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: **CC-003**

DATE VERIFIED: **March 22, 2012**

QUALITY ASSURANCE TECHNICIAN: **Leah Hardenbergh**

Leah Hardenbergh

LOCATION: WILLIAMSBURG, VIRGINIA

Stormwater Division

MEMORANDUM

DATE: March 10, 2010

TO: Michael J. Gillis, Virginia Correctional Enterprises Document Management Services

FROM: Jo Anna Ripley, Stormwater

PO: 270712

RE: Files Approved for Scanning

General File ID or BMP ID: CC003

PIN: 3910100131

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

Property Description: Senior Care/Retirment Facility

Site Address: 3800 Treyburn Drive

(For internal use only) **Box** 10 **Drawer:** 6

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

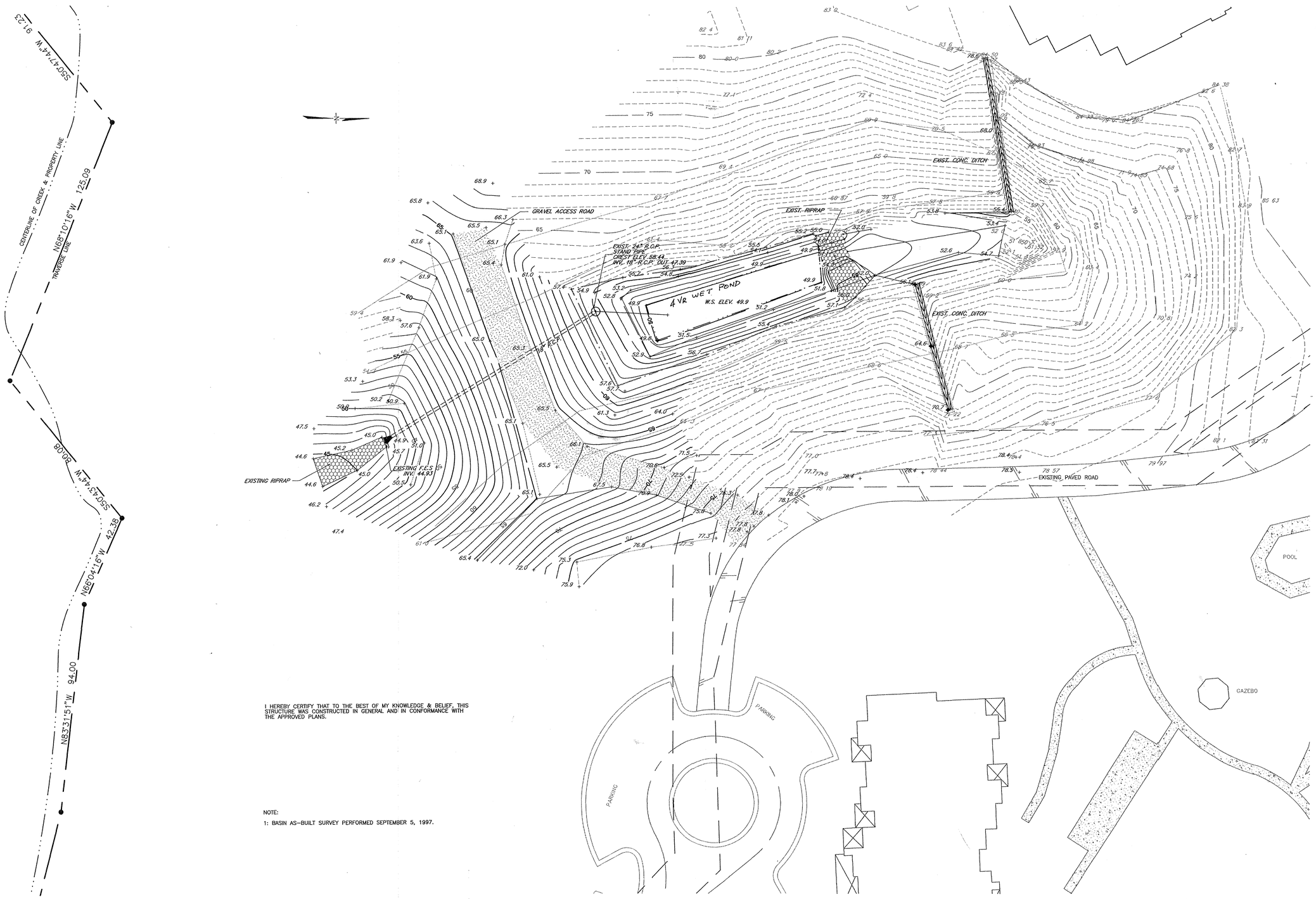
Comments

CC003

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



I HEREBY CERTIFY THAT TO THE BEST OF MY KNOWLEDGE & BELIEF, THIS STRUCTURE WAS CONSTRUCTED IN GENERAL AND IN CONFORMANCE WITH THE APPROVED PLANS.

NOTE:

1: BASIN AS-BUILT SURVEY PERFORMED SEPTEMBER 5, 1997.

GRAPHIC SCALE 1"=20'

0 20 40 60

COMMONWEALTH OF VIRGINIA
9-15-97
STEPHEN A. ROMEO
No. 14B5-B
LAND SURVEYOR

Langley and McDonald, P.C.

Engineers • Surveyors • Planners
Landscape Architects • Environmental Consultants

VIRGINIA BEACH WILLIAMSBURG

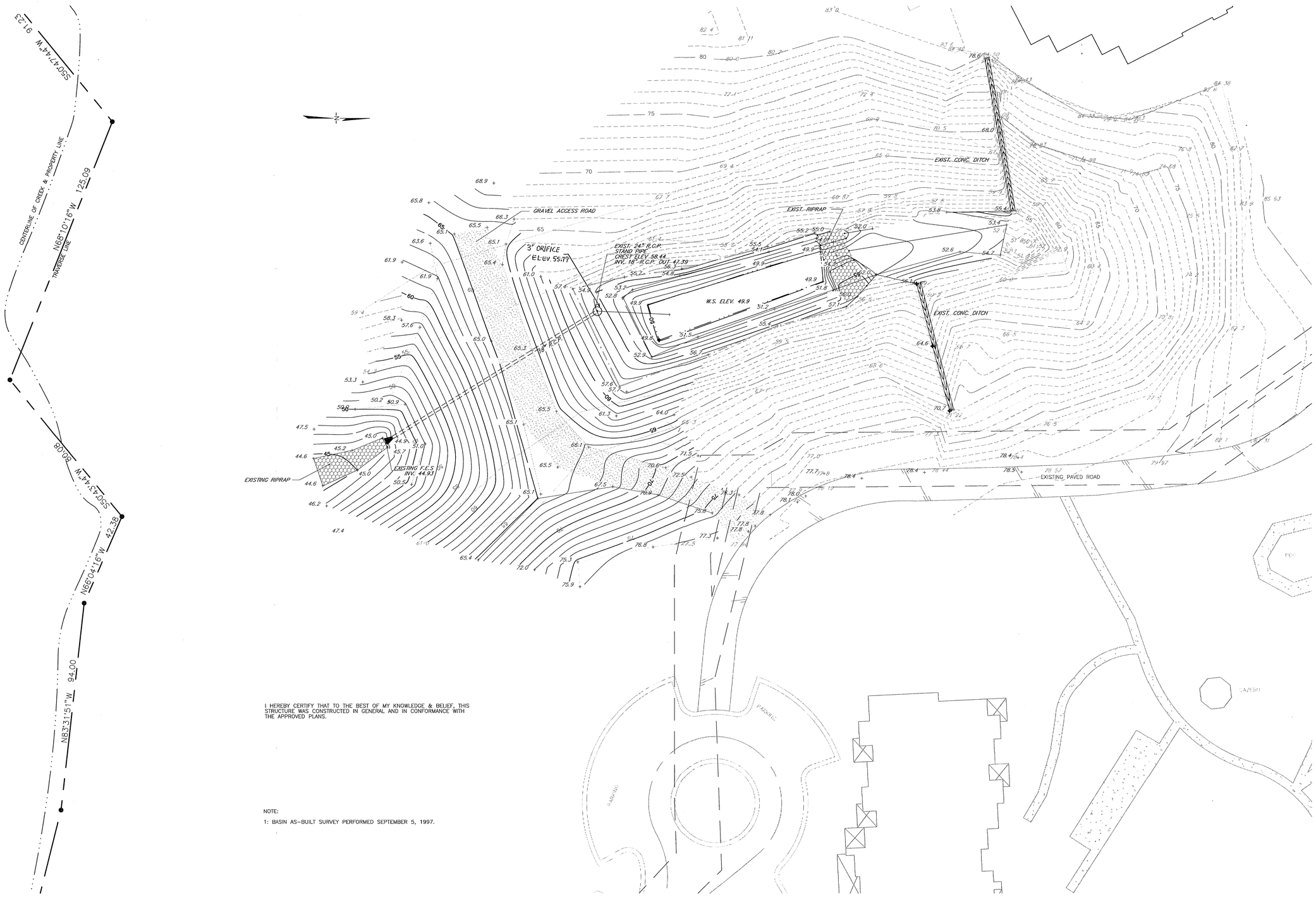
DES.	
DWN.	A.J.R.
CHK.	S.A.R.
DATE	9/12/97

CHAMBREL BMP RECORD DRAWING

PROJ.NO.	96079
SCALE:	1" = 20'
SHEET	1 OF 1
DWG. NO.	6718 W

CC003; SP-127-95

CC003_WILLIAMSBURG_CANCER_CENTER_CHAMBREL - 004



I HEREBY CERTIFY THAT TO THE BEST OF MY KNOWLEDGE & BELIEF, THIS STRUCTURE WAS CONSTRUCTED IN GENERAL AND IN CONFORMANCE WITH THE APPROVED PLANS.

NOTE:

1: BASIN AS-BUILT SURVEY PERFORMED SEPTEMBER 5, 1997.

GRAPHIC SCALE 1"=20'

0 20 40 60

COMMONWEALTH OF VIRGINIA
9-15-97
STEPHEN A. ROMEO
No. 1448-B
LAND SURVEYOR

Langley and McDonald, P.C.

Engineers • Surveyors • Planners
Landscape Architects • Environmental Consultants

WILLIAMSBURG
VIRGINIA BEACH

DES.	
DWN.	A.J.R.
CHK.	S.A.R.
DATE	9/12/97

CHAMBREL BMP RECORD DRAWING

PROJ.NO.	96079
SCALE:	1" = 20'
SHEET OF	1 1
DWG. NO.	

CC003_WILLIAMSBURG_CANCER_CENTER_CHAMBREL - 005

Langley and McDonald — Transmittal

ENGINEERS•PLANNERS•SURVEYORS

☐ 5544 Greenwich Road, Virginia Beach, Virginia 23462, (804) 473-2000

☑ 201 Packets Court, Williamsburg, Virginia 23185, (804) 253-2975

Project: Williamsburg Cancer Treatment Center

To: Darryl Cook
Code Compliance-James City Co.
P.O. Box 8784
Williamsburg, VA 23187-8784

From: Steve Romeo

Date: 9-15-97

Reply requested: ☐ Yes ☐ No

Reply to:

We are sending you:
- ☐ Attached
- ☐ Under separate cover via:
- ☑ Prints
- ☐ Copy of letter
- ☐ Plans
- ☐ Specifications
- ☐ Shop drawings
- ☐

Transmitted as checked below:
- ☐ For your use
- ☐ As requested
- ☐ For review and comment
- ☐ For approval
- ☐ Return for correction
- ☐ Approved as noted
- ☐ Approved
- ☐

RECEIVED SEP 1997 ENVIRONMENTAL DIVISION

Copies	Date	No.	Description
4	9/15/97		Chambrel BMP Record Drawing

Remarks: 2.65 Below crest of riser

Copies
1. File: 96079
2.
3.
4.

Enclosures
- ☐
- ☐
- ☐
- ☐

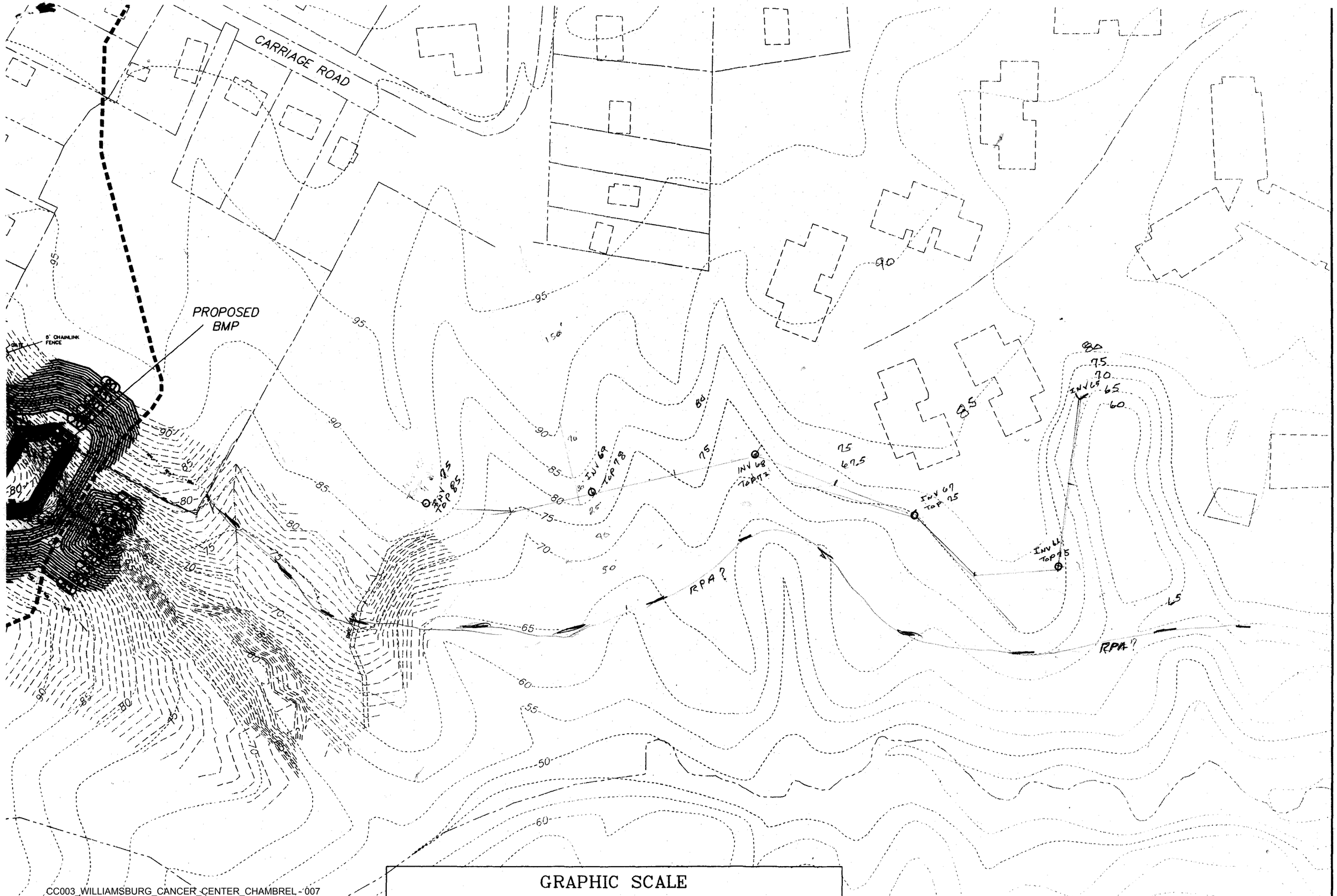
Langley and McDonald

By: JMP

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

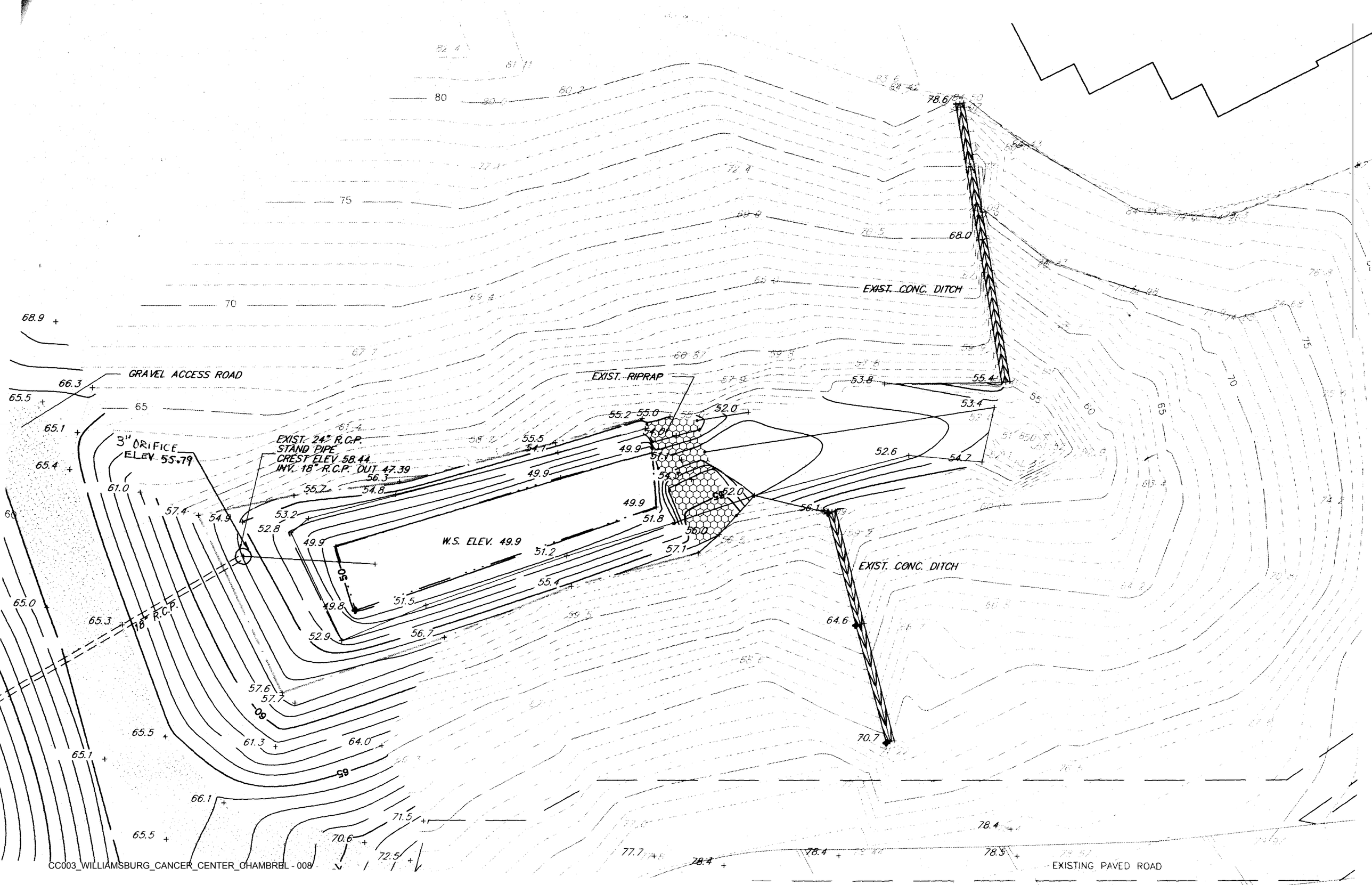
#4

CC003_WILLIAMSBURG_CANCER_CENTER_CHAMBREL - 006

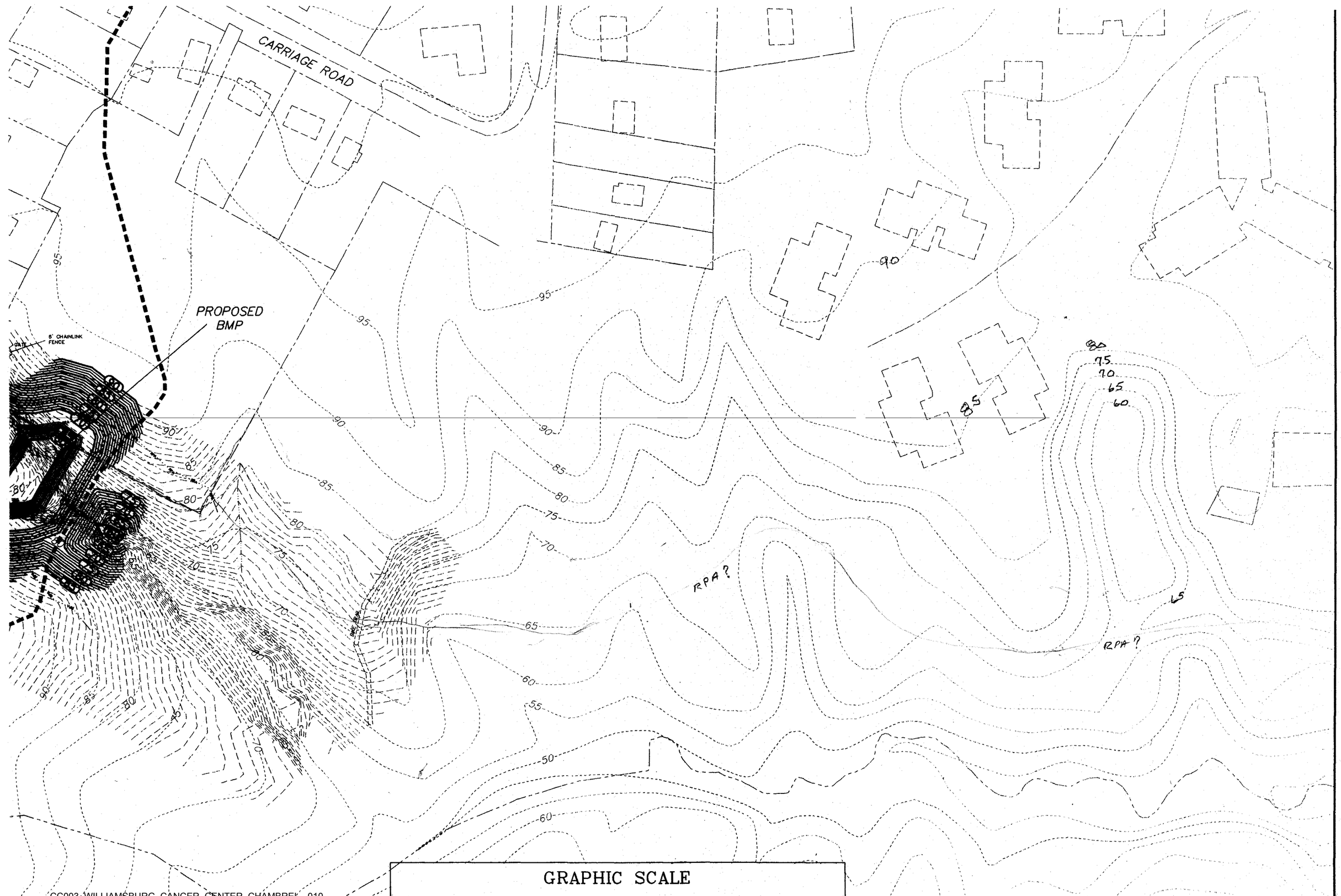


CC003_WILLIAMSBURG_CANCER_CENTER_CHAMBREL - 007

MONS GROUP

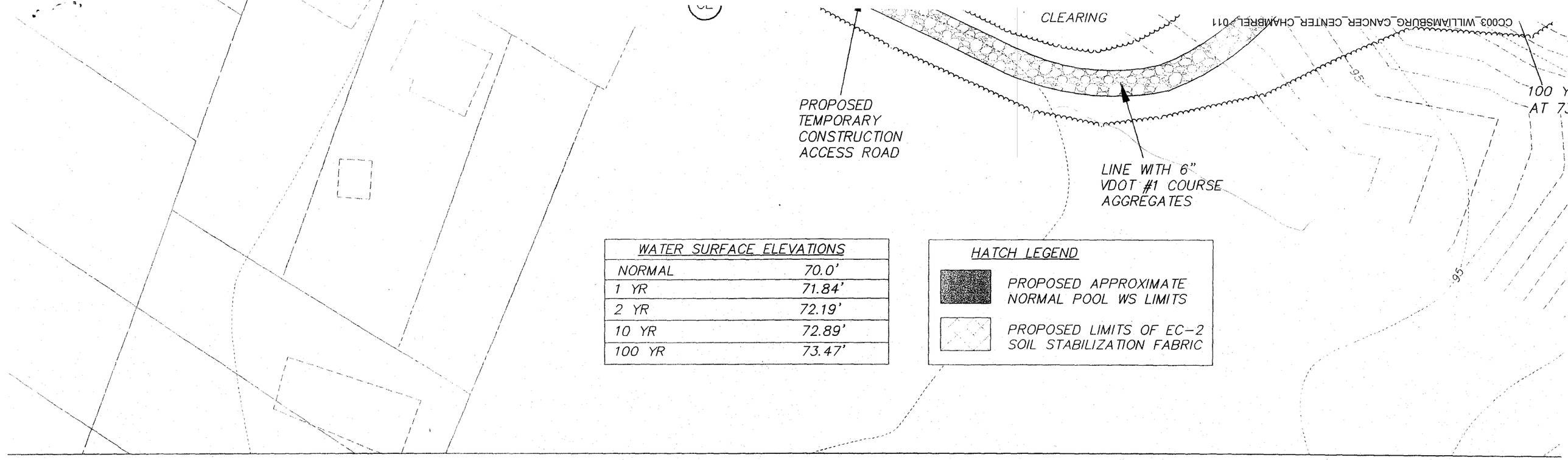

GRAVEL ACCESS ROAD
3" ORIFICE
ELEV. 55.79
EXIST. 24" R.C.P.
STAND PIPE
CREST ELEV. 58.44
INV. 18" R.C.P. OUT 47.39
18" R.C.P.
EXIST. RIPRAP
W.S. ELEV. 49.9
EXIST. CONC. DITCH
EXIST. CONC. DITCH
EXISTING PAVED ROAD
80
75
70
65
60
50
78.6
68.0
55.4
53.8
53.4
52.6
54.7
52.0
55.2
55.0
54.0
49.9
55.5
54.1
56.3
55.7
54.8
53.2
52.8
51.8
56.1
56.0
57.1
51.2
55.4
51.5
56.7
52.9
49.8
57.6
57.7
61.3
64.0
64.6
70.7
68.9
66.3
65.5
65.1
65.4
61.0
57.4
54.9
65.0
65.3
66.1
71.5
70.6
72.5
77.7
78.4
78.5

CARRIAGE ROAD
WATFORD LANE
PROPOSED BMP
5' CHAINLINK FENCE
GATE
105
100
95
90
85
80
75
70
65
60
55



CC003-WILLIAMSBURG_CANCER_CENTER_CHAMBREL - 010

MONS GROUP



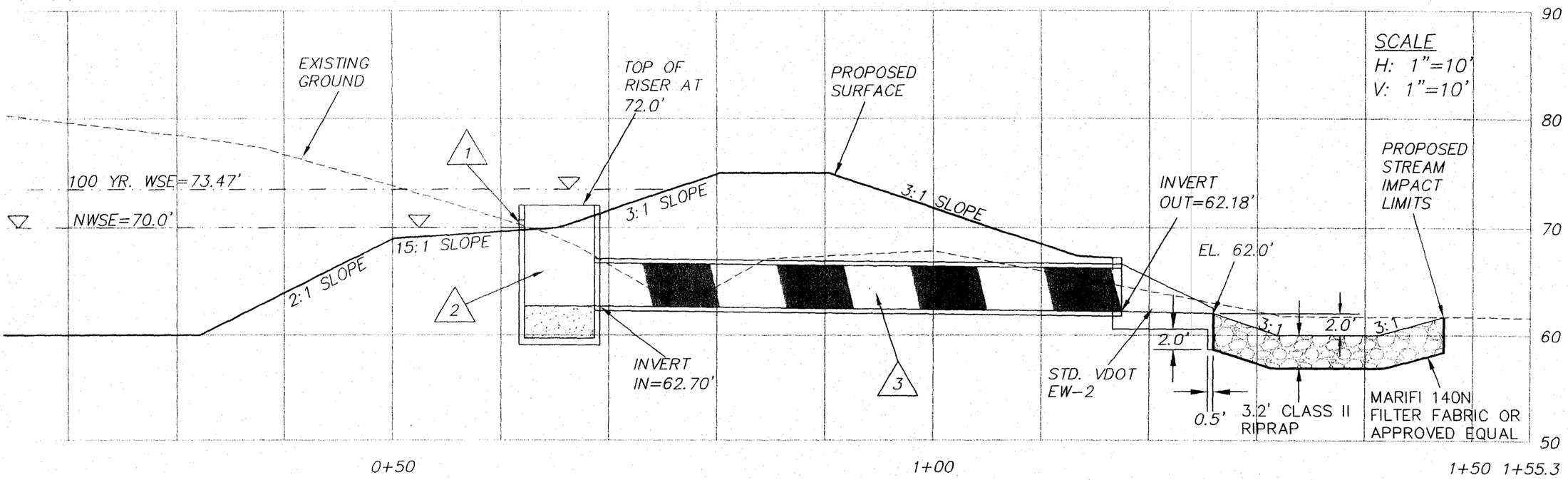
WATER SURFACE ELEVATIONS	
NORMAL	70.0'
1 YR	71.84'
2 YR	72.19'
10 YR	72.89'
100 YR	73.47'

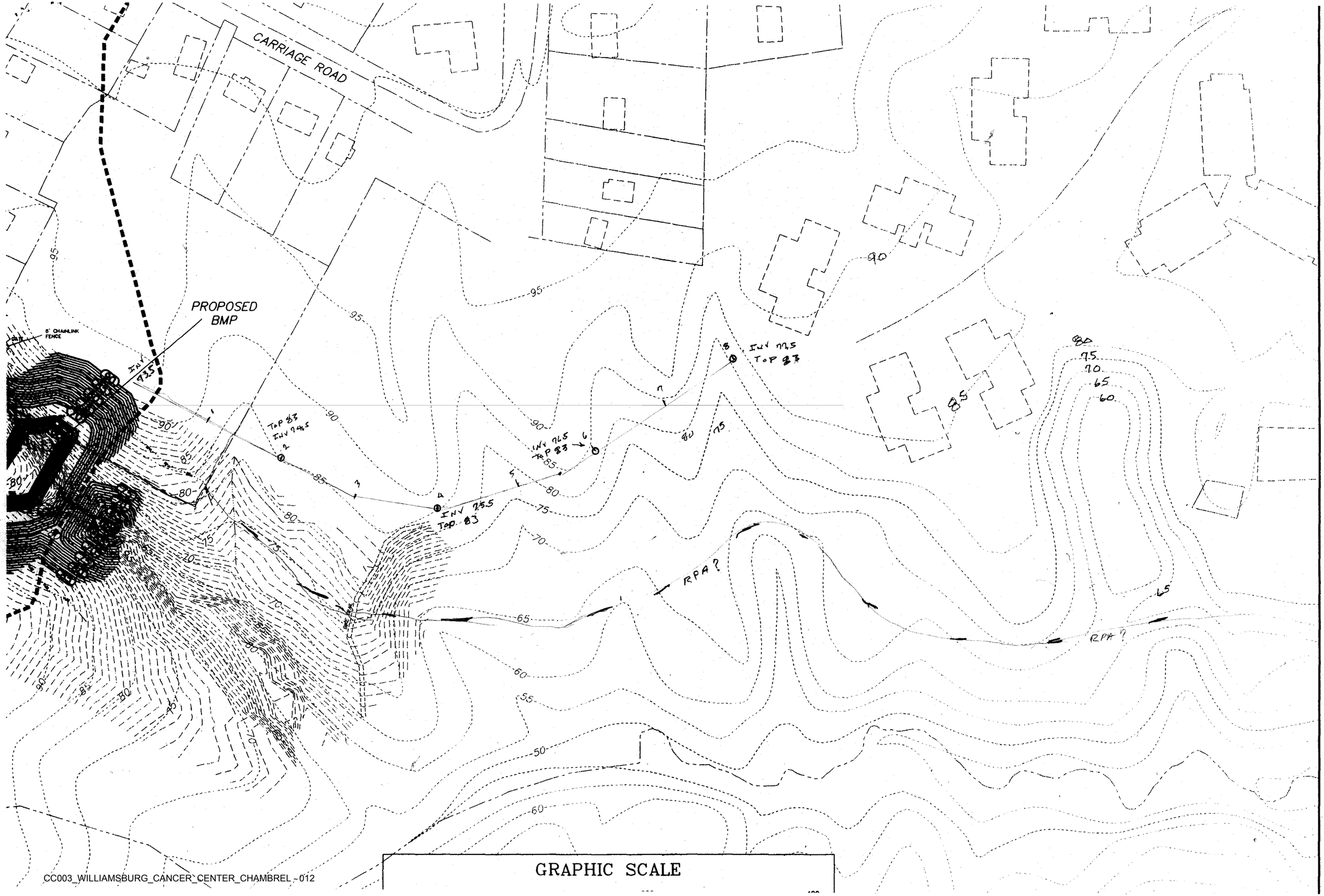
HATCH LEGEND

PROPOSED APPROXIMATE NORMAL POOL WS LIMITS

PROPOSED LIMITS OF EC-2 SOIL STABILIZATION FABRIC

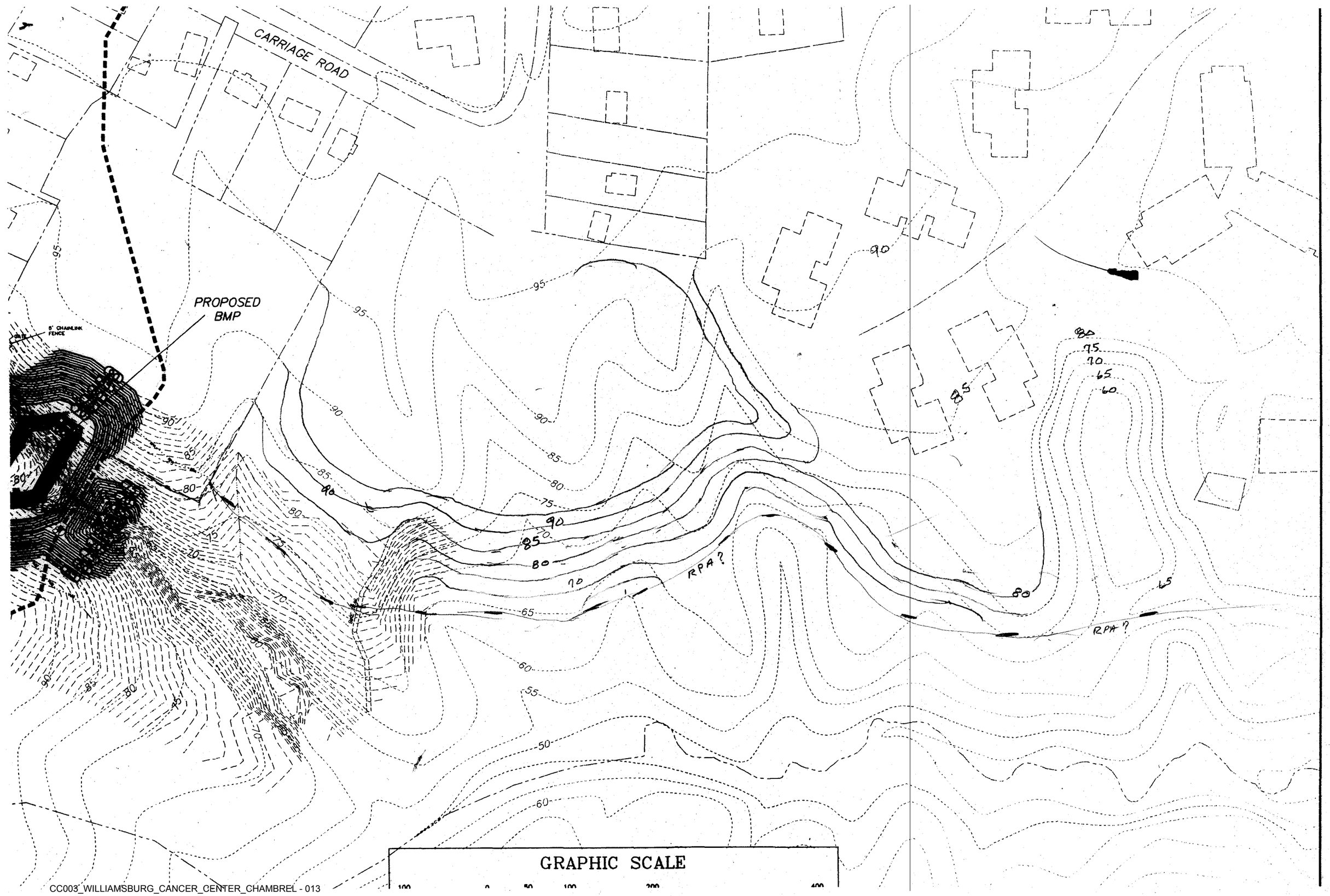
A-A





CC003_WILLIAMSBURG_CANCER_CENTER_CHAMBREL - 012

MONS GROUP



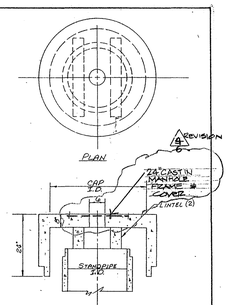
MONS GROUP

CC003_WILLIAMSBURG_CANCER_CENTER_CHAMBREL - 013

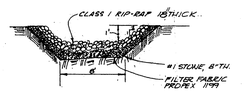
CC000_WILLIAMSBURG_CANCER_CENTER_CHAMBERLIN_044

DA WP RR
14 AC 6.8 AC 6.56 AC

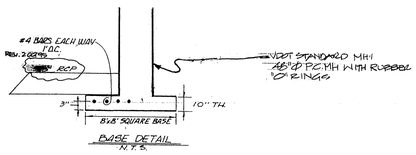
STAND PIPE I.D.	CAP I.D.	CAP WEIGHT	LINTELS 8"x8"x7'8"	LINTELS 7"x8"x7'8"
24"	42"	1,115#	2-8"	—
42"	66"	2,965#	3-8"	—



ANTI-VORTEXING TOP

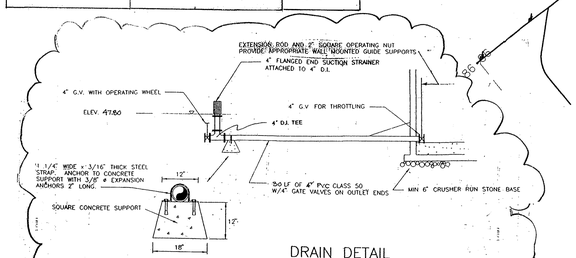


OUTFALL DETAIL
N.T.S.

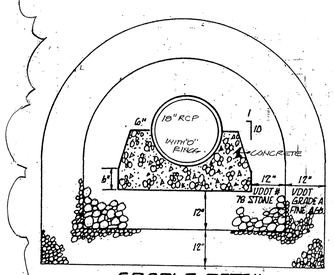


BASE DETAIL
N.T.S.

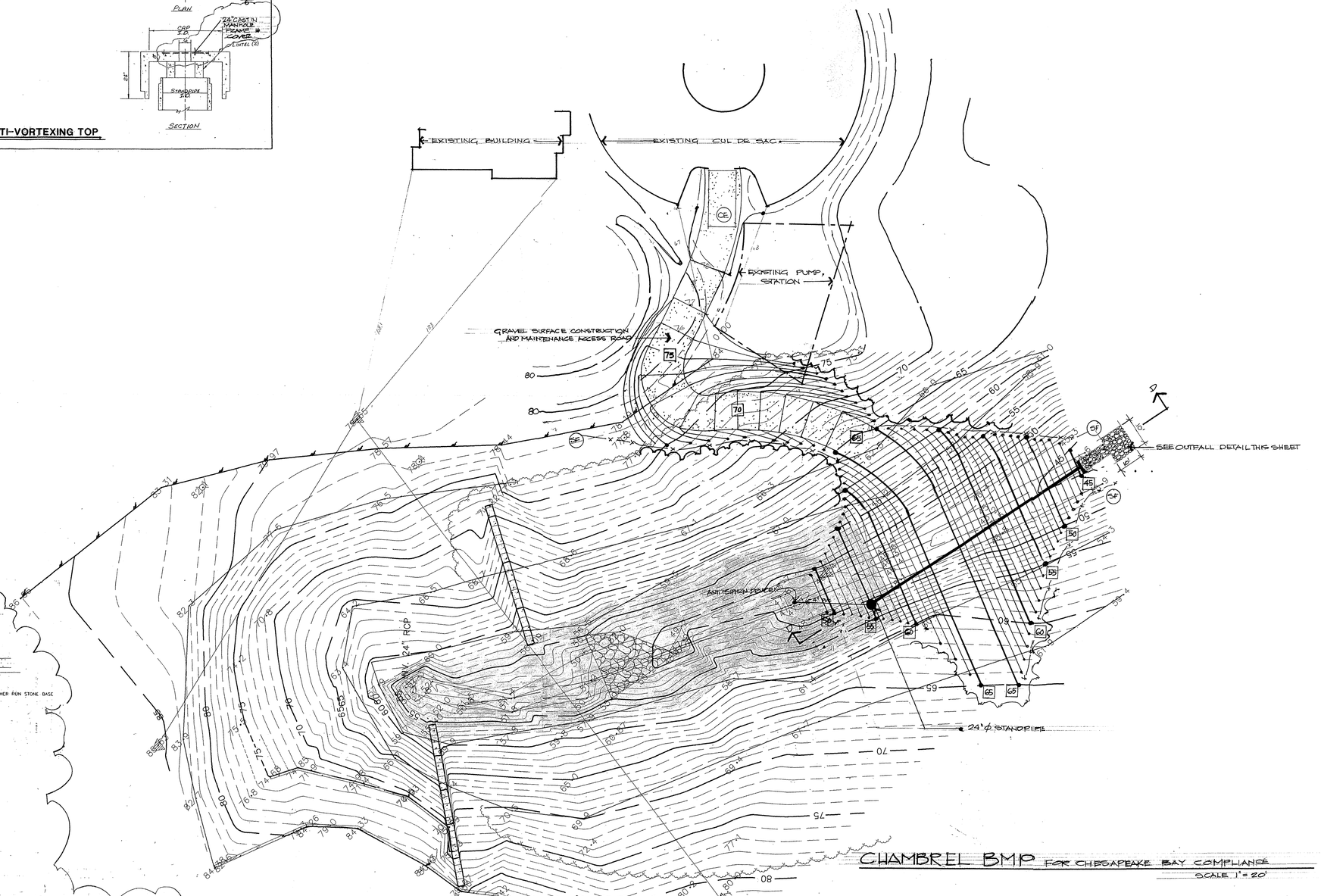
STORM FREQUENCY	PEAK ELEV.	PEAK OUTFLOW	FROM SUPPORTING CALCS INFLOW
2 YEAR	59.78	15.81 CFS	42.00 CFS
10 YEAR	60.30	19.19 CFS	50.40 CFS
100 YEAR	60.61	21.01 CFS	71.40 CFS



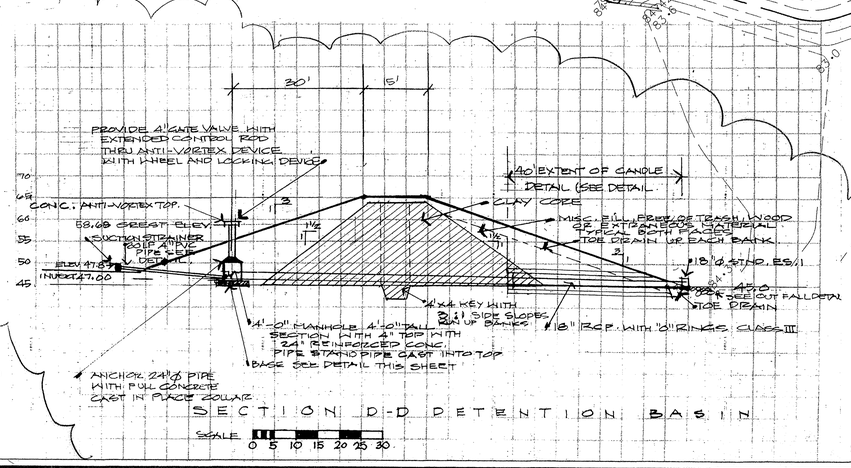
DRAIN DETAIL
N.T.S.



CRADLE DETAIL



CHAMBREL BMP FOR CHESAPEAKE BAY COMPLIANCE
SCALE 1" = 20'

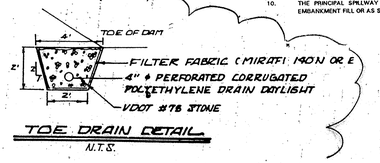


SECTION D-D DETENTION BASIN
SCALE 0 5 10 15 20 25 30

GRAPHIC SCALE IN FEET
20 16 12 8 4 0 20 40 60 80 100

GENERAL NOTES - DAM CONSTRUCTION

1. EMBANKMENT SUBGRADES TO BE STRIPPED OF ALL TOPSOIL, ORGANIC MATTER, AND SOFT AND LOOSE SOILS PRIOR TO PLACEMENT OF FILL MATERIALS.
2. SUBGRADE TO BE PROOF ROLLED WITH A LOADED TANDEM DUMP TRUCK OR SIMILAR EQUIPMENT.
3. AREAS THAT EXHIBIT EXCESSIVE PUMPING OR WEAVING WILL REQUIRE UNDERCUTTING.
4. COMPACTED EMBANKMENT FILL TO BE FREE OF ORGANIC MATTER AND CLASSIFY SM, SC, ML, MH OR CL IN ACCORDANCE WITH UNIFIED SOIL CLASSIFICATION SYSTEM, ASTM D-2487.
5. EMBANKMENT FILL TO BE PLACED IN LOOSE LIFTS NOT EXCEEDING 8 INCHES IN THICKNESS AND SHOULD BE COMPACTED TO AT LEAST 95% OF MAXIMUM DRY DENSITY ACCORDING TO ASTM D-698, STANDARD PROCTOR. FILL SHOULD COMPACTED AT MOISTURE CONTENTS WITHIN 3% ABOVE AND 1% BELOW THE OPTIMUM MOISTURE CONTENT FOR THE MATERIAL USED.
6. THE SURFACE OF EACH COMPLETED LIFT OF COMPACTED EMBANKMENT FILL SHOULD BE SCARIFIED TO A DEPTH OF 2 TO 3 INCHES PRIOR TO PLACING ADDITIONAL FILL TO LIMIT THE DEVELOPMENT OF HORIZONTAL SEEPAGE PLANES WITHIN THE EMBANKMENT.
7. COMPACTED EMBANKMENT FILL TO BE PLACED IN HORIZONTAL LIFTS.
8. SURFACES STEEPER THAN 4:1 TO BE BENCHED TO RECEIVE FILL. BENCH HEIGHTS NOT TO EXCEED 2 FEET.
9. BACKFILL ALONG THE PRINCIPAL SPILLWAY CONDUIT SHOULD BE PLACED EQUALLY ON BOTH SIDES OF THE PIPE DURING FILLING.
10. THE PRINCIPAL SPILLWAY PIPE TO BE SUPPORTED ON COMPACTED EMBANKMENT FILL OR AS SHOWN ON THE PLANS.
11. A DRAINAGE FILTER TO BE INSTALLED AROUND THE PRINCIPAL SPILLWAY PIPE FROM THE DOWNSTREAM TOE INTO THE EMBANKMENT AS SHOWN ON THE PLANS.
12. SUFFICIENT CLEARANCE SHOULD BE PROVIDED FOR STANDARD COMPACTION EQUIPMENT TO ACCESS DURING BACKFILLING ALONG THE PRINCIPAL SPILLWAY CONDUIT. THE BACKFILL SHOULD BE RAMMED UP AGAINST THE CONDUIT ON A MAXIMUM SLOPE OF 6:1. WHERE ACCESS IS LIMITED, THINNER LIFT THICKNESS, HAND COMPACTION AND TIGHT CONTROL ON MATERIAL QUALITY WILL BE NECESSARY.
13. WHERE TRENCH EXCAVATION FOR THE INSTALLATION OF THE PRINCIPAL SPILLWAY CONDUIT IS NECESSARY, SLOPE TO BE CUT NO STEEPER THAN 2:1.
14. SITE DRAINAGE TO BE PROVIDED TO MAINTAIN SUBGRADES FREE OF WATER AND TO AVOID SATURATION AND DISTURBANCE OF THE SUBGRADE SOILS PRIOR TO CONSTRUCTING FOUNDATIONS AND PLACING FILL. ANY SOILS THAT HAVE BEEN WEAKENED DUE TO SATURATION AND DISTURBANCE TO BE REMOVED AS RECOMMENDED BY THE ENGINEER.
15. DEWATERING OF THE DAM FOUNDATION AREAS (WELL POINTING OR PUMPING FROM SUMPS), AND THE DIVERSION OF SURFACE WATER AWAY FROM THE WORK AREA MAY BE NECESSARY TO ALLOW PROPER EXECUTION OF THE CONSTRUCTION WORK. DEWATERING SHOULD BEGIN PRIOR TO EARTHWORK SO THAT THE SPILLWAY CONDUIT CAN BE INSTALLED AND SURFACE WATER WOULD THEN BE DIVERTED THROUGH THE PRINCIPAL SPILLWAY.
16. THE EMBANKMENT FOUNDATION TO BE FREE OF PONDED WATER, EXCESSIVELY MUDDY CONDITIONS AND IN DRAINABLE CONDITION AS NEEDED FOR PROPER EXECUTION OF THE CONSTRUCTION WORK.
17. COMPACTION OF BACKFILL AROUND THE SPILLWAY STRUCTURE IS CRITICAL WITH REGARD TO SEEPAGE. DURING CONSTRUCTION OF THE DRAINAGE FILTER AROUND THE PRINCIPAL SPILLWAY CONDUIT, CARE SHOULD BE EXERCISED WITH RESPECT TO THE INSTALLATION OF THE FINE AND COARSE MATERIALS IN ORDER TO PREVENT CONTAMINATION BY FOREIGN MATTER.



TOE DRAIN DETAIL
N.T.S.

COMMONWEALTH OF VIRGINIA
W. E. CROSSWHITE
CERTIFICATE No. 004398

Langley and McDonald, P.C.
Engineers · Surveyors · Planners
Landscape Architects · Environmental Consultants
WILLIAMSBURG
VIRGINIA BEACH

DES. NHM
DWN. WEC
CHK. NHM
DATE REVISED 12 MAY 1995

WILLIAMSBURG COMPREHENSIVE CANCER TREATMENT CENTER and MEDICAL OFFICE BUILDING

TREYBURN DRIVE, WILLIAMSBURG, JAMES CITY COUNTY, VIRGINIA

DEVELOPERS: DOCTOR and MRS MARK E. ELLIS

SHEET 6A OF 6
DISK
PROJ. NO. 94025-4
DWG. 5436GW

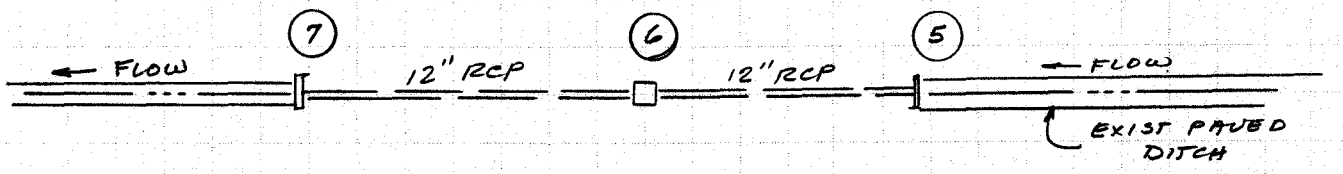
CC003_WILLIAMSBURG_CANCER_CENTER_CHAMBREL - 015

Langley and McDonald
A PROFESSIONAL CORPORATION
ENGINEERS • PLANNERS • SURVEYORS
VIRGINIA BEACH - WILLIAMSBURG, VIRGINIA

Subject CANCER TREATMENT CENTER
Computed By MRG Checked By

Project No. 94254
Client
Date 10/27/94 Sheet No.

RUNOFF @ TRAYBURN DRIVE ENTRANCE



* EXISTING FLOW (5 to 6)

TOTAL AREA 0.8163 Ac
PAVED AREA 0.1710 Ac

0.171 @ 0.9 = 0.1539
0.6453 @ 0.25 = 0.1613
0.3152

CA_{TOTAL} = 0.3152
t_c = 10 min.
I_{10} = 5.93 in/hr
Q_{10} = 1.87 cfs

* ADD PROP. FLOW @ 6 to 7

TOTAL AREA = 0.9705 Ac
PAVED AREA = 0.3252 Ac

0.3252 @ 0.9 = 0.2926
0.6453 @ 0.25 = 0.1613
0.4539

CA_{TOTAL} = 0.4539

t_c = 10 min
I_{10} = 5.93 in/hr
Q_{10} = 2.69 cfs

Triangular Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: CANCER TREATMENT CTR

Comment: Flow in Exist Conc. Ditch

Solve For Depth

Given Input Data:

Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.015
Channel Slope....	0.0200 ft/ft
Discharge.....	1.87 cfs

Computed Results:

Depth.....	0.44 ft
Velocity.....	4.76 fps
Flow Area.....	0.39 sf
Flow Top Width...	1.77 ft
Wetted Perimeter.	1.98 ft
Critical Depth...	0.56 ft
Critical Slope...	0.0058 ft/ft
Froude Number....	1.79 (flow is Supercritical)

Open Channel Flow Module, Version 3.09 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name: CANCER TREATMENT CTR

Comment: Conc Entrance @ 6 to 7

Solve For Actual Depth

Given Input Data:

Diameter.....	1.00 ft
Slope.....	0.0200 ft/ft
Manning's n.....	0.013
Discharge.....	2.69 cfs

Computed Results:

Depth.....	0.52 ft
Velocity.....	6.52 fps
Flow Area.....	0.41 sf
Critical Depth....	0.70 ft
Percent Full.....	51.99 %
Full Capacity.....	5.04 cfs
QMAX @.94D.....	5.42 cfs
Froude Number.....	1.79 (flow is Supercritical)

Open Channel Flow Module, Version 3.09 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel - Uniform flow

Worksheet Name: CANCER TREATMENT CTR

Comment: Conc Entrance @ 5 to 6

Solve For Actual Depth

Given Input Data:

Diameter.....	1.00 ft
Slope.....	0.0200 ft/ft
Manning's n.....	0.013
Discharge.....	1.87 cfs

Computed Results:

Depth.....	0.42 ft
Velocity.....	5.94 fps
Flow Area.....	0.31 sf
Critical Depth....	0.58 ft
Percent Full.....	42.18 %
Full Capacity.....	5.04 cfs
QMAX @.94D.....	5.42 cfs
Froude Number.....	1.85 (flow is Supercritical)

Open Channel Flow Module, Version 3.09 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Langley and McDonald
A PROFESSIONAL CORPORATION
ENGINEERS · PLANNERS · SURVEYORS
VIRGINIA BEACH - WILLIAMSBURG, VIRGINIA

Subject CANCER TREATMENT CENTER

Computed By MRG Checked By

Project No. 94254

Client

Date 10/13/94 Sheet No.

RUNOFF CALCULATIONS @ (3) TO (4)

$A = 1.01$ Ac

$C = 0.3754$

$CA = 0.3796$

$t_c = 10$ min.

$I_{10} = 5.93$ in/hr.

$Q_{10} = 2.2510 \Rightarrow 2.25$ cfs

FILE: CANCER3.MRG
Project: CANCER TREATMENT CENTER
Location:
Design:
Date: 13-Oct-94

LANGLEY and McDONALD, P.C.
201 Packets Court
Williamsburg, Virginia 23185

WEIGHTED "C" VALUE CALCULATIONS

STD. METHOD

Area		Coeff.		C x A
0.6192	@	0.25	=	0.1548
0.8375	@	0.9	=	0.7538
				0.90855

0.90855 / 1.4567 = 0.623704 (weighted coefficient)

INLET No.	TOTAL AREA	PAVED AREA	PERVIOUS AREA	WEIGHTED "C"VALUE
1	1.0112	0.1951	0.8161	0.3754
2	0.8716	0.1446	0.7270	0.3579

s13H FILE: CANCER1.MRG

Project: CANCER TREATMENT CENTER
Location: James City County, Virginia
Design: M. Gordon
Date: Oct. 14, 1994
Revision:
Yr. Storm: 10
N Value: 0.013

LANGLEY and McDONALD, P.C.
201 Packets Court
Williamsburg, Virginia 23185

STORM SEWER DESIGN COMPUTATIONS

FROM PT.	TO PT.	DRAIN. AREA	RUN-OFF COEFF.	C x A INCR.	C x A ACCUM.	INLET TIME	RAIN FALL	RUNOFF "Q" INCR.	RUNOFF "Q" ACCUM.	INVERT ELEV. UP	INVERT ELEV. LOW	LENGTH	SLOPE	PIPE DIAM.
		acres	"C"			min.	in/hr	cfs	cfs			ft.	ft./ft.	inches
		[E]	[E]			[E]				[E]		[E]		[E]
1	2	0.87	0.36	0.31	0.31	10.00	5.93	1.85	1.85	51.21	50.94	70	0.0038	12

FROM PT.	TO PT.	VELOCITY	CAPACITY	FLOW TIME	FLOW RATIO	VELOCITY RATIO	REMARKS
		ft./sec.	cfs	min.	Qp/Qf	Vp/Vf	
1	2	3.17	2.20	0.37	0.84	1.13	

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: CANCER TREATMENT CTR

Comment: PG-4 FROM 2 TO 5

Solve For Depth

Given Input Data:

Bottom Width.....	1.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.015
Channel Slope....	0.3339 ft/ft
Discharge.....	1.85 cfs

Computed Results:

Depth.....	0.12 ft
Velocity.....	12.19 fps
Flow Area.....	0.15 sf
Flow Top Width...	1.49 ft
Wetted Perimeter.	1.55 ft
Critical Depth...	0.37 ft
Critical Slope...	0.0056 ft/ft
Froude Number....	6.72 (flow is Supercritical)

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: CANCER TREATMENT CTR

Comment: PG-4 FROM 3 TO 4

Solve For Depth

Given Input Data:

Bottom Width.....	1.00 ft
Left Side Slope..	2.00:1 (H:V)
Right Side Slope.	2.00:1 (H:V)
Manning's n.....	0.015
Channel Slope....	0.2736 ft/ft
Discharge.....	2.25 cfs

Computed Results:

Depth.....	0.14 ft
Velocity.....	12.11 fps
Flow Area.....	0.19 sf
Flow Top Width...	1.58 ft
Wetted Perimeter.	1.64 ft
Critical Depth...	0.41 ft
Critical Slope...	0.0055 ft/ft
Froude Number....	6.22 (flow is Supercritical)

Open Channel Flow Module, Version 3.09 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Langley and McDonald
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VIRGINIA BEACH - WILLIAMSBURG, VIRGINIA

Subject _____

Computed By _____ Checked By _____

Project No. _____

Client _____

Date 5/23/94 Sheet No. A.

PRE-DEV. POLLUTANT RUNOFF FROM PROPOSED MED. FACIL.

USING DEFAULT 16% IMPERV.

$[0.05 + 0.009(16)] \times 4Ac. \times 2.33 = 1.8$ LB/YR.

ASSUMING 0% IMPERV. COVER

$[0.05 + 0.009(0)] \times 4Ac. \times 2.33 = 0$ LB/YR.

PRE-DEV. POLLUTANT RUNOFF FROM PROPOSED NURSING FACIL.

USING DEFAULT 16% IMPERV.

$[0.05 + 0.009(16)] \times 5Ac. \times 2.33 = 2.26$ LB/YR

ASSUMING 0% IMPERV. COVER

$[0.05 + 0.009(0)] \times 5Ac. \times 2.33 = 0$ LB/YR.

POST-DEV. POLLUTANT RUNOFF FROM PROPOSED MED. FACIL.

ASSUMING 46% IMPERV. SURFACE

$[0.05 + 0.009(46) \times 4Ac. \times 2.33 = 4.3$ LB/YR.

POST-DEV. POLLUTANT RUNOFF FROM PROPOSED NURSING FACIL.

ASSUMING 49% IMPERV. SURFACE

$[0.05 + 0.009(45) \times 5Ac. \times 2.33 = 5.3$ LB/YR.

TOTAL REMOVAL REQMT. BASED UPON DEFAULT 16%

$(4.3 \text{ LB/YR} + 5.3 \text{ LB/YR}) - (1.8 \text{ LB/YR} + 2.3 \text{ LB/YR}) = 5.5$ LB/YR.

TOTAL REMOVAL REQMT. BASED UPON 0% PRE-DEV. IMPERV. COVER

$4.3 \text{ LB/YR} + 5.3 \text{ LB/YR} = 9.6$ LB/YR.

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Subject _____

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Project No. _____

Client _____

Date 5/23/94 Sheet No. B.

ACTUAL REMOVAL

OF 14 AC. DRAINING TO PROPOSED DETEN. BASIN
40% TOWNHOUSE @ 40% IMPERV.
60% APARTMENTS @ 55% IMPERV.

COMPOSITE IMPERV. PERCENT

FROM CBLAM PG. C-10

14 AC. x 40% x 40% IMPERV. = 2.2 AC IMPERV.
14 AC x 60% x 55% IMPERV. = 4.6 AC. IMPERV.
6.8 AC. ÷ 14 = 48.7% IMPERV.

POLLUTANT RUNOFF FROM 14 DEV. ACRES @ 48.7% IMPERV.
[0.05 + 0.009(48.7%)] x 14 x 2.33 = 15.9 LB/YR.

ASSUMING A 50% EFFICIENT 4 YR WET POND
ACTUAL REMOVAL IS:

15.9 LB/YR x ~~50%~~ 40% = ~~7.9~~ 6.36 LB/YR. REMOVAL.

REMOVAL REQMT. BASED UPON DEFAULT VALUE = 5.5 LB/YR.

REMOVAL REQMT. BASED UPON ASSUMED
PRE-DEV. 0% IMPERV. = 9.6 LB/YR.

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Subject _____

Computed By _____ Checked By _____

Project No. _____

Client _____

Date 5/23/94 Sheet No. C.

VOLUME REQMTS. FOR 4 Vr. DETEN. BASIN
ASSUMING 14 AC. DRAINAGE AREA @ 48.7% IMPERV.

$$VOL = \frac{(R_m)(R_v)}{12} A$$

$R_v = 0.05 + 0.009(48.7) = 0.49$
$R_m = 0.45"$

$$VOL = \frac{(0.45)(0.49)}{12}(14) = 0.26 \text{ Ac-FT.} \times 4 = 1.0 \text{ Ac-FT}$$

1.0 Ac-FT = 43560 C.F.

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Subject _____

Computed By _____ Checked By _____

Project No. _____

Client _____

Date 5/23/94 Sheet No. D.

FLOW ATTENUATION CALCS.

AT BASIN - FOR 14 AC. DRAINING TO IT
ASSUME T_c = 7.5 MIN. EXISTING.

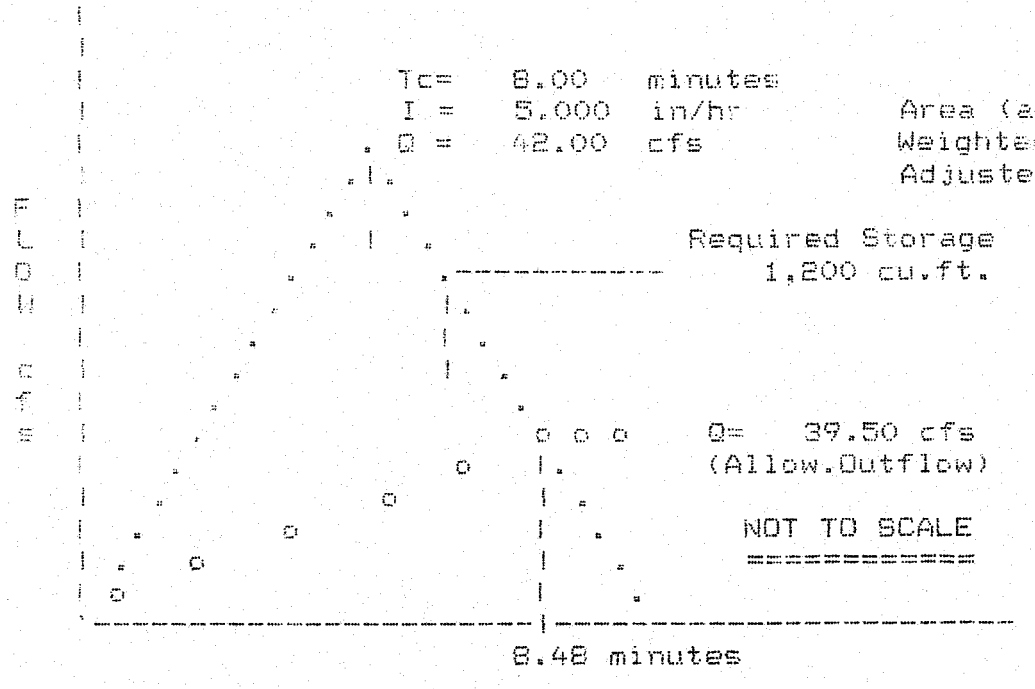
$Q_2 = 14(0.6)(4.7''/HR) = 39.5$ c.f.s.
$Q_{10} = 14(0.6)(6.0''/HR) = 50.4$ c.f.s.
$Q_{100} = 14(0.6)(8.2''/HR) = 69.0$ c.f.s.

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 17:58:13 11-01-1994

MODIFIED RATIONAL METHOD
---- Graphical Summary for Maximum Required Storage ----

BMP AT CHAMBREL

```
*****************************************************************************
*                                  |                                        *
*  RETURN FREQUENCY:   2 yr        |  Allowable Outflow:     39.50 cfs      *
*  'C' Adjustment: 1.000           |  Required Storage:      1,200 cu.ft.   *
*                                  |                                        *
*                STORM DURATION = Tc for Max.Storage                        *
*---------------------------------------------------------------------------*
*  Peak Inflow:   42.00 cfs        Inflow .HYD stored: 2OUTMF  .HYD         *
*****************************************************************************
```



2

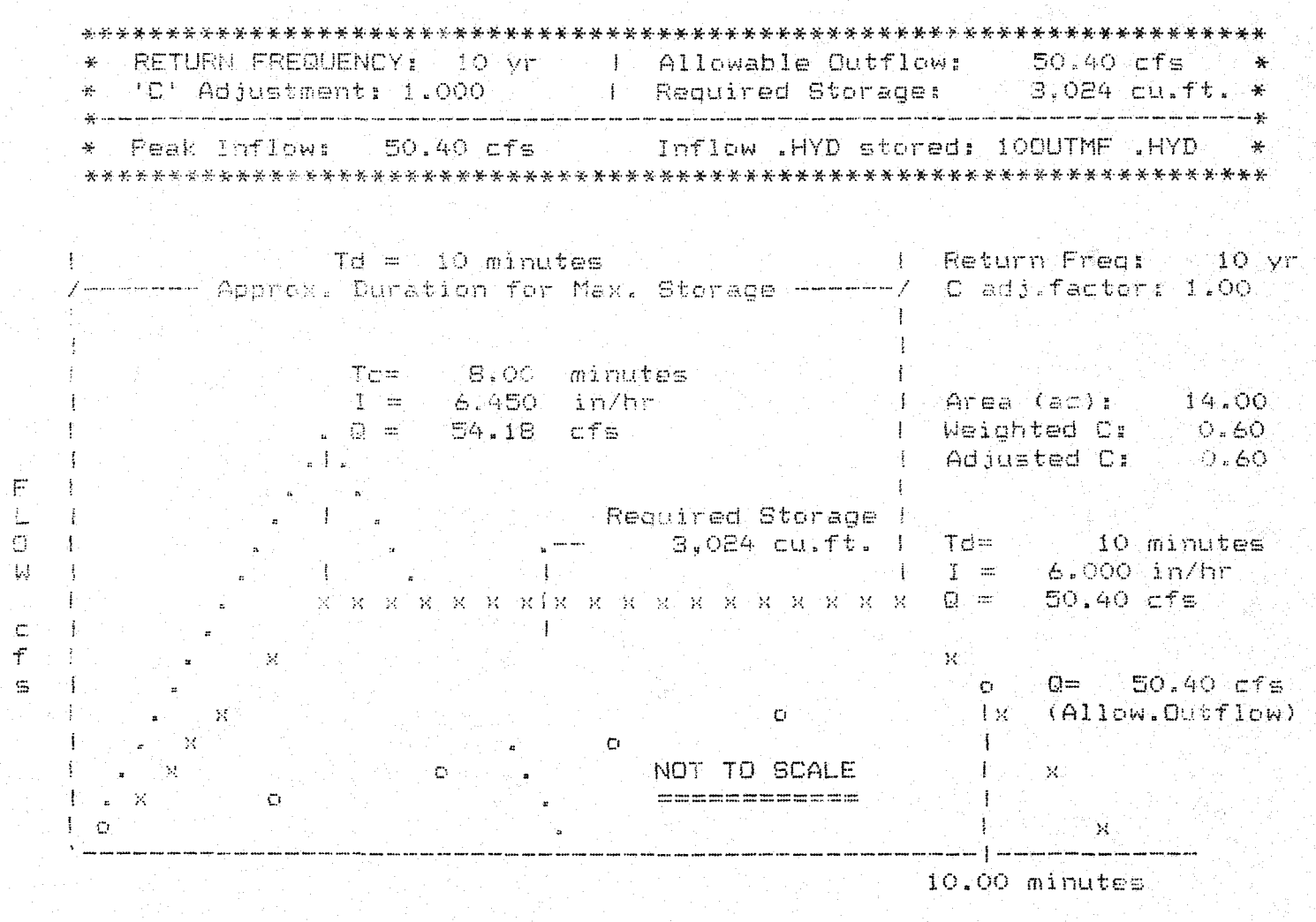
Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 17:58:13 11-01-1994

MODIFIED RATIONAL METHOD
---- Graphical Summary for Maximum Required Storage ----

First peak outflow point assumed to occur at inflow recession leg.

BMP AT CHAMBREL

```
*****************************************************************************
*  RETURN FREQUENCY:  10 yr      |  Allowable Outflow:     50.40 cfs      *
*  'C' Adjustment: 1.000         |  Required Storage:      3,024 cu.ft.  *
*---------------------------------------------------------------------------*
*  Peak Inflow:   50.40 cfs        Inflow .HYD stored: 100UTMF .HYD       *
*****************************************************************************
```

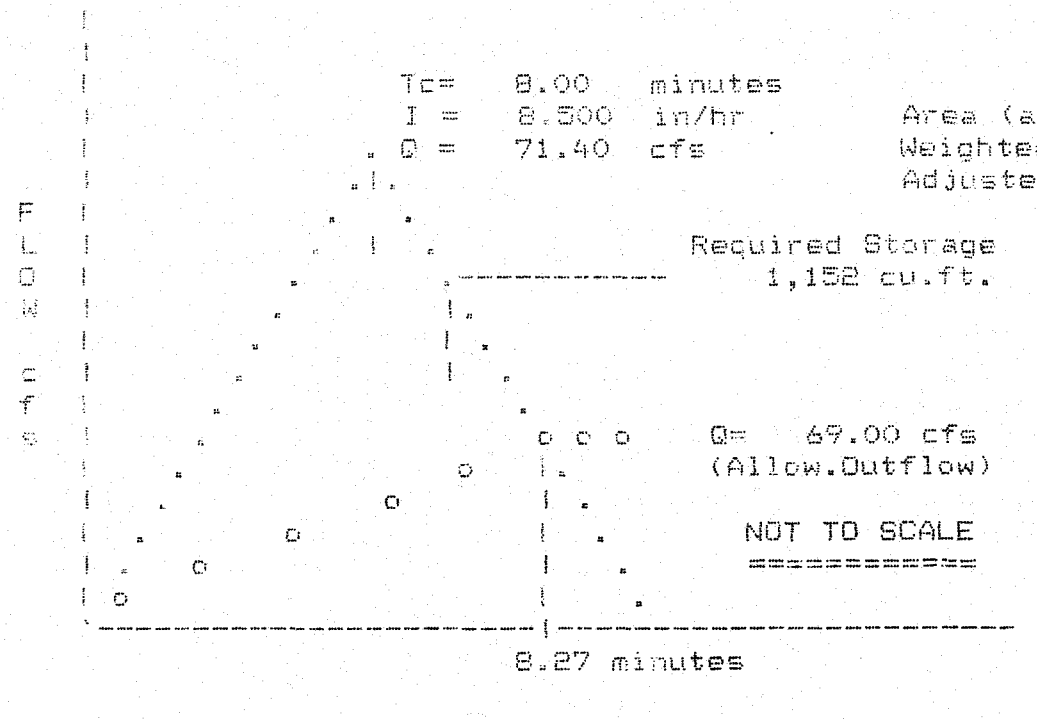


Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 17:58:13 11-01-1994

MODIFIED RATIONAL METHOD
---- Graphical Summary for Maximum Required Storage ----

BMP AT CHAMBREL

```
*****************************************************************************
*                                   |                                       *
*  RETURN FREQUENCY: 100 yr         |  Allowable Outflow:     69.00 cfs     *
*  'C' Adjustment: 1.000            |  Required Storage:      1,152 cu.ft.  *
*                                   |                                       *
*                STORM DURATION = Tc for Max.Storage                        *
*---------------------------------------------------------------------------*
*  Peak Inflow:   71.40 cfs         Inflow .HYD stored: 100OUTMF.HYD         *
*****************************************************************************
```



Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 17:58:13 11-01-1994

BMP AT CHAMBREL

**** Modified Rational Hydrograph *****

Weighted C = 0.600 Area= 14.000 acres Tc = 8.00 minutes

Adjusted C = 0.600 Td= 8.00 min. I= 5.00 in/hr Qp= 42.00 cfs

RETURN FREQUENCY: 2 year storm Adj.factor = 1.00
Output file: 2OUTMF .HYD

HYDROGRAPH FOR MAXIMUM STORAGE
For the 2 Year Storm

Time increment = 1.00 Minutes
Time on left represents time for first Q in each row.

Time Minutes							
0.00	0.00	5.25	10.50	15.75	21.00	26.25	31.50
7.00	36.75	42.00	36.75	31.50	26.25	21.00	15.75
14.00	10.50	5.25	0.00				

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 17:58:13 11-01-1994

BMP AT CHAMBREL

**** Modified Rational Hydrograph *****

Weighted C = 0.600 Area= 14.000 acres Tc = 8.00 minutes

Adjusted C = 0.600 Td= 10.00 min. I= 6.00 in/hr Qp= 50.40 cfs

RETURN FREQUENCY: 10 year storm Adj.factor = 1.00
Output file: 10OUTMF .HYD

HYDROGRAPH FOR MAXIMUM STORAGE
For the 10 Year Storm

Time increment = 1.00 Minutes
Time on left represents time for first Q in each row.

Time Minutes							
0.00	0.00	6.30	12.60	18.90	25.20	31.50	37.80
7.00	44.10	50.40	50.40	50.40	44.10	37.80	31.50
14.00	25.20	18.90	12.60	6.30	0.00		

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Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 17:58:13 11-01-1994

BMP AT CHAMBREL

**** Modified Rational Hydrograph *****

Weighted C = 0.600 Area= 14.000 acres Tc = 8.00 minutes

Adjusted C = 0.600 Td= 8.00 min. I= 8.50 in/hr Qp= 71.40 cfs

RETURN FREQUENCY: 100 year storm Adj.factor = 1.00
Output file: 100OUTMF.HYD

HYDROGRAPH FOR MAXIMUM STORAGE
For the 100 Year Storm

Time increment = 1.00 Minutes
Time on left represents time for first Q in each row.

Time Minutes							
0.00	0.00	8.93	17.85	26.78	35.70	44.63	53.55
7.00	62.48	71.40	62.48	53.55	44.63	35.70	26.78
14.00	17.85	8.93	0.00				

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 17:58:13 11-01-1994

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BMP AT CHAMBREL

* * * * * * SUMMARY OF RATIONAL METHOD PEAK DISCHARGES * * * * * *

Q = adj * C * I * A
Where: Q=cfs, C=Weighted Runoff Coefficient, I=in/hour, A=acres
adj = 'C' adjustment factor for each return frequency

RETURN FREQUENCY = 2 years
'C' adjustment, k = 1
Adj. 'C' = Wtd.'C' x 1

Subarea Descr.	Runoff 'C'	Area acres	Tc (min)	Wtd. 'C'	Adj. 'C'	I in/hr	Total acres	Peak Q (cfs)

8

POND-2 Version: 5.17
S/N: 1295130250

CHAMBREL POND

CALCULATED 11-01-1994 18:15:36
DISK FILE: b:MMF1 .VOL

Planimeter scale: 1 inch = 40 ft.

Elevation (ft)	Planimeter (sq.in.)	Area (sq.ft)	A1+A2+sqr(A1*A2) (sq.ft)	* Volume (cubic-ft)	Volume Sum (cubic-ft)
50.00	0.80	1,280	0	0	0
55.00	3.90	6,240	10,346	17,244	17,244
58.68	*I*	10,625	25,007	30,675	47,919
60.00	7.80	12,480	27,545	45,908	63,151
65.00	11.20	17,920	45,355	75,591	138,743

I ---> Interpolated area from closest two planimeter readings.

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

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Outlet Structure File: MMF1 .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
CHAMBREL BMP MONTICELLO MEDICAL FACILITY

****

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

Elevation (ft)	Q (cfs)	Contributing Structures
58.68	0.0	1
59.18	6.9	1
59.68	15.1	1
60.18	18.5	1
60.68	21.4	1
61.18	23.9	1
61.68	26.2	1
62.18	28.3	1
62.68	30.3	1
63.00	31.4	1

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Outlet Structure File: MMF1 .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
CHAMBREL BMP MONTICELLO MEDICAL FACILITY

****

Outlet Structure File: b:MMF1 .STR
Planimeter Input File: b:MMF1 .VOL
Rating Table Output File: b:MMF1 .PND

Min. Elev.(ft) = 58.68 Max. Elev.(ft) = 63 Incr.(ft) = .5

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

****
SYSTEM CONNECTIVITY
****

Structure	No.	Q Table		Q Table
STAND PIPE	1		->	1

Outflow rating table summary was stored in file:
b:MMF1 .PND

Outlet Structure File: MMF1 .STR

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POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
CHAMBREL BMP MONTICELLO MEDICAL FACILITY

****

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

STAND PIPE
Stand Pipe with weir or orifice flow

E1 elev.(ft)? 58.68
E2 elev.(ft)? 63.001
Crest elev.(ft)? 58.68
Diameter (ft)? 2.0
Weir coefficient? 3.1
Orifice coefficient? .60
Start transition elev.(ft) @ ?
Transition height (ft)?

(12)

Outlet Structure File: MMF1 .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****
CHAMBREL BMP MONTICELLO MEDICAL FACILITY

****

Outflow Rating Table for Structure #1
STAND PIPE Stand Pipe with weir or orifice flow

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

Elevation (ft)	Q (cfs)	Computation	Messages
58.68	0.0	Weir:	H =0.0
59.18	6.9	Weir:	H =.5
59.68	15.1	Orifice:	H =1.0
60.18	18.5	Orifice:	H =1.5
60.68	21.4	Orifice:	H =2.0
61.18	23.9	Orifice:	H =2.5
61.68	26.2	Orifice:	H =3.0
62.18	28.3	Orifice:	H =3.5
62.68	30.3	Orifice:	H =4.0
63.00	31.4	Orifice:	H =4.32

Weir Cw = 3.1 Weir length = 6.283186 ft
Orifice Co = .6 Orifice area = 3.141593 sq.ft.
Q (cfs) = (Cw * L * H**1.5) or (Co * A * sqr(2*g*H))
No transition used, transition height = 0.0
Weir equation = Orifice equation @ elev.= 59.45661 ft

EXECUTED: 11-01-1994 18:19:45

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*************************************************
*                                               *
*  CHAMBREL BMP   MONTICELLO MEDICAL FACILITY   *
*                                               *
*                                               *
*                                               *
*                                               *
*************************************************
```

Inflow Hydrograph: b:2OUTMF .HYD
Rating Table file: b:MMF1 .PND

-----INITIAL CONDITIONS----
Elevation = 58.68 ft
Outflow = 0.00 cfs
Storage = 47,919 cu-ft

GIVEN POND DATA			INTERMEDIATE ROUTING COMPUTATIONS	
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)	2S/t (cfs)	2S/t + O (cfs)
58.68	0.0	47,919	1597.0	1597.0
59.18	6.9	53,402	1779.7	1786.6
59.68	15.1	59,232	1974.0	1989.1
60.18	18.5	65,414	2180.0	2198.5
60.68	21.4	71,869	2395.1	2416.5
61.18	23.9	78,578	2618.7	2642.6
61.68	26.2	85,546	2851.0	2877.2
62.18	28.3	92,773	3092.0	3120.3
62.68	30.3	100,279	3342.0	3372.3
63.00	31.4	105,223	3506.7	3538.1

Time increment (t) = 1.0 min.

POND-2 Version: 5.17 S/N: 1295130250
EXECUTED: 11-01-1994 18:19:45

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Pond File: b:MMF1 .PND
Inflow Hydrograph: b:2OUTMF .HYD
Outflow Hydrograph: b:OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	------	1597.0	1597.0	0.00	58.68
1.0	5.25	5.3	1601.8	1602.2	0.19	58.69
2.0	10.50	15.8	1616.1	1617.6	0.75	58.73
3.0	15.75	26.3	1639.0	1642.3	1.65	58.80
4.0	21.00	36.8	1670.0	1675.8	2.87	58.89
5.0	26.25	47.3	1708.5	1717.3	4.38	59.00
6.0	31.50	57.8	1754.0	1766.3	6.16	59.13
7.0	36.75	68.3	1805.5	1822.2	8.34	59.27
8.0	42.00	78.8	1862.6	1884.3	10.86	59.42
9.0	36.75	78.8	1915.0	1941.3	13.17	59.56
10.0	31.50	68.3	1953.5	1983.2	14.86	59.67
11.0	26.25	57.8	1980.3	2011.3	15.46	59.73
12.0	21.00	47.3	1996.1	2027.6	15.72	59.77
13.0	15.75	36.8	2001.3	2032.9	15.81	59.78
14.0	10.50	26.3	1996.1	2027.5	15.72	59.77
15.0	5.25	15.8	1980.9	2011.8	15.47	59.73
16.0	0.00	5.3	1956.2	1986.1	14.98	59.67

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

Pond File: b:MMF1 .PND
Inflow Hydrograph: b:2OUTMF .HYD
Outflow Hydrograph: b:OUT .HYD

Starting Pond W.S. Elevation = 58.68 ft

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

Peak Inflow = 42.00 cfs
Peak Outflow = 15.81 cfs
Peak Elevation = 59.78 ft

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

Initial Storage = 47,919 cu-ft
Peak Storage From Storm = 12,606 cu-ft

Total Storage in Pond = 60,525 cu-ft

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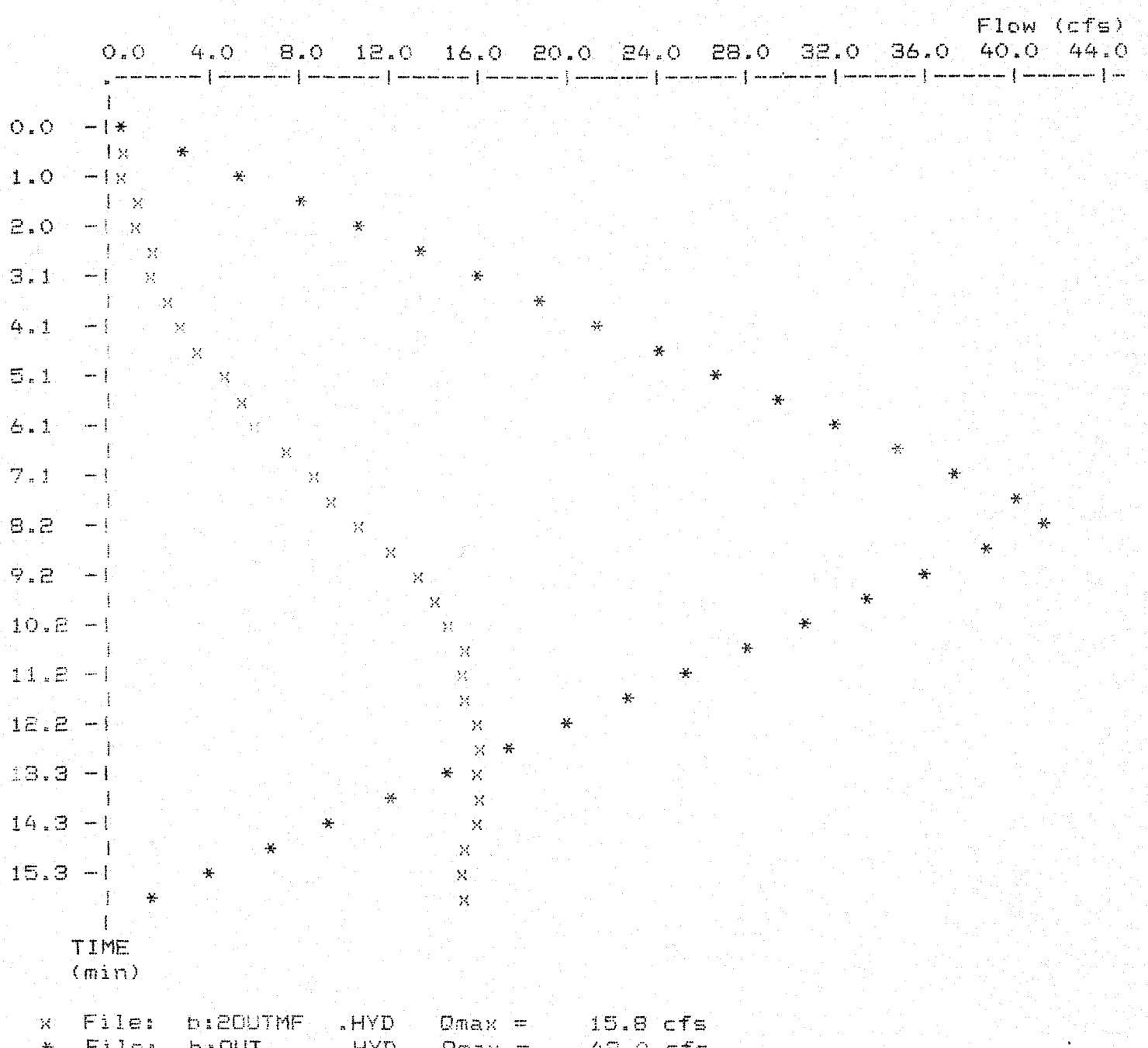
POND-2 Version: 5.17 S/N: 1295130250 Page 4

Pond File: b:MMF1 .PND
Inflow Hydrograph: b:2OUTMF .HYD
Outflow Hydrograph: b:OUT .HYD

EXECUTED: 11-01-1994
18:19:45

Peak Inflow = 42.00 cfs
Peak Outflow = 15.81 cfs
Peak Elevation = 59.78 ft



x File: b:2OUTMF .HYD Qmax = 15.8 cfs
* File: b:OUT .HYD Qmax = 42.0 cfs

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```
*************************************************
*                                               *
*  CHAMBREL BMP   MONTICELLO MEDICAL FACILITY   *
*                                               *
*                                               *
*                                               *
*                                               *
*************************************************
```

Inflow Hydrograph: b:10OUTMF .HYD
Rating Table file: b:MMF1 .PND

-----INITIAL CONDITIONS-----
Elevation = 58.68 ft
Outflow = 0.00 cfs
Storage = 47,919 cu-ft

GIVEN POND DATA			INTERMEDIATE ROUTING COMPUTATIONS	
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)	2S/t (cfs)	2S/t + O (cfs)
58.68	0.0	47,919	1597.0	1597.0
59.18	6.9	53,402	1779.7	1786.6
59.68	15.1	59,232	1974.0	1989.1
60.18	18.5	65,414	2180.0	2198.5
60.68	21.4	71,869	2395.1	2416.5
61.18	23.9	78,578	2618.7	2642.6
61.68	26.2	85,546	2851.0	2877.2
62.18	28.3	92,778	3092.0	3120.3
62.68	30.3	100,279	3342.0	3372.3
63.00	31.4	105,223	3506.7	3538.1

Time increment (t) = 1.0 min.

POND-2 Version: 5.17 S/N: 1295130250
EXECUTED: 11-01-1994 18:22:01

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Pond File: b:MMF1 .PND
Inflow Hydrograph: b:10OUTMF .HYD
Outflow Hydrograph: b:OUT .HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
0.0	0.00
1.0	6.30
2.0	12.60
3.0	18.90
4.0	25.20
5.0	31.50
6.0	37.80
7.0	44.10
8.0	50.40
9.0	50.40
10.0	50.40
11.0	44.10
12.0	37.80
13.0	31.50
14.0	25.20
15.0	18.90
16.0	12.60
17.0	6.30
18.0	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
-----	1597.0	1597.0	0.00	58.68
6.3	1602.8	1603.3	0.23	58.70
18.9	1619.9	1621.7	0.90	58.75
31.5	1647.4	1651.4	1.98	58.82
44.1	1684.7	1691.5	3.44	58.93
56.7	1730.9	1741.4	5.25	59.06
69.3	1785.3	1800.2	7.45	59.21
81.9	1846.8	1867.2	10.16	59.38
94.5	1915.0	1941.3	13.17	59.56
100.8	1984.7	2015.8	15.53	59.74
100.8	2052.2	2085.5	16.67	59.91
94.5	2111.4	2146.7	17.66	60.06
81.9	2156.5	2193.3	18.41	60.17
69.3	2188.0	2225.8	18.86	60.24
56.7	2206.5	2244.7	19.11	60.29
44.1	2212.2	2250.6	19.19	60.30
31.5	2205.5	2243.7	19.10	60.28
18.9	2186.7	2224.4	18.84	60.24
6.3	2156.2	2193.0	18.41	60.17

19

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

Pond File: b:MMF1 .PND
Inflow Hydrograph: b:10OUTMF .HYD
Outflow Hydrograph: b:OUT .HYD

Starting Pond W.S. Elevation = 58.68 ft

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

Peak Inflow = 50.40 cfs
Peak Outflow = 19.19 cfs
Peak Elevation = 60.30 ft

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

Initial Storage = 47,919 cu-ft
Peak Storage From Storm = 19,037 cu-ft

Total Storage in Pond = 66,956 cu-ft

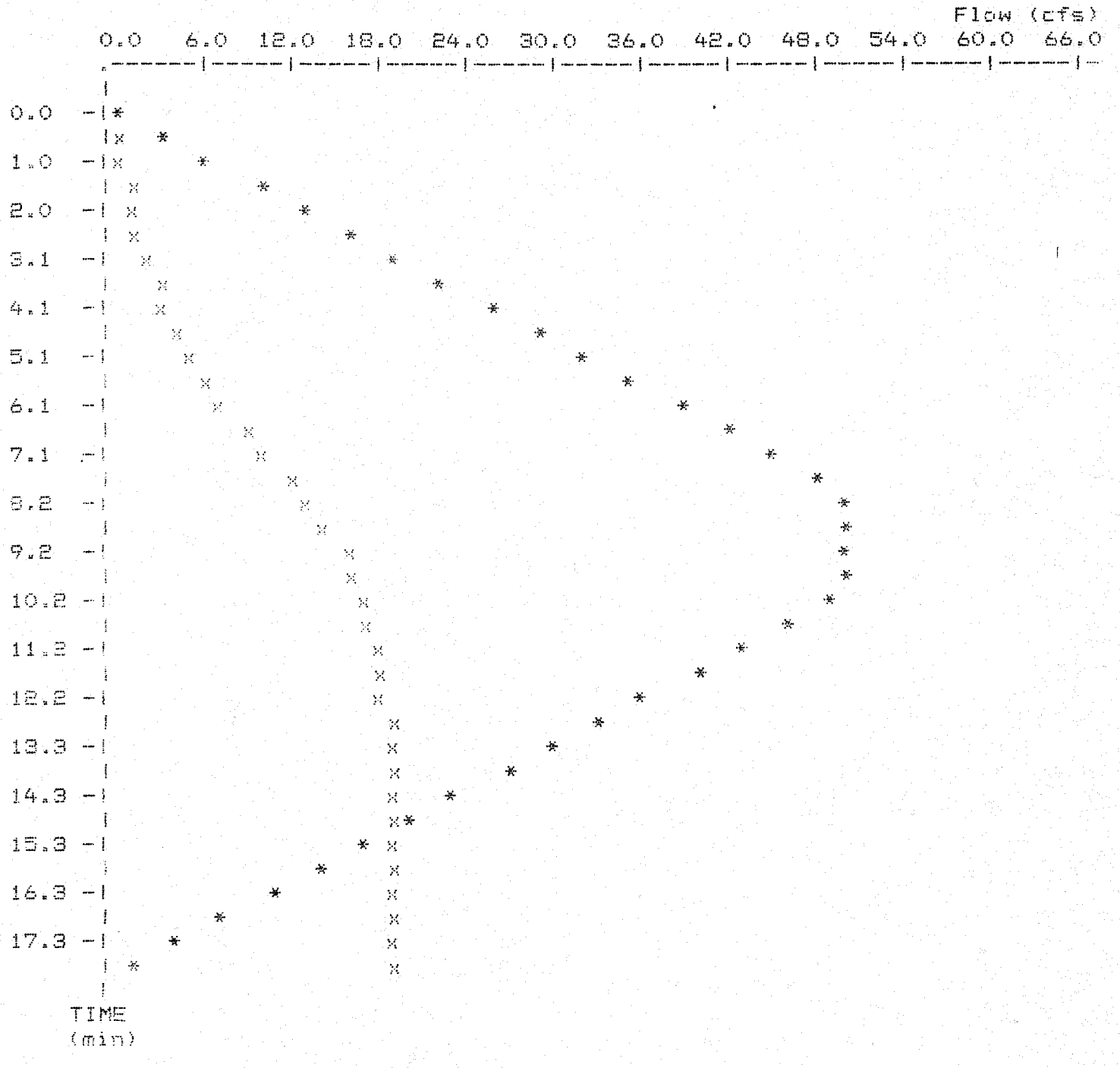
POND-2 Version: 5.17 S/N: 1295130250 Page 4

20

Pond File: b:MMF1 .PND
Inflow Hydrograph: b:10OUTMF .HYD
Outflow Hydrograph: b:OUT .HYD

EXECUTED: 11-01-1994
18:22:01

Peak Inflow = 50.40 cfs
Peak Outflow = 19.19 cfs
Peak Elevation = 60.30 ft



x File: b:10OUTMF .HYD Qmax = 19.2 cfs
* File: b:OUT .HYD Qmax = 50.4 cfs

```
*************************************************
*                                               *
*  CHAMBREL BMP   MONTICELLO MEDICAL FACILITY   *
*                                               *
*                                               *
*                                               *
*                                               *
*************************************************
```

21

Inflow Hydrograph: b:100OUTMF.HYD
Rating Table file: b:MMF1 .PND

-----INITIAL CONDITIONS----
Elevation = 58.68 ft
Outflow = 0.00 cfs
Storage = 47,919 cu-ft

GIVEN POND DATA			INTERMEDIATE ROUTING COMPUTATIONS	
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)	2S/t (cfs)	2S/t + O (cfs)
58.68	0.0	47,919	1597.0	1597.0
59.18	6.9	53,402	1779.7	1786.6
59.68	15.1	59,232	1974.0	1989.1
60.18	18.5	65,414	2180.0	2198.5
60.68	21.4	71,869	2395.1	2416.5
61.18	23.9	78,578	2618.7	2642.6
61.68	26.2	85,546	2851.0	2877.2
62.18	28.3	92,778	3092.0	3120.3
62.68	30.3	100,279	3342.0	3372.3
63.00	31.4	105,223	3506.7	3538.1

Time increment (t) = 1.0 min.

POND-2 Version: 5.17 S/N: 1295130250
EXECUTED: 11-01-1994 18:23:58

Pond File: b:MMF1 .PND
Inflow Hydrograph: b:100OUTMF.HYD
Outflow Hydrograph: b:OUT .HYD

22

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
0.0	0.00
1.0	8.93
2.0	17.85
3.0	26.78
4.0	35.70
5.0	44.63
6.0	53.55
7.0	62.48
8.0	71.40
9.0	62.48
10.0	53.55
11.0	44.63
12.0	35.70
13.0	26.78
14.0	17.85
15.0	8.93
16.0	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
-----	1597.0	1597.0	0.00	58.68
8.9	1605.2	1605.9	0.32	58.70
26.8	1629.5	1632.0	1.28	58.77
44.6	1668.5	1674.1	2.81	58.88
62.5	1721.2	1731.0	4.88	59.03
80.3	1786.5	1801.6	7.51	59.22
98.2	1863.0	1884.7	10.87	59.42
116.0	1949.6	1979.0	14.69	59.66
133.9	2050.2	2083.5	16.63	59.91
133.9	2147.6	2184.1	18.27	60.15
116.0	2224.9	2263.6	19.37	60.33
98.2	2282.7	2323.1	20.16	60.47
80.3	2321.7	2363.1	20.69	60.56
62.5	2342.2	2384.2	20.97	60.61
44.6	2344.9	2386.9	21.01	60.61
26.8	2330.0	2371.6	20.80	60.58
8.9	2298.2	2339.0	20.37	60.50

23

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

Pond File: b:MMF1 .PND
Inflow Hydrograph: b:100OUTMF.HYD
Outflow Hydrograph: b:OUT .HYD

Starting Pond W.S. Elevation = 58.68 ft

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

Peak Inflow = 71.40 cfs
Peak Outflow = 21.01 cfs
Peak Elevation = 60.61 ft

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

Initial Storage = 47,919 cu-ft
Peak Storage From Storm = 23,072 cu-ft

Total Storage in Pond = 70,990 cu-ft

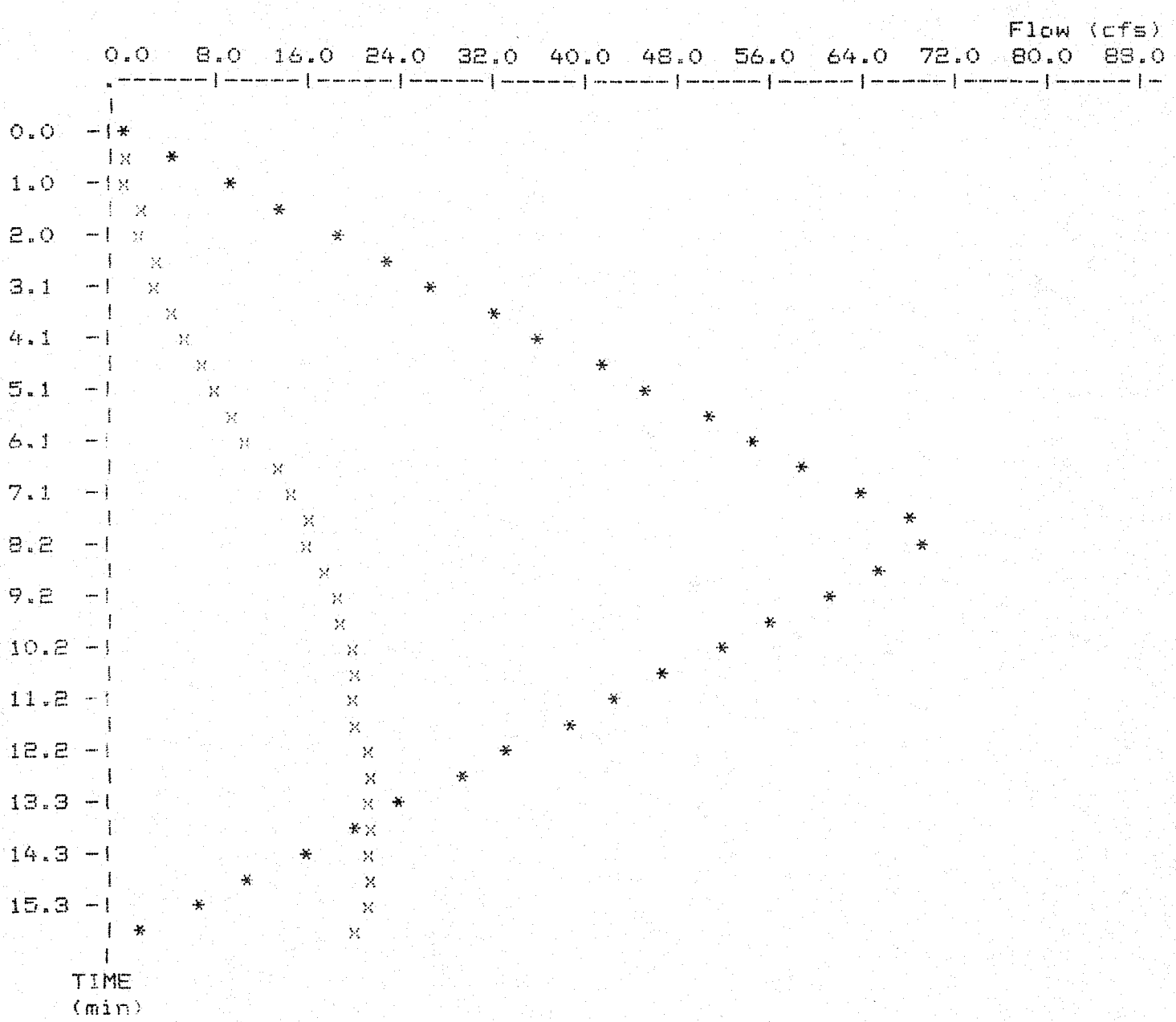
POND-2 Version: 5.17 S/N: 1295130250 Page 4

24

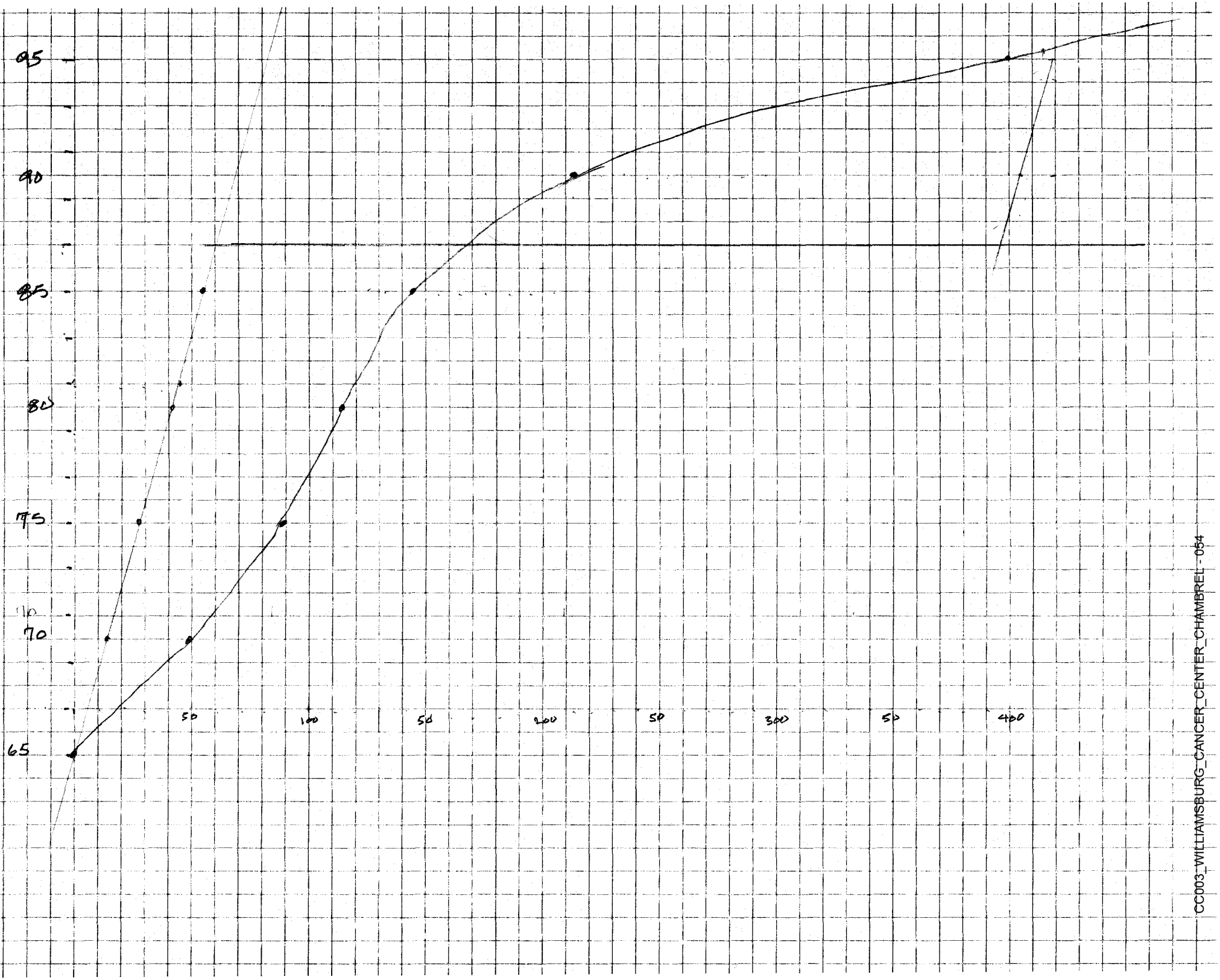
Pond File: b:MMF1 .PND
Inflow Hydrograph: b:100OUTMF.HYD
Outflow Hydrograph: b:OUT .HYD

EXECUTED: 11-01-1994
18:23:58

Peak Inflow = 71.40 cfs
Peak Outflow = 21.01 cfs
Peak Elevation = 60.61 ft



x File: b:100OUTMF.HYD Qmax = 21.0 cfs
* File: b:OUT .HYD Qmax = 71.4 cfs



CC003_WILLIAMSBURG_CANCER_CENTER_CHAMBREL - 054

MONTICELLO AVENUE
MEDICAL AND COMPREHENSIVE CANCER CARE FACILITY

CHESAPEAKE BAY NARRATIVE

Due to site topography and development levels necessary to meet financial feasibility, it became necessary to consider off-site areas to meet the Chesapeake Bay Preservation Ordinance requirement. The contiguous Chambrel Retirement Community presented an opportunity to provide a pollutant removal that not only met but exceeded the removal levels required by the proposed project.

For the proposed Medical Facility, Sheet A of the accompanying calculations shows that the existing pollutant runoff is 1.8 lb./year, based upon the 16% default value. Upon development, Sheet A shows a pollutant runoff of 4.3 lb./year. The removal required is the difference between these two numbers, 2.5 lb./year. Sheet B of the calculations shows that the pollutant removal provided by the proposed basin (a BMP with a 50% efficiency rating), intercepting the flow from 14 acres of the Chambrel site, is 7.9 lb./year.

Until the proposed nursing care facility is built at Chambrel, this level of excess removal will continue. With future construction of the proposed nursing care facility at Chambrel, the required pollutant removal is 5.5 lb./year, versus 7.9 lb./year actually provided (see Page B of attached calculations). These figures are based on the Virginia Chesapeake Bay Default calculation procedure outlined in Appendix C of the Chesapeake Bay Local Assistance Manual ← VOID AS OF 2003

Pages 1-7 of the calculations show the hydrographs generated by the modified rational method for areas draining to the proposed detention basin. The hydrographs are based upon a 0.6 runoff coefficient and a time of concentration of 8 minutes. The calculated runoff peak flows, currently existing, (Q) for the 2, 10 and 100 year storms are as follows:

2 year - 39.5 c.f.s. (Page 1)
10 year - 50.4 c.f.s. (Page 2)
100 year - 69.0 c.f.s. (Page 3)

Page 8 of the calculations show the characteristics of the detention basin. At the elevation of the standpipe rim, 58.68, a pond volume of 47,919 cubic feet is shown. This compares with a required 4 V_r volume of 43,560 cubic feet shown on Sheet C.

Comps for CC003; SP-127-95
As submitted under
Expansion Plan SP-46-04.

CC003_WILLIAMSBURG_CANCER_CENTER_CHAMBREL - 055

The basin's peak outflows, elevations and existing peak flows for the 14 acres draining to it are shown as follows:

STORM	EXISTING "Q"	BASIN "Q"	PEAK EL.
2	39.5	15.8	59.78 (PG. 15)
10	50.4	19.2	60.30 (PG. 19)
100	69.0	21.0	60.61 (PG. 23)

The proposed impoundment structure's crest is elevation 65. This is nearly 4.5 feet higher than the 100 year storm water surface elevation, therefore, an emergency spillway is not necessary.

CC003_WILLIAMSBURG_CANCER_CENTER_CHAMBREL - 056

$V_p = 4 \cdot V_r$

V_p = VOLUME OF PERMANENT POOL

$V_r = 0.5 \cdot R_v \cdot A \cdot 3630$

$R_v = 0.05 + 0.009 \cdot I$

I = % IMP. OF WATERSHED ONSITE

$V_r = 0.5 \cdot (0.05 + 0.009 \cdot \underset{I}{_____}) \cdot \underset{A}{_____} \cdot 3630$

$\therefore V_r =$

$V_p = 4 \cdot V_r =$

FROM ORIGINAL COMPUTATIONS:

40% TOWNHOUSES @ 40% IMP.
60% APARTMENTS @ 90% IMP.

COMPOSITE IMP.

2.2 AC (IMP. FROM TOWNHOUSES)
4.6 AC (" " APARTMENTS)

$\frac{6.8 \text{ AC}}{14 \text{ AC}}$ TOTAL IMP. / SITE AREA = 48.7% TOTAL IMP. AREA

$\therefore V_r = 0.5(0.05 + 0.009 \cdot 48.7) \cdot 14 \cdot 3630 = 12{,}407$

$4 \cdot V_r = 49{,}630$ ← THIS IS REQ'D PERMANENT POOL VOLUME OCCURING @ ± ELEV. 59.00

ROUTINGS GO FROM HERE!

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS
AMPAD

Langley and McDonald
A PROFESSIONAL CORPORATION
ENGINEERS • PLANNERS • SURVEYORS
VIRGINIA BEACH - WILLIAMSBURG, VIRGINIA

Subject _____

Computed By _____ Checked By _____

Project No. _____

Client _____

Date 5/23/94 Sheet No. C.

VOLUME REQMTS. FOR 4 Vr. DETEN. BASIN
ASSUMING 14 AC. DRAINAGE AREA @ 48.7% IMPERV.

$$VOL = \frac{(R_m)(R_v)}{12} A$$

$R_v = 0.05 + 0.009(48.7) = 0.49$
$R_m = 0.45"$

$$VOL = \frac{(0.45)(0.49)}{12}(14) = 0.26 \text{ AC-FT.} \times 4 = 1.0 \text{ AC-FT}$$

1.0 AC-FT = 43560 C.F.

6/27/05	WETLAND DELINEATION DATA FORM
8/5/05	REQUEST FOR USACE WETLAND CONFIRMATION
9/22/05	USACE WETLAND CONFIRMATION
1/13/06	USACE ADDDITIONAL WETLAND IMPACT
5/3/06	INDIVIDUAL PERMIT APPLICATION
6/22/06	USACE QUESTIONS PROJECT NEED
7/28/06	ADDITIONAL INFORMATION TO USACE
7/31/06	ADDITIONAL INFORMATION TO DEQ
11/30/06	USACE PERMIT
1/31/07	CHES BAY BOARD EXCEPTION
7/30/07	EMAIL FROM TIMMONS

CANCER TREATMENT CENTER

1. MEDICAL SITE -
   4 AC

2. PROPOSED NURSING FACILITY -
   5 AC

3. 14 AC WATERSHED
   9 AC Developed
   5 AC Undeveloped (to be nursing facility)

BMPs/NOS	SITE	NOS	TOTAL DA Controlled
a) 6 Pt -	Med Site	1.6 ac	6.7
	Nursing Site	2.0 ac	8.4
			15.1
b) 8 Pt	Med Site	0.8	5
	Nursing Site	1.0	6.25
			11.25
c) 9 Pt	Med Site	0.4	4.45
	Nursing Site	0.5	5.55
			10.00

Need to control up to 14 ac of watershed

OXFORD

7200 Wisconsin Avenue, 11th Floor
Bethesda, Maryland 20814-4815
Telephone: (301) 654-3100
Facsimile: (301) 654-8161

July 19, 1994

Post-it™ Fax Note 7671	Date 7/19	# of pages ▶ 1
To Norm Mason	From Sal Campana	
Co./Dept. Cargill + McDonald	Co. Drucker + Falk	
Phone #	Phone # 873-1401	
Fax # 229-0049	Fax # 873-0727	

Vincent A. Campana, Jr.
Director, Commercial Sales & Leasing
Drucker & Falk
9286 Warwick Blvd.
Newport News, VA 23607

Dear Mr. Campana:

This letter will confirm for you that Williamsburg Oxford Limited Partnership, D/B/A Chambrel at Williamsburg ("Chambrel") strongly supports your construction of a Storm Water Management Facility ("Facility") to be constructed on the Chambrel property for the benefit of Chambrel and the Ellis Development Project ("Project"). We recognize this Facility would be constructed at a sufficient size to incorporate the requirements of both the Project and a yet to be constructed Nursing Home consisting of approximately 150 beds at the back of the Chambrel property. Also, we understand any costs associated with this Facility incurred by Chambrel will be reimbursed by the Project.

Please proceed with your current plans including the drafting of the required easements to be granted related to the Project and forward the documents to my attention upon completion for review and comment. The additional items previously discussed including location of Chambrel signage and the aesthetic appeal of the Facility should be approved by the Executive Director of the Chambrel prior to forwarding requests to my attention.

Nothing contained in this letter is intended to grant any rights to the Project by Chambrel or to waive any rights of Chambrel to approve the final plans for the Facility or the related documents granting an easement for the Project.

I hope this letter will be helpful, and look forward to the successful completion of the Facility. Please contact me if you have any questions.

Sincerely,
WILLIAMSBURG - OXFORD LIMITED PARTNERSHIP,
By: OXFORD INVESTMENT CORPORATION, GENERAL PARTNER

Douglas A. Ewing
Assistant Vice President

File
94-25

07/19/94 16:44 ☎8042441974 DRUCKER & FALK →→→ CS&L 002/002
CC003_WILLIAMSBURG_CANCER_CENTER_CHAMBREL - 061

Wayland Bass

From: Marion Paine
Sent: Thursday, July 26, 2007 4:33 PM
To: 'smoniak@brookdaleliving.com'; 'amarston@aesva.com'; Wayland Bass
Cc: 'mburin@brookdaleliving.com'; Leo Rogers; Rick Hanson
Subject: Regional Pond

Thank you for meeting to talk further about relocation of the pond. I apologize if you thought we would have Timmons data for you today and hope Timmons will provide that quickly for you.

I reviewed my records and found that Peter Saunders gave us permission to conduct soil borings on the undeveloped portion of the Chambrel property to investigate the possible location for the regional pond on June 8, 2005.

It is certainly unfortunate that the county and Chambrel have been working on similar projects without the benefit of cooperating and sharing information. I hope now that discussions have resumed we can prevent further duplication of efforts or working at cross-purposes.

Wayland or I will be in touch next week after he has discussed modifying the design with our county staff.

Marion O. Paine
Community Development Planner
James City County Office of Housing and Community Development
5320 Palmer Lane, Suite 1A
Williamsburg, VA 23188-2674
757-259-5347
757-220-0640 (Fax)
mpaine@james-city.va.us

Wayland Bass

From: Ben Virts [Ben.Virts@timmons.com]
Sent: Monday, July 30, 2007 3:35 PM
To: Mike Woolson; Wayland Bass
Cc: Michelle Virts; Chris Dodson; Andrew Gould
Subject: Ironbound BMP: Relocation Permitting

Mike and Wayland:

As a follow up to our conversation I am providing a summary or our comments from this morning. The focus of our call was the feasibility from a regulatory permitting standpoint of relocating the Ironbound Regional BMP to a location lower in the watershed to capture a greater drainage area than is currently proposed. Our concerns included the following:

Relocating the BMP at this time provides the following concerns:

- During a regulatory pre-application meeting held onsite prior to permitting, the Corps of Engineers (COE) expressed their desire to avoid stream impacts below where the BMP is currently proposed for the following reasons:
  - The current location of the BMP impacts a degraded stream channel and addresses an area of severe bank erosion, sediment contribution to the stream, head cutting, and residential solid waste that has been dumped in the stream headwaters in past years. This area is serving as a point source for refuse traveling downstream.
  - The impoundment of the BMP is located at the junction of two intermittent stream channels and impacts a short distance of perennial stream where these two streams join. The intermittent streams that will be impacted by the BMP are degraded. However, the perennial stream channel below the proposed BMP location is in relatively good condition and is relatively stable. The downstream portions of the channel below the proposed BMP location are a higher quality resource than the proposed impact streams.
- The COE requested that we design to minimize impacts to the perennial channel and we have obtained an Individual Permit for the project with this in mind (issued Nov. 30, 2006). Requesting a permit modification that presents a redesign including more perennial channel impacts would be a difficult sell since they are aware that the project can be undertaken with less impact under the currently permitted design.
- The James City County Wetlands Board has approved the current project and the RPA impacts required. Similar to above, gaining approval of a design with greater RPA impacts may be difficult.
- The DEQ permit has not been issued yet, but the process is nearing completion. In line with the guidance of the COE, the DEQ has focused their attention on minimizing the impacts to the stable perennial channel downstream of the current BMP location. Presenting greater perennial impacts may be difficult.
- Presenting a new design and reentering the permitting process with each of the agencies noted above will delay construction for the required agency processing times.
- The forebay associated with the Bay Aging Housing Project is located immediately upstream of the currently proposed BMP and was proposed as a maintenance feature for the BMP during permitting. This forebay has been constructed and is currently in place. Relocation the BMP may require an additional forebay to be constructed and/or require additional maintenance features for the BMP if a forebay will not be in place similar to the currently proposed location.
- An offsite stream restoration site has been identified for the proposed BMP impacts. The site is anticipated to provide sufficient credit units for the permitted BMP impacts, but not a significant excess. If a redesign requires compensatory mitigation above that proposed by the current design, an additional restoration site or the purchase of mitigation bank credits may be required for permit approvals.

Please let us know if we can provide any additional information. Thank You.

Ben Virts, WPIT
Environmental Project Manager
TIMMONS GROUP
Your Vision Achieved Through Ours
Office: 804-200-6442
Mobile: 804-928-8424
Fax: 804-560-1648

KAUFMAN & CANOLES
| A Professional Corporation |
Attorneys and Counselors at Law

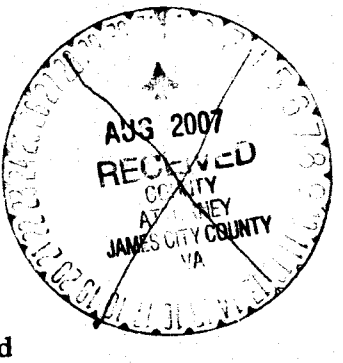
Alvin P. Anderson
757 / 259-3815
apanderson@kaufcan.com

757 / 259-3800
fax: 757 / 259-3838

Mailing Address:
P.O. Box 6000
Williamsburg, VA 23188

4801 Courthouse Street
Suite 300
Williamsburg, VA 23188

August 31, 2007



Leo P. Rogers, Esq.
County Attorney
P.O. Box 8784
Williamsburg, VA 23187-8784

RE: CMCP-Williamsburg, LLC; BLC-Williamsburg, LLC; and Brookdale Senior Living t/a Chambrel at Williamsburg v. James City County
Our File No. 0127784

Dear Leo:

On August 24, 2007, I received 27 pages of copied material from you pursuant to the Freedom of Information Request previously provided to the County on August 8, 2007. Upon receipt of these materials I immediately shared the same with Jim Money, Senior Vice-President/Marketing & Development with Brookdale Senior Living; with G. Archer Marston, Vice-President with AES Consulting Engineers; and, of course, with the environmental regulatory attorneys within our firm. After that review, all of us have come to various conclusions one of which is that there might well be additional materials which were overlooked in the assembly by the County of the response to the Freedom of Information Act request. I would respectively request that you make an additional inquiry to ensure that the 27 pages received constitutes a full, fair and complete response.

Notwithstanding the above, and consistent with my commitment to you upon receipt of the materials on August 24, 2007, I have included herewith a copy of a letter from Mr. Marston regarding the additional information requested from AES, the preliminary scope of work with which AES has been charged, and the possible schedule within which its work might be completed.

This letter is written in the interest of promoting a compromise/settlement and, accordingly, no portion of this letter or the attached may later be used in any proceeding for any purpose without the express written permission of my client obtained through me.

Disclosure Required by Internal Revenue Service Circular 230: This communication is not a tax opinion. To the extent it contains tax advice, it is not intended or written by the practitioner to be used, and it cannot be used by the taxpayer, for the purpose of avoiding tax penalties that may be imposed on the taxpayer by the Internal Revenue Service.

After the additional information is provided, I would welcome a meeting between the representatives of the Timmons Group and AES to address the engineering issues involved.

Very truly yours,

Alvin P. Anderson

APA/df
WMB\6164543\1

cc: James Money
R. Barrow Blackwell, Esq.
Marina Phillips, Esq.

CONSULTING ENGINEERS
5248 Olde Towne Road, Suite 1, Williamsburg, VA 23188
614 Moorefield Park Drive, Richmond, VA 23236
6632 Main Street, Gloucester, VA 23061
(757) 253-0040
(804) 330-8040
(804) 693-4450
www.aesva.com

August 30, 2007

Mr. Alvin P. Anderson, Esq.
Kaufman and Canoles
P.O. Box 6000
Williamsburg, Virginia 23188

RE: Brookdale/Chambrel
AES Project No. 7645-01

Dear Alvin,

AES is currently in the process of conducting topographic and wetland surveys of the portion of the Chambrel site designated for the expansion of the facility. The wetland field work necessary to allow AES to complete the topographic and location surveys will be complete by Tuesday, September 4th. We anticipate having a base map completed and a preliminary design of a stormwater management facility which could potentially be shared by the County and Chambrel by the end of September.

In order to accomplish this preliminary design we will need a copy of the pond calculations as well as a current set of plans for the proposed County pond (the previously provided set was a 50% submittal). We request that you obtain these items, on behalf of our client, for our use.

Please feel free to contact me if you have any questions or require additional information.

Sincerely,

AES Consulting Engineers

G. Archer Marston, III, P.E.
Vice President

S:\Jobs\7645\01-ChambrelExpansion\Admin\Correspondence\Letters\764501L01-gam.doc

Date Record Created:

Created By:

WS_BMPNO: CC003

Print Record

PRINTED ON
Wednesday, March 10, 201
2:28:36 PM

WATERSHED	CC
BMP ID NO	003
PLAN NO	SP-127-95
TAX PARCEL	(39-1)(1-131)
PIN NO	391010000131
CONSTRUCTION DATE	2/15/1996
PROJECT NAME	Chambrel Cancer Treatment Center
FACILITY LOCATION	3800 Treyburn Drive
CITY-STATE	Williamsburg, VA
CURRENT OWNER	Williamsburg Oxford Ltd. Partnership
OWNER ADDRESS	7537 East McDonald Drive
OWNER ADDRESS 2	
CITY-STATE-ZIP CODE	Scottsdale, AZ 85250
OWNER PHONE	
MAINT AGREEMENT	Yes
EMERG ACTION PLAN	No

Get Last BMP No

Return to Menu

MAINTENANCE PLAN	No
SITE AREA acre	9
LAND USE	Insitutional
old BMP TYP	Wet Pond
JCC BMP CODE	A2 Wet Pond
POINT VALUE	9
SVC DRAIN AREA acres	14
SERVICE AREA DESCRI	Cancer Treat & Nursing Center
IMPERV AREA acres	6.80
RECV STREAM	Lake Matoca
EXT DET-WQ-CTRL	Yes
WTR QUAL VOL acre-ft	1.1
CHAN PROT CTRL	No
CHAN PROT VOL acre-ft	0
SW/FLOOD CONTROL	Yes
GEOTECH REPORT	No

CTRL STRUC DESC	RCP Standpi
CTRL STRUC SIZE inches	24
OTLT BARRL DESC	RCP
OTLT BARRL SIZE inch	18
EMERG SPILLWAY	No
DESIGN HW ELEV	65
PERM POOL ELEV	49.9
2-YR OUTFLOW cfs	15.81
10-YR OUTFLOW cfs	19.20
REC DRAWING	Yes
CONSTR CERTIF	No

LAST INSP DATE 2/1/2001 Inspected by:

INTERNAL RATING 4

MISC/COMMENTS

West of site buildings. Offsite BMP.

Additional Comments:

WATERSHED	CC	MAINTENANCE PLAN	No	CTRL STRUC DESC	RCP Standpi
BMP ID NO	003	SITE AREA acre	9	CTRL STRUC SIZE inches	24
PLAN NO	SP-127-95	LAND USE	Insitutional	OTLT BARRL DESC	RCP
TAX PARCEL	(39-1)(1-131)	old BMP TYP	Wet Pond	OTLT BARRL SIZE inch	18
PIN NO	391010000131	JCC BMP CODE			
CONSTRUCTION DATE	1/01/98	POINT VALUE	9	EMERG SPILLWAY	No
PROJECT NAME	Chambrel Cancer Treatment Center			DESIGN HW ELEV	65
FACILITY LOCATION	3800 Treyburn Drive			PERM POOL ELE	49.9
CITY-STATE	Williamsburg, VA	SVC DRAIN AREA acres	14	2-YR OUTFLOW cfs	15.80
CURRENT OWNER	Williamsburg Oxford Ltd. Partnership			10-YR OUTFLOW cfs	19.20
OWNER ADDRESS	7537 East McDonald Drive			REC DRAWING	Yes
OWNER ADDRESS 2		SERVICE AREA DESCRI	Cancer Treat & Nursing Center		
CITY-STATE-ZIP CODE	Scottsdale, AZ 85250	IMPERV AREA acres	6.80	CONSTR CERTI	No
OWNER PHONE		RECV STREAM	Lake Matoca		
MAINT AGREEMENT	Yes	EXT DET-WQ-CTRL	Yes	LAST INSP DATE	2/1/2001
EMERG ACTION PLAN	No	WTR QUAL VOL acre-ft	1.1	INTERNAL RATING	4
		CHAN PROT CTRL	No	MISC/COMMENTS	
		CHAN PROT VOL acre-ft	0	West of site buildings.	
		SW/FLOOD CONTROL	Yes		
		GEOTECH REPORT	No		

Get Last BMP No

Return to Menu

FOR:

Environmental
Division
Attn: Scott Thomas, PE