CERTIFICATE OF AUTHENTICITY

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

BMP NUMBER: **DC008**

DATE VERIFIED: **May 17, 2012**

QUALITY ASSURANCE TECHNICIAN: **Leah Hardenbergh**

Leah Hardenbergh

LOCATION: WILLIAMSBURG, VIRGINIA

Stormwater Division

MEMORANDUM

DATE: March 10, 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: DC008

PIN: 1110100025

Subdivision, Tract, Business or Owner Name (if known): Knezick, Donald R & Suzanne B

Property Description: Pinelands Nursery

Site Address: 8877 Richmond Road

(For internal use only) **Box** 10 **Drawer:** 6

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

Comments
This is a combined folder with DC007 and DC008

DC 007 + DC008

Contents for Stormwater Management Facilities As-built Files

Each file is to contain:

1. As-built plan
2. Completed construction certification
3. Construction Plan
4. Design Calculations
5. Watershed Map
6. Maintenance Agreement
7. Correspondence with owners
8. Inspection Records
9. Enforcement Actions

Section 4 - Professional Certifications:

Certifying Professionals: *(Note: A Registered Professional Engineer or Certified Land Surveyor is responsible for preparation of a Record Drawing, sometimes referred to as an As-Built plan, for the drainage system for the project including any Stormwater Management/BMP Facilities. A Registered Professional Engineer is responsible for the inspection, monitoring and certification of Stormwater Management / BMP facilities during its construction.)*

Record Drawing and Construction Certifications for Stormwater Management / BMP Facilities

Record Drawing Certification

Firm Name: Williamsburg Environmental Group
Mailing Address: 3000 Easter Circle
Williamsburg, VA 23188
Business Phone: (757) 220-6869
Fax: (757) 229-4507

Name: Michael Ballard
Title: Senior Engineer

Signature: Michael Ballard
Date: 11/13/01

I hereby certify to the best of my judgement, knowledge and belief that this record drawing represents the actual condition of the Stormwater Management / BMP facility. The facility appears to conform with the provisions of the approved design plan, specifications and stormwater management plan, except as specifically noted.

COMMONWEALTH OF VIRGINIA
Michael H Ballard
MICHAEL H. BALLARD
No. 035107
11/13/01
PROFESSIONAL ENGINEER

_____ (Seal)

Virginia Registered Professional Engineer
or Certified Land Surveyor

Construction Certification

Firm Name: _____
Mailing Address: _____
_____
Business Phone: _____
Fax: _____

Name: Michael Ballard
Title: Senior Engineer

Signature: Michael Ballard
Date: 11/13/01

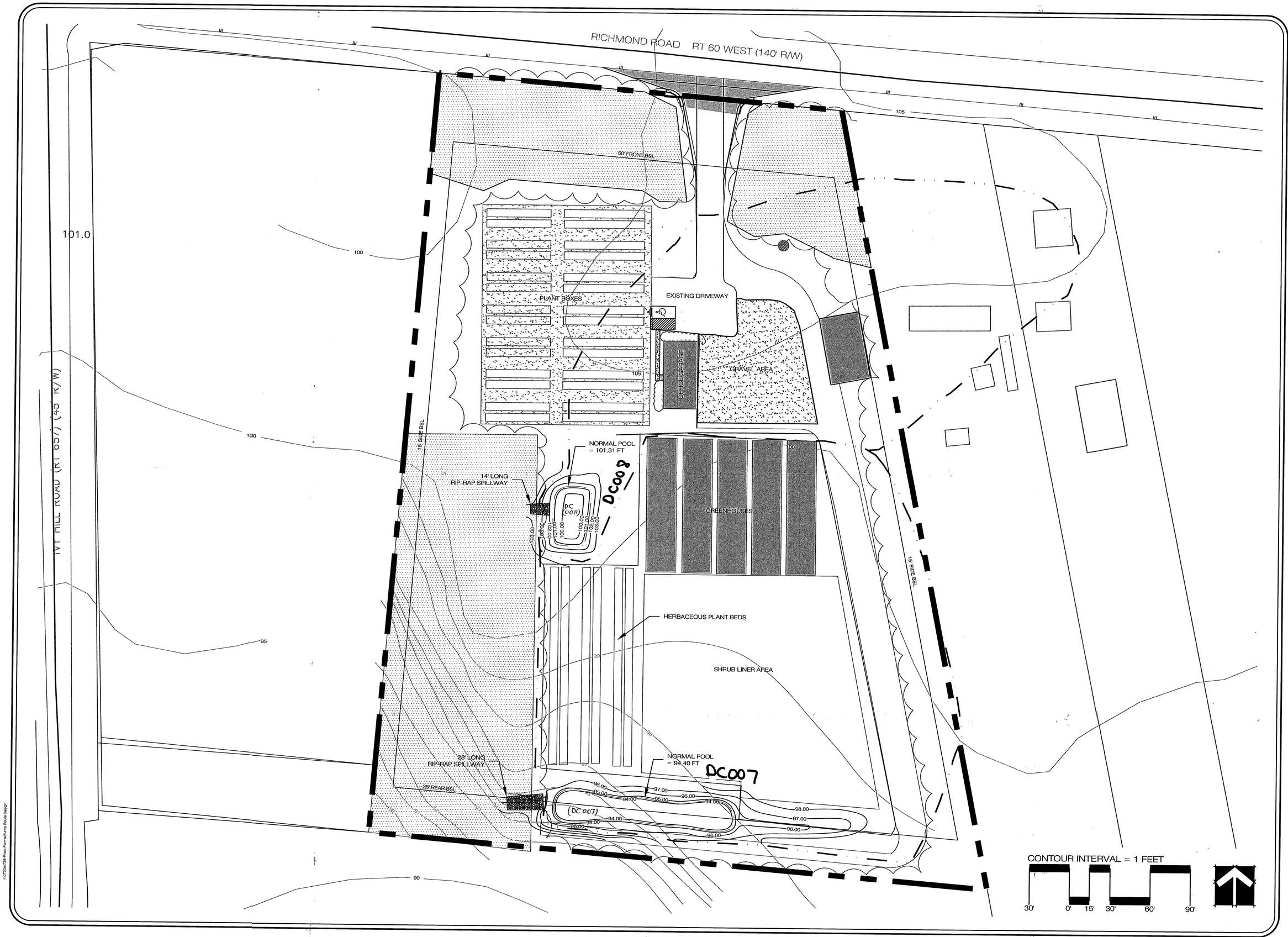
I hereby certify to the best of my judgement, knowledge and belief that this Stormwater Management / BMP facility was monitored and constructed in accordance with the provisions of the approved design plan, specifications and stormwater management plan, except as specifically noted.

COMMONWEALTH OF VIRGINIA
Michael H Ballard
MICHAEL H. BALLARD
No. 035107
11/13/01
PROFESSIONAL ENGINEER

_____ (Seal)

Virginia Registered
Professional Engineer

DC 007; DC 008
SP-11-99



DC 007 & DC 008

SP-11-99

WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants
3020 Eastern Circle
Williamsburg, Virginia 23188
(757) 220-6869
7325 Beaufont Springs Drive, Suite 100
Richmond, Virginia 23225
(804) 267-3474
46030 Manekin Plaza, Suite 160
Sterling, Virginia 20166
(703) 406-1390

BMP AS-BUILT
PINELANDS NURSERY
JAMES CITY COUNTY, VIRGINIA

REVISIONS:
DATE:

DRAWN BY: JGM
DESIGNED BY: ELA
DATE: 11/13/01
CHECKED BY: MHB/TJS

SHEET: A-1
JOB#: 946

E:\0702\ok729-Fred Permit\Pump Route Design

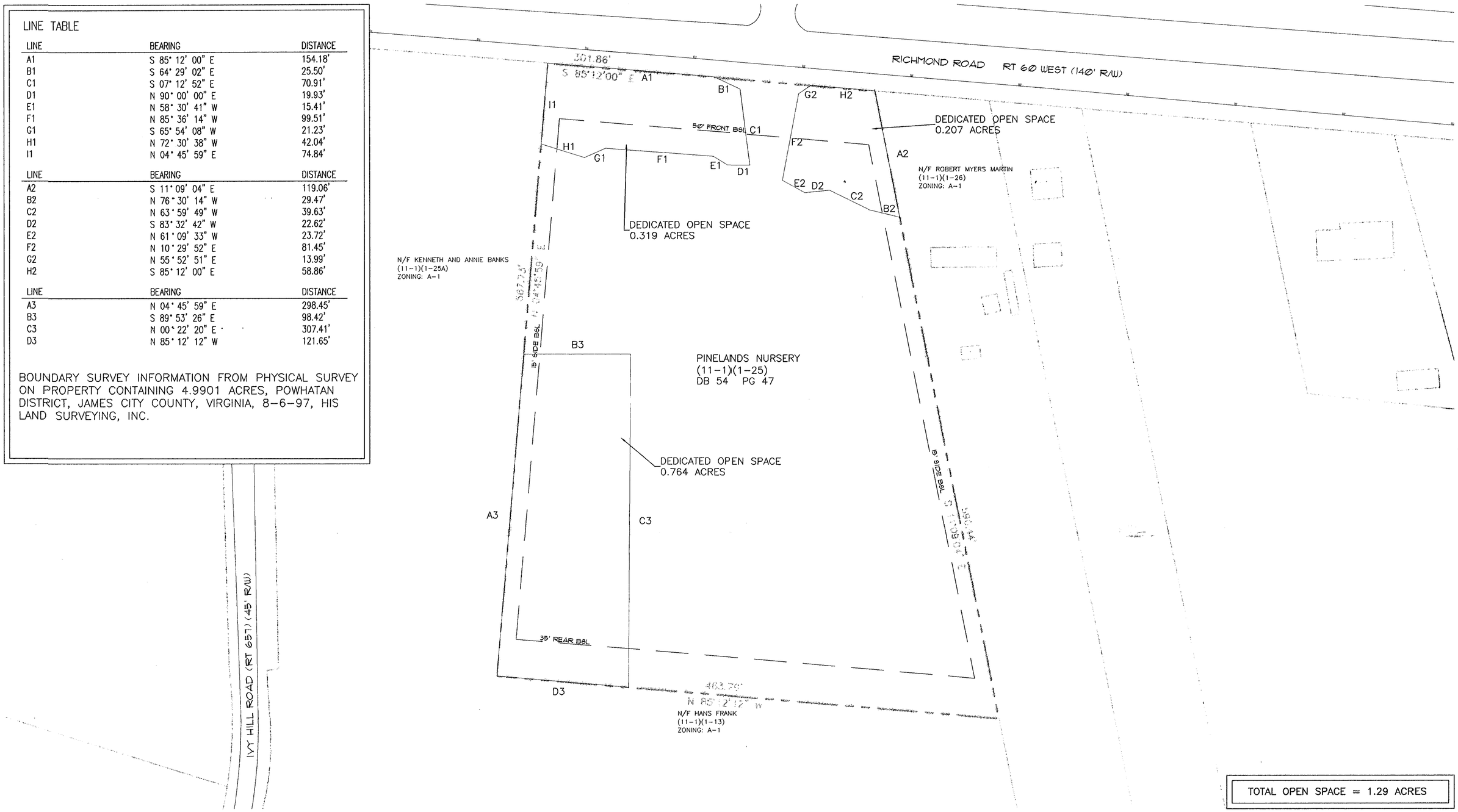
LINE TABLE

LINE	BEARING	DISTANCE
A1	S 85° 12' 00" E	154.18'
B1	S 64° 29' 02" E	25.50'
C1	S 07° 12' 52" E	70.91'
D1	N 90° 00' 00" E	19.93'
E1	N 58° 30' 41" W	15.41'
F1	N 85° 36' 14" W	99.51'
G1	S 65° 54' 08" W	21.23'
H1	N 72° 30' 38" W	42.04'
I1	N 04° 45' 59" E	74.84'

LINE	BEARING	DISTANCE
A2	S 11° 09' 04" E	119.06'
B2	N 76° 30' 14" W	29.47'
C2	N 63° 59' 49" W	39.63'
D2	S 83° 32' 42" W	22.62'
E2	N 61° 09' 33" W	23.72'
F2	N 10° 29' 52" E	81.45'
G2	N 55° 52' 51" E	13.99'
H2	S 85° 12' 00" E	58.86'

LINE	BEARING	DISTANCE
A3	N 04° 45' 59" E	298.45'
B3	S 89° 53' 26" E	98.42'
C3	N 00° 22' 20" E	307.41'
D3	N 85° 12' 12" W	121.65'

BOUNDARY SURVEY INFORMATION FROM PHYSICAL SURVEY ON PROPERTY CONTAINING 4.9901 ACRES, POWHATAN DISTRICT, JAMES CITY COUNTY, VIRGINIA, 8-6-97, HIS LAND SURVEYING, INC.



TOTAL OPEN SPACE = 1.29 ACRES

OPEN SPACE DEDICATION
PINELANDS NURSERY
JAMES CITY COUNTY, VIRGINIA

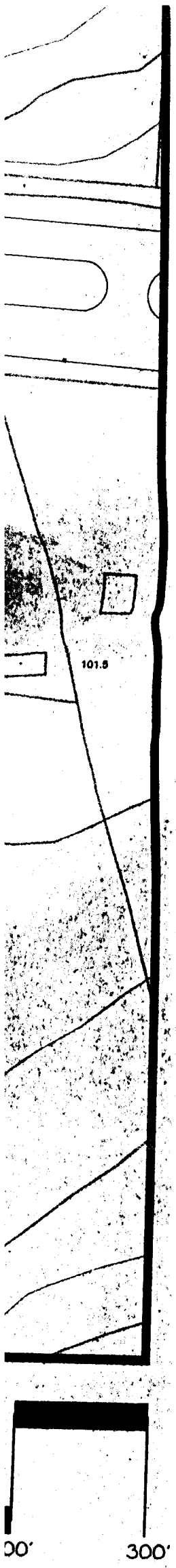
60' 0' 30' 60' 120' 180'

I HEREBY CERTIFY THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF, THIS PLAT COMPLIES WITH ALL OF THE REQUIREMENTS OF THE BOARD OF SUPERVISORS AND ORDINANCES OF THE COUNTY OF JAMES CITY, VIRGINIA, REGARDING THE PLATTING OF SUBDIVISIONS WITHIN THE COUNTY.

ERIK L. ALLEN, P.E. — DATE 7-6-99

COMMONWEALTH OF VIRGINIA
ERIK L. ALLEN
No. 024783
PROFESSIONAL ENGINEER

WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants
3000 EASTER CIRCLE
WILLIAMSBURG, VIRGINIA 23188
(757) 220 - 6869



TAX MAP REFERENCE: (11-1)(1-25)

TOTAL PROJECT AREA: 4.99 ACRES/100 %
TOTAL IMPERVIOUS AREA: 1.01 ACRES/20.3 %
PROPOSED DISTURBED AREA: 2.57 ACRES/51.5 %

BUILDING SETBACKS:

FRONT: 50'
REAR: 35'
SIDE: 15'

PROPOSED BUILDINGS:
(NO ELECTRICTY IS PROPOSED FOR THE POLE BARN OR GREENHOUSES)

POLE BARN:
*USE GROUP: UTILITY AND MISCELLANEOUS-U
*TYPE OF CONSTRUCTION: TYPE 2-C
*PROPOSED HEIGHT: 16 FEET

GREENHOUSES:
*USE GROUP: UTILITY AND MISCELLANEOUS-U
*TYPE OF CONSTRUCTION: TYPE 2-C
*PROPOSED HEIGHT: 10 FEET

PROPOSED PARKING : (1) 17'X18' PAVED VAN ACESSIBLE PARKING SPACE WITH SIGN

SHEET INDEX:

1. COVER SHEET
2. SITE PLAN
3. STORMWATER MANAGEMENT PLAN
4. EROSION AND SEDIMENT CONTROL PLAN
5. NOTES AND DETAILS
6. NOTES AND DETAILS

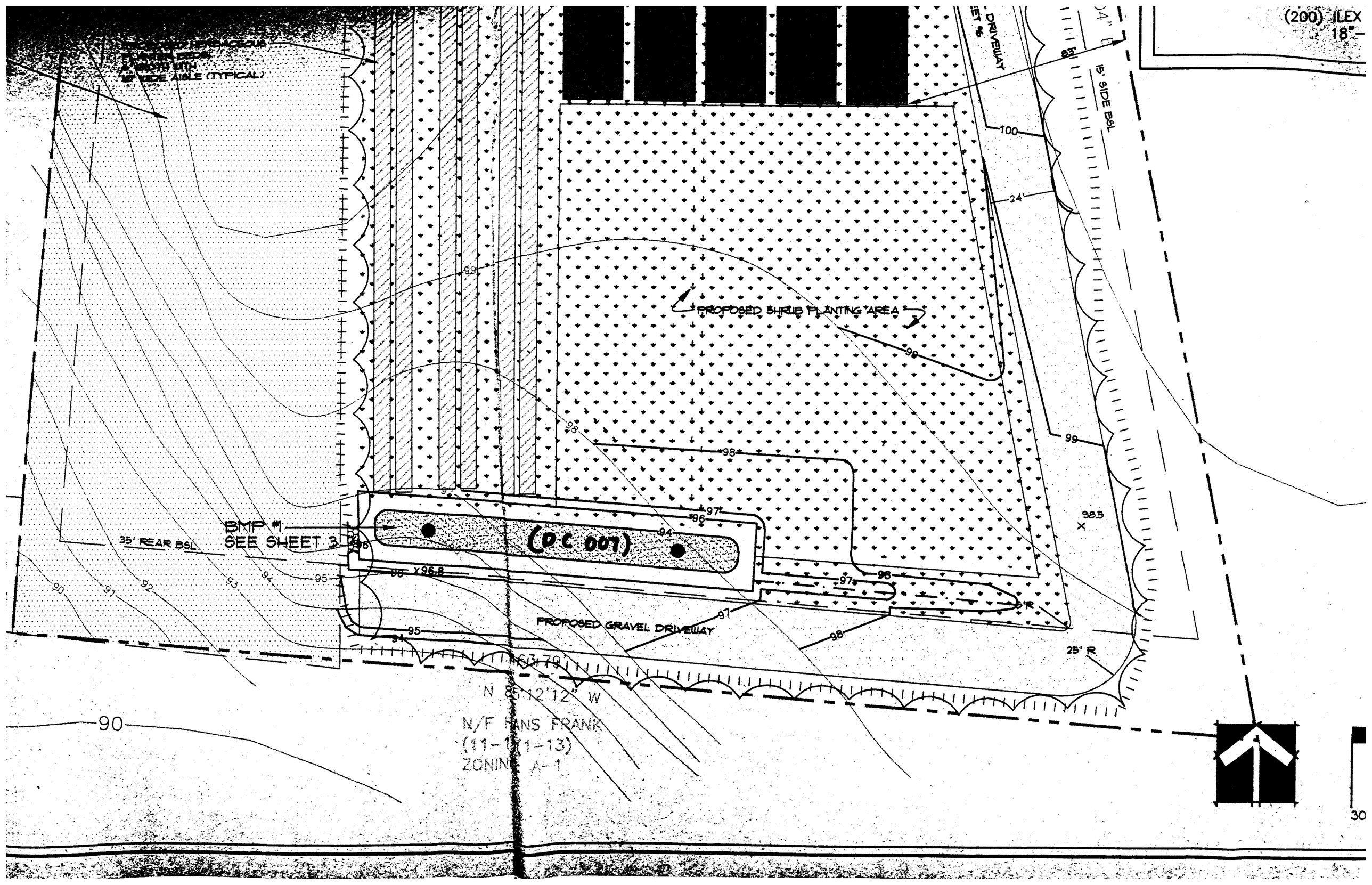
AUG 1999
RECEIVED
PLANNING DEPARTMENT

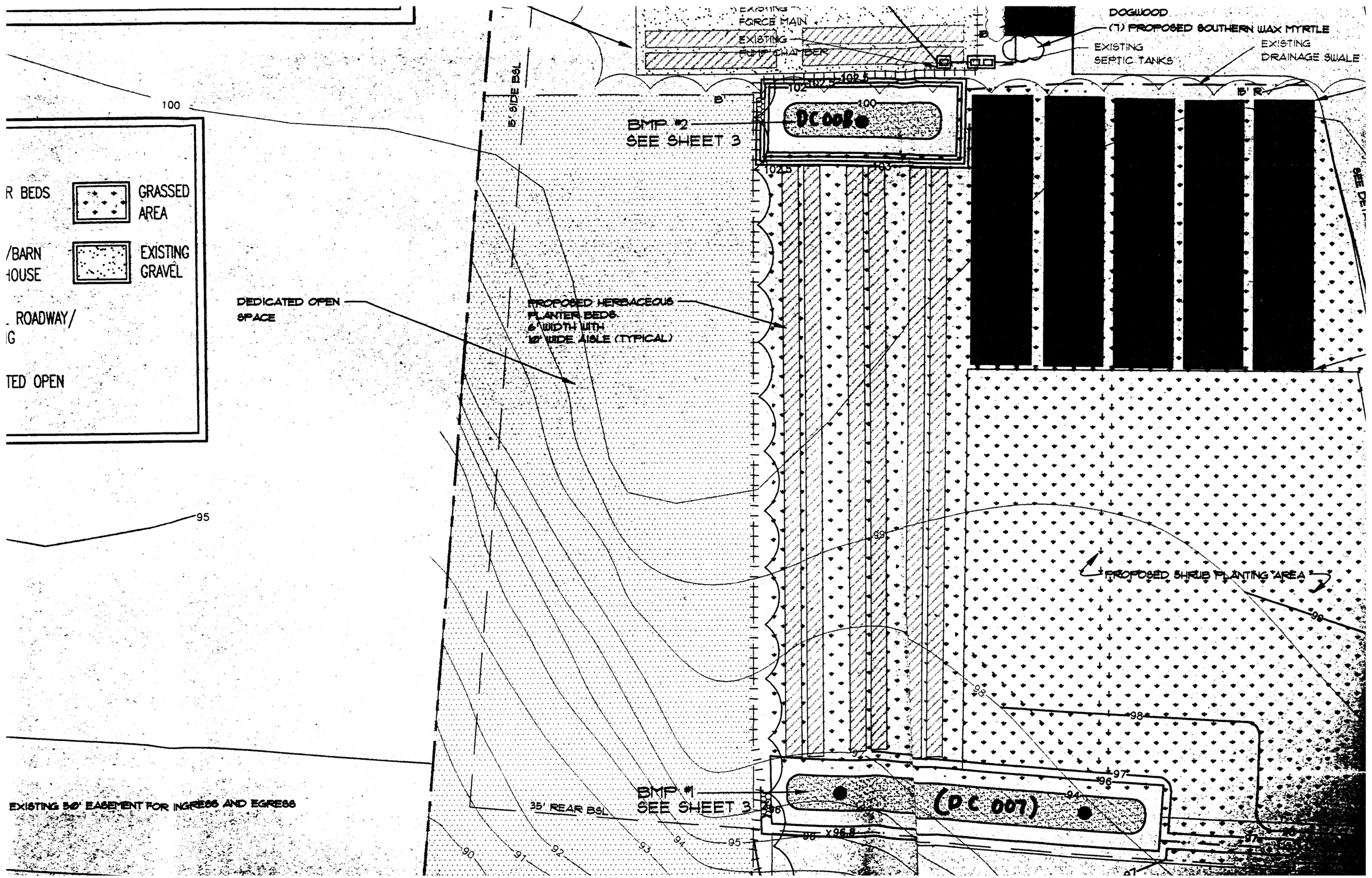
COUNTY OF JAMES CITY
FINAL SITE PLAN

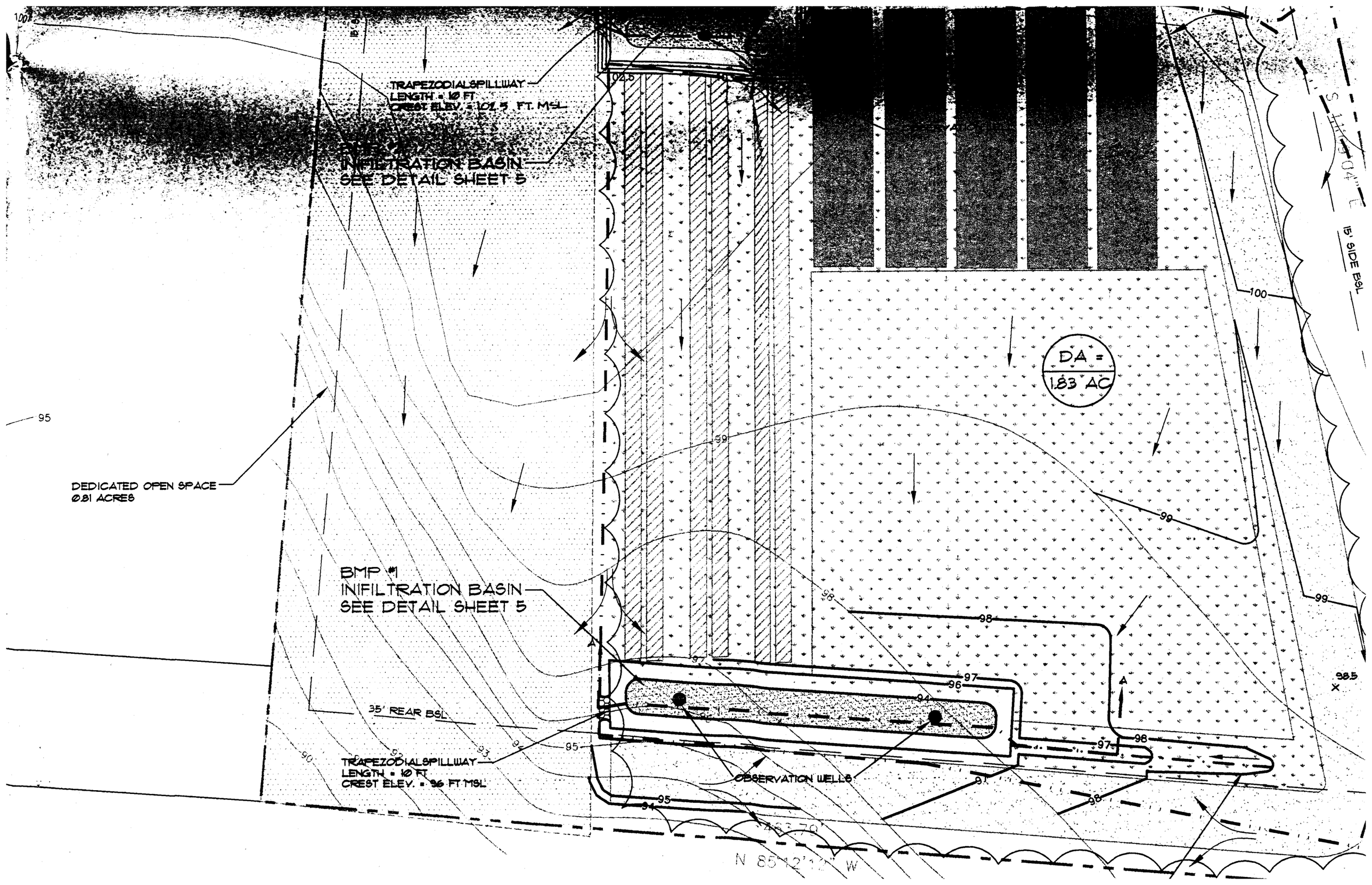
APPROVALS		DATE
Planning	PP	2-1-99
Housing	CLL	2-3-99
VDOT	JEM	6-9-99
Planning		7/3/99
Environ	DEE	8-27-99
Zoning Adm.		7/3/99
JCSA	DWP	2-11-99
County Eng.	WMB	2-8-99
REA	MS	2-8-99
Other	CC	1-28-99

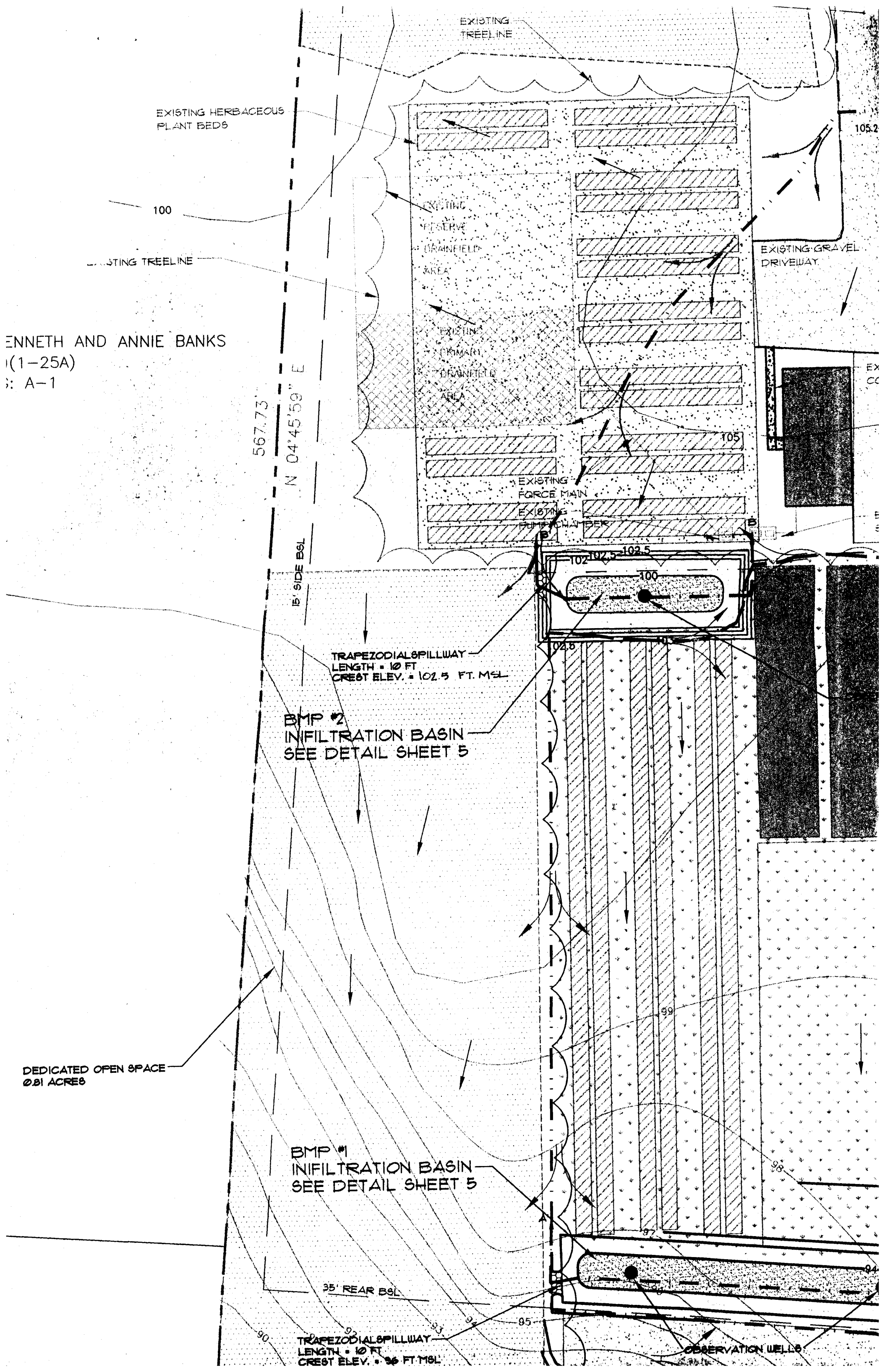
SP-11-99

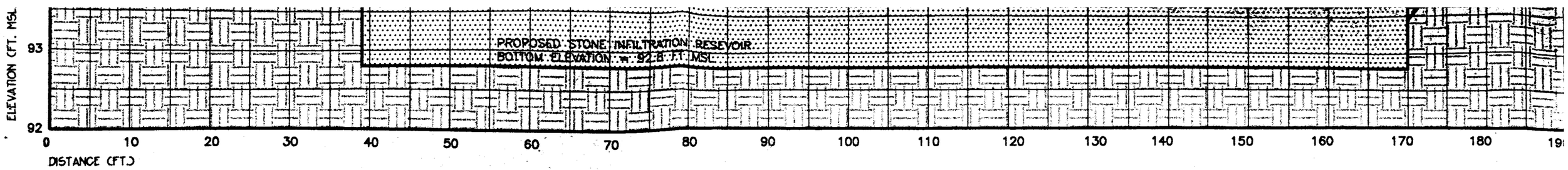
WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants
3000 Easter Circle, Williamsburg, Virginia 23188 (757) 220-6869


(200) ILEX
18"
15' SIDE BSL
DRIVEWAY
PROPOSED SHRUB PLANTING AREA
BMP #1
SEE SHEET 3
(DC 007)
35' REAR BSL
PROPOSED GRAVEL DRIVEWAY
25' R
N 85°12'12" W
N/F HANS FRANK
(11-1-1-13)
ZONING A-1
90
91
92
93
94
95
96
97
98
99
100
24'
98.5
30


R BEDS
GRASSED AREA
/BARN
HOUSE
EXISTING GRAVEL
ROADWAY/
G
TED OPEN
100
95
DEDICATED OPEN SPACE
EXISTING 30' EASEMENT FOR INGRESS AND EGRESS
EXISTING FORCE MAIN
EXISTING PUMP CHAMBER
15' SIDE BSL
B'
BMP #2
SEE SHEET 3
DC008
102
102.5
100
102.5
103
DOGWOOD
(1) PROPOSED SOUTHERN WAX MYRTLE
EXISTING SEPTIC TANKS
EXISTING DRAINAGE SWALE
15' R
PROPOSED HERBACEOUS PLANTER BEDS
6' WIDTH WITH
12' WIDE AISLE (TYPICAL)
99
PROPOSED SHRUB PLANTING AREA
98
97
96
94
BMP #1
SEE SHEET 3
35' REAR BSL
(DC 007)
96
95
96.8
90
91
92
93
94
87

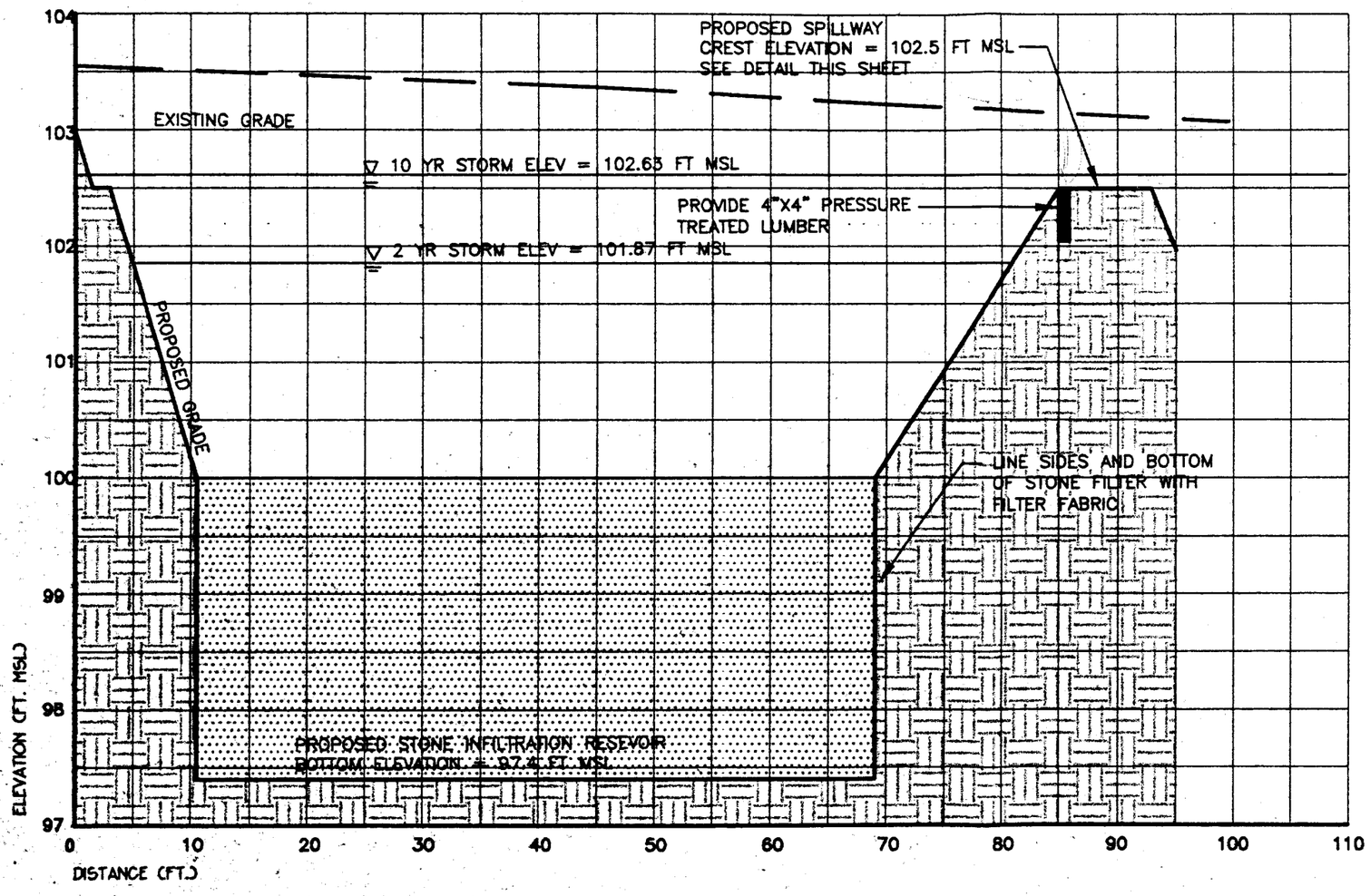

TRAPEZOIDAL SPILLWAY
LENGTH = 10 FT
CREST ELEV. = 102.5 FT. MSL
INFILTRATION BASIN
SEE DETAIL SHEET 5
DA =
1.83 AC
DEDICATED OPEN SPACE
0.81 ACRES
BMP #1
INFILTRATION BASIN
SEE DETAIL SHEET 5
35' REAR BSL
15' SIDE BSL
TRAPEZOIDAL SPILLWAY
LENGTH = 10 FT
CREST ELEV. = 96 FT MSL
OBSERVATION WELLS
N 85°12'12" W
102.5
100
99
98
97
96
95
94
93
92
91
90
98.5


EXISTING TREELINE
EXISTING HERBACEOUS PLANT BEDS
100
EXISTING TREELINE
ENNETH AND ANNIE BANKS
(1-25A)
: A-1
EXISTING RESERVE DRAINFIELD AREA
EXISTING PRIMARY DRAINFIELD AREA
105.2
EXISTING GRAVEL DRIVEWAY
567.73'
N 04°45'59" E
105
EXISTING FORCE MAIN
EXISTING PUMP CHAMBER
B
B'
15' SIDE BSL
102.5
100
TRAPEZODIAL SPILLWAY
LENGTH = 10 FT
CREST ELEV. = 102.5 FT. MSL
BMP #2
INFILTRATION BASIN
SEE DETAIL SHEET 5
DEDICATED OPEN SPACE
0.81 ACRES
99
BMP #1
INIFILTRATION BASIN
SEE DETAIL SHEET 5
98
97
94
35' REAR BSL
95
90
92
93
TRAPEZODIAL SPILLWAY
LENGTH = 10 FT
CREST ELEV. = 96 FT MSL
OBSERVATION WELLS



BMP #1 SECTION: A-A'

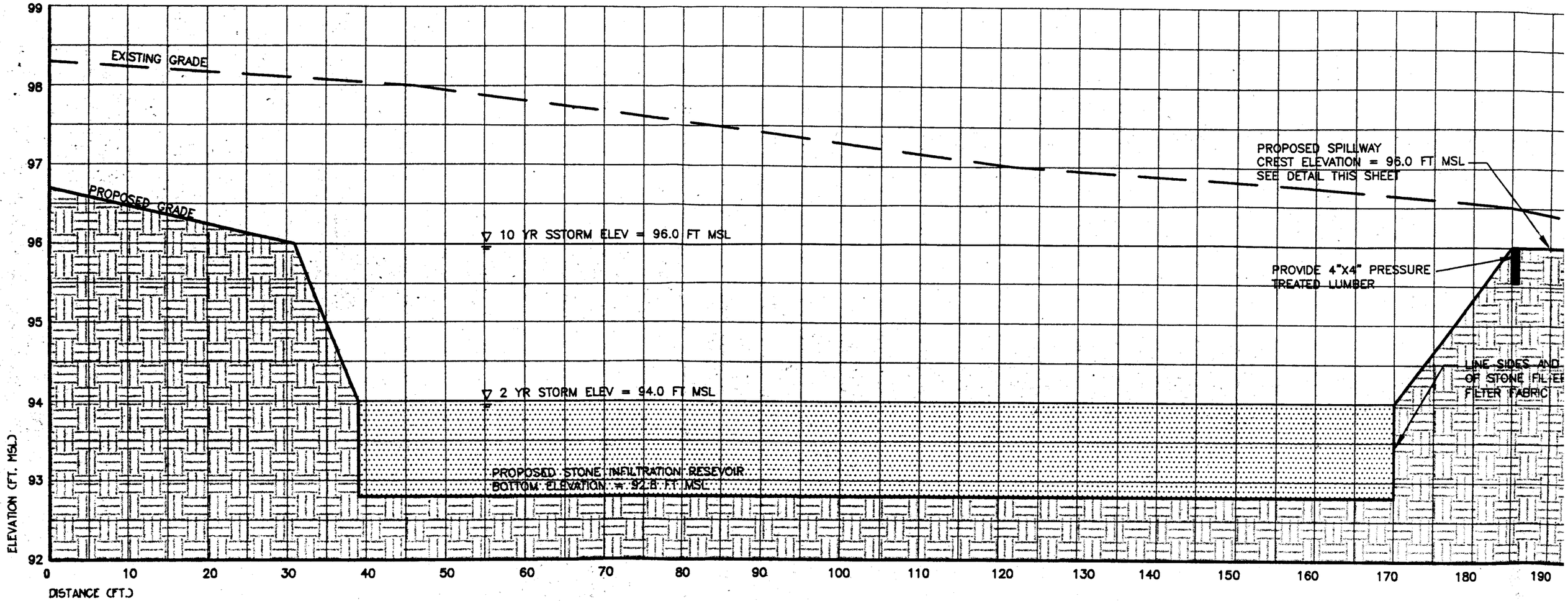
VERTICAL SCALE: 1" = 5'. HORIZONTAL SCALE 1" = 10'



NOTE: ALL STONE USED IN THE INFILTRATION TRE
IS TO BE CLEANED OR WASHED VDOT #57

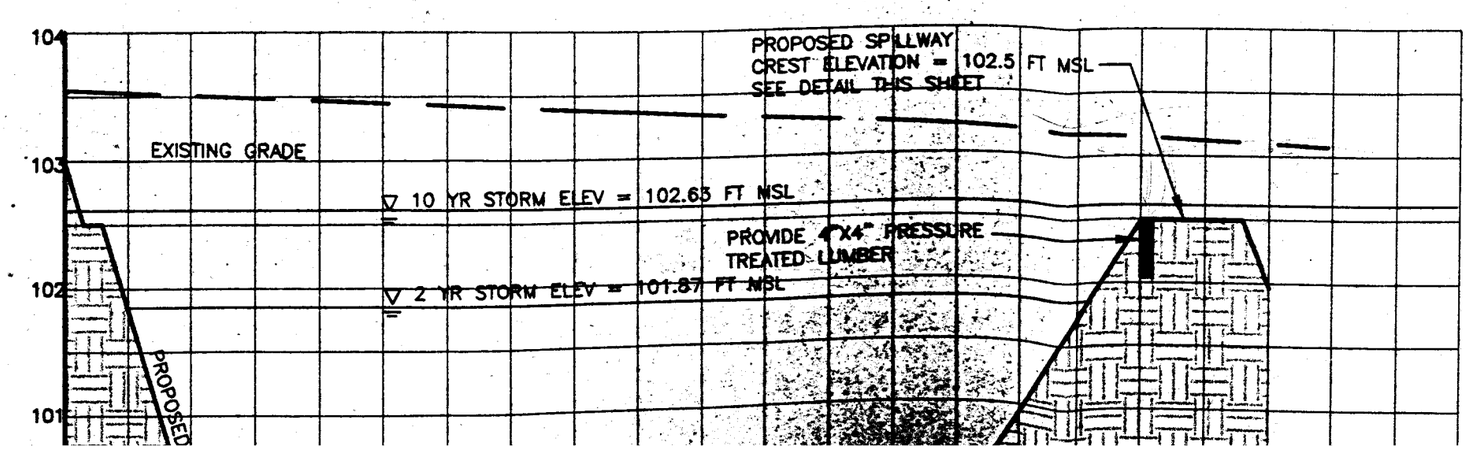
BMP #2 SECTION: B-B''

VERTICAL SCALE: 1" = 5'. HORIZONTAL SCALE 1" = 10'

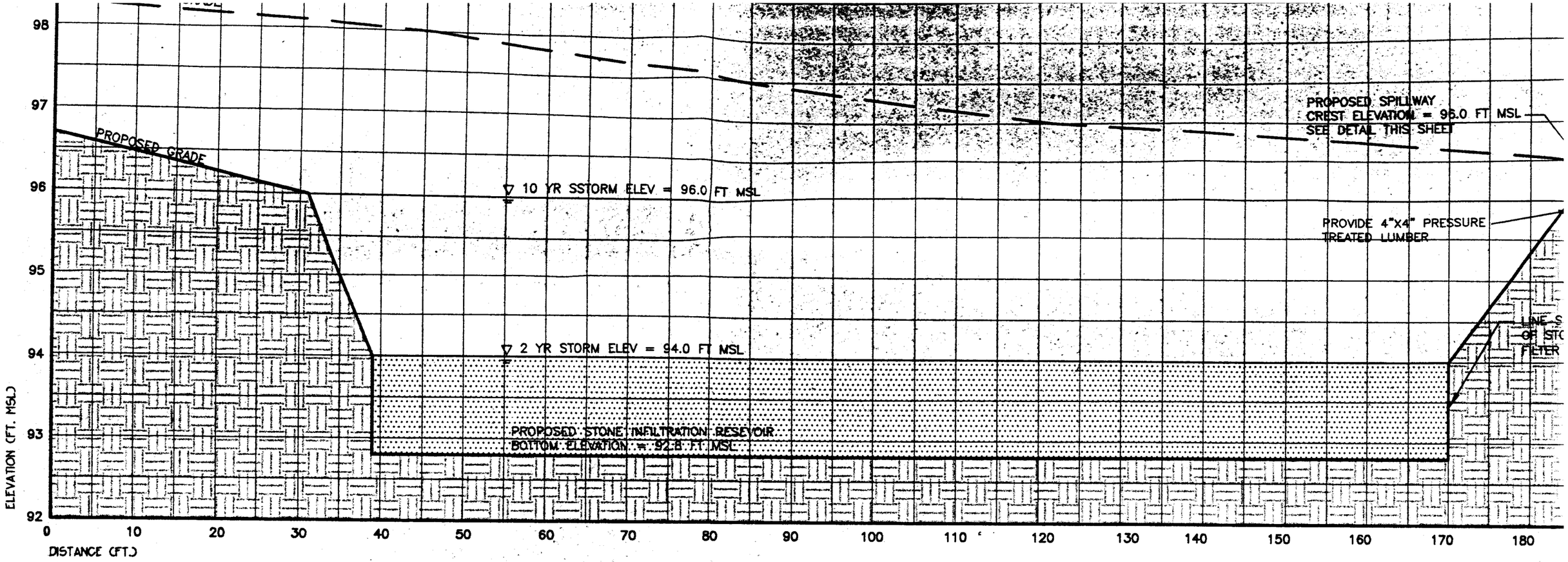


BMP #1 SECTION: A-A'

VERTICAL SCALE: 1" = 5'. HORIZONTAL SCALE 1" = 10'

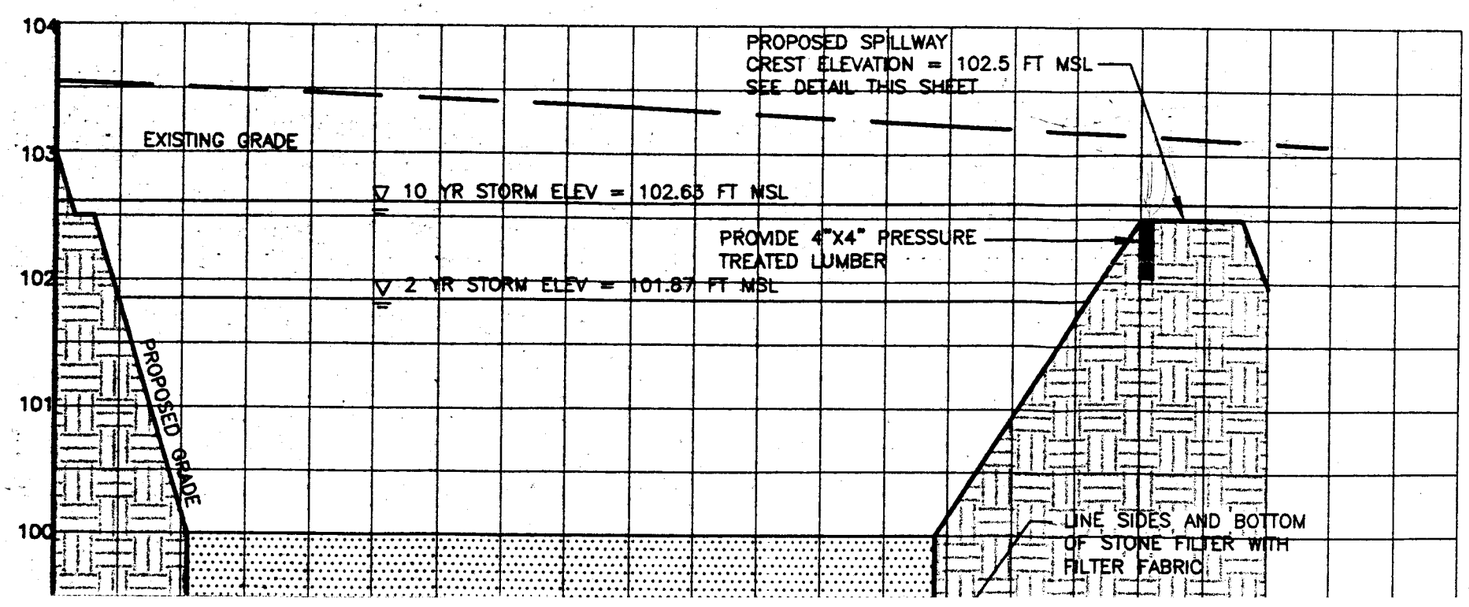


NOTE: ALL STONE USED IN THE INFILTRATION TRENC
IS TO BE CLEANED OR WASHED VDOT #57 S

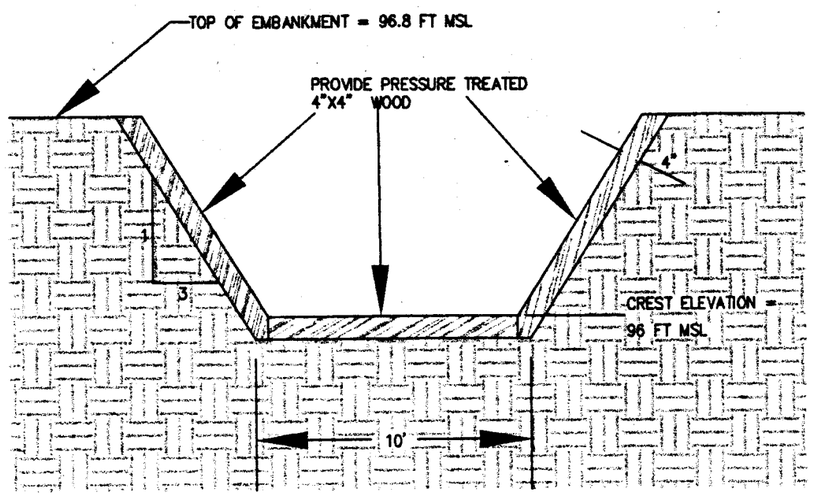


BMP #1 SECTION: A-A'

VERTICAL SCALE: 1" = 5', HORIZONTAL SCALE 1" = 10'



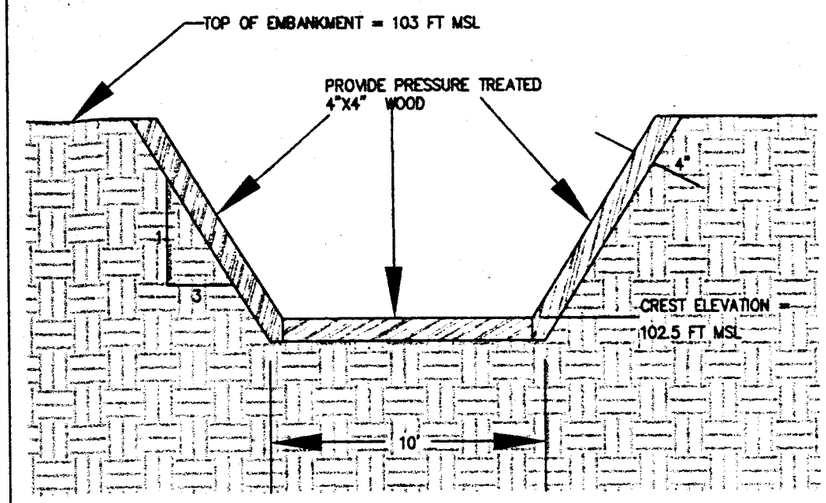
NOTE: ALL STONE USED IN THE INFILTRATION
IS TO BE CLEANED OR WASHED VDOT



SECTION VIEW

DETAIL: BMP #1 SPILLWAY

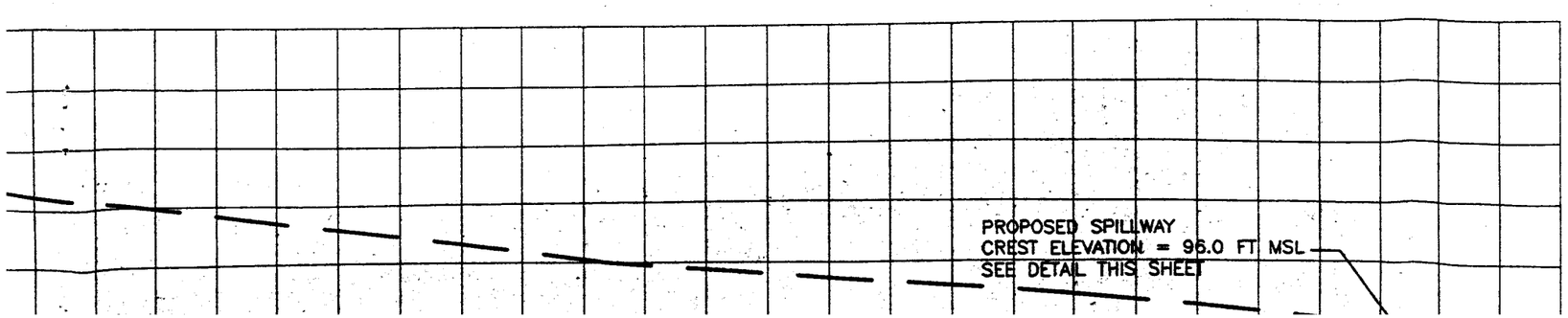
NTS



SECTION VIEW

DETAIL: BMP #2 SPILLWAY

NTS



ENGINEERING CONSULTING SERVICES, LTD.
Geotechnical • Construction Materials • Environmental

July 9, 1999

Mr. Erik L. Allen, P.E.
Williamsburg Environmental Group, Inc.
3000 Easter Circle
Williamsburg, Virginia 23188

Post-it® Fax Note 7671	Date 12 July 99	# of pages ▶ 3
To Erik Allen	From Mark Jenkins	
Co./Dept. WEG	Co. ECS	
Phone #	Phone #	
Fax # 229-4507	Fax #	

Reference: **Pineland Nursery**
Infiltration Structures
James City County, Virginia

ECS Project No. R5330

Dear Mr. Allen:

Pursuant to your request, ECS, Ltd. has performed an infiltration investigation at the site of the above referenced project. The purpose of this investigation was to provide estimates of infiltration rates for the proposed BMPs (BMP1 and BMP2). This exploration was accomplished by performing a hand auger boring at each proposed BMP location to a depth of 10 feet below existing surface grades, visually classifying the soils encountered within each hand auger boring and performing gradation analyses on selected soil samples. The field and laboratory data, as well information obtained from the Soil Survey of James City County, were then used to estimate the infiltration coefficients for each BMP.

The soil deposits encountered in the hand auger borings were classified in the field in general accordance with ASTM D-2488 (Description and Identification of Soils - Visual/Manual Procedures). Groundwater was not encountered in either hand auger boring. Field classification indicated that the subsurface soils were generally arranged as follows:

BMP-1:
0.0-1.0 feet: Topsoil and Rootmat
1.0-2.0 feet: Tan, Silty Fine SAND (SP-SM)
2.0-2.5 feet: Orangish Brown, Moist, Fine Sandy CLAY (CL-SC)
2.5-5.0 feet: Yellowish Brown, Moist, Silty Fine SAND (SM)
5.0-9.5 feet: Light Brown and Yellowish Brown, Moist, Silty Fine SAND (SM), Trace Clay
9.5-10. feet: Orangish Brown, Moist, Silty Fine SAND (SM)

BMP-2:
0.0-0.8 feet: Topsoil
0.8-1.5 feet. Tan and Light Brown, Silty Fine SAND (SM)
1.5-3.5 feet: Orangish Brown, Moist, Fine Sandy CLAY (CL-SC)
3.5-4.0 feet: Orangish Brown, Moist, Silty Fine SAND (SM)
4.0-9.0 feet: Orangish Brown, Moist, Silty and Clayey Fine SAND (SM-SC)
9.0-10. feet: Yellowish Brown, Moist, Silty Fine SAND (SM)

Based on the Soil Survey of James City County, these soils deposits appear to consist of the Kempsville (19B) soil series, and our field observations are consistent with this series.

Soil samples representing the Silty to Clayey Fine SAND (SM-SC and SM) stratum encountered in the hand auger borings below a depth of about 5 feet (proposed infiltration depth) were collected and returned to our Williamsburg soils laboratory for moisture content and sieve analysis (full gradation). The results of this testing and our estimated are summarized in the following table:

Boring Number	Sample Number	Depth (feet)	% Passing #200 Sieve	Natural Moisture Content (%)	Estimated Infiltration Rate (in/hr)	USCS Symbol
BMP-1	2	6.0-6.5	26.0	11.7	1.0	SM
BMP-2	1	5.5-6.0	36.0	18.6	0.6	SM-SC

We have appreciated the opportunity to be of service to The Williamsburg Environmental Group, Inc. on this project. Please call if we can be of any further assistance, or if you have any questions with regard to the information submitted herein.

Respectfully,

ENGINEERING CONSULTING SERVICES, LTD.

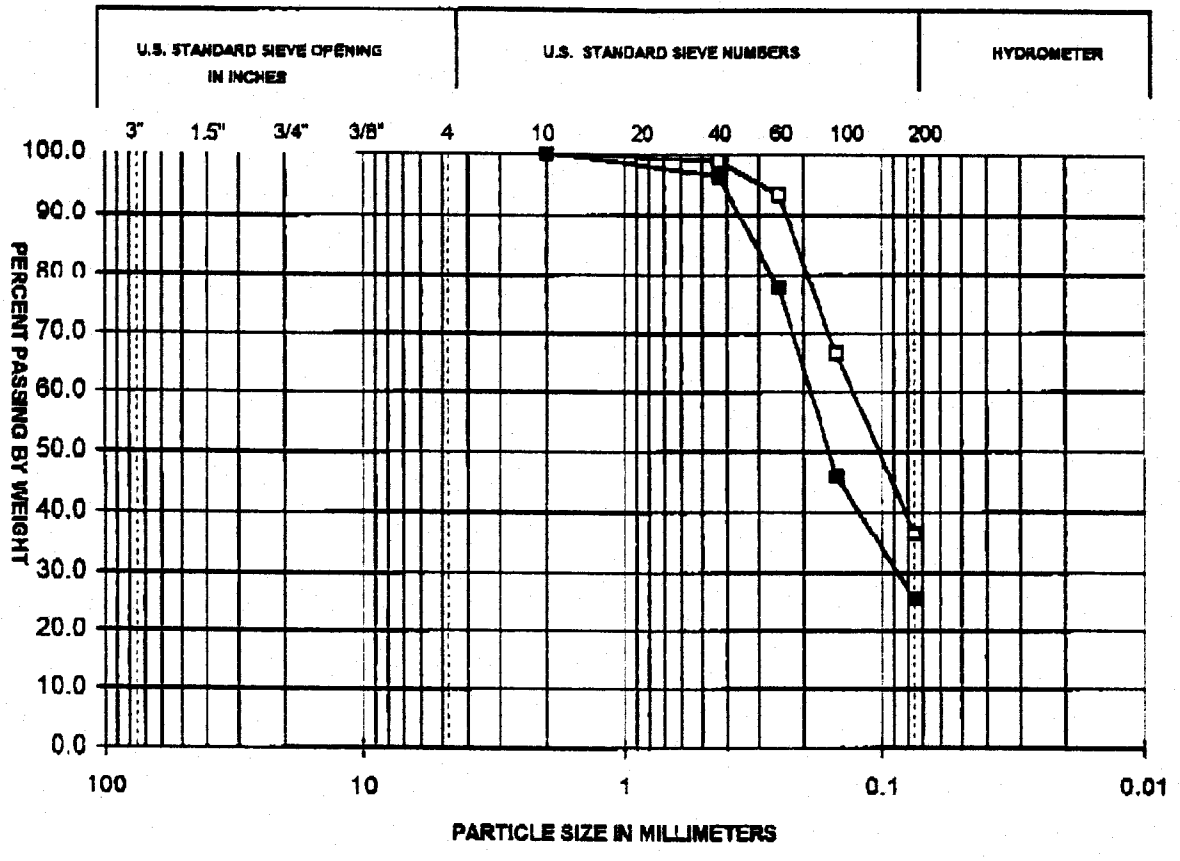
Mark L. Jenkins

Mark L. Jenkins, P.E.
Project Engineer

COMMONWEALTH OF VIRGINIA
MARK L. JENKINS
NO. 28153
PROFESSIONAL ENGINEER

Enclosure: Gradation Curves

amm\cd\R5330bmp.doc



Boring/ Sample No.	Depth (feet)	Symbol	LL	PI	Description
/ 1	5.5 - 6'	□			Orangish Brown, Moist, Silty and Clayey Fine SAND
/ 2	6 - 6.5'	■			Yellowish Brown, Moist, Silty Fine SAND
/		△			0
/		▲			0

Project: Pineland Nursery
Project No.: R5330

Date: 6/23/99

Engineering Consulting Services, Ltd
Richmond, Virginia

Particle Size Distribution Curves

Pinelands Nursery
Hydrologic/Hydraulic
Summary

Pre-Development Hydrology

BMP #1

Structure 1									
Pre-development									
		Area				Curve Number			Composit
		Total	A	B	C	A	B	C	
Post-development									
	Forested	1.83	0.65	1.18	0	30	55	70	46.12
	Planted Boxes	0	0	0	0	40	40	40	0.00
	House	0	0	0	0	98	98	98	0.00
	Gravel Roadway/Parking	0	0	0	0	72	82	87	0.00
	Grass Walkway	0	0	0	0	77	86	91	0.00
	Planting Area	0	0	0	0	77	86	91	0.00
	Lawn	0	0	0	0	39	61	74	0.00
	Total	1.83	0.65	1.18	0				46.12

Structure 1									
Post-development									
		Area				Curve Number			Composit
		Total	A	B	C	A	B	C	
Post-development									
	Forested	0.33	0	0.33	0	30	55	70	9.92
	Planted Boxes	0.18	0.08	0.1	0	40	40	40	3.93
	House	0.25	0	0.25	0	98	98	98	13.39
	Gravel Roadway/Parking	0.28	0.18	0.1	0	72	82	87	11.56
	Grass Walkways	0.18	0.08	0.1	0	39	61	74	5.04
	Planting Area	0.61	0.41	0.2	0	39	61	74	15.40
	Lawn	0	0	0	0	39	61	74	0.00
	Total	1.83	0.75	1.08	0				59.25

Return Frequency: 2 years

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

Executed: 05-10-1999 07:30:44
Watershed file: --> C:\PONDPACK\PINEPRE1.MOP
Hydrograph file: --> C:\PONDPACK\PINPS2.HYD

BMP #1 Pre-development Hydrographs

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

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
Composit	1.83	46.0	0.50	0.00	3.50	0.10	I.67 .50

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

Total area = 1.83 acres or 0.00286 sq.mi
Peak discharge = 0 cfs

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

Subarea Description	Input Values Tc (hr)	Input Values * Tt (hr)	Rounded Values Tc (hr)	Rounded Values * Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
Composit	0.50	0.00	**	**	No	Computed Ia/p > .5

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

Return Frequency: 2 years

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

Executed: 05-10-1999 07:30:44
Watershed file: --> C:\PONDPACK\PINEPRE1.MOP
Hydrograph file: --> C:\PONDPACK\PINPS2.HYD

BMP #1 Pre-development Hydrographs

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

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
Composit	0	0.0
Composite Watershed	0	0.0

Return Frequency: 2 years

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

Executed: 05-10-1999 07:30:44
Watershed file: --> C:\PONDPACK\PINEPRE1.MOP
Hydrograph file: --> C:\PONDPACK\PINPS2.HYD

BMP #1 Pre-development Hydrographs

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
Composit	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
Composit	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
Composit	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
Composit	0	0	0	0	0
Total (cfs)	0	0	0	0	0

Return Frequency: 10 years

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

Executed: 05-10-1999 07:30:44
Watershed file: --> C:\PONDPACK\PINEPRE1.MOP
Hydrograph file: --> C:\PONDPACK\PINPS10.HYD

BMP #1 Pre-development Hydrographs

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

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
Composit	1.83	46.0	0.50	0.00	5.70	0.74	I.41 .41

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

Total area = 1.83 acres or 0.00286 sq.mi
Peak discharge = 1 cfs

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

Subarea Description	Input Values Tc (hr)	Input Values * Tt (hr)	Rounded Values Tc (hr)	Rounded Values * Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
Composit	0.50	0.00	**	**	Yes	--

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

Return Frequency: 10 years

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

Executed: 05-10-1999 07:30:44
Watershed file: --> C:\PONDPACK\PINEPRE1.MOP
Hydrograph file: --> C:\PONDPACK\PINPS10.HYD

BMP #1 Pre-development Hydrographs

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

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
Composit	1	12.4
Composite Watershed	1	12.4

Return Frequency: 10 years

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

Executed: 05-10-1999 07:30:44
Watershed file: --> C:\PONDPACK\PINEPRE1.MOP
Hydrograph file: --> C:\PONDPACK\PINPS10.HYD

BMP #1 Pre-development Hydrographs

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
Composit	0	0	0	0	0	0	0	0	1
Total (cfs)	0	0	0	0	0	0	0	0	1

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
Composit	1	1	1	0	0	0	0	0	0
Total (cfs)	1	1	1	0	0	0	0	0	0

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
Composit	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
Composit	0	0	0	0	0
Total (cfs)	0	0	0	0	0

Return Frequency: 100 years

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

Executed: 05-10-1999 07:30:44
Watershed file: --> C:\PONDPACK\PINEPRE1.MOP
Hydrograph file: --> C:\PONDPACK\PINPS100.HYD

BMP #1 Pre-development Hydrographs

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

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
Composit	1.83	46.0	0.50	0.00	8.10	1.89	I.29 .29

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

Total area = 1.83 acres or 0.00286 sq.mi
Peak discharge = 2 cfs

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

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
Composit	0.50	0.00	**	**	Yes	--

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

Return Frequency: 100 years

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

Executed: 05-10-1999 07:30:44
Watershed file: --> C:\PONDPACK\PINEPRE1.MOP
Hydrograph file: --> C:\PONDPACK\PINPS100.HYD

BMP #1 Pre-development Hydrographs

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

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
Composit	2	12.3
Composite Watershed	2	12.3

Return Frequency: 100 years

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

Executed: 05-10-1999 07:30:44
Watershed file: --> C:\PONDPACK\PINEPRE1.MOP
Hydrograph file: --> C:\PONDPACK\PINPS100.HYD

BMP #1 Pre-development Hydrographs

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
Composit	0	0	0	0	0	0	1	2	2
Total (cfs)	0	0	0	0	0	0	1	2	2

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
Composit	2	2	2	1	1	1	1	0	0
Total (cfs)	2	2	2	1	1	1	1	0	0

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
Composit	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
Composit	0	0	0	0	0
Total (cfs)	0	0	0	0	0

BMP #2

Structure 2										
Pre-development										
		Area				Curve Number			Composit	
		Total	A	B	C	A	B	C		
Post-development										
	Forested	0.6	0	0.6	0	30	55	70	18.86	
	Planted Boxes	0.05	0	0.05	0	40	40	40	1.14	
	House	0.05	0	0.05	0	98	98	98	2.80	
	Gravel Roadway/Parking	0.22	0	0.22	0	72	82	87	10.31	
	#57 Gravel	0.09	0	0.09	0	72	82	87	4.22	
	Planting Area	0	0	0	0	50	50	50	0.00	
	Lawn	0.3	0	0.3	0	39	61	74	10.46	
	Total	1.31	0	1.31	0				47.78	

Structure 2									
Post-development									
		Area				Curve Number			Composit
		Total	A	B	C	A	B	C	
Post-development									
	Forested	0.56	0	0.56	0	30	55	70	23.51
	Planted Boxes	0.05	0	0.05	0	40	40	40	1.53
	House	0.09	0	0.09	0	98	98	98	6.73
	Gravel Roadway/Parking	0.32	0	0.32	0	72	82	87	20.03
	Grass Walkways	0	0	0	0	39	61	74	0.00
	#57 Gravel	0.09	0	0.09	0	72	82	87	5.63
	Lawn	0.2	0	0.2	0	39	61	74	9.31
	Total	1.31	0	1.31	0				66.75

Return Frequency: 2 years

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

Executed: 05-21-1999 16:35:44
Watershed file: --> C:\PONDPACK\PINEPRE2.MOP
Hydrograph file: --> C:\PONDPACK\PINPS2.HYD

Pinelands BMP #2 Pre-development Hydrographs

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

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
Composit	1.31	48.0	0.50	0.00	3.50	0.15	I.62 .50

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

Total area = 1.31 acres or 0.00205 sq.mi
Peak discharge = 0 cfs

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

Subarea Description	Input Values Tc (hr)	Input Values * Tt (hr)	Rounded Values Tc (hr)	Rounded Values * Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
Composit	0.50	0.00	**	**	No	Computed Ia/p > .5

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

Return Frequency: 2 years

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

Executed: 05-21-1999 16:35:44
Watershed file: --> C:\PONDPACK\PINEPRE2.MOP
Hydrograph file: --> C:\PONDPACK\PINPS2.HYD

Pinelands BMP #2 Pre-development Hydrographs

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

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
Composit	0	0.0
Composite Watershed	0	0.0

Return Frequency: 2 years

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

Executed: 05-21-1999 16:35:44
Watershed file: --> C:\PONDPACK\PINEPRE2.MOP
Hydrograph file: --> C:\PONDPACK\PINPS2.HYD

Pinelands BMP #2 Pre-development Hydrographs

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
Composit	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
Composit	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
Composit	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
Composit	0	0	0	0	0
Total (cfs)	0	0	0	0	0

Return Frequency: 10 years

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

Executed: 05-21-1999 16:35:44
Watershed file: --> C:\PONDPACK\PINEPRE2.MOP
Hydrograph file: --> C:\PONDPACK\PINPS10.HYD

Pinelands BMP #2 Pre-development Hydrographs

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

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
Composit	1.31	48.0	0.50	0.00	5.70	0.87	I.38 .38

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

Total area = 1.31 acres or 0.00205 sq.mi
Peak discharge = 1 cfs

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

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
Composit	0.50	0.00	**	**	Yes	--

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

Return Frequency: 10 years

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

Executed: 05-21-1999 16:35:44
Watershed file: --> C:\PONDPACK\PINEPRE2.MOP
Hydrograph file: --> C:\PONDPACK\PINPS10.HYD

Pinelands BMP #2 Pre-development Hydrographs

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

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
Composit	1	12.4
Composite Watershed	1	12.4

Return Frequency: 100 years

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

Executed: 05-21-1999 16:35:44
Watershed file: --> C:\PONDPACK\PINEPRE2.MOP
Hydrograph file: --> C:\PONDPACK\PINPS100.HYD

Pinelands BMP #2 Pre-development Hydrographs

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

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
Composit	1.31	48.0	0.50	0.00	8.10	2.10	I.27 .27

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

Total area = 1.31 acres or 0.00205 sq.mi
Peak discharge = 2 cfs

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

Subarea Description	Input Values Tc (hr)	Input Values * Tt (hr)	Rounded Values Tc (hr)	Rounded Values * Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
Composit	0.50	0.00	**	**	Yes	--

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

Return Frequency: 100 years

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

Executed: 05-21-1999 16:35:44
Watershed file: --> C:\PONDPACK\PINEPRE2.MOP
Hydrograph file: --> C:\PONDPACK\PINPS100.HYD

Pinelands BMP #2 Pre-development Hydrographs

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

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
Composit	2	12.4
Composite Watershed	2	12.4

Return Frequency: 100 years

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

Executed: 05-21-1999 16:35:44
Watershed file: --> C:\PONDPACK\PINEPRE2.MOP
Hydrograph file: --> C:\PONDPACK\PINPS100.HYD

Pinelands BMP #2 Pre-development Hydrographs

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
Composit	0	0	0	0	0	0	1	1	2
Total (cfs)	0	0	0	0	0	0	1	1	2

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
Composit	2	2	1	1	1	0	0	0	0
Total (cfs)	2	2	1	1	1	0	0	0	0

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
Composit	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
Composit	0	0	0	0	0
Total (cfs)	0	0	0	0	0

Post-Development Hydrology

BMP #1

Return Frequency: 2 years

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

Executed: 05-10-1999 07:31:16
Watershed file: --> C:\PONDPACK\PINEPST1.MOP
Hydrograph file: --> C:\PONDPACK\PINPS2.HYD

BMP #1 Post-development Hydrographs

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

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used	
Composit	1.83	59.0	0.50	0.00	3.50	0.49	I.4	.40

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

Total area = 1.83 acres or 0.00286 sq.mi
Peak discharge = 0 cfs

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

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
Composit	0.50	0.00	**	**	Yes	--

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

Return Frequency: 2 years

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

Executed: 05-10-1999 07:31:16
Watershed file: --> C:\PONDPACK\PINEPST1.MOP
Hydrograph file: --> C:\PONDPACK\PINPS2.HYD

BMP #1 Post-development Hydrographs

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

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
Composit	0	0.0
Composite Watershed	0	0.0

Return Frequency: 2 years

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

Executed: 05-10-1999 07:31:16
Watershed file: --> C:\PONDPACK\PINEPST1.MOP
Hydrograph file: --> C:\PONDPACK\PINPS2.HYD

BMP #1 Post-development Hydrographs

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
Composit	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
Composit	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
Composit	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
Composit	0	0	0	0	0
Total (cfs)	0	0	0	0	0

Return Frequency: 10 years

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

Executed: 05-10-1999 07:31:16
Watershed file: --> C:\PONDPACK\PINEPST1.MOP
Hydrograph file: --> C:\PONDPACK\PINPS10.HYD

BMP #1 Post-development Hydrographs

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

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
Composit	1.83	59.0	0.50	0.00	5.70	1.65	I.24 .24

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

Total area = 1.83 acres or 0.00286 sq.mi
Peak discharge = 2 cfs

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

Subarea Description	Input Values Tc (hr)	Input Values * Tt (hr)	Rounded Values Tc (hr)	Rounded Values * Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
Composit	0.50	0.00	**	**	Yes	--

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

Return Frequency: 10 years

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

Executed: 05-10-1999 07:31:16
Watershed file: --> C:\PONDPACK\PINEPST1.MOP
Hydrograph file: --> C:\PONDPACK\PINPS10.HYD

BMP #1 Post-development Hydrographs

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

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
Composit	2	12.3
Composite Watershed	2	12.3

Return Frequency: 10 years

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

Executed: 05-10-1999 07:31:16
Watershed file: --> C:\PONDPACK\PINEPST1.MOP
Hydrograph file: --> C:\PONDPACK\PINPS10.HYD

BMP #1 Post-development Hydrographs

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
Composit	0	0	0	0	0	0	1	2	2
Total (cfs)	0	0	0	0	0	0	1	2	2

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
Composit	2	2	1	1	1	1	0	0	0
Total (cfs)	2	2	1	1	1	1	0	0	0

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
Composit	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
Composit	0	0	0	0	0
Total (cfs)	0	0	0	0	0

Return Frequency: 100 years

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

Executed: 05-10-1999 07:31:16
Watershed file: --> C:\PONDPACK\PINEPST1.MOP
Hydrograph file: --> C:\PONDPACK\PINPS100.HYD

BMP #1 Post-development Hydrographs

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

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used	
Composit	1.83	59.0	0.50	0.00	8.10	3.30	I.17	.17

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

Total area = 1.83 acres or 0.00286 sq.mi
Peak discharge = 5 cfs

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

Subarea Description	Input Values Tc (hr)	Input Values * Tt (hr)	Rounded Values Tc (hr)	Rounded Values * Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
Composit	0.50	0.00	**	**	Yes	--

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

Return Frequency: 100 years

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

Executed: 05-10-1999 07:31:16
Watershed file: --> C:\PONDPACK\PINEPST1.MOP
Hydrograph file: --> C:\PONDPACK\PINPS100.HYD

BMP #1 Post-development Hydrographs

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

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
Composit	5	12.4
Composite Watershed	5	12.4

Return Frequency: 100 years

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

Executed: 05-10-1999 07:31:16
Watershed file: --> C:\PONDPACK\PINEPST1.MOP
Hydrograph file: --> C:\PONDPACK\PINPS100.HYD

BMP #1 Post-development Hydrographs

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
Composit	0	0	0	0	1	1	2	4	5
Total (cfs)	0	0	0	0	1	1	2	4	5

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
Composit	5	4	3	2	1	1	1	1	1
Total (cfs)	5	4	3	2	1	1	1	1	1

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
Composit	1	0	0	0	0	0	0	0	0
Total (cfs)	1	0	0	0	0	0	0	0	0

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
Composit	0	0	0	0	0
Total (cfs)	0	0	0	0	0

BMP #2

Return Frequency: 2 years

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

Executed: 05-21-1999 16:29:47
Watershed file: --> C:\PONDPACK\PINEPST2.MOP
Hydrograph file: --> C:\PONDPACK\PINPS2.HYD

BMP #2 Post-development Hydrographs

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

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
Composit	1.31	67.0	0.50	0.00	3.50	0.85	I.28 .28

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

Total area = 1.31 acres or 0.00205 sq.mi
Peak discharge = 1 cfs

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

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
Composit	0.50	0.00	**	**	Yes	--

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

Return Frequency: 2 years

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

Executed: 05-21-1999 16:29:47
Watershed file: --> C:\PONDPACK\PINEPST2.MOP
Hydrograph file: --> C:\PONDPACK\PINPS2.HYD

BMP #2 Post-development Hydrographs

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

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
Composit	1	12.3
Composite Watershed	1	12.3

Return Frequency: 2 years

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

Executed: 05-21-1999 16:29:47
Watershed file: --> C:\PONDPACK\PINEPST2.MOP
Hydrograph file: --> C:\PONDPACK\PINPS2.HYD

BMP #2 Post-development Hydrographs

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
Composit	0	0	0	0	0	0	0	1	1
Total (cfs)	0	0	0	0	0	0	0	1	1

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
Composit	1	1	1	0	0	0	0	0	0
Total (cfs)	1	1	1	0	0	0	0	0	0

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
Composit	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
Composit	0	0	0	0	0
Total (cfs)	0	0	0	0	0

Return Frequency: 10 years

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

Executed: 05-21-1999 16:29:47
Watershed file: --> C:\PONDPACK\PINEPST2.MOP
Hydrograph file: --> C:\PONDPACK\PINPS10.HYD

BMP #2 Post-development Hydrographs

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

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
Composit	1.31	67.0	0.50	0.00	5.70	2.31	I.17 .17

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

Total area = 1.31 acres or 0.00205 sq.mi
Peak discharge = 2 cfs

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

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
Composit	0.50	0.00	**	**	Yes	--

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

Return Frequency: 10 years

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

Executed: 05-21-1999 16:29:47
Watershed file: --> C:\PONDPACK\PINEPST2.MOP
Hydrograph file: --> C:\PONDPACK\PINPS10.HYD

BMP #2 Post-development Hydrographs

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

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
Composit	2	12.3
Composite Watershed	2	12.3

Return Frequency: 10 years

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

Executed: 05-21-1999 16:29:47
Watershed file: --> C:\PONDPACK\PINEPST2.MOP
Hydrograph file: --> C:\PONDPACK\PINPS10.HYD

BMP #2 Post-development Hydrographs

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
Composit	0	0	0	0	0	1	1	2	2
Total (cfs)	0	0	0	0	0	1	1	2	2

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
Composit	2	2	1	1	1	0	0	0	0
Total (cfs)	2	2	1	1	1	0	0	0	0

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
Composit	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
Composit	0	0	0	0	0
Total (cfs)	0	0	0	0	0

Return Frequency: 100 years

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

Executed: 05-21-1999 16:29:47
Watershed file: --> C:\PONDPACK\PINEPST2.MOP
Hydrograph file: --> C:\PONDPACK\PINPS100.HYD

BMP #2 Post-development Hydrographs

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

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
Composit	1.31	67.0	0.50	0.00	8.10	4.20	I.12 .12

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

Total area = 1.31 acres or 0.00205 sq.mi
Peak discharge = 4 cfs

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

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
Composit	0.50	0.00	**	**	Yes	--

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

Return Frequency: 100 years

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

Executed: 05-21-1999 16:29:47
Watershed file: --> C:\PONDPACK\PINEPST2.MOP
Hydrograph file: --> C:\PONDPACK\PINPS100.HYD

BMP #2 Post-development Hydrographs

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

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
Composit	4	12.3
Composite Watershed	4	12.3

Return Frequency: 100 years

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

Executed: 05-21-1999 16:29:47
Watershed file: --> C:\PONDPACK\PINEPST2.MOP
Hydrograph file: --> C:\PONDPACK\PINPS100.HYD

BMP #2 Post-development Hydrographs

Composite Hydrograph Summary (cfs)

Subarea Description	11.0 hr	11.3 hr	11.6 hr	11.9 hr	12.0 hr	12.1 hr	12.2 hr	12.3 hr	12.4 hr
Composit	0	0	0	0	1	1	3	4	4
Total (cfs)	0	0	0	0	1	1	3	4	4

Subarea Description	12.5 hr	12.6 hr	12.7 hr	12.8 hr	13.0 hr	13.2 hr	13.4 hr	13.6 hr	13.8 hr
Composit	4	3	3	2	1	1	1	1	0
Total (cfs)	4	3	3	2	1	1	1	1	0

Subarea Description	14.0 hr	14.3 hr	14.6 hr	15.0 hr	15.5 hr	16.0 hr	16.5 hr	17.0 hr	17.5 hr
Composit	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	18.0 hr	19.0 hr	20.0 hr	22.0 hr	26.0 hr
Composit	0	0	0	0	0
Total (cfs)	0	0	0	0	0

Stage-Storage

BMP #1

POND-2 Version: 5.20
S/N:

BMP #1 Stage/Storage Data

CALCULATED 05-10-1999 07:34:23
DISK FILE: c:\pondpack\PINEPST1.VOL

Planimeter scale: 1 inch = 1 ft.

Elevation (ft)	Planimeter (sq.in.)	Area (acres)	A1+A2+sqr(A1*A2) (acres)	* Volume (acre-ft)	Volume Sum (acre-ft)
94.00	1,753.00	0.04	0.00	0.00	0.00
95.00	*I*	0.06	0.15	0.05	0.05
96.00	3,718.00	0.09	0.18	0.12	0.12
97.25	3,750.00	0.09	0.26	0.11	0.23

I ---> Interpolated area from closest two planimeter readings.

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

BMP #2

POND-2 Version: 5.20
S/N:

BMP #2 Stage/Storage Data

CALCULATED 05-21-1999 16:33:39
DISK FILE: c:\pondpack\PINEPST2.VOL

Planimeter scale: 1 inch = 1 ft.

Elevation (ft)	Planimeter (sq.in.)	Area (acres)	A1+A2+sqr(A1*A2) (acres)	* Volume (acre-ft)	Volume Sum (acre-ft)
100.00	741.00	0.02	0.00	0.00	0.00
101.00	*I*	0.03	0.07	0.02	0.02
102.00	1,785.00	0.04	0.08	0.06	0.06
102.50	2,047.00	0.05	0.13	0.02	0.08
103.00	2,744.00	0.06	0.16	0.03	0.11

I ---> Interpolated area from closest two planimeter readings.

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

Outlet Structure Data

BMP #1

Outlet Structure File: PINEPST1.STR

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

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

Elevation (ft)	Q (cfs)	Contributing Structures
94.00	0.0	
94.06	0.0	
94.12	0.0	
94.18	0.0	
94.24	0.0	
94.30	0.0	
94.36	0.0	
94.42	0.0	
94.48	0.0	
94.54	0.0	
94.60	0.0	
94.66	0.0	
94.72	0.0	
94.78	0.0	
94.84	0.0	
94.90	0.0	
94.96	0.0	
95.02	0.0	
95.08	0.0	
95.14	0.0	
95.20	0.0	
95.26	0.0	
95.32	0.0	
95.38	0.0	
95.44	0.0	
95.50	0.0	
95.56	0.0	
95.62	0.0	
95.68	0.0	
95.74	0.0	
95.80	0.0	
95.86	0.0	
95.92	0.0	
95.98	0.0	
96.04	0.3	1
96.10	1.1	1
96.16	2.1	1
96.22	3.4	1
96.28	4.9	1
96.34	6.6	1
96.40	8.4	1
96.46	10.3	1
96.50	11.7	1

Outlet Structure File: PINEPST1.STR

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

Outlet Structure File: c:\pondpack\PINEPST1.STR
Planimeter Input File: c:\pondpack\PINEPST1.VOL
Rating Table Output File: c:\pondpack\PINEPST1.PND

Min. Elev.(ft) = 94 Max. Elev.(ft) = 96.5 Incr.(ft) = .06

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

****
SYSTEM CONNECTIVITY
****

Structure	No.	Q Table		Q Table
WEIR-VR	1		->	1

Outflow rating table summary was stored in file:
c:\pondpack\PINEPST1.PND

Outlet Structure File: PINEPST1.STR

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

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

WEIR-VR
Weir - Vertical Rectangular

E1 elev.(ft)?	96
E2 elev.(ft)?	96.501
Weir coefficient?	3.33
Weir elev.(ft)?	96
Length (ft)?	10
Contracted/Suppressed (C/S)?	C

Outlet Structure File: PINEPST1.STR

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

Outflow Rating Table for Structure #1
WEIR-VR Weir - Vertical Rectangular

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

Elevation (ft)	Q (cfs)	Computation Messages
94.00	0.0	E < Inv.El.= 96
94.06	0.0	E < Inv.El.= 96
94.12	0.0	E < Inv.El.= 96
94.18	0.0	E < Inv.El.= 96
94.24	0.0	E < Inv.El.= 96
94.30	0.0	E < Inv.El.= 96
94.36	0.0	E < Inv.El.= 96
94.42	0.0	E < Inv.El.= 96
94.48	0.0	E < Inv.El.= 96
94.54	0.0	E < Inv.El.= 96
94.60	0.0	E < Inv.El.= 96
94.66	0.0	E < Inv.El.= 96
94.72	0.0	E < Inv.El.= 96
94.78	0.0	E < Inv.El.= 96
94.84	0.0	E < Inv.El.= 96
94.90	0.0	E < Inv.El.= 96
94.96	0.0	E < Inv.El.= 96
95.02	0.0	E < Inv.El.= 96
95.08	0.0	E < Inv.El.= 96
95.14	0.0	E < Inv.El.= 96
95.20	0.0	E < Inv.El.= 96
95.26	0.0	E < Inv.El.= 96
95.32	0.0	E < Inv.El.= 96
95.38	0.0	E < Inv.El.= 96
95.44	0.0	E < Inv.El.= 96
95.50	0.0	E < Inv.El.= 96
95.56	0.0	E < Inv.El.= 96
95.62	0.0	E < Inv.El.= 96
95.68	0.0	E < Inv.El.= 96
95.74	0.0	E < Inv.El.= 96
95.80	0.0	E < Inv.El.= 96
95.86	0.0	E < Inv.El.= 96
95.92	0.0	E < Inv.El.= 96
95.98	0.0	E < Inv.El.= 96

Outlet Structure File: PINEPST1.STR

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

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

Outflow Rating Table for Structure #1
WEIR-VR Weir - Vertical Rectangular

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

Elevation (ft)	Q (cfs)	Computation Messages
96.04	0.3	H =.04
96.10	1.1	H =.1
96.16	2.1	H =.16
96.22	3.4	H =.22
96.28	4.9	H =.28
96.34	6.6	H =.34
96.40	8.4	H =.4
96.46	10.3	H =.46
96.50	11.7	H =.5

C = 3.33 L (ft) = 10
H (ft) = Table elev. - Invert elev. (96 ft)
Q (cfs) = C * (L-.2H) * (H**1.5) -- Contracted Weir

BMP #2

Outlet Structure File: PINEPST2.STR

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

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

Elevation (ft)	Q (cfs)	Contributing Structures
100.50	0.0	
100.56	0.0	
100.62	0.0	
100.68	0.0	
100.74	0.0	
100.80	0.0	
100.86	0.0	
100.92	0.0	
100.98	0.0	
101.04	0.0	
101.10	0.0	
101.16	0.0	
101.22	0.0	
101.28	0.0	
101.34	0.0	
101.40	0.0	
101.46	0.0	
101.52	0.0	
101.58	0.0	
101.64	0.0	
101.70	0.0	
101.76	0.0	
101.82	0.0	
101.88	0.0	
101.94	0.0	
102.00	0.0	
102.06	0.0	
102.12	0.0	
102.18	0.0	
102.24	0.0	
102.30	0.0	
102.36	0.0	
102.42	0.0	
102.48	0.0	
102.54	0.3	1
102.60	1.1	1
102.66	2.1	1
102.72	3.4	1
102.78	4.9	1
102.84	6.6	1
102.90	8.4	1
102.96	10.3	1
103.00	11.7	1

Outlet Structure File: PINEPST2.STR

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

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

WEIR-VR
Weir - Vertical Rectangular

E1 elev.(ft)?	102.5
E2 elev.(ft)?	103.001
Weir coefficient?	3.33
Weir elev.(ft)?	102.5
Length (ft)?	10
Contracted/Suppressed (C/S)?	C

Outlet Structure File: PINEPST2.STR

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

Outflow Rating Table for Structure #1
WEIR-VR Weir - Vertical Rectangular

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

Elevation (ft)	Q (cfs)	Computation Messages
100.50	0.0	E < Inv.El.= 102.5
100.56	0.0	E < Inv.El.= 102.5
100.62	0.0	E < Inv.El.= 102.5
100.68	0.0	E < Inv.El.= 102.5
100.74	0.0	E < Inv.El.= 102.5
100.80	0.0	E < Inv.El.= 102.5
100.86	0.0	E < Inv.El.= 102.5
100.92	0.0	E < Inv.El.= 102.5
100.98	0.0	E < Inv.El.= 102.5
101.04	0.0	E < Inv.El.= 102.5
101.10	0.0	E < Inv.El.= 102.5
101.16	0.0	E < Inv.El.= 102.5
101.22	0.0	E < Inv.El.= 102.5
101.28	0.0	E < Inv.El.= 102.5
101.34	0.0	E < Inv.El.= 102.5
101.40	0.0	E < Inv.El.= 102.5
101.46	0.0	E < Inv.El.= 102.5
101.52	0.0	E < Inv.El.= 102.5
101.58	0.0	E < Inv.El.= 102.5
101.64	0.0	E < Inv.El.= 102.5
101.70	0.0	E < Inv.El.= 102.5
101.76	0.0	E < Inv.El.= 102.5
101.82	0.0	E < Inv.El.= 102.5
101.88	0.0	E < Inv.El.= 102.5
101.94	0.0	E < Inv.El.= 102.5
102.00	0.0	E < Inv.El.= 102.5
102.06	0.0	E < Inv.El.= 102.5
102.12	0.0	E < Inv.El.= 102.5
102.18	0.0	E < Inv.El.= 102.5
102.24	0.0	E < Inv.El.= 102.5
102.30	0.0	E < Inv.El.= 102.5
102.36	0.0	E < Inv.El.= 102.5
102.42	0.0	E < Inv.El.= 102.5
102.48	0.0	E < Inv.El.= 102.5

Outlet Structure File: PINEPST2.STR

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

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

Outflow Rating Table for Structure #1
WEIR-VR Weir - Vertical Rectangular

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

Elevation (ft)	Q (cfs)	Computation Messages
102.54	0.3	H =.04
102.60	1.1	H =.1
102.66	2.1	H =.16
102.72	3.4	H =.22
102.78	4.9	H =.28
102.84	6.6	H =.34
102.90	8.4	H =.4
102.96	10.3	H =.46
103.00	11.7	H =.5

C = 3.33 L (ft) = 10
H (ft) = Table elev. - Invert elev. (102.5 ft)
Q (cfs) = C * (L-.2H) * (H**1.5) -- Contracted Weir

Storm Routing Summaries

BMP #1

```
*********************
*                   *
*     Pinelands     *
* BMP #1 Routings   *
*                   *
*                   *
*                   *
*********************
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Inflow Hydrograph: c:\pondpack\PINPS2 .HYD
Rating Table file: c:\pondpack\PINEPST1.PND

----INITIAL CONDITIONS----
Elevation = 94.00 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
94.00	0.0	0.000
94.06	0.0	0.002
94.12	0.0	0.005
94.18	0.0	0.008
94.24	0.0	0.010
94.30	0.0	0.013
94.36	0.0	0.016
94.42	0.0	0.019
94.48	0.0	0.022
94.54	0.0	0.025
94.60	0.0	0.028
94.66	0.0	0.031
94.72	0.0	0.034
94.78	0.0	0.037
94.84	0.0	0.041
94.90	0.0	0.044
94.96	0.0	0.048
95.02	0.0	0.051
95.08	0.0	0.055
95.14	0.0	0.059
95.20	0.0	0.063
95.26	0.0	0.067
95.32	0.0	0.071
95.38	0.0	0.075
95.44	0.0	0.079
95.50	0.0	0.083
95.56	0.0	0.088
95.62	0.0	0.092
95.68	0.0	0.097
95.74	0.0	0.102
95.80	0.0	0.106

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + 0 (cfs)
0.0	0.0
0.6	0.6
1.2	1.2
1.8	1.8
2.5	2.5
3.1	3.1
3.8	3.8
4.5	4.5
5.2	5.2
5.9	5.9
6.7	6.7
7.4	7.4
8.2	8.2
9.0	9.0
9.8	9.8
10.7	10.7
11.5	11.5
12.4	12.4
13.3	13.3
14.2	14.2
15.2	15.2
16.1	16.1
17.1	17.1
18.1	18.1
19.1	19.1
20.2	20.2
21.2	21.2
22.3	22.3
23.4	23.4
24.6	24.6
25.7	25.7

GIVEN POND DATA			INTERMEDIATE ROUTING COMPUTATIONS	
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)	2S/t (cfs)	2S/t + 0 (cfs)
95.86	0.0	0.111	26.9	26.9
95.92	0.0	0.116	28.1	28.1
95.98	0.0	0.121	29.3	29.3
96.04	0.3	0.126	30.5	30.8
96.10	1.1	0.131	31.8	32.9
96.16	2.1	0.136	33.0	35.1
96.22	3.4	0.142	34.3	37.7
96.28	4.9	0.147	35.5	40.4
96.34	6.6	0.152	36.8	43.4
96.40	8.4	0.157	38.0	46.4
96.46	10.3	0.162	39.2	49.5
96.50	11.7	0.166	40.1	51.8

Time increment (t) = 0.100 hrs.

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

Pond File: c:\pondpack\PINEPST1.PND
Inflow Hydrograph: c:\pondpack\PINPS2 .HYD
Outflow Hydrograph: c:\pondpack\KDD-2 .HYD

Starting Pond W.S. Elevation = 94.00 ft

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

Peak Inflow = 0.00 cfs
Peak Outflow = 0.00 cfs
Peak Elevation = 94.00 ft

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

Initial Storage = 0.00 ac-ft
Peak Storage From Storm = 0.00 ac-ft

Total Storage in Pond = 0.00 ac-ft

>>>>>> Warning, peak outflow = last ordinate point. <<<<<<

>>>>>> Warning, peak outflow = last ordinate point. <<<<<<

```
*********************
*                   *
*     Pinelands     *
* BMP #1 Routings   *
*                   *
*                   *
*                   *
*********************
```

Inflow Hydrograph: c:\pondpack\PINPS10 .HYD
Rating Table file: c:\pondpack\PINEPST1.PND

----INITIAL CONDITIONS----
Elevation = 94.00 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
94.00	0.0	0.000
94.06	0.0	0.002
94.12	0.0	0.005
94.18	0.0	0.008
94.24	0.0	0.010
94.30	0.0	0.013
94.36	0.0	0.016
94.42	0.0	0.019
94.48	0.0	0.022
94.54	0.0	0.025
94.60	0.0	0.028
94.66	0.0	0.031
94.72	0.0	0.034
94.78	0.0	0.037
94.84	0.0	0.041
94.90	0.0	0.044
94.96	0.0	0.048
95.02	0.0	0.051
95.08	0.0	0.055
95.14	0.0	0.059
95.20	0.0	0.063
95.26	0.0	0.067
95.32	0.0	0.071
95.38	0.0	0.075
95.44	0.0	0.079
95.50	0.0	0.083
95.56	0.0	0.088
95.62	0.0	0.092
95.68	0.0	0.097
95.74	0.0	0.102
95.80	0.0	0.106

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + 0 (cfs)
0.0	0.0
0.6	0.6
1.2	1.2
1.8	1.8
2.5	2.5
3.1	3.1
3.8	3.8
4.5	4.5
5.2	5.2
5.9	5.9
6.7	6.7
7.4	7.4
8.2	8.2
9.0	9.0
9.8	9.8
10.7	10.7
11.5	11.5
12.4	12.4
13.3	13.3
14.2	14.2
15.2	15.2
16.1	16.1
17.1	17.1
18.1	18.1
19.1	19.1
20.2	20.2
21.2	21.2
22.3	22.3
23.4	23.4
24.6	24.6
25.7	25.7

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
95.86	0.0	0.111
95.92	0.0	0.116
95.98	0.0	0.121
96.04	0.3	0.126
96.10	1.1	0.131
96.16	2.1	0.136
96.22	3.4	0.142
96.28	4.9	0.147
96.34	6.6	0.152
96.40	8.4	0.157
96.46	10.3	0.162
96.50	11.7	0.166

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
26.9	26.9
28.1	28.1
29.3	29.3
30.5	30.8
31.8	32.9
33.0	35.1
34.3	37.7
35.5	40.4
36.8	43.4
38.0	46.4
39.2	49.5
40.1	51.8

Time increment (t) = 0.100 hrs.

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

Pond File: c:\pondpack\PINEPST1.PND
Inflow Hydrograph: c:\pondpack\PINPS10 .HYD
Outflow Hydrograph: c:\pondpack\KDD-10 .HYD

Starting Pond W.S. Elevation = 94.00 ft

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

Peak Inflow = 2.00 cfs
Peak Outflow = 0.14 cfs
Peak Elevation = 96.01 ft

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

Initial Storage = 0.00 ac-ft
Peak Storage From Storm = 0.12 ac-ft

Total Storage in Pond = 0.12 ac-ft

```
*********************
*                   *
*     Pinelands     *
* BMP #1 Routings   *
*                   *
*                   *
*                   *
*********************
```

Inflow Hydrograph: c:\pondpack\PINPS100.HYD
Rating Table file: c:\pondpack\PINEPST1.PND

----INITIAL CONDITIONS----
Elevation = 94.00 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
94.00	0.0	0.000
94.06	0.0	0.002
94.12	0.0	0.005
94.18	0.0	0.008
94.24	0.0	0.010
94.30	0.0	0.013
94.36	0.0	0.016
94.42	0.0	0.019
94.48	0.0	0.022
94.54	0.0	0.025
94.60	0.0	0.028
94.66	0.0	0.031
94.72	0.0	0.034
94.78	0.0	0.037
94.84	0.0	0.041
94.90	0.0	0.044
94.96	0.0	0.048
95.02	0.0	0.051
95.08	0.0	0.055
95.14	0.0	0.059
95.20	0.0	0.063
95.26	0.0	0.067
95.32	0.0	0.071
95.38	0.0	0.075
95.44	0.0	0.079
95.50	0.0	0.083
95.56	0.0	0.088
95.62	0.0	0.092
95.68	0.0	0.097
95.74	0.0	0.102
95.80	0.0	0.106

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
0.6	0.6
1.2	1.2
1.8	1.8
2.5	2.5
3.1	3.1
3.8	3.8
4.5	4.5
5.2	5.2
5.9	5.9
6.7	6.7
7.4	7.4
8.2	8.2
9.0	9.0
9.8	9.8
10.7	10.7
11.5	11.5
12.4	12.4
13.3	13.3
14.2	14.2
15.2	15.2
16.1	16.1
17.1	17.1
18.1	18.1
19.1	19.1
20.2	20.2
21.2	21.2
22.3	22.3
23.4	23.4
24.6	24.6
25.7	25.7

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
95.86	0.0	0.111
95.92	0.0	0.116
95.98	0.0	0.121
96.04	0.3	0.126
96.10	1.1	0.131
96.16	2.1	0.136
96.22	3.4	0.142
96.28	4.9	0.147
96.34	6.6	0.152
96.40	8.4	0.157
96.46	10.3	0.162
96.50	11.7	0.166

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
26.9	26.9
28.1	28.1
29.3	29.3
30.5	30.8
31.8	32.9
33.0	35.1
34.3	37.7
35.5	40.4
36.8	43.4
38.0	46.4
39.2	49.5
40.1	51.8

Time increment (t) = 0.100 hrs.

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

Pond File: c:\pondpack\PINEPST1.PND
Inflow Hydrograph: c:\pondpack\PINPS100.HYD
Outflow Hydrograph: c:\pondpack\KDD-50 .HYD

Starting Pond W.S. Elevation = 94.00 ft

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

Peak Inflow = 5.00 cfs
Peak Outflow = 4.28 cfs
Peak Elevation = 96.26 ft

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

Initial Storage = 0.00 ac-ft
Peak Storage From Storm = 0.14 ac-ft

Total Storage in Pond = 0.14 ac-ft

BMP #2

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*********************
*                   *
*     Pinelands     *
* BMP #2 Routings   *
*                   *
*                   *
*                   *
*********************
```

Inflow Hydrograph: c:\pondpack\PINPS2 .HYD
Rating Table file: c:\pondpack\PINEPST2.PND

----INITIAL CONDITIONS----
Elevation = 100.50 ft
Outflow = 0.00 cfs
Storage = 0.01 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
100.50	0.0	0.010
100.56	0.0	0.011
100.62	0.0	0.012
100.68	0.0	0.014
100.74	0.0	0.015
100.80	0.0	0.017
100.86	0.0	0.018
100.92	0.0	0.020
100.98	0.0	0.022
101.04	0.0	0.023
101.10	0.0	0.025
101.16	0.0	0.027
101.22	0.0	0.029
101.28	0.0	0.030
101.34	0.0	0.032
101.40	0.0	0.034
101.46	0.0	0.036
101.52	0.0	0.038
101.58	0.0	0.040
101.64	0.0	0.042
101.70	0.0	0.045
101.76	0.0	0.047
101.82	0.0	0.049
101.88	0.0	0.051
101.94	0.0	0.054
102.00	0.0	0.056
102.06	0.0	0.059
102.12	0.0	0.061
102.18	0.0	0.064
102.24	0.0	0.066
102.30	0.0	0.069

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
2.4	2.4
2.7	2.7
3.0	3.0
3.4	3.4
3.7	3.7
4.1	4.1
4.4	4.4
4.8	4.8
5.2	5.2
5.6	5.6
6.0	6.0
6.5	6.5
6.9	6.9
7.3	7.3
7.8	7.8
8.3	8.3
8.8	8.8
9.2	9.2
9.8	9.8
10.3	10.3
10.8	10.8
11.3	11.3
11.9	11.9
12.5	12.5
13.0	13.0
13.6	13.6
14.2	14.2
14.8	14.8
15.4	15.4
16.1	16.1
16.7	16.7

GIVEN POND DATA			INTERMEDIATE ROUTING COMPUTATIONS	
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)	2S/t (cfs)	2S/t + 0 (cfs)
102.36	0.0	0.072	17.4	17.4
102.42	0.0	0.075	18.0	18.0
102.48	0.0	0.077	18.7	18.7
102.54	0.3	0.080	19.4	19.7
102.60	1.1	0.083	20.1	21.2
102.66	2.1	0.086	20.8	22.9
102.72	3.4	0.089	21.6	25.0
102.78	4.9	0.093	22.4	27.3
102.84	6.6	0.096	23.2	29.8
102.90	8.4	0.100	24.1	32.5
102.96	10.3	0.103	25.0	35.3
103.00	11.7	0.106	25.6	37.3

Time increment (t) = 0.100 hrs.

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

Pond File: c:\pondpack\PINEPST2.PND
Inflow Hydrograph: c:\pondpack\PINPS2 .HYD
Outflow Hydrograph: c:\pondpack\KDD-2 .HYD

Starting Pond W.S. Elevation = 100.50 ft

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

Peak Inflow = 1.00 cfs
Peak Outflow = 0.00 cfs
Peak Elevation = 101.87 ft

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

Initial Storage = 0.01 ac-ft
Peak Storage From Storm = 0.04 ac-ft

Total Storage in Pond = 0.05 ac-ft

>>>>>> Warning, peak outflow = last ordinate point. <<<<<<

>>>>>> Warning, peak outflow = last ordinate point. <<<<<<

```
*********************
*                   *
*     Pinelands     *
* BMP #2 Routings   *
*                   *
*                   *
*                   *
*********************
```

Inflow Hydrograph: c:\pondpack\PINPS10 .HYD
Rating Table file: c:\pondpack\PINEPST2.PND

----INITIAL CONDITIONS----
Elevation = 100.50 ft
Outflow = 0.00 cfs
Storage = 0.01 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
100.50	0.0	0.010
100.56	0.0	0.011
100.62	0.0	0.012
100.68	0.0	0.014
100.74	0.0	0.015
100.80	0.0	0.017
100.86	0.0	0.018
100.92	0.0	0.020
100.98	0.0	0.022
101.04	0.0	0.023
101.10	0.0	0.025
101.16	0.0	0.027
101.22	0.0	0.029
101.28	0.0	0.030
101.34	0.0	0.032
101.40	0.0	0.034
101.46	0.0	0.036
101.52	0.0	0.038
101.58	0.0	0.040
101.64	0.0	0.042
101.70	0.0	0.045
101.76	0.0	0.047
101.82	0.0	0.049
101.88	0.0	0.051
101.94	0.0	0.054
102.00	0.0	0.056
102.06	0.0	0.059
102.12	0.0	0.061
102.18	0.0	0.064
102.24	0.0	0.066
102.30	0.0	0.069

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + 0 (cfs)
2.4	2.4
2.7	2.7
3.0	3.0
3.4	3.4
3.7	3.7
4.1	4.1
4.4	4.4
4.8	4.8
5.2	5.2
5.6	5.6
6.0	6.0
6.5	6.5
6.9	6.9
7.3	7.3
7.8	7.8
8.3	8.3
8.8	8.8
9.2	9.2
9.8	9.8
10.3	10.3
10.8	10.8
11.3	11.3
11.9	11.9
12.5	12.5
13.0	13.0
13.6	13.6
14.2	14.2
14.8	14.8
15.4	15.4
16.1	16.1
16.7	16.7

GIVEN POND DATA			INTERMEDIATE ROUTING COMPUTATIONS	
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)	2S/t (cfs)	2S/t + 0 (cfs)
102.36	0.0	0.072	17.4	17.4
102.42	0.0	0.075	18.0	18.0
102.48	0.0	0.077	18.7	18.7
102.54	0.3	0.080	19.4	19.7
102.60	1.1	0.083	20.1	21.2
102.66	2.1	0.086	20.8	22.9
102.72	3.4	0.089	21.6	25.0
102.78	4.9	0.093	22.4	27.3
102.84	6.6	0.096	23.2	29.8
102.90	8.4	0.100	24.1	32.5
102.96	10.3	0.103	25.0	35.3
103.00	11.7	0.106	25.6	37.3

Time increment (t) = 0.100 hrs.

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

Pond File: c:\pondpack\PINEPST2.PND
Inflow Hydrograph: c:\pondpack\PINPS10 .HYD
Outflow Hydrograph: c:\pondpack\KDD-10 .HYD

Starting Pond W.S. Elevation = 100.50 ft

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

Peak Inflow = 2.00 cfs
Peak Outflow = 1.59 cfs
Peak Elevation = 102.63 ft

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

Initial Storage = 0.01 ac-ft
Peak Storage From Storm = 0.07 ac-ft

Total Storage in Pond = 0.08 ac-ft

```
*********************
*                   *
*     Pinelands     *
* BMP #2 Routings   *
*                   *
*                   *
*                   *
*********************
```

Inflow Hydrograph: c:\pondpack\PINPS100.HYD
Rating Table file: c:\pondpack\PINEPST2.PND

----INITIAL CONDITIONS----
Elevation = 100.50 ft
Outflow = 0.00 cfs
Storage = 0.01 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
100.50	0.0	0.010
100.56	0.0	0.011
100.62	0.0	0.012
100.68	0.0	0.014
100.74	0.0	0.015
100.80	0.0	0.017
100.86	0.0	0.018
100.92	0.0	0.020
100.98	0.0	0.022
101.04	0.0	0.023
101.10	0.0	0.025
101.16	0.0	0.027
101.22	0.0	0.029
101.28	0.0	0.030
101.34	0.0	0.032
101.40	0.0	0.034
101.46	0.0	0.036
101.52	0.0	0.038
101.58	0.0	0.040
101.64	0.0	0.042
101.70	0.0	0.045
101.76	0.0	0.047
101.82	0.0	0.049
101.88	0.0	0.051
101.94	0.0	0.054
102.00	0.0	0.056
102.06	0.0	0.059
102.12	0.0	0.061
102.18	0.0	0.064
102.24	0.0	0.066
102.30	0.0	0.069

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
2.4	2.4
2.7	2.7
3.0	3.0
3.4	3.4
3.7	3.7
4.1	4.1
4.4	4.4
4.8	4.8
5.2	5.2
5.6	5.6
6.0	6.0
6.5	6.5
6.9	6.9
7.3	7.3
7.8	7.8
8.3	8.3
8.8	8.8
9.2	9.2
9.8	9.8
10.3	10.3
10.8	10.8
11.3	11.3
11.9	11.9
12.5	12.5
13.0	13.0
13.6	13.6
14.2	14.2
14.8	14.8
15.4	15.4
16.1	16.1
16.7	16.7

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
102.36	0.0	0.072
102.42	0.0	0.075
102.48	0.0	0.077
102.54	0.3	0.080
102.60	1.1	0.083
102.66	2.1	0.086
102.72	3.4	0.089
102.78	4.9	0.093
102.84	6.6	0.096
102.90	8.4	0.100
102.96	10.3	0.103
103.00	11.7	0.106

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
17.4	17.4
18.0	18.0
18.7	18.7
19.4	19.7
20.1	21.2
20.8	22.9
21.6	25.0
22.4	27.3
23.2	29.8
24.1	32.5
25.0	35.3
25.6	37.3

Time increment (t) = 0.100 hrs.

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

Pond File: c:\pondpack\PINEPST2.PND
Inflow Hydrograph: c:\pondpack\PINPS100.HYD
Outflow Hydrograph: c:\pondpack\KDD-50 .HYD

Starting Pond W.S. Elevation = 100.50 ft

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

Peak Inflow = 4.00 cfs
Peak Outflow = 4.30 cfs
Peak Elevation = 102.76 ft

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

Initial Storage = 0.01 ac-ft
Peak Storage From Storm = 0.08 ac-ft

Total Storage in Pond = 0.09 ac-ft

PINELANDS NURSERY

"The Source For Native Plants & Erosion Control Products"

323 ISLAND ROAD
COLUMBUS, NEW JERSEY 08022
(609) 291-9486 Office (609) 298-8939 Fax

Scott Thomas
Environmental Division
James City County
Williamsburg, Virginia,

Scott,

The stone was just poured for Spillway areas. I had enough stone (#1 stone) placed in the two spillway areas to level the land. Filtering out of the BMP area should be sufficiently slow enough if by chance they over top. Following is the drawings that I made for the planting areas of the BMP. I hope they are adequate enough. If you see any other problems please let me know. Mike Ballard from WEG should be forwarding you the construction certification. At this point I would need Jerry Lewis to come out and give his approval so that we might expedite the bond release process. I want to take this opportunity to thank you and James City County for your continued support and review of the Pinelands Nursery Site Plan. Looking forward to seeing the Biologs at work at the County site. Next time you are going out there please give a call.

Thank you.

Regards,

Suzanne McIninch
Nursery Mngr.
Pinelands Nursery Toano

BMP CONVERSION PLAN
OCTOBER 2001

Printed on Recycled Paper

BMP #1 PINELANDS NURSERY SHALLOW POND WETLAND

SLOPE OF POND HAS S.cyperinus, T. latifolia, A. virginicus already

THE SHALLOW AREAS OF THE POND WILL BE PLANTED WITH DUCK POTATO (S. latifolia) TUBERS.

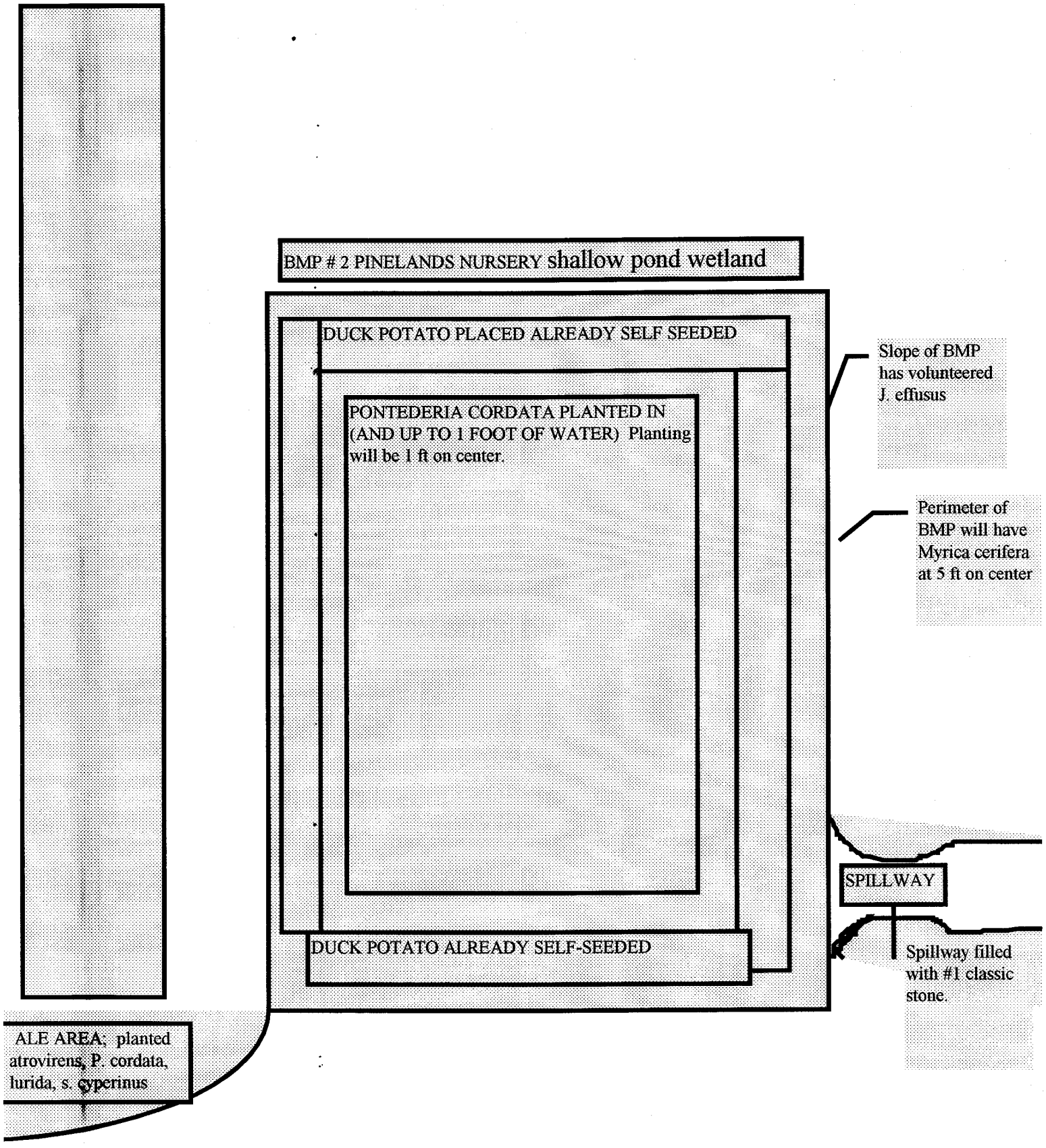
THE INTERNAL PORTIONS OF THE POND WILL BE PLANTED WITH PICKERELWEED (P.cordata).

#1 CLASSIC STONE

Perimeter of pond to be planted with I. Verticillata. All tublings at 8 ft on center.

Perimeter of pond to be planted with A. arbutifolia, M. cerifera, A. melanocarpa

GREENHOUSE #5



WILLIAMSBURG
ENVIRONMENTAL
GROUP, INC.

Environmental Consultants

NOV 2001
RECEIVED
ENVIRONMENTAL DIVISION

November 13, 2001

Scott J. Thomas
Civil Engineer
Environmental Division
James City County
101 Mounts Bay Road
P.O. Box 8784
Williamsburg, Virginia 23187-8784

Re: **Pinelands Nursery BMPs**
WEG Project #946

Dear Mr. Thomas:

This letter is to inform you of the completion of the wet pond/BMP design construction at the Pinelands Nursery site. We have enclosed the required construction certification forms and the as-built drawings. The ponds will function with 10-foot spillways that will pass storm events up to and including the 100-year storm without overtopping. This data was previously provided in a facsimile transmittal to your office.

Sue McInnich at Pinelands Nursery will complete a planting plan and also place the required stone at the outfalls for each pond, as requested. We trust that this completes the information required by the County on this project.

If you have any questions or need additional information, please let me know.

Sincerely,

Michael H. Ballard

Michael H. Ballard
Senior Engineer

Enclosure
tjs
cc: Sue McInnich

DC 007;
DC 008
SP-11-99

C:\TEMP\Pinelands BMP Final memo.doc

3000 Easter Circle • Williamsburg, Virginia 23188 • (757) 220-6869 • FAX (757) 229-4507

Scott Thomas

From: Scott Thomas
Sent: Wednesday, October 10, 2001 2:38 PM
To: Gerry Lewis; Darryl Cook
Subject: Pinelands Nursery

Pinelands Nursery
SP-111-99

This is a summary of events for the BMP at this project and my recommendations.

1. The larger infiltration BMP (BMP # 1) is not functional. We monitored it and came to the conclusion that it is not drawing down. All are in agreement County (Gerry & myself), the owner and the engineer that it is not functional.

2. Many causes exist for infil basins to malfunction. Geotechnical, design, construction practices, sediment load, etc. The cause in this case was not definite or certain. Based on my judgement, I believe it is due to two reasons-the infiltration rate was overestimated by the geotech and due to an improper construction technique (compaction, geotextile, etc.).

3. The nursery specializes in wetland plants, so it is more feasible to modify the facility to become a shallow marsh, than to re-install the infiltration facility, which could fail again.

4. Under that premise, I directed Sue Macinich to get the engineer back involved (Williamsburg Environmental Group) and run through some hydraulics with a permanent shallow wet pool to check volume, discharge and WSEL's and whether modifications to the principal flow control structures are necessary. I told her that the analyses could be simple, a resubmission would not be necessary as long as we had computations, sketches, etc. to make a decision.

5. Based on WEG's numbers the facility will still not overtop for the 2-, 10- and 100-year storms. I called Tim Stemann to discuss the results. Postdevelopment outflow from BMP # 1 was slightly over the predev 2-year but by less than 0.5 cfs. Although minimal, I stated that in order to compensate for slightly higher discharges compared to predev, a "beefed" up outlet protection device could be used to mitigate increased flows. Built in accordance with VESCH standards, a beefed up OP would dissipate the outflow velocities from the basin and prevent erosion at the outflow and try to return it back to sheet flow before it goes into the existing natural swale at the woods.

6. Called Sue to discuss our review and approach. Stated requirement for "beefed" up OP and she said she would comply. Also requested a sketch plan and list of plant types/arrangements that she would use in the marsh area. Of primary focus is the larger basin BMP 1. She will forward that to me.

In summary, the infiltration basin has failed and we still hold bond. I do not think it is in the best interest of stormwater management from our perspective to require tearing out the main basin (BMP 1) and rebuilding something that could fail again. Based on my review of the project, it appears a high level of plan review and inspective effort went into the BMP design, so I think it was a constructability or upfront geotech flaw. This is the risk for infiltration facilities and in this case, what was best suited for the site did not work. This in combination with the fact that they grow wetland plants at the site and a wetland-shallow marsh system would be used by them as an exhibit area, it is the best choice for retrofit. I also don't think a formal full plan revision is necessary either, as the conversion/retrofit is simple. The comps and sketches are suitable to me.

I will discuss with Sue the record drawing and construction certification requirements. As there is no change to the BMP structurally or hydraulically, except for the outlet protection, the record drawing should be easy. She will still need construction certification, especially because of the embankment before bond release.

Scott

SP-11-99

WILLIAMSBURG ENVIRONMENTAL GROUP, INC.

Environmental Consultants

FACSIMILE TRANSMITTAL

REVIEWED 10-10-2000 ST.

Date: October 2, 2001

To: Scott Thomas

Fax Number: 259-4032

From: Tim Stemann

Subject: Pinelands Nursery BMPs
WEG Project #: 946

cc: Sue McInnich (757-566-3625)

Total # of Pages (including this cover sheet): 3

If any part of this fax transmission is missing or not clearly received, please call Gina at (757) 220-6869.

Message:

Scott:

This fax contains the latest pond routings for the two BMPs located at Pineland Nursery on Route 60. Sue McInnich informed us that they were not infiltrating, as previously designed, so the routings were re-calculated considering the normal pool elevation to be at the height of the previously designed spillways, instead of at the bottom of the ponds.

As you can see, the ponds will still not overtop for the 2, 10 or 100-year storm events.

Hopefully this will finalize the issue. If you have any additional questions please let Mike Ballard or me know.

Tim Stemann
Staff Engineer

Questions

1. WHICH IS MAIN BMP #1 or #2
2. ANY MODIFICATIONS REQUIRED TO PRINCIPAL/EM SPILLWAYS
3. ARE ENGINEERS IN AGREEMENT THAT INFIL FACILITY HAS FAILED + CONVERSION TO SHALLOW MARSH IS BEST WAY TO RESOLVE.
4. 2-YR POSTDEV ROUTED > PRE 0.5 to 0.8 cfs. WHAT CAN BE DONE TO MITIGATE. SUGGEST BEEFED UP OP DEVICES

NEED

1. PLANT / TYPE / ARRANGEMENT SKETCH
2. RD/CC
3. COMPS ✓

L:\0900's\946-Pineland's Nursery\engineering\word documents\Fax to Scott Thomas.doc

3000 Easter Circle • Williamsburg, Virginia 23188 • (757) 220-6869 • FAX (757) 229-4507

SUE 566-3620

BMP#2 HYDROLOGY

BASIN CHARACTERISTICS	DA ACRES	CN	Tc HOURS
PRE-DEVELOPMENT	1.31	48	0.50
POST-DEVELOPMENT	1.31	67	0.50

TOP OF BASIN ELEVATION	103.0 FT (MSL)
NORMAL POOL ELEVATION	102.5 FT (MSL)
CREST ELEVATION	102.5 FT (MSL)

HYDROLOGIC SUMMARY	2-YR CFS	10-YR CFS	100-YR CFS
PRE-DEVELOPMENT	0.0	1.0	2.0
POST-DEVELOPMENT	0.8	2.6	4.6
POST-DEVELOPMENT ROUTED	0.8	2.6	4.5

ROUTED ELEVATIONS

2-YR STORM ELEVATION	102.5 FT (MSL)
10-YR STORM ELEVATION	102.6 FT (MSL)
100-YR STORM ELEVATION	102.7 FT (MSL)

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

SP-11-99

County BMP ID Code (if known): DC 008

Name of Facility: Pinelands Nursery (UPPER POND) BMP No.: 2 of 2 Date: 11/29/01

Location: West Side of Property - 8877 Richmond Road

Name of Owner: Pinelands Nursery

Name of Inspector: SJ Thomas

Type of Facility: Previous Infil Basin; Convert to Shallow Marsh due to failure.

Weather Conditions: Cloudy, 60's Type: ☒ Final Inspection ☐ County BMP Inspection Program ☐ Owner Inspection

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. No action required.
Routine - The item checked requires attention, but does not present an immediate threat to the function/integrity of the BMP.
Urgent - The item checked requires immediate attention to keep the BMP operational and to 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: 45' x 30' EXCAV; 3H:1V interior SS; 4' deep				
Grass Height	✓			Adequate.
Vegetation Condition	✓			Adequate.
Tree Growth	✓			None.
Erosion	✓			Some slope erosion, minor
Trash & Debris	✓			
Seepage	✓			
Fencing or Benches	✓			
Interior Landscaping/Planted Areas: ☐ None ☒ Constructed Wetland/Shallow Marsh ☐ Naturally Established Vegetation				
Vegetated Conditions	✓			Pickerelweed planted in
Trash & Debris	✓			Bottom of basin; 2' o.c. each
Floating Material	✓			way; full coverage.
Erosion	✓			(Note: Stone media directly
Sediment	✓	MINOR		below. Monitor for
Dead Plant	✓			success)
Aesthetics	✓			
Other				
Notes: Pickerelweed in basin; Muck Potato Edges				

Facility Item	O.K.	Routine	Urgent	Comments
Water Pools: ☐ Permanent Pool (Retention Basin) ☑ Shallow Marsh (Detention Basin) ☐ None, Dry (Detention Basin)				
Shoreline Erosion	✓			Dry. Stone + Geotextile
Algae	✓			in bottom basin. Need RAIN.
Trash & Debris	✓			(No 57 stone)
Sediment	✓			
Aesthetics	✓			Water 4" below surf rock.
Other				
Inflows (Describe Types/Locations): Surface Runoff				
Condition of Structure	✓			
Erosion	✓			
Trash and Debris	✓			
Sediment	✓			
Outlet Protection	✓			
Other	✓			
Principal Flow Control Structure - Riser, Intake, etc. (Describe Type): None. Crest Spillway. VDOT #1				
Condition of Structure	X			
Corrosion	X			
Trash and Debris	X			
Sediment	X			
Vegetation	X			
Other				15'x10' size. Outfall Stable.
Principal Outlet Structure - Barrel, Conduit, etc. : None.				
Condition of Structure				
Settlement				
Trash & Debris				
Erosion/Sediment				
Outlet Protection				
Other				
Emergency Spillway (Overflow): See Above				
Vegetation	X			
Lining	X			
Erosion	X			
Trash & Debris	X			
Other	X			
Notes: Note: Bottom basin failure, geotextile stone (infil) Convert to Shallow Marsh				

Facility Item	O.K.	Routine	Urgent	Comments
Nuisance Type Conditions:				
Mosquito Breeding	X			
Animal Burrows	X			
Graffiti	X			
Other	X			
Surrounding Perimeter Conditions:	East, Greenhorses; West Woods; North & South Yard Area.			
Land Uses	X			clean, wet areas.
Vegetation	X			
Trash & Debris	X			
Aesthetics	X			
Access /Maintenance Roads or Paths	X			
Other				

Remarks:

Basin mutation between infil basin & shallow marsh. Planting in dry, stone media but little rainfall. Curious as to future success. Combination of infil failure w/ sm plantings may provide good envir. for plants. Consider as a case study. Perform routine follow-up inspections every 6 months.

- Note: Surface Geotextile clogged with green algae, 100%. Possible cause of failure to infil french (Geotextile to be removed by owner)

Overall Environmental Division Internal Rating: 3

Signature: Scott J. Thomas P.E. **Date:** 11/29/01

Title: Civil Engineer ENV DIV

SWMProg\BMP\CoInspProg\DetRet.wpd

WATERSHED	DC
BMP ID NO	008
PLAN NO	SP-11-99
TAX PARCEL	(11-01)(01-25)
PIN NO	1110100025
CONSTRUCTION DATE	10/1/2000
PROJECT NAME	Pinelands Nursery BMP # 2
FACILITY LOCATION	8877 Richmond Road
CITY-STATE	Toano, Va. 23168
CURRENT OWNER	Donald & Suzanne Knezick
OWNER ADDRESS	8877 Richmond Road
OWNER ADDRESS 2	
CITY-STATE-ZIP CODE	Toano, Va. 23168
OWNER PHONE	
MAINT AGREEMENT	Yes
EMERG ACTION PLAN	No

Get Last BMP No

Return to Menu

MAINTENANCE PLAN	No
SITE AREA acre	4.99
LAND USE	Gen Agricultural
old BMP TYP	Shallow Marsh
JCC BMP CODE	
POINT VALUE	
SVC DRAIN AREA acres	1.31
SERVICE AREA DESCRI	Building, Greenhouse & Yards
IMPERV AREA acres	0.38
RECV STREAM	UT of Diascund Creek
EXT DET-WQ-CTRL	Yes
WTR QUAL VOL acre-ft	0.08
CHAN PROT CTRL	No
CHAN PROT VOL acre-ft	0
SW/FLOOD CONTROL	Yes
GEOTECH REPORT	Yes

CTRL STRUC DESC	Weir Spillwa
CTRL STRUC SIZE inches	120
OTLT BARRL DESC	None
OTLT BARRL SIZE inch	
EMERG SPILLWAY	Yes
DESIGN HW ELEV	102.7
PERM POOL ELE	102.5
2-YR OUTFLOW cfs	0.80
10-YR OUTFLOW cfs	2.60
REC DRAWING	Yes
CONSTR CERTI	No
LAST INSP DATE	
INTERNAL RATING	

MISC/COMMENTS

Orig BMP per SP-11-99 (infil) failed & converted to SM. Also see DC 007.

DC008
DC007

WATER WORKS SUPPLY OF VIRGINIA, INC.

8338 OLD RICHFOOD ROAD
MECHANICSVILLE, VA 23111
PHONE 804.730.9050
FAX 804.730.4520

25211 PLEASANT VALLEY ROAD
CHANTILLY, VA 22021
PHONE 703.327.4513
FAX 703.327.4707

3/10 1:30 MARK
3/16 2:30 (-3 5/8")

3 5/8" down

$$\frac{3.625''}{145.00 \text{ hours}} = \frac{0.025''}{hr.}$$

[INFILTRATION RATE]

0.5" MIN / hr.

$$\frac{0.025}{0.5} = 5\% \text{ of MIN. REQUIRED infiltration}$$

$$\frac{0.025}{1.0} = 2.5\% \text{ of MIN. INFILT. RATE}$$

1.0"/HR Design rate

JCC ENV DIV
FAILED INFIL
(BMP #1)
FIELD DATA

Pinelands Nursery
BMP SIZING

BMP 1

1) **Compute Rv**

Drainage Area =	1.83 acre
Impervious Area=	0.41 acres Draining to the BMP
% Impervious=	22.4%

Rv = (.05+.009(%Impervious)
Rv = .25

ORIGINAL
FAILED
DESIGN
BMP #1 & #2
INFIL

2) **Compute Storage Volume**

Provide an infiltration basin.

Vol = (runoff from a ½" storm)
Vol = (Rv)(1/2")(drainage area)
Vol = .019 ac-ft
Vol = 827.6 CF
Void Ratio = 0.4
Volume of Stone = 827.6/0.4 = 2069 CF

BMP 2

1) **Compute Rv**

Drainage Area =	1.31 acre
Impervious Area=	0.38 acres Draining to the BMP
% Impervious=	27.4%

Rv = (.05+.009(%Impervious)
Rv = .29

2) **Compute Storage Volume**

Provide a infiltration basin.

Vol = (runoff from a ½" storm)
Vol = (Rv)(1/2")(drainage area)
Vol = .016 ac-ft
Vol = 705.2 CF
Void Ratio = 0.4
Volume of Stone = 705.2/0.4 = 1763 CF

PINELANDS

Structure 1										
Post-development										
		Area				Curve Number			Composit	
		Total	A	B	C	A	B	C		
Post-development										
	Forested	0.1	0	0.1	0	30	55	70	3.44	
	Planted Boxes	0.18	0.08	0.1	0	40	40	40	4.50	– $I_a = 3.0''$
	House	0.25	0	0.25	0	98	98	98	15.31	
DIRT (GRAVEL)	~~Gravel~~ Roadway/Parking	0.28	0.18	0.1	0	72(76)	82(85)	87(89)	13.23	
	#57 Stone – w/in Planting Box	0.18	0.08	0.1	0	50	50	50	5.63	– $I_a = 2.0''$
	Planting Area – w/in	0.61	0.41	0.2	0	50	50	50	19.06	$I_a = 2.0''$
	Lawn	0	0	0	0	39	61	74	0.00	
	Total	1.6	0.75	0.85	0				61.16	

How to ensure that the open stone is preserved.

4" Geoweb – Presto or Equiv.

↓

These areas will not be considered impervious

BMPs will not discharge up to the 2-year storm

Large openspace area will be dedicated to NOS