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: PC034

PIN: 3710600001A

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

Property Description: Open Space A, B, and C Parcel 1 Phase 1 & Parcel D Phase 2

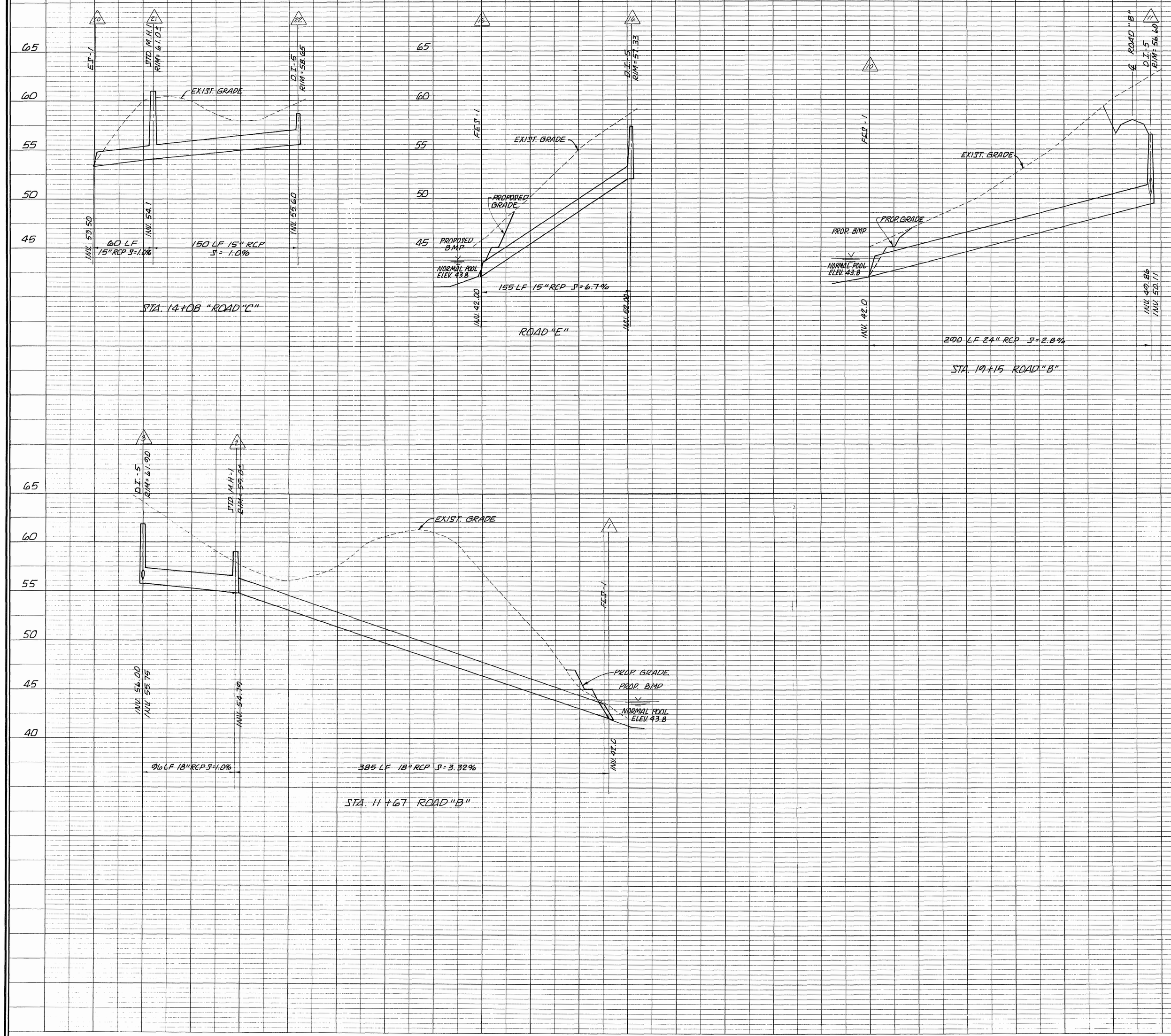
Site Address: 3999 Driftwood Way

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

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

Comments

SCALE: HORIZ. - 1" - 50'
VERT. - 1" - 5'



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

DES.	CRO
DWN.	HTB
CHK.	
DATE	11/3/93

STORM DRAIN PROFILES
SpringHill
PHASE I
FOR
SPRINGHILL DEVELOPMENT COMPANY, LLC
JAMES CITY COUNTY, VIRGINIA

PROJ. NO.	93039-4
SCALE:	AS NOTED
SHEET	14A OF 14
DWG.	5035GW

314611

FUTURE DEVELOPMENT = 1,804,509 S.F. OR 41.43 ACRES
TOTAL PARCEL = 3,573,065 S.F. OR 82.03 ACRES
ZONING = R-2 PARCEL (1-2)(37-2)

* (HEREBY DEDICATED FOR PUBLIC STREET PURPOSES)

GRID NORTH

PB 59 P 47-49
DB 689/160

DB
PB 5

(37-2)(01-0

N/F
CHARLES NEW
(P.B. 6, PG. 31)
(D.B. 28, PG. 293)

N/F
MARY LEE NEW

COMMON AREA
OPEN SPACE 1-B

PARCEL "D"
850,165 S.F.
OR 19.52 AC.

EXISTING 10' TRAIL

COMMON AREA
℄ 20' DRAINAGE EASEMENT TO HOMEOWNER'S ASSOCIATION

COMMON (A) AREA 1-A
150' GREENSPACE BUFFER

COMMON (C) 1-A
℄ 20' DRAINAGE EASEMENT TO HOMEOWNER'S ASSOCIATION

BOUNDARY FOLLOWS FENCE & CHOP LINE

28" PINE/FENCE

FENCE POST

MONU. (F)

IP(F)

N 72° 55' 51" E
577.65'

N 64° 25' 02" E
388.49'

N 81° 13' 52" E
359.22'

N 85° 48' 28" E
520.49'

N 82° 37' 14" E
377.92'

50' ACCESS EASEMENT TO CHARLES NEW PROPERTY

15" OAK/CHOP

24" OAK/CHOP

30" OAK/

RELOCATED 10' GRAVEL ROAD

EXISTING 10' GRAVEL ACCESS ROAD

FUTURE DEVELOPMENT
1,804,509 S.F.
OR 41.43 AC.

S63° 26' 18" E
142.44'

S52° 28' 16" E
213.01'

EXISTING FOUNDATION

S81° 58' 11" E
295.96'

N70° 52' 13" E
143.33'

N73° 28' 15" E
240.11'

N83° 03' 2
350.0

20' SANITARY SEWER EASEMENT TO JCSA

991.50' TOTAL

PERMANENT 10' GRAVEL ACCESS EASEMENT

COMMON AREA 1A (B)

COMMON AREA
℄ 20' DRAINAGE EASEMENT TO HOMEOWNER'S ASSOCIATION

S 78° 05' 01" W
350.14'

S 81° 37' 46" W
300.17'

S 79° 00' 44" W
728.18'

STATE RTE. 613 NEWS ROAD (VARIABLE WIDTH R/W)

℄ NEWS ROAD
(D.B. 139, PG. 635)

N/F
CASEY PROPERTIES

FORD'S COLONY @ WILLIAMSBURG
SECTION VII
(P.B. 50, PG. 40)

DRIFTWOOD WAY (50' R/W)
TEAKWOOD DRIVE (50' R/W)
BOXWOOD LANE (50' R/W)
ROSEWOOD COURT (50' R/W)
SPRINGHILL DRIVE (50' R/W)

SHEET 2 OF 3
SHEET 3 OF 3

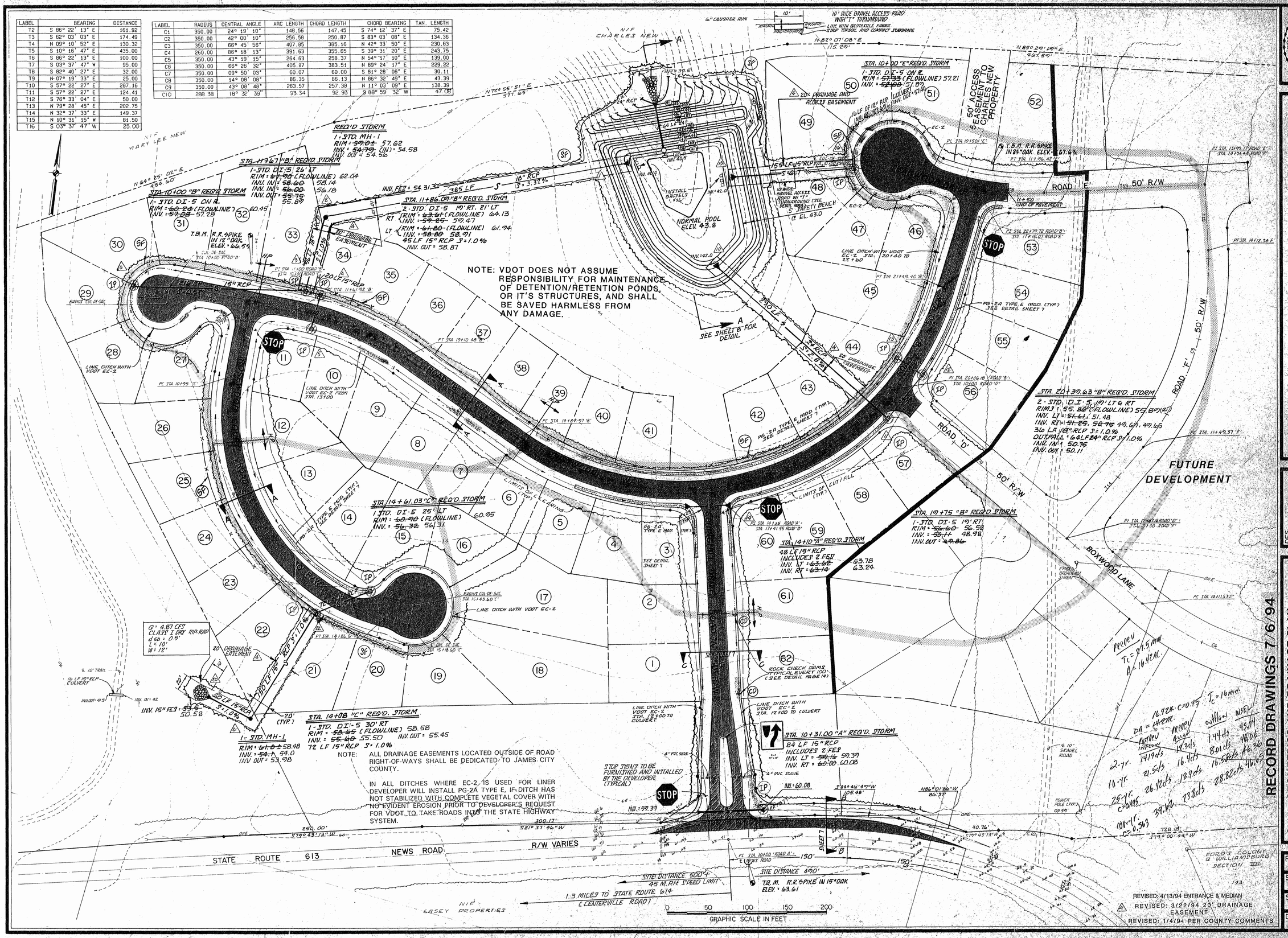
NOTE: ALL LOTS ARE TO BE SERVED BY PUBLIC WATER AND PUBLIC SEWE

OWNER'S CERTIFICATE

CERTIFICATE OF APPROVAL

LABEL	BEARING	DISTANCE
T2	S 86° 22' 13" E	161.92
T3	S 62° 03' 03" E	174.49
T4	N 09° 10' 52" E	130.32
T5	S 10° 16' 47" E	435.00
T6	S 86° 22' 13" E	100.00
T7	S 03° 37' 47" W	95.00
T8	S 82° 40' 27" E	32.00
T9	N 07° 19' 33" E	25.00
T10	S 57° 22' 27" E	287.16
T11	S 57° 22' 27" E	124.41
T12	S 76° 33' 04" E	50.00
T13	N 79° 28' 45" E	202.75
T14	N 32° 37' 33" E	149.37
T15	N 10° 31' 15" W	81.50
T16	S 03° 37' 47" W	25.00

LABEL	RADIUS	CENTRAL ANGLE	ARC LENGTH	CHORD LENGTH	CHORD BEARING	TAN. LENGTH
C1	350.00	24° 19' 10"	148.56	147.45	S 74° 12' 37" E	75.42
C2	350.00	42° 00' 10"	256.58	250.87	S 83° 03' 08" E	134.36
C3	350.00	66° 45' 56"	407.85	385.16	N 42° 33' 50" E	230.63
C4	260.00	86° 18' 13"	391.63	355.65	S 39° 31' 20" E	243.75
C5	350.00	43° 19' 15"	264.63	258.37	N 54° 17' 10" E	139.00
C6	350.00	66° 26' 32"	405.87	383.51	N 89° 24' 17" E	229.22
C7	350.00	09° 50' 03"	60.07	60.00	S 81° 28' 06" E	30.11
C8	350.00	14° 08' 08"	86.35	86.13	N 86° 32' 49" E	43.39
C9	350.00	43° 08' 48"	263.57	257.38	N 11° 03' 09" E	138.39
C10	288.38	18° 32' 39"	93.34	92.93	S 88° 59' 32" W	47.08



COMMONWEALTH OF VIRGINIA
JOHN L. HUTCHERSON
No.
LICENSED PROFESSIONAL ENGINEER

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

DES. CRO
DWN. HTB
CHK.
DATE 11/3/93

GEOMETRICS AND DRAINAGE PLAN
Springhill
PHASE I
FOR
SPRINGHILL DEVELOPMENT COMPANY, LLC
JAMES CITY COUNTY, VIRGINIA

RECORD DRAWINGS 7/6/94

PROJ. NO. 93039-4
SCALE 1" = 50'
SHEET 3 OF 14
DWG 5040W

S-89-93 PC 034

OF NOTARIZATION

Virginia

Newport News

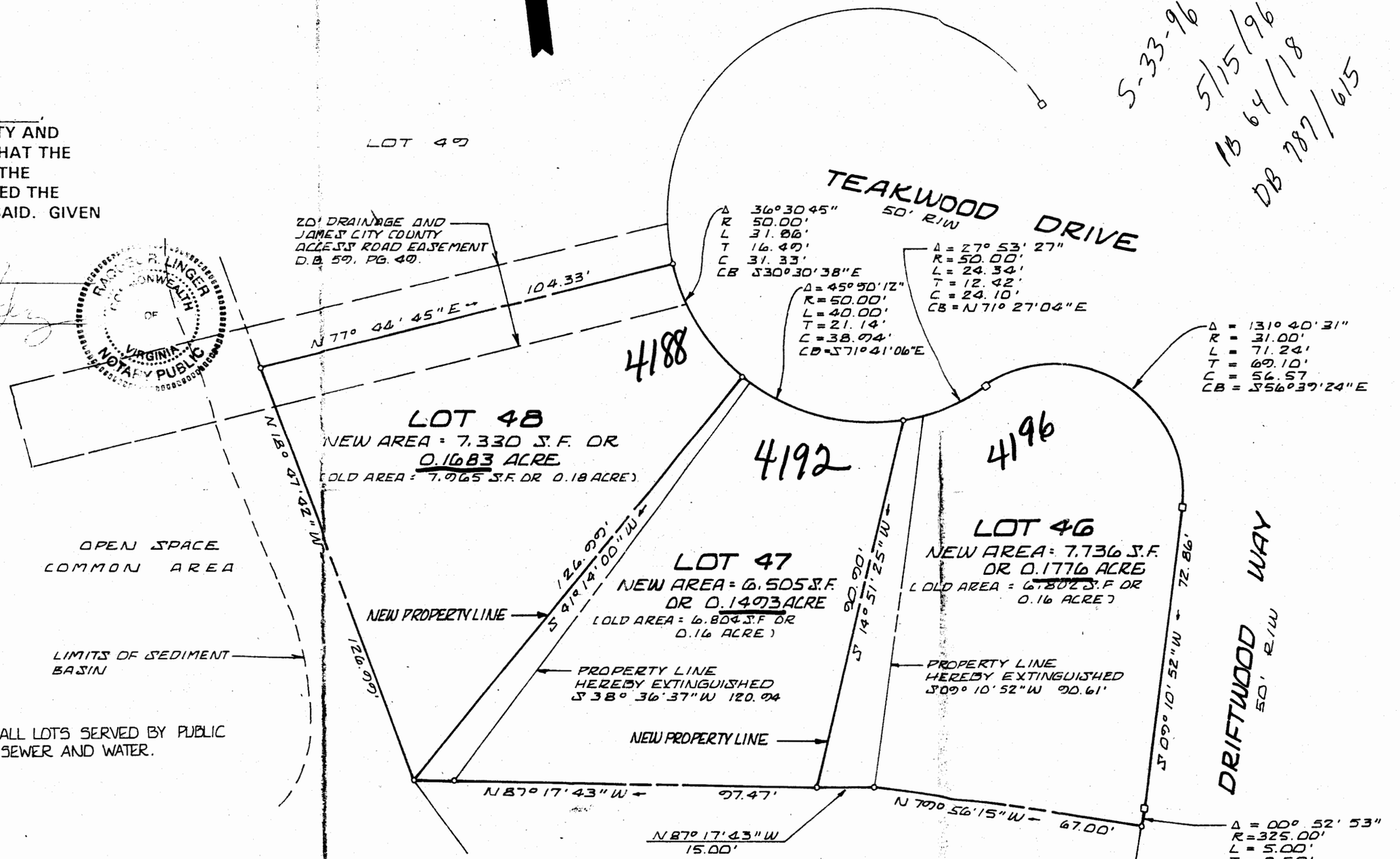
Raquel R. Jasillo-Linger,

LIC IN AND FOR THE COUNTY AND
AID, DO HEREBY CERTIFY THAT THE
SE NAMES ARE SIGNED TO THE
RITING HAVE ACKNOWLEDGED THE
ME IN THE COUNTY AFORESAID. GIVEN
ME THIS 28 DAY OF
, 1996
ON EXPIRES: 11-30-97

SIGNATURE

RAQUEL R. LINGER
COMMONWEALTH OF VIRGINIA
NOTARY PUBLIC

5-33-96
5/15/96
PB 64/18
DB 787/615



NOTE: ALL LOTS SERVED BY PUBLIC SEWER AND WATER.

ATE OF SOURCE OF TITLE - LOT 48

PROPERTY SHOWN ON THIS PLAT WAS
BY SPRINGHILL DEVELOPMENT CO., L.L.C.
ARD DOBSON BUILDER, INC. BY DEED
7/12/95 AND RECORDED IN THE OFFICE
ERK OF THE CIRCUIT COURT OF THE
F JAMES CITY IN DEED BOOK 745,
58

CERTIFICATE OF NOTARIZATION

STATE OF Virginia

COUNTY OF Newport News

I, (PRINT) Raquel R. Jasillo-Linger
A NOTARY PUBLIC IN AND FOR THE COUNTY AND
STATE AFORESAID, DO HEREBY CERTIFY THAT THE
PERSONS WHOSE NAMES ARE SIGNED TO THE

MAPPED
14 1996
JAMES CITY COUNTY
REAL ESTATE ASSESSMENTS

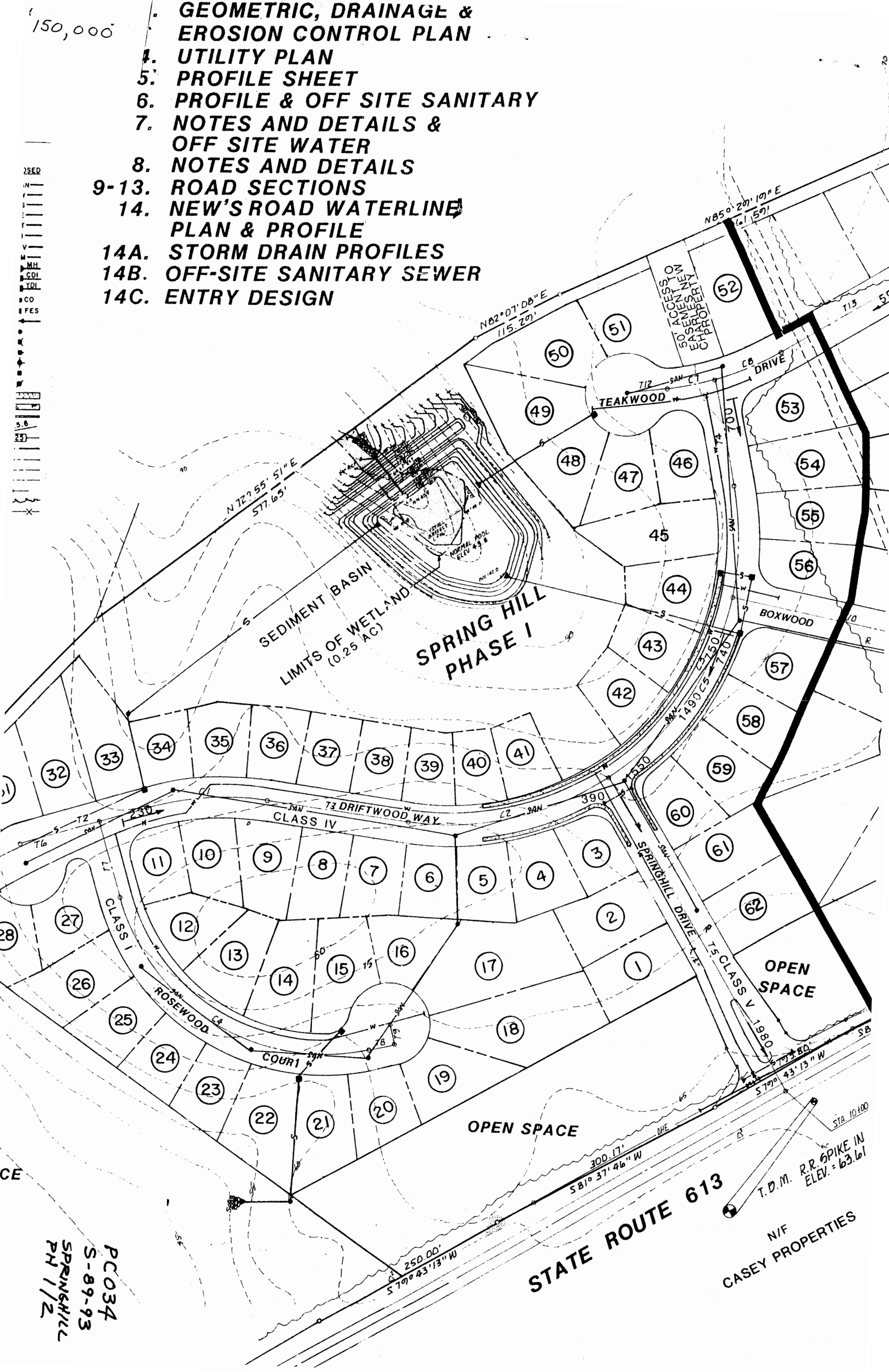
(31-1)(06-0-00XX-)

S-33-96

APR 1996

150,000

3. GEOMETRIC, DRAINAGE & EROSION CONTROL PLAN
4. UTILITY PLAN
5. PROFILE SHEET
6. PROFILE & OFF SITE SANITARY
7. NOTES AND DETAILS & OFF SITE WATER
8. NOTES AND DETAILS
9-13. ROAD SECTIONS
14. NEW'S ROAD WATERLINE PLAN & PROFILE
14A. STORM DRAIN PROFILES
14B. OFF-SITE SANITARY SEWER
14C. ENTRY DESIGN



PC034
S-89-93
SPRINGHILL
PH 1/2

256.58	250.87	S 83° 03' 08" E	134.36
407.85	385.16	N 42° 33' 50" E	230.63
391.63	355.65	S 39° 31' 20" E	243.75
264.63	258.37	N 54° 17' 10" E	139.00
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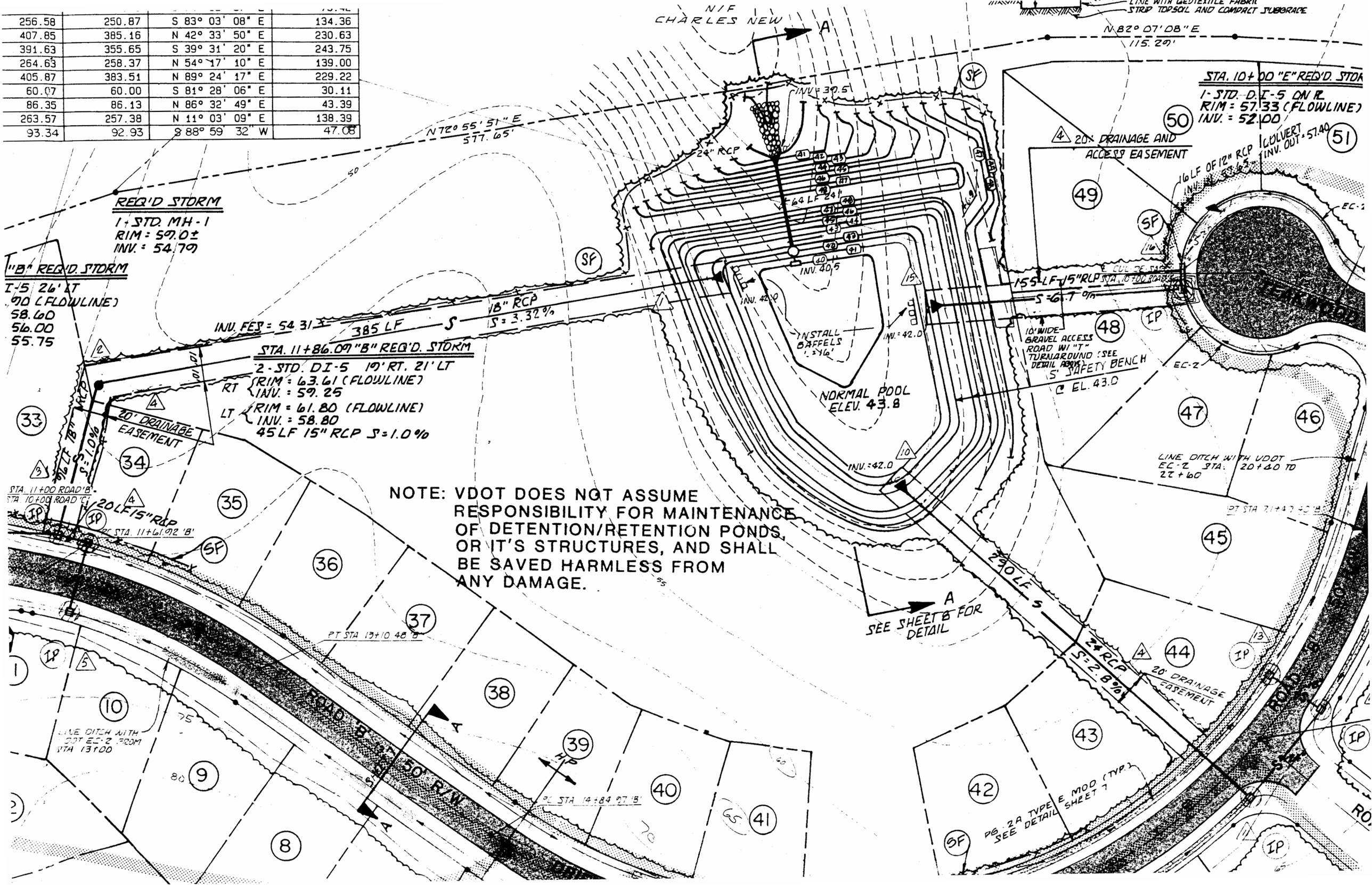


NOTE: VDOT DOES NOT ASSUME RESPONSIBILITY FOR MAINTENANCE OF DETENTION/RETENTION PONDS, OR IT'S STRUCTURES, AND SHALL BE SAVED HARMLESS FROM ANY DAMAGE.

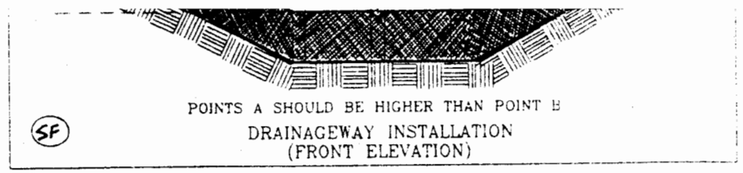
IFIC WRITTEN APPROVAL OF THE RESIDENT ENGINEER

TRACTOR SHALL BE RESPONSIBLE FOR MAKING SURE T TRUCKS AND OTHER VEHICLES LEAVING SITE ARE NED SUFFICIENTLY SO AS NOT TO CREATE A)WAY NUISANCE OR HAZARD.

IM SEWER PIPE SHALL BE REINFORCED CONCRETE PIPE CONFORMING TO ASTM C76, CLASS III, B-WALL KNESS, TONGUE AND GROOVE, UNLESS OTHERWISE :D.

:FILLING: BACKFILLING SHALL BE IN ACCORDANCE THE FOLLOWING:

THE CONTRACTOR SHALL REFILL ALL EXCAVATIONS AS RAPIDLY AS PRACTICABLE AFTER INSPECTION OF THE PIPE. BACKFILL SHALL BE CAREFULLY PLACED AROUND AND OVER THE PIPE AND STRUCTURES AND SHALL NOT BE PERMITTED TO FALL DIRECTLY ON THE PIPE OR STRUCTURES FROM A HEIGHT WHICH WOULD CAUSE DAMAGE OR DISTURB THE PIPE OR STRUCTURES.



Source: Adapted from Installation of Straw and Fabric Filter Barriers for Sediment Control, Sherwood and Wyant

Plate 3.05-2

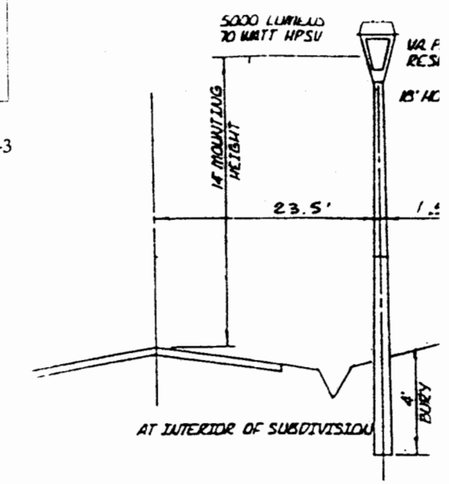
THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED AND WHERE AN OVERFLOW CAPACITY IS NECESSARY TO PREVENT EXCESSIVE PONDING AROUND THE STRUCTURE.

IP • GRAVEL SHALL BE VDOT #3, #357 OR #5 COARSE AGGREGATE

Source: Va. DSWC

Plate 3.07-3

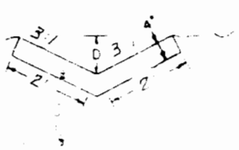
VISIT THE SITE IN ADVANCE OF THE
AND EVALUATE INSITU MATERIAL
PREPARE HIS/HER BID AND AT HIS/HE

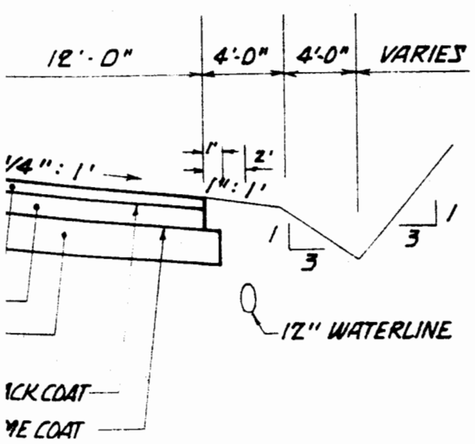


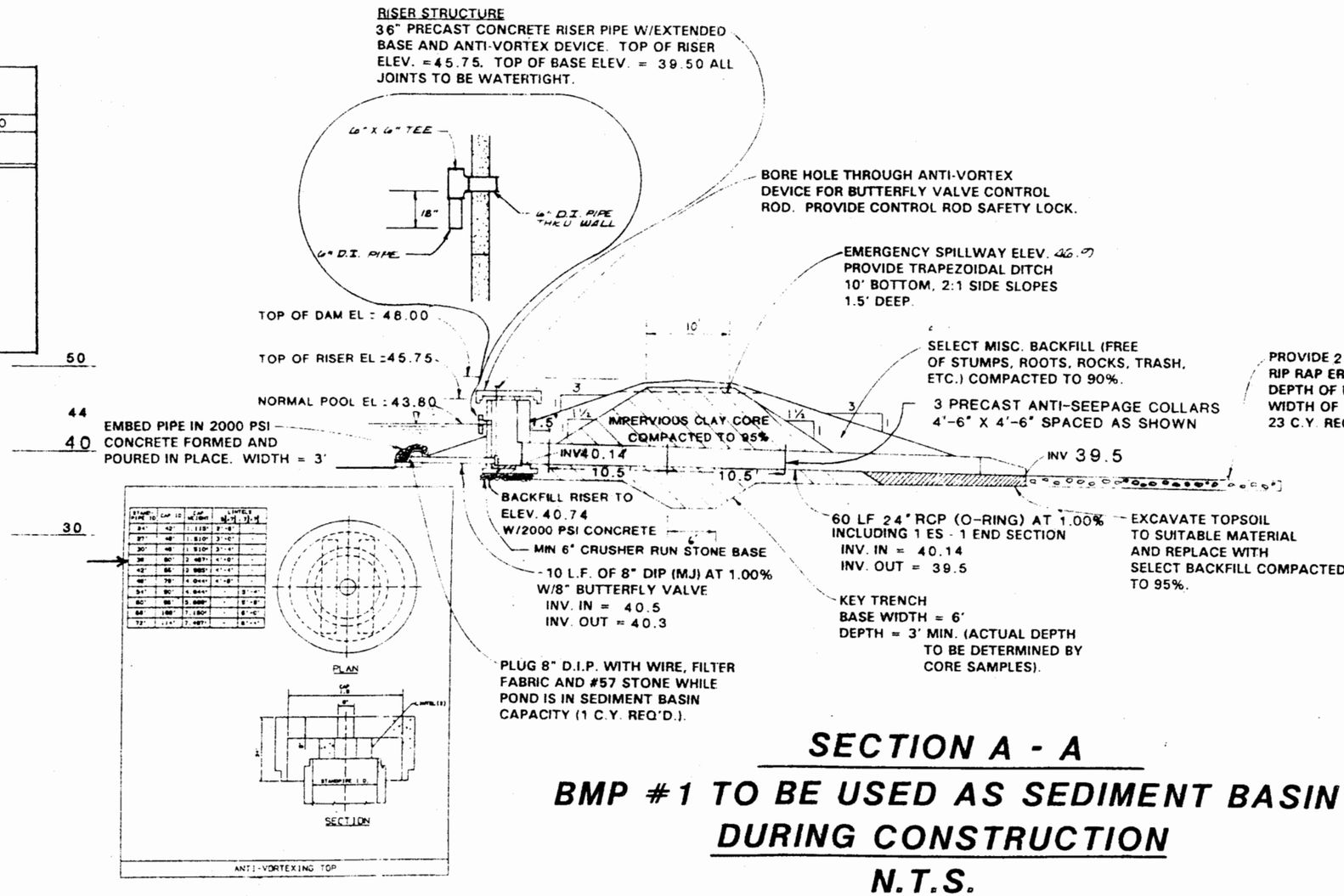
SECURITY LIGHTI
N.T.S.

DITCH AT TOE OF FILL OR TOP OF CUT

8"	2'-0"	2'-0"	0.500



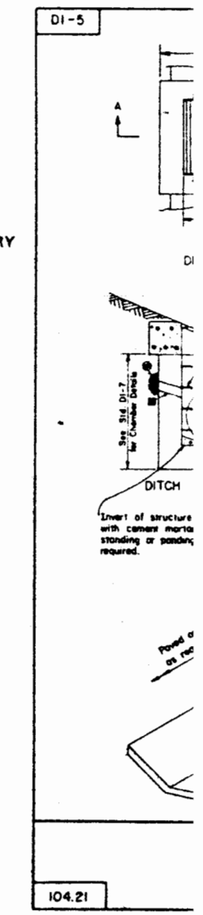




SECTION A - A

BMP #1 TO BE USED AS SEDIMENT BASIN DURING CONSTRUCTION

N.T.S.



PHASE I

BEING A SUBDIVISION OF THE PROPERTY OF

INGHILL DEVELOPMENT COMPANY, LLC

JAMES CITY COUNTY, VIRGINIA

SCALE: 1" = 50' DATE: 4/15/94

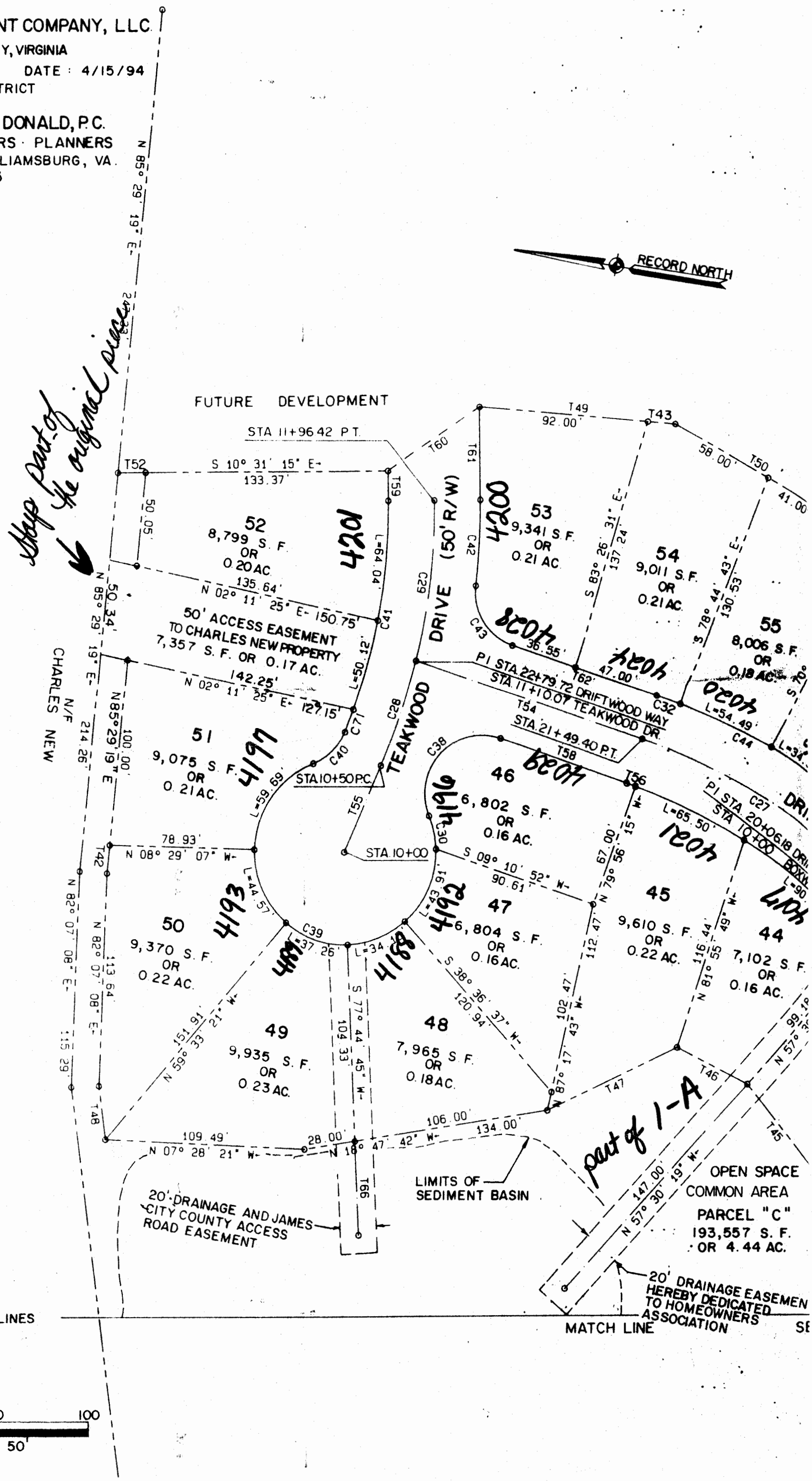
BERKELEY DISTRICT

LANGLEY AND McDONALD, P.C.

ENGINEERS · SURVEYORS · PLANNERS

101 PACKETS COURT, WILLIAMSBURG, VA.

SHEET 3 OF 3



NOTE: BUILDING SETBACK LINES NOT APPLICABLE

25 0 50 100

GRAPHIC SCALE 1" = 50'

DRAINAGE,

STORMWATER MANAGEMENT,

AND EROSION CONTROL DESIGN CALCULATIONS

FOR

SPRINGHILLL

PHASE 1

October 29,1993

Revised January 4, 1994

Langley and McDonald, P.C.

Engineers
Surveyors
Planners
Landscape Architects
Environmental Consultants

5544 Greenwich Road, Virginia Beach, VA 23462
(804) 473-2000 FAX: (804) 497-7933

201 Packets Court, Williamsburg, VA 23185
(804) 253-2975 FAX: (804) 229-0049

DRAINAGE,

STORMWATER MANAGEMENT,

AND EROSION CONTROL DESIGN CALCULATIONS

FOR

SPRINGHILLL

PHASE 1

October 29,1993

Revised January 4, 1994

DRAINAGE, STORMWATER MANAGEMENT, AND EROSION CONTROL DESIGN

The Drainage, Stormwater Management, and Erosion Control facilities for Phase 1 have been developed in basic conformance with the "Overall Drainage and Stormwater Management Plan". We have designed the wet pond as a 9 point BMP using 4 times the volume required by the Chesapeake Bay Preservation Act. The design volume required is as follows:

Required Volume of BMP 1

$$V_r = \frac{(R_m)(R_v)}{12} \times Ac.$$

$R_v = (0.05 + 0.009I) = [0.05 + 0.009(35.0)] = 0.365$
(Where I = 35% from CBLAM Sheet C-10, attached, ave. lot size 0.18 Ac.)

$R_m = 0.45"$

Ac. = 16.42 Acres

$$V_r = \frac{(0.45)(0.365)}{12} \times 16.42 = 0.275 \text{ ac.-ft.} = 9{,}800 \text{ cu. ft.}$$

A 9 Point BMP wet pond requires 4 x V_r normal storage.

$V_r \times 4 = 0.225$ ac.-ft. x 4 = 0.90 ac.-ft. = 39,200 cu. ft.

The BMP pond was designed using the Modified Rational Method and run on Haestad Methods Inc.'s Quick TR-55 and Pond-2 software. Intensity, Duration, and Frequency Curve data used was taken from the VDOT Drainage Manual for Norfolk (Rev. 6/92).

The BMP pond will be used as a sediment basin during construction. The total contributing acreage to BMP 1 is 16.42 acres. Thus, the required sediment trap volume is 1.364 Ac.-ft. For the 25-year storm frequency, the pond provides 0.916 ac.-ft. of wet storage volume and 0.987 ac. ft. of dry storage volume for a total storage volume of 1.90 ac.-ft.

ANNUAL STORM PHOSPHOROUS EXPORT — *TABLE 1*

For Existing Urban Land Uses
(in pounds/acre/year)

LAND USES	IMPERVIOUS COVER (%)	ANNUAL RAINFALL (in) 40	41	42	43	44	45
	0	0.11	0.11	0.11	0.11	0.12	0.12
5.0 acre residential lots	5	0.20	0.21	0.21	0.22	0.22	0.23
2.0 acre residential lots	10	0.30	0.30	0.31	0.32	0.33	0.33
1.0 acre residential lots	15	0.39	0.40	0.41	0.42	0.43	0.44
	16	0.41	0.42	0.43	0.44	0.45	0.46
	17	0.43	0.44	0.45	0.46	0.47	0.48
	18	0.45	0.46	0.47	0.48	0.49	0.51
	19	0.47	0.48	0.49	0.50	0.52	0.53
0.50 acre residential lots	20	2.03	2.08	2.13	2.18	2.23	2.28
0.33 acre residential lots	25	2.42	2.48	2.54	2.61	2.67	2.72
0.25 acre residential lots	30	2.82	2.89	2.96	3.03	3.10	3.17
0.18	35	3.22	3.30	3.38	3.46	3.54	3.62
Townhouses	40	3.61	3.70	3.79	3.88	3.97	4.06
	45	4.01	4.11	4.21	4.31	4.41	4.51
	50	4.41	4.52	4.63	4.74	4.85	4.96
Garden Apartments	55	4.80	4.92	5.04	5.16	5.28	5.40
	60	5.20	5.33	5.46	5.59	5.72	5.85
	65	5.60	5.74	5.88	6.02	6.16	6.30
Light	70	5.99	6.14	6.29	6.44	6.59	6.74
Commercial/Industrial	75	6.39	6.55	6.71	6.87	7.03	7.19
	80	6.79	6.96	7.13	7.29	7.46	7.63
Heavy	85	7.98	8.17	8.37	8.57	8.77	8.97
Commercial/Industrial	90	7.58	7.77	7.96	8.15	8.34	8.53
	95	7.98	8.17	8.37	8.57	8.77	8.97
Asphalt/Pavement	100	8.37	8.58	8.79	9.00	9.21	9.42

For Non-Urban Land Uses
(in pounds/acre/year)

LAND USE	SILT LOAM SOILS	LOAM SOILS	SANDY LOAM SOILS
Conventional Tillage Cropland	3.71	2.42	0.83
Conservation Tillage Cropland	2.32	1.52	0.52
Pasture Land	0.91	0.59	0.20
Forest Land	0.19	0.12	0.04

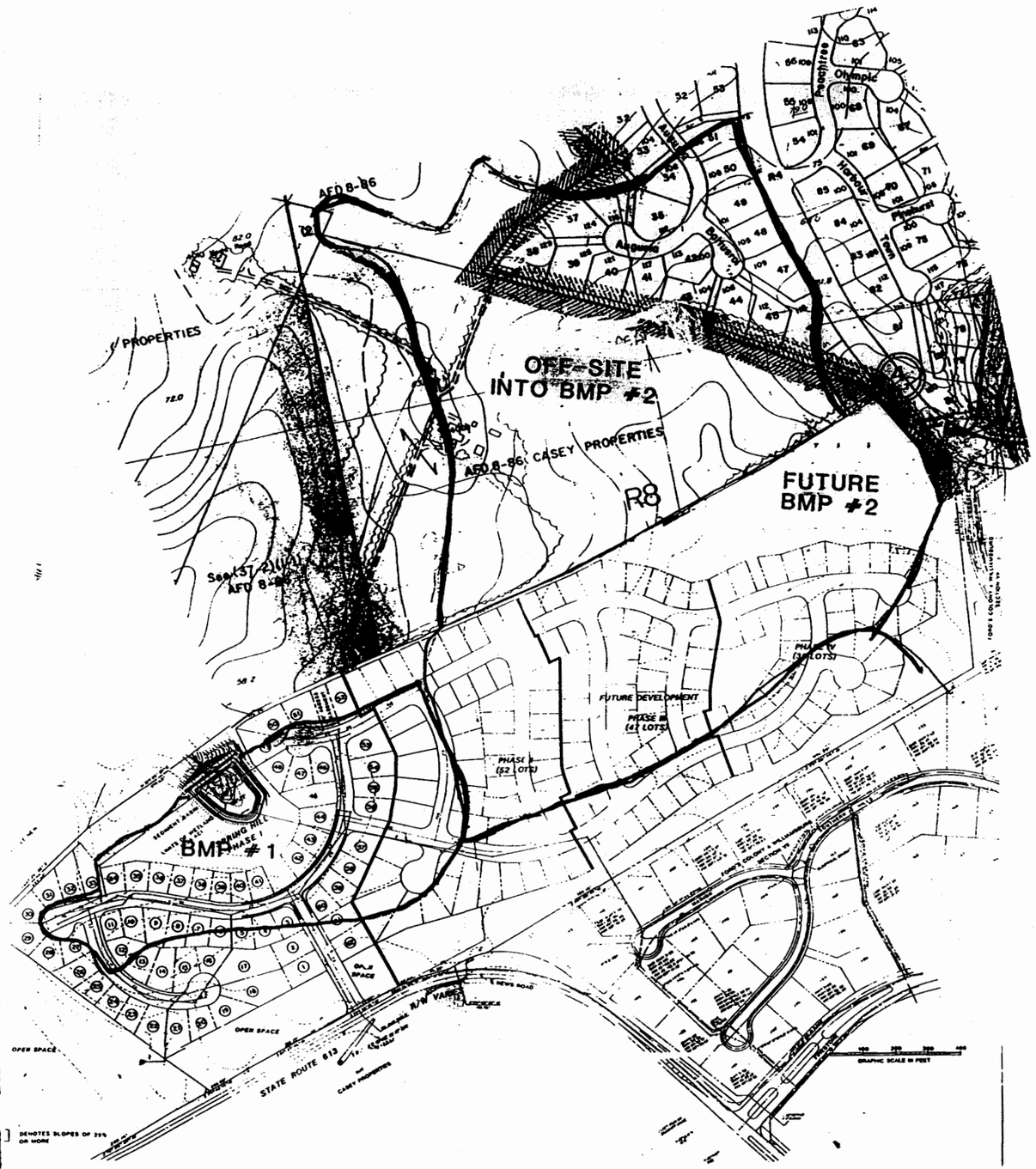


TABLE 3

WORKSHEET FOR BMP POINT SYSTEM

A. STRUCTURAL BMP POINT ALLOCATION

BMP	BMP Points		Fraction of Site Served by BMP		Weighted BMP Points
1 WET POND (#7)	9	x	$\frac{16.42}{82.93}$ = 19.8%	=	1.78 PHASE 1
2 EXT.DRY DET. (#3)	6	x	$\frac{22.1}{82.93}$ = 26.6%	=	1.60 FUTURE
EXT. DRY DET.	6	x	$\frac{31.3}{82.93}$ = 37.7%	=	2.26 OFF-SITE
		x		=	

TOTAL WEIGHTED STRUCTURAL BMP POINTS: 5.64

B. NATURAL OPEN SPACE CREDIT

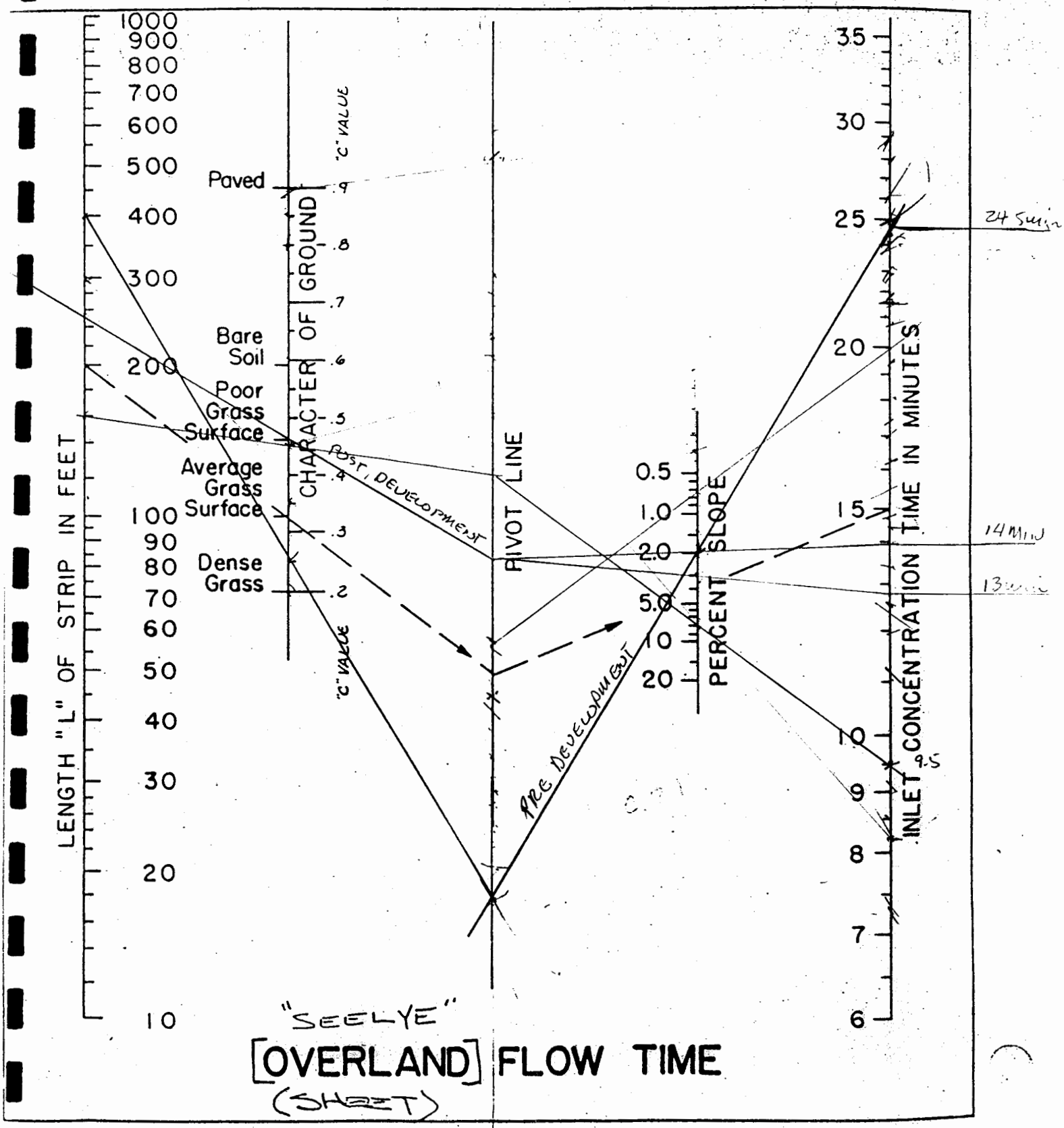
Fraction of Site		Natural Open Space Credit		Points for Natural Open Space
* $\frac{37.75}{82.93}$ = 45.5%	x	0.1 (0.1 per 1%)	=	4.55

C. TOTAL WEIGHTED POINTS

5.64	+	4.55	=	10.19
Structural BMP Points		Natural Open Space Points		TOTAL

* 39.75 ACRES - 1 ACRE BMP #1 & 1 ACRE BMP #2 = 37.75 AC.

FIG. 1.5.1.1



"SEELYE"

[OVERLAND] FLOW TIME

(SHEET)

REPRINTED WITH PERMISSION FROM "DATA BOOK FOR CIVIL ENGINEERS" VOL. I - DESIGN 2ND EDITION (1951) BY E. E. SEELYE

VINICITY MAP SCALE: 1" - 2000'

LABEL	BEARING	DISTANCE
T2	S 86° 22' 13" E	161.92
T3	S 62° 03' 03" E	174.49
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C6	350.00	66° 52' 02"	405.07	383.51	N 89° 24' 17" E	229.22
C7	350.00	9° 52' 03"	60.07	60.00	S 81° 28' 06" E	30.11
C8	350.00	14° 14' 08"	86.35	86.13	N 85° 32' 49" E	43.39
C9	350.00	42° 15' 49"	263.57	257.38	N 11° 03' 09" E	138.39
C10	350.00	15° 32' 39"	93.34	92.83	S 86° 59' 32" W	47.08

PRE-DEVELOPMENT tc

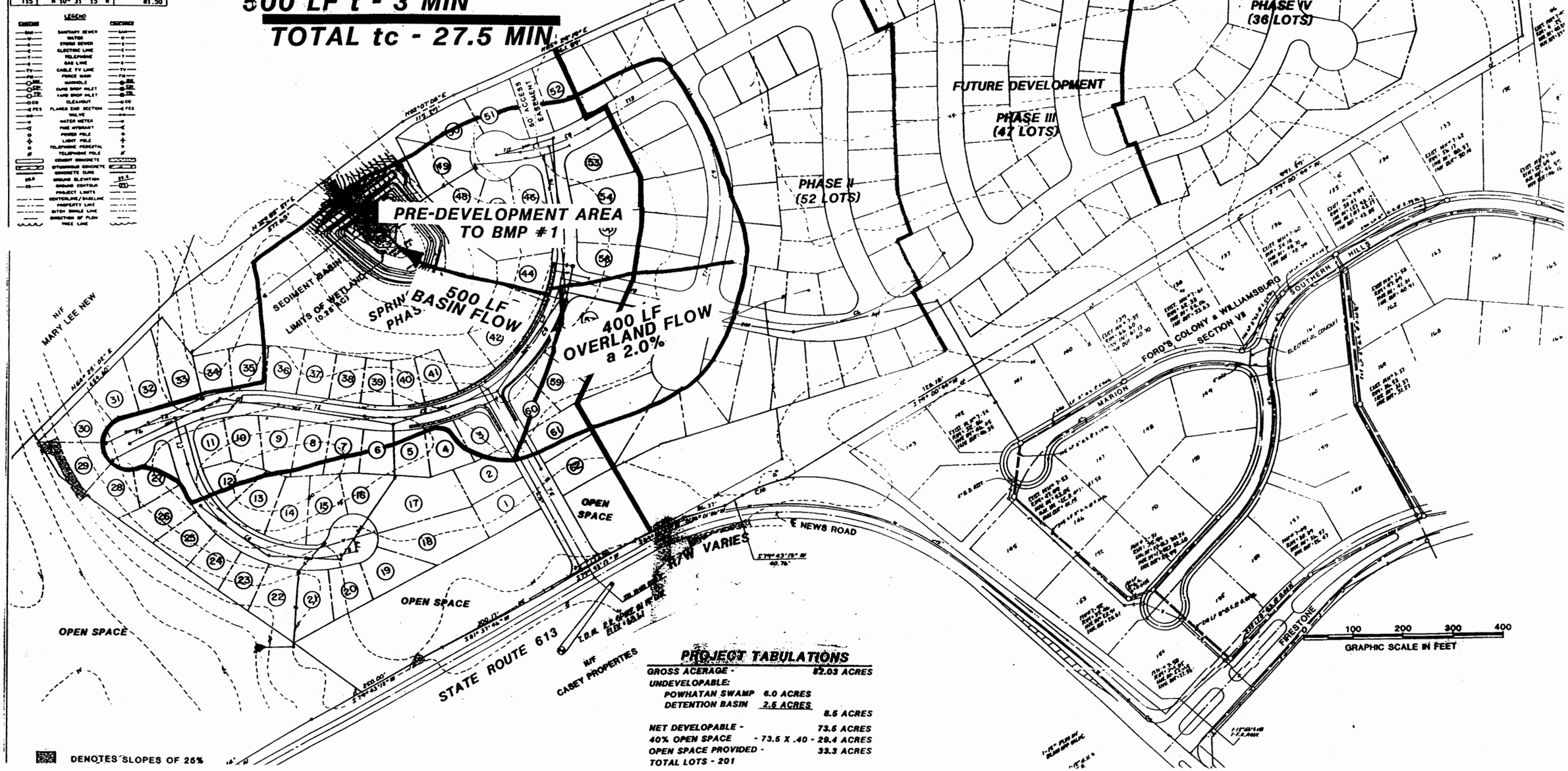
OVERLAND FLOW
400 lf a 2.0% t - 24.5 MIN

BASIN FLOW
500 LF t - 3 MIN

TOTAL tc - 27.5 MIN

LEGEND

EXISTING		PROPOSED
SAN	SANITARY SEWER	SAN
W	WATER	W
S	STORM SEWER	S
E	ELECTRIC LINE	E
T	TELEPHONE	T
G	GAS LINE	G
TV	CABLE TV LINE	TV
FN	FENCE SIGN	FN
MH	MANHOLE	MH
CB	CURB INLET	CB
YIN	YARD INLET	YIN
CO	CLEANOUT	CO
FES	FLARED END SECTION	FES
	VALVE	
	WATER METER	
	FIRE HYDRANT	
	POWER POLE	
	LIGHT POLE	
	TELEPHONE PEDESTAL	
	TELEPHONE POLE	
	CONVENT CONCRETE	
	STURMPHIRE CONCRETE	
	CONCRETE CURB	
95.5	GROUND ELEVATION	95.5
95	GROUND CONTOUR	95
	PROJECT LIMITS	
	CENTERLINE/BASELINE	
	PROPERTY LINE	
	DITCH SHALE LINE	
	DIRECTION OF FLOW	
	TREE LINE	



PROJECT TABULATIONS

GROSS ACERAGE -		82.03 ACRES
UNDEVELOPABLE:		
POWHATAN SWAMP	6.0 ACRES	
DETENTION BASIN	2.6 ACRES	
		8.6 ACRES
NET DEVELOPABLE -		73.6 ACRES
40% OPEN SPACE	- 73.6 X .40 -	29.4 ACRES
OPEN SPACE PROVIDED -		33.3 ACRES
TOTAL LOTS - 201		

DENOTES SLOPES OF 25%

VINICITY MAP SCALE: 1" - 2000'

C1	350.00	24° 19' 10"	148.56	147.45	S 74° 12' 37" E	75.42
C2	350.00	42° 00' 10"	256.58	250.87	S 83° 03' 06" E	134.36
C3	350.00	66° 55' 56"	407.85	385.16	N 42° 33' 50" E	230.63
C4	260.00	86° 18' 13"	391.63	355.85	S 39° 31' 20" E	243.75
C5	350.00	43° 19' 25"	264.63	258.37	N 54° 17' 10" E	138.08
C6	300.00	77° 50' 02"	405.87	383.51	N 89° 24' 17" E	228.22
C7	350.00	9° 52' 03"	60.07	60.00	S 61° 20' 06" E	30.11
C8	350.00	14° 08' 08"	86.35	86.13	N 86° 32' 49" E	43.39
C9	350.00	43° 00' 49"	263.57	257.38	N 11° 03' 09" E	138.38
C10	200.00	26° 22' 39"	93.34	92.53	S 88° 59' 32" W	47.08

LABEL	BEARING	DISTANCE
T2	S 86° 22' 13" E	161.92
T3	S 62° 03' 03" E	174.49
T4	N 09° 10' 52" E	130.32
T5	S 10° 16' 47" E	435.00
T6	S 86° 22' 13" E	100.00
T7	S 03° 37' 47" W	95.00
T8	S 82° 40' 27" E	32.00
T9	N 07° 19' 33" E	25.00
T10	S 57° 22' 27" E	287.16
T11	S 57° 22' 27" E	124.41
T12	S 76° 33' 04" E	50.00
T13	N 79° 28' 45" E	202.75
T14	N 32° 37' 33" E	149.37
T15	N 10° 31' 15" W	81.50

LEGEND

EXISTING		PROPOSED
SAN	SANITARY SEWER	SAN
W	WATER	W
S	STORM SEWER	S
E	ELECTRIC LINE	E
T	TELEPHONE	T
G	GAS LINE	G
TV	CABLE TV LINE	TV
FN	FENCE GAIN	FN
MH	MANHOLE	MH
CB	CURB DROP INLET	CB
YD	YARD DROP INLET	YD
CO	CLEANOUT	CO
FES	FLARED END SECTION	FES
	VALVE	
	WATER METER	
	FIRE HYDRANT	
	POWER POLE	
	LIGHT POLE	
	TELEPHONE PEDESTAL	
	TELEPHONE POLE	
	CEMENT CONCRETE	
	BITUMINOUS CONCRETE	
	CONCRETE CURB	
25.0	GROUND ELEVATION	25.0
25	GROUND CONTOUR	25
	PROJECT LIMITS	
	CENTERLINE/BASELINE	
	PROPERTY LINE	
	DITCH SWALE LINE	
	DIRECTION OF FLOW	
	TREE LINE	

POST DEVELOPMENT tc

OVERLAND FLOW
250 LF a 2.0% t - 14 MIN

CHANNEL
350 LF a 3.18% t - 1.5 MIN

PIPE
290 LF a 2.8% t - 0.5 MIN

TOTAL tc - 16 MIN

OVERLAND FLOW
250 LF a 3.0%
t - 13 MIN

OVERLAND FLOW
250 LF a 2.0%
tc - 14 MIN

BMP #1
WET POND

SEDIMENT BASIN

LIMITS OF WETLANDS (0.28 AC)

SPRING HILL
PHASE I

BMP #2

PHASE IV
(36 LOTS)

FUTURE DEVELOPMENT

PHASE III
(47 LOTS)

PHASE II
(52 LOTS)

ACCESS EASEMENT

OPEN SPACE

OPEN SPACE

OPEN SPACE

N/F CHARLES NEW

N/F MARY LEE NEW

N/F CASEY PROPERTIES

STATE ROUTE 613

R/W VARIES

NEWS ROAD

FORD'S COLONY a WILLIAMSBURG SECTION VII

SOUTHERN HILLS

MARION

FIRESTONE

ELECTRICAL CONDUIT

HIGH GROUND

100 200 300 400
GRAPHIC SCALE IN FEET

DENOTES SLOPES OF 25% OR MORE

PROJECT TABULATIONS

GROSS ACERAGE -		82.03 ACRES
UNDEVELOPABLE:		
POWHATAN SWAMP	6.0 ACRES	
DETENTION BASIN	2.5 ACRES	
		8.5 ACRES
NET DEVELOPABLE -		73.5 ACRES
40% OPEN SPACE	- 73.5 X .40 - 29.4 ACRES	
OPEN SPACE PROVIDED -		33.3 ACRES
TOTAL LOTS - 201		
TOTAL LOTS ALLOWED - 82.5 X 2.5 - 206		

T. JOSEPH McDONALD
1906-1982

GEORGE E. LANGLEY
Consultant

Langley and McDonald
A Professional Corporation

FAX TRANSMITTAL COVER SHEET

PLEASE DELIVER THE FOLLOWING MATERIAL AS SOON AS POSSIBLE

TO: DARREL COOK

TELECOPIER NUMBER: 253-6663

FROM: JOHN HUTCHERSON

NUMBER OF PAGES: 2 (Including Cover Sheet)

IF NOT RECEIVED PROPERLY PLEASE NOTIFY US IMMEDIATELY BY CALLING: (804) 253-2975

JOB NO.: SPRINGHILL PKG

DATE SENT: 1/11/94

IF YOU WISH TO RESPOND BY FAX, OUR FAX NUMBER IS: (804) 229-0049

SPECIAL MESSAGE: Revised Sheet (12) in DITCH CALCS

ENGINEERS • PLANNERS • SURVEYORS

MAIN OFFICES • 5544 GREENWICH ROAD • SUITE 209 • VIRGINIA BEACH • VIRGINIA • 23462 • TEL: (804) 473-3000 • FAX: (804) 497-7933
BUSCH CORPORATE CENTER • 201 PACKETS COURT • WILLIAMSBURG • VIRGINIA • 23185 • TEL: (804) 253-2975 • FAX: (804) 229-0049

REACH DESCRIPTION = STA 15+00 TO 11+75 RD B RT

STATION = 13+00 TO 12+50 RD B RT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
STRIP # 3 1) C = .65 2) WS = 120
3) SLOPE = .0283 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 6 8) NO CHANGES

Enter number of item you wish to change:

STATION: 13+00 TO 12+50 RD B RT
C= 0.66 A= 0.166 CA= 0.109 ACCA= 0.409
I2= 5.5 Q2= 2.23 I10= 6.9 Q10= 8.82
S= 0.028

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	3.1 __	3.3 __	5.9 __	6.4 __	
0.050 __	2.1 __	2.3 __	7.1 __	7.7 __	EC-2
0.015 __	5.3 __	5.6 __	4.5 __	4.9 __	

REACH DESCRIPTION = STA 15+00 TO 11+75 RD B RT

STATION = 12+50 TO 11+75 RD B RT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
STRIP # 3 1) C = .65 2) WS = 150
3) SLOPE = .0283 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 75
7) Tc= 7 8) NO CHANGES

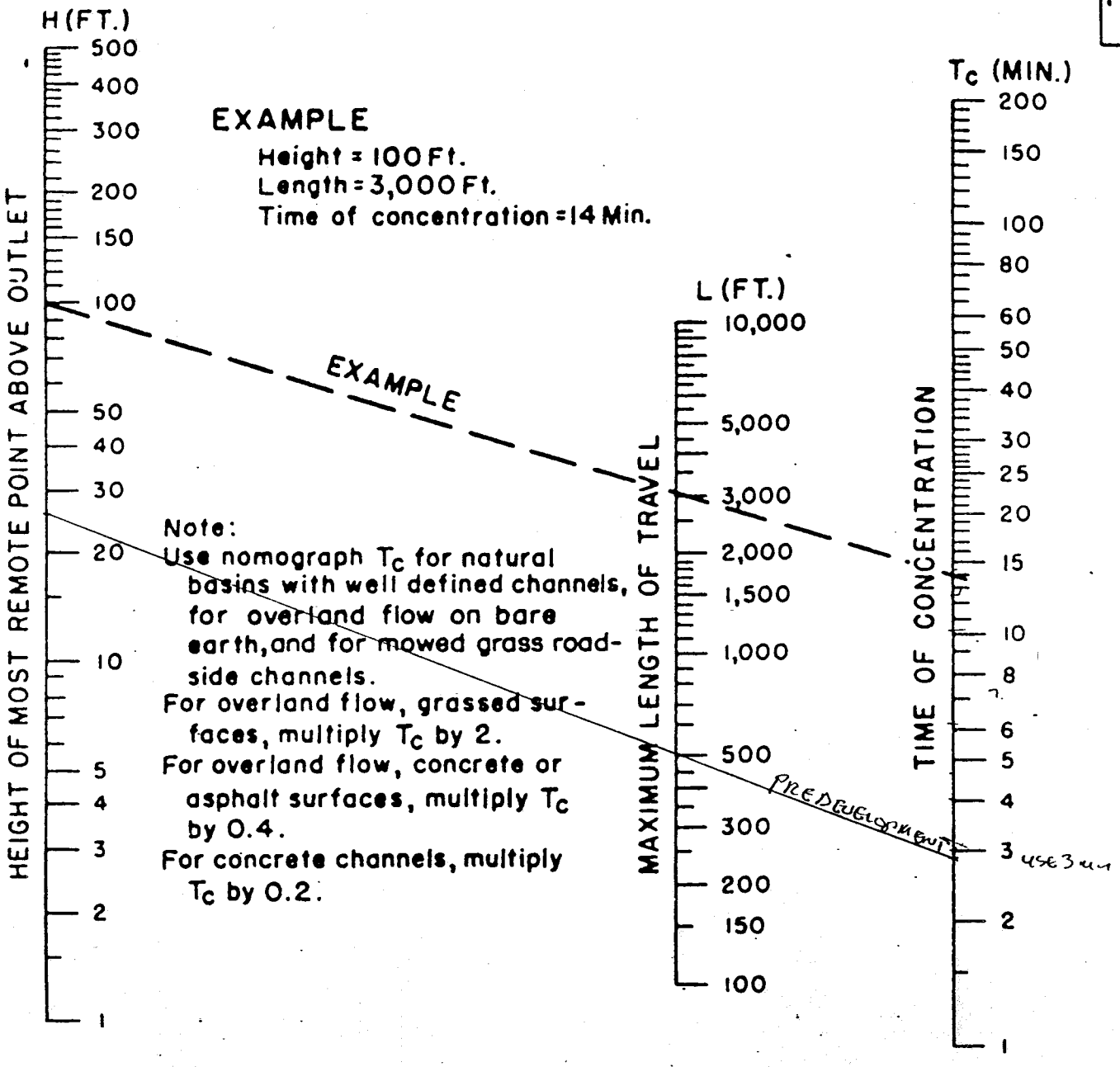
Enter number of item you wish to change:

STATION: 12+50 TO 11+75 RD B RT
C= 0.66 A= 0.301 CA= 0.198 ACCA= 0.607
I2= 5.2 Q2= 3.18 I10= 6.7 Q10= 4.04
S= 0.028

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	3.4 __	3.6 __	6.7 __	7.3 __	
0.050 __	2.3 __	2.5 __	8.1 __	8.8 __	EC-2
0.015 __	5.7 __	6.1 __	5.2 __	5.6 __	

RCO 1/14/94 (19)

TCC

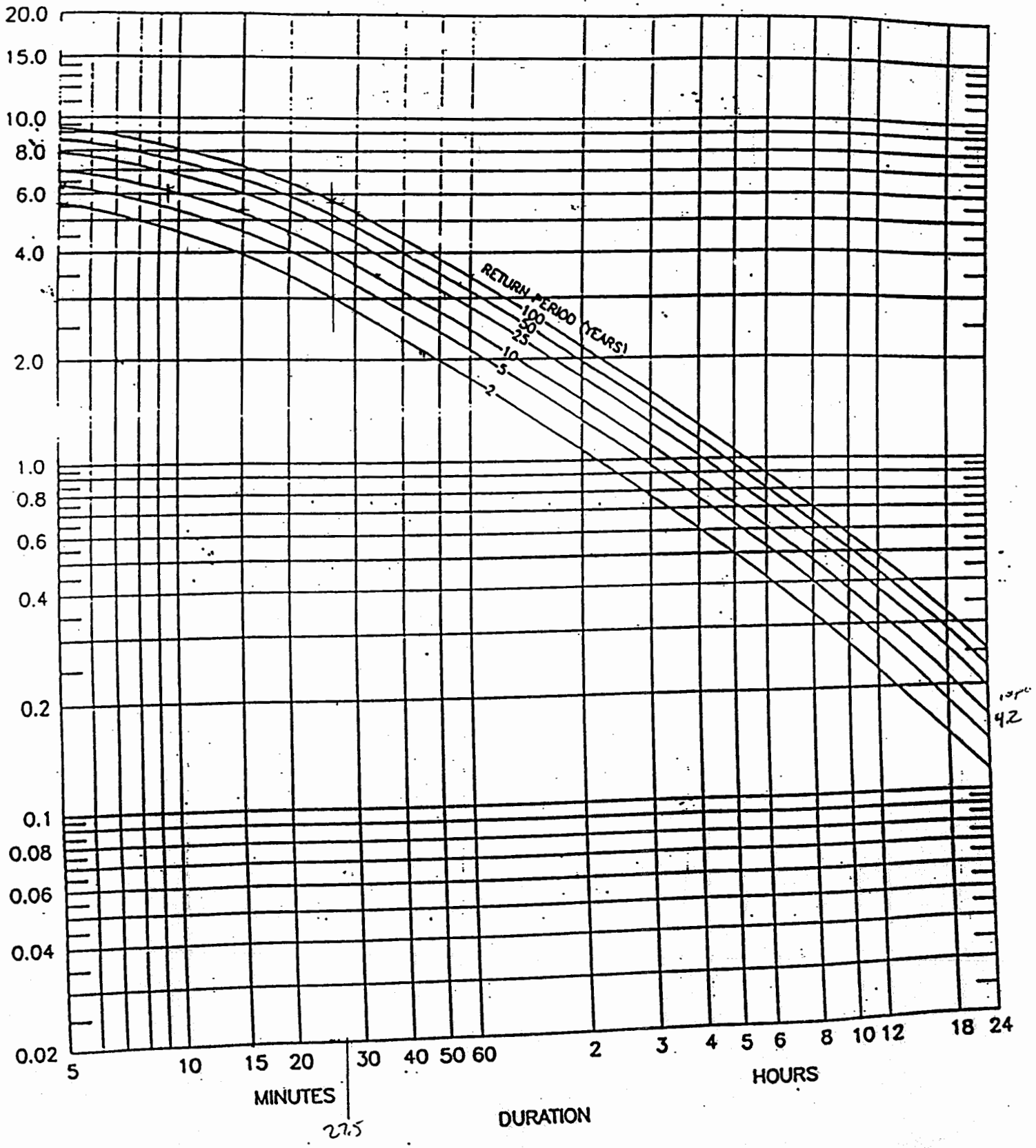


Based on study by P. Z. Kirpich,
Civil Engineering, Vol. 10, No. 6, June 1940, p. 362

TIME OF CONCENTRATION OF SMALL DRAINAGE BASINS

NORFOLK, VA.

Fig. 1.5.1.7



Rev. 6/92

Post Dev

```
MODIFIED RATIONAL METHOD (.MOD)                                   Screen #1
93039-4 <-This File    Max.Q(cfs)12.3      16.4      18.9      23.8
NORFOLK <-.IDF File    Freq.(yrs)2         10        25        100
1       <-.HYD Incr.(min) `C'Adj1          1         1.1       1.25
Output hydrographs (HYD Files):*2N       *10N      *25N      *100N     *

Titles:SPRINGHILL, PHASE 1,BMP #1

I Method (T,I)      *Graphs     *Qp's      *Grand Summary    *Single Summaries

STORM DATA FOR THIS Tc CONTOUR          Subarea Descr.   Runoff 'C'  Area (acres)
                                                          .45          16.42
     Tc (minutes): 16
     Td (minutes):

 Leave Td field blank to use
 a series of Modified Rational
 hydrographs to compute the
 maximum storage requirement.

 To compute only peaks, leave
 `Method (T/I)' field blank.

Esc -Exit   <F5> Compute   <F1>-Ins   <Ctrl-X> -Del   PgUp -Prev.  PgDn -Next
```

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 20:10:15 12-09-1993

POST DEVEL

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

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

SPRINGHILL, PHASE 1,BMP #1

Area = 16.42 acres Tc = 16.00 minutes

Frequency (years)	Adjusted 'C'	Duration minutes	Intens. in/hr	Qpeak cfs	Allowable cfs	VOLUMES Inflow (cu.ft.)	VOLUMES Storage (cu.ft.)
2	0.450	54	1.920	28.0 14.19	12.30	45,965	20,135
10	0.450	46	2.910	21.50	16.40	59,345	28,841
25	0.495	50	3.250	26.42	18.90	79,247	41,825
100	0.563	43	4.290	39.62	23.80	102,229	60,103

MULTIPLE STORM ROUTING FOR PONDS (.MSR)

93039-4 <-- This File

Title: SPRINGHILL, PHASE 1, BMP #1

Storm Comments	Return Frequency (years)	Inflow Hydrograph (.HYD)		Pond Rating Table File (.PND)		Starting W.S.Elev. (feet)		Outflow Hydrograph (.HYD)
	2	2N	—	93039-4	@	40.0	—	2NOUT
	10	10N	—	93039-4	@	40.0	—	10NOUT
	25	25N	—	93039-4	@	40.0	—	25NOUT
	100	100N	—	93039-4	@	40.0	—	100NOUT
			—		@		—	

OUTPUT OPTIONS

* Input Data * Routing Computations * Routing Summary Plots

NOTE: If you are using 'Outlet Structures(.STR)' for computing your Q vs.E rating table, you must compute a PND file for use with this MSR option. If W.S. Elev. is left blank, the first elevation in PND will be used. If Outflow HYD is left blank, an outflow HYD file will not be stored.

<Esc> Exit <F5> Compute

Outlet Structure File: 93039-4 .STR

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

****
SPRINGHILL, PHASE 1, BMP #1

****

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

Elevation (ft)	Q (cfs)	Contributing Structures
43.80	0.0	
44.30	0.4	1
44.80	0.8	1
45.30	1.0	1
45.80	1.5	2 +1
46.30	14.1	2 +1
46.80	35.2	2 +1
47.30	53.0	3 +2 +1
47.80	83.8	3 +2 +1
48.00	99.4	3 +2 +1

Outlet Structure File: 93039-4 .STR

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

****
SPRINGHILL, PHASE 1, BMP #1

****

Outlet Structure File: c:\data\93039-4 .STR
Planimeter Input File: c:\data\93039-4 .VOL
Rating Table Output File: c:\data\93039-4 .PND

Min. Elev.(ft) = 43.8 Max. Elev.(ft) = 48 Incr.(ft) = .5

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

****
SYSTEM CONNECTIVITY
****

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

Outflow rating table summary was stored in file:
c:\data\93039-4 .PND

Outlet Structure File: 93039-4 .STR

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

****
SPRINGHILL, PHASE 1, BMP #1

****

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

ORIFICE-VC
Orifice - Vertical Circular

E1 elev.(ft)?	43.81
E2 elev.(ft)?	48.001
Orifice coeff.?	.6
Invert elev.(ft)?	43.81
Datum elev.(ft)?	44.05
Diameter (ft)?	.48

Outlet Structure File: 93039-4 .STR

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

****
SPRINGHILL, PHASE 1, BMP #1

****

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

STAND PIPE
Stand Pipe with weir or orifice flow

E1 elev.(ft)? 45.75
E2 elev.(ft)? 48.001
Crest elev.(ft)? 45.75
Diameter (ft)? 3.0
Weir coefficient? 3.33
Orifice coefficient? .6
Start transition elev.(ft) @ ?
Transition height (ft)?

Outlet Structure File: 93039-4 .STR

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

****
SPRINGHILL, PHASE 1, BMP #1

****

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

WEIR-XY
Weir - Defined by X, Y Coordinates
E1 (ft) = 46.9 E2 (ft) = 48.001

X dist.(ft)	Y elev.(ft)
0	48
3	46.9
13	46.9
16	48

```
DETENTION OUTLET STRUCTURES (.STR)
93039-4    + 93039-4    = 93039-4    | 43.8        48          .5        N (y/n)
This File + .VOL File = .PND File    | Min.Elev.   Max.Elev.   Incr.   Dump All?

Other Elevs:
SPRINGHILL, PHASE 1, BMP #1
                                                                        <-Titles

< Precedence >                        < Structure Data >
WEIR-XY              ->               Orifice - Vertical Circular
STAND PIPE 2         -> 2             ORIFICE-VC     1                    1
ORIFICE-VC 1         -> 1                     This ID.No. (+/?)  Another -> ID out

                                      E1 elev.(ft)?
                                      E2 elev.(ft)?

                                      Orifice coeff.?          .6
                                      Invert elev.(ft)?        43.81
                                      Datum  elev.(ft)?        44.05
                                      Diameter (ft)?           .48

F1-Insert Structure     F5-Compute     <Esc>-Exit     Ctrl-X -Delete Structure
```

DETENTION OUTLET STRUCTURES (.STR)

93039-4 + 93039-4 = 93039-4	48.8	48	.5	N (y/n)
This File + .VOL File = .PND File	Min.Elev.	Max.Elev.	Incr.	Dump All?

Other Elevs:
SPRINGHILL, PHASE 1, BMP #1

<-Titles

< Precedence >

WEIR-XY	->
STAND PIPE 2	-> 2
ORIFICE-VC 1	-> 1

< Structure Data >

Stand Pipe with weir or orifice flow
STAND PIPE 2 2
This ID.No. (+/?) Another -> ID out

E1 elev.(ft)?
E2 elev.(ft)?
Crest elev.(ft)? 45.75
Diameter (ft)? 3.0
Weir coefficient? 3.33
Orifice coefficient? .6
Start transition elev.(ft) @ ?
Transition height (ft)?

F1-Insert Structure F5-Compute <Esc>-Exit Ctrl-X -Delete Structure

DETENTION OUTLET STRUCTURES (.STR)

93039-4 + 93039-4 = 93039-4	43.8	48	.5	N (y/n)
This File + .VOL File = .PND File	Min.Elev.	Max.Elev.	Incr.	Dump All?

Other Elevs:
SPRINGHILL, PHASE 1, BMP #1

<-Titles

< Precedence >

WEIR-XY	3	-> 3
STAND PIPE	2	-> 2
ORIFICE-VC	1	-> 1

< Structure Data >

Weir - Defined by X, Y Coordinates
WEIR-XY 3 3
This ID.No. (+/?) Another -> ID out

		X=	Y=
E1 elev.(ft)?		X=	Y=
E2 elev.(ft)?		X=	Y=
Weir coeff.	3.33	X=	Y=
		X=	Y=
X= 0	Y= 48.0	X=	Y=
X= 3	Y= 46.9	X=	Y=
X= 13	Y= 46.9	X=	Y=
X= 16	Y= 48.0	X=	Y=
X=	Y=	X=	Y=

F1-Insert Structure F5-Compute <Esc>-Exit Ctrl-X -Delete Structure

POND-2 Version: 5.17
S/N: 1295130250

SPRINGHILL, PHASE 1, BMP #1

CALCULATED 12-09-1993 12:57:17
DISK FILE: c:\data\93039-4 .VOL

Planimeter scale: 1 inch = 50 ft.

Elevation (ft)	Planimeter (sq.in.)	Area (sq.ft)	A1+A2+sqr(A1*A2) (sq.ft)	* Volume (cubic-ft)	Volume Sum (cubic-ft)
40.00	1.85	4,625	0	0	0
41.00	4.90	12,250	24,402	8,134	8,134
42.00	5.85	14,625	40,260	13,420	21,554
43.00	6.75	16,875	47,210	15,737	37,291
44.00	7.70	19,250	54,148	18,049	55,340
45.00	8.90	22,250	62,196	20,732	76,072
46.00	11.55	28,875	76,472	25,491	101,563
47.00	13.05	32,625	92,193	30,731	132,294
48.00	15.55	38,875	107,113	35,704	167,998

Elevations With Areas Interpolated From
The Closest Two Planimeter Readings

43.50	-----	18,043	52,367	8,728	46,018
43.80	-----	18,762	53,431	14,248	51,539
45.75	-----	27,138	73,961	18,490	94,562

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

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

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

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

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

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 13:06:54 01-04-1994

>>>>> I-D-F Curve <<<<<

Recurrence Frequency = 2

DURATION minutes	INTENSITY inches/hour
0	0
5	5.7
6	5.5
7	5.25
8	5.0
9	4.75
10	4.6
15	4.0
20	3.5
30	2.75
40	2.25
50	2.0
60	1.8
120	1.15
180	.75
240	.6
300	.5
360	.42
480	.32
600	.27
720	.22
1080	.15
1440	.12

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 20:10:15 12-09-1993

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

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

SPRINGHILL, PHASE 1,BMP #1

RETURN FREQUENCY: 2 yr `C' Adjustment = 1.000 Allowable Q = 12.30 cfs

Hydrograph file duration= 54.00 minutes
Hydrograph file: 2N .HYD Tc = 16.00 minutes

Weighted 'C'	Adjusted 'C'	Duration minutes	Intens. in/hr	Areas acres	Qpeak cfs	VOLUMES Inflow (cu.ft.)	VOLUMES Storage (cu.ft.)
0.450	[illegible]	16	3.900	16.42	28.[illegible]	27,664	16,856
0.450	[illegible]	20	[illegible]	16.42	25.86	31,034	17,780
0.450	0.450	30	[illegible]	16.42	20.[illegible]	34,576	[illegible]
0.450	0.450	40	2.250	16.42	16.63	39,901	[illegible]
0.450	0.450	50	2.000	16.42	14.76	44,334	[illegible]
**********	**********	**********	**********	**********	**********	Storage Maximum	
0.450	0.450	54	1.920	16.42	14.19	45,965	20,135
**********	**********	**********	**********	**********	**********	**********	**********
0.450	0.450	60	1.800	16.42	13.30	47,881	19,837
0.450	0.450	120	1.150	16.42	8.50	Qpeak < Qallow	

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 20:10:15 12-09-1993

SPRINGHILL, PHASE 1,BMP #1

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

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

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

Subarea Descr.	Runoff 'C'	Area acres	Tc (min)	Wtd. 'C'	Adj. 'C'	I in/hr	Total acres	Peak Q (cfs)
	0.450	16.42						
			16.00	0.450	0.450	3.900	16.42	28.82

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 20:10:15 12-09-1993

SPRINGHILL, PHASE 1,BMP #1

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

Weighted C = 0.450 Area= 16.420 acres Tc = 16.00 minutes

Adjusted C = 0.450 Td= 54.00 min. I= 1.92 in/hr Qp= 14.19 cfs

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

HYDROGRAPH FOR MAXIMUM STORAGE
For the 2 Year Storm

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

Time Minutes							
0.00	0.00	0.89	1.77	2.66	3.55	4.43	5.32
7.00	6.21	7.09	7.98	8.87	9.75	10.64	11.53
14.00	12.41	13.30	14.19	14.19	14.19	14.19	14.19
21.00	14.19	14.19	14.19	14.19	14.19	14.19	14.19
28.00	14.19	14.19	14.19	14.19	14.19	14.19	14.19
35.00	14.19	14.19	14.19	14.19	14.19	14.19	14.19
42.00	14.19	14.19	14.19	14.19	14.19	14.19	14.19
49.00	14.19	14.19	14.19	14.19	14.19	14.19	13.30
56.00	12.41	11.53	10.64	9.75	8.87	7.98	7.09
63.00	6.21	5.32	4.43	3.55	2.66	1.77	0.89
70.00	0.00						

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 20:10:15 12-09-1993

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

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

SPRINGHILL, PHASE 1,BMP #1

```
*****************************************************************
*  RETURN FREQUENCY:    2 yr     |  Allowable Outflow:    12.30 cfs    *
*  'C' Adjustment: 1.000         |  Required Storage:    20,135 cu.ft. *
*---------------------------------------------------------------------*
*  Peak Inflow:    14.19 cfs        Inflow .HYD stored: 2N       .HYD   *
*****************************************************************
```

```
     |                Td =  54 minutes                    |  Return Freq:      2 yr
     /-------- Approx. Duration for Max. Storage -------/  C adj.factor: 1.00
     |                                                    |
     |                                                    |
     |                 Tc=   16.00  minutes               |
     |                 I =   3.900  in/hr                 |  Area (ac):     16.42
     |               . Q =   28.82  cfs                   |  Weighted C:     0.45
     |              .|.                                   |  Adjusted C:     0.45
F    |             .   .                                  |
L    |            .  |  .              Required Storage   |
O    |           .       .         .--    20,135 cu.ft.   |  Td=       54 minutes
W    |          .    |    .        |                     |  I =    1.920 in/hr
     |         .     x x x x x x x|x x x x x x x x x x x  Q =   14.19 cfs
c    |        .                   |
f    |       .    x                                       x
s    |      .                                               o   Q=   12.30 cfs
     |     .   x                                o          |x  (Allow.Outflow)
     |    .  x                   .     o                   |
     |   .  x                o    .       NOT TO SCALE     |   x
     |  . x       o                .      ============      |
     | o                            .                       |      x
     `-------------------------------------------------------|------------
                                                            56.13 minutes
```

EXECUTED: 12-09-1993 13:57:28 Return Freq: 2 years

```
*********************************
*                               *
* SPRINGHILL, PHASE 1, BMP #1   *
*                               *
*                               *
*                               *
*                               *
*********************************
```

Inflow Hydrograph: c:\data\2N .HYD
Rating Table file: c:\data\93039-4 .PND

-----INITIAL CONDITIONS-----
Elevation = 43.80 ft
Outflow = 0.00 cfs
Storage = 51,539 cu-ft

GIVEN POND DATA				INTERMEDIATE ROUTING COMPUTATIONS	
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)		2S/t (cfs)	2S/t + O (cfs)
43.80	0.0	51,539	ok - Dead Storage = 29,000 for Sed Basin.	1717.6	1717.6
44.30	0.4	61,246		2041.1	2041.5
44.80	0.8	71,684		2389.0	2389.8
45.30	1.0	83,030		2767.1	2768.1
45.80	1.5	95,927		3196.9	3198.4
46.30	14.1	110,390		3678.9	3693.0
46.80	35.2	125,846		4194.0	4229.2
47.30	53.0	142,352		4744.1	4797.1
47.80	83.8	160,353		5344.0	5427.8
48.00	99.4	167,998		5598.8	5698.2

Time increment (t) = 1.0 min.

Pond File: c:\data\93039-4 .PND
Inflow Hydrograph: c:\data\2N .HYD
Outflow Hydrograph: c:\data\2NOUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	-----	1717.6	1717.6	0.00	43.80
1.0	0.89	0.9	1718.5	1718.5	0.00	43.80
2.0	1.77	2.7	1721.2	1721.2	0.00	43.81
3.0	2.66	4.4	1725.6	1725.6	0.01	43.81
4.0	3.55	6.2	1731.7	1731.8	0.02	43.82
5.0	4.43	8.0	1739.7	1739.7	0.03	43.83
6.0	5.32	9.8	1749.3	1749.4	0.04	43.85
7.0	6.21	11.5	1760.8	1760.9	0.05	43.87
8.0	7.09	13.3	1773.9	1774.1	0.07	43.89
9.0	7.98	15.1	1788.8	1789.0	0.09	43.91
10.0	8.87	16.9	1805.5	1805.7	0.11	43.94
11.0	9.75	18.6	1823.8	1824.1	0.13	43.96
12.0	10.64	20.4	1843.9	1844.2	0.16	44.00
13.0	11.53	22.2	1865.7	1866.1	0.18	44.03
14.0	12.41	23.9	1889.2	1889.6	0.21	44.07
15.0	13.30	25.7	1914.4	1914.9	0.24	44.10
16.0	14.19	27.5	1941.4	1941.9	0.28	44.15
17.0	14.19	28.4	1969.1	1969.7	0.31	44.19
18.0	14.19	28.4	1996.8	1997.5	0.35	44.23
19.0	14.19	28.4	2024.4	2025.2	0.38	44.27
20.0	14.19	28.4	2052.0	2052.8	0.41	44.32
21.0	14.19	28.4	2079.5	2080.4	0.44	44.36
22.0	14.19	28.4	2106.9	2107.9	0.48	44.40
23.0	14.19	28.4	2134.3	2135.3	0.51	44.43
24.0	14.19	28.4	2161.6	2162.6	0.54	44.47
25.0	14.19	28.4	2188.8	2189.9	0.57	44.51
26.0	14.19	28.4	2216.0	2217.2	0.60	44.55
27.0	14.19	28.4	2243.1	2244.4	0.63	44.59
28.0	14.19	28.4	2270.1	2271.5	0.66	44.63
29.0	14.19	28.4	2297.1	2298.5	0.70	44.67
30.0	14.19	28.4	2324.1	2325.5	0.73	44.71
31.0	14.19	28.4	2350.9	2352.4	0.76	44.75
32.0	14.19	28.4	2377.7	2379.3	0.79	44.78
33.0	14.19	28.4	2404.5	2406.1	0.81	44.82
34.0	14.19	28.4	2431.2	2432.9	0.82	44.86
35.0	14.19	28.4	2457.9	2459.6	0.84	44.89
36.0	14.19	28.4	2484.6	2486.3	0.85	44.93
37.0	14.19	28.4	2511.3	2513.0	0.87	44.96
38.0	14.19	28.4	2537.9	2539.6	0.88	45.00
39.0	14.19	28.4	2564.5	2566.3	0.89	45.03
40.0	14.19	28.4	2591.0	2592.9	0.91	45.07
41.0	14.19	28.4	2617.6	2619.4	0.92	45.10
42.0	14.19	28.4	2644.1	2646.0	0.94	45.14
43.0	14.19	28.4	2670.6	2672.5	0.95	45.17
44.0	14.19	28.4	2697.0	2699.0	0.96	45.21

POND-2 Version: 5.17 S/N: 1295130250
EXECUTED: 12-09-1993 13:57:28 Return Freq: 2 years

Pond File: c:\data\93039-4 .PND
Inflow Hydrograph: c:\data\2N .HYD
Outflow Hydrograph: c:\data\2NOUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
45.0	14.19	28.4	2723.5	2725.4	0.98	45.24
46.0	14.19	28.4	2749.9	2751.8	0.99	45.28
47.0	14.19	28.4	2776.2	2778.2	1.01	45.31
48.0	14.19	28.4	2802.5	2804.6	1.04	45.34
49.0	14.19	28.4	2828.7	2830.9	1.07	45.37
50.0	14.19	28.4	2854.9	2857.1	1.10	45.40
51.0	14.19	28.4	2881.0	2883.3	1.13	45.43
52.0	14.19	28.4	2907.1	2909.4	1.16	45.46
53.0	14.19	28.4	2933.1	2935.5	1.19	45.49
54.0	14.19	28.4	2959.0	2961.4	1.22	45.52
55.0	13.30	27.5	2984.0	2986.5	1.25	45.55
56.0	12.41	25.7	3007.1	3009.7	1.28	45.58
57.0	11.53	23.9	3028.5	3031.1	1.31	45.61
58.0	10.64	22.2	3048.0	3050.6	1.33	45.63
59.0	9.75	20.4	3065.7	3068.4	1.35	45.65
60.0	8.87	18.6	3081.5	3084.3	1.37	45.67
61.0	7.98	16.9	3095.6	3098.4	1.38	45.68
62.0	7.09	15.1	3107.9	3110.7	1.40	45.70
63.0	6.21	13.3	3118.4	3121.2	1.41	45.71
64.0	5.32	11.5	3127.1	3129.9	1.42	45.72
65.0	4.43	9.8	3134.0	3136.8	1.43	45.73
66.0	3.55	8.0	3139.1	3141.9	1.43	45.73
67.0	2.66	6.2	3142.4	3145.3	1.44	45.74
68.0	1.77	4.4	3144.0	3146.8	1.44	45.74
69.0	0.89	2.7	3143.7	3146.6	1.44	45.74
70.0	0.00	0.9	3141.8	3144.6	1.44	45.74

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

Pond File: c:\data\93039-4 .PND
Inflow Hydrograph: c:\data\2N .HYD
Outflow Hydrograph: c:\data\2NOUT .HYD

Starting Pond W.S. Elevation = 43.80 ft

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

Peak Inflow = 14.19 cfs ✓ 2 YR
Peak Outflow = 1.44 cfs
Peak Elevation = 45.74 ft

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

Initial Storage = 51,539 cu-ft 1.2 Ac/ft
Peak Storage From Storm = 42,842 cu-ft

Total Storage in Pond = 94,381 cu-ft 2.2.

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 13:08:41 01-04-1994

>>>>> I-D-F Curve <<<<<

Recurrence Frequency = 10

DURATION minutes	INTENSITY inches/hour
0	0
5	7.0
6	6.75
7	6.5
8	6.45
9	6.25
10	6.0
15	5.25
20	4.7
30	3.75
40	3.15
50	2.75
60	2.45
120	1.6
180	1.15
240	.87
300	.72
360	.62
480	.47
600	.38
720	.32
1080	.21
1440	.17

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 20:10:15 12-09-1993

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

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

SPRINGHILL, PHASE 1,BMP #1

RETURN FREQUENCY: 10 yr 'C' Adjustment = 1.000 Allowable Q = 16.40 cfs

Hydrograph file duration= 46.00 minutes
Hydrograph file: 10N .HYD Tc = 16.00 minutes

Weighted 'C'	Adjusted 'C'	Duration minutes	Intens. in/hr	Areas acres	Qpeak cfs	VOLUMES Inflow (cu.ft.)	Storage (cu.ft.)
0.450	0.450	16	5.140	16.42	37.98	36,460	20,716
0.450	0.450	20	4.700	16.42	34.73	41,674	23,962
0.450	0.450	30	3.750	16.42	27.71	49,876	27,244
0.450	0.450	40	3.150	16.42	23.28	55,861	28,309
**********						Storage	Maximum
0.450	0.450	46	2.910	16.42	21.50	59,345	28,841
**********							
0.450	0.450	50	2.750	16.42	20.32	60,959	28,487
0.450	0.450	60	2.450	16.42	18.10	65,171	27,779
0.450	0.450	120	1.600	16.42	11.82	Qpeak < Qallow	

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 20:10:15 12-09-1993

SPRINGHILL, PHASE 1,BMP #1

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

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

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

Subarea Descr.	Runoff 'C'	Area acres	Tc (min)	Wtd. 'C'	Adj. 'C'	I in/hr	Total acres	Peak Q (cfs)
	0.450	16.42						
			16.00	0.450	0.450	5.140	16.42	37.98

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 20:10:15 12-09-1993

SPRINGHILL, PHASE 1,BMP #1

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

Weighted C = 0.450 Area= 16.420 acres Tc = 16.00 minutes

Adjusted C = 0.450 Td= 46.00 min. I= 2.91 in/hr Qp= 21.50 cfs

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

HYDROGRAPH FOR MAXIMUM STORAGE
For the 10 Year Storm

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

Time Minutes							
0.00	0.00	1.34	2.69	4.03	5.38	6.72	8.06
7.00	9.41	10.75	12.09	13.44	14.78	16.13	17.47
14.00	18.81	20.16	21.50	21.50	21.50	21.50	21.50
21.00	21.50	21.50	21.50	21.50	21.50	21.50	21.50
28.00	21.50	21.50	21.50	21.50	21.50	21.50	21.50
35.00	21.50	21.50	21.50	21.50	21.50	21.50	21.50
42.00	21.50	21.50	21.50	21.50	21.50	20.16	18.81
49.00	17.47	16.13	14.78	13.44	12.09	10.75	9.41
56.00	8.06	6.72	5.38	4.03	2.69	1.34	0.00

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 20:10:15 12-09-1993

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

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

SPRINGHILL, PHASE 1,BMP #1

```
*****************************************************************
*  RETURN FREQUENCY:  10 yr     |  Allowable Outflow:    16.40 cfs    *
*  'C' Adjustment: 1.000        |  Required Storage:    28,841 cu.ft. *
*---------------------------------------------------------------*
*  Peak Inflow:   21.50 cfs       Inflow .HYD stored: 10N     .HYD   *
*****************************************************************
```

```
    |                Td =  46 minutes                  |  Return Freq:    10 yr
    /-------- Approx. Duration for Max. Storage -------/  C adj.factor: 1.00
    |                                                  |
    |                                                  |
    |                Tc=   16.00  minutes              |
    |                I =   5.140  in/hr                |  Area (ac):     16.42
    |              . Q =   37.98  cfs                  |  Weighted C:     0.45
    |             .|.                                  |  Adjusted C:     0.45
F   |            .   .                                 |
L   |           .  |  .              Required Storage  |
O   |          .       .        .--    28,841 cu.ft.  |  Td=       46 minutes
W   |         .    |    .       |                     |  I =    2.910 in/hr
    |        .     x x x x x x x|x x x x x x x x x x x |  Q =    21.50 cfs
c   |       .                   |
f   |      .    x                                      |  x
s   |     .                                            |    o   Q=   16.40 cfs
    |    .   x                          o              |   |x  (Allow.Outflow)
    |   .  x                   .     o                 |
    |  .  x                o    .       NOT TO SCALE   |   x
    | . x        o                .      ============  |
    | o                             .                  |       x
    `--------------------------------------------------|------------
                                                     49.80 minutes
```

```
*********************************
*                               *
* SPRINGHILL, PHASE 1, BMP #1   *
*                               *
*                               *
*                               *
*                               *
*********************************
```

Inflow Hydrograph: c:\data\10N .HYD
Rating Table file: c:\data\93039-4 .PND

-----INITIAL CONDITIONS----
Elevation = 43.80 ft
Outflow = 0.00 cfs
Storage = 51,539 cu-ft

GIVEN POND DATA			INTERMEDIATE ROUTING COMPUTATIONS	
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)	2S/t (cfs)	2S/t + O (cfs)
43.80	0.0	51,539	1717.6	1717.6
44.30	0.4	61,246	2041.1	2041.5
44.80	0.8	71,684	2389.0	2389.8
45.30	1.0	83,030	2767.1	2768.1
45.80	1.5	95,927	3196.9	3198.4
46.30	14.1	110,390	3678.9	3693.0
46.80	35.2	125,846	4194.0	4229.2
47.30	53.0	142,352	4744.1	4797.1
47.80	83.8	160,353	5344.0	5427.8
48.00	99.4	167,998	5598.8	5698.2

Time increment (t) = 1.0 min.

Pond File: c:\data\93039-4 .PND
Inflow Hydrograph: c:\data\10N .HYD
Outflow Hydrograph: c:\data\10NOUT .HYD

INFLOW HYDROGRAPH — ROUTING COMPUTATIONS

TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	-----	1717.6	1717.6	0.00	43.80
1.0	1.34	1.3	1719.0	1719.0	0.00	43.80
2.0	2.69	4.0	1723.0	1723.0	0.01	43.81
3.0	4.03	6.7	1729.7	1729.7	0.01	43.82
4.0	5.38	9.4	1739.0	1739.1	0.03	43.83
5.0	6.72	12.1	1751.0	1751.1	0.04	43.85
6.0	8.06	14.8	1765.7	1765.8	0.06	43.87
7.0	9.41	17.5	1783.0	1783.2	0.08	43.90
8.0	10.75	20.2	1803.0	1803.2	0.11	43.93
9.0	12.09	22.8	1825.5	1825.8	0.13	43.97
10.0	13.44	25.5	1850.7	1851.1	0.16	44.01
11.0	14.78	28.2	1878.5	1878.9	0.20	44.05
12.0	16.13	30.9	1909.0	1909.5	0.24	44.10
13.0	17.47	33.6	1942.0	1942.6	0.28	44.15
14.0	18.81	36.3	1977.7	1978.3	0.32	44.20
15.0	20.16	39.0	2015.9	2016.6	0.37	44.26
16.0	21.50	41.7	2056.7	2057.6	0.42	44.32
17.0	21.50	43.0	2098.8	2099.7	0.47	44.38
18.0	21.50	43.0	2140.8	2141.8	0.52	44.44
19.0	21.50	43.0	2182.6	2183.8	0.56	44.50
20.0	21.50	43.0	2224.4	2225.6	0.61	44.56
21.0	21.50	43.0	2266.1	2267.4	0.66	44.62
22.0	21.50	43.0	2307.7	2309.1	0.71	44.68
23.0	21.50	43.0	2349.2	2350.7	0.76	44.74
24.0	21.50	43.0	2390.6	2392.2	0.80	44.80
25.0	21.50	43.0	2431.9	2433.6	0.82	44.86
26.0	21.50	43.0	2473.2	2474.9	0.85	44.91
27.0	21.50	43.0	2514.5	2516.2	0.87	44.97
28.0	21.50	43.0	2555.7	2557.5	0.89	45.02
29.0	21.50	43.0	2596.9	2598.7	0.91	45.08
30.0	21.50	43.0	2638.0	2639.9	0.93	45.13
31.0	21.50	43.0	2679.1	2681.0	0.95	45.18
32.0	21.50	43.0	2720.2	2722.1	0.98	45.24
33.0	21.50	43.0	2761.2	2763.2	1.00	45.29
34.0	21.50	43.0	2802.1	2804.2	1.04	45.34
35.0	21.50	43.0	2842.9	2845.1	1.09	45.39
36.0	21.50	43.0	2883.6	2885.9	1.14	45.44
37.0	21.50	43.0	2924.3	2926.6	1.18	45.48
38.0	21.50	43.0	2964.8	2967.3	1.23	45.53
39.0	21.50	43.0	3005.2	3007.8	1.28	45.58
40.0	21.50	43.0	3045.6	3048.2	1.33	45.63
41.0	21.50	43.0	3085.9	3088.6	1.37	45.67
42.0	21.50	43.0	3126.0	3128.9	1.42	45.72

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

Pond File: c:\data\93039-4 .PND
Inflow Hydrograph: c:\data\10N .HYD
Outflow Hydrograph: c:\data\10NOUT .HYD

Starting Pond W.S. Elevation = 43.80 ft

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

Peak Inflow = 21.50 cfs
Peak Outflow = 8.00 cfs
Peak Elevation = 46.06 ft

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

Initial Storage	=	51,539 cu-ft
Peak Storage From Storm	=	51,845 cu-ft
Total Storage in Pond	=	103,384 cu-ft

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 13:08:41 01-04-1994

>>>>> I-D-F Curve <<<<<

Recurrence Frequency = 25

DURATION minutes	INTENSITY inches/hour
0	0
5	8
6	7.75
7	7.5
8	7.25
9	7
10	6.8
15	6
20	5.4
30	4.4
40	3.6
50	3.25
60	2.8
120	1.75
180	1.35
240	1
300	.85
360	.725
480	.55
600	.45
720	.375
1080	.25
1440	.2

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 20:10:15 12-09-1993

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

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

SPRINGHILL, PHASE 1,BMP #1

RETURN FREQUENCY: 25 yr 'C' Adjustment = 1.100 Allowable Q = 18.90 cfs

Hydrograph file duration= 50.00 minutes
Hydrograph file: 25N .HYD Tc = 16.00 minutes

Weighted 'C'	Adjusted 'C'	Duration minutes	Intens. in/hr	Areas acres	Qpeak cfs	VOLUMES Inflow (cu.ft.)	Storage (cu.ft.)
0.450	0.495	16	5.880	16.42	47.79	45,880	27,736
0.450	0.495	20	5.400	16.42	43.89	52,669	32,257
0.450	0.495	30	4.400	16.42	35.76	64,373	38,291
0.450	0.495	40	3.600	16.42	29.26	70,225	38,473
********** Storage Maximum							
0.450	0.495	50	3.250	16.42	26.42	79,247	41,825
0.450	0.495	60	2.800	16.42	22.76	81,929	38,837
0.450	0.495	120	1.750	16.42	14.22	Qpeak < Qallow	

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 20:10:15 12-09-1993

SPRINGHILL, PHASE 1,BMP #1

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

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

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

Subarea Descr.	Runoff 'C'	Area acres	Tc (min)	Wtd. 'C'	Adj. 'C'	I in/hr	Total acres	Peak Q (cfs)
	0.450	16.42						
			16.00	0.450	0.495	5.880	16.42	47.79

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 20:10:15 12-09-1993

SPRINGHILL, PHASE 1,BMP #1

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

Weighted C = 0.450 Area= 16.420 acres Tc = 16.00 minutes

Adjusted C = 0.495 Td= 50.00 min. I= 3.25 in/hr Qp= 26.42 cfs

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

HYDROGRAPH FOR MAXIMUM STORAGE
For the 25 Year Storm

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

Time Minutes							
0.00	0.00	1.65	3.30	4.95	6.60	8.25	9.91
7.00	11.56	13.21	14.86	16.51	18.16	19.81	21.46
14.00	23.11	24.76	26.42	26.42	26.42	26.42	26.42
21.00	26.42	26.42	26.42	26.42	26.42	26.42	26.42
28.00	26.42	26.42	26.42	26.42	26.42	26.42	26.42
35.00	26.42	26.42	26.42	26.42	26.42	26.42	26.42
42.00	26.42	26.42	26.42	26.42	26.42	26.42	26.42
49.00	26.42	26.42	24.76	23.11	21.46	19.81	18.16
56.00	16.51	14.86	13.21	11.56	9.91	8.25	6.60
63.00	4.95	3.30	1.65	0.00			

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 20:10:15 12-09-1993

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

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

SPRINGHILL, PHASE 1,BMP #1

```
*****************************************************************************
*  RETURN FREQUENCY:  25 yr      |  Allowable Outflow:     18.90 cfs      *
*  'C' Adjustment: 1.100         |  Required Storage:     41,825 cu.ft.  *
*---------------------------------------------------------------------------*
*  Peak Inflow:   26.42 cfs        Inflow .HYD stored: 25N      .HYD      *
*****************************************************************************
```

```
|                Td =  50 minutes                      |  Return Freq:     25 yr
/-------- Approx. Duration for Max. Storage -------/  C adj.factor: 1.10
|                                                     |
|                                                     |
|                 Tc=   16.00  minutes                |
|                 I =   5.880  in/hr                  |  Area (ac):     16.42
|               . Q =   47.79  cfs                    |  Weighted C:     0.45
|              .|.                                    |  Adjusted C:     0.50
F |            .   .                                  |
L |           .  |  .              Required Storage   |
O |          .       .        .--     41,825 cu.ft.  |  Td=       50 minutes
W |         .    |    .       |                      |  I =    3.250 in/hr
  |        .     x x x x x x x|x x x x x x x x x x x  Q =    26.42 cfs
c |       .                   |
f |      .    x                                       x
s |     .                                               o   Q=    18.90 cfs
  |    .   x                                o          |x  (Allow.Outflow)
  |   .  x                     .     o                 |
  |  .  x                 o     .       NOT TO SCALE   |   x
  | . x        o                .       ============   |
  | o                            .                     |       x
  `-----------------------------------------------------|------------
                                                      54.55 minutes
```

EXECUTED: 12-09-1993 13:59:15 Return Freq: 25 years

```
*********************************
*                               *
* SPRINGHILL, PHASE 1, BMP #1   *
*                               *
*                               *
*                               *
*                               *
*********************************
```

Inflow Hydrograph: c:\data\25N .HYD
Rating Table file: c:\data\93039-4 .PND

----INITIAL CONDITIONS----
Elevation = 43.80 ft
Outflow = 0.00 cfs
Storage = 51,539 cu-ft

GIVEN POND DATA			INTERMEDIATE ROUTING COMPUTATIONS	
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)	2S/t (cfs)	2S/t + O (cfs)
43.80	0.0	51,539	1717.6	1717.6
44.30	0.4	61,246	2041.1	2041.5
44.80	0.8	71,684	2389.0	2389.8
45.30	1.0	83,030	2767.1	2768.1
45.80	1.5	95,927	3196.9	3198.4
46.30	14.1	110,390	3678.9	3693.0
46.80	35.2	125,846	4194.0	4229.2
47.30	53.0	142,352	4744.1	4797.1
47.80	83.8	160,353	5344.0	5427.8
48.00	99.4	167,998	5598.8	5698.2

Time increment (t) = 1.0 min.

POND-2 Version: 5.17 S/N: 1295130250
EXECUTED: 12-09-1993 13:59:15 Return Freq: 25 years

Pond File: c:\data\93039-4 .PND
Inflow Hydrograph: c:\data\25N .HYD
Outflow Hydrograph: c:\data\25NOUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	------	1717.6	1717.6	0.00	43.80
1.0	1.65	1.7	1719.3	1719.3	0.00	43.80
2.0	3.30	4.9	1724.2	1724.2	0.01	43.81
3.0	4.95	8.3	1732.4	1732.4	0.02	43.82
4.0	6.60	11.6	1743.9	1744.0	0.03	43.84
5.0	8.25	14.9	1758.6	1758.7	0.05	43.86
6.0	9.91	18.2	1776.7	1776.8	0.07	43.89
7.0	11.56	21.5	1797.9	1798.1	0.10	43.92
8.0	13.21	24.8	1822.4	1822.7	0.13	43.96
9.0	14.86	28.1	1850.2	1850.5	0.16	44.01
10.0	16.51	31.4	1881.1	1881.6	0.20	44.05
11.0	18.16	34.7	1915.3	1915.8	0.24	44.11
12.0	19.81	38.0	1952.7	1953.3	0.29	44.16
13.0	21.46	41.3	1993.3	1994.0	0.34	44.23
14.0	23.11	44.6	2037.1	2037.9	0.40	44.29
15.0	2$.76	47.9	2084.1	2085.0	0.45	44.36
16.0	26.42	51.2	2134.2	2135.2	0.51	44.43
17.0	26.42	52.8	2185.9	2187.1	0.57	44.51
18.0	26.42	52.8	2237.5	2238.8	0.63	44.58
19.0	26.42	52.8	2289.0	2290.4	0.69	44.66
20.0	26.42	52.8	2340.3	2341.8	0.74	44.73
21.0	26.42	52.8	2391.6	2393.2	0.80	44.80
22.0	26.42	52.8	2442.7	2444.4	0.83	44.87
23.0	26.42	52.8	2493.9	2495.6	0.86	44.94
24.0	26.42	52.8	2544.9	2546.7	0.88	45.01
25.0	26.42	52.8	2596.0	2597.8	0.91	45.07
26.0	26.42	52.8	2646.9	2648.8	0.94	45.14
27.0	26.42	52.8	2697.8	2699.8	0.96	45.21
28.0	26.42	52.8	2748.7	2750.7	0.99	45.28
29.0	26.42	52.8	2799.5	2801.5	1.04	45.34
30.0	26.42	52.8	2850.1	2852.3	1.10	45.40
31.0	26.42	52.8	2900.6	2903.0	1.16	45.46
32.0	26.42	52.8	2951.0	2953.5	1.22	45.52
33.0	26.42	52.8	3001.3	3003.9	1.27	45.57
34.0	26.42	52.8	3051.5	3054.2	1.33	45.63
35.0	26.42	52.8	3101.6	3104.4	1.39	45.69
36.0	26.42	52.8	3151.5	3154.4	1.45	45.75
37.0	26.42	52.8	3201.1	3204.4	1.65	45.81
38.0	26.42	52.8	3248.1	3253.9	2.91	45.86
39.0	26.42	52.8	3292.7	3300.9	4.11	45.90
40.0	26.42	52.8	3335.0	3345.5	5.25	45.95
41.0	26.42	52.8	3375.2	3387.9	6.33	45.99
42.0	26.42	52.8	3413.4	3428.1	7.35	46.03
43.0	26.42	52.8	3449.6	3466.2	8.32	46.07
44.0	26.42	52.8	3483.9	3502.4	9.24	46.11

Pond File: c:\data\93039-4 .PND
Inflow Hydrograph: c:\data\25N .HYD
Outflow Hydrograph: c:\data\25NOUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
45.0	26.42	52.8	3516.5	3536.8	10.12	46.14
46.0	26.42	52.8	3547.5	3569.4	10.95	46.17
47.0	26.42	52.8	3576.8	3600.3	11.74	46.21
48.0	26.42	52.8	3604.7	3629.7	12.49	46.24
49.0	26.42	52.8	3631.1	3657.5	13.20	46.26
50.0	26.42	52.8	3656.2	3684.0	13.87	46.29
51.0	24.76	51.2	3678.1	3707.4	14.67	46.31
52.0	23.11	47.9	3695.2	3726.0	15.40	46.33
53.0	21.46	44.6	3707.9	3739.7	15.94	46.34
54.0	19.81	41.3	3716.5	3749.1	16.31	46.35
55.0	18.16	38.0	3721.4	3754.5	16.52	46.36
56.0	16.51	34.7	3722.9	3756.1	16.58	46.36
57.0	14.86	31.4	3721.3	3754.3	16.51	46.36
58.0	13.21	28.1	3716.7	3749.4	16.32	46.35
59.0	11.56	24.8	3709.5	3741.5	16.01	46.35
60.0	9.91	21.5	3699.8	3731.0	15.59	46.34
61.0	8.25	18.2	3687.8	3717.9	15.08	46.32
62.0	6.60	14.9	3673.7	3702.6	14.48	46.31
63.0	4.95	11.6	3657.4	3685.2	13.90	46.29
64.0	3.30	8.3	3638.9	3665.7	13.40	46.27
65.0	1.65	4.9	3618.1	3643.8	12.85	46.25
66.0	0.00	1.7	3595.3	3619.8	12.23	46.23

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

Pond File: c:\data\93039-4 .PND
Inflow Hydrograph: c:\data\25N .HYD
Outflow Hydrograph: c:\data\25NOUT .HYD

Starting Pond W.S. Elevation = 43.80 ft

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

Peak Inflow = 26.42 cfs
Peak Outflow = 16.58 cfs
Peak Elevation = 46.36 ft

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

Initial Storage = 51,539 cu-ft
Peak Storage From Storm = 60,670 cu-ft

Total Storage in Pond = 112,208 cu-ft

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 13:08:41 01-04-1994

>>>>> I-D-F Curve <<<<<

Recurrence Frequency = 100

DURATION minutes	INTENSITY inches/hour
0	0
5	9.25
6	9.0
7	8.85
8	8.5
9	8.25
10	8.0
15	7.2
20	6.5
30	5.25
40	4.5
50	3.8
60	3.4
120	2.25
180	1.7
240	1.3
300	1.1
360	.9
480	.7
600	.57
720	.48
1080	.32
1440	.28

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 20:10:15 12-09-1993

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

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

SPRINGHILL, PHAS 1,BMP #1

RETURN FREQUENCY: 100 yr 'C' Adjustment = 1.250 Allowable Q = 23.80 cfs

Hydrograph file duration= 43.00 minutes
Hydrograph file: 100N .HYD Tc = 16.00 minutes

Weighted 'C'	Adjusted 'C'	Duration minutes	Intens. in/hr	Areas acres	Qpeak cfs	VOLUMES Inflow (cu.ft.)	Storage (cu.ft.)
0.450	0.563	16	7.060	16.42	65.21	62,600	39,752
0.450	0.563	20	6.500	16.42	60.04	72,043	46,339
0.450	0.563	30	5.250	16.42	48.49	87,283	54,439
0.450	0.563	40	4.500	16.42	41.56	99,752	59,768
**********						Storage	Maximum
0.450	0.563	43	4.290	16.42	39.62	102,229	60,103
**********							
0.450	0.563	50	3.800	16.42	35.10	105,293	58,169
0.450	0.563	60	3.400	16.42	31.40	113,052	58,788
0.450	0.563	120	2.250	16.42	20.78	Qpeak < Qallow	

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 20:10:15 12-09-1993

SPRINGHILL, PHASE 1,BMP #1

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

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

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

Subarea Descr.	Runoff 'C'	Area acres	Tc (min)	Wtd. 'C'	Adj. 'C'	I in/hr	Total acres	Peak Q (cfs)
	0.450	16.42						
			16.00	0.450	0.563	7.060	16.42	65.21

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 20:10:15 12-09-1993

SPRINGHILL, PHASE 1,BMP #1

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

Weighted C = 0.450 Area= 16.420 acres Tc = 16.00 minutes

Adjusted C = 0.563 Td= 43.00 min. I= 4.29 in/hr Qp= 39.62 cfs

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

HYDROGRAPH FOR MAXIMUM STORAGE
For the 100 Year Storm

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

Time Minutes							
0.00	0.00	2.48	4.95	7.43	9.91	12.38	14.86
7.00	17.34	19.81	22.29	24.76	27.24	29.72	32.19
14.00	34.67	37.15	39.62	39.62	39.62	39.62	39.62
21.00	39.62	39.62	39.62	39.62	39.62	39.62	39.62
28.00	39.62	39.62	39.62	39.62	39.62	39.62	39.62
35.00	39.62	39.62	39.62	39.62	39.62	39.62	39.62
42.00	39.62	39.62	37.15	34.67	32.19	29.72	27.24
49.00	24.76	22.29	19.81	17.34	14.86	12.38	9.91
56.00	7.43	4.95	2.48	0.00			

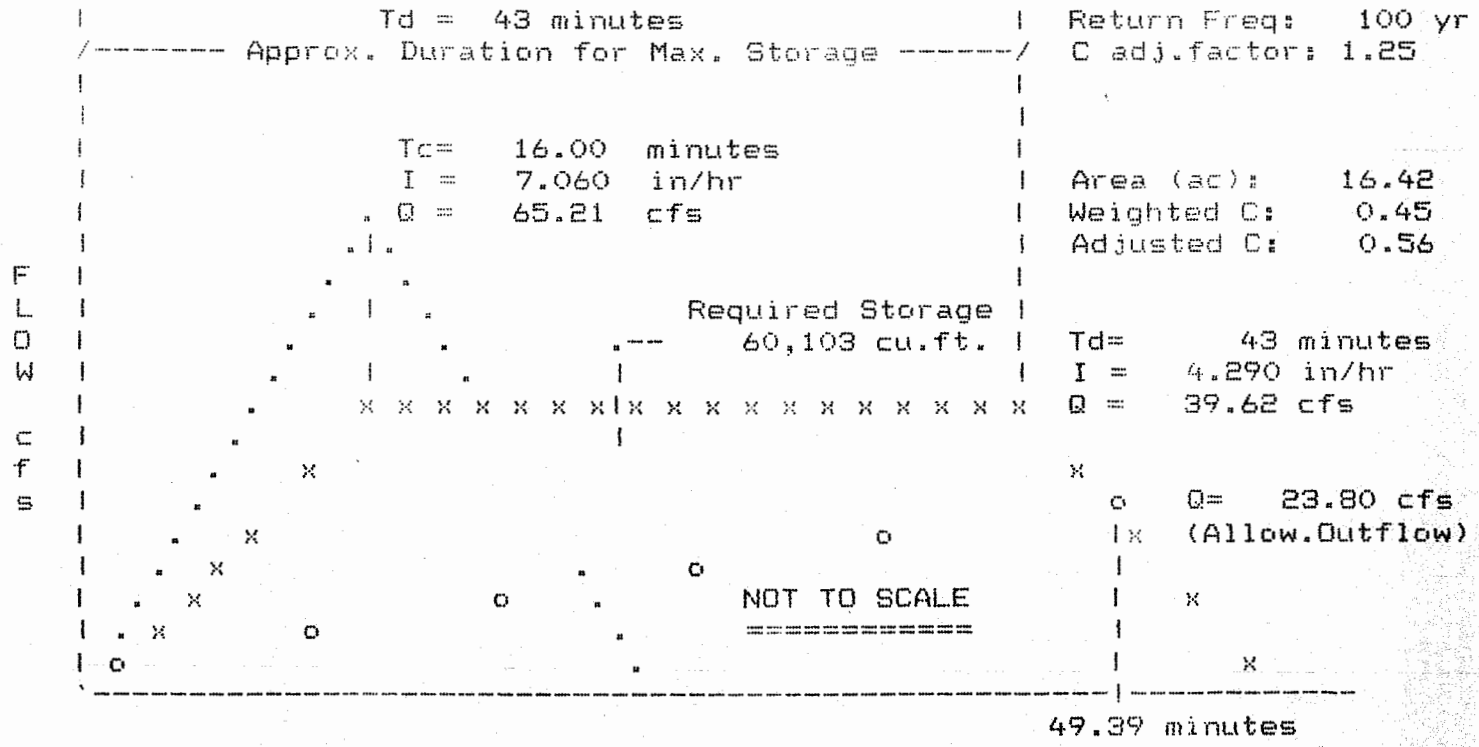
Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 20:10:15 12-09-1993

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

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

SPRINGHILL, PHASE 1,BMP #1

```
*****************************************************************************
*  RETURN FREQUENCY: 100 yr      |  Allowable Outflow:     23.80 cfs      *
*  'C' Adjustment: 1.250         |  Required Storage:     60,103 cu.ft.  *
*---------------------------------------------------------------------------*
*  Peak Inflow:    39.62 cfs        Inflow .HYD stored: 100N     .HYD     *
*****************************************************************************
```



```
**********************************
*                                *
* SPRINGHILL, PHASE 1, BMP #1    *
*                                *
*                                *
*                                *
*                                *
**********************************
```

Inflow Hydrograph: c:\data\100N .HYD
Rating Table file: c:\data\93039-4 .PND

----INITIAL CONDITIONS----
Elevation = 43.80 ft
Outflow = 0.00 cfs
Storage = 51,539 cu-ft

GIVEN POND DATA			INTERMEDIATE ROUTING COMPUTATIONS	
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)	2S/t (cfs)	2S/t + O (cfs)
43.80	0.0	51,539	1717.6	1717.6
44.30	0.4	61,246	2041.1	2041.5
44.80	0.8	71,684	2389.0	2389.8
45.30	1.0	83,030	2767.1	2768.1
45.80	1.5	95,927	3196.9	3198.4
46.30	14.1	110,390	3678.9	3693.0
46.80	35.2	125,846	4194.0	4229.2
47.30	53.0	142,352	4744.1	4797.1
47.80	83.8	160,353	5344.0	5427.8
48.00	99.4	167,998	5598.8	5698.2

Time increment (t) = 1.0 min.

POND-2 Version: 5.17 S/N: 1295130250
EXECUTED: 12-09-1993 14:00:33 Return Freq: 100 years

Pond File: c:\data\93039-4 .PND
Inflow Hydrograph: c:\data\100N .HYD
Outflow Hydrograph: c:\data\100NOUT .HYD

INFLOW HYDROGRAPH — ROUTING COMPUTATIONS

TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	-----	1717.6	1717.6	0.00	43.80
1.0	2.48	2.5	1720.1	1720.1	0.00	43.80
2.0	4.95	7.4	1727.5	1727.5	0.01	43.82
3.0	7.43	12.4	1739.8	1739.9	0.03	43.83
4.0	9.91	17.3	1757.1	1757.2	0.05	43.86
5.0	12.38	22.3	1779.2	1779.4	0.08	43.90
6.0	14.86	27.2	1806.2	1806.4	0.11	43.94
7.0	17.34	32.2	1838.1	1838.4	0.15	43.99
8.0	19.81	37.2	1874.9	1875.3	0.19	44.04
9.0	22.29	42.1	1916.5	1917.0	0.25	44.11
10.0	24.76	47.1	1962.9	1963.5	0.30	44.18
11.0	27.24	52.0	2014.2	2014.9	0.37	44.26
12.0	29.72	57.0	2070.3	2071.2	0.43	44.34
13.0	32.19	61.9	2131.2	2132.2	0.50	44.43
14.0	34.67	66.9	2196.9	2198.1	0.58	44.52
15.0	3'.15	71.8	2267.4	2268.7	0.66	44.63
16.0	39.62	76.8	2342.7	2344.2	0.75	44.73
17.0	39.62	79.2	2420.3	2421.9	0.82	44.84
18.0	39.62	79.2	2497.8	2499.5	0.86	44.95
19.0	39.62	79.2	2575.2	2577.0	0.90	45.05
20.0	39.62	79.2	2652.6	2654.5	0.94	45.15
21.0	39.62	79.2	2729.9	2731.8	0.98	45.25
22.0	39.62	79.2	2807.0	2809.1	1.05	45.35
23.0	39.62	79.2	2884.0	2886.3	1.14	45.44
24.0	39.62	79.2	2960.8	2963.2	1.23	45.53
25.0	39.62	79.2	3037.4	3040.0	1.32	45.62
26.0	39.62	79.2	3113.8	3116.6	1.40	45.70
27.0	39.62	79.2	3190.1	3193.1	1.49	45.79
28.0	39.62	79.2	3262.7	3269.3	3.31	45.87
29.0	39.62	79.2	3331.6	3341.9	5.16	45.95
30.0	39.62	79.2	3397.0	3410.9	6.91	46.01
31.0	39.62	79.2	3459.1	3476.3	8.58	46.08
32.0	39.62	79.2	3518.0	3538.4	10.16	46.14
33.0	39.62	79.2	3574.0	3597.3	11.66	46.20
34.0	39.62	79.2	3627.0	3653.2	13.09	46.26
35.0	39.62	79.2	3677.0	3706.3	14.62	46.31
36.0	39.62	79.2	3723.1	3756.3	16.59	46.36
37.0	39.62	79.2	3765.5	3802.3	18.40	46.40
38.0	39.62	79.2	3804.6	3844.8	20.07	46.44
39.0	39.62	79.2	3840.6	3883.9	21.61	46.48
40.0	39.62	79.2	3873.8	3919.9	23.03	46.51
41.0	39.62	79.2	3904.4	3953.1	24.33	46.54
42.0	39.62	79.2	3932.6	3983.6	25.54	46.57
43.0	39.62	79.2	3958.5	4011.8	26.64	46.60
44.0	37.15	76.8	3980.2	4035.3	27.57	46.62

Pond File: c:\data\93039-4 .PND
Inflow Hydrograph: c:\data\100N .HYD
Outflow Hydrograph: c:\data\100NOUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
45.0	34.67	71.8	3995.5	4052.0	28.23	46.63
46.0	32.19	66.9	4005.1	4062.4	28.63	46.64
47.0	29.72	61.9	4009.4	4067.0	28.82	46.65
48.0	27.24	57.0	4008.8	4066.3	28.79	46.65
49.0	24.76	52.0	4003.6	4060.8	28.57	46.64
50.0	22.29	47.1	3994.3	4050.7	28.17	46.63
51.0	19.81	42.1	3981.2	4036.4	27.61	46.62
52.0	17.34	37.2	3964.5	4018.4	26.90	46.60
53.0	14.86	32.2	3944.6	3996.7	26.05	46.58
54.0	12.38	27.2	3921.7	3971.9	25.07	46.56
55.0	9.91	22.3	3896.1	3944.0	23.98	46.53
56.0	7.43	17.3	3867.9	3913.4	22.77	46.51
57.0	4.95	12.4	3837.3	3880.2	21.47	46.47
58.0	2.48	7.4	3804.6	3844.7	20.07	46.44
59.0	0.00	2.5	3769.9	3807.1	18.59	46.41

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

Pond File: c:\data\93039-4 .PND
Inflow Hydrograph: c:\data\100N .HYD
Outflow Hydrograph: c:\data\100NOUT .HYD

Starting Pond W.S. Elevation = 43.80 ft

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

Peak Inflow = 39.62 cfs
Peak Outflow = 28.82 cfs
Peak Elevation = 46.65 ft DAW

Top = 48.0
FB = 1.35' OK

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

Initial Storage = 51,539 cu-ft
Peak Storage From Storm = 69,632 cu-ft

Total Storage in Pond = 121,170 cu-ft

CHECK BARREL CAPACITY

TABLE 3.14-B
PIPE FLOW CHART, n = 0.013

Q_{100} = 25.87
PEAK OUT

FOR REINFORCED CONCRETE PIPE INLET $K_a = K_e + K_b = 0.65$ AND 70 FEET OF REINFORCED CONCRETE PIPE CONDUIT (full flow assumed)

Note correction factors for pipe lengths other than 70 feet

diameter of pipe in inches

H, in feet	12"	15"	18"	21"	24"	30"	36"	42"	48"	54"	60"	66"	72"	78"	84"	90"	96"	102"
1	3.22	5.44	8.29	11.8	15.9	26.0	38.6	53.8	71.4	91.5	114	139	167	197	229	264	302	342
2	4.55	7.69	11.7	16.7	22.5	36.8	54.6	76.0	101	129	161	197	236	278	324	374	427	483
3	5.57	9.42	14.4	20.4	27.5	45.0	66.9	93.1	124	159	198	241	289	341	397	458	523	592
4	6.43	10.9	16.6	23.5	31.8	52.0	77.3	108	143	183	228	278	334	394	459	529	604	683
5	7.19	12.2	18.5	26.3	35.5	58.1	86.4	120	160	205	255	311	373	440	513	591	675	764
6	7.88	13.3	20.3	28.8	38.9	63.7	94.6	132	175	224	280	341	409	482	562	647	739	837
7	8.51	14.4	21.9	31.1	42.0	68.8	102	142	189	242	302	368	441	521	607	699	798	904
8	9.10	15.4	23.5	33.3	44.9	73.5	109	152	202	259	323	394	472	557	685	748	854	966
9	9.65	16.3	24.9	35.3	47.7	78.0	116	161	214	275	342	418	500	590	688	793	905	1025
10	10.2	17.2	26.2	37.2	50.2	82.2	122	170	226	289	361	440	527	622	725	836	954	1080
11	10.7	18.0	27.5	39.0	52.7	86.2	128	178	237	304	379	462	553	653	761	877	1001	1133
12	11.1	18.9	28.7	40.8	55.0	90.1	134	186	247	317	395	482	578	682	794	916	1045	1184
13	11.6	19.6	29.9	42.4	57.3	93.7	139	194	257	330	411	502	601	710	827	953	1088	1232
14	12.0	20.4	31.0	44.1	59.4	97.3	145	201	267	342	427	521	624	736	858	989	1129	1278
15	12.5	21.1	32.1	45.6	61.5	101	150	208	277	354	442	539	646	762	888	1024	1169	1323
16	12.9	21.8	33.2	47.1	63.5	104	155	215	286	366	457	557	667	787	917	1057	1207	1367
17	13.3	22.4	34.2	48.5	65.5	107	159	222	294	377	471	574	688	812	946	1090	1244	1409
18	13.7	23.1	35.2	49.9	67.4	110	164	228	303	388	484	591	708	835	973	1121	1280	1450
19	14.0	23.7	36.1	51.3	69.2	113	168	234	311	399	497	607	727	858	1000	1152	1315	1489
20	14.4	24.3	37.1	52.6	71.0	116	173	240	319	409	510	623	746	880	1026	1182	1350	1528
21	14.7	24.9	38.0	53.9	72.8	119	177	246	327	419	523	638	764	902	1051	1211	1383	1566
22	15.1	25.5	38.9	55.2	74.5	122	181	252	335	429	535	653	782	923	1076	1240	1415	1603
23	15.4	26.1	39.8	56.5	76.2	125	186	258	342	439	547	668	800	944	1100	1268	1447	1639
24	15.8	26.7	40.6	57.7	77.8	127	189	263	350	448	559	682	817	964	1123	1295	1478	1674
25	16.1	27.2	41.5	58.9	79.4	130	193	269	357	458	571	696	834	984	1147	1322	1509	1708
26	16.4	27.7	42.3	60.0	81.0	133	197	274	364	467	582	710	850	1004	1169	1348	1539	1742
27	16.7	28.3	43.1	61.2	82.5	135	201	279	371	476	593	723	867	1023	1192	1373	1568	1775
28	17.0	28.8	43.9	62.3	84.1	138	204	285	378	484	604	737	883	1041	1214	1399	1597	1808
29	17.3	29.3	44.7	63.4	85.5	140	208	290	384	493	615	750	898	1060	1235	1423	1625	1840
30	17.6	29.8	45.4	64.5	87.0	142	212	294	391	501	625	763	913	1078	1256	1448	1653	1871
L, in feet	Correction Factors For Other Pipe Lengths																	
20	1.30	1.24	1.21	1.18	1.15	1.12	1.10	1.08	1.07	1.06	1.05	1.05	1.04	1.04	1.03	1.03	1.03	1.03
30	1.22	1.18	1.15	1.13	1.12	1.09	1.08	1.06	1.05	1.05	1.04	1.04	1.03	1.03	1.03	1.02	1.02	1.02
40	1.15	1.13	1.11	1.10	1.08	1.07	1.05	1.05	1.04	1.03	1.03	1.03	1.02	1.02	1.02	1.02	1.02	1.02
50	1.09	1.08	1.07	1.06	1.05	1.04	1.04	1.03	1.03	1.02	1.02	1.02	1.02	1.01	1.01	1.01	1.01	1.01
60	1.04	1.04	1.03	1.03	1.03	1.02	1.02	1.02	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
70	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
80	.96	.97	.97	.97	.98	.98	.98	.99	.99	.99	.99	.99	.99	.99	.99	.99	.99	.99
90	.93	.94	.94	.95	.95	.96	.97	.97	.98	.98	.98	.98	.98	.99	.99	.99	.99	.99
100	.90	.91	.92	.93	.93	.95	.95	.96	.97	.97	.97	.98	.98	.98	.98	.98	.98	.99
120	.84	.86	.87	.89	.90	.91	.93	.94	.94	.95	.96	.96	.96	.97	.97	.97	.97	.98
140	.80	.82	.83	.85	.86	.88	.90	.91	.92	.93	.94	.94	.95	.95	.96	.96	.96	.97
160	.76	.78	.80	.82	.83	.86	.88	.89	.90	.91	.92	.93	.94	.94	.95	.95	.95	.96

Source: USDA-SCS

TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET

(with or without an emergency spillway)

Project SPRING HILL PHASE 1

Basin # 1 Location NORTH OF RD. "B"

Total area draining to basin: 16.42 acres.

Basin Volume Design

Wet Storage:

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

   67 cu. yds. x 16.42 acres = 1100.14 cu. yds.

2. Available basin volume = 1478 cu. yds. at elevation 43.8. (From storage - elevation curve)

3. Excavate _____ cu. yds. to obtain required volume*. SEE PLANS FOR BMP #1

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

4. Available volume before cleanout required.

   33 cu. yds. x 16.42 acres = 541.86 cu. yds. REQUIRED → 8.27 CY/A. AVAILABLE

5. Elevation corresponding to cleanout level = 42.8.

   (From Storage - Elevation Curve)

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

Dry Storage:

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

   67 cu. yds. x 16.42 acres = 1100.14 cu. yds.

8. Total available basin volume at crest of riser* = 1593 cu. yds. at elevation 45.75. (From Storage - Elevation Curve) 82937 - 39914 = 43023

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

9. Diameter of dewatering orifice = 6 * in. * SEE "SEDIMENT BASIN DRY STORAGE VOLUME DRAWDOWN TIME" ATTACHED

10. Diameter of flexible tubing = N/A in. (diameter of dewatering orifice plus 2 inches). USING RIGID TEE PIPING FOR PERMANENT TRASH PROTECTION

Preliminary Design Elevations

11. Crest of Riser = 45.75

Top of Dam = 48.00

Design High Water = 45.87

Upstream Toe of Dam = 41.0

Basin Shape

12. Length of Flow L = _____
Effective Width We = _____

$W_E = A/L = \frac{18762.5}{150} = 125$

$\frac{L}{W_E} = \frac{150}{125} = 1.2$

If > 2, baffles are not required _____

$W_E = \frac{18,762}{90} = 208$

If < 2, baffles are required _____

$\frac{L}{W_E} = \frac{90}{208} = 0.43$

Runoff

$W_E = \frac{18762}{50} = 375$

13. Q_2 = 4.97 cfs (From Chapter 5) SEE BMP CALCS

$\frac{L}{W_E} = \frac{50}{375} = 0.13$

14. Q_{25} = 16.35 cfs (From Chapter 5) SEE BMP CALCS

Principal Spillway Design

15. With emergency spillway, required spillway capacity $Q_p = Q_2 =$ 4.97 cfs. (riser and barrel)

Without emergency spillway, required spillway capacity $Q_p = Q_{25} =$ 16.35 cfs. (riser and barrel)

16. With emergency spillway:

Assumed available head (h) = 47.0 - 45.75 = 1.25 ft. (Using Q_2)

h = Crest of Emergency Spillway Elevation - Crest of Riser Elevation

Without emergency spillway:

Assumed available head (h) = N/A ft. (Using Q_{25})

h = Design High Water Elevation - Crest of Riser Elevation

17. Riser diameter (D_r) = 36 in. Actual head (h) = 0.18 ft. 2 YEAR
0.60 25 YEAR

(From Plate 3.14-8.)

Note: Avoid orifice flow conditions.

18. Barrel length (l) = 60 ft.

Head (H) on barrel through embankment = * ft.

(From Plate 3.14-7).

*
4.93 2 YEAR
5.35 25 YEAR
5.57 100 YEAR

19. Barrel diameter = 24" in.

(From Plate 3.14-B [concrete pipe] or Plate 3.14-A [corrugated pipe]).

20. Trash rack and anti-vortex device

Diameter = 60 inches.

Height = 24 inches.

(From Table 3.14-D).

Emergency Spillway Design

21. Required spillway capacity Q_c = Q_{25} - Q_p = 0 cfs. Q_{100} = 25.87 AND WILL PASS THRU PRINCIPAL SPILLWAY

22. Bottom width (b) = 10 ft.; the slope of the exit channel (s) = 0.06 ft./foot; and the minimum length of the exit channel (x) = 100 ft.
(From Table 3.14-C).

Anti-Seep Collar Design

23. Depth of water at principal spillway crest (Y) = 6.43 ft. 46.57 − 40.14

Slope of upstream face of embankment (Z) = 3 :1.

Slope of principal spillway barrel (S_b) = 1.0 % $L_s = Y(Z+4)\left(1+\frac{S}{0.25-S}\right)$

Length of barrel in saturated zone (L_s) = 47 ft. $6.43(7)(1.042) = 46.9$

24. Number of collars required = _____ dimensions = _____

(from Plate 3.14-12).

Final Design Elevations

25. Top of Dam = 49.0

Design High Water = 46.57 (100-YEAR)

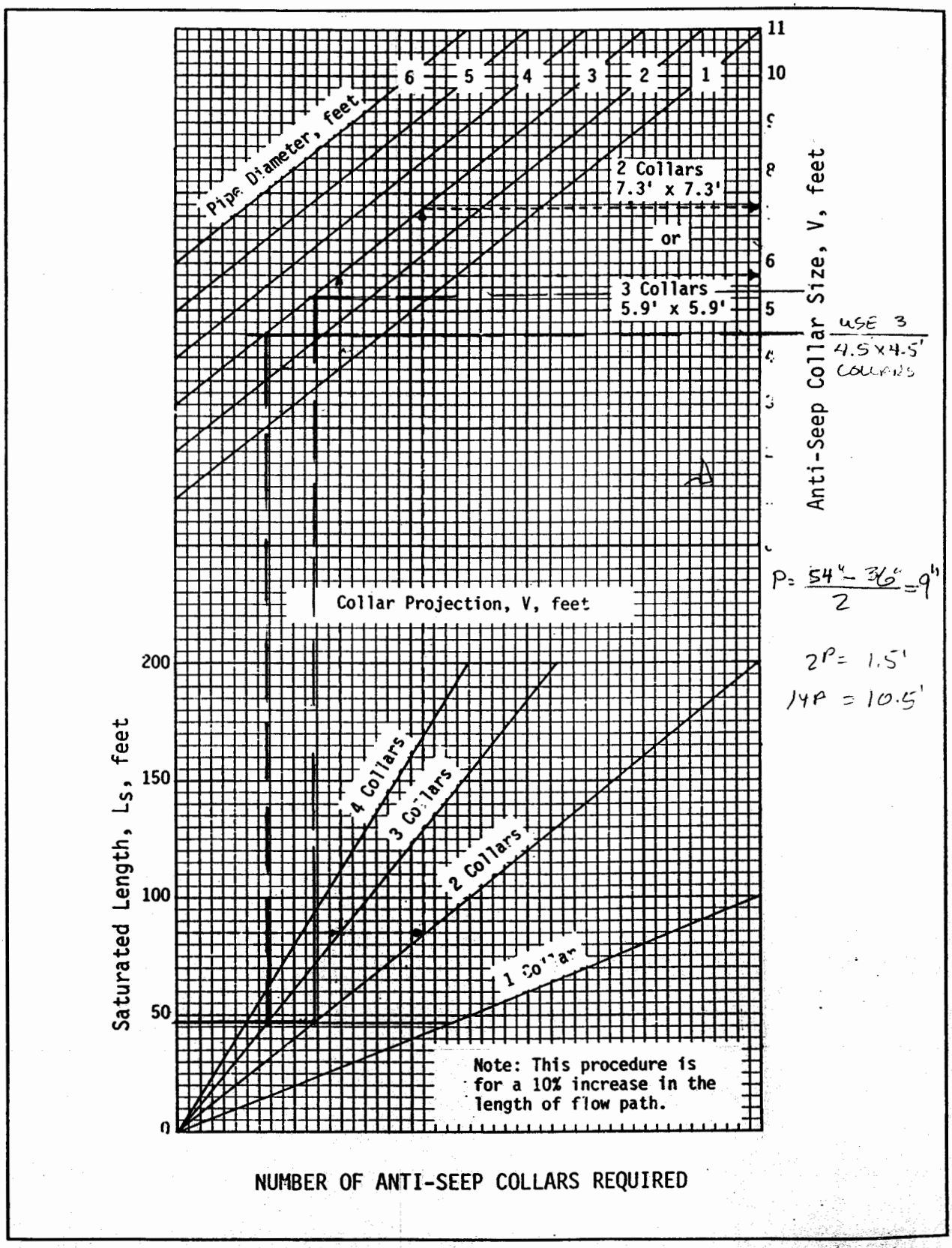
Emergency Spillway Crest = 47.00

Principal Spillway Crest = 45.75

Dewatering Orifice Invert = 43.80

Cleanout Elevation = 42.8

Elevation of Upstream Toe of Dam or Excavated Bottom of "Wet Storage Area" (if excavation was performed) = 41.0



Source: USDA-SCS

Plate 3.14-12

SEDIMENT BASIN DRY STORAGE
VOLUME DRAWDOWN TIME

PAGE
LANGLEY & McDONALD, P.C.
WILLIAMSBURG, VIRGINIA
12/06/93

ORIFICE

ORIFICE = 6.00 INCHES

ELEV. (FT.)	FLOW (CFS)
43.81	0.00
44.06	.19
44.31	.47
44.56	.67
44.81	.82
45.06	.95
45.31	1.06
45.56	1.16

Avg 0.665 CFS

FORMULA USED Q = C * A * SQR 2gh HEAD > Dia

Q = 3 * D * HEAD^1.5 HEAD < Dia

STORAGE BETWEEN EL 45.75 & EL 43.80
VOL 82,937 - 39,914 = 43,023

43,023 cu ft ÷ 0.67 CFS = 64,213 SEC.
64,213 SEC ÷ 60 SEC/MIN ÷ 60 MIN/HR = 17.84 HRS

TIME TO EMPTY = 17.84 HRS

STORM SEWER DESIGN COMPUTATIONS

. & D 229

ROU. _____ PROJ. SPRINGHILL PHASE I
COUNTY _____ DISTRICT _____
DESCRIPTION _____

SHEET 1 OF 3

FROM POINT	TO POINT	AREA DRAIN. "A" ACRES	RUN-OFF COEF. C	CA INCRE-MENT	CA ACCUM-ULATED	INLET TIME MIN-UTES	RAIN FALL 10 IN./HR.	RUNOFF Q_{10} C.F.S.	INVERT ELEVATIONS UPPER END	INVERT ELEVATIONS LOWER END	LENGTH FT.	SLOPE FT./FT.	DIA. IN.	CAPA-CITY C.F.S.	VEL. F.P.S.	FLOW TIME SEC.	REMARKS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
AREA	TO 5	1.18	0.45	0.53		9.5	6.2	3.29									
5 TO 4	4							3.29		58.80	45	0.01	15	6.5	6.8	6.6	
AREA	TO 4	0.20	0.65	0.13		5	7.0	0.91									
4	3							4.20	58.80	58.60	20	0.01	15	6.5	6.8	2.9	
AREA	TO 6	0.53	0.80	0.42		5	7.0	2.97									
6	3							2.97	57.03	56.00	216	0.005	15"	4.6	4.2	52	
AREA	TO 3	0.05	0.65	0.032		5	7.0	0.23									
3	2							7.40	55.75	54.79	96	0.01	18	10.6	5.8	16	
2	1							7.40	54.79	42.0	385	0.033	18"	19.0	11.0	35	

STORM SEWER DESIGN COMPUTATIONS

. & D 229

ROU. : _____ PROJ. SPRING HILL PHASE 1
COUNTY _____ DISTRICT _____
DESCRIPTION _____

SHEET 2 OF 3

FROM POINT	TO POINT	AREA DRAIN. "A" ACRES	RUN-OFF COEF. C	CA INCRE-MENT	CA ACCUM-ULATED	INLET TIME MIN-UTES	RAIN FALL IN./HR.	RUNOFF Q C.F.S.	INVERT ELEVATIONS UPPER END	INVERT ELEVATIONS LOWER END	LENGTH FT.	SLOPE FT./FT.	DIA. IN.	CAPA-CITY C.F.S.	VEL. F.P.S.	FLOW TIME SEC.	REMARKS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
AREA	TO 13	0.33	0.65	0.98		5	7.0	6.86									
13	12							6.86	51.61	51.25	36	0.01	18	10.6	6.5	5.5	
AREA	TO 12	3.21	0.45	1.45		15	5.3	7.66									
12	11							14.52	50.75	50.11	64	0.01	24	22.8	8.0	8.0	
AREA	TO 14	0.54	0.65	0.35													
AREA	TO 11	2.43	0.45	1.09	1.44	15	5.3	7.66									
11	10							22.17	50.11	42.0	290	0.028	24	37.5	10.8	27	
* CULVERT	14	0.54	0.65	0.35		5	7.0	2.45	63.62	63.14	45	0.01	15				HW = 0.9' OK

STORM SEWER DESIGN COMPUTATIONS

. & D 229

ROU. : _____ PROJ. SPRINGHILL PHASE 1
COUNTY _____ DISTRICT _____
DESCRIPTION _____

SHEET 3 OF 3

FROM POINT	TO POINT	AREA DRAIN. "A" ACRES	RUN-OFF COEF. C	CA INCRE-MENT	CA ACCUM-ULATED	INLET TIME MIN-UTES	RAIN FALL IN./HR.	RUNOFF Q C.F.S.	INVERT ELEVATIONS UPPER END	INVERT ELEVATIONS LOWER END	LENGTH FT.	SLOPE FT./FT.	DIA. IN.	CAPA-CITY C.F.S.	VEL. F.P.S.	FLOW TIME SEC.	REMARKS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
AREA	TO 16	0.83	0.65	0.54		5	7.0	3.84									
16	15							3.84	52.0	42.0	150	0.067	15	16.7	13.0	12	
AREA	23	1.03	0.45	0.46		5	7.0	3.24									
23	22							3.24	56.32	55.60	72	0.01	15	6.5	6.8	10.6	
AREA	TO 22	0.30	0.65	0.20		5	7.0	1.63									
22	21							4.87	55.6	54.1	150	0.01	15	6.5	6.8	22	
21	20							4.87	54.1	53.5	60	0.01	15	6.5	6.8	8.8	

REACH DESCRIPTION = STA 12+80 TO 10+40 RD A LT

STATION = 12+80 TO 12+00 RD A LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
3) SLOPE = .0422 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 80
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

REACH DESCRIPTION: STA 12+80 TO 10+40 RD A LT

STATION: 12+80 TO 12+00 RD A LT
C= 0.69 A= 0.046 CA= 0.032 ACCA= 0.032
I2= 5.7 Q2= 0.18 I10= 7.1 Q10= 0.23
S= 0.042

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	1.9 __	2.0 __	2.1 __	2.3 __	_____
0.050 __	1.3 __	1.4 __	2.6 __	2.8 __	_____
0.015 __	3.2 __	3.4 __	1.6 __	1.8 __	_____

REACH DESCRIPTION = STA 12+80 TO 10+40 RD A LT

STATION = 12+00 TO 11+00 RD A LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
3) SLOPE = .0422 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 100
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 12+00 TO 11+00 RD A LT
C= 0.69 A= 0.057 CA= 0.040 ACCA= 0.071
I2= 5.7 Q2= 0.41 I10= 7.1 Q10= 0.51
S= 0.042

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.4 __	2.5 __	2.9 __	3.1 __	_____
0.050 __	1.6 __	1.7 __	3.5 __	3.8 __	_____
0.015 __	4.0 __	4.2 __	2.2 __	2.4 __	_____

REACH DESCRIPTION = STA 12+80 TO 10+40 RD A LT

STATION = 11+00 TO 10+40 RD A LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
3) SLOPE = .0422 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 60
7) Tc= 6 8) NO CHANGES

Enter number of item you wish to change:

STATION: 11+00 TO 10+40 RD A LT
= 0.69 A= 0.034 CA= 0.024 ACCA= 0.095
2= 5.5 Q2= 0.52 I10= 6.9 Q10= 0.66
S= 0.042

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.5 __	2.7 __	3.1 __	3.4 __	_____
0.050 __	1.7 __	1.8 __	3.8 __	4.2 __	_____
0.015 __	4.2 __	4.5 __	2.4 __	2.7 __	_____

REACH DESCRIPTION = STA 12+80 TO 10+40 RD A RT

STATION = 12+80 TO 12+00 RD A RT

STRIP # 1	1) C = .9	2) WS = 12
STRIP # 2	1) C = .5	2) WS = 13
STRIP # 3	1) C = .65	2) WS = 100

3) SLOPE = .0422 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 80
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 12+80 TO 12+00 RD A RT

C= 0.66	A= 0.230	CA= 0.151	ACCA= 0.151
T2= 5.7	Q2= 0.86	I10= 7.1	Q10= 1.08
S= 0.042			

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.9 __	3.0 __	3.8 __	4.1 __	_____
0.050 __	1.9 __	2.1 __	4.6 __	5.0 __	_____
0.015 __	4.8 __	5.1 __	2.9 __	3.2 __	_____

REACH DESCRIPTION = STA 12+80 TO 10+40 RD A RT

STATION = 12+00 TO 11+00 RD A RT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
STRIP # 3 1) C = .65 2) WS = 70
3) SLOPE = .0422 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 100
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

TATION: 12+00 TO 11+00 RD A RT
= 0.66 A= 0.218 CA= 0.144 ACCA= 0.296

2= 5.7 Q2= 1.68 I10= 7.1 Q10= 2.11
= 0.042

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	3.4 __	3.6 __	4.9 __	5.3 __	_____
.050 __	2.3 __	2.4 __	5.9 __	6.4 __	_____
.015 __	5.7 __	6.0 __	3.8 __	4.1 __	_____

REACH DESCRIPTION = STA 12+80 TO 10+40 RD A RT

STATION = 11+00 TO 10+40 RD A RT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
STRIP # 3 1) C = .65 2) WS = 30
3) SLOPE = .0422 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 60
7) Tc= 6 8) NO CHANGES

Enter number of item you wish to change:

TATION: 11+00 TO 10+40 RD A RT
= 0.67 A= 0.076 CA= 0.051 ACCA= 0.346
I2= 5.5 Q2= 1.89 I10= 6.9 Q10= 2.38
= 0.042

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	3.5 __	3.7 __	5.1 __	5.6 __	_____
0.050 __	2.4 __	2.5 __	6.2 __	6.7 __	_____
0.015 __	5.9 __	6.2 __	3.9 __	4.8 __	_____

REACH DESCRIPTION = STA 12+80 TO 14+10 RD A LT

STATION = 12+80 TO 13+50 RD A LT

STRIP # 1	1) C = .9	2) WS = 12
STRIP # 2	1) C = .5	2) WS = 13
STRIP # 3	1) C = .65	2) WS = 60
3) SLOPE = .0388	4) FRONT SIDE SLOPE = 4	
5) BACK SIDE SLOPE = 4	6) LS= 70	
7) Tc= 5	8) NO CHANGES	

Enter number of item you wish to change:

STATION: 12+80 TO 13+50 RD A LT

C= 0.66	A= 0.137	CA= 0.090	ACCA= 0.090
I2= 5.7	Q2= 0.51	I10= 7.1	Q10= 0.65
S= 0.039			

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.4 __	2.6 __	3.2 __	3.5 __	_____
0.050 __	1.7 __	1.8 __	3.9 __	4.2 __	_____
0.015 __	4.1 __	4.3 __	2.5 __	2.7 __	_____

REACH DESCRIPTION = STA 12+80 TO 14+10 RD A LT

STATION = 13+50 TO 14+10 RD A LT

STRIP # 1	1) C = .9	2) WS = 12
STRIP # 2	1) C = .5	2) WS = 13
STRIP # 3	1) C = .65	2) WS = 40
3) SLOPE = .0388	4) FRONT SIDE SLOPE = 4	
5) BACK SIDE SLOPE = 4	6) LS= 60	
7) Tc= 5	8) NO CHANGES	

Enter number of item you wish to change:

STATION: 13+50 TO 14+10 RD A LT

C= 0.67	A= 0.090	CA= 0.060	ACCA= 0.150
I2= 5.7	Q2= 0.85	I10= 7.1	Q10= 1.07
S= 0.039			

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.8 __	2.9 __	3.3 __	4.2 __	_____
0.050 __	1.9 __	2.0 __	4.7 __	5.1 __	_____
0.015 __	4.6 __	4.9 __	3.0 __	3.2 __	_____

REACH DESCRIPTION = 12+80 TO 14+10 RD A THEN 17+40 TO 19+75 RD B RT

STATION = 12-80 TO 13+50 RD A RT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
STRIP # 3 1) C = .65 2) WS = 65
3) SLOPE = .0388 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 70
7) Tc= 14 8) NO CHANGES

Enter number of item you wish to change:

STATION: 12-80 TO 13+50 RD A RT
= 0.66 A= 0.145 CA= 0.096 ACCA= 0.096
I2= 4.1 Q2= 0.39 I10= 5.3 Q10= 0.51
S= 0.039

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.3 __	2.4 __	2.9 __	3.2 __	_____
0.050 __	1.6 __	1.7 __	3.5 __	3.8 __	_____
0.015 __	3.8 __	4.1 __	2.2 __	2.4 __	_____

REACH DESCRIPTION = 12+80 TO 14+10 RD A THEN 17+40 TO 19+75 RD B RT

STATION = 13+50 TO 14+10 RD A RT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
STRIP # 3 1) C = .65 2) WS = 40
3) SLOPE = .0388 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 60
7) Tc= 14 8) NO CHANGES

Enter number of item you wish to change:

STATION: 13+50 TO 14+10 RD A RT
= 0.67 A= 0.090 CA= 0.060 ACCA= 0.156
I2= 4.1 Q2= 0.63 I10= 5.3 Q10= 0.83
S= 0.039

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.6 __	2.7 __	3.4 __	3.8 __	_____
0.050 __	1.7 __	1.9 __	4.2 __	4.6 __	_____
0.015 __	4.3 __	4.6 __	2.7 __	2.9 __	_____

REACH DESCRIPTION = 12+80 TO 14+10 RD A THEN 17+40 TO 19+75 RD B RT

STATION = 17+40 TO 18+00 RD B RT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
STRIP # 3 1) C = .65 2) WS = 40
3) SLOPE = .0318 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 60
7) Tc= 15 8) NO CHANGES

Enter number of item you wish to change:

STATION: 17+40 TO 18+00 RD B RT
= 0.67 A= 0.090 CA= 0.060 ACCA= 0.215
2= 3.9 Q2= 0.85 I10= 5.2 Q10= 1.11
S= 0.032

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.6 __	2.7 __	4.0 __	4.4 __	_____
0.050 __	1.7 __	1.9 __	4.8 __	5.3 __	_____
0.015 __	4.3 __	4.6 __	3.1 __	3.4 __	_____

REACH DESCRIPTION = 12+80 TO 14+10 RD A THEN 17+40 TO 19+75 RD B RT

STATION = 18+00 TO 18+50 RD B RT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
STRIP # 3 1) C = .65 2) WS = 180
3) SLOPE = .0318 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 15 8) NO CHANGES

Enter number of item you wish to change:

STATION: 18+00 TO 18+50 RD B RT
= 0.66 A= 0.236 CA= 0.154 ACCA= 0.370
2= 3.9 Q2= 1.46 I10= 5.2 Q10= 1.90
S= 0.032

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.9 __	3.1 __	4.9 __	5.4 __	_____
0.050 __	2.0 __	2.1 __	5.9 __	6.5 __	_____
0.015 __	4.9 __	5.3 __	3.8 __	4.2 __	_____

REACH DESCRIPTION = 12+80 TO 14+10 RD A THEN 17+40 TO 19+75 RD B RT

STATION = 18+50TO 19+00 RD B RT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
STRIP # 3 1) C = .65 2) WS = 230
3) SLOPE = .0318 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 15 8) NO CHANGES

Enter number of item you wish to change:

STATION: 18+50TO 19+00 RD B RT
0.65 A= 0.293 CA= 0.192 ACCA= 0.561
I2= 3.9 Q2= 2.21 I10= 5.2 Q10= 2.89
S= 0.032

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	3.3 __	3.5 __	5.7 __	6.3 __	
.050 __	2.2 __	2.4 __	6.9 __	7.6 __	_____
0.015 __	5.5 __	5.9 __	4.4 __	4.9 __	_____

REACH DESCRIPTION = 12+80 TO 14+10 RD A THEN 17+40 TO 19+75 RD B RT

STATION = 19+00 TO 19+50 RD B RT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
STRIP # 3 1) C = .65 2) WS = 300
3) SLOPE = .0318 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 16 8) NO CHANGES

Enter number of item you wish to change:

STATION: 19+00 TO 19+50 RD B RT
C= 0.65 A= 0.374 CA= 0.244 ACCA= 0.805
I2= 3.8 Q2= 3.08 I10= 5.0 Q10= 4.03
S= 0.032

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	3.5 __	3.8 __	6.5 __	7.1 __	_____
0.050 __	2.4 __	2.6 __	7.8 __	8.7 __	_____
0.015 __	5.9 __	6.4 __	5.0 __	5.5 __	_____

REACH DESCRIPTION = 12+80 TO 14+10 RD A THEN 17+40 TO 19+75 RD B RT

STATION = 19+50 TO ~~20+00~~ 19+75 RD B RT

STRIP # 1	1) C = .9	2) WS = 12
STRIP # 2	1) C = .5	2) WS = 13
STRIP # 3	1) C = .65	2) WS = 300

3) SLOPE = .0318 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 25
7) Tc= 16 8) NO CHANGES

Enter number of item you wish to change:

STATION: 19+50 TO 20+00 RD B RT

= 0.65	A= 0.187	CA= 0.122	ACCA= 0.927
12= 3.8	Q2= 3.54	I10= 5.0	Q10= 4.64
S= 0.032			

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	3.7 __	3.9 __	6.8 __	7.5 __	_____
0.050 __	2.5 __	2.7 __	8.8 __	9.1 __	_____
0.015 __	6.2 __	6.6 __	5.2 __	5.8 __	_____

REACH DESCRIPTION =
TA 11+75 TO 10+25 RD C RT THEN 10+75 TO 9+50 RD B RT

STATION = 11+75 TO 11+00 RD C RT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 20
3) SLOPE = .037 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 75
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 11+75 TO 11+00 RD C RT
= 0.65 A= 0.055 CA= 0.036 ACCA= 0.036
E= 5.7 Q2= 0.20 I10= 7.1 Q10= 0.26
S= 0.037

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	1.9 __	2.0 __	2.3 __	2.5 __	
0.050 __	1.3 __	1.4 __	2.5 __	3.0 __	
0.015 __	3.2 __	3.4 __	1.8 __	1.9 __	

REACH DESCRIPTION =
TA 11+75 TO 10+25 RD C RT THEN 10+75 TO 9+50 RD B RT

STATION = 11+00 TO 10+25 RD C RT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 20
3) SLOPE = .037 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 75
7) Tc= 5 8) NO CHANGES

STATION: 11+00 TO 10+25 RD C RT
C= 0.65 A= 0.055 CA= 0.036 ACCA= 0.072
E= 5.7 Q2= 0.41 I10= 7.1 Q10= 0.51
= 0.037

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.3 __	2.4 __	2.9 __	3.2 __	
0.050 __	1.5 __	1.6 __	3.6 __	3.9 __	
0.015 __	3.8 __	4.0 __	2.3 __	2.5 __	

REACH DESCRIPTION =
A 11+75 TO 10+25 RD C RT THEN 10+75 TO 9+50 RD B RT

STATION = 10+75 TO 10+00 RD B RT

STRIP # 1 1) C = .9 2) WS = 40
STRIP # 2 1) C = .5 2) WS = 13
STRIP # 3 1) C = .65 2) WS = 30
3) SLOPE = .0435 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 75
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

TATION: 10+75 TO 10+00 RD B RT
= 0.75 A= 0.143 CA= 0.107 ACCA= 0.179
2= 5.7 Q2= 1.02 I10= 7.1 Q10= 1.27
0.043

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.080 __	3.0 __	3.2 __	4.0 __	4.4 __	_____
0.050 __	2.1 __	2.2 __	4.9 __	5.3 __	_____
0.015 __	5.1 __	5.4 __	3.1 __	3.4 __	_____

REACH DESCRIPTION =
TA 11+75 TO 10+25 RD C RT THEN 10+75 TO 9+50 RD B RT

STATION = 10+00 TO 9+50 RD B RT

STRIP # 1 1) C = .9 2) WS = 60
STRIP # 2 1) C = .5 2) WS = 20
3) SLOPE = .0435 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 6 8) NO CHANGES

Enter number of item you wish to change:

TATION: 10+00 TO 9+50 RD B RT
= 0.80 A= 0.092 CA= 0.074 ACCA= 0.252
I2= 5.5 Q2= 1.38 I10= 6.9 Q10= 1.74
S= 0.043

S value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	3.3 __	3.4 __	4.5 __	4.9 __	_____
0.050 __	2.2 __	2.4 __	5.5 __	6.0 __	_____
0.015 __	5.5 __	5.8 __	3.5 __	3.8 __	_____

REACH DESCRIPTION = STA 11+00 TO 9+50 RD B LT

STATION = 11+00 TO 10+50 RD B LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 20
3) SLOPE = .0326 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 11+00 TO 10+50 RD B LT
C= 0.65 A= 0.037 CA= 0.024 ACCA= 0.024
I2= 5.7 Q2= 0.14 I10= 7.1 Q10= 0.17
I= 0.033

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	1.6 __	1.7 __	2.0 __	2.2 __	
0.050 __	1.1 __	1.2 __	2.4 __	2.6 __	
0.015 __	2.8 __	2.9 __	1.5 __	1.7 __	

REACH DESCRIPTION = STA 11+00 TO 9+50 RD B LT

STATION = 10+50 TO 10+00 RD B LT

STRIP # 1 1) C = .9 2) WS = 20
STRIP # 2 1) C = .5 2) WS = 20
3) SLOPE = .0326 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 10+50 TO 10+00 RD B LT
C= 0.70 A= 0.046 CA= 0.032 ACCA= 0.056
I2= 5.7 Q2= 0.32 I10= 7.1 Q10= 0.40
I= 0.033

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.0 __	2.1 __	2.8 __	3.0 __	
0.050 __	1.4 __	1.5 __	3.3 __	3.6 __	
0.015 __	3.4 __	3.6 __	2.1 __	2.3 __	

REACH DESCRIPTION = STA 11+00 TO 9+50 RD B LT

STATION = 10+00 TO 9+50 RD B LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 20
3) SLOPE = .0326 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 10+00 TO 9+50 RD B LT
C= 0.65 A= 0.037 CA= 0.024 ACCA= 0.080
Q2= 5.7 Q2= 0.45 I10= 7.1 Q10= 0.57
S= 0.033

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.2 __	2.3 __	3.1 __	3.4 __	_____
0.050 __	1.5 __	1.6 __	3.8 __	4.1 __	_____
0.015 __	3.7 __	3.9 __	2.4 __	2.6 __	_____

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REACH DESCRIPTION = STA 11+00 TO 11+50 RD B LT

STATION = 11+00 TO 11+50 RD B LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 20
3) SLOPE = .016 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

EACH DESCRIPTION: STA 11+00 TO 11+50 RD B LT

TATION: 11+00 TO 11+50 RD B LT

= 0.65	A= 0.037	CA= 0.024	ACCA= 0.024
2= 5.7	Q2= 0.14	I10= 7.1	Q10= 0.17
= 0.016			

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
.030 __	1.2 __	1.3 __	2.3 __	2.5 __	_____
.050 __	0.9 __	0.9 __	2.8 __	3.0 __	_____
.015 __	2.1 __	2.2 __	1.8 __	1.9 __	_____

REACH DESCRIPTION =
STA 11+75 TO 10+25 RD C LT THEN 11+25 TO 11+75 RD B RT

STATION = 11+75 TO 11+00 RD C LT

STRIP # 1	1) C = .9	2) WS = 12
STRIP # 2	1) C = .5	2) WS = 13
STRIP # 3	1) C = .65	2) WS = 100

3) SLOPE = .037 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 75
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

TATION: 11+75 TO 11+00 RD C LT
= 0.66 A= 0.216 CA= 0.142 ACCA= 0.142
T2= 5.7 Q2= 0.81 I10= 7.1 Q10= 1.01
S= 0.037

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value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.7 __	2.8 __	3.8 __	4.1 __	_____
0.050 __	1.8 __	1.9 __	4.6 __	5.0 __	_____
0.015 __	4.5 __	4.8 __	2.9 __	3.2 __	_____

REACH DESCRIPTION =
STA 11+75 TO 10+25 RD C LT THEN 11+25 TO 11+75 RD B RT

STATION = 11+25 TO 11+75 RD B RT

STRIP # 1	1) C = .9	2) WS = 12
STRIP # 2	1) C = .5	2) WS = 13
STRIP # 3	1) C = .65	2) WS = 150

3) SLOPE = .016 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 75
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 11+25 TO 11+75 RD B RT

= 0.66	A= 0.301	CA= 0.198	ACCA= 0.340
2= 5.7	Q2= 1.93	I10= 7.1	Q10= 2.42
S= 0.016			

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.4 __	2.6 __	6.2 __	6.7 __	_____
0.050 __	1.7 __	1.8 __	7.5 __	8.1 __	_____
0.015 __	4.1 __	4.3 __	4.8 __	5.2 __	_____

50

REACH DESCRIPTION = STA 15+00 TO 11+75 RD B RT

STATION = 15+00 TO 14+50 RD B RT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
STRIP # 3 1) C = .65 2) WS = 35
3) SLOPE = .0283 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 15+00 TO 14+50 RD B RT
C= 0.67 A= 0.069 CA= 0.046 ACCA= 0.046
I2= 5.7 Q2= 0.26 I10= 7.1 Q10= 0.33
S= 0.028

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	1.8 __	1.9 __	2.6 __	2.9 __	_____
0.050 __	1.2 __	1.3 __	3.2 __	3.5 __	_____
0.015 __	3.1 __	3.2 __	2.0 __	2.2 __	_____

REACH DESCRIPTION = STA 15+00 TO 11+75 RD B RT

STATION = 14+50 TO 14+00 RD B RT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
STRIP # 3 1) C = .65 2) WS = 60
3) SLOPE = .0283 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 14+50 TO 14+00 RD B RT
C= 0.66 A= 0.098 CA= 0.065 ACCA= 0.111

I2= 5.7 Q2= 0.63 I10= 7.1 Q10= 0.79
S= 0.028

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.3 __	2.4 __	3.6 __	4.0 __	_____
0.050 __	1.6 __	1.6 __	4.4 __	4.8 __	_____
0.015 __	3.8 __	4.0 __	2.8 __	3.1 __	_____

REACH DESCRIPTION = STA 15+00 TO 11+75 RD B RT

STATION = 14+00 TO 13+50 RD B RT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
STRIP # 3 1) C = .65 2) WS = 90
3) SLOPE = .0283 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 6 8) NO CHANGES

Enter number of item you wish to change:

STATION: 14+00 TO 13+50 RD B RT
= 0.66 A= 0.132 CA= 0.087 ACCA= 0.198
E= 5.5 Q2= 1.08 I10= 6.9 Q10= 1.36
S= 0.028

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.6 __	2.8 __	4.5 __	4.9 __	
0.050 __	1.8 __	1.9 __	5.4 __	5.9 __	
0.015 __	4.4 __	4.6 __	3.4 __	3.8 __	

REACH DESCRIPTION = STA 15+00 TO 11+75 RD B RT

STATION = 13+50 TO 13+00 RD B RT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
STRIP # 3 1) C = .65 2) WS = 110
3) SLOPE = .0283 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 6 8) NO CHANGES

Enter number of item you wish to change:

STATION: 13+50 TO 13+00 RD B RT
= 0.66 A= 0.155 CA= 0.102 ACCA= 0.300
T2= 5.5 Q2= 1.64 I10= 6.9 Q10= 2.06
S= 0.028

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.9 __	3.1 __	5.2 __	5.7 __	
0.050 __	2.0 __	2.1 __	6.3 __	6.9 __	
0.015 __	4.9 __	5.1 __	4.0 __	4.4 __	

REACH DESCRIPTION = STA 15+00 TO 11+75 RD B RT

STATION = 13+00 TO 12+50 RD B RT

STRIP # 1	1) C = .9	2) WS = 12
STRIP # 2	1) C = .5	2) WS = 13
STRIP # 3	1) C = .65	2) WS = 120
3) SLOPE = .0283	4) FRONT SIDE SLOPE = 4	
5) BACK SIDE SLOPE = 4	6) LS= 50	
7) Tc= 6	8) NO CHANGES	

Enter number of item you wish to change:

STATION: 13+00 TO 12+50 RD B RT

C= %53.91 A= 0.166 CA= 8.973 ACCA= 1.273

I2= 5.5 Q2= 50.63 I10= 4.9 Q10= 68.87

= 0.028

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	6.8 __	7.3 __	18.8 __	20.6 __	_____
0.050 __	4.7 __	4.9 __	22.8 __	24.9 __	_____
0.015 __	11.5 __	12.2 __	14.5 __	15.9 __	_____

REACH DESCRIPTION = STA 15+00 TO 11+75 RD B RT

STATION = 12+50 TO 11+75 RD B RT

STRIP # 1	1) C = .9	2) WS = 12
STRIP # 2	1) C = .5	2) WS = 13
STRIP # 3	1) C = .65	2) WS = 150
3) SLOPE = .0283	4) FRONT SIDE SLOPE = 4	
5) BACK SIDE SLOPE = 4	6) LS= 75	
7) Tc= 7	8) NO CHANGES	

Enter number of item you wish to change:

STATION: 12+50 TO 11+75 RD B RT

C= 0.66 A= 0.301 CA= 0.198 ACCA= 9.470

I2= 5.2 Q2= 49.69 I10= 6.7 Q10= 63.01

= 0.028

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	6.8 __	7.2 __	18.7 __	20.5 __	_____
0.050 __	4.6 __	4.9 __	22.7 __	24.8 __	_____
0.015 __	11.4 __	12.1 __	14.4 __	15.8 __	_____

REACH DESCRIPTION = STA 15+00 TO 11+75 RD B LT

STATION = 15+00 TO 14+00 RD B LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 20
3) SLOPE = .0283 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 100
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 15+00 TO 14+00 RD B LT
C= 0.65 A= 0.074 CA= 0.048 ACCA= 0.048
L= 5.7 Q2= 0.27 I10= 7.1 Q10= 0.34
S= 0.028

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	1.8 __	2.0 __	2.7 __	2.9 __	_____
0.050 __	1.3 __	1.3 __	3.2 __	3.5 __	_____
0.015 __	3.1 __	3.3 __	2.1 __	2.2 __	_____

REACH DESCRIPTION = STA 15+00 TO 11+75 RD B LT

STATION = 14+00 TO 13+00 RD B LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 20
3) SLOPE = .0283 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 100
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 14+00 TO 13+00 RD B LT
C= 0.65 A= 0.073 CA= 0.048 ACCA= 0.096
L= 5.7 Q2= 0.54 I10= 7.1 Q10= 0.68
S= 0.028

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.2 __	2.3 __	3.4 __	3.8 __	_____
0.050 __	1.5 __	1.6 __	4.2 __	4.5 __	_____
0.015 __	3.7 __	3.9 __	2.7 __	2.9 __	_____

REACH DESCRIPTION = STA 15+00 TO 11+75 RD B LT

STATION = 13+00 TO 11+75 RD B LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 20
3) SLOPE = .0283 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 125
7) Tc= 6 8) NO CHANGES

Enter number of item you wish to change:

TATION: 13+00 TO 11+75 RD B LT
= 0.65 A= 0.092 CA= 0.060 ACCA= 0.155
2= 515 Q2= 0.85 I10= 6.9 Q10= 1.07
= 0.028

alue	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030	2.5	2.6	4.1	4.4	
.050	1.7	1.8	4.9	5.4	USE EC-2
015	4.1	4.4	3.1	3.4	

REACH DESCRIPTION = 15+00 TO 17+10 RD B RT

STATION = 15+00 TO 15+75 RD B RT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 20
3) SLOPE = .0318 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 75
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 15+00 TO 15+75 RD B RT
C= 0.65 A= 0.055 CA= 0.036 ACCA= 0.036
I2= 5.7 Q2= 0.20 I10= 7.1 Q10= 0.26
S= 0.032

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	1.8 __	1.9 __	2.3 __	2.5 __	_____
0.050 __	1.2 __	1.3 __	2.8 __	3.1 __	_____
0.015 __	3.0 __	3.2 __	1.8 __	2.0 __	_____

REACH DESCRIPTION = 15+00 TO 17+10 RD B RT

STATION = 15+75 TO 16+50 RD B RT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
STRIP # 3 1) C = .65 2) WS = 50
3) SLOPE = .0318 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 75
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 15+75 TO 16+50 RD B RT
C= 0.66 A= 0.129 CA= 0.086 ACCA= 0.122
I2= 5.7 Q2= 0.69 I10= 7.1 Q10= 0.87
S= 0.032

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.4 __	2.6 __	3.7 __	4.0 __	_____
0.050 __	1.7 __	1.8 __	4.5 __	4.9 __	_____
0.015 __	4.1 __	4.3 __	2.8 __	3.1 __	_____

REACH DESCRIPTION = 15+00 TO 17+10 RD B RT

STATION = 16+50 TO 17+10 RD B RT

STRIP # 1	1) C = .9	2) WS = 12
STRIP # 2	1) C = .5	2) WS = 13
STRIP # 3	1) C = .65	2) WS = 70

3) SLOPE = .0318 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 60
7) Tc= 6 8) NO CHANGES

Enter number of item you wish to change:

STATION: 16+50 TO 17+10 RD B RT

C= 0.66	A= 0.131	CA= 0.087	ACCA= 0.208
Q2= 5.5	Q2= 1.14	I10= 6.9	Q10= 1.43
S= 0.032			

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.8 __	2.9 __	4.4 __	4.9 __	_____
0.050 __	1.9 __	2.0 __	5.4 __	5.9 __	_____
0.015 __	4.6 __	4.9 __	3.4 __	3.7 __	_____

REACH DESCRIPTION = STA 15+00 TO 20+40 RD B LT

STATION = 15+00 TO 16+00 RD B LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 20
3) SLOPE = .0318 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 100
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 15+00 TO 16+00 RD B LT
= 0.65 A= 0.074 CA= 0.048 ACCA= 0.048
I2= 5.7 Q2= 0.27 I10= 7.1 Q10= 0.34
S= 0.032

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	1.9 __	2.0 __	2.6 __	2.8 __	_____
0.050 __	1.3 __	1.4 __	3.2 __	3.4 __	_____
0.015 __	3.2 __	3.4 __	2.0 __	2.2 __	_____

REACH DESCRIPTION = STA 15+00 TO 20+40 RD B LT

STATION = 16+00 TO 17+00 RD B LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 20
3) SLOPE = .0318 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 100
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 16+00 TO 17+00 RD B LT
= 0.65 A= 0.073 CA= 0.048 ACCA= 0.096
I2= 5.7 Q2= 0.54 I10= 7.1 Q10= 0.68
S= 0.032

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.3 __	2.4 __	3.4 __	3.7 __	_____
0.050 __	1.6 __	1.7 __	4.1 __	4.4 __	_____
0.015 __	3.9 __	4.1 __	2.6 __	2.8 __	_____

REACH DESCRIPTION = STA 15+00 TO 20+40 RD B LT

STATION = 17+00 TO 18+00 RD B LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 20
3) SLOPE = .0318 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 100
7) Tc= 6 8) NO CHANGES

Enter number of item you wish to change:

STATION: 17+00 TO 18+00 RD B LT
= 0.65 A= 0.073 CA= 0.048 ACCA= 0.143
2= 5.5 Q2= 0.78 I10= 6.9 Q10= 0.99
S= 0.032

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.5 __	2.7 __	3.9 __	4.2 __	_____
0.050 __	1.7 __	1.8 __	4.7 __	5.1 __	_____
0.015 __	4.2 __	4.5 __	3.0 __	3.3 __	_____

REACH DESCRIPTION = STA 15+00 TO 20+40 RD B LT

STATION = 18+00 TO 19+00 RD B LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 20
3) SLOPE = .0318 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 100
7) Tc= 6 8) NO CHANGES

Enter number of item you wish to change:

STATION: 18+00 TO 19+00 RD B LT
= 0.65 A= 0.073 CA= 0.048 ACCA= 0.191
2= 5.5 Q2= 1.04 I10= 6.9 Q10= 1.32
S= 0.032

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.7 __	2.9 __	4.3 __	4.7 __	_____
0.050 __	1.8 __	2.0 __	5.2 __	5.7 __	_____
0.015 __	4.5 __	4.8 __	3.3 __	3.6 __	_____

REACH DESCRIPTION = STA 15+00 TO 20+40 RD B LT

STATION = 19+00 TO 20+00 RD B LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 20
3) SLOPE = .0318 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 100
7) Tc= 7 8) NO CHANGES

Enter number of item you wish to change:

STATION: 19+00 TO 20+00 RD B LT
C= 0.65 A= 0.073 CA= 0.048 ACCA= 0.239
Q2= 5.2 Q2= 1.25 I10= 6.7 Q10= 1.59
S= 0.032

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.8 __	3.0 __	4.6 __	5.0 __	_____
0.050 __	1.9 __	2.0 __	5.6 __	6.1 __	_____
0.015 __	4.7 __	5.0 __	3.6 __	3.9 __	_____

REACH DESCRIPTION = STA 15+00 TO 20+40 RD B LT

STATION = 20+00 TO 20+40 RD B LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 20
3) SLOPE = .0318 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 40
7) Tc= 7 8) NO CHANGES

Enter number of item you wish to change:

STATION: 20+00 TO 20+40 RD B LT
C= 0.65 A= 0.029 CA= 0.019 ACCA= 0.258
Q2= 5.2 Q2= 1.35 I10= 6.7 Q10= 1.72
S= 0.032

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.9 __	3.1 __	4.7 __	5.2 __	_____
0.050 __	2.0 __	2.1 __	5.8 __	6.3 __	_____
0.015 __	4.8 __	5.1 __	3.7 __	4.0 __	_____

REACH DESCRIPTION = STA 22+79.72 TO 20+40 RD B RT

STATION = 21+50 TO 21+00 RD B RT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
STRIP # 3 1) C = .65 2) WS = 265
3) SLOPE = .0392 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 14 8) NO CHANGES

Enter number of item you wish to change:

STATION: 21+50 TO 21+00 RD B RT
C= 0.65 A= 0.333 CA= 0.218 ACCA= 0.797
I2= 4.1 Q2= 3.24 I10= 5.3 Q10= 4.23
S= 0.039

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	3.9 __	4.1 __	6.3 __	7.0 __	_____
0.050 __	2.6 __	2.8 __	7.7 __	8.5 __	_____
0.015 __	6.5 __	7.0 __	4.9 __	5.4 __	_____

REACH DESCRIPTION = STA 22+79.72 TO 20+40 RD B RT

STATION = 21+00 TO 20+40 RD B RT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
STRIP # 3 1) C = .65 2) WS = 255
3) SLOPE = .0392 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 60
7) Tc= 15 8) NO CHANGES

Enter number of item you wish to change:

STATION: 21+00 TO 20+40 RD B RT
C= 0.65 A= 0.386 CA= 0.252 ACCA= 1.049
I2= 3.9 Q2= 4.14 I10= 5.2 Q10= 5.41
S= 0.039

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	4.1 __	4.4 __	6.9 __	7.7 __	_____
0.050 __	2.8 __	3.0 __	8.4 __	9.3 __	_____
0.015 __	6.9 __	7.4 __	5.4 __	5.9 __	_____

REACH DESCRIPTION = STA 22+79.72 TO 20+40 RD B RT

STATION = 22+80 TO 22+00

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
STRIP # 3 1) C = .65 2) WS = 270
3) SLOPE = .0392 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 80
7) Tc= 13 8) NO CHANGES

Enter number of item you wish to change:

STATION: 22+80 TO 22+00
C= 0.65 A= 0.543 CA= 0.355 ACCA= 0.355
I2= 4.2 Q2= 1.49 I10= 5.5 Q10= 1.94
S= 0.039

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	3.2 __	3.4 __	4.7 __	5.2 __	_____
0.050 __	2.2 __	2.3 __	5.7 __	6.3 __	_____
0.015 __	5.4 __	5.7 __	3.7 __	4.0 __	_____

REACH DESCRIPTION = STA 22+79.72 TO 20+40 RD B RT

STATION = 22+00 TO 21+50 RD B RT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
STRIP # 3 1) C = .65 2) WS = 275
3) SLOPE = .0392 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 13 8) NO CHANGES

Enter number of item you wish to change:

STATION: 22+00 TO 21+50 RD B RT
C= 0.65 A= 0.344 CA= 0.225 ACCA= 0.580
I2= 4.2 Q2= 2.44 I10= 5.5 Q10= 3.17
S= 0.039

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	3.6 __	3.9 __	5.7 __	6.3 __	_____
0.050 __	2.5 __	2.6 __	6.9 __	7.6 __	_____
0.015 __	6.1 __	6.5 __	4.4 __	4.8 __	_____

REACH DESCRIPTION = STA 22+79.72 TO 20+40 RD B LT

STATION = 22+80 TO 22+00 RD B LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 40
3) SLOPE = .0392 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 80
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 22+80 TO 22+00 RD B LT
= 0.59 A= 0.096 CA= 0.057 ACCA= 0.057
2= 5.7 Q2= 0.32 I10= 7.1 Q10= 0.40
S= 0.039

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.2 __	2.3 __	2.7 __	2.9 __	_____
0.050 __	1.5 __	1.6 __	3.2 __	3.5 __	_____
0.015 __	3.6 __	3.9 __	2.1 __	2.2 __	_____

REACH DESCRIPTION = STA 22+79.72 TO 20+40 RD B LT

STATION = 22+00 TO 21+50 RD B LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 20
3) SLOPE = .0392 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 22+00 TO 21+50 RD B LT
= 0.65 A= 0.037 CA= 0.024 ACCA= 0.080
2= 5.7 Q2= 0.46 I10= 7.1 Q10= 0.57
S= 0.039

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.4 __	2.5 __	3.0 __	3.3 __	_____
0.050 __	1.6 __	1.7 __	3.7 __	4.0 __	_____
0.015 __	4.0 __	4.2 __	2.3 __	2.6 __	_____

REACH DESCRIPTION = STA 22+79.72 TO 20+40 RD B LT

STATION = 21+50 TO 21+00 RD B LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 20
3) SLOPE = .0392 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 6 8) NO CHANGES

Enter number of item you wish to change:

STATION: 21+50 TO 21+00 RD B LT
= 0.65 A= 0.037 CA= 0.024 ACCA= 0.104

2= 5.5 Q2= 0.57 I10= 6.9 Q10= 0.72
S= 0.039

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.5 __	2.7 __	3.3 __	3.6 __	_____
0.050 __	1.7 __	1.8 __	4.0 __	4.4 __	_____
0.015 __	4.2 __	4.5 __	2.5 __	2.8 __	_____

REACH DESCRIPTION = STA 22+79.72 TO 20+40 RD B LT

STATION = 21+00 TO 20+40 RD B LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 20
3) SLOPE = .0392 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 60
7) Tc= 7 8) NO CHANGES

Enter number of item you wish to change:

STATION: 21+00 TO 20+40 RD B LT
= 0.65 A= 0.044 CA= 0.029 ACCA= 0.133
T2= 5.2 Q2= 0.70 I10= 6.7 Q10= 0.88
S= 0.039

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.6 __	2.8 __	3.6 __	3.9 __	_____
0.050 __	1.8 __	1.9 __	4.3 __	4.7 __	_____
0.015 __	4.4 __	4.7 __	2.7 __	3.0 __	_____

REACH DESCRIPTION = STA 11+75 TO 14+00 RD C RT

STATION = 13+00 TO 13+50 RD C RT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 20
3) SLOPE = .052 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 13+00 TO 13+50 RD C RT
C= 0.65 A= 0.037 CA= 0.024 ACCA= 0.084
I2= 5.7 Q2= 0.48 I10= 7.1 Q10= 0.60
S= 0.052

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.7 __	2.8 __	2.9 __	3.2 __	_____
0.050 __	1.8 __	1.9 __	3.5 __	3.7 __	_____
0.015 __	4.5 __	4.7 __	2.3 __	2.5 __	_____

REACH DESCRIPTION = STA 11+75 TO 14+00 RD C RT

STATION = 13+50 TO 14+00 RD C RT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 20
3) SLOPE = .052 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 6 8) NO CHANGES

Enter number of item you wish to change:

STATION: 13+50 TO 14+00 RD C RT
C= 0.65 A= 0.037 CA= 0.024 ACCA= 0.107
I2= 5.5 Q2= 0.59 I10= 6.9 Q10= 0.74
S= 0.052

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.8 __	3.0 __	3.2 __	3.5 __	_____
0.050 __	1.9 __	2.0 __	3.8 __	4.2 __	_____
0.015 __	4.7 __	5.0 __	2.4 __	2.7 __	_____

REACH DESCRIPTION = STA 11+75 TO 14+61.03 RD C LT

STATION = 11+75 TO 12+50 RD C LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
STRIP # 3 1) C = .65 2) WS = 100
3) SLOPE = .052 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 75
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 11+75 TO 12+50 RD C LT
C= 0.66 A= 0.215 CA= 0.142 ACCA= 0.142
I2= 5.7 Q2= 0.81 I10= 7.1 Q10= 1.01
S= 0.052

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	3.0 __	3.2 __	3.6 __	3.9 __	_____
0.050 __	2.1 __	2.2 __	4.3 __	4.7 __	_____
0.015 __	5.1 __	5.4 __	2.8 __	3.0 __	_____

REACH DESCRIPTION = STA 11+75 TO 14+61.03 RD C LT

STATION = 12+00 TO 13+00 RD C LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
STRIP # 3 1) C = .65 2) WS = 120
3) SLOPE = .052 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 12+00 TO 13+00 RD C LT
C= 0.66 A= 0.166 CA= 0.109 ACCA= 0.251
I2= 5.7 Q2= 1.43 I10= 7.1 Q10= 1.79
S= 0.052

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	3.5 __	3.7 __	4.4 __	4.8 __	_____
0.050 __	2.4 __	2.5 __	5.4 __	5.8 __	_____
0.015 __	5.9 __	6.2 __	3.4 __	3.7 __	_____

REACH DESCRIPTION = STA 11+75 TO 14+61.03 RD C LT

STATION = 13+00 TO 13+50 RD C LT

STRIP # 1	1) C = .9	2) WS = 12
STRIP # 2	1) C = .5	2) WS = 13
STRIP # 3	1) C = .65	2) WS = 150

3) SLOPE = .052 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 6 8) NO CHANGES

Enter number of item you wish to change:

TATION: 13+00 TO 13+50 RD C LT
= 0.66 A= 0.201 CA= 0.132 ACCA= 0.089
I2= 5.5 Q2= 2.09 I10= 6.9 Q10= 2.64
= 0.052

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	3.9 __	4.1 __	5.1 __	5.6 __	_____
0.050 __	3.6 __	2.8 __	6.2 __	6.7 __	_____
0.015 __	6.5 __	6.9 __	3.9 __	4.3 __	_____

REACH DESCRIPTION = STA 11+75 TO 14+61.03 RD C LT

STATION = 13+50 TO 14+00 RD C LT

STRIP # 1	1) C = .9	2) WS = 12
STRIP # 2	1) C = .5	2) WS = 13
STRIP # 3	1) C = .65	2) WS = 170

3) SLOPE = .052 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 7 8) NO CHANGES

Enter number of item you wish to change:

TATION: 13+50 TO 14+00 RD C LT
= 0.66 A= 0.224 CA= 0.147 ACCA= 0.530
I2= 5.2 Q2= 2.78 I10= 6.7 Q10= 3.52
= 0.052

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	4.1 __	4.4 __	5.7 __	6.2 __	_____
0.050 __	2.8 __	3.0 __	6.9 __	7.5 __	_____
0.015 __	7.0 __	7.4 __	4.4 __	4.8 __	_____

REACH DESCRIPTION = STA 11+75 TO 14+61.03 RD C LT

STATION = 14+00 TO 14+61 RD C LT

STRIP # 1	1) C = .9	2) WS = 12
STRIP # 2	1) C = .5	2) WS = 13
STRIP # 3	1) C = .65	2) WS = 140

3) SLOPE = .052 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 61
7) Tc= 8 8) NO CHANGES

Enter number of item you wi ı to change:

STATION: 14+00 TO 14+61 RD C LT

C= 0.66	A= 0.231	CA= 0.152	ACCA= 0.681
I2= 5.0	Q2= 3.44	I10= 6.4	Q10= 4.38
S= 0.052			

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	4.4 __	4.6 __	6.1 __	6.7 __	_____
0.050 __	3.0 __	3.2 __	7.4 __	8.1 __	_____
0.015 __	7.4 __	7.8 __	4.7 __	5.2 __	_____

REACH DESCRIPTION = STA 15+70 TO 14+00 RD C RT

STATION = 15+70 TO 15+00 RD C RT

STRIP # 1 1) C = .9 2) WS = 20
STRIP # 2 1) C = .5 2) WS = 25
3) SLOPE = .0417 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 70
7) TC= 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 15+70 TO 15+00 RD C RT

C= 0.68	A= 0.072	CA= 0.049	ACCA= 0.049
I2= 5.7	Q2= 0.28	I10= 7.1	Q10= 0.35
S= 0.042			

n value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.1 __	2.3 __	2.5 __	2.7 __	_____
0.050 __	1.5 __	1.5 __	3.0 __	3.3 __	_____
0.015 __	3.6 __	3.8 __	1.9 __	2.1 __	_____

REACH DESCRIPTION = STA 15+70 TO 14+00 RD C RT

STATION = 15+00 TO 14+50 RD C RT

STRIP # 1 1) C = .9 2) WS = 15
STRIP # 2 1) C = .5 2) WS = 25
3) SLOPE = .0417 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 60
7) TC = 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 15+00 TO 14+50 RD C RT

C= 0.65	A= 0.046	CA= 0.030	ACCA= 0.079
I2= 5.7	Q2= 0.45	I10= 7.1	Q10= 0.56
S= 0.042			

n value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.4 __	2.6 __	3.0 __	3.2 __	_____
0.050 __	1.6 __	1.7 __	3.6 __	3.9 __	_____
0.015 __	4.1 __	4.3 __	2.3 __	2.5 __	_____

REACH DESCRIPTION = STA 15+70 TO 14+00 RD C RT

STATION = 14+50 TO 14+00 RD C RT

STRIP # 1 1) C = .9 2) WS = 18
STRIP # 2 1) C = .5 2) WS = 25
3) SLOPE = .0417 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 6 8) NO CHANGES

Enter number of item you wish to change:

STATION: 14+50 TO 14+00 RD C RT
C= 0.63 A= 0.042 CA= 0.027 ACCA= 0.106
Q2= 5.5 Q2= 0.58 I10= 6.9 Q10= 0.73
S= 0.042

n value	velocity (2,10) ft/s		depth (2,10) ft		remarks
0.030 __	2.6 __	2.7 __	3.3 __	3.6 __	_____
0.050 __	1.9 __	1.9 __	4.0 __	4.3 __	_____
0.015 __	4.3 __	4.6 __	2.5 __	2.8 __	_____

REACH DESCRIPTION = STA 15+70 TO 14+61 RD C LT

STATION = 15+70 TO 15+00 RD C LT

STRIP # 1	1) C = .9	2) WS = 60
STRIP # 2	1) C = .5	2) WS = 20
STRIP # 3	1) C = .65	2) WS = 20
3) SLOPE = .0417	4) FRONT SIDE SLOPE = 4	
5) BACK SIDE SLOPE = 4	6) LS= 70	
7) Tc= 5	8) NO CHANGES	

Enter number of item you wish to change:

TATION: 15+70 TO 15+00 RD C LT
= 0.77 A= 0.161 CA= 0.124 ACCA= 0.124

2= 5.7 Q2= 0.70 I10= 7.1 Q10= 0.88
= 0.042

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.7 __	2.9 __	3.5 __	3.8 __	_____
0.050 __	1.8 __	2.0 __	4.3 __	4.7 __	_____
0.015 __	4.5 __	4.8 __	2.7 __	3.0 __	_____

REACH DESCRIPTION = STA 15+70 TO 14+61 RD C LT

STATION = 15+00 TO 14+61 RD C LT

STRIP # 1	1) C = .9	2) WS = 30
STRIP # 2	1) C = .5	2) WS = 20
STRIP # 3	1) C = .65	2) WS = 60
3) SLOPE = .0417	4) FRONT SIDE SLOPE = 4	
5) BACK SIDE SLOPE = 4	6) LS= 39	
7) Tc= 5	8) NO CHANGES	

Enter number of item you wish to change:

STATION: 15+00 TO 14+61 RD C LT
= 0.69 A= 0.098 CA= 0.068 ACCA= 0.192
2= 5.7 Q2= 1.09 I10= 7.1 Q10= 1.37
S= 0.042

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	3.0 __	3.2 __	4.2 __	4.5 __	_____
0.050 __	2.1 __	2.2 __	5.0 __	5.5 __	_____
0.015 __	5.1 __	5.4 __	3.2 __	3.5 __	_____

REACH DESCRIPTION = STA 11+00 TO 9+50 RD E RT

STATION = 11+00 TO 10+50 RD E RT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 13
STRIP # 3 1) C = .65 2) WS = 25
3) SLOPE = .04 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

TATION: 11+00 TO 10+50 RD E RT
= 0.67 A= 0.057 CA= 0.039 ACCA= 0.039
2= 5.7 Q2= 0.22 I10= 7.1 Q10= 0.27
= 0.040

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
.030 __	2.0 __	2.1 __	2.3 __	2.5 __	_____
.050 __	1.4 __	1.4 __	2.8 __	3.0 __	_____
.015 __	3.3 __	3.5 __	1.8 __	1.9 __	_____

REACH DESCRIPTION = STA 11+00 TO 9+50 RD E RT

STATION = 10+50 TO 10+00 RD E RT

STRIP # 1 1) C = .9 2) WS = 40
STRIP # 2 1) C = .5 2) WS = 20
3) SLOPE = .04 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 10+50 TO 10+00 RD E RT
= 0.77 A= 0.069 CA= 0.053 ACCA= 0.091
2= 5.7 Q2= 0.52 I10= 7.1 Q10= 0.65
3= 0.040

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
.030 __	2.5 __	2.6 __	3.2 __	3.5 __	_____
.050 __	1.7 __	1.8 __	3.8 __	4.2 __	_____
.015 __	4.1 __	4.4 __	2.5 __	2.7 __	_____

REACH DESCRIPTION = STA 11+00 TO 9+50 RD E RT

STATION = 10+00 TO 9+50 RD E RT

STRIP # 1 1) C = .9 2) WS = 30
STRIP # 2 1) C = .5 2) WS = 20
3) SLOPE = .04 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 6 8) NO CHANGES

Enter number of item you wish to change:

STATION: 10+00 TO 9+50 RD E RT

= 0.74	A= 0.057	CA= 0.042	ACCA= 0.134
2= 5.5	Q2= 0.73	I10= 6.9	Q10= 0.92
S= 0.040			

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.7 __	2.8 __	3.6 __	3.9 __	_____
0.050 __	1.8 __	1.9 __	4.4 __	4.8 __	_____
0.015 __	4.5 __	4.8 __	2.8 __	3.0 __	_____

REACH DESCRIPTION = STA 13+99.17 TO 9+500 RD E LT

STATION = 10+50 TO 10+00 RD E LT

STRIP # 1 1) C = .9 2) WS = 40
STRIP # 2 1) C = .65 2) WS = 25
3) SLOPE = .04 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 6 8) NO CHANGES

Enter number of item you wish to change:

STATION: 10+50 TO 10+00 RD E LT
C= 0.80 A= 0.075 CA= 0.060 ACCA= 0.383
Q2= 5.5 Q2= 2.09 I10= 6.9 Q10= 2.64
S= 0.040

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	3.5 __	3.7 __	5.4 __	5.8 __	_____
0.050 __	2.4 __	2.5 __	6.5 __	7.1 __	_____
0.015 __	5.9 __	6.2 __	4.1 __	4.5 __	_____

REACH DESCRIPTION = STA 13+99.17 TO 9+500 RD E LT

STATION = 10+00 TO 9+50 RD E LT

STRIP # 1 1) C = .9 2) WS = 30
STRIP # 2 1) C = .65 2) WS = 20
3) SLOPE = .04 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 6 8) NO CHANGES

Enter number of item you wish to change:

STATION: 10+00 TO 9+50 RD E LT
C= 0.80 A= 0.057 CA= 0.046 ACCA= 0.429
Q2= 5.5 Q2= 2.34 I10= 6.9 Q10= 2.96
S= 0.040

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	3.6 __	3.8 __	5.6 __	6.1 __	_____
0.050 __	2.5 __	2.6 __	6.8 __	7.4 __	_____
0.015 __	6.1 __	6.4 __	4.3 __	4.7 __	_____

REACH DESCRIPTION = STA 13+99.17 TO 9+500 RD E LT

STATION = 14+00 TO 13+00 RD E LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .5 2) WS = 50
3) SLOPE = .04 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 100
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 14+00 TO 13+00 RD E LT
= 0.58 A= 0.142 CA= 0.082 ACCA= 0.082
2= 5.7 Q2= 0.47 I10= 7.1 Q10= 0.59
S= 0.040

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.4 __	2.5 __	3.1 __	3.3 __	_____
0.050 __	1.6 __	1.7 __	3.7 __	4.0 __	_____
0.015 __	4.0 __	4.3 __	2.4 __	2.6 __	_____

REACH DESCRIPTION = STA 13+99.17 TO 9+500 RD E LT

STATION = 13+00 TO 12+00 RD E LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .65 2) WS = 40
3) SLOPE = .04 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 100
7) Tc= 5 8) NO CHANGES

Enter number of item you wish to change:

STATION: 13+00 TO 12+00 RD E LT
= 0.71 A= 0.119 CA= 0.084 ACCA= 0.167
2= 5.7 Q2= 0.95 I10= 7.1 Q10= 1.19
S= 0.040

value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	2.9 __	3.0 __	4.0 __	4.3 __	_____
0.050 __	2.0 __	2.1 __	4.8 __	5.2 __	_____
0.015 __	4.8 __	5.1 __	3.1 __	3.3 __	_____

53

REACH DESCRIPTION = STA 13+99.17 TO 9+500 RD E LT

STATION = 12+00 TO 11+00 RD E LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .65 2) WS = 50
3) SLOPE = .04 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 100
7) Tc= 6 8) NO CHANGES

Enter number of item you wish to change:

STATION: 12+00 TO 11+00 RD E LT
= 0.70 A= 0.142 CA= 0.099 ACCA= 0.266

I2= 5.5 Q2= 1.45 I10= 6.9 Q10= 1.83
= 0.040

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	3.2 __	3.4 __	4.7 __	5.1 __	_____
0.050 __	2.2 __	2.3 __	5.7 __	6.2 __	_____
0.015 __	5.4 __	5.7 __	3.6 __	3.9 __	_____

REACH DESCRIPTION = STA 13+99.17 TO 9+500 RD E LT

STATION = 11+00 TO 10+50 RD E LT

STRIP # 1 1) C = .9 2) WS = 12
STRIP # 2 1) C = .65 2) WS = 60
3) SLOPE = .04 4) FRONT SIDE SLOPE = 4
5) BACK SIDE SLOPE = 4 6) LS= 50
7) Tc= 6 8) NO CHANGES

Enter number of item you wish to change:

STATION: 11+00 TO 10+50 RD E LT
= 0.69 A= 0.083 CA= 0.057 ACCA= 0.323
I2= 5.5 Q2= 1.76 I10= 6.9 Q10= 2.23
= 0.040

C value	velocity (2,10) ft/s		depth (2,10) in.		remarks
0.030 __	3.4 __	3.6 __	5.0 __	5.5 __	_____
0.050 __	2.3 __	2.4 __	6.1 __	6.6 __	_____
0.015 __	5.6 __	6.0 __	3.9 __	4.2 __	_____

December 5, 2000

Mr. Dan Girouard
4216 Teakwood Drive
Williamsburg, Va. 23188

Re: Springhill Subdivision
Stormwater Management Facility (PC 034)

Dear Mr. Girouard:

As discussed, the Environmental Division is willing to meet with you to discuss the County's stormwater management program and maintenance activities associated with the wet pond situated within Springhill Subdivision.

I have attached some **"first contact"** information for your use. The information includes general landscaping guidance for stormwater management BMP's (Best Management Practices) and a sample maintenance plan for a wet (retention) pond facility. The maintenance plan can be expanded upon once an inspection is performed and record plans for the facility, if available, are reviewed.

In addition, I have also attached three (3) informative brochures. Two of the brochures are published by the Association of State Dam Safety Officials and relate to dam safety. They include *Dam Ownership: Responsibility and Liability* and *Dam Ownership: Procuring the Services of a Professional Engineer*. The other brochure is *A Guide for Maintaining and Operating BMP's*, a publication distributed through our office by a cooperative effort from the Hampton Roads Regional Stormwater Management Committee and HR STORM, a regional stormwater education effort coordinated by the Hampton Roads Planning District Commission.

If you have any questions or comments, please contact me at 757-253-6639. Our office is always available to assist you and provide guidance with drainage and stormwater management.

Sincerely,

Scott J. Thomas, P.E.
Civil Engineer
Environmental Division

SWMProg\Education\Subdivsions\Springhill.let1

July 16, 2002

Mr. Al Hutchens
4028 Oakwood Drive
Williamsburg, Va. 23188

Re: Springhill Subdivision
Stormwater Management Facilities
County BMP ID Codes: PC 034 & PC 030

Dear Mr. Hutchens:

It was a pleasure to meet with you on Tuesday July 16th 2002 to discuss the County's stormwater management program and maintenance activities associated with the stormwater management facilities situated Springhill Subdivision.

I have attached some **"first contact"** information for your use. The information includes general landscaping guidance for stormwater management BMP's (Best Management Practices), watershed awareness tips and a sample maintenance plan for wet pond facilities. In addition, I have also attached several informational brochures including *A Guide for Maintaining and Operating BMP's*, a publication distributed through our office by a cooperative effort from the Hampton Roads Regional Stormwater Management Committee and HR STORM, a regional stormwater education effort coordinated by the Hampton Roads Planning District Commission.

If you have any questions or comments, please contact me at 757-253-6639. Our office is always available to assist you and provide guidance with drainage and stormwater management.

Sincerely,

Scott J. Thomas, P.E.
Civil Engineer
Environmental Division

SWMProg\Education\Subdivsions\Springhill2.fc

General Landscaping Guidance for All Stormwater Management /BMP Facilities

- ❒ *Trees, shrubs and/or any type of woody vegetation are not allowed on earthen fill embankments.*
- ❒ *Keep trees and shrubs at least 15 feet away from the toe of constructed earthen fill embankment slopes.*
- ❒ *Keep trees or shrubs having long taproot systems away from constructed fill embankments or subsurface drains.*
- ❒ *Keep trees and shrubs at least 25 feet away from perforated pipes, drains or stone/soil filters.*
- ❒ *Keep trees and shrubs at least 25 feet away from principal flow control structures (risers, grates, etc.).*
- ❒ *Keep vegetation and sediment at least 15 feet away from low flow orifice openings.*
- ❒ *Clean trash and debris frequently from within the facility and at principal flow control structures. Only trained or authorized personnel should enter confined spaces or structural components of the facility.*
- ❒ *Keep herbaceous (not woody) embankment plantings limited in height and girth.*
- ❒ *Maintain erosion control mats, blankets and fabrics in channels or on slopes to reduce erosion potential.*
- ❒ *Keep emergency spillways stabilized with plant material that can withstand strong flows. Root material should be fibrous and substantial, but lacking a taproot.*
- ❒ *Seed and mulch bare, exposed or formed soil erosion gullies around the facility. Divert surface runoff from seeded and mulched areas until vegetation establishes.*
- ❒ *Check water tolerances of existing native plant materials prior to inundation of pond areas.*
- ❒ *Stabilize aquatic and safety benches with emergent wetland plant species and specialized wet-seed mix.*
- ❒ *Keep access to embankments or flow control structures free of trees or shrubs. Ensure areas that are planted adjacent to access routes can withstand compaction, damage or vibration that may occur due to passing vehicles or heavy equipment.*
- ❒ *To reduce thermal warming effects, shade inflow and outflow channels as well as southern exposures.*
- ❒ *Avoid plantings that require routine or intensive chemical applications such as turf, lawn grass, etc.*
- ❒ *Use salt-tolerant plants if excessive amounts of deicing salt are anticipated in inflow runoff.*
- ❒ *Soil test perimeter areas periodically to determine if soil amendments are necessary. Contact the local office of the Virginia Cooperative Extension for assistance.*
- ❒ *Select native plant species which adapt to local soil and climate conditions over exotic or foreign species.*
- ❒ *Decrease or minimize areas where yard turf is used. Use low maintenance ground cover to help absorb and filter runoff and prevent erosion where possible.*
- ❒ *Maintain pond buffers (25 ft. minimum from design high water elevation) as meadow or forest areas. Preserve existing trees and ground cover within buffer areas to the greatest extent possible.*
- ❒ *Discourage resident geese populations by planting trees, shrubs and native ground covers in non-forested pond buffer areas.*
- ❒ *Plant stream and normal pool buffers (except fill embankments) with native trees, shrubs, grasses and herbaceous material where possible to stabilize banks, provide shade and provide for water quality enhancement.*
- ❒ *Stabilize eroded pond shorelines with native wetland plants or coconut (coir) fiber logs.*
- ❒ *Use selective or strategic plantings to minimize access to deeper pools, steep slopes or structures.*
- ❒ *If warranted, provide educational signs around the perimeter of the facility to indicate that it is a Stormwater Management Area or to designate planting, maintenance or mowing (or non-mowing) zones.*
- ❒ *Avoid the overuse of any one type of plant material and seed mixtures with weeds or invasive species.*
- ❒ *Preserve existing, native vegetation to the greatest extent possible unless it deters from the stormwater function or structural integrity of the facility. Strive to keep all tributary drainage areas in a stabilized condition..*
- ❒ *Aesthetics and cosmetic characteristics are important considerations. Strive to maintain the BMP with a natural, scenic character that blends well with the community theme, physical location and all surrounding land uses. Screening is promoted, but care should be exercised to avoid conflicts with required maintenance activities or practices that would threaten the stormwater function or structural integrity of the facility. Critical areas are embankments, riser structures, outlet barrels, spillways, trash racks, forebays, inlets, inflow channels, etc.*
- ❒ *Original design or enhanced landscaping should not encroach upon public or private roadways, sidewalks, trails or emergency vehicle access routes.*
- ❒ *Refer to the approved plan for the BMP. Some plans provide specific guidance relative to operation, inspection and maintenance. Although this is a current requirement of the Environmental Division, this information may not necessarily be found on all plans, especially for older facilities. Contact the Environmental Division at **757-253-6670** for additional information.*

PROTECTED WITH PRIDE IN JAMES CITY COUNTY

Revised 07/10/03

Watershed Awareness Tips

Although you may not have waterfront property or property located directly adjacent to a stormwater management or storm drainage facility, the rain that runs off your roof, lawn, driveway or lot can eventually end up in the nearest drainage facility, waterway or waterbody. Stormwater which enters inlets and storm drain systems along your street eventually leads to the nearest stormwater management facility, waterway, lake, pond, river, stream or bay.

By following these tips, you can help prevent pollution into these features and promote watershed awareness.

- ❒ ***Easy on pesticides and herbicides.*** *Don't overspray your lawn or garden since these products may be toxic or a source for contamination. Use them sparingly and in strict accordance with label directions. Seek non-toxic alternatives whenever possible and pull weeds by hand. The local office of the Virginia Cooperative Extension and local master gardener groups are good sources of information relative to the application and use of these types of products.*

- ❒ ***Use chemical fertilizers sparingly.*** *Don't overuse fertilizers especially near pond or stream edges. Rain and lawn watering washes excess fertilizers into waterways and waterbodies causing nutrient pollution which contributes to the overgrowth of algae.*

- ❒ ***Control grass clippings.*** *If you don't use your grass clippings for mulch or compost, put them in the trash instead of a storm drain, channel or along the edge of waterbodies. These materials decay and are a source of water quality problems. Contact your local solid waste disposal department to understand proper disposal of bagged woody or grass material.*

- ❒ ***Plant instead of paving.*** *Ground cover minimizes runoff. Consider converting lawns adjacent to waterways and waterbodies with native woody and meadow-like vegetation to create buffers to control runoff and erosion. Plants native to the area should be used for landscaping purposes since they have reduced needs for fertilizers and pesticides.*

- ❒ ***Redirect runoff from roofs, patios and driveways.*** *Minimize flow by redirecting runoff from downspouts to grassed or landscaped areas or to rain gardens to promote filtering and infiltration into soils. Runoff which is conveyed directly to impervious surfaces and into storm drainage systems carries leaves, fertilizers, pesticides, grass clippings, trash, debris and sediment load.*

- ❒ ***Watering the driveway won't make it grow.*** *Save the hose for gardening rather than for sweeping or cleaning. Wash vehicles on lawn areas to help filter out detergents. Use soap and cleaning products sparingly and utilize biodegradable detergents with little or no phosphates if possible.*

- ❒ ***Storm drains are for stormwater.*** *Never pour used motor oil, anti-freeze, leaves, lawn clippings or other waste materials or chemicals directly into inlets, storm drains or channels. Motor oils and anti-freeze are extremely toxic to wildlife and plants and can contaminate water supply sources. Drop off used vehicle lubricants and chemicals at acceptable disposal or recycling stations.*

- ❒ ***Add grassed swales and berms to yards.*** *A swale is a small dip in the slope of a yard. A berm is a small mound. Vegetated linings in swales/berms help to filter or infiltrate runoff into the soils. Although use of swales/berms are encouraged, avoid conveying concentrated drainage onto an adjacent property or neighbor.*

- ❒ ***Educate your neighbors.*** *Pass these tips on to your friends and neighbors. Work together to promote watershed awareness and strive to improve water quality by preserving or adding vegetation, promoting infiltration and by neighborhood sponsored cleanup programs.*

Rev 01/30/02

(Note: This is a Sample Maintenance Plan for a Detention or Retention type facilities. Use or modify as required specific to operation, maintenance and inspection requirements for your designed SWM / BMP facility.)

Maintenance Plan (Detention or Retention Pond BMP's)

A maintenance program is required to ensure the Stormwater Management (SWM) / Best Management Practice (BMP) facility functions as designed and to provide for reasonable aesthetic conditions. Proper maintenance is encouraged to prevent the introduction of debris and sediment at inflow locations, pretreatment areas, the BMP itself, its principal control structures and downstream waterways. Following installation and establishment of vegetation in disturbed site areas, inspections for sediment buildups will be performed at least quarterly. It is anticipated that under normal conditions, sediment removal will be required once every 5 to 10 years. If other construction or related land-disturbing activities are performed upslope of the BMP, adequate protection measures should be implemented with inspections performed at least once weekly.

The Owner or its designated representative will inspect the SWM/BMP structure after each significant rainfall event or the following working day if a weekend or holiday occurs. A significant rainfall for this structure is defined as one (1) inch or more of gauged rainfall within a 24 hour period. Once per year (more or less) a representative of the County may jointly inspect the structure. Appropriate action, performed at the cost of the owner will be taken to ensure appropriate maintenance. Keys to locked access points or structures shall be made available to the County upon request.

BMP Description: {Briefly describe the type of structure, the site it serves and function in layman terms. Example: BMP # 1 serves a drainage area of 5.5 acres associated with Section 1 of XYZ Development. The facility is a 4 point, dry-type detention facility, County Type F-2 BMP. A dry-type detention pond temporarily stores runoff and is normally dry during non-rainfall periods. Typically draw down times range from 24 to 72 hours following a storm event. Principal structures associated with the BMP consist of two 24 inch inflow storm drains, a 72 inch vertical RCP riser, 36 inch RCP outlet barrel and 6 ft. wide, grass-lined trapezoidal shaped emergency overflow channel. There are 3 openings in the riser to provide for water quality drawdown and to offer control for the 2- and 10- year design storm events. During the 100-year storm, the maximum water level should rise to about 2 feet above the top of the riser and within 1.5 feet below the top of dam. During this type of larger storm event, the emergency spillway, which is located through the embankment directly west of the riser structure, will discharge flow. If functioning properly, normal storm events should reach an elevation just below the top of the riser and the pond should draw down in about 24 to 36 hours.}

Inspection and maintenance of the facility will consist of the following additional measures:

1. Inspect for sediment buildup by visual observation and a physical determination of sediment depth within pond storage areas. If the depth of sediment reaches the depth of x ' - x " above the bottom of pond (or Cleanout Elevation of xxx.x) , removal is required. At the same time, or at least once per year, clean pretreatment devices, the riser bottom and outlet pipes of accumulated sediments. Dispose of sediments removed from the facility at an acceptable disposal area. (Note: Cleanout Elevation corresponds to 10 percent of the Water Quality Volume).

2. Perform maintenance mowing of pond grasses at least twice each year. Grasses such as tall fescue should be mowed in early summer after emergence of the heads on cool season grasses and in late fall to prevent seeds of annual weeds from maturing. Mowing of legumes can be less frequent. Trees, shrubs and woody vegetation are not be permitted to grow along or on any part of the embankment embankment that was constructed using engineered (compacted) fills.

3. Perform soil sampling on stabilized pond soil areas at least once every 4 years. Soil sampling and testing should be performed by qualified independent soil testing laboratory such as VPI&SU. Apply additional lime and fertilizer in accordance with test recommendations.

4. In stabilized pond areas, if vegetation covers less than 40 % of soil surfaces, lime, fertilize and seed in accordance with recommendations for new seedlings. If vegetation covers more than 40 % but less than 70 % of soil surfaces, lime, fertilize and over seed in accordance with current seeding recommendations or requirements of the Virginia Erosion and Sediment Control Handbook (VESCH).

5. Perform quarterly inspections of the riser section and crest spillway for the observance of collected trash and debris. Immediately remove any trash or debris that prevents the movement of water. Remove any trash and litter downstream and at storm drain or channel inflow locations to maintain the integrity of the structure and provide an attractive appearance.

6. Perform yearly structural inspections of the facility for damage. Structural inspection shall be performed on the concrete riser, anti-vortex device, trash rack, orifices/weirs, outlet barrel and pond embankment. Exposed metal surfaces shall be re-painted or re-galvanized to minimize rust damage or replaced if rust damage is irreversible. If damage is evident, further investigation by a professional engineer may be required to assess the integrity of the structure.

7. Perform quarterly inspections of the graded side slopes of the facility for signs of animal/rodent borrows or slope erosion. Immediately perform necessary repairs, refilling or reseeding.

8. Perform yearly observations of perimeter areas surrounding the facility to ensure changes in land use, topography or access have not occurred and do not affect the operation, maintenance, access or safety features as provided. Appropriate action is required to ensure adequacy and to provide a clear, safe passage for maintenance vehicles to the engineered embankment and principal flow control structures.

9. Inspect and exercise pond drain valves, if provided, on a regular basis.

10. Record Keeping. The owner or designated representative shall keep reasonable, accurate written records of inspections performed for the structure. Records shall document routine maintenance and/or repairs performed. Copies shall be provided to the County upon request.

11. The facility shall not accept additional drainage or be modified in any way without prior consent or approval by the Environmental Division of James City County.

(End)

DEVELOPMENT MANAGEMENT

101-E MOUNTS BAY ROAD, P.O. BOX 8784, WILLIAMSBURG, VIRGINIA 23187-8784
(757) 253-6671 Fax: (757) 253-6850 E-MAIL: devtman@james-city.va.us

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codecomp@james-city.va.us

ENVIRONMENTAL DIVISION
(757) 253-6670
environ@james-city.va.us

PLANNING
(757) 253-6685
planning@james-city.va.us

COUNTY ENGINEER
(757) 253-6678

INTEGRATED PEST MANAGEMENT
(757) 259-4116

April 10, 2001

Mr. Myrl Hairfield
Springhill Development Company
10858 Warwick Blvd.
Newport News, Va. 23601

Re: Springhill Phase 1 (County Plan S-89-93)
Stormwater Management Facility (County BMP ID Code: PC 034)

Dear Mr. Hairfield:

The Environmental Division has reviewed a record drawing and performed a final construction inspection on April 9th 2001 for a wet pond stormwater management facility for the above referenced project. The wet pond is located in the common area west of the cul-de-sac at Teakwood Drive and north of Springhill Drive at the main site entrance.

The following items must be addressed prior to release of the developer's surety instrument for the stormwater management/BMP facility:

Record Drawing:

1. Based on our review, the record drawing dated July 6th 1994 by Langley & McDonald (now Landmark Design Group) is **satisfactory** for the facility.

Construction-Related Items:

2. Remove all silt fence left in place from subdivision development activities such as road and pond construction, site utilities, etc. (ie. not related to current single-family construction).

✓3. Clear and remove the last remaining area of tree growth on the downstream embankment. Small trees and saplings are present in the area immediately surrounding the outlet end of the pond barrel. All other embankment areas are grassed and in satisfactory condition.

✓4. Fill, repair and stabilize (with seed & mulch) a surface slope/bank erosion area on the east shoreline just below Lot 48. This area is located above the permanent pool.

5. Stabilize with seed & mulch all bare, disturbed soil areas associated with recent incidental utility work around the pond.

NOT DEV. RESPONSIBILITY;
POST CONSTRUCTION HOA ACTION
TO INSTALL AERATOR

SAT
5-15-01

6. Clean and remove localized sediment deposits and vegetation at the outfall end of the 18-inch storm drain located at the northwest corner of the pond. Flow into the pond must not be obstructed by vegetation and sediment. Also, remove the temporary plywood baffle which is also present at this location.

7. Clean and remove several large, floating tree branches which were present around the riser structure. At the time of inspection, two 1-2 inch logs were obstructing flow at the 6-inch orifice and removed. *(Note: Debris was removed from the orifice but not from the pond).*

8. Clean and remove localized sediment deposits and vegetation within 15 feet of the riser structure. Small willow saplings and sediment (2-3 ft. in depth) were observed at this location.

Once these items are satisfactorily completed, we can then proceed with final release of the surety on the project. Once construction-related items are complete, contact our office appropriately. Please call me at 757-253-6639 or Beth Davis at 757-253-6702, if you have any further comments or questions.

Sincerely,

Scott J. Thomas, P.E.
Civil Engineer
Environmental Division

C. E. Davis

Catherine "Beth" Davis
Engineering Inspector

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DEVELOPMENT MANAGEMENT

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COUNTY ENGINEER
(757) 253-6678

INTEGRATED PEST MANAGEMENT
(757) 259-4116

April 10, 2001

Mr. Ken Premru
4212 Rosewood Court
Williamsburg, Va. 23188

Re: Springhill Subdivision
Wet Pond at Teakwood Drive
County BMP ID Code: PC 034

Dear Mr. Premru:

As discussed, enclosed for your information is a copy of the final construction inspection report performed for the wet pond stormwater management facility located in the vicinity of Teakwood Drive. This inspection was performed on April 9th 2001. Also enclosed is a location map of the facility and information from our current BMP database.

It has been a pleasure to work with you and other members of the HOA concerning this facility. If you have any additional questions or comments relative to stormwater management, please contact me at 757-253-6639.

Sincerely,

Scott J. Thomas, P.E.
Civil Engineer
Environmental Division

DEVELOPMENT MANAGEMENT

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INTEGRATED PEST MANAGEMENT
(757) 259-4116

April 10, 2001

Mr. Myrl Hairfield
Springhill Development Company
10858 Warwick Blvd.
Newport News, Va. 23601

Re: Springhill Phase 1 (County Plan S-89-93)
Stormwater Management Facility (County BMP ID Code: PC 034)

Dear Mr. Hairfield:

The Environmental Division has reviewed a record drawing and performed a final construction inspection on April 9th 2001 for a wet pond stormwater management facility for the above referenced project. The wet pond is located in the common area west of the cul-de-sac at Teakwood Drive and north of Springhill Drive at the main site entrance.

The following items must be addressed prior to release of the developer's surety instrument for the stormwater management/BMP facility:

Record Drawing:

1. Based on our review, the record drawing dated July 6th 1994 by Langley & McDonald (now Landmark Design Group) is **satisfactory** for the facility.

Construction-Related Items:

2. Remove all silt fence left in place from subdivision development activities such as road and pond construction, site utilities, etc. (ie. not related to current single-family construction).

3. Clear and remove the last remaining area of tree growth on the downstream embankment. Small trees and saplings are present in the area immediately surrounding the outlet end of the pond barrel. All other embankment areas are grassed and in satisfactory condition.

4. Fill, repair and stabilize (with seed & mulch) a surface slope/bank erosion area on the east shoreline just below Lot 48. This area is located above the permanent pool.

5. Stabilize with seed & mulch all bare, disturbed soil areas associated with recent incidental utility work around the pond.

6. Clean and remove localized sediment deposits and vegetation at the outfall end of the 18-inch storm drain located at the northwest corner of the pond. Flow into the pond must not be obstructed by vegetation and sediment. Also, remove the temporary plywood baffle which is also present at this location.

7. Clean and remove several large, floating tree branches which were present around the riser structure. At the time of inspection, two 1-2 inch logs were obstructing flow at the 6-inch orifice and removed. *(Note: Debris was removed from the orifice but not from the pond).*

8. Clean and remove localized sediment deposits and vegetation within 15 feet of the riser structure. Small willow saplings and sediment (2-3 ft. in depth) were observed at this location.

Once these items are satisfactorily completed, we can then proceed with final release of the surety on the project. Once construction-related items are complete, contact our office appropriately. Please call me at 757-253-6639 or Beth Davis at 757-253-6702, if you have any further comments or questions.

Sincerely,

Scott J. Thomas, P.E.
Civil Engineer
Environmental Division

C. E. Davis

Catherine "Beth" Davis
Engineering Inspector

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

S-89-93
GPIN 3710600001A

Database Inventory No. (if known): PC 034

Name of Facility: SPRINGHILL PHASE 1/2 BMP No.: 1 of 2 Date: 04/09/01

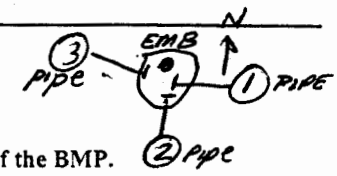
Location: End of Teakwood Drive 3999 Driftwood Way

Name of Owner: Springhill HOA

Inspector: SJ Thomas, Beth DAVIS (FINAL CONSTRUCTION Inspection)

Type of Facility: Wet POND

Weather Conditions: Sunny, Warm, HIGH 70's



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	X			Maintained at 4" height
Vegetation Condition	X			Some minor bare spot o/s Left (east)
Tree Growth		X		Remove trees 15' from barrel out.
Erosion	X			None Observed.
Trash & Debris	X			Crate @ outlet.
Seepage	X			None Observed.
Fencing or Benches				
Interior Landscaping/Planted Areas: ☐ None ☐ Constructed Wetland/Shallow Marsh ☒ Naturally Established Vegetation				
Vegetated Conditions	X			Wet Pool
Trash & Debris	X			
Floating Material	X			
Erosion	X			
Sediment	X			
Dead Plant	X			
Aesthetics	X			
Other				
Service Area - SF Lots & ROADWAYS, WOODS				

Facility Item	O.K.	Routine	Urgent	Comments
Water Pools ☒ Permanent Pool (Retention Basin) ☐ Shallow Marsh (Detention Basin) ☐ None (Detention Basin)				
Shoreline Erosion	X	X		East Area slope bank erosion
Algae	X			More than usual but ok
Trash & Debris	X			Minor trash + debris alongshore.
Sediment	X			
Aesthetics	X			Maintain upshore w/ cattails.
Other	X			Dist. incid. util area (west side
~~Inflow~~ RISER Stuctures (Describe Locations): 36" RCP Riser w/ conc-cap; 8" Low-Flow orif				
Condition of Structure	X			RCP ok.
Erosion	X		RISER	
Trash and Debris		X		clean wood debris @ riser 2" logs
Sediment				2-3 ft deep @ Riser
Aesthetics				
Other		X		Clear veg 15' from Riser
~~Principal Flow Control~~ INFLOW Structure - Intake, Riser, etc. (Describe Location): 1) 15" RCP EAST 2) 24" RCP SOUTH 3) 18" RCP west				
Condition of Structure	X			Note:
Corrosion	X			Pipe 1 & 2 ok. Pipe 3 west
Trash and Debris	X		INFLOWS	1-2 ft of sediment & catail
Sediment		X		veg needs removed.
Aesthetics	X			Obstructing drainage. Clean +
Other				Remove from vicinity. Remove Baffle.
Principal Outlet Structure - Barrel, Conduit, etc.: 24" RCP BARREL				
Condition of Structure	X			
Settlement	X			None observed.
Trash & Debris		X		Remove Wood + Leaves from End Sect
Sediment	X			
Erosion	X			
Other				
Emergency Spillway (Overflow): 8' BW; Trapez-Shaped				
Vegetation	X			Grassed
Lining	X			GRASSED
Erosion	X			None.
Trash & Debris	X			None.
Other	X			Well-Maintained

Facility Item	O.K.	Routine	Urgent	Comments
Nuisance Type Conditions:				
Mosquito Breeding	X			None observed.
Animal Burrows	X			" "
Graffiti	X			" "
Other				
Surrounding Perimeter Conditions:				
Land Uses	X			SF Lots, Open Space + Wood
Vegetation	X			Common Area South end.
Trash & Debris	X			
Aesthetics	X			Good Perimeter
Access /Maintenance Roads or Paths	X			Access between Lot 48&49 Teakwood or back Common Area.
Other				

Remarks:

- Remove tree saplings within 15 ft. of barrel outlet.
- Slope/BANK interior erosion at east (LOT 48-49) side
- New incidental utility areas west & south need stabilized.
- Remove Plywood Baffle – west side (temp.)
- Clean & remove 2-3" Floating logs. Were into low flow orifice @ time of inspection.
- Clear & remove veg & sed 2 to 4' deep at riser (within 15')
- Remove tree + wood debris from End sect Barrel.
- Clear + remove sed 1-2' deep + vegetation @ Pipe 3 (vicinity of pipe out)
- Maint Road gravel. Does not appear to be need for. Would induce addt'l disturbance. (Plan shows maint road, not in place.)

Overall Environmental Division Internal Rating: 3

Signature: Scott Thomas P.E. **Date:** 04/09/01 2:25 pm

Title: Civil Engineer Environmental Division

SWMProg\BMP\CoInspProg\DetRet.wpd

Mr. Myrl
HAirfield
Springhill Develop
Comp
10858 WARWICK
BLVD
NN VA 23601

WATERSHED	PC	MAINTENANCE PLAN	No	CTRL STRUC DESC	RCP Riser
BMP ID NO	034	SITE AREA acre	40.55	CTRL STRUC SIZE inches	36
PLAN NO	S-89-93	LAND USE	SF Residential	OTLT BARRL DESC	RCP Barrel
TAX PARCEL	(37-1)(6-1A)	old BMP TYP	Wet Pond	OTLT BARRL SIZE inch	24
PIN NO	3710600001A	JCC BMP CODE			
CONSTRUCTION DATE	1/1/1994	POINT VALUE	9	EMERG SPILLWAY	Yes
PROJECT NAME	Springhill Sudiv Phase 1&2			DESIGN HW ELEV	46.65
FACILITY LOCATION	3999 Driftwood Way (End Teakwood Drive)			PERM POOL ELEV	43.8
CITY-STATE	Williamsburg, Va. 23188	SVC DRAIN AREA acres	16.42	2-YR OUTFLOW cfs	1.44
CURRENT OWNER	Springhill HOA			10-YR OUTFLOW cfs	8.00
OWNER ADDRESS	10858 Warwick Boulevard			REC DRAWING	Yes
OWNER ADDRESS 2		SERVICE AREA DESCRI	23 lots PH I/8 lots PH II and Roadways		
CITY-STATE-ZIP CODE	Newport News, Va. 23601	IMPERV AREA acres	14.00	CONSTR CERTI	No
OWNER PHONE		RECV STREAM	UT of Powhatan Creek		
MAINT AGREEMENT	No	EXT DET-WQ-CTRL	Yes	LAST INSP DATE	4/9/2001
		WTR QUAL VOL acre-ft	1.2	INTERNAL RATING	3
EMERG ACTION PLAN	No	CHAN PROT CTRL	No	MISC/COMMENTS	
		CHAN PROT VOL acre-ft	0	Access off Teakwood Drive Lot 48/49. HOA contracts R-Maint.	
		SW/FLOOD CONTROL	Yes		
		GEOTECH REPORT	No		

Get Last BMP No

Return to Menu

PC030
PC034
SPRING HILL

ENGINEERS · PLANNERS · SURVEYORS
5544 Greenwich Road
☐ Virginia Beach, Virginia 23462
(804) 473-2000

☑ 201 Packets Court
Williamsburg, Virginia 23185
(804) 253-2975

Project: SPRINGHILL - RECORD DWGS.

To: KEITH LEFTWITCH
J.C.C.

From: RONNIE ORCEBORNE

Date: 7/8/94

Reply requested: ☐ Yes ☑ No

Reply to:

We are sending you:
☑ Attached
☐ Under separate cover via:

☐ Prints
☐ Copy of letter
☐ Plans
☐ Specifications
☐ Shop drawings
☑ Mylars

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

RECORD DWGS

Copies	Date	No.	Description
1	~~HEY3~~	5041W	COVERSHEET W/ SAN. SEWER
1	7/6/94	5040W	CTGM
1	"	5039W	UTILITIES
1	"	5037W	SAN. SEWER EASEMENT

Remarks: ANY QUESTION PLEASE FEEL FREE TO CALL ME.

Copies
1. File: 93039-4
2.
3.
4.

Enclosures
☐
☐
☐
☐

Langley and McDonald

By: Howard Bengston
Ronnie Osborne

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

#4

MEMORANDUM

Langley and McDonald, P.C.
Engineers
Surveyors
Planners
Landscape Architects
Environmental Consultants

Main Office: 5544 Greenwich Road, Virginia Beach, VA 23462
(757) 473-2000 FAX#: (757) 497-7933
Williamsburg Office:,4029 Ironbound Rd. Wmbg, VA 23188
(757) 253–2975 FAX#: (757) 229–0049
E-mail: nmason@langleywb.com

To: Kristin Chisman

From: Norman Mason

Date: March 10, 1999

Subject: Springhill Phase 1

Kristin,

As discussed, here are two prints of the record drawings of the drainage plan for Springhill Phase1. These drawings, along with the rest of the Phase 1 record drawings were sent to Keith Letchworth at James City County on July 8, 1994. A copy of that transmittal note accompanies this memo. Please let me know if there are any further questions in his regard.

3/99

* CALLED NORMAN MASON & INFORMED HIM WE NEEDED BMP AS-BUILTS. HE CLAIMS THEY WEREN'T REQUIRED ON THE PLAN. HE IS CORRECT BUT WE ARE STILL REQUIRING THEM. DWM

5544 Greenwich Road
☐ Virginia Beach, Virginia 23462
(804) 473-2000

☑ 201 Packets Court
Williamsburg, Virginia 23185
(804) 253-2975

Project: SPRINGHILL - RECORD DWGS.

To: KEITH LEFTWITCH
J.C.C.

From: RONNIE ORCEBORNE

Date: 7/8/94

Reply requested: ☐ Yes ☑ No

Reply to:

We are sending you:
☑ Attached
☐ Under separate cover via:

☐ Prints
☐ Copy of letter
☐ Plans
☐ Specifications
☐ Shop drawings
☑ Mylars

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

RECORD DWGS

Copies	Date	No.	Description
1	~~11/5/93~~	5041W	COVERSHEET W/ SAN. SEWER
1	7/6/94	5040W	CADM
1	"	5039W	UTILITIES
1	"	5037W	SAN. SEWER EASEMENT

Remarks: ANY QUESTION PLEASE FEEL FREE TO CALL ME.

Copies
1. File: 93039-4
2.
3.
4.

Enclosures
☐
☐
☐
☐

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

Langley and McDonald

By: Howard Bengston
Ronnie Orsborne

#4

MEMORANDUM

Langley and McDonald, P.C.
Engineers
Surveyors
Planners
Landscape Architects
Environmental Consultants

Main Office: 5544 Greenwich Road, Virginia Beach, VA 23462
(757) 473-2000 FAX#: (757) 497-7933
Williamsburg Office:,4029 Ironbound Rd. Wmbg, VA 23188
(757) 253–2975 FAX#: (757) 229–0049
E-mail: nmason@langleywb.com

To: Kristin Chisman

From: Norman Mason

Date: March 10, 1999

OCT 0 2 2000

Subject: Springhill Phase 1

PC 034 (S-89-93)

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As discussed, here are two prints of the record drawings of the drainage plan for Springhill Phase1. These drawings, along with the rest of the Phase 1 record drawings were sent to Keith Letchworth at James City County on July 8, 1994. A copy of that transmittal note accompanies this memo. Please let me know if there are any further questions in his regard.

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ADD SHEET 7 OF PLAN SECT A-A BMP 1 TO PLAN.

ENVIRONMENTAL DIVISION CITIZEN COMPLAINT RESPONSE FORM

Complainant's Name: KNIGHT SMITH

Address: 4189 TEAKWOOD DRIVE WBG VA 23188 (LOT 48)

Telephone No.: H: 258-0001
W: 564-2221 (WJCC Sheriff's Office)

Date Received: 11/27/00

Date Assigned: 11/27/00

Location of Problem: LOT 48-49 Springhill Phase 1 (S-89-93)
20' Drainage & Access Easement 15"ϕ pipe to BMP.

Type of Complaint

- ☐ Drainage
- ☐ Erosion
- ☐ Land Disturbing
- ☐ Tree Removal
- ☐ Sink Hole
- ☐ Street Sign
- ☐ Street Light
- ☒ Other: Dispute with HOA about 20' Drainage & Maint. Easement and 15" RCP storm drain across lot to BMP Phase I.

SPRINGHILL HOA
10858 WARWICK BLVD
NN VA 23601

DAY AFTER CALL FROM:
DAN GIROUARD HOA PRES.
4216 TEAKWOOD DRIVE
WBG VA 23188
CELL 810-1931
3499
394 DRIFTWOOD WAY
23188

GPIN
3710600001A
PARCEL 1, PH1
OPEN SPACE COMMON AREA 8.596AC.

Inspector Assigned: SJ Thomas

Watershed Code: PC (BMP ID PC034)

Date Investigated: 11/27/00

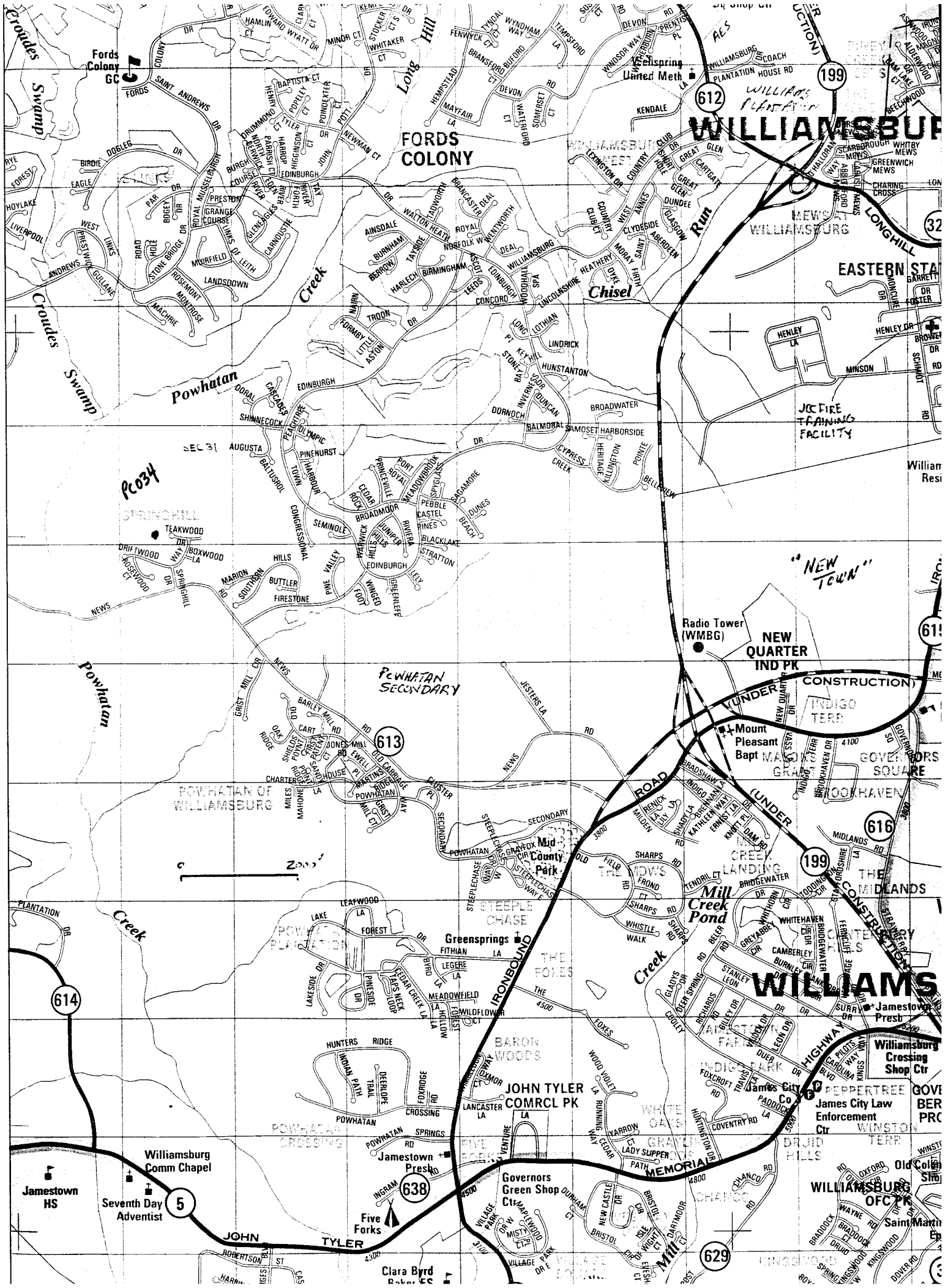
Complainant Contacted? ☒ Yes ☐ No

Field Investigation? ☒ Yes ☐ No

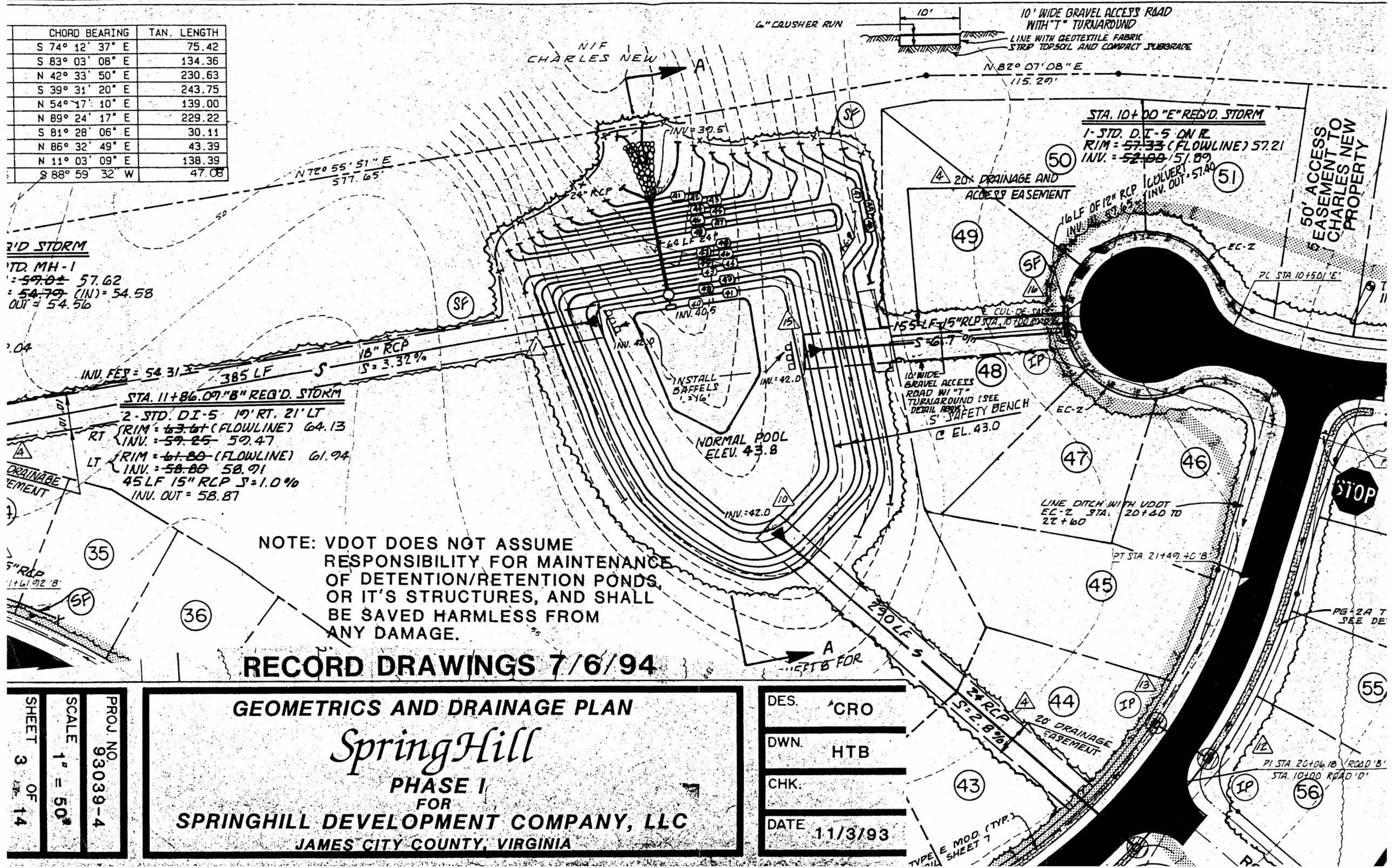
Follow up Required? ☒ Yes ☐ No

Note: The 10' gravel road that was present when he bought the lot/home in 1994.

Results of Investigation:
No immediate action required.
JCC ENV. DIV to remain neutral in dispute. However SJT to research current plat, dev plan & file to assist prop. owner with factual information. Note: Owner is irrate that HOA sent him letter to remove fence & landscaping from access easement that he thought was abandoned as such under the terms of him buying the home. Our current site plan & as-built shows easement.


FORDS COLONY
Fords Colony GC
Wellspring United Meth
WILLIAMSBURG
Croudes Swamp
Long Hill
Powhatan Creek
Chisel Run
EASTERN STATE
JCC FIRE TRAINING FACILITY
PC034
POWHATAN SECONDARY
"NEW TOWN"
Radio Tower (WMBG)
NEW QUARTER IND PK
Mount Pleasant Bapt
Mid County Park
Mill Creek Pond
Greensprings
IRONBOUND
JOHN TYLER COMRCL PK
Williamsburg Crossing Shop Ctr
James City Co
James City Law Enforcement Ctr
Jamestown Presb
Williamsburg Comm Chapel
Jamestown HS
Seventh Day Adventist
Five Forks
Governors Green Shop Ctr
WILLIAMSBURG OFC PK
Clara Byrd
JOHN TYLER HIGHWAY
MEMORIAL
LONGHILL ROAD
CONSTRUCTION
199
612
613
614
615
616
629
638
5

CHORD BEARING	TAN. LENGTH
S 74° 12' 37" E	75.42
S 83° 03' 08" E	134.36
N 42° 33' 50" E	230.63
S 39° 31' 20" E	243.75
N 54° 17' 10" E	139.00
N 89° 24' 17" E	229.22
S 81° 28' 06" E	30.11
N 86° 32' 49" E	43.39
N 11° 03' 09" E	138.39
S 88° 59' 32" W	47.08



RECORD DRAWINGS 7/6/94

PROJ. NO. 93039-4

SCALE 1" = 50'

SHEET 3 OF 14

GEOMETRICS AND DRAINAGE PLAN

SpringHill

PHASE I

FOR

SPRINGHILL DEVELOPMENT COMPANY, LLC

JAMES CITY COUNTY, VIRGINIA

DES.	CRO
DWN.	HTB
CHK.	
DATE	11/3/93

Scott Thomas

From: Scott Thomas
Sent: Thursday, January 18, 2007 11:30 AM
To: 'kendellwarren@cox.net'
Cc: Wayland Bass
Subject: Springhill Subdivision BMPs
Attachments: Springhill.jpg; Springhill.let1.pdf; Springhill2.fc.pdf; Landscaping.tips.pdf; WatAware.tips.pdf; Maint.wetdry.pdf

Kendell

Nice talking to you again today. Sorry the rain cancelled our last scheduled meeting. As discussed, we will arrange to meet and visit the two stormwater management facilities at Springhill once you get back from your trip. The two stormwater management facilites (ie. BMPs – Best Management Practices) within the subdivision are listed as follows:

BMP # 1 (front pond); County BMP ID Code PC034; Phases 1 & 2, County Plan No. S-89-93
BMP # 2 (back pond); County BMP ID Code PC 030; Phases 3 & 4, County Plan No. S-56-98

I have had some contact and correspondence with HOA representatives in the past; however, it appears we may need to start from scratch.
I attached some preliminary information for you to look at until we meet and my contact information is listed below:

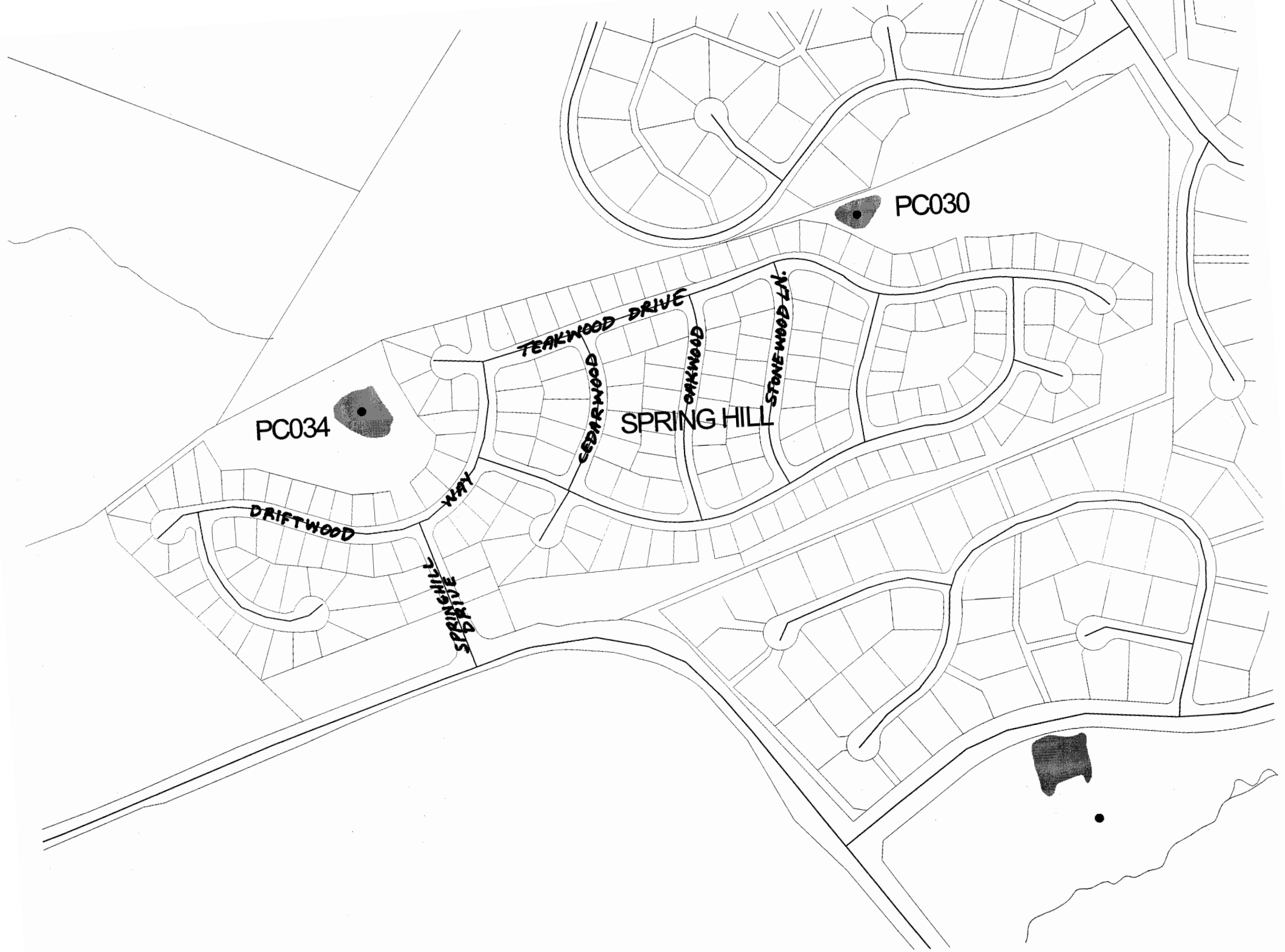
1) A map of the subdivision showing the location of the BMPs and the County ID Codes (file: Springhill.jpg)
2) Copy of a letter that I sent to the HOA dated December 5, 2000
3) Copy of a letter that I sent to the HOA dated July 16, 2002.
4) Landscaping tips for BMPs
5) Watershed Awareness tips
6) Sample BMP maintenance plan for wet ponds.

I also suggest that before we meet, you visit our PRIDE website at www.protectedwithpride.org as it has tons of useful information for HOA's as it relates to watershed and BMP education as well as maintenance. It also explains our PRIDE mini-grant program ($ 500) for communities that are interested in improving water quality. Talk to you later. Have a safe trip.

Scott J. Thomas, P.E.
Chief Engineer - Stormwater
James City County
Environmental Division
Phone: 757-253-6639

Visit:
http://www.james-city.va.us/resources/devmgmt/div_devmgmt_environ.html
and
www.protectedwithpride.org

PC163
PC191
PC030
PC034
PC094


PC030
PC034
TEAKWOOD DRIVE
CEDARWOOD
OAKWOOD
STONEWOOD LN.
SPRING HILL
DRIFTWOOD
WAY
SPRINGHILL DRIVE