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: **JR002**

DATE VERIFIED: **June 26, 2012**

QUALITY ASSURANCE TECHNICIAN: **Leah Hardenbergh**

Leah Hardenbergh

LOCATION: WILLIAMSBURG, VIRGINIA

Stormwater Division

MEMORANDUM

DATE: March 11, 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: JR002

PIN: 5920100046

Subdivision, Tract, Business or Owner Name (if known): Williamsburg James City County Schools

Property Description: James River Elementary

Site Address: 8901 Pocahontas Trail

(For internal use only) **Box** 14 **Drawer:** 7

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

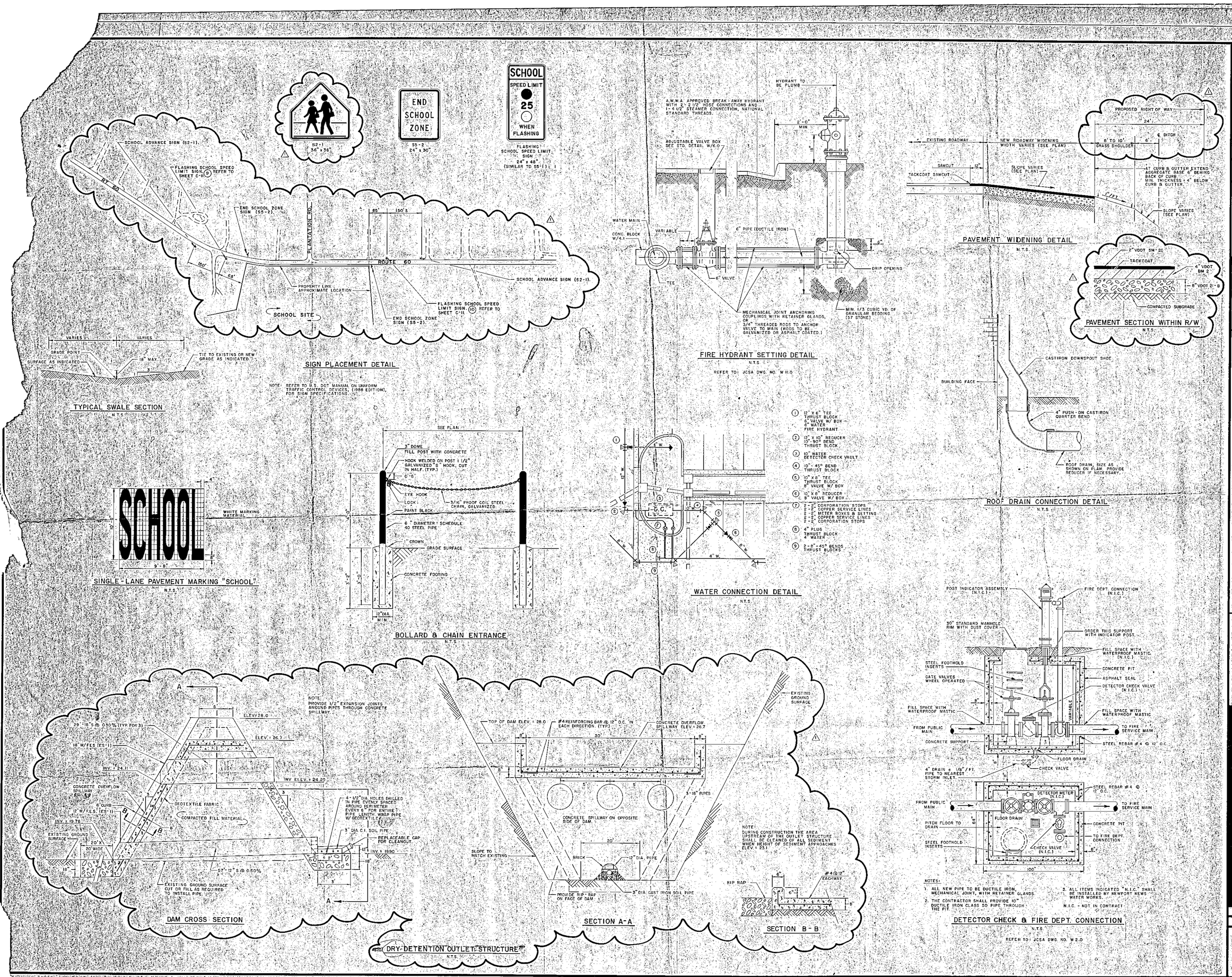
Comments

JR-002

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



Date: APRIL 15, 1992

Revisions:

△ MAY 6, 1992

COMMONWEALTH OF VIRGINIA
C. ALLAN BAMFORTH, JR.
No. 3587
04-15-92
PROFESSIONAL ENGINEER

C. ALLAN BAMFORTH, JR.
ENGINEER-SURVEYOR, LTD
NORFOLK, VIRGINIA

ROBERTS DISTRICT ELEMENTARY SCHOOL AND COMMUNITY CENTER

James City County, Virginia

State Project No. 131-12A

SITE DETAILS

Williamsburg-James City County Public Schools

SHRIVER AND HOLLAND ASSOCIATES

Architects
Planners
Project Coordinators

355 W. Freemason Street
Norfolk, Virginia 23510
804/627/4525

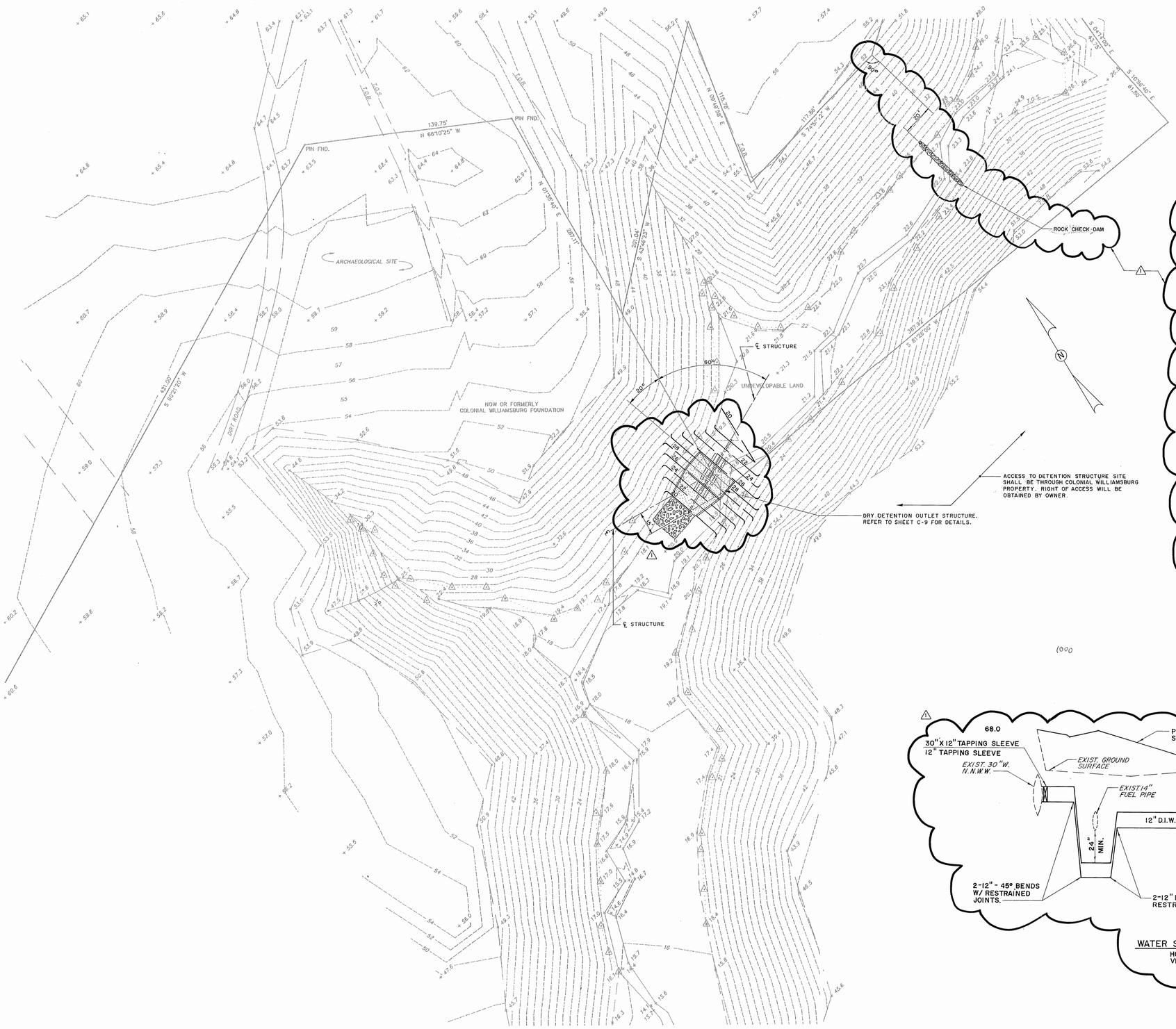
Comm: 7920

File: 91.041

Sheet

C-9

of

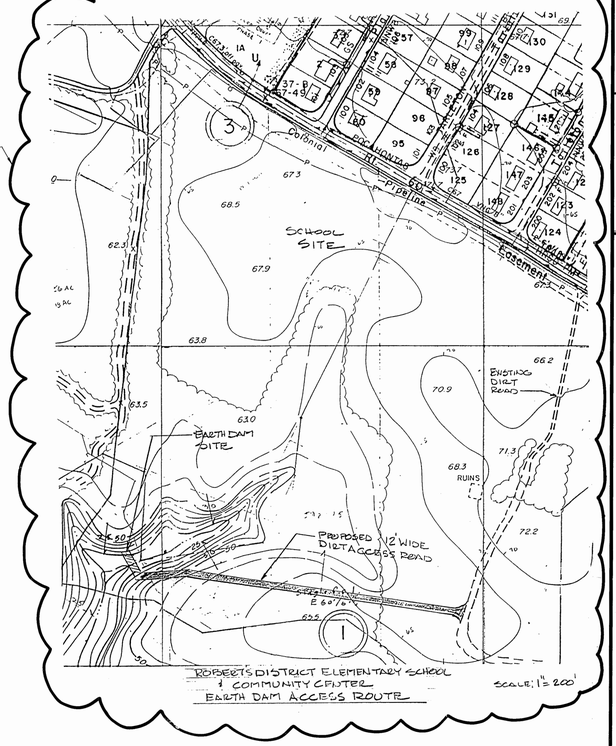


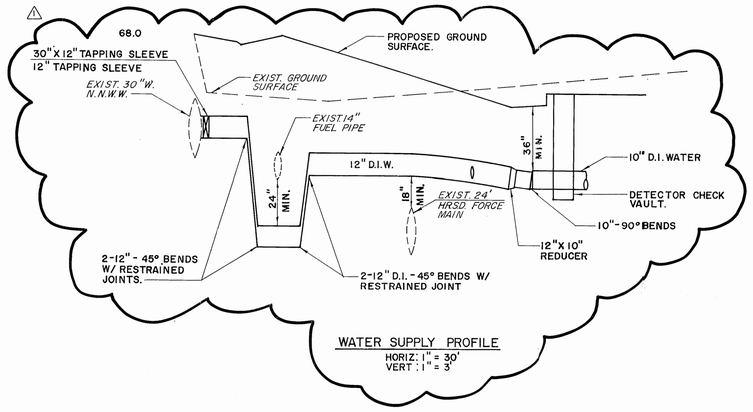
REQUIREMENTS FOR ACCESS TO EARTH DAM SITE

Access to the site of the proposed Earth Dam Site will be through property owned by Colonial Williamsburg. A passable dirt road exists for a portion of the way to the site. The contractor will be required to do necessary clearing and grading to construct a passable dirt road, 12 feet wide, at existing grade, as shown on the attached sketch. The road shall be benched into the slope. Slope protection and silt fence will be required. At the completion of the job the road and adjacent cleared areas shall be regraded and left in a passable condition. Prior to beginning construction, the contractor shall meet with the County Engineer to discuss detailed requirements for working within the wetland areas and on the steep slopes.

Bids shall be based on the following quantities:

1.	Clear and grubb 20' wide access	-	16,000 S.F.
2.	Grade & maintain 12' wide dirt road	-	1,000 L.F.
3.	Grade and bench on slope	-	400 C.Y.
4.	Slope protection with Jute Mesh	-	4,000 S.F.
5.	Silt fence	-	2,000 L.F.
6.	Seed disturbed areas	-	5,000 S.F.





WATER SUPPLY PROFILE
HORIZ: 1" = 30'
VERT: 1" = 3'

GRAPHIC SCALE:
1" = 30' 0" 30' 60' 120'

Date: APRIL 15, 1992
Revisions:
1 MAY 6, 1992

COMMONWEALTH OF VIRGINIA
C. ALLAN BAMFORTH, JR.
No. 7587
04-15-92
CERTIFIED PROFESSIONAL ENGINEER

C. ALLAN BAMFORTH, JR.
ENGINEER-SURVEYOR, LTD
NORFOLK, VIRGINIA

ROBERTS DISTRICT ELEMENTARY SCHOOL AND COMMUNITY CENTER

James City County, Virginia — State Project No. 131-12A

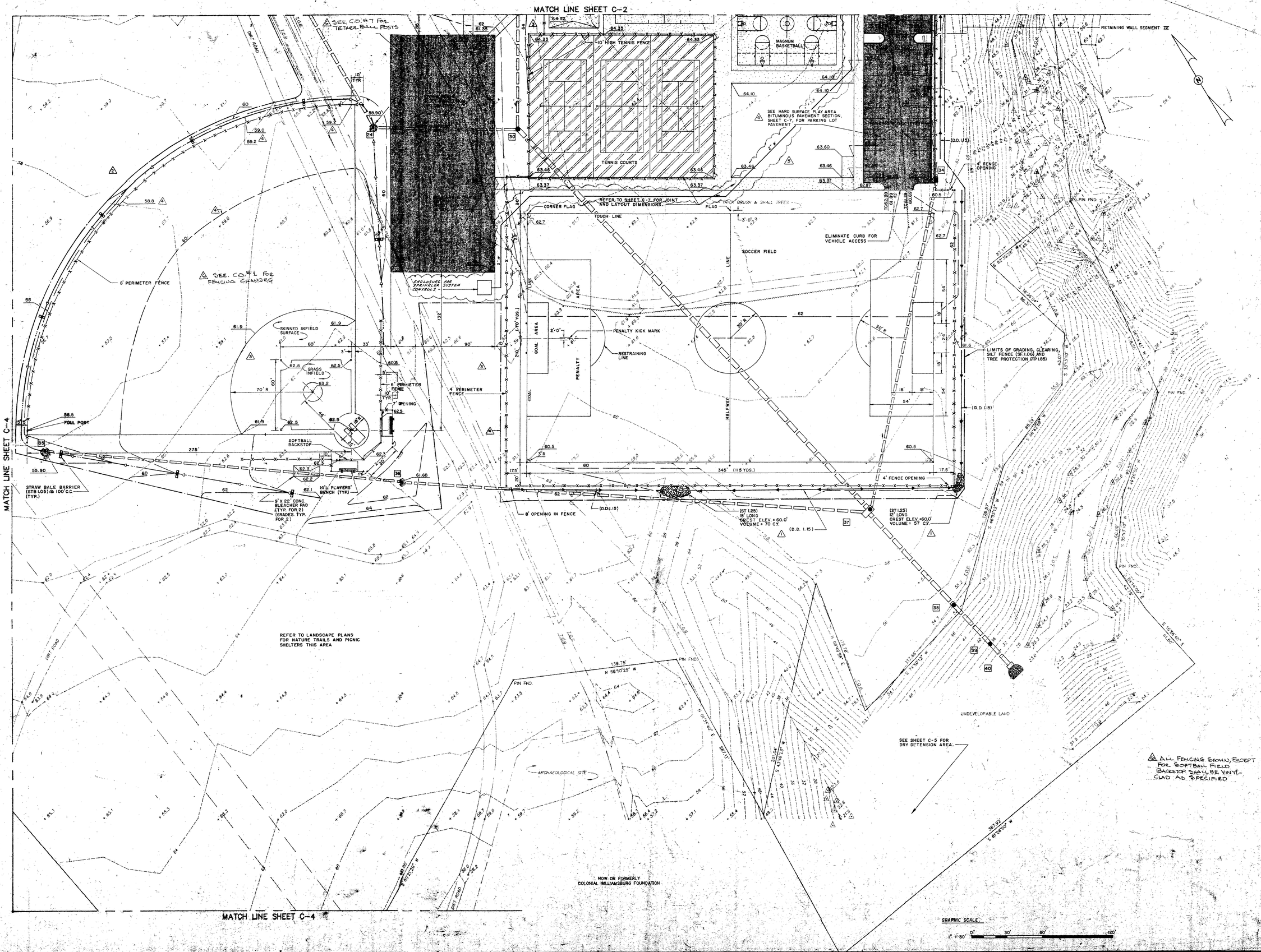
SITE PLAN

Williamsburg-James City County Public Schools

SHRIVER AND HOLLAND ASSOCIATES
Architects
Planners
Project Coordinators
355 W. Freemason Street
Norfolk, Virginia 23510
804 / 627 / 4525

Comm: 7920
File: 91.041
Sheet C-5
of.

JR002_JAMES_RIVER_ELEMENTARY - 005



Date: APRIL 15, 1992

Revisions:

1 MAY 6, 1992

2 JUNE 22, 1992

COMMONWEALTH OF VIRGINIA — C. ALLAN BAMFORTH, JR. — 587 — REGISTERED PROFESSIONAL ENGINEER — 04-15-92

C. ALLAN BAMFORTH, JR.
ENGINEER-SURVEYOR, LTD
NORFOLK, VIRGINIA

3 JUNE 24, 1992

4 JULY 31, 1992
REVISED TO ADDENDUM #3

5 JUNE 29, 1993
ADDED SPRINKLER WATER SYSTEM

6 "AS BUILT" OCT. 27, 1994

SEE SPECIFICATIONS APPENDIX I FOR "AS-BUILT" SKETCHES, NOTES, AND TECHNICAL DATA.

ROBERTS DISTRICT ELEMENTARY SCHOOL AND COMMUNITY CENTER

James City County, Virginia

State Project No. 131-12A

SITE PLAN

James River ES
JR002

Williamsburg - James City County Public Schools

SHRIVER AND HOLLAND ASSOCIATES
Architects, Planners, Project Coordinators
355 W. Freemason Street
Norfolk, Virginia 23510
804/627-4525

Comm: 7920

File: 91.041

Sheet

C-3

of

WMSBURG - JAMES CITY CO
Public Schools
Operation Center
301 Ironbound Rd.
Williamsburg, VA 23185-7328

STORM SEWER DATA

STRUCTURE DATA

1 ~~EC-1 INV. 15" = 65.89~~

2 ~~DI-3A RIM = INV. = 63.76~~

3 ~~EC-1 W/ EC-1 INV. 15" = 63.63~~

4 ES-1
INV. 27" = 59.00

5 MH-1
RIM = 66.30
INV. 6" (NW) = 62.30
INV. 6" (SW) = 63.31
INV. 6" (S) = 63.31
INV. 15" (NE) = 61.55

6 DI-3A
RIM = 65.72
INV. = 61.26

7 DI-3A
RIM = 65.26
INV. = 61.17

8 DI-1
RIM = 66.50
INV. 4" (NE) = 64.00
INV. 4" (SW) = 64.50
INV. 6" (NW) = 63.83
INV. 12" (SE) = 62.70

9 MH-1
RIM = 66.60
INV. 6" (E) = 62.87
INV. 8" (SW) = 62.70
INV. 12" (NW) = 62.37
INV. 15" (NE) = 61.82

10 DI-3A
RIM = 65.15
INV. = 60.85

11 DI-3A
RIM = 64.75
INV. 15" (SW) = 60.76
INV. 15" (SE) = 60.76
INV. 15" (NE) = 60.76
INV. 21" (NW) = 60.26

12 DI-3A
RIM = 65.00
INV. = 60.16

13 DI-3A
RIM = 65.17
INV. = 60.02

14 DI-2A
RIM = 65.65
INV. 21" (S) = 59.77
INV. 24" (NW) = 59.52

15 DI-3A
RIM = 63.11
INV. 24" (SE) = 59.14
INV. 24" (W) = 58.38

16 DI-4A
RIM = 62.36
INV. 24" (NE) = 58.07
INV. 24" (E) = 58.07
INV. 36" (SW) = 57.07

17 DI-1
RIM = 64.00
INV. 6" (SW) = 61.02
INV. 15" (W) = 60.27

18 DI-1
RIM = 64.00
INV. 6" (SE) = 61.02
INV. 15" (E) = 60.13
INV. 15" (NW) = 60.13

19 ES-1
INV. 15" = 58.80

20 DI-4A
RIM = 63.15
INV. 15" (NE) = 58.70
INV. 15" (SE) = 59.63
INV. 36" (NE) = 56.86
INV. 36" (SW) = 56.86

21 T-DI-1 W/ B-1
RIM = 64.00
INV. 6" (SE) = 61.50
INV. 36" (NE) = 56.29
INV. 36" (SW) = 56.29

22 DI-1
RIM = 66.15
INV. = 61.86

23 T-DI-1 W/ B-1
RIM = 61.60
INV. 15" (NE) = 58.18
INV. 36" (N) = 56.02
INV. 36" (S) = 54.68

24 T-DI-1 W/ B-1
RIM = 58.90
INV. 36" (N) = 54.09
INV. 42" (SE) = 53.59

25 DI-1
RIM = 66.15
INV. 4" (SW) = 63.82
INV. 6" (NW) = 63.65
INV. 12" (SE) = 63.15

26 DI-1
RIM = 66.10
INV. 6" (NE) = 63.66
INV. 12" (NW) = 62.99
INV. 15" (SW) = 62.74

27 DI-1
RIM = 65.85
INV. = 62.83

28 DI-1
RIM = 66.10
INV. 15" (NE) = 62.63
INV. 15" (SE) = 62.63
INV. 15" (W) = 61.63

29 DI-1
RIM = 64.47
INV. 15" (E) = 61.40
INV. 15" (SW) = 59.40

30 MH-1
RIM = 63.00
INV. 15" (NE) = 59.00
INV. 42" (NW) = 53.34
INV. 42" (S) = 52.88

31 DI-3A
RIM = 63.87
INV. = 60.43

32 DI-1
RIM = 64.19
INV. = 60.22

33 MH-1
RIM = 62.12
INV. 15" (NE) = 59.03
INV. 15" (NW) = 59.03
INV. 18" (SW) = 57.03

34 DI-3A
RIM = 60.22
INV. = 56.45

35 DI-1
RIM = 55.90
INV. = 53.40

36 DI-1
RIM = 61.68
INV. = 52.79

37 JUNCTION BOX JB-1 TYPE B,
W = 3'-0", D = 6'-0"
RIM = 59.50
INV. 18" (NE) = 55.32
INV. 21" (NW) = 52.00
INV. 42" (N) = 52.00
INV. 48" (S) = 52.00

38 MH-1 MODIFIED W/7' INSIDE DIAMETER *
RIM = 54.00
INV. 48" (N) = 47.50
INV. 48" (S) = 34.00

39 MH 1 MODIFIED W/7' INSIDE DIAMETER *
RIM = 38.00
INV. 48" (N) = 31.50
INV. 48" (S) = 23.60

40 ENERGY DISSIPATOR W/EC-1 (FOR 48" PIPE)
INV. = 23.58

* PROVIDE R-2 TAPER AND FLAT SLAB TOP W/ MH-1A FRAME AND COVER

PIPE DATA

1 - 2 [illegible] - 15" S. @ 0.70 %
2 - 3 [illegible] - 15" S. @ 0.30 %
4 - 16 [illegible] - 24" S. @ 0.87 %
5 - 7 [illegible] - 15" S. @ 0.52 %
6 - 7 [illegible] - 15" S. @ 1.56 %
7 - 11 [illegible] - 15" S. @ 0.30 %
8 - 9 [illegible] - 12" S. @ 0.52 %
9 - 11 [illegible] - 15" S. @ 0.52 %
10 - 11 [illegible] - 15" S. @ 1.56 %
11 - 12 [illegible] - 21" S. @ 0.52 %
12 - 13 [illegible] - 21" S. @ 0.30 %
13 - 14 [illegible] - 21" S. @ 0.30 %
14 - 15 [illegible] - 24" S. @ 0.20 %
15 - 16 [illegible] - 24" S. @ 0.25 %
16 - 20 [illegible] - 36" S. @ 0.20 %
17 - 18 [illegible] - 15" S. @ 0.20 %
18 - 20 [illegible] - 15" S. @ 0.30 %
19 - 20 [illegible] - 15" S. @ 0.40 %
20 - 21 [illegible] - 36" S. @ 0.25 %
21 - 23 [illegible] - 36" S. @ 0.25 %
22 - 23 [illegible] - 15" S. @ 2.08 %
23 - 24 [illegible] - 36" S. @ 0.40 %
24 - 30 [illegible] - 42" S. @ 0.20 %
25 - 26 [illegible] - 12" S. @ 0.40 %
26 - 28 [illegible] - 15" S. @ 0.20 %
27 - 28 [illegible] - 15" S. @ 0.20 %
28 - 29 [illegible] - 15" S. @ 0.30 %
29 - 30 [illegible] - 15" S. @ 0.30 %
30 - 37 [illegible] - 42" S. @ 0.20 %
31 - 33 100' - 15" S. @ 0.40 %
32 - 33 62' - 15" S. @ 0.30 %
33 - 34 194' - 18" S. @ 0.30 %
34 - 37 282' - 18" S. @ 0.40 %
35 - 36 306' - 21" S. @ 0.20 %
36 - 37 394' - 21" S. @ 0.20 %
37 - 38 107' - 48" S. @ 4.20 %
38 - 39 45' - 48" S. @ 5.56% RCP CL IV
39 - 40 25' - 48" S @ 0.08% RCP CL IV

NOTE: ALL STRUCTURE DESIGNATIONS REFER TO VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE STANDARDS.

NOTE: MH 2 MAY BE SUBSTITUTED FOR MH-1

ROOF DRAIN

STRUCTURE DATA

A S. CO.
INV. 4" (SE) = 62.45
INV. 6" (N) = 62.37

B S. CO.
INV. = 61.88

C S. CO.
INV. = 61.43

D S. CO.
INV. 4" (SW) = 62.45
INV. 6" (N) = 62.37

E S. CO.
INV. = 61.88

F S. CO.
INV. = 61.43

G S. CO.
INV. 6" = 64.30

H S. CO.
INV. 4" (S) = 63.69
INV. 6" (W) = 63.61

I S. CO.
INV. 4" (S) = 63.45
INV. 6" (E) = 63.37

J S. CO.
INV. = 62.70

K S. CO.
INV. = 63.40

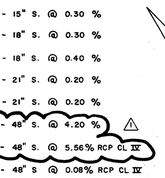
L S. CO.
INV. 8" = 61.91

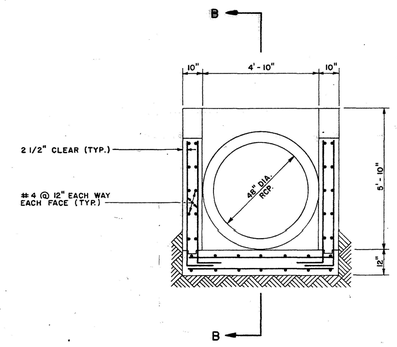
M S. CO.
INV. = 63.20

PIPE DATA

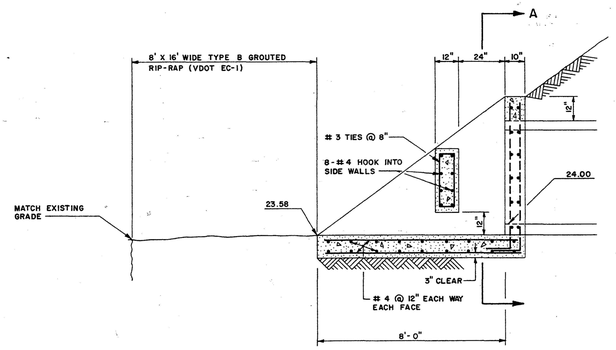
A - B 47' - 6" S. @ 1.04 %
B - C 43' - 6" S. @ 1.04 %
C - 17 40' - 6" S. @ 1.04 %
D - E 47' - 6" S. @ 1.04 %
E - F 43' - 6" S. @ 1.04 %
F - 18 40' - 6" S. @ 1.04 %
G - 8 45' - 6" S. @ 1.04 %
H - 9 71' - 6" S. @ 1.04 %
I - J 65' - 6" S. @ 1.04 %
J - 5 38' - 6" S. @ 1.04 %
K - 5 9' - 6" S. @ 1.04 %
L - 9 9' - 8" S. @ 1.04 %
M - 21 82' - 6" S. @ 2.08 %

NOTE: DOWNSPOUT DRAIN LINES SHOWN = 4" S. @ 1.04% MIN.
DOWNSPOUT DRAIN LINES SHOWN = 6" S. @ 1.04% MIN.
CONNECT TO DOWNSPOUTS AS SHOWN IN DETAIL ON DWG. C-9



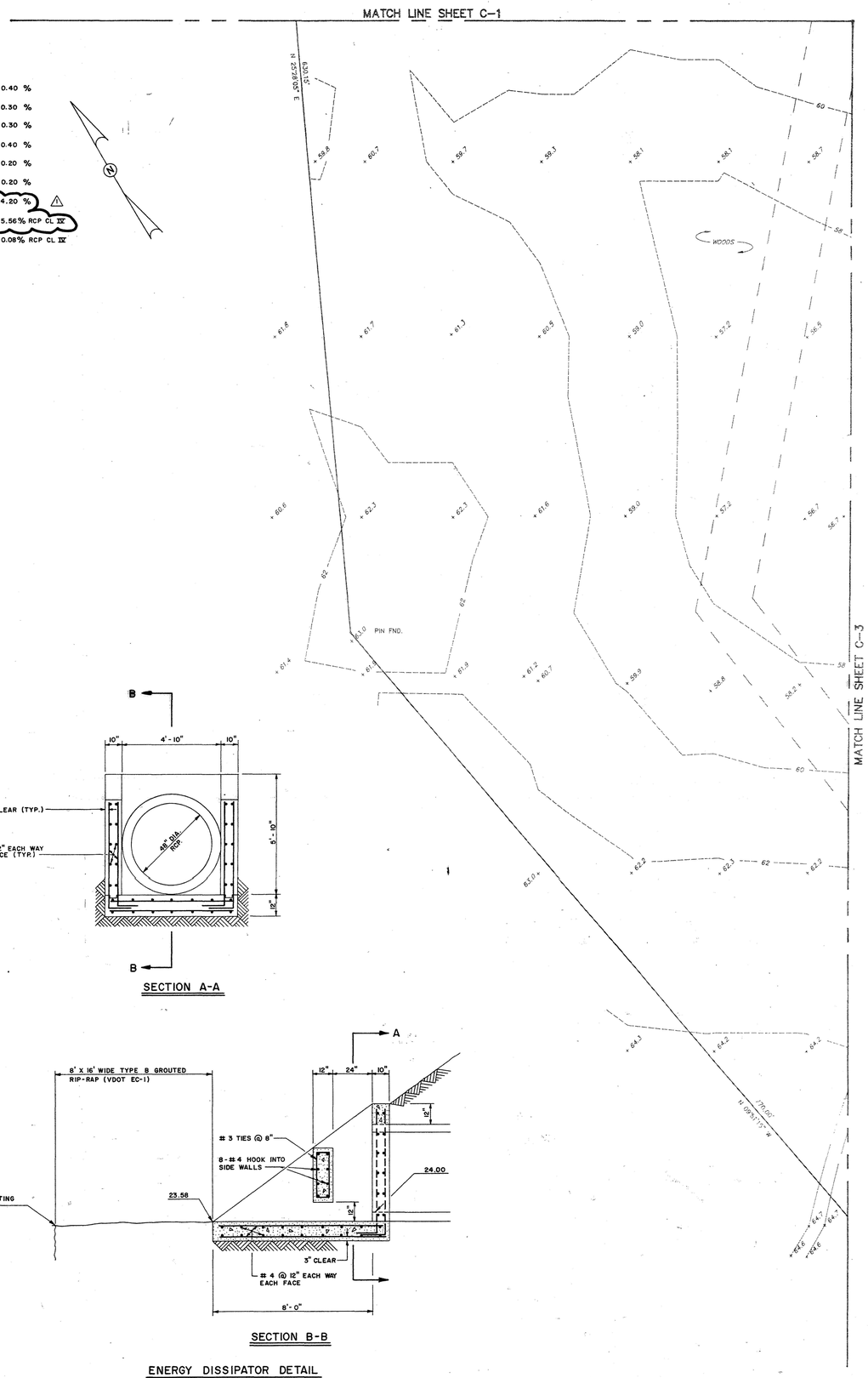


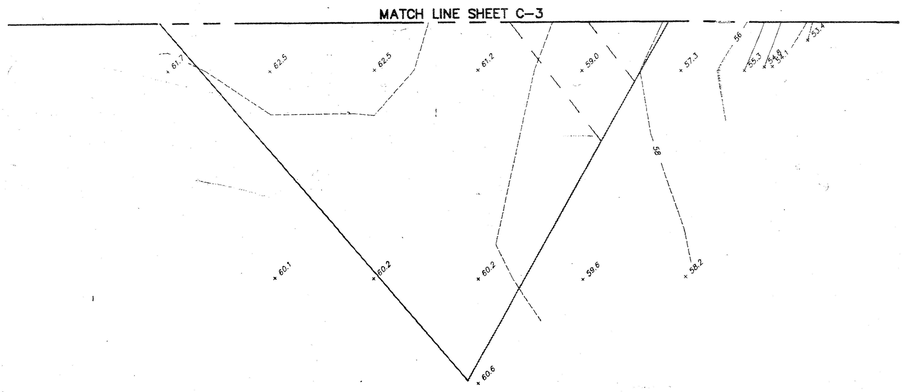
SECTION A-A



SECTION B-B

ENERGY DISSIPATOR DETAIL
N.T.S.





GRAPHIC SCALE:
1" = 30' 0" 30' 60' 120'

Date: APRIL 15, 1992
Revisions:
1 MAY 6, 1992
2 JULY 31, 1992

COMMONWEALTH OF VIRGINIA
C. ALLAN BAMFORTH, JR.
14587
04-15-92
CERTIFIED PROFESSIONAL ENGINEER

C. ALLAN BAMFORTH, JR.
ENGINEER-SURVEYOR, LTD
NORFOLK, VIRGINIA

1 "As Built" Oct. 27, 1994

SEE SPECIFICATIONS APPENDIX I FOR "AS-BUILT" SKETCHES, NOTES, AND TECHNICAL DATA.

ROBERTS DISTRICT ELEMENTARY SCHOOL AND COMMUNITY CENTER

James City County, Virginia

State Project No. 131-12A

SITE PLAN & SCHEDULES

Williamsburg-James City County Public Schools

SHRIVER AND HOLLAND ASSOCIATES
Architects
Planners
Project Coordinators
355 W. Freemason Street
Norfolk, Virginia 23510
804 / 627 4525

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WMSBURG - JAMES CITY CO
Public Schools
Operation Center
597 Jolly Pond Rd.
Wmsburg, VA 23185-7328

ROBERT'S DISTRICT

ELEMENTARY SCHOOL AND COMMUNITY CENTER

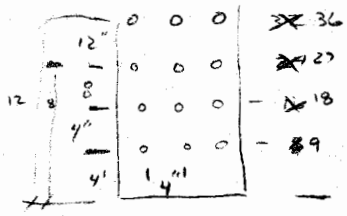
WILLIAMSBURG - JAMES CITY COUNTY PUBLIC SCHOOLS

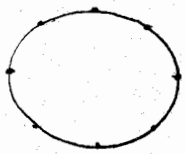
STORM DRAINAGE CALCULATIONS

need 36 - ½" ϕ holes

- 4" O.C. -

- horiz & vertical





37"

Gravel Jacket

FILTER Fabric

Top elev - 24.2

Lowest ½ hole - 20.0

concrete base -

18" thick base

2x ϕ of pipe - 24" base 18" thick

inset riser - 6"

AUD @ Top - 18" ϕ

#3 stone (BMP)

12" Tee Section

4' riser section

PREPARED BY:

C. ALLAN BAMFORTH, JR.
ENGINEER-SURVEYOR, LTD.
NORFOLK, VIRGINIA

APRIL 2, 1992

DETERMINE COMPLIANCE WITH BMP REQUIREMENTS —

THE BMP HAS BEEN DESIGNED TO SERVE THE SCHOOL SITE, HIGHWAY DRAINAGE ADJACENT TO THE SITE AND EXISTING UNDEVELOPED AREA OWNED BY COLONIAL WILLIAMSBURG.

AREAS

TOTAL AREA CONTRIBUTING TO BMP	=	67.89 AC.
TOTAL AREA OF SCHOOL SITE	=	32.82 AC.
AREA OF SCHOOL SITE CONTRIBUTING	=	30.44 AC
AREA OF SCHOOL SITE DISTURBED	=	17.2 AC
UNDISTURBED SCHOOL SITE CONTRIBUTING	=	13.2 AC

THE BMP DISCHARGE STRUCTURE HAS BEEN DESIGNED TO SERVE AS A SEDIMENT TRAP AS WELL AS A STORM WATER MANAGEMENT AND WATER QUALITY DEVICE.

SILT TRAP -

THE SOIL AND EROSION CONTROL HANDBOOK STATES THAT A TEMPORARY SILT TRAP SHOULD BE ADEQUATE TO RETAIN 67 CUBIC YARDS OF SILT PER ACRE OF SITE AREA.

THE PRESENT DESIGN PROVIDES STORAGE FOR 67 C.Y./AC X TOTAL SCHOOL SITE AREA CONTRIBUTING

THE VERTICAL PERFORATED STAND PIPE IS SET AT A TOP ELEVATION = DEPTH OF SILT = 27 CY/AC X THE DISTURBED AREA OF THE SCHOOL SITE.

STORM WATER MANAGEMENT —

THE IMPOUNDMENT HAS BEEN SIZED TO LIMIT THE DISCHARGE TO THE PREDEVELOPED RATE OF THE 67.89 ACRE CONTRIBUTING AREA. THE DETENTION VOLUME ALLOWS FOR THE PROPOSED DEVELOPMENT OF THE SCHOOL SITE ONLY. ANY FUTURE DEVELOPMENT ON THE ADJACENT COLONIAL WILLIAMSBURG PROPERTY WOULD HAVE TO PROVIDE ITS OWN STORM WATER MANAGEMENT.

THE DISCHARGE PIPES AND DETENTION VOLUME HAVE BEEN DETERMINED USING THE RATIONAL METHOD AND FLOOD ROUTING SOFTWARE DEVELOPED BY HAESTAD METHODS

BMP —

THE BMP HAS BEEN DESIGNED TO PROVIDE EXTENDED DRY DETENTION WITH A DISCHARGE DRAINAGE TIME GREATER THAN 24 HOURS. SINCE THE DRAINAGE AREA BELOW ELEVATION 26± HAS BEEN DETERMINED TO BE WETLANDS WE HAVE CLASSIFIED THE DETENTION AREA AS A SHALLOW MARSH.

THE BMP POINT SYSTEM CALCULATIONS FOR THE SCHOOL SITE ALONE AND TOTAL DRAINAGE AREA ARE SHOWN ON THE FOLLOWING SHEETS.

SCHOOL SITE ONLY

TABLE 3

WORKSHEET FOR BMP POINT SYSTEM

A. STRUCTURAL BMP POINT ALLOCATION

BMP	BMP Points		Fraction of Site Served by BMP		Weighted BMP Points
DESIGN 4	9	x	30.44/32.82 = .927	=	8
		x		=	
		x		=	
		x		=	

TOTAL WEIGHTED STRUCTURAL BMP POINTS: 8

B. NATURAL OPEN SPACE CREDIT

Fraction of Site		Natural Open Space Credit		Points for Natural Open Space
13.2/30.44 = .403	x	40.3% x 0.1 (0.1 per 1%)	=	4

C. TOTAL WEIGHTED POINTS

8	+	4	=	12
Structural BMP Points		Natural Open Space Points		TOTAL

REGIONAL AREA

TABLE 3

WORKSHEET FOR BMP POINT SYSTEM

A. STRUCTURAL BMP POINT ALLOCATION

BMP	BMP Points		Fraction of Site Served by BMP		Weighted BMP Points	
DESIGN 4	9	x	65.51/67.89 = .965	=	8.7	
DESIGN 3	6	x	67.89/32.82	=	12.4	- (1)
DESIGN 2	4	x	"	=	8.3	- (2)
		x		=		

TOTAL WEIGHTED STRUCTURAL BMP POINTS: 8.7

B. NATURAL OPEN SPACE CREDIT

Fraction of Site		Natural Open Space Credit		Points for Natural Open Space
13.2/67.89 = .194	x	19.4% x .1 (0.1 per 1%)	=	1.9

C. TOTAL WEIGHTED POINTS

Structural BMP Points		Natural Open Space Points		TOTAL	
8.7	+	1.9	=	10.6	
(1) 12.4		0	=	12.4	✓
(2) 8.3	+	1.9	=	10.2	✓

↳ min. open space = 11.5 ac to = 1.7 PTS.

3-30-92

PROJECT : J.C.C. ELEM. SCHOOL (91.041)

SUBJECT : STORM DRAINAGE / BMP CALC.

PREDEVELOPED CONDITIONS :

TOTAL AREA = 67.89 AC.

HOUSING AREA :	A = 6.87	C = 0.45	CA = 3.09
ROAD (RT. 60) :	A = 0.79	C = 0.90	CA = 0.71
UNDEVELOPED AREA :	A = 60.23	C = 0.2	CA = 12.05
			CA = 15.85

TIME OF CONCENTRATION :

L = 900' C = 0.2 S = 1% T_c = 38 MIN. I = 3.25

Q_{2pre} = 2.31 × 15.85 = 36.6 cfs

Q_{10PRE} = 51.51 CFS.

DEVELOPED CONDITIONS :

FROM DRAINAGE CALC. :	A = 29.28	C_w = 0.42	CA = 12.29
UNDEVELOPED AREA :	A = 38.61	C = 0.2	CA = 7.72
			CA = 20.01

IMPERVIOUS AREA (SITE) : 7.96 AC = 346738 SF

VOLUME TO BE DETAINED AND RELEASED : 346738 SF × 0.08 = 27739 CF

$Q = 27739 \div \left(24 \times 60 \frac{MIN}{HR.} \times 60 \frac{SEC}{MIN.}\right) = 0.32$ CFS

SIZE PIPE BASED ON ORIFICE EQN.

$Q = CA\sqrt{2gH}$ C = 0.61 g = 32.2 FT/SEC.^{2} H = 4.0±'

$0.32 \text{ CFS} = 0.61\, A \sqrt{2(32.2)4}$

$0.0654 = A$ $A = \frac{\pi D^2}{4}$ $D^2 =$

D = 0.28

USE 3" PIPE

3-31-92

PROJECT: JCC ELEM. SCHOOL (91.041)

SUBJECT: STORM DRAINAGE / BMP CALC

ACRES DISTURBED = 17.2

VOL. OF SEDIMENT = 67 CY/AC.

17.2 AC × 67 CY/AC × 27 CF/CY = 31114.8 CF

67 × 67.9 × 27 = 122,831 = 2.8 ac ft 0.714 AC-FT

VOL. PROVIDED @ ELEV. = 24.4 ±

CLEAN OUT WHEN SEDIMENT VOLUME = 27 CY/AC.

VOLUME = 27 CY/AC × 17.2 × 27 CF/CY = 12538.8 CF

= 0.288 AC-FT

VOL. PROVIDED @ ELEV. = 23.1 ±

BMP -

DA = 67.89

Imp Area (site) = 7.96 ac or 11.7%

R_v = .155

V = 0.395 ac ft for March = @ 6" disp = 34,410 ft³ = .79 ac

– elev 28 is where this vol is attained – N.G. is 9 ft

Try 6 Pt BMP

Total Imp = 7.96 + 0.79 ac + (.25)(6.87) = 10.5 ac

10.5/67.9 = 15.4%

R_v = .189

Vol = 1.07 ac ft or 46,609 ft³

Rel Rate = 46,609 / 24 × 3600 = 0.54 cfs – 3" ø orifice

Vol achieved @ approx elev = 25

Try 4 PT BMP

½" Vol for Imp area = .5" × 10.5 ac × 1/12 = 0.44 ac ft or 19,057 ft³

= elev 23.5' rel rate = 19,057 / 12 × 3600 = 0.44 cfs – use 3" ø

POND-2 Version: 5.14
S/N: 1220515156

James City County Elementary School - Regional BMP

CALCULATED 04-01-1992 01:50:10
DISK FILE: c:\pondpack\files\JCCES-3 .VOL

Planimeter scale: 1 inch = 30 ft.

Elevation (ft)	Planimeter (sq.in.)	Area (acres)	A1+A2+sqr(A1*A2) (acres)	* Volume (acre-ft)	Volume Sum (acre-ft)
20.00	0.00	0.00	0.00	0.00	0.00
22.00	6.40	0.13	0.13	0.09	0.09
24.00	17.95	0.37	0.72	0.48	0.57
26.00	27.58	0.57	1.40	0.93	1.50
28.00	37.51	0.77	2.01	1.34	2.84
30.00	46.38	0.96	2.60	1.73	4.57

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

Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

Outlet Structure File: JCCES-3 .STR

POND-2 Version: 5.14 S/N: 1220515156
Date Executed: Time Executed:

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James City County Elementary School - Regional BMP

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

Elevation (ft)	Q (cfs)	Contributing Structures
20.00	0.0	1
21.00	0.2	1
22.00	0.3	1
23.00	0.4	1
24.00	0.5	1
24.20	0.5	5 +3 +2 +1
25.00	7.7	5 +3 +2 +1
26.00	26.6	5 +3 +2 +1
26.70	36.7	5 +4 +3 +2 +1
27.00	56.5	5 +4 +3 +2 +1
28.00	198.3	5 +4 +3 +2 +1
29.00	407.0	5 +4 +3 +2 +1
30.00	664.6	5 +4 +3 +2 +1

Outlet Structure File: JCCES-3 .STR

POND-2 Version: 5.14 S/N: 1220515156
Date Executed: Time Executed:

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James City County Elementary School - Regional BMP

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Outlet Structure File: c:\pondpack\files\JCCES-3 .STR
Planimeter Input File: c:\pondpack\files\JCCES-3 .VOL
Rating Table Output File: c:\pondpack\files\JCCES-3 .PND

Min. Elev.(ft) = 20 Max. Elev.(ft) = 30 Incr.(ft) = 1

Additional elevations (ft) to be included in table:
* *
24.2 26.7

****
SYSTEM CONNECTIVITY
****

Structure	No.	Q Table		Q Table
CULVERT-CR	5		->	5
WEIR-VR	4		->	4
CULVERT-CR	3		->	3
CULVERT-CR	2		->	2
CULVERT-CR	1		->	1

Outflow rating table summary was stored in file:
c:\pondpack\files\JCCES-3 .PND

Outlet Structure File: JCCES-3 .STR

POND-2 Version: 5.14 S/N: 1220515156
Date Executed: Time Executed:

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James City County Elementary School - Regional BMP

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>>>>>> Structure No. 5 <<<<<<
(Input Data)

CULVERT-CR
Circular Culvert (With Inlet Control)

E1 elev.(ft)?	24.2
E2 elev.(ft)?	30.001
Diam. (ft)?	1.50
Inv. el.(ft)?	24.2
Slope (ft/ft)?	0.003
T1 ratio?	
T2 ratio?	
K Coeff.?	0.0045
M Coeff.?	2.0
c Coeff.?	0.0317
Y Coeff.?	0.69
Form 1 or 2?	1
Slope factor?	-0.5

Outlet Structure File: JCCES-3 .STR

POND-2 Version: 5.14 S/N: 1220515156
Date Executed: Time Executed:

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James City County Elementary School - Regional BMP

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>>>>>> Structure No. 4 <<<<<<
(Input Data)

WEIR-VR
Weir - Vertical Rectangular

E1 elev.(ft)?	26.7
E2 elev.(ft)?	30.001
Weir coefficient?	3.33
Weir elev.(ft)?	26.7
Length (ft)?	30
Contracted/Suppressed (C/S)?	S

Outlet Structure File: JCCES-3 .STR

POND-2 Version: 5.14 S/N: 1220515156
Date Executed: Time Executed:

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James City County Elementary School - Regional BMP

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>>>>>> Structure No. 3 <<<<<<
(Input Data)

CULVERT-CR
Circular Culvert (With Inlet Control)

E1 elev.(ft)?	24.2
E2 elev.(ft)?	30.001
Diam. (ft)?	1.50
Inv. el.(ft)?	24.2
Slope (ft/ft)?	0.003
T1 ratio?	
T2 ratio?	
K Coeff.?	0.0045
M Coeff.?	2.0
c Coeff.?	0.0317
Y Coeff.?	0.69
Form 1 or 2?	1
Slope factor?	-0.5

Outlet Structure File: JCCES-3 .STR

POND-2 Version: 5.14 S/N: 1220515156
Date Executed: Time Executed:

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James City County Elementary School - Regional BMP

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

CULVERT-CR
Circular Culvert (With Inlet Control)

E1 elev.(ft)?	20
E2 elev.(ft)?	30.001
Diam. (ft)?	0.25
Inv. el.(ft)?	20.0
Slope (ft/ft)?	0.005
T1 ratio?	
T2 ratio?	
K Coeff.?	0.0045
M Coeff.?	2.0
c Coeff.?	0.0398
Y Coeff.?	0.69
Form 1 or 2?	1
Slope factor?	-0.5

Outlet Structure File: JCCES-3 .STR

POND-2 Version: 5.14 S/N: 1220515156
Date Executed: Time Executed:

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James City County Elementary School - Regional BMP

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>>>>>> Structure No. 2 <<<<<<
(Input Data)

CULVERT-CR
Circular Culvert (With Inlet Control)

E1 elev.(ft)?	24.2
E2 elev.(ft)?	30.001
Diam. (ft)?	1.50
Inv. el.(ft)?	24.20
Slope (ft/ft)?	0.003
T1 ratio?	
T2 ratio?	
K Coeff.?	0.0045
M Coeff.?	2.0
c Coeff.?	0.0317
Y Coeff.?	0.69
Form 1 or 2?	1
Slope factor?	-0.5

Outlet Structure File: JCCES-3 .STR

POND-2 Version: 5.14 S/N: 1220515156
Date Executed: Time Executed:

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James City County Elementary School - Regional BMP

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Outflow Rating Table for Structure #3
CULVERT-CR Circular Culvert (With Inlet Control)

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

Elevation (ft)	Q (cfs)	Computation Messages
20.00	0.0	E < Inv.El.= 24.2
21.00	0.0	E < Inv.El.= 24.2
22.00	0.0	E < Inv.El.= 24.2
23.00	0.0	E < Inv.El.= 24.2
24.00	0.0	E < Inv.El.= 24.2
24.20	0.0	No headwater
25.00	2.4	Equ.1: HW =.8 dc=.584 Ac=.636
26.00	8.7	Submerged: HW =1.8
26.70	12.0	Submerged: HW =2.5
27.00	13.2	Submerged: HW =2.8
28.00	16.5	Submerged: HW =3.8
29.00	19.3	Submerged: HW =4.8
30.00	21.6	Submerged: HW =5.8

Used Unsubmerged Equ. Form (1) for elev. less than 25.84 ft
Used Submerged Equation for elevations greater than 25.99 ft
HW=Headwater (ft) dc=Critical depth (ft) Ac=Area (sq.ft) at dc

Transition flows interpolated from the following values:
E1=25.84 ft; Q1=7.58 cfs; Dc=1.07 ft; E2=25.99 ft; Q2=8.66 cfs

Outlet Structure File: JCCES-3 .STR

POND-2 Version: 5.14 S/N: 1220515156
Date Executed: Time Executed:

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James City County Elementary School - Regional BMP

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Outflow Rating Table for Structure #4
WEIR-VR Weir - Vertical Rectangular

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

Elevation (ft)	Q (cfs)	Computation Messages
20.00	0.0	E < Inv.El.= 26.7
21.00	0.0	E < Inv.El.= 26.7
22.00	0.0	E < Inv.El.= 26.7
23.00	0.0	E < Inv.El.= 26.7
24.00	0.0	E < Inv.El.= 26.7
24.20	0.0	E < Inv.El.= 26.7
25.00	0.0	E < Inv.El.= 26.7
26.00	0.0	E < Inv.El.= 26.7
26.70	0.0	H =0.0
27.00	16.4	H =.3
28.00	148.1	H =1.3
29.00	348.5	H =2.3
30.00	598.9	H =3.3

C = 3.33 L (ft) = 30
H (ft) = Table elev. - Invert elev. (26.7 ft)
Q (cfs) = C * L * (H**1.5) -- Suppressed Weir

Outlet Structure File: JCCES-3 .STR

POND-2 Version: 5.14 S/N: 1220515156
Date Executed: Time Executed:

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James City County Elementary School - Regional BMP

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Outflow Rating Table for Structure #5
CULVERT-CR Circular Culvert (With Inlet Control)

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

Elevation (ft)	Q (cfs)	Computation Messages
20.00	0.0	E < Inv.El.= 24.2
21.00	0.0	E < Inv.El.= 24.2
22.00	0.0	E < Inv.El.= 24.2
23.00	0.0	E < Inv.El.= 24.2
24.00	0.0	E < Inv.El.= 24.2
24.20	0.0	No headwater
25.00	2.4	Equ.1: HW =.8 dc=.584 Ac=.636
26.00	8.7	Submerged: HW =1.8
26.70	12.0	Submerged: HW =2.5
27.00	13.2	Submerged: HW =2.8
28.00	16.5	Submerged: HW =3.8
29.00	19.3	Submerged: HW =4.8
30.00	21.6	Submerged: HW =5.8

Used Unsubmerged Equ. Form (1) for elev. less than 25.84 ft
Used Submerged Equation for elevations greater than 25.99 ft
HW=Headwater (ft) dc=Critical depth (ft) Ac=Area (sq.ft) at dc

Transition flows interpolated from the following values:
E1=25.84 ft; Q1=7.58 cfs; Dc=1.07 ft; E2=25.99 ft; Q2=8.66 cfs

Outlet Structure File: JCCES-3 .STR

POND-2 Version: 5.14 S/N: 1220515156
Date Executed: Time Executed:

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James City County Elementary School - Regional BMP

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Outflow Rating Table for Structure #2
CULVERT-CR Circular Culvert (With Inlet Control)

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

Elevation (ft)	Q (cfs)	Computation Messages
20.00	0.0	E < Inv.El.= 24.2
21.00	0.0	E < Inv.El.= 24.2
22.00	0.0	E < Inv.El.= 24.2
23.00	0.0	E < Inv.El.= 24.2
24.00	0.0	E < Inv.El.= 24.2
24.20	0.0	No headwater
25.00	2.4	Equ.1: HW =.8 dc=.584 Ac=.636
26.00	8.7	Submerged: HW =1.8
26.70	12.0	Submerged: HW =2.5
27.00	13.2	Submerged: HW =2.8
28.00	16.5	Submerged: HW =3.8
29.00	19.3	Submerged: HW =4.8
30.00	21.6	Submerged: HW =5.8

Used Unsubmerged Equ. Form (1) for elev. less than 25.84 ft
Used Submerged Equation for elevations greater than 25.99 ft
HW=Headwater (ft) dc=Critical depth (ft) Ac=Area (sq.ft) at dc

Transition flows interpolated from the following values:
E1=25.84 ft; Q1=7.58 cfs; Dc=1.07 ft; E2=25.99 ft; Q2=8.66 cfs

Outlet Structure File: JCCES-3 .STR

POND-2 Version: 5.14 S/N: 1220515156
Date Executed: Time Executed:

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James City County Elementary School - Regional BMP

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Outflow Rating Table for Structure #1
CULVERT-CR Circular Culvert (With Inlet Control)

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

Elevation (ft)	Q (cfs)	Computation Messages
20.00	0.0	No headwater
21.00	0.2	Submerged: HW =1.0
22.00	0.3	Submerged: HW =2.0
23.00	0.4	Submerged: HW =3.0
24.00	0.5	Submerged: HW =4.0
24.20	0.5	Submerged: HW =4.2
25.00	0.5	Submerged: HW =5.0
26.00	0.6	Submerged: HW =6.0
26.70	0.6	Submerged: HW =6.7
27.00	0.6	Submerged: HW =7.0
28.00	0.7	Submerged: HW =8.0
29.00	0.7	Submerged: HW =9.0
30.00	0.8	Submerged: HW =10.0

Used Unsubmerged Equ. Form (1) for elev. less than 20.27 ft
Used Submerged Equation for elevations greater than 20.33 ft
HW=Headwater (ft) dc=Critical depth (ft) Ac=Area (sq.ft) at dc

Transition flows interpolated from the following values:
E1=20.27 ft; Q1=.09 cfs; Dc=.18 ft; E2=20.33 ft; Q2=9.999 cfs

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*********************************************************************
*                                                                   *
* James City County Elementary School - Regional BMP  10 YR Storm   *
*                                                                   *
*                                                                   *
*                                                                   *
*                                                                   *
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Inflow Hydrograph: c:\pondpack\files\JCCES-3 .HYD
Rating Table file: c:\pondpack\files\JCCES-3 .PND

----INITIAL CONDITIONS----
Elevation = 20.00 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
20.00	0.0	0.000
21.00	0.2	0.011
22.00	0.3	0.088
23.00	0.4	0.270
24.00	0.5	0.571
24.20	0.5	0.647
25.00	7.7	0.988
26.00	26.6	1.505
26.70	36.7	1.927
27.00	56.5	2.123
28.00	198.3	2.844
29.00	407.0	3.664
30.00	664.6	4.574

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
16.0	16.2
128.0	128.3
392.0	392.4
829.2	829.7
939.5	940.0
1434.7	1442.4
2184.5	2211.1
2797.9	2834.6
3082.4	3138.9
4129.2	4327.5
5318.5	5725.5
6640.7	7305.3

Time increment (t) = 0.017 hrs.

EXECUTED: 04-01-1992 01:51:06

Pond File: c:\pondpack\files\JCCES-3 .PND
Inflow Hydrograph: c:\pondpack\files\JCCES-3 .HYD
Outflow Hydrograph: c:\pondpack\files\OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.000	0.00	-----	0.0	0.0	0.00	20.00
0.017	1.71	1.7	1.7	1.7	0.02	20.11
0.033	3.42	5.1	6.6	6.8	0.08	20.42
0.050	5.13	8.6	14.8	15.2	0.19	20.94
0.067	6.84	12.0	26.4	26.8	0.21	21.09
0.083	8.56	15.4	41.3	41.8	0.22	21.23
0.100	10.27	18.8	59.7	60.1	0.24	21.39
0.117	11.98	22.3	81.4	81.9	0.26	21.59
0.133	13.69	25.7	106.5	107.1	0.28	21.81
0.150	15.40	29.1	135.0	135.6	0.30	22.03
0.167	17.11	32.5	166.9	167.5	0.31	22.15
0.183	18.82	35.9	202.1	202.8	0.33	22.28
0.200	20.53	39.4	240.8	241.5	0.34	22.43
0.217	22.24	42.8	282.9	283.6	0.36	22.59
0.233	23.96	46.2	328.3	329.1	0.38	22.76
0.250	25.67	49.6	377.1	377.9	0.39	22.95
0.267	27.38	53.1	429.4	430.2	0.41	23.09
0.283	29.09	56.5	485.0	485.8	0.42	23.21
0.300	30.80	59.9	544.0	544.9	0.43	23.35
0.317	32.51	63.3	606.4	607.3	0.45	23.49
0.333	34.22	66.7	672.2	673.2	0.46	23.64
0.350	35.93	70.2	741.4	742.4	0.48	23.80
0.367	37.65	73.6	814.0	815.0	0.50	23.97
0.383	39.36	77.0	890.0	891.0	0.50	24.11
0.400	41.07	80.4	968.6	970.5	0.94	24.25
0.417	42.78	83.8	1048.2	1052.4	2.11	24.38
0.433	44.49	87.3	1128.9	1135.5	3.30	24.51
0.450	46.20	90.7	1210.6	1219.6	4.51	24.65
0.467	47.91	94.1	1293.2	1304.7	5.73	24.78
0.483	49.62	97.5	1376.8	1390.7	6.96	24.92
0.500	51.33	101.0	1460.6	1477.8	8.57	25.05
0.517	53.05	104.4	1543.6	1565.0	10.72	25.16
0.533	54.76	107.8	1625.7	1651.4	12.84	25.27
0.550	56.47	111.2	1707.1	1736.9	14.94	25.38
0.567	58.18	114.7	1787.7	1821.7	17.03	25.49
0.583	59.89	118.1	1867.5	1905.7	19.09	25.60
0.600	61.60	121.5	1946.7	1989.0	21.14	25.71
0.617	63.31	124.9	2025.3	2071.7	23.17	25.82
0.633	65.02	128.3	2103.3	2153.6	25.19	25.93
0.650	63.31	128.3	2177.7	2231.6	26.93	26.02
0.667	61.60	124.9	2246.5	2302.6	28.08	26.10
0.683	59.89	121.5	2309.7	2368.0	29.14	26.18
0.700	58.18	118.1	2367.5	2427.8	30.11	26.24
0.717	56.47	114.7	2420.2	2482.2	30.99	26.30
0.733	54.76	111.2	2467.9	2531.4	31.79	26.36

EXECUTED: 04-01-1992 01:51:06

Pond File: c:\pondpack\files\JCCES-3 .PND
Inflow Hydrograph: c:\pondpack\files\JCCES-3 .HYD
Outflow Hydrograph: c:\pondpack\files\OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.750	53.05	107.8	2510.7	2575.7	32.51	26.41
0.767	51.33	104.4	2548.8	2615.0	33.14	26.45
0.783	49.62	101.0	2582.3	2649.7	33.70	26.49
0.800	47.91	97.5	2611.4	2679.8	34.19	26.53
0.817	46.20	94.1	2636.3	2705.6	34.61	26.56
0.833	44.49	90.7	2657.1	2727.0	34.96	26.58
0.850	42.78	87.3	2673.9	2744.4	35.24	26.60
0.867	41.07	83.8	2686.8	2757.8	35.45	26.61
0.884	39.36	80.4	2696.1	2767.3	35.61	26.62
0.900	37.65	77.0	2701.7	2773.1	35.70	26.63
0.917	35.93	73.6	2703.8	2775.2	35.74	26.63
0.934	34.22	70.2	2702.5	2773.9	35.72	26.63
0.950	32.51	66.7	2697.9	2769.2	35.64	26.63
0.967	30.80	63.3	2690.2	2761.2	35.51	26.62
0.984	29.09	59.9	2679.4	2750.1	35.33	26.61
1.000	27.38	56.5	2665.7	2735.9	35.10	26.59
1.017	25.67	53.1	2649.1	2718.8	34.82	26.57
1.034	23.96	49.6	2629.8	2698.7	34.50	26.55
1.050	22.24	46.2	2607.7	2676.0	34.13	26.52
1.067	20.53	42.8	2583.0	2650.5	33.72	26.49
1.084	18.82	39.4	2555.9	2622.4	33.26	26.46
1.100	17.11	35.9	2526.3	2591.8	32.77	26.43
1.117	15.40	32.5	2494.3	2558.8	32.23	26.39
1.134	13.69	29.1	2460.1	2523.4	31.66	26.35
1.150	11.98	25.7	2423.6	2485.7	31.05	26.31
1.167	10.27	22.3	2385.1	2445.9	30.40	26.26
1.184	8.56	18.8	2344.5	2403.9	29.72	26.22
1.200	6.84	15.4	2301.9	2359.9	29.01	26.17
1.217	5.13	12.0	2257.3	2313.8	28.26	26.12
1.234	3.42	8.6	2210.9	2265.8	27.49	26.06
1.250	1.71	5.1	2162.6	2216.0	26.68	26.01
1.267	0.00	1.7	2113.5	2164.4	25.45	25.94

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

Pond File: c:\pondpack\files\JCCES-3 .PND
Inflow Hydrograph: c:\pondpack\files\JCCES-3 .HYD
Outflow Hydrograph: c:\pondpack\files\OUT .HYD

Starting Pond W.S. Elevation = 20.00 ft

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

Peak Inflow = 65.02 cfs
Peak Outflow = 35.74 cfs - < $Q_{2\,pre}$ = 36.6
Peak Elevation = 26.63 ft

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

Initial Storage = 0.00 ac-ft
Peak Storage From Storm = 1.89 ac-ft

Total Storage in Pond = 1.89 ac-ft

Pond File: c:\pondpack\files\JCCES-3 .PND
Inflow Hydrograph: c:\pondpack\files\JCCES-3 .HYD
Outflow Hydrograph: c:\pondpack\files\OUT .HYD
EXECUTED: 04-01-1992
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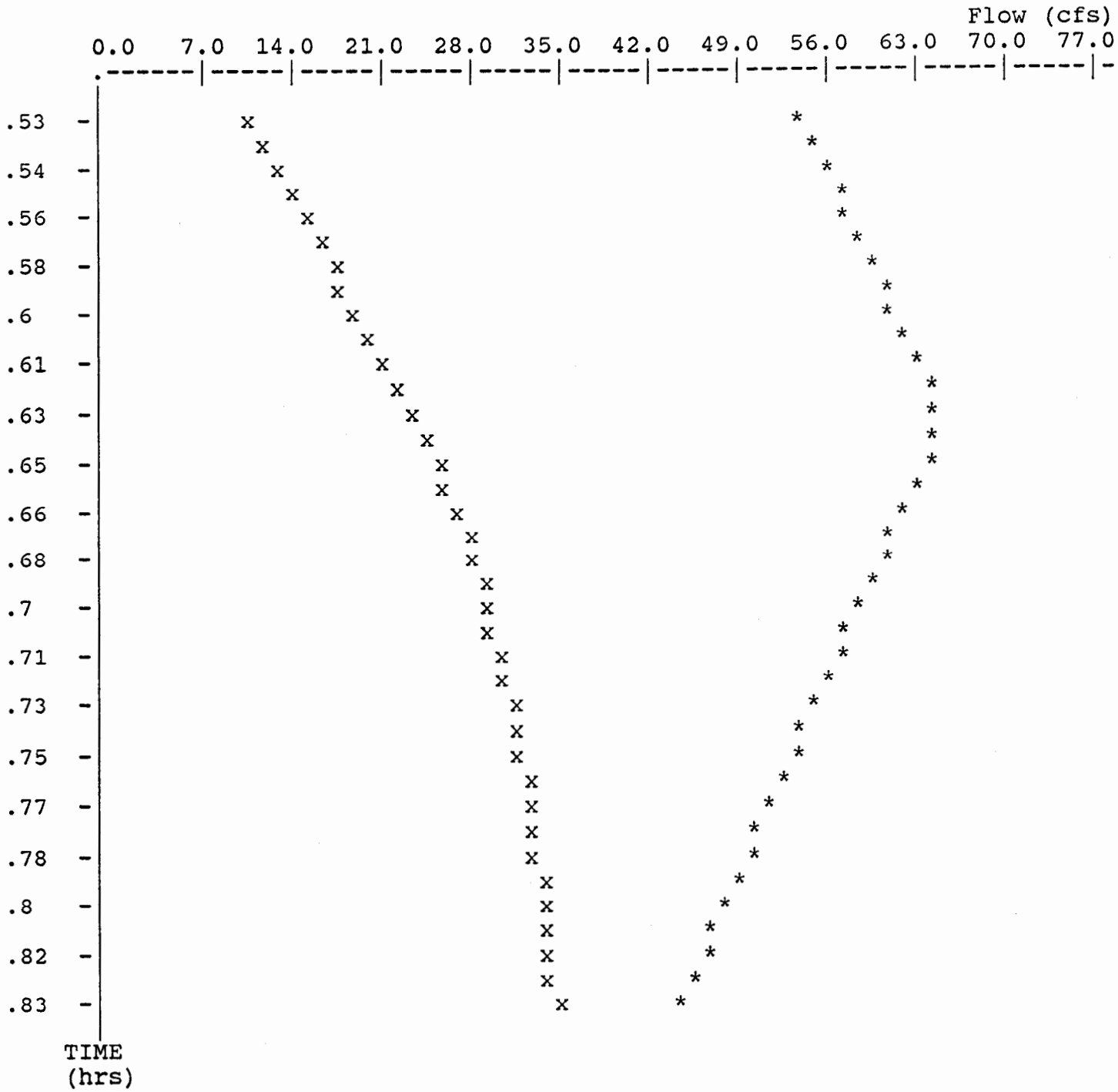
Peak Inflow = 65.02 cfs
Peak Outflow = 35.74 cfs
Peak Elevation = 26.63 ft



x File: c:\pondpack\files\JCCES-3 .HYD Qmax = 35.7 cfs
* File: c:\pondpack\files\OUT .HYD Qmax = 65.0 cfs

```
*********************************************************************
*                                                                   *
* James City County Elementary School - Regional BMP 100 YR Storm   *
*                                                                   *
*                                                                   *
*                                                                   *
*                                                                   *
*********************************************************************
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Inflow Hydrograph: c:\pondpack\files\JCCES-4 .HYD
Rating Table file: c:\pondpack\files\JCCES-3 .PND

----INITIAL CONDITIONS----
Elevation = 20.00 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA			INTERMEDIATE ROUTING COMPUTATIONS	
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)	2S/t (cfs)	2S/t + O (cfs)
20.00	0.0	0.000	0.0	0.0
21.00	0.2	0.011	16.0	16.2
22.00	0.3	0.088	128.0	128.3
23.00	0.4	0.270	392.0	392.4
24.00	0.5	0.571	829.2	829.7
24.20	0.5	0.647	939.5	940.0
25.00	7.7	0.988	1434.7	1442.4
26.00	26.6	1.505	2184.5	2211.1
26.70	36.7	1.927	2797.9	2834.6
27.00	56.5	2.123	3082.4	3138.9
28.00	198.3	2.844	4129.2	4327.5
29.00	407.0	3.664	5318.5	5725.5
30.00	664.6	4.574	6640.7	7305.3

Time increment (t) = 0.017 hrs.

Pond File: c:\pondpack\files\JCCES-3 .PND
Inflow Hydrograph: c:\pondpack\files\JCCES-4 .HYD
Outflow Hydrograph: c:\pondpack\files\OUT .HYD

INFLOW HYDROGRAPH

TIME (hrs)	INFLOW (cfs)
0.000	0.00
0.017	2.15
0.033	4.30
0.050	6.45
0.067	8.60
0.083	10.75
0.100	12.90
0.117	15.05
0.133	17.20
0.150	19.35
0.167	21.49
0.183	23.64
0.200	25.79
0.217	27.94
0.233	30.09
0.250	32.24
0.267	34.39
0.283	36.54
0.300	38.69
0.317	40.84
0.333	42.99
0.350	45.14
0.367	47.29
0.383	49.44
0.400	51.59
0.417	53.74
0.433	55.89
0.450	58.04
0.467	60.19
0.483	62.33
0.500	64.48
0.517	66.63
0.533	68.78
0.550	70.93
0.567	73.08
0.583	75.23
0.600	77.38
0.617	79.53
0.633	81.68
0.650	81.68
0.667	81.68
0.683	81.68
0.700	81.68
0.717	81.68
0.733	81.68

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
-----	0.0	0.0	0.00	20.00
2.2	2.1	2.2	0.03	20.13
6.4	8.3	8.5	0.11	20.53
10.8	18.7	19.1	0.20	21.03
15.1	33.3	33.7	0.22	21.16
19.4	52.2	52.6	0.23	21.33
23.7	75.3	75.8	0.25	21.53
28.0	102.7	103.3	0.28	21.78
32.3	134.4	135.0	0.30	22.03
36.6	170.3	170.9	0.32	22.16
40.8	210.5	211.1	0.33	22.31
45.1	254.9	255.6	0.35	22.48
49.4	303.6	304.3	0.37	22.67
53.7	356.5	357.3	0.39	22.87
58.0	413.8	414.6	0.41	23.05
62.3	475.3	476.1	0.42	23.19
66.6	541.0	541.9	0.43	23.34
70.9	611.1	612.0	0.45	23.50
75.2	685.3	686.3	0.47	23.67
79.5	763.9	764.9	0.49	23.85
83.8	846.7	847.7	0.50	24.03
88.1	933.9	934.9	0.50	24.19
92.4	1022.8	1026.3	1.74	24.34
96.7	1113.4	1119.6	3.07	24.49
101.0	1205.6	1214.4	4.43	24.64
105.3	1299.3	1310.9	5.82	24.79
109.6	1394.5	1408.9	7.22	24.95
113.9	1489.7	1508.4	9.32	25.09
118.2	1584.4	1608.0	11.77	25.22
122.5	1678.5	1706.9	14.20	25.34
126.8	1772.1	1805.3	16.62	25.47
131.1	1865.1	1903.2	19.03	25.60
135.4	1957.7	2000.6	21.42	25.73
139.7	2049.8	2097.4	23.80	25.85
144.0	2141.5	2193.8	26.17	25.98
148.3	2234.0	2289.8	27.87	26.09
152.6	2327.8	2386.6	29.44	26.20
156.9	2422.6	2484.7	31.03	26.31
161.2	2518.5	2583.8	32.64	26.42
163.4	2613.5	2681.9	34.23	26.53
163.4	2705.3	2776.8	35.76	26.64
163.4	2790.8	2868.6	38.91	26.73
163.4	2865.2	2954.2	44.48	26.82
163.4	2929.9	3028.6	49.32	26.89
163.4	2986.2	3093.3	53.53	26.96

Pond File: c:\pondpack\files\JCCES-3 .PND
Inflow Hydrograph: c:\pondpack\files\JCCES-4 .HYD
Outflow Hydrograph: c:\pondpack\files\OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.750	81.68	163.4	3034.0	3149.6	57.77	27.01
0.767	81.68	163.4	3070.5	3197.4	63.48	27.05
0.783	81.68	163.4	3098.2	3233.8	67.82	27.08
0.800	79.53	161.2	3117.6	3259.4	70.87	27.10
0.817	77.38	156.9	3129.2	3274.5	72.68	27.11
0.833	75.23	152.6	3134.7	3281.8	73.55	27.12
0.850	73.08	148.3	3135.6	3283.0	73.69	27.12
0.867	70.93	144.0	3133.1	3279.6	73.29	27.12
0.884	68.78	139.7	3127.8	3272.8	72.47	27.11
0.900	66.63	135.4	3120.6	3263.2	71.33	27.10
0.917	64.48	131.1	3111.8	3251.7	69.95	27.09
0.934	62.33	126.8	3101.8	3238.6	68.39	27.08
0.950	60.19	122.5	3090.9	3224.3	66.69	27.07
0.967	58.04	118.2	3079.4	3209.2	64.88	27.06
0.984	55.89	113.9	3067.4	3193.3	62.99	27.05
1.000	53.74	109.6	3054.9	3177.0	61.04	27.03
1.017	51.59	105.3	3042.1	3160.2	59.04	27.02
1.034	49.44	101.0	3029.2	3143.2	57.01	27.00
1.050	47.29	96.7	3014.6	3125.9	55.65	26.99
1.067	45.14	92.4	2998.2	3107.0	54.42	26.97
1.084	42.99	88.1	2980.1	3086.3	53.08	26.95
1.100	40.84	83.8	2960.7	3064.0	51.62	26.93
1.117	38.69	79.5	2940.1	3040.3	50.08	26.90
1.134	36.54	75.2	2918.4	3015.3	48.46	26.88
1.150	34.39	70.9	2895.8	2989.3	46.77	26.85
1.167	32.24	66.6	2872.4	2962.4	45.02	26.83
1.184	30.09	62.3	2848.3	2934.7	43.21	26.80
1.200	27.94	58.0	2823.6	2906.3	41.37	26.77
1.217	25.79	53.7	2798.4	2877.3	39.48	26.74
1.234	23.64	49.4	2772.7	2847.8	37.56	26.71
1.250	21.49	45.1	2745.0	2817.8	36.43	26.68
1.267	19.35	40.8	2714.0	2785.8	35.91	26.65
1.284	17.20	36.6	2679.9	2750.5	35.34	26.61
1.300	15.05	32.3	2642.7	2712.1	34.72	26.56
1.317	12.90	28.0	2602.5	2670.6	34.04	26.52
1.334	10.75	23.7	2559.5	2626.2	33.32	26.47
1.350	8.60	19.4	2513.8	2578.9	32.56	26.41
1.367	6.45	15.1	2465.3	2528.8	31.75	26.36
1.384	4.30	10.8	2414.3	2476.1	30.89	26.30
1.400	2.15	6.4	2360.8	2420.8	30.00	26.24
1.417	0.00	2.2	2304.8	2362.9	29.06	26.17

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

Pond File: c:\pondpack\files\JCCES-3 .PND
Inflow Hydrograph: c:\pondpack\files\JCCES-4 .HYD
Outflow Hydrograph: c:\pondpack\files\OUT .HYD

Starting Pond W.S. Elevation = 20.00 ft

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

Peak Inflow = 81.68 cfs
Peak Outflow = 73.69 cfs
Peak Elevation = 27.12 ft - ok

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

Initial Storage = 0.00 ac-ft
Peak Storage From Storm = 2.21 ac-ft

Total Storage in Pond = 2.21 ac-ft

Pond File: c:\pondpack\files\JCCES-3 .PND
Inflow Hydrograph: c:\pondpack\files\JCCES-4 .HYD
Outflow Hydrograph: c:\pondpack\files\OUT .HYD
EXECUTED: 04-01-1992
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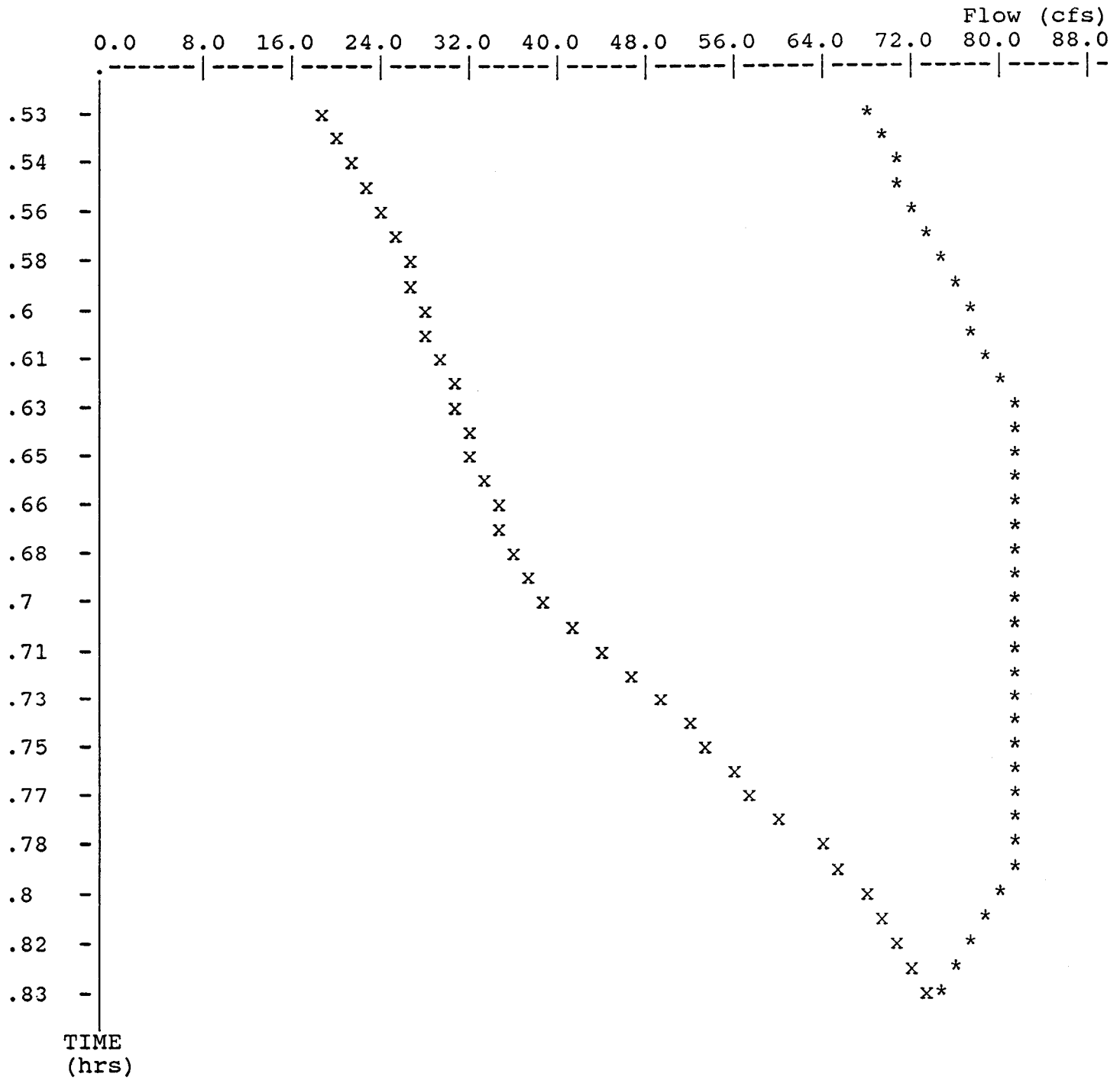
Peak Inflow = 81.68 cfs
Peak Outflow = 73.69 cfs
Peak Elevation = 27.12 ft



x File: c:\pondpack\files\JCCES-4 .HYD Qmax = 73.7 cfs
* File: c:\pondpack\files\OUT .HYD Qmax = 81.7 cfs

PROJ. NO.: 91.078
DESIGNED BY: REG / RWC
CHECKED BY:

PROJ. NAME: J.C.C. ELEM. SCHOOL
LOCATION: J.C.C. - CARTER'S GROVE
DATE: 3-11-92

C. ALLAN BAMFORTH, JR.
ENGINEER SURVEYOR
NORFOLK, VIRGINIA

STORM SEWER DESIGN COMPUTATIONS

FROM POINT	TO POINT	AREA DRAIN "A"	RUN-OFF COEF.	C A		INLET TIME	RAIN FALL	RUNOFF "Q" C.F.S.		INVERT ELEV.		LENGTH OF PIPE	SLOPE OF PIPE	DIA. OF PIPE	VEL. OF PIPE	CAPA-CITY	FLOW TIME IN PIPE	TOP OF PIPE ELEV.	RIM ELEV.	REMARKS
		ACRES	C	INCRE-MENT	ACCUM-ULATED	MIN-UTES	INCHES	INCRE-MENT	ACCUM-ULATED	UPPER END	LOWER END	FT.	FT./FT.	INCHES	FT./SEC.	C.F.S.	MIN-UTES	FT.	FT.	
1	2	0.54	0.44		0.24	13.8	5.33		1.28	65.80	63.75	293	0.0070	15	4.41	5.41	1.1		-	
2	3	0.28	0.90	0.25	0.49	14.9	5.18		2.54	63.75	63.63	40	0.0030	15	2.88	3.54			67.26	
4	16	8.12	0.43	3.49	3.98	20.0	4.58		18.23	59.00	58.07	107	0.0087	24	6.71	21.07				L=350 C=0.40 S=1.7%
5	7	0.20	0.90	-	0.18	-				61.55	61.17	73	0.0052	15					66.30	CONTRIBUTING AREA FROM ROOF DRAINS ONLY.
6	7	0.24	0.67	0.16	-	13.7	5.34	0.86		61.26	61.17	6'	0.0156	15					65.72	
7	11	0.32	0.70	0.22	0.56	13.7	5.34		2.99	61.17	60.76	135	0.0030	15	2.88	3.54	0.8		65.26	
8	9	0.21	0.9	-	0.19	-			-	62.70	62.37	63	0.0052	12					66.50	CONTRIBUTING AREA FROM ROOF DRAINS ONLY
9	11	0.32	0.9	0.29	0.48	-				61.82	60.76	203	0.0052	15					66.60	"
10	11	0.18	0.86	0.15	-	8.8	6.15	0.92	-	60.85	60.76	6	0.0156	15					65.15	
11	12	0.31	0.67	0.21	1.40	14.5	5.23		7.32	60.26	60.16	20	0.0052	21	4.74	11.39	0.1		64.75	
12	13	0.32	0.62	0.20	1.60	14.6	5.22		8.35	60.16	60.02	48	0.0030	21	3.61	8.68			65.00	
13	14	0.48	0.58	0.28	1.88	21.9	4.39		↓	60.02	59.77	84	0.0030	21	3.61	8.68	0.4		65.17	L=90' C=0.2 S=0.55% t=20.8 + 130' IN G.P. @ 2.0 FPS T=1.1
14	15	0.11	0.9	0.10	1.98	22.3	4.35		8.61	59.52	59.14	192	0.0020	24	3.22	10.12	1.0		65.65	
15	16	0.51	0.75	0.38	2.36	23.3	4.26		10.05	58.38	58.07	126	0.0025	24	3.60	11.31	0.6	60.63	63.11	
16	20	0.51	0.9	0.46	6.34	23.9	4.20		26.63	57.07	56.86	106	0.0020	36	4.72	33.35	0.4	60.40	62.36	

12.65

SHEET ____ OF ____

PROJ. NO.: 91,078
DESIGNED BY: REG / RWC
CHECKED BY:

PROJ. NAME: J.C.C. ELEM SCH.
LOCATION: J.C.C. - CARTER'S GROVE
DATE: 3-11-92

C. ALLAN BAMFORTH, JR.
ENGINEER SURVEYOR
NORFOLK, VIRGINIA

STORM SEWER DESIGN COMPUTATIONS

FROM POINT	TO POINT	AREA DRAIN "A"	RUN-OFF COEF.	C A		INLET TIME	RAIN FALL	RUNOFF "Q" C.F.S.		INVERT ELEV.		LENGTH OF PIPE	SLOPE OF PIPE	DIA. OF PIPE	VEL. OF PIPE	CAPA-CITY	FLOW TIME IN PIPE	TOP OF PIPE ELEV.	RIM ELEV.	REMARKS
		ACRES	C	INCRE-MENT	ACCUM-ULATED	MIN-UTES	INCHES	INCRE-MENT	ACCUM-ULATED	UPPER END	LOWER END	FT.	FT./FT.	INCHES	FT./SEC.	C.F.S.	MIN-UTES	FT.	FT.	
17	18	0.28	0.55	-	0.15	15.2	5.14		0.77	60.27	60.13	71	0.0020	15	2.35	2.89	0.5		64.00	L=90' C=0.2 S=2.8% t=15.2
18	20	0.32	0.50	0.16	0.31	15.7	5.06		1.57	60.13	59.63	168	0.0030	15	2.88	3.54			64.00	
19	20	1.17	0.20		0.23	22.6			0.99	58.80	58.70	24	0.0040	15	3.33	4.09	0.1		-	L=260' C=0.2 S=2.3% t=22.6
20	21	0.98	0.76	0.74	7.62	24.3	4.17		31.78	56.86	56.29	227	0.0025	36	4.72	33.35	0.8		63.15	
21	23	0.24	0.43	0.10	7.72	25.1	4.10		↓	56.29	56.02	109	0.0025	36	4.72	33.35	0.4		64.00	
22	23	0.25	0.80		0.20	10.3	5.68		1.18	61.86	58.18	177	0.0208	15					66.15	L=27' C=0.2 S=2% t=10.3
23	24	0.53	0.25	0.13	8.05	25.5	4.07		32.75	54.68	54.09	147	0.0040	36	5.97	42.19	0.4		61.50	
24	30	2.05	0.40	0.82	8.87	25.9	4.04		35.63	53.59	53.34	124	0.0020	42	4.68	44.99	0.4		58.90	
25	26	0.24	0.75	-	0.18	13.6	5.36	-	0.96	63.15	62.99	41	0.0040	12	2.87	2.25	0.2		66.15	L=45' C=0.2 S=12% t=13.6
26	28	0.15	0.76	0.11	0.29	13.8	5.33		1.55	62.74	62.63	56	0.0020	15	2.35	2.89	0.4		66.10	
27	28	0.17	0.57	0.10	-	16.0	5.04	0.50		62.83	62.63	98	0.0020	15	2.35	2.89	0.7		65.85	
28	29	0.11	0.39	0.04	0.43	16.7	4.95		2.12	61.63	61.40	77	0.0030	15	2.88	3.54	0.4		66.10	
29	30	0.12	0.72	0.09	0.52	17.1	4.90		2.55	59.40	59.00	135	0.0030	15	2.88	3.54			64.47	
30	37	-	-	-	9.39	26.3	4.00		37.56	52.88	52.00	439	0.0020	42	4.68	44.99			63.00	

6.61

SHEET ____ OF ____

PROJ. NO.: 91.078
DESIGNED BY:
CHECKED BY:

PROJ. NAME: JCC. ELEM. SCHOOL
LOCATION:
DATE: 3-11-92

C. ALLAN BAMFORTH, JR.
ENGINEER SURVEYOR
NORFOLK, VIRGINIA

STORM SEWER DESIGN COMPUTATIONS

FROM POINT	TO POINT	AREA DRAIN "A"	RUN-OFF COEF.	C A		INLET TIME	RAIN FALL	RUNOFF "Q" C.F.S.		INVERT ELEV.		LENGTH OF PIPE	SLOPE OF PIPE	DIA. OF PIPE	VEL. OF PIPE	CAPA-CITY	FLOW TIME IN PIPE	TOP OF PIPE ELEV.	RIM ELEV.	REMARKS
		ACRES	C	INCRE-MENT	ACCUM-ULATED	MIN-UTES	INCHES	INCRE-MENT	ACCUM-ULATED	UPPER END	LOWER END	FT.	FT./FT.	INCHES	FT./SEC.	C.F.S.	MIN-UTES	FT.	FT.	
31	33	0.92	0.65	-	0.60	16.0	5.04		3.02	60.07	59.03	100	0.0104	15	5.38	6.60	0.3		63.57	L=65' C=0.2 S=3.6% t=12.6 + 405 IN G.P. @ 2 FPS t=3.4
32	33	0.26	0.90	-	0.23	5.0	6.96		1.60	60.32	59.03	62	0.0208	15					64.19	
33	34	-	-	-	0.83	16.3	5.00		4.15	57.03	56.45	194	0.0030	18	3.26	5.75	1.0		62.12	
34	37	0.42	0.9	0.38	1.21	17.3	4.66		5.90	56.45	55.37	282	0.0040	18	3.76	6.64			60.22	
35	36	8.08	0.20		1.62	33.8	3.48		5.64	53.40	52.79	306	0.0020	21	2.95	7.09	1.7		55.90	L=450 C=0.2 S=1.3% t=31.5 + 210 IN SWALE @ 1.5 FPS t=2.3
36	37	0.34	0.20	0.07	1.69	35.5	3.38		5.72	52.79	52.00	394	0.0020	21	2.95	7.09	2.2		61.68	
37	38	-	-		12.29	37.7	3.26		40.07	52.00	51.77	113	0.0020	42	4.68	44.99			59.00	

10.02

SHEET ____ OF ____

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WATERSHED	JR
BMP ID NO	002
PLAN NO	
TAX PARCEL	(59-2)(1-46)
PIN NO	59201000046
CONSTRUCTION DATE	8/1/1992
PROJECT NAME	James River Elementary School
FACILITY LOCATION	8901 Pocahontas Trail
CITY-STATE	Williamsburg, VA
CURRENT OWNER	WJCC Schools
OWNER ADDRESS	County School Board
OWNER ADDRESS 2	
CITY-STATE-ZIP CODE	Williamsburg, VA 23185
OWNER PHONE	
MAINT AGREEMENT	Yes
EMERG ACTION PLAN	No

Get Last BMP No

Return to Menu

MAINTENANCE PLAN	No	CTRL STRUC DESC	
SITE AREA acre	33	CTRL STRUC SIZE inches	
LAND USE	Public School	OTLT BARRL DESC	RCP
old BMP TYP	Dry Pond	OTLT BARRL SIZE inch	12
JCC BMP CODE	F2 Dry ED with forebay		
POINT VALUE	6	EMERG SPILLWAY	No
		DESIGN HW ELEV	
		PERM POOL ELEV	
SVC DRAIN AREA acres	68	2-YR OUTFLOW cfs	
		10-YR OUTFLOW cfs	
		REC DRAWING	No
SERVICE AREA DESCRI	US 60 and CW property		
IMPERV AREA acres	7.96	CONSTR CERTIF	No
RECV STREAM	UT of James River		
EXT DET-WQ-CTRL	No	LAST INSP DATE 11/8/2000	Inspected by:
WTR QUAL VOL acre-ft	0	INTERNAL RATING	2
CHAN PROT CTRL	No	MISC/COMMENTS	
CHAN PROT VOL acre-ft	1.1		
SW/FLOOD CONTROL	No		
GEOTECH REPORT	No		

Additional Comments: