



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: MC042

DATE VERIFIED: December 31, 2012

QUALITY ASSURANCE TECHNICIAN: Leah Hardenbergh



LOCATION: WILLIAMSBURG, VIRGINIA



Stormwater Division

MEMORANDUM

Date: April 4, 2012
To: Michael J. Gillis, Virginia Correctional Enterprises Document Management Services
From: Leah Hardenbergh
PO: 110426
Re: Files Approved for Scanning

General File ID or BMP ID: MC042
PIN: 3842000001A
Owner Name (if known): MEADOWS II (THE)
Legal Property Description: NATURAL OPEN SPACE S-4 P-2 THE MEADOWS
Site Address: COMMON AREA BEHIND 3712 SHACKLETON LANE

(For internal use only):

Box # 4

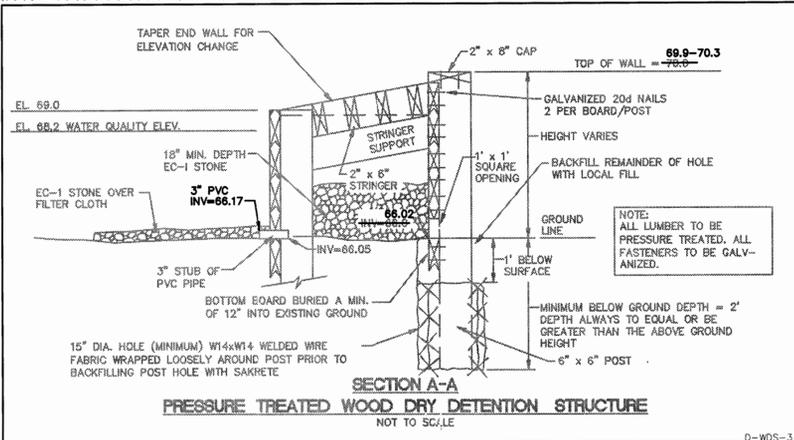
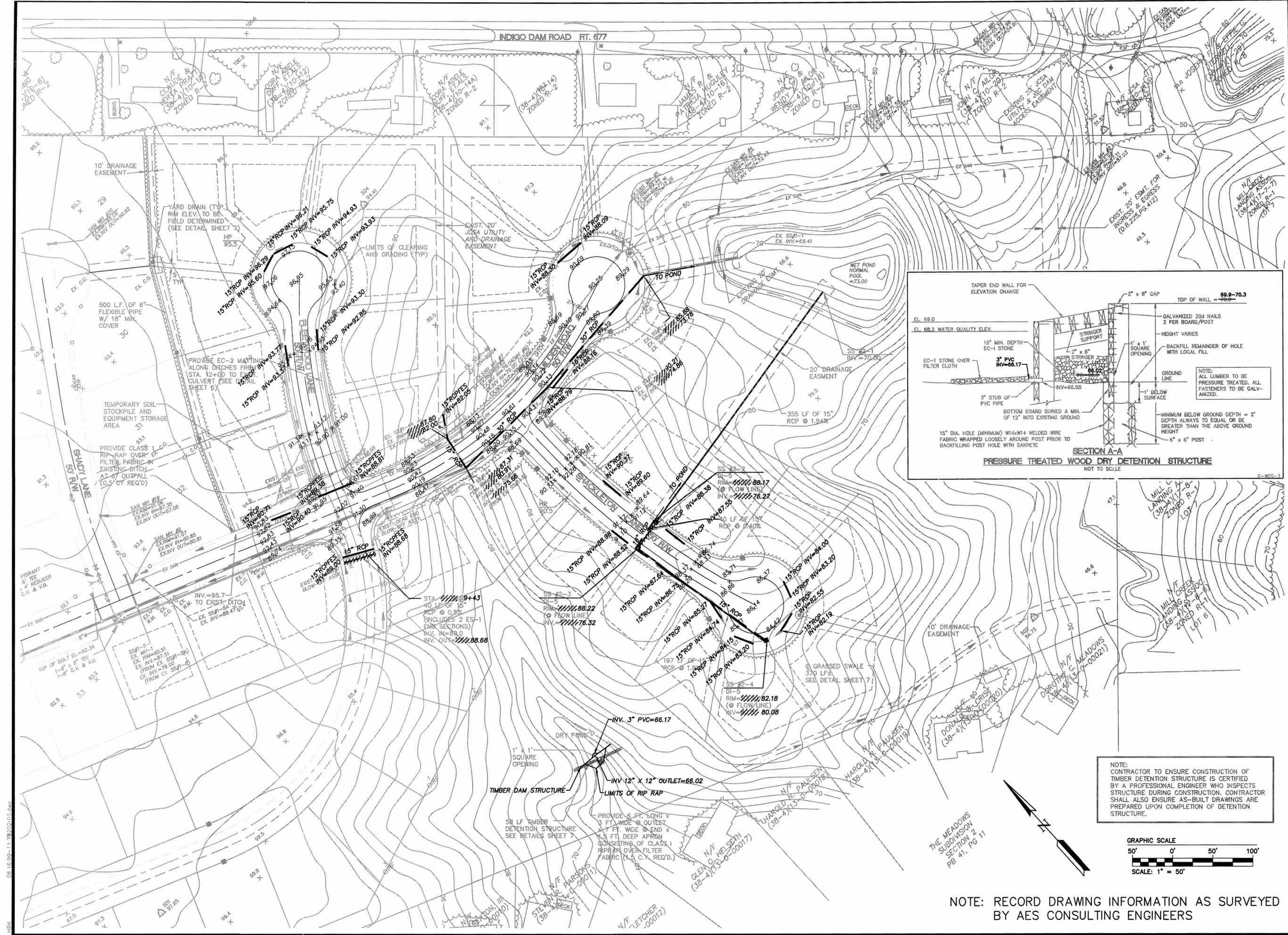
Agreements (in file as of scan date): N Book or Doc #:

MC-042

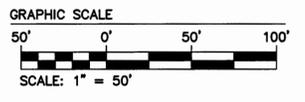
Contents for Stormwater Management Facilities As-built Files

Each file is to contain:

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



NOTE:
CONTRACTOR TO ENSURE CONSTRUCTION OF
TIMBER DETENTION STRUCTURE IS CERTIFIED
BY A PROFESSIONAL ENGINEER WHO INSPECTS
STRUCTURE DURING CONSTRUCTION. CONTRACTOR
SHALL ALSO ENSURE AS-BUILT DRAWINGS ARE
PREPARED UPON COMPLETION OF DETENTION
STRUCTURE.



NOTE: RECORD DRAWING INFORMATION AS SURVEYED
BY AES CONSULTING ENGINEERS

NO.	DATE	REVISION / COMMENT / NOTE
1	3/4/97	REVISION
2	5/6/97	REVISED PER JCC COMMENTS DATED 2/29/97
3	8/27/98	RECORD DRAWING



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



THE MEADOWS
SECTION IV, PHASE II

OWNER/DEVELOPER: MEADOWS II LIMITED PARTNERSHIP
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

DRAINAGE AND EROSION AND SEDIMENT CONTROL

Designed SOW/CAH/DPW	Drawn EAW
Scale 1"=50'	Date 3/11/97
Project No. 7820-2	
Drawing No. 3 OF 7	

R SHALL BE RESPONSIBLE FOR REPLACING, WITH
RIALS, ANY PAVEMENT, DRIVEWAYS, WALKS,
HAT MUST BE CUT OR THAT ARE DAMAGED DURING

ONFLICTS, OR DISCREPANCIES IN THIS PLAN
RTED TO THE ENGINEER FOR RESOLUTION
DING WITH THE WORK.
ORTS, WITH PROCTOR, ARE REQUIRED FOR
ASE, BASE, SURFACE COURSE, CULVERTS,
TURES, AND UTILITIES WITHIN THE RIGHT OF
FIED MATERIALS TEST LAB IN ACCORDANCE WITH
IONS AND STANDARDS.
PIPE CULVERTS, STORM SEWERS, AND
TURES SHALL HAVE BEDDING MATERIAL IN
TH VDOT SPECIFICATIONS AND STANDARDS.
BE SUITABLE MATERIAL FREE OF DEBRIS, TREE
ESS MOISTURE, AND COMPACTED.
ITCHES SHOWN AS PAVED ON PLANS ARE TO BE
RDNCE WITH THE STANDARD TYPICAL SECTION
HE PLANS, UNLESS OTHERWISE DIRECTED BY THE
ER, IN WRITING. ANY ADDITIONAL PAVING OF
HER THAN THOSE SHOWN ON THE ROAD PLANS
INED PRIOR TO ACCEPTANCE OF THE ROADS
SECONDARY ROAD SYSTEM.
ITY APPROVAL OF SUBDIVISION ROAD PLANS
LUDE THE RIGHT TO ADD ADDITIONAL FACILITIES.
OF THESE PLANS WILL EXPIRE THREE YEARS
OF APPROVAL.
RUBBING SHALL BE COMPLETED WITHIN THE
AND INDICATED ON THE LAYOUT PLAN.
MUST BE APPROVED BY VDOT PRIOR TO
BASE.

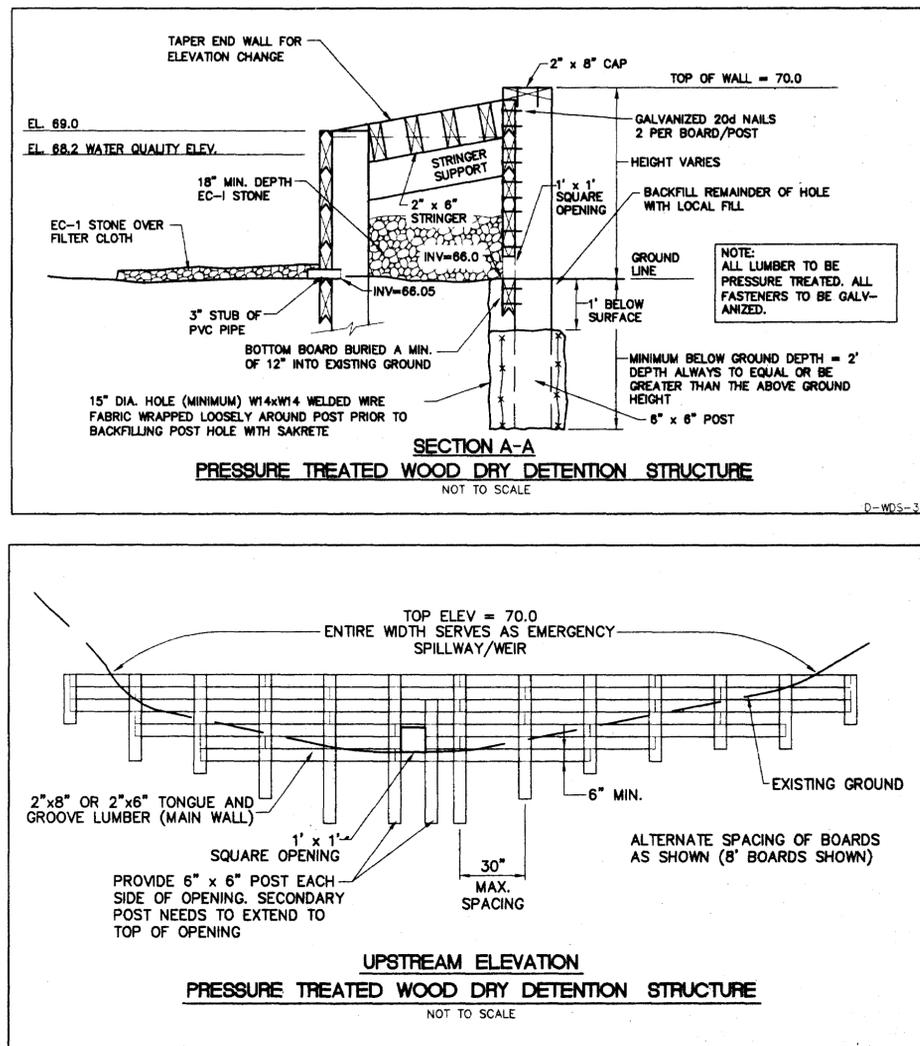
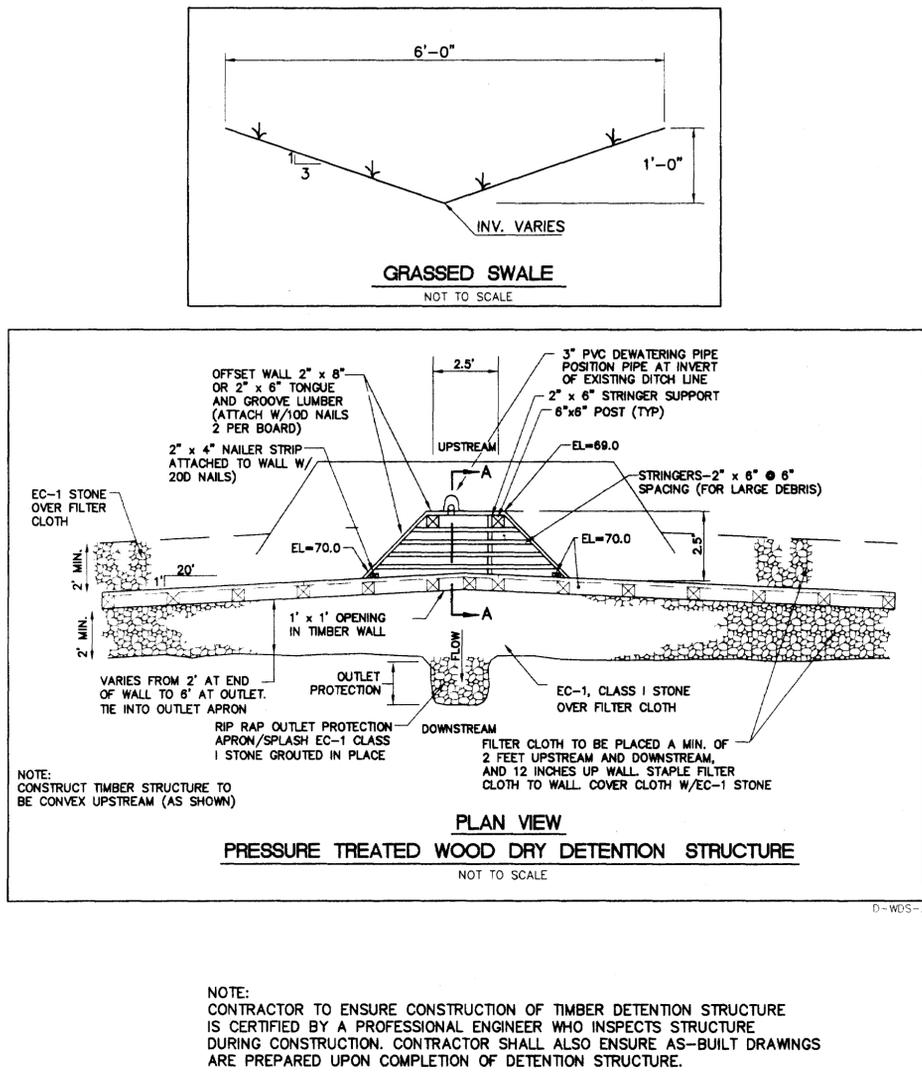
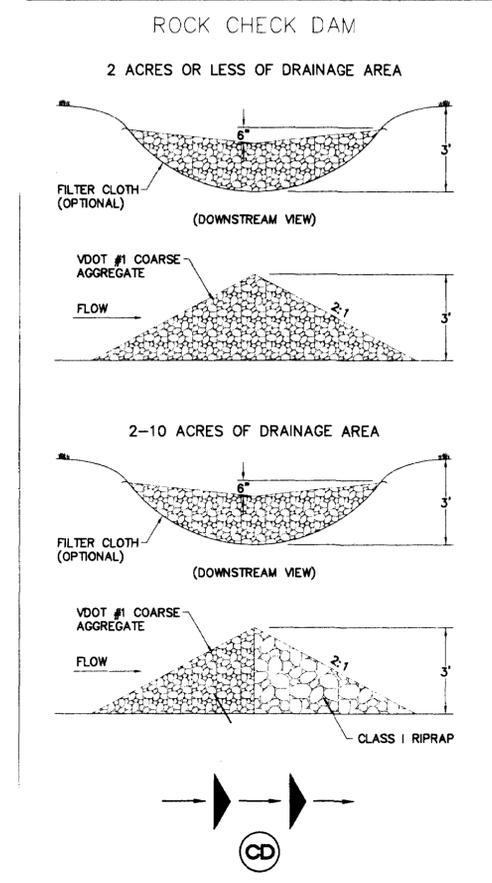
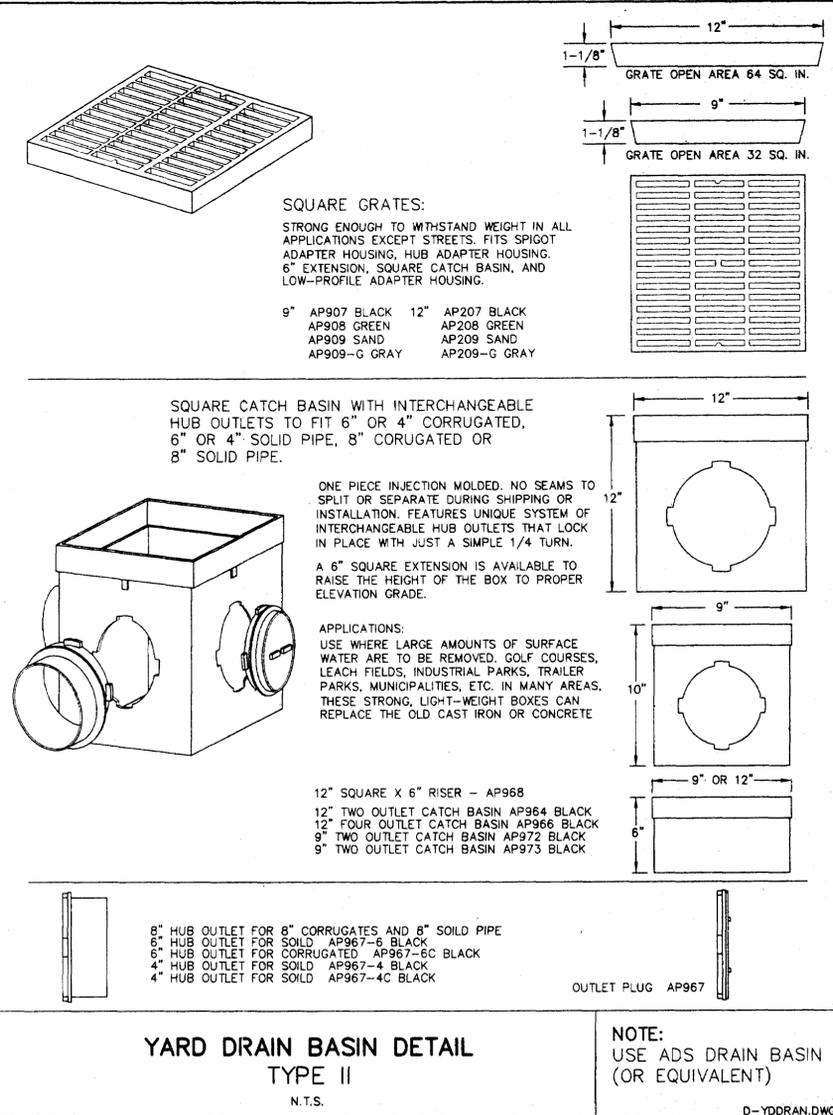
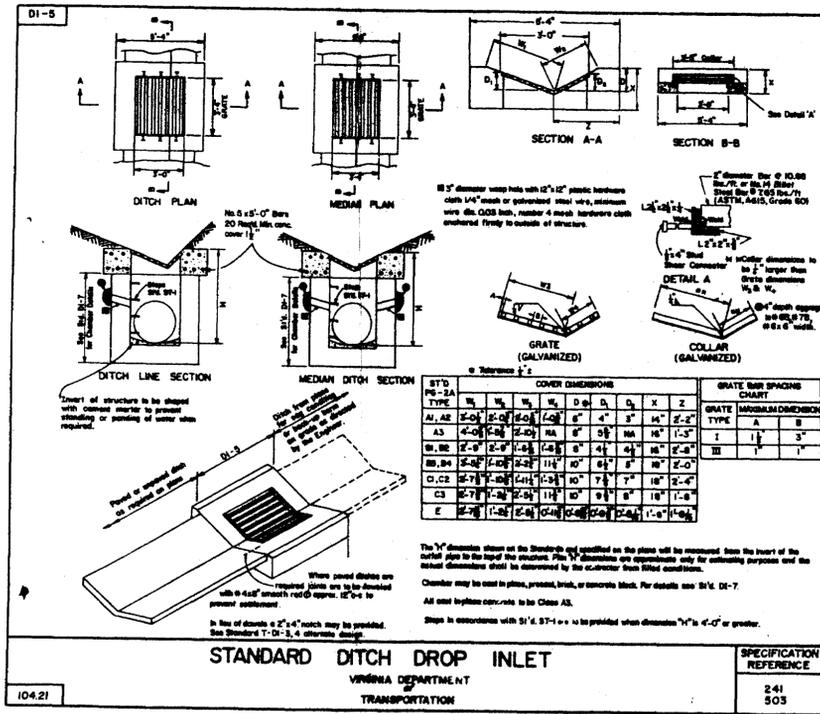
APPROVED BY VDOT FOR DEPTH, TEMPLATE, AND
FORE SURFACE IS APPLIED.
RE TO BE IN PLACE PRIOR TO LAYING BASE

Y OF THE CBR REPORT IS TO BE SUBMITTED TO
APPROVAL OF THE PAVEMENT DESIGN.
UES ARE LESS THAN 10, THE DEVELOPER WILL BE
IBMIT FOR OUR APPROVAL, HIS PROPOSED
STRUCTION.
MAY BE REQUIRED WHERE FIELD CONDITIONS
RALLY, ALL DITCHES WITH SLOPES EXCEEDING
SS SHALL BE PAVED UNLESS OTHERWISE
HE ENGINEER, OWNER, VDOT, AND THE LOCAL

SEDIMENT CONTROL MEASURES SHALL BE THE F
F THE ROAD CONTRACTOR.
AND OVERBURDEN TO BE REMOVED FROM
CULDER PRIOR TO THE CONDITION OF

SOURCE OF MATERIALS ARE TO BE
T OF ALL MATERIALS AND BE IN ACCORDANCE
ND BRIDGE SPECIFICATIONS" AND "ROAD AND

T ALLOWED IN VDOT RIGHT OF WAY.
LL BE RESPONSIBLE FOR THE COST OF THE SIGNAL
R AN ACCOUNTS RECEIVABLE NUMBER.
OPMENT PLAN IS NEEDED FOR THIS REVIEW.
STUDY IS NEEDED FOR THIS REVIEW.
OF ROADWAY(S). INCLUDE ALL ENTRANCES,
LANES, SPEED LIMITS, PAVEMENT MARKINGS,
INTERSECTIONS.
H WHICH HAS NOT DEVELOPED A GOOD SOD BY
TANCE, MUST BE PAVED" NEEDS TO BE ADDED.
AT THE EDGE OF PAVEMENT IN 10' INTERVALS
OF THE CUL-DE-SAC.



NO.	DATE	REVISION / COMMENT / NOTE
1	3/11/97	REVISED PER JCC COMMENTS DATED 2-28-97



5248 Old Towne Road, Suite 1
Williamsburg, Virginia 23188
(757) 253-0040
Fax (757) 220-8994



STORMWATER MANAGEMENT NOTES AND DETAILS
THE MEADOWS
SECTION IV, PHASE I
OWNER/DEVELOPER: MEADOWS I LIMITED PARTNERSHIP
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed SOW/DPW	Drawn KEG
Scale NONE	Date 3/11/97
Project No. 7820-2	
Drawing No. 7 OF 7	

Worksheet 3: Time of concentration (T_c) or travel time (T_t)

Project _____ By _____ Date _____

Location _____ Checked _____ Date _____

Circle one: Present Developed _____

Circle one: T_c T_t through subarea _____

NOTES: Space for as many as two segments per flow type can be used for each worksheet.

Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to T_c only)

Segment ID

1. Surface description (table 3-1)
2. Manning's roughness coeff., n (table 3-1) ..
3. Flow length, L (total L \leq 300 ft) ft
4. Two-yr 24-hr rainfall, P_2 in
5. Land slope, s ft/ft
6. $T_t = \frac{0.007 (nL)^{0.8}}{P_2^{0.5} s^{0.4}}$ Compute T_t hr

100	
2	
+ =	.22

Shallow concentrated flow

Segment ID

7. Surface description (paved or unpaved)
8. Flow length, L ft
9. Watercourse slope, s $\frac{33}{1000}$ ft/ft
10. Average velocity, V (figure 3-1) ft/s
11. $T_t = \frac{L}{3600 V}$ Compute T_t hr

u	
1000	
2.9	
.1 + =	.1 6 min

Channel flow

Segment ID

12. Cross sectional flow area, a ft²
13. Wetted perimeter, p_w ft
14. Hydraulic radius, $r = \frac{a}{p_w}$ Compute r ft
15. Channel slope, s ft/ft
16. Manning's roughness coeff., n
17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V ft/s
18. Flow length, L ft
19. $T_t = \frac{L}{3600 V}$ Compute T_t hr
20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19) hr

3	
200	
.02 + =	.02
=	.35

Worksheet 2: Runoff curve number and runoff

Project _____ By _____ Date _____

Location _____ Checked _____ Date _____

Circle one: Present Developed _____

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN ^{1/}			Area □□ acres □□ mi ² □□ %	Product of CN x area
		Table 2-2	Fig. 2-3	Fig. 2-4		
		Totals =				

^{1/} Use only one CN source per line.

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \text{---} = \text{---}; \quad \text{Use CN} = \boxed{}$$

2. Runoff

Frequency yr
 Rainfall, P (24-hour) in
 Runoff, Q in
 (Use P and CN with table 2-1, fig. 2-1, or eqs. 2-3 and 2-4.)

Storm #1	Storm #2	Storm #3

DRY POND REVISIONS

While only 3.34 acres were to drain to the Phase II dry pond, preparation of the construction plans showed that an additional 0.7 acres should be directed to the pond. Thus, the total contributing drainage area of the dry pond is 4.04 acres. The design elevations for the pond were set slightly higher than necessary when the drainage area was 3.34 acres, therefore, no adjustment to these elevations is required to manage the area increase.

Post-Development Conditions

Total DA = 4.04 AC

<u>Description of Area</u>	<u>Area (AC)</u>
Residential Lots	2.77
Right of Way	0.00
Open Space	1.27

Determine required volume for normal pool, V_r :

BMP/ SWM dry pond, design 3 (6 points, 30% removal rate)

$$V_r = (1.0"/AC)(DA)(R_v)$$

where: $R_v = \text{runoff coefficient} = 0.05 + 0.009(\% \text{ impervious})$

Determine % impervious:

$$\text{Single Family Residential Lots} = (2.77)(0.30) = 0.83 \text{ AC}$$

$$\text{Total \% imp for site} = 0.83 / 4.04 = 0.205\%$$

$$R_v = 0.05 + 0.009(20.5) = 0.234$$

$$V_r = (1.0"/AC)(1/12")(4.04 \text{ AC})(43,560 \text{ SF/AC})(0.234) = \underline{\underline{3,432 \text{ CF}}}$$

Water Quality elevation for this volume is achieved at EL 68.5
(from stage/ storage table)

Size Orifice for 24-Hour Detention:

$$Q_{\text{MAX}} = (3432 \text{ CF} / 86400 \text{ SEC}) = 0.04 \text{ CFS}$$

JCC minimum size of 3" must be used.

Calculate Q_{REL} :

$$\begin{aligned} h_{avg} &= (68.5 - 66) / 2 && = 1.25 \text{ FT} \\ Q_{REL} &= CA[\text{SQRT}(2gh_{avg})] && = 0.33 \text{ CFS} \end{aligned}$$

where: C = discharge coefficient = 0.73
 A = area of orifice = 0.05 SF
 g = gravity = 32.2 FT/SEC²
 h_{avg} = average head

While Q_{REL} is greater than Q_{MAX} , the 3" diameter orifice must be used.

Design Elevations:

Water quality elevation	= 68.5
2 year high water elev.	= 69.2
10 year high water elev.	= 69.3
100 year high water elev.	= 69.5

Top of timber structure elev.	= 70.0
Principle spillway elev.	= 69.0
Inv. of dewatering orifice	= 66.05
Inv. of outlet barrel	= 66.0

Dr

11

1. RESERVOIR No = 2. 2. RESERVOIR NAME = BULKHEAD....

3. $S = K_s * Z^b$

$K_s = 0$ $b = 0$ *Day Pond.*

START ELEV = 0..... INCREMENT = 0...

	STAGE ft	ELEVATION ft	CO AREA sq ft	INC STORAGE cu ft	TOT STORAGE cu ft
4	0.00	66.00.	500.....	0	0
5	2.00	68.00.	1570.....	2070	2070
6	4.00	70.00.	3690.....	5260	7330
7	6.00	72.00.	7140.....	10830	18160
8	0.00	0.00.	0.....	0	0
9	0.00	0.00.	0.....	0	0
10	0.00	0.00.	0.....	0	0
11	0.00	0.00.	0.....	0	0
12	0.00	0.00.	0.....	0	0
13	0.00	0.00.	0.....	0	0
14	0.00	0.00.	0.....	0	0

Change item number: 0

└ to cont

Reservoir No. 2

OUTLET STRUCTURES

CULVERT STRUC A. $Q = CoA[2gh/k]^{.5}$		CULVERT STRUC B. $Q = CoA[2gh/k]^{.5}$	
1. WIDTH (in) = 14.	9. WIDTH (in) = 3..	10. HEIGHT (in) = 3..	11. No. BARRELS = 1..
2. HEIGHT (in) = 14.	12. INVERT ELEV. = 66.05....	13. Co = 0.60	14. CULVERT LENGTH (ft) = 0...
3. No. BARRELS = 1..	15. CULVERT SLOPE (%) = 0...	16. MANNING'S N-VALUE = .013	17. MULTI-STAGE OPTION ? (Y/N) Y
4. INVERT ELEV. = 66.....			
5. Co = 0.60			
6. CULVERT LENGTH (ft) = 1...			
7. CULVERT SLOPE (%) = .1..			
8. MANNING'S N-VALUE = .013			
WEIR STRUCTURE A. $Q = CwLH^{EXP}$		WEIR STRUCTURE B. $Q = CwLH^{EXP}$	
18. CREST LENGTH (ft) = 9.5....	23. CREST LENGTH (ft) = 58....	24. CREST ELEVATION = 70....	25. Cw = 3.00
19. CREST ELEVATION = 69....	26. EXP = 1.50	27. MULTI-STAGE OPTION ? (Y/N) N	
20. Cw = 3.00			
21. EXP = 1.50			
22. MULTI-STAGE OPTION ? (Y/N) Y			

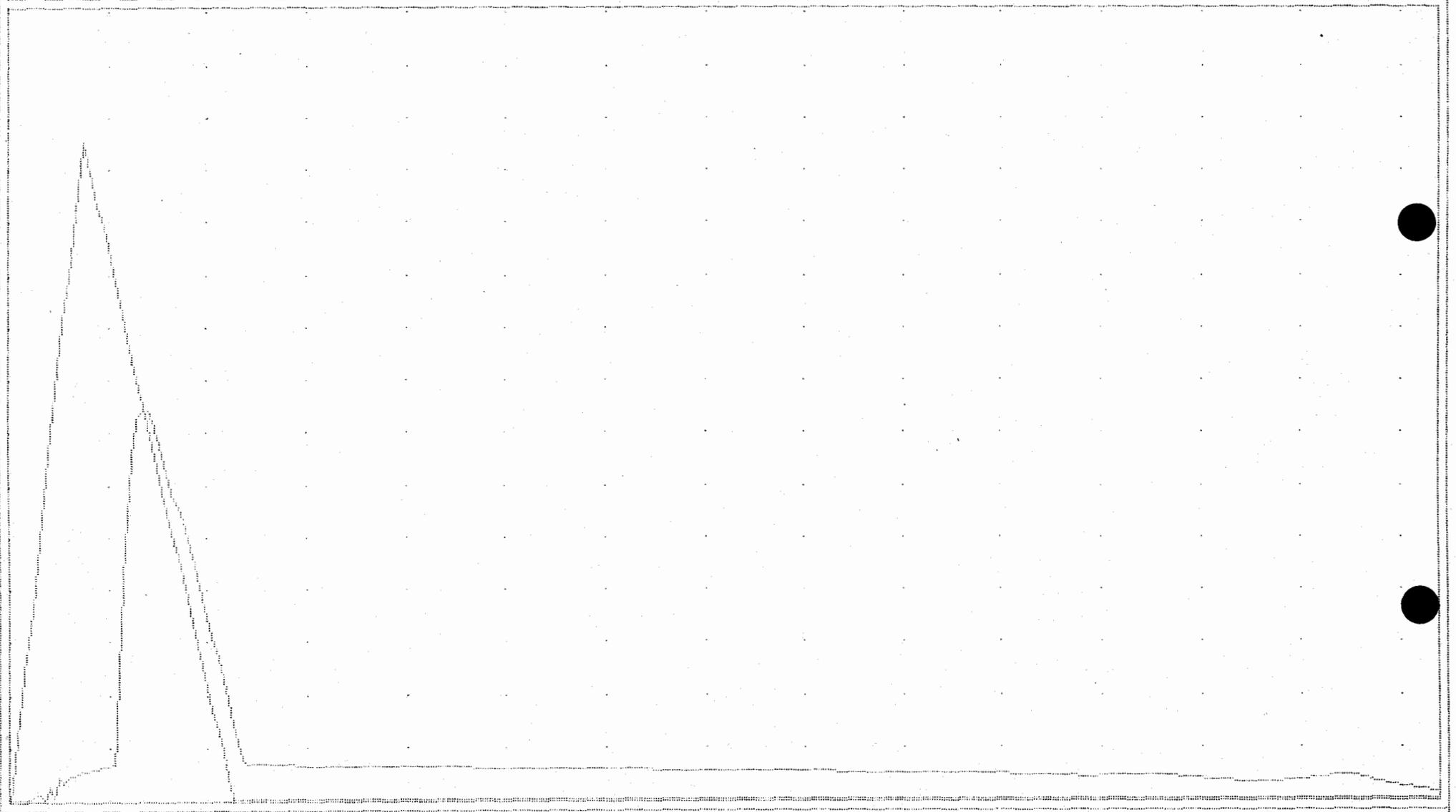
Change item number: 0

└ to cont

Qp = 3.7

RESERVOIR ROUTE

2 Yr



UGU = 20 min

12

UGU = 0.5 cfs

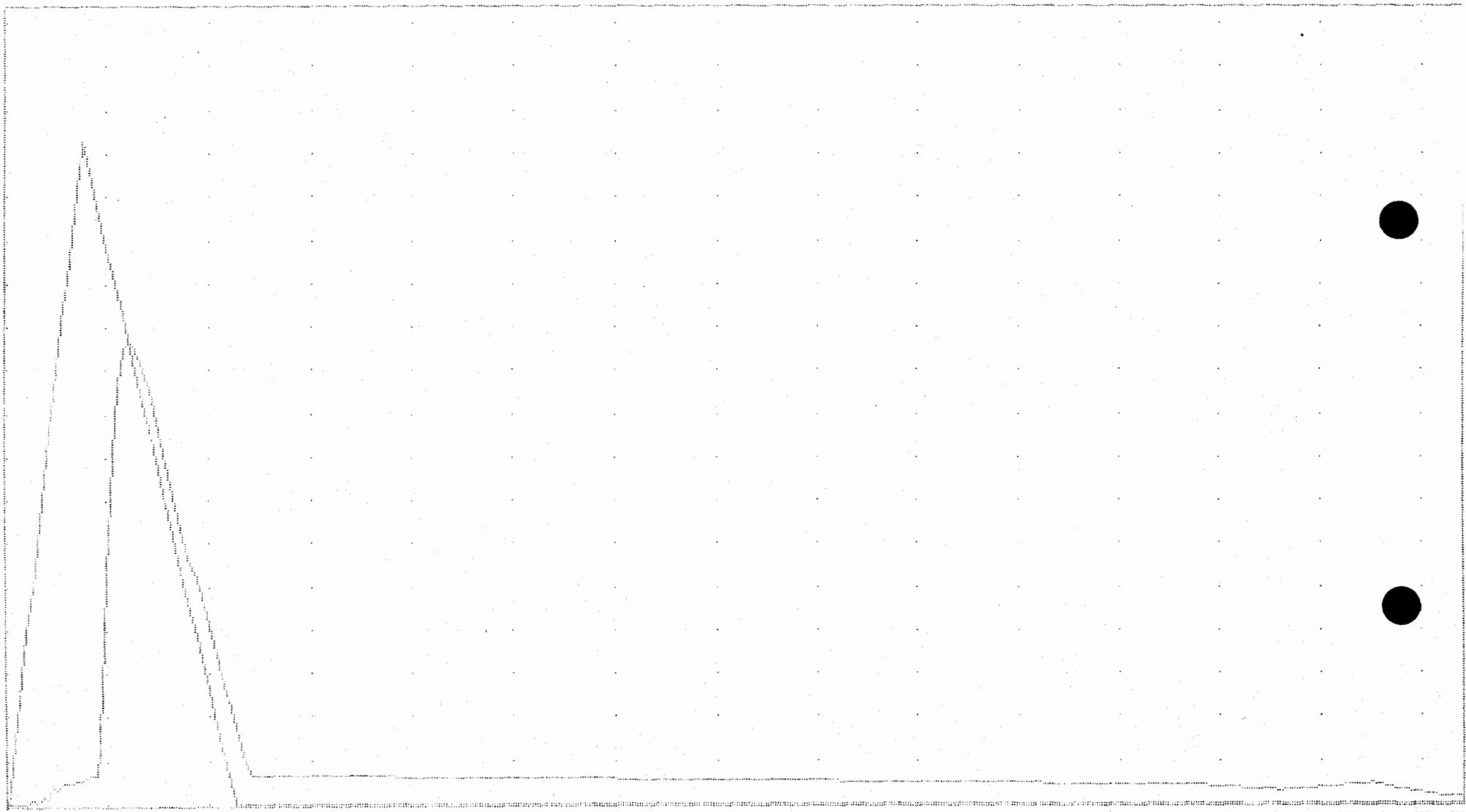
MAX STORAGE = 5321

MC042 COMMON AREA MEADOWS - 011 69.24

$Q_p = 5.3$

RESERVOIR ROUTE

10 Yr



NCH = 20 min

10

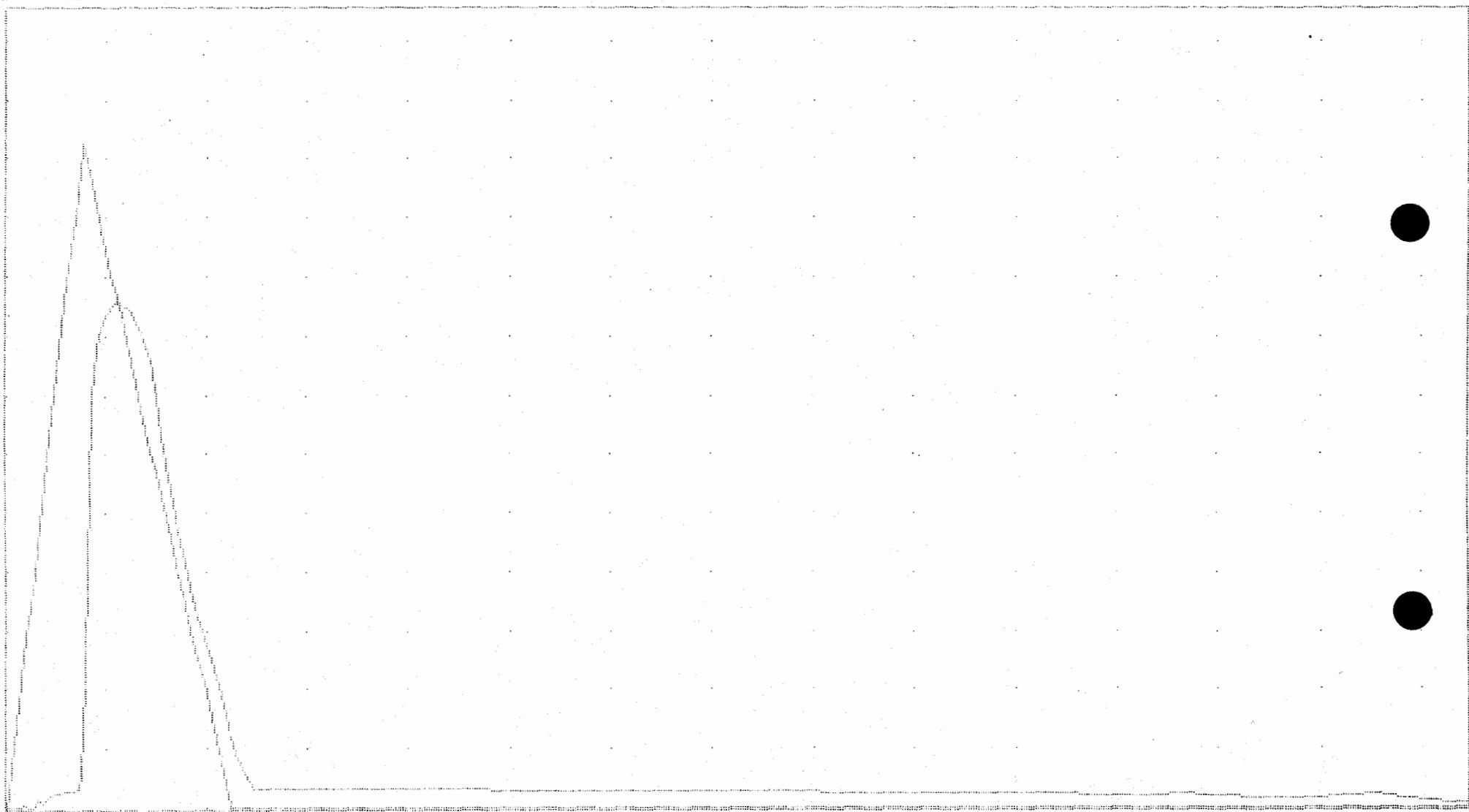
$Q_{CH} = 0.5$ cfs

MAX STORAGE = 5500

Qp = 0.5

RESERVOIR ROUTE

100 Yr



DCU = 20 min

14

DCU = 1.0 cfs

MAX STORAGE = 6127

MC042_COMMON_AREA_MEADOWS - 013
MAX ELEVATION = 69.54

MEADOWS - Sect

Timber Structure

- check Meadows, Sect 2
~~Phase~~
 watershed - twin 30's
 under Tondil Cont

Proposed to have 7.8 ac
 reduced to 4.04 ac

1 acre bypass - approx flow - 1 cfs = 450 gal/min

Predevelopment Watershed

3.4 ac	3.4
3.34	.78
	.72
	3.75
	1.14
	0.40
	.19
	.06
	4.14 (-2)
	<hr/> 14.58
	<hr/> -2
	<hr/> 12.5 ±

Per Previous Plans - 49.7 ac, 30+ ac

Per Deidre Wells -

4.3 cfs - pre 2	} for reduced w/ched
5.4 cfs - 10 yr	
6.4 cfs - 25 yr.	

For watershed

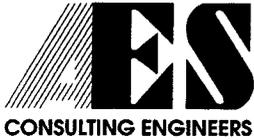
$C = .25 \quad t_p = 0.35$

$I_2 = 3.2$
 $T = 4.4$

$A = 12.5$

$Q_2 = .25 \times 3.2 \times 12.5 = 10 \text{ cfs}$

$Q_{10} = 13.8 \text{ cfs}$



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

July 8, 1999

Mr. John H. Kniest, Jr.
Van Kniest, Inc.
426 Airport Road
Williamsburg, Virginia 23185

RE: The Meadows Section 4, Phase II
Stormwater Management Timber Detention Structure Inspection
AES Project No. 7820-2

Dear Mr. Kniest:

AES Consulting Engineers on November 4, 1998 performed an inspection of the constructed improvements for the James City County required Stormwater Management Timber Detention Structure located between Shackleton Lane and Cherry Walk for the above referenced project. During construction field checks of the materials and equipment by our staff indicated the proper construction methods, techniques, sequences and/or procedures were in accordance with the approved plans and applicable standards. The November 4, 1998 inspection revealed that, to the best of our knowledge all improvements have been constructed in accordance with the approved plans and applicable standards. However, it is the contractor's responsibility to ensure that as-built drawings of the structure are prepared to the satisfaction of James City County.

Should you have any questions pertaining to this matter, please do not hesitate to give me a call.

Sincerely,

AES Consulting Engineers

A handwritten signature in black ink, appearing to read 'Richard A. Costello', written in a cursive style.

Richard A. Costello, P.E.

cc: Mr. Darryl Cook - J.C.C. Code Compliance
Mr. Bill Taylor - Toano Contractors, Inc.

S:\JOBS\7820\02\WORDPROC\Document\78202104.doc

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	8.27.99	JOB NO.	7820-2
ATTENTION	DAVID MEADOR		
RE:	MEADOWS SECTION 4, PHASE 2		

TO JCC
ENVIRONMENT DEPT

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
1			RECORD DRAWING OF TIMBER DAM MC 042

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

PLEASE CALL WITH ANY QUESTIONS.

COPY TO _____

SIGNED: Lindie P. Potts

WATERSHED	MC	MAINTENANCE PLAN	No	CTRL STRUC DESC	Square Orif
BMP ID NO	042	SITE AREA acre	9.02	CTRL STRUC SIZE inches	12"x12"
PLAN NO		LAND USE	SF Residential	OTLT BARRL DESC	
TAX PARCEL		old BMP TYP	Timber Crib Wall	OTLT BARRL SIZE inch	
PIN NO	3842000001A	JCC BMP CODE			
CONSTRUCTION DATE	1/1/1999	POINT VALUE		EMERG SPILLWAY	No
PROJECT NAME	The Meadows Sect 5 Timber Crib Wall			DESIGN HW ELEV	
FACILITY LOCATION	South 3713 Cherry Walk			PERM POOL ELE	
CITY-STATE	Williamsburg, Va. 23188	SVC DRAIN AREA acres		2-YR OUTFLOW cfs	0.00
CURRENT OWNER	Meadows II Limited Partnership			10-YR OUTFLOW cfs	0.00
OWNER ADDRESS	426B Airport Road			REC DRAWING	Yes
OWNER ADDRESS 2		SERVICE AREA DESCRI	SF Lots & Roads		
CITY-STATE-ZIP CODE	Williamsburg, Va. 23188	IMPERV AREA acres	0.00	CONSTR CERTI	No
OWNER PHONE		RECV STREAM	UT of Mill Creek		
MAINT AGREEMENT	No	EXT DET-WQ-CTRL	Yes	LAST INSP DATE	
EMERG ACTION PLAN	No	WTR QUAL VOL acre-ft		INTERNAL RATING	
		CHAN PROT CTRL	No	MISC/COMMENTS	
		CHAN PROT VOL acre-ft		Timber Crib wall. Outfalls to Meadows	
		SW/FLOOD CONTROL	No	Sec 2.	
		GEOTECH REPORT	No		

Get Last BMP No

Return to Menu





Meadows Subdivision
Scale: 1 inch = 500 feet (approx.)