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: PC066

PIN: 3310100028

Subdivision, Tract, Business or Owner Name (if known): Prime Outlets

Property Description: Regional Shopping Center

Site Address: 5715 Richmond Road

(For internal use only) **Box** 6 **Drawer:** 3

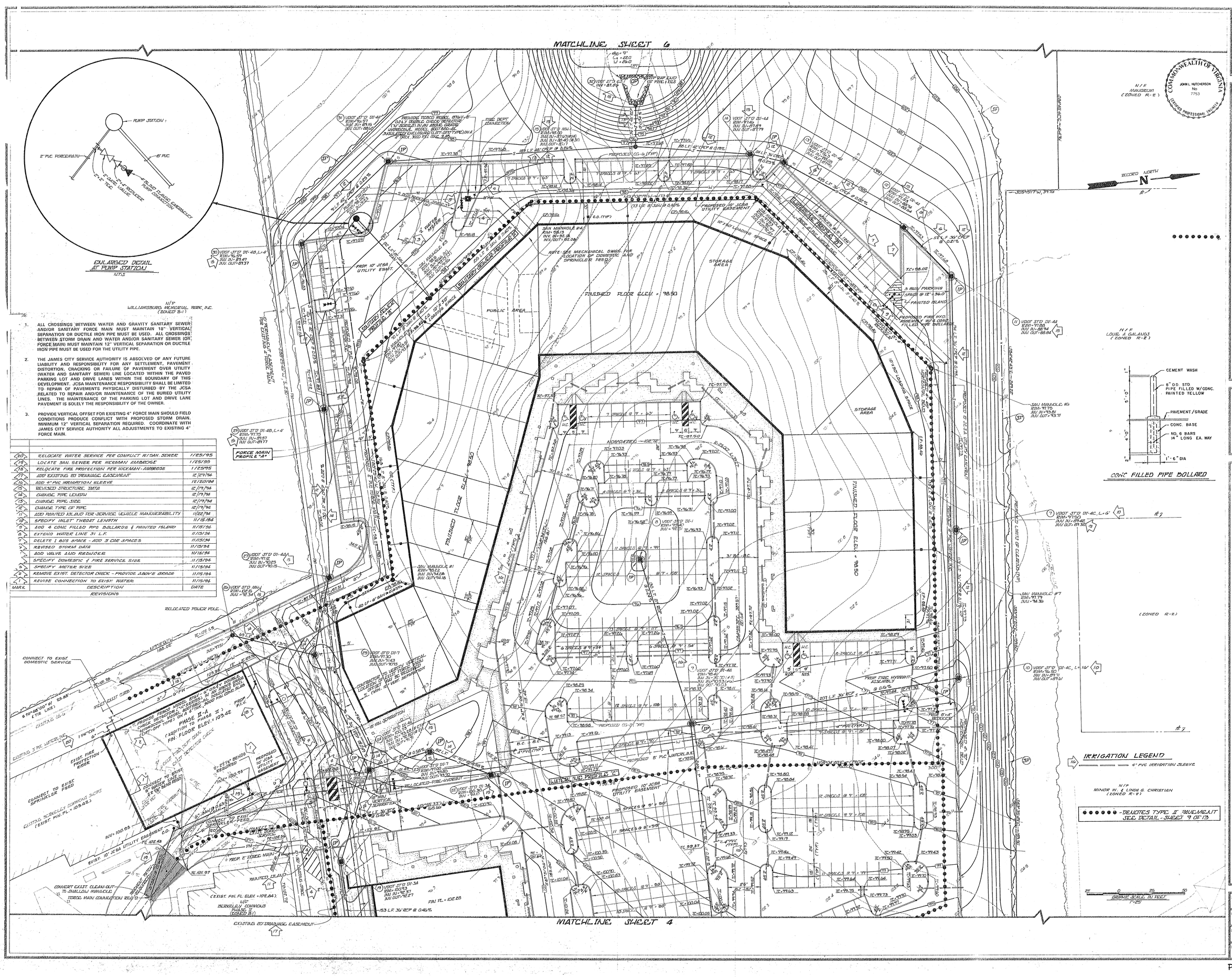
Agreements: (in file as of scan date) **N** **Book or Doc#:** **Page:**

Comments

WATERSHED	PC	MAINTENANCE PLAN	No	CTRL STRUC DESC	CMP Riser
BMP ID NO	066	SITE AREA acre	15.33	CTRL STRUC SIZE inches	72
PLAN NO		LAND USE	Bus/Comm	OTLT BARRL DESC	CMP Barrel
TAX PARCEL	(33-01)(01-28)	old BMP TYP	Dry Detention	OTLT BARRL SIZE inch	48
PIN NO	3310100028	JCC BMP CODE			
CONSTRUCTION DATE		POINT VALUE	6	EMERG SPILLWAY	Yes
PROJECT NAME	Prime Outlets (Berkeleys Commons)			DESIGN HW ELEV	91.83
FACILITY LOCATION	5715 Richmond Road			PERM POOL ELEV	na
CITY-STATE	Williamsburg, Va. 23188	SVC DRAIN AREA acres	60.33	2-YR OUTFLOW cfs	43.25
CURRENT OWNER	Williamsburg Outlets LLC			10-YR OUTFLOW cfs	100.47
OWNER ADDRESS	5211 International Drive			REC DRAWING	Yes
OWNER ADDRESS 2		SERVICE AREA DESCRI	Buildings & Parking Area		
CITY-STATE-ZIP CODE	Orlando, FL 32819	IMPERV AREA acres		CONSTR CERTI	No
OWNER PHONE		RECV STREAM	UT of Powhatan Creek		
MAINT AGREEMENT	Yes	EXT DET-WQ-CTRL	No	LAST INSP DATE	7/31/2000
EMERG ACTION PLAN	No	WTR QUAL VOL acre-ft	0	INTERNAL RATING	4
		CHAN PROT CTRL	No	MISC/COMMENTS	
		CHAN PROT VOL acre-ft	3.7	form Berkeley Comm Ph 4. Serves Phase I-III and IV.	
		SW/FLOOD CONTROL	No		
		GEOTECH REPORT	No		

Get Last BMP No

Return to Menu



1. ALL CROSSINGS BETWEEN WATER AND GRAVITY SANITARY SEWER AND/OR SANITARY FORCE MAIN MUST MAINTAIN 18" VERTICAL SEPARATION OR DUCTILE IRON PIPE MUST BE USED. ALL CROSSINGS BETWEEN STORM DRAIN AND WATER AND/OR SANITARY SEWER (OR FORCE MAIN) MUST MAINTAIN 12" VERTICAL SEPARATION OR DUCTILE IRON PIPE MUST BE USED FOR THE UTILITY PIPE.

2. THE JAMES CITY SERVICE AUTHORITY IS ABSOLVED OF ANY FUTURE LIABILITY AND RESPONSIBILITY FOR ANY SETTLEMENT, PAVEMENT DISTORTION, CRACKING OR FAILURE OF PAVEMENT OVER UTILITY (WATER AND SANITARY SEWER) LINE LOCATED WITHIN THE PAVED PARKING LOT AND DRIVE LANES WITHIN THE BOUNDARY OF THIS DEVELOPMENT. JCSA MAINTENANCE RESPONSIBILITY SHALL BE LIMITED TO REPAIR OF PAVEMENTS PHYSICALLY DISTURBED BY THE JCSA RELATED TO REPAIR AND/OR MAINTENANCE OF THE BURIED UTILITY LINES. THE MAINTENANCE OF THE PARKING LOT AND DRIVE LANE PAVEMENT IS SOLELY THE RESPONSIBILITY OF THE OWNER.

3. PROVIDE VERTICAL OFFSET FOR EXISTING 4" FORCE MAIN SHOULD FIELD CONDITIONS PRODUCE CONFLICT WITH PROPOSED STORM DRAIN. MINIMUM 12" VERTICAL SEPARATION REQUIRED. COORDINATE WITH JAMES CITY SERVICE AUTHORITY ALL ADJUSTMENTS TO EXISTING 4" FORCE MAIN.

MARK	DESCRIPTION	DATE
20	RELOCATE WATER SERVICE PER CONFLICT W/SAN. SEWER	1/25/95
19	LOCATE SAN. SEWER PER HICKMAN AMBROSE	1/25/95
18	RELOCATE FIRE PROTECTION PER HICKMAN-AMBROSE	1/25/95
17	ADD EXISTING 20' DRAINAGE EASEMENT	12/29/94
16	ADD 4" PVC IRRIGATION SLEEVE	12/20/94
15	REVISED STRUCTURE DATA	12/19/94
14	CHANGE PIPE LENGTH	12/19/94
13	CHANGE PIPE SIZE	12/19/94
12	CHANGE TYPE OF PIPE	12/19/94
11	ADD PAINTED ISLAND FOR SERVICE VEHICLE MANUVERABILITY	11/22/94
10	SPECIFY INLET THROAT LENGTH	11/15/94
9	ADD 4 CONC FILLED PIPE BOLLARDS & PAINTED ISLAND	11/15/94
8	EXTEND WATER LINE 31 L.F.	11/15/94
7	DELETE 1 BUS SPACE - ADD 5 CAR SPACES	11/15/94
6	REVISED STORM DATA	11/15/94
5	ADD VALVE AND REDUCER	11/15/94
4	SPECIFY DOMESTIC & FIRE SERVICE SIZE	11/15/94
3	SPECIFY METER SIZE	11/15/94
2	REMOVE EXIST. DETECTOR CHECK - PROVIDE ABOVE GRADE	11/15/94
1	REVISE CONNECTION TO EXIST. WATER	11/15/94

REVISIONS

COMMONWEALTH OF VIRGINIA
STEPHEN A. ROMEO
No. 1445-B

COMMONWEALTH OF VIRGINIA
JOHN L. HUTCHERSON
No. 7753
CERTIFIED PROFESSIONAL ENGINEER

Langley and McDonald, P.C.
Engineers · Surveyors · Planners
Landscape Architects · Environmental Consultants
WILLIAMSBURG VIRGINIA BEACH

DES.	MRG
DWN.	GSW
CHK.	SAR
DATE	AUGUST 31, 1994

BERKELEY COMMONS

PHASE II-A (ADDITION TO PHASE II) AND PHASE IV

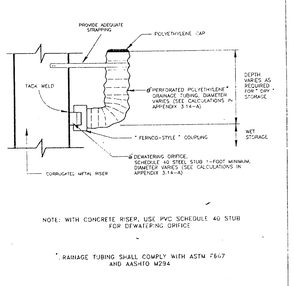
OWNED BY

MG SHOPPING CENTERS LIMITED PARTNERSHIP

SITE PLAN

SHEET	5 OF 13
DISK	
PROJ. NO.	87040
DWG.	5367EW

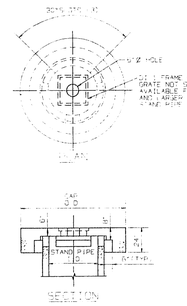
RECOMMENDED DEWATERING SYSTEM FOR SEDIMENT BASINS



NOTE: WITH CONCRETE RISER, USE PVC SCHEDULE 40 STUB FOR DEWATERING ORIFICE

*DRAINAGE TUBING SHALL COMPLY WITH ASTM F667 AND AASHTO M294

STAND-PIPE ID	CAP OD	APPROX. CAP WT (lbs)
24"	51"	2141
27"	58"	1 527*
30"	58"	1 329*
36"	66½"	1 753*
42"	73½"	2 053*
48"	80½"	2 173*
54"	87½"	2 573*
60"	94½"	2 913*
66"	101½"	3 298*
72"	107"	3 409*
78"	114"	3 769*
84"	124"	4 809*
96"	133"	5 506*
108"	147"	5 822*



ANTI-VORTEX DEVICE

CRP CONCRETE PIPE & PRODUCTS CO., INC.

DATE OCT. 24-93

PAGE 14

REVISIONS		
MARK	DESCRIPTION	DATE
1	REVISE LENGTH OF 48" RCP THRU DAM	11/15/94
2	REVISE EW-1 TO EW-2	11/16/94
3	REVISE 6" D.I.P. TO 12" D.I.P.	11/15/94
4	REVISE LIMITS OF CLEARING	11/15/94
5	ADD 255 L.F. OF SILT FENCE PER COUNTY	11/15/94
6	REVISE 3:1 SLOPE TO 2:1	11/15/94
7	REVISE CONTOURS-(ADDITIONAL EXCAVATION)	11/15/94
8	MODIFY GRATE TOP FOR 72" DIA. PIPE	12/20/94
9	DELETE GRATE; PROVIDE ANTI-VORTEX TRASH RACK	1/20/95
10	ALLOW CORR. METAL EQUIVALENT ALTERNATE	1/20/95
11	MODIFY BASE PER CONC. TRASH RACK	1/20/95

1992 3.14

TABLE 3.14-D

CONCENTRIC TRASH RACK AND ANTI-VORTEX DEVICE DESIGN TABLE

Riser Diam., in.	Cylinder Diameter, inches	Cylinder Thickness, gage	Height, inches	Minimum Size Support Bar	Minimum Top Thickness	Minimum Top Stiffener
12	18	16	6	#6 Rebar or 1½ x 1½ x 3/16 angle	16 ga (F&C)	-
15	21	16	7	- -	- -	-
18	27	16	8	- -	- -	-
21	30	16	11	-	16 ga.(C), 14 ga.(F)	-
24	36	16	13	- -	- -	-
27	42	16	15	- -	- -	-
36	54	14	17	#8 Rebar	14 ga.(C), 12 ga.(F)	-
42	60	16	19	- -	- -	-
48	72	16	21	1¼" pipe or 1½ x 1½ x ¼ angle	14 ga.(C), 10 ga.(F)	-
54	78	16	25	- -	- -	-
60	90	14	29	1½" pipe or 1½ x 1½ x ¼ angle	12 ga.(C), 8 ga.(F)	-
66	96	14	33	2" pipe or 2 x 2 x 3/16 angle	12 ga.(C), 8 ga.(F) w/stiffener	2 x 2 x ¼ angle
72	102	14	36	-	- -	2½ x 2½ x ¼ angle
78	114	14	39	2½" pipe or 2 x 2 x ¼ angle	- -	- -
84	120	12	42	2½" pipe or 2½ x 2½ x ¼ angle	- -	2½ x 2½ x 3/16 angle

Note: The criterion for sizing the cylinder is that the area between the inside of the cylinder and the outside of the riser is equal to or greater than the area inside the riser. Therefore, the above table is invalid for use with concrete pipe risers.
Note: Corrugation for 12"-36" pipe measures 2½" x ½"; for 42"-84" the corrugation measures 5" x 1" or 6" x 1".
Note: C = corrugated; F = flat

Source: Adapted from USDA-SCS and Carl M. Hershaw Drainage Products Information.

Source: USDA-SCS

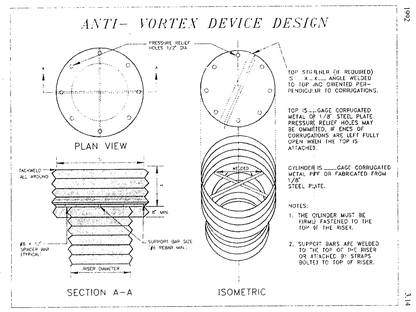
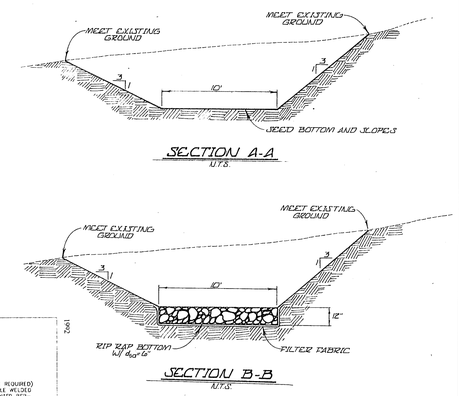


Plate 3.14-10 3.14

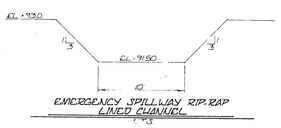


STORM	Q-IN	Q-OUT	PEAK ELEVATION
2 YEAR	72 cfs	42.59 cfs	90.73
10 YEAR	145 cfs	99.38 cfs	91.33
25 YEAR	159 cfs	110.29 cfs	91.43
100 YEAR	206 cfs	164.52 cfs	91.83

~~NOTE: CONCRETE RISER SHALL BE TACK WELDED TO CORRUGATED METAL RISER AND SHALL BE STRAPPED TO THE CORRUGATED METAL RISER~~ MRG/SAR

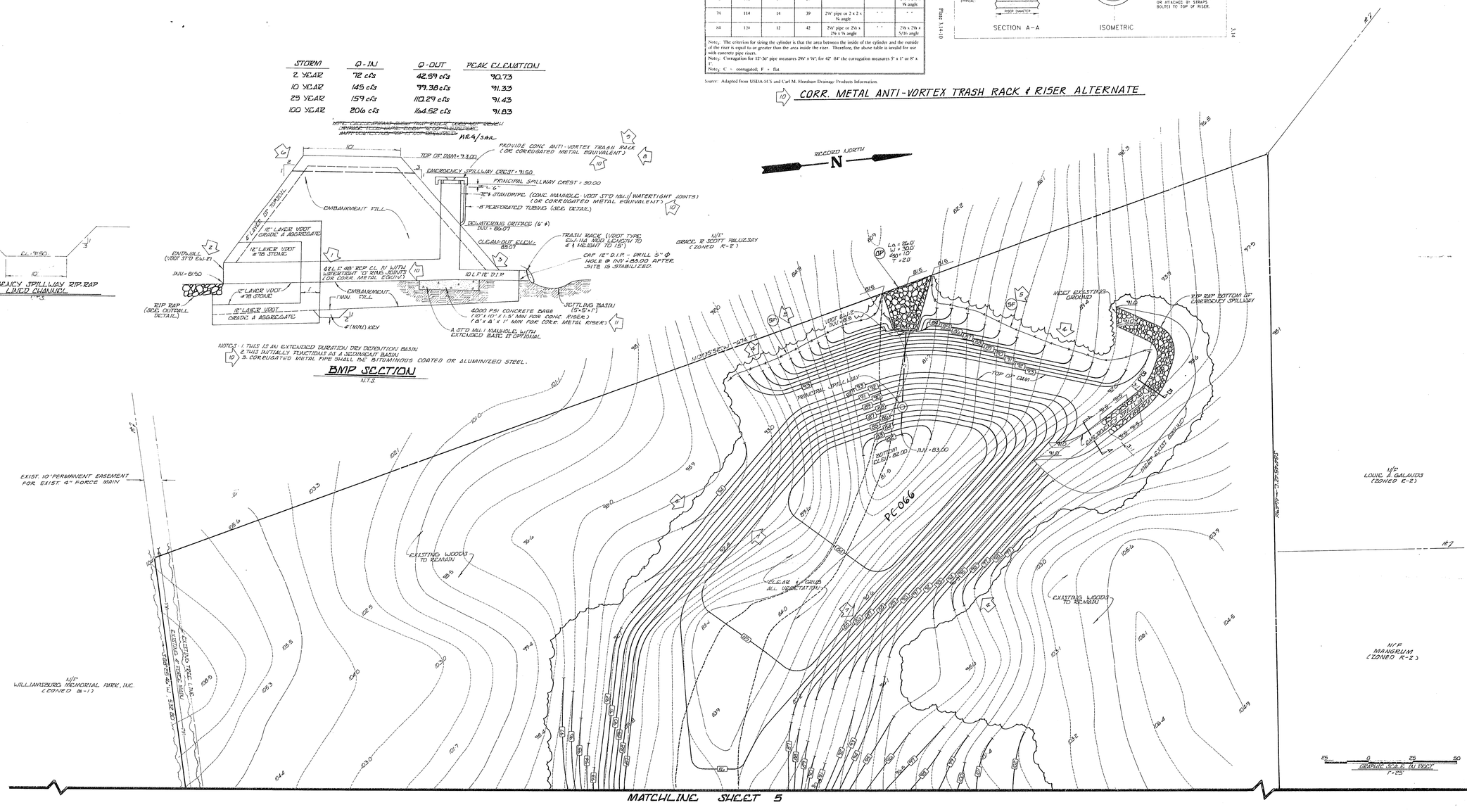
NOTES: 1. THIS IS AN EXTENDED DURATION DRY DETENTION BASIN
2. THIS INITIALLY FUNCTIONS AS A SEDIMENT BASIN
3. CORRUGATED METAL TYPE SHALL BE BITUMINOUS COATED OR ALUMINIZED STEEL.

BMP SECTION
N.T.S.



EMERGENCY SPILLWAY RIP-RAP LINED CHANNEL
N.T.S.

CORR. METAL ANTI-VORTEX TRASH RACK & RISER ALTERNATE



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STEPHEN A. ROMEO
No. 1449-B
LAND SURVEYOR

Langley and McDonald, P.C.
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WILLIAMSBURG
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OWNED BY
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SITE PLAN

SHEET	6 OF 13
DISK	
PROJ. NO.	87040
DWG.	5367FW

PC 066

NOW OR FORMERLY
LOUIE A. GALANOS

S84°45'42"E
464.96'

S05°15'16"W
39.76'

1124.54' TO ROUTE #60

N13°35'52"W
674.77'

NOW OR FORMERLY

GRACE R. SCOTT PALUZSAY

PROPERTY LINE

RECORD NORTH

- 2.29
90.5

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RECORD DRAWING
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WOODS LINE

RIP RAP

48"CMP

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INV=81.06
INV=82.59

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VIRGINIA BEACH WILLIAMSBURG

PROJ#87040-78 5980W

Subject SCOTT'S POND
[redacted]
Computed LMP Checked

LANDMARK DESIGN GROUP

Project # 1990104-000.00
Client C.K. TODOR
Date 3-06-01 Sheet # 1

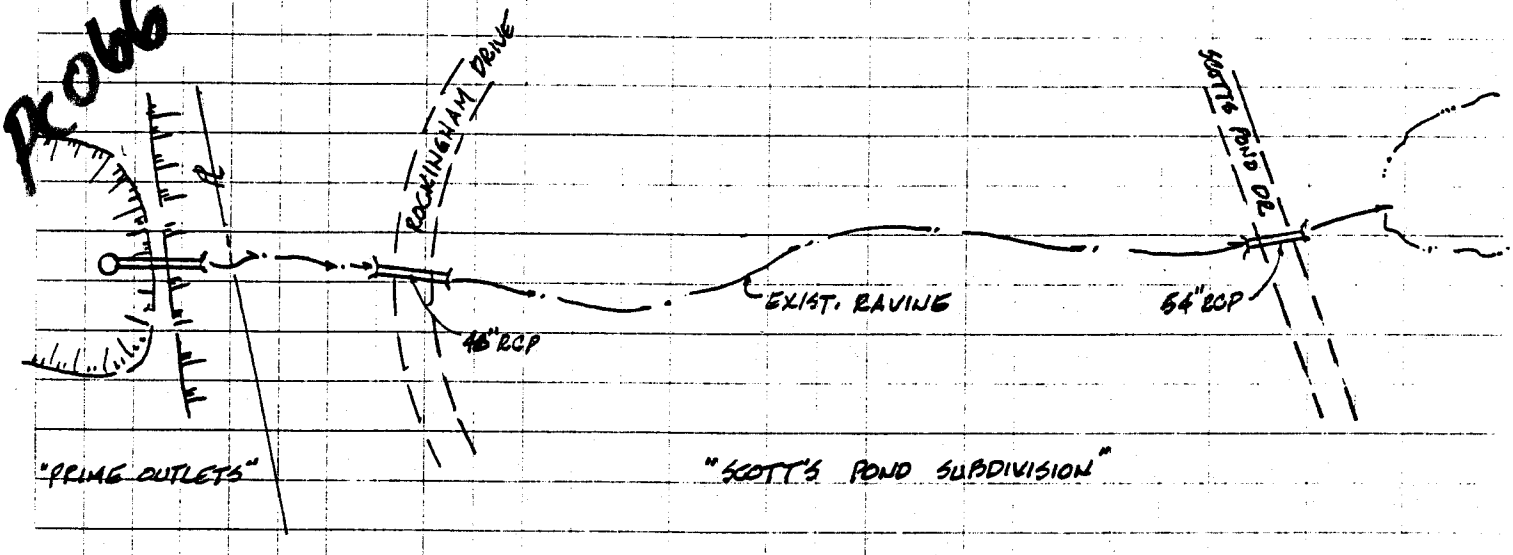
Engineers • Planners • Surveyors • Landscape Architects • Environmental Consultants

BREACH ANALYSIS EXISTING "PRIME OUTLETS" DETENTION BASIN

MODELING PROCEDURE:

- USE NATIONAL WEATHER SERVICE "FLOWAW MODEL" (GENERLIZED FLOOD ROUTING - UNSTEADY FLOW SIMULATION MODEL)
- MODEL SINGLE DAM WITH LEVEL-POOL ROUTING
- OUTFLOW HYDROGRAPH BASED ON FULL DETENTION BASIN VOLUME
- USE PIPING INITIATION BREACH (PIPING FAILURE)

PC066



File: PC 066
PRIME OUTLETS

Project SCOTT'S POND

Computed LMP Checked

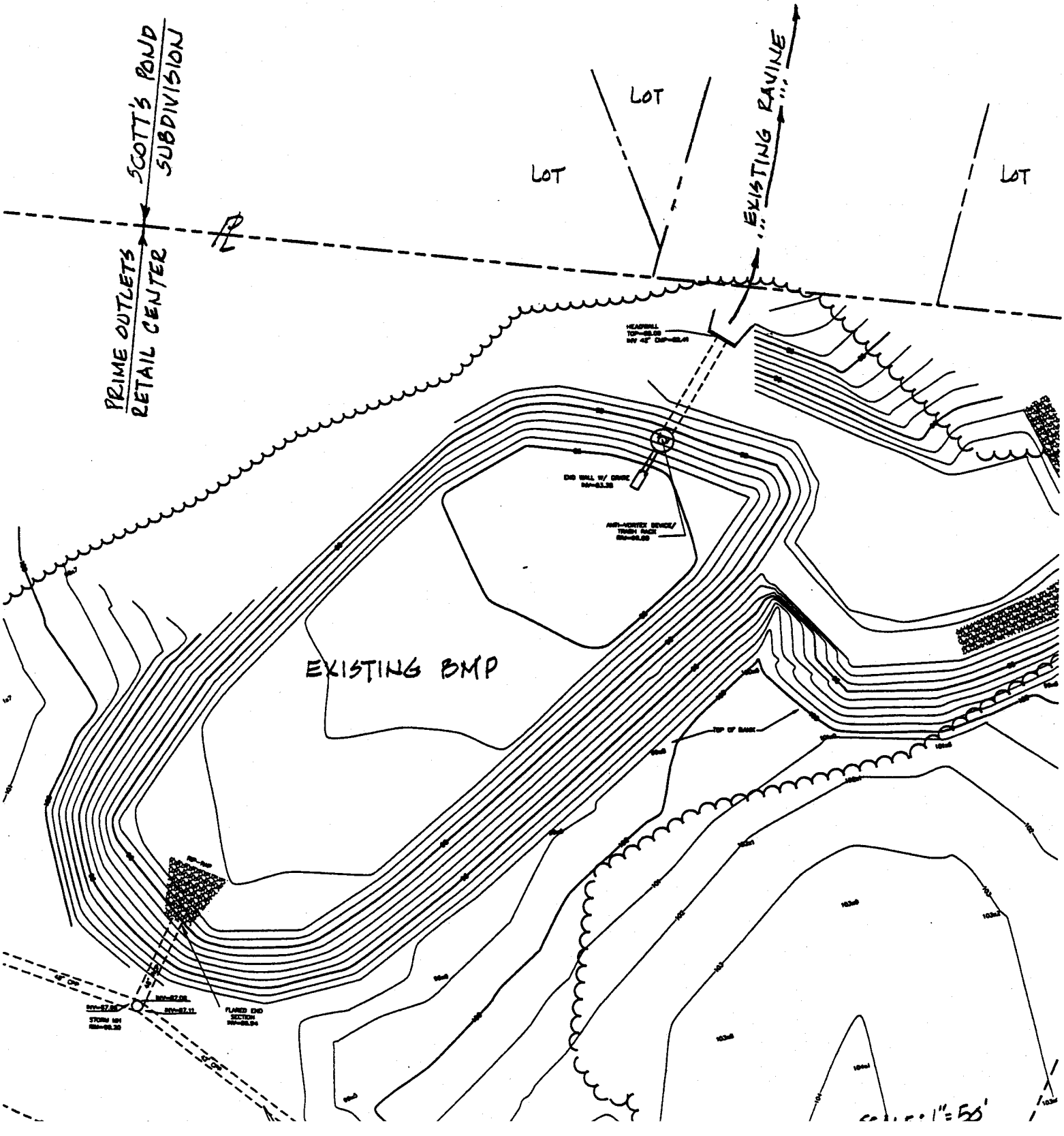
LANDMARK DESIGN GROUP

Project # 1990104 - 000.00

Client C.K. TUDOR

Date 3-06-01 Sheet # 2

Engineers • Planners • Surveyors • Landscape Architects • Environmental Consultants



Project SCOTTS POND

Computed LMP Checked

LANDMARK DESIGN GROUP

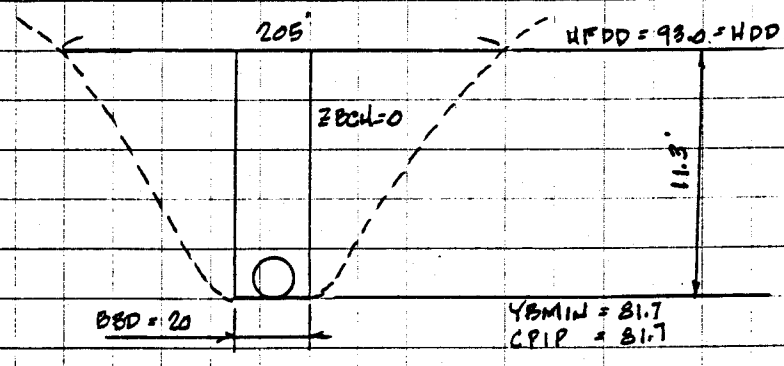
Project # 1990104-000.00

Client C.K. TUDOR

Date 3-06-01 Sheet # 3

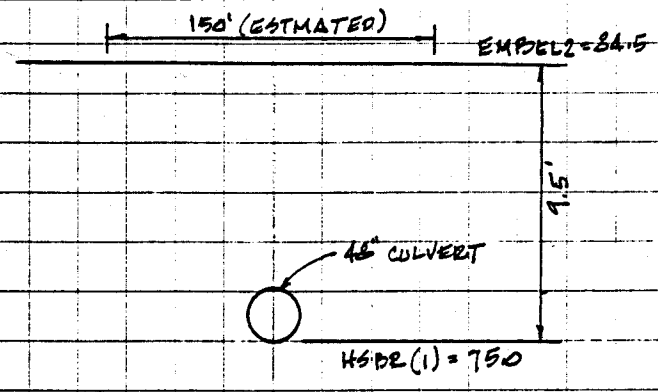
Engineers • Planners • Surveyors • Landscape Architects • Environmental Consultants

SECTION AT EXIST. DAM EMBANKMENT



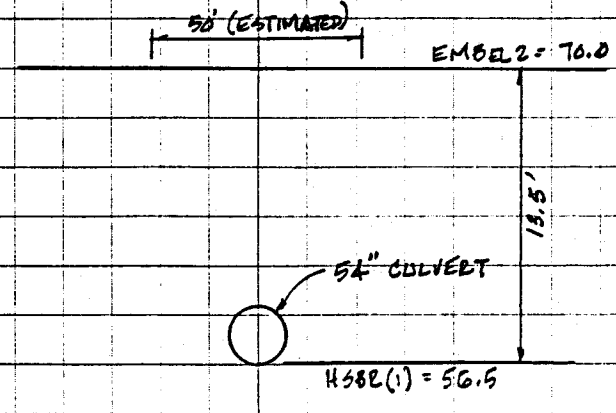
TFH = 0.25 HRS (15 MIN.)

SECTION AT ROCKINGHAM DR. (STA. 11+23)



Actual = 84.0 → 84.5

SECTION AT SCOTTS POND DR. (STA. 25+10)



Project SCOTT'S POND

Computed LMP Checked

LANDMARK DESIGN GROUP

Project # 1990104-000.00

Client C.V. TUDOR

Date 3-06-01 Sheet # 4

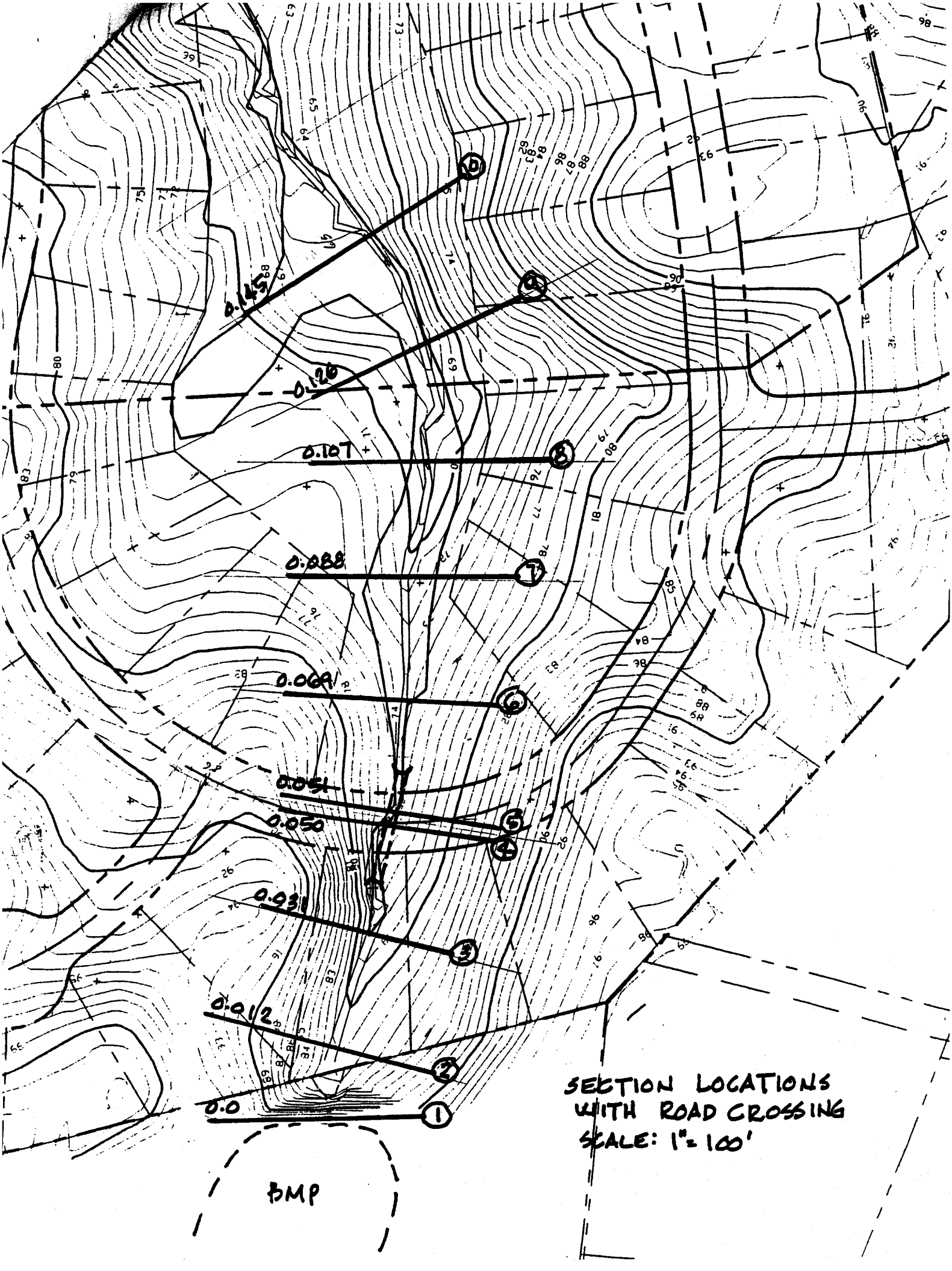
Engineers • Planners • Surveyors • Landscape Architects • Environmental Consultants

PRIME OUTLETS DETENTION BASIN STORAGE (PER FIELD TOPO)

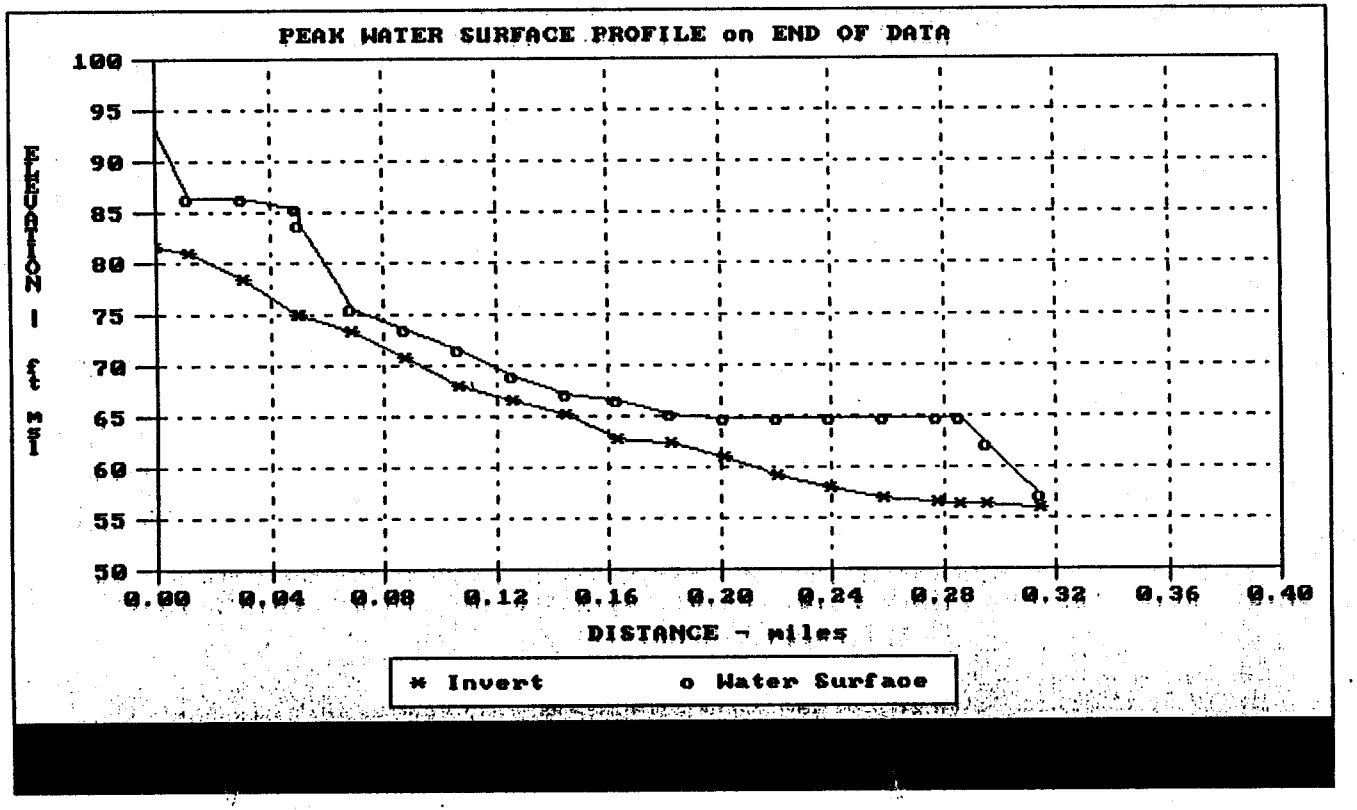
ELEV.	SURFACE AREA (SF.)	SURFACE AREA (ACRES)
83	0	0
85	4950	0.114
87	18,460	0.424
88	22,125	0.508
90	25,855	0.594
93	32,480	0.746

CROSS SECTIONS DOWNSTREAM (PER SCOTT'S POND TOPO)

STA.	MILE	SECTION DATA				
0	0	81.7 / 0	82.0 / 16	83.0 / 55	85.0 / 88	93.0 / 205
0+65	0.012	81.0 / 0	83.0 / 54	85.0 / 88	87.0 / 120	89.0 / 158
1+65	0.031	78.3 / 0	80.0 / 38	82.0 / 71	84.0 / 100	86.0 / 122
2+65	0.050	75.0 / 0	77.0 / 42	79.0 / 85	81.0 / 105	83.0 / 136
3+65	0.069	73.5 / 0	75.0 / 40	77.0 / 78	79.0 / 120	81.0 / 155
4+65	0.088	70.8 / 0	72.0 / 41	74.0 / 106	75.0 / 160	76.0 / 195
5+65	0.107	68.0 / 0	69.5 / 30	70.5 / 62	71.5 / 90	73.0 / 140
6+65	0.126	66.7 / 0	67.0 / 15	68.0 / 42	69.0 / 68	70.0 / 90
7+65	0.145	65.2 / 0	66.0 / 75	67.0 / 95	68.0 / 118	69.0 / 138
8+65	0.164	62.8 / 0	63.0 / 10	64.0 / 30	65.0 / 50	70.0 / 165
9+65	0.183	62.5 / 0	64.0 / 21	66.0 / 70	68.0 / 116	70.0 / 165
10+65	0.202	61.0 / 0	63.0 / 50	65.0 / 105	67.0 / 145	68.0 / 165
11+65	0.221	59.2 / 0	60.0 / 28	62.0 / 60	65.0 / 110	67.0 / 145
12+65	0.240	57.9 / 0	59.0 / 40	61.0 / 72	63.0 / 100	65.0 / 140
13+65	0.259	57.1 / 0	60.0 / 50	62.0 / 80	64.0 / 110	66.0 / 135
14+65	0.278	56.6 / 0	57.0 / 45	60.0 / 85	65.0 / 155	68.0 / 205
15+10	0.286	56.5 / 0	57.0 / 90	60.0 / 150	65.0 / 250	67.0 / 290
15+65	0.315	56.0 / 0	57.0 / 90	60.0 / 125	65.0 / 205	70.0 / 300


0.0
0.012
0.031
0.050
0.051
0.069
0.088
0.107
0.128
0.145
1
2
3
4
5
6
7
8
9
10
BMP
SECTION LOCATIONS
WITH ROAD CROSSING
SCALE: 1"= 100'

0.316
0.386
0.278
0.259
0.240
0.221
0.202
0.184
0.164


PEAK WATER SURFACE PROFILE on END OF DATA
ELEVATION - ft MSL
100
95
90
85
80
75
70
65
60
55
50
0.00
0.04
0.08
0.12
0.16
0.20
0.24
0.28
0.32
0.36
0.40
DISTANCE - miles
* Invert
o Water Surface

PROGRAM FLDWAV 1.0.0 (DATE: NOVEMBER 28, 1998)

HYDROLOGIC RESEACH LABORATORY

W/OH1 OFFICE OF HYDROLOGY

NOAA, NATIONAL WEATHER SERVICE

SILVER SPRING, MARYLAND 20910

SUMMARY OF INPUT DATA

SCOTT'S POND SUBDIVISION

PRIME OUTLETS BMP BREACH ANALYSIS

EPSY	THETA	F1	XFACT	DTHYD	DTOUT	METRIC
0.010	1.000	0.600	5280.000	0.000	0.000	0

JN	NU	ITMAX	KWARM	KFLP	NET	ICOND	FUTURE DATA
1	3	10	2	0	0	0	0 0 0

NYQD	KCG	NCG	KPRES
0	0	0	0

NCS	KPL	JNK	KREVRS	NFGRF
5	2	5	0	0

IOBS	KTERM	NP	NPST	NPEND
0	0	0	0	0

TEH	DTHII	DTHPLT	FRDFR	DTEXP	MDT
2.000	0.00000	0.00000	0.50	0.00000	20

NLEV	DHLV	DTHLV
0	0.00000	0.00000

RIVER NO.	NBT	NPT1	NPT2	EPQJ	COFW	VWIND	WINAGL
1	20	1	20	100.00	0.00	0.00	0.00

RIVER NO.	KU	KD	NQL	NGAGE	NRCM1	NQCM	NSTR	FUTURE DATA
1	2	4	0	4	1	0	0	0 0 0

RIVER NO.	MIXF	MUD	KFTR	KLOS	FUTURE DATA
1	2	0	0	0	0 0 0 0 0 0

XT(I, 1) I=1,NB(1)

0.000	0.012	0.031	0.050	0.051	0.069	0.088	0.107
0.126	0.145	0.164	0.183	0.202	0.221	0.240	0.259
0.278	0.286	0.296	0.315				

DXM(I, 1) I=1,NB(1)

100.000	0.500	0.200	0.500	0.200	0.500	0.500	0.500
0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500
0.500	0.500	0.500					

CH(I, 1) I=1,NRCH

10	0	0	35	0	0	0	0
0	0	0	0	0	0	0	0
0	35	0					

RIVER NO. 1, DAM NO. 1

SAR(L, 1, 1) L=1,8

0.75	0.59	0.51	0.42	0.11	0.00	0.00	0.00

HSAR(L, 1, 1) L=1,8

93.00	90.00	88.00	87.00	85.00	83.00	0.00	0.00

LAD	HDD	CLL	CDOD	QTD	ICHAN
1	93.00	20.00	3.00	164.50	0

ICG	HSPD	SPL	CSD	HGTD	CGD
0	0.00	0.00	0.00	0.00	0.00

TFH	DTHDB	HFDD	BBD	ZBCH	YBMIN	BREXP	CPIP
0.250	0.00000	93.00	20.00	0.00	81.70	1.00	81.70

RIVER NO. 1, BRIDGE NO. 1

LAD	EMBEL2	EMBW2	EMBEL1	EMBW1	BRGW	CDBRG
4	84.50	150.00	0.00	0.00	50.00	0.80

BRGHS(L, 2, 1), L=1,8)

75.00	77.00	78.00	79.00	79.10	0.00	0.00	0.00

BRGBS(L, 2, 1), L=1,8)

4.00	4.00	4.00	4.00	0.00	0.00	0.00	0.00

TFH	DTHDB	HFDD	BBD	ZBCH	YBMIN	BREXP	CPIP
0.50	0.00	93.00	0.00	0.00	0.00	1.00	0.00

RIVER NO. 1, BRIDGE NO. 2

LAD	EMBEL2	EMBW2	EMBEL1	EMBW1	BRGW	CDBRG
18	70.00	50.00	0.00	0.00	50.00	0.80

BRGHS(L, 3, 1), L=1,8)

56.50	57.00	58.00	59.00	60.00	61.00	61.10	0.00

L, 3, 1), L=1,8)

4.50	4.50	4.50	4.50	4.50	4.50	0.00	0.00

TFH	DTHDB	HFDD	BBD	ZBCH	YBMIN	BREXP	CPIP
1.00	0.00	93.00	0.00	0.00	0.00	1.00	0.00

PLOTTING/OBSERVED TIME SERIES FOR RIVER J= 1

I	NGS	ID
1	1	DS 0
2	2	DS 1
3	3	DS 2
4	4	DS 3

ST1(K,1), K = 1, NU

164.50 164.50 164.50

T1(K,1), K = 1, NU

0.00 0.50 2.00

RIVER NO. 1

I=	1	FLDSTG=	0.00	YDI=	93.00	QDI=	0.	AS1= 0.
	HS=		81.70	82.00	83.00	85.00	93.00	
	BS=		0.0	15.0	55.0	88.0	205.0	
	BSS=		0.0	0.0	0.0	0.0	0.0	
I=	2	FLDSTG=	0.00	YDI=	0.00	QDI=	0.	AS1= 0.
	HS=		81.00	83.00	85.00	87.00	89.00	
	BS=		0.0	54.0	88.0	120.0	158.0	
	BSS=		0.0	0.0	0.0	0.0	0.0	
I=	3	FLDSTG=	0.00	YDI=	0.00	QDI=	0.	AS1= 0.
	HS=		78.30	80.00	82.00	84.00	86.00	
	BS=		0.0	38.0	71.0	100.0	122.0	
	BSS=		0.0	0.0	0.0	0.0	0.0	
I=	4	FLDSTG=	0.00	YDI=	0.00	QDI=	0.	AS1= 0.
	HS=		75.00	77.00	79.00	80.00	84.50	
	BS=		4.0	4.0	4.0	4.0	4.0	
	BSS=		0.0	0.0	0.0	0.0	150.0	
I=	5	FLDSTG=	0.00	YDI=	0.00	QDI=	0.	AS1= 0.
	HS=		75.00	77.00	79.00	80.00	84.00	
	BS=		4.0	4.0	4.0	4.0	4.0	
	BSS=		0.0	0.0	0.0	0.0	4.0	
I=	6	FLDSTG=	0.00	YDI=	0.00	QDI=	0.	AS1= 0.
	HS=		73.50	75.00	77.00	79.00	81.00	
	BS=		0.0	40.0	78.0	120.0	155.0	
	BSS=		0.0	0.0	0.0	0.0	0.0	
I=	7	FLDSTG=	0.00	YDI=	0.00	QDI=	0.	AS1= 0.
	HS=		70.80	72.00	74.00	75.00	76.00	
	BS=		0.0	41.0	100.0	160.0	195.0	
	BSS=		0.0	0.0	0.0	0.0	0.0	
I=	8	FLDSTG=	0.00	YDI=	0.00	QDI=	0.	AS1= 0.
	HS=		68.00	69.50	70.50	71.50	73.00	

BS=	0.0	30.0	62.0	90.0	140.0		
BSS=	0.0	0.0	0.0	0.0	0.0		
9 FLDSTG=	0.00	YDI=	0.00	QDI=	0.	AS1=	0.
HS=	66.70	67.00	68.00	69.00	70.00		
BS=	0.0	15.0	42.0	68.0	90.0		
BSS=	0.0	0.0	0.0	0.0	0.0		
I= 10 FLDSTG=	0.00	YDI=	0.00	QDI=	0.	AS1=	0.
HS=	65.20	66.00	67.00	68.00	69.00		
BS=	0.0	75.0	95.0	118.0	138.0		
BSS=	0.0	0.0	0.0	0.0	0.0		
I= 11 FLDSTG=	0.00	YDI=	0.00	QDI=	0.	AS1=	0.
HS=	62.80	63.00	64.00	65.00	70.00		
BS=	0.0	10.0	30.0	50.0	165.0		
BSS=	0.0	0.0	0.0	0.0	0.0		
I= 12 FLDSTG=	0.00	YDI=	0.00	QDI=	0.	AS1=	0.
HS=	62.50	64.00	66.00	68.00	70.00		
BS=	0.0	21.0	70.0	110.0	165.0		
BSS=	0.0	0.0	0.0	0.0	0.0		
I= 13 FLDSTG=	0.00	YDI=	0.00	QDI=	0.	AS1=	0.
HS=	61.00	63.00	65.00	67.00	68.00		
BS=	0.0	50.0	105.0	145.0	165.0		
BSS=	0.0	0.0	0.0	0.0	0.0		
I= 14 FLDSTG=	0.00	YDI=	0.00	QDI=	0.	AS1=	0.
HS=	59.20	60.00	62.00	65.00	67.00		
BS=	0.0	28.0	60.0	110.0	145.0		
BSS=	0.0	0.0	0.0	0.0	0.0		
I= 15 FLDSTG=	0.00	YDI=	0.00	QDI=	0.	AS1=	0.
HS=	57.90	59.00	61.00	63.00	65.00		
BS=	0.0	40.0	72.0	100.0	140.0		
BSS=	0.0	0.0	0.0	0.0	0.0		
I= 16 FLDSTG=	0.00	YDI=	0.00	QDI=	0.	AS1=	0.
HS=	57.10	60.00	62.00	64.00	66.00		
BS=	0.0	50.0	80.0	110.0	135.0		
BSS=	0.0	0.0	0.0	0.0	0.0		
I= 17 FLDSTG=	0.00	YDI=	0.00	QDI=	0.	AS1=	0.
HS=	56.60	57.00	60.00	65.00	68.00		
BS=	0.0	45.0	85.0	155.0	205.0		
BSS=	0.0	0.0	0.0	0.0	0.0		
I= 18 FLDSTG=	0.00	YDI=	0.00	QDI=	0.	AS1=	0.
HS=	56.50	59.00	60.00	61.00	70.00		
BS=	4.5	4.5	4.5	4.5	4.5		
BSS=	0.0	0.0	0.0	0.0	50.0		
I= 19 FLDSTG=	0.00	YDI=	0.00	QDI=	0.	AS1=	0.
HS=	56.50	59.00	60.00	61.00	70.00		
BS=	4.5	4.5	4.5	4.5	4.5		
BSS=	0.0	0.0	0.0	0.0	4.5		
I= 20 FLDSTG=	0.00	YDI=	0.00	QDI=	0.	AS1=	0.
HS=	56.00	57.00	60.00	65.00	70.00		
BS=	0.0	90.0	125.0	205.0	300.0		
BSS=	0.0	0.0	0.0	0.0	0.0		

H INFO RIVER NO. 1

KEC(I,1), I = 1, NM(1)

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00					

NCM(K, 1), K=1,NRCM1(1)

1

CM(K, 1, 1)= 0.0600 0.0600 0.0600 0.0600 0.0600

METHOD OF ROUTING FOR THIS RIVER SYSTEM:

RIVER NO. 1

L= 1 KRTYP= 0 KRT1= 1 KRTN= 20 IMPLICIT DYNAMIC ROUTING

SUMMARY OF ARRAY SIZES

NO. OF RIVERS IN THE SYSTEM	1
MAXIMUM NO. OF CROSS SECTIONS ON ANY RIVER	21
NO. OF COMPUTATIONAL TIME STEPS	161
MAXIMUM NO. OF GAGING STATIONS ON ANY RIVER	4
MAXIMUM NO. OF ROUTING TECHNIQUES IN THE SYSTEM	1
NO. OF SETS OF POINTS IN THE D/S RATING CURVE TABLE ...	1
MAXIMUM NO. OF MANNING N REACHES ON ANY RIVER	21
NO. OF SETS OF POINTS IN THE MANNING N TABLE	5
NO. OF SETS OF POINTS IN THE BS VS HSS TABLE	5
MAXIMUM NO. OF LATERAL FLOW HYDROGRAPHS ON ANY RIVER ..	1
MAXIMUM NO. OF REACHES ON ANY RIVER	20
MAXIMUM NO. OF EQUATIONS TO BE SOLVED (K2*2)	42
MAXIMUM NO. OF INTERNAL BOUNDARIES ON ANY RIVER	3
TOTAL NO. OF LEVEE REACHES IN THE SYSTEM	1
MAXIMUM NO. OF MULTIPLE GATES ON ANY RIVER	1
NO. OF DAMS WHICH HAVE MULTIPLE GATES	0
NO. OF POINTS IN THE MOVABLE GATE TIME SERIES	1
NO. OF INTERPOLATED LEVEE REACHES IN THE SYSTEM	1
MAXIMUM NO. OF ACTUAL CROSS SECTIONS ON ANY RIVER	20
TOTAL NO. OF HYDROGRAPH POINTS USED IN FLDGRF PROGRAM .	322

SUMMARY OF OUTPUT DATA

RIVER NO	SECT NO	X MILE	BED ELEV. FEET	REACH NO	LENGTH MILE	SLOPE FPM	ROUTING	STRUCT.
1	1	0.000	81.700	1	0.01	0.00	IMP(MIX)	DAM
1	2	0.012	81.000	2	0.02	142.11	IMP(MIX)	
1	3	0.031	78.300	3	0.02	173.68	IMP(MIX)	
1	4	0.050	75.000	4	0.00	0.00	IMP(MIX)	BRIDGE
1	5	0.051	75.000	5	0.02	83.33	IMP(MIX)	
1	6	0.069	73.500	6	0.02	142.11	IMP(MIX)	
1	7	0.088	70.800	7	0.02	147.37	IMP(MIX)	
1	8	0.107	68.000	8	0.02	68.42	IMP(MIX)	
1	9	0.126	66.700	9	0.02	78.95	IMP(MIX)	
1	10	0.145	65.200	10	0.02	126.32	IMP(MIX)	
1	11	0.164	62.800	11	0.02	15.79	IMP(MIX)	
1	12	0.183	62.500	12	0.02	78.95	IMP(MIX)	
1	13	0.202	61.000	13	0.02	94.74	IMP(MIX)	
1	14	0.221	59.200	14	0.02	68.42	IMP(MIX)	
1	15	0.240	57.900	15	0.02	42.11	IMP(MIX)	
1	16	0.259	57.100	16	0.02	26.32	IMP(MIX)	
1	17	0.278	56.600	17	0.01	12.50	IMP(MIX)	
1	18	0.286	56.500	18	0.01	0.00	IMP(MIX)	BRIDGE
1	19	0.296	56.500	19	0.02	26.32	IMP(MIX)	
1	20	0.315	56.000					

NEW INPUT CROSS SECTION NO. AFTER INTERPOLATION

```
RIVER NO.   1
   NN=      1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17  18  19  20
```

RIVER NO. 1

```
LAD=     1   4  18
NGS=     1   2   3   4

L=    1     KRTYP= 0     KRT1=   1     KRTN=  20

     (SLOP(I,J),I=1,N) FOR RIVER NO.   1
 0.011048 0.026914 0.032895 0.000001 0.015783 0.026914 0.027911 0.012959
 0.014952 0.023923 0.002990 0.014952 0.017943 0.012959 0.007975 0.004984
 0.002367 0.000001 0.004984 0.004984
```

QDI(I, 1)

```
 0.      0.      0.      0.      0.      0.      0.      0.
 0.      0.      0.      0.      0.      0.      0.      0.
 0.      0.      0.      0.
```

YDI(I, 1)

```
93.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
 0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
 0.00    0.00    0.00    0.00
```

PUTE INITIAL FLOW, NORMAL AND INITIAL DEPTH FOR RIVER NO 1 **

QDI(I,1),I=1,N)

165.	165.	165.	165.	165.	165.	165.	165.
165.	165.	165.	165.	165.	165.	165.	165.
165.	165.	165.	165.				

INITIAL DISCHARGES:

(QDI FOR RIVER NO. 1

165.	165.	165.	165.	165.	165.	165.	165.
165.	165.	165.	165.	165.	165.	165.	165.
165.	165.	165.	165.				

WATER ELEVATION AT SECTION N= 20 IS 57.10

WATER ELEVATION AT SECTION N= 19 IS 59.83

BACKWATER	INN= 19	YNN=	59.83	DEP=	3.33			
I= 18	QIL=	165.	YIL=	63.75	DEP=	7.25	ITB=	12
I= 17	QIL=	165.	YIL=	63.83	DEP=	7.23	ITB=	11
I= 16	QIL=	165.	YIL=	63.83	DEP=	6.73	ITB=	4
I= 15	QIL=	165.	YIL=	63.84	DEP=	5.94	ITB=	5
I= 14	QIL=	165.	YIL=	63.84	DEP=	4.64	ITB=	4
I= 13	QIL=	165.	YIL=	63.87	DEP=	2.87	ITB=	3
I= 12	QIL=	165.	YIL=	64.54	DEP=	2.04	ITB=	11
I= 11	QIL=	165.	YIL=	65.63	DEP=	2.83	ITB=	3
I= 10	QIL=	165.	YIL=	66.29	DEP=	1.09	ITB=	4
I= 9	QIL=	165.	YIL=	68.47	DEP=	1.77	ITB=	4
I= 8	QIL=	165.	YIL=	70.17	DEP=	2.17	ITB=	4
I= 7	QIL=	165.	YIL=	72.42	DEP=	1.62	ITB=	4
I= 6	QIL=	165.	YIL=	75.27	DEP=	1.77	ITB=	3
I= 5	QIL=	165.	YIL=	78.75	DEP=	3.75	ITB=	11
I= 4	QIL=	165.	YIL=	82.67	DEP=	7.67	ITB=	11
I= 3	QIL=	165.	YIL=	82.95	DEP=	4.65	ITB=	4
I= 2	QIL=	165.	YIL=	82.95	DEP=	1.95	ITB=	4
I= 1	QIL=	165.	YIL=	93.00	DEP=	11.30	ITB=	4

INITIAL WATER ELEVATION:

YDI FOR RIVER NO. 1

93.00	82.95	82.95	82.67	78.75	75.27	72.42	70.17
68.47	66.29	65.63	64.54	63.87	63.84	63.84	63.83
63.83	63.75	59.83	57.10				

FILE OF CRESTS AND TIMES

ORIGINAL CROSS-SECTION

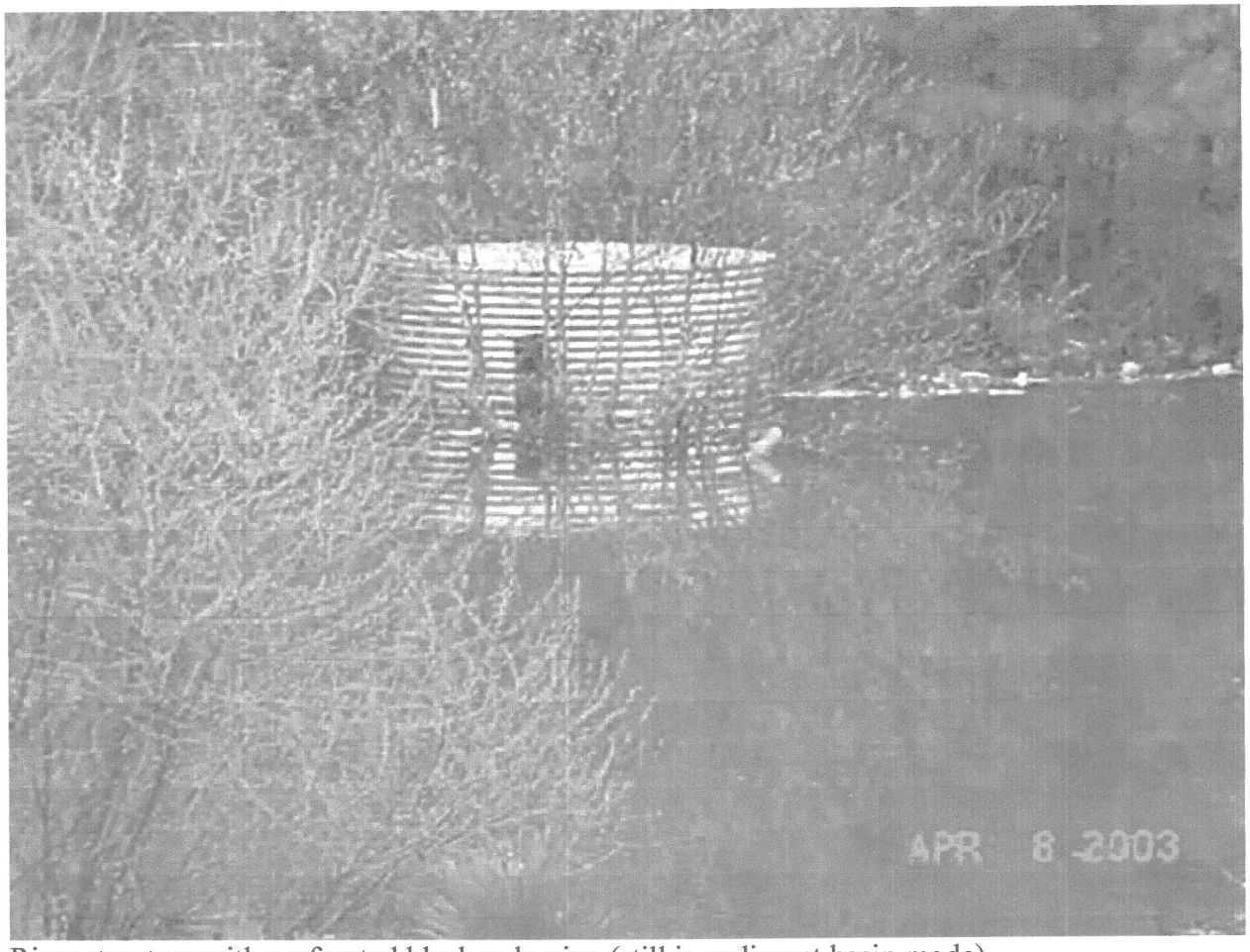
PEAK STAGE EXCEEDED MAX HS

RVR NO.	SEC NO.	LOCATION MILE	BOTTOM FEET	TIME MAX WSEL(HR)	MAX WSEL FEET	TIME MAX FLOW(CFS)	MAX FLOW CFS	MAX VEL (FPS)
1	1*	0.000	81.70	0.00000	93.00	0.12500	707.	1.78
1	2*	0.012	81.00	0.15000	86.39	0.12500	707.	3.61
1	3*#	0.031	78.30	0.15000	86.38	0.13750	620.	1.14
1	4*#	0.050	75.00	0.13750	85.43	0.15000	716.	17.93
1	5*	0.051	75.00	0.13750	83.76	0.13750	588.	16.79
1	6*	0.069	73.50	0.13750	75.69	0.13750	580.	9.32
1	7*	0.088	70.80	0.12500	73.60	0.13750	580.	5.40
1	8*	0.107	68.00	0.13750	71.53	0.13750	574.	3.91
1	9*	0.126	66.70	0.13750	69.06	0.13750	536.	5.97
1	10*	0.145	65.20	0.13750	67.29	0.13750	496.	3.47
1	11*	0.164	62.80	0.13750	66.69	0.13750	437.	2.45
1	12*	0.183	62.50	0.13750	65.15	0.13750	394.	7.39
1	13*	0.202	61.00	0.22500	64.88	0.15000	375.	2.33
1	14*	0.221	59.20	0.22500	64.87	0.15000	339.	1.10
1	15*	0.240	57.90	0.22500	64.87	0.15000	294.	0.60
1	16*	0.259	57.10	0.22500	64.86	0.15000	244.	0.54
1	17*	0.278	56.60	0.22500	64.86	0.15000	190.	0.27
1	18*	0.286	56.50	0.22500	64.79	0.26062	182.	5.24
1	19*	0.296	56.50	0.25156	62.19	0.26062	182.	7.62
1	20*	0.315	56.00	0.00000	57.10	0.25874	212.	3.92

SP-035-03 Prime Outlets, Phase 5A&B – BMP #PC-066

Overview from parking lot inlet.

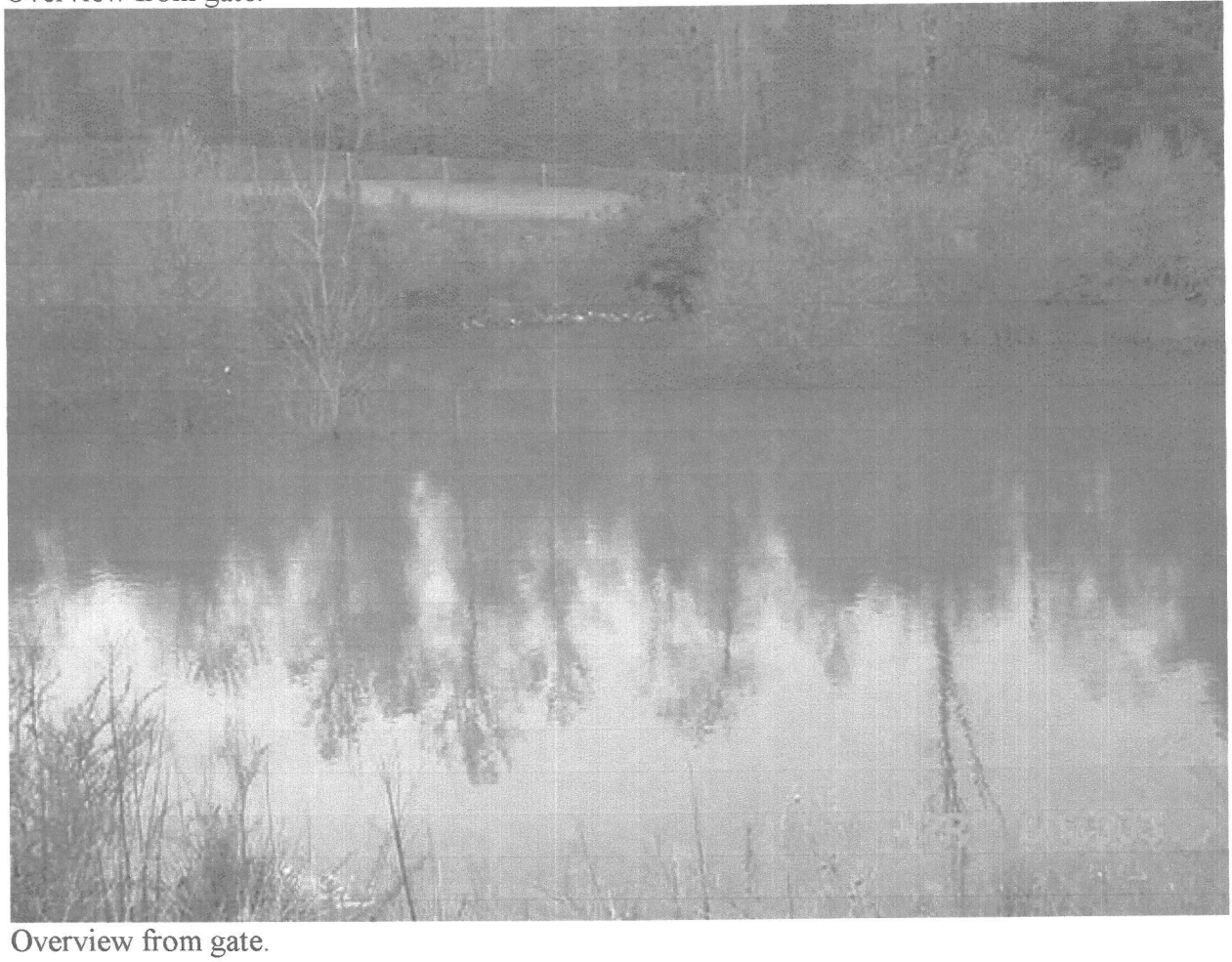
Primary outfall into BMP.



Riser structure with perforated black poly pipe (still in sediment basin mode).

Overview from gate.

Overview from gate.



Overview from gate.

Overview from gate.

Emergency spillway.

Emergency spillway.

First culvert crossing downstream (Scott's Pond, Section 2).

Embankment.

Embankment.

PC066
PRIME OUTLETS
YC002
PC043
PC036
PC124

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

Database Inventory No. (if known): PC-066 (066?)

Name of Facility: Berkleys Green BMP No.: PC Date: 7/31/09

Location: West rear perimeter

Name of Owner:

Inspector: Rick Hall

Type of Facility: Dry basin

Weather Conditions: Overcast

If an inspection item is not applicable, mark NA, otherwise mark the appropriate column.

O.K. - The item checked is in adequate condition and the maintenance program is currently satisfactory.
Routine - The item checked requires attention, but does not present an immediate threat to the function of the BMP.
Urgent - The item checked requires immediate attention to keep the BMP operational and prevent damage to the facility.

Provide an explanation and details in the comment column, if routine or urgent are marked.

Facility Item	O.K.	Routine	Urgent	Comments
Embankments and Side Slopes:				
Grass Height		✓		
Vegetated Condition				
Erosion	✓			
Weed Growth		✓		Small pines
Trash & Debris	✓			
Fencing or Benches	✓			
Constructed Wetlands (Landscaped & Planted) Areas:				
Vegetated Conditions		✓		shrubs, tall weeds, trees.
Trash & Debris	✓			
Floatables	✓			
Erosion	✓			
Sediment	✓			
Dead Plant	✓			
Aesthetics	✓			
Other				
Other				

Facility Item	O.K.	Routine	Urgent	Comments
Water Pools	☐ Permanent Pool (Retention Basin)	☑ Shallow Marsh (Detention Basin)		
Shoreline Erosion	✓			
Algae	✓			
Trash & Debris	✓			
Sediment	✓			
Aesthetics	✓			
Other				
Inlet Structure # 1 (Describe Location):				
Condition of Structure	✓			
Erosion	✓			
Trash and Debris	✓			
Sediment	✓			
Aesthetics	✓			
Other				
Inlet Structure # 2 (Describe Location):				
Condition of Structure				
Erosion				
Trash and Debris				
Sediment				
Aesthetics				
Other				
Inlet Structure # 3 (Describe Location):				
Condition of Structure				
Erosion				
Trash and Debris				
Sediment				
Aesthetics				
Other				
Outlet - Principal Flow Control Structure (Describe Location):				
Condition of Structure	✓			
Erosion	✓			
Trash and Debris	✓			
Sediment	✓			
Aesthetics	✓			
Settlement	✓			
Other				

Facility Item	O.K.	Routine	Urgent	Comments
Emergency Spillway (Overflow):				
Vegetation		✓		pine growth
Lining	✓			
Erosion	✓			
Trash & Debris	✓			
Dam/Outlet Channel	✓			
Other				
Nuisance Type Conditions:				
Mosquito Breeding				
Animal Burrows				
Graffiti	✓			
Other				
Surrounding Perimeter Conditions:				
Land Uses	✓			
Vegetation	✓			
Trash & Debris	✓			
Aesthetics	✓			
Access /Maintenance Roads or Paths	✓			
Other				

Remarks: Appears good structurally, no signs of erosion or seepage.
Slopes have dense growth of weeds, pine saplings and some small hardwoods starting. Basin bottom has significant woody growth and tall weeds/grass — needs maintenance

i-5

Overall Environmental Division Internal Rating: 3

Signature: W. Rick Grell **Date:** 7/31/00

Title: Envir. Spec.

SWMProg\BMP\CoInspProg\DetRet.wpd

LANDMARK DESIGN GROUP
TRANSMITTAL

JUL 2003 RECEIVED ENVIRONMENTAL DIVISION

To: DARRYL COOK

Company: JCC ENV DIV

From: STEPHEN ROMEO

Date: 7-2-03

Subject: PRIME OUTLETS

LMDG Job No.:

Attached please find:
- ☐ Prints
- ☐ Plans
- ☐ Specifications
- ☐ Drawings
- ☐ Report
- ☐ Letter
- ☐

Transmitted as checked below:
- ☐ For your use
- ☐ As requested
- ☐ For review and comment
- ☐ For approval
- ☐ Approved
- ☐

Copies	Date	Drawing No.	Description
1	3-15-96	—	BMP CONST. CERTIFICATION

Notes:

Copies		Enclosures
1.	File:	☐
2.	PAUL REED	☐
3.		☐
4.		☐
5.		☐

LandMark Design Group, Inc.

By: Stephen Romeo

Engineers ♦ Planners ♦ Surveyors ♦ Landscape Architects ♦ Environmental Scientists
4029 Ironbound Road, Suite 100, Williamsburg, VA 23188 (757) 253-2975 FAX: (757) 229-0049
lmdg@landmarkdg.com

Langley and McDonald Transmittal

ENGINEERS•PLANNERS•SURVEYORS

5544 Greenwich Road
☐ Virginia Beach, Virginia 23462
(757) 473-2000

201 Packets Court
☑ Williamsburg, Virginia 23185
(757) 253-2975

Project: Berkeley Commons IV

To: Darryl Cook
James City County

From: Stephen Romeo

Date: March 15, 1996

Reply requested: ☐ Yes ☐ No

Reply to:

We are sending you:
- ☐ Attached
- ☐ Under separate cover via:
- ☐ Prints
- ☐ Copy of letter
- ☐ Plans
- ☐ Specifications
- ☐ Shop drawings
- ☐

Transmitted as checked below:
- ☐ For your use
- ☐ As requested
- ☐ For review and comment
- ☑ For approval
- ☐ Return for correction
- ☐ Approved as noted
- ☐ Approved
- ☐

Copies	Date	No.	Description

Remarks: BMP record drawings have been transmitted to you previously. BMP still configured as sediment basin and needs to be configured for post construction stage upon your approval. Pursuant to the approved plan requirements, I observed construction of the earth embankment, principal spillway and emergency spillway on a daily basis. Accordingly, I hereby certify that, to the best of my knowledge, judgement and belief, the structure was constructed in general conformance with the approved plans and specifications.

3-15-96

COMMONWEALTH OF VIRGINIA
STEPHEN M. ROMEO
No. 1449-B
LAND SURVEYOR

Copies	Enclosures
1. File: 87040	☐
2. Tom Archer	☐
3. Mike Tyler	☐
4.	☐

Langley and McDonald
Stephen Romeo
By:

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

#4

PRIME OUTLETS BMP

WITH Phase 5 Development

DA = 60.3a

RCN = 81.6 ⇒ 82

Imp Cover = 54% ; 32.5 ac

R_v = 0.536

WQ_v = 1"/imp ac or 116,855 ft^3

– Elev 89.35 ⇒ 116,855

Channel Protection

2.8"

RCN ⇒ 82 ⇒ RO = 1.22"

$1.22'' \times 60.3 ac \times \frac{1}{12} \times 43,560 = 267,045\ ft^3$

Top of Dam = 93.0

$V_{STORAGE}$ = 248,416 ft^3

@ ELEV 90 – V_s = 138,142 ft^3

2 year Q_{in} = 69cfs Q_{OUT} = 43.25cfs Peak Elev = 90.74

Emergency Spillway @ 91.5

5" ø orifice @ elev 83.0

72" ø riser @ elev 90.0

48" ø barrel

BERKELEY COMMONS - PHASE IV
STORMWATER MANAGEMENT
L&M JOB 87-040-65-06

A dry detention pond has been selected to treat runoff from the proposed Phase IV development of Berkeley Commons, as well as off-site areas as shown on the drainage area map. The pond has been sized to meet the water quality requirements of James City County, as well as control the 2- and 10- year peak flow rates to pre-development levels.

The pond will enhance water quality by detaining the first 0.5" of runoff from the impervious areas draining to it for 6 to 12 hours. The entire drainage area to the pond is 60.3 acres and is 49% impervious. Therefore, 53,628 cubic feet of water quality storage is required. Phase IV of Berkeley Commons encompasses 15.33 acres, 14.6 of which will drain to the pond. Natural open space will be retained on 4.7 of the 15.33 acres, or 31% of the site. Off-site areas draining to the pond, including Phases I through III of Berkeley Commons, total 45.7 acres. As shown on the BMP Point System worksheet, the pond results in a total of 18.8 points.

Hydrologic modeling was performed on the watershed using SCS TR-55 to determine the amount of detention volume needed to control the 2- and 10-year peak flow rates. The watershed was divided into two subareas and modeled under pre- and post-development conditions. One subarea (B) includes that area which drains to the existing VDOT channel along the southern boundary of the Phase IV site. This area was analyzed when the other phases of Berkeley Commons were developed. The other subarea (A) includes the Phase IV site and the surrounding area that drains to the depression on the western boundary of the site. Hydrologic data for these two subareas and the resulting hydrographs are shown on the TR-55 output. As shown by this output, the timing of the various hydrographs play a significant role in determining the peak flow rates at the outfall location.

Utilizing the SCS procedures, approximately 2.1 acre-feet (91,476 cubic feet) of storage is required to reduce the post-development, 10-year peak flow rate to pre-development conditions (1.5 acre-feet is needed for the 2-year storm). This pond will exceed the water quantity and quality storage requirements by providing over 92,000 cubic feet of available storage.

ORIGINAL
CHES. - BAY
COMPLIANCE

TABLE 3

WORKSHEET FOR BMP POINT SYSTEM

BERKELEY COMMONS - PHASE IV

A. STRUCTURAL BMP POINT ALLOCATION

	BMP	BMP Points		Fraction of Site Served by BMP		Weighted BMP Points	
(1)	DRY DETENTION DESIGN 2	4	x	$\frac{14.60}{15.33} = 0.95$	=	3.8	ON-SITE
		4	x	$\frac{45.70}{15.33} = 2.98$	=	11.9	OFF-SITE
			x		=		
			x		=		

TOTAL WEIGHTED STRUCTURAL BMP POINTS: 15.7

B. NATURAL OPEN SPACE CREDIT

Fraction of Site		Natural Open Space Credit (0.1 per 1%)		Points for Natural Open Space
31%	x		=	3.1

C. TOTAL WEIGHTED POINTS

15.7	+	3.1	=	18.8
Structural BMP Points		Natural Open Space Points		TOTAL

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

Subject BERKELEY CONDOS
Phase 4
Computed By MRG Checked By

Project No. 87040-65-B
Client
Date Sheet No.

6 PT. BMP WATER QUALITY VOLUME CALCULATIONS

% IMPERVIOUS = 49 %

$R_v = 0.05 + (0.009 \times 49) = 0.4910$

R_m = vol of mean storm = 1.0 inch
R_v = rainfall coefficient = 0.49
A = area of contributing watershed
= 61.75 Ac × 43560 = 2,689,830 SF

$Vol. = [(R_m) * (R_v)/12](A)$

$= (1.0\ (0.49)/12)(2{,}689{,}830)$

$= 109{,}834.72$ C.F.

DRAWDOWN

• TRY 6" ϕ ORFICE (VERTICAL)

$Q = C_d\ A \sqrt{2gh}$

$Q = 0.6 \left[\frac{(6/12)^2}{4}\right] \pi \sqrt{2gh}$

$Q = 0.6\ (0.0625)\ \pi\ (15.269)$

$Q = 1.798 \Rightarrow 1.80$ cfs

* 109,826 CF OF VOL. OCCURS @ ELEV. 90.25

$h = \frac{90.25 - 83.0}{2} = 3.625$

Drawdown time = $\frac{\text{Vol. reqd}}{\text{flow rate}} = \frac{109{,}834.72}{1.80} = 61{,}056.44$ sec
= 16.96 hrs

• TRY 5" ϕ ORFICE

$Q = 0.6\ (0.0434)\ \pi\ (15.269)$
$= 1.249$ cfs $\Rightarrow 1.25$ cfs

Drawdown time = $\frac{109{,}834.72}{1.25} = 87{,}867.77$ sec $\Rightarrow$ 24.41 hrs

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VIRGINIA BEACH - WILLIAMSBURG, VIRGINIA

Subject BERKELEY COMMONS
PHASE 4
Computed By MRG Checked By

Project No. 88040-65-8
Client
Date 11/3/94 Sheet No.

FLOW THROUGH EMERGENCY SPILLWAY

$Q = CLH^{3/2}$
$= (2.62)(10)(0.33)^{3/2}$
$= 20.62(0.1896)$
$= 3.91$ cfs

$C = 2.62$
$L = 10.00'$
$H = 0.33'$

* PEAK OUTFLOW @ 100 YR. EVENT = 164.52 cfs

* MAX. FLOW THRU 48" ϕ PIPE THRU DAM = 164.52 − 3.91 = 160.61 cfs.

* FLOW IS LOW ENOUGH THAT THERE IS NO NEED FOR PROTECTING THE RAVINE SLOPE BEYOND POINT THAT EMERGENCY SPILLWAY MEETS EXIST GROUND.

Langley and McDonald, P.C.
ENGINEERS • SURVEYORS • PLANNERS
LANDSCAPE ARCHITECTS • ENVIRONMENTAL CONSULTANTS
VIRGINIA BEACH • WILLIAMSBURG, VIRGINIA

Subject BERKELEY COMMONS
PH.5 - POND CALCS
Computed By MRG Checked By

Project No. 97040-301
Client
Date 12-17-97 Sheet No.

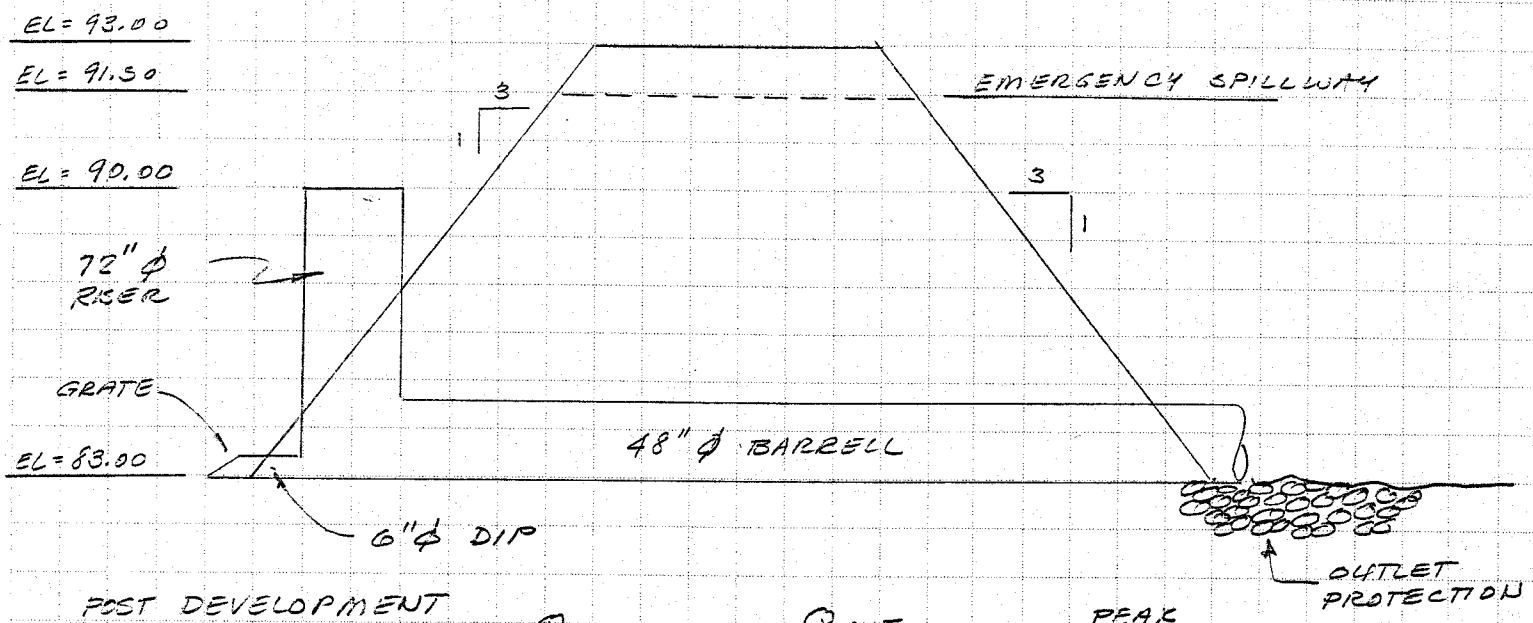
COMPARISON OF PHASES 4 & 5 ROUTINGS

	2 YR		10 YR		25 YR		100 YR	
	PEAK OUTFLOW	PEAK ELEV.	PEAK OUTFLOW	PEAK ELEV	PEAK OUTFLOW	PEAK ELEV	PEAK OUTFLOW	PEAK ELEV
PHASE 4	42.59 cfs	90.73	99.38 cfs	91.33	110.29 cfs	91.43	164.52 cfs	91.83
PHASE 5	43.75 cfs	90.74	100.47 cfs	91.34	116.72 cfs	91.49	163.89 cfs	91.83

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

Subject: BERKELEY COMMONS
PH. 5 - POND CALCS
Computed By: MRS Checked By: SAC

Project No. 87040-301
Client
Date 12-17-97 Sheet No.

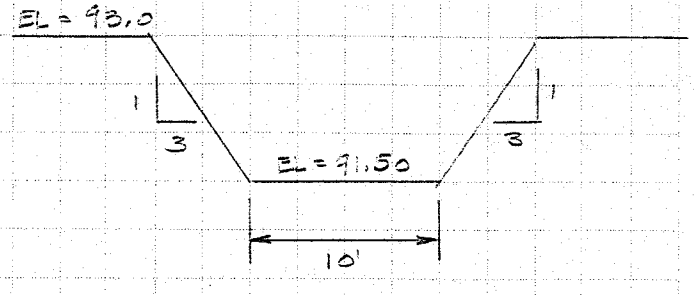


POST DEVELOPMENT	Q_{IN}	Q_{OUT}	PEAK ELEV.
2-YR	69 cfs	43.25 cfs	90.74
10 YR	137 cfs	100.47 cfs	91.34
25 YR	158 cfs	116.72 cfs	91.49
100 YR	204 cfs	163.89 cfs	91.83

PREDEVELOPMENT

2 YR ⟹ 59 cfs

10 YR ⟹ 133 cfs



EMERGENCY SPILLWAY RIP-RAP LINED CHANNEL

Return Frequency: 2 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:22:12
Watershed file: --> C:\PONDPACK\87040\PH5PRE .MOP
Hydrograph file: --> C:\PONDPACK\87040\PRE-2.HYD

BERKELEY COMMONS PHASE 5
L&M JOB 87040-301
PRE-DEVELOPMENT CONDITIONS

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used	
A	23.04	77.0	0.75	0.00	3.50	1.43	I.17	.17
B	37.26	83.0	0.75	0.20	3.50	1.86	I.12	.12

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 60.30 acres or 0.09422 sq.mi
Peak discharge = 59 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	Input Values * Tt (hr)	Rounded Values Tc (hr)	Rounded Values * Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
A	0.75	0.00	**	**	Yes	--
B	0.75	0.20	**	**	Yes	--

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

Return Frequency: 2 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:22:12
Watershed file: --> C:\PONDPACK\87040\PH5PRE .MOP
Hydrograph file: --> C:\PONDPACK\87040\PRE-2.HYD

BERKELEY COMMONS PHASE 5
L&M JOB 87040-301
PRE-DEVELOPMENT CONDITIONS

>>>> Summary of Subarea Times to Peak <<<<

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
A	20	12.6
B	41	12.8
Composite Watershed	59	12.8

Return Frequency: 2 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:22:12
Watershed file: --> C:\PONDPACK\87040\PH5PRE .MOP
Hydrograph file: --> C:\PONDPACK\87040\PRE-2.HYD

BERKELEY COMMONS PHASE 5
L&M JOB 87040-301
PRE-DEVELOPMENT CONDITIONS

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
A	0	1	1	1	2	2	4	8	13
B	1	1	2	3	3	4	5	8	14
Total (cfs)	1	2	3	4	5	6	9	16	27

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
A	18	20	20	18	13	9	7	5	4
B	22	31	38	41	38	28	19	14	10
Total (cfs)	40	51	58	59	51	37	26	19	14

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
A	3	3	2	2	2	2	1	1	1
B	8	6	5	4	4	3	3	3	2
Total (cfs)	11	9	7	6	6	5	4	4	3

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
A	1	1	1	1	0
B	2	2	2	1	0

Return Frequency: 2 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:22:12
Watershed file: --> C:\PONDPACK\87040\PH5PRE .MOP
Hydrograph file: --> C:\PONDPACK\87040\PRE-2.HYD

BERKELEY COMMONS PHASE 5
L&M JOB 87040-301
PRE-DEVELOPMENT CONDITIONS

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
11.0	1	14.8	6
11.1	1	14.9	6
11.2	2	15.0	6
11.3	2	15.1	6
11.4	2	15.2	6
11.5	3	15.3	6
11.6	3	15.4	6
11.7	3	15.5	6
11.8	4	15.6	6
11.9	4	15.7	6
12.0	5	15.8	5
12.1	6	15.9	5
12.2	9	16.0	5
12.3	16	16.1	5
12.4	27	16.2	5
12.5	40	16.3	4
12.6	51	16.4	4
12.7	58	16.5	4
12.8	59	16.6	4
12.9	55	16.7	4
13.0	51	16.8	4
13.1	44	16.9	4
13.2	37	17.0	4
13.3	31	17.1	4
13.4	26	17.2	4
13.5	23	17.3	3
13.6	19	17.4	3
13.7	16	17.5	3
13.8	14	17.6	3
13.9	12	17.7	3
14.0	11	17.8	3
14.1	10	17.9	3
14.2	10	18.0	3
14.3	9	18.1	3
14.4	8	18.2	3
14.5	8	18.3	3

Return Frequency: 2 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:22:12
Watershed file: --> C:\PONDPACK\87040\PH5PRE .MOP
Hydrograph file: --> C:\PONDPACK\87040\PRE-2.HYD

BERKELEY COMMONS PHASE 5
L&M JOB 87040-301
PRE-DEVELOPMENT CONDITIONS

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
18.6	3	22.4	2
18.7	3	22.5	2
18.8	3	22.6	2
18.9	3	22.7	2
19.0	3	22.8	2
19.1	3	22.9	2
19.2	3	23.0	2
19.3	3	23.1	1
19.4	3	23.2	1
19.5	3	23.3	1
19.6	3	23.4	1
19.7	3	23.5	1
19.8	3	23.6	1
19.9	3	23.7	1
20.0	3	23.8	1
20.1	3	23.9	1
20.2	3	24.0	1
20.3	3	24.1	1
20.4	3	24.2	1
20.5	3	24.3	1
20.6	3	24.4	1
20.7	3	24.5	1
20.8	3	24.6	1
20.9	3	24.7	1
21.0	2	24.8	1
21.1	2	24.9	1
21.2	2	25.0	0
21.3	2	25.1	0
21.4	2	25.2	0
21.5	2	25.3	0
21.6	2	25.4	0
21.7	2	25.5	0
21.8	2	25.6	0
21.9	2	25.7	0
22.0	2	25.8	0
22.1	2	25.9	0
22.2	2		
22.3	2		

Return Frequency: 10 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:22:12
Watershed file: --> C:\PONDPACK\87040\PH5PRE .MOP
Hydrograph file: --> C:\PONDPACK\87040\PRE-10.HYD

BERKELEY COMMONS PHASE 5
L&M JOB 87040-301
PRE-DEVELOPMENT CONDITIONS

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used	
A	23.04	77.0	0.75	0.00	5.80	3.31	I.1	.10
B	37.26	83.0	0.75	0.20	5.80	3.91	I.07	.10

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 60.30 acres or 0.09422 sq.mi
Peak discharge = 133 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	Input Values * Tt (hr)	Rounded Values Tc (hr)	Rounded Values * Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
A	0.75	0.00	**	**	No	Computed Ia/p < .1
B	0.75	0.20	**	**	No	Computed Ia/p < .1

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

Return Frequency: 10 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:22:12
Watershed file: --> C:\PONDPACK\87040\PH5PRE .MOP
Hydrograph file: --> C:\PONDPACK\87040\PRE-10.HYD

BERKELEY COMMONS PHASE 5
L&M JOB 87040-301
PRE-DEVELOPMENT CONDITIONS

>>>> Summary of Subarea Times to Peak <<<<

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
A	51	12.6
B	89	12.8
Composite Watershed	133	12.8

Return Frequency: 10 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:22:12
Watershed file: --> C:\PONDPACK\87040\PH5PRE .MOP
Hydrograph file: --> C:\PONDPACK\87040\PRE-10.HYD

BERKELEY COMMONS PHASE 5
L&M JOB 87040-301
PRE-DEVELOPMENT CONDITIONS

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
A	2	2	3	4	5	8	14	23	35
B	3	3	5	6	7	9	12	19	31
Total (cfs)	5	5	8	10	12	17	26	42	66

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
A	45	51	49	44	30	20	15	11	9
B	48	67	82	89	80	58	41	29	22
Total (cfs)	93	118	131	133	110	78	56	40	31

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
A	7	6	5	4	4	3	3	3	2
B	17	13	10	9	7	7	6	5	5
Total (cfs)	24	19	15	13	11	10	9	8	7

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
A	2	2	2	1	0
B	5	4	3	3	0

Return Frequency: 10 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:22:12
Watershed file: --> C:\PONDPACK\87040\PH5PRE .MOP
Hydrograph file: --> C:\PONDPACK\87040\PRE-10.HYD

BERKELEY COMMONS PHASE 5
L&M JOB 87040-301
PRE-DEVELOPMENT CONDITIONS

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
11.0	5	14.8	14
11.1	5	14.9	14
11.2	5	15.0	13
11.3	5	15.1	13
11.4	6	15.2	12
11.5	7	15.3	12
11.6	8	15.4	11
11.7	9	15.5	11
11.8	9	15.6	11
11.9	10	15.7	11
12.0	12	15.8	10
12.1	17	15.9	10
12.2	26	16.0	10
12.3	42	16.1	10
12.4	66	16.2	10
12.5	93	16.3	9
12.6	118	16.4	9
12.7	131	16.5	9
12.8	133	16.6	9
12.9	122	16.7	9
13.0	110	16.8	8
13.1	94	16.9	8
13.2	78	17.0	8
13.3	67	17.1	8
13.4	56	17.2	8
13.5	48	17.3	7
13.6	40	17.4	7
13.7	36	17.5	7
13.8	31	17.6	7
13.9	28	17.7	7
14.0	24	17.8	7
14.1	22	17.9	7
14.2	21	18.0	7
14.3	19	18.1	7
14.4	18	18.2	7
14.5	16	18.3	7

Return Frequency: 10 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:22:12
Watershed file: --> C:\PONDPACK\87040\PH5PRE .MOP
Hydrograph file: --> C:\PONDPACK\87040\PRE-10.HYD

BERKELEY COMMONS PHASE 5
L&M JOB 87040-301
PRE-DEVELOPMENT CONDITIONS

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
18.6	6	22.4	4
18.7	6	22.5	4
18.8	6	22.6	3
18.9	6	22.7	3
19.0	6	22.8	3
19.1	6	22.9	3
19.2	6	23.0	3
19.3	6	23.1	3
19.4	6	23.2	3
19.5	6	23.3	3
19.6	5	23.4	3
19.7	5	23.5	2
19.8	5	23.6	2
19.9	5	23.7	2
20.0	5	23.8	2
20.1	5	23.9	2
20.2	5	24.0	2
20.3	5	24.1	2
20.4	5	24.2	2
20.5	5	24.3	2
20.6	5	24.4	2
20.7	5	24.5	2
20.8	5	24.6	1
20.9	5	24.7	1
21.0	4	24.8	1
21.1	4	24.9	1
21.2	4	25.0	1
21.3	4	25.1	1
21.4	4	25.2	1
21.5	4	25.3	1
21.6	4	25.4	1
21.7	4	25.5	0
21.8	4	25.6	0
21.9	4	25.7	0
22.0	4	25.8	0
22.1	4	25.9	0
22.2	4		
22.3	4		

Return Frequency: 25 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:22:12
Watershed file: --> C:\PONDPACK\87040\PH5PRE .MOP
Hydrograph file: --> C:\PONDPACK\87040\PRE-25.HYD

BERKELEY COMMONS PHASE 5
L&M JOB 87040-301
PRE-DEVELOPMENT CONDITIONS

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used	
A	23.04	77.0	0.75	0.00	6.50	3.92	I.09	.10
B	37.26	83.0	0.75	0.20	6.50	4.56	I.06	.10

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 60.30 acres or 0.09422 sq.mi
Peak discharge = 156 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	Input Values * Tt (hr)	Rounded Values Tc (hr)	Rounded Values * Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
A	0.75	0.00	**	**	No	Computed Ia/p < .1
B	0.75	0.20	**	**	No	Computed Ia/p < .1

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

Return Frequency: 25 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:22:12
Watershed file: --> C:\PONDPACK\87040\PH5PRE .MOP
Hydrograph file: --> C:\PONDPACK\87040\PRE-25.HYD

BERKELEY COMMONS PHASE 5
L&M JOB 87040-301
PRE-DEVELOPMENT CONDITIONS

>>>> Summary of Subarea Times to Peak <<<<

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
A	60	12.6
B	104	12.8
Composite Watershed	156	12.8

Return Frequency: 25 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:22:12
Watershed file: --> C:\PONDPACK\87040\PH5PRE .MOP
Hydrograph file: --> C:\PONDPACK\87040\PRE-25.HYD

BERKELEY COMMONS PHASE 5
L&M JOB 87040-301
PRE-DEVELOPMENT CONDITIONS

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
A	2	3	3	5	6	10	16	27	41
B	3	4	5	7	8	10	14	22	36
Total (cfs)	5	7	8	12	14	20	30	49	77

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
A	54	60	58	52	36	24	17	13	10
B	56	78	96	104	93	68	47	34	25
Total (cfs)	110	138	154	156	129	92	64	47	35

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
A	9	7	6	5	4	4	3	3	3
B	20	15	12	10	8	8	7	6	6
Total (cfs)	29	22	18	15	12	12	10	9	9

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
A	3	2	2	2	0
B	5	5	4	3	0

Return Frequency: 25 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:22:12
Watershed file: --> C:\PONDPACK\87040\PH5PRE .MOP
Hydrograph file: --> C:\PONDPACK\87040\PRE-25.HYD

BERKELEY COMMONS PHASE 5
L&M JOB 87040-301
PRE-DEVELOPMENT CONDITIONS

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
11.0	5	14.8	16
11.1	6	14.9	16
11.2	6	15.0	15
11.3	7	15.1	14
11.4	7	15.2	14
11.5	8	15.3	13
11.6	8	15.4	13
11.7	9	15.5	12
11.8	11	15.6	12
11.9	12	15.7	12
12.0	14	15.8	12
12.1	20	15.9	12
12.2	30	16.0	12
12.3	49	16.1	12
12.4	77	16.2	11
12.5	110	16.3	11
12.6	138	16.4	10
12.7	154	16.5	10
12.8	156	16.6	10
12.9	142	16.7	10
13.0	129	16.8	9
13.1	110	16.9	9
13.2	92	17.0	9
13.3	78	17.1	9
13.4	64	17.2	9
13.5	56	17.3	9
13.6	47	17.4	9
13.7	41	17.5	9
13.8	35	17.6	9
13.9	32	17.7	9
14.0	29	17.8	8
14.1	27	17.9	8
14.2	24	18.0	8
14.3	22	18.1	8
14.4	21	18.2	8
14.5	19	18.3	8

Return Frequency: 25 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:22:12
Watershed file: --> C:\PONDPACK\87040\PH5PRE .MOP
Hydrograph file: --> C:\PONDPACK\87040\PRE-25.HYD

BERKELEY COMMONS PHASE 5
L&M JOB 87040-301
PRE-DEVELOPMENT CONDITIONS

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
18.6	7	22.4	4
18.7	7	22.5	4
18.8	7	22.6	4
18.9	7	22.7	4
19.0	7	22.8	4
19.1	7	22.9	4
19.2	7	23.0	4
19.3	7	23.1	4
19.4	7	23.2	4
19.5	6	23.3	3
19.6	6	23.4	3
19.7	6	23.5	3
19.8	6	23.6	3
19.9	6	23.7	3
20.0	6	23.8	3
20.1	6	23.9	3
20.2	6	24.0	2
20.3	6	24.1	2
20.4	6	24.2	2
20.5	6	24.3	2
20.6	6	24.4	2
20.7	6	24.5	2
20.8	6	24.6	2
20.9	6	24.7	2
21.0	6	24.8	2
21.1	5	24.9	1
21.2	5	25.0	1
21.3	5	25.1	1
21.4	5	25.2	1
21.5	5	25.3	1
21.6	5	25.4	1
21.7	5	25.5	1
21.8	5	25.6	0
21.9	5	25.7	0
22.0	5	25.8	0
22.1	5	25.9	0
22.2	5		
22.3	5		

Return Frequency: 100 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:22:12
Watershed file: --> C:\PONDPACK\87040\PH5PRE .MOP
Hydrograph file: --> C:\PONDPACK\87040\PRE-100.HYD

BERKELEY COMMONS PHASE 5
L&M JOB 87040-301
PRE-DEVELOPMENT CONDITIONS

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used	
A	23.04	77.0	0.75	0.00	8.00	5.27	I.07	.10
B	37.26	83.0	0.75	0.20	8.00	5.98	I.05	.10

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 60.30 acres or 0.09422 sq.mi
Peak discharge = 206 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	Input Values * Tt (hr)	Rounded Values Tc (hr)	Rounded Values * Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
A	0.75	0.00	**	**	No	Computed Ia/p < .1
B	0.75	0.20	**	**	No	Computed Ia/p < .1

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

Return Frequency: 100 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:22:12
Watershed file: --> C:\PONDPACK\87040\PH5PRE .MOP
Hydrograph file: --> C:\PONDPACK\87040\PRE-100.HYD

BERKELEY COMMONS PHASE 5
L&M JOB 87040-301
PRE-DEVELOPMENT CONDITIONS

>>>> Summary of Subarea Times to Peak <<<<

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
A	80	12.6
B	136	12.8
Composite Watershed	206	12.8

Return Frequency: 100 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:22:12
Watershed file: --> C:\PONDPACK\87040\PH5PRE .MOP
Hydrograph file: --> C:\PONDPACK\87040\PRE-100.HYD

BERKELEY COMMONS PHASE 5
L&M JOB 87040-301
PRE-DEVELOPMENT CONDITIONS

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
A	2	3	5	7	9	13	22	37	56
B	4	5	7	10	11	14	18	29	47
Total (cfs)	6	8	12	17	20	27	40	66	103

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
A	72	80	78	70	48	33	23	18	14
B	73	103	126	136	122	89	62	44	33
Total (cfs)	145	183	204	206	170	122	85	62	47

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
A	12	9	8	7	6	5	5	4	4
B	26	20	16	13	11	10	9	8	7
Total (cfs)	38	29	24	20	17	15	14	12	11

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
A	4	3	3	2	0
B	7	6	5	4	0

Return Frequency: 100 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:22:12
Watershed file: --> C:\PONDPACK\87040\PH5PRE .MOP
Hydrograph file: --> C:\PONDPACK\87040\PRE-100.HYD

BERKELEY COMMONS PHASE 5
L&M JOB 87040-301
PRE-DEVELOPMENT CONDITIONS

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
11.0	6	14.8	22
11.1	7	14.9	21
11.2	7	15.0	20
11.3	8	15.1	19
11.4	9	15.2	19
11.5	11	15.3	18
11.6	12	15.4	18
11.7	14	15.5	17
11.8	15	15.6	17
11.9	17	15.7	16
12.0	20	15.8	16
12.1	27	15.9	15
12.2	40	16.0	15
12.3	66	16.1	15
12.4	103	16.2	15
12.5	145	16.3	14
12.6	183	16.4	14
12.7	204	16.5	14
12.8	206	16.6	14
12.9	188	16.7	13
13.0	170	16.8	13
13.1	146	16.9	12
13.2	122	17.0	12
13.3	104	17.1	12
13.4	85	17.2	12
13.5	74	17.3	11
13.6	62	17.4	11
13.7	54	17.5	11
13.8	47	17.6	11
13.9	42	17.7	11
14.0	38	17.8	11
14.1	35	17.9	11
14.2	32	18.0	11
14.3	29	18.1	11
14.4	27	18.2	11
14.5	26	18.3	10

Return Frequency: 100 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:22:12
Watershed file: --> C:\PONDPACK\87040\PH5PRE .MOP
Hydrograph file: --> C:\PONDPACK\87040\PRE-100.HYD

BERKELEY COMMONS PHASE 5
L&M JOB 87040-301
PRE-DEVELOPMENT CONDITIONS

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
18.6	10	22.4	5
18.7	10	22.5	5
18.8	9	22.6	5
18.9	9	22.7	5
19.0	9	22.8	5
19.1	9	22.9	5
19.2	9	23.0	4
19.3	9	23.1	4
19.4	9	23.2	4
19.5	8	23.3	4
19.6	8	23.4	4
19.7	8	23.5	4
19.8	8	23.6	4
19.9	8	23.7	3
20.0	8	23.8	3
20.1	8	23.9	3
20.2	8	24.0	3
20.3	8	24.1	3
20.4	8	24.2	3
20.5	8	24.3	3
20.6	7	24.4	2
20.7	7	24.5	2
20.8	7	24.6	2
20.9	7	24.7	2
21.0	7	24.8	2
21.1	7	24.9	2
21.2	7	25.0	2
21.3	7	25.1	1
21.4	7	25.2	1
21.5	6	25.3	1
21.6	6	25.4	1
21.7	6	25.5	1
21.8	6	25.6	1
21.9	6	25.7	0
22.0	6	25.8	0
22.1	6	25.9	0
22.2	6		
22.3	6		

Return Frequency: 2 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:41:53
Watershed file: --> C:\PONDPACK\87040\PH5POST .MOP
Hydrograph file: --> C:\PONDPACK\87040\POST-2.HYD

BERKELEY COMMONS - PHASE 5
L&M No. 87040-301
James City County, Virginia

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used	
A	23.04	87.0	0.20	0.00	3.50	2.18	I.09	.10
B	37.26	84.0	0.75	0.20	3.50	1.94	I.11	.11

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 60.30 acres or 0.09422 sq.mi
Peak discharge = 69 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
A	0.20	0.00	**	**	No	Computed Ia/p < .1
B	0.75	0.20	**	**	Yes	--

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

Return Frequency: 2 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:41:53
Watershed file: --> C:\PONDPACK\87040\PH5POST .MOP
Hydrograph file: --> C:\PONDPACK\87040\POST-2.HYD

BERKELEY COMMONS - PHASE 5
L&M No. 87040-301
James City County, Virginia

>>>> Summary of Subarea Times to Peak <<<<

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
A	63	12.2
B	44	12.8
Composite Watershed	69	12.2

Return Frequency: 2 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:41:53
Watershed file: --> C:\PONDPACK\87040\PH5POST .MOP
Hydrograph file: --> C:\PONDPACK\87040\POST-2.HYD

BERKELEY COMMONS - PHASE 5
L&M No. 87040-301
James City County, Virginia

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
A	2	2	4	16	32	58	63	38	20
B	1	2	2	3	3	4	6	9	15
Total (cfs)	3	4	6	19	35	62	69	47	35

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
A	13	10	8	7	5	5	4	4	3
B	23	33	40	44	39	29	20	14	11
Total (cfs)	36	43	48	51	44	34	24	18	14

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
A	3	3	3	2	2	2	2	2	1
B	9	7	5	4	4	3	3	3	2
Total (cfs)	12	10	8	6	6	5	5	5	3

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
A	1	1	1	1	0
B	2	2	2	1	0

Return Frequency: 2 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:41:53
Watershed file: --> C:\PONDPACK\87040\PH5POST .MOP
Hydrograph file: --> C:\PONDPACK\87040\POST-2.HYD

BERKELEY COMMONS - PHASE 5
L&M No. 87040-301
James City County, Virginia

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
11.0	3	14.8	7
11.1	3	14.9	6
11.2	4	15.0	6
11.3	4	15.1	6
11.4	5	15.2	6
11.5	5	15.3	6
11.6	6	15.4	6
11.7	10	15.5	6
11.8	15	15.6	6
11.9	19	15.7	6
12.0	35	15.8	5
12.1	62	15.9	5
12.2	69	16.0	5
12.3	47	16.1	5
12.4	35	16.2	5
12.5	36	16.3	5
12.6	43	16.4	5
12.7	48	16.5	5
12.8	51	16.6	5
12.9	48	16.7	5
13.0	44	16.8	5
13.1	39	16.9	5
13.2	34	17.0	5
13.3	29	17.1	5
13.4	24	17.2	4
13.5	21	17.3	4
13.6	18	17.4	3
13.7	16	17.5	3
13.8	14	17.6	3
13.9	13	17.7	3
14.0	12	17.8	3
14.1	11	17.9	3
14.2	11	18.0	3
14.3	10	18.1	3
14.4	9	18.2	3
14.5	9	18.3	3

Return Frequency: 2 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:41:53
Watershed file: --> C:\PONDPACK\87040\PH5POST .MOP
Hydrograph file: --> C:\PONDPACK\87040\POST-2.HYD

BERKELEY COMMONS - PHASE 5
L&M No. 87040-301
James City County, Virginia

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
18.6	3	22.4	2
18.7	3	22.5	2
18.8	3	22.6	2
18.9	3	22.7	2
19.0	3	22.8	2
19.1	3	22.9	2
19.2	3	23.0	2
19.3	3	23.1	1
19.4	3	23.2	1
19.5	3	23.3	1
19.6	3	23.4	1
19.7	3	23.5	1
19.8	3	23.6	1
19.9	3	23.7	1
20.0	3	23.8	1
20.1	3	23.9	1
20.2	3	24.0	1
20.3	3	24.1	1
20.4	3	24.2	1
20.5	3	24.3	1
20.6	3	24.4	1
20.7	3	24.5	1
20.8	3	24.6	1
20.9	3	24.7	1
21.0	2	24.8	1
21.1	2	24.9	1
21.2	2	25.0	0
21.3	2	25.1	0
21.4	2	25.2	0
21.5	2	25.3	0
21.6	2	25.4	0
21.7	2	25.5	0
21.8	2	25.6	0
21.9	2	25.7	0
22.0	2	25.8	0
22.1	2	25.9	0
22.2	2		
22.3	2		

Return Frequency: 10 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:41:53
Watershed file: --> C:\PONDPACK\87040\PH5POST .MOP
Hydrograph file: --> C:\PONDPACK\87040\POST-10.HYD

BERKELEY COMMONS - PHASE 5
L&M No. 87040-301
James City County, Virginia

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used	
A	23.04	87.0	0.20	0.00	5.80	4.33	I.05	.10
B	37.26	84.0	0.75	0.20	5.80	4.01	I.07	.10

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 60.30 acres or 0.09422 sq.mi
Peak discharge = 137 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	Input Values * Tt (hr)	Rounded Values Tc (hr)	Rounded Values * Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
A	0.20	0.00	**	**	No	Computed Ia/p < .1
B	0.75	0.20	**	**	No	Computed Ia/p < .1

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

Return Frequency: 10 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:41:53
Watershed file: --> C:\PONDPACK\87040\PH5POST .MOP
Hydrograph file: --> C:\PONDPACK\87040\POST-10.HYD

BERKELEY COMMONS - PHASE 5
L&M No. 87040-301
James City County, Virginia

>>>> Summary of Subarea Times to Peak <<<<

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
A	125	12.2
B	91	12.8
Composite Watershed	137	12.2

Return Frequency: 10 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:41:53
Watershed file: --> C:\PONDPACK\87040\PH5POST .MOP
Hydrograph file: --> C:\PONDPACK\87040\POST-10.HYD

BERKELEY COMMONS - PHASE 5
L&M No. 87040-301
James City County, Virginia

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
A	4	5	7	33	63	115	125	75	39
B	3	4	5	7	7	9	12	19	32
Total (cfs)	7	9	12	40	70	124	137	94	71

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
A	26	20	16	13	11	10	8	8	7
B	49	69	85	91	82	60	42	30	22
Total (cfs)	75	89	101	104	93	70	50	38	29

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
A	6	5	5	5	4	4	3	3	3
B	18	13	11	9	7	7	6	5	5
Total (cfs)	24	18	16	14	11	11	9	8	8

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
A	3	2	2	2	0
B	5	4	4	3	0

Return Frequency: 10 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:41:53
Watershed file: --> C:\PONDPACK\87040\PH5POST .MOP
Hydrograph file: --> C:\PONDPACK\87040\POST-10.HYD

BERKELEY COMMONS - PHASE 5
L&M No. 87040-301
James City County, Virginia

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
11.0	7	14.8	15
11.1	8	14.9	14
11.2	8	15.0	14
11.3	9	15.1	13
11.4	10	15.2	13
11.5	11	15.3	12
11.6	12	15.4	12
11.7	21	15.5	11
11.8	31	15.6	11
11.9	40	15.7	11
12.0	70	15.8	11
12.1	124	15.9	11
12.2	137	16.0	11
12.3	94	16.1	11
12.4	71	16.2	10
12.5	75	16.3	10
12.6	89	16.4	9
12.7	101	16.5	9
12.8	104	16.6	9
12.9	98	16.7	9
13.0	93	16.8	8
13.1	81	16.9	8
13.2	70	17.0	8
13.3	60	17.1	8
13.4	50	17.2	8
13.5	44	17.3	8
13.6	38	17.4	8
13.7	34	17.5	8
13.8	29	17.6	8
13.9	26	17.7	8
14.0	24	17.8	8
14.1	22	17.9	8
14.2	20	18.0	8
14.3	18	18.1	8
14.4	17	18.2	8
14.5	17	18.3	7

Return Frequency: 10 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:41:53
Watershed file: --> C:\PONDPACK\87040\PH5POST .MOP
Hydrograph file: --> C:\PONDPACK\87040\POST-10.HYD

BERKELEY COMMONS - PHASE 5
L&M No. 87040-301
James City County, Virginia

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
18.6	7	22.4	4
18.7	7	22.5	4
18.8	6	22.6	4
18.9	6	22.7	4
19.0	6	22.8	4
19.1	6	22.9	4
19.2	6	23.0	4
19.3	6	23.1	4
19.4	6	23.2	4
19.5	6	23.3	3
19.6	6	23.4	3
19.7	6	23.5	3
19.8	6	23.6	3
19.9	6	23.7	3
20.0	6	23.8	3
20.1	6	23.9	3
20.2	6	24.0	2
20.3	6	24.1	2
20.4	6	24.2	2
20.5	6	24.3	2
20.6	6	24.4	2
20.7	6	24.5	2
20.8	6	24.6	2
20.9	6	24.7	2
21.0	6	24.8	2
21.1	5	24.9	1
21.2	5	25.0	1
21.3	5	25.1	1
21.4	5	25.2	1
21.5	5	25.3	1
21.6	5	25.4	1
21.7	5	25.5	1
21.8	5	25.6	0
21.9	5	25.7	0
22.0	5	25.8	0
22.1	5	25.9	0
22.2	5		
22.3	5		

Return Frequency: 25 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:41:53
Watershed file: --> C:\PONDPACK\87040\PH5POST .MOP
Hydrograph file: --> C:\PONDPACK\87040\POST-25.HYD

BERKELEY COMMONS - PHASE 5
L&M No. 87040-301
James City County, Virginia

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used	
A	23.04	87.0	0.20	0.00	6.50	5.00	I.05	.10
B	37.26	84.0	0.75	0.20	6.50	4.67	I.06	.10

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 60.30 acres or 0.09422 sq.mi
Peak discharge = 158 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
A	0.20	0.00	**	**	No	Computed Ia/p < .1
B	0.75	0.20	**	**	No	Computed Ia/p < .1

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

Return Frequency: 25 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:41:53
Watershed file: --> C:\PONDPACK\87040\PH5POST .MOP
Hydrograph file: --> C:\PONDPACK\87040\POST-25.HYD

BERKELEY COMMONS - PHASE 5
L&M No. 87040-301
James City County, Virginia

>>>> Summary of Subarea Times to Peak <<<<

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
A	144	12.2
B	106	12.8
Composite Watershed	158	12.2

Return Frequency: 25 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:41:53
Watershed file: --> C:\PONDPACK\87040\PH5POST .MOP
Hydrograph file: --> C:\PONDPACK\87040\POST-25.HYD

BERKELEY COMMONS - PHASE 5
L&M No. 87040-301
James City County, Virginia

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
A	4	6	8	38	73	133	144	87	45
B	3	4	5	8	9	11	14	22	37
Total (cfs)	7	10	13	46	82	144	158	109	82

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
A	30	23	18	15	13	11	10	9	8
B	57	80	98	106	95	69	48	35	26
Total (cfs)	87	103	116	121	108	80	58	44	34

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
A	7	6	6	5	5	4	4	4	3
B	20	15	13	10	9	8	7	6	6
Total (cfs)	27	21	19	15	14	12	11	10	9

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
A	3	3	2	2	0
B	5	5	4	3	0

Return Frequency: 25 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:41:53
Watershed file: --> C:\PONDPACK\87040\PH5POST .MOP
Hydrograph file: --> C:\PONDPACK\87040\POST-25.HYD

BERKELEY COMMONS - PHASE 5
L&M No. 87040-301
James City County, Virginia

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
11.0	7	14.8	17
11.1	8	14.9	16
11.2	9	15.0	15
11.3	10	15.1	15
11.4	11	15.2	15
11.5	12	15.3	14
11.6	13	15.4	14
11.7	24	15.5	14
11.8	35	15.6	14
11.9	46	15.7	13
12.0	82	15.8	13
12.1	144	15.9	12
12.2	158	16.0	12
12.3	109	16.1	12
12.4	82	16.2	12
12.5	87	16.3	11
12.6	103	16.4	11
12.7	116	16.5	11
12.8	121	16.6	11
12.9	114	16.7	11
13.0	108	16.8	10
13.1	94	16.9	10
13.2	80	17.0	10
13.3	69	17.1	10
13.4	58	17.2	10
13.5	51	17.3	9
13.6	44	17.4	9
13.7	39	17.5	9
13.8	34	17.6	9
13.9	30	17.7	9
14.0	27	17.8	8
14.1	25	17.9	8
14.2	23	18.0	8
14.3	21	18.1	8
14.4	20	18.2	8
14.5	20	18.3	8

Return Frequency: 25 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:41:53
Watershed file: --> C:\PONDPACK\87040\PH5POST .MOP
Hydrograph file: --> C:\PONDPACK\87040\POST-25.HYD

BERKELEY COMMONS - PHASE 5
L&M No. 87040-301
James City County, Virginia

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
18.6	8	22.4	4
18.7	8	22.5	4
18.8	8	22.6	4
18.9	8	22.7	4
19.0	8	22.8	4
19.1	8	22.9	4
19.2	8	23.0	4
19.3	7	23.1	4
19.4	7	23.2	4
19.5	7	23.3	3
19.6	7	23.4	3
19.7	7	23.5	3
19.8	6	23.6	3
19.9	6	23.7	3
20.0	6	23.8	3
20.1	6	23.9	3
20.2	6	24.0	2
20.3	6	24.1	2
20.4	6	24.2	2
20.5	6	24.3	2
20.6	6	24.4	2
20.7	6	24.5	2
20.8	6	24.6	2
20.9	6	24.7	2
21.0	6	24.8	2
21.1	5	24.9	1
21.2	5	25.0	1
21.3	5	25.1	1
21.4	5	25.2	1
21.5	5	25.3	1
21.6	5	25.4	1
21.7	5	25.5	1
21.8	5	25.6	0
21.9	5	25.7	0
22.0	5	25.8	0
22.1	5	25.9	0
22.2	5		
22.3	5		

Return Frequency: 100 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:41:53
Watershed file: --> C:\PONDPACK\87040\PH5POST .MOP
Hydrograph file: --> C:\PONDPACK\87040\POST-100.HYD

BERKELEY COMMONS - PHASE 5
L&M No. 87040-301
James City County, Virginia

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used	
A	23.04	87.0	0.20	0.00	8.00	6.45	I.04	.10
B	37.26	84.0	0.75	0.20	8.00	6.10	I.05	.10

* Travel time from subarea outfall to composite watershed outfall point.
I -- Subarea where user specified interpolation between Ia/p tables.

Total area = 60.30 acres or 0.09422 sq.mi
Peak discharge = 204 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	Input Values * Tt (hr)	Rounded Values Tc (hr)	Rounded Values * Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
A	0.20	0.00	**	**	No	Computed Ia/p < .1
B	0.75	0.20	**	**	No	Computed Ia/p < .1

* Travel time from subarea outfall to composite watershed outfall point.
** Tc & Tt are available in the hydrograph tables.

Return Frequency: 100 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:41:53
Watershed file: --> C:\PONDPACK\87040\PH5POST .MOP
Hydrograph file: --> C:\PONDPACK\87040\POST-100.HYD

BERKELEY COMMONS - PHASE 5
L&M No. 87040-301
James City County, Virginia

>>>> Summary of Subarea Times to Peak <<<<

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
A	186	12.2
B	139	12.8
Composite Watershed	204	12.2

Return Frequency: 100 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:41:53
Watershed file: --> C:\PONDPACK\87040\PH5POST .MOP
Hydrograph file: --> C:\PONDPACK\87040\POST-100.HYD

BERKELEY COMMONS - PHASE 5
L&M No. 87040-301
James City County, Virginia

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
A	5	7	11	49	94	172	186	112	58
B	4	5	7	10	11	14	18	29	48
Total (cfs)	9	12	18	59	105	186	204	141	106

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
A	39	30	24	20	16	14	13	11	10
B	75	105	129	139	125	91	63	45	34
Total (cfs)	114	135	153	159	141	105	76	56	44

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
A	9	8	8	7	6	6	5	5	4
B	27	20	16	13	11	10	9	8	7
Total (cfs)	36	28	24	20	17	16	14	13	11

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
A	4	4	3	3	0
B	7	6	5	4	0

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:41:53
Watershed file: --> C:\PONDPACK\87040\PH5POST .MOP
Hydrograph file: --> C:\PONDPACK\87040\POST-100.HYD

BERKELEY COMMONS - PHASE 5
L&M No. 87040-301
James City County, Virginia

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
11.0	9	14.8	22
11.1	10	14.9	21
11.2	11	15.0	20
11.3	12	15.1	19
11.4	14	15.2	19
11.5	16	15.3	18
11.6	18	15.4	18
11.7	32	15.5	17
11.8	45	15.6	17
11.9	59	15.7	17
12.0	105	15.8	16
12.1	186	15.9	16
12.2	204	16.0	16
12.3	141	16.1	16
12.4	106	16.2	15
12.5	114	16.3	15
12.6	135	16.4	14
12.7	153	16.5	14
12.8	159	16.6	14
12.9	150	16.7	14
13.0	141	16.8	13
13.1	123	16.9	13
13.2	105	17.0	13
13.3	90	17.1	13
13.4	76	17.2	12
13.5	66	17.3	12
13.6	56	17.4	11
13.7	50	17.5	11
13.8	44	17.6	11
13.9	40	17.7	11
14.0	36	17.8	11
14.1	33	17.9	11
14.2	31	18.0	11
14.3	28	18.1	11
14.4	27	18.2	11
14.5	25	18.3	11

Return Frequency: 100 years

TR-55 TABULAR HYDROGRAPH METHOD
Type II. Distribution
(24 hr. Duration Storm)

Executed: 12-17-1997 12:41:53
Watershed file: --> C:\PONDPACK\87040\PH5POST .MOP
Hydrograph file: --> C:\PONDPACK\87040\POST-100.HYD

BERKELEY COMMONS - PHASE 5
L&M No. 87040-301
James City County, Virginia

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
18.6	10	22.4	6
18.7	10	22.5	6
18.8	10	22.6	6
18.9	10	22.7	6
19.0	10	22.8	6
19.1	10	22.9	5
19.2	10	23.0	5
19.3	9	23.1	5
19.4	9	23.2	5
19.5	9	23.3	5
19.6	9	23.4	5
19.7	9	23.5	4
19.8	8	23.6	4
19.9	8	23.7	4
20.0	8	23.8	4
20.1	8	23.9	4
20.2	8	24.0	4
20.3	8	24.1	3
20.4	8	24.2	3
20.5	8	24.3	3
20.6	8	24.4	3
20.7	8	24.5	3
20.8	8	24.6	2
20.9	8	24.7	2
21.0	8	24.8	2
21.1	7	24.9	2
21.2	7	25.0	2
21.3	7	25.1	2
21.4	7	25.2	1
21.5	7	25.3	1
21.6	7	25.4	1
21.7	7	25.5	1
21.8	7	25.6	1
21.9	7	25.7	1
22.0	7	25.8	0
22.1	7	25.9	0
22.2	7		
22.3	6		

POND-2 Version: 5.20
S/N:

BERKELEY COMMONS -Phase 4
James City County, Virginia
L&M File No. 87040-65-8

CALCULATED 12-17-1997 13:35:21
DISK FILE: c:\pondpack\87040\ALT1 .VOL

Planimeter scale: 1 inch = 25 ft.

Elevation (ft)	Planimeter (sq.in.)	Area (sq.ft)	A1+A2+sqr(A1*A2) (sq.ft)	* Volume (cubic-ft)	Volume Sum (cubic-ft)
82.00	0.69	431	0	0	0
83.00	1.67	1,044	2,146	715	715
84.00	9.55	5,969	9,508	3,169	3,885
85.00	19.70	12,313	26,854	8,951	12,836
86.00	28.27	17,669	44,731	14,910	27,746
87.00	39.26	24,538	63,028	21,009	48,756
88.00	46.37	28,981	80,186	26,729	75,484
89.00	49.90	31,188	90,233	30,078	105,562
90.00	54.39	33,994	97,742	32,581	138,142
91.00	52.14	32,588	99,864	33,288	171,431
92.00	63.18	39,488	107,947	35,982	207,413
93.00	68.06	42,538	123,009	41,003	248,416

Elevations With Areas Interpolated From
The Closest Two Planimeter Readings

85.07	-----	12,656	37,452	874	13,710
86.07	-----	18,113	53,671	1,252	28,999
87.32	-----	25,919	75,676	8,072	56,828
89.14	-----	31,573	94,140	4,393	109,955

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

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

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

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

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

Outlet Structure File: ALT1 .STR

POND-2 Version: 5.20 S/N:
Date Executed: Time Executed:

****
BERKELEY COMMONS - Phase 4
James City County, Virginia

PROPOSED BMP
****

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

Elevation (ft)	Q (cfs)	Contributing Structures
83.00	0.0	1
83.25	0.2	1
83.50	0.4	2
83.75	0.5	2
84.00	0.6	2
84.25	0.7	2
84.50	0.8	2
84.75	0.8	2
85.00	0.9	2
85.25	1.0	2
85.50	1.0	2
85.75	1.1	2
86.00	1.1	2
86.25	1.2	2
86.50	1.2	2
86.75	1.3	2
87.00	1.3	2
87.25	1.3	2
87.50	1.5	2 +3
87.75	1.8	2 +3
88.00	2.1	2 +4
88.25	2.3	2 +4
88.50	2.4	2 +4
88.75	2.6	2 +4
89.00	2.7	2 +4
89.25	2.9	2 +4
89.50	3.0	2 +4
89.75	3.1	2 +4
90.00	3.2	2 +4 +5
90.25	11.1	2 +4 +5
90.50	25.4	2 +4 +5
90.75	43.9	2 +4 +5
91.00	65.8	2 +4 +5
91.25	90.6	2 +4 +5
91.50	118.1	2 +4 +5
91.75	151.7	2 +4 +5 +6
92.00	191.1	2 +4 +5 +6
92.25	229.9	2 +4 +5 +6
92.50	254.2	2 +4 +5 +6

92.75	280.7	2 +4 +5 +6
93.00	0.0	

Outlet Structure File: ALT1 .STR

POND-2 Version: 5.20 S/N:
Date Executed: Time Executed:

****
BERKELEY COMMONS - Phase 4
James City County, Virginia

PROPOSED BMP
****

Outlet Structure File: c:\pondpack\87040\ALT1 .STR
Planimeter Input File: c:\pondpack\87040\ALT1 .VOL
Rating Table Output File: c:\pondpack\87040\ALT1 .PND

Min. Elev.(ft) = 83 Max. Elev.(ft) = 93 Incr.(ft) = .25

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

****
SYSTEM CONNECTIVITY
****

Structure	No.	Q Table		Q Table
TABLE	1		->	1
ORIFICE-VC	2		->	2
TABLE	3		->	3
ORIFICE-VC	4		->	4
STAND PIPE	5		->	5
WEIR-XY	6		->	6

Outflow rating table summary was stored in file:
c:\pondpack\87040\ALT1 .PND

Outlet Structure File: ALT1 .STR

POND-2 Version: 5.20 S/N:
Date Executed: Time Executed:

****
BERKELEY COMMONS - Phase 4
James City County, Virginia

PROPOSED BMP
****

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

TABLE
Input your own rating table.
E1 (ft) =83 E2 (ft) =83.40

Constant (ft) added to each elevation was:

Elev. (ft)	Q (cfs)
83	0
83.04000000000001	.01
83.08	.03
83.12	.05
83.16	.08
83.2	.11
83.23999999999999	.15
83.28	.19
83.31999999999999	.23
83.36	.27
83.40000000000001	.32

Outlet Structure File: ALT1 .STR

POND-2 Version: 5.20 S/N:
Date Executed: Time Executed:

****
BERKELEY COMMONS - Phase 4
James City County, Virginia

PROPOSED BMP
****

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

ORIFICE-VC
Orifice - Vertical Circular

E1 elev.(ft)?	83.40
E2 elev.(ft)?	93.0
Orifice coeff.?	.6
Invert elev.(ft)?	83
Datum elev.(ft)?	83.21
Diameter (ft)?	.42

Outlet Structure File: ALT1 .STR

POND-2 Version: 5.20 S/N:
Date Executed: Time Executed:

****
BERKELEY COMMONS - Phase 4
James City County, Virginia

PROPOSED BMP
****

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

TABLE
Input your own rating table.
E1 (ft) =87.32 E2 (ft) =87.82

Constant (ft) added to each elevation was:

Elev. (ft)	Q (cfs)
87.31999999999999	0
87.37	.02
87.42	.05
87.47	.09
87.52	.13
87.56999999999999	.19
87.62	.25
87.67	.31
87.72	.38
87.77	.45
87.81999999999999	.53

Outlet Structure File: ALT1 .STR

POND-2 Version: 5.20 S/N:
Date Executed: Time Executed:

****
BERKELEY COMMONS - Phase 4
James City County, Virginia

PROPOSED BMP
****

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

ORIFICE-VC
Orifice - Vertical Circular

E1 elev.(ft)?	87.82
E2 elev.(ft)?	93.0
Orifice coeff.?	.6
Invert elev.(ft)?	87.32
Datum elev.(ft)?	87.57
Diameter (ft)?	.5

Outlet Structure File: ALT1 .STR

POND-2 Version: 5.20 S/N:
Date Executed: Time Executed:

****
BERKELEY COMMONS - Phase 4
James City County, Virginia

PROPOSED BMP
****

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

STAND PIPE
Stand Pipe with weir or orifice flow

E1 elev.(ft)?	90.00
E2 elev.(ft)?	93.0
Crest elev.(ft)?	90.00
Diameter (ft)?	6
Weir coefficient?	3.3
Orifice coefficient?	0.6
Start transition elev.(ft) @ ?	
Transition height (ft)?	

Outlet Structure File: ALT1 .STR

POND-2 Version: 5.20 S/N:
Date Executed: Time Executed:

****
BERKELEY COMMONS - Phase 4
James City County, Virginia

PROPOSED BMP
****

>>>>>> Structure No. 6 <<<<<<
(Input Data)

WEIR-XY
Weir - Defined by X, Y Coordinates
E1 (ft) =91.55 E2 (ft) =93.0

X dist.(ft)	Y elev.(ft)
0	93
4.5	91.5
14.5	91.5
19	93

Outlet Structure File: ALT1 .STR

POND-2 Version: 5.20 S/N:
Date Executed: Time Executed:

****
BERKELEY COMMONS - Phase 4
James City County, Virginia

PROPOSED BMP
****

Outflow Rating Table for Structure #1
TABLE Input your own rating table.

Elevation (ft)	Q (cfs)	Computation Messages
83.00	0.0	
83.25	0.2	Interpolated from input table
83.50	0.0	E = or > E2=83.40
83.75	0.0	E = or > E2=83.40
84.00	0.0	E = or > E2=83.40
84.25	0.0	E = or > E2=83.40
84.50	0.0	E = or > E2=83.40
84.75	0.0	E = or > E2=83.40
85.00	0.0	E = or > E2=83.40
85.25	0.0	E = or > E2=83.40
85.50	0.0	E = or > E2=83.40
85.75	0.0	E = or > E2=83.40
86.00	0.0	E = or > E2=83.40
86.25	0.0	E = or > E2=83.40
86.50	0.0	E = or > E2=83.40
86.75	0.0	E = or > E2=83.40
87.00	0.0	E = or > E2=83.40
87.25	0.0	E = or > E2=83.40
87.50	0.0	E = or > E2=83.40
87.75	0.0	E = or > E2=83.40
88.00	0.0	E = or > E2=83.40
88.25	0.0	E = or > E2=83.40
88.50	0.0	E = or > E2=83.40
88.75	0.0	E = or > E2=83.40
89.00	0.0	E = or > E2=83.40
89.25	0.0	E = or > E2=83.40
89.50	0.0	E = or > E2=83.40
89.75	0.0	E = or > E2=83.40
90.00	0.0	E = or > E2=83.40
90.25	0.0	E = or > E2=83.40
90.50	0.0	E = or > E2=83.40
90.75	0.0	E = or > E2=83.40
91.00	0.0	E = or > E2=83.40
91.25	0.0	E = or > E2=83.40
91.50	0.0	E = or > E2=83.40
91.75	0.0	E = or > E2=83.40
92.00	0.0	E = or > E2=83.40

Outlet Structure File: ALT1 .STR

POND-2 Version: 5.20 S/N:
Date Executed: Time Executed:

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

Outflow Rating Table for Structure #1
TABLE Input your own rating table.

Elevation (ft)	Q (cfs)	Computation Messages
92.25	0.0	E = or > E2=83.40
92.50	0.0	E = or > E2=83.40
92.75	0.0	E = or > E2=83.40
93.00	0.0	E = or > E2=83.40

Outlet Structure File: ALT1 .STR

POND-2 Version: 5.20 S/N:
Date Executed: Time Executed:

****
BERKELEY COMMONS - Phase 4
James City County, Virginia

PROPOSED BMP
****

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

Elevation (ft)	Q (cfs)	Computation Messages
83.00	0.0	E < E1=83.40
83.25	0.0	E < E1=83.40
83.50	0.4	H =.29
83.75	0.5	H =.54
84.00	0.6	H =.79
84.25	0.7	H =1.04
84.50	0.8	H =1.29
84.75	0.8	H =1.54
85.00	0.9	H =1.79
85.25	1.0	H =2.04
85.50	1.0	H =2.29
85.75	1.1	H =2.54
86.00	1.1	H =2.79
86.25	1.2	H =3.04
86.50	1.2	H =3.29
86.75	1.3	H =3.54
87.00	1.3	H =3.79
87.25	1.3	H =4.04
87.50	1.4	H =4.29
87.75	1.4	H =4.54
88.00	1.5	H =4.79
88.25	1.5	H =5.04
88.50	1.5	H =5.29
88.75	1.6	H =5.54
89.00	1.6	H =5.79
89.25	1.6	H =6.04
89.50	1.7	H =6.29
89.75	1.7	H =6.54
90.00	1.7	H =6.79
90.25	1.8	H =7.04
90.50	1.8	H =7.29
90.75	1.8	H =7.54
91.00	1.9	H =7.79
91.25	1.9	H =8.04

Outlet Structure File: ALT1 .STR

POND-2 Version: 5.20 S/N:
Date Executed: Time Executed:

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

Elevation (ft)	Q (cfs)	Computation Messages
91.50	1.9	H =8.29
91.75	1.9	H =8.54
92.00	2.0	H =8.79
92.25	2.0	H =9.04
92.50	2.0	H =9.290
92.75	2.1	H =9.540
93.00	0.0	E = or > E2=93.0

C = .6 A = .1385442 sq.ft.
H (ft) = Table elev. - Datum elev. (83.21 ft)
Q (cfs) = C * A * sqr(2g * H)

Outlet Structure File: ALT1 .STR

POND-2 Version: 5.20 S/N:
Date Executed: Time Executed:

****
BERKELEY COMMONS - Phase 4
James City County, Virginia

PROPOSED BMP
****

Outflow Rating Table for Structure #3
TABLE Input your own rating table.

Elevation (ft)	Q (cfs)	Computation Messages
83.00	0.0	E < E1=87.32
83.25	0.0	E < E1=87.32
83.50	0.0	E < E1=87.32
83.75	0.0	E < E1=87.32
84.00	0.0	E < E1=87.32
84.25	0.0	E < E1=87.32
84.50	0.0	E < E1=87.32
84.75	0.0	E < E1=87.32
85.00	0.0	E < E1=87.32
85.25	0.0	E < E1=87.32
85.50	0.0	E < E1=87.32
85.75	0.0	E < E1=87.32
86.00	0.0	E < E1=87.32
86.25	0.0	E < E1=87.32
86.50	0.0	E < E1=87.32
86.75	0.0	E < E1=87.32
87.00	0.0	E < E1=87.32
87.25	0.0	E < E1=87.32
87.50	0.1	Interpolated from input table
87.75	0.4	Interpolated from input table
88.00	0.0	E = or > E2=87.82
88.25	0.0	E = or > E2=87.82
88.50	0.0	E = or > E2=87.82
88.75	0.0	E = or > E2=87.82
89.00	0.0	E = or > E2=87.82
89.25	0.0	E = or > E2=87.82
89.50	0.0	E = or > E2=87.82
89.75	0.0	E = or > E2=87.82
90.00	0.0	E = or > E2=87.82
90.25	0.0	E = or > E2=87.82
90.50	0.0	E = or > E2=87.82
90.75	0.0	E = or > E2=87.82
91.00	0.0	E = or > E2=87.82
91.25	0.0	E = or > E2=87.82
91.50	0.0	E = or > E2=87.82
91.75	0.0	E = or > E2=87.82
92.00	0.0	E = or > E2=87.82

Outlet Structure File: ALT1 .STR

POND-2 Version: 5.20 S/N:
Date Executed: Time Executed:

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

Outflow Rating Table for Structure #3
TABLE Input your own rating table.

Elevation (ft)	Q (cfs)	Computation Messages
92.25	0.0	E = or > E2=87.82
92.50	0.0	E = or > E2=87.82
92.75	0.0	E = or > E2=87.82
93.00	0.0	E = or > E2=87.82

Outlet Structure File: ALT1 .STR

POND-2 Version: 5.20 S/N:
Date Executed: Time Executed:

****
BERKELEY COMMONS - Phase 4
James City County, Virginia

PROPOSED BMP
****

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

Elevation (ft)	Q (cfs)	Computation Messages
83.00	0.0	E < E1=87.82
83.25	0.0	E < E1=87.82
83.50	0.0	E < E1=87.82
83.75	0.0	E < E1=87.82
84.00	0.0	E < E1=87.82
84.25	0.0	E < E1=87.82
84.50	0.0	E < E1=87.82
84.75	0.0	E < E1=87.82
85.00	0.0	E < E1=87.82
85.25	0.0	E < E1=87.82
85.50	0.0	E < E1=87.82
85.75	0.0	E < E1=87.82
86.00	0.0	E < E1=87.82
86.25	0.0	E < E1=87.82
86.50	0.0	E < E1=87.82
86.75	0.0	E < E1=87.82
87.00	0.0	E < E1=87.82
87.25	0.0	E < E1=87.82
87.50	0.0	E < E1=87.82
87.75	0.0	E < E1=87.82
88.00	0.6	H =.43
88.25	0.8	H =.68
88.50	0.9	H =.930
88.75	1.0	H =1.18
89.00	1.1	H =1.43
89.25	1.2	H =1.68
89.50	1.3	H =1.93
89.75	1.4	H =2.18
90.00	1.5	H =2.43
90.25	1.5	H =2.68
90.50	1.6	H =2.93
90.75	1.7	H =3.18
91.00	1.8	H =3.43
91.25	1.8	H =3.68

Outlet Structure File: ALT1 .STR

POND-2 Version: 5.20 S/N:
Date Executed: Time Executed:

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

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

Elevation (ft)	Q (cfs)	Computation Messages
91.50	1.9	H =3.93
91.75	1.9	H =4.18
92.00	2.0	H =4.43
92.25	2.0	H =4.68
92.50	2.1	H =4.93
92.75	2.2	H =5.18
93.00	0.0	E = or > E2=93.0

C = .6 A = .1963496 sq.ft.
H (ft) = Table elev. - Datum elev. (87.57 ft)
Q (cfs) = C * A * sqr(2g * H)

Outlet Structure File: ALT1 .STR

POND-2 Version: 5.20 S/N:
Date Executed: Time Executed:

****
BERKELEY COMMONS - Phase 4
James City County, Virginia

PROPOSED BMP
****

Outflow Rating Table for Structure #5
STAND PIPE Stand Pipe with weir or orifice flow

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

Elevation (ft)	Q (cfs)	Computation Messages
83.00	0.0	E < Inv.El.= 90
83.25	0.0	E < E1=90.00
83.50	0.0	E < E1=90.00
83.75	0.0	E < E1=90.00
84.00	0.0	E < E1=90.00
84.25	0.0	E < E1=90.00
84.50	0.0	E < E1=90.00
84.75	0.0	E < E1=90.00
85.00	0.0	E < E1=90.00
85.25	0.0	E < E1=90.00
85.50	0.0	E < E1=90.00
85.75	0.0	E < E1=90.00
86.00	0.0	E < E1=90.00
86.25	0.0	E < E1=90.00
86.50	0.0	E < E1=90.00
86.75	0.0	E < E1=90.00
87.00	0.0	E < E1=90.00
87.25	0.0	E < E1=90.00
87.50	0.0	E < E1=90.00
87.75	0.0	E < E1=90.00
88.00	0.0	E < E1=90.00
88.25	0.0	E < E1=90.00
88.50	0.0	E < E1=90.00
88.75	0.0	E < E1=90.00
89.00	0.0	E < E1=90.00
89.25	0.0	E < E1=90.00
89.50	0.0	E < E1=90.00
89.75	0.0	E < E1=90.00
90.00	0.0	Weir: H =0.0
90.25	7.8	Weir: H =.25
90.50	22.0	Weir: H =.5
90.75	40.4	Weir: H =.750

Outlet Structure File: ALT1 .STR

POND-2 Version: 5.20 S/N:
Date Executed: Time Executed:

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

Outflow Rating Table for Structure #5
STAND PIPE Stand Pipe with weir or orifice flow

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

Elevation (ft)	Q (cfs)	Computation	Messages
91.00	62.2	Weir:	H =1.0
91.25	86.9	Weir:	H =1.25
91.50	114.3	Weir:	H =1.5
91.75	144.0	Weir:	H =1.75
92.00	175.9	Weir:	H =2.0
92.25	204.2	Orifice:	H =2.25
92.50	215.3	Orifice:	H =2.5
92.75	225.8	Orifice:	H =2.75
93.00	0.0	E = or > E2=93.0	

Weir Cw = 3.3 Weir length = 18.84956 ft
Orifice Co = .6 Orifice area = 28.27434 sq.ft.
Q (cfs) = (Cw * L * H**1.5) or (Co * A * sqr(2*g*H))
No transition used, transition height = 0.0
Weir equation = Orifice equation @ elev.= 92.18863 ft

Outlet Structure File: ALT1 .STR

POND-2 Version: 5.20 S/N:
Date Executed: Time Executed:

****
BERKELEY COMMONS - Phase 4
James City County, Virginia

PROPOSED BMP
****

Outflow Rating Table for Structure #6
WEIR-XY Weir - Defined by X, Y Coordinates

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

Elevation (ft)	Q (cfs)	Computation Messages	
83.00	0.0	E < Y min= 91.5	
83.25	0.0	E < Y min= 91.5	
83.50	0.0	E < Y min= 91.5	
83.75	0.0	E < Y min= 91.5	
84.00	0.0	E < Y min= 91.5	
84.25	0.0	E < Y min= 91.5	
84.50	0.0	E < Y min= 91.5	
84.75	0.0	E < Y min= 91.5	
85.00	0.0	E < Y min= 91.5	
85.25	0.0	E < Y min= 91.5	
85.50	0.0	E < Y min= 91.5	
85.75	0.0	E < Y min= 91.5	
86.00	0.0	E < Y min= 91.5	
86.25	0.0	E < Y min= 91.5	
86.50	0.0	E < Y min= 91.5	
86.75	0.0	E < Y min= 91.5	
87.00	0.0	E < Y min= 91.5	
87.25	0.0	E < Y min= 91.5	
87.50	0.0	E < Y min= 91.5	
87.75	0.0	E < Y min= 91.5	
88.00	0.0	E < Y min= 91.5	
88.25	0.0	E < Y min= 91.5	
88.50	0.0	E < Y min= 91.5	
88.75	0.0	E < Y min= 91.5	
89.00	0.0	E < Y min= 91.5	
89.25	0.0	E < Y min= 91.5	
89.50	0.0	E < Y min= 91.5	
89.75	0.0	E < Y min= 91.5	
90.00	0.0	E < E1=91.55	
90.25	0.0	E < E1=91.55	
90.50	0.0	E < E1=91.55	
90.75	0.0	E < E1=91.55	
91.00	0.0	E < E1=91.55	
91.25	0.0	E < E1=91.55	
91.50	0.0	E < E1=91.55	
91.75	3.8	W(ft)=11.5	Max. D(ft)=.25
92.00	11.2	W(ft)=13.0	Max. D(ft)=.5

Outlet Structure File: ALT1 .STR

POND-2 Version: 5.20 S/N:
Date Executed: Time Executed:

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Outflow Rating Table for Structure #6
WEIR-XY Weir - Defined by X, Y Coordinates

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

Elevation (ft)	Q (cfs)	Computation Messages	
92.25	21.6	W(ft)=14.5	Max. D(ft)=.750
92.50	34.8	W(ft)=16.0	Max. D(ft)=1.0
92.75	50.7	W(ft)=17.5	Max. D(ft)=1.25
93.00	0.0	E = or > E2=93.0	

```
*********************************
*                               *
*   BERKELEY COMMONS PHASE 5    *
*       L&M No. 87040-301       *
* James City County, Virginia   *
*                               *
*                               *
*********************************
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Inflow Hydrograph: c:\pondpack\87040\POST-2 .HYD
Rating Table file: c:\pondpack\87040\ALT1 .PND

----INITIAL CONDITIONS----
Elevation = 83.00 ft
Outflow = 0.00 cfs
Storage = 715 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
83.00	0.0	715
83.25	0.2	1,078
83.50	0.4	1,684
83.75	0.5	2,599
84.00	0.6	3,885
84.25	0.7	5,546
84.50	0.8	7,568
84.75	0.8	9,986
85.00	0.9	12,836
85.25	1.0	16,069
85.50	1.0	19,622
85.75	1.1	23,509
86.00	1.1	27,746
86.25	1.2	32,363
86.50	1.2	37,392
86.75	1.3	42,850
87.00	1.3	48,756
87.25	1.3	55,024
87.50	1.5	61,565
87.75	1.8	68,383
88.00	2.1	75,484
88.25	2.3	82,798
88.50	2.4	90,247
88.75	2.6	97,835
89.00	2.7	105,562
89.25	2.9	113,445
89.50	3.0	121,501
89.75	3.1	129,733
90.00	3.2	138,142
90.25	11.1	146,596
90.50	25.4	154,962

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
4.0	4.0
6.0	6.2
9.4	9.8
14.4	14.9
21.6	22.2
30.8	31.5
42.0	42.8
55.5	56.3
71.3	72.2
89.3	90.3
109.0	110.0
130.6	131.7
154.1	155.2
179.8	181.0
207.7	208.9
238.1	239.4
270.9	272.2
305.7	307.0
342.0	343.5
379.9	381.7
419.4	421.5
460.0	462.3
501.4	503.8
543.5	546.1
586.5	589.2
630.3	633.2
675.0	678.0
720.7	723.8
767.5	770.7
814.4	825.5
860.9	886.3

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
90.75	43.9	163,240
91.00	65.8	171,430
91.25	90.6	179,784
91.50	118.1	188,559
91.75	151.7	197,765
92.00	191.1	207,413
92.25	229.9	217,379
92.50	254.2	227,533
92.75	280.7	237,879

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + 0 (cfs)
906.9	950.8
952.4	1018.2
998.8	1089.4
1047.6	1165.7
1098.7	1250.4
1152.3	1343.4
1207.7	1437.6
1264.1	1518.3
1321.5	1602.2

Time increment (t) = 6.0 min.

Pond File: c:\pondpack\87040\ALT1 .PND
Inflow Hydrograph: c:\pondpack\87040\POST-2 .HYD
Outflow Hydrograph: c:\pondpack\87040\5OUT-2 .HYD

INFLOW HYDROGRAPH / ROUTING COMPUTATIONS

TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
660.0	3.00	-----	4.0	4.0	0.00	83.00
666.0	3.00	6.0	9.2	10.0	0.40	83.51
672.0	4.00	7.0	15.1	16.2	0.52	83.79
678.0	4.00	8.0	21.9	23.1	0.61	84.03
684.0	5.00	9.0	29.5	30.9	0.69	84.23
690.0	5.00	10.0	38.0	39.5	0.77	84.43
696.0	6.00	11.0	47.4	49.0	0.80	84.61
702.0	10.00	16.0	61.7	63.4	0.84	84.86
708.0	15.00	25.0	84.7	86.7	0.98	85.20
714.0	19.00	34.0	116.7	118.7	1.04	85.60
720.0	35.00	54.0	168.3	170.7	1.16	86.15
726.0	62.00	97.0	262.7	265.3	1.30	86.95
732.0	69.00	131.0	390.0	393.7	1.89	87.83
738.0	47.00	116.0	501.1	506.0	2.41	88.51
744.0	35.00	82.0	577.8	583.1	2.69	88.96
750.0	36.00	71.0	642.9	648.8	2.93	89.34
756.0	43.00	79.0	715.7	721.9	3.10	89.74
762.0	48.00	91.0	789.9	806.7	8.39	90.16
768.0	51.00	99.0	836.6	888.9	26.15	90.51
774.0	48.00	99.0	856.5	935.6	39.55	90.69
780.0	44.00	92.0	862.0	948.5	43.25	90.74
786.0	39.00	83.0	860.5	945.0	42.25	90.73
792.0	34.00	73.0	855.6	933.5	38.95	90.68
798.0	29.00	63.0	849.3	918.6	34.68	90.63
804.0	24.00	53.0	842.3	902.3	29.98	90.56
810.0	21.00	45.0	835.9	887.3	25.69	90.50
816.0	18.00	39.0	829.5	874.9	22.73	90.45
822.0	16.00	34.0	823.4	863.5	20.03	90.41
828.0	14.00	30.0	818.1	853.4	17.66	90.36
834.0	13.00	27.0	813.7	845.1	15.70	90.33
840.0	12.00	25.0	810.3	838.7	14.20	90.30
846.0	11.00	23.0	807.4	833.3	12.93	90.28
852.0	11.00	22.0	805.4	829.4	12.02	90.27
858.0	10.00	21.0	803.8	826.4	11.30	90.25
864.0	9.00	19.0	801.4	822.8	10.71	90.24
870.0	9.00	18.0	798.9	819.4	10.21	90.22
876.0	8.00	17.0	796.5	815.9	9.72	90.21
882.0	8.00	16.0	794.1	812.5	9.23	90.19
888.0	7.00	15.0	791.6	809.1	8.73	90.17
894.0	6.00	13.0	788.4	804.6	8.09	90.15
900.0	6.00	12.0	785.5	800.4	7.49	90.14
906.0	6.00	12.0	783.3	797.5	7.06	90.12
912.0	6.00	12.0	781.8	795.3	6.75	90.11
918.0	6.00	12.0	780.8	793.8	6.54	90.11
924.0	6.00	12.0	780.0	792.8	6.38	90.10

Pond File: c:\pondpack\87040\ALT1 .PND
Inflow Hydrograph: c:\pondpack\87040\POST-2 .HYD
Outflow Hydrograph: c:\pondpack\87040\5OUT-2 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
930.0	6.00	12.0	779.4	792.0	6.27	90.10
936.0	6.00	12.0	779.1	791.4	6.19	90.09
942.0	6.00	12.0	778.8	791.1	6.14	90.09
948.0	5.00	11.0	777.9	789.8	5.95	90.09
954.0	5.00	10.0	776.5	787.9	5.68	90.08
960.0	5.00	10.0	775.6	786.5	5.48	90.07
966.0	5.00	10.0	774.9	785.6	5.34	90.07
972.0	5.00	10.0	774.4	784.9	5.25	90.06
978.0	5.00	10.0	774.0	784.4	5.17	90.06
984.0	5.00	10.0	773.8	784.0	5.12	90.06
990.0	5.00	10.0	773.6	783.8	5.09	90.06
996.0	5.00	10.0	773.5	783.6	5.06	90.06
1002.0	5.00	10.0	773.4	783.5	5.04	90.06
1008.0	5.00	10.0	773.3	783.4	5.03	90.06
1014.0	5.00	10.0	773.3	783.3	5.02	90.06
1020.0	5.00	10.0	773.2	783.3	5.02	90.06
1026.0	5.00	10.0	773.2	783.2	5.01	90.06
1032.0	4.00	9.0	772.5	782.2	4.86	90.05
1038.0	4.00	8.0	771.3	780.5	4.62	90.04
1044.0	3.00	7.0	769.7	778.3	4.29	90.03
1050.0	3.00	6.0	767.8	775.7	3.92	90.02
1056.0	3.00	6.0	766.5	773.8	3.66	90.01
1062.0	3.00	6.0	765.6	772.5	3.47	90.01
1068.0	3.00	6.0	764.9	771.6	3.33	90.00
1074.0	3.00	6.0	764.4	770.9	3.24	90.00
1080.0	3.00	6.0	764.0	770.4	3.20	90.00
1086.0	3.00	6.0	763.6	770.0	3.20	90.00
1092.0	3.00	6.0	763.2	769.6	3.20	89.99
1098.0	3.00	6.0	762.9	769.2	3.20	89.99
1104.0	3.00	6.0	762.5	768.9	3.20	89.99
1110.0	3.00	6.0	762.1	768.5	3.20	89.99
1116.0	3.00	6.0	761.7	768.1	3.19	89.99
1122.0	3.00	6.0	761.3	767.7	3.19	89.98
1128.0	3.00	6.0	760.9	767.3	3.19	89.98
1134.0	3.00	6.0	760.5	766.9	3.19	89.98
1140.0	3.00	6.0	760.1	766.5	3.19	89.98
1146.0	3.00	6.0	759.8	766.1	3.19	89.98
1152.0	3.00	6.0	759.4	765.8	3.19	89.97
1158.0	3.00	6.0	759.0	765.4	3.19	89.97
1164.0	3.00	6.0	758.6	765.0	3.19	89.97
1170.0	3.00	6.0	758.3	764.6	3.19	89.97
1176.0	3.00	6.0	757.9	764.3	3.19	89.97
1182.0	3.00	6.0	757.5	763.9	3.19	89.96
1188.0	3.00	6.0	757.1	763.5	3.18	89.96
1194.0	3.00	6.0	756.8	763.1	3.18	89.96
1200.0	3.00	6.0	756.4	762.8	3.18	89.96

Pond File: c:\pondpack\87040\ALT1 .PND
Inflow Hydrograph: c:\pondpack\87040\POST-2 .HYD
Outflow Hydrograph: c:\pondpack\87040\5OUT-2 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
1206.0	3.00	6.0	756.0	762.4	3.18	89.96
1212.0	3.00	6.0	755.7	762.0	3.18	89.95
1218.0	3.00	6.0	755.3	761.7	3.18	89.95
1224.0	3.00	6.0	755.0	761.3	3.18	89.95
1230.0	3.00	6.0	754.6	761.0	3.18	89.95
1236.0	3.00	6.0	754.2	760.6	3.18	89.95
1242.0	3.00	6.0	753.9	760.2	3.18	89.94
1248.0	3.00	6.0	753.5	759.9	3.18	89.94
1254.0	3.00	6.0	753.2	759.5	3.18	89.94
1260.0	2.00	5.0	751.8	758.2	3.17	89.93
1266.0	2.00	4.0	749.5	755.8	3.17	89.92
1272.0	2.00	4.0	747.2	753.5	3.16	89.91
1278.0	2.00	4.0	744.9	751.2	3.16	89.90
1284.0	2.00	4.0	742.5	748.9	3.15	89.88
1290.0	2.00	4.0	740.2	746.5	3.15	89.87
1296.0	2.00	4.0	738.0	744.2	3.14	89.86
1302.0	2.00	4.0	735.7	742.0	3.14	89.85
1308.0	2.00	4.0	733.4	739.7	3.13	89.83
1314.0	2.00	4.0	731.2	737.4	3.13	89.82
1320.0	2.00	4.0	728.9	735.2	3.12	89.81
1326.0	2.00	4.0	726.7	732.9	3.12	89.80
1332.0	2.00	4.0	724.4	730.7	3.11	89.79
1338.0	2.00	4.0	722.2	728.4	3.11	89.77
1344.0	2.00	4.0	720.0	726.2	3.11	89.76
1350.0	2.00	4.0	717.8	724.0	3.10	89.75
1356.0	2.00	4.0	715.6	721.8	3.10	89.74
1362.0	2.00	4.0	713.4	719.6	3.09	89.73
1368.0	2.00	4.0	711.3	717.4	3.09	89.72
1374.0	2.00	4.0	709.1	715.3	3.08	89.70
1380.0	2.00	4.0	707.0	713.1	3.08	89.69
1386.0	1.00	3.0	703.8	710.0	3.07	89.67
1392.0	1.00	2.0	699.7	705.8	3.06	89.65
1398.0	1.00	2.0	695.6	701.7	3.05	89.63
1404.0	1.00	2.0	691.5	697.6	3.04	89.61
1410.0	1.00	2.0	687.4	693.5	3.03	89.58
1416.0	1.00	2.0	683.4	689.4	3.02	89.56
1422.0	1.00	2.0	679.4	685.4	3.02	89.54
1428.0	1.00	2.0	675.3	681.4	3.01	89.52
1434.0	1.00	2.0	671.3	677.3	3.00	89.50
1440.0	1.00	2.0	667.4	673.3	2.99	89.47
1446.0	1.00	2.0	663.4	669.4	2.98	89.45
1452.0	1.00	2.0	659.5	665.4	2.97	89.43
1458.0	1.00	2.0	655.5	661.5	2.96	89.41
1464.0	1.00	2.0	651.6	657.5	2.95	89.39
1470.0	1.00	2.0	647.7	653.6	2.95	89.36
1476.0	1.00	2.0	643.9	649.7	2.94	89.34

Pond File: c:\pondpack\87040\ALT1 .PND
Inflow Hydrograph: c:\pondpack\87040\POST-2 .HYD
Outflow Hydrograph: c:\pondpack\87040\5OUT-2 .HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
1482.0	1.00
1488.0	1.00
1494.0	1.00
1500.0	0.00
1506.0	0.00
1512.0	0.00
1518.0	0.00
1524.0	0.00
1530.0	0.00
1536.0	0.00
1542.0	0.00
1548.0	0.00
1554.0	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
2.0	640.0	645.9	2.93	89.32
2.0	636.2	642.0	2.92	89.30
2.0	632.3	638.2	2.91	89.28
1.0	627.5	633.3	2.90	89.25
0.0	621.8	627.5	2.87	89.22
0.0	616.1	621.8	2.85	89.19
0.0	610.4	616.1	2.82	89.15
0.0	604.9	610.4	2.80	89.12
0.0	599.3	604.9	2.77	89.09
0.0	593.8	599.3	2.75	89.06
0.0	588.4	593.8	2.72	89.03
0.0	583.0	588.4	2.70	89.00
0.0	577.6	583.0	2.69	88.96

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

Pond File: c:\pondpack\87040\ALT1 .PND
Inflow Hydrograph: c:\pondpack\87040\POST-2 .HYD
Outflow Hydrograph: c:\pondpack\87040\5OUT-2 .HYD

Starting Pond W.S. Elevation = 83.00 ft

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

Peak Inflow = 69.00 cfs
Peak Outflow = 43.25 cfs
Peak Elevation = 90.74 ft

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

Initial Storage = 715 cu-ft
Peak Storage From Storm = 162,234 cu-ft

Total Storage in Pond = 162,949 cu-ft

Warning: Inflow hydrograph truncated on left side.

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*********************************
*                               *
*   BERKELEY COMMONS PHASE 5    *
*       L&M No. 87040-301       *
* James City County, Virginia   *
*                               *
*                               *
*********************************
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Inflow Hydrograph: c:\pondpack\87040\POST-10 .HYD
Rating Table file: c:\pondpack\87040\ALT1 .PND

----INITIAL CONDITIONS----
Elevation = 83.00 ft
Outflow = 0.00 cfs
Storage = 715 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
83.00	0.0	715
83.25	0.2	1,078
83.50	0.4	1,684
83.75	0.5	2,599
84.00	0.6	3,885
84.25	0.7	5,546
84.50	0.8	7,568
84.75	0.8	9,986
85.00	0.9	12,836
85.25	1.0	16,069
85.50	1.0	19,622
85.75	1.1	23,509
86.00	1.1	27,746
86.25	1.2	32,363
86.50	1.2	37,392
86.75	1.3	42,850
87.00	1.3	48,756
87.25	1.3	55,024
87.50	1.5	61,565
87.75	1.8	68,383
88.00	2.1	75,484
88.25	2.3	82,798
88.50	2.4	90,247
88.75	2.6	97,835
89.00	2.7	105,562
89.25	2.9	113,445
89.50	3.0	121,501
89.75	3.1	129,733
90.00	3.2	138,142
90.25	11.1	146,596
90.50	25.4	154,962

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
4.0	4.0
6.0	6.2
9.4	9.8
14.4	14.9
21.6	22.2
30.8	31.5
42.0	42.8
55.5	56.3
71.3	72.2
89.3	90.3
109.0	110.0
130.6	131.7
154.1	155.2
179.8	181.0
207.7	208.9
238.1	239.4
270.9	272.2
305.7	307.0
342.0	343.5
379.9	381.7
419.4	421.5
460.0	462.3
501.4	503.8
543.5	546.1
586.5	589.2
630.3	633.2
675.0	678.0
720.7	723.8
767.5	770.7
814.4	825.5
860.9	886.3

GIVEN POND DATA			INTERMEDIATE ROUTING COMPUTATIONS	
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)	2S/t (cfs)	2S/t + 0 (cfs)
90.75	43.9	163,240	906.9	950.8
91.00	65.8	171,430	952.4	1018.2
91.25	90.6	179,784	998.8	1089.4
91.50	118.1	188,559	1047.6	1165.7
91.75	151.7	197,765	1098.7	1250.4
92.00	191.1	207,413	1152.3	1343.4
92.25	229.9	217,379	1207.7	1437.6
92.50	254.2	227,533	1264.1	1518.3
92.75	280.7	237,879	1321.5	1602.2

Time increment (t) = 6.0 min.

Pond File: c:\pondpack\87040\ALT1 .PND
Inflow Hydrograph: c:\pondpack\87040\POST-10 .HYD
Outflow Hydrograph: c:\pondpack\87040\5OUT-10 .HYD

INFLOW HYDROGRAPH / ROUTING COMPUTATIONS

TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
660.0	7.00	-----	4.0	4.0	0.00	83.00
666.0	8.00	15.0	17.9	19.0	0.56	83.89
672.0	8.00	16.0	32.4	33.9	0.72	84.30
678.0	9.00	17.0	47.8	49.4	0.80	84.62
684.0	10.00	19.0	65.1	66.8	0.87	84.92
690.0	11.00	21.0	84.1	86.1	0.98	85.19
696.0	12.00	23.0	105.1	107.1	1.00	85.46
702.0	21.00	33.0	135.9	138.1	1.10	85.82
708.0	31.00	52.0	185.5	187.9	1.20	86.31
714.0	40.00	71.0	253.9	256.5	1.30	86.88
720.0	70.00	110.0	360.6	363.9	1.66	87.63
726.0	124.00	194.0	549.4	554.6	2.62	88.80
732.0	137.00	261.0	792.5	810.4	8.92	90.18
738.0	94.00	231.0	888.2	1023.5	67.66	91.02
744.0	71.00	165.0	897.2	1053.2	78.00	91.12
750.0	75.00	146.0	894.2	1043.2	74.52	91.09
756.0	89.00	164.0	898.7	1058.2	79.73	91.14
762.0	101.00	190.0	908.0	1088.7	90.37	91.25
768.0	104.00	205.0	914.8	1113.0	99.11	91.33
774.0	98.00	202.0	915.8	1116.8	100.47	91.34
780.0	93.00	191.0	913.1	1106.8	96.89	91.31
786.0	81.00	174.0	907.5	1087.1	89.78	91.24
792.0	70.00	151.0	898.8	1058.5	79.83	91.14
798.0	60.00	130.0	889.8	1028.8	69.50	91.04
804.0	50.00	110.0	880.2	999.8	59.83	90.93
810.0	44.00	94.0	871.2	974.2	51.49	90.84
816.0	38.00	82.0	863.8	953.2	44.67	90.76
822.0	34.00	72.0	856.6	935.8	39.61	90.69
828.0	29.00	63.0	849.7	919.6	34.96	90.63
834.0	26.00	55.0	843.3	904.7	30.68	90.57
840.0	24.00	50.0	838.5	893.3	27.42	90.53
846.0	22.00	46.0	834.5	884.5	24.98	90.49
852.0	20.00	42.0	830.3	876.5	23.11	90.46
858.0	18.00	38.0	826.0	868.3	21.17	90.43
864.0	17.00	35.0	822.1	861.0	19.44	90.40
870.0	17.00	34.0	819.5	856.1	18.29	90.38
876.0	16.00	33.0	817.6	852.5	17.45	90.36
882.0	16.00	32.0	816.1	849.6	16.77	90.35
888.0	15.00	31.0	814.7	847.1	16.17	90.34
894.0	14.00	29.0	813.0	843.7	15.38	90.32
900.0	14.00	28.0	811.5	841.0	14.73	90.31
906.0	13.00	27.0	810.2	838.5	14.15	90.30
912.0	13.00	26.0	809.0	836.2	13.61	90.29
918.0	12.00	25.0	807.8	834.0	13.09	90.28
924.0	12.00	24.0	806.6	831.8	12.58	90.28

Pond File: c:\pondpack\87040\ALT1 .PND
Inflow Hydrograph: c:\pondpack\87040\POST-10 .HYD
Outflow Hydrograph: c:\pondpack\87040\5OUT-10 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
930.0	11.00	23.0	805.5	829.6	12.07	90.27
936.0	11.00	22.0	804.4	827.5	11.57	90.26
942.0	11.00	22.0	803.8	826.4	11.30	90.25
948.0	11.00	22.0	803.5	825.8	11.16	90.25
954.0	11.00	22.0	803.3	825.5	11.09	90.25
960.0	11.00	22.0	803.1	825.3	11.06	90.25
966.0	11.00	22.0	803.1	825.1	11.05	90.25
972.0	10.00	21.0	802.3	824.1	10.89	90.24
978.0	10.00	20.0	801.0	822.3	10.63	90.24
984.0	9.00	19.0	799.4	820.0	10.31	90.22
990.0	9.00	18.0	797.5	817.4	9.93	90.21
996.0	9.00	18.0	796.2	815.5	9.66	90.20
1002.0	9.00	18.0	795.3	814.2	9.47	90.20
1008.0	8.00	17.0	793.9	812.3	9.19	90.19
1014.0	8.00	16.0	792.2	809.9	8.85	90.18
1020.0	8.00	16.0	791.0	808.2	8.60	90.17
1026.0	8.00	16.0	790.1	807.0	8.43	90.17
1032.0	8.00	16.0	789.5	806.1	8.31	90.16
1038.0	8.00	16.0	789.1	805.5	8.22	90.16
1044.0	8.00	16.0	788.8	805.1	8.16	90.16
1050.0	8.00	16.0	788.5	804.8	8.11	90.16
1056.0	8.00	16.0	788.4	804.5	8.08	90.15
1062.0	8.00	16.0	788.3	804.4	8.06	90.15
1068.0	8.00	16.0	788.2	804.3	8.04	90.15
1074.0	8.00	16.0	788.1	804.2	8.03	90.15
1080.0	8.00	16.0	788.1	804.1	8.02	90.15
1086.0	8.00	16.0	788.1	804.1	8.01	90.15
1092.0	8.00	16.0	788.0	804.1	8.01	90.15
1098.0	7.00	15.0	787.3	803.0	7.86	90.15
1104.0	7.00	14.0	786.1	801.3	7.61	90.14
1110.0	7.00	14.0	785.2	800.1	7.44	90.13
1116.0	7.00	14.0	784.6	799.2	7.31	90.13
1122.0	7.00	14.0	784.1	798.6	7.22	90.13
1128.0	6.00	13.0	783.1	797.1	7.01	90.12
1134.0	6.00	12.0	781.7	795.1	6.72	90.11
1140.0	6.00	12.0	780.6	793.7	6.51	90.10
1146.0	6.00	12.0	779.9	792.6	6.37	90.10
1152.0	6.00	12.0	779.4	791.9	6.26	90.10
1158.0	6.00	12.0	779.0	791.4	6.19	90.09
1164.0	6.00	12.0	778.8	791.0	6.13	90.09
1170.0	6.00	12.0	778.6	790.8	6.09	90.09
1176.0	6.00	12.0	778.4	790.6	6.07	90.09
1182.0	6.00	12.0	778.3	790.4	6.05	90.09
1188.0	6.00	12.0	778.3	790.3	6.03	90.09
1194.0	6.00	12.0	778.2	790.3	6.02	90.09
1200.0	6.00	12.0	778.2	790.2	6.02	90.09

Pond File: c:\pondpack\87040\ALT1 .PND
Inflow Hydrograph: c:\pondpack\87040\POST-10 .HYD
Outflow Hydrograph: c:\pondpack\87040\5OUT-10 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
1206.0	6.00	12.0	778.2	790.2	6.01	90.09
1212.0	6.00	12.0	778.1	790.2	6.01	90.09
1218.0	6.00	12.0	778.1	790.1	6.01	90.09
1224.0	6.00	12.0	778.1	790.1	6.00	90.09
1230.0	6.00	12.0	778.1	790.1	6.00	90.09
1236.0	6.00	12.0	778.1	790.1	6.00	90.09
1242.0	6.00	12.0	778.1	790.1	6.00	90.09
1248.0	6.00	12.0	778.1	790.1	6.00	90.09
1254.0	6.00	12.0	778.1	790.1	6.00	90.09
1260.0	6.00	12.0	778.1	790.1	6.00	90.09
1266.0	5.00	11.0	777.4	789.1	5.86	90.08
1272.0	5.00	10.0	776.2	787.4	5.61	90.08
1278.0	5.00	10.0	775.3	786.2	5.43	90.07
1284.0	5.00	10.0	774.7	785.3	5.31	90.07
1290.0	5.00	10.0	774.2	784.7	5.22	90.06
1296.0	5.00	10.0	773.9	784.2	5.16	90.06
1302.0	5.00	10.0	773.7	783.9	5.11	90.06
1308.0	5.00	10.0	773.6	783.7	5.08	90.06
1314.0	5.00	10.0	773.4	783.6	5.06	90.06
1320.0	5.00	10.0	773.4	783.4	5.04	90.06
1326.0	5.00	10.0	773.3	783.4	5.03	90.06
1332.0	5.00	10.0	773.3	783.3	5.02	90.06
1338.0	5.00	10.0	773.2	783.3	5.01	90.06
1344.0	4.00	9.0	772.5	782.2	4.87	90.05
1350.0	4.00	8.0	771.3	780.5	4.62	90.04
1356.0	4.00	8.0	770.4	779.3	4.44	90.04
1362.0	4.00	8.0	769.8	778.4	4.31	90.04
1368.0	4.00	8.0	769.3	777.8	4.22	90.03
1374.0	4.00	8.0	769.0	777.3	4.16	90.03
1380.0	4.00	8.0	768.8	777.0	4.11	90.03
1386.0	4.00	8.0	768.6	776.8	4.08	90.03
1392.0	4.00	8.0	768.5	776.6	4.06	90.03
1398.0	3.00	7.0	767.7	775.5	3.90	90.02
1404.0	3.00	6.0	766.4	773.7	3.64	90.01
1410.0	3.00	6.0	765.5	772.4	3.45	90.01
1416.0	3.00	6.0	764.9	771.5	3.32	90.00
1422.0	3.00	6.0	764.4	770.9	3.23	90.00
1428.0	3.00	6.0	764.0	770.4	3.20	90.00
1434.0	3.00	6.0	763.6	770.0	3.20	90.00
1440.0	2.00	5.0	762.2	768.6	3.20	89.99
1446.0	2.00	4.0	759.8	766.2	3.19	89.98
1452.0	2.00	4.0	757.5	763.8	3.19	89.96
1458.0	2.00	4.0	755.1	761.5	3.18	89.95
1464.0	2.00	4.0	752.8	759.1	3.18	89.94
1470.0	2.00	4.0	750.4	756.8	3.17	89.93
1476.0	2.00	4.0	748.1	754.4	3.17	89.91

Pond File: c:\pondpack\87040\ALT1 .PND
Inflow Hydrograph: c:\pondpack\87040\POST-10 .HYD
Outflow Hydrograph: c:\pondpack\87040\5OUT-10 .HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
1482.0	2.00
1488.0	2.00
1494.0	1.00
1500.0	1.00
1506.0	1.00
1512.0	1.00
1518.0	1.00
1524.0	1.00
1530.0	1.00
1536.0	0.00
1542.0	0.00
1548.0	0.00
1554.0	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
4.0	745.8	752.1	3.16	89.90
4.0	743.5	749.8	3.16	89.89
3.0	740.2	746.5	3.15	89.87
2.0	735.9	742.2	3.14	89.85
2.0	731.6	737.9	3.13	89.82
2.0	727.4	733.6	3.12	89.80
2.0	723.2	729.4	3.11	89.78
2.0	718.9	725.2	3.10	89.76
2.0	714.8	720.9	3.09	89.73
1.0	709.6	715.8	3.08	89.71
0.0	703.5	709.6	3.07	89.67
0.0	697.3	703.5	3.06	89.64
0.0	691.3	697.3	3.04	89.61

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

Pond File: c:\pondpack\87040\ALT1 .PND
Inflow Hydrograph: c:\pondpack\87040\POST-10 .HYD
Outflow Hydrograph: c:\pondpack\87040\5OUT-10 .HYD

Starting Pond W.S. Elevation = 83.00 ft

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

Peak Inflow = 137.00 cfs
Peak Outflow = 100.47 cfs
Peak Elevation = 91.34 ft

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

Initial Storage = 715 cu-ft
Peak Storage From Storm = 182,220 cu-ft

Total Storage in Pond = 182,935 cu-ft

Warning: Inflow hydrograph truncated on left side.

EXECUTED: 12-17-1997 13:01:51 Return Freq: 25 years

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*********************************
*                               *
*   BERKELEY COMMONS PHASE 5    *
*       L&M No. 87040-301       *
* James City County, Virginia   *
*                               *
*                               *
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Inflow Hydrograph: c:\pondpack\87040\POST-25 .HYD
Rating Table file: c:\pondpack\87040\ALT1 .PND

----INITIAL CONDITIONS----
Elevation = 83.00 ft
Outflow = 0.00 cfs
Storage = 715 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
83.00	0.0	715
83.25	0.2	1,078
83.50	0.4	1,684
83.75	0.5	2,599
84.00	0.6	3,885
84.25	0.7	5,546
84.50	0.8	7,568
84.75	0.8	9,986
85.00	0.9	12,836
85.25	1.0	16,069
85.50	1.0	19,622
85.75	1.1	23,509
86.00	1.1	27,746
86.25	1.2	32,363
86.50	1.2	37,392
86.75	1.3	42,850
87.00	1.3	48,756
87.25	1.3	55,024
87.50	1.5	61,565
87.75	1.8	68,383
88.00	2.1	75,484
88.25	2.3	82,798
88.50	2.4	90,247
88.75	2.6	97,835
89.00	2.7	105,562
89.25	2.9	113,445
89.50	3.0	121,501
89.75	3.1	129,733
90.00	3.2	138,142
90.25	11.1	146,596
90.50	25.4	154,962

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
4.0	4.0
6.0	6.2
9.4	9.8
14.4	14.9
21.6	22.2
30.8	31.5
42.0	42.8
55.5	56.3
71.3	72.2
89.3	90.3
109.0	110.0
130.6	131.7
154.1	155.2
179.8	181.0
207.7	208.9
238.1	239.4
270.9	272.2
305.7	307.0
342.0	343.5
379.9	381.7
419.4	421.5
460.0	462.3
501.4	503.8
543.5	546.1
586.5	589.2
630.3	633.2
675.0	678.0
720.7	723.8
767.5	770.7
814.4	825.5
860.9	886.3

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
90.75	43.9	163,240
91.00	65.8	171,430
91.25	90.6	179,784
91.50	118.1	188,559
91.75	151.7	197,765
92.00	191.1	207,413
92.25	229.9	217,379
92.50	254.2	227,533
92.75	280.7	237,879

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + 0 (cfs)
906.9	950.8
952.4	1018.2
998.8	1089.4
1047.6	1165.7
1098.7	1250.4
1152.3	1343.4
1207.7	1437.6
1264.1	1518.3
1321.5	1602.2

Time increment (t) = 6.0 min.

Pond File: c:\pondpack\87040\ALT1 .PND
Inflow Hydrograph: c:\pondpack\87040\POST-25 .HYD
Outflow Hydrograph: c:\pondpack\87040\5OUT-25 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
660.0	7.00	-----	4.0	4.0	0.00	83.00
666.0	8.00	15.0	17.9	19.0	0.56	83.89
672.0	9.00	17.0	33.4	34.9	0.73	84.32
678.0	10.00	19.0	50.8	52.4	0.80	84.68
684.0	11.00	21.0	70.0	71.8	0.90	84.99
690.0	12.00	23.0	91.0	93.0	1.00	85.28
696.0	13.00	25.0	114.0	116.0	1.03	85.57
702.0	24.00	37.0	148.8	151.0	1.10	85.95
708.0	35.00	59.0	205.4	207.8	1.20	86.49
714.0	46.00	81.0	283.8	286.4	1.30	87.10
720.0	82.00	128.0	407.7	411.8	2.03	87.94
726.0	144.00	226.0	627.9	633.7	2.90	89.25
732.0	158.00	302.0	854.1	929.9	37.91	90.67
738.0	109.00	267.0	917.0	1121.1	102.03	91.35
744.0	82.00	191.0	913.4	1108.0	97.32	91.31
750.0	87.00	169.0	906.1	1082.4	88.16	91.23
756.0	103.00	190.0	910.1	1096.1	93.01	91.27
762.0	116.00	219.0	919.3	1129.1	104.90	91.38
768.0	121.00	237.0	926.8	1156.3	114.71	91.47
774.0	114.00	235.0	928.4	1161.8	116.72	91.49
780.0	108.00	222.0	925.2	1150.4	112.59	91.45
786.0	94.00	202.0	918.7	1127.2	104.23	91.37
792.0	80.00	174.0	909.1	1092.7	91.80	91.26
798.0	69.00	149.0	898.7	1058.1	79.71	91.14
804.0	58.00	127.0	888.9	1025.7	68.42	91.03
810.0	51.00	109.0	879.5	997.9	59.20	90.92
816.0	44.00	95.0	871.3	974.5	51.60	90.84
822.0	39.00	83.0	864.2	954.3	45.04	90.76
828.0	34.00	73.0	857.2	937.2	40.01	90.70
834.0	30.00	64.0	850.4	921.2	35.41	90.64
840.0	27.00	57.0	844.5	907.4	31.45	90.58
846.0	25.00	52.0	839.8	896.5	28.32	90.54
852.0	23.00	48.0	836.2	887.8	25.84	90.51
858.0	21.00	44.0	832.2	880.2	23.95	90.47
864.0	20.00	41.0	828.6	873.2	22.33	90.45
870.0	20.00	40.0	826.1	868.6	21.23	90.43
876.0	19.00	39.0	824.3	865.1	20.42	90.41
882.0	18.00	37.0	822.3	861.3	19.52	90.40
888.0	17.00	35.0	820.1	857.3	18.57	90.38
894.0	16.00	33.0	817.9	853.1	17.59	90.36
900.0	15.00	31.0	815.7	848.9	16.61	90.35
906.0	15.00	30.0	814.0	845.7	15.85	90.33
912.0	15.00	30.0	813.1	844.0	15.45	90.33
918.0	14.00	29.0	812.1	842.1	15.00	90.32
924.0	14.00	28.0	811.0	840.1	14.53	90.31

Pond File: c:\pondpack\87040\ALT1 .PND
Inflow Hydrograph: c:\pondpack\87040\POST-25 .HYD
Outflow Hydrograph: c:\pondpack\87040\5OUT-25 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
930.0	14.00	28.0	810.5	839.0	14.28	90.31
936.0	14.00	28.0	810.2	838.5	14.15	90.30
942.0	13.00	27.0	809.5	837.2	13.84	90.30
948.0	13.00	26.0	808.6	835.5	13.45	90.29
954.0	12.00	25.0	807.6	833.6	13.00	90.28
960.0	12.00	24.0	806.5	831.6	12.53	90.28
966.0	12.00	24.0	806.0	830.5	12.28	90.27
972.0	12.00	24.0	805.7	830.0	12.15	90.27
978.0	11.00	23.0	805.0	828.7	11.84	90.26
984.0	11.00	22.0	804.1	827.0	11.45	90.26
990.0	11.00	22.0	803.6	826.1	11.24	90.25
996.0	11.00	22.0	803.4	825.6	11.13	90.25
1002.0	11.00	22.0	803.2	825.4	11.08	90.25
1008.0	10.00	21.0	802.4	824.2	10.91	90.24
1014.0	10.00	20.0	801.1	822.4	10.65	90.24
1020.0	10.00	20.0	800.2	821.1	10.46	90.23
1026.0	10.00	20.0	799.5	820.2	10.33	90.23
1032.0	10.00	20.0	799.0	819.5	10.23	90.22
1038.0	9.00	19.0	798.0	818.0	10.02	90.22
1044.0	9.00	18.0	796.5	816.0	9.73	90.21
1050.0	9.00	18.0	795.5	814.5	9.52	90.20
1056.0	9.00	18.0	794.8	813.5	9.37	90.20
1062.0	9.00	18.0	794.2	812.8	9.26	90.19
1068.0	8.00	17.0	793.2	811.2	9.04	90.18
1074.0	8.00	16.0	791.7	809.2	8.74	90.18
1080.0	8.00	16.0	790.6	807.7	8.53	90.17
1086.0	8.00	16.0	789.9	806.6	8.38	90.16
1092.0	8.00	16.0	789.3	805.9	8.27	90.16
1098.0	8.00	16.0	788.9	805.3	8.19	90.16
1104.0	8.00	16.0	788.7	804.9	8.14	90.16
1110.0	8.00	16.0	788.5	804.7	8.10	90.15
1116.0	8.00	16.0	788.3	804.5	8.07	90.15
1122.0	8.00	16.0	788.2	804.3	8.05	90.15
1128.0	8.00	16.0	788.2	804.2	8.03	90.15
1134.0	8.00	16.0	788.1	804.2	8.02	90.15
1140.0	8.00	16.0	788.1	804.1	8.02	90.15
1146.0	8.00	16.0	788.1	804.1	8.01	90.15
1152.0	8.00	16.0	788.0	804.1	8.01	90.15
1158.0	7.00	15.0	787.3	803.0	7.86	90.15
1164.0	7.00	14.0	786.1	801.3	7.61	90.14
1170.0	7.00	14.0	785.2	800.1	7.44	90.13
1176.0	7.00	14.0	784.6	799.2	7.31	90.13
1182.0	7.00	14.0	784.1	798.6	7.22	90.13
1188.0	6.00	13.0	783.1	797.1	7.01	90.12
1194.0	6.00	12.0	781.7	795.1	6.72	90.11
1200.0	6.00	12.0	780.6	793.7	6.51	90.10

Pond File: c:\pondpack\87040\ALT1 .PND
Inflow Hydrograph: c:\pondpack\87040\POST-25 .HYD
Outflow Hydrograph: c:\pondpack\87040\5OUT-25 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
1206.0	6.00	12.0	779.9	792.6	6.37	90.10
1212.0	6.00	12.0	779.4	791.9	6.26	90.10
1218.0	6.00	12.0	779.0	791.4	6.19	90.09
1224.0	6.00	12.0	778.8	791.0	6.13	90.09
1230.0	6.00	12.0	778.6	790.8	6.09	90.09
1236.0	6.00	12.0	778.4	790.6	6.07	90.09
1242.0	6.00	12.0	778.3	790.4	6.05	90.09
1248.0	6.00	12.0	778.3	790.3	6.03	90.09
1254.0	6.00	12.0	778.2	790.3	6.02	90.09
1260.0	6.00	12.0	778.2	790.2	6.02	90.09
1266.0	5.00	11.0	777.5	789.2	5.87	90.08
1272.0	5.00	10.0	776.2	787.5	5.62	90.08
1278.0	5.00	10.0	775.3	786.2	5.44	90.07
1284.0	5.00	10.0	774.7	785.3	5.31	90.07
1290.0	5.00	10.0	774.3	784.7	5.22	90.06
1296.0	5.00	10.0	773.9	784.3	5.16	90.06
1302.0	5.00	10.0	773.7	783.9	5.11	90.06
1308.0	5.00	10.0	773.6	783.7	5.08	90.06
1314.0	5.00	10.0	773.4	783.6	5.06	90.06
1320.0	5.00	10.0	773.4	783.4	5.04	90.06
1326.0	5.00	10.0	773.3	783.4	5.03	90.06
1332.0	5.00	10.0	773.3	783.3	5.02	90.06
1338.0	5.00	10.0	773.2	783.3	5.01	90.06
1344.0	4.00	9.0	772.5	782.2	4.87	90.05
1350.0	4.00	8.0	771.3	780.5	4.62	90.04
1356.0	4.00	8.0	770.4	779.3	4.44	90.04
1362.0	4.00	8.0	769.8	778.4	4.31	90.04
1368.0	4.00	8.0	769.3	777.8	4.22	90.03
1374.0	4.00	8.0	769.0	777.3	4.16	90.03
1380.0	4.00	8.0	768.8	777.0	4.11	90.03
1386.0	4.00	8.0	768.6	776.8	4.08	90.03
1392.0	4.00	8.0	768.5	776.6	4.06	90.03
1398.0	3.00	7.0	767.7	775.5	3.90	90.02
1404.0	3.00	6.0	766.4	773.7	3.64	90.01
1410.0	3.00	6.0	765.5	772.4	3.45	90.01
1416.0	3.00	6.0	764.9	771.5	3.32	90.00
1422.0	3.00	6.0	764.4	770.9	3.23	90.00
1428.0	3.00	6.0	764.0	770.4	3.20	90.00
1434.0	3.00	6.0	763.6	770.0	3.20	90.00
1440.0	2.00	5.0	762.2	768.6	3.20	89.99
1446.0	2.00	4.0	759.8	766.2	3.19	89.98
1452.0	2.00	4.0	757.5	763.8	3.19	89.96
1458.0	2.00	4.0	755.1	761.5	3.18	89.95
1464.0	2.00	4.0	752.8	759.1	3.18	89.94
1470.0	2.00	4.0	750.4	756.8	3.17	89.93
1476.0	2.00	4.0	748.1	754.4	3.17	89.91

Pond File: c:\pondpack\87040\ALT1 .PND
Inflow Hydrograph: c:\pondpack\87040\POST-25 .HYD
Outflow Hydrograph: c:\pondpack\87040\5OUT-25 .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
1482.0	2.00	4.0	745.8	752.1	3.16	89.90
1488.0	2.00	4.0	743.5	749.8	3.16	89.89
1494.0	1.00	3.0	740.2	746.5	3.15	89.87
1500.0	1.00	2.0	735.9	742.2	3.14	89.85
1506.0	1.00	2.0	731.6	737.9	3.13	89.82
1512.0	1.00	2.0	727.4	733.6	3.12	89.80
1518.0	1.00	2.0	723.2	729.4	3.11	89.78
1524.0	1.00	2.0	718.9	725.2	3.10	89.76
1530.0	1.00	2.0	714.8	720.9	3.09	89.73
1536.0	0.00	1.0	709.6	715.8	3.08	89.71
1542.0	0.00	0.0	703.5	709.6	3.07	89.67
1548.0	0.00	0.0	697.3	703.5	3.06	89.64
1554.0	0.00	0.0	691.3	697.3	3.04	89.61

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

Pond File: c:\pondpack\87040\ALT1 .PND
Inflow Hydrograph: c:\pondpack\87040\POST-25 .HYD
Outflow Hydrograph: c:\pondpack\87040\5OUT-25 .HYD

Starting Pond W.S. Elevation = 83.00 ft

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

Peak Inflow = 158.00 cfs
Peak Outflow = 116.72 cfs
Peak Elevation = 91.49 ft

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

Initial Storage = 715 cu-ft
Peak Storage From Storm = 187,404 cu-ft

Total Storage in Pond = 188,120 cu-ft

Warning: Inflow hydrograph truncated on left side.

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*   BERKELEY COMMONS PHASE 5    *
*       L&M No. 87040-301       *
* James City County, Virginia   *
*                               *
*                               *
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Inflow Hydrograph: c:\pondpack\87040\POST-100.HYD
Rating Table file: c:\pondpack\87040\ALT1 .PND

----INITIAL CONDITIONS----
Elevation = 83.00 ft
Outflow = 0.00 cfs
Storage = 715 cu-ft

GIVEN POND DATA			INTERMEDIATE ROUTING COMPUTATIONS	
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)	2S/t (cfs)	2S/t + O (cfs)
83.00	0.0	715	4.0	4.0
83.25	0.2	1,078	6.0	6.2
83.50	0.4	1,684	9.4	9.8
83.75	0.5	2,599	14.4	14.9
84.00	0.6	3,885	21.6	22.2
84.25	0.7	5,546	30.8	31.5
84.50	0.8	7,568	42.0	42.8
84.75	0.8	9,986	55.5	56.3
85.00	0.9	12,836	71.3	72.2
85.25	1.0	16,069	89.3	90.3
85.50	1.0	19,622	109.0	110.0
85.75	1.1	23,509	130.6	131.7
86.00	1.1	27,746	154.1	155.2
86.25	1.2	32,363	179.8	181.0
86.50	1.2	37,392	207.7	208.9
86.75	1.3	42,850	238.1	239.4
87.00	1.3	48,756	270.9	272.2
87.25	1.3	55,024	305.7	307.0
87.50	1.5	61,565	342.0	343.5
87.75	1.8	68,383	379.9	381.7
88.00	2.1	75,484	419.4	421.5
88.25	2.3	82,798	460.0	462.3
88.50	2.4	90,247	501.4	503.8
88.75	2.6	97,835	543.5	546.1
89.00	2.7	105,562	586.5	589.2
89.25	2.9	113,445	630.3	633.2
89.50	3.0	121,501	675.0	678.0
89.75	3.1	129,733	720.7	723.8
90.00	3.2	138,142	767.5	770.7
90.25	11.1	146,596	814.4	825.5
90.50	25.4	154,962	860.9	886.3

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
90.75	43.9	163,240
91.00	65.8	171,430
91.25	90.6	179,784
91.50	118.1	188,559
91.75	151.7	197,765
92.00	191.1	207,413
92.25	229.9	217,379
92.50	254.2	227,533
92.75	280.7	237,879

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
906.9	950.8
952.4	1018.2
998.8	1089.4
1047.6	1165.7
1098.7	1250.4
1152.3	1343.4
1207.7	1437.6
1264.1	1518.3
1321.5	1602.2

Time increment (t) = 6.0 min.

Pond File: c:\pondpack\87040\ALT1 .PND
Inflow Hydrograph: c:\pondpack\87040\POST-100.HYD
Outflow Hydrograph: c:\pondpack\87040\5OUT-100.HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
660.0	9.00
666.0	10.00
672.0	11.00
678.0	12.00
684.0	14.00
690.0	16.00
696.0	18.00
702.0	32.00
708.0	45.00
714.0	59.00
720.0	105.00
726.0	186.00
732.0	204.00
738.0	141.00
744.0	106.00
750.0	114.00
756.0	135.00
762.0	153.00
768.0	159.00
774.0	150.00
780.0	141.00
786.0	123.00
792.0	105.00
798.0	90.00
804.0	76.00
810.0	66.00
816.0	56.00
822.0	50.00
828.0	44.00
834.0	40.00
840.0	36.00
846.0	33.00
852.0	31.00
858.0	28.00
864.0	27.00
870.0	25.00
876.0	24.00
882.0	23.00
888.0	22.00
894.0	21.00
900.0	20.00
906.0	19.00
912.0	19.00
918.0	18.00
924.0	18.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
-----	4.0	4.0	0.00	83.00
19.0	21.8	23.0	0.61	84.02
21.0	41.2	42.8	0.80	84.50
23.0	62.5	64.2	0.85	84.87
26.0	86.5	88.5	0.99	85.22
30.0	114.4	116.5	1.03	85.57
34.0	146.2	148.4	1.10	85.93
50.0	193.8	196.2	1.20	86.39
77.0	268.2	270.8	1.30	86.99
104.0	368.8	372.2	1.73	87.69
164.0	527.7	532.8	2.54	88.67
291.0	798.5	818.7	10.12	90.22
390.0	934.2	1188.5	127.14	91.57
345.0	951.4	1279.2	163.89	91.83
247.0	936.2	1198.4	131.08	91.60
220.0	926.8	1156.2	114.70	91.47
249.0	931.6	1175.8	122.13	91.53
288.0	940.6	1219.6	139.47	91.66
312.0	947.3	1252.6	152.64	91.76
309.0	947.9	1256.3	154.22	91.77
291.0	944.6	1238.9	147.14	91.72
264.0	938.3	1208.6	135.14	91.63
228.0	929.6	1166.3	118.38	91.50
195.0	918.0	1124.6	103.29	91.37
166.0	906.6	1084.0	88.72	91.23
142.0	895.8	1048.6	76.38	91.11
122.0	886.5	1017.8	65.68	91.00
106.0	877.6	992.5	57.44	90.90
94.0	870.3	971.6	50.66	90.83
84.0	864.2	954.3	45.03	90.76
76.0	858.5	940.2	40.86	90.71
69.0	853.1	927.5	37.21	90.66
64.0	848.6	917.1	34.22	90.62
59.0	844.6	907.6	31.51	90.58
55.0	841.2	899.6	29.21	90.55
52.0	838.4	893.2	27.37	90.53
49.0	836.0	887.4	25.72	90.50
47.0	833.7	883.0	24.62	90.49
45.0	831.5	878.7	23.62	90.47
43.0	829.3	874.5	22.62	90.45
41.0	827.0	870.3	21.62	90.43
39.0	824.8	866.0	20.62	90.42
38.0	823.0	862.8	19.86	90.40
37.0	821.6	860.0	19.22	90.39
36.0	820.3	857.6	18.65	90.38

Pond File: c:\pondpack\87040\ALT1 .PND
Inflow Hydrograph: c:\pondpack\87040\POST-100.HYD
Outflow Hydrograph: c:\pondpack\87040\5OUT-100.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
930.0	17.00	35.0	819.1	855.3	18.11	90.37
936.0	17.00	34.0	817.9	853.1	17.59	90.36
942.0	17.00	34.0	817.3	851.9	17.31	90.36
948.0	16.00	33.0	816.4	850.3	16.93	90.35
954.0	16.00	32.0	815.5	848.4	16.49	90.34
960.0	16.00	32.0	814.9	847.5	16.26	90.34
966.0	16.00	32.0	814.7	846.9	16.14	90.34
972.0	15.00	31.0	814.0	845.7	15.84	90.33
978.0	15.00	30.0	813.1	844.0	15.44	90.33
984.0	14.00	29.0	812.1	842.1	15.00	90.32
990.0	14.00	28.0	811.0	840.1	14.53	90.31
996.0	14.00	28.0	810.5	839.0	14.28	90.31
1002.0	14.00	28.0	810.2	838.5	14.15	90.30
1008.0	13.00	27.0	809.5	837.2	13.84	90.30
1014.0	13.00	26.0	808.6	835.5	13.45	90.29
1020.0	13.00	26.0	808.1	834.6	13.24	90.29
1026.0	13.00	26.0	807.9	834.1	13.13	90.29
1032.0	12.00	25.0	807.2	832.9	12.83	90.28
1038.0	12.00	24.0	806.3	831.2	12.44	90.27
1044.0	11.00	23.0	805.3	829.3	12.00	90.27
1050.0	11.00	22.0	804.3	827.3	11.53	90.26
1056.0	11.00	22.0	803.7	826.3	11.28	90.25
1062.0	11.00	22.0	803.4	825.7	11.15	90.25
1068.0	11.00	22.0	803.3	825.4	11.09	90.25
1074.0	11.00	22.0	803.1	825.3	11.06	90.25
1080.0	11.00	22.0	803.0	825.1	11.04	90.25
1086.0	11.00	22.0	803.0	825.0	11.03	90.25
1092.0	11.00	22.0	802.9	825.0	11.02	90.25
1098.0	11.00	22.0	802.9	824.9	11.02	90.25
1104.0	11.00	22.0	802.9	824.9	11.01	90.25
1110.0	10.00	21.0	802.2	823.9	10.86	90.24
1116.0	10.00	20.0	800.9	822.2	10.62	90.23
1122.0	10.00	20.0	800.1	820.9	10.44	90.23
1128.0	10.00	20.0	799.4	820.1	10.31	90.23
1134.0	10.00	20.0	799.0	819.4	10.22	90.22
1140.0	10.00	20.0	798.7	819.0	10.16	90.22
1146.0	10.00	20.0	798.4	818.7	10.11	90.22
1152.0	10.00	20.0	798.3	818.4	10.08	90.22
1158.0	9.00	19.0	797.5	817.3	9.91	90.21
1164.0	9.00	18.0	796.2	815.5	9.65	90.20
1170.0	9.00	18.0	795.2	814.2	9.46	90.20
1176.0	9.00	18.0	794.6	813.2	9.33	90.19
1182.0	9.00	18.0	794.1	812.6	9.23	90.19
1188.0	8.00	17.0	793.1	811.1	9.02	90.18
1194.0	8.00	16.0	791.6	809.1	8.73	90.17
1200.0	8.00	16.0	790.6	807.6	8.52	90.17

Pond File: c:\pondpack\87040\ALT1 .PND
Inflow Hydrograph: c:\pondpack\87040\POST-100.HYD
Outflow Hydrograph: c:\pondpack\87040\5OUT-100.HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
1206.0	8.00
1212.0	8.00
1218.0	8.00
1224.0	8.00
1230.0	8.00
1236.0	8.00
1242.0	8.00
1248.0	8.00
1254.0	8.00
1260.0	8.00
1266.0	7.00
1272.0	7.00
1278.0	7.00
1284.0	7.00
1290.0	7.00
1296.0	7.00
1302.0	7.00
1308.0	7.00
1314.0	7.00
1320.0	7.00
1326.0	7.00
1332.0	7.00
1338.0	6.00
1344.0	6.00
1350.0	6.00
1356.0	6.00
1362.0	6.00
1368.0	6.00
1374.0	5.00
1380.0	5.00
1386.0	5.00
1392.0	5.00
1398.0	5.00
1404.0	5.00
1410.0	4.00
1416.0	4.00
1422.0	4.00
1428.0	4.00
1434.0	4.00
1440.0	4.00
1446.0	3.00
1452.0	3.00
1458.0	3.00
1464.0	3.00
1470.0	3.00
1476.0	2.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
16.0	789.8	806.6	8.37	90.16
16.0	789.3	805.8	8.26	90.16
16.0	788.9	805.3	8.19	90.16
16.0	788.7	804.9	8.13	90.16
16.0	788.5	804.7	8.09	90.15
16.0	788.3	804.5	8.07	90.15
16.0	788.2	804.3	8.05	90.15
16.0	788.2	804.2	8.03	90.15
16.0	788.1	804.2	8.02	90.15
16.0	788.1	804.1	8.02	90.15
15.0	787.3	803.1	7.87	90.15
14.0	786.1	801.3	7.62	90.14
14.0	785.2	800.1	7.44	90.13
14.0	784.6	799.2	7.31	90.13
14.0	784.2	798.6	7.22	90.13
14.0	783.8	798.2	7.16	90.13
14.0	783.6	797.8	7.11	90.12
14.0	783.4	797.6	7.08	90.12
14.0	783.3	797.4	7.06	90.12
14.0	783.3	797.3	7.04	90.12
14.0	783.2	797.3	7.03	90.12
14.0	783.2	797.2	7.02	90.12
13.0	782.4	796.2	6.87	90.12
12.0	781.2	794.4	6.62	90.11
12.0	780.3	793.2	6.44	90.10
12.0	779.7	792.3	6.31	90.10
12.0	779.2	791.7	6.22	90.10
12.0	778.9	791.2	6.16	90.09
11.0	778.0	789.9	5.97	90.09
10.0	776.6	788.0	5.69	90.08
10.0	775.6	786.6	5.49	90.07
10.0	774.9	785.6	5.35	90.07
10.0	774.4	784.9	5.25	90.06
10.0	774.0	784.4	5.18	90.06
9.0	773.1	783.0	4.98	90.06
8.0	771.7	781.1	4.70	90.05
8.0	770.7	779.7	4.50	90.04
8.0	770.0	778.7	4.35	90.04
8.0	769.5	778.0	4.25	90.03
8.0	769.1	777.5	4.18	90.03
7.0	768.1	776.1	3.98	90.02
6.0	766.7	774.1	3.70	90.02
6.0	765.7	772.7	3.50	90.01
6.0	765.0	771.7	3.36	90.00
6.0	764.5	771.0	3.25	90.00
5.0	763.1	769.5	3.20	89.99

Pond File: c:\pondpack\87040\ALT1 .PND
Inflow Hydrograph: c:\pondpack\87040\POST-100.HYD
Outflow Hydrograph: c:\pondpack\87040\5OUT-100.HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
1482.0	2.00
1488.0	2.00
1494.0	2.00
1500.0	2.00
1506.0	2.00
1512.0	1.00
1518.0	1.00
1524.0	1.00
1530.0	1.00
1536.0	1.00
1542.0	1.00
1548.0	0.00
1554.0	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
4.0	760.7	767.1	3.19	89.98
4.0	758.4	764.7	3.19	89.97
4.0	756.0	762.4	3.18	89.96
4.0	753.6	760.0	3.18	89.94
4.0	751.3	757.6	3.17	89.93
3.0	748.0	754.3	3.17	89.91
2.0	743.7	750.0	3.16	89.89
2.0	739.4	745.7	3.15	89.87
2.0	735.1	741.4	3.14	89.84
2.0	730.8	737.1	3.13	89.82
2.0	726.6	732.8	3.12	89.80
1.0	721.4	727.6	3.11	89.77
0.0	715.2	721.4	3.09	89.74

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

Pond File: c:\pondpack\87040\ALT1 .PND
Inflow Hydrograph: c:\pondpack\87040\POST-100.HYD
Outflow Hydrograph: c:\pondpack\87040\5OUT-100.HYD

Starting Pond W.S. Elevation = 83.00 ft

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

Peak Inflow	=	204.00 cfs
Peak Outflow	=	163.89 cfs
Peak Elevation	=	91.83 ft

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

Initial Storage	=	715 cu-ft
Peak Storage From Storm	=	200,035 cu-ft

Total Storage in Pond	=	200,751 cu-ft

Warning: Inflow hydrograph truncated on left side.

- Rear yard should be increased if building is taller than 35'

- Hotel site must meet building coverage and FAR reqs.

- Hotel site must still meet Ches. Bay

- calcs supporting these should be submitted w/ any subdivision request.