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: **CC011**

DATE VERIFIED: **May 4, 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: CC011

PIN: 4820100003

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

Property Description: Senior Care/Retirment Facility

Site Address: 5560 Williamsburg Landing Drive

(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 file with CC011 and CC012

CC-011-CC-012

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

IMPORTANT MESSAGE

FOR JOAN

DATE 10-1 TIME 11:35 A.M. P.M.

WHILE YOU WERE OUT

M CHUCK PINNELL

OF WMSBRG LANDING

PHONE NO. 898-3738

TELEPHONED		PLEASE CALL	✓
CALLED TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL			

MESSAGE pager 499-4371

NANCY HARRISON WILLIAMSBURG LANDING

565-6504

SIGNED DD

CASCADE P3-A2334 PRINTED IN U.S.A.

CONSULTING ENGINEERS

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

April 29, 2002

APR 2002
RECEIVED
ENVIRONMENTAL DIVISION

Mr. Scott Thomas, P.E.
Environmental Division
James City County
P.O. Box 8784
Williamsburg, VA 23187

RE: Williamsburg Landing Nursing and Living Facility
(Now Woodhaven at Williamsburg)
Plan No. SP-50-96
BMP ID Codes: CC 011 (BMP 1 Dry Pond)
AES Project No. 8162

Dear Scott:

I hereby certify to the best of my 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 noted herein.

As Engineering Consulting Services LTD provided daily on-site inspection and monitoring services for the construction of the BMP facilities, and as those records are lost and no longer available, AES Consulting Engineers can only offer our opinion based upon our weekly site visits and our recollection that the work was properly performed and approved at the time.

If you have any further questions or concerns, please do not hesitate to contact Howard W. Price or me at (757) 253-0040.

Sincerely,

AES Consulting Engineers

Richard A. Costello, P.E.
President

COMMONWEALTH OF VIRGINIA
RICHARD A. COSTELLO
CERTIFICATE NO.
013250
4/29/02
CERTIFIED PROFESSIONAL ENGINEER

S:\jobs\8162\00\WORDPROC\Document\81620L47.rac.doc

CERTIFICATION DOCUMENTS

Scott Thomas

From: Richard Costello [rcostello@aesva.com]
Sent: Thursday, April 25, 2002 9:09 AM
To: Scott Thomas
Cc: Howard Price; Alvin Anderson; Nancy Harrison
Subject: Williamsburg Landing BMP Certifications

Scott

I will be sending out an abbreviated certification letter shortly, that unfortunately meets only a portion of your usual requirements but will have to do.

This situation was indirectly caused by the Architect for the expansion, who required all of professionals to subcontract with him. ECS did all the geotechnical work and normally would have sent reports to the Architect (in Penna.), the Owner (in Nashville Tenn..) and the on-site Owner/Architects field trailer. Whatever the case AES received none of those reports and ECS says they cannot find them in their records. Neither the Architect nor ECS will provide the County with a Certification on Construction, therefore AES Consulting Engineers as the Designer will. However, I do not have the benefit of the reports to guide AES in the Certification letter.

While I know ECS did a proper job of inspection and testing on the project, I cannot certify it in accordance with your usual language, so a modified Certification as discussed in your email of January 31st will need to suffice.

I suggest that Williamsburg Landing withhold any geotechnical contracts from ECS in conjunction with their latest project in parallel effort to get this information recovered.

If any of the respondents have question on this email, please respond directly.

Thanks

Richard Costello, P.E.
President
AES Consulting Engineers
ph 757.253.0040 fax 757.220.8994

AES Consulting Engineers a Professional Corporation Confidentiality Note: This e-mail and any attachments are confidential and may be protected by legal privilege. If you are not the intended recipient, be aware that any disclosure, copying, distribution or use of this e-mail or any attachment is prohibited. If you have received this e-mail in error, please notify us immediately by returning it to the sender and delete this copy from your system. Thank you for your cooperation.

GENERAL NOTES:

1. FUTURE EXPANSION IS SHOWN FOR INFORMATION PURPOSES ONLY. ANY FUTURE CONSTRUCTION WILL REQUIRE AN ADDITIONAL SITE PLAN.
2. THE CONTOUR INTERVAL IS 1 FOOT.
3. THE PROJECT AREA IS ZONED R-5.
4. THIS PARCEL IS DESIGNATED AS PART OF TAX PARCEL (48-2)(1-3).
5. ADDRESS OF THIS SITE IS _____ WILLIAMSBURG LANDING DRIVE.
6. THE CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES AND MISS UTILITY (1-800-552-7001) FOR THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO STARTING ANY CONSTRUCTION.
7. A 20' UTILITY EASEMENT ALONG ALL WATER AND SEWER LINES SHALL BE PROVIDED TO JCSA AND SHOWN ON EASEMENT PLATS AT A LATER DATE.
8. PARKING TABULATIONS:

PHASE 1 (NURSING & ASSISTED LIVING FACILITY)

PARKING SPACES PROVIDED:
103 SPACES (EXCLUDES POOL PARKING)
5 VAN HANDICAP SPACES
TOTAL PARKING SPACES PROVIDED = 108

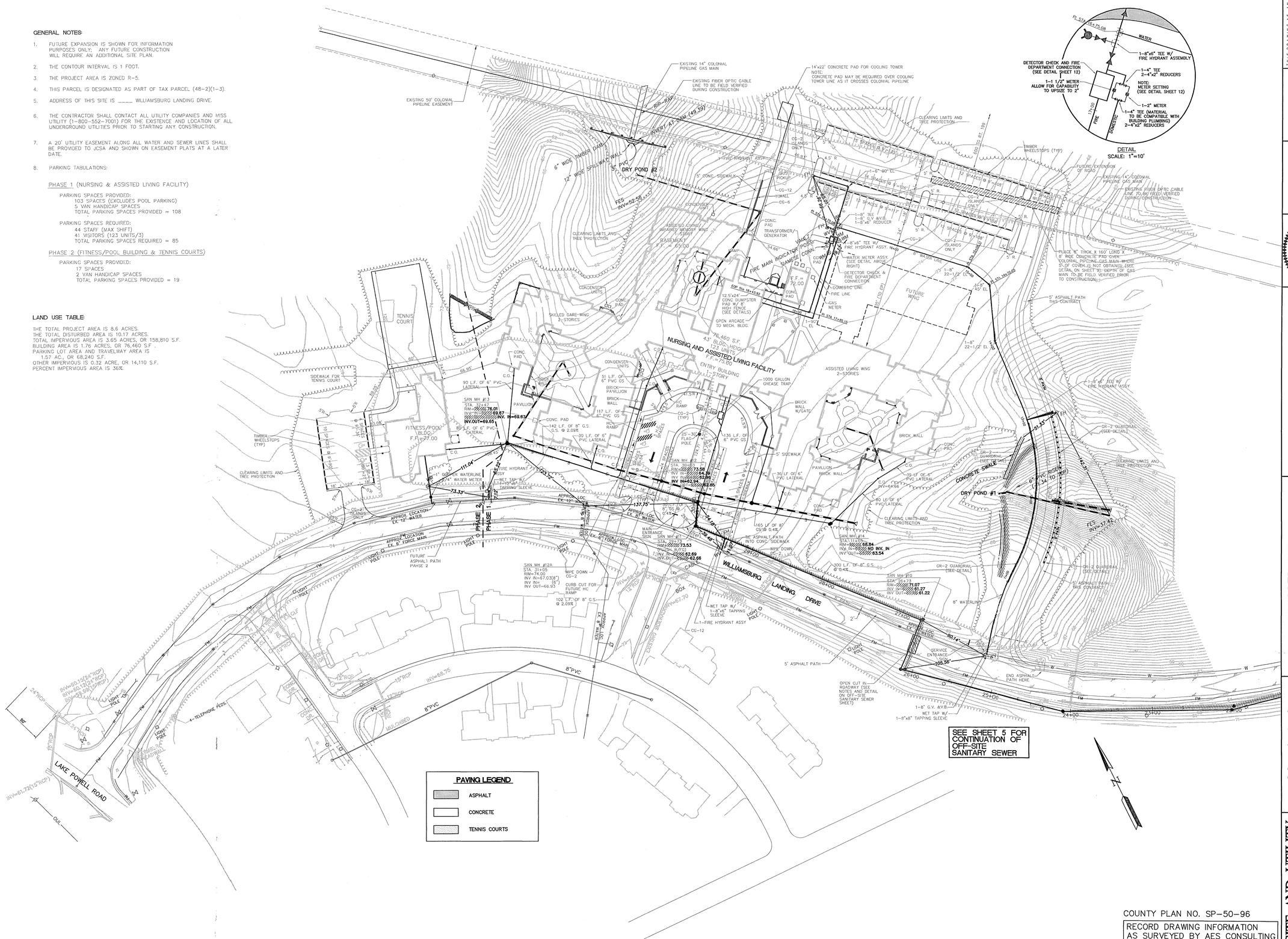
PARKING SPACES REQUIRED:
44 STAFF (MAX SHIFT)
41 VISITORS (123 UNITS/3)
TOTAL PARKING SPACES REQUIRED = 85

PHASE 2 (FITNESS/POOL BUILDING & TENNIS COURTS)

PARKING SPACES PROVIDED:
17 SPACES
2 VAN HANDICAP SPACES
TOTAL PARKING SPACES PROVIDED = 19

LAND USE TABLE:

THE TOTAL PROJECT AREA IS 8.6 ACRES.
THE TOTAL DISTURBED AREA IS 10.17 ACRES.
TOTAL IMPERVIOUS AREA IS 3.65 ACRES, OR 158,810 S.F.
BUILDING AREA IS 1.76 ACRES, OR 76,460 S.F .
PARKING LOT AREA AND TRAVELWAY AREA IS 1.57 AC., OR 68,240 S.F.
OTHER IMPERVIOUS IS 0.32 ACRE, OR 14,110 S.F.
PERCENT IMPERVIOUS AREA IS 36%.



COUNTY PLAN NO. SP-50-96

RECORD DRAWING INFORMATION AS SURVEYED BY AES CONSULTING ENGINEERS ON 5/15/2000

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

THIS DRAWING AS AN INSTRUMENT OF SERVICE, IS THE PROPERTY OF AES CONSULTING ENGINEERS AND MAY NOT BE REPRODUCED WITHOUT THEIR PERMISSION AND UNLESS THE REPRODUCER CLEARLY REMOVES HIS NAME AS ARCHITECT/ENGINEER.

COMPACTED SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AT THE SITE BEFORE PROCEEDING WITH THE WORK.

COMMONWEALTH OF VIRGINIA
10020
PROFESSIONAL ENGINEER
CERTIFIED

NEW NURSING & ASSISTED LIVING FACILITY
FOR
WILLIAMSBURG LANDING, INC. JAMES CITY COUNTY, VA.

DRAWN BY: EAW | CHECKED BY: EMG | APPROVED BY: RAC

REVISIONS

NO.	DATE	DESCRIPTION
1	6/26/96	REV. PER JCC COMMENTS - HWP

SITE AND UTILITY PLAN

DRAWING NO. C001 | SCALE: 1" = 40' | DATE: 6/26/96

COMMISSION NO.

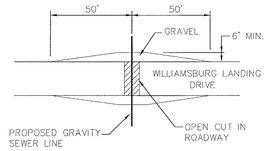
06.06.00-15:56:20R00.dwg

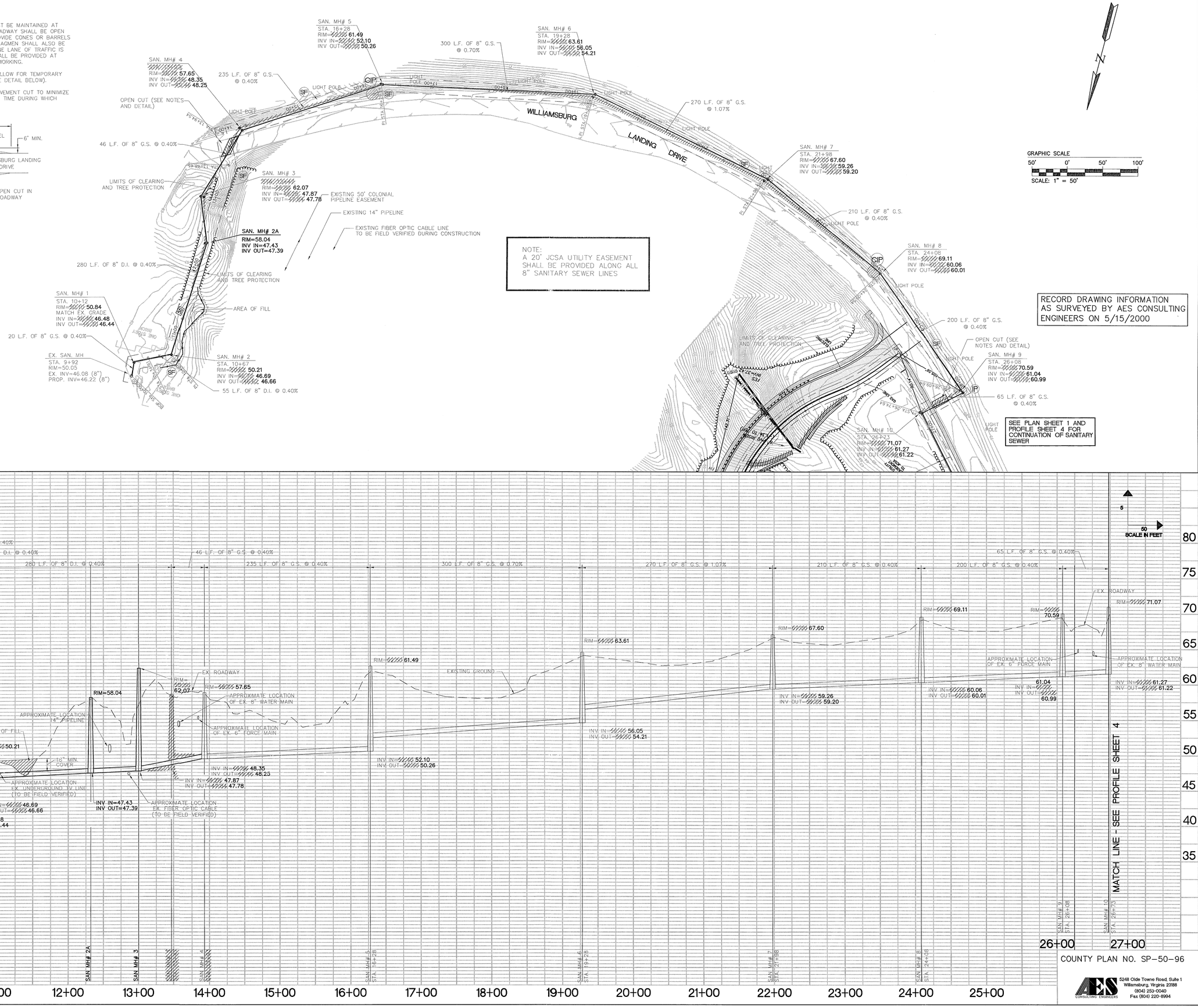
HEK

CC011_WILLIAMSBURG_LANDING_NURSERY_&_ASSISTED_LIVING - 006

ROAD OPEN CUT REQUIREMENTS:

1. ACCESS FOR EMERGENCY VEHICLES MUST BE MAINTAINED AT ALL TIMES. AT LEAST ONE LANE OF ROADWAY SHALL BE OPEN AT ALL TIMES. CONTRACTOR SHALL PROVIDE CONES OR BARRELS TO DELINEATE THE TRAVELLED LANE. FLAGMEN SHALL ALSO BE PROVIDED DURING TIMES WHEN ONLY ONE LANE OF TRAFFIC IS PERMITTED. TWO LANES OF TRAFFIC SHALL BE PROVIDED AT ALL TIMES WHEN CONTRACTOR IS NOT WORKING.
2. SHOULDERS SHALL BE GRAVELLED TO ALLOW FOR TEMPORARY TRAVELWAY DURING CONSTRUCTION (SEE DETAIL BELOW).
3. USE SELECT SAND FOR BACKFILL IN PAVEMENT CUT TO MINIMIZE FUTURE SETTLEMENT AND TO DECREASE TIME DURING WHICH ROAD IS BLOCKED.





THIS DRAWING AS AN INSTRUMENT OF SERVICE IS THE PROPERTY OF AES CONSULTING ENGINEERS. REPRODUCED WITHOUT THIS PERMISSION AND UNLESS THE REPRODUCER CLEARLY REMOVES HIS NAME AS OWNER OF THE DRAWING.

CONTRACTORS SHALL VERIFY ALL DIMENSIONS AT THE SITE BEFORE PROCEEDING WITH THE WORK

COMMONWEALTH OF VIRGINIA
RICHARD A. CAMPBELL
LICENSED
013250
6/28/01
PROFESSIONAL ENGINEER

REESE LOWER PATRICK & SCOTT ARCHITECTS
1918 HARRISONBURG DRIVE - LANCASTER, PA. 17601 - 717 569-5591

NEW NURSING & ASSISTED LIVING FACILITY
FOR
WILLIAMSBURG LANDING, INC. JAMES CITY COUNTY, VA.

DRAWN BY: EAW | CHECKED BY: EMG/AWP | APPROVED BY: RAC

REVISIONS

NO.	DATE	DESCRIPTION
1	6/25/98	REV. PER. JCC COMMENTS - HWP
2	7/19/98	COORDINATION/ADDENDUM NO. 4
3	7/29/98	COORDINATION/ADDENDUM NO. 5
4	11/21/98	REVISED BID DOCUMENTS

OFF-SITE SANITARY SEWER PLAN & PROFILE

SCALE: AS SHOWN | DATE: 4/30/96

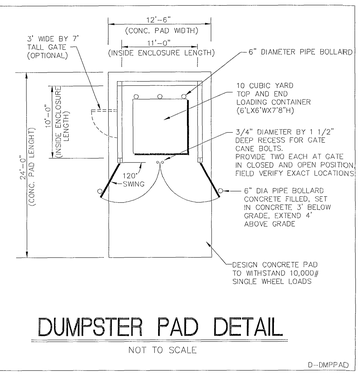
DRAWING NO. C005 | COMMISSION NO.

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

05/06/00-15:23 620C05.dwg

HBK

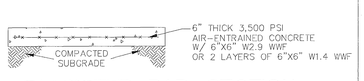
CC011_WILLIAMSBURG_LANDING_NURSERY_&_ASSISTED_LIVING - 007



DUMPSTER PAD DETAIL

NOT TO SCALE

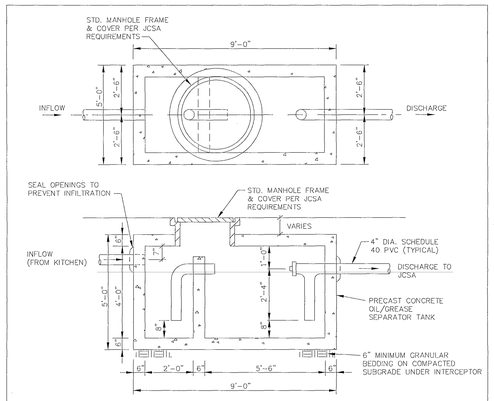
D-DMPPAD



DUMPSTER PAD SECTION

NOT TO SCALE

D-DMPSEC



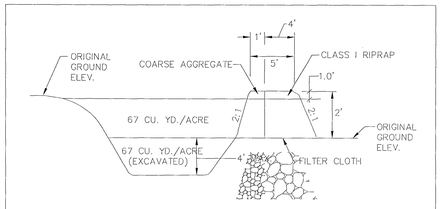
NOTES:

1. THE DIMENSIONS GIVEN ARE FOR A TYPICAL PRECAST 1,000 GALLON INTERCEPTOR. SIZE WILL VARY DEPENDING ON THE KITCHEN/RESTAURANT REQUIREMENTS.
2. ALL KITCHEN WASTES SHALL BE DISCARDED INTO THE INTERCEPTOR.
3. STEEL REINFORCEMENT IS REQUIRED WHEN INTERCEPTOR IS LOCATED IN TRAFFIC AREAS.
4. OWNER/DEVELOPER IS RESPONSIBLE FOR INSURING THAT INTERCEPTOR OPERATES PROPERLY AND RECEIVES REQUIRED MAINTAINANCE.

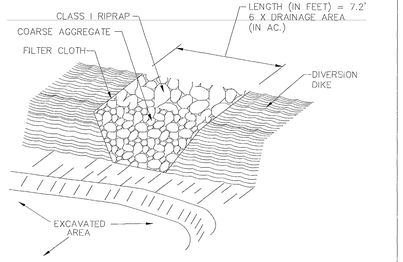
TYPICAL OIL/GREASE INTERCEPTOR (TRAP)

NOT TO SCALE

D-7-2



CROSS SECTION OF OUTLET



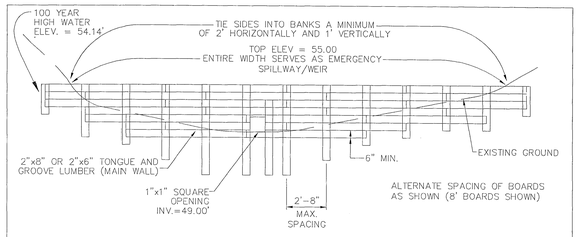
** COARSE AGGREGATE SHALL BE VDOT #3, #357 OR #5

OUTLET (PERSPECTIVE VIEW)

TEMPORARY SEDIMENT TRAP

N.T.S

D-STRAP

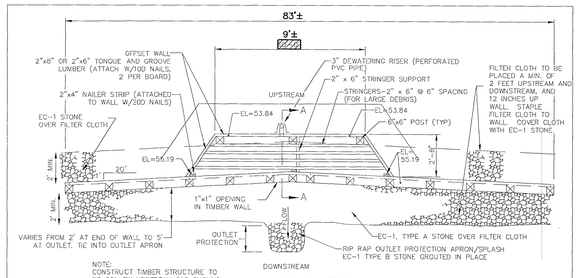


UPSTREAM ELEVATION
PRESSURE TREATED WOOD DRY DETENTION STRUCTURE

SCALE: 1/4" = 1'

DRY POND #2

D-WDS-1

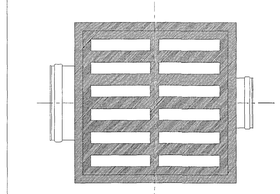


PLAN VIEW
PRESSURE TREATED WOOD DRY DETENTION STRUCTURE

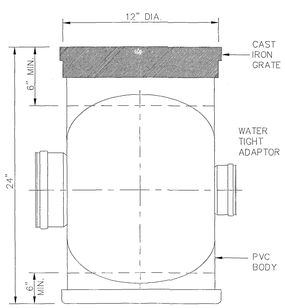
SCALE: 1/4" = 1'

DRY POND #2

D-WDS-2



- MULTI NUMBER OF INLETS/OUTLETS
- OUTLET DIAMETERS AVAILABLE 4" THRU 10"
- VARIBLE ELEVATION OF OUTLETS
- VARIOUS TYPES OF OUTLETS WITH WATERTIGHT ADAPTERS SDR-35 SEWER/A-2000 CORRUGATED PVC/ ULTRA-RIB PVC/CORRUGATED POLY
- CUSTOM MADE TO SPECIFICATIONS
- HEAVY DUTY CAST IRON GRATE-PVC BODY



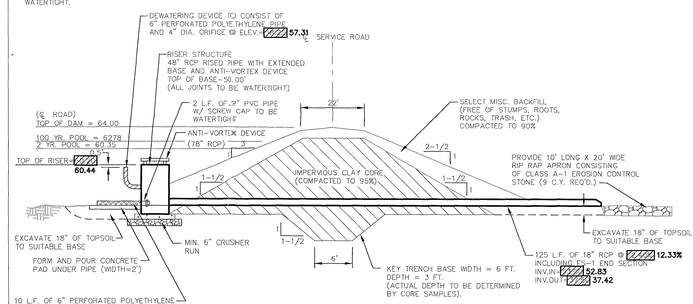
ADS 12" DRAIN BASIN

N.T.S.

D-ADS12B

NOTE:
AFTER ALL DISTURBED AREAS WITHIN THE BASIN'S DRAINAGE AREA ARE STABILIZED AND OPERATION AS TEMPORARY SEDIMENT BASIN CEASES, THE SCREW CAP ON THE 2" PVC PIPE ATTACHED TO THE WATER QUALITY ORIFICE IS TO BE OPENED, THE DEWATERING DEVICE REMOVED, AND THE DEWATERING ORIFICE SEALED TO BE WATERTIGHT.

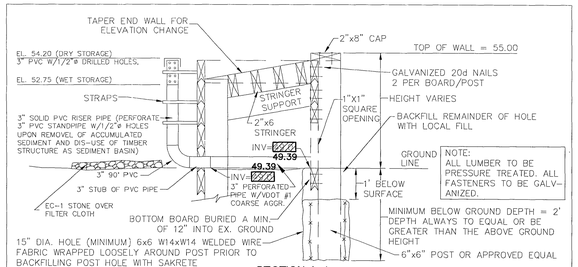
NOTE:
SEDIMENT CLEANOUT POINT DURING OPERATION AS TEMPORARY SEDIMENT BASIN AS AT 5,070 C.F. OF STORAGE OR ELEV.=57.00



DAM - CROSS SECTION
DRY POND #1

NOT TO SCALE

D-8162



NOTE:
ALL LUMBER TO BE PRESSURE TREATED. ALL FASTENERS TO BE GALVANIZED.

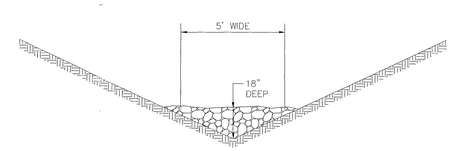
MINIMUM BELOW GROUND DEPTH = 2' DEPTH ALWAYS TO EQUAL OR BE GREATER THAN THE ABOVE GROUND HEIGHT

SECTION A-A
PRESSURE TREATED WOOD DRY DETENTION STRUCTURE

SCALE: 3/4" = 1'

DRY POND #2

D-WDS-3



OUTFALL
CROSS SECTION

NOT TO SCALE

COUNTY PLAN NO. SP-50-96

RECORD DRAWING INFORMATION AS SURVEYED BY AES CONSULTING ENGINEERS ON 5/15/2000

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

THIS DRAWING AS AN INSTRUMENT OF SERVICE IS THE PROPERTY OF REESE LOWER PATRICK & SCOTT, ARCHITECTS. IT MAY NOT BE REPRODUCED WITHOUT HIS PERMISSION AND UNLESS THE REPRODUCTION BEARS HIS NAME AS ARCHITECT.

CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AT THE SITE BEFORE PROCEEDING

COMMONWEALTH OF VIRGINIA
REGISTERED PROFESSIONAL ENGINEER
C. J. LEE
No. 11250
6/20/01

RL REESE LOWER PATRICK & SCOTT ARCHITECTS
5510 MARCHWOOD DRIVE - LANCASTER, PA. 17601 - 717-581-0931

NEW NURSING & ASSISTED LIVING FACILITY
FOR
WILLIAMSBURG LANDING, INC. JAMES CITY COUNTY, VA.

DRAWN BY:	CHECKED BY:	APPROVED BY:
MWC	EMG/RWP	RAC

REVISIONS

NO	DATE	DESCRIPTION
1	6/25/96	REV. PRE. JCC. COMMENTS - HWP
2	7/29/96	COORDINATION/ADDENDUM NO. 4 (NONE THIS SHEET)
3	7/29/96	COORDINATION/ADDENDUM NO. 5
4	11/21/96	REVISED BID DOCUMENTS

NOTES AND DETAILS

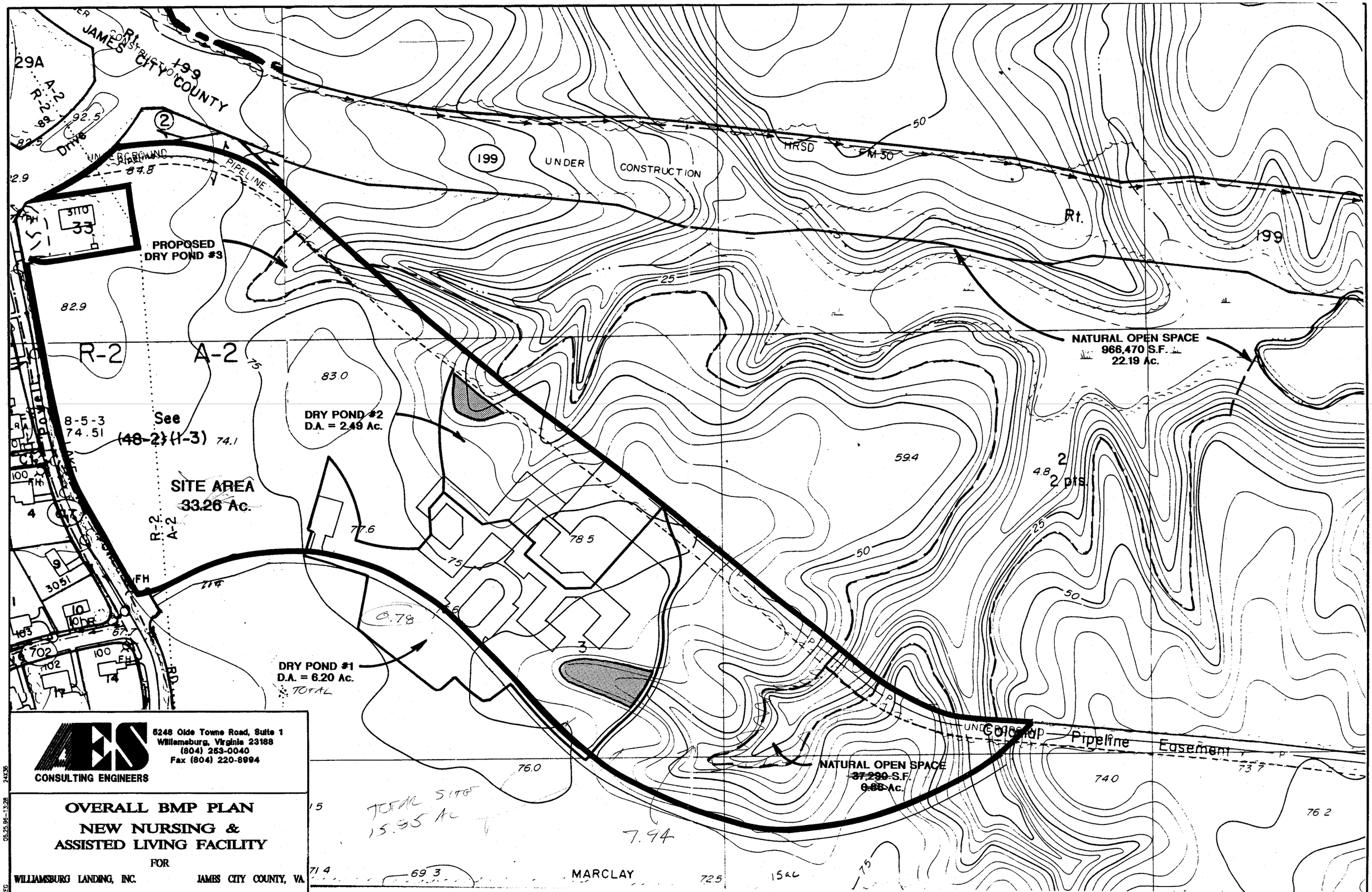
DRAWING NO. C010

COMMISSION NO. | SCALE: AS NOTED | DATE: 6/25/96

06.06.00-15:38 620x710.dwg

HBK

CC011_WILLIAMSBURG_LANDING_NURSERY_&_ASSISTED_LIVING - 008



AES CONSULTING ENGINEERS

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

OVERALL BMP PLAN
NEW NURSING & ASSISTED LIVING FACILITY

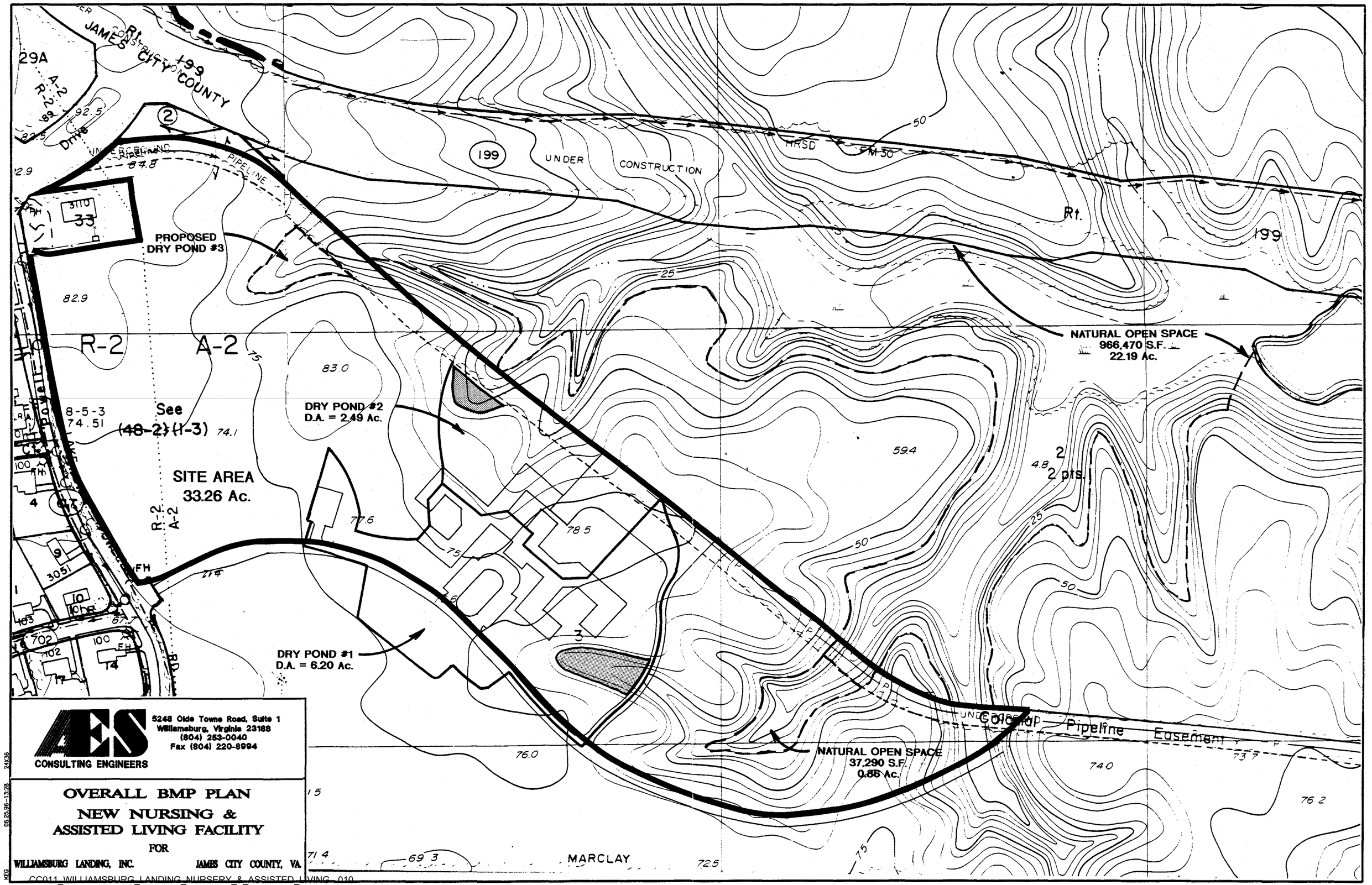
FOR

WILLIAMSBURG LANDING, INC. JAMES CITY COUNTY, VA.

06-25-96-13:28 24X36

KEG

CC011_WILLIAMSBURG_LANDING_NURSERY_&_ASSISTED_LIVING - 003



AES
CONSULTING ENGINEERS

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

OVERALL BMP PLAN
NEW NURSING & ASSISTED LIVING FACILITY
FOR

WILLIAMSBURG LANDING, INC. JAMES CITY COUNTY, VA.

CC011_WILLIAMSBURG_LANDING_NURSERY_&_ASSISTED_LIVING - 010

24X36 06.25.98-13:28 KEG

TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET

(with or without an emergency spillway)

Project WILLIAMSBURG LANDING #8162

Basin # 1 Location EAST OF BUILDING ADJACENT TO SERVICE ROAD.

Total area draining to basin: 5.69 acres.

Basin Volume Design

Wet Storage:

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

   67 cu. yds. x 6.20 acres = 415 cu. yds. = 11,216 cu. FT. @ 58.50 FT

2. Available basin volume = 2008 cu. yds. at elevation 63.00. (From storage - elevation curve)

3. Excavate 0 cu. yds. to obtain required volume*.

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

4. Available volume before cleanout required.

   33 cu. yds. x 6.20 acres = 205 cu. yds. = 5524 cu. FT.

5. Elevation corresponding to cleanout level = 57.10.

   (From Storage - Elevation Curve)

6. Distance from invert of the dewatering orifice to cleanout level = 1.45 ft. (Min. = 1.0 ft.)

Dry Storage:

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

   67 cu. yds. x 6.20 acres = 415 cu. yds. = 11,216 cu. FT

8. Total available basin volume at crest of riser* = 840 cu. yds. at elevation 60.20. (From Storage - Elevation Curve)

$Q = 0.6 A_o \sqrt{2gh}$
$h = 1.78$ FT
$Q = 11,276 / 21,600$ sec
$= 0.52$ CFS
$0.52 = 6.28 A_o$
$A_o = 0.0768$ FT^2 3.75"

DRAIN IN 6 HR

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

9. Diameter of dewatering orifice = USE 4.0 in.

10. Diameter of flexible tubing = 6.0 in. (diameter of dewatering orifice plus 2 inches).

Preliminary Design Elevations

11. Crest of Riser = 60.20

Top of Dam = 64.00

Design High Water = 63.00

Upstream Toe of Dam = 53.00

Basin Shape

12. Length of Flow / Effective Width $\frac{L}{We} = \frac{170 \text{ FT}}{30} = 5.67$

If > 2, baffles are not required ✓

If < 2, baffles are required _____

Runoff

13. Q_2 = 20.67 cfs (From Chapter 5)

14. Q_{25} = 45.01 cfs (From Chapter 5)

Principal Spillway Design (SEE ATTACHED CALCULATIONS)

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

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

Anti-Seep Collar Design

23. Depth of water at principal spillway crest (Y) = ____ ft.

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

Slope of principal spillway barrel (S_b) = _____%

Length of barrel in saturated zone (L_s) = _____ ft.

24. Number of collars required = _____ dimensions = _____

(from Plate 3.14-12).

Final Design Elevations

25. Top of Dam = 64.00

Design High Water = 62.78

Emergency Spillway Crest = —

Principal Spillway Crest = 60.20

Dewatering Orifice Invert = 53.00

Cleanout Elevation = 57.10

Elevation of Upstream Toe of Dam
or Excavated Bottom of "Wet Storage
Area" (if excavation was performed) = 53.00

WILLIAMSBURG LANDING

DRY POND #1

8162
6/21/96
HWA

SIZE WATER QUALITY ORIFICE TO RETAIN WATER FOR 24 HOURS

VOLUME = 22,432 CF TIME = 24 HOURS = 86,400 SEC

$Q_{RELEASE} = \frac{22,432 CF}{86,400 SEC} = 0.26 CFS$

ORIFICE IS @ ELEV. = 53.00'

$Q = kA_0 \sqrt{2g\Delta h}$ Δh = 60.2 − 53 = 7.20
Q = 0.26 CFS
k = 0.73

$0.26 CFS = 0.73 A_0 \sqrt{2(32.2)(7.2)}$ $0.26 = 15.72 A_0$

$A_0 = 0.0165 FT^2 = \frac{\pi D^2}{4}$ D = 0.1451 FT = 1.74 IN.

USE 2 IN ORIFICE → RETAINS 18 HRS

SMALLER ORIFICE WILL CLOG TO EASY.

SCS METHOD

PRE-DEVELOPMENT

D.A. = 5.19 AC SOIL GROUP C CN = 73

POST-DEVELOPMENT

D.A. = 6.20 AC SOIL GROUP C CN = 85

HYDROLOGIC REPORT FOR

WILLIAMSBURG LANDING

DRY POND #1

JOB NO. 8162

prepared by:

AES CONSULTING ENGINEERS

5248 OLDE TOWNE RD,SUITE 1

WILLIAMSBURG, VA. 23188

DATE: 06/21/96

```
 Option 1                          STAGE / STORAGE TABLE                          R to res
IMMM
```

HYDROLOGIC REPORT

2 year pre dev.....
.....
.....

Hyd. No. 1

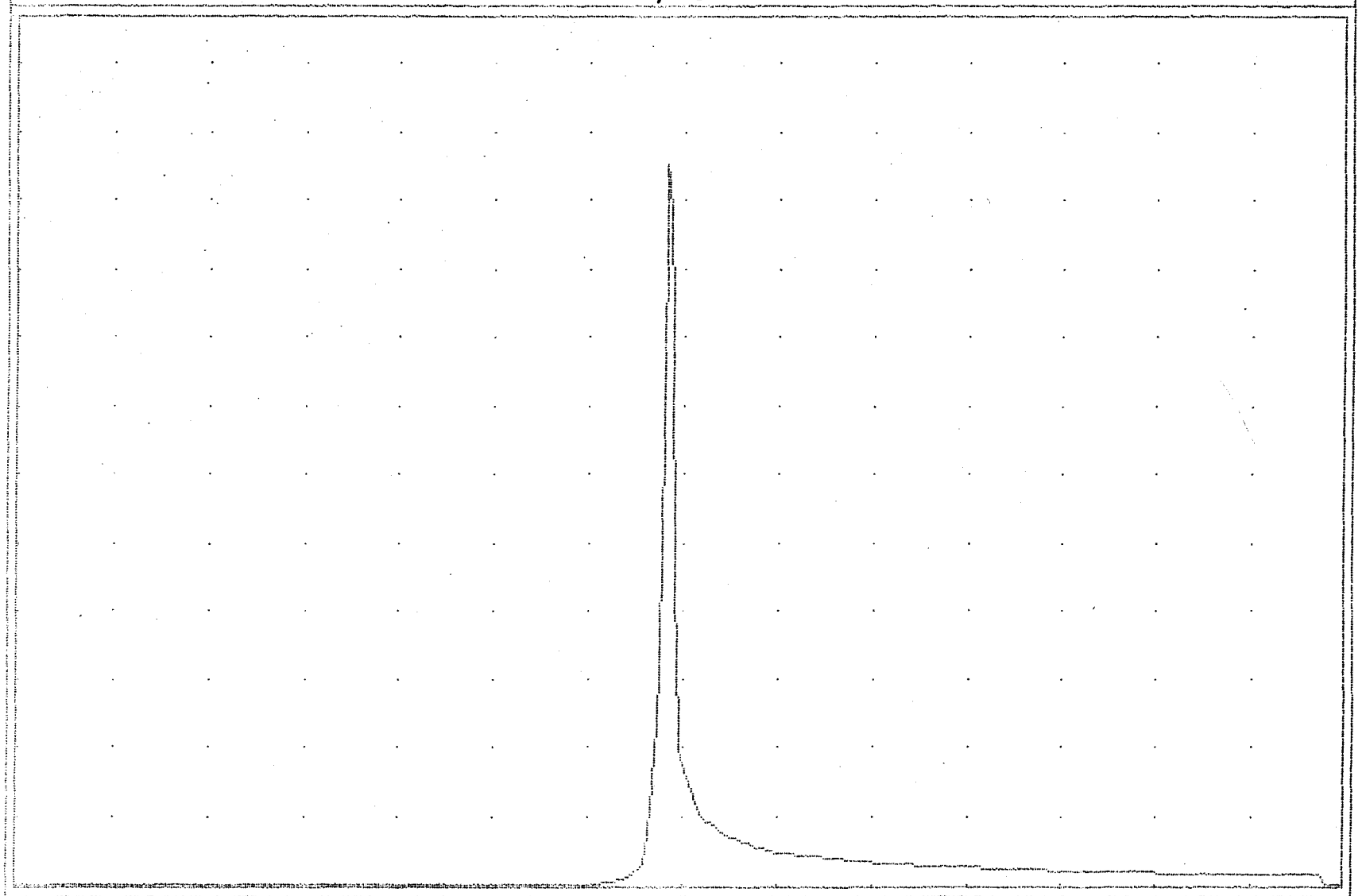
Hydrograph type	= S.C.S. RUNOFF	Peak discharge	= 10.55 cfs
Storm frequency	= 2 yr	Time interval	= 5 min
Basin area	= 5.19 ac	Basin curve No.	= 73
Ave basin slope	= 12 %	Hydraulic len	= 500 ft
Basin lag	= 3.9 min	Time of concen	= 6.49 min
Total precip.	= 3.50 in	Distribution	= S.C.S. II

HYDROGRAPH DISCHARGE TABLE

TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfS)	
11.42	0.20	11.50	0.25	11.58	0.52	11.67	1.22
11.75	2.46	11.83	5.19	11.92	10.55	12.00	9.73
12.08	4.12	12.17	1.92	12.25	1.74	12.33	1.56
12.42	1.36	12.50	1.16	12.58	1.01	12.67	0.94

Qp = 10.5 S.C.S. RUNOFF 2 Yr

PLG



HGU = 105 min 1 VGU = 1.0 cfs

VOL = (cuft/acft) = 25002 / 0.574

HYDROLOGIC REPORT

2 year post dev.....
.....
.....

Hyd. No. 2

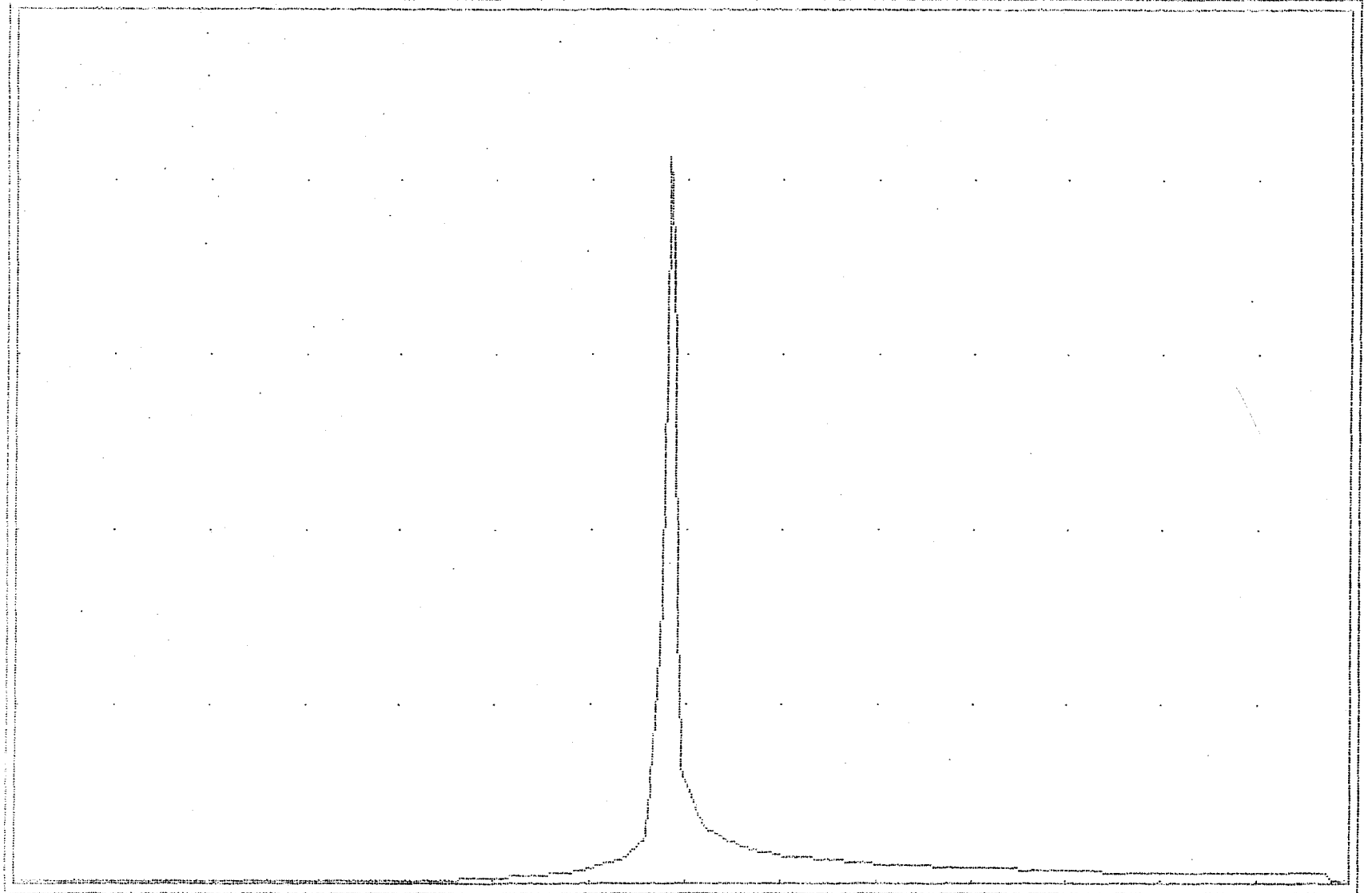
Hydrograph type	= S.C.S. RUNOFF	Peak discharge	= 20.67 cfs
Storm frequency	= 2 yr	Time interval	= 5 min
Basin area	= 5.69 ac	Basin curve No.	= 85
Ave basin slope	= 12 %	Hydraulic len	= 300 ft
Basin lag	= 1.8 min	Time of concen	= 2.97 min
Total precip.	= 3.50 in	Distribution	= S.C.S. II

HYDROGRAPH DISCHARGE TABLE

TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfS)	
11.42	1.03	11.50	1.14	11.58	2.04	11.67	4.03
11.75	6.82	11.83	11.98	11.92	20.67	12.00	17.46
12.08	7.00	12.17	3.17	12.25	2.85	12.33	2.53
12.42	2.20	12.50	1.86	12.58	1.61	12.67	1.49
12.75	1.42	12.83	1.34	12.92	1.27	13.00	1.19
13.08	1.12	13.17	1.08	13.25	1.04	13.33	0.99

Qp = 20.7 S.C.S. RUNOFF 2 Yr

POST

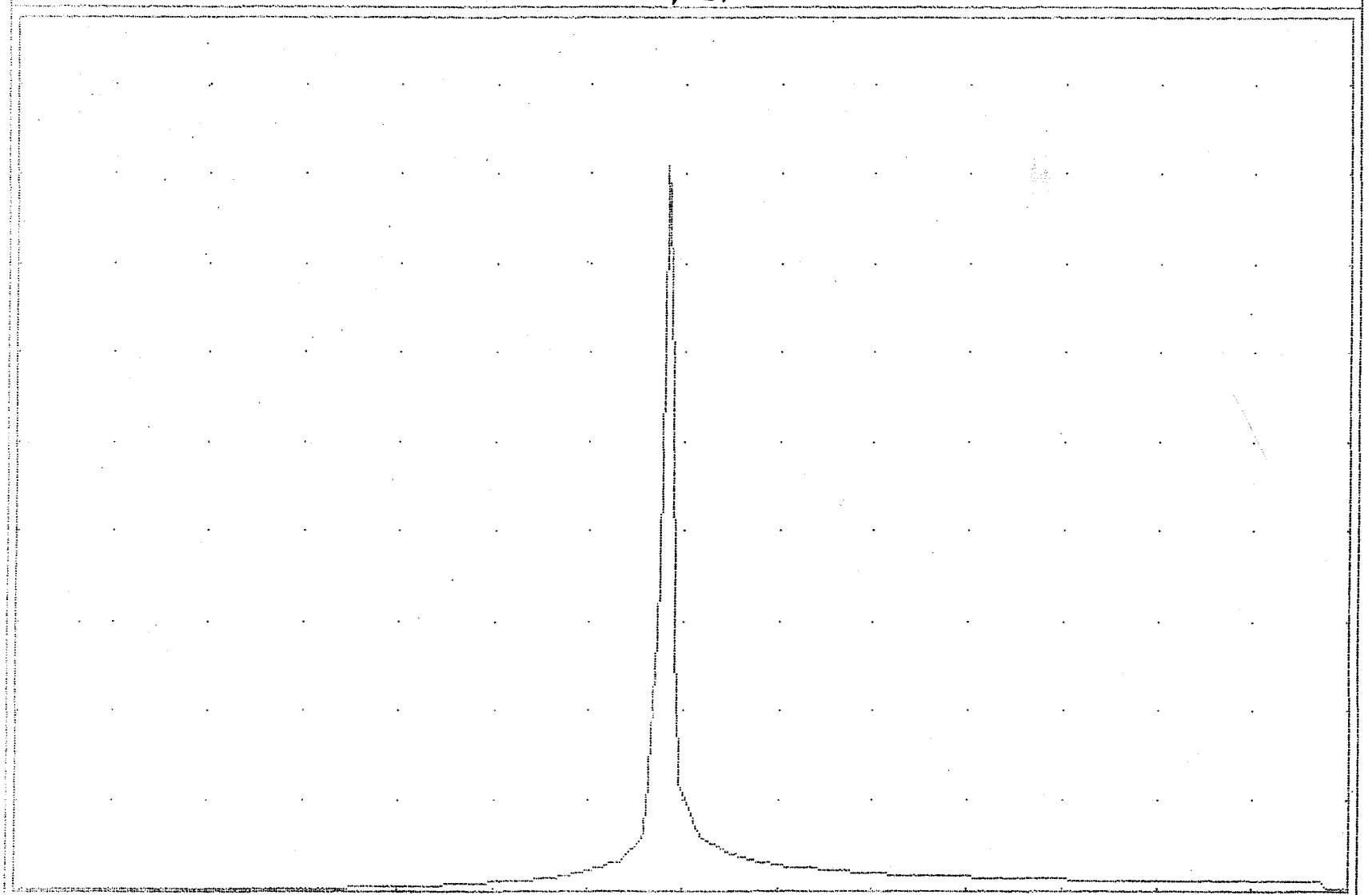


HGU = 105 min 2 VGU = 5.0 cfs

VOL = (cuft/acft) = 46854 / 1.076

Qp = 40.5 S.C.S. RUNOFF 10 Yr

POST

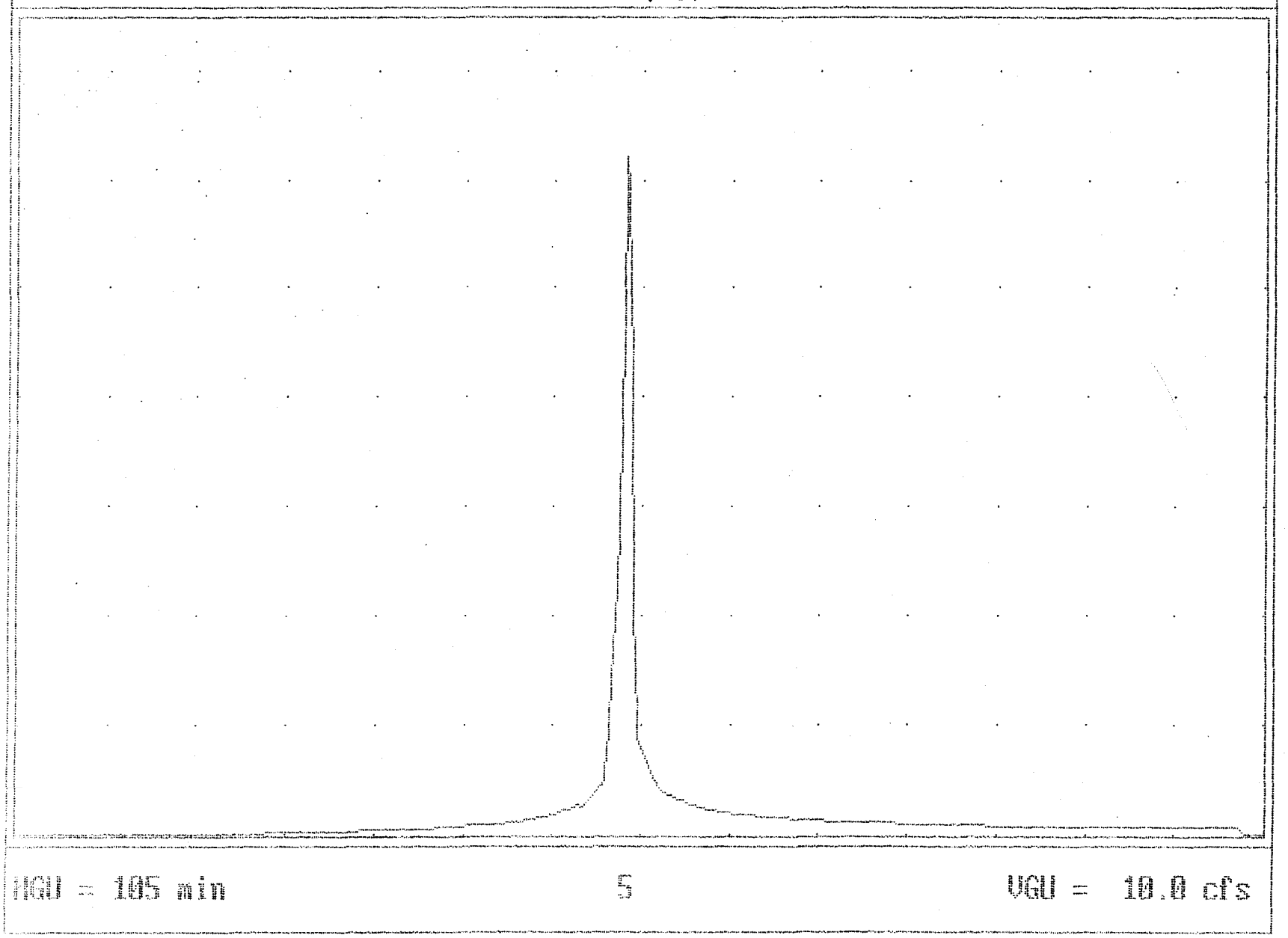


HGU = 105 min 3 VGU = 5.0 cfs

VOL = (cuft/acft) = 93417 / 2.145

Qp = 62.2 S.C.S. RUNOFF 100 Yr

POST

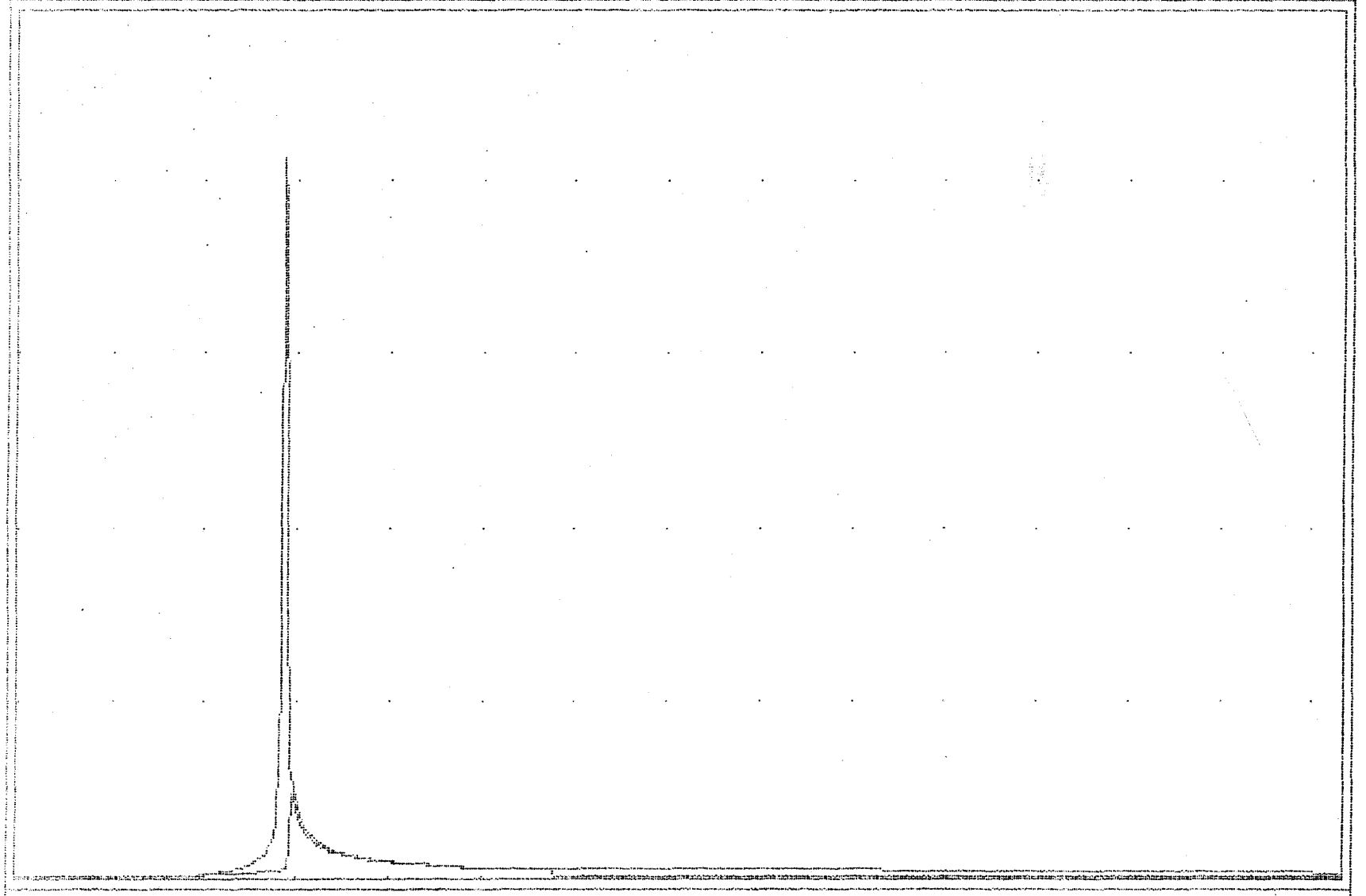


MGU = 105 min 5 VGU = 10.0 cfs

VOL = (cuft/acft) = 146617 / 3.366

Qp = 2.5 RESERVOIR ROUTE 2 Yr

THRU POND #1



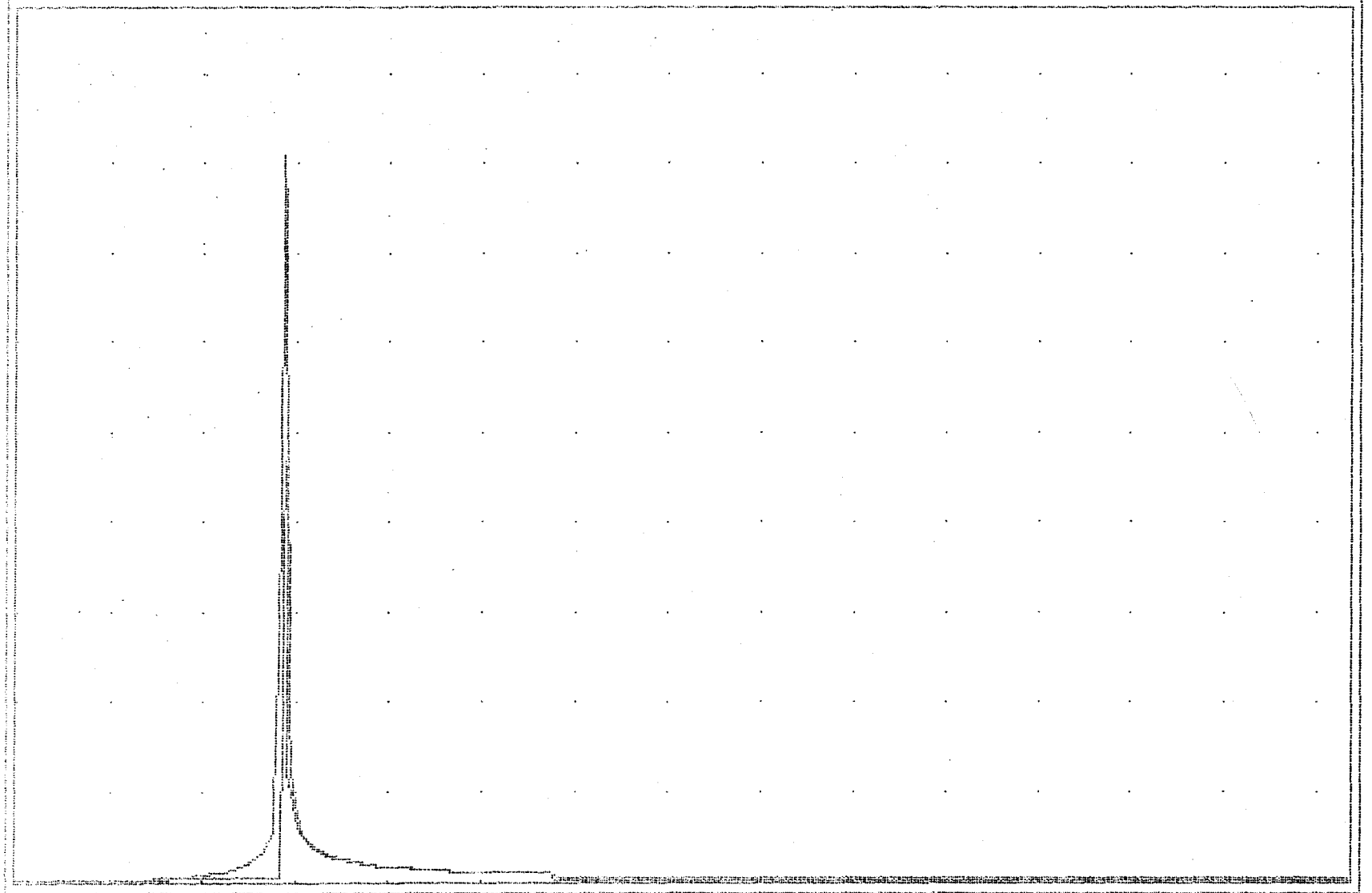
HGU = 250 min 12 VGU = 5.0 cfs

MAX STORAGE = 24008

MAX ELEVATION = 60.35

Qp = 23.4 RESERVOIR ROUTE 10 Yr

THRU POND #1



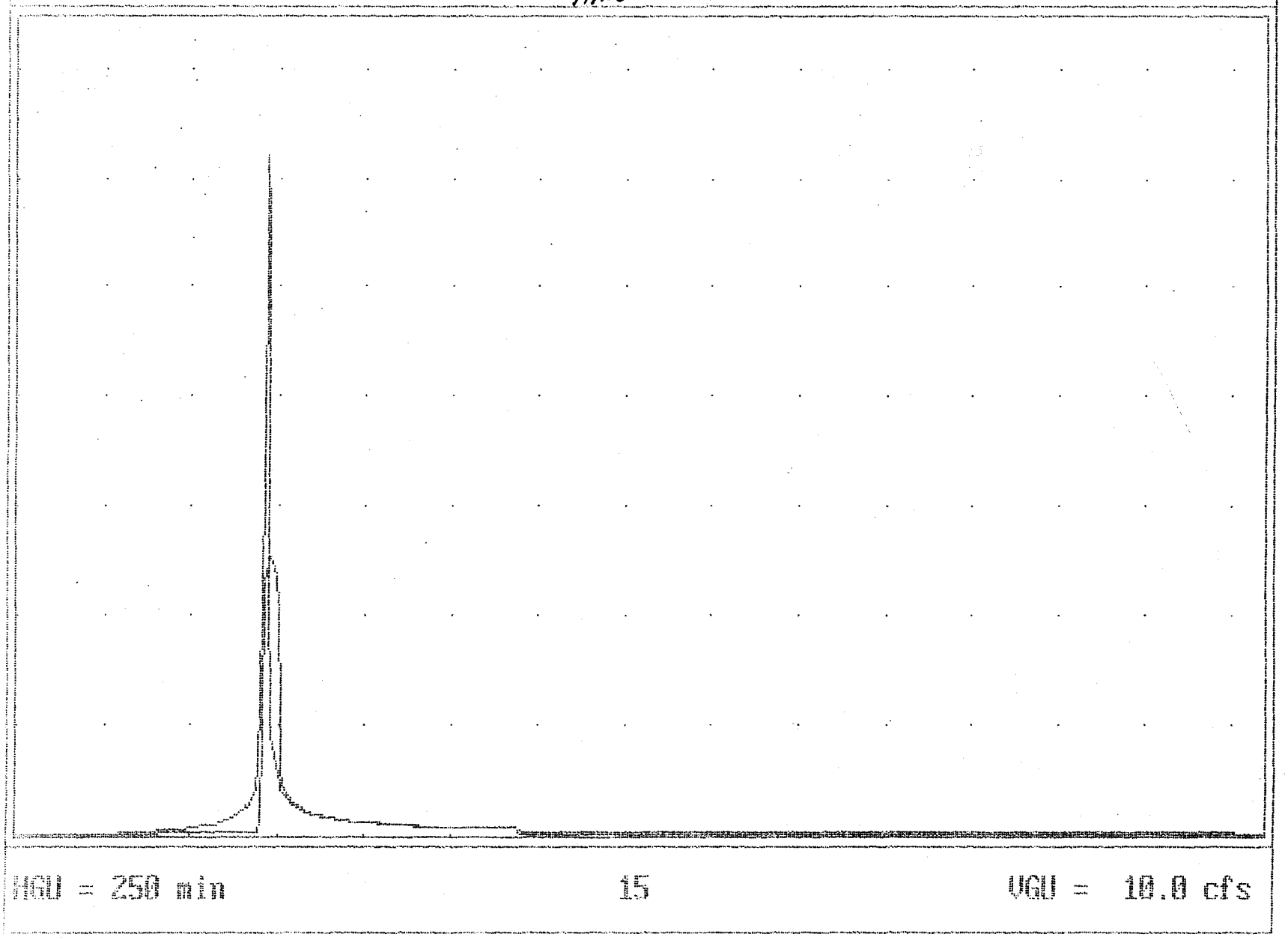
HGU = 250 min 13 VGU = 5.0 cfs

MAX STORAGE = 32918

MAX ELEVATION = 61.29

Qp = 25.6 RESERVOIR ROUTE 100 Yr

THRU POND #1



MAX STORAGE = 51303

MAX ELEVATION = 62.78

(S-50-96)

HYDRAULIC REPORT FOR

WILLIAMSBURG LANDING

JOB NO. 8162

STORM SEWER

SD-1 TO SD-6

prepared by:

AES CONSULTING ENGINEERS

5248 OLDE TOWNE RD.,SUITE 1

WILLIAMSBURG, VA. 23188

REVISED DATE: 06/21/96

STORM SEWER DESIGN / ANALYSIS

Return Period = 10 Yrs
Rainfall file: JCCN

Run Date: 06-22-1996
File: F:8162.ST3

LINE 1 / Q = 10.11 / HT = 24 / WID = 24 / N = .013 / L = 190 / JLC = 0

OUTFALL TO SD-1 / Outfall

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	65.39	13.71	64.25	5.45	65.85	18.14	-2.25	1.85
UPSTRM	66.32	17.07	64.90	4.23	66.60	21.76	6.09	2.39

Drainage area (ac)	=	0.52	Slope of invert (%)	=	0.3421
Runoff coefficient	=	0.80	Slope energy grade line (%)	=	0.3929
Time of conc (min)	=	5.45	Critical depth (in)	=	13.51
Inlet time (min)	=	5.00	Natural ground elev. (ft)	=	73.00
Intensity (in/hr)	=	6.83	Upstream surcharge (ft)	=	0.00
Cumulative C*A	=	1.48	Additional Q (cfs)	=	0.00
Q = CA * I (cfs)	=	10.11	Line capacity (cfs)	=	13.23
Q catchment (cfs)	=	2.90	Inlet length (ft)	=	0.00
Q carryover (cfs)	=	5.53	Gutter slope (ft/ft)	=	0.0000
Q captured (cfs)	=	0.00	Cross slope (ft/ft)	=	0.0000
Q bypassed (cfs)	=	8.43	Ponding width (ft)	=	N/A

LINE 2 / Q = 7.33 / HT = 18 / WID = 18 / N = .013 / L = 55 / JLC = 1

SD-1 TO SD-2 / DNLN = 1

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	66.32	17.07	64.90	4.23	66.60	17.53	6.59	1.73
UPSTRM	66.48	12.39	65.45	5.65	66.98	16.67	6.25	1.30

Drainage area (ac)	=	0.60	Slope of invert (%)	=	1.0000
Runoff coefficient	=	0.70	Slope energy grade line (%)	=	0.6869
Time of conc (min)	=	5.27	Critical depth (in)	=	12.39
Inlet time (min)	=	5.00	Natural ground elev. (ft)	=	73.20
Intensity (in/hr)	=	6.89	Upstream surcharge (ft)	=	0.00
Cumulative C*A	=	1.06	Additional Q (cfs)	=	0.00
Q = CA * I (cfs)	=	7.33	Line capacity (cfs)	=	10.50
Q catchment (cfs)	=	2.93	Inlet length (ft)	=	0.00
Q carryover (cfs)	=	2.60	Gutter slope (ft/ft)	=	0.0000
Q captured (cfs)	=	0.00	Cross slope (ft/ft)	=	0.0000
Q bypassed (cfs)	=	5.53	Ponding width (ft)	=	N/A

LINE 3 / Q = 4.49 / HT = 15 / WID = 15 / N = .013 / L = 60 / JLC = 1

SD-2 TO SD-3 / DNLN = 2

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	66.98	15.00	65.45	3.66	67.19	0.00	6.5	1.23
UPSTRM	67.23	13.53	66.10	3.85	67.46	8.92	5.65	1.17

Drainage area (ac)	=	0.83	Slope of invert (%)	=	1.0833
Runoff coefficient	=	0.45	Slope energy grade line (%)	=	0.4538
Time of conc (min)	=	5.00	Critical depth (in)	=	10.17
Inlet time (min)	=	5.00	Natural ground elev. (ft)	=	73.00
Intensity (in/hr)	=	6.97	Upstream surcharge (ft)	=	0.00
Cumulative C*A	=	0.64	Additional Q (cfs)	=	0.00
Q = CA * I (cfs)	=	4.49	Line capacity (cfs)	=	6.72
Q catchment (cfs)	=	2.60	Inlet length (ft)	=	0.00
Q carryover (cfs)	=	0.00	Gutter slope (ft/ft)	=	0.0000
Q captured (cfs)	=	0.00	Cross slope (ft/ft)	=	0.0000
Q bypassed (cfs)	=	2.60	Ponding width (ft)	=	N/A

LINE 4 / Q = 2.41 / HT = 15 / WID = 15 / N = .013 / L = 130 / JLC = 0

SD-3 TO SD-4 / DNLN = 3

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	67.46	15.00	66.10	1.97	67.52	0.00	5.65	1.23
UPSTRM	68.02	7.46	67.40	3.96	68.27	15.00	5.34	0.61

Drainage area (ac)	=	0.00	Slope of invert (%)	=	1.0000
Runoff coefficient	=	0.00	Slope energy grade line (%)	=	0.5749
Time of conc (min)	=	0.42	Critical depth (in)	=	7.46
Inlet time (min)	=	0.00	Natural ground elev. (ft)	=	74.00
Intensity (in/hr)	=	8.94	Upstream surcharge (ft)	=	0.00
Cumulative C*A	=	0.27	Additional Q (cfs)	=	0.00
Q = CA * I (cfs)	=	2.41	Line capacity (cfs)	=	6.46
Q catchment (cfs)	=	0.00	Inlet length (ft)	=	0.00
Q carryover (cfs)	=	0.00	Gutter slope (ft/ft)	=	0.0000
Q captured (cfs)	=	0.00	Cross slope (ft/ft)	=	0.0000
Q bypassed (cfs)	=	0.00	Ponding width (ft)	=	N/A

LINE 5 / Q = 2.47 / HT = 15 / WID = 15 / N = .013 / L = 95 / JLC = 0

SD-4 TO SD-5 / DNLN = 4

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	67.95	6.60	67.40	4.75	68.30	14.89	5.34	0.52
UPSTRM	68.90	6.60	68.35	4.75	69.25	14.89	3.7	0.52

Drainage area (ac)	= 0.15	Slope of invert (%)	= 1.0000
Runoff coefficient	= 0.90	Slope energy grade line (%)	= 1.0000
Time of conc (min)	= 0.09	Critical depth (in)	= 7.54
Inlet time (min)	= 0.00	Natural ground elev. (ft)	= 73.30
Intensity (in/hr)	= 9.14	Upstream surcharge (ft)	= 0.00
Cumulative C*A	= 0.27	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 2.47	Line capacity (cfs)	= 6.46
Q catchment (cfs)	= 0.00	Inlet length (ft)	= 0.00
Q carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.0000
Q captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.0000
Q bypassed (cfs)	= 0.00	Ponding width (ft)	= N/A

Note: Normal depth assumed

LINE 6 / Q = 1.24 / HT = 15 / WID = 15 / N = .013 / L = 15 / JLC = 0

SD-5 TO SD-6 / DNLN = 5

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	68.90	6.60	68.35	2.39	68.99	9.95	3.7	0.52
UPSTRM	68.95	5.35	68.50	3.16	69.10	14.37	3.55	0.39

Drainage area (ac)	= 0.15	Slope of invert (%)	= 1.0000
Runoff coefficient	= 0.90	Slope energy grade line (%)	= 0.7508
Time of conc (min)	= 0.00	Critical depth (in)	= 5.35
Inlet time (min)	= 0.00	Natural ground elev. (ft)	= 73.30
Intensity (in/hr)	= 9.19	Upstream surcharge (ft)	= 0.00
Cumulative C*A	= 0.14	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 1.24	Line capacity (cfs)	= 6.46
Q catchment (cfs)	= 0.00	Inlet length (ft)	= 0.00
Q carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.0000
Q captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.0000
Q bypassed (cfs)	= 0.00	Ponding width (ft)	= N/A

HYDRAULIC REPORT FOR

WILLIAMSBURG LANDING

JOB NO. 8162

STORM SYSTEM

SD-7 TO SD-8

Prepared by:

AES CONSULTING ENGINEERS

5248 OLDE TOWNE RD,SUITE 1

WILLIAMSBURG, VA 23188

REVISED DATE: 6/21/96

Return Period = 100 Yrs
Rainfall file: JCCN

Run Date: 06-22-1996
File: F:8162-1.ST3

LINE 1 / Q = 2.82 / HT = 15 / WID = 15 / N = .013 / L = 48 / JLC = 1

SD-8 TO OUTFALL / Outfall

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	67.47	5.67	67.00	6.63	68.16	14.55	-1.25	0.43
UPSTRM	68.47	5.67	68.00	6.63	69.16	14.55	4.05	0.43

Drainage area (ac)	= 0.16	Slope of invert (%)	= 2.0833
Runoff coefficient	= 0.75	Slope energy grade line (%)	= 2.0833
Time of conc (min)	= 5.19	Critical depth (in)	= 8.07
Inlet time (min)	= 5.00	Natural ground elev. (ft)	= 73.30
Intensity (in/hr)	= 9.18	Upstream surcharge (ft)	= 0.00
Cumulative C*A	= 0.31	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 2.82	Line capacity (cfs)	= 9.32
Q catchment (cfs)	= 1.11	Inlet length (ft)	= 0.00
Q carryover (cfs)	= 1.73	Gutter slope (ft/ft)	= 0.0000
Q captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.0000
Q bypassed (cfs)	= 2.84	Ponding width (ft)	= N/A

Note: Normal depth assumed

LINE 2 / Q = 1.73 / HT = 15 / WID = 15 / N = .013 / L = 28 / JLC = .9

SD-7 SD-8 / DNLN = 1

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	69.16	13.88	68.00	1.46	69.19	14.43	4.05	1.19
UPSTRM	70.10	6.32	69.40	3.53	70.29	14.81	2.65	0.49

Drainage area (ac)	= 0.25	Slope of invert (%)	= 5.0000
Runoff coefficient	= 0.75	Slope energy grade line (%)	= 3.3230
Time of conc (min)	= 5.00	Critical depth (in)	= 6.32
Inlet time (min)	= 5.00	Natural ground elev. (ft)	= 73.30
Intensity (in/hr)	= 9.24	Upstream surcharge (ft)	= 0.00
Cumulative C*A	= 0.19	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 1.73	Line capacity (cfs)	= 14.44
Q catchment (cfs)	= 1.73	Inlet length (ft)	= 0.00
Q carryover (cfs)	= 0.00	Gutter slope (ft/ft)	= 0.0000
Q captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.0000
Q bypassed (cfs)	= 1.73	Ponding width (ft)	= N/A

HYDRAULIC REPORT FOR

WILLIAMSBURG LANDING

JOB NO. 8162

STORM SYSTEM

SD-9 TO SD-11

Prepared by:

AES CONSULTING ENGINEERS

5248 OLDE TOWNE RD,SUITE 1

WILLIAMSBURG, VA 23188

DATE: 4/24/96

Return Period = 10 Yrs
Rainfall file: JCCN

Run Date: 04-24-1996
File: F:8162-2.ST3

LINE 1 / Q = 7.59 / HT = 15 / WID = 15 / N = .013 / L = 155 / JLC = 1.2

SD-11 OUTFALL / Outfall

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	52.63	7.53	52.00	12.30	54.98	15.00	-1.25	0.62
UPSTRM	61.63	7.53	61.00	12.30	63.98	15.00	7.25	0.62

Drainage area (ac)	= 1.26	Slope of invert (%)	= 5.8065
Runoff coefficient	= 0.80	Slope energy grade line (%)	= 5.8065
Time of conc (min)	= 6.96	Critical depth (in)	= 13.28
Inlet time (min)	= 5.00	Natural ground elev. (ft)	= 69.50
Intensity (in/hr)	= 6.41	Upstream surcharge (ft)	= 0.00
Cumulative C*A	= 1.18	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 7.59	Line capacity (cfs)	= 15.56
Q catchment (cfs)	= 7.03	Inlet length (ft)	= 0.00
Q carryover (cfs)	= 1.23	Gutter slope (ft/ft)	= 0.0000
Q captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.0000
Q bypassed (cfs)	= 8.25	Ponding width (ft)	= N/A

Note: Normal depth assumed

LINE 2 / Q = 1.21 / HT = 15 / WID = 15 / N = .013 / L = 100 / JLC = 1.1

SD-11 SD-10 / DNLN = 1

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	64.45	15.00	61.00	0.99	64.46	0.00	7.25	1.23
UPSTRM	64.48	15.00	63.00	0.99	64.50	0.00	9.05	1.23

Drainage area (ac)	= 0.11	Slope of invert (%)	= 2.0000
Runoff coefficient	= 0.80	Slope energy grade line (%)	= 0.0352
Time of conc (min)	= 5.27	Critical depth (in)	= 5.29
Inlet time (min)	= 5.00	Natural ground elev. (ft)	= 73.30
Intensity (in/hr)	= 6.89	Upstream surcharge (ft)	= 0.23
Cumulative C*A	= 0.18	Additional Q (cfs)	= 0.00
Q = CA * I (cfs)	= 1.21	Line capacity (cfs)	= 9.13
Q catchment (cfs)	= 0.61	Inlet length (ft)	= 0.00
Q carryover (cfs)	= 0.61	Gutter slope (ft/ft)	= 0.0000
Q captured (cfs)	= 0.00	Cross slope (ft/ft)	= 0.0000
Q bypassed (cfs)	= 1.23	Ponding width (ft)	= N/A

LINE 3 / Q = 0.61 / HT = 15 / WID = 15 / N = .013 / L = 25 / JLC = .9

SD-10 SD-9 / DNLN = 2

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	64.50	15.00	63.00	0.50	64.50	0.00	9.05	1.23
UPSTRM	64.65	3.76	64.25	2.55	64.75	13.00	9	0.24

Drainage area (ac)	=	0.11	Slope of invert (%)	=	5.0000
Runoff coefficient	=	0.80	Slope energy grade line (%)	=	0.6474
Time of conc (min)	=	5.00	Critical depth (in)	=	3.76
Inlet time (min)	=	5.00	Natural ground elev. (ft)	=	74.50
Intensity (in/hr)	=	6.97	Upstream surcharge (ft)	=	0.00
Cumulative C*A	=	0.09	Additional Q (cfs)	=	0.00
Q = CA * I (cfs)	=	0.61	Line capacity (cfs)	=	14.44
Q catchment (cfs)	=	0.61	Inlet length (ft)	=	0.00
Q carryover (cfs)	=	0.00	Gutter slope (ft/ft)	=	0.0000
Q captured (cfs)	=	0.00	Cross slope (ft/ft)	=	0.0000
Q bypassed (cfs)	=	0.61	Ponding width (ft)	=	N/A

Option 1 #1 STAGE / STORAGE TABLE R to re

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

	STAGE ft.	ELEVATION ft	CO AREA sq ft	INC STORAGE cu ft	TOT STORAGE cu ft
4	0.00	53.00.	70.....	0	0
5	1.00	54.00.	356.....	213	213
6	2.00	55.00.	1076....	716	929
7	3.00	56.00.	2025....	1550	2479
8	4.00	57.00.	3245....	2635	5114
9	5.00	58.00.	4488....	3866	8980 wet 58.1
10	6.00	59.00.	5884....	5186	14166
11	7.00	60.00.	7665....	6774	20940
12	8.00	61.00.	9838....	8751	29691
13	9.00	62.00.	12181...	11009	40700
14	10.00	63.00.	14868...	13524	54224

64 - Top of DAM

Change item number: 0 DY to c

```
•Reservoir No. 1                    OUTLET STRUCTURES
IMMM
```

Rainfall file: jcc RATIONAL HYDROGRAPH C:9162

```
IMMM
```

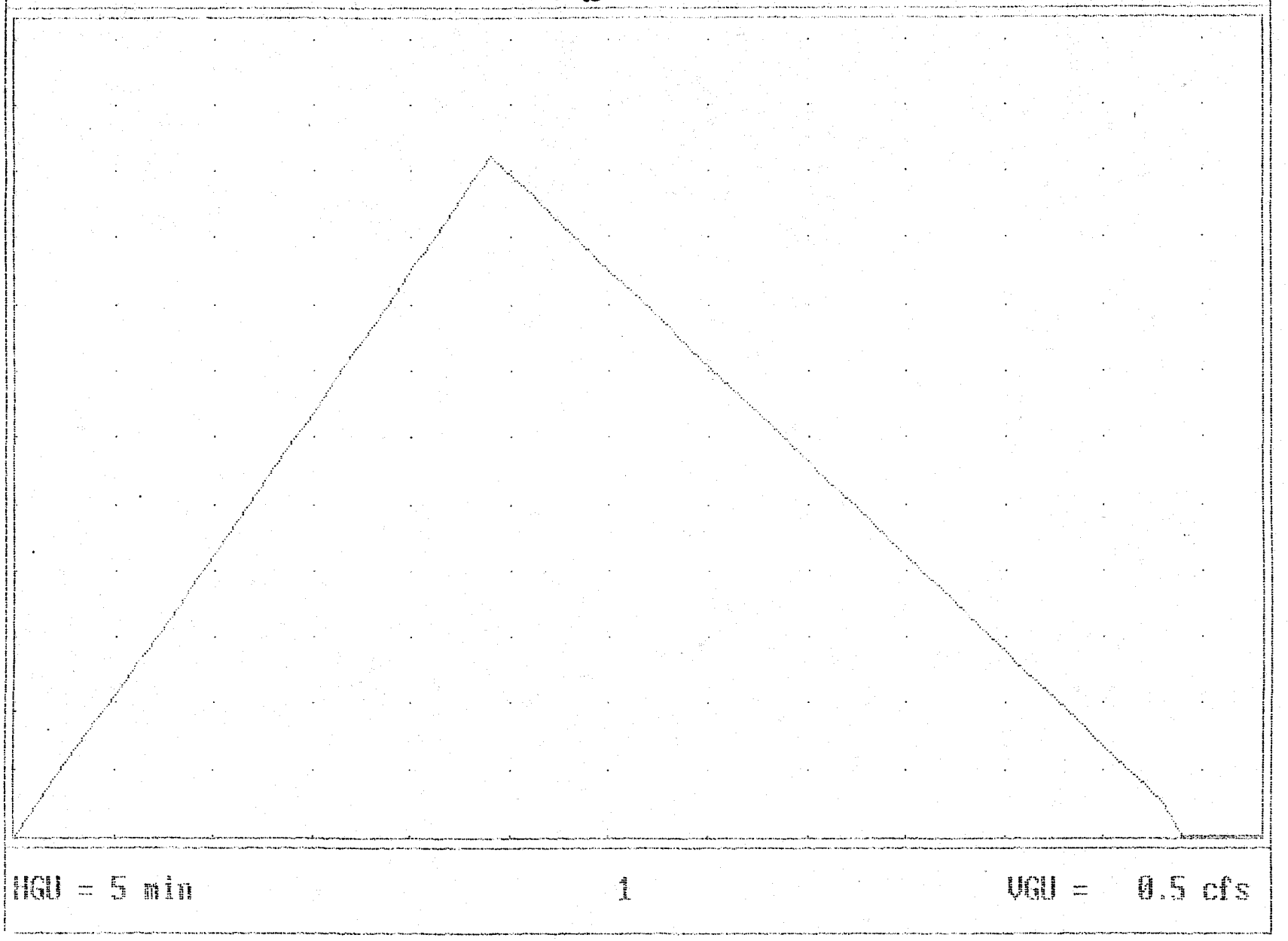
Rainfall file: jcc RATIONAL HYDROGRAPH C:8162.

```
:
: 1. HYDROGRAPH No. = 2............
:
: 2. HYDROGRAPH DESCRIPTION
:
:       A. 2 year post dev.......
:       B. ......................
:       C. ......................
:
: 3. AREA (ac) = 5.69..............
:
: 4. RUNOFF COEFFICIENT = .47......
:
: 5. TIME OF CONCEN. (min) = 5.....
:
: 6. RETURN PERIOD = 2.............
:
: 7. RECEDING LIMB FACTOR  = 1.49..
:
:   (0 for Dekalb Rational)
:
```

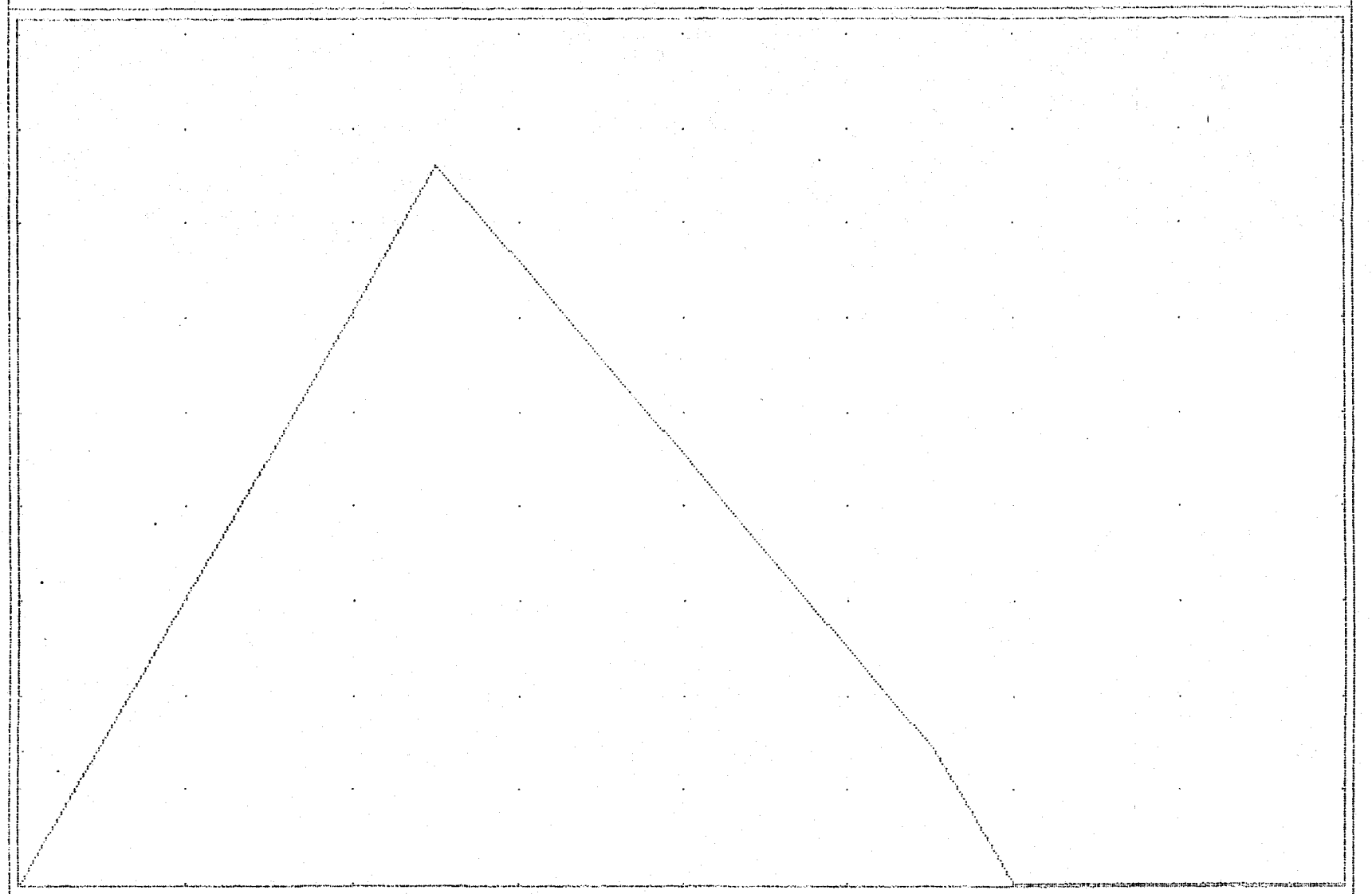
	Hyd.	Qpeak	Hyd.	Qpeak
CC				
CC	1	5.11	2	15.24
CC	3	18.00	4	21.18
CC	5	24.87	6	2.78
CC	7	11.61	8	13.65
CC	9	16.47	10	19.69
CC	11	0.00	12	4.31
CC	13	4.52	14	4.75
CC	15	4.97	16	0.00
CC	17	2.74	18	3.63
CC	19	4.38	20	7.37
CC				

Change item number: 0

PRE

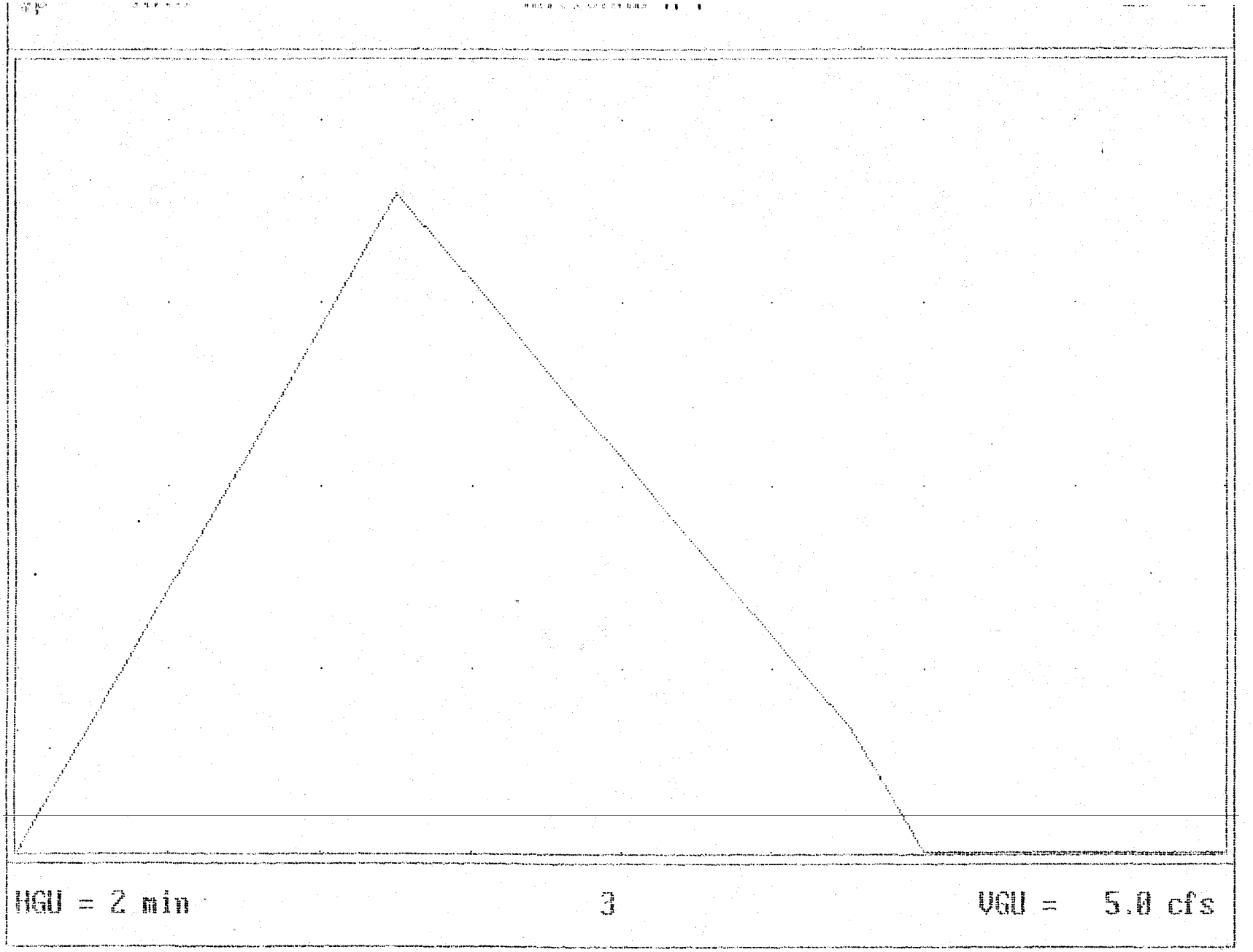


VOL = (cuft/acft) = 9164 / 0.210

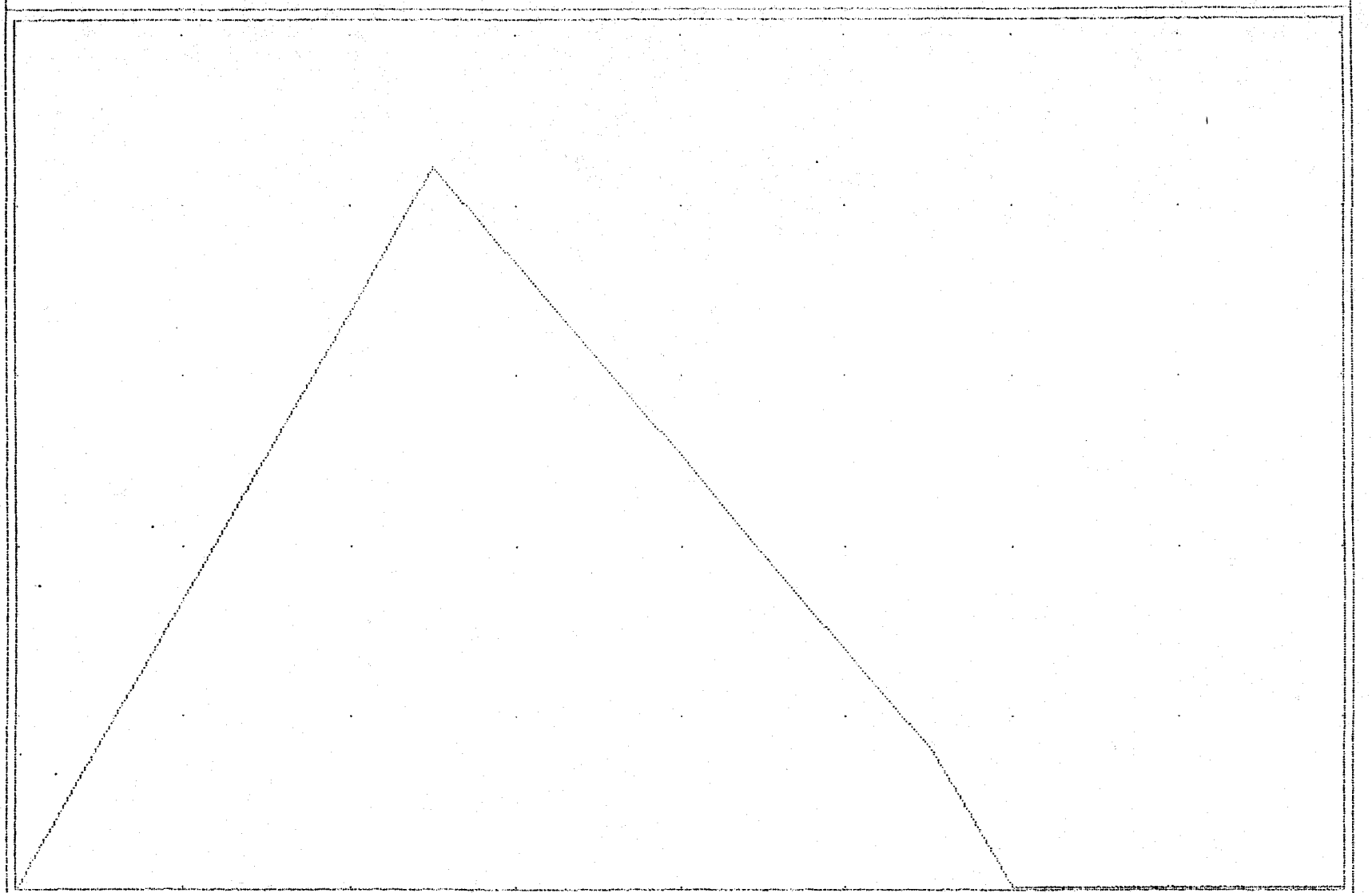


HGU = 2 min 2 VGU = 2.0 cfs

VOL = (cuft/acft) = 5651 / 0.130

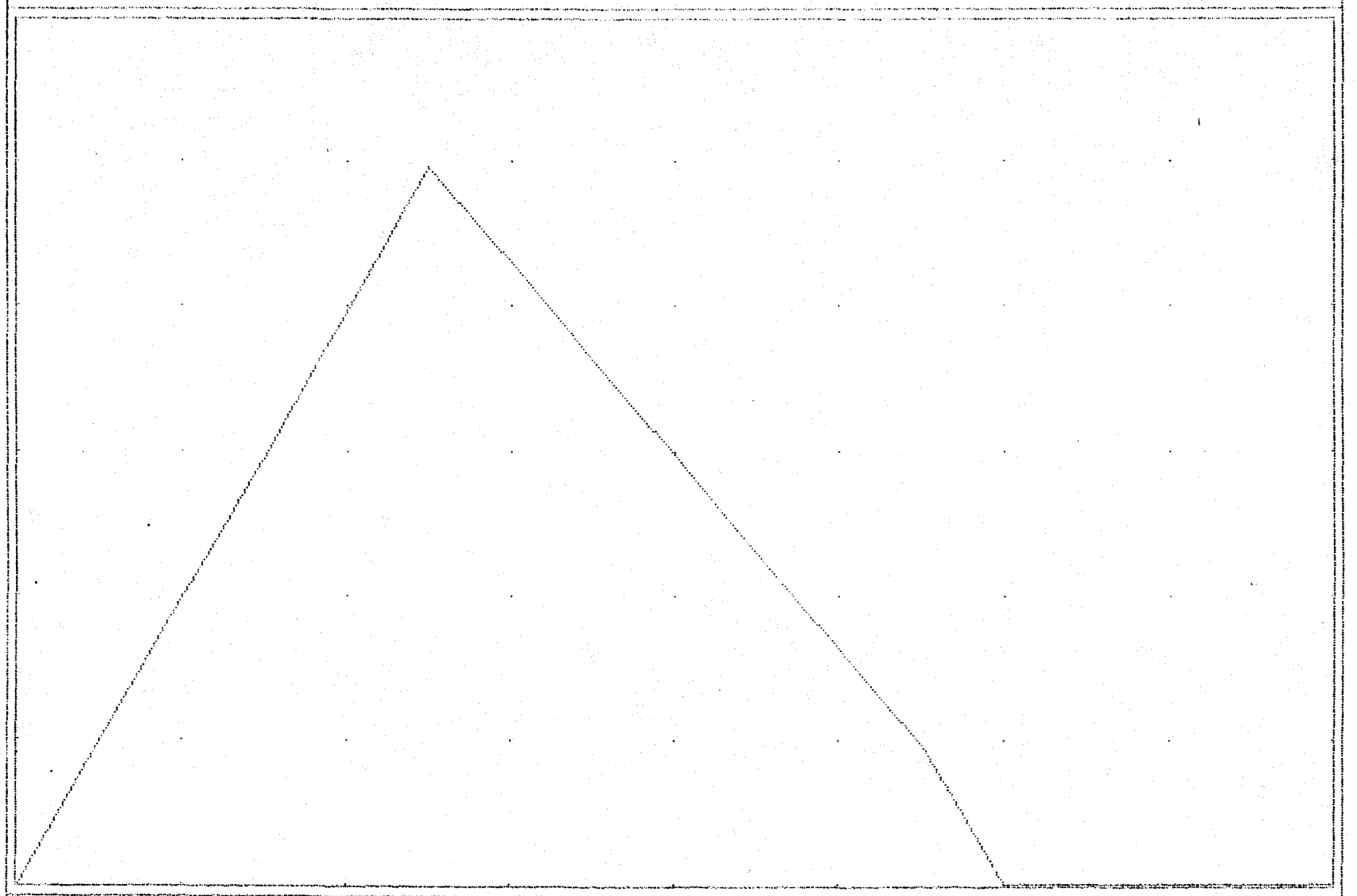


VOL = (cuft/acft) = 6676 / 0.153



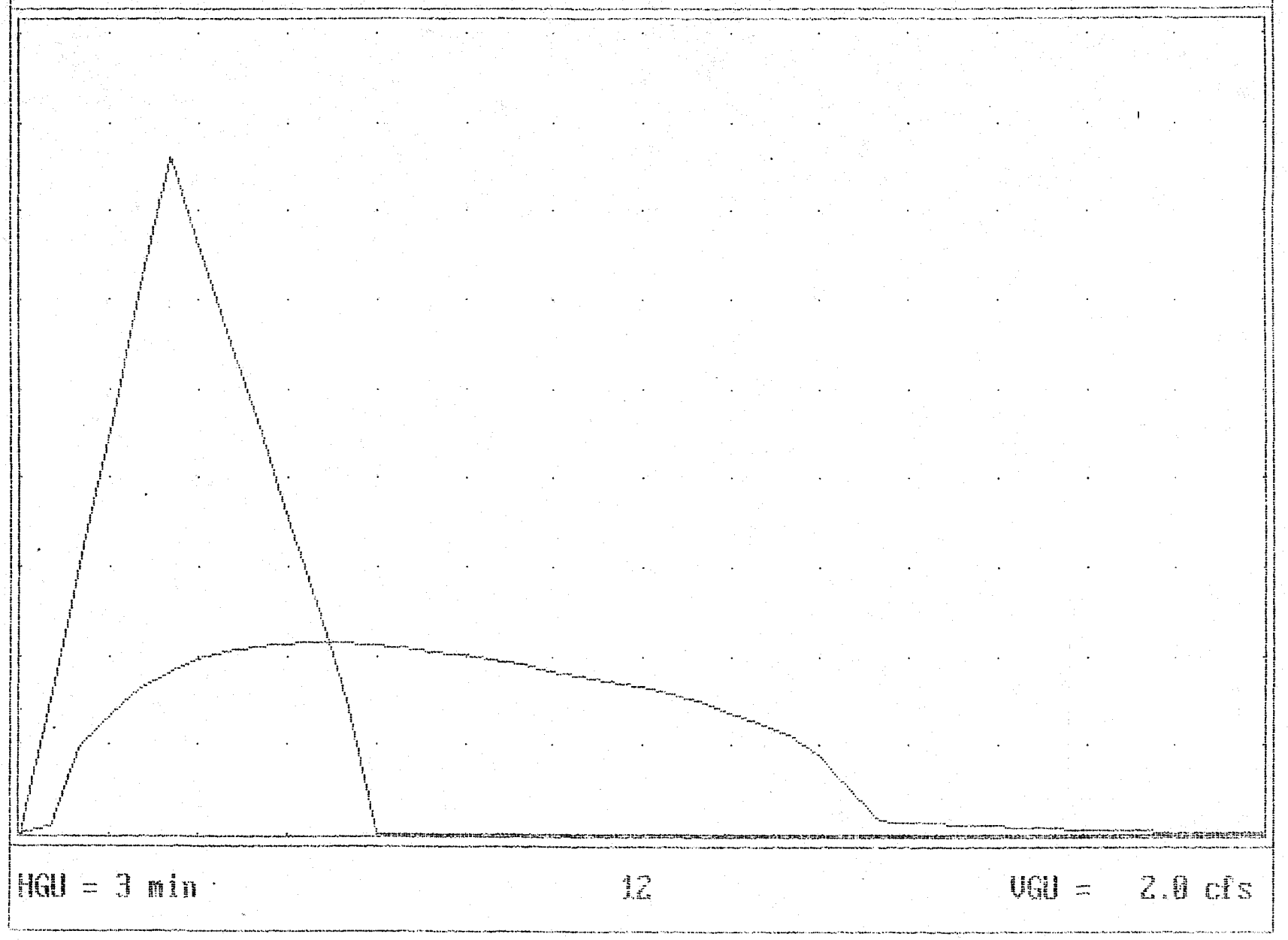
HGU = 2 min 4 VGU = 5.0 cfs

VOL = (cuft/acft) = 7853 / 0.180



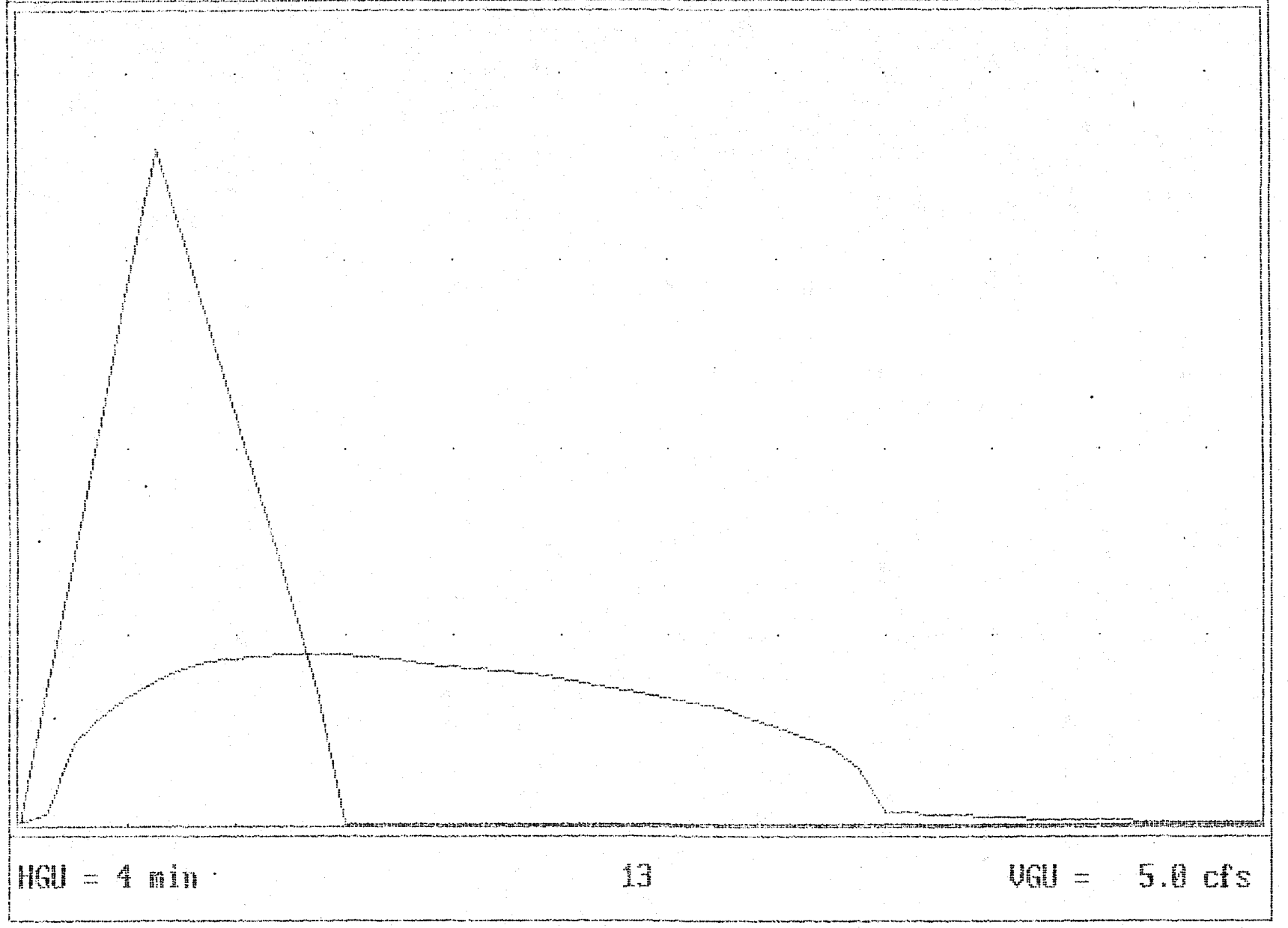
UGU = 2 min 5 UGU = 5.0 cfs

VOL = (cuft/acft) = 9222 / 0.212



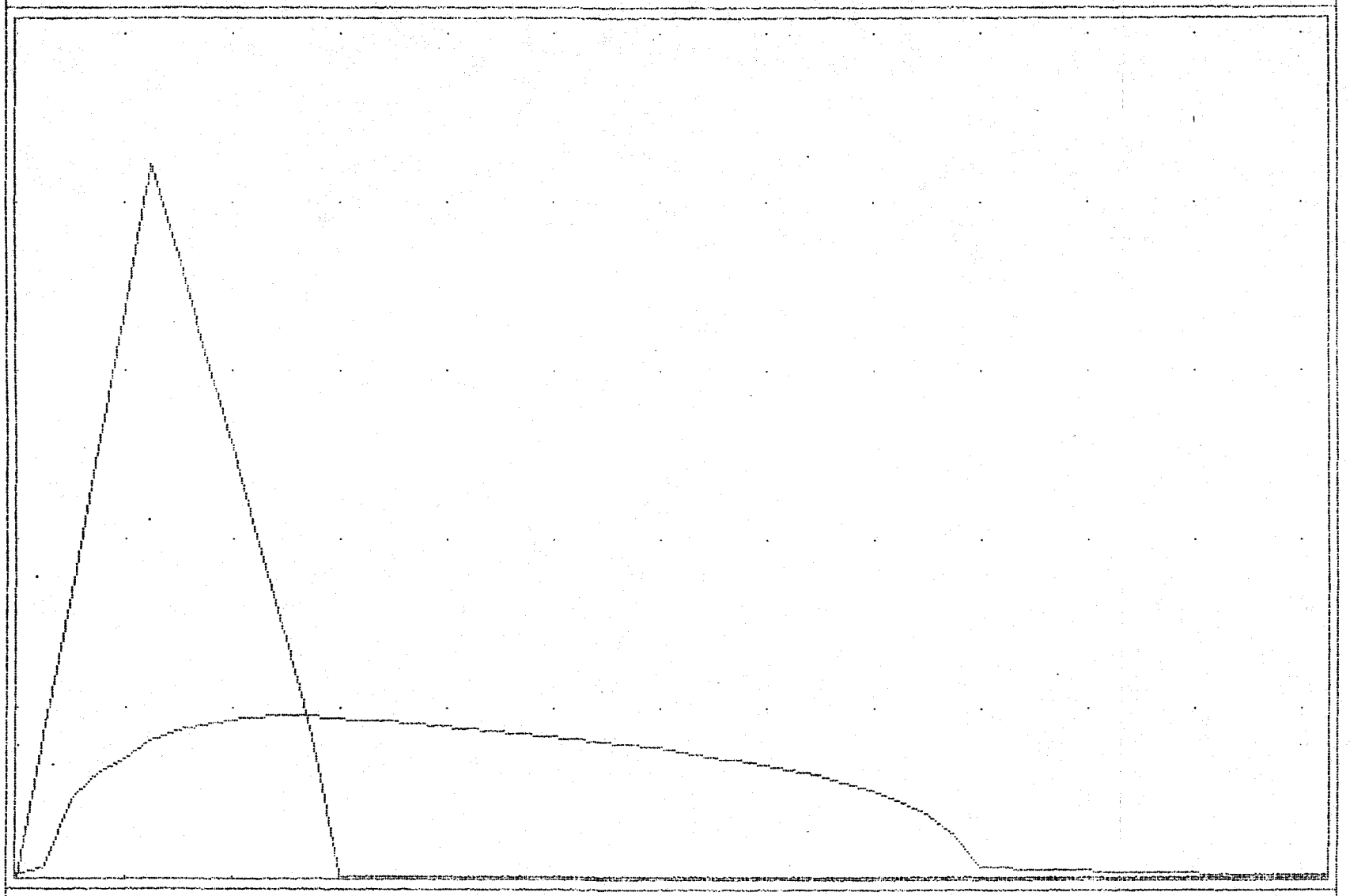
MAX STORAGE = 3512

MAX ELEVATION = 56.39



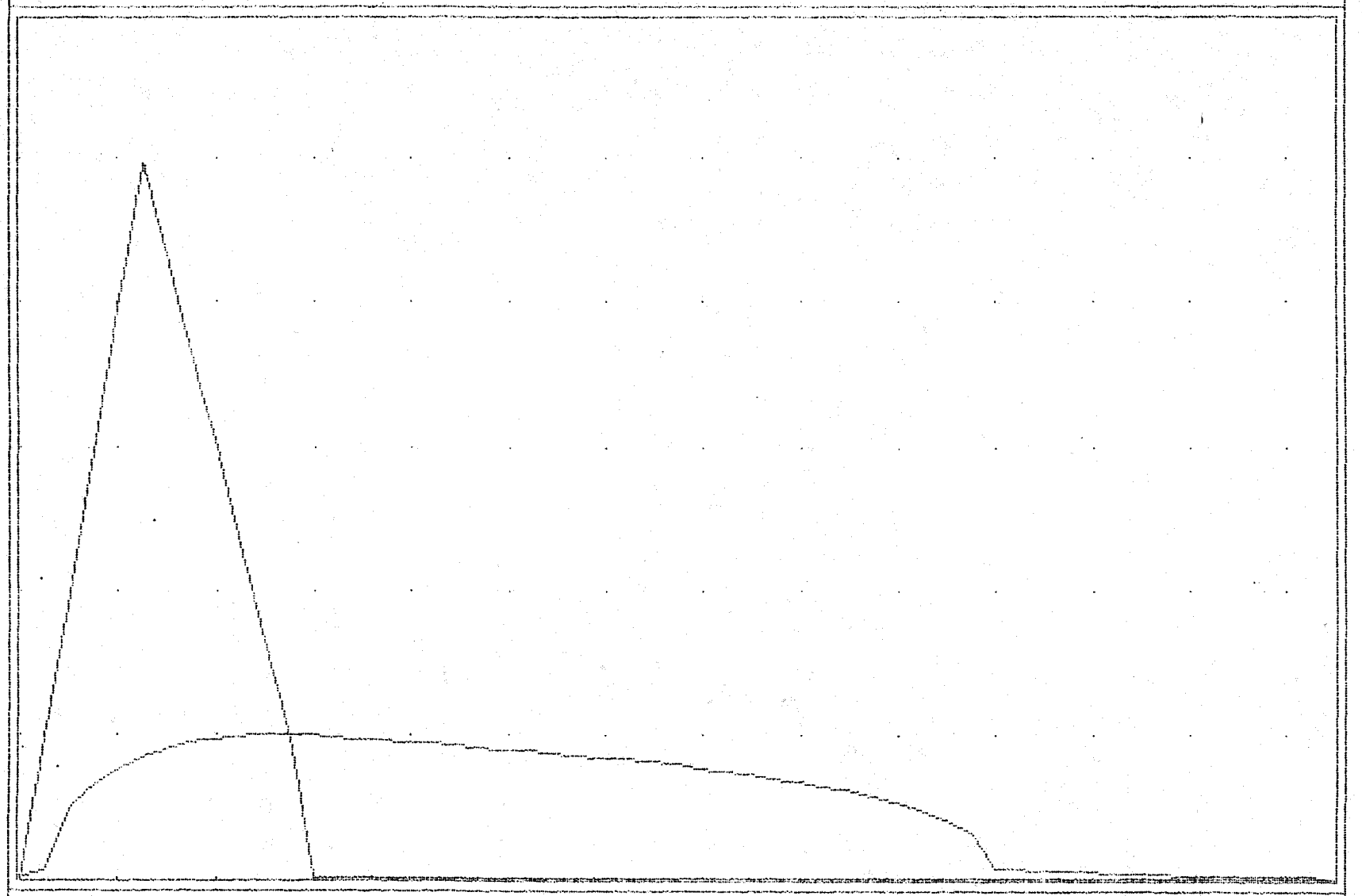
MAX STORAGE = 4386

MAX ELEVATION = 56.72



MAX STORAGE = 5430

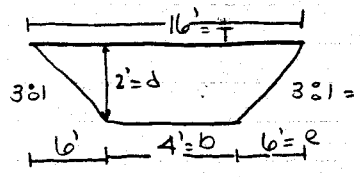
MAX ELEVATION = 57.08



HGU = 4 min 15 VGU = 5.0 cfs

MAX STORAGE = 6670

MAX ELEVATION = 57.40



$Z = \frac{e}{d}$

TRAPEZOIDAL CHANNEL

X-SECTIONAL AREA (A) = $bd + Zd^2 = 4(2) + 3(2^2) = 20\ ft^2$

HYDRAULIC RADIUS = $\frac{bd + Zd^2}{b + 2d\sqrt{Z^2+1}} = \frac{4(2) + 3(2^2)}{4 + 2(2)\sqrt{3^2+1}} = 1.20$

FOR GRASS LINED CHANNELS:

CHANNEL S ≈ 10% ∴ V_{max} permissible = 4 ft/sec

CORRECTION FACTOR:
$R/T = 1.25 \Rightarrow .84$

∴ $V_{max} = 4(.84) = 3.36$ ft/sec

KNOWN $Q_{peak} = 9\ ft^3/sec$

$Q = VA$
$9\ ft^3/sec = V(20\ ft^2)$
∴ $V = 0.45$ ft/sec < $V_{max} = 3.36$ ft/sec

∴ THESE CALCULATIONS SHOW THE CHANNEL TO BE MORE THAN ADEQUATE FOR THE PEAK FLOW.

Job# 8162
WILLIAMSBURG LANDING
8/28/96

48 ϕ Concrete pipe - ID = 58" - OD

72" area = ~~4072~~ in^2

58" area = ~~2642~~

~~1430~~

48" area = 12.57 ft^2

58" " ~ 18.35

72" " = 28.27

72 28.27

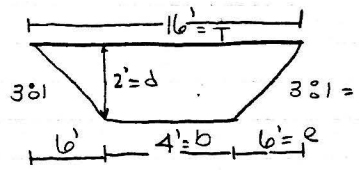
58 - 18.35

9.9 < 12.57 ft^2 - N.G.

78" = 33.18

- 18.35

14.83 > 12.57 - ok.



$Z = \frac{e}{d}$

TRAPEZOIDAL CHANNEL

X-SECTIONAL AREA (A) = $bd + Zd^2 = 4(2) + 3(2^2) = 20\ ft^2$

HYDRAULIC RADIUS = $\frac{bd + Zd^2}{b + 2d\sqrt{Z^2+1}} = \frac{4(2) + 3(2^2)}{4 + 2(2)\sqrt{3^2+1}} = 1.20$

FOR GRASS LINED CHANNELS:

CHANNEL S ≈ 10% ∴ V_{max} permissible = ~~4~~ ft/sec 2.5'/sec

CORRECTION FACTOR:
$A/T = 1.25 \Rightarrow .84$

∴ $V_{max} = 4(.84) = 3.36$ ft/sec

KNOWN Q_{peak} 9 ft^3/sec

→ $Q = VA$
$9\ ft^3/sec = V(20\ ft^2)$
∴ $V = 0.45$ ft/sec < $V_{max} = 3.36$ ft/sec

∴ THESE CALCULATIONS SHOW THE CHANNEL TO BE MORE THAN ADEQUATE FOR THE PEAK FLOW.

↳ depth will not be 2.0'

Need to use Manning eqn.

Job# 8162
WILLIAMSBURG LANDING
8/28/96

$\frac{25}{33}$ = 7.5 pts

Try 23.26

0.64 = $\frac{2.49 \text{ ac}}{23.26} \times 6$

2.4 = $\frac{6.2}{23.26} \times 9$ 6 ⇒ 1.6

3.0 or 2.2

1.68
.45
2.00

NOS - 6.26 ⇒ 9.26

.75 - need 1.63ac.

33.
-10
23
9 - site dev.
14
22
36 - NOS

8.7

$\frac{36}{45}$ = 8 PTS
3 PTS
11.0

8
2.2
10.2

1. Run calcs by WNB
2. Check on procedure w/ Gary - can we give final approval before everyone has a complete set.

- Wmbg Lndg -

2' deep

Filter Fabric

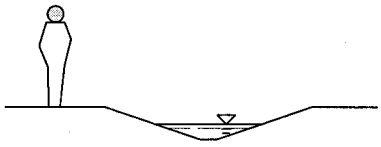
Class I RR

approx 2:1 SS w/ 1' bottom

approx 150' feet long w/ 3' high CD @ 20' below bottom

Computer-Aided Hydrology & Hydraulics
CHANNEL Program
Version 1.06

Project: The Landing - Timber Structure Outfall
User: Darryl Cook, P.E.
Date: 5 September 1996, Thursday
Time: 11:58 am
Output: C:\CAHH\REVIEW.OUT



Vegetation, Retardance Class B

FLEXIBLE (HEC-15) ANALYSIS

INPUTS:

DISCHARGE	7 cfs
Bottom Slope (ft/ft)	.1
Left Side Slope (hor/vert)	3
Right Side Slope (hor/vert)	3
Bottom Width (ft)	1
Freeboard (ft)	1

LINING MATERIAL:

Vegetation, Retardance Class B

OUTPUTS:

	MILD CHANNEL	
	NORMAL	CRITICAL
FLOW DEPTH	.893 ft	.659 ft
Velocity (fps)	2.13	3.568
Flow Area (sf)	3.286	1.962
Hydraulic Radius (ft)	.494	.38
Froude Number	0.5222	1.0000
Width at Depth (ft)	6.359	4.954
Width at Freeboard (ft)	12.359	
Computed Manning n	0.1378	

	COMPUTED	PERMISSIBLE
Velocity (fps)	2.13 Stable?	1.767
Shear Stress (psf)	5.573 Stable?	2.1

BMP CALCULATIONS

WMBG LANDING #8162

1) STRUCTURAL BMP POINTS

DRY POND #1	6 PTS	$\frac{6.20}{15.85}$	=	2.35
DRY POND #2	6 PTS	$\frac{2.49}{15.85}$	=	0.94
TOTAL STRUCTURAL POINTS				**3.29**

15.85 IS – 7.94 Ac BETWEEN COL PIPELINE STREET AND WMSB LAND SA
7.91 Ac OF BLDG SITE LOCATION DRAINING TO POND #2

2) OPEN SPACE

$\frac{30.13}{38.04}$ (100) × .1 = 7.92

30.13 IS 7.94Ac + 22.19 Ac OF OPEN SPACE

38.04 Ac IS BLDG SITE (~~7.94~~ 22.19 + 15.85)

TOTAL POINTS

3.29 + 7.92 = 11.21

THEREFORE, OPEN SPACE CAN BE CUT DOWN TO 25.52 Ac
WHICH IS 3.33Ac. OF THE 7.94 Ac

$\frac{25.52}{38.04}$ ×10 = 6.7 NOS

3.3

10.0 PTS -

Need Cons. Easement for the 3.33 ac of 22.19 ac.

~~9-6-96~~

BMP CALCULATIONS

WMBG LANDING

#8162 DARRYL

1) STRUCTURAL BMP POINTS

DRY POND #1	6 PTS	$\frac{6.20}{15.85}$	=	2.35
DRY POND #2	6 PTS	$\frac{2.49}{15.85}$	=	0.94
TOTAL STRUCTURAL POINTS				3.29

15.85 IS 7.94 Ac BETWEEN COL PIPELINE EASMNT AND WMBG LANDING
7.91 Ac OF BLDG SITE LOCATION DRAINING TO PONDS 1 & 2

2) OPEN SPACE

$\frac{30.13}{38.04}$ (100) × .1 = 7.92

30.13 IS 7.94Ac + 22.19 Ac OF OPEN SPACE

38.04 Ac IS BLDG SITE (~~7.94~~ 22.19 + 15.85)

TOTAL POINTS

3.29 + 7.92 = 11.21

THEREFORE, OPEN SPACE CAN BE CUT DOWN TO 25.52 Ac
WHICH IS 3.33Ac. OF THE 7.94 Ac

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

CODE COMPLIANCE
(757) 253-6626
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) 253-2620

August 3, 2000

AES Consulting Engineers
5248 Olde Towne Road
Williamsburg, Va. 23188
Attn: Mr. Richard A. Costello, P.E.

Re: Williamsburg Landing (County Plan SP-50-96)
Nursing & Assisted Living Facility
Record Drawings and Construction Certification

Dear Mr. Costello:

The Environmental Division has reviewed a record drawing set, consisting of Sheets C001, C005 and C010, as submitted to our office on June 7th for the above referenced project.

The record drawings dated May 15th 2000 provide as-built information for two stormwater management/BMP facilities on this site. Dry Pond # 1 is an embankment-type detention facility located approximately 100 feet east of the main building and just west of the service road. Dry Pond # 2 is a timber crib wall- type dry detention facility located along the north (back) side of the main building.

Based on our review of the record drawings and concurrent field observations, the following items must be addressed prior to release of the developer's surety instrument for the stormwater management/BMP facilities:

1. In accordance with Erosion and Sediment Control Note # 18 on Sheet 009 of the approved plan, construction certifications for the BMP's are required. None were provided.

2. Add approved County plan number (SP-50-96) at the bottom right hand corner of each sheet.

3. Consistently add labels Dry Pond # 1 and Dry Pond # 2, as appropriate, on record drawing plan views and details.

4. Dry Pond # 1. The as-built invert-in and invert-out elevation for the pond outlet barrel would result in an as-built pond barrel slope different from that of the approved design plan. Make this correction on the detail on record drawing Sheet C010 as necessary.

5. Date and sign the professional seal as provided on each of the record drawing sheets.

Construction Related Items

6. Dry Pond # 1. Sediment, vegetation and tree growth at the pond's primary storm drain inflow (flared end section) needs cleaned and removed. This inflow is located approximately 170 feet upstream (west) of the riser near the building. Cleaning and removal only pertains to the actual flared end section and its associated outlet protection structure only, not established downstream vegetation areas.

7. Dry Pond # 1. Wood debris and trash within and in immediate overbank areas associated with the paved channels west (upstream side) of the pond embankment needs cleaned and removed. Erosion and scour holes formed at the end of the paved channels, especially the paved channel on the right side of the embankment, needs filled and stabilized.

8. Dry Pond # 1. Tree saplings and heavier vegetation within 15 feet of the riser needs removed. Also, floating wood debris and trash located on the pond embankment just east of the riser needs cleaned and removed.

9. Dry Pond # 1. An erosion/scour hole about 10' L x 8' W x 2' deep is present at the outfall end of the 18 inch pond outlet barrel. This area is located on the east side of the service road. The scour hole was temporarily filled with scrap 12 inch diameter cut wood logs. The wood logs need removed and the rock outlet protection pad needs re-established in accordance with the approved plan or with heavier or larger sized riprap.

10. Dry Pond # 2 (Timber Crib Wall). Thick vegetation and tree saplings, some higher than the height of the wall, are present along both sides of the timber crib wall. This vegetation needs cleaned and removed from both sides of the wall (Note: a 10 ft. clear zone is recommended).

11. Dry Pond # 2. The 3 inch diameter PVC riser needs perforated in accordance with the approved plan. Perforations were only visible on the bottom portion of the riser. Also, perforations that are present in the bottom half of the riser were clogged with organic material and need cleaned.

12. Dry Pond # 2. Sediment and organic material needs cleaned and removed from the immediate vicinity at the base of the perforated riser pipe. Sediment measured approximately 8 inches in depth at this location.

13. Dry Pond # 2. The proposed 2 x 6 longitudinal stringers at 6 inch spacing (provided for capture of large debris) were not observed atop the offset wall portion of the structure.

One reproducible and one blue/black set of the record drawings are requested once the items above are adequately addressed. Resubmission of corrected record drawings can be in advance of the construction certification or construction related items.

Please contact me at 757-253-6639 if you have any further comments or questions relative to record drawing or construction certification requirements for these facilities.

Sincerely,

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

G:\SWMProg\AsBuilts\SP-50-96.cert

Scott Thomas

From: Scott Thomas
Sent: Friday, February 22, 2002 11:42 AM
To: 'Richard Costello'
Subject: RE: Williamsburg Landing BMP Cert

I trust you will do whatever is prudent to get us a construction certification that is satisfactory for the two onsite BMP facilities. Thanks for the update.

-----Original Message-----
From: Richard Costello [mailto:rcostello@aesva.com]
Sent: Friday, February 22, 2002 10:21 AM
To: scottt@james-city.va.us
Cc: Nancy Harrison
Subject: RE: Williamsburg Landing BMP Cert

ECS did all the Geotechnical inspections. They have not found any records of reports on their first look. We are making them look again since we specifically remember them doing and Bob Moss also remembers. I hope they find something since I could certify something if I had their reports. The architect hired them on our recommendation and reports went to the Owner, arch, and contractor.

Maybe Nancy Harrison can find the Owner's copies. I know the arch & contractor settled on money issues on the project and will not help us.

Richard Costello, P.E.
President
AES Consulting Engineers
ph 757.253.0040 fax 757.220.8994

AES Consulting Engineers a Professional Corporation Confidentiality Note:
This e-mail and any attachments are confidential and may be protected by legal privilege. If you are not the intended recipient, be aware that any disclosure, copying, distribution or use of this e-mail or any attachment is prohibited. If you have received this e-mail in error, please notify us immediately by returning it to the sender and delete this copy from your system. Thank you for your cooperation.

-----Original Message-----
From: scottt@james-city.va.us [mailto:scottt@james-city.va.us]
Sent: Thursday, January 31, 2002 5:21 PM
To: rcostello@aesva.com
Subject: Williamsburg Landing BMP Cert

Project: Williamsburg Landing Nursing & Living Facility (now Woodhaven at Williamsburg)
Plan No.: SP-50-96
BMP ID Codes: CC 011 (BMP 1 Dry Pond) & CC 012 (BMP 2 Timber Crib)

RE: BMP Certification Issues

As discussed with you today, in an effort to close out this project and in full consideration of all related circumstances pertaining to certification of BMPs for the project, we have decided to proceed with release of the erosion and sediment control bond being held for this project, under the condition that you proceed with trying to resolve the construction certification issue that is still outstanding.

As of this date, all record drawing and construction related issues as outlined in the Environmental Division letter dated August 3rd 2000 have been fully addressed to our satisfaction. However, the letter as previously forwarded to our office to serve as construction certification (June 28th 2001) was considered inappropriate. Language in that letter did not meet the intent of Erosion and Sediment Control Note # 18 as provided on Sheet 009 of the approved plans. Therefore, submission of a construction certification in proper format is still outstanding.

Based on my review of the project and discussions with you and Environmental Division staff, I am aware of the history related to who actually performed onsite construction inspection and monitoring and how personnel changes in that organization may result in difficulty in obtaining certification from that firm. In addition, as current engineer of record, I am also aware that you are unable to certify certain portions of BMP construction as you (or your delegated person) were not onsite to monitor critical construction milestones. However, these circumstances do not release the owner/contractor from their responsibility to retain the services of a professional engineer while construction is being performed and to provide subsequent construction certification in accordance with the standard note that was present on the plans when it was approved.

As such, in order to resolve this issue, I request that you perform due dilegence to research available information on the construction of the BMP (as performed by others) and based on that information, provide us with a certification that is satisfactory to meet the intent of our program requirements. It is suggested you utilize Page 3 of the JCC Environmental Division, Stormwater Management/BMP Facilities, Record Drawing and Construction Certification, Standard Forms & Instructions, if desired, with proper exceptions/exclusions as necessary based upon your knowledge, judgement and belief about construction of the BMPs.

If you have any questions, please call me at 757-253-6639.

Scott J. Thomas, P.E.
James City County
Environmental Division

Scott Thomas

From: Scott Thomas
Sent: Thursday, January 31, 2002 5:21 PM
To: 'rcostello@aesva.com'
Subject: Williamsburg Landing BMP Cert

Project: Williamsburg Landing Nursing & Living Facility (now Woodhaven at Williamsburg)
Plan No.: SP-50-96
BMP ID Codes: CC 011 (BMP 1 Dry Pond) & CC 012 (BMP 2 Timber Crib)
RE: BMP Certification Issues

As discussed with you today, in an effort to close out this project and in full consideration of all related circumstances pertaining to certification of BMPs for the project, we have decided to proceed with release of the erosion and sediment control bond being held for this project, under the condition that you proceed with trying to resolve the construction certification issue that is still outstanding.

As of this date, all record drawing and construction related issues as outlined in the Environmental Division letter dated August 3rd 2000 have been fully addressed to our satisfaction. However, the letter as previously forwarded to our office to serve as construction certification (June 28th 2001) was considered inappropriate. Language in that letter did not meet the intent of Erosion and Sediment Control Note # 18 as provided on Sheet 009 of the approved plans. Therefore, submission of a construction certification in proper format is still outstanding.

Based on my review of the project and discussions with you and Environmental Division staff, I am aware of the history related to who actually performed onsite construction inspection and monitoring and how personnel changes in that organization may result in difficulty in obtaining certification from that firm. In addition, as current engineer of record, I am also aware that you are unable to certify certain portions of BMP construction as you (or your delegated person) were not onsite to monitor critical construction milestones. However, these circumstances do not release the owner/contractor from their responsibility to retain the services of a professional engineer while construction is being performed and to provide subsequent construction certification in accordance with the standard note that was present on the plans when it was approved.

As such, in order to resolve this issue, I request that you perform due dilegence to research available information on the construction of the BMP (as performed by others) and based on that information, provide us with a certification that is satisfactory to meet the intent of our program requirements. It is suggested you utilize Page 3 of the JCC Environmental Division, Stormwater Management/BMP Facilities, Record Drawing and Construction Certification, Standard Forms & Instructions, if desired, with proper exceptions/exclusions as necessary based upon your knowledge, judgement and belief about construction of the BMPs.

If you have any questions, please call me at 757-253-6639.

Scott J. Thomas, P.E.
James City County
Environmental Division

Woodhaven
@ WMBG.

CONSULTING ENGINEERS

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

June 28, 2001

NOT SUFFICIENT FOR CONST. CERT.

Mr. Scott Thomas
Environmental Division
James City County
P.O. Box 8784
Williamsburg, VA 23187

RE: Williamsburg Landing
Record Drawings – Dry Ponds #1 and #2
AES Project No. 8162

Dear Scott:

This letter is to certify that as of the date of this letter, having conducted a final inspection of the above referenced project, the dry ponds have been substantially complete in accordance with the plans and specifications for the project dated June 26, 1996.

If you have any further questions or concerns, please do not hesitate to contact Howard W. Price or me at (757) 253-0040.

Sincerely,

AES Consulting Engineers

Richard A. Costello, P.E.
President

S:\Jobs\8162\00\WORDPROC\Document\81620L44.HWP.doc

JAMES CITY COUNTY - ENVIRONMENTAL DIVISION

Office Phone: 757-253-6670 Fax Number: 757-259-4032

DATE SENT: 1/14/02

Name: Frank Huckaby

Firm or Company:

Facsimile Number: 258-3795

Number of pages including this transmittal: 3

From: Scott J. Thomas

James City County
P O Box 8784
Williamsburg VA 23187-8784

Comments: BMP Letter issued 8/03/00 for Williamsburg Landing Nursing & Assisted Living Facility (SP-50-96) BMP's CC011 AND CC012

If you do not receive all pages, call 757-253-6670 as soon as possible

CALLED 1/14/02 TO TELL ME THEY WILL BE STARTING BMP CR WORK. PER OUR LETTER AUG 3 2000

SCOTT J. THOMAS. P.E.
CIVIL ENGINEER

ENVIRONMENTAL DIVISION

101 MOUNTS BAY ROAD, P.O. BOX 8784 (757) 253-6639
WILLIAMSBURG, VIRGINIA 23187-8784 FAX: (757) 259-4032
E-MAIL: scottt@james-city.va.us

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

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

LETTER OF TRANSMITTAL

DATE	JOB NO.
6/29/01	8162

ATTENTION: SCOTT THOMAS

RE: WMBG LANDING POND AS-BUILTS

TO: JCC ENVIRONMENTAL DIV.

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

☐ Shop drawings ☒ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
2		3SH.	AS-BUILTS/RECORD DRAWINGS
1		1SH.	CERTIFICATION LETTER

JUN 2001 RECEIVED ENVIRONMENTAL DIVISION

THESE ARE TRANSMITTED as checked below:

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

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

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

☐ For review and comment ☐ _____

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

REMARKS

COPY TO _____ SIGNED: [signature]

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

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

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

LETTER OF TRANSMITTAL

DATE	JOB NO.
6/7/00	8162

ATTENTION: DARRYL COX

RE: WMBG LANDING AS-BUILTS

TO JAMES CITY COUNTY ENVIRONMENTAL DIV.

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

☐ Shop drawings ☒ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
2		3 SH.	RECORD DRAWINGS – ENV. DIV.
2		3 SH.	" " – JCSA

JUN 2000 RECEIVED ENVIRONMENTAL DIVISION

THESE ARE TRANSMITTED as checked below:

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

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

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

☐ For review and comment ☐ _____

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

REMARKS

COPY TO JCSA - KEITH LOTCHWORTH SIGNED: [signature]

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

CONSULTING ENGINEERS

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

June 25, 1996

Mr. Michael A. Freda
James City County Planning
P. O. Box 8794
Williamsburg, Virginia 23187

RE: Williamsburg Landing
AES Project No. 8162

Dear Mr. Freda:

To facilitate your review of the subject project, we are providing the following list of revisions which correspond to your review comments dated May 29, 1996.

PLANNING

1. CG-2 has already been provided at the end of parking bays.

2. The correct zoning, R-5 is now indicated on the site plan.

3. The distance from Route 199 to the parking lot is shown on the site plan.

4. Reese Engineering is submitting electrical plans which include lighting details.

5. The sanitary sewer line has been relocated along Williamsburg Landing Drive.

6. The height, square footage, and number of floors are indicated on the site plan. Please note that the application for a height limitation waiver has already been submitted.

7. The number of units is also indicated on the site plan.

CODE COMPLIANCE

1-3. The owner/developer will be responsible for obtaining all permits and agreements.

4. **Noted - as-built drawings for the detention basins will be provided upon completion.**

5. Limits of clearing have been shown on the entire site.

Richard A. Costello, P.E. • Andrew M. Snyder, P.E. • G. Archer Marston, III, P.E.
G.T. Wilson, Jr., C.L.S. • Steven O. Wigley, P.E. • G. Donald Gartrell, III, P.E.

(804) 253-0040 FAX (804) 220-8994

4. Hydrant calls have also been revised.

5. The Detector Check and Fire Department Connection detail is on sheet 12. The meter bypasses the detector check to separate the domestic flow from the fire flow.

6. The Capacity of the water system will also be provided by ABS Consultants.

7. We will be happy to confer with staff concerning the sewage design flow.

V.D.O.T.

1-3. The traffic engineer will provide calculations as needed.

If you have any further questions or comments, please feel free to contact us at your convenience.

Sincerely,

AES Consulting Engineers

Howard W. Price

cc: Eric S. McRoberts - Reese, Lower, Patrick & Scott, Ltd.

File –
Wmbg Landing

DEPARTMENT OF DEVELOPMENT MANAGEMENT
P. O. Box 8784
Williamsburg, Virginia 23187-8784

County Government Center, 101-E Mounts Bay Road

Development Manager
(804) 253-6671

Code Compliance
253-6626

County Engineer
253-6678

Planning
253-6685

Integrated Pest Management
253-2620

July 3, 1996

Mr. Howard Price
AES, Consulting Engineers
5248 Olde Towne Road, Suite 1
Williamsburg, VA 23188

Dear Mr. Price,

Pursuant to your letter request of May 14, 1996 an exception to the Chesapeake Bay Preservation Regulations is granted for disturbance of slopes exceeding 25% for development of a service road accessing the rear of the Assisted Living Facility at Williamsburg Landing. It is our understanding that you agreed to increase the slope of downstream face of the road crossing to 2:1 in order to decrease the steep area disturbed. Please contact me if you have any further questions.

Sincerely,

Bernard M. Farmer, Jr., P. E.
Director of Code Compliance

cc: Darryl Cook

Fax: (804) 253-6663

CONSULTING ENGINEERS

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

May 14, 1996

Mr. Bernard M. Farmer Jr.
Director of Code Compliance
James City County
101-E Mounts Bay Road
Williamsburg, Virginia 23187

RE: Williamsburg Landing
AES Project No. 8162

Dear Mr. Farmer:

AES Consulting Engineers on behalf of Williamsburg Landing Inc. respectfully request an exception to allow land disturbance on 25% slopes per Section 19B-9 of the County's Chesapeake Bay Preservation Ordinance.

The proposed service road accessing the rear parking lot of the Nursing and Assisted Living Facility has some minor areas of disturbance with 25% slopes. This service road also acts as a dam for the proposed Dry Pond BMP facility on the site which enables us to remove all the necessary pollutants to achieve appropriate water quality. Consequently, this location of the service road is the most functional because it not only allows us to limit the amount of disturbance, but achieve water quality for the subject project.

After the construction of the road and dam have been completed, all disturbed areas shall be stabilized in accordance with all applicable VESCH standards and specifications.

Please review this request and advise me of your decision concerning this exception at your earliest convenience.

Best regards,

AES Consulting Engineers

Howard W. Price

cc: Eric S. McRoberts - Reese, Lower, Patrick & Scott, Ltd.

Richard A. Costello, P.E. • Andrew M. Snyder, P.E. • G. Archer Marston, III, P.E.
G.T. Wilson, Jr., C.L.S. • Steven O. Wigley, P.E. • G. Donald Gartrell, III, P.E.
(804) 253-0040 FAX (804) 220-8994

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

Database Inventory No. (if known): CC-00-002

Name of Facility: Williamsburg Landing BMP No.: #1 Date: 08/02/00

Location: 100' EAST OF MAIN NURSING & ASSISTED LIVING FACILITY

Name of Owner: Williamsburg Landing, Inc.

Inspector: S.J. Thomas

Type of Facility: DRY DETENTION POND (EMBANKMENT TYPE) County F-2

Weather Conditions: PARTY Sunny, MID 80'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			D/S GROWTH HIGHER & NOT MAINTAINED.
Vegetated Condition	X			U/S OK. D/S FERNS NO TREES YET.
Weed Growth	X			
Erosion	X			
Trash & Debris		X		LITTER & WOOD DEBRIS U/S EMB. NEAR RISER. CUT LOGS D/S RIGHT.
Seepage	X			
Fencing or Benches	X			
Constructed Wetlands (Interior Landscaped & Planted) Areas: N/A				
Vegetated Conditions				
Trash & Debris				
Floatables				
Erosion				
Sediment				
Dead Plant				
Aesthetics				
Other				

Facility Item	O.K.	Routine	Urgent	Comments
Water Pools ☐ Permanent Pool (Retention Basin) ☒ Shallow Marsh (Detention Basin)				
Shoreline Erosion	X			
Algae	X			NO WATER POOL OBSERVED.
Trash & Debris	X	X		TRASH & WOOD DEBRIS PAVED DITCH INFLOWS + EMBANKMENT @ RISER.
Sediment	X			
Aesthetics	X			GOOD LOW COVER.
Other	X			
Inflow Stuctures (Describe Locations): INFLOW PIPE 170' WEST OF RISER. 2 PAVED CHANNELS INFLOW AT U/S EMBANK. LEFT & RIGHT.				
Condition of Structure		X		REMOVE VEG. AT INFLOW POINTS.
Erosion		X		SCOUR HOLES @ END PAVED CHANNELS.
Trash and Debris		X		TRASH/DEBRIS @ END & OVERBANK CHAN.
Sediment	X			
Aesthetics	X	X		TRASH + DEBRIS NEEDS REMOVED.
Other	X			
Principal Flow Control Structure - Intake, Riser, etc. (Describe Location): 48" VERT. RCP W/ CAP @ EMB. MID POINT				
Condition of Structure	X			
Corrosion	X			
Trash and Debris		X		REMOVE TREES 15' OF RISER.
Sediment	X			
Aesthetics	X			
Other				GOOD CONDITION STRUCTURALLY.
Principal Outlet Structure - Barrel, Conduit, etc. : 18" OUTLET BARREL UNDER SERVICE ROAD.				
Condition of Structure	X			
Settlement	X			
Trash & Debris			X	OUT. PROT. RIPRAP WASHED D/S. 12" DIA CUT LOGS PUT IN SCOUR HOLE.
Sediment	X			
Erosion			X	10'W x 8'W x 2' DEEP SCOUR HOLE AT END. RIPRAP MISSING
Other				
Emergency Spillway (Overflow): NO PRIMARY STRUCT; ROAD LOW SPOT E/S.				
Vegetation	X			ROAD + ADJ. VEG GOOD, GROOMED.
Lining	X			
Erosion	X			
Trash & Debris	X			
Other				
NOTE: Dumped logs, bark + wood chips on D/S RT. EMBANKMENT APPROX. 50' from ℄ ROAD.				

Facility Item	O.K.	Routine	Urgent	Comments
Nuisance Type Conditions:				
Mosquito Breeding	X			
Animal Burrows	X			
Graffiti	X			
Other				TRASH, WOOD DEBRIS FLOATABLES EVIDENT.
Surrounding Perimeter Conditions:				
Land Uses	X			
Vegetation	X			
Trash & Debris	X			
Aesthetics	X			GOOD, WELL GROOMED PERIMETER.
Access /Maintenance Roads or Paths	X			
Other	X			

Remarks: THIS INSPECTION WAS PERFORMED FOLLOWING CONSTRUCTION & PRIOR TO BOND RELEASE. LETTER DATED AUGUST 3RD 2000 FORWARD TO ENGINEER. 13 ITEMS TO BE ADDRESSED FOR BMP #1 & #2. Refer to Letter for BMP #1 RECORD DRAWING, CONSTRUCTION CERTIFICATION & "HIT-LIST" ITEMS.

Overall Environmental Division Internal Rating: 5

Signature: Anthony J. Thomas, P.E. **Date:** 08/14/00

Title: ENVIRONMENTAL DIVISION, CIVIL ENGINEER

SWMProg\BMP\CoInspProg\DetRet.wpd

Date Record Created:

Created By:

WS_BMPNO: CC011

Print Record

PRINTED ON
Wednesday, March 10, 201
3:05:28 PM

WATERSHED	CC
BMP ID NO	011
PLAN NO	SP-50-96
TAX PARCEL	(48-2)(1-3)
PIN NO	48201000030
CONSTRUCTION DATE	10/1/1999
PROJECT NAME	Williamsburg Landing
FACILITY LOCATION	100' East Main Building
CITY-STATE	Williamsburg, Va.
CURRENT OWNER	Williamsburg Landing
OWNER ADDRESS	5700 Wmbg Landing Drive
OWNER ADDRESS 2	
CITY-STATE-ZIP CODE	Williamsburg, Va. 23185
OWNER PHONE	
MAINT AGREEMENT	Yes
EMERG ACTION PLAN	No

Get Last BMP No | Return to Menu

MAINTENANCE PLAN	No	CTRL STRUC DESC	RCP Riser
SITE AREA acre	33.26	CTRL STRUC SIZE inches	48
LAND USE	Nurs/Asst Liv	OTLT BARRL DESC	RCP
old BMP TYP	Dry Pond	OTLT BARRL SIZE inch	18
JCC BMP CODE	F2 Dry ED with forebay		
POINT VALUE	6	EMERG SPILLWAY	No
		DESIGN HW ELEV	62.78
		PERM POOL ELEV	No
SVC DRAIN AREA acres	5.19	2-YR OUTFLOW cfs	0.00
		10-YR OUTFLOW cfs	0.00
		REC DRAWING	Yes
SERVICE AREA DESCRI	Building & Parking Area		
IMPERV AREA acres	0.00	CONSTR CERTIF	No
RECV STREAM	College Creek		
EXT DET-WQ-CTRL	Yes	LAST INSP DATE 8/2/2000	Inspected by:
WTR QUAL VOL acre-ft		INTERNAL RATING	4
CHAN PROT CTRL	No	MISC/COMMENTS	
CHAN PROT VOL acre-ft		Nurs & Liv Facility (Woodhaven). Also See CC 012. BMP#1 Dry Pond	
SW/FLOOD CONTROL	Yes		
GEOTECH REPORT	No		

Additional Comments:

CC012
Timber Crib Wall
North of Main Building
Williamsburg Landing
Nursing & Assisted
Living Facility
CC011
Embankment Facility
along Service Road

S-50-96

DARCYL

TABLE 3

WORKSHEET FOR BMP POINT SYSTEM

WILLIAMSBURG LANDING #8162

NURSING & ASSISTED LIVING FACILITY

A. STRUCTURAL BMP POINT ALLOCATION

BMP	BMP Points		Fraction of Site Served by BMP		Weighted BMP Points
DRY POND #1	6	x	6.20 / 33.26	=	1.12
DRY POND #2	6	x	2.49 / 33.26	=	0.45
		x		=	
FUTURE DRY POND #3	6	x	10.0 / 33.26	=	(1.80)

TOTAL WEIGHTED STRUCTURAL BMP POINTS: 1.57 (3.37)

B. NATURAL OPEN SPACE CREDIT

Fraction of Site		Natural Open Space Credit		Points for Natural Open Space
23.05 / 33.26 (100)	x	23.05 + 2.19 / 33.26 = .416 / (0.1 per 1%)	=	6.93

C. TOTAL WEIGHTED POINTS

1.57 (3.37)	+	6.93	=	8.50 (10.30)
Structural BMP Points		Natural Open Space Points		TOTAL

NOTE: THE APPROXIMATE 11.5 AC ± TO THE WEST OF THE NURSING FACILITY SHALL BE RESPONSIBLE FOR OBTAINING A MINIMUM OF 1.50 POINTS PER JAMES CITY COUNTY.

(+) INDICATES FUTURE ADDITIONS.

TABLE 3

WORKSHEET FOR BMP POINT SYSTEM

WILLIAMSBURG LANDING #3162
NURSING & ASSISTED LIVING FACILITY

A. STRUCTURAL BMP POINT ALLOCATION

BMP	BMP Points		Fraction of Site Served by BMP		Weighted BMP Points
DRY POND #1	6	x	6.20 / 33.26	=	1.12
DRY POND #2	6	x	2.49 / 33.26	=	0.45
		x		=	
FUTURE DRY POND #3	6	x	10.0 / 33.26	=	(1.80)

TOTAL WEIGHTED STRUCTURAL BMP POINTS: 1.57 (3.37) ←

B. NATURAL OPEN SPACE CREDIT

Fraction of Site		Natural Open Space Credit		Points for Natural Open Space
23.05 / 33.26 (100) (22.19)	x	.1 (0.1 per 1%)	=	4.16 / 6.93

23.05 / 55.45

C. TOTAL WEIGHTED POINTS

(3.37) 1.57	+	6.93	=	(10.30) 8.50
Structural BMP Points		Natural Open Space Points		TOTAL

NOTE: 1) THE APPROXIMATE 11.5 AC ± TO THE WEST OF THE NURSING FACILITY SHALL BE RESPONSIBLE FOR OBTAINING A MINIMUM OF 1.50 POINTS PER JAMES CITY COUNTY.

(+) INDICATES FUTURE ADDITIONS.

2) ADDING THE 22.19 AC TO THE TOTAL SITE AREA AS OPEN SPACE HAS NO NET EFFECT ON THE TOTAL POINTS. (i.e., 100 x .1 = 10)

3) THE EXISTING ASSISTED LIVING REPORTS THE INTENT. PLEASE CALL.