



## **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**

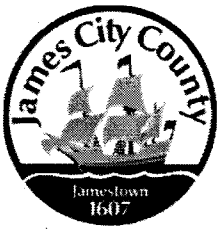
**DATE VERIFIED: May 4, 2012**

**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

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**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

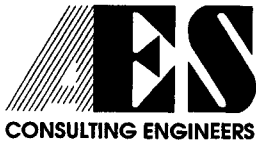
C

Each file is to contain:

E

- 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>JOAN</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</u>			
<u>999-4371</u>			
<u>NANCY HARRISON</u> <u>WILLIAMSBURG</u>			
<u>565-6504</u> <u>LANDING</u>			
SIGNED <u>DD</u>			
CASCADE P3-A2334			
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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 of Richard A. Costello in black ink.

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-S.
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 JCSEA 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

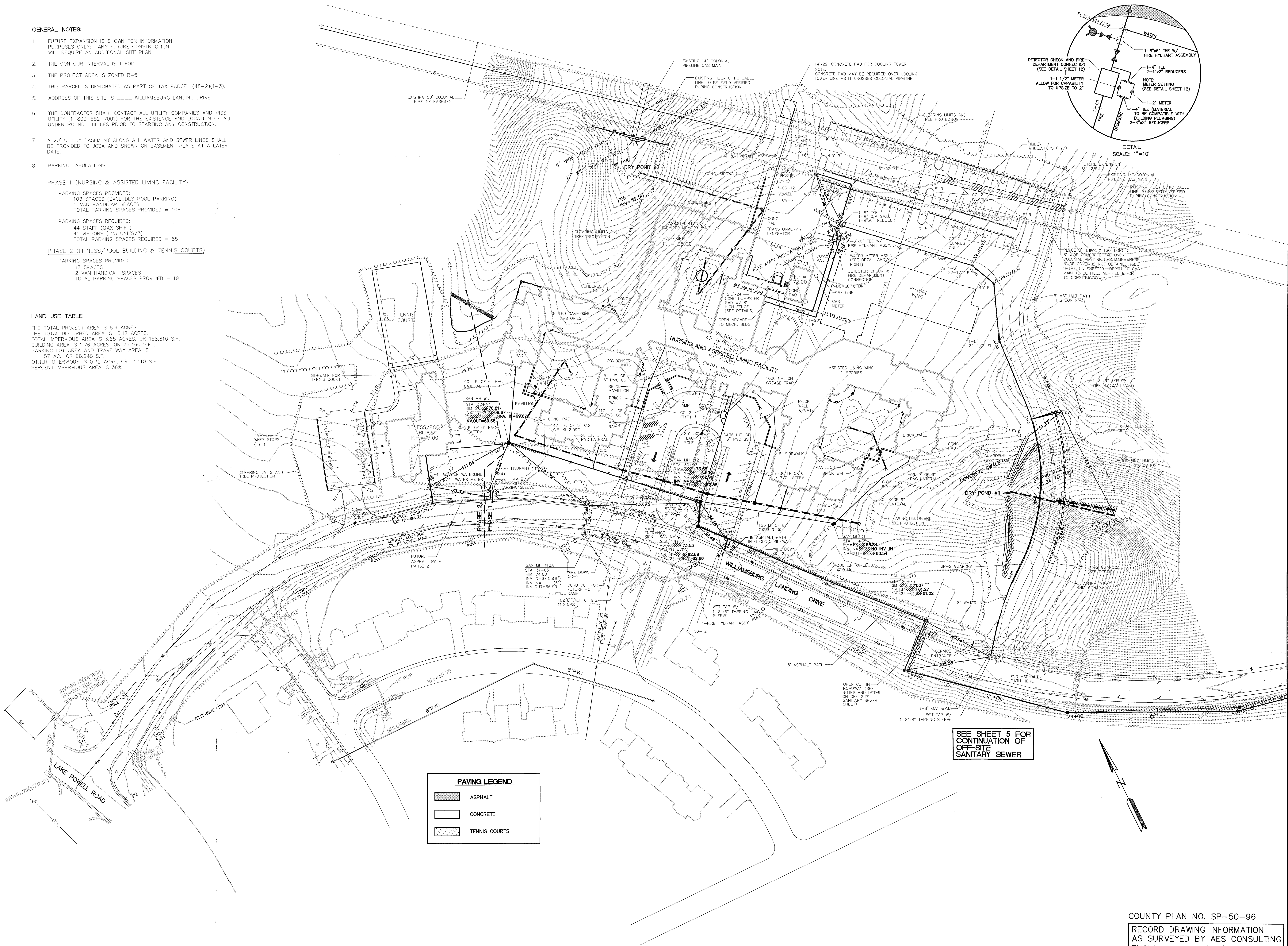
PARKING SPACES REQUIRED:  
44 STAFF (MAX SHIFT)  
41 VISITORS (123 UNITS/3)  
TOTAL PARKING SPACES REQUIRED = 85

## PHASE 2 (FITNESS/POOL BUILDING & TENNIS COURTS)

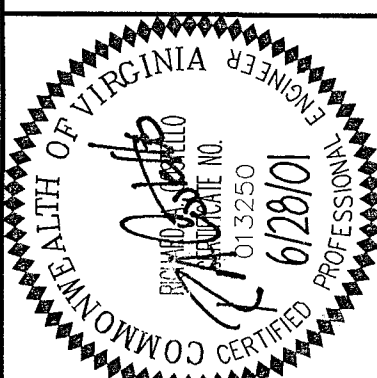
PARKING SPACES PROVIDED:  
17 SPACES  
2 VAN HANDICAP SPACES  
TOTAL PARKING SPACES PROVIDED = 19

## 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%.



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

NO.	DATE	DESCRIPTION
1	6/25/96	REV. PER JCC COMMENTS - HMP

SITE AND UTILITY PLAN  
DRAWING NO. C001  
COMMISSION NO. SCALE: 1" = 40'  
DATE: 6/25/96

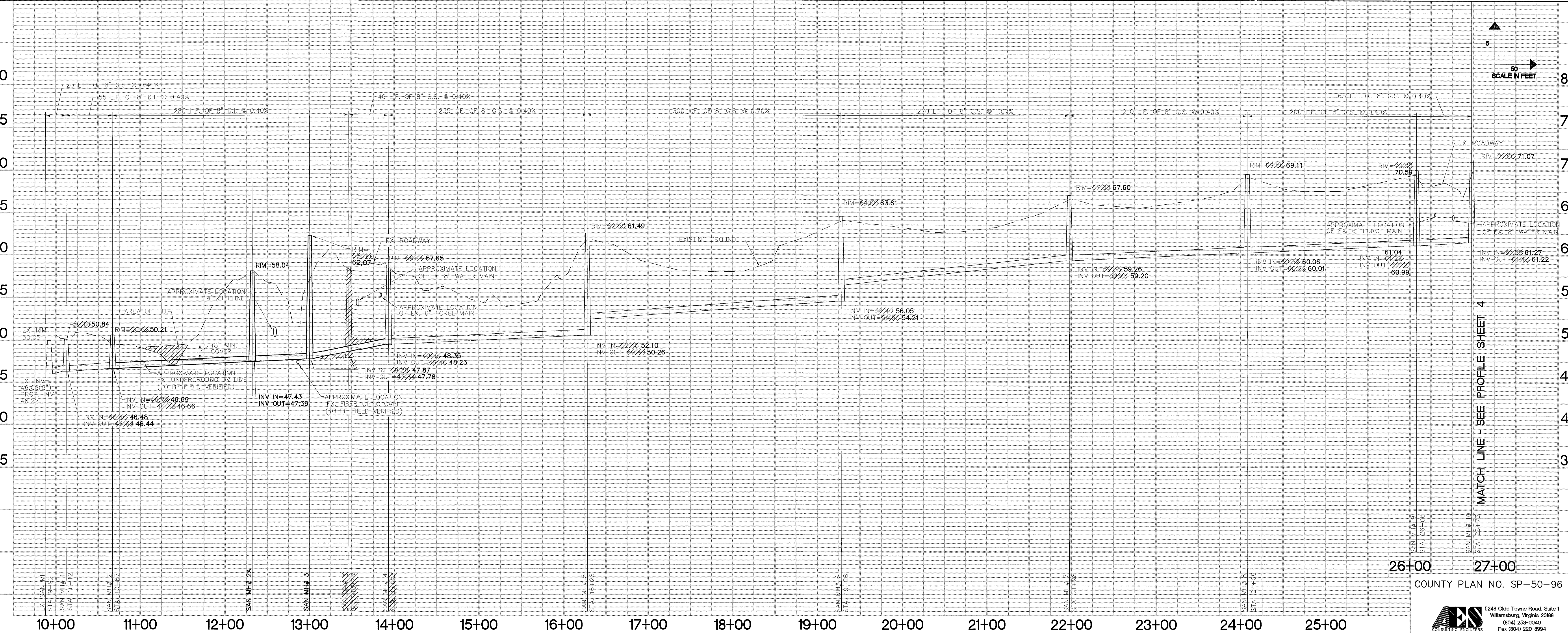
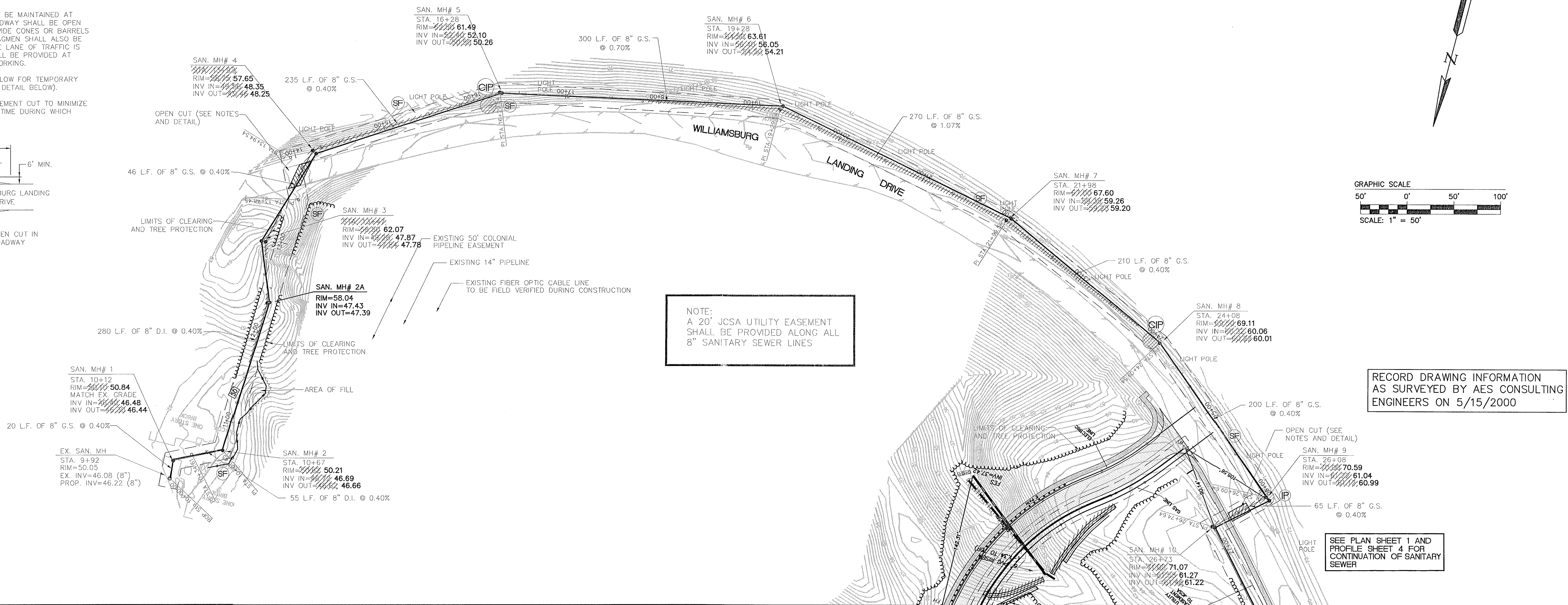
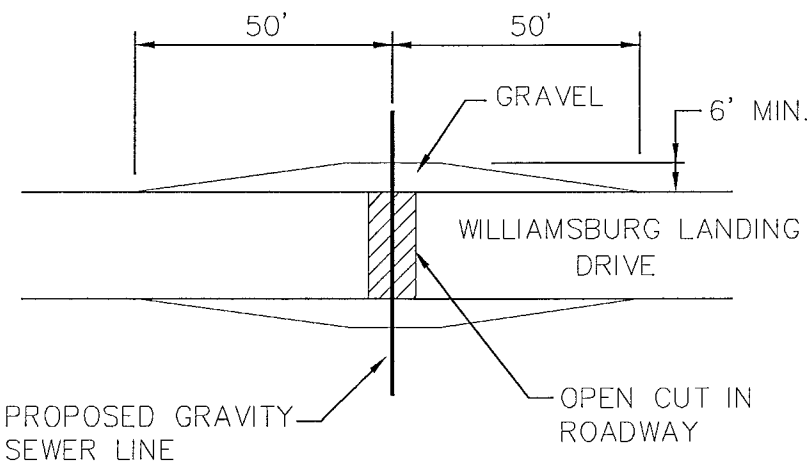
COUNTY PLAN NO. SP-50-96  
RECORD DRAWING INFORMATION  
AS SURVEYED BY AES CONSULTING ENGINEERS ON 5/15/2000

AES CONSULTING ENGINEERS  
5248 Old Towne Road, Suite 1  
Williamsburg, Virginia 23098  
(804) 253-0040  
Fax (804) 220-8994



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.



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COMMONWEALTH OF VIRGINIA  
REGISTERED PROFESSIONAL ENGINEER  
No. 60201  
JAMES PATRICK & SCOTT ARCHITECTS

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

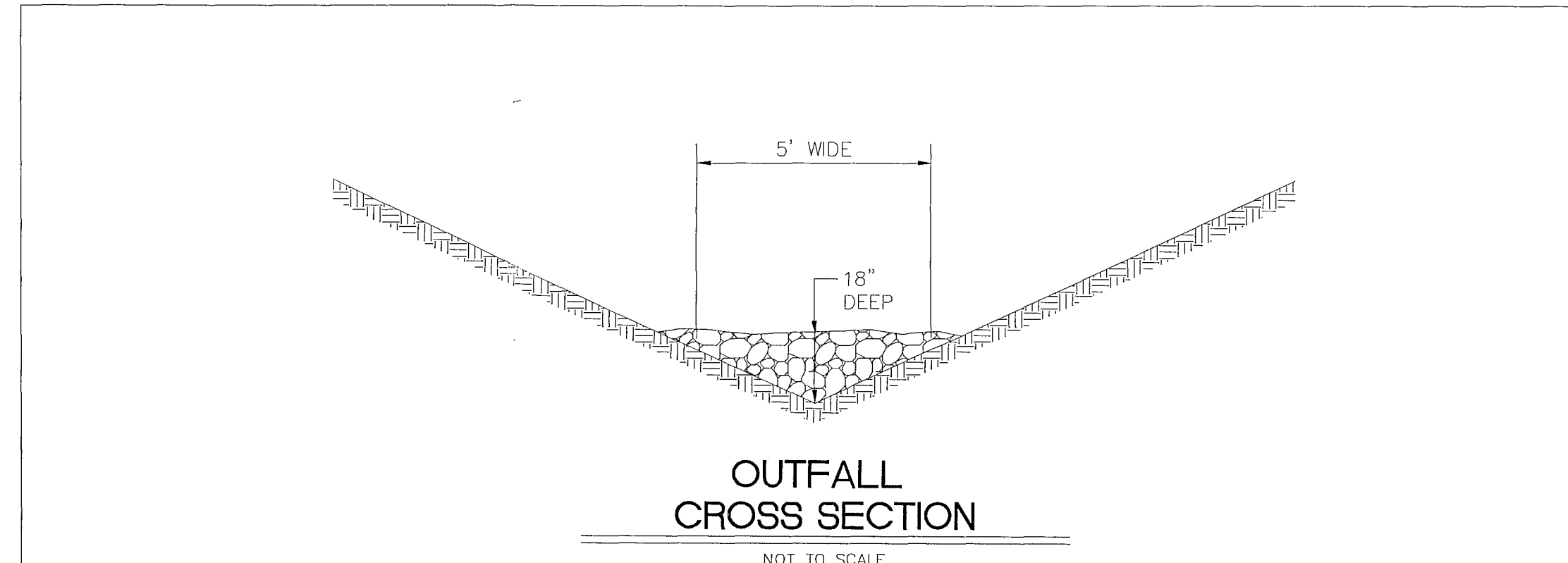
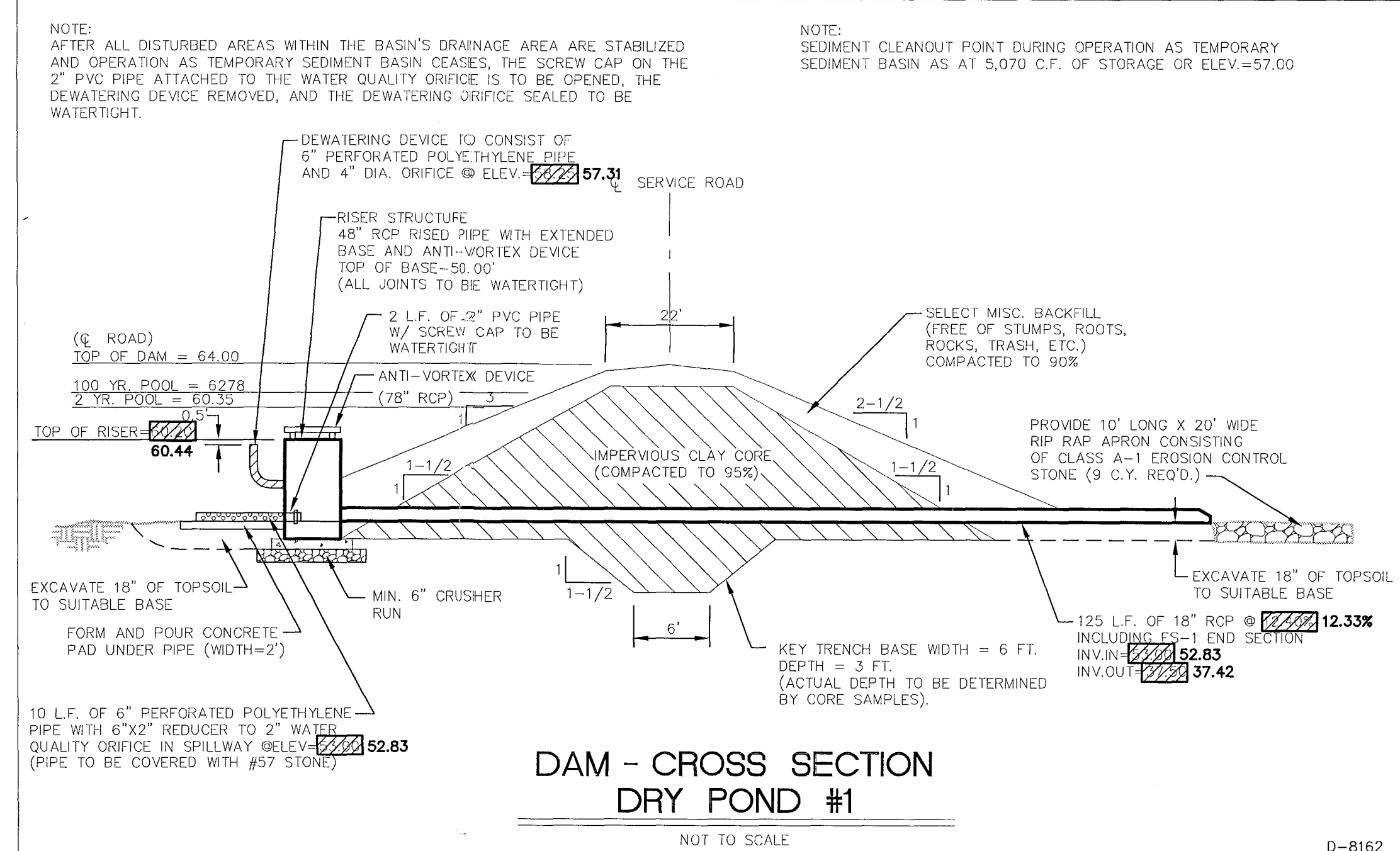
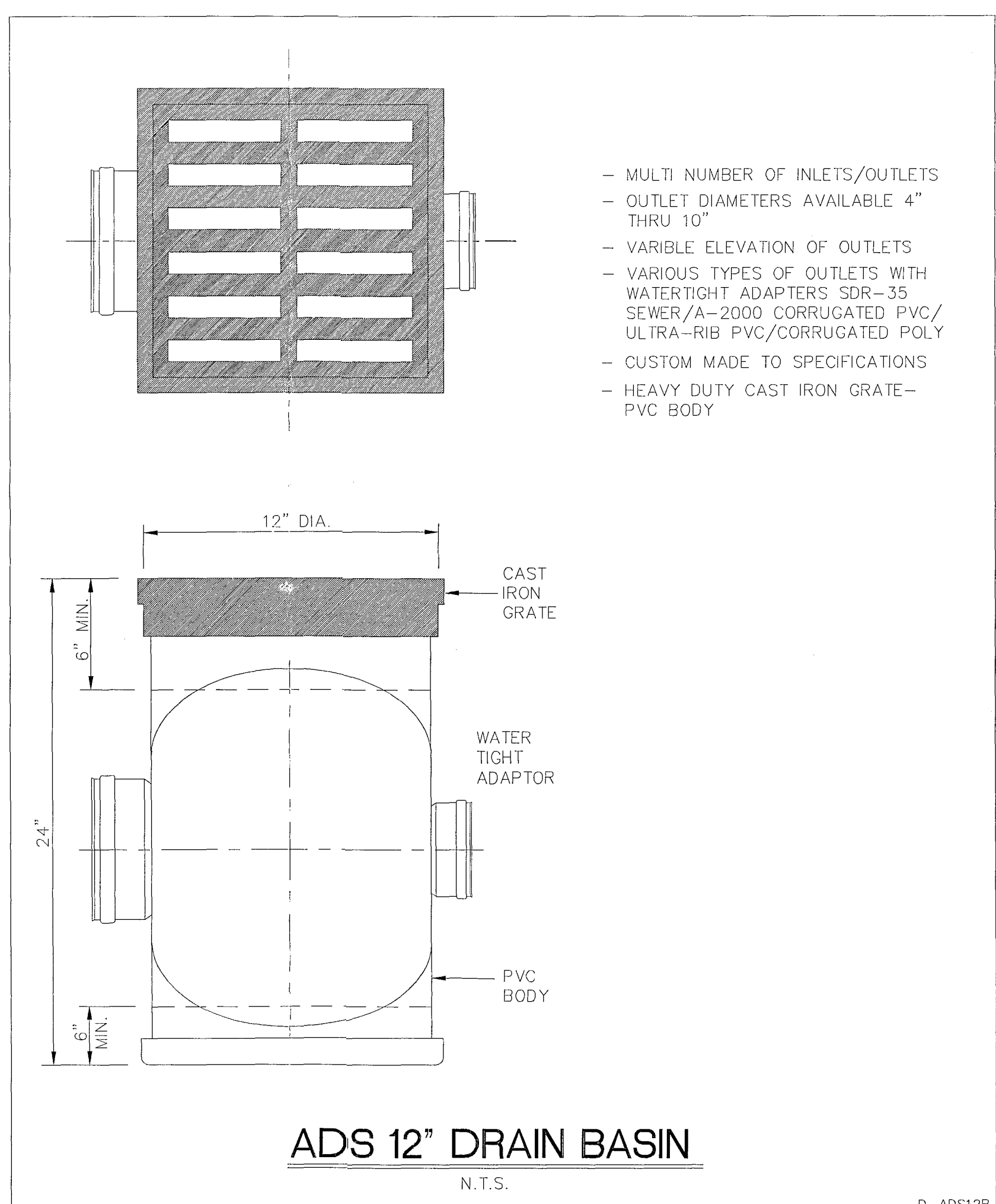
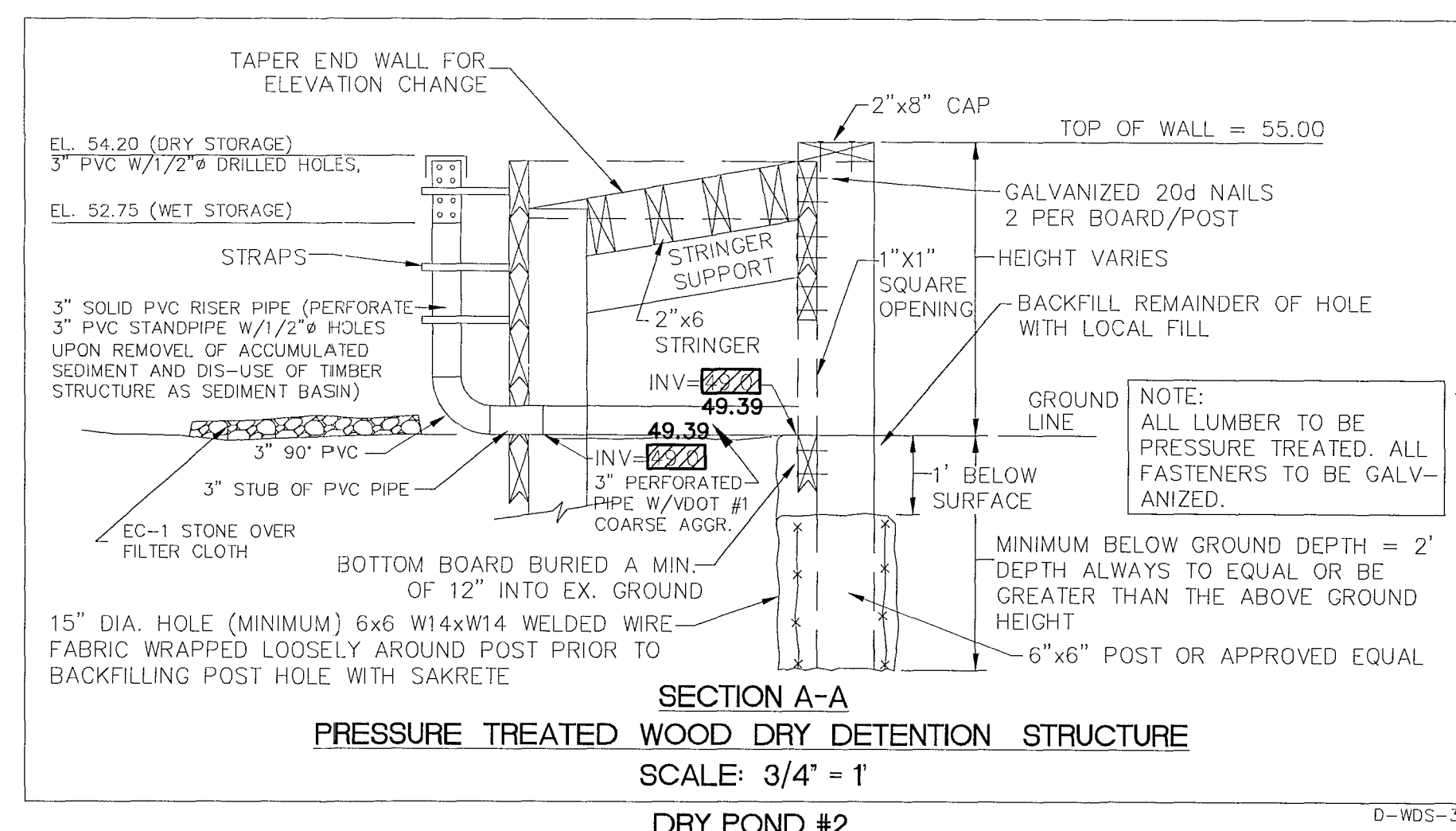
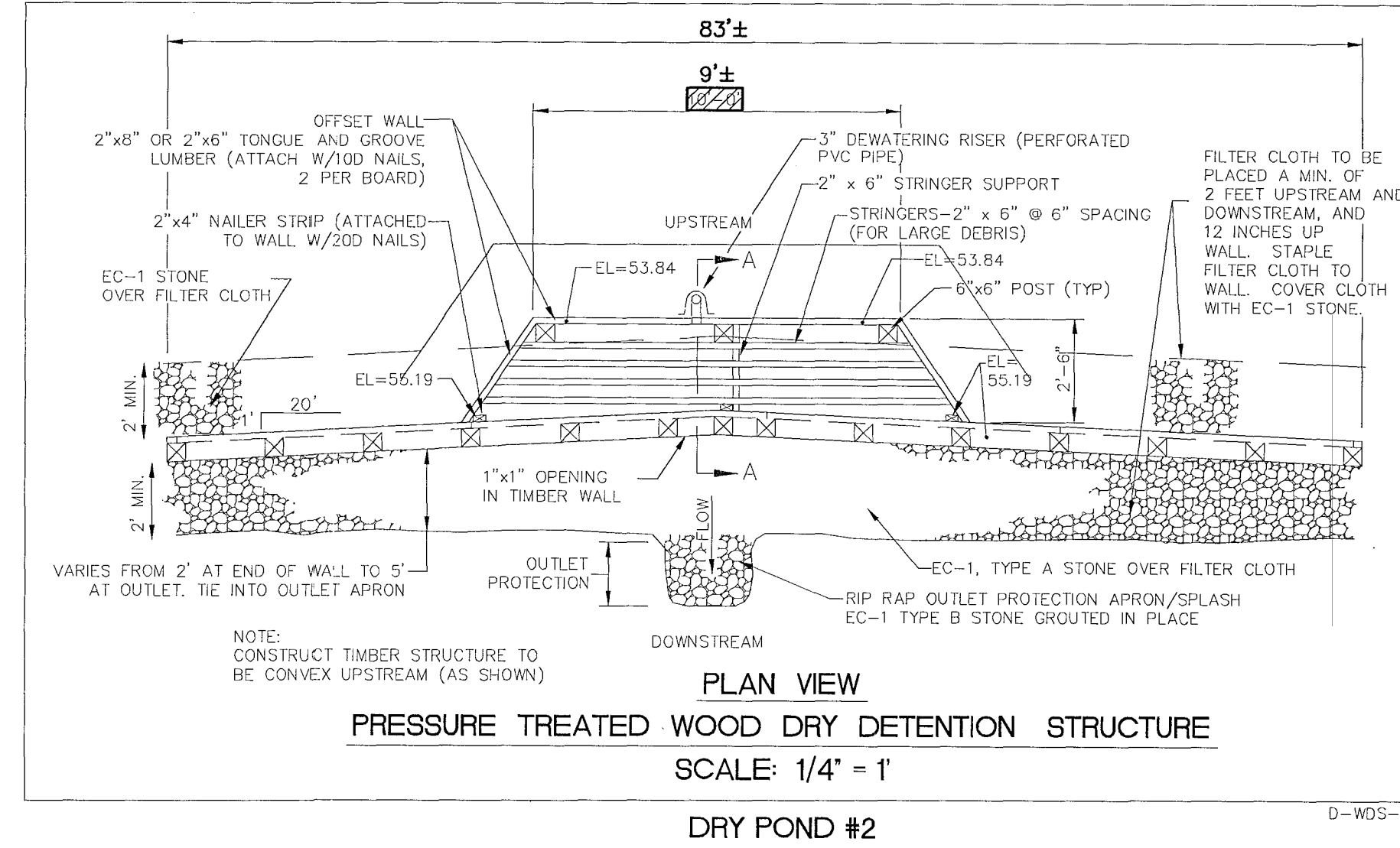
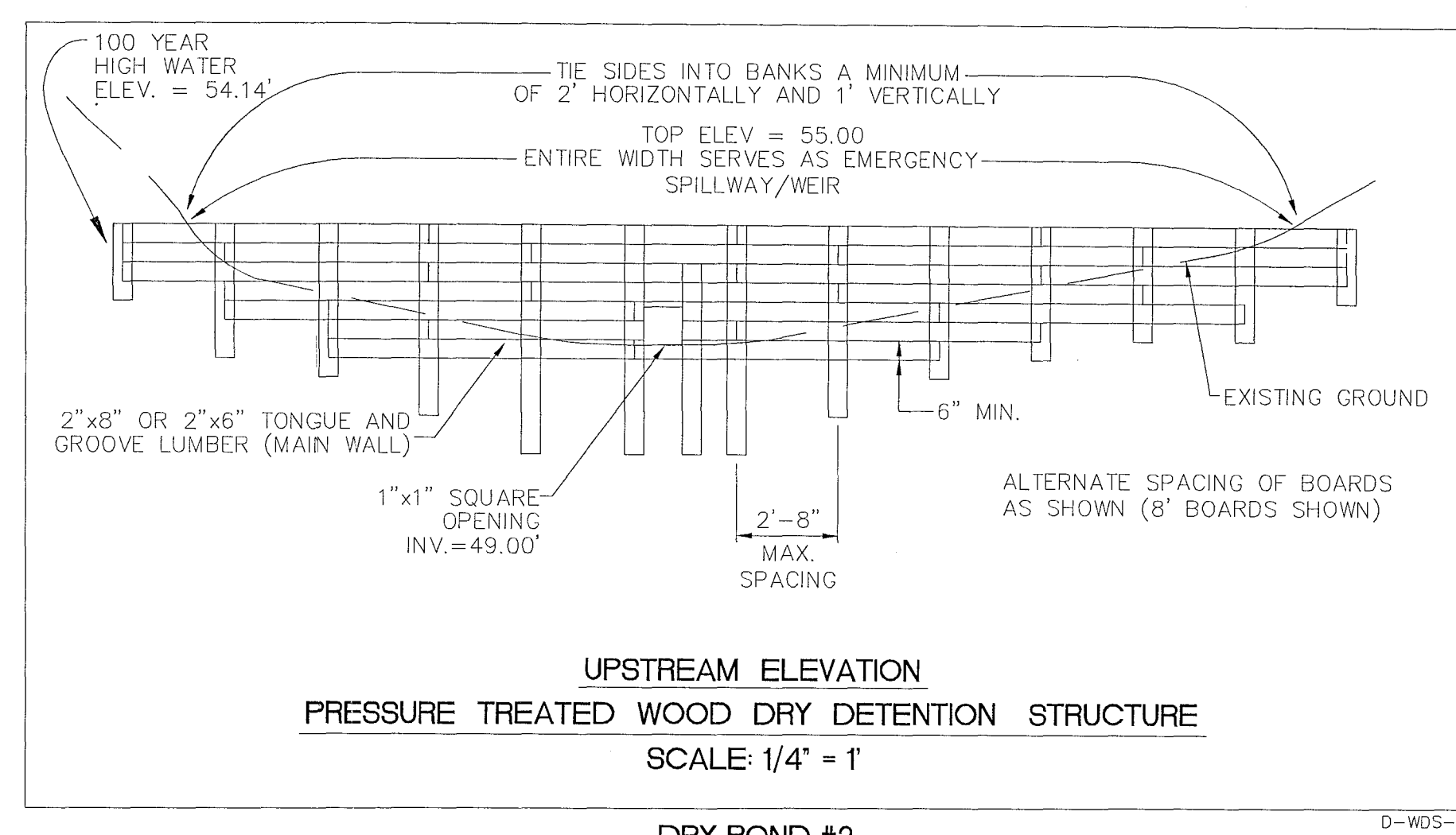
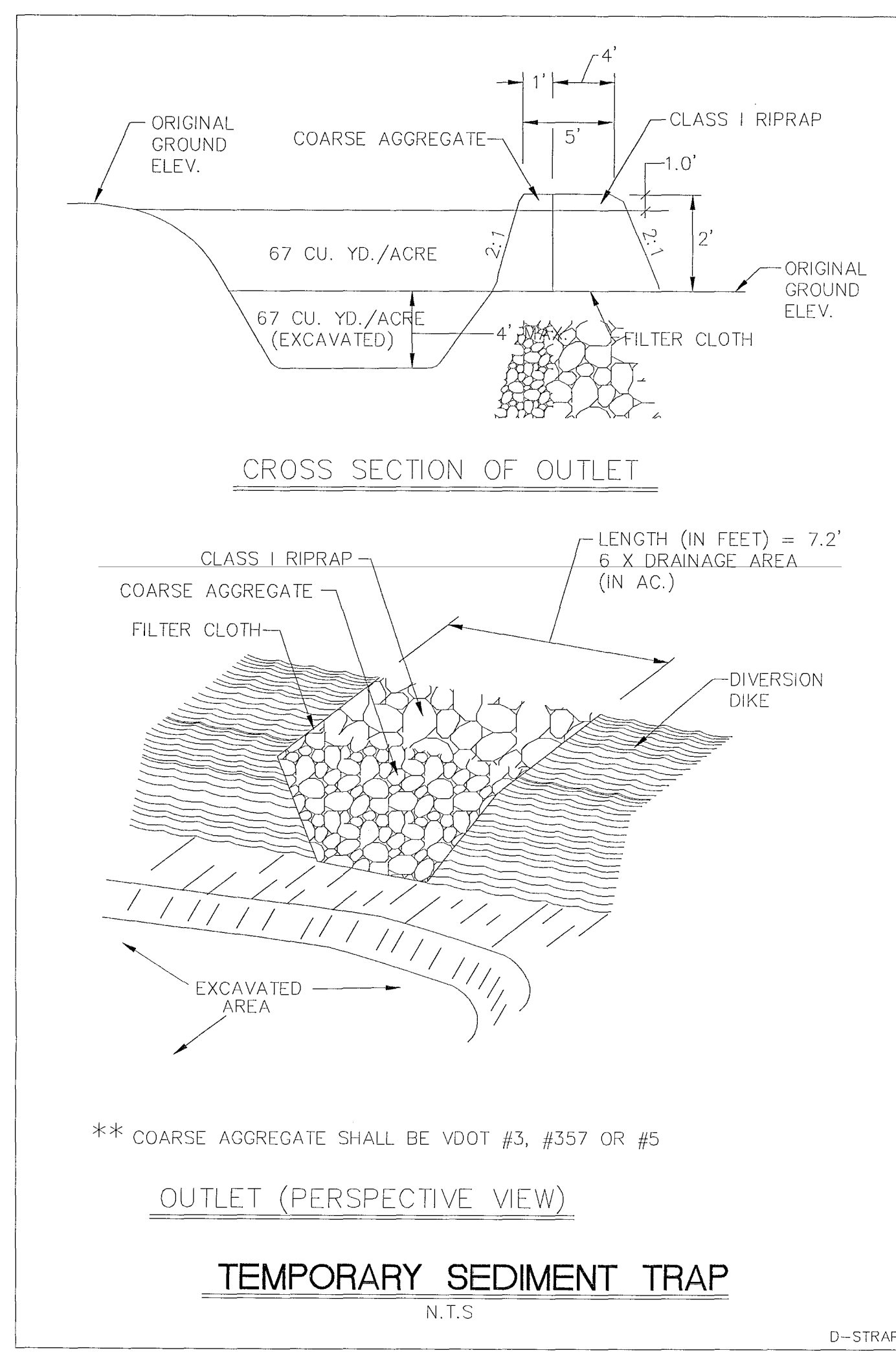
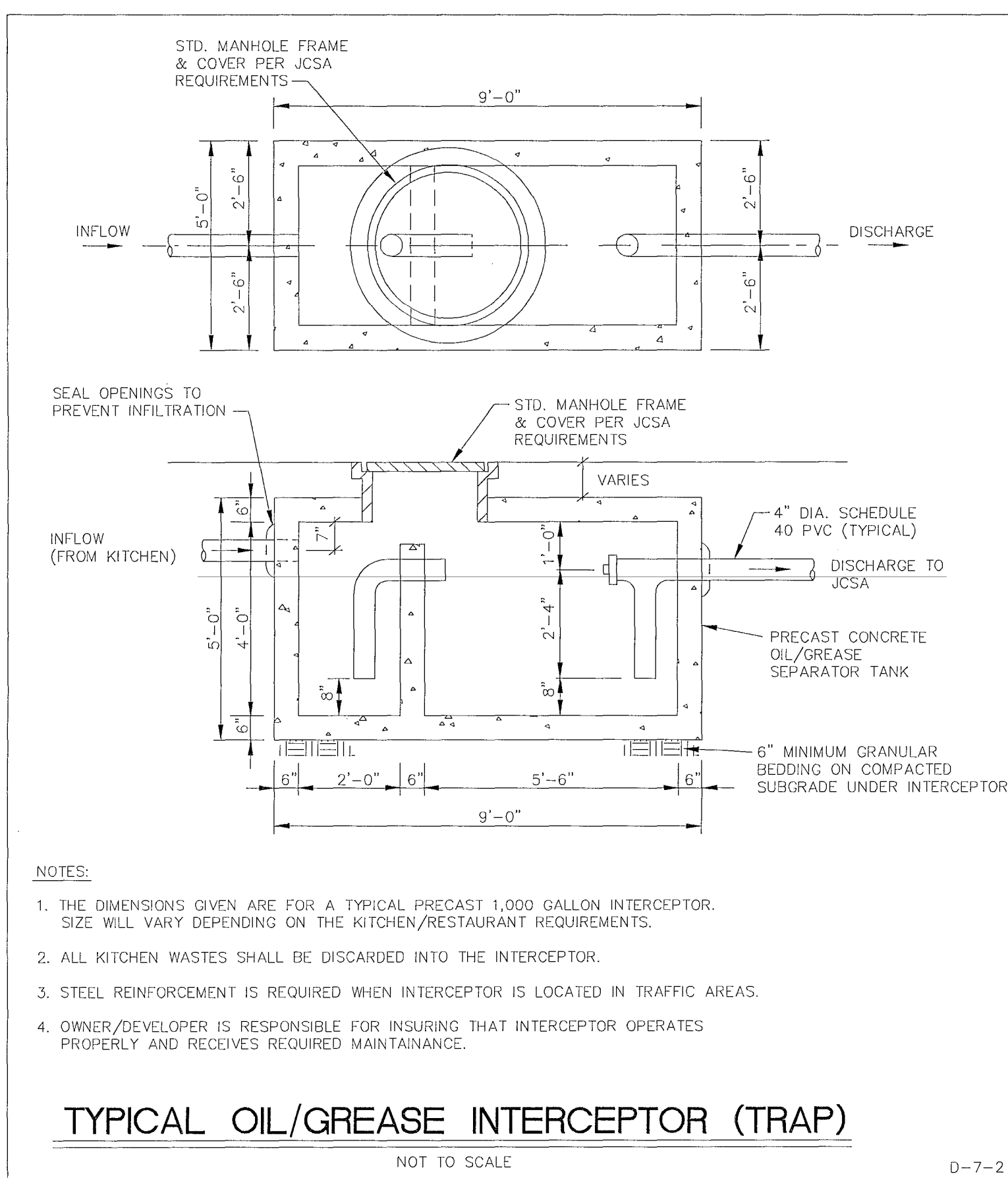
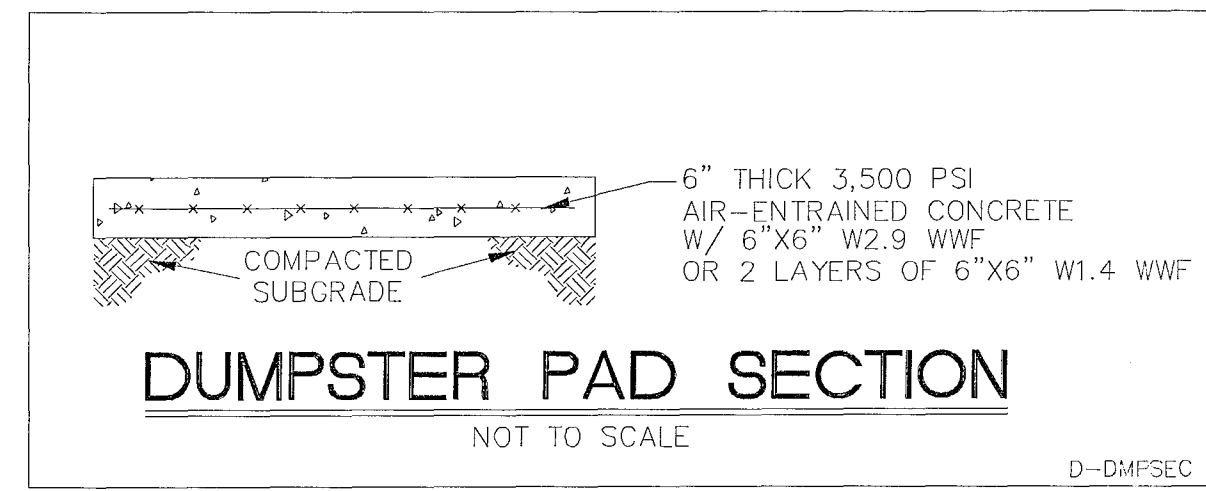
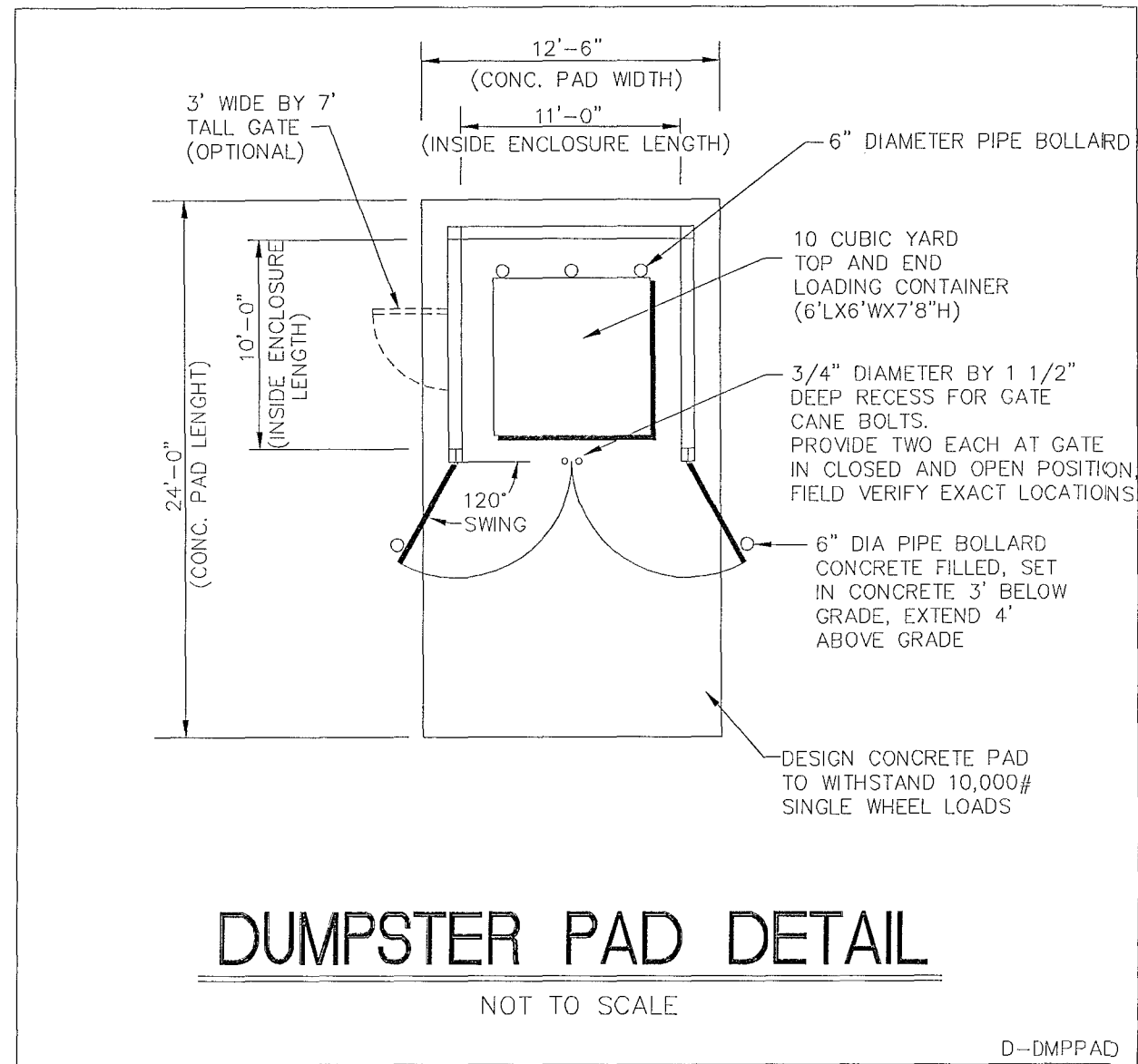
DESIGNED BY: EAW  
CHECKED BY: EMG/ANP  
APPROVED BY: RAC

REVISIONS	
NO.	DATE
1	6/25/96
2	7/15/96
3	7/25/96
4	11/21/96

OFF-SITE SANITARY SEWER PLAN & PROFILE  
C005  
DATE: 4/25/96  
AS SHOWN

2548 Olde Towne Road, Suite 1  
Williamsburg, Virginia 23188  
(804) 253-0040  
Fax (804) 220-8994





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

COMMONWEALTH OF VIRGINIA  
JAMES CITY COUNTY, VA  
ARCHITECTS  
RILEY, LOWER, PATRICK & SCOTT  
1510 GREENBRIER DRIVE, LANCASTER, PA 17601-7175-1501

NEW NURSING & ASSISTED LIVING FACILITY FOR JAMES CITY COUNTY, VA  
WILLIAMSBURG LANDING, INC.  
CHECKED BY: ENG/RMP  
APPROVED BY: RUC  
DRAWN BY: MWC

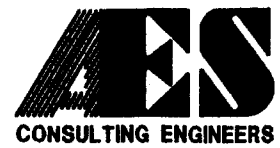
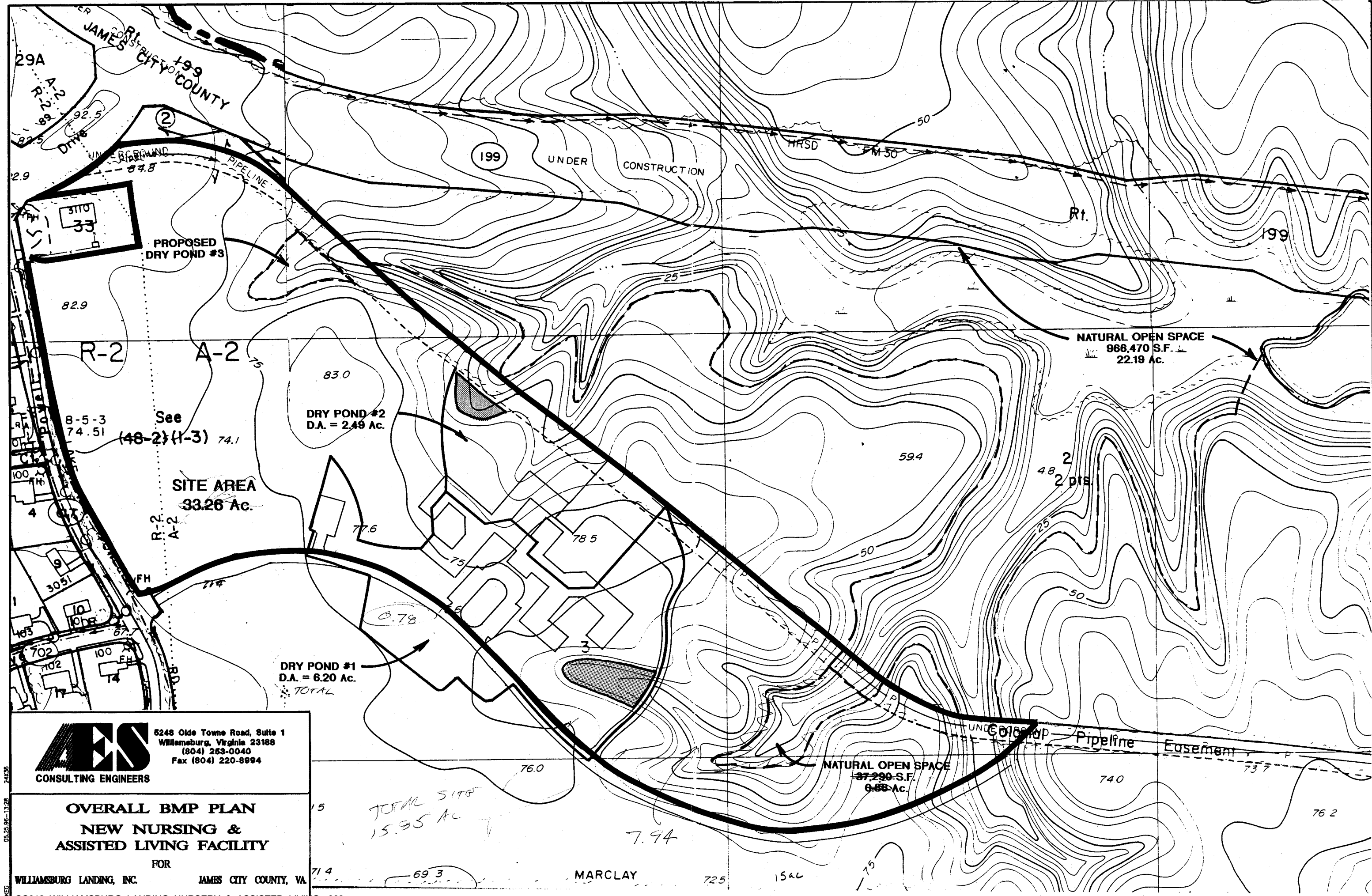
NOTES AND DETAILS  
REVISIONS  
NO. DATE DESCRIPTION  
1 6/25/96 REV. PRE. JCC COMMENTS - RHP  
2 7/19/96 COORDINATION/ADDENDUM NO. 4  
3 7/29/96 COORDINATION/ADDENDUM NO. 5  
4 11/21/96 REVISED BID DOCUMENTS

C010  
C010  
C010

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) 233-0040  
Fax (804) 220-8994





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.

TOTAL SITE  
15.95 Ac

MARCLAY

725

1526

Scale 1"=200'





# 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 AIRFIELD BASEMENT

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).

$$67 \text{ cu. yds.} \times \underline{2.49} \text{ acres} = \underline{167} \text{ cu. yds.} \quad \begin{array}{l} 4504 \text{ cu. ft} \\ @ \underline{52.75} \end{array}$$

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).

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

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

\* 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

TIMBER STRUCTURE

$Q = 0.6 A_o \sqrt{2gh}$   
 $h = 1.25 \text{ FT}$   
 $Q = 4504 / 21,600 \text{ sec}$   
 $Q = 0.21 \text{ CFS}$   
 $0.21 = 5.38 A_o$   
 $A_o = 0.039 \text{ FT}^2$   
 $0.22 \text{ FT} \text{ or } 2.67 \text{ in.}$

DRAIN IN 6 HRS

### Preliminary Design Elevations

11. Crest of <sup>TIMBER STR.</sup> Riser = 55.00

Top of <sup>TIMBER STR.</sup> Dam = 55.00

Design High Water = 53.00

Upstream Toe of Dam = 49.00

### Basin Shape

12. Length of Flow  $\frac{L}{W_e} =$  \_\_\_\_\_  
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 <sup>TIMBER STR</sup> 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

$Q_{RELEASE} = \frac{8255 CF}{86,400 SEC} = \underline{0.10 CFS}$

ORIFICE IS @ ELEVATION 49.00'

$Q = K A_0 \sqrt{2gh}$

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

$Q = 0.10 CFS$

$K = 0.73$

$0.10 CFS = 0.73 A_0 \sqrt{2(32.2)(6)}$

$0.10 = 14.35 A_0$

$A_0 = 0.0070 F_1^2 = \frac{\pi D^2}{4}$

$D = 0.0992 FT = 1.19 IN.$

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



# 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 concn = 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

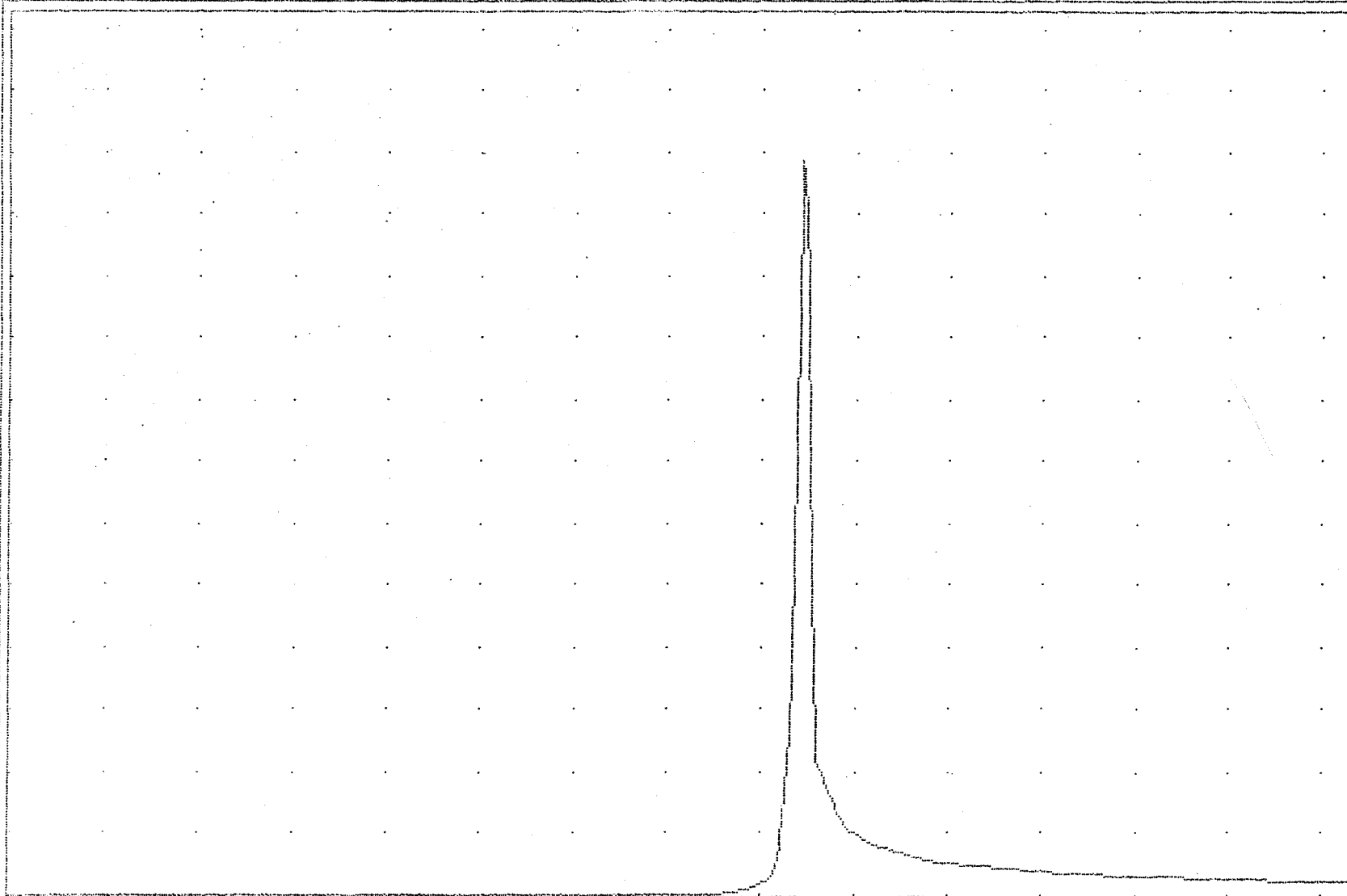


Qp = 5.9

S.C.S. RUNOFF

2 yr

P/E



HGU = 85 min

6

VGU = 0.5 cfs

VOL = (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 concn = 1.87 min
Total precip. = 3.50 in	Distribution = S.C.S. II

### HYDROGRAPH DISCHARGE TABLE

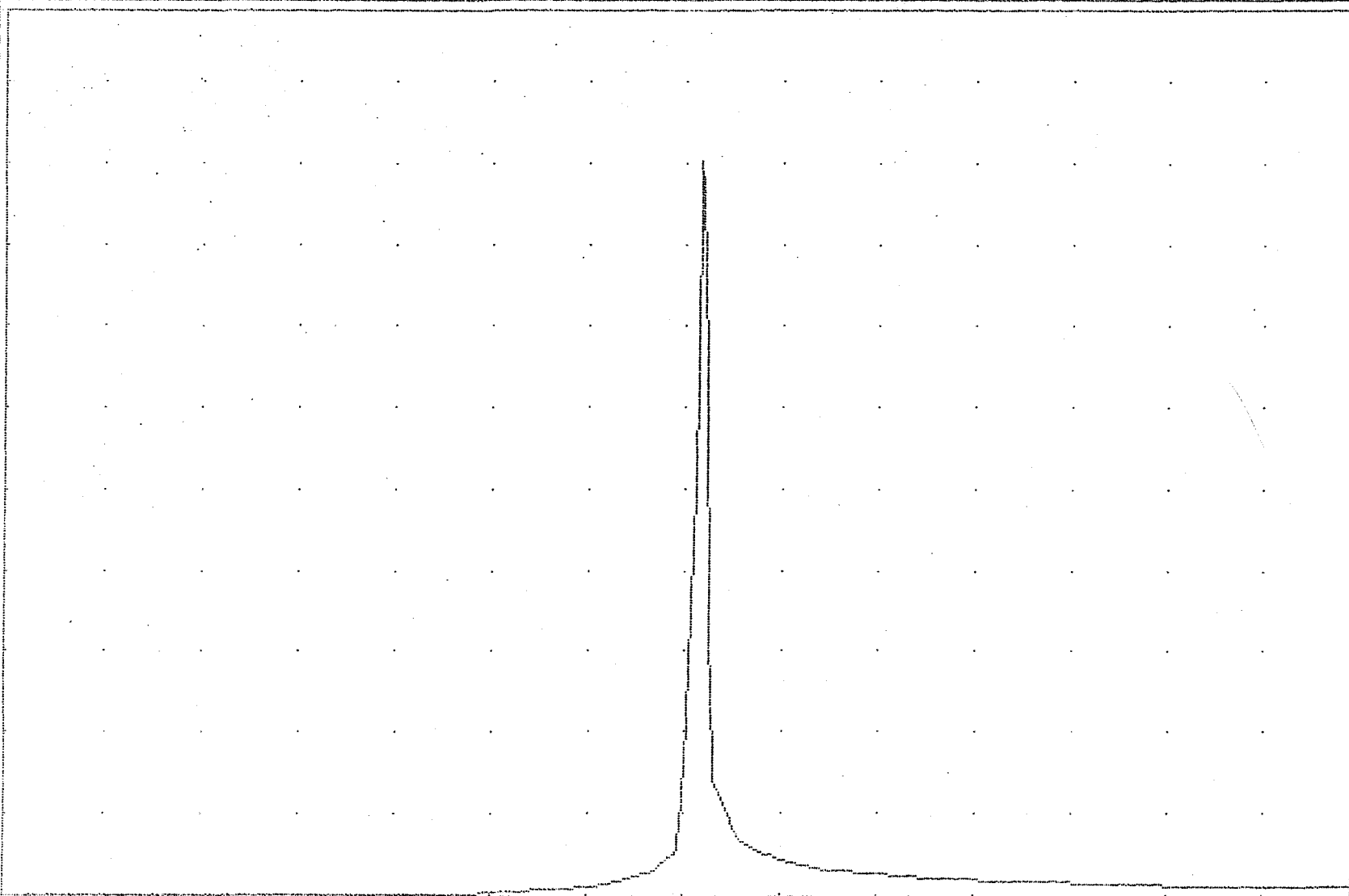
TIME--OUTFLOW		TIME--OUTFLOW		TIME--OUTFLOW		TIME--OUTFLOW	
(hrs	cfs)	(hrs	cfs)	(hrs	cfs)	(hrs	cfs)
11.42	0.45	11.50	0.50	11.58	0.89	11.67	1.76
11.75	2.99	11.83	5.24	11.92	9.05	12.00	7.64
12.08	3.06	12.17	1.39	12.25	1.25	12.33	1.11

Up = 9.0

S.C.S. RUNOFF

2 Yr

POST



HCU = 100 min

7

UGU = 1.0 cfs

QOL = (cuft/acft) = 20504 / 0.471

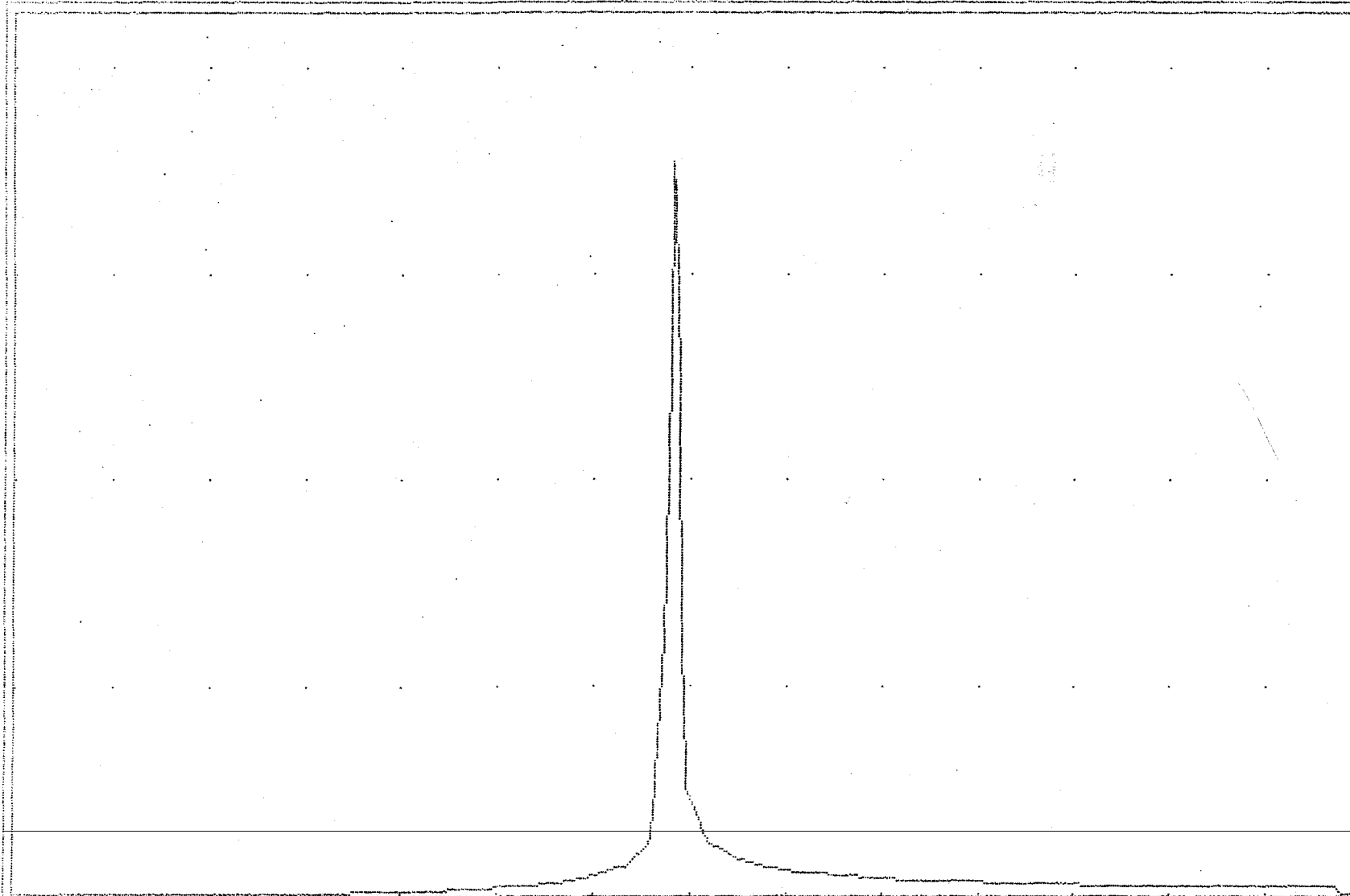


Q<sub>10</sub> = 14.4

S.C.S. RUNOFF

10 1/2

Post



HGU = 105 min

8

VGU = 5.0 cfs

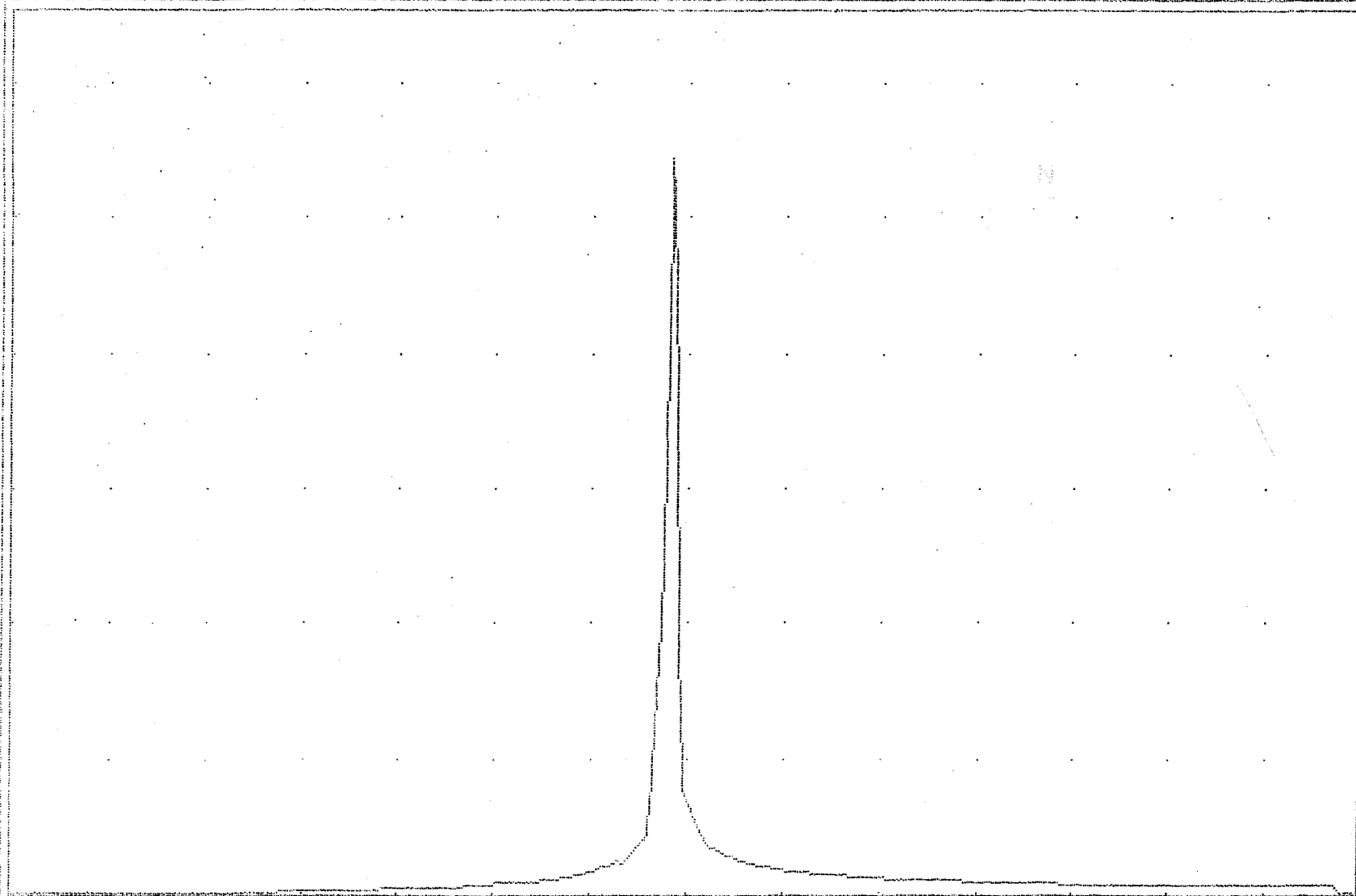
$$VOL = (cuf\text{t}/acft) = 40880 / 0.938$$

Qp = 27.2

S.C.S. RUNOFF

100 Yr

POST



tGU = 105 min

10

UGU = 5.0 cfs

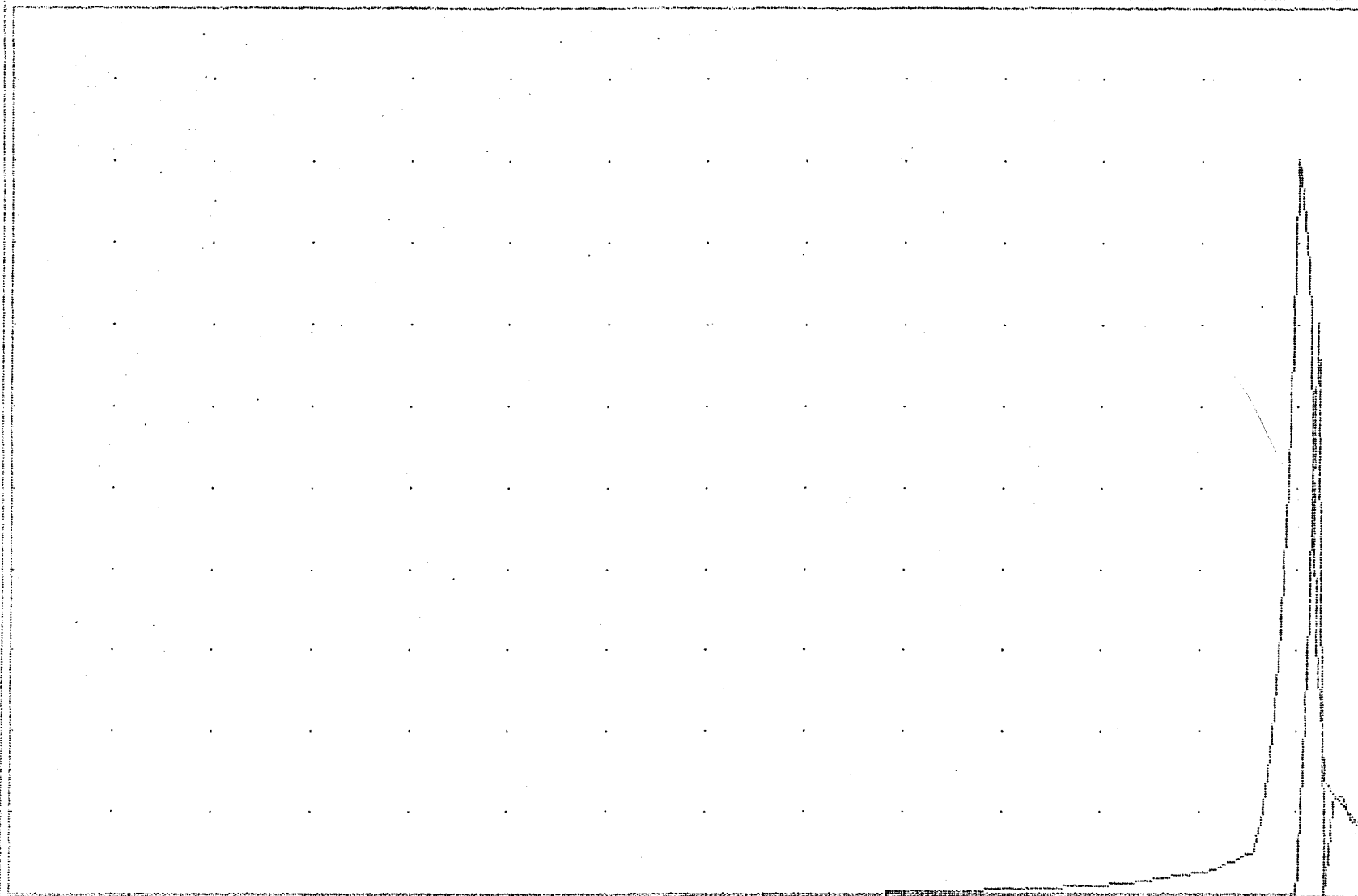
UOL = (cuft/acft) = 64161 / 1.473

Qp = 7.0

RESERVOIR ROUTE

2 Yr

THRU POND #2



HGU = 55 min

17

VGU = 1.0 cfs

MAX STORAGE = 8445

MAX ELEVATION = 54.05

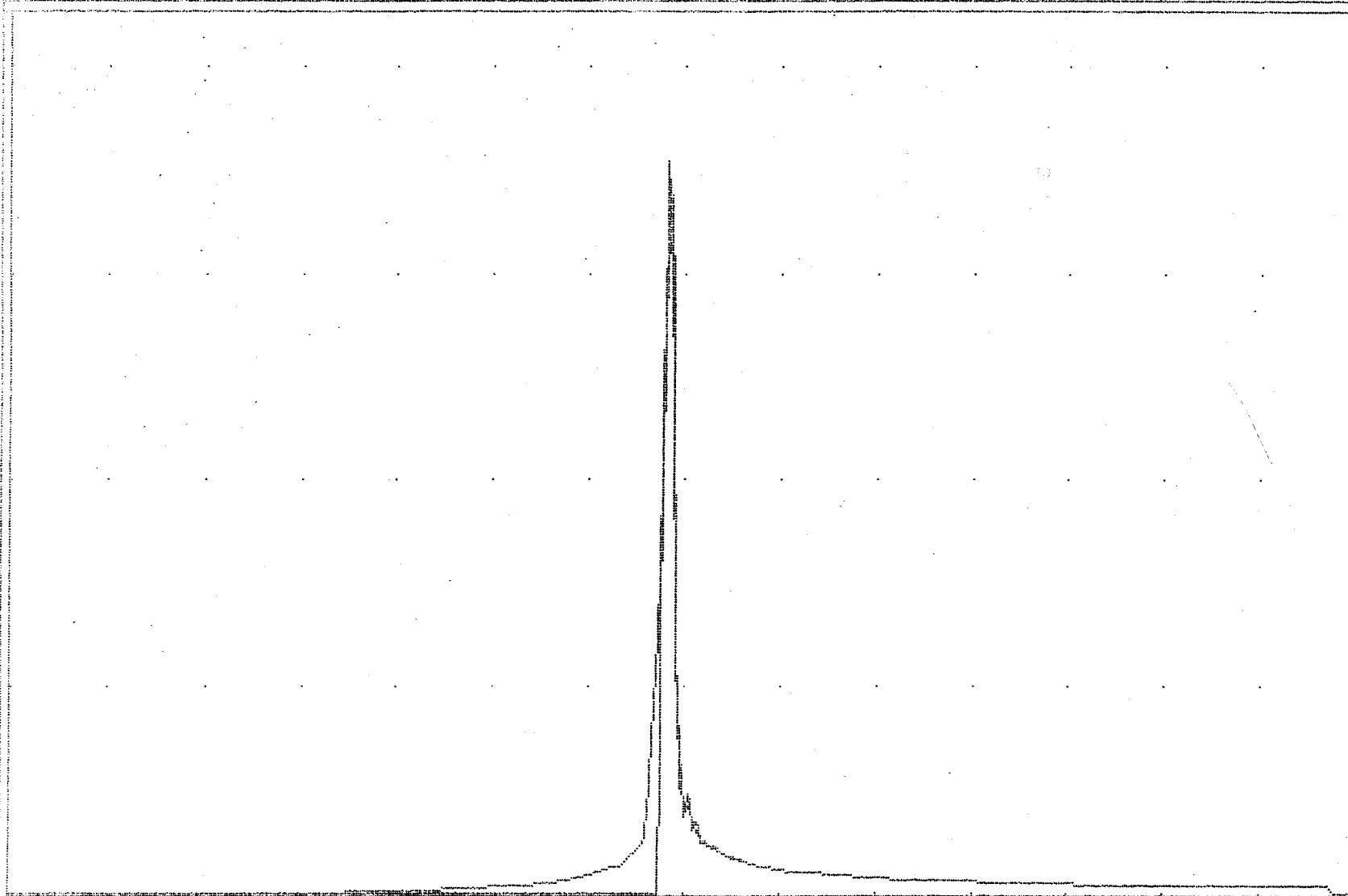


Q<sub>100</sub> = 16.9

RESERVOIR ROUTE

10 Yr

THAU POND #2



WCU = 105 min

10

UCU = 5.0 cfs

MAX STORAGE = 8692

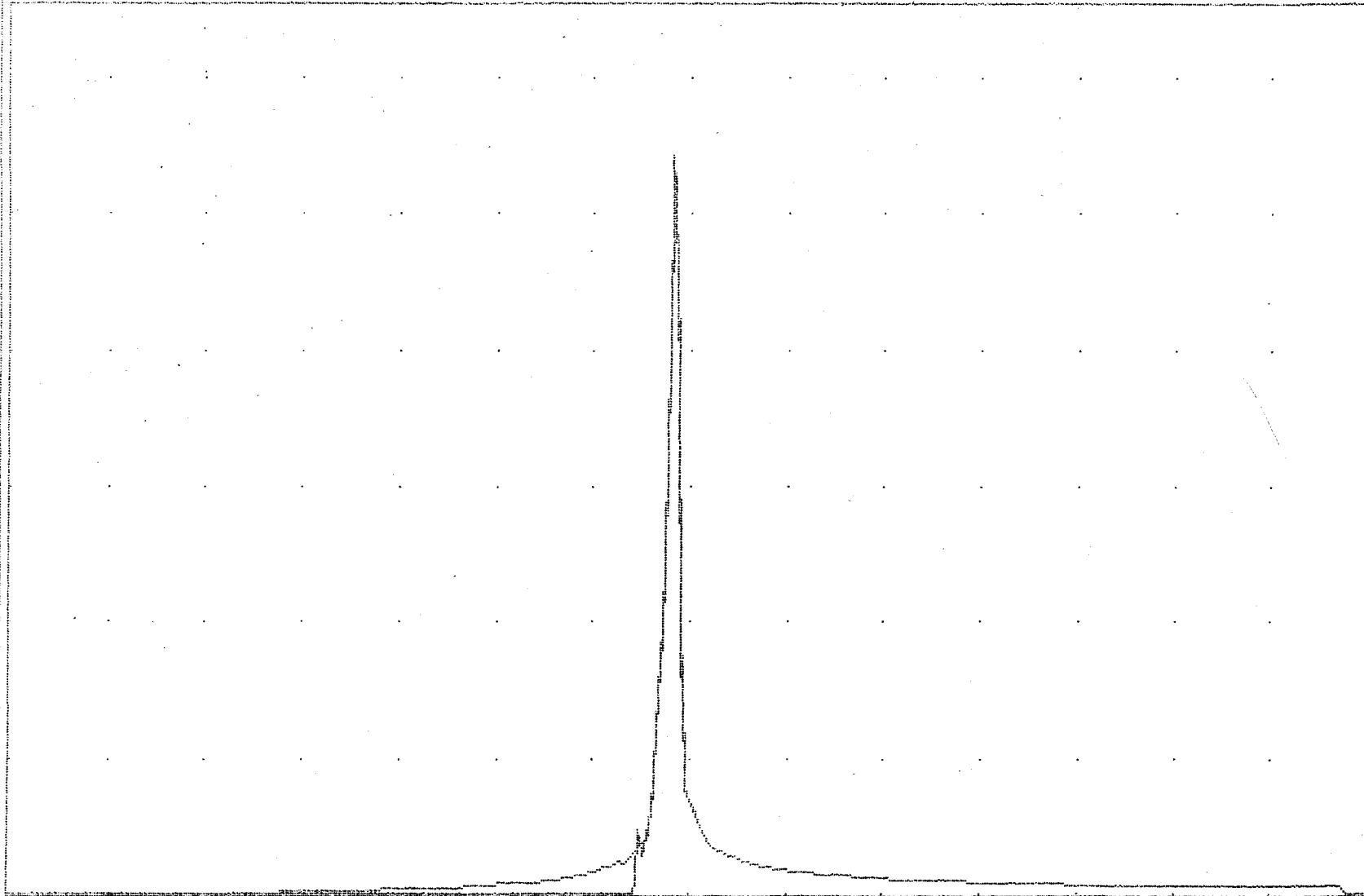
MAX ELEVATION = 54.11

Qp = 26.0

RESERVOIR ROUTE

100 Yr

THRU POND #2



HGU = 105 min

20

UGU = 5.0 cfs

MAX STORAGE = 8839

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 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	69.00	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	ELEVATION	CO AREA	INC STORAGE	TOT STORAGE
	ft.	ft	sq ft	cu ft	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

#####

Change item number: 0

DY to c

58.1

wet



• Reservoir No. 1

# OUTLET STRUCTURES

#####

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

:

: 1. WIDTH (in) = 15.  
: 2. HEIGHT (in) = 15.  
: 3. No. BARRELS = 1.. 50  
: 4. INVERT ELEV. = 53.7.....  
: 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.

#####

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

#####

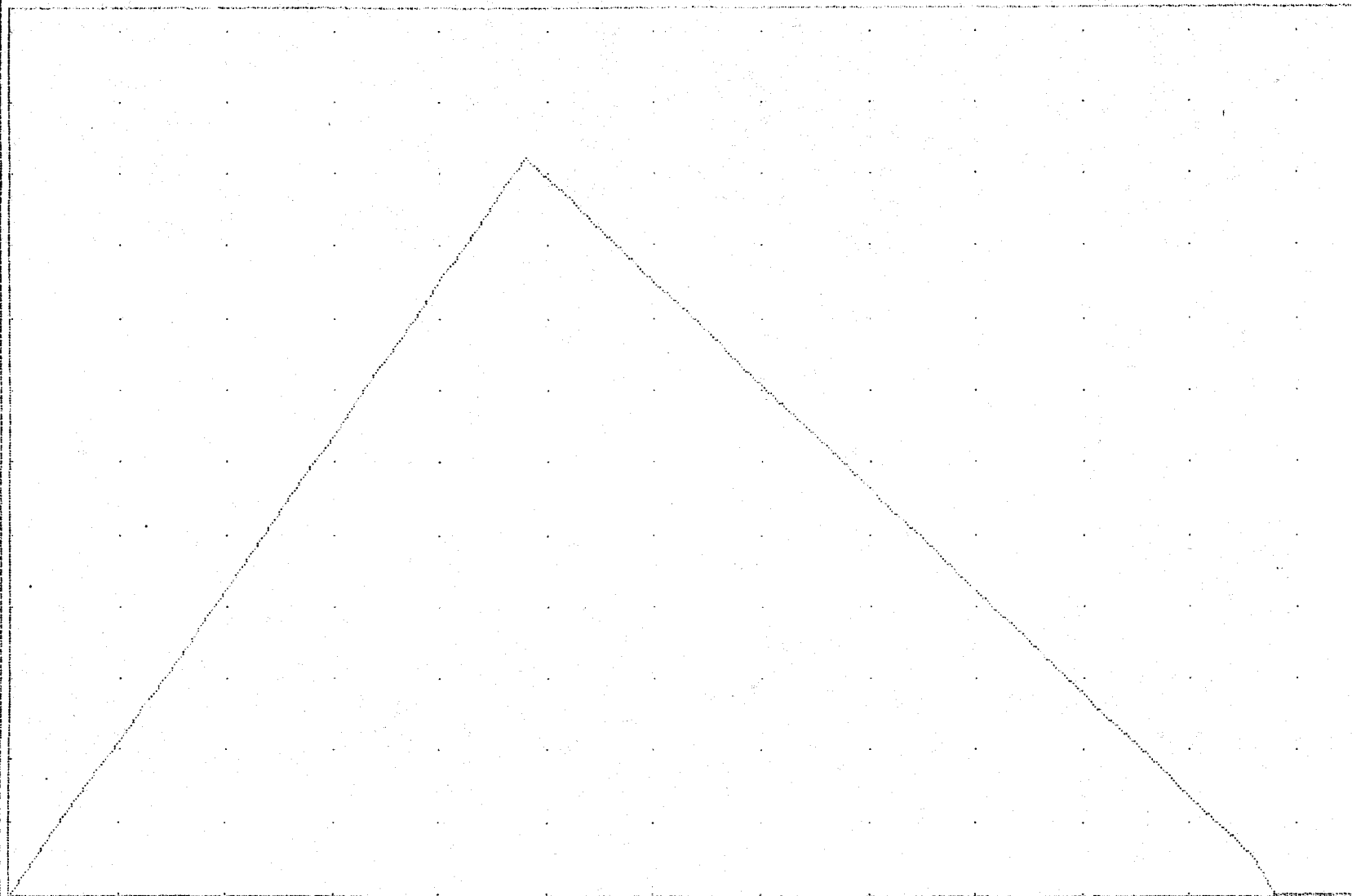
Change item number: 0

C. 8162.

.....

CC012 WILLIAMSBURG LANDING NURSERY &amp; ASSISTED LIVING - 038

PRE

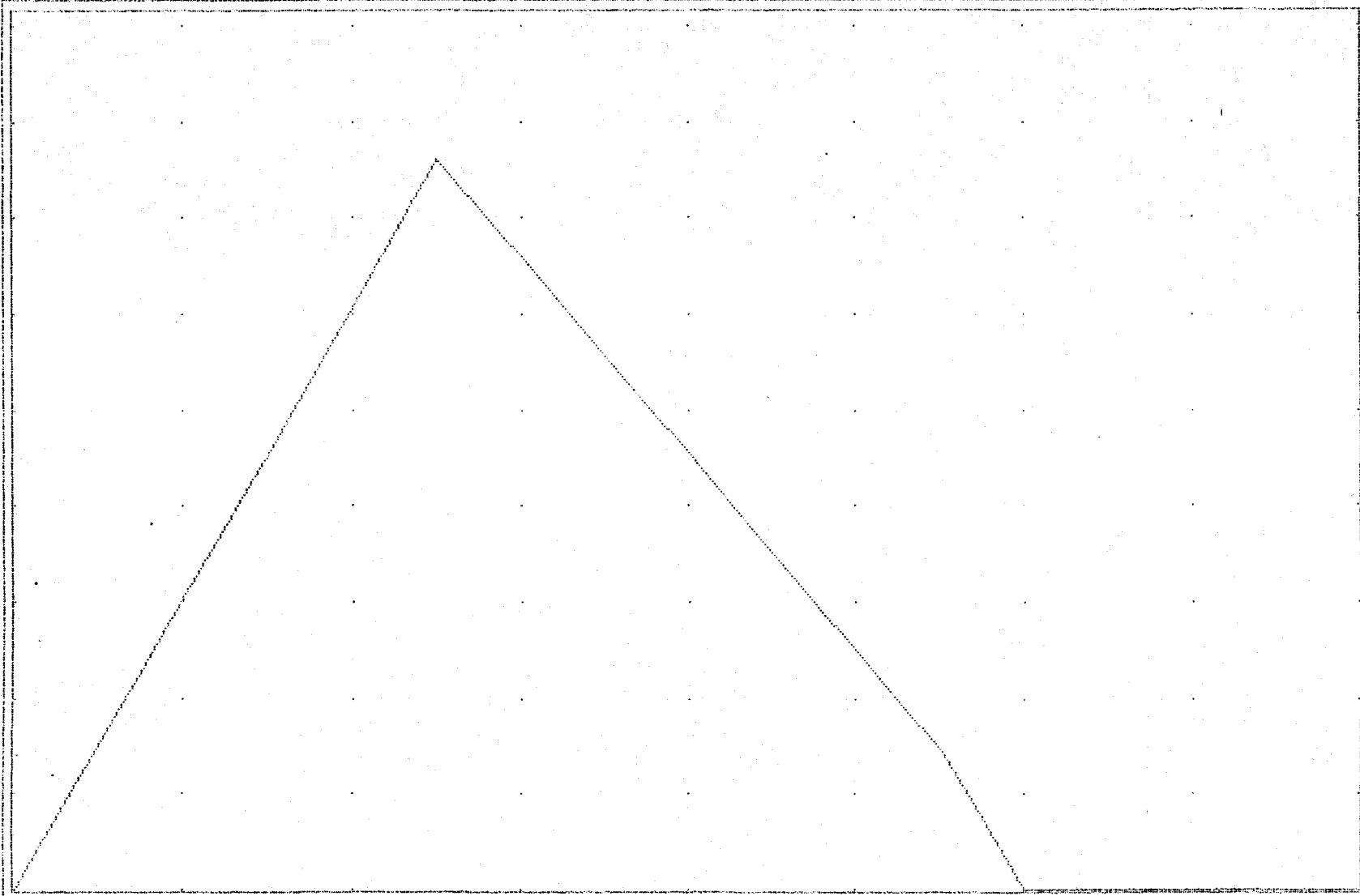


HGU = 5 min

1

VGU = 0.5 cfs

$$VOL = (cuf\text{t}/ac\text{ft}) = 9164 / 0.210$$



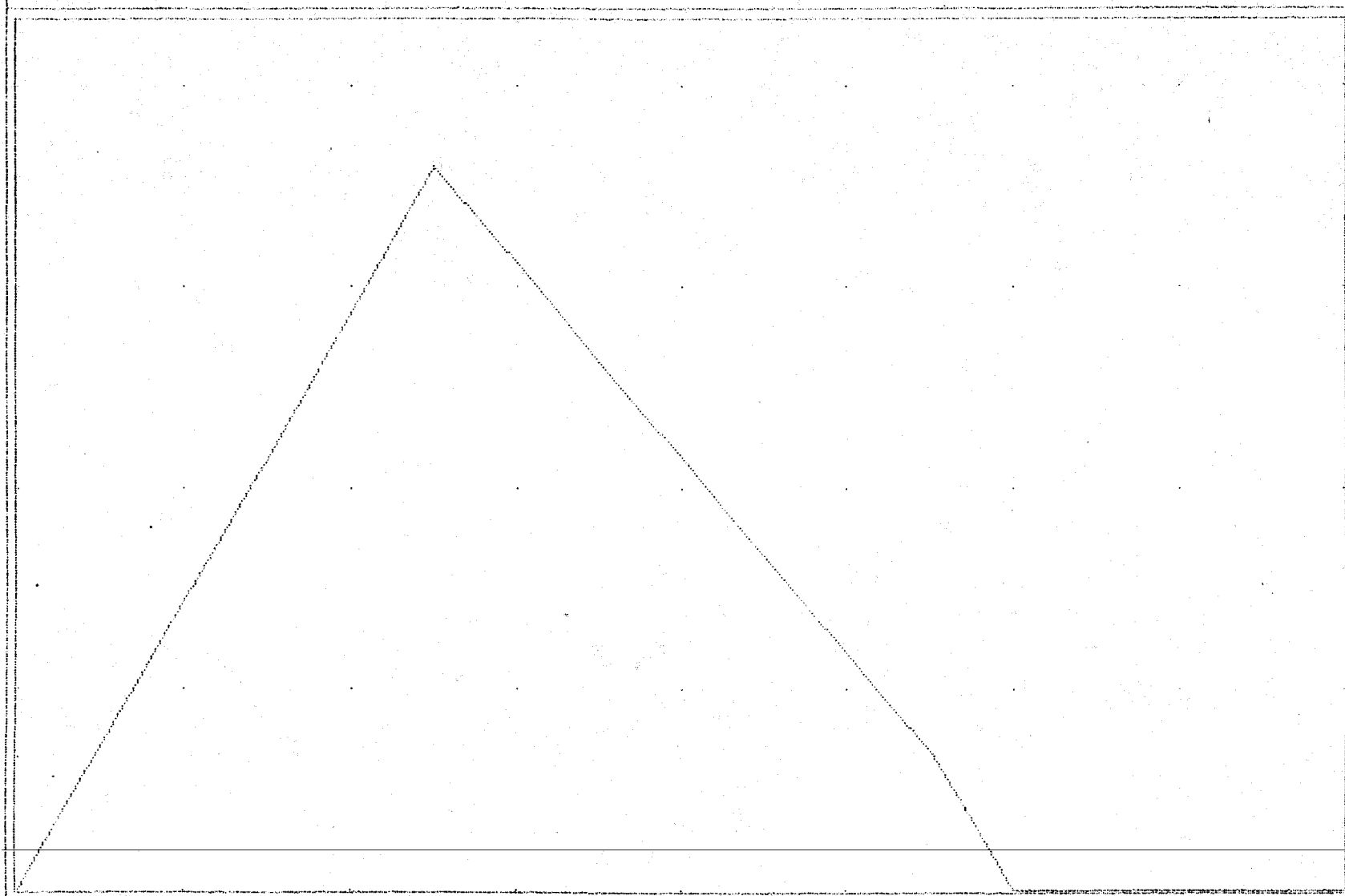
HGU = 2 min

2

HGU = 2.0 cfs

UOL = (cuf t/acft) = 5651 / 0.130



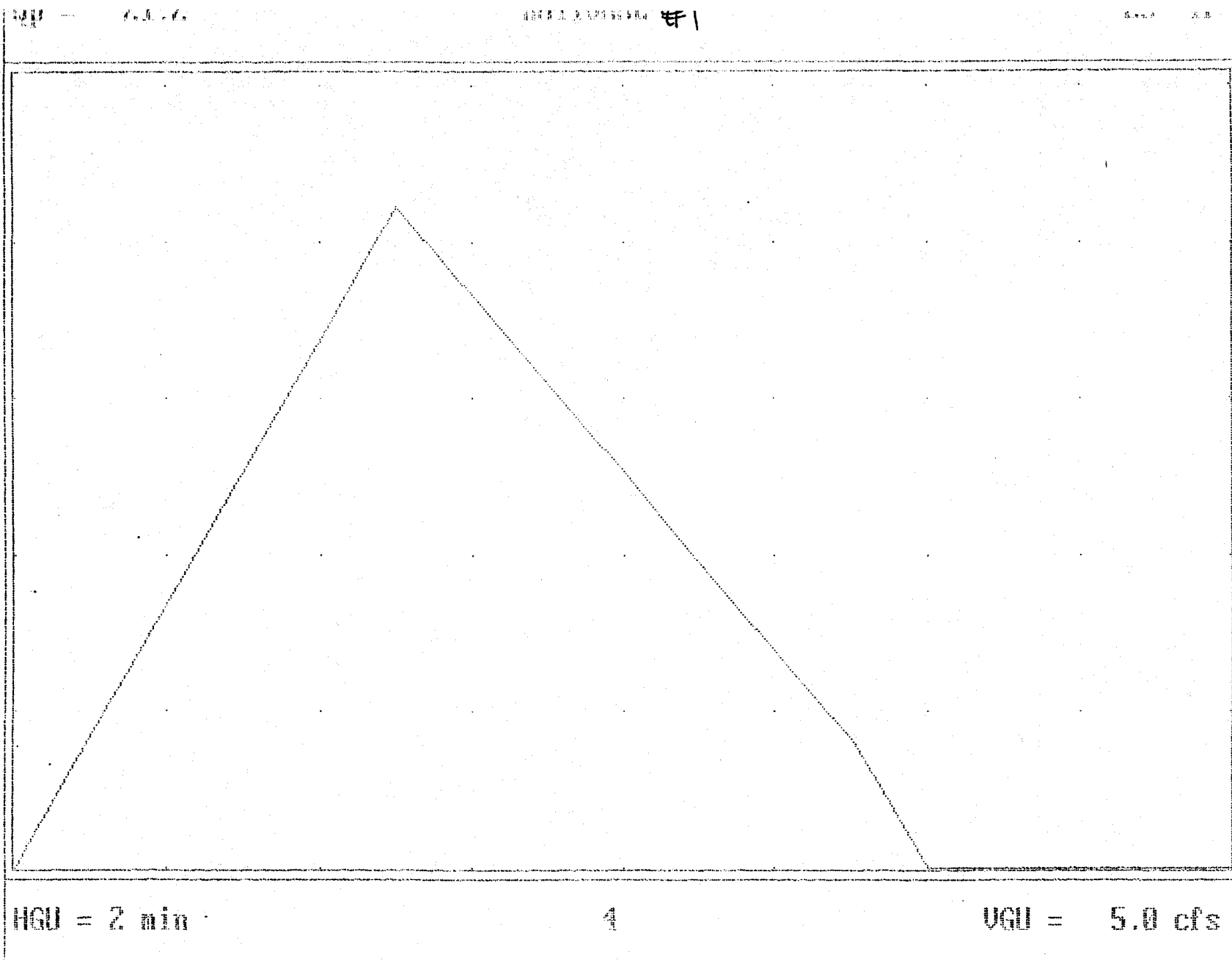


HGU = 2 min

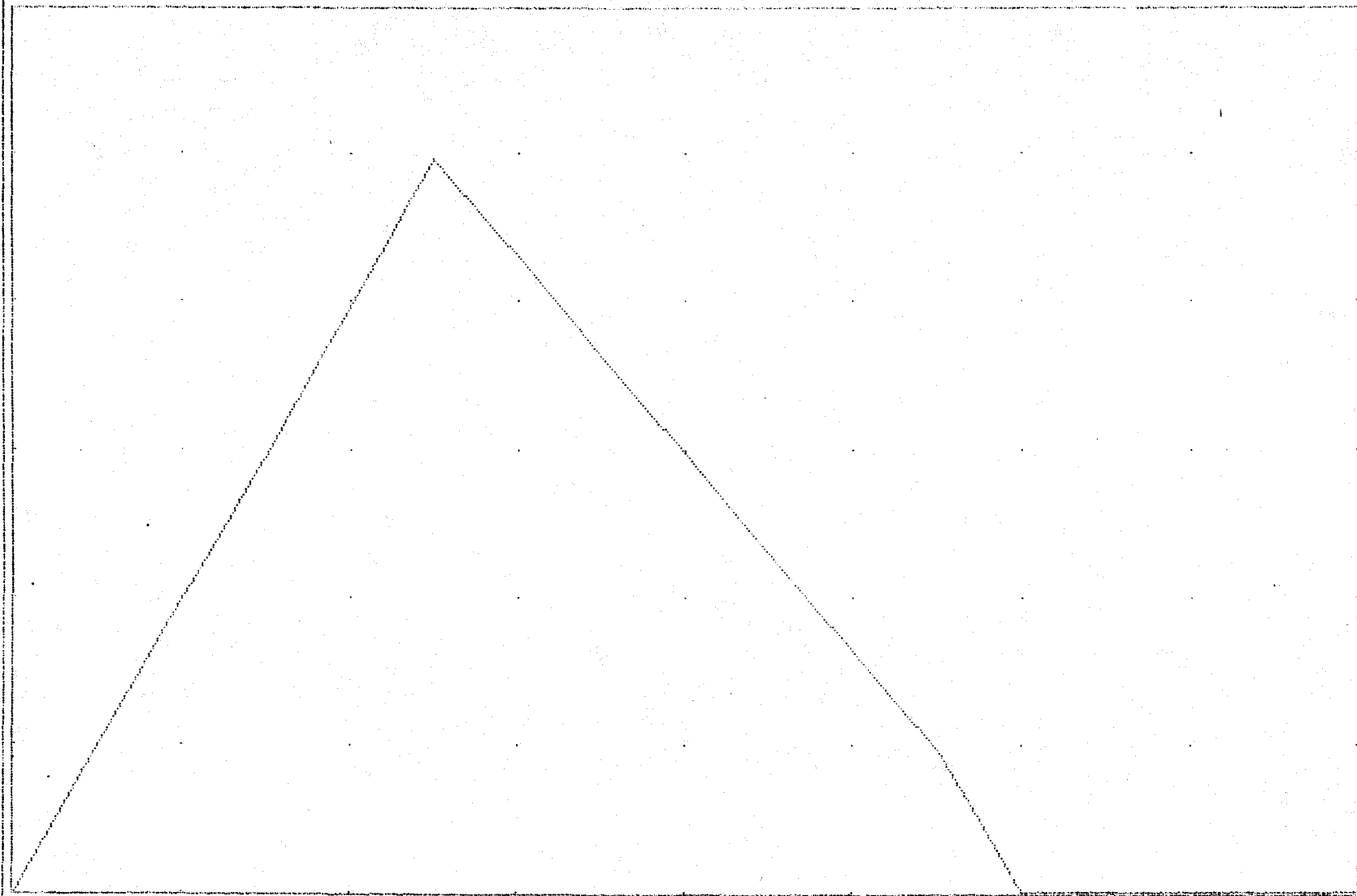
3

VGU = 5.0 cfs

$$UOL = (\text{cuft/acft}) = 6676 / 0.153$$



$$VOL = (\text{cuft/acft}) = 7053 / 0.100$$

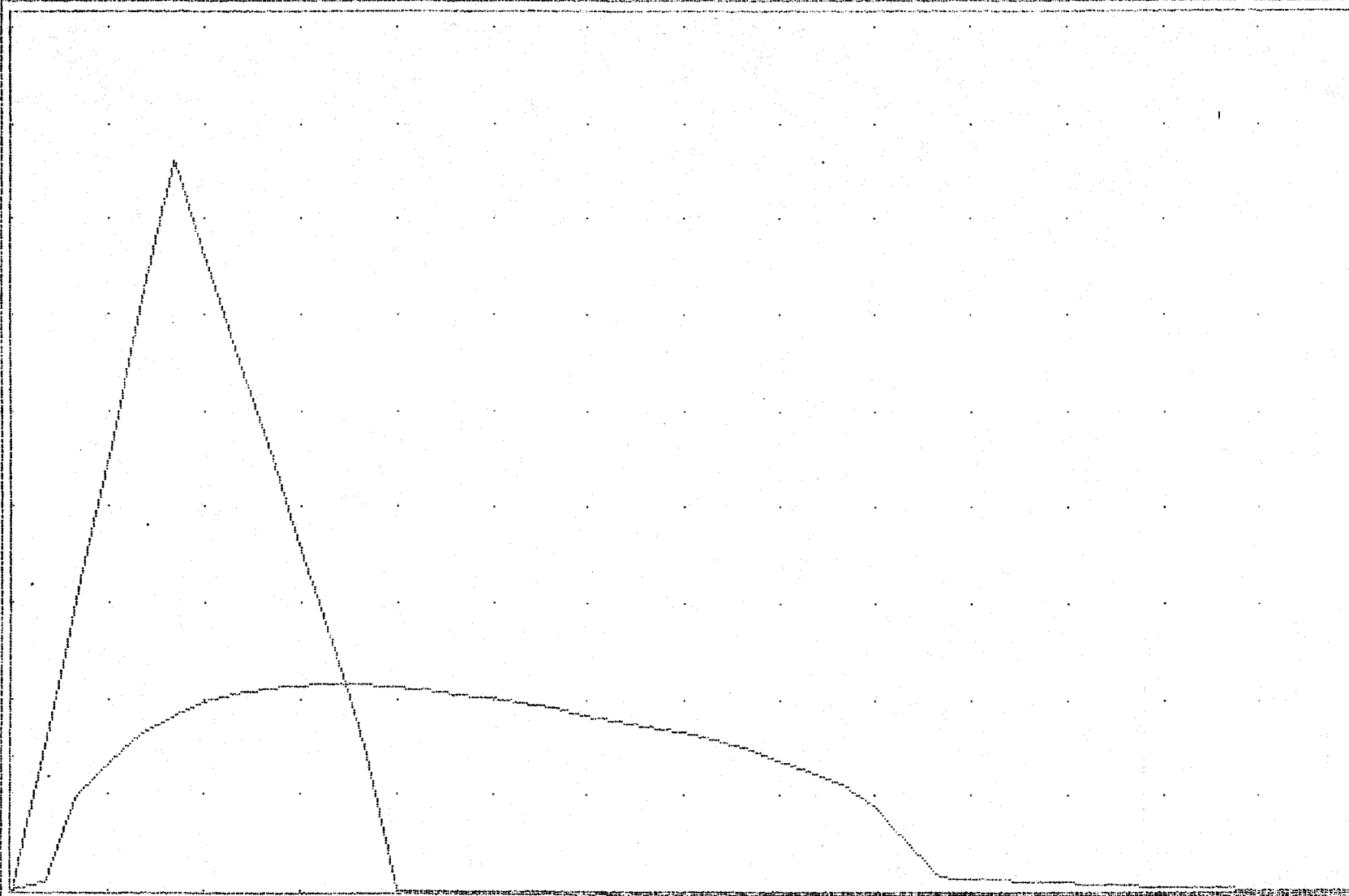


HGU = 2 min

5

VGU = 5.0 cfs

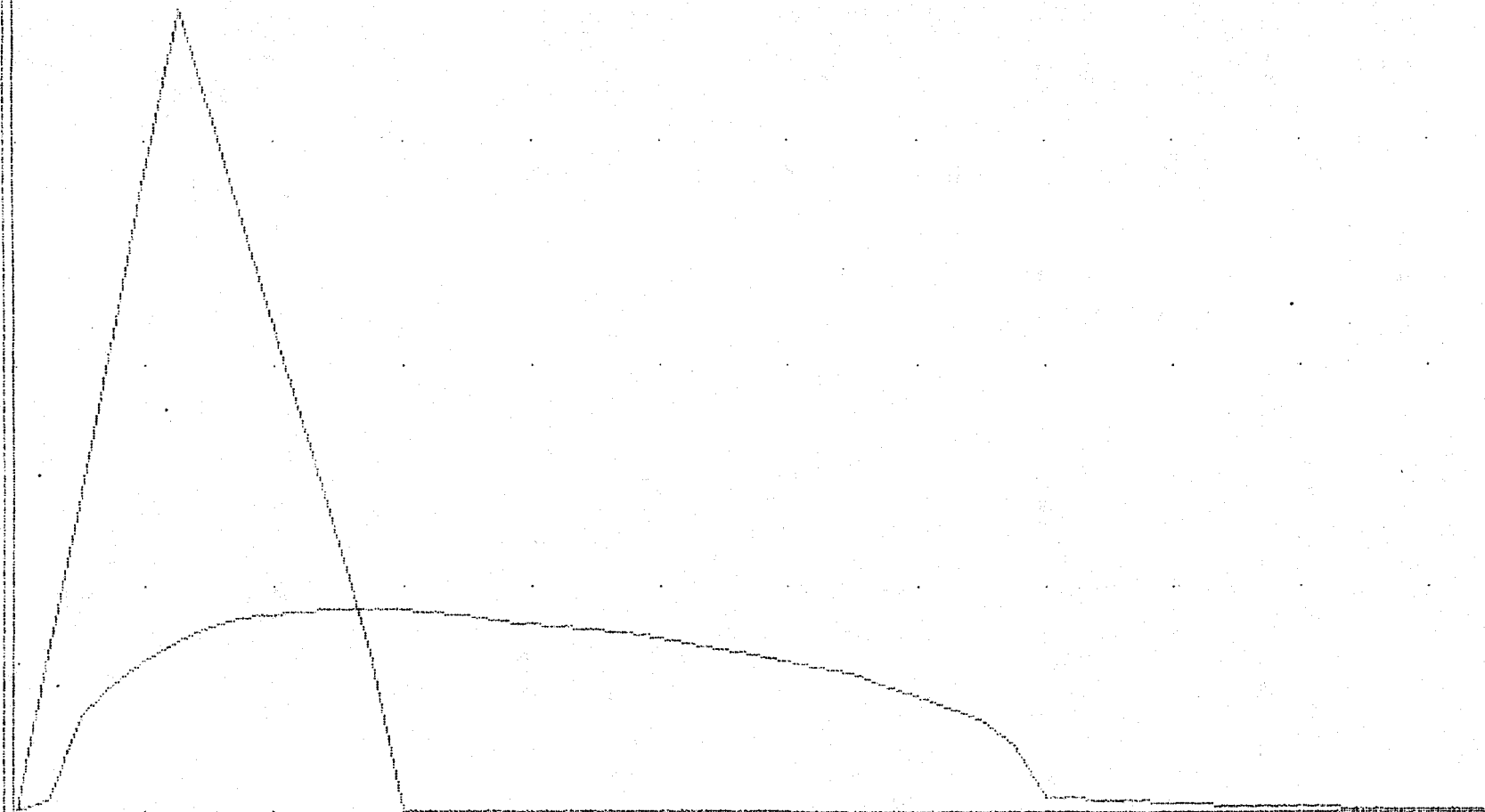
$$UOL = (\text{cuft/acft}) = 9222 / 0.212$$



HGU = 3 min 12 UGU = 2.0 cfs

MAX STORAGE = 3512

MAX ELEVATION = 56.39



HGU = 4 min

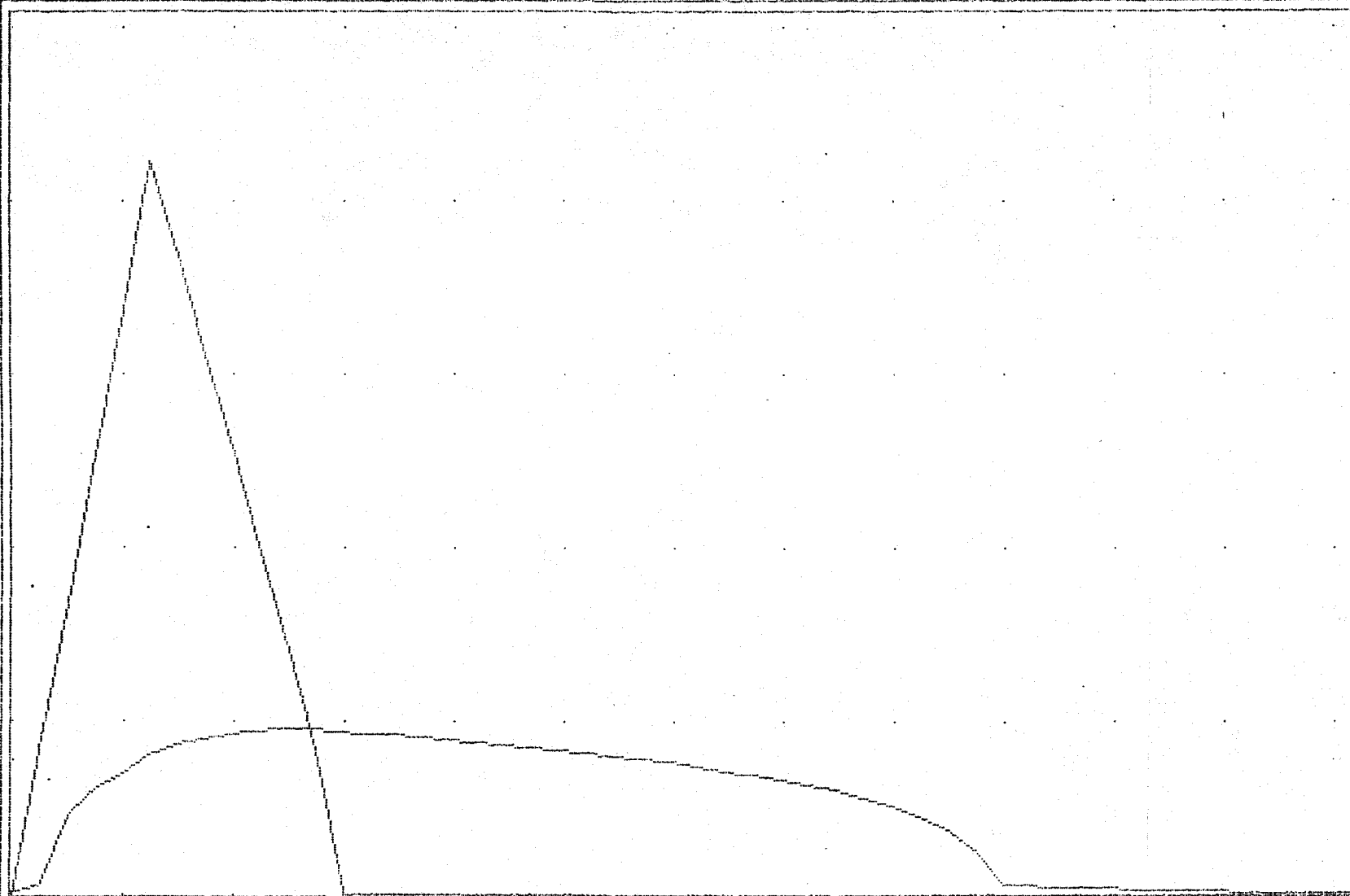
13

VGU = 5.0 cfs

MAX STORAGE = 4386

MAX ELEVATION = 56.72





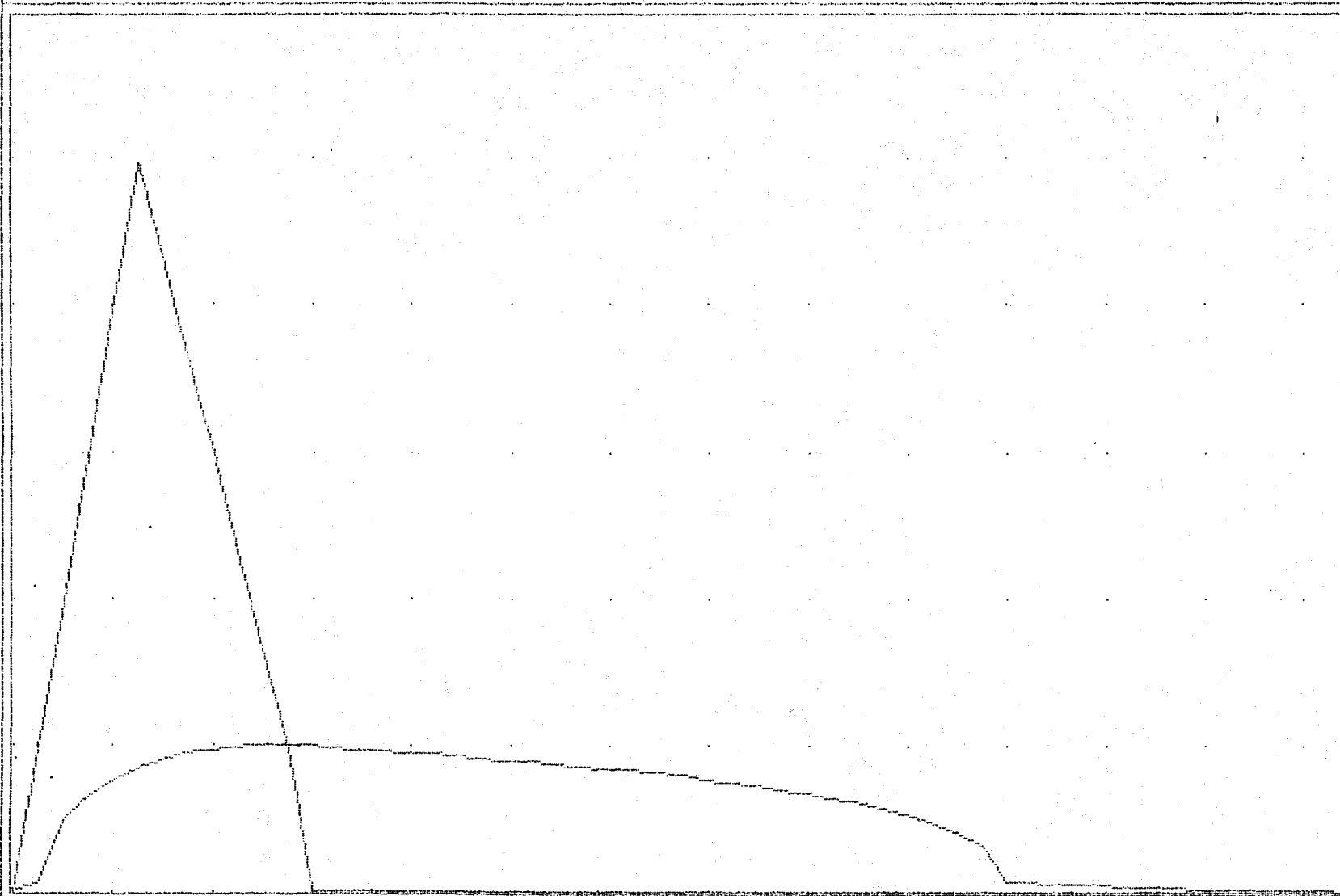
HGU = 4 min

14

UGU = 5.0 cfs

MAX STORAGE = 5430

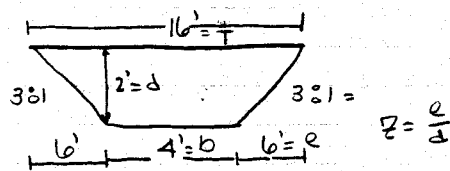
MAX ELEVATION = 57.08



HGU = 4 min 15 UGU = 5.0 cfs

MAX STORAGE = 6670

MAX ELEVATION = 57.40



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" Concrete pipe - ID = 58" - OD

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

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

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

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

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

$$72 \quad 28.27$$

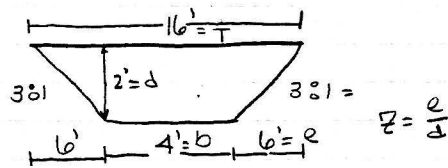
$$58 \quad - 18.35$$

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

$$78" = 33.18$$

$$- 18.35$$

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



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:

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

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

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

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

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

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

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

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

$$\text{Try } 23.26$$

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

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

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

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

$$.75 - \text{need } 1.63 \text{ ac.}$$

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

$$8.7$$

$$\begin{array}{r} 14 \\ 22 \\ \hline 36 - \text{NOS} \end{array}$$

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

$$\begin{array}{r} 3 \text{ PTS} \\ \hline 11.0 \end{array}$$

$$\begin{array}{r} 8 \\ 2.2 \\ \hline 10.2 \end{array}$$

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

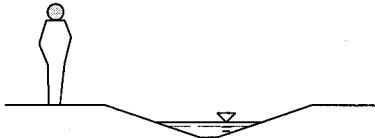


- Wmbg Lndg -  
2' deep  
Filter Fabric  
Class I RR  
approx 2:1 SS w/ 1' bottom

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



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
	2.13 Stable?	1.767
Shear Stress (psf)	5.573 Stable?	2.1

# BMA CALCULATIONS

WMBG LANDING

48162

## 1) STRUCTURAL BMA POINTS

$$\text{DRY POND \#1} \quad 6 \text{ PTS} \quad \frac{6.20}{15.85} = 2.35$$

$$\text{DRY POND \#2} \quad 6 \text{ PTS} \quad \frac{2.49}{15.85} = 0.94$$

TOTAL STRUCTURAL POINTS

3.29

15.85 is  $\left\{ \begin{array}{l} 7.94 \text{ Ac BETWEEN COL PIPOLINE BEHIND AND WMBG LANDING} \\ 7.91 \text{ Ac OF BLDG SITE LOCATION SPACING TO BUND 182} \end{array} \right.$

## 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

$$3.29 + 7.92 = \underline{11.21}$$

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

$$\frac{25.52}{38.04} \times 100 = 6.7 \text{ NOS}$$

$$\frac{3.3}{10.0} \text{ PTS} =$$

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

BMA CALCULATIONSWMBG LANDING

H8162

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><u>3.29</u></u>

15.85 is 7.94 Ac BETWEEN COL PIPALING USMINT AND WMBG LAND OR  
7.91 Ac OF BLDG SITE LOCATION REMAINING TO PONDS 1 & 2

## 2) OPEN SPACE

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

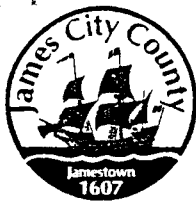
30.13 is 7.94 Ac + 22.19 Ac OF OPEN SPACE

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

TOTAL POINTS

$$3.29 + 7.92 = \underline{\underline{11.21}}$$

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 7<sup>th</sup> for the above referenced project.

The record drawings dated May 15<sup>th</sup> 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

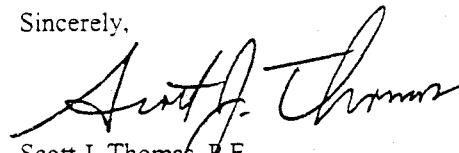
6. Dry Pond # 1. Sediment, vegetation and tree growth at the pond's primary storm drain inflow (flared end section) needs cleaned and removed. This inflow is located approximately 170 feet upstream (west) of the riser near the building. Cleaning and removal only pertains to the actual flared end section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

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

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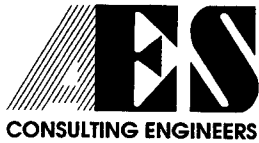
Based on my review of the project and discussions with you and Environmental Division staff, I am aware of the history related to who actually performed onsite construction inspection and monitoring and how personnel changes in that organization may result in difficulty in obtaining certification from 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

*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', written over the printed 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

*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](mailto: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**TO JCC ENVIRONMENTAL DIV.

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

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		35H.	AS-BUILTS/RECORD DRAWINGS
1		15H.	CERTIFICATION LETTER



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]

**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**TO JAMES CITY COUNTY  
ENVIRONMENTAL DIV.

DATE <u>6/7/00</u>	JOB NO. <u>8162</u>
ATTENTION <u>DARRYL GORE</u>	
RE: <u>WMBG LANDING</u> <u>15-BUILTS</u>	

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 SET.	RECORD DRAWINGS - ENV. DIV.
2		3 SET.	" " - JCSA

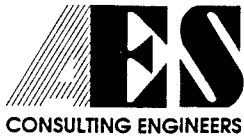


THESE ARE TRANSMITTED as checked below:

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☐ For review and comment ☐ \_\_\_\_\_  
☐ FOR BIDS DUE \_\_\_\_\_ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS

COPY TO JCSA - KEITH LUTCHWORTH 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,

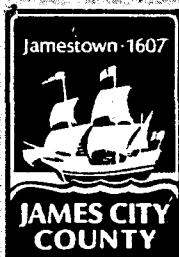
AES Consulting Engineers



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,

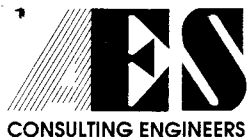
Pursuant to your letter request of May 14, 1996 an exception to the Chesapeake Bay Preservation Regulations is granted for disturbance of slopes exceeding 25% for development of a service road accessing the rear of the Assisted Living Facility at Williamsburg Landing. It is our understanding that you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

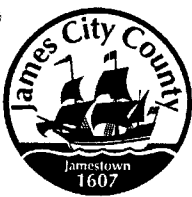
A handwritten signature in dark ink, appearing to read 'Howard W. Price', is written over a light blue horizontal line.

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.  
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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	Adjacent vegetation, higher than wall height. Needs removed 10' zone.
Weed Growth			X	See Above
Erosion	X			None.
Trash & Debris	X			None.
Seepage	X			None.
Fencing or Benches	X			N/A.
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
<b>Water Pools</b> <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				
<b>Inflow Structures (Describe Locations):</b> Primary INFLOW single storm drain SE OF WALL				
Condition of Structure	X			<del>OK.</del> OK.
Erosion	X			Minor Erosion @ Pipe Outfall.
Trash and Debris	X			OK.
Sediment	X			OK.
Aesthetics	X			OK.
Other				
<b>Principal Flow Control Structure - Intake, Riser, etc. (Describe Location):</b> Timber Weir Wall, 3" Ø 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				
<b>Principal Outlet Structure - Barrel, Conduit, etc. :</b> 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				
<b>Emergency Spillway (Overflow):</b> EMER. RELEASE OVER WALL				
Vegetation	X			
Lining	X			
Erosion	X			
Trash & Debris	X			
Other	X			

Facility Item	O.K.	Routine	Urgent	Comments
<b>Nuisance Type Conditions:</b>				
Mosquito Breeding	X			None
Animal Burrows	X			None.
Graffiti	X			None
Other	X			None.
<b>Surrounding Perimeter Conditions:</b>				
Land Uses				
Vegetation				
Trash & Debris				
Aesthetics				
Access /Maintenance Roads or Paths				
Other				
<b>Remarks:</b> 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.				
<b>Overall Environmental Division Internal Rating:</b> <u>4</u>				
<b>Signature:</b> <u>Scott J. Thorne P.E.</u>		<b>Date:</b> <u>08/14/00</u>		
<b>Title:</b> <u>Environmental Div. Civil Engineer.</u>				

SWMPProg\BMP\CoInspProg\DetRet.wpd

Date Record Created:

Created By:

WS\_BMPNO:

CC012

Print Record

WATERSHED

BMP ID NO

PLAN NO

TAX PARCEL

PIN NO

CONSTRUCTION DATE

PROJECT NAME

FACILITY LOCATION

CITY-STATE

CURRENT OWNER

OWNER ADDRESS

OWNER ADDRESS 2

CITY-STATE-ZIP CODE

OWNER PHONE

MAINT AGREEMENT

EMERG ACTION PLAN

CC

012

SP-50-96

(48-2)(1-3)

48201000030

9/1/1999

Williamsburg Landing

North of Main Building

Williamsburg, Va.

Williamsburg Landing

5700 Wmbg. Landing Drive

Williamsburg, Va. 23185

Yes

No

PRINTED ON

Wednesday, March 10, 201

3:05:35 PM

MAINTENANCE PLAN

SITE AREA acre

LAND USE

old BMP TYP

JCC BMP CODE

POINT VALUE

SVC DRAIN AREA acres

SERVICE AREA DESCR

IMPERV AREA acres

RECV STREAM

EXT DET-WQ-CTRL

WTR QUAL VOL acre-ft

CHAN PROT CTRL

CHAN PROT VOL acre-ft

SW/FLOOD CONTROL

GEOTECH REPORT

No

33.26

Institutional

Timber Crib

F1 Timber Walls

6

Building & Parking Area

College Creek

Yes

No

Yes

No

CTRL STRUC DESC

CTRL STRUC SIZE inches

OTLT BARRL DESC

OTLT BARRL SIZE inch

EMERG SPILLWAY

DESIGN HW ELEV

PERM POOL ELEV

2-YR OUTFLOW cfs

10-YR OUTFLOW cfs

REC DRAWING

CONSTR CERTIF

INTERNAL RATING

MISC/COMMENTS

PVC

3

Timber Wall

No

55.0

na

0.00

0.00

Yes

No

4

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

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



DARKYL

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
$\frac{23.05}{33.26} (100)$	$\frac{23.05}{33.26} = .693$ (0.1 per 1%)	x	6.93

## C. TOTAL WEIGHTED POINTS

(3.37)			(10.30)
1.57	+	6.93	= 8.50
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

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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
$\frac{23.05}{33.26 (100)}$	$\frac{1}{(0.1 \text{ per } 1\%)}$	x	$\frac{4.16}{6.93}$
23.05			
55.45			

## C. TOTAL WEIGHTED POINTS

1.57	+	6.93	=	(10.30)
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.,  $100 \times 1.0 (0)$ )

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