



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: CC012

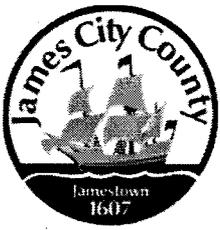
DATE VERIFIED: May 4, 2012

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: CC012

PIN: 4820100003

Subdivision, Tract, Business or Owner

Name (if known):

Williamsburg Landing

Property Description:

Senior Care/Retirement 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

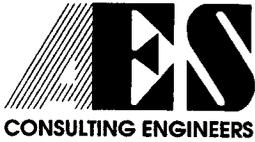
Contents for Stormwater Management Facilities As-built Files

C
E

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 <u>JUAN</u>	
DATE <u>10-1</u>	TIME <u>11:35</u> A.M. P.M.
WHILE YOU WERE OUT	
M <u>CHUCK PINNELL</u>	
OF <u>WMSBURG LANDING</u>	
PHONE NO. <u>898-3738</u>	
TELEPHONED <input type="checkbox"/>	PLEASE CALL <input checked="" type="checkbox"/>
CALLED TO SEE YOU <input type="checkbox"/>	WILL CALL AGAIN <input type="checkbox"/>
WANTS TO SEE YOU <input type="checkbox"/>	RUSH <input type="checkbox"/>
RETURNED YOUR CALL <input type="checkbox"/>	
MESSAGE <u>page 1 999-4371</u>	
<u>NANCY HARRISON WILLIAMSBURG LANDING</u>	
<u>565-6504</u>	
SIGNED <u>DD</u>	
CASCADE P3-A2334	
PRINTED IN U.S.A.	



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

April 29, 2002

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 012 (BMP 2 Timber Crib)
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 specifically noted.

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

A handwritten signature in black ink that reads 'Richard A. Costello'.

Richard A. Costello, P.E.
President

S:\jobs\8162\00\WORDPROC\Document\81620L48.rac.doc

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

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4/26/2002

CC012_WILLIAMSBURG_LANDING_NURSERY_&_ASSISTED_LIVING - 005

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

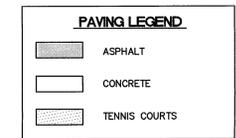
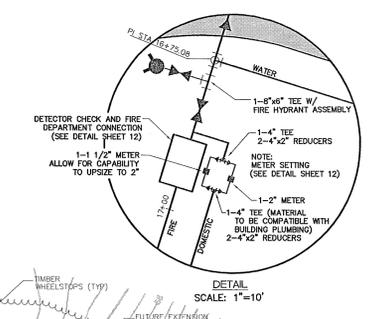
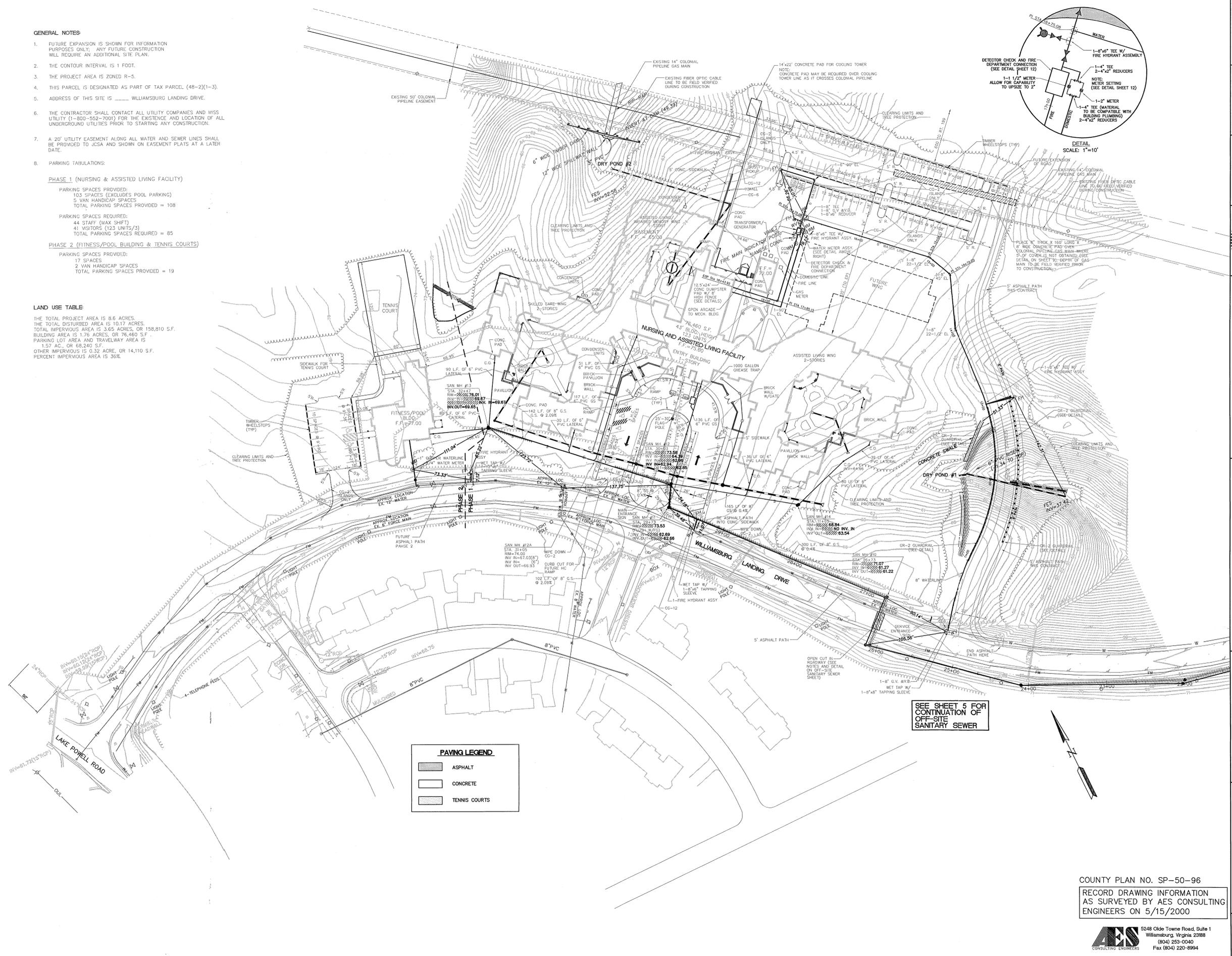
PARKING SPACES REQUIRED:
 44 STAFF (MAX SHIFT)
 41 VISITORS (123 UNITS/3)
 TOTAL PARKING SPACES REQUIRED = 85

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 78,460 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%.



SEE SHEET 5 FOR CONTINUATION OF OFF-SITE SANITARY SEWER



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

DESIGNED BY: EAW
 CHECKED BY: ENG
 APPROVED BY: RAC

NO	DATE	DESCRIPTION
1	6/25/96	REV. PER ACC COMMENTS - HWP

SITE AND UTILITY PLAN

COMMISSIONER'S SCALE: 1" = 40'

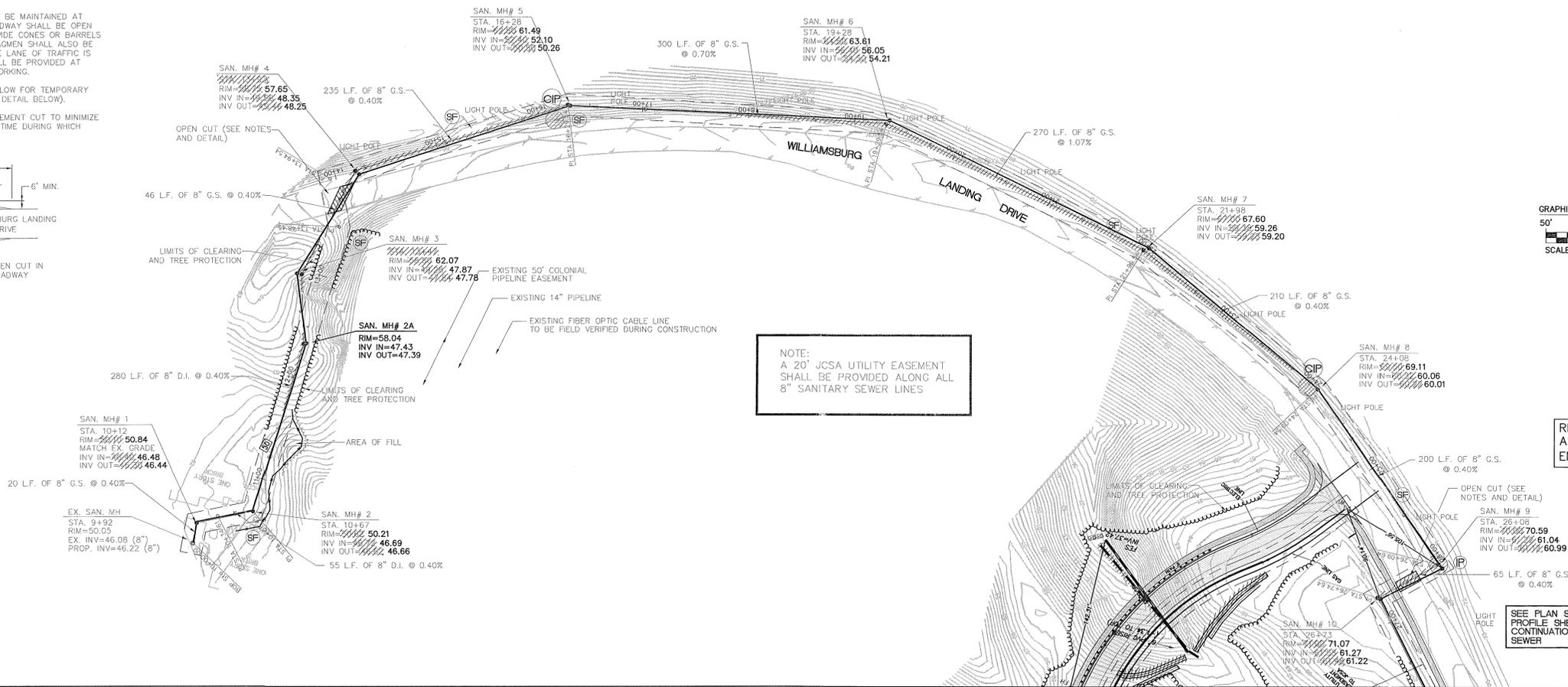
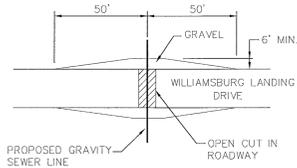
DATE: 6/25/96

COUNTY PLAN NO. SP-50-96
 RECORD DRAWING INFORMATION
 AS SURVEYED BY AES CONSULTING ENGINEERS ON 5/15/2000



ROAD OPEN CUT REQUIREMENTS:

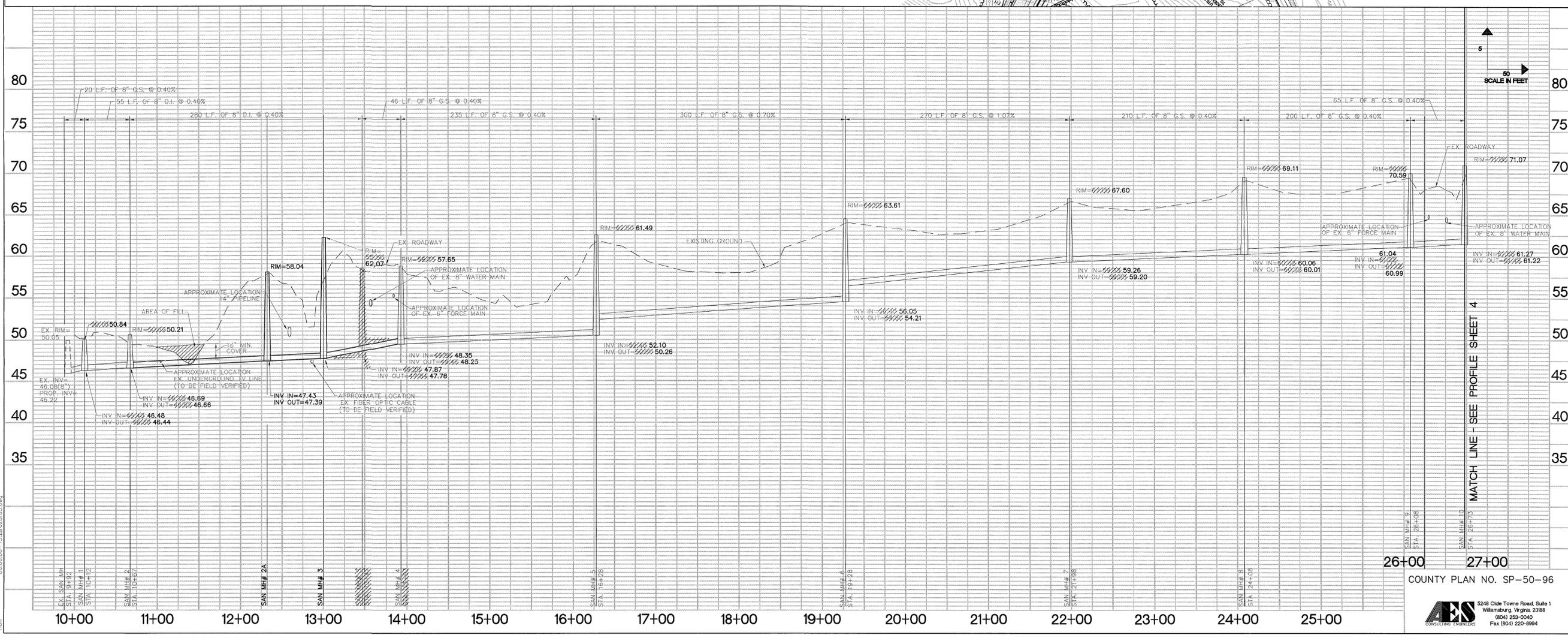
1. ACCESS FOR EMERGENCY VEHICLES MUST BE MAINTAINED AT ALL TIMES. AT LEAST ONE LANE OF ROADWAY SHALL BE OPEN AT ALL TIMES. CONTRACTOR SHALL PROVIDE CONES OR BARRELS TO DELINEATE THE TRAVELLED LANE. FLAGMEN SHALL ALSO BE PROVIDED DURING TIMES WHEN ONLY ONE LANE OF TRAFFIC IS PERMITTED. TWO LANES OF TRAFFIC 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.



NOTE:
A 20' JCSA UTILITY EASEMENT SHALL BE PROVIDED ALONG ALL 8" SANITARY SEWER LINES

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

SEE PLAN SHEET 1 AND
PROFILE SHEET 4 FOR
CONTINUATION OF SANITARY
SEWER



MATCH LINE - SEE PROFILE SHEET 4

26+00 27+00
COUNTY PLAN NO. SP-50-96

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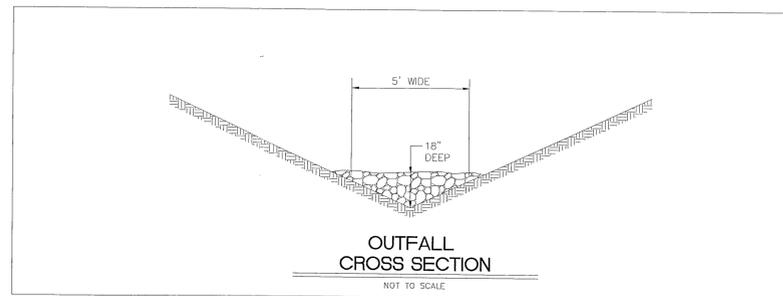
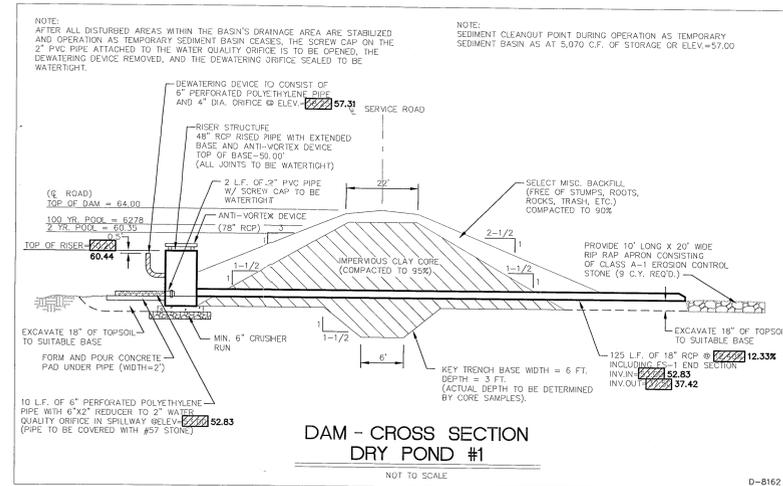
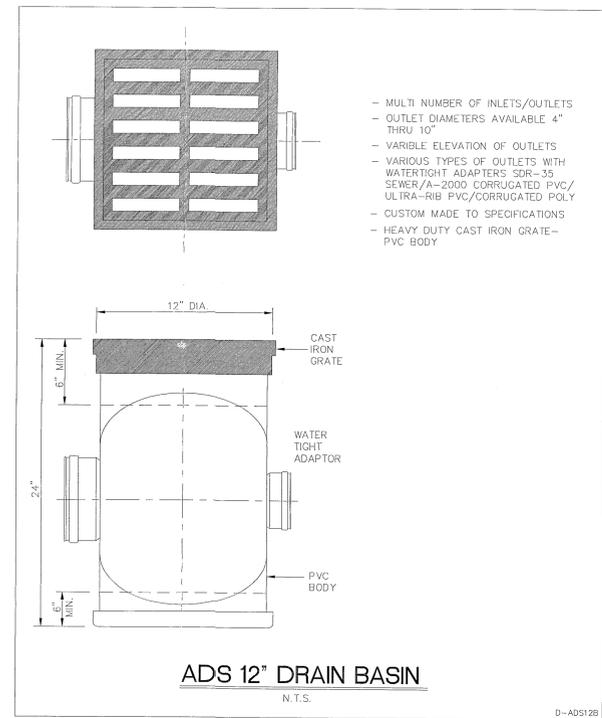
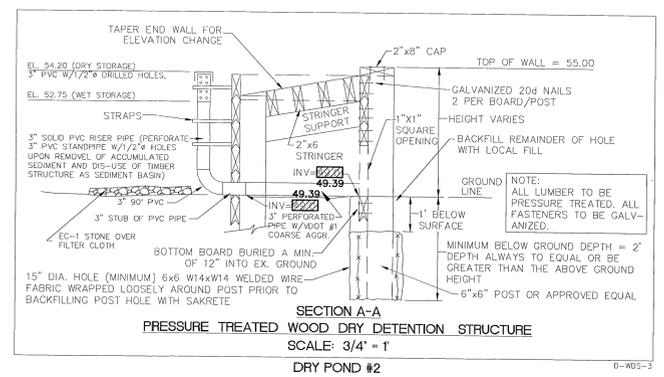
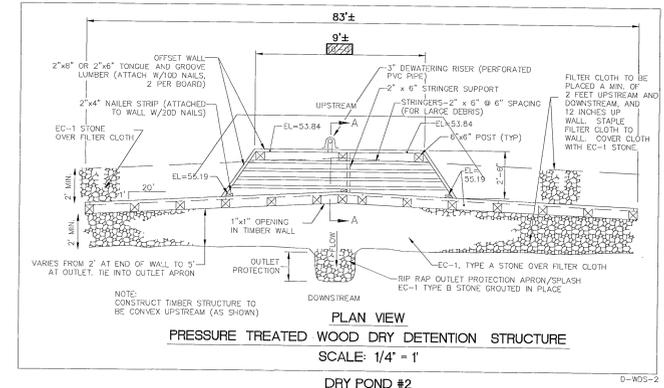
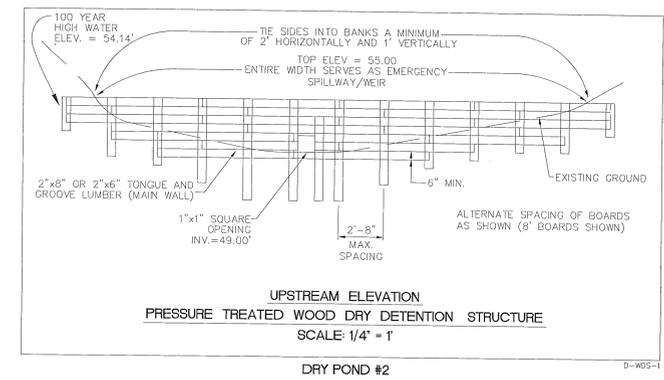
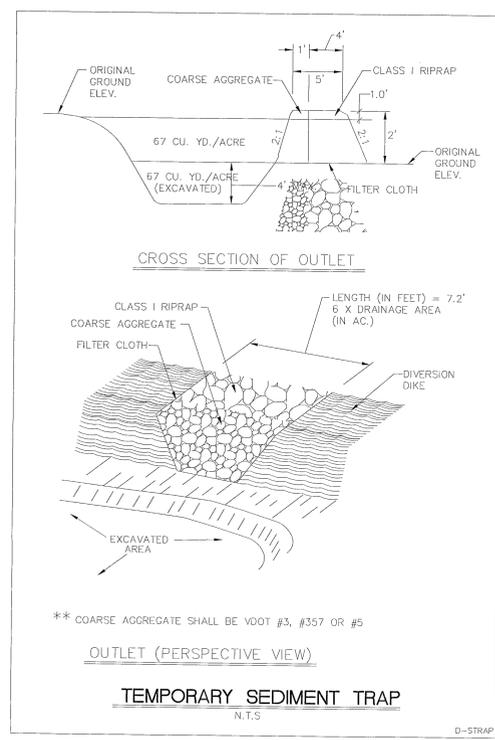
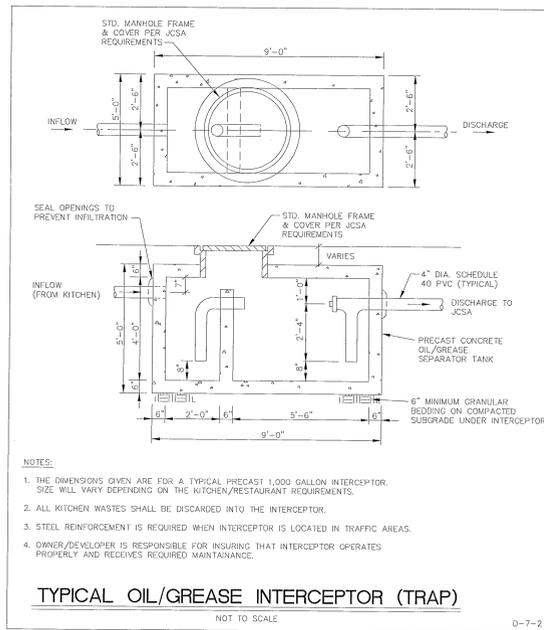
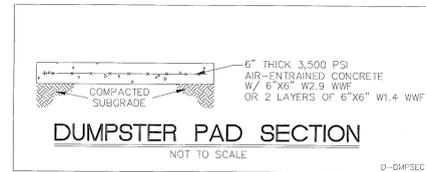
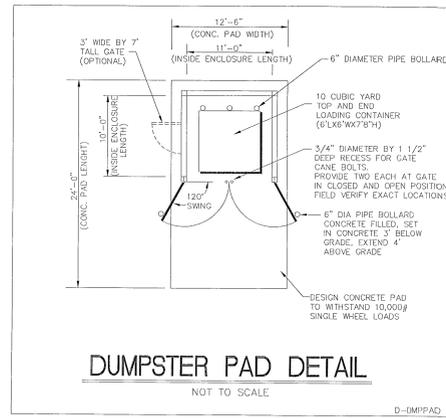
RL REESE
PS PATRICK & SCOTT
ARCHITECTS
1100 HARRISBURG DRIVE, LANCASTER, PA. 17601 • 717-546-1911

NEW NURSING & ASSISTED LIVING FACILITY
FOR
WILLIAMSBURG LANDING, INC. JAMES CITY COUNTY, VA.
DESIGNED BY: EAW
CHECKED BY: EMG/ARW
APPROVED BY: RAC

REVISIONS		
NO.	DATE	DESCRIPTION
1	6/25/06	REV. PER AEC COMMENTS - IMP
2	7/19/06	COORDINATION/ADDENDUM NO. 4
3	7/27/06	COORDINATION/ADDENDUM NO. 5
4	11/21/06	REVISED BID DOCUMENTS

OFF-SITE SANITARY SEWER PLAN & PROFILE
DATE: 4/28/06
C005
PERMISSION NO.: SCALE: AS SHOWN

AES CONSULTING ENGINEERS
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(804) 253-0040
Fax (804) 220-8944



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

COMMONWEALTH OF VIRGINIA
REGISTERED PROFESSIONAL ARCHITECT
JAMES PATRICK & SCOTT ARCHITECTS
WILLIAMSBURG, VIRGINIA
11/22/01
6/20/01

NEW NURSING & ASSISTED LIVING FACILITY FOR JAMES CITY COUNTY, VA
WILLIAMSBURG LANDING, INC.
DRAWN BY: MRC
CHECKED BY: ENGR/HP
APPROVED BY: BMC

NO.	DATE	DESCRIPTION
1	6/25/06	REV. PRE-JCC COMMENTS - HWP
2	7/19/06	COORDINATION/ADDENDUM NO. 4 (NONE THIS SHEET)
3	7/29/06	COORDINATION/ADDENDUM NO. 5
4	11/21/06	REVISED BID DOCUMENTS

NOTES AND DETAILS

REVISIONS

DATE: 6/25/06
SCALE: AS NOTED
SCALE: 6/25/06

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

06.06.001-15.3886207.10.dwg
11/21/06

TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET

(with or without an emergency spillway)

Project WILLIAMSBURG LANDING #8162
 Basin # 2 Location NORTHWEST OF BUILDING ADJACENT TO COLONIAL PIPELINE CASSEMENT
 Total area draining to basin: 2.49 acres.

Basin Volume Design

Wet Storage:

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

$$67 \text{ cu. yds.} \times \underline{2.49} \text{ acres} = \underline{167} \text{ cu. yds.} \quad \begin{matrix} 4504 \text{ CU. FT} \\ @ \underline{52.75} \end{matrix}$$
2. Available basin volume = 458 cu. yds. at elevation 55.00. (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.

$$33 \text{ cu. yds.} \times \underline{2.49} \text{ acres} = \underline{82} \text{ cu. yds.} \quad 2219 \text{ CU. FT}$$
5. Elevation corresponding to cleanout level = 51.70.
 (From Storage - Elevation Curve)
6. Distance from invert of the dewatering orifice to cleanout level = 1.05 ft.
 (Min. = 1.0 ft.)

Dry Storage:

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

$$67 \text{ cu. yds.} \times \underline{2.49} \text{ acres} = \underline{167} \text{ cu. yds.} \quad 4504 \text{ CU. FT.}$$

TIMBER STRUCTURE

8. Total available basin volume at crest of riser* = 458 cu. yds. at elevation 55.00. (From Storage - Elevation Curve)

$q = 0.6 A_0 \sqrt{2gh}$
 $h = 1.25 \text{ FT}$
 $q = 450 \text{ gpm} / 21,600 \text{ sec}$
 $q = 0.21 \text{ cfs}$
 $0.21 = 5.38 A_0$
 $A_0 = 0.039 \text{ FT}^2$
 $0.22 \text{ FT} \times 2.67 \text{ IN.}$
 DRAIN IN 6 IN. 3

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

9. Diameter of dewatering orifice = 2.0 in.

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

SEE DETAIL

Preliminary Design Elevations

11. Crest of Riser = 55.00

Top of Dam = 55.00

Design High Water = 53.00

Upstream Toe of Dam = 49.00

Basin Shape

12. Length of Flow $\frac{L}{We}$ = _____
Effective Width

If > 2, baffles are not required _____

If < 2, baffles are required _____

Runoff

13. Q_2 = _____ cfs (From Chapter 5)

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

Principal Spillway Design

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 ^{TIMBER STR} Dam = 55.00
 Design High Water = 54.14
 Emergency Spillway Crest = —
 Principal Spillway Crest = 55.00
 Dewatering Orifice Invert = 49.00
 Cleanout Elevation = 51.70
 Elevation of Upstream Toe of Dam
 or Excavated Bottom of "Wet Storage
 Area" (if excavation was performed) = _____

WILLIAMSBURG LANDING

8162

6/21/96

HWP

DRY POND #2

TIMBER STRUCTURE

SIZE WATER QUALITY ORIFICE TO DRAIN WATER FOR 24 HOURS

VOLUME = 8255 CF

TIME - 24 HOURS = 86,400 SEC

ORIFICE Q = $\frac{8255 \text{ CF}}{86,400 \text{ SEC}} = \underline{0.10 \text{ CFS}}$

ORIFICE IS @ ELEVATION 49.00'

$Q = K A_o \sqrt{2 g H}$

$\Delta h = 55 - 49.00 = 6.00'$

$Q = 0.10 \text{ CFS}$

$K = 0.73$

$0.10 \text{ CFS} = 0.73 A_o \sqrt{2 (32.2) (6)}$

$0.10 = 14.35 A_o$

$A_o = 0.0070 \text{ Ft}^2 = \frac{\pi D^2}{4}$

$D = 0.0992 \text{ FT} = 1.15 \text{ IN.}$

USE 1" SQUARE ORIFICE IN TIMBER STRUCTURE

SCS METHOD

PRE-DEVELOPMENT

D.A. = 2.92 Ac

SOIL GROUP C

CN = 73

POST-DEVELOPMENT

D.A. = 2.99 Ac

SOIL GROUP C

CN = 85

WILLIAMSBURG LANDING

DRY POND #2

JOB NO. 8162

prepared by:

AES CONSULTING ENGINEERS
5248 OLDE TOWNE RD, SUITE 1
WILLIAMSBURG, VA. 23188

DATE: 06/21/96

1. RESERVOIR No = 2. 2. RESERVOIR NAME = back pond...

3. $S = K_s * Z^b$
 $K_s = 0$ $b = 0$
 START ELEV = 0.0000 INCREMENT = 0.0000

STAGE ft	ELEVATION ft	CO AREA sq ft	INC STORAGE cu ft	TOT STORAGE cu ft
4	0.00	72.0000	0	0
5	1.00	547.0000	309	309
6	2.00	1204.0000	875	1184
7	3.00	1932.0000	1568	2752
8	4.00	2714.0000	2323	5075
9	5.00	3647.0000	3180	8255
10	6.00	4593.0000	4120	12375
11	0.00	0.0000	0	0
12	0.00	0.0000	0	0
13	0.00	0.0000	0	0
14	0.00	0.0000	0	0

Change item number: 0 DY to cor

Reservoir No. 2 OUTLET STRUCTURES

CULVERT STRUC A. $Q=C_oA[2gh/k]^{.5}$ CULVERT STRUC B. $Q=C_oA[2gh/k]^{.5}$

1. WIDTH (in) = 1..	9. WIDTH (in) = 0..
2. HEIGHT (in) = 1..	10. HEIGHT (in) = 0..
3. No. BARRELS = 1..	11. No. BARRELS = 1..
4. INVERT ELEV. = 49.0000	12. INVERT ELEV. = 52.0000
5. $C_o = 0.60$	13. $C_o = 0.60$
6. CULVERT LENGTH (ft) = 1.00	14. CULVERT LENGTH (ft) = 1.00
7. CULVERT SLOPE (%) = 1.00	15. CULVERT SLOPE (%) = 1.00
8. MANNING'S N-VALUE = .013	16. MANNING'S N-VALUE = .013
	17. MULTI-STAGE OPTION ? (Y/N) Y

WEIR STRUCTURE A. $Q=C_wLH^{EXP}$ WEIR STRUCTURE B. $Q=C_wLH^{EXP}$

18. CREST LENGTH (ft) = 160.0000	23. CREST LENGTH (ft) = 0.0000
19. CREST ELEVATION = 54.0000	24. CREST ELEVATION = 0.0000
20. $C_w = 3.00$	25. $C_w = 3.00$
21. EXP = 1.50	26. EXP = 1.50
22. MULTI-STAGE OPTION ? (Y/N) N	27. MULTI-STAGE OPTION ? (Y/N) N

Change item number: 0 DY to cor

HYDROLOGIC REPORT FOR

HYDROLOGIC REPORT

2 year pre dev.....
 for DRY POND #2.....

Hyd. No. 6

Hydrograph type = S.C.S. RUNOFF	Peak discharge = 5.93 cfs
Storm frequency = 2 yr	Time interval = 5 min
Basin area = 2.92 ac	Basin curve No. = 73
Ave basin slope = 9 %	Hydraulic len = 200 ft
Basin lag = 2.2 min	Time of concen = 3.60 min
Total precip. = 3.50 in	Distribution = S.C.S. II

HYDROGRAPH DISCHARGE TABLE

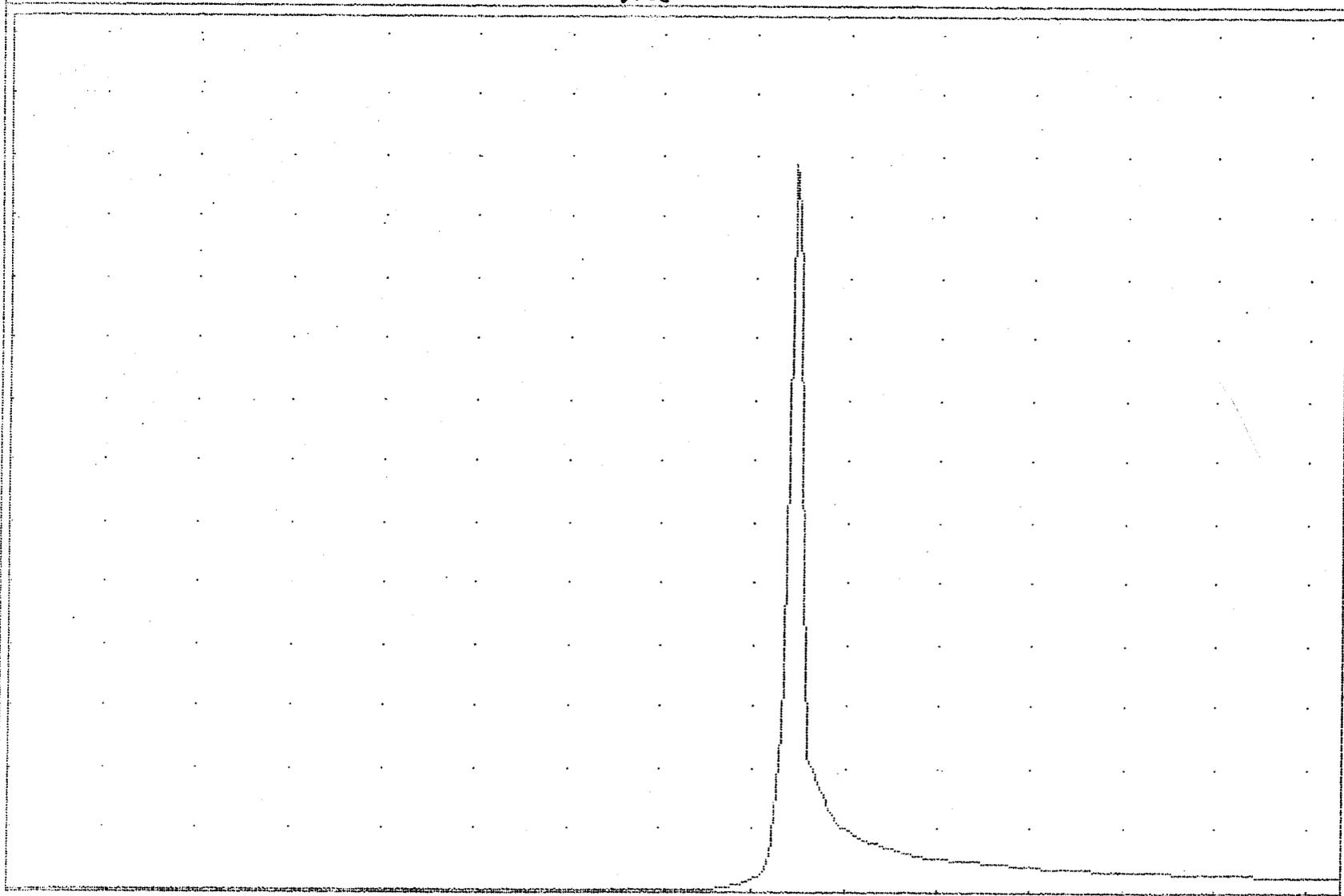
TIME--OUTFLOW		TIME--OUTFLOW		TIME--OUTFLOW		TIME--OUTFLOW	
(hrs	cfs)	(hrs	cfs)	(hrs	cfs)	(hrs	cfs)
11.75	1.39	11.83	2.92	11.92	5.93	12.00	5.47
12.08	2.32	12.17	1.08	12.25	0.98	12.33	0.88

Qp = 5.9

S.C.S. RUNOFF

2 Yr

PX5



UGU = 85 min

6

UGU = 0.5 cfs

UOL = (cuft/acft) = 14067 / 0.323

HYDROLOGIC REPORT

2 year post dev.....
 for DRY POND #2.....

Hyd. No. 7

Hydrograph type = S.C.S. RUNOFF	Peak discharge = 9.05 cfs
Storm frequency = 2 yr	Time interval = 5 min
Basin area = 2.49 ac	Basin curve No. = 85
Ave basin slope = 10 %	Hydraulic len = 150 ft
Basin lag = 1.1 min	Time of concen = 1.87 min
Total precip. = 3.50 in	Distribution = S.C.S. II

HYDROGRAPH DISCHARGE TABLE

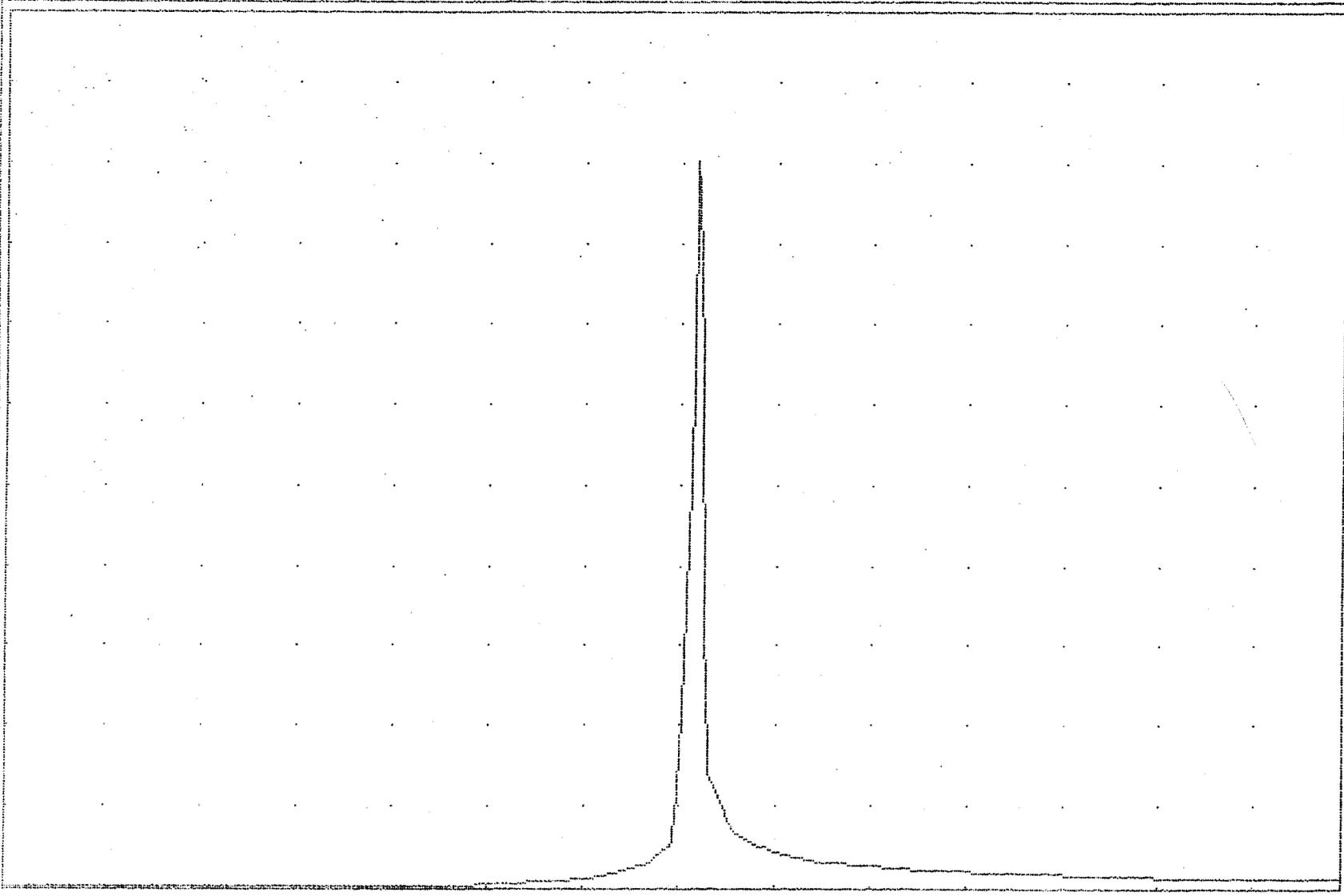
TIME--OUTFLOW (hrs cfs)	TIME--OUTFLOW (hrs cfs)	TIME--OUTFLOW (hrs cfs)	TIME--OUTFLOW (hrs cfs)
11.42 0.45	11.50 0.50	11.58 0.89	11.67 1.76
11.75 2.99	11.83 5.24	11.92 9.05	12.00 7.64
12.08 3.06	12.17 1.39	12.25 1.25	12.33 1.11

Q₁₀ = 5.0

S.C.S. RUNOFF

2 Yr

POST



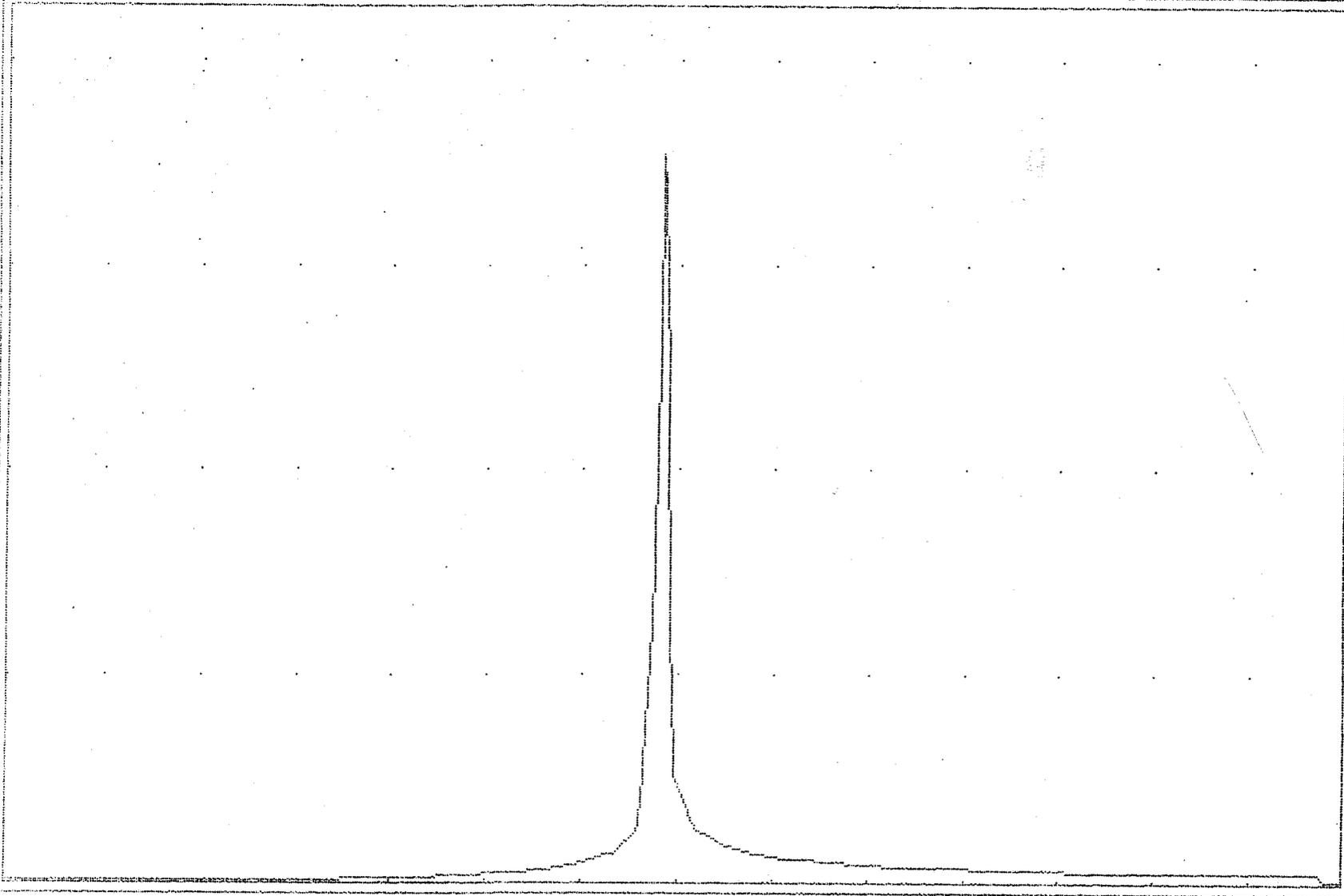
WGU = 100 min

7

UGU = 1.0 cfs

VOL = (cuft/acft) = 20504 / 0.471

Post



HOU = 105 min

8

VGU = 5.0 cfs

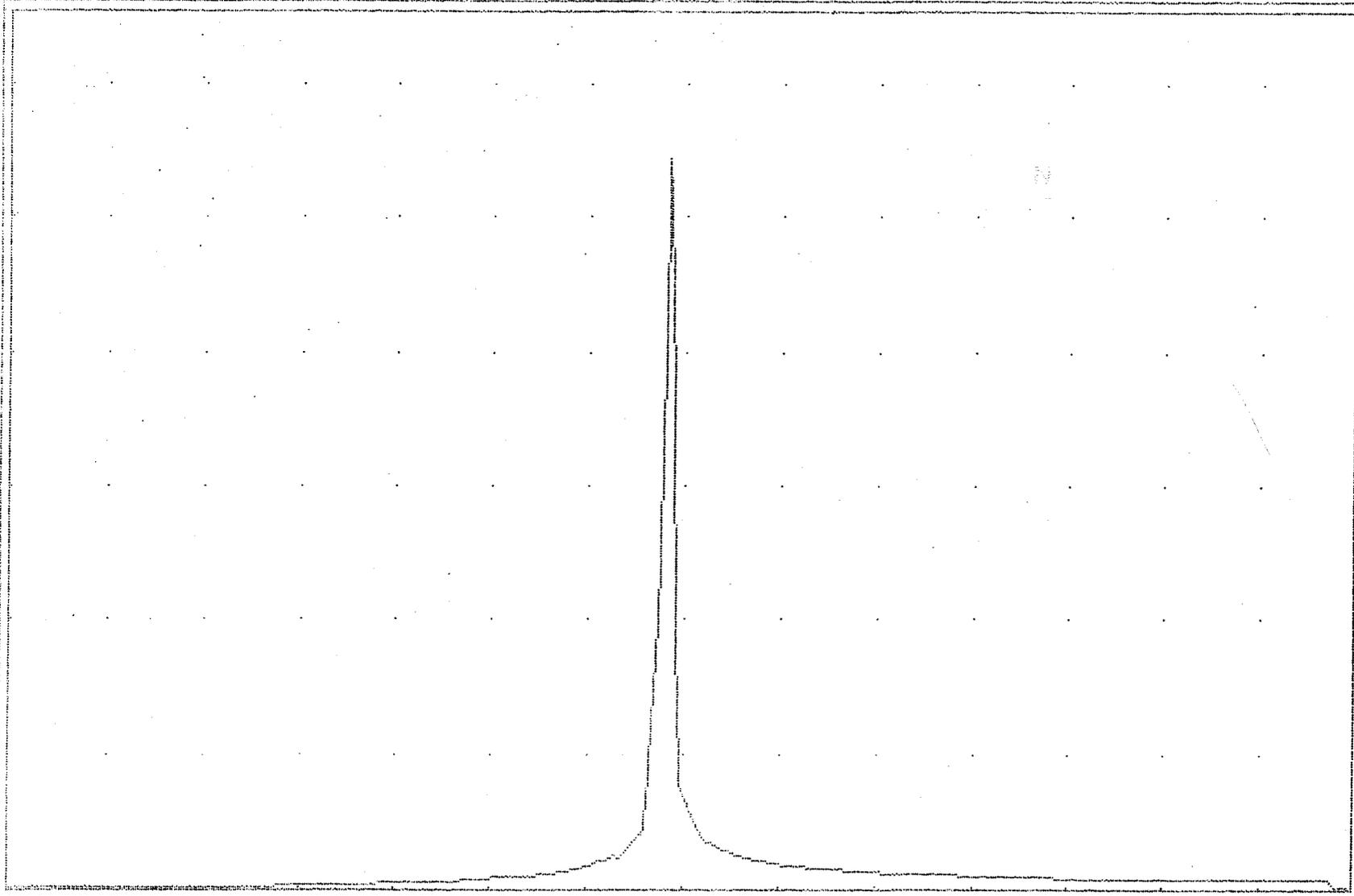
WOL = (cuft/acft) = 40880 / 0.938

Qp = 27.2

S.C.S. RUNOFF

100 Yr

POST



TGU = 105 min

10

UGU = 5.0 cfs

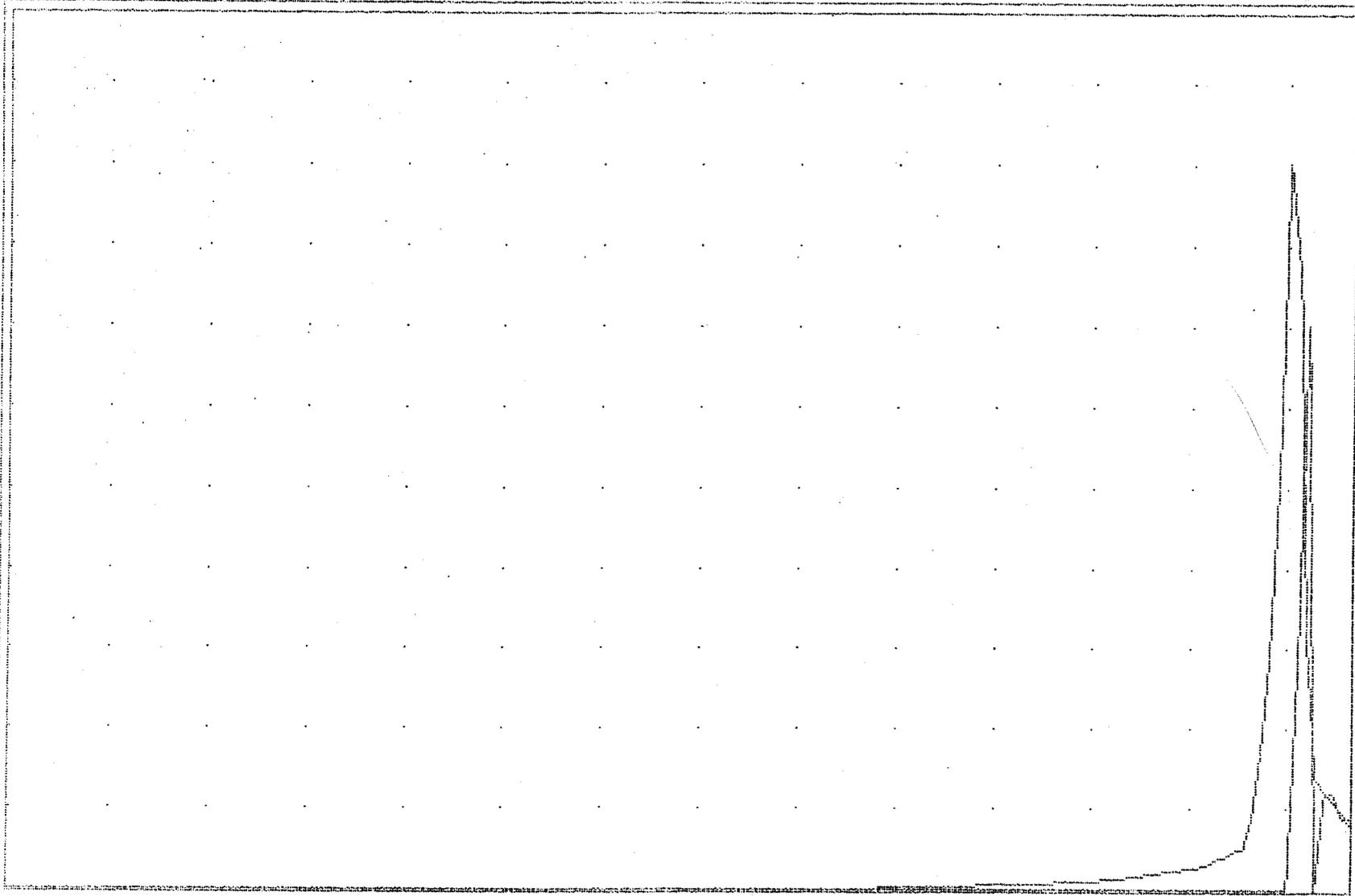
UOL = (cuft/acft) = 64161 / 1.473

Op = 7.0

RESERVOIR ROUTE

2 Yr

THRU POND #2



NGU = 55 min

17

UGU = 1.0 cfs

MAX STORAGE = 8445

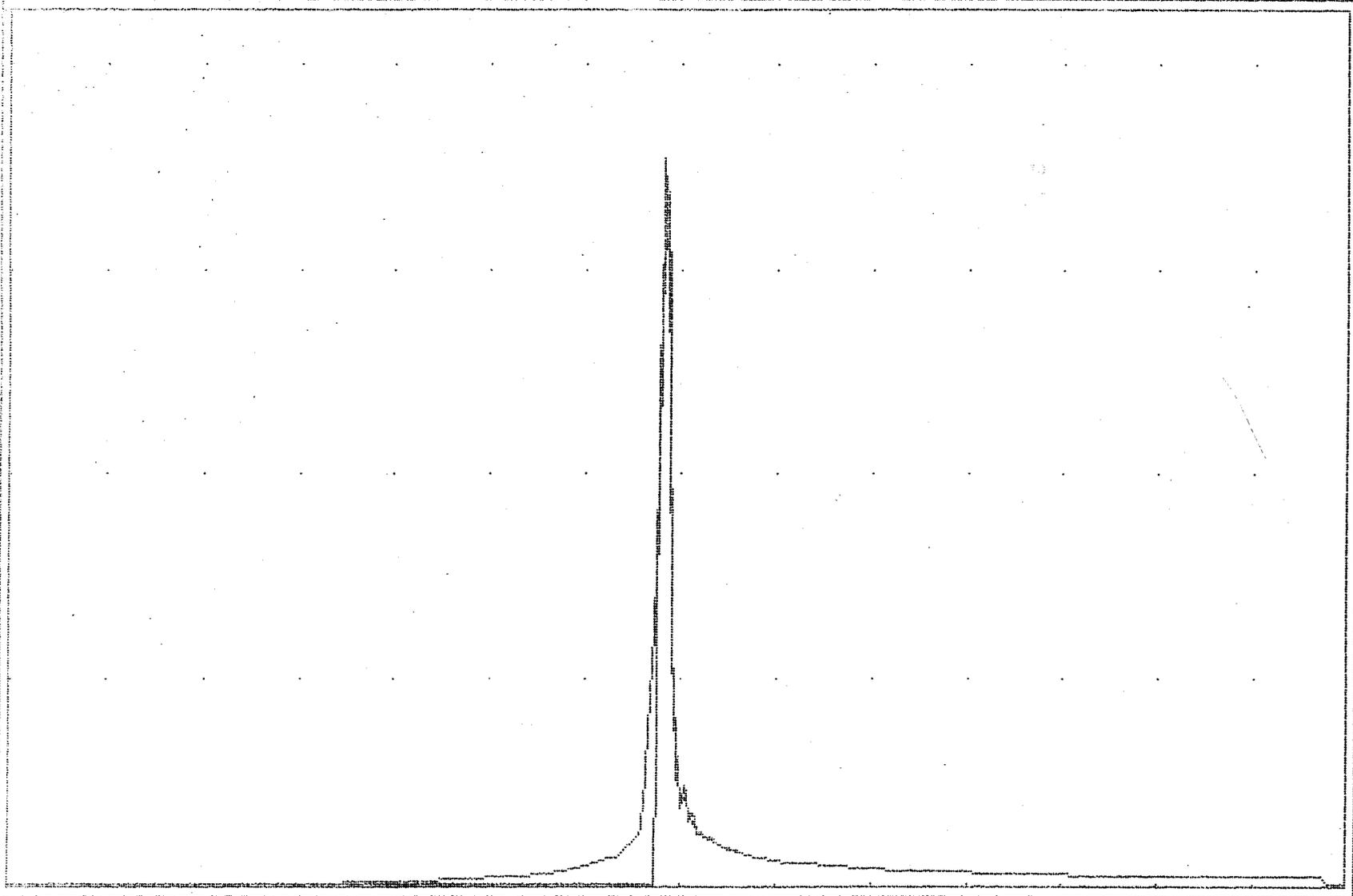
MAX ELEVATION = 54.05

Q₁₀₀ = 16.9

RESERVOIR ROUTE

10 Yr

THAU POND #2



TIME = 105 min

10

Q₁₀₀ = 5.0 cfs

MAX STORAGE = 8692

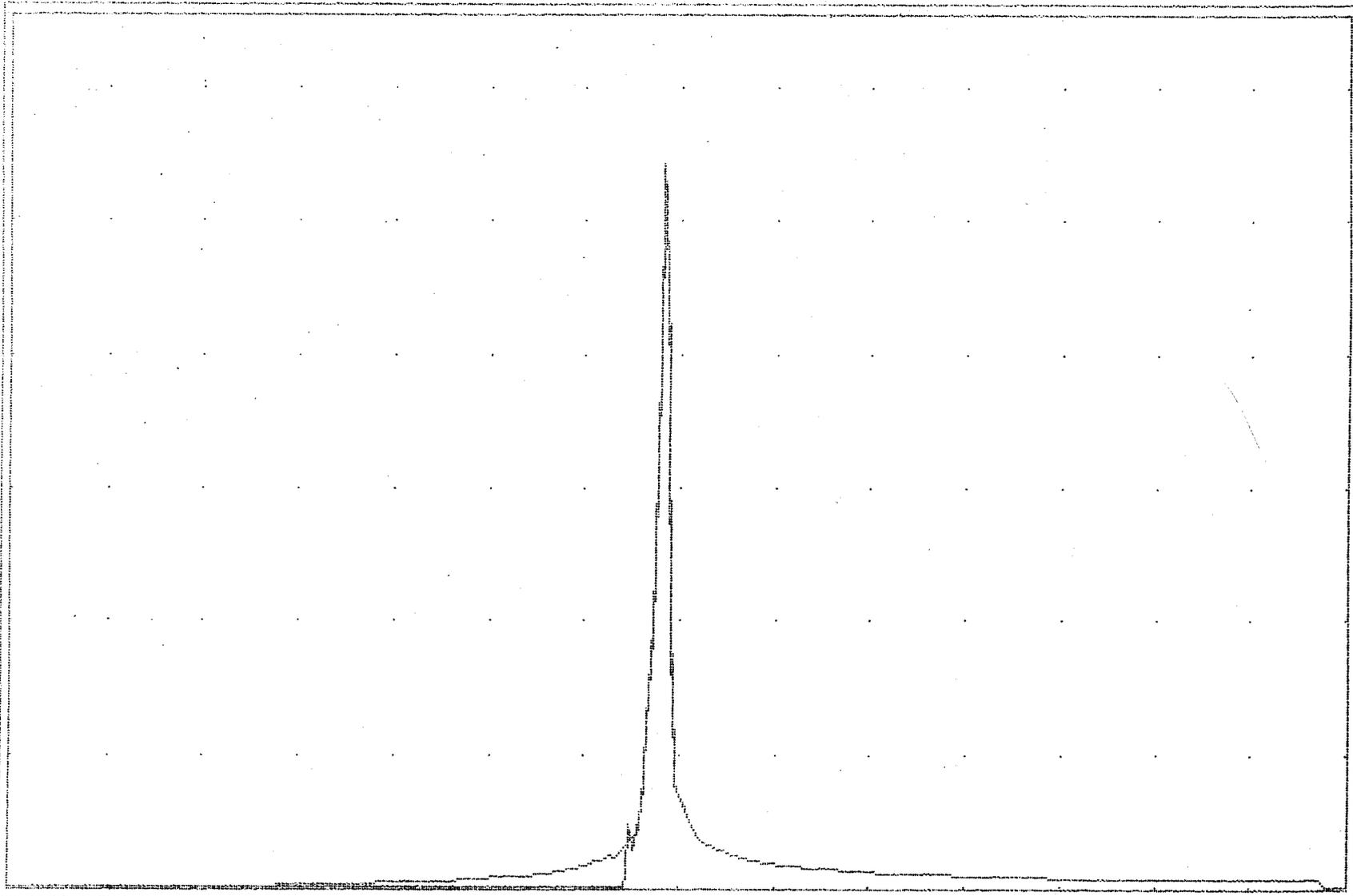
MAX ELEVATION = 54.11

Q = 26.0

RESERVOIR ROUTE

100 Yr

THRU POND #2



HAI = 105 min

20

UGI = 5.0 cfs

MAX STORAGE = 0839

MAX ELEVATION = 54.14

✓
(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
<hr/>			
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
<hr/>			
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 D*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 D*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) =	6.25	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

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
<hr/>			
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. $S = K_s * Z^b$
 : $K_s = 0.....$ $b = 0.....$
 : 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
: 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

58.1
wet

#####

Change item numbers: 0

BY to c

Reservoir No. 1

OUTLET STRUCTURES

#####

: CULVERT STRUC A. Q=CoA[2gh/k]^0.5 CULVERT STRUC B. Q=CoA[2gh/k]^0.5

: 1. WIDTH (in) = 15.
: 2. HEIGHT (in) = 15.
: 3. No. BARRELS = 1. - 50
: 4. INVERT ELEV. = 53.
: 5. Co = 0.60
: 6. CULVERT LENGTH (ft) = 180.
: 7. CULVERT SLOPE (%) = 8.89
: 8. MANNING'S N-VALUE = .013

9. WIDTH (in) = 10.
10. HEIGHT (in) = 10.
11. No. BARRELS = 1.
12. INVERT ELEV. = 53.
13. Co = 0.60
14. CULVERT LENGTH (ft) = 1...
15. CULVERT SLOPE (%) = 1...
16. MANNING'S N-VALUE = .013
17. MULTI-STAGE OPTION ? (Y/N) Y

: WEIR STRUCTURE A. Q=CwLH^EXP

WEIR STRUCTURE B. Q=CwLH^EXP

: 18. CREST LENGTH (ft) = 12.57..
: 19. CREST ELEVATION = 57.4...
: 20. Cw = 3.00
: 21. EXP = 1.50
: 22. MULTI-STAGE OPTION ? (Y/N) Y

23. CREST LENGTH (ft) = 0.....
24. CREST ELEVATION = 0.....
25. Cw = 3.00
26. EXP = 1.50
27. MULTI-STAGE OPTION ? (Y/N) N

#####

Change item number: 0

DY to c.

Rainfall file: jcc

RATIONAL HYDROGRAPH

#####

	Hyd.	Qpeak	Hyd.	Qpeak
1. HYDROGRAPH No. = 1.....	[[
2. HYDROGRAPH DESCRIPTION	[[1	5.11	2	15.24
A. 2 year pre dev.....	[[3	18.00	4	21.18
B.	[[5	24.87	6	2.78
C.	[[7	11.61	8	13.65
3. AREA (ac) = 5.19.....	[[9	16.47	10	19.69
4. RUNOFF COEFFICIENT = .35.....	[[11	0.00	12	4.31
5. TIME OF CONCEN. (min) = 24....	[[13	4.52	14	4.75
6. RETURN PERIOD = 2.....	[[15	4.97	16	0.00
7. RECEDING LIMB FACTOR = 1.49..	[[17	2.74	18	3.63
(0 for Dekalb Rational)	[[19	4.38	20	7.37

#####

Change item number: 0

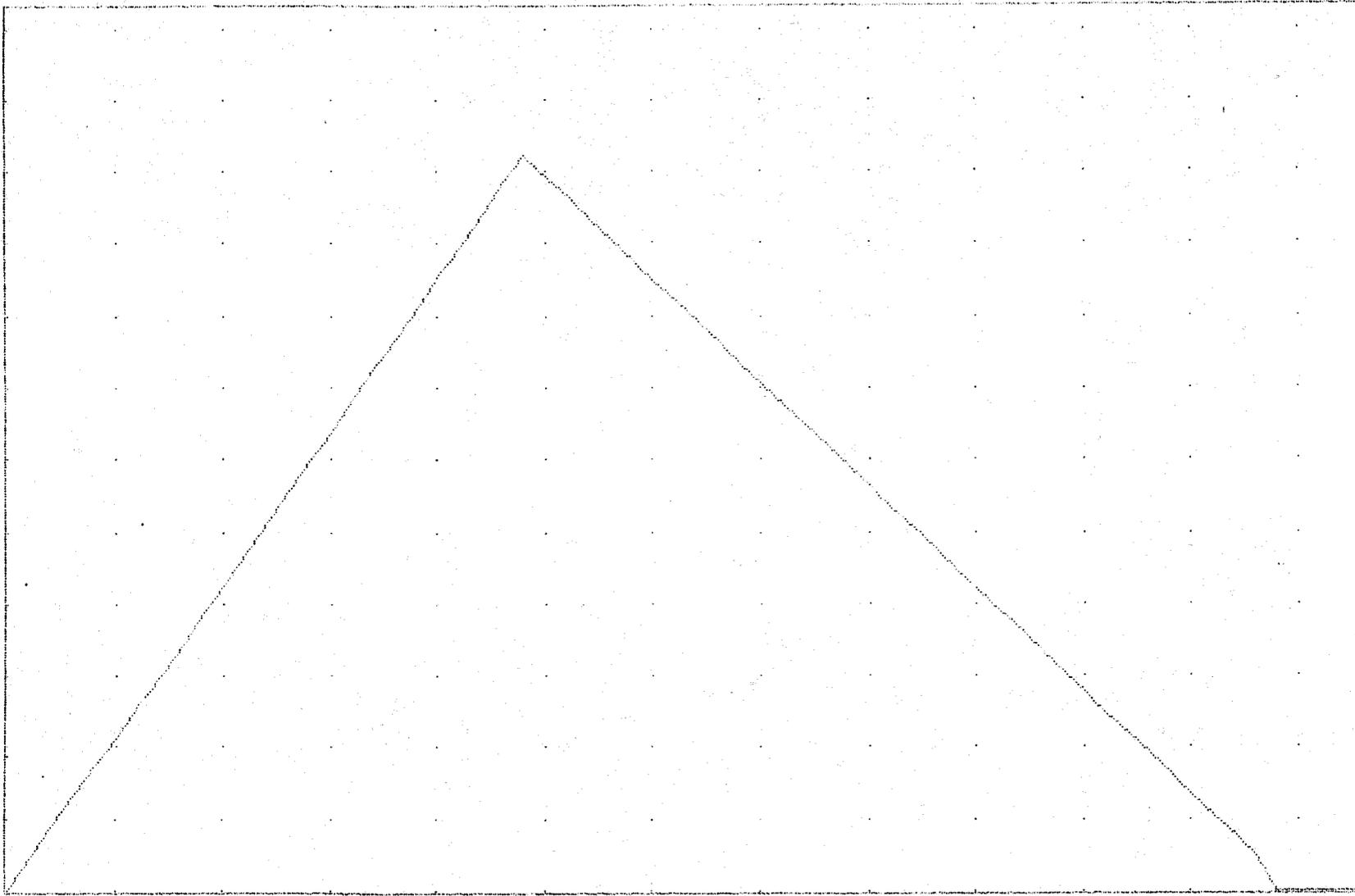
#####

	Hyd.	Qpeak	Hyd.	Qpeak
1. HYDROGRAPH No. = 2.....	CC			
2. HYDROGRAPH DESCRIPTION	CC 1	5.11	2	15.24
	CC 3	18.00	4	21.18
A. 2 year post dev.....	CC 5	24.87	6	2.78
B.	CC 7	11.61	8	13.65
C.	CC 9	16.47	10	19.69
	CC 11	0.00	12	4.31
3. AREA (ac) = 5.69.....	CC 13	4.52	14	4.75
	CC 15	4.97	16	0.00
4. RUNOFF COEFFICIENT = .47.....	CC 17	2.74	18	3.63
	CC 19	4.38	20	7.37
5. TIME OF CONCEN. (min) = 5.....	CC			
6. RETURN PERIOD = 2.....				
7. RECEDING LIMB FACTOR = 1.49..				
(0 for Dekalb Rational)				

#####

Change item number: 0

PRE

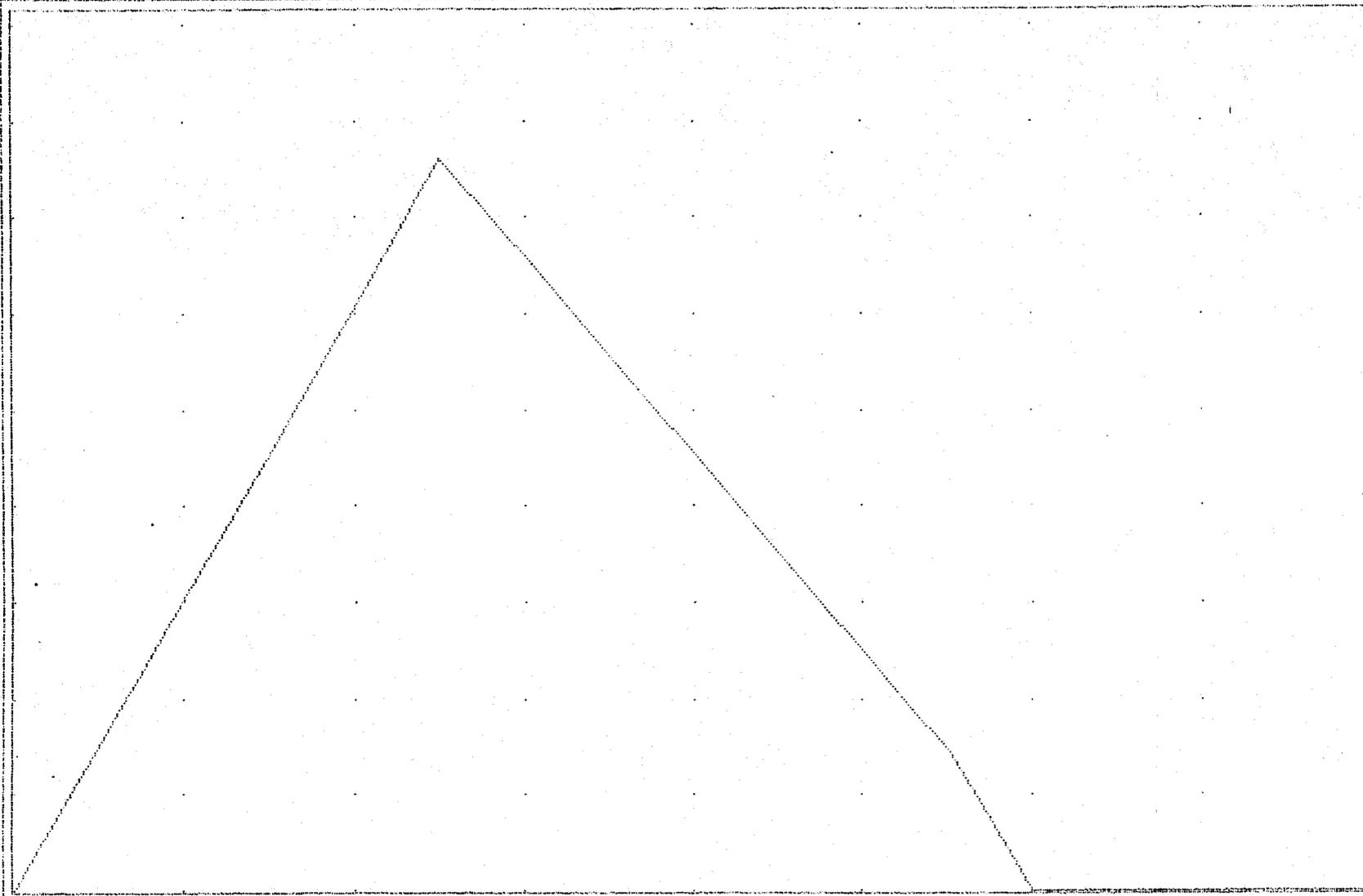


HGU = 5 min

1

HGU = 0.5 cfs

$$VOL = (\text{cuft/acft}) = 9164 / 0.210$$

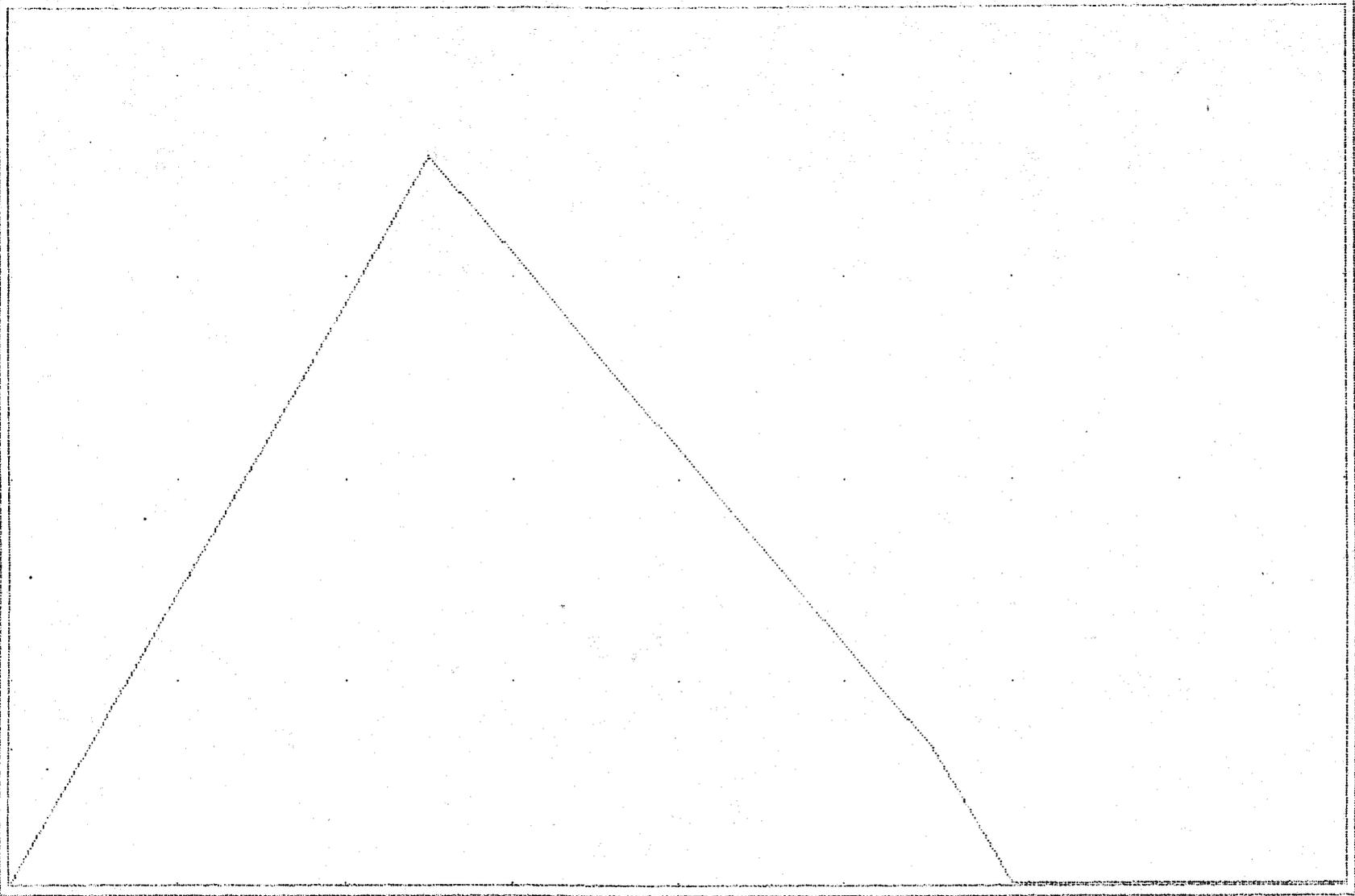


UQU = 2 min

2

UQU = 2.0 cfs

$$UOL = (\text{cuft/acft}) = 5651 / 0.100$$

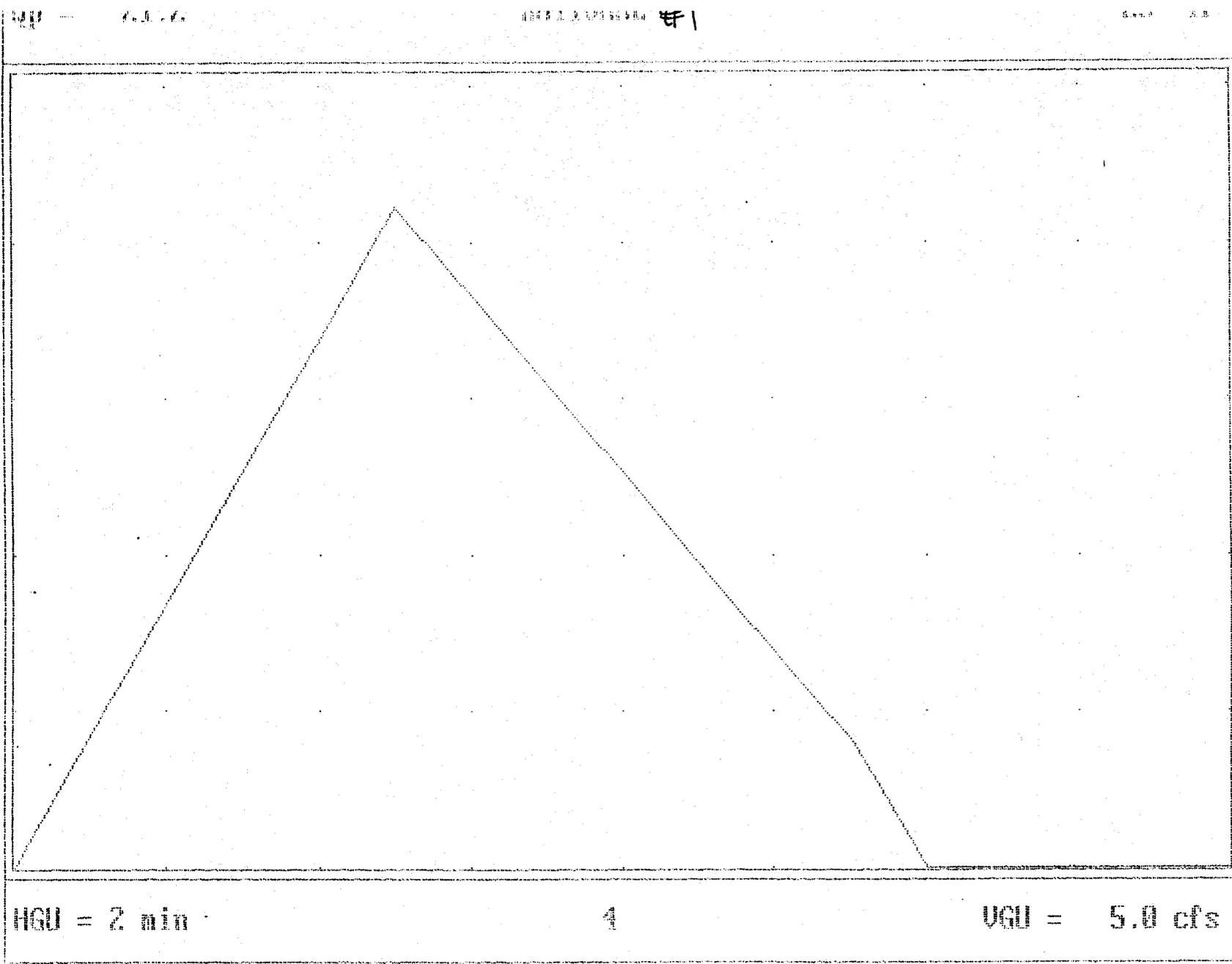


HGU = 2 min

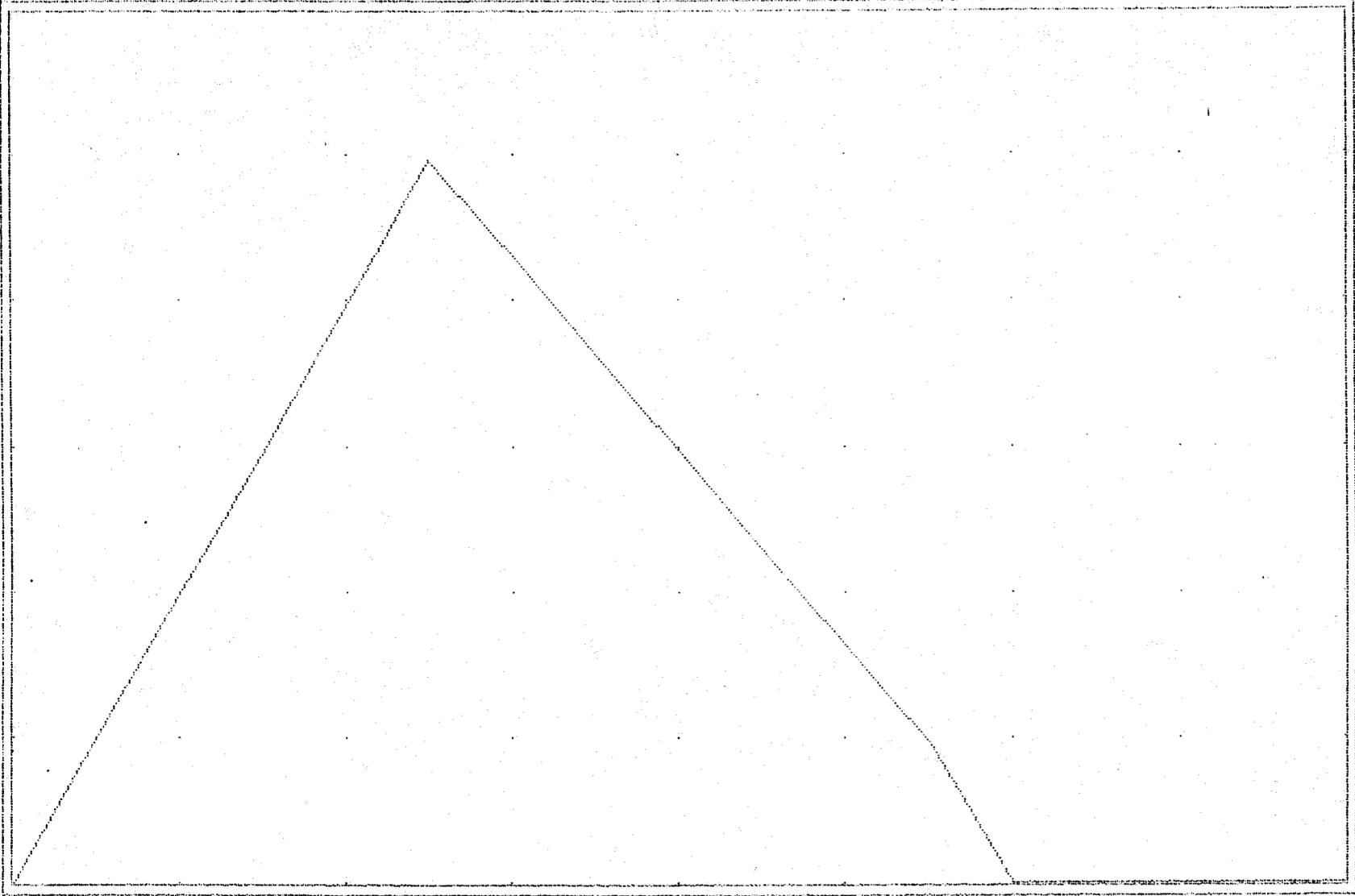
3

VGU = 5.0 cfs

$VOL = (cuft/acft) = 6676 / 0.153$



$VOL = (cuft/acft) = 7853 / 0.100$

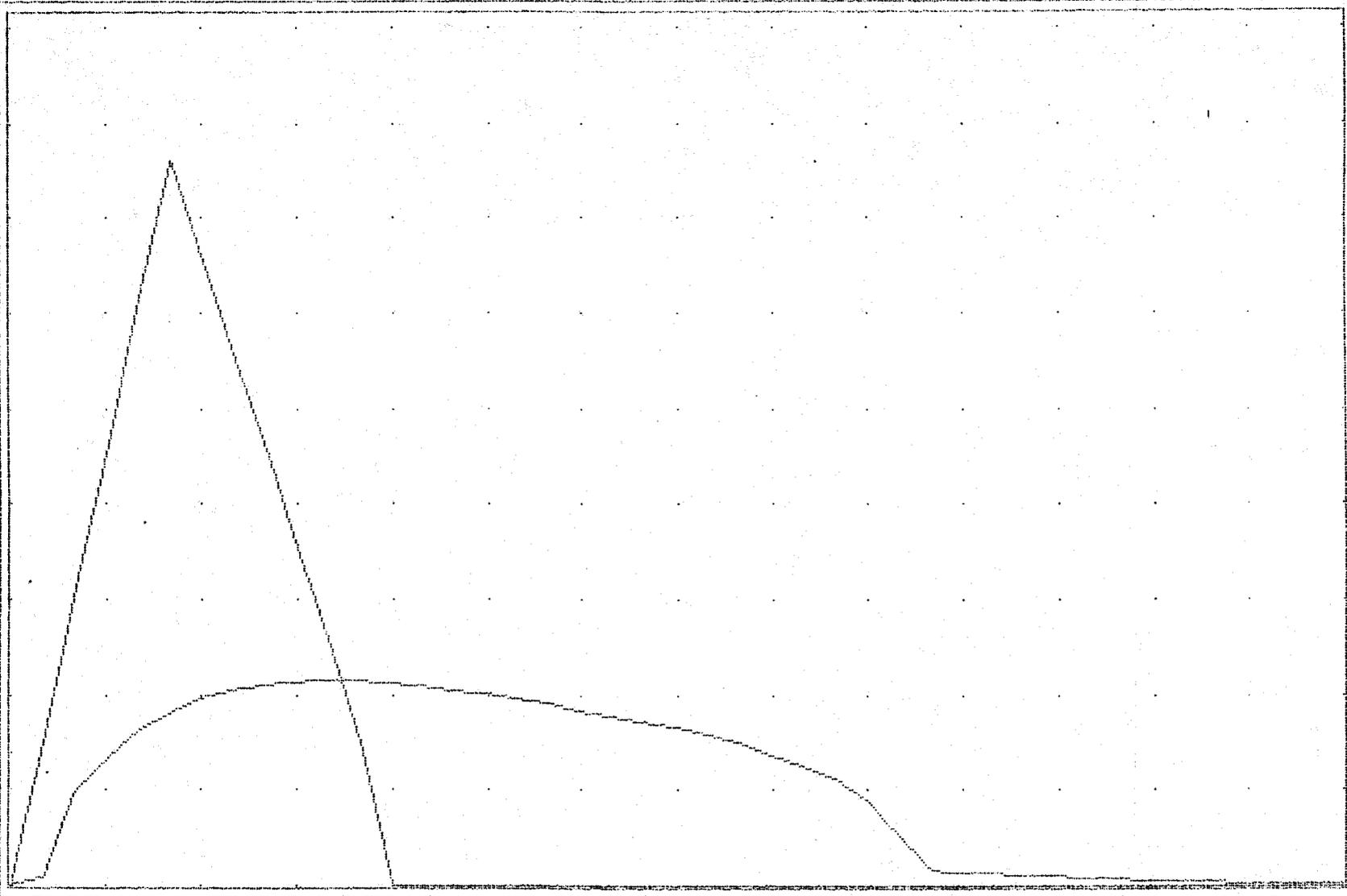


HGU = 2 min

5

UGU = 5.0 cfs

$$UOL = (\text{cuft/acft}) = 9222 / 0.212$$



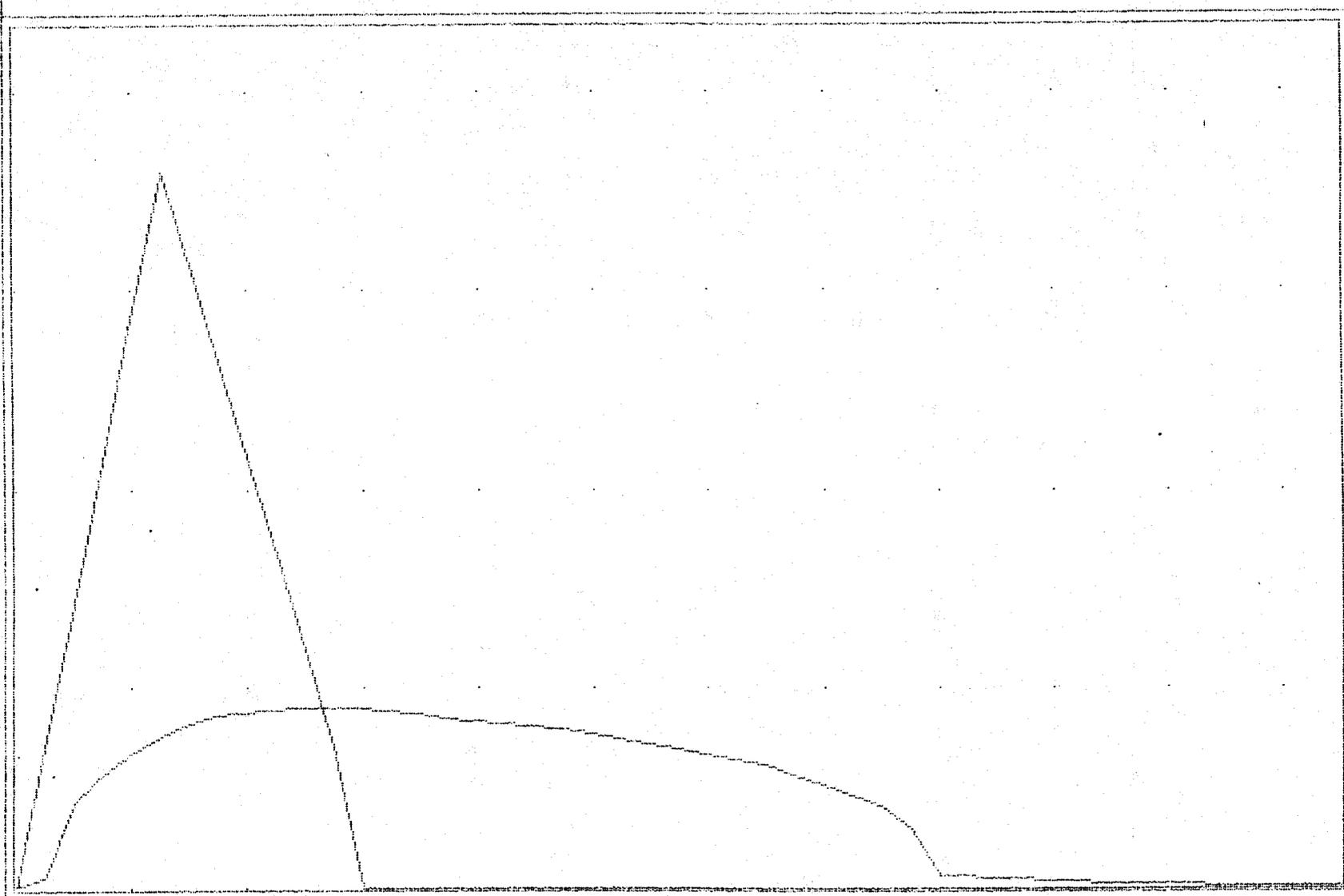
HGU = 3 min

12

UGU = 2.0 cfs

MAX STORAGE = 3512

MAX ELEVATION = 56.39



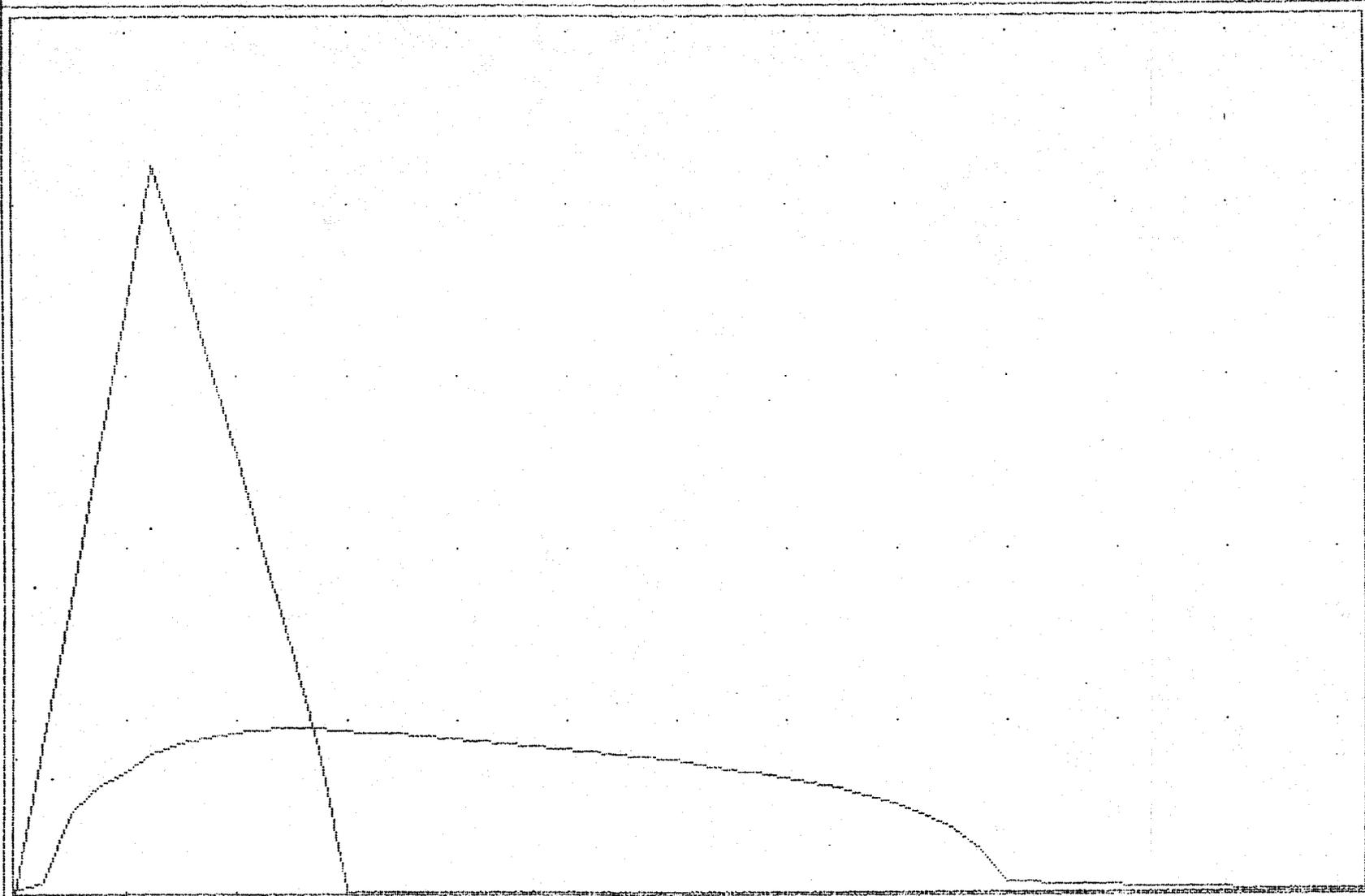
HGU = 4 min

13

VGU = 5.0 cfs

MAX STORAGE = 4386

MAX ELEVATION = 56.72



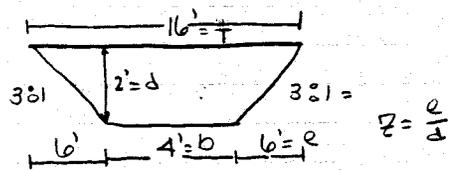
HGU = 4 min

14

UGU = 5.0 cfs

MAX STORAGE = 5430

MAX ELEVATION = 57.08



TRAPEZOIDAL CHANNEL

$$X\text{-SECTIONAL AREA (A)} = bd + zd^2 = 4(2) + 3(2^2) = 20 \text{ ft}^2$$

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

FOR GRASS LINED CHANNELS:

$$\text{CHANNELS} \approx 10\% \therefore V_{\text{max permissible}} = 4 \text{ ft/sec}$$

$$\text{CORRECTION FACTOR} \\ A/T = 1.25 \Rightarrow .84$$

$$\therefore V_{\text{max}} = 4(.84) = 3.36 \text{ ft/sec}$$

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

$$Q = VA \\ 9 \text{ ft}^3/\text{sec} = V(20 \text{ ft}^2)$$

$$\therefore V = 0.45 \text{ ft/sec} < V_{\text{max}} = 3.36 \text{ ft/sec}$$

- 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

$$72" \text{ area} = 4072 \text{ in}^2$$

$$58" \text{ area} = \frac{2642}{1430}$$

$$48" \text{ area} = 12.57 \text{ ft}^2$$

$$58" \text{ " } = 18.35$$

$$72" \text{ " } = 28.27$$

$$72 \quad 28.27$$

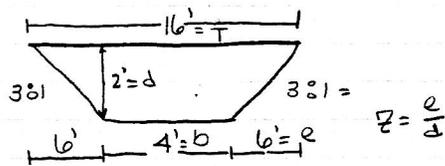
$$58 \quad - 18.35$$

$$9.9 < 12.57 \text{ ft}^2 - \text{N.G.}$$

$$78" = 33.18$$

$$- 18.35$$

$$14.83 > 12.57 - \text{ok.}$$



TRAPEZOIDAL CHANNEL

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

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

FOR GRASS LINED CHANNELS:

CHANNELS \approx 10% $\therefore V_{\text{max permissible}} = 4 \text{ ft/sec}$ 2.5' / sec

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

$$\therefore V_{\text{max}} = 4(.84) = 3.36 \text{ ft/sec}$$

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

$$\begin{aligned} \rightarrow Q &= VA \\ 9 \text{ ft}^3/\text{sec} &= V(20 \text{ ft}^2) \\ \therefore V &= 0.45 \text{ ft/sec} < V_{\text{max}} = 3.36 \text{ ft/sec} \end{aligned}$$

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

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

Try 23.26

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

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

$$\frac{\quad}{3.0} \text{ or } 2.2$$

$$\text{NOS} - 6.26 \Rightarrow 9.26$$

.75 - need 1.63 ac.

$$\begin{array}{r} 1.68 \\ 45 \\ \hline 2.00 \end{array}$$

$$\begin{array}{r} 33. \\ -10 \\ \hline 23 \\ 9 \text{ - site dev.} \\ \hline 14 \end{array}$$

8.7

$$\begin{array}{r} 22 \\ 36 \text{ - NOS} \\ \hline \end{array}$$

$$\frac{36}{45} = 8 \text{ PTS}$$

$$\frac{3 \text{ PTS}}{\hline} 11.0$$

8
2.2
<hr/>
10.2

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

- Wmby Lndg -

2' deep

Filter Fabric

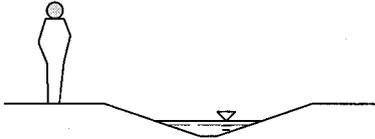
Class I RR

approx 2:1 SS w/ 1' bottom

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



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

BMA CALCULATIONS

WMBG LANDING

N9162

1) STRUCTURAL BMA 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 EOL PIPELINE BEHIND AND WMBG LANDING
7.91 Ac OF BLOG SITE LOCATION RELATIVE TO FUNDS 182

2) OPEN SPACE

$\frac{30.13}{38.04} (100) \times 11 = \underline{7.92}$

30.13 is 7.94Ac + 22.19 Ac OF OPEN SPACE

38.04 Ac IS BLOG 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

$\frac{25.52}{38.04} \times 10 = 6.7$ NOS

$\frac{3.3}{10.0}$ PTS -

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

BMA CALCULATIONS

WMBG LANDING

#8162

DARRYL

1) STRUCTURAL BMA 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			<u>3.29</u>

15.85 is 7.94 Ac BETWEEN COL PIPING USMT AND WMBG LAND DR
7.91 Ac OF BLDG SITE LOCATION DRAINING TO PONDS 1 & 2

2) OPEN SPACE

$\frac{30.13}{38.04} (100) \times 11 = \underline{7.92}$

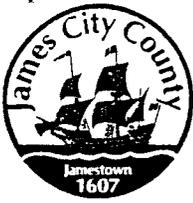
30.13 is 7.94 Ac + 22.19 Ac OF OPEN SPACE

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

TOTAL POINTS

3.29 + 7.92 = 11.21

THUSFORE, OPEN SPACE CAN BE CUT DOWN TO 25.52 Ac WHICH IS 3.33 Ac 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

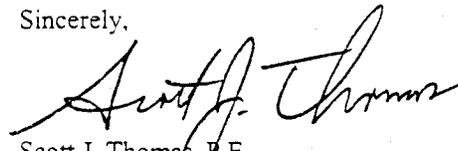
6. Dry Pond # 1. Sediment, vegetation and tree growth at the pond's primary storm drain inflow (flared end section) needs cleaned and removed. This inflow is located approximately 170 feet upstream (west) of the riser near the building. Cleaning and removal only pertains to the actual flared end section 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

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 diligence 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

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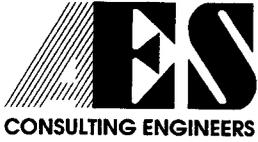
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If you have any questions, please call me at 757-253-6639.

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

*Woodhaven
© WMBG.*



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

June 28, 2001

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

*NOT SUFFICIENT
FOR CONST. CERT.*

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

A handwritten signature in black ink, appearing to read 'Richard A. Costello', is written over the typed name.

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 NURSERY &
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

Handwritten note:
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

LETTER OF TRANSMITTAL

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

DATE <i>6/29/01</i>	JOB NO. <i>8162</i>
ATTENTION <i>SCOTT THOMAS</i>	
RE: <i>WMBG LANDING POND AS-BUILTS</i>	

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
<i>2</i>		<i>35H.</i>	<i>AS-BUILTS/RECORD DRAWINGS</i>
<i>1</i>		<i>15H.</i>	<i>CERTIFICATION LETTER</i>



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: *Scott Thomas*

AES CONSULTING ENGINEERS

Engineering, Surveying and Planning

5248 Olde Towne Road, Suite 1

WILLIAMSBURG, VIRGINIA 23188

LETTER OF TRANSMITTAL

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

DATE <i>6/7/00</i>	JOB NO. <i>8162</i>
ATTENTION <i>DARRYL COOK</i>	
RE: <i>WMB & LANDING AS-BUILTS</i>	

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
<i>2</i>		<i>3 SET</i>	<i>RECORD DRAWINGS - ENV. DIV.</i>
<i>2</i>		<i>3 SET</i>	<i>" " - JCSA</i>

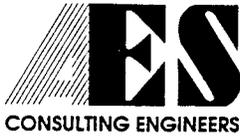


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 As requested Returned for corrections Return _____ corrected prints
 For review and comment _____
 FOR BIDS DUE _____ PRINTS RETURNED AFTER LOAN TO US

REMARKS

COPY TO *JCSA - KEITH COTCHWORTH* SIGNED: *[Signature]*



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

Mr. Michael A. Freda
June 25, 1996
Page 3

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,

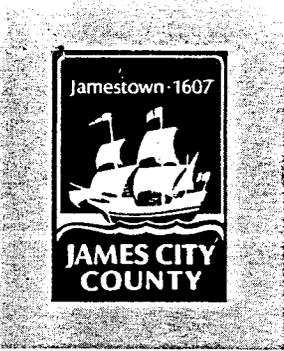
AES Consulting Engineers



Howard W. Price

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

File -
Wmby Landing



DEPARTMENT OF DEVELOPMENT MANAGEMENT
P. O. Box 8784
Williamsburg, Virginia 23187-8784
County Government Center, 101-E Mounts Bay Road

July 3, 1996

Development Manager
(804) 253-6671

Code Compliance
253-6626

County Engineer
253-6678

Planning
253-6685

Integrated Pest Management
253-2620

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

Dear Mr. Price,

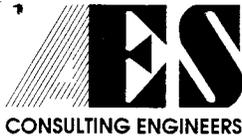
Pursuant to your letter request of May 14, 1996 an exception to the Chesapeake Bay Preservation Regulations is granted for disturbance of slopes exceeding 25% for development of a service road accessing the rear of the Assisted Living Facility at Williamsburg Landing. It is our understanding that you 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



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

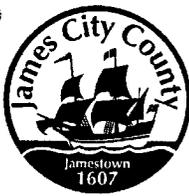
A handwritten signature in cursive script, appearing to read 'Howard W. Price'.

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.

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James City County Environmental Division

Stormwater Management / BMP Inspection Report

Detention and Retention Pond Facilities

Database Inventory No. (if known): CC-00-003

Name of Facility: Williamsburg LANDING BMP No.: #2 Date: 08/02/00

Location: Along BACK (North) side of MAIN Nursing & Assisted Living FAC.

Name of Owner: Williamsburg LANDING, INC.

Inspector: S.J. Thomas

Type of Facility: Extended Detention, Timber Crib Wall Type. County F-2

Weather Conditions: Partly 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: <u>Timber Crib Wall Type (Treated 2x Lumber)</u>				
Grass Height	X			
Vegetated Condition			X	<u>Adjacent vegetation, higher than wall height. Needs removed 10' zone.</u>
Weed Growth			X	<u>See Above</u>
Erosion	X			<u>None.</u>
Trash & Debris	X			<u>None.</u>
Seepage	X			<u>None.</u>
Fencing or Benches	X			<u>N/A.</u>
Constructed Wetlands (Interior Landscaped & Planted) Areas: <u>N/A.</u>				
Vegetated Conditions				
Trash & Debris				
Floatables				
Erosion				
Sediment				
Dead Plant				
Aesthetics				
Other				

Facility Item	O.K.	Routine	Urgent	Comments
Water Pools <input type="checkbox"/> Permanent Pool (Retention Basin) <input checked="" type="checkbox"/> Shallow Marsh (Detention Basin)				
Shoreline Erosion	X			None.
Algae	X			None. No Perm. Pool.
Trash & Debris	X			None.
Sediment		X		Depth at Wall 8" MEASURED.
Aesthetics	X			Interior Vegetation in Basin.
Other				
Inflow Structures (Describe Locations): Primary INFLOW single storm drain SE OF WALL				
Condition of Structure	X			OK. OK.
Erosion	X			Minor Erosion @ Pipe Outfall.
Trash and Debris	X			OK.
Sediment	X			OK.
Aesthetics	X			OK.
Other				
Principal Flow Control Structure - Intake, Riser, etc. (Describe Location): Timber Weir Wall, 3" ϕ PERF. RISER				
Condition of Structure	X			Perforations incomplete up riser.
Corrosion	X			PVC Pipe
Trash and Debris		X		3" DIA. RISER PERF. CLOGGED.
Sediment		X		8" DEPTH AT 3" DIA RISER BASE.
Aesthetics		X		Trees & Brush Heads REMOVED.
Other				
Principal Outlet Structure - Barrel, Conduit, etc. : WEIR WALL, Treated Timber.				
Condition of Structure		X		Stringers PER PLAN MISSING.
Settlement	X			None observed.
Trash & Debris	X			None.
Sediment	X			None D/S.
Erosion	X			GOOD D/S RIPRAP CHANNEL.
Other				
Emergency Spillway (Overflow): EMER. RELEASE OVER WALL				
Vegetation	X			
Lining	X			
Erosion	X			
Trash & Debris	X			
Other	X			

Facility Item	O.K.	Routine	Urgent	Comments
Nuisance Type Conditions:				
Mosquito Breeding	X			None
Animal Burrows	X			None.
Graffiti	X			None
Other	X			None.
Surrounding Perimeter Conditions:				
Land Uses				
Vegetation				
Trash & Debris				
Aesthetics				
Access /Maintenance Roads or Paths				
Other				
Remarks: Refer to letter dated Aug 03 2000 to Owners Engineer. Inspection performed following Construction & prior to bond release. Various record drawing, construction certification & "hit-list" items necessary.				
Overall Environmental Division Internal Rating: <u>4</u>				
Signature: <u>Scott J. Thorne P.E.</u>				Date: <u>08/14/00</u>
Title: <u>Environmental Div. Civil Engineer.</u>				

SWMProg\BMP\CoInspProg\DetRet.wpd

Date Record Created:

WS_BMPNO:

Print Record

Created By:

CC012

WATERSHED CC
 BMP ID NO 012
 PLAN NO SP-50-96
 TAX PARCEL (48-2)(1-3)
 PIN NO 48201000030
 CONSTRUCTION DATE 9/1/1999
 PROJECT NAME Williamsburg Landing
 FACILITY LOCATION North of 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

PRINTED ON
Wednesday, March 10, 201
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MAINTENANCE PLAN No
 SITE AREA acre 33.26
 LAND USE Institutional
 old BMP TYP Timber Crib
 JCC BMP CODE F1 Timber Walls
 POINT VALUE 6

CTRL STRUC DESC PVC
 CTRL STRUC SIZE inches 3
 OTLT BARRL DESC Timber Wall
 OTLT BARRL SIZE inch

SVC DRAIN AREA acres

EMERG SPILLWAY No
 DESIGN HW ELEV 55.0
 PERM POOL ELEV na
 2-YR OUTFLOW cfs 0.00
 10-YR OUTFLOW cfs 0.00
 REC DRAWING Yes

SERVICE AREA DESCR Building & Parking Area

IMPERV AREA acres
 RECV STREAM College Creek

EXT DET-WQ-CTRL Yes
 WTR QUAL VOL acre-ft

LAST INSP DATE 8/2/2000 Inspected by:

CHAN PROT CTRL No
 CHAN PROT VOL acre-ft

INTERNAL RATING 4

SW/FLOOD CONTROL Yes

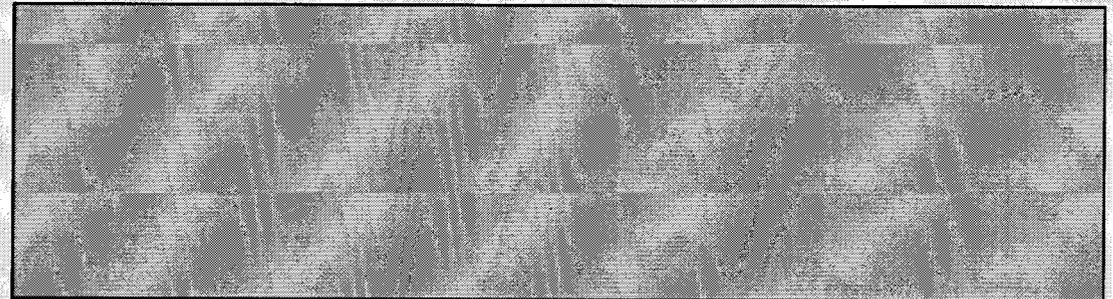
MISC/COMMENTS
 Nursing & Liv Facility (Woodhaven). Also See CC 011. BMP#2

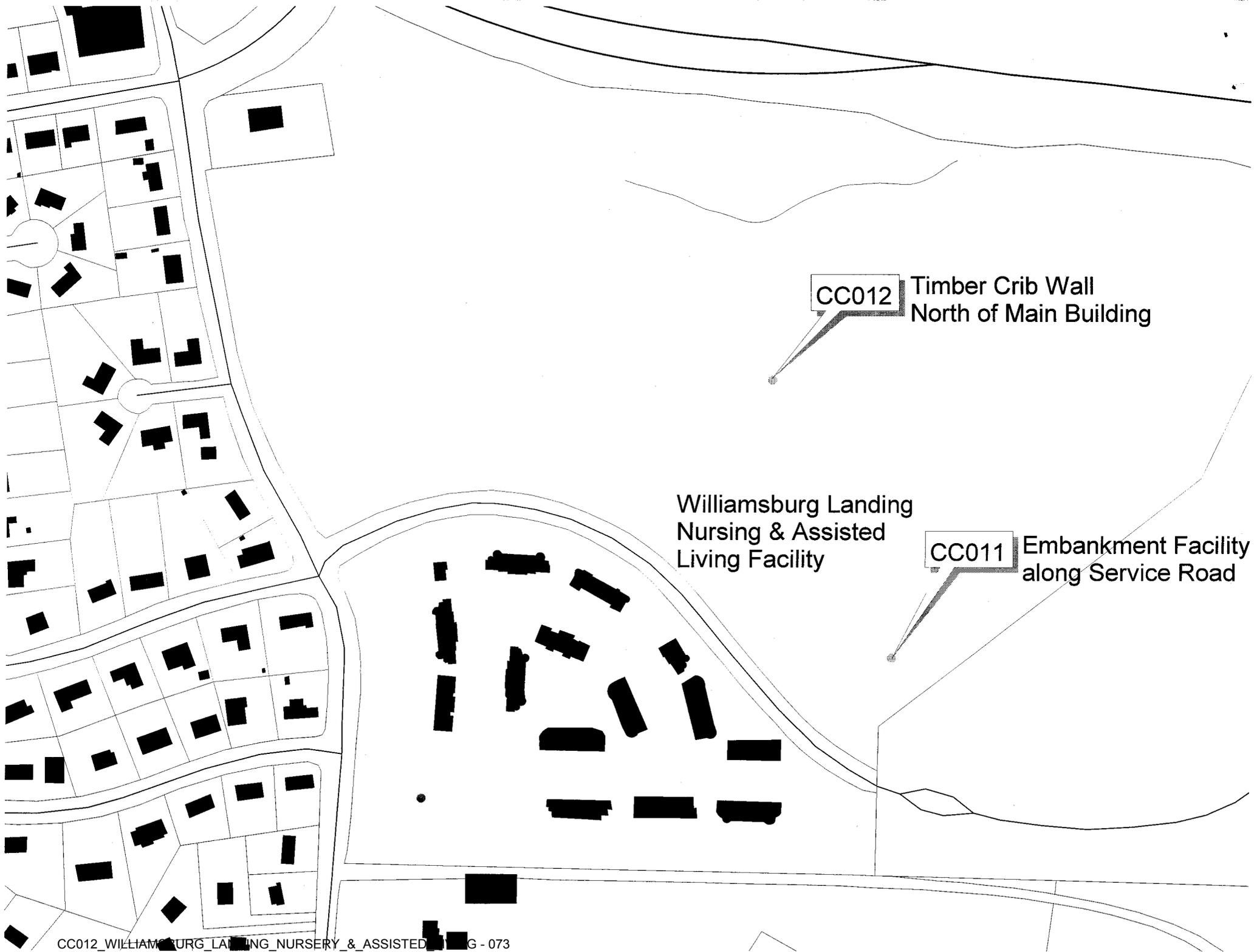
GEOTECH REPORT No

Get Last BMP No

Return to Menu

Additional Comments:





CC012

Timber Crib Wall
North of Main Building

Williamsburg Landing
Nursing & Assisted
Living Facility

CC011

Embankment Facility
along Service Road

DARRYL

TABLE 3

WORKSHEET FOR BMP POINT SYSTEM

WILLIAMSBURG LANDING #8162
NURSING & ASSISTED LIVING FACILITY

A. STRUCTURAL BMP POINT ALLOCATION

<u>BMP</u>	<u>BMP Points</u>		<u>Fraction of Site Served by BMP</u>	<u>Weighted BMP Points</u>
<u>DEY POND #1</u>	<u>6</u>	x	$\frac{6.20}{33.26}$	<u>1.12</u>
<u>DEY POND #2</u>	<u>6</u>	x	$\frac{2.49}{33.26}$	<u>0.45</u>
<u>FUTURE DEY POND #3</u>	<u>6</u>	x	$\frac{10.0}{33.26}$	<u>(1.80)</u>
TOTAL WEIGHTED STRUCTURAL BMP POINTS:				<u>1.57</u> <u>(3.37)</u>

B. NATURAL OPEN SPACE CREDIT

<u>Fraction of Site</u>	<u>Natural Open Space Credit</u>	<u>Points for Natural Open Space</u>
$\frac{23.05}{33.26 (100)}$	$\frac{23.05 + 2.19}{33.26} = .416$ (0.1 per 1%)	<u>6.93</u>

C. TOTAL WEIGHTED POINTS

<u>1.57</u>	+	<u>6.93</u>	=	<u>(10.30)</u>
Structural BMP Points		Natural Open Space Points		TOTAL
				<u>8.50</u>

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.

(x) INDICATES FUTURE ADDITIONS.

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
DEY POND #1	6	x	$\frac{6.20}{33.26}$	=	1.12
DEY POND #2	6	x	$\frac{2.49}{33.26}$	=	0.45
		x		=	
FUTURE DEY POND #3	6	x	$\frac{10.0}{33.26}$	=	(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
$\frac{23.05}{33.26 (100)}$.1	x	4.16
	(0.1 per 1%)	=	6.93

C. TOTAL WEIGHTED POINTS

1.57	+	6.93	=	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.

(x) 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., $100 \times 1.0 = 100$)