Slope of invert (%)	= 1.5385
Runoff coefficient	= 0.70	Slope energy grade line (%)	= 1.5385
Time of conc (min)	= 20.64	Critical depth (in)	= 17.97
Inlet time (min)	= 5.00	Natural ground elev. (ft)	= 70.33
Intensity (in/hr)	= 4.34	Upstream surcharge (ft)	= 0.00
Cumulative C*A	= 4.12	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 17.89	Line capacity (cfs)	= 28.05
Q catchment (cfs)	= 0.54	Inlet length (ft)	= 0.00
Q carryover (cfs)	= 23.94	Gutter slope (ft/ft)	= 0.0000
Q captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.0000
Q bypassed (cfs)	= 24.48	Ponding width (ft)	= N/A

Note: Normal depth assumed

LINE 2 / Q = 0.88 / HT = 12 / WID = 12 / N = .013 / L = 30 / JLC = 1

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

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	67.52	12.00	65.00	1.12	67.54	0.00	4.33	0.79
UPSTRM	67.58	6.03	67.00	2.23	67.66	12.00	2.18	0.40

Drainage area (ac)	= 0.18	Slope of invert (%)	= 6.6667
Runoff coefficient	= 0.70	Slope energy grade line (%)	= 0.3954
Time of conc (min)	= 5.00	Critical depth (in)	= 4.78
Inlet time (min)	= 5.00	Natural ground elev. (ft)	= 70.18
Intensity (in/hr)	= 7.00	Upstream surcharge (ft)	= 0.00
Cumulative C*A	= 0.13	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 0.88	Line capacity (cfs)	= 9.20
Q catchment (cfs)	= 0.88	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)	= 0.88	Ponding width (ft)	= N/A

LINE 3 / Q = 5.84 / HT = 12 / WID = 12 / N = .013 / L = 135 / JLC = 1

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

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	67.52	12.00	65.00	7.44	68.38	0.00	4.33	0.79
UPSTRM	73.16	11.55	72.20	7.53	74.04	4.58	3.16	0.78

Drainage area (ac) =	0.23	Slope of invert (%) =	5.3333
Runoff coefficient =	0.70	Slope energy grade line (%) =	4.1960
Time of conc (min) =	5.41	Critical depth (in) =	11.55
Inlet time (min) =	5.00	Natural ground elev. (ft) =	76.36
Intensity (in/hr) =	6.88	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.85	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	5.84	Line capacity (cfs) =	8.22
Q catchment (cfs) =	1.13	Inlet length (ft) =	0.00
Q carryover (cfs) =	4.81	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	5.94	Ponding width (ft) =	N/A

LINE 4 / Q = 0.98 / HT = 12 / WID = 12 / N = .013 / L = 24 / JLC = 1

SS#3-2C - SS#3-2B / DNLN = 3

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	74.04	12.00	72.20	1.25	74.07	0.00	3.16	0.79
UPSTRM	74.08	12.00	72.70	1.25	74.11	0.00	2.66	0.79

Drainage area (ac) =	0.35	Slope of invert (%) =	2.0833
Runoff coefficient =	0.40	Slope energy grade line (%) =	0.1764
Time of conc (min) =	5.00	Critical depth (in) =	5.04
Inlet time (min) =	5.00	Natural ground elev. (ft) =	76.36
Intensity (in/hr) =	7.00	Upstream surcharge (ft) =	0.38
Cumulative C*A =	0.14	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	0.98	Line capacity (cfs) =	5.14
Q catchment (cfs) =	0.98	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) =	0.98	Ponding width (ft) =	N/A

LINE 5 / Q = 3.80 / HT = 12 / WID = 12 / N = .013 / L = 65 / JLC = 1

SS#3-2D - SS#3-2B / DNLN = 3

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	74.04	12.00	72.20	4.84	74.41	0.00	3.16	0.79
UPSTRM	75.33	9.92	74.50	5.48	75.79	9.08	2.29	0.69

Drainage area (ac) =	0.48	Slope of invert (%) =	3.5385
Runoff coefficient =	0.40	Slope energy grade line (%) =	2.1319
Time of conc (min) =	5.20	Critical depth (in) =	9.92
Inlet time (min) =	5.00	Natural ground elev. (ft) =	77.79
Intensity (in/hr) =	6.94	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.55	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	3.80	Line capacity (cfs) =	6.70
Q catchment (cfs) =	1.34	Inlet length (ft) =	0.00
Q carryover (cfs) =	2.49	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	3.83	Ponding width (ft) =	N/A

LINE 6 / Q = 2.49 / HT = 12 / WID = 12 / N = .013 / L = 45 / JLC = 1

SS#3-2E - SS#3-2D / DNLN = 5

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	75.79	12.00	74.50	3.17	75.95	0.00	2.29	0.79
UPSTRM	76.48	8.03	75.50	4.46	76.79	11.29	2.01	0.56

Drainage area (ac) =	0.89	Slope of invert (%) =	2.2222
Runoff coefficient =	0.40	Slope energy grade line (%) =	1.8623
Time of conc (min) =	5.00	Critical depth (in) =	8.03
Inlet time (min) =	5.00	Natural ground elev. (ft) =	78.52
Intensity (in/hr) =	7.00	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.36	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	2.49	Line capacity (cfs) =	5.31
Q catchment (cfs) =	2.49	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) =	2.49	Ponding width (ft) =	N/A

LINE 7 / Q = 13.35 / HT = 24 / WID = 24 / N = .013 / L = 24 / JLC = 1

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

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	67.52	24.00	65.00	4.25	67.80	0.00	3.33	3.14
UPSTRM	67.40	16.76	66.00	5.70	67.90	22.03	2.33	2.34

Drainage area (ac) =	0.34	Slope of invert (%) =	4.1667
Runoff coefficient =	0.40	Slope energy grade line (%) =	0.4223
Time of conc (min) =	20.56	Critical depth (in) =	15.52
Inlet time (min) =	10.00	Natural ground elev. (ft) =	70.33
Intensity (in/hr) =	4.35	Upstream surcharge (ft) =	0.00
Cumulative C*A =	3.07	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	13.35	Line capacity (cfs) =	46.17
Q catchment (cfs) =	0.79	Inlet length (ft) =	0.00
Q carryover (cfs) =	16.33	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	17.12	Ponding width (ft) =	N/A

LINE 8 / Q = 12.78 / HT = 24 / WID = 24 / N = .013 / L = 25 / JLC = 1

SS#3-4 - SS#3-3 / DNLN = 7

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	67.90	22.81	66.00	4.14	68.17	23.40	2.33	3.08
UPSTRM	67.79	16.66	66.40	5.49	68.26	22.12	1.77	2.33

Drainage area (ac) =	0.52	Slope of invert (%) =	1.6000
Runoff coefficient =	0.40	Slope energy grade line (%) =	0.3569
Time of conc (min) =	20.48	Critical depth (in) =	15.19
Inlet time (min) =	10.00	Natural ground elev. (ft) =	70.18
Intensity (in/hr) =	4.36	Upstream surcharge (ft) =	0.00
Cumulative C*A =	2.93	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	12.78	Line capacity (cfs) =	28.61
Q catchment (cfs) =	1.21	Inlet length (ft) =	0.00
Q carryover (cfs) =	15.12	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	16.33	Ponding width (ft) =	N/A

LINE 9 / Q = 11.94 / HT = 24 / WID = 24 / N = .013 / L = 70 / JLC = 1

SS#3-5 - SS#3-4 / DNLN = 8

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	68.26	22.28	66.40	3.93	68.50	23.12	1.77	3.04
UPSTRM	68.25	15.03	67.00	5.77	68.77	23.22	1.87	2.07

Drainage area (ac) =	0.05	Slope of invert (%) =	0.8571
Runoff coefficient =	0.70	Slope energy grade line (%) =	0.3901
Time of conc (min) =	20.23	Critical depth (in) =	14.68
Inlet time (min) =	5.00	Natural ground elev. (ft) =	70.87
Intensity (in/hr) =	4.38	Upstream surcharge (ft) =	0.00
Cumulative C*A =	2.72	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	11.94	Line capacity (cfs) =	20.94
Q catchment (cfs) =	0.24	Inlet length (ft) =	0.00
Q carryover (cfs) =	14.88	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	15.12	Ponding width (ft) =	N/A

LINE 10 / Q = 11.80 / HT = 18 / WID = 18 / N = .013 / L = 30 / JLC = 1

SS#3-5A - SS#3-5 / DNLN = 9

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	68.77	18.00	67.00	6.68	69.46	0.00	2.37	1.77
UPSTRM	69.83	15.93	68.50	7.13	70.62	11.48	2.11	1.65

Drainage area (ac) =	0.25	Slope of invert (%) =	5.0000
Runoff coefficient =	0.40	Slope energy grade line (%) =	3.8543
Time of conc (min) =	20.16	Critical depth (in) =	15.93
Inlet time (min) =	5.00	Natural ground elev. (ft) =	72.11
Intensity (in/hr) =	4.39	Upstream surcharge (ft) =	0.00
Cumulative C*A =	2.69	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	11.80	Line capacity (cfs) =	23.48
Q catchment (cfs) =	0.70	Inlet length (ft) =	0.00
Q carryover (cfs) =	14.18	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	14.88	Ponding width (ft) =	N/A

LINE 11 / Q = 11.38 / HT = 18 / WID = 18 / N = .013 / L = 24 / JLC = 1

SS#3-6 - SS#3-5A / DNLN = 10

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	70.62	18.00	68.50	6.44	71.26	0.00	2.11	1.77
UPSTRM	70.90	18.00	68.80	6.44	71.54	0.00	1.8	1.77

Drainage area (ac) =	0.06	Slope of invert (%) =	1.2500
Runoff coefficient =	0.70	Slope energy grade line (%) =	1.1748
Time of conc (min) =	20.10	Critical depth (in) =	15.64
Inlet time (min) =	5.00	Natural ground elev. (ft) =	72.11
Intensity (in/hr) =	4.40	Upstream surcharge (ft) =	0.60
Cumulative C*A =	2.59	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	11.38	Line capacity (cfs) =	11.74
Q catchment (cfs) =	0.29	Inlet length (ft) =	0.00
Q carryover (cfs) =	13.88	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	14.18	Ponding width (ft) =	N/A

LINE 12 / Q = 4.58 / HT = 12 / WID = 12 / N = .013 / L = 35 / JLC = 1

SS#3-6A - SS#3-6 / DNLN = 11

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	71.54	12.00	68.80	5.83	72.07	0.00	2.3	0.79
UPSTRM	72.12	12.00	71.00	5.83	72.65	0.00	2.34	0.79

Drainage area (ac) =	1.48	Slope of invert (%) =	6.2857
Runoff coefficient =	0.35	Slope energy grade line (%) =	1.6509
Time of conc (min) =	20.00	Critical depth (in) =	10.81
Inlet time (min) =	20.00	Natural ground elev. (ft) =	74.35
Intensity (in/hr) =	4.41	Upstream surcharge (ft) =	0.12
Cumulative C*A =	1.04	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	4.58	Line capacity (cfs) =	8.93
Q catchment (cfs) =	2.28	Inlet length (ft) =	0.00
Q carryover (cfs) =	3.02	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	5.30	Ponding width (ft) =	N/A

LINE 13 / Q = 3.02 / HT = 12 / WID = 12 / N = .013 / L = 100 / JLC = 1

SS#3-6B - SS#3-6A / DNLN = 12

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	72.65	12.00	71.00	3.84	72.88	0.00	2.34	0.79
UPSTRM	77.10	8.84	76.00	4.87	77.47	10.57	-1	0.62

Drainage area (ac)	= 1.30	Slope of invert (%)	= 5.0000
Runoff coefficient	= 0.40	Slope energy grade line (%)	= 4.5937
Time of conc (min)	= 10.00	Critical depth (in)	= 8.84
Inlet time (min)	= 10.00	Natural ground elev. (ft)	= 76.00
Intensity (in/hr)	= 5.81	Upstream surcharge (ft)	= 0.10
Cumulative C*A	= 0.52	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 3.02	Line capacity (cfs)	= 7.96
Q catchment (cfs)	= 3.02	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)	= 3.02	Ponding width (ft)	= N/A

LINE 14 / Q = 8.13 / HT = 15 / WID = 15 / N = .013 / L = 35 / JLC = 1

SS#3-7 - SS#3-6 / DNLN = 11

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	71.54	15.00	68.80	6.62	72.23	0.00	2.05	1.23
UPSTRM	72.10	15.00	70.20	6.62	72.78	0.00	1.76	1.23

Drainage area (ac)	= 0.30	Slope of invert (%)	= 4.0000
Runoff coefficient	= 0.40	Slope energy grade line (%)	= 1.5841
Time of conc (min)	= 12.36	Critical depth (in)	= 13.73
Inlet time (min)	= 5.00	Natural ground elev. (ft)	= 73.21
Intensity (in/hr)	= 5.39	Upstream surcharge (ft)	= 0.65
Cumulative C*A	= 1.51	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 8.13	Line capacity (cfs)	= 12.91
Q catchment (cfs)	= 0.84	Inlet length (ft)	= 0.00
Q carryover (cfs)	= 7.74	Gutter slope (ft/ft)	= 0.0000
Q captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.0000
Q bypassed (cfs)	= 8.58	Ponding width (ft)	= N/A

LINE 15 / Q = 0.81 / HT = 12 / WID = 12 / N = .013 / L = 24 / JLC = 1

SS#3-7A - SS#3-7 / DNLN = 14

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	72.78	12.00	70.20	1.03	72.80	0.00	2.01	0.79
UPSTRM	72.81	12.00	70.50	1.03	72.83	0.00	1.7	0.79

Drainage area (ac) =	0.29	Slope of invert (%) =	1.2500
Runoff coefficient =	0.40	Slope energy grade line (%) =	0.1211
Time of conc (min) =	5.00	Critical depth (in) =	4.58
Inlet time (min) =	5.00	Natural ground elev. (ft) =	73.21
Intensity (in/hr) =	7.00	Upstream surcharge (ft) =	1.31
Cumulative C*A =	0.12	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	0.81	Line capacity (cfs) =	3.98
Q catchment (cfs) =	0.81	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) =	0.81	Ponding width (ft) =	N/A

LINE 16 / Q = 6.91 / HT = 12 / WID = 12 / N = .013 / L = 150 / JLC = 1

SS#3-8 - SS#3-7 / DNLN = 14

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	72.78	12.00	70.20	8.80	73.98	0.00	2.01	0.79
UPSTRM	82.98	11.75	82.00	8.85	84.19	3.45	2.51	0.78

Drainage area (ac) =	1.37	Slope of invert (%) =	7.8667
Runoff coefficient =	0.40	Slope energy grade line (%) =	6.8073
Time of conc (min) =	12.08	Critical depth (in) =	11.75
Inlet time (min) =	12.00	Natural ground elev. (ft) =	85.52
Intensity (in/hr) =	5.44	Upstream surcharge (ft) =	0.00
Cumulative C*A =	1.27	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	6.91	Line capacity (cfs) =	9.99
Q catchment (cfs) =	2.99	Inlet length (ft) =	0.00
Q carryover (cfs) =	3.94	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	6.93	Ponding width (ft) =	N/A

LINE 17 / Q = 3.94 / HT = 12 / WID = 12 / N = .013 / L = 24 / JLC = 1

SS#3-8A - SS#3-8 / DNLN = 16

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	84.19	12.00	82.00	5.02	84.59	0.00	2.51	0.79
UPSTRM	84.88	12.00	82.50	5.02	85.27	0.00	2.01	0.79

Drainage area (ac) =	1.81	Slope of invert (%) =	2.0833
Runoff coefficient =	0.40	Slope energy grade line (%) =	1.2272
Time of conc (min) =	12.00	Critical depth (in) =	10.11
Inlet time (min) =	12.00	Natural ground elev. (ft) =	85.52
Intensity (in/hr) =	5.45	Upstream surcharge (ft) =	1.38
Cumulative C*A =	0.72	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	3.94	Line capacity (cfs) =	5.14
Q catchment (cfs) =	3.94	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) =	3.94	Ponding width (ft) =	N/A

ROADSIDE DITCH DESIGN

TC = 10min

I_{10} = 5.5 in/hr
I_2 = 4.0 in/hr

c = 0.30

PROJECT FC 18
DATE
PROJ# SGS2-18

NAME OF STREET

FROM STATION (DIRECTION	TO STATION OF FLOW)	LEFT OR RIGHT	A AC	$Q_2 = CI_2A$ CFS	CUMULA Q_2 CFS	AVG SLOPE FT/FT	ACTUAL VEL_2 FPS	ALLOW VEL_2 FPS	LINING TYPE	$Q_{10} = CI_{10}A$ CFS	CUM Q_{10} CFS	ACT VEL_{10} FPS	DEPTH OF $FLOW_{10}$ IN.	REMARKS
DRAINAGE BETWEEN LOTS	DITCH 30 & 31	—	1.3	1.6	1.6	0.09	8.5	—	PAVED	2.2	2.2	10.0	4.9	USE PAVED V-DITCH W/2:1 SS, DEPTH=6
DRAINAGE DITCH BET. LOTS 13 AND 14			9.8	11.8	11.8	0.05	4.5	10.0	EC-3	16.2	16.2	5.0	15	USE EC-3 W/2:1 SS LINED V-DITCH DEPTH=1.
DRAINAGE DITCH BET. LOTS 5 AND 6			0.9	2.2	2.2	0.035	1.2	3.5	GRASS	1.5	1.5	2.3	7	USE GRASS V-DITC W/2:1 SS, DEPTH=1.
" BETWEEN LOTS 8 AND 9			1.7	2.0	2.0	0.12	3.5	4.0	EC-2	2.8	2.8	4.0	7	USE EC-2 W/2:1 SS, LINED V-D DEPTH=1.

HYDRAULIC REPORT FOR

FORD'S COLONY

SECTION 18

SYSTEM #1

JOB #5652-18

AES CONSULTING ENGINEERS

5248 OLDE TOWNE ROAD

WILLIAMSBURG, VA. 23188

12/27/95

STORM SEWER DESIGN / ANALYSIS

Return Period = 10 Yrs
Rainfall file: JCC

Run Date: 01-31-1996
File: f:FC18-1.ST3

LINE 1 / Q = 3.01 / HT = 12 / WID = 12 / N = .013 / L = 100 / JLC = 1

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

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	60.37	4.39	60.00	11.54	62.43	11.56	-1	0.26
UPSTRM	69.37	4.39	69.00	11.54	71.43	11.56	3	0.26

Drainage area (ac) =	0.63	Slope of invert (%) =	9.0000
Runoff coefficient =	0.40	Slope energy grade line (%) =	9.0000
Time of conc (min) =	6.01	Critical depth (in) =	8.82
Inlet time (min) =	5.00	Natural ground elev. (ft) =	73.00
Intensity (in/hr) =	6.71	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.45	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	3.01	Line capacity (cfs) =	10.68
Q catchment (cfs) =	1.76	Inlet length (ft) =	0.00
Q carryover (cfs) =	0.73	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	2.50	Ponding width (ft) =	N/A

Note: Normal depth assumed

LINE 2 / Q = 1.36 / HT = 12 / WID = 12 / N = .013 / L = 120 / JLC = 1

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

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	71.43	12.00	69.00	1.73	71.48	0.00	3	0.79
UPSTRM	72.99	5.93	72.50	3.51	73.19	12.00	2.36	0.39

Drainage area (ac) =	0.13	Slope of invert (%) =	2.9167
Runoff coefficient =	0.70	Slope energy grade line (%) =	1.4204
Time of conc (min) =	5.25	Critical depth (in) =	5.93
Inlet time (min) =	0.00	Natural ground elev. (ft) =	75.86
Intensity (in/hr) =	6.92	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.20	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	1.36	Line capacity (cfs) =	6.08
Q catchment (cfs) =	0.00	Inlet length (ft) =	0.00
Q carryover (cfs) =	0.73	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	0.73	Ponding width (ft) =	N/A

LINE 3 / Q = 0.73 / HT = 12 / WID = 12 / N = .013 / L = 24 / JLC = 1

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

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	73.19	8.22	72.50	1.28	73.21	9.93	2.36	0.57
UPSTRM	73.24	5.84	72.70	1.94	73.30	12.00	2.16	0.38

Drainage area (ac)	= 0.15	Slope of invert (%)	= 0.8333
Runoff coefficient	= 0.70	Slope energy grade line (%)	= 0.1423
Time of conc (min)	= 5.00	Critical depth (in)	= 4.36
Inlet time (min)	= 5.00	Natural ground elev. (ft)	= 75.86
Intensity (in/hr)	= 7.00	Upstream surcharge (ft)	= 0.00
Cumulative C*A	= 0.11	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 0.73	Line capacity (cfs)	= 3.25
Q catchment (cfs)	= 0.73	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)	= 0.73	Ponding width (ft)	= N/A

HYDRAULIC REPORT FOR

FORD'S COLONY

SECTION 18

SYSTEM #2

JOB #5652-18

AES CONSULTING ENGINEERS

5248 OLDE TOWNE ROAD

WILLIAMSBURG, VA. 23188

12/27/95

STORM SEWER DESIGN / ANALYSIS

Return Period = 10 Yrs
Rainfall file: JCC

Run Date: 01-31-1996
File: f:FC18-2.ST3

LINE 1 / Q = 5.10 / HT = 15 / WID = 15 / N = .013 / L = 75 / JLC = 1

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

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	67.40	4.78	67.00	15.15	70.96	13.98	-1.25	0.34
UPSTRM	77.60	4.78	77.20	15.15	81.16	13.98	3.1	0.34

Drainage area (ac) =	0.23	Slope of invert (%)	=13.6000
Runoff coefficient =	0.70	Slope energy grade line (%)	=13.6000
Time of conc (min) =	5.65	Critical depth (in)	= 10.84
Inlet time (min) =	5.00	Natural ground elev. (ft)	= 81.55
Intensity (in/hr) =	6.81	Upstream surcharge (ft)	= 0.00
Cumulative C*A =	0.75	Additional Q (cfs)	= 0.00
Q = CA * I (cfs) =	5.10	Line capacity (cfs)	= 23.81
Q catchment (cfs) =	1.13	Inlet length (ft)	= 0.00
Q carryover (cfs) =	4.11	Gutter slope (ft/ft)	= 0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft)	= 0.0000
Q bypassed (cfs) =	5.24	Ponding width (ft)	= N/A

Note: Normal depth assumed

LINE 2 / Q = 4.03 / HT = 15 / WID = 15 / N = .013 / L = 24 / JLC = 1

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

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	81.16	15.00	77.20	3.28	81.33	0.00	3.1	1.23
UPSTRM	81.25	15.00	77.80	3.28	81.42	0.00	2.5	1.23

Drainage area (ac) =	0.54	Slope of invert (%)	= 2.5000
Runoff coefficient =	0.40	Slope energy grade line (%)	= 0.3886
Time of conc (min) =	5.53	Critical depth (in)	= 9.63
Inlet time (min) =	5.00	Natural ground elev. (ft)	= 81.55
Intensity (in/hr) =	6.85	Upstream surcharge (ft)	= 2.20
Cumulative C*A =	0.59	Additional Q (cfs)	= 0.00
Q = CA * I (cfs) =	4.03	Line capacity (cfs)	= 10.21
Q catchment (cfs) =	1.51	Inlet length (ft)	= 0.00
Q carryover (cfs) =	2.60	Gutter slope (ft/ft)	= 0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft)	= 0.0000
Q bypassed (cfs) =	4.11	Ponding width (ft)	= N/A

LINE 3 / Q = 2.57 / HT = 12 / WID = 12 / N = .013 / L = 35 / JLC = 1

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

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	81.42	12.00	77.80	3.27	81.59	0.00	2.75	0.79
UPSTRM	81.60	12.00	78.75	3.27	81.77	0.00	2.16	0.79

Drainage area (ac) =	0.26	Slope of invert (%) =	2.7143
Runoff coefficient =	0.40	Slope energy grade line (%) =	0.5190
Time of conc (min) =	5.35	Critical depth (in) =	8.15
Inlet time (min) =	5.00	Natural ground elev. (ft) =	81.92
Intensity (in/hr) =	6.90	Upstream surcharge (ft) =	1.85
Cumulative C*A =	0.37	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	2.57	Line capacity (cfs) =	5.87
Q catchment (cfs) =	0.73	Inlet length (ft) =	0.00
Q carryover (cfs) =	1.88	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	2.60	Ponding width (ft) =	N/A

LINE 4 / Q = 1.88 / HT = 12 / WID = 12 / N = .013 / L = 50 / JLC = 1

SS#2-3B - SS#2-3A / DNLN = 3

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	81.77	12.00	78.75	2.39	81.86	0.00	2.16	0.79
UPSTRM	82.00	12.00	80.20	2.39	82.08	0.00	2.31	0.79

Drainage area (ac) =	0.67	Slope of invert (%) =	2.9000
Runoff coefficient =	0.40	Slope energy grade line (%) =	0.2774
Time of conc (min) =	5.00	Critical depth (in) =	6.97
Inlet time (min) =	5.00	Natural ground elev. (ft) =	83.52
Intensity (in/hr) =	7.00	Upstream surcharge (ft) =	0.80
Cumulative C*A =	0.27	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	1.88	Line capacity (cfs) =	6.06
Q catchment (cfs) =	1.88	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) =	1.88	Ponding width (ft) =	N/A

LD-269
Rev 3-83

Project FORD'S COLONY SECTION 18

Plan Sheet No. ____ Designer ____
Rev. Date ____ Date ____

Sheet ____ of ____

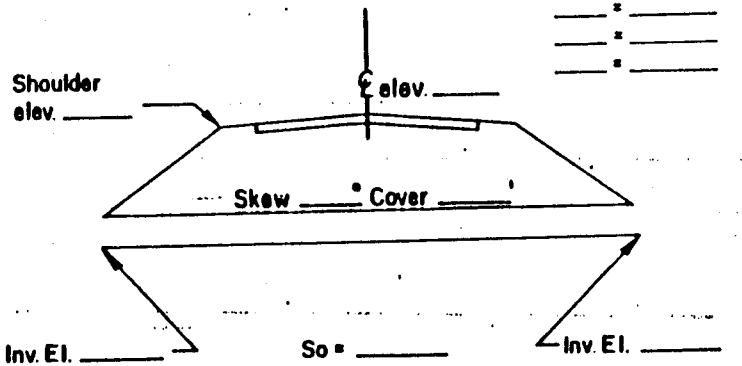
HYDROLOGICAL DATA:
D.A. = 117.7 AC.

$Q = CIA$
$C = 0.20$
$I_{10} = 2.9$ in/hr
$T_c = 40$ min

AHW Controls
100 yr. Flood plain ____ elev. ____
Design AHW depth ____ elev. ____
Structures ____ elev. ____

STATION ____

freq. TWelev.
____ = ____
____ = ____
____ = ____
____ = ____
____ = ____



DISCHARGES USED
Q 10 = 68.3 CFS
Q ____ = ____ CFS
Q ____ = ____ CFS
Q ____ = ____ CFS
Q ____ = ____ CFS

RISK ASSESSMENT
ADT ____
Detours Available ____, Length ____
Overtopping Stage ____
Flood Plain Management ____
Criteria and Significant Impact ____

240 A

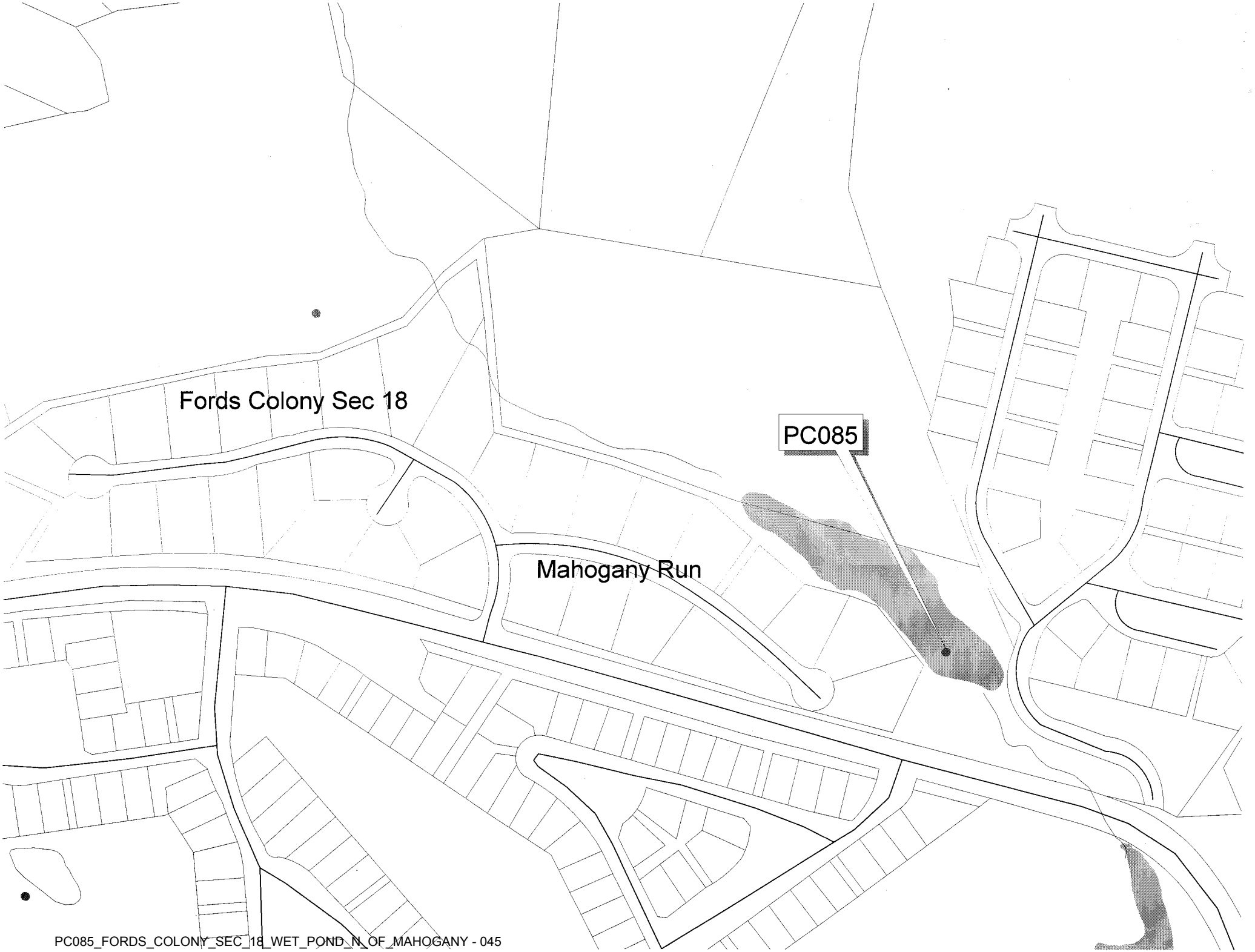
CULVERT TYPE & SIZE	Q	Q/B	HEADWATER COMPUTATIONS									CONT. HW. ELEV.	OUTLET VELOCITY		End Treat.	COMMENTS
			INLET CONT.		OUTLET CONTROL											
			HW/D	HW	Ke	dc	$\frac{dc+D}{2}$	ho	H	LSo	HW		C.M.	Smooth		
48" CMP	68.3		0.97	3.88	0.5	2.6	3.3	3.3	1.1	0.4	4.0	4.0				HW ELEV OF OUTLET CONTROL
(OR 4-24" CMP)																

Design Flood Exceed Prob. ____ Elev. ____
Overtop Flood Exceed Prob. ____ Elev. ____
Base Flood 1% Exceed Prob. ____ Elev. ____

WATERSHED	PC	MAINTENANCE PLAN	No	CTRL STRUC DESC	Riser
BMP ID NO	085	SITE AREA acre	2400	CTRL STRUC SIZE inches	72
PLAN NO	S-98-87	LAND USE	SF Residential	OTLT BARRL DESC	Alum Barrel
TAX PARCEL	(31-03)(01-1B)	old BMP TYP	Wet Pond	OTLT BARRL SIZE inch	54
PIN NO	3131000001B	JCC BMP CODE			
CONSTRUCTION DATE	1/1/1991	POINT VALUE	6	EMERG SPILLWAY	No
PROJECT NAME	Fords Colony Sec. 18			DESIGN HW ELEV	60.0
FACILITY LOCATION	Behind (North) of 129 Mahogany Run			PERM POOL ELE	57.0
CITY-STATE	Williamsburg, Va. 23188	SVC DRAIN AREA acres	164.6	2-YR OUTFLOW cfs	
CURRENT OWNER	Fords Colony at Williamsburg HOA			10-YR OUTFLOW cfs	
OWNER ADDRESS	1 Fords Colony Drive			REC DRAWING	No
OWNER ADDRESS 2		SERVICE AREA DESCRI	FC Sec 18 & Offsite Area		
CITY-STATE-ZIP CODE	Williamsburg, Va. 23188	IMPERV AREA acres		CONSTR CERTI	No
OWNER PHONE		RECV STREAM	UT of Powhatan Creek		
MAINT AGREEMENT	Yes	EXT DET-WQ-CTRL	Yes	LAST INSP DATE	9/11/2000
EMERG ACTION PLAN	No	WTR QUAL VOL acre-ft	16.5	INTERNAL RATING	4
		CHAN PROT CTRL	No	MISC/COMMENTS	
		CHAN PROT VOL acre-ft	0	Sec 18 S-32-96. 2.41 acre greenway FC Sec 18.	
		SW/FLOOD CONTROL	Yes		
		GEOTECH REPORT	No		

Get Last BMP No

Return to Menu



PC085_FORDS_COLONY_SEC_18_WET_POND_N_OF_MAHOGANY - 045