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: **PC006**

DATE VERIFIED: **October 26, 2012**

QUALITY ASSURANCE TECHNICIAN: **Leah Hardenbergh**

Leah Hardenbergh

LOCATION: WILLIAMSBURG, VIRGINIA

Stormwater Division

MEMORANDUM

DATE: March 13, 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: PC006

PIN: 3740300001A

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

Property Description: Timeshare common area

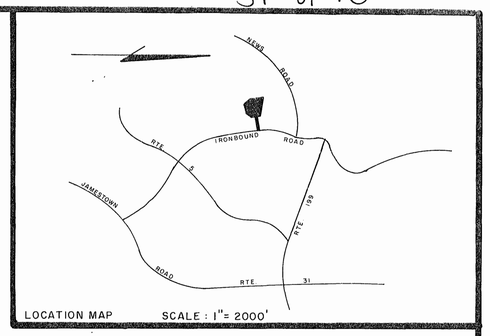
Site Address: 4300 Fithian LN

(For internal use only) **Box** 4 **Drawer:** 3

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

Comments

SP-81-90



SITE DEVELOPMENT PLANS

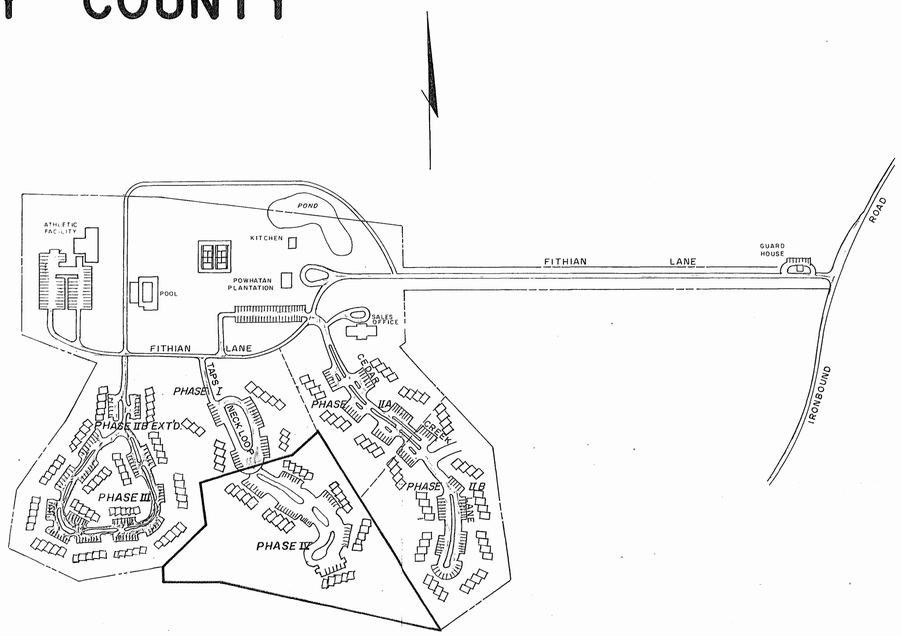
PHASE IV

POWHATAN PLANTATION RESORT

JAMES CITY COUNTY VIRGINIA

NOV 1990
RECEIVED
PLANNING DEPARTMENT

COUNTY OF JAMES CITY
AN
Recd
AP
ATE
Fire: CSW/MAF 8/13/90
Hor: GEM/MAF 8/2/90
Hi: BSB/MAF 8/2/90
Ex: 12/26/90
Fu: Dec/MAF 12/21/90
Zon: 1/3/91
JCSA: ATQ/MAF 8/2/90
County Atty: WB/MAF 11/26/90
Other: .....



GENERAL INFORMATION-ENTIRE DEVELOPMENT

TOTAL SITE AREA	—	254.56 AC.
TOTAL AMOUNT OF SITE COVERED BY BUILDING	—	6.93 AC.
PERCENT OF SITE COVERED BY BUILDING	—	2.7 %
TOTAL AMOUNT OF OPEN SPACE	—	234.80 AC.
PERCENT OF SITE COVERED BY OPEN SPACE	—	92.2 %
TOTAL NUMBER OF UNITS FOR PHASES I-V	—	226 UNITS

OWNER - POWHATAN ASSOCIATES, A JOINT VENTURE — **NORFOLK, VA.**

BUILDER - BUSH CONSTRUCTION CORP. — **NORFOLK, VA.**

SITE DESIGN - FREEMAN & ASSOCIATES — **NORFOLK, VA.**

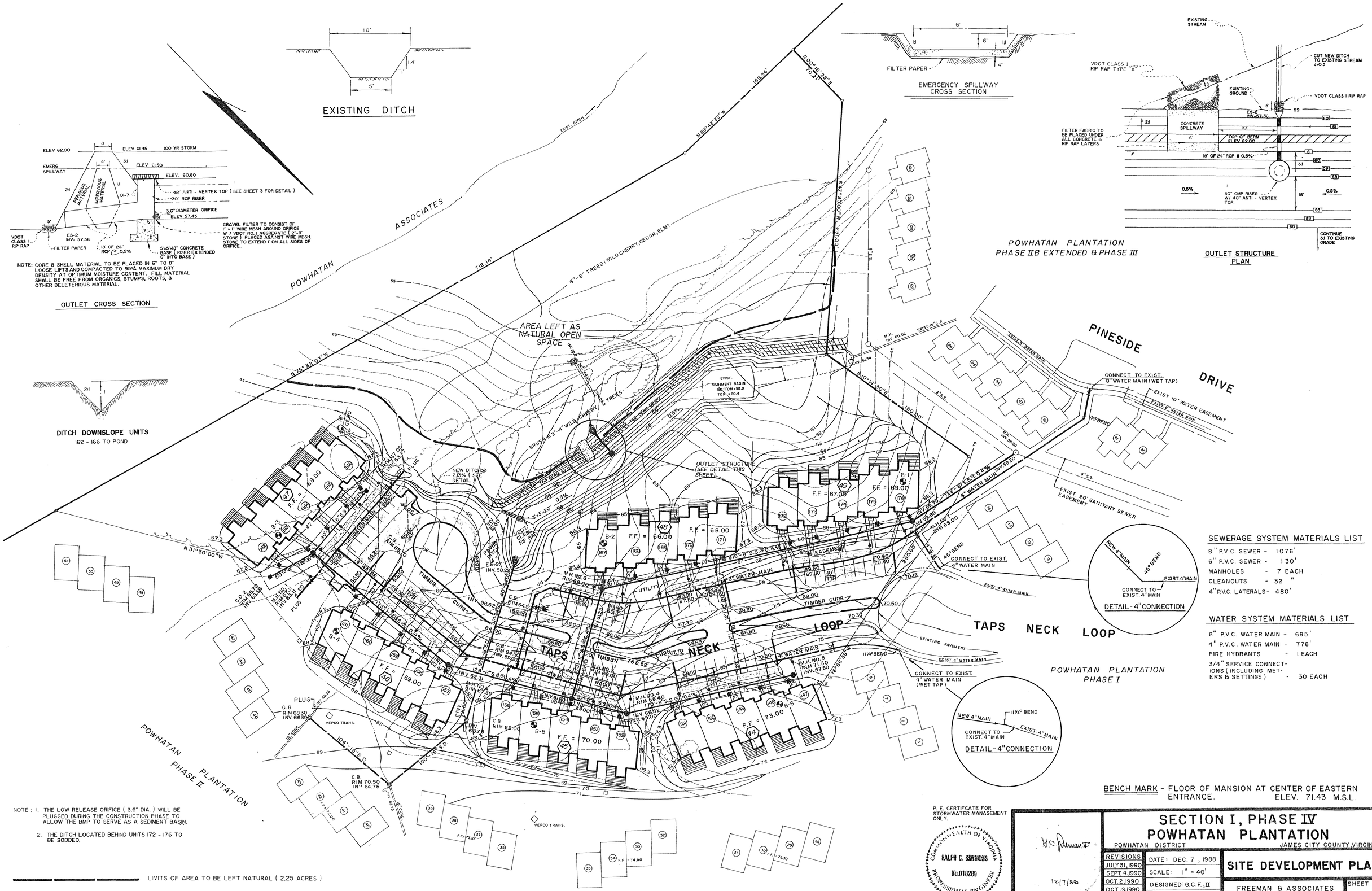
GENERAL INFORMATION
PHASE IV PROJECT AREA

1. ZONING - PUD-R
2. TAX MAP NO. - 38-3, PARCEL (1-19)
3. TOTAL AREA = 6.106 ACRES
4. OPEN AREA = 4.895 ACRES
5. PARKING SPACES = 60 (2 SPACES/UNIT X 30 UNITS)
6. DISTURBED AREA = 4.0 ACRES
7. PROPOSED - 3[illegible], 2-STORY, WOOD FRAMED, ATTACHED DWELLING UNITS
8. ROADS - 0.29 AC[illegible]ES, PARKING - .04 ACRES, BUILDINGS - 0.88 ACRES
9. UNITS / DEVE[illegible]OPMENTAL ACRE = 4.9 TOTAL BLDG. FLOOR AREA = 37,209.6 SQ.FT.
10. % PAVEMENT [illegible]5.4, % BUILDINGS = 14.4, % OPEN SPACE = 80.2
11. BUILDING FLO[illegible]R AREA = 6201.6 SQ. FT., MAX. HEIGHT = 30 FT. (UNIT FLOOR AREA = 2370 SQ.FT.)

DRAWING INDEX

1. SITE DEVELOPMENT PLAN
2. STANDARD DETAILS
3. EROSION CONTROL PLAN
4. UTILITY PROFILES
5. LANDSCAPE PLAN

OCT. 19, 1990
OCT. 2, 1990
SEPT. 27, 1990
SEPT. 4, 1990
JULY 31, 1990
DEC. 7, 1988



SEWERAGE SYSTEM MATERIALS LIST

8" P.V.C. SEWER	1076'
6" P.V.C. SEWER	130'
MANHOLES	7 EACH
CLEANOUTS	32 "
4" P.V.C. LATERALS	480'

WATER SYSTEM MATERIALS LIST

8" P.V.C. WATER MAIN	695'
4" P.V.C. WATER MAIN	778'
FIRE HYDRANTS	1 EACH
3/4" SERVICE CONNECTIONS (INCLUDING METERS & SETTINGS)	30 EACH

NOTE : 1. THE LOW RELEASE ORIFICE (3.6" DIA.) WILL BE PLUGGED DURING THE CONSTRUCTION PHASE TO ALLOW THE BMP TO SERVE AS A SEDIMENT BASIN.

2. THE DITCH LOCATED BEHIND UNITS 172 - 176 TO BE SODDED.

BENCH MARK - FLOOR OF MANSION AT CENTER OF EASTERN ENTRANCE. ELEV. 71.43 M.S.L.

P. E. CERTIFCATE FOR STORMWATER MANAGEMENT ONLY.

COMMONWEALTH OF VIRGINIA
RALPH C. SIMMONS
No. 018280
PROFESSIONAL ENGINEER

12/7/88

SECTION I, PHASE IV
POWHATAN PLANTATION

POWHATAN DISTRICT — JAMES CITY COUNTY, VIRGINIA

REVISIONS	
JULY 31, 1990	
SEPT. 4, 1990	
OCT. 2, 1990	
OCT. 19, 1990	
OCT. 29, 1990	
NOV. 16, 1990	

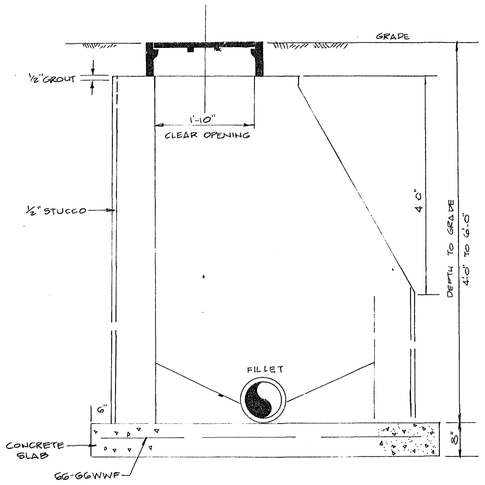
DATE: DEC. 7, 1988
SCALE: 1" = 40'
DESIGNED: G.C.F., II
DRAWN: S.D.
CHECKED: G.C.F., II

SITE DEVELOPMENT PLAN

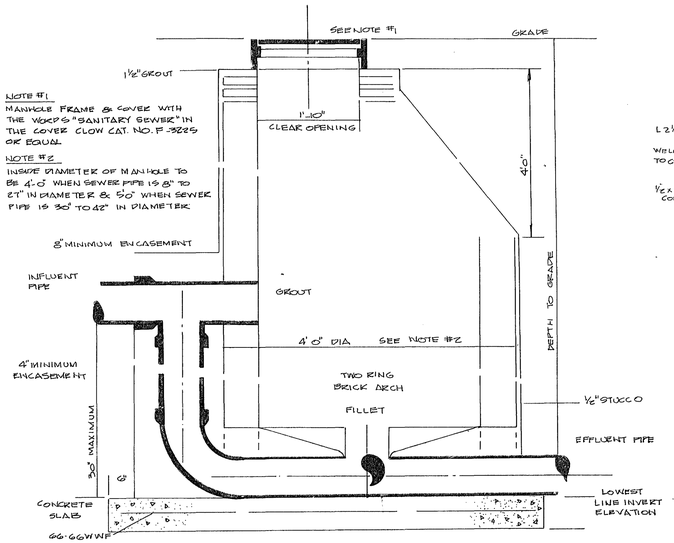
FREEMAN & ASSOCIATES
LAND SURVEYORS
NORFOLK, VIRGINIA

SHEET 1 OF 5

PC006_POWHATAN_PLANTATION_PHASE_4_DRY_POND_E - 004



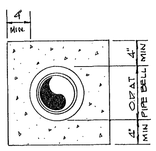
STANDARD MANHOLE
DEPTH 4'-0" - 6'-0"



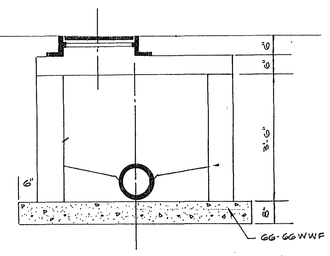
NOTE #1
MANHOLE FRAME & COVER WITH THE W&CPS "SANITARY SEWER" IN THE COVER CLOW CAT. NO. F-3225 OR EQUAL.

NOTE #2
INSIDE DIAMETER OF MANHOLE TO BE 4'-0" WHEN SEWER PIPE IS 8" TO 27" IN DIAMETER & 5'-0" WHEN SEWER PIPE IS 30" TO 42" IN DIAMETER.

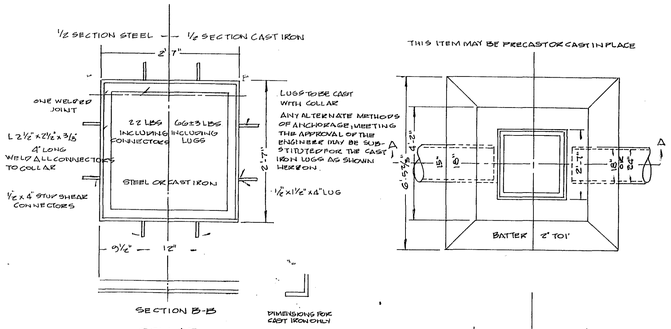
MANHOLE WITH OUTSIDE DROP



TYPICAL SEWER PIPE ENCASEMENT



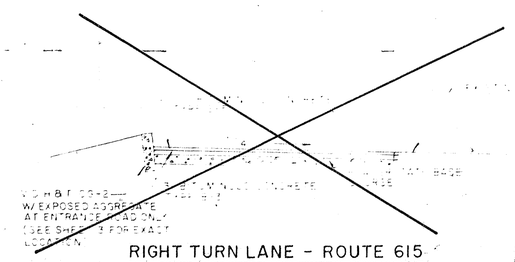
SHALLOW MANHOLE
DEPTH OF LESS THAN 4'-0"



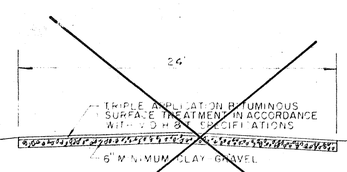
STANDARD CATCH BASIN

GENERAL NOTES

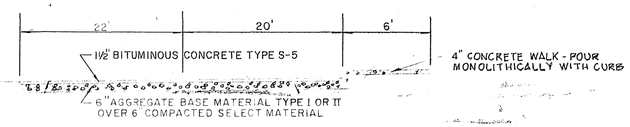
1. PRIOR TO CONSTRUCTION WITHIN ANY EXISTING PUBLIC RIGHT OF WAY, THE CONTRACTOR SHALL OBTAIN A PERMIT FROM THE VIRGINIA DEPARTMENT OF HIGHWAYS, WILLIAMSBURG, VIRGINIA.
2. PRIOR TO CONSTRUCTION OR EXCAVATION, THE CONTRACTOR SHALL ASSUME THE RESPONSIBILITY OF LOCATING ANY UNDERGROUND UTILITIES (PUBLIC OR PRIVATE) THAT MAY EXIST AND CROSS THROUGH THE AREA OF CONSTRUCTION, THAT ARE NOT SHOWN ON THESE PLANS. UTILITY COMPANIES SHALL BE NOTIFIED 24 HOURS IN ADVANCE OF ANY EXCAVATION IN PROXIMITY OF THEIR UTILITIES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING AT HIS EXPENSE ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING WITH MATCHING MATERIALS ANY DRIVEWAYS, WALKS, CURBS, ETC., THAT MUST BE CUT OR ARE DAMAGED DURING CONSTRUCTION.
5. THE CONTRACTOR SHALL PROVIDE TEMPORARY DRAINAGE DURING CONSTRUCTION IN AREAS THAT MAY BE DAMAGED BY FLOODING.
6. THE CONTRACTOR SHALL BE REQUIRED TO EXCAVATE BELOW PLAN GRADE ANY MATERIALS WHICH ARE UNSUITABLE FOR FOUNDATIONS, SUBGRADES, OR OTHER ROADWAY PURPOSES WITHIN THE LIMITS OF STREET CONSTRUCTION AND BACKFILL THESE AREAS WITH AN APPROVED MATERIAL. THE EXTENT OF UNDERCUTTING AND BACKFILLING SHALL BE DETERMINED BY THE VIRGINIA DEPARTMENT OF HIGHWAYS.
7. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH CURRENT STANDARDS AND SPECIFICATIONS OF THE VIRGINIA DEPARTMENT OF HIGHWAYS.
8. ALL WATER MAIN CONSTRUCTION SHALL CONFORM WITH THE STANDARDS AND SPECIFICATIONS OF THE JAMES CITY SERVICE AUTHORITY, JAMES CITY COUNTY, VIRGINIA
9. PIPE "FOLD-ING" SHALL NOT BE USED ON WATER MAINS, SLEEVES SHALL BE USED IN LIEU OF FOLD-INS.
10. TEE RODS SHALL BE USED ON BENDS AND FITTINGS WHERE WATER MAIN IS OFFSET UNDER STORM DRAINS OR OTHER UTILITIES.
11. WATER MAINS MAY BE ROLLED UNDER STORM DRAINS WITHOUT FITTINGS WHEN THE CHANGE IN VERTICAL GRADE IS TWO FEET OR LESS.
12. WHERE SEWER AND WATER LINES CROSS, THERE MUST BE 18" MINIMUM VERTICAL CLEARANCE, AND THE WATER MAIN LAID SO THE CENTER OF A PIPE LENGTH CROSSES THE CENTER OF THE SEWER LINE WITH JOINTS AS REMOTE AS POSSIBLE.
13. ALL SANITARY SEWER LINES AND MANHOLES SHALL BE CONSTRUCTED TO CONFORM WITH THE STANDARDS AND SPECIFICATIONS OF THE JAMES CITY SERVICE AUTHORITY.
14. ALL SANITARY SEWER PIPE SHALL BE SDR-35, P.V.C. ALL WATER MAINS SHALL BE SDR-18, P.V.C. & THEY SHALL BE TESTED IN ACCORDANCE WITH JAMES CITY CO. CRITERIA. SEWER MAINS SHALL BE AIR-TESTED
15. ALL CONCRETE SHALL BE CLASS "A3" AIR-ENTRAINED (3500 PSI MIN.)
16. THRUST BLOCKS SHALL BE INSTALLED AT ALL BENDS OF 22 1/2° OR GREATER.
17. EMBANKMENTS SHALL BE MADE OF APPROVED MATERIAL AND SHALL BE BUILT IN LAYERS NOT EXCEEDING EIGHT INCHES OF LOOSE MATERIAL AND COMPACTED IN ACCORDANCE WITH THE SPECIFICATIONS OF THE VIRGINIA DEPARTMENT OF HIGHWAYS.
18. THE CONTRACTOR SHALL CONSTRUCT AND MAINTAIN SILT TRAPS SUFFICIENT TO PREVENT SOIL FROM BEING ERODED FROM THE SITE INTO ANY ADJACENT DRAINAGE SYSTEMS, DITCHES, OR WATER COURSES, ANY MATERIAL THAT IS SO ERODED SHALL BE PROMPTLY REMOVED.
19. DROP MANHOLES SHALL BE PRECAST AS APPROVED BY THE JAMES CITY SERVICE AUTHORITY.
20. SEWER MANHOLES, CLEAN-OUTS, WATER VALVES AND METERS SHALL BE SET AT ESTABLISHED FINISHED GRADE ON-SITE.
21. INDIVIDUAL PARKING SPACES TO BE IDENTIFIED BY PAVEMENT STRIPES.



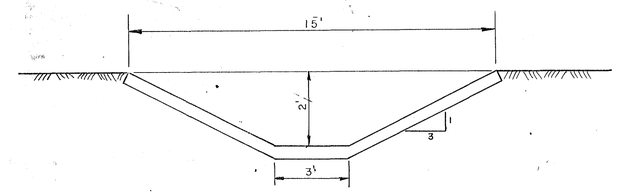
RIGHT TURN LANE - ROUTE 615



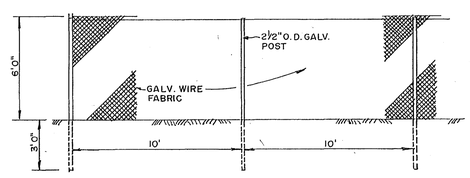
INTERIOR ROADS
CATEGORY 5



PARKING AREAS



DITCH DETAIL A-A



PROTECTIVE FENCING

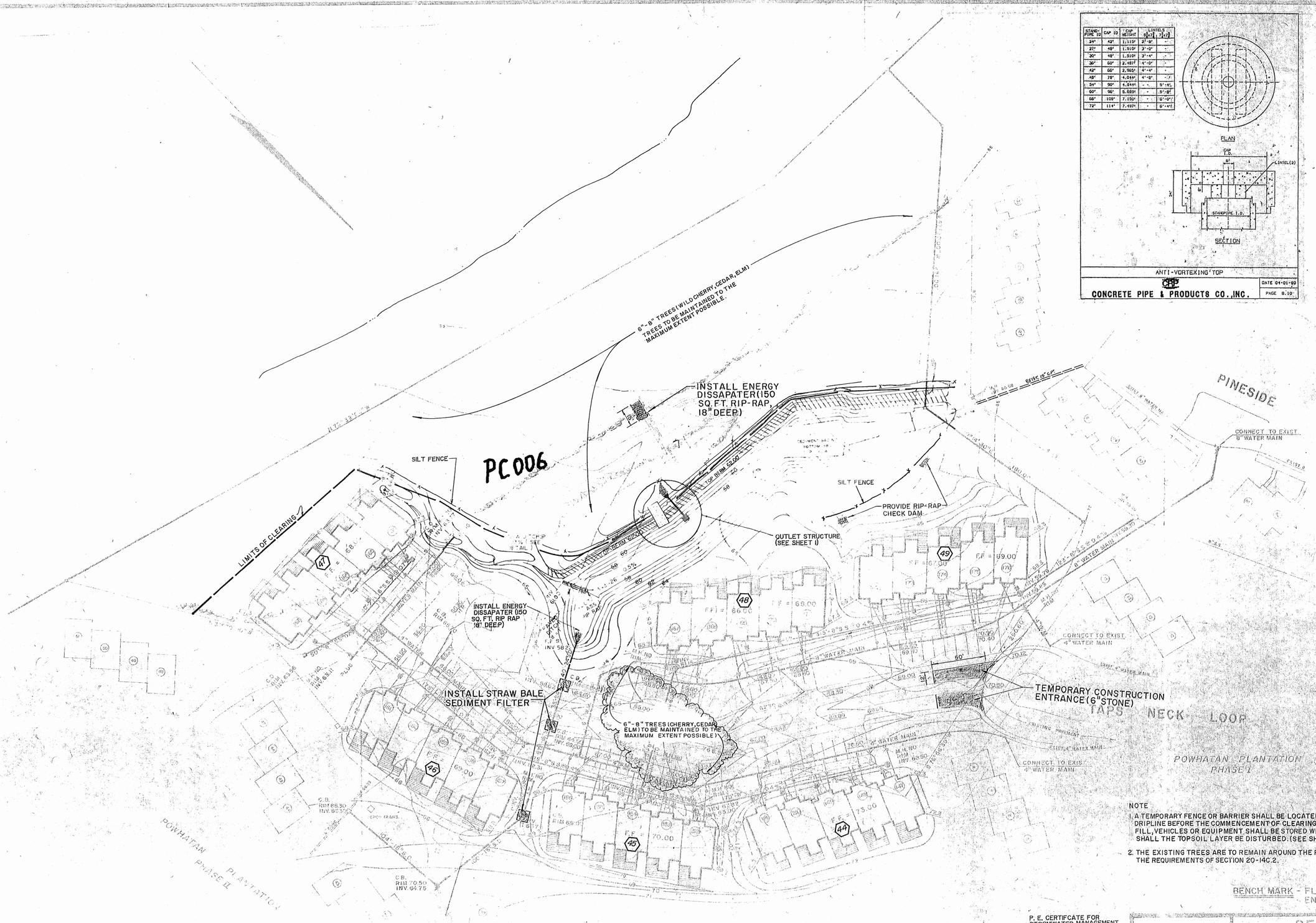
12/7/88

SECTION I, PHASE V
POWHATAN PLANTATION

POWHATAN DISTRICT — JAMES CITY COUNTY, VIRGINIA

REVISIONS	DATE: JULY 23, 1987	STANDARD DETAILS	
SEPT. 14, 1987			
OCT. 14, 1987	SCALE: AS NOTED		
DEC. 7, 1988	DESIGNED W.E.D.	FREEMAN & ASSOCIATES LAND SURVEYORS VIRGINIA	SHEET 2 OF 5
JULY 31, 1990			
SEPT. 4, 1990	DRAWN W.E.D.		
OCT. 2, 1990	CHECKED		

PC006_POWHATAN_PLANTATION_PHASE_4_DRY_POND_E - 005



STAND-PIPE I.D.	CAP I.D.	CAP HEIGHT	LINTELS (2)	
			'A'	'B'
24"	42"	1.115'	2'-8"	-
27"	48"	1.510'	3'-0"	-
30"	48"	1.510'	3'-4"	-
36"	60"	2.487'	4'-0"	-
42"	60"	2.985'	4'-4"	-
48"	78"	4.069'	4'-8"	-/-
54"	90"	4.944'	- -	5'-4"
60"	96"	5.881'	-	5'-8"
66"	109"	7.150'	-	6'-0"
72"	114"	7.497'	-	6'-4"

ANTI-VORTEXING TOP

CRP CONCRETE PIPE & PRODUCTS CO., INC.

DATE 04-01-80

PAGE 8.10

Erosion and Sediment Control Notes

The purpose of the erosion control measures shown on these plans shall be to preclude the transport of all waterborne sediments resulting from construction activities from entering onto adjacent properties or State waters. If field inspection reveals the inadequacy of the plan to confine sediment to the project site, appropriate modifications will be made to correct any plan deficiencies.

1. All erosion and sediment control measures shall be installed and maintained in accordance with the "Virginia Erosion and Sediment Control Handbook". The contractor shall be thoroughly familiar with all applicable measures contained therein which may be pertinent to this project.

2. All points of construction ingress and egress shall be protected by a temporary construction entrance to prevent tracking of mud onto public right-of-ways. An entrance permit from VDOT is required prior to any construction activities within State right-of-ways.

3. Sediment basins and traps, perimeter dikes, sediment barriers and other measures intended to trap sediment on-site must be constructed as a first step in grading and be made functional before upslope land disturbance takes place. Earthen structures such as dams, dikes, and diversions must be seeded and mulched within 15 days of installation. An on-site pre-construction meeting will be held between the Office of Code Compliance and the contractor to identify those measures to be initially installed.

4. Maintenance of all erosion and sediment control measures shall be accomplished in accordance with the "Virginia Erosion and Sediment Control Handbook". Maintenance will include the repair of measures damaged by any subcontractor including those of the public utility companies. At the pre-construction meeting, the contractor will supply Code Compliance with the name of the individual who will be responsible for ensuring maintenance of installed measures on a daily basis.

5. Surface flows over cut and fill slopes shall be controlled by either redirecting flows from transversing the slopes or by installing mechanical devices to safely lower water downslope without causing erosion. A temporary fill diversion (Std. & Spec. 1.16) shall be installed prior to the end of each working day.

6. Sediment control measures may require minor field adjustments at time of construction to insure their intended purpose is accomplished. Office of Code Compliance approval will be required for other deviations from the approved plans.

7. The contractor shall strip and pile topsoil at the locations shown on this plan or as directed by the engineer. Silt fence shall be placed at the toe of the stockpile after stripping of topsoil is complete.

8. The contractor shall complete drainage facilities within 30 days following completion of rough grading at any point within the project. The installation of drainage facilities shall take precedence over all underground utilities. Outfall ditches from drainage structures shall be stabilized immediately after construction of same. This includes installation of erosion control sizes where required. Any drainage or outfalls required for a street must be completed before street grading begins.

9. Permanent or temporary soil stabilization must be applied to all denuded areas within 15 days after final grade is reached on any portion of the site. Soil stabilization must also be applied to denuded areas which may not be at final grade but will remain dormant (undisturbed) for longer than 30 days. Soil stabilization measures include vegetative establishment, mulching and the early application of gravel base material on areas to be paved.

10. No more than 300' of sanitary sewer, storm sewer, or waterlines are to be open at one time. Following installation of any portion of these items, all disturbed areas are to be immediately stabilized (i.e., the same day).

11. If disturbed area stabilization is to be accomplished during the months of December, January, or February, stabilization shall consist of mulching in accordance with Specification 1.75. Seeding will then take place as soon as the season permits.

12. The term Seeding, Final Vegetative Cover or Stabilization, on this plan shall mean the successful germination and establishment of a stable grass cover from a properly prepared seedbed containing the specified amounts of seed, lime, and fertilizer in accordance with Specification 1.66, Permanent Seeding. Irrigation shall be required as necessary to ensure establishment of grass cover.

13. All slopes steeper than 3:1 shall require the use of erosion control blankets such as excelsior blankets to aid in the establishment of a vegetative cover. Installation shall be in accordance with Specification 1.75, Mulching and Manufacturer's Instructions.

14. Inlet protection in accordance with Specification 1.08 shall be provided for all storm drain inlets as soon as practical following construction of same.

15. Temporary liners, such as polyethylene sheets, shall be provided for all paved ditches until the permanent concrete liner is installed.

15. Paved ditches shall be required wherever erosion is evident. Particular attention shall be paid to those areas where grades exceed 3%.

17. Temporary erosion control measures are not to be removed until all disturbed areas are stabilized. After stabilization is complete, all measures shall be removed within 30 days. Trapped sediment shall be spread and seeded.

18. Off-site waste or borrow areas shall be approved by the Office of Code Compliance prior to the import of any borrow or export of any waste to or from the project site.

19. All paved and/or piped outfalls will be constructed before road grading and utility installation begins.

SEWERAGE SYSTEM MATERIALS LIST

8" P.V.C. SEWER	1076'
6" P.V.C. SEWER	130'
MANHOLES	7 EACH
CLEANOUTS	32 "
4" P.V.C. LATERALS	480'

WATER SYSTEM MATERIALS LIST

8" P.V.C. WATER MAIN	695'
4" P.V.C. WATER MAIN	778'
FIRE HYDRANTS	11 EACH
3/4" SERVICE CONNECTIONS (INCLUDING METERS & SETTINGS)	30 EACH

NOTE

1. A TEMPORARY FENCE OR BARRIER SHALL BE LOCATED AND MAINTAINED OUTSIDE THE DRIPLINE BEFORE THE COMMENCEMENT OF CLEARING AND GRADING. NO MATERIAL, DEBRIS, FILL, VEHICLES OR EQUIPMENT SHALL BE STORED WITHIN THE FENCE ENCLOSURE, NOR SHALL THE TOPSOIL LAYER BE DISTURBED. (SEE SHEET 2 FOR FENCE DETAIL)

2. THE EXISTING TREES ARE TO REMAIN AROUND THE PERIMETER OF THE SITE AND MEET THE REQUIREMENTS OF SECTION 20-14C.2.

BENCH MARK - FLOOR OF MANSION AT CENTER OF EASTERN ENTRANCE. ELEV. 71.63 M.S.L.

P. E. CERTIFCATE FOR STORMWATER MANAGEMENT ONLY.

COMMONWEALTH OF VIRGINIA
RALPH C. SIMMONS
No. 018289
PROFESSIONAL ENGINEER

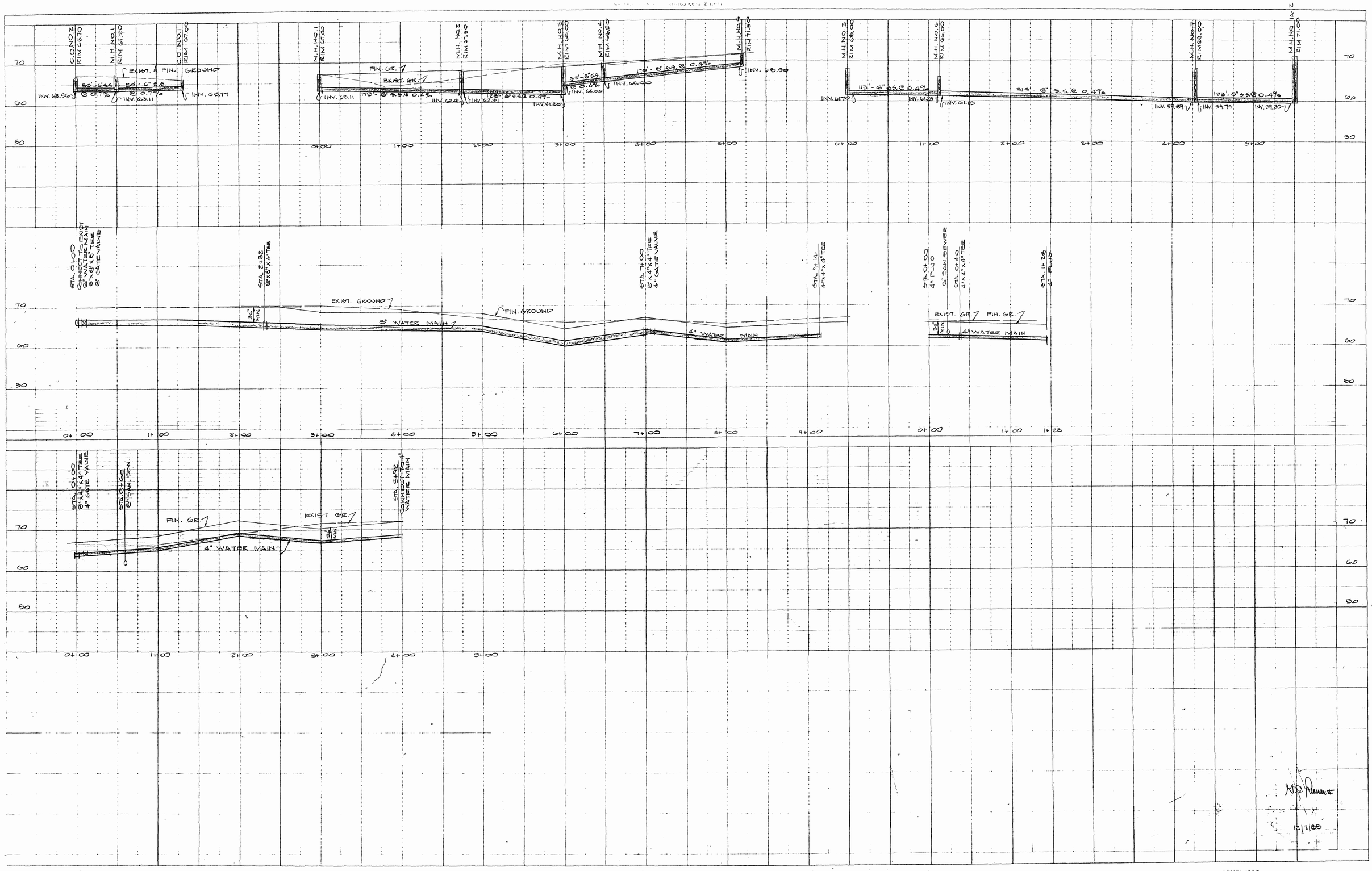
12/7/90

SECTION I, PHASE IV
POWHATAN PLANTATION

POWHATAN SHIRE
JAMES CITY COUNTY, VIRGINIA

REVISIONS	DATE DEC. 7 1989	EROSION CONTROL PLAN
JULY 31, 1990	SCALE 1" = 60'	
SEPT. 4, 1990	DESIGNED G.C.F., III	FREEMAN & ASSOCIATES
OCT. 2, 1990	DRAWN	
OCT. 19, 1990	CHECKED	
NOV. 16, 1990		

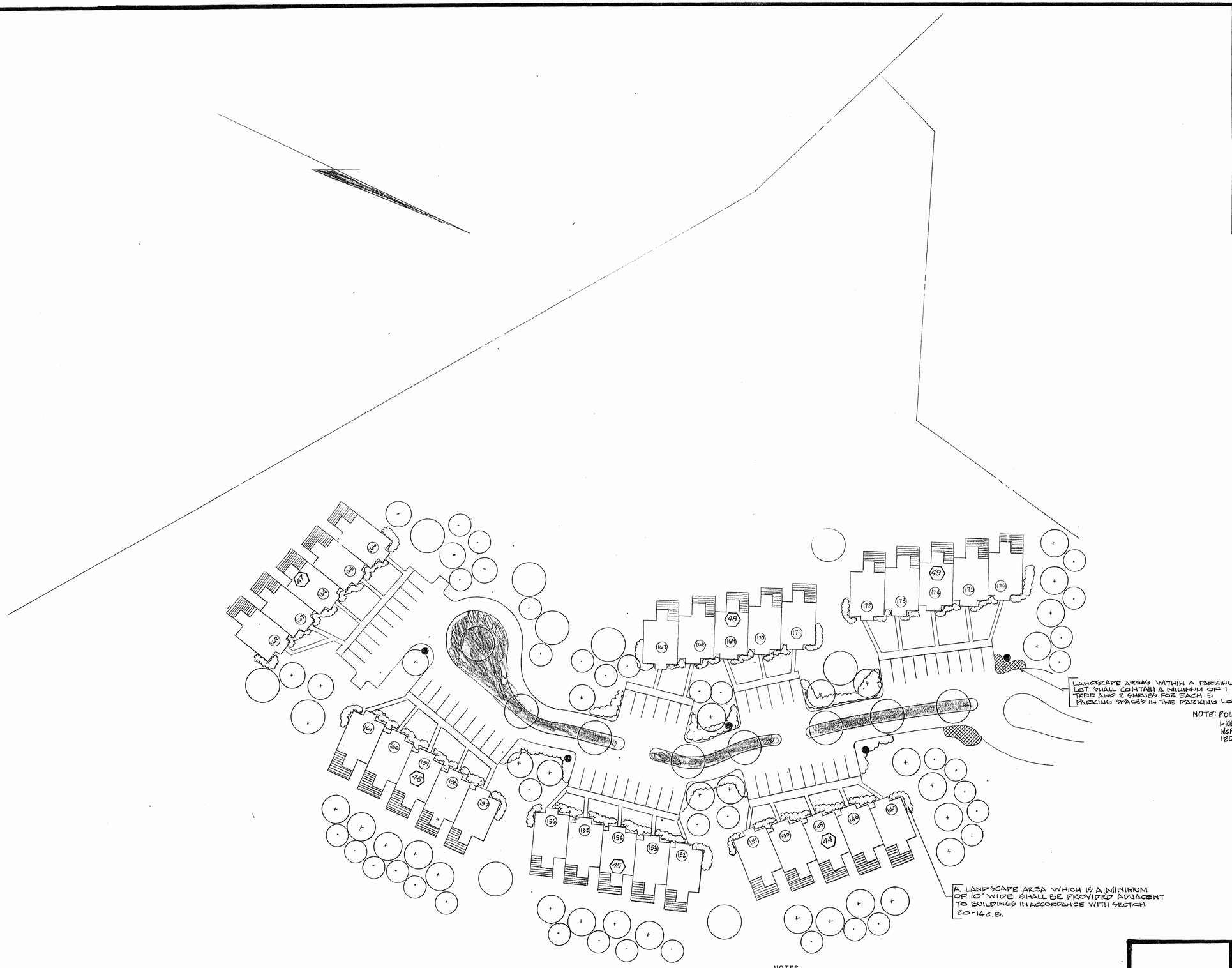
SHEET 35



UTILITY PROFILES - POWHATAN PLANTATION, SECTION I, PHASE IV

JULY 31, 1990
DEC. 7, 1988

PC006_POWHATAN_PLANTATION_PHASE_4_DRY_POND_E - 007



LEGEND

- QUERCUS PHELLOS/WILLOW OAK (3"-3½" CAL.)
- MAGNOLIA GRANDIFLORA (8'-10')
- BRADFORD PEAR (6'-8')
- SHRUB MASSES (IN ACCORDANCE WITH SECTION 20-14C.B)
- BERMAL PLANTING BERMED TO 24"
- GROUNDCOVER — CREEPING JUNIPER - 6" HIGH (JUNIPER HORIZONTALIS)
- ANNUAL BEDS
- STREET LIGHT (MAX. HGT. 15')

FOUNDATION PLANTING

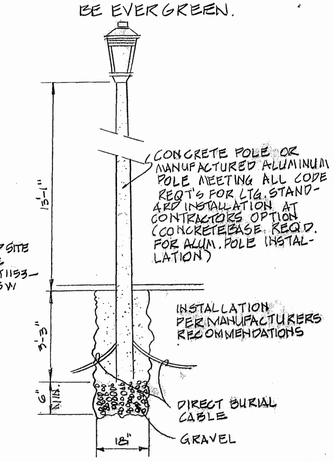
(PER 5 UNIT BLDG.)

8 BURFORDI HOLLY - (3'-3½')
2 F.F. HOLLY (3'-4')
6 NANDINA
20 LIRIOPE (1 GAL. CANS)
24 JUNIPER (18")
16 ILEX COMPACTA (15"-18")
6 HELLERI HOLLY (3'-4')
6 DWARF NANCINA
3 CLEYERA JAPONICA (3'-4')
36 FLOWERING BEGONIAS

NOTE: FOUNDATION PLANTING SHALL BE IN ACCORDANCE WITH SECTION 20-14C.B.

NOTE: AT LEAST SIX TREES WITHIN THE PARKING AREA SHALL BE A MINIMUM HEIGHT OF TEN FEET AND AT LEAST FIFTEEN TREES SHALL BE A MINIMUM OF SIX FEET FOR EVERGREENS AND FLOWERING VARIETIES AND EIGHT FEET FOR DECIDUOUS SHADE TREES. 50% OF THE TREES W/IN THE PARKING LOT SHALL BE DECIDUOUS SHADE TREES OF AT LEAST A 2½" CALIPER AND THAT 25% OF THE SHRUBS SHALL BE EVERGREEN.

NOTE: POLE MOUNTED SITE LIGHTING TO BE MCPHILBEN 12T1153-120V-PC, 175W



LIGHT STANDARD

NOTES

1. ALL REQUIRED PLANTINGS SHALL CONFORM WITH THE MOST RECENT EDITION OF "THE AMERICAN STANDARD FOR NURSERY STOCK" PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN AND SHALL BE PLANTED IN ACCORDANCE WITH THE MOST RECENT EDITION OF "GUIDELINES FOR PLANTING LANDSCAPE TREES AND PLANTING AND CARE OF TREES AND SHRUBS" PUBLISHED BY THE VIRGINIA COOPERATIVE EXTENSION SERVICE.

SECTION I, PHASE IV
POWHATAN PLANTATION

POWHATAN DISTRICT — JAMES CITY COUNTY, VIRGINIA

REVISIONS	
JULY 31, 1990	DATE: DEC. 7, 1988
SEPT. 4, 1990	SCALE: 1" = 40'
SEPT. 27, '90	DESIGNED: G.C.F., II
	DRAWN: S.D.
	CHECKED: G.C.F., II

LANDSCAPE PLAN

FREEMAN & ASSOCIATES
LAND SURVEYORS
NORFOLK, VIRGINIA

SHEET 5 OF 5

PC006_POWHATAN_PLANTATION_PHASE_4_DRY_POND_E - 008

Powhatan Plantation Phase IV

BMP Calculations

Job# 90268

Rickmond Engineering, Inc.

10/29/90

TABLE OF CONTENTS

		Page
Preface		i
I.	Drainage Area Map	1
	Size Pond for Runoff from 1 inch of Rain	2
	Stage-Storage	3
	Size Orifice for 24 hour Release	4
	BMP Worksheet	5
	Phase IV Pre-Development	6
	Phase IV Post-Development	7
	Size Orifice for 2 Year Storm	8
	13.92 acre Post Development Runoff	9
	Size Weir for 10 Year Storm	10
	Size Barrell Pipe for Outlet Structure	11
	Size Emergency Spillway	13
	Size Ditch Downslope of Buildings #162-166 to Pond	14

PREFACE

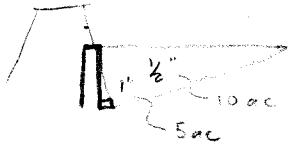
The following drainage calculations pertain to Powhatan Plantation, Phase IV located in James City County, Virginia.

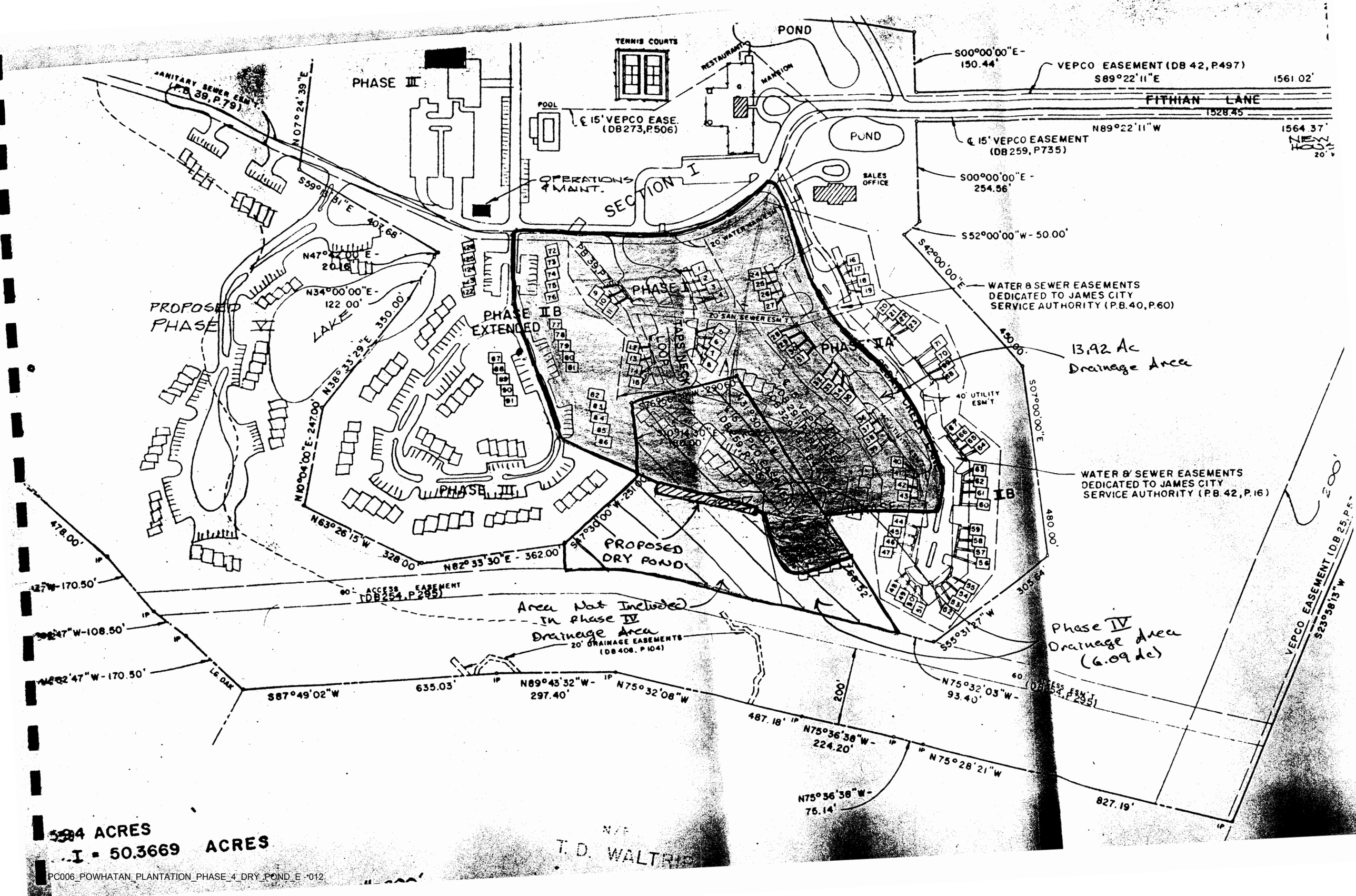
Phase IV consists of 6.09 acres containing 30 time-share units, roads, parking spaces, sidewalks, and landscaping. For the purpose of these calculations 3.01 acres of land contained in Phase IV and 3.08 acres of off-site land flow into the pond to account for the 6.09 acres (total area of Phase IV). The amount of runoff from 1 inch of rain is released over 24 hours and the 2 year storm is controlled to pre-development conditions for the area of Phase IV (6.09 acres). The 10 year storm and 100 year storm post-development runoff from the entire 13.92 acres that flow to the pond are passed by the primary and secondary outlet. 2.25 acres of land in Phase IV are dedicated as green space to be left natural.

3.01 ac onsite into basin
3.08 ac offsite

2.25 -open space-

V basin is what matters.




TENNIS COURTS
POND
RESTAURANT
MANSION
S00°00'00"E - 150.44'
VEPCO EASEMENT (DB 42, P.497)
S89°22'11"E
1561.02'
FITHIAN LANE
1528.45'
N89°22'11"W
1564.37'
NEW HOPE
20'
SANITARY SEWER ESM'T (P.B. 39, P.79)
N07°24'39"E
PHASE III
POOL
℄ 15' VEPCO EASE. (DB273, P.506)
OPERATIONS & MAINT.
SECTION I
POND
℄ 15' VEPCO EASEMENT (DB 259, P735)
SALES OFFICE
S00°00'00"E - 254.56'
S59°13'31"E 407.68'
S52°00'00"W - 50.00'
S42°00'00"E
N47°42'00"E - 20.16'
N34°00'00"E - 122.00'
PROPOSED PHASE VI
LAKE
350.00'
N38°33'29"E
PHASE IIB EXTENDED
20' WATER DRAINAGE
PB 39, P.79
PHASE I
20' SAN SEWER ESM'T
WATER & SEWER EASEMENTS DEDICATED TO JAMES CITY SERVICE AUTHORITY (P.B. 40, P.60)
PHASE IIA
450.00'
13.92 Ac Drainage Area
40' UTILITY ESM'T
S07°00'00"E
247.00'
N10°04'00"E
PHASE III
WATER & SEWER EASEMENTS DEDICATED TO JAMES CITY SERVICE AUTHORITY (P.B. 42, P.16)
IB
480.00'
N63°26'15"W
328.00'
N82°33'30"E - 362.00'
S7°30'00"W - 251.00'
PROPOSED DRY POND
478.00'
N27°W - 170.50'
60' ACCESS EASEMENT (DB 254, P.295)
Area Not Included In Phase IV Drainage Area
20' DRAINAGE EASEMENTS (DB 408, P 104)
Phase IV Drainage Area (6.09 ac)
S55°31'27"W
305.64'
VEPCO EASEMENT (DB 25, P.5)
S23°58'13"W
N82°47"W - 108.50'
N82°47"W - 170.50'
LG OAK
S87°49'02"W
635.03'
N89°43'32"W - 297.40'
N75°32'08"W
487.18'
N75°36'38"W - 224.20'
N75°32'03"W - 93.40'
200'
N75°28'21"W
N75°36'38"W - 75.14'
827.19'
584 ACRES
I = 50.3669 ACRES
N/F
T. D. WALTRIP

Fine Sandy Loam Soils -

Load - 1.4 lbs/yr -

Load - .2 -

3.0 ac x (1.4 - .2) = 3.6 lbs/yr inc.

Basin needs to remove this

13.92 x 1.4 = 19.5 lbs uncontrolled load

$\frac{3.6}{19.5}$ = 20%

Need a BMP = 4 pts, on 13.92 ac

.2 x 19.5 = 3.9 lbs ok

10.9 ac - 4 pt

2.25 - 3.7 pt

~~3.01 - 4 pt~~

$\frac{3.01}{6.01}$ .5 x 4 = 2 PTS

5.7 PTS

OFFSITE -

Need ½" volume for 6/12 hrs -

½" x 13.92 x ½' 25,265 cuft

12 hr drawdown = .6 cfs
6 hr " 1.2 cfs

57.5 - elev - orifice

60.6 - storage elev -

h = 3'

orifice = 1.7" ø.

@ H = 1.5 - Q = .43 cfs - 18,576

2.4" - 1.2 cfs @ 3' head -
.9 cfs @ 1.5' head -

POWPLNT4.DAT

STORM	Pre	Post	Out	Vs	ELEV
2-24	11	13	5.0	0.9	3.4
10-24	21	24	10.7	1.0	3.8
100-24	37	40	12.5	1.1	4.0

Prin. = 24" pipe @ elev 60.5

Emerg. - 10' E+S @ elev 61.5

Top of dam - 62.0

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JOB 90268
SHEET NO. 2 OF
CALCULATED BY KMJ DATE 10/25/90
CHECKED BY RCS DATE 10/25/90
SCALE

Phase IV

Total Area : 6.09 ac (Phase IV)
Impervious Area: (On Site)

$\frac{2.25}{6.01} = 3.7$

Building: $\frac{1580\ ft^2}{1\ unit} \Big| \frac{30\ units}{} = 47{,}400\ ft^2$

$.49 \times 9 = 4.45$

8.15

Sidewalk: $6{,}150\ ft^2$

5 PT BMP

Road = $23{,}500\ ft^2$

Total Imp = $77{,}050\ ft^2 = 1.77\ ac. = 29\%$ of site

RV = .31

$.5 \times 13.92 \times \frac{1}{12} = 25{,}319$ cu ft

4 PT -

3.7 - PTS NAT SPACE

Green Space = $\frac{2.25\ ac}{6.09\ ac} = .37\%$

13.92
- 3.01
10.9 ac offsite

Size Pond: RV = .05 + .009I
= .05 + .009(29)

RV = .31

$Vol = (.31\ in)\left(\frac{1\ ft}{12\ in}\right)\left(\frac{43{,}560\ ft^2}{1\ ac}\right)(6.09\ ac)$

Vol = 6,831 ft^3 (required storage volume)

Storage to Elev 59.02

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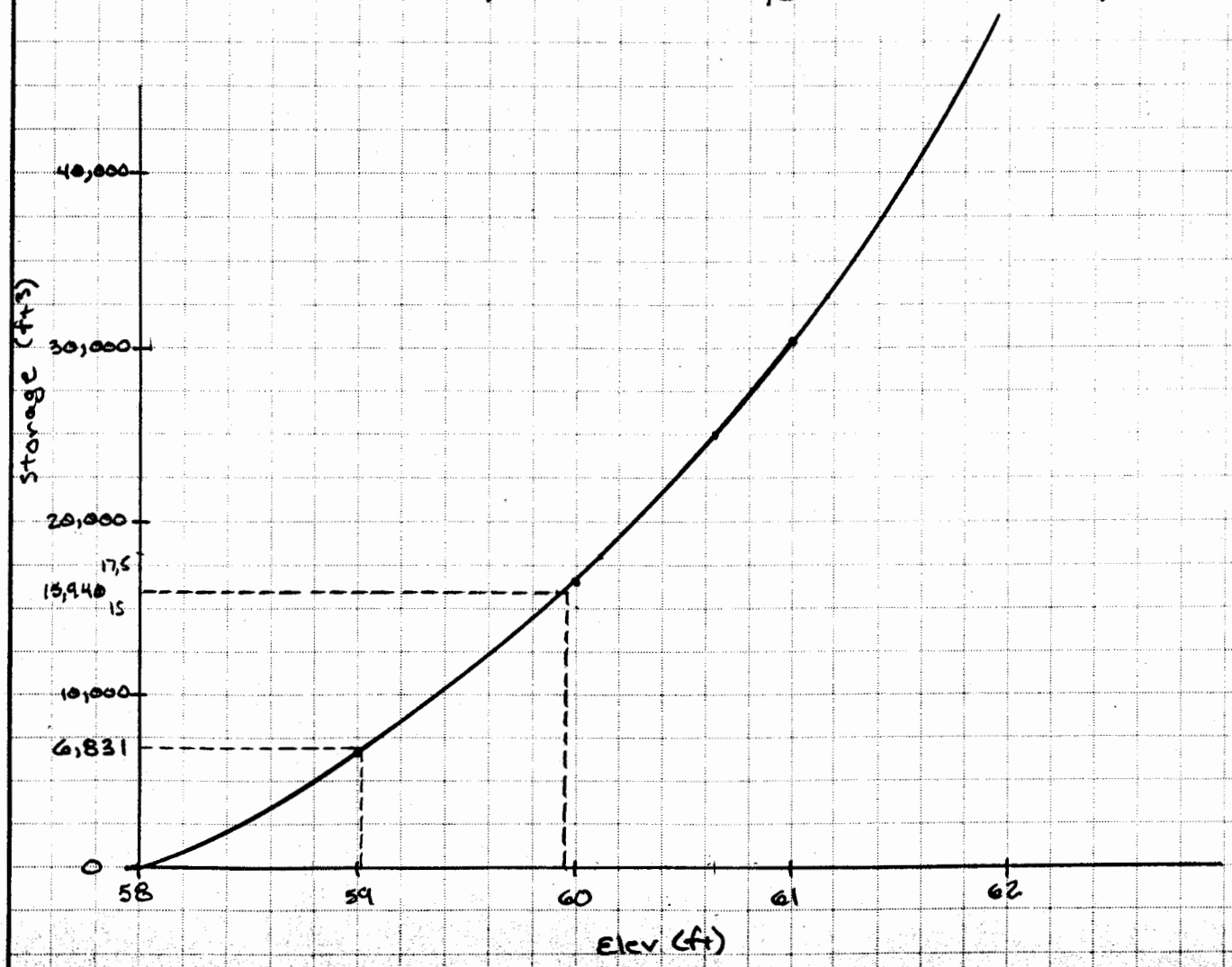
SCALE

Stage - Storage

Elev (ft)	Δ Elev (ft)	Area (ft²)	Increm Vol (ft³)	Accum Vol (ft³)
	0			
58		4,960	0	0
	1			
59		7,840	6,400	6,400
	1			
60		11,840	9,840	16,240
	1			
61		16,848	14,344	30,584
	1			
62		21,664	19,256	49,840



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CHECKED BY RCS DATE 10/25/90
SCALE

Design Orifice to retain 1in of runoff from Phase IV for 24hr:

$V = 6{,}831 \text{ ft}^3$

$Q_R = 24 \text{ hr release rate} = \frac{6{,}831 \text{ ft}^3}{24 \text{ hr}} \Big| \frac{1 \text{ hr}}{3600 \text{ s}} = .079 \text{ cfs}$

H for storage of $6{,}831 \text{ ft}^3 = 1.02$ @ Elev 59.02

$h = \frac{2}{3} H = \frac{2}{3}(1.02) = .68$

$Q = CA\sqrt{2gh}$

$.079 = .62A\sqrt{2(32.2)(.68)}$

$A = .019 \text{ ft}^2 = \pi r^2$

$r = .078' = .94'' \Rightarrow \text{dia} = 1.88''$

Use $1\frac{7}{8}''$ diameter hole ←

13.92 ac - DA.
2.25 ac - Open Space - 16%

RCS. 10/25/90

WORKSHEET FOR BMP POINT SYSTEM

POWHATAN PLANTATION, SECTION I, PHASE IV

A. STRUCTURAL BMP POINT ALLOCATION

BMP	BMP POINTS		Fraction of Site Served by BMP		Weighted BMP Points
Phase IV Dry Pond (#4)	9	X	3.01ac / 6.09ac = .49	=	4.4
Offsite Dry Pond	9	X	3.08ac / 6.09ac = .51	=	4.6
		X		=	
		X		=	

TOTAL WEIGHTED STRUCTURAL BMP POINTS: 9.0

B. NATURAL OPEN SPACE CREDIT

Fraction of Site		Natural Open Space Credit		Points for Natural Open Space
37%	X	.1	=	3.7

C. TOTAL WEIGHTED POINTS

9.0	+	3.7	=	12.7
Structural BMP Points		Natural Open Space Points		TOTAL

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JOB 90268
SHEET NO. 6 OF
CALCULATED BY KMJ DATE 10/26/90
CHECKED BY RCS DATE 10/26/90
SCALE

Drainage Area Phase IV
Pre Development
2yr Storm

DA-____

c= .25
A=6.09 Ac:

OVERLAND FLOW

L= 350 ft.
S= 4.29 %
Tc= 22 min.

CHANNEL FLOW

H= 3 ft.
L= 110 ft.
Tc= 1 min.

Tc= 23 min.

i_2 =3.15 in/hr

Q=CAi=(.25)(6.09 Ac.)(3.15 in/hr)

Q=4.80 cfs

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JOB 90268
SHEET NO. 7 OF
CALCULATED BY KMJ DATE 10/26/90
CHECKED BY RCS DATE 10/26/90
SCALE

Drainage Area Phase IV
Post Development
2 yr Storm

DA-____

c= .70
A= 6.09 Ac: (3.01 ac. in Phase IV) + (3.08 ac offsite)

OVERLAND FLOW

L= 90 ft.
S= 2.22 %
Tc= 6 min.

CHANNEL FLOW

H= 13 ft.
L= 630 ft.
Tc= 5 min.

Tc= 11 min.

i_2 = 4.7 in/hr

Q=CAi=(.70)(6.09 Ac.)(4.7 in/hr)

Q= 20.04 cfs

From Waller Method:
2 year storm
CA_{DEV} = 4.260
Tc_{DEV} = 11 min
Q_{OUT} = 4.80

V = 15,940 cf @ Elev 59.95

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JOB 90268
SHEET NO. 8 OF
CALCULATED BY RMJ DATE 10/26/90
CHECKED BY RCS DATE 10/26/90
SCALE

Size Orifice to Control 2yr Storm to Predevelopment Rate

$Q = 4.80$ cfs

$H = (59.95 - 59.02) = .93$

$h = .75$ (assume orifice dia ≈ 4.5")

$Q = CA\sqrt{2gh}$

$4.80 = .62\,A\sqrt{2(32.2)(.75)}$

$A = 1.11\ ft^2 = \pi r^2$ ✓

$r = .59'$ ⟹ use 1.18' diameter hole w/ Area = 1.09 ft^2

Area of 7" dia. orifice = .27 ft^2

Use 4-7" dia orifices w/ Area = 1.08 ft^2

$\frac{Q}{\sqrt{2gh}} = CA$

$\frac{Q}{C\sqrt{2gh}} = A$

CL2/(CL3 *@SQRT(2*32.2*2*32.2*

$A = \pi r^2$

$r = \sqrt{A/\pi}$

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JOB 902.68
SHEET NO. 9 OF
CALCULATED BY KMJ DATE 10/25/90
CHECKED BY RCS DATE 10/25/90
SCALE

Drainage Area
to Dry Pond
(Post Development)
Includes Entire 13.92 acres

DA-____

c= .65
A=13.92 Ac.
6.09

OVERLAND FLOW

L= 550 ft.
S= 0.5 %
Tc= 17 min.

CHANNEL FLOW

H= 12 ft.
L= 450 ft.
Tc= 3.5 min.

Tc=20.5 min.
i_2 = 3.35
i_{10}= 4.45 in/hr , i_{100} = 6.0

Q=CAi=(____)(____Ac.)(____in/hr)

Q_2=30.31 cfs

Q_{10}=40.26 cfs

Q_{100} = 54.29 cfs

Pre -
c= .25 x 6.09 + .7 x 7.83 = .5
A = 13.92
T_c = 23 min
i_2 = 3.15

$Q_{2\,pre}$ = 21.9 cfs

Q_{out} = 21 cfs
V_{stor} = 15,900 ft^3 - same as for their assumption

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JOB 90268
SHEET NO. 10 OF
CALCULATED BY KMI DATE 10/26/90
CHECKED BY RCS DATE 10/26/90
SCALE

Size Weir to Pass 10 yr Storm

$Q_{10} = 40.26$ cfs

Head is allowed to rise to Elev 61.00

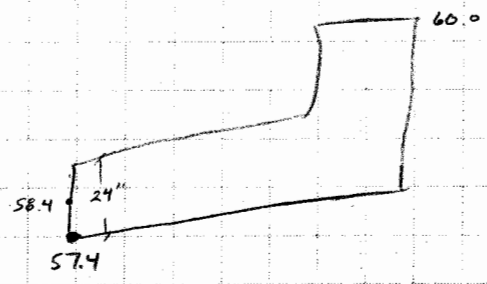
1st determine Q for 7" orifices with H = 1.98'

$h = (1.98 - .58/2) = 1.69$

$Q = CA\sqrt{2gh}$

$Q = (.62)(1.08)\sqrt{2(32.2)(1.69)}$

$Q = 6.99$ cfs



$Q_{WEIR} = 40.26$ cfs $- 6.99$ cfs $= 33.27$ cfs

$Q_w = CLH^{3/2}$

Vs	Elev	Q (59.95)	Weir	Orifice	24" ~~18"~~ Pipe
18,400	60.1	30			~~14~~ 26
24,400		26			

Use DI-7:
C = 3.1
L = 2(3.5) + 2(3) = 13
Q = 31.80

2
Soils 29B C
10B C

RCN - 81 - 30% Imp
RCN - 74 - open space

$33.27 = (3.1)(13)(H)^{3/2}$

H = .88 @ Elev 60.83

22% × 74 + 78% × 81 = 79

COVLDRYZ.DTE

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JOB 90268
SHEET NO. 11 OF
CALCULATED BY HMJ DATE 10/26/90
CHECKED BY RCS DATE 10/26/90
SCALE

CULVERT DESIGN
Barrel

c= .65
A= 13.92 Ac.

OVERLAND FLOW

L= 550 ft.
S= 0.5 %
Tc= 17 min.

CHANNEL FLOW

H= 12 ft.
L= 450 ft.
Tc= 3.5 min.

Tc= 20.5 min

i_{10}= 4.45 in/hr

Q=CAi=(.65)(13.92 Ac.)(4.45 in/hr)

Q= 40.26 cfs
L= 13 ft.
S= 0.5 %
HW= 4 ft.

Inv_i= 57.45
Inv_o= 57.38

INLET CONTROL

Q=15.50 cfs (Emergency Spillway will Pass Remainder)

D= 18 in. or 1.5 ft.

HW/D= 2.65 HW=(1.5 ft.)(2.65)= 3.98 ft. < 4.0 ft.

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SCALE

OUTLET CONTROL

$d_c = 1.5$

$h_o = \frac{d_c + D}{2} = \frac{1.5 + 1.5}{2} = 1.5$

$S_oL = (.005)(13) = .07$

$d_n = 1.5$

$\frac{d}{D} = 1.0$ $\frac{r}{D} = .25$ P.E. Manual Pg 3-43

$R = .38$

$v = \frac{1.49}{n} R^{2/3} S^{1/2} = 2.30$ fps

$H = (1 + k_e + \frac{29 n^2 L}{R^{4/3}}) \frac{v^2}{2g} = .19$

$HW = H + h_o - S_oL = 1.62$

Inlet control governs

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JOB 90268
SHEET NO. 13 OF
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SCALE

Size Emergency Spillway

$Q_{100} = 54.29$ cfs

$Q_{ES} = 54.29$ cfs $- 15.50$ cfs $= 38.79$ cfs

Use Weir at Elev 60.80
$H = 61.95 - 60.80 = 1.15$

$Q_w = CLH^{3/2}$

$38.79 = (3.1)(L)(1.15)^{3/2}$

$L = 10.25'$

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JOB 90268
SHEET NO. 14 OF
CALCULATED BY KMJ DATE 10/29/90
CHECKED BY DATE
SCALE

Ditch Downslope of Bldgs
#162-#166 to Pond

DA-____

c= .70
A= .51 Ac.

OVERLAND FLOW

L= 180 ft.
S= 1.11 %
Tc= 9 min.

CHANNEL FLOW

H= 4.5 ft.
L= 225 ft.
Tc= 2 min.

Tc= 11 min.

i_2 = 4.5 in/hr

Q=CAi=(.70)(.51 Ac.)(4.5 in/hr)

Q= 1.61 cfs

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JOB 90268
SHEET NO. 15 OF
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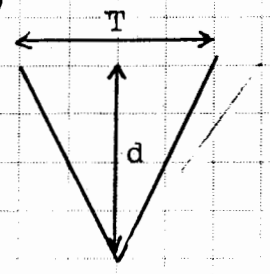
CHECKED BY DATE
SCALE

V-DITCH DESIGN

Ditch Downslope of Bldgs #162 - #166 to Pond



Q= 1.61 cfs
S= 2.13 %
L= 225 ft.

T= 4.0 ft.
d= 1.0 ft.

$R = \frac{zd}{2(z^2+1)^{1/2}} = \frac{(2)(1\text{ ft.})}{2(5)^{1/2}} = .45$ ft.

n= ____

$A = zd^2 = (2)(1\text{ ft.})^2 = 2.0$ ft.^{2}

$V \times R = (5\text{ fps})(.45) = 2.25$

n = .091 (class B)
n = .053 (class C)

Check Q: $Q = \frac{1.49}{n} R^{2/3} S^{1/2} A = \frac{1.49}{.091}(.45)^{2/3}(.0213)^{1/2}\,2$

Q = 2.80 cfs > 1.61 cfs OK

Check V: $AR^{2/3} = \frac{Qn}{1.49 S^{1/2}} = \frac{(1.61)(.053)}{1.49(.0213)^{1/2}} = .39$

d = .75	A = 1.13	R = .34	$AR^{2/3}$ = .54
d = .67	A = .90	R = .30	$AR^{2/3}$ = .40

$V = \frac{Q}{A} = \frac{1.61}{.90} = 1.79$ fps < 5.0 fps grass ditch OK

Date Record Created:

Created By:

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WATERSHED	PC
BMP ID NO	006
PLAN NO	SP-81-90
TAX PARCEL	
PIN NO	3740300001A
CONSTRUCTION DATE	1/3/1991
PROJECT NAME	Powhatan Plantation Ph 4
FACILITY LOCATION	Pond E - Tap Neck Loop
CITY-STATE	Williamsburg, Va. 23188
CURRENT OWNER	Powhatan Plantation Owners Association
OWNER ADDRESS	4029 Ironbound Road
OWNER ADDRESS 2	
CITY-STATE-ZIP CODE	Williamsburg, Va. 23185
OWNER PHONE	
MAINT AGREEMENT	Yes
EMERG ACTION PLAN	No

MAINTENANCE PLAN	No
SITE AREA acre	42
LAND USE	Timeshares
old BMP TYP	Dry Pond
JCC BMP CODE	F2 Dry ED with forebay
POINT VALUE	9
SVC DRAIN AREA acres	11.23
SERVICE AREA DESCRI	NONE
IMPERV AREA acres	
RECV STREAM	POW.CK. TRIB.
EXT DET-WQ-CTRL	Yes
WTR QUAL VOL acre-ft	0.46
CHAN PROT CTRL	No
CHAN PROT VOL acre-ft	0
SW/FLOOD CONTROL	No
GEOTECH REPORT	No

CTRL STRUC DESC	RCP Riser
CTRL STRUC SIZE inches	30
OTLT BARRL DESC	RCP Barrel
OTLT BARRL SIZE inch	24
EMERG SPILLWAY	Yes
DESIGN HW ELEV	61.95
PERM POOL ELEV	na
2-YR OUTFLOW cfs	30.31
10-YR OUTFLOW cfs	40.26
REC DRAWING	No
CONSTR CERTIF	No
LAST INSP DATE	9/21/2000
Inspected by:	
INTERNAL RATING	1

MISC/COMMENTS

Pond E. Dry Pond Design 2. 1/2" runoff of entire DA.

Get Last BMP No | Return to Menu | Print Record

Additional Comments:

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Phone: 757-229-1776
Fax: 757-229-4683
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PROJECT NO.
PROJECT NAME Powhatan Plantation Drainage Improvements
SHEET NO. _____ OF _____
CALCULATED BY: MSF DATE:7-18-2005
CHECKED BY: DATE:

BASIS FOR ESTIMATE: ✓No Design Completed ☐Preliminary Design ☐Final Design ☐Other (specify)_____

CONSTRUCTION COST ESTIMATE

ITEM DESCRIPTION	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	TOTAL PER UNIT	TOTAL ITEM COST
MOBILIZATION	1	LS	$10,000	$10,000.00
POND A				
OUTLET PROTECTION (2-culverts 10'x8' remove and replace rip rap)	18	SY	$62	$1,116.00
SHORELINE STABILIZATION (100'x20' cut slope and stabilize with EC-3 matting)	222	SY	$8	$1,776.00
STABILIZE SWALE ENTERING POND (30'x8' light grading & rip rap)	27	SY	$62	$1,674.00
SHORELINE STABILIZATION (60'x10' replace small gravel with rip rap)	67	SY	$58	$3,886.00
POND B				
STABILIZE SWALE (145' Light Grading with EC-2 matting/Remove stumps & Debris)	322	SY	$11	$3,542.00
Rip rap culvert outlet (15'x8')	13	SY	$50	$650.00
Rip Rap end of swale (10'x20')	22	SY	$50	$1,100.00
REMOVE LOW PAVER WALL (100'x2.5' high)	18	CY	$18	$324.00
SHORELINE STABILIZATION (120' Regrading & Relocating Shrubs & EC-3 matting)	133	SY	$17	$2,261.00
120'x20' Remove shrubs and mulch and replace with suitable vegetation	267	SY	$16	$4,272.00
500'x10' Replace small gravel with rip rap	556	SY	$58	$32,248.00
REGRADE @ OUTLET FROM POND A (45' Remove debris add rip rap and stabilize bank)	50	SY	$88	$4,400.00
REMOVE ELECTRIC BOX	1	EA	$150	$150.00
REMOVE WOODY GROWTH BELOW OUTLET TO POND C (50'x10')	56	SY	$4	$224.00
Replace CMP end section	1	EA	$500	$500.00
REPLACE DAMAGED TRASH RACK & REPLACE RISER IF NECESSARY	1	EA	$7,500	$7,500.00
POND C				
CULVERT OUTLET PROTECTION (10'x8')	9	SY	$62	$558.00
15'x8' Regrade and remove vegetation - stabilize with Rip Rap	13	SY	$56	$728.00
STABILIZE POND C OUTFALL (20'X10' Rip Rap)	22	SY	$52	$1,144.00
STABILIZE SWALE ENTERING POND (90'x20' Light grading and EC-2 matting)	200	SY	$8	$1,600.00
Remove / grind 6 stumps	6	EA	$100	$600.00
SHORELINE STABILIZATION (125'x20' Remove vegetation and stabilize w/ EC-3 matting)	278	SY	$9	$2,502.00
205'x15' light grading and stabilize with EC-3 matting	342	SY	$9	$3,078.00
REPLACE RISER	1	EA	$7,500	$7,500.00
SLIP LINE OUTLET PIPE AND EXTEND TO BASE OF NEW SLOPE	150	LF	$100	$15,000.00
FRONT SLOPE RESTORATION TO 3:1 SLOPE (Regrade 300'x15' with EC-3 matting)	500	SY	$7	$3,500.00
REAR SLOPE RESTORATION TO 2.5:1 SLOPE				
Clear 300'x50' including approximately 50 trees > 12" diameter and many <12"	2,225	SY	$45	$100,125.00
Fill and grade back slope to 2.5:1 slope	3,350	CY	$26	$87,100.00
Protect slope with EC-3 matting	1,700	SY	$7	$11,900.00
SUB TOTAL				**$310,958.00**
SURVEY STAKEOUT	1	LS	$2,000	$2,000.00
CONSTRUCTION ADMIN 10%				$31,095.80
CONTINGENCY 10%				$34,405.38
TOTAL				**$378,459.18**

NOTES:
1. Quantities should be considered approximate only.
2. No permitting costs have been included in this estimate.
3. Assume geotextile fabric under all rip rap.
4. No design, consulting or geotechnical fees are included in this estimate.
5. All stumps on dam face to be ground in place. DO NOT REMOVE.