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: **PC049**

DATE VERIFIED: **October 22, 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: PC049

PIN: 4710100031D

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

Property Description: Parcel D

Site Address: 3204 Ironbound Road

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

Agreements: (in file as of scan date) **Y** **Book or Doc#:** 582 **Page:** 138

Comments
Dry Pond

FILE

12288

DECLARATION OF COVENANTS

INSPECTION/MAINTENANCE OF RUNOFF CONTROL FACILITY

THIS DECLARATION, made this 16th day of September, 19 92, between C. Lewis Waltrip II, and all successors in interest, hereinafter referred to as the "COVENANTOR(S)," owner(s) of the following property: Powhatan Office Park See description at bottom of page, and James City County, Virginia, hereinafter referred to as the "COUNTY."

WITNESSETH:

We, the COVENANTOR(S), with full authority to execute deeds, mortgages, other covenants, and all rights, titles and interests in the property described above, do hereby covenant with the COUNTY as follows:

1. The COVENANTOR(S) shall provide maintenance for the runoff control facility, hereinafter referred to as the "FACILITY," located on and serving the above-described property to ensure that the FACILITY is and remains in proper working condition in accordance with approved design standards, and with the law and applicable executive regulations.

2. If necessary, the COVENANTOR(S) shall levy regular or special assessments against all present or subsequent owners of property served by the FACILITY to ensure that the FACILITY is properly maintained.

3. The COVENANTOR(S) shall provide and maintain perpetual access from public right-of-ways to the FACILITY for the COUNTY, its agent and its contractor.

4. The COVENANTOR(S) shall grant the COUNTY, its agent and its contractor a right of entry to the FACILITY for the purpose of inspecting, operating, installing, constructing, reconstructing, maintaining or repairing the FACILITY.

5. If, after reasonable notice by the COUNTY, the COVENANTOR(S) shall fail to maintain the FACILITY in accordance with the approved design standards and with the law and applicable executive regulations, the COUNTY may perform all necessary repair or maintenance work, and the COUNTY may assess the COVENANTOR(S) and/or all property served by the FACILITY for the cost of the work and any applicable penalties.

6. The COVENANTOR(S) shall indemnify and save the COUNTY harmless from any and all claims for damages to persons or property arising from the installation, construction, maintenance, repair, operation or use of the FACILITY.

7. The COVENANTOR(s) shall promptly notify the COUNTY when the COVENANTOR(S) legally transfers any of the COVENANTOR(S)' responsibilities for the FACILITY. The COVENANTOR(S)' shall supply the COUNTY with a copy of any document of transfer, executed by both parties.

8. The covenants contained herein shall run with the land and shall bind the COVENANTOR(S) and the COVENANTOR(S)' heirs, executors, administrators, successors and assignees, and shall bind all present and subsequent owners of property served by the FACILITY.

9. This DECLARATION shall be recorded in the County Land Records.

The property includes 2.81 acres (±) located on the southwest corner of the intersection of Ingram and Ironbound Roads, and including Parcels A-D as depicted on Tax Map #47-1 (1-31) with street addresses as follows: Parcel A, #213 Ingram Rd; Parcel B, #3200 Ironbound Rd; Parcel C, #215 Ingram Rd; Parcel D, #223 Ingram Rd.

IN WITNESS WHEREOF, the COVENANTOR(S) have executed this DECLARATION OF COVENANTS as of this 16th day of September, 19 92.

COVENANTOR(S)

C. LEWIS WALTRIP II, OWNER

ATTEST:

COVENANTOR(S)

ATTEST:

COMMONWEALTH OF VIRGINIA
CITY/COUNTY OF YORK

I, the undersigned Notary Public, in and for the jurisdiction aforesaid, do certify that C. Lewis Waltrip II, whose name is signed as such to the foregoing writing bearing date 16th day of September, 19 92, this day sworn the same before me in my jurisdiction aforesaid.

GIVEN under my hand this 16th day of September, of 19 92.

Stanley J. Dykstra
Notary Public

My Commission expires: 31 July 1993

Approved as to form:

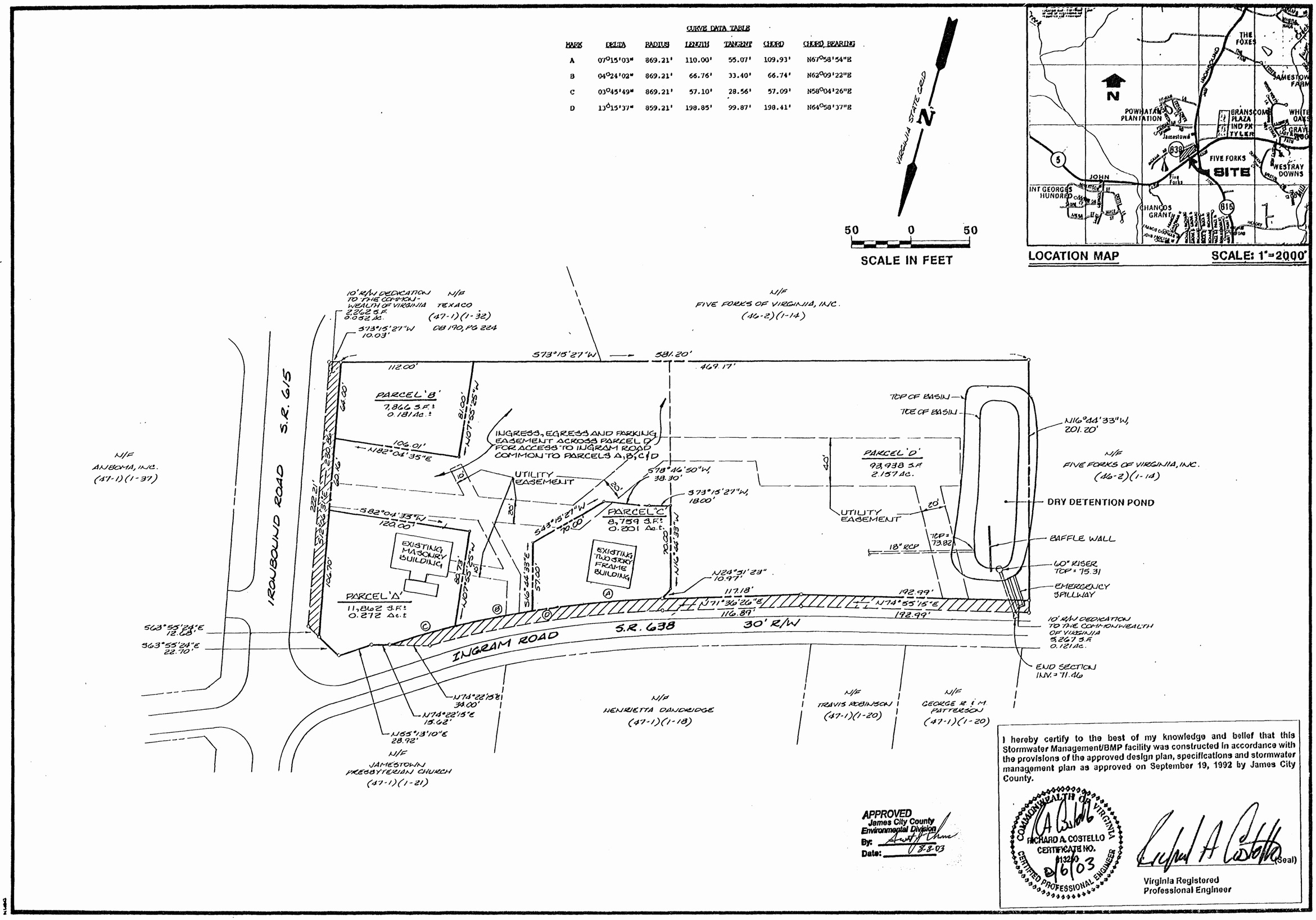
Leo P. Rogers

In the [illegible] Williamsburg and [illegible]
City of [illegible] Wit:
[illegible] Circuit Court
[illegible] of [illegible]
21 Sept. 1992 [illegible] Covenants
[illegible] was [illegible] certificate annexed and
admitted to [illegible] 8:52 o'clock
Teste: [illegible], Clerk
by Howard
Deputy Clerk

0261U.Wpf
Revised 9/92

CURVE DATA TABLE

MARK	DELTA	RADIUS	LENGTH	TANGENT	CHORD	CHORD BEARING
A	07°15'03"	869.21'	110.00'	55.07'	109.93'	N67°58'54"E
B	04°24'02"	869.21'	66.76'	33.40'	66.74'	N62°09'22"E
C	03°45'49"	869.21'	57.10'	28.56'	57.09'	N58°04'26"E
D	13°15'37"	859.21'	198.85'	99.87'	198.41'	N64°58'37"E



APPROVED
James City County
Environmental Division
By: [signature]
Date: 8-8-03

I hereby certify to the best of my knowledge and belief that this Stormwater Management/BMP facility was constructed in accordance with the provisions of the approved design plan, specifications and stormwater management plan as approved on September 19, 1992 by James City County.

COMMONWEALTH OF VIRGINIA
RICHARD A. COSTELLO
CERTIFICATE NO. 11240
8/6/03
CERTIFIED PROFESSIONAL ENGINEER

[signature] (Seal)
Virginia Registered Professional Engineer

AES CONSULTING ENGINEERS
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(804) 253-0040
Fax (804) 220-8994

AS-BUILT DRAWING

POWHATAN OFFICE PARK FIVE FORKS

C. LEWIS WALTRIP, II

BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

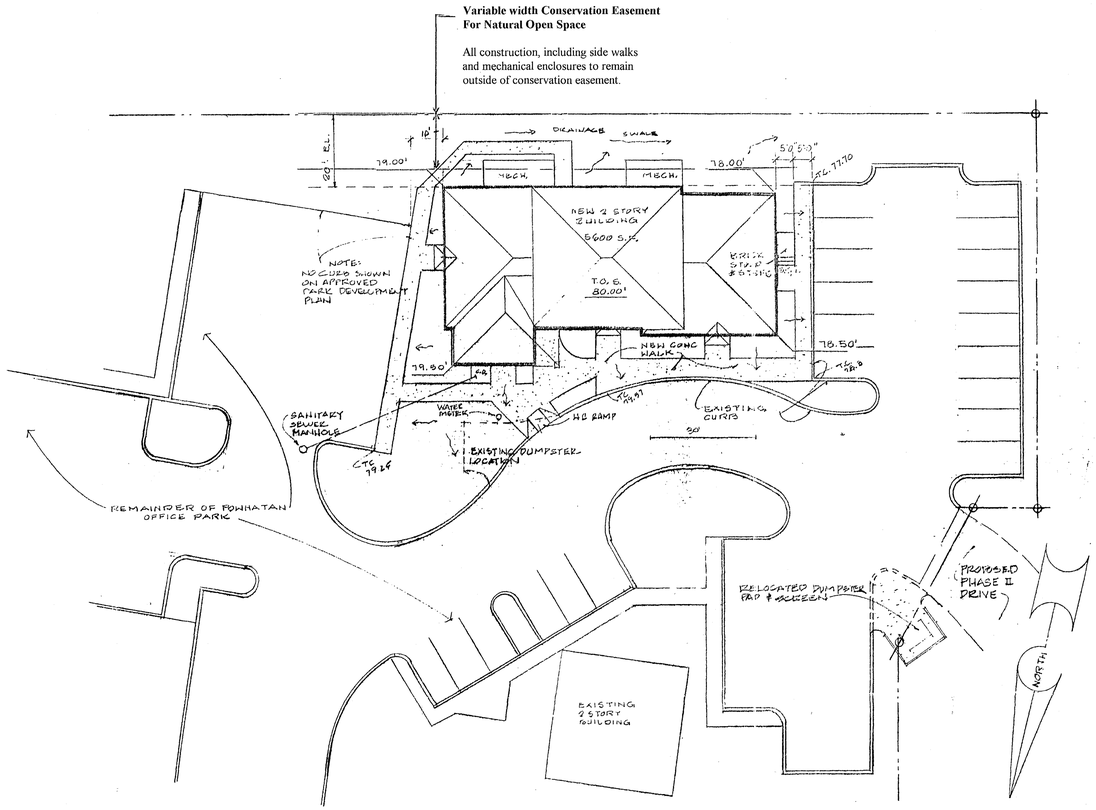
COMMONWEALTH OF VIRGINIA
2-18-97
RONALD W. EADS
No. 1948
LAND SURVEYOR

No.	DATE	REVISION / COMMENT / NOTE	BY
1	2/97	AS-BUILT POND	RWE

Designed RWE	Drawn RMJ
Scale 1"=50'	Date 2/18/97
Project No. 7309	
Drawing No. 1 of 1	

AS-BUILT DRAWING – 2/18/97

SP-110-96



SITE PLAN
1" = 20'-0"

GENERAL NOTES

A. USE GROUP B
CONSTRUCTION TYPE 5B
DESIGNED UNDER 1993 EDITION OF BOCA NATIONAL BUILDING CODE.

B. ALL DIMENSIONS ARE TO FACE OF STUD UNLESS OTHERWISE NOTED.

C. DESIGN ASSUMPTIONS:
SOIL ELASTICITY: TO BE CHECKED
SOIL BEARING CAPACITY: 2,500 PSF MIN.
CONCRETE: 3,000 PSI AT 28 DAYS
GARAGE SLAB: 3,500 PSI AT 28 DAYS
LUMBER: NO 2 SOUTHERN YELLOW PINE, 19% MAX. MOISTURE CONTENT, OR BETTER, AND/OR MINIMUM F_b = 1200 PSI FOR SPANS OVER 16 FT., SPRUCE/PINE/FIR, AND/OR F_b = 1000 PSI.

D. DOUBLE JOISTS UNDER ALL PARTITION WALLS PARALLEL TO JOISTS, LEAVING 3 1/2" BETWEEN JOISTS FOR WIRING AND PLUMBING.

E. MICROLAM BEAMS AND HEADERS SHALL BE SIZED BY MANUFACTURER. MULTIPLE MEMBERS SHALL BE FASTENED TOGETHER WITH MIN. 2 ROWS 16d NAILS AT 12" O.C.

F. ROOF PENETRATIONS BY EXHAUSTS AND VENTS SHALL BE GANGED WHENEVER POSSIBLE, AND SHALL BE RESTRICTED TO REAR ROOF PLANES.

G. ALL PRE-ENGINEERED STRUCTURAL MEMBERS MUST BE FIELD INSPECTED AFTER INSTALLATION BY THE MANUFACTURER'S REPRESENTATIVE. THE ARCHITECT WILL NOT BE RESPONSIBLE FOR IMPROPER INSTALLATION.

H. THESE DRAWINGS AND THIS DESIGN REMAIN THE PROPERTY OF GUERNSEY/TINGLE ARCHITECTS AND MAY NOT BE ALTERED, REPRODUCED OR BUILT WITHOUT WRITTEN PERMISSION OF THE ARCHITECT.

I. PROVIDE HC ACCESSIBLE BOTTLED DRINKING WATER UNIT IN EACH SPACE.

J. ENTRANCE DOORS SHALL BE THERMATRU FULL LITE FIBERGLASS DOORS WITH CLOSERS.

HEADER SCHEDULE

SPAN	HEADER SIZE
UP TO 4'-0"	(2) 2X8'S W/ 1/2" PLYWD SPACER
UP TO 6'-0"	(2) 2X10'S W/ 1/2" PLYWD SPACER
UP TO 8'-0"	(2) 2X12'S W/ 1/2" PLYWD SPACER

WINDOW/DOOR TYPES

WINDOWS ARE LINCOLN WOOD DOUBLE HUNG WINDOWS, TRUE DIVIDED TOP LITE, UNLESS OTHERWISE NOTED. NUMBERS ARE GLASS SIZES IN INCHES.

LIVING AREA

FIRST FLOOR	4,024
SECOND FLOOR	1,576
TOTAL AREA	5,600

PLEASE NOTE THAT THE SECOND FLOOR AREA (1,576) EXCLUDES STAIRS BUT INCLUDES LANDING.

Powhatan Office Park Phase I
Area Tabulations (with Spencer Builder #2)

		Sq. Ft.	Ac.	Percentage
Building coverage:	Previous:	7,450	.1986	11.8
	Change:	1,224		
	New:	8,674		
Other impervious surface:	Previous:	30,437	.737	43.77
	Change:	1,745		
	New:	32,492		
Open space:	Previous:	35,461	.744	44.18
	Change:	2,969		
	New:	32,492		
Total Phase I:		73,348	1.684	100.00

Building Height: 25 ft. average upper roof height above front walk

Revisions			
Symbol	Description	Date	Initials
	GRADE ELEVATIONS	10-25-96	RSG

Guernsey Tingle Architects
WILLIAMSBURG, VIRGINIA
804-220-0220

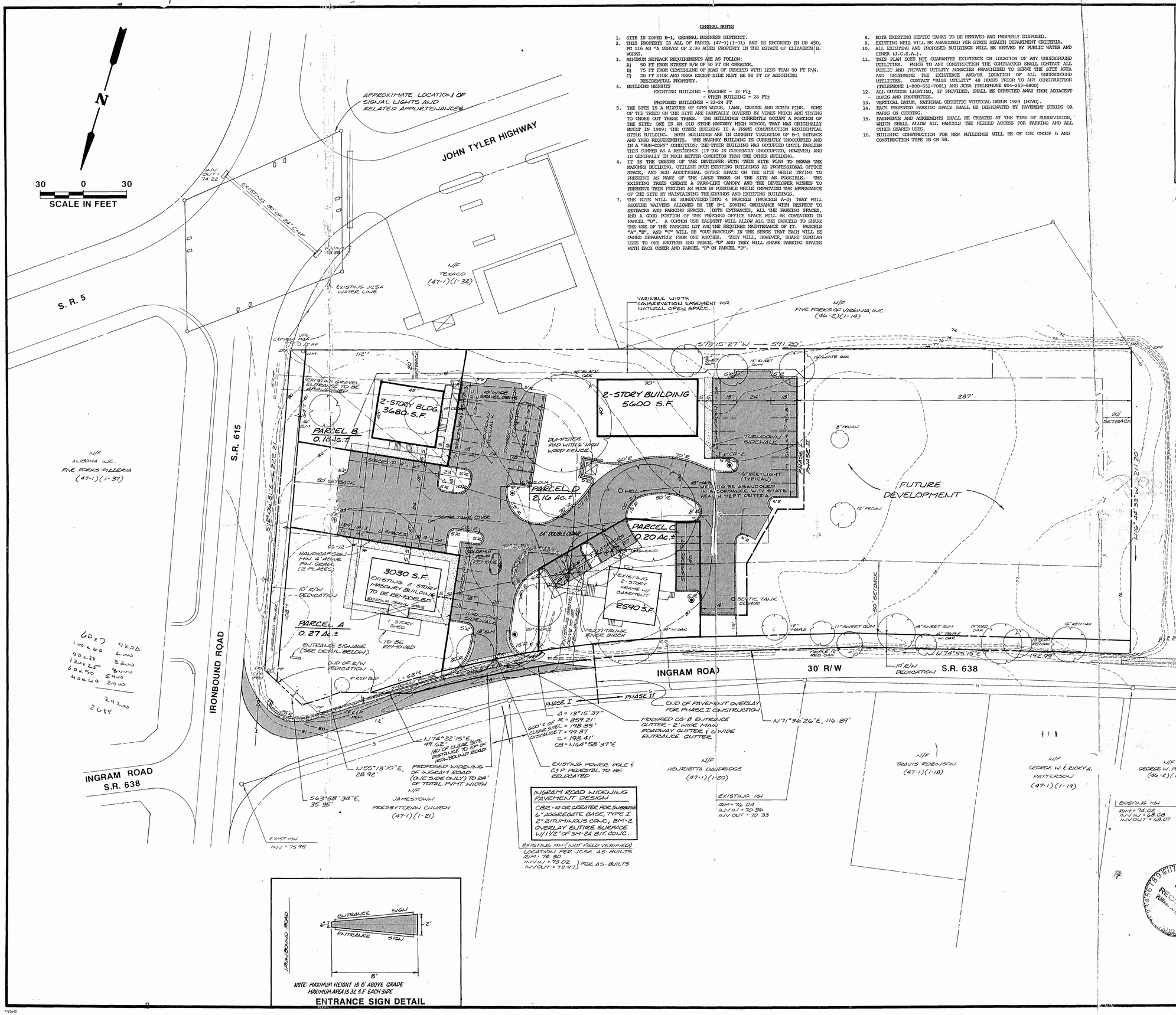
Spencer Office Building No. 2
Powhatan Office Park, James City County, Virginia

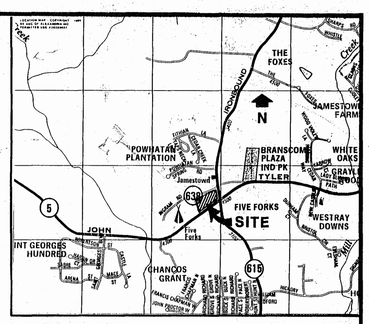
COMMONWEALTH OF VIRGINIA
ROGER S. GUERNSEY
CERTIFICATE NO. 4096
ARCHITECT

Date	10-11-96
Drawn	G.D.F.
Checked	R.S.G.
Project	96057
Sheet	A 1 of Sheets

GENERAL NOTES

1. SITE IS ZONED B-1, GENERAL BUSINESS DISTRICT.
2. THIS PROPERTY IS ALL OF PARCEL (47-1)(1-31) AND IS RECORDED IN DB 450, PG 516 AS "A SURVEY OF 2.98 ACRES PROPERTY IN THE ESTATE OF ELIZABETH B. WORRS.
3. MINIMUM SETBACK REQUIREMENTS ARE AS FOLLOW:
   A) 50 FT FROM STREET R/W OF 50 FT OR GREATER.
   B) 75 FT FROM CENTERLINE OF ROAD OF STREETS WITH LESS THAN 50 FT R/W.
   C) 20 FT SIDE AND REAR EXCEPT SIDE MUST BE 50 FT IF ADJOINING RESIDENTIAL PROPERTY.
4. BUILDING HEIGHTS
   EXISTING BUILDING - MASONRY - 32 FT±
   - OTHER BUILDING - 28 FT±
   PROPOSED BUILDINGS - 22-24 FT.
5. THE SITE IS A MIXTURE OF OPEN WOODS, LAWN, GARDEN AND SCRUB PINE. SOME OF THE TREES ON THE SITE ARE PARTIALLY COVERED BY VINES WHICH ARE TRYING TO CHOKE OUT THESE TREES. TWO BUILDINGS CURRENTLY OCCUPY A PORTION OF THE SITE; ONE IS AN OLD STONE MASONRY HIGH SCHOOL THAT WAS ORIGINALLY BUILT IN 1909; THE OTHER BUILDING IS A FRAME CONSTRUCTION RESIDENTIAL STYLE BUILDING. BOTH BUILDINGS ARE IN CURRENT VIOLATION OF B-1 SETBACK AND YARD REQUIREMENTS. THE MASONRY BUILDING IS CURRENTLY UNOCCUPIED AND IN A "RUN-DOWN" CONDITION; THE OTHER BUILDING WAS OCCUPIED UNTIL EARLIER THIS SUMMER AS A RESIDENCE (IT TOO IS CURRENTLY UNOCCUPIED, HOWEVER) AND IS GENERALLY IN MUCH BETTER CONDITION THAN THE OTHER BUILDING.
6. IT IS THE DESIRE OF THE DEVELOPER WITH THIS SITE PLAN TO REHAB THE MASONRY BUILDING, UTILIZE BOTH EXISTING BUILDINGS AS PROFESSIONAL OFFICE SPACE, AND ADD ADDITIONAL OFFICE SPACE ON THE SITE WHILE TRYING TO PRESERVE AS MANY OF THE LARGE TREES ON THE SITE AS POSSIBLE. THE EXISTING TREES CREATE A PARK-LIKE CANOPY AND THE DEVELOPER WISHES TO PRESERVE THIS FEELING AS MUCH AS POSSIBLE WHILE IMPROVING THE APPEARANCE OF THE SITE BY MAINTAINING THE GROUNDS AND EXISTING BUILDINGS.
7. THE SITE WILL BE SUBDIVIDED INTO 4 PARCELS (PARCELS A-D) THAT WILL REQUIRE WAIVERS ALLOWED BY THE B-1 ZONING ORDINANCE WITH RESPECT TO SETBACKS AND PARKING SPACES. BOTH ENTRANCES, ALL THE PARKING SPACES, AND A GOOD PORTION OF THE PROPOSED OFFICE SPACE WILL BE CONTAINED IN PARCEL "D". A COMMON USE EASEMENT WILL ALLOW ALL THE PARCELS TO SHARE THE USE OF THE PARKING LOT AND THE REQUIRED MAINTENANCE OF IT. PARCELS "A", "B", AND "C" WILL BE "OUT PARCELS" IN THE SENSE THAT EACH WILL BE OWNED SEPARATELY FROM ONE ANOTHER. THEY WILL, HOWEVER, SHARE SIMILAR USES TO ONE ANOTHER AND PARCEL "D" AND THEY WILL SHARE PARKING SPACES WITH EACH OTHER AND PARCEL "D" ON PARCEL "D".
8. BOTH EXISTING SEPTIC TANKS TO BE REMOVED AND PROPERLY DISPOSED.
9. EXISTING WELL WILL BE ABANDONED PER STATE HEALTH DEPARTMENT CRITERIA.
10. ALL EXISTING AND PROPOSED BUILDINGS WILL BE SERVED BY PUBLIC WATER AND SEWER (J.C.S.A.).
11. THIS PLAN DOES NOT GUARANTEE EXISTENCE OR LOCATION OF ANY UNDERGROUND UTILITIES. PRIOR TO ANY CONSTRUCTION THE CONTRACTOR SHALL CONTACT ALL PUBLIC AND PRIVATE UTILITY AGENCIES FRANCHISED TO SERVE THE SITE AREA AND DETERMINE THE EXISTENCE AND/OR LOCATION OF ALL UNDERGROUND UTILITIES. CONTACT "MISS UTILITY" 48 HOURS PRIOR TO ANY CONSTRUCTION (TELEPHONE 1-800-552-7001) AND JCSA (TELEPHONE 804-253-6800)
12. ALL OUTDOOR LIGHTING, IF PROVIDED, SHALL BE DIRECTED AWAY FROM ADJACENT ROADS AND PROPERTIES.
13. VERTICAL DATUM, NATIONAL GEODETIC VERTICAL DATUM 1929 (NGVD).
14. EACH PROPOSED PARKING SPACE SHALL BE DESIGNATED BY PAVEMENT STRIPS OR MARKS ON CURBING.
15. EASEMENTS AND AGREEMENTS SHALL BE CREATED AT THE TIME OF SUBDIVISION, WHICH SHALL ALLOW ALL PARCELS THE NEEDED ACCESS FOR PARKING AND ALL OTHER SHARED USES.
16. BUILDING CONSTRUCTION FOR NEW BUILDINGS WILL BE OF USE GROUP B AND CONSTRUCTION TYPE 3B OR 5B.





LOCATION MAP SCALE: 1"=2000'

POWHATAN OFFICE PARK

AREA TABULATION

	S.F.±	AC.±	
10 FOOT R/W DEDICATION S.R. 615	2,265	0.052	
10 FOOT R/W DEDICATION S.R. 638	5,267	0.121	
PHASE I	73,348	1.684	
PHASE II (FUTURE DEVELOPMENT)	49,067	1.126	
TOTAL PARCEL	129,947	2.983	
BUILDING COVERAGE	7,450	0.171	10.15%
OTHER IMPERVIOUS SURFACES	30,437	0.699	41.50%
OPEN SPACE	35,461	0.814	48.35%
PHASE I	73,348	1.684	100.00%

PARKING CALCULATIONS

14,900 S.F. OFFICE SPACE
NEED 1 SPACE/250 S.F. OFFICE SPACE
14,900/250 = 59.6 60 SPACES REQUIRED (INCLUDES 2 HANDICAPPED)
PROVIDED 58 SPACES + 2 HANDICAPPED SPACE = TOTAL 60 SPACES

◉ DENOTES STREETLIGHT 100 WATT HIGH PRESSURE SODIUM VAPOR MOUNTED ON 20' POLE. (OR APPROVED EQUAL).

INDEX TO SHEETS

1. SITE PLAN
2. UTILITY AND DRAINAGE PLAN
3. LANDSCAPING PLAN
4. NOTES AND DETAILS
SD-3e. STANDARD WATER DETAIL
SD-2b. STANDARD SEWER DETAIL

COUNTY OF JAMES CITY
FINAL SITE PLAN

RECEIVED

APPROVALS		DATE
FIRE DEPARTMENT	DM/MAC	8/14/91
HEALTH DEPARTMENT	JWS/MAF	8/5/91
HIGHWAY DEPARTMENT	BSS/MAC	9/15/92
PLANNING COMMISSION	DRD/MAF	9/16/92
PUBLIC WORKS DEPARTMENT		9/17/92
ZONING ADMINISTRATION	AFG/MAF	6/25/92
JCSA	WB/MAF	7/3/92
OTHER		
OTHER		

SP-73-91
JAMES CITY COUNTY SITE PLAN NUMBER

No.	DATE	REVISION / COMMENT / NOTE	BY
1	9/9/92	REVISED PER J.C.Co. COMMENTS	HWP

COMMONWEALTH OF VIRGINIA
C. ARCHER MARSTON III
No. 018232
PROFESSIONAL ENGINEER

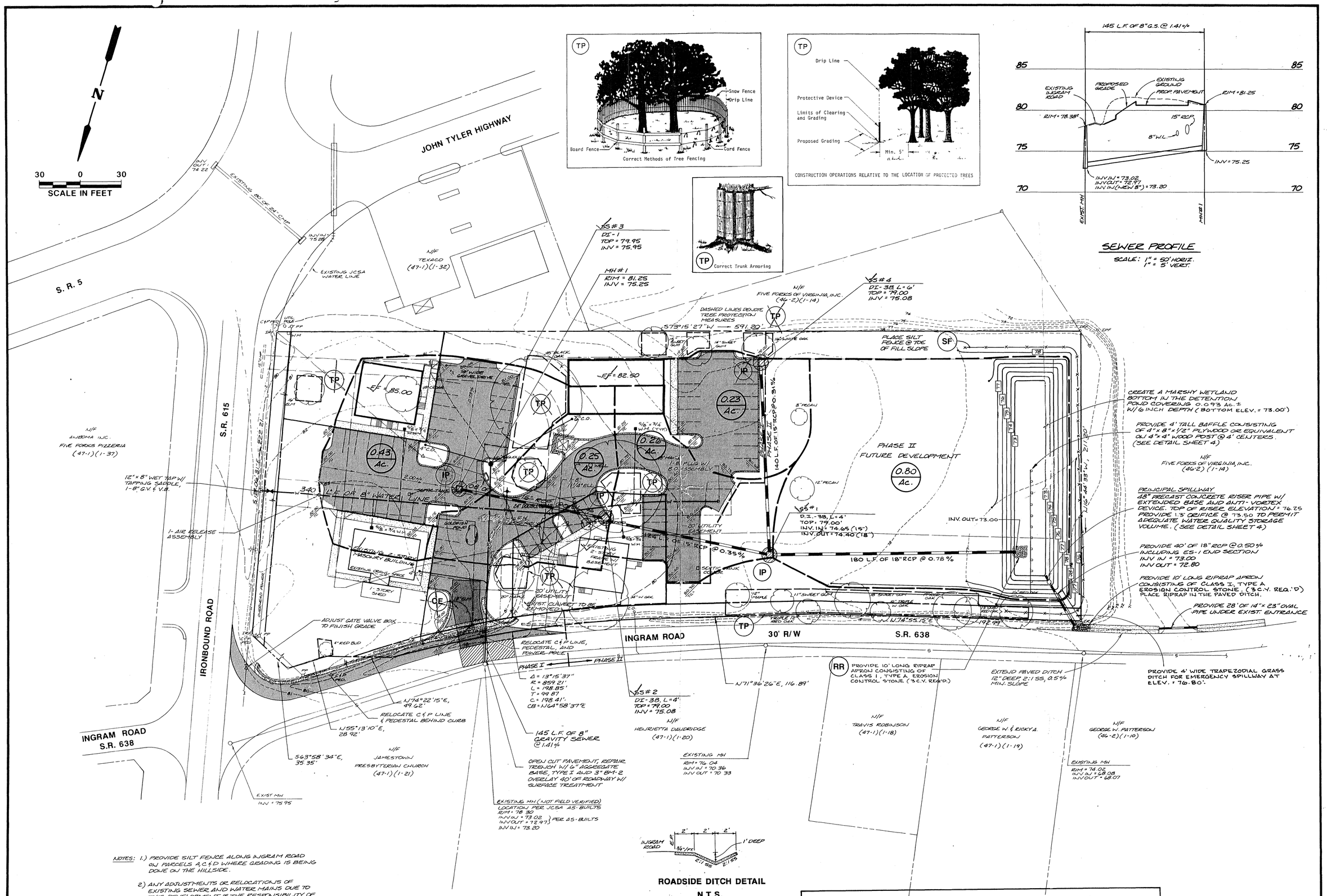
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(804) 253-0040
FAX: (804)220-8994
CONSULTING ENGINEERS

SITE PLAN
POWHATAN OFFICE PARK

OWNER/DEVELOPER: C. LEWIS WALTRIP II, INC.
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
GAM/HWP	RMJ
Scale	Date
1"=30'	AUG.,1991

Project No. 7309
Drawing No. 1



SEWER PROFILE

SCALE: 1" = 50' HORIZ.
1" = 5' VERT.

ROADSIDE DITCH DETAIL

N.T.S.

NOTES: 1.) PROVIDE SILT FENCE ALONG INGRAM ROAD ON PARCELS A, C & D WHERE GRADING IS BEING DONE ON THE HILLSIDE.

2) ANY ADJUSTMENTS OR RELOCATIONS OF EXISTING SEWER AND WATER MAINS DUE TO THIS DEVELOPMENT IS THE RESPONSIBILITY OF THE DEVELOPER.

NOTE: VDOT IS ABSOLVED FROM THE RESPONSIBILITY FOR THE DRAINAGE RELATED TO THE DETENTION BASIN.

No.	DATE	REVISION / COMMENT / NOTE	BY
1	10/9/92	REVISED PER J.C.Co. COMMENTS	HWF

COMMONWEALTH OF VIRGINIA
C. ARCHER MARSTON III
No. 016232
PROFESSIONAL ENGINEER

5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(804) 253-0040
FAX: (804)220-8994
CONSULTING ENGINEERS

UTILITY AND DRAINAGE PLAN
POWHATAN OFFICE PARK

OWNER/DEVELOPER: C. LEWIS WALTRIP II, INC.

BERKELEY DISTRICT — JAMES CITY COUNTY — VIRGINIA

Designed GAM/HWP	Drawn RMJ
Scale 1"=30'	Date AUG., 1991
Project No. 7309	
Drawing No. 2	

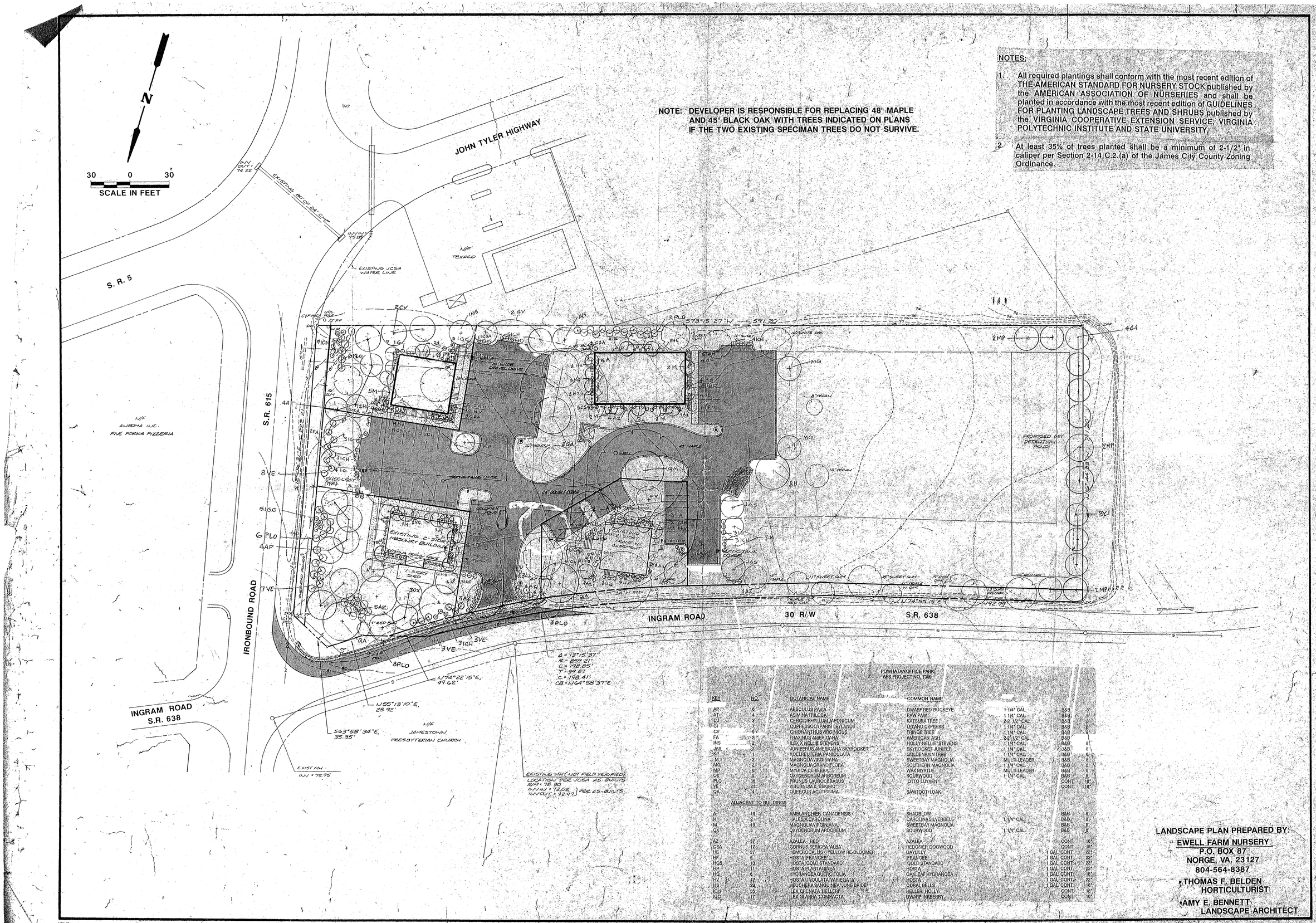
N2564D

R:\0089_POWHATAN_OFFICE_PARK_PHASE_1&2_INGRAM_RD - 008

NOTE: DEVELOPER IS RESPONSIBLE FOR REPLACING 48" MAPLE AND 45" BLACK OAK WITH TREES INDICATED ON PLANS IF THE TWO EXISTING SPECIMAN TREES DO NOT SURVIVE.

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 NURSERIES and shall be planted in accordance with the most recent edition of GUIDELINES FOR PLANTING LANDSCAPE TREES AND SHRUBS published by the VIRGINIA COOPERATIVE EXTENSION SERVICE, VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY.
2. At least 35% of trees planted shall be a minimum of 2-1/2" in caliper per Section 2-14 C.2.(a) of the James City County Zoning Ordinance.



POWHATAN OFFICE PARK
AES PROJECT NO. 7309

KEY	NO.	BOTANICAL NAME	COMMON NAME			
AP	6	AESCULUS PAVIA	DWARF RED BUCKEYE	1 1/4" CAL.	B&B	8'
AT	4	ASIMINA TRILOBA	PAW PAW	1 1/4" CAL.	B&B	8'
CJ	2	CERCIDIPHYLLUM JAPONICUM	KATSURA TREE	2 1/2" CAL.	B&B	8'
CI	2	CUPRESSOCYPARIS LEYLANDII	LEYLAND CYPRESS	1 1/4" CAL.	B&B	8'
CV	6	CHIONANTHUS VIRGINICUS	FRINGE TREE	1 1/4" CAL.	B&B	8'
FA	3	FRAXINUS AMERICANA	AMERICAN ASH	2 1/2" CAL.	B&B	
INS	2	ILEX X NELLIE STEVENS	HOLLY NELLIE STEVENS	1 1/4" CAL.	B&B	8'
JAS	3	JUNIPERUS AMERICANA SKYROCKET	SKYROCKET JUNIPER	1 1/4" CAL.	B&B	8'
KP	1	KOELREUTERIA PANICULATA	GOLDENRAIN TREE	1 1/4" CAL.	B&B	8'
M	2	MAGNOLIA VIRGINIANA	SWEETBAY MAGNOLIA	MULTI-LEADER	B&B	8'
MG	2	MAGNOLIA GRANDIFLORA	SOUTHERN MAGNOLIA	1 1/4" CAL.	B&B	8'
MP	9	MYRICA CERIFERA	WAX MYRTLE	MULTI-LEADER	B&B	8'
OX	9	OXYDENDRUM ARBOREUM	SOURWOOD	1 1/4" CAL.	B&B	8'
PLO	39	PRUNUS LAUROCERASUS	OTTO LUYKEN		CONT.	18"
VE	21	VIBURNUM X. ESKIMO			CONT.	18"
QA	1	QUERCUS ACUTISSIMA	SAWTOOTH OAK			
ADJACENT TO BUILDINGS						
A	16	AMELANCHIER CANADENSIS	SHADBLOW		B&B	8'
H	2	HALESIA CAROLINA	CAROLINA SILVERBELL	1 1/4" CAL.	B&B	8'
M	19	MAGNOLIA VIRGINIANA	SWEETBAY MAGNOLIA		B&B	8'
OX	3	OXYDENDRUM ARBOREUM	SOURWOOD	1 1/4" CAL.	B&B	8'
AZ	37	AZALEA - RED	AZALEA		CONT.	18"
CSA	12	CORNUS SERICEA 'ALBA'	REDOSIER DOGWOOD		CONT.	18"
HE	27	HEMEROCALLIS - YELLOW RE-BLOOMER	DAYLILY	1 GAL CONT.		22"
HF	8	HOSTA FRANCEE	FRANCEE	1 GAL CONT.		22"
HGS	13	HOSTA GOLD STANDARD	GOLD STANDARD	1 GAL CONT.		22"
HP	5	HOSTA PLANTAGINEA	HOSTA	1 GAL CONT.		22"
HQ	6	HYDRANGEA QUERCIFOLIA	OAKLEAF HYDRANGEA	1 GAL CONT.		18"
HV	47	HOSTA UNDULATA VARIEGATA	HOSTA	1 GAL CONT.		22"
HS	29	HEUCHERA SANGUINEA 'JUNE BRIDE'	CORAL BELLS	1 GAL CONT.		18"
ICH	35	ILEX CRENATA 'HELLERI'	HELLERI HOLLY		CONT.	18"
IGO	17	ILEX GLABRA COMPACTA	DWARF INKBERRY		CONT.	18"

LANDSCAPE PLAN PREPARED BY:
EWELL FARM NURSERY
P.O. BOX 87
NORGE, VA. 23127
804-564-8387
THOMAS F. BELDEN
HORTICULTURIST
AMY E. BENNETT
LANDSCAPE ARCHITECT

No.	DATE	REVISION / COMMENT / NOTE	BY
5	9/19/02	REVISED PER J.C.Co. COMMENTS	MWP
4	4/15/02	REVISED PER J.C.C. & VDOT COMMENTS	GAH
3	3/25/02	REVISED PER J.C.C. & VDOT COMMENTS	GAH
2	2/12/02	REVISED PER JAMES CITY COUNTY REVIEW COMMENTS	MWP
1	12/31/01	REVISED PER ZONING ADMINISTRATOR COMMENTS	MWP

5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(804) 253-0040
FAX: (804)220-8994
CONSULTING ENGINEERS

LANDSCAPING PLAN
POWHATAN OFFICE PARK
OWNER/DEVELOPER: C. LEWIS WALTRIP II, INC.
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
Scale 1"=30'	Date
Project No. 7309	
Drawing No. 3	

ROAD CONSTRUCTION NOTES

1. ALL ROADS AND DRAINAGE FACILITIES SHOULD BE CONSTRUCTED IN ACCORDANCE WITH CURRENT REGULATIONS, SPECIFICATIONS AND STANDARDS, AND SUBDIVISION STREET REQUIREMENTS OF THE VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT).

2. STANDARD PE-1 ENTRANCES WITH A MINIMUM OF 24' OF 15" CONCRETE CULVERT PIPE SHALL BE REQUIRED FOR ALL DRIVEWAYS. IF ENDWALLS ARE PROVIDED AT EITHER END OF DRIVEWAY CULVERT, THE MAXIMUM ALLOWABLE HEIGHT OF THE ENDWALL IS TWO BRICK COURSES ABOVE THE DIRECTLY ADJACENT EDGE OF THE MAIN ROADWAY PAVEMENT (OR APPROXIMATELY 5" TO 8").

3. ALL SHOULDERS, DITCHES AND BACKSLOPES MUST BE STABILIZED PRIOR TO ACCEPTANCE OF ROADS INTO THE STATE SECONDARY ROAD SYSTEM.

4. THE ROAD CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL ITEMS OF ROAD WORK & DRAINAGE WITH EXISTING AND PROPOSED UNDERGROUND UTILITIES (POWER, WATER, SEWER AND TELEPHONE) SUCH THAT NO DUPLICATION OF WORK EFFORT IS INCURRED.

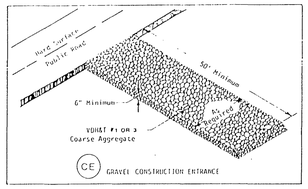
5. UPON COMPLETION, INSPECTION AND ACCEPTANCE, ALL ROADS AND DRAINAGE FACILITIES SHALL BE DEDICATED TO VDOT FOR INCLUSION IN THE STATE SECONDARY ROAD SYSTEM.

6. ALL ITEMS OF ROADWORK AND DRAINAGE NECESSARY FOR THE ROADS TO BE ACCEPTED INTO THE STATE SECONDARY ROAD SYSTEM, WHETHER WRITTEN ON THESE PLANS OR NOT ARE HEREBY EXPRESSLY IMPLIED. NO OMISSIONS, ERRORS OR OVERSIGHTS ON THE PART OF THE ENGINEER OR OWNER SHALL DETRACT FROM THE CONTRACTORS RESPONSIBILITY OF COMPLETING ALL ITEMS OF ROADWORK & DRAINAGE SATISFACTORY IN EVERY RESPECT TO JAMES CITY COUNTY AND VDOT.

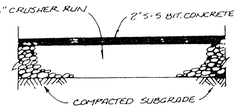
7. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE THE RESPONSIBILITY OF THE ROAD CONTRACTOR.

8. LATERAL UNDERDRAINS MAY BE REQUIRED WHERE FIELD CONDITIONS WARRANT. A CHANGE ORDER FOR SAME WILL BE EXECUTED IF REQUIRED BY VDOT, THE ENGINEER, COUNTY OR OWNER.

9. PAVED DITCHES MAY BE REQUIRED WHERE FIELD CONDITIONS WARRANT. GENERALLY, ALL DITCHES WITH SLOPES EXCEEDING 3% SHALL BE PAVED UNLESS OTHERWISE APPROVED BY THE ENGINEER, OWNER, VDOT AND THE LOCAL GOVERNING BODY.

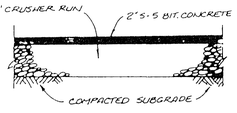


CE GRAVEL CONSTRUCTION ENTRANCE

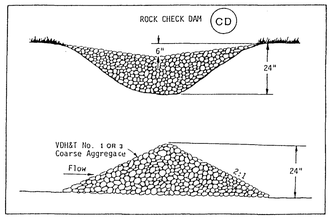


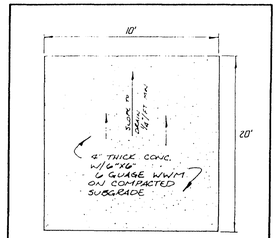
TYPICAL PAVEMENT SECTION

NOT TO SCALE



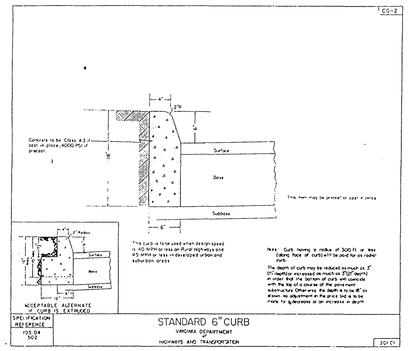
TYPICAL OFF-SITE PAVEMENT SECTION
INGRAM ROAD
N.T.S.

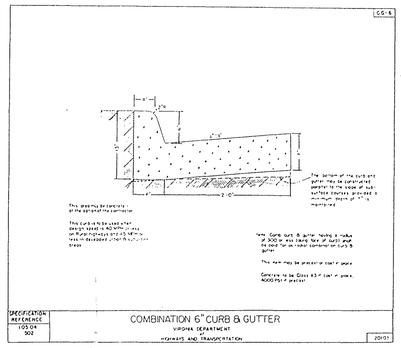


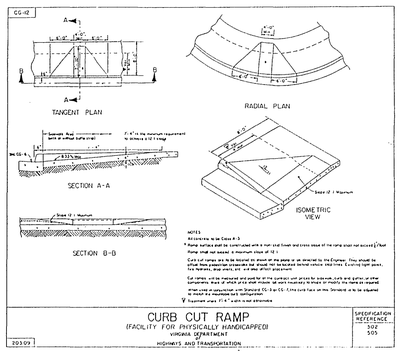


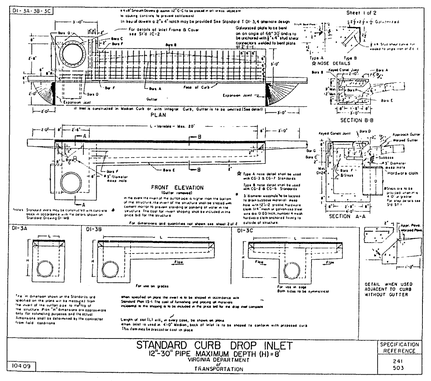
DUMPSTER PAD DETAIL

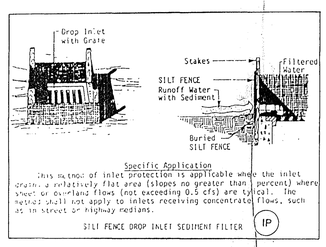
N.T.S.

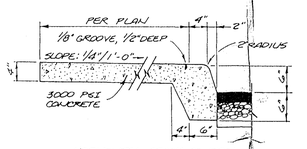








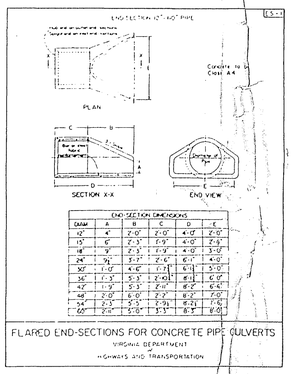


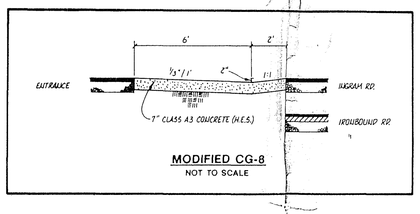


HORIZONTAL CRACK CONTROL JOINTS SHALL BE 5'± C-C UNLESS OTHERWISE NOTED

TURNDOWN SIDEWALK DETAIL

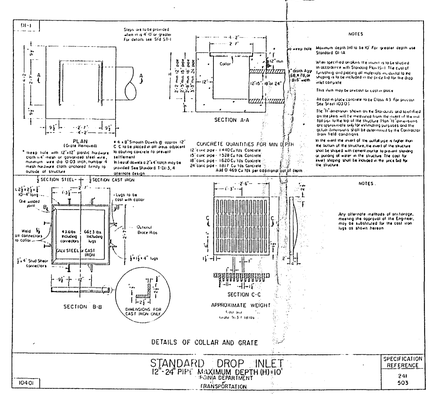
SCALE: 3/4" = 1'-0"





MODIFIED CG-8

NOT TO SCALE



EROSION AND SEDIMENT CONTROL NOTES

The purpose of the erosion control measures shown on these plans shall be to preclude the transport of all watersborne 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 with 15 days of installation. An on-site pre-construction meeting will be held between the Department of Public Works 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 Public Works 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. Department of Public Works 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 stone where required. Any drainage 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 site 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.

16. 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.

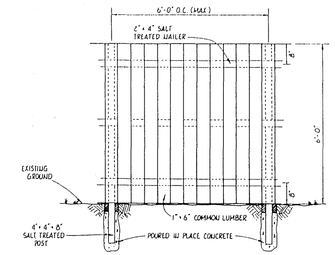
18. Off-site waste or borrow areas shall be approved by James City County prior to the import of any borrow or export of any waste to or from the project site.

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

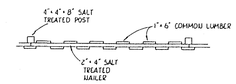
20. A Land Disturbing Permit and Siltation Agreement, with surety, are required for this project.

21. A preconstruction conference shall be held on-site between the County, the Developer, the Project Engineer and the Contractor prior to issuance of a Land Disturbing Permit. The Contractor shall submit a narrative plan to the County prior to the preconstruction conference detailing the sequence of construction for the project, including installation of erosion control measures.

22. All roadways and shoulders shall be stabilized with at least six inches of crusher run aggregate immediately after grading. Crusher run aggregate shall be the material specified in Section 206 of the Virginia Department of Transportation Road and Bridge Specifications.



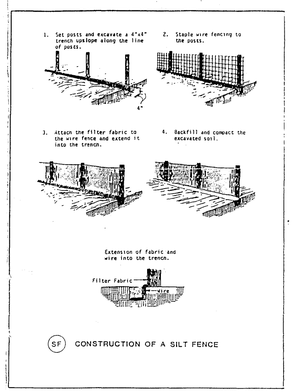
PROFILE



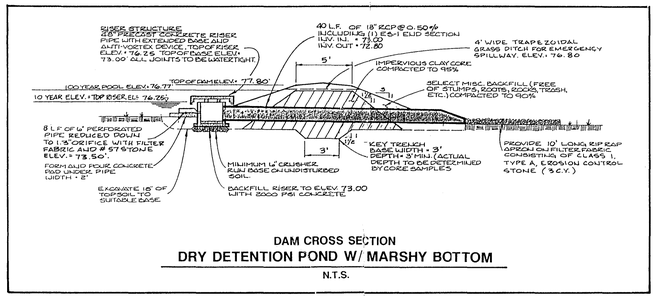
PLAN

6' WOOD FENCE DETAIL

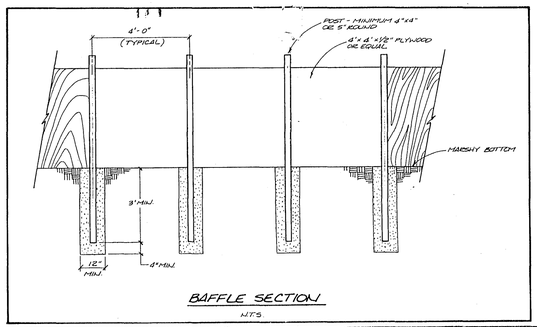
NOT TO SCALE



SF CONSTRUCTION OF A SILT FENCE



DAM CROSS SECTION
DRY DETENTION POND W/ MARSHY BOTTOM
N.T.S.



BAFFLE SECTION

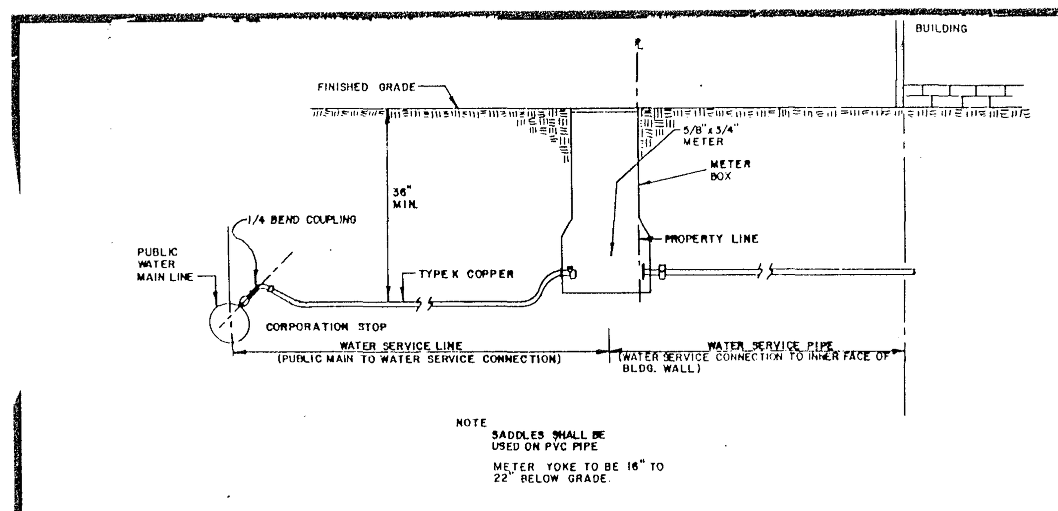
N.T.S.

No.	DATE	REVISION / COMMENT / NOTE	BY
1	9/9/92	REVISED PER J.C.C. COMMENTS	HWP

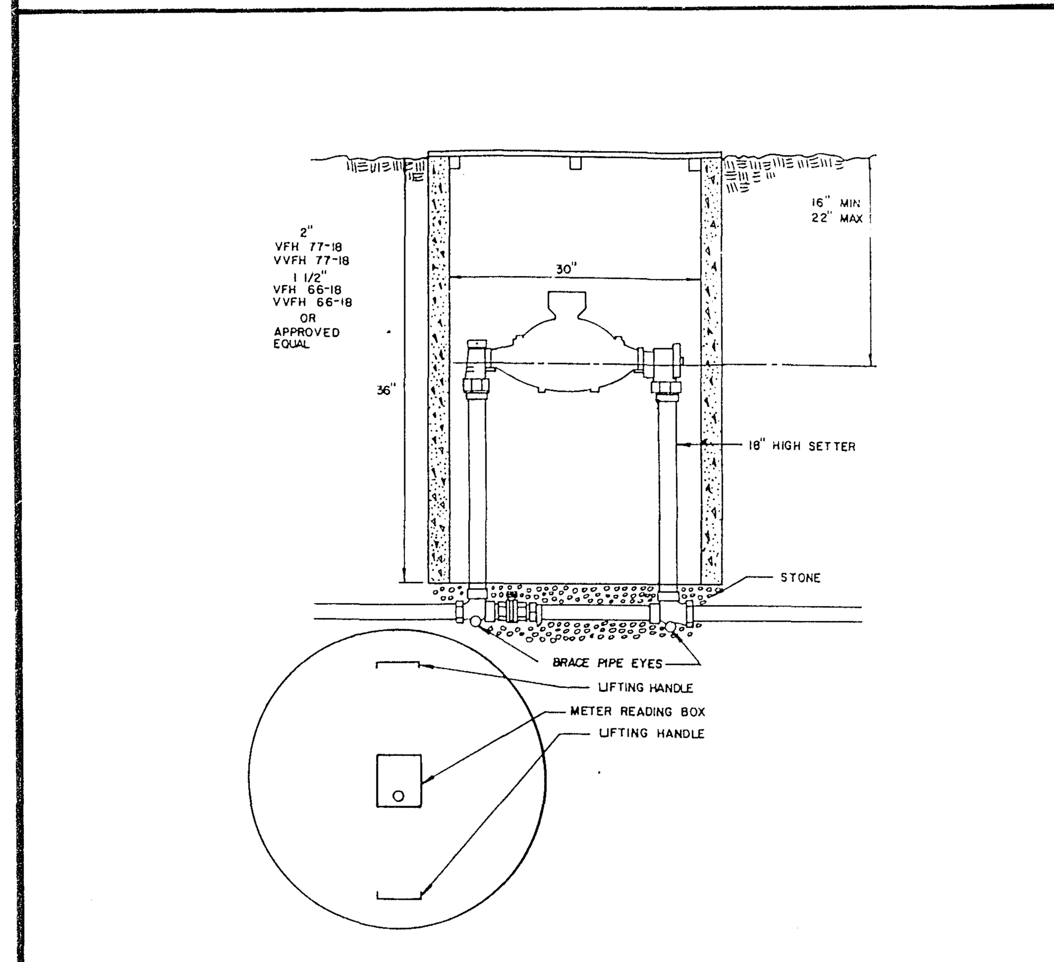
AES, a professional corporation
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23185
(804) 253-0040
Engineering, Planning, Surveying

NOTES AND DETAILS
POWHATAN OFFICE PARK
OWNER/DEVELOPER: C. LEWIS WALTRIP II, INC.
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

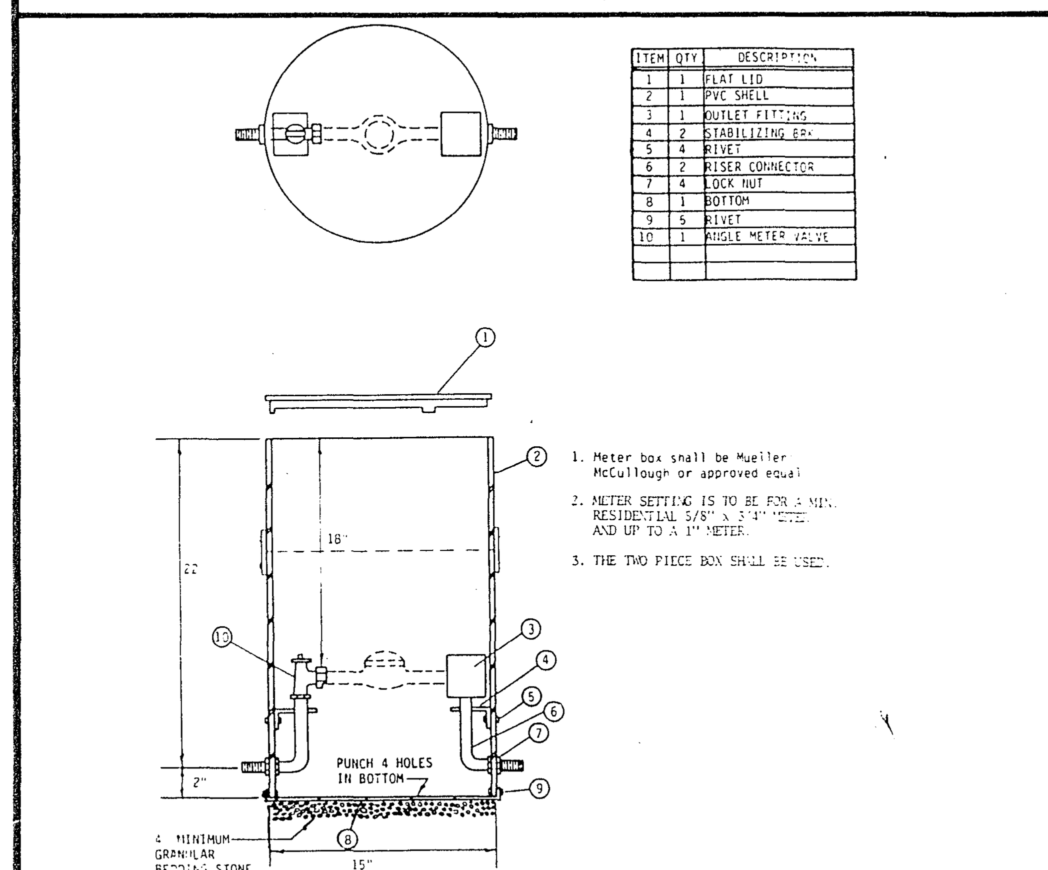
Designed	Drawn
Scale	Date
Project No. 7309	
Drawing No. 4	



TYPICAL WATER SERVICE

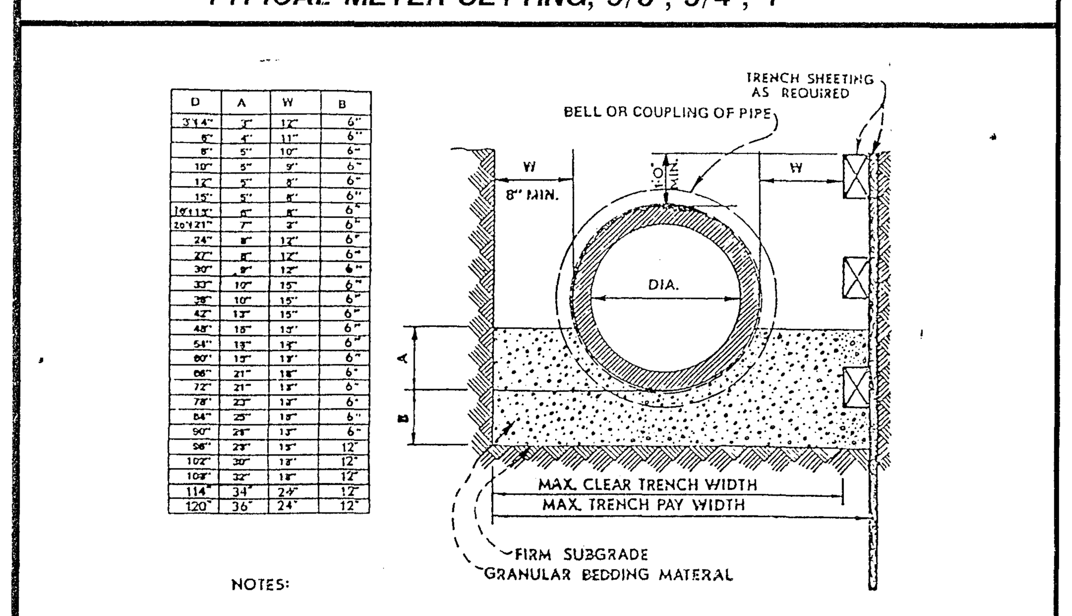


TYPICAL METER SETTING, 1-1/2" AND 2"



1. Meter box shall be Mueller McCullough or approved equal.
2. METER SETTING IS TO BE FOR 5/8" MIN. RESIDENTIAL 5/8" x 3/4" METER AND UP TO A 1" METER.
3. THE TWO PIECE BOX SHALL BE USED.

TYPICAL METER SETTING, 5/8", 3/4", 1"



NOTES:

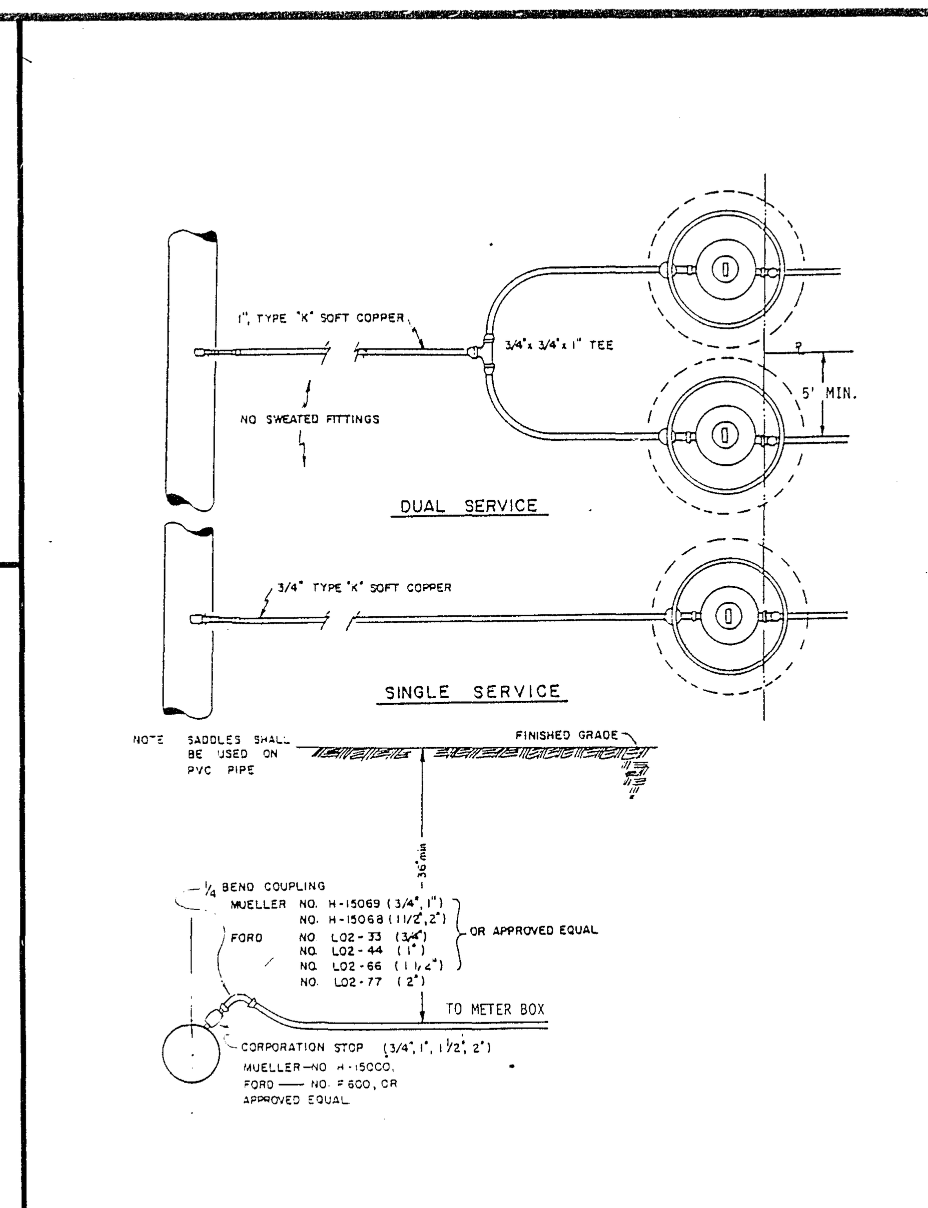
WHERE SPECIFICALLY REQUIRED, f'c=2000 psi @ 28 DAYS CONCRETE AND SADDLE BLOCKS SHALL BE USED IN LIEU OF THE GRAVEL CRADLE.

THE GRANULAR MATERIALS FOR BEDDING SHALL BE (ASTM C33 "67) WASHED GRAVEL OR CRUSHED STONE FOR 90° AND SMALLER.

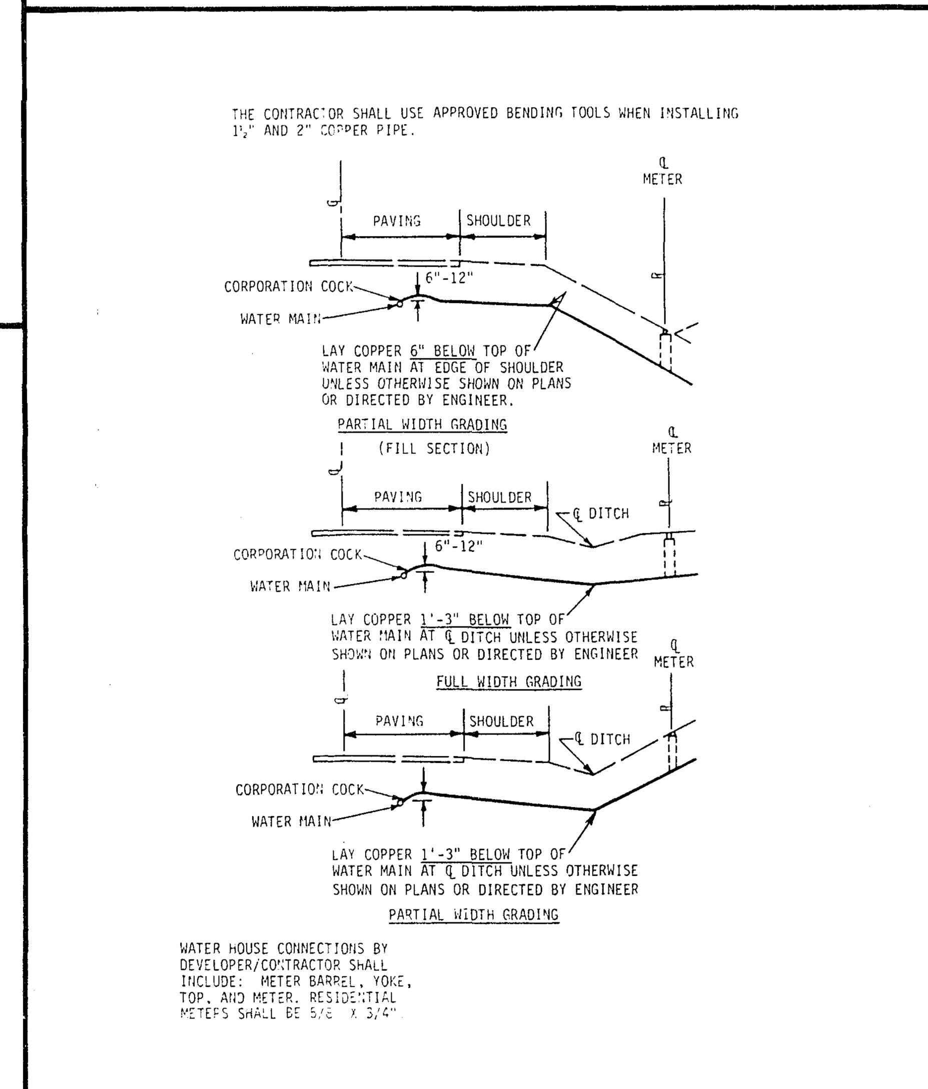
MAXIMUM CLEAR TRENCH WIDTH SHALL BE PLUS THE OUTSIDE DIAMETER OF THE PIPE.

ELLIPTICAL PIPE SHALL BE BEDDED IN SAND. SEE CONTRACT DRAWINGS FOR AMOUNT OF BEDDING REQUIRED

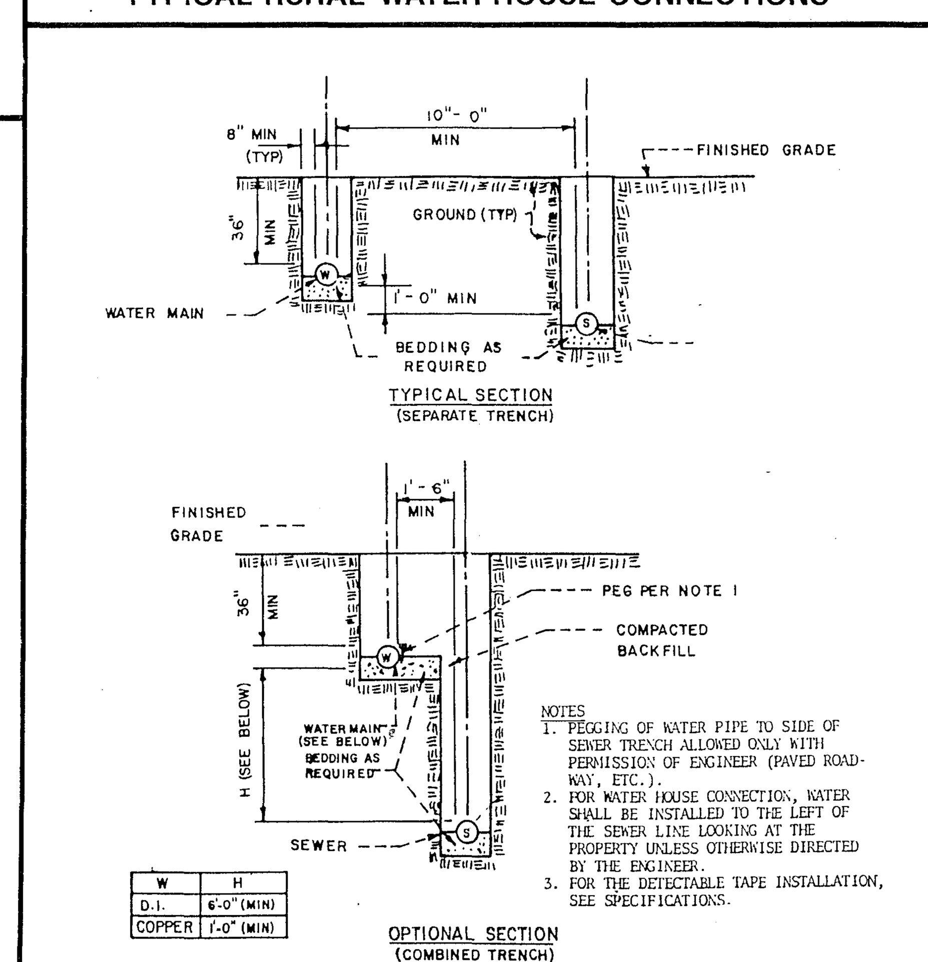
BEDDING AND TRENCH WIDTHS



DUAL AND SINGLE SERVICE INSTALLATION

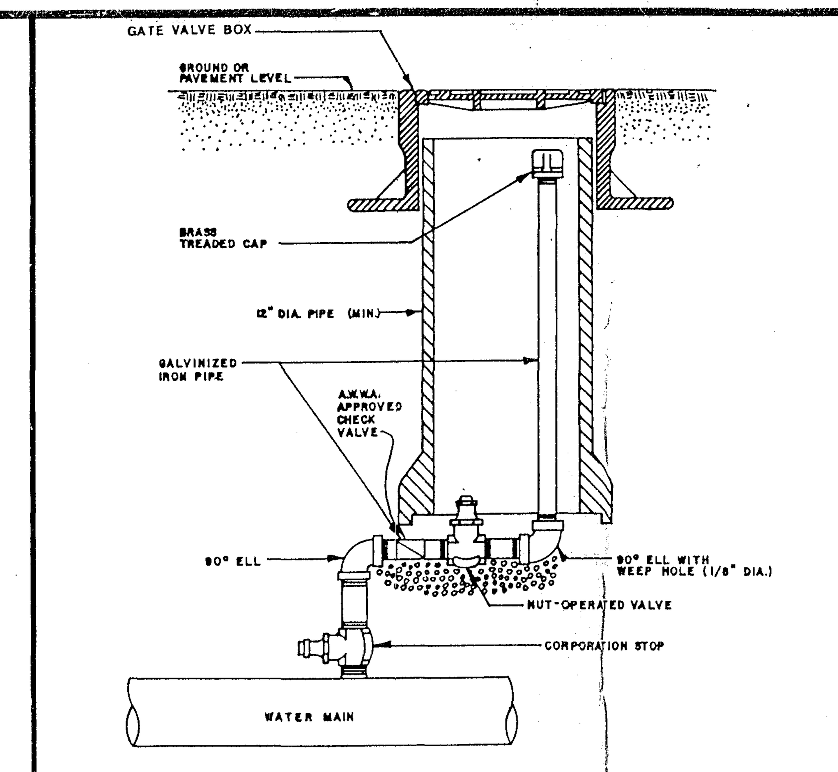


TYPICAL RURAL WATER HOUSE CONNECTIONS



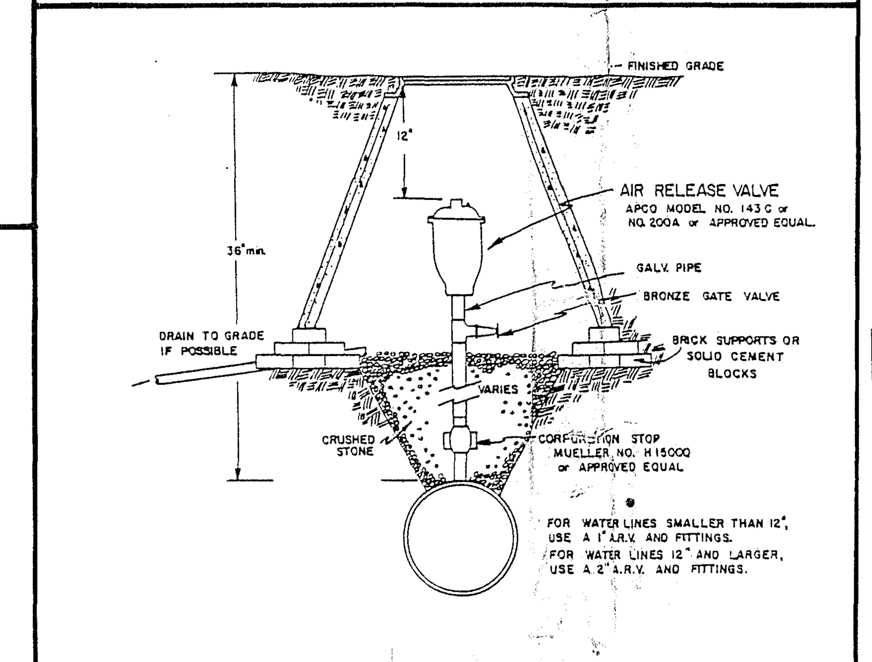
NOTES
1. PEGGING OF WATER PIPE TO SIDE OF SEWER TRENCH ALLOWED ONLY WITH PERMISSION OF ENGINEER (PAVED ROADWAY, ETC.).
2. FOR WATER HOUSE CONNECTION, WATER SHALL BE INSTALLED TO THE LEFT OF THE SEWER LINE LOOKING AT THE PROPERTY UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
3. FOR THE DETECTABLE TAPE INSTALLATION, SEE SPECIFICATIONS.

MINIMUM WATER AND SEWER LINE SEPARATION



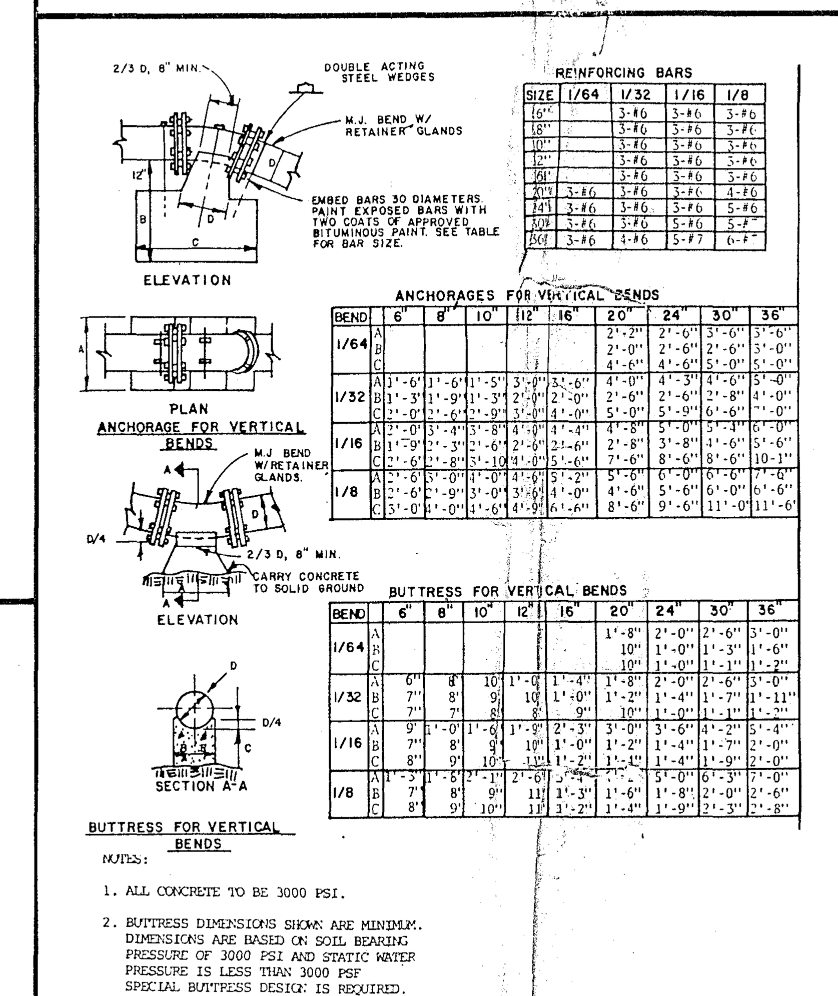
GENERAL NOTES
1. 2" MATERIAL TO BE USED ON ALL PIPES.
2. TAPPING SADDLES SHALL BE USED ON PVC; DUCTILE IRON MAY BE DIRECT TAPPING.

MANUAL AIR RELEASE VALVE



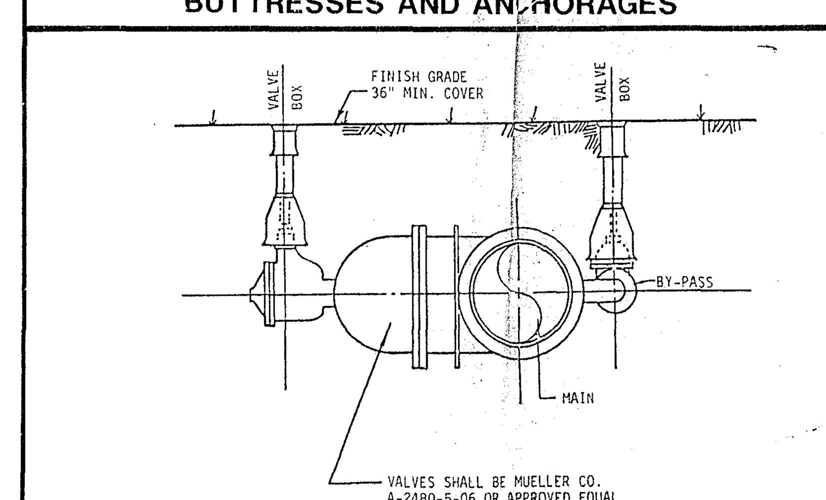
A PRECAST MANHOLE CONE AND COVER WITH "WATER" CAST IN THE LID SHALL BE USED. AN ADEQUATE FOUNDATION SHALL BE INSTALLED SO THE WATER LINE DOESN'T SUPPORT THE MANHOLE CONE.

AUTOMATIC AIR RELEASE VALVE

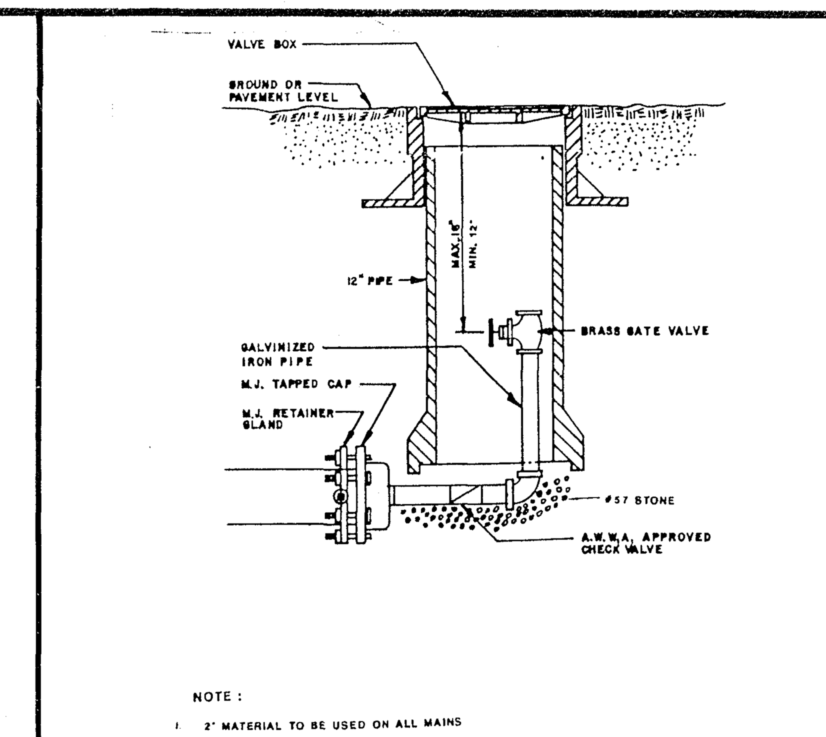


NOTES:
1. ALL CONCRETE TO BE 3000 PSI.
2. BUTTRESS DIMENSIONS SHOWN ARE MINIMUM. DIMENSIONS ARE BASED ON SOIL BEARING PRESSURE OF 3000 PSI AND STATIC WATER PRESSURE IS LESS THAN 3000 PSF SPECIAL BUTTRESS DESIGN IS REQUIRED.

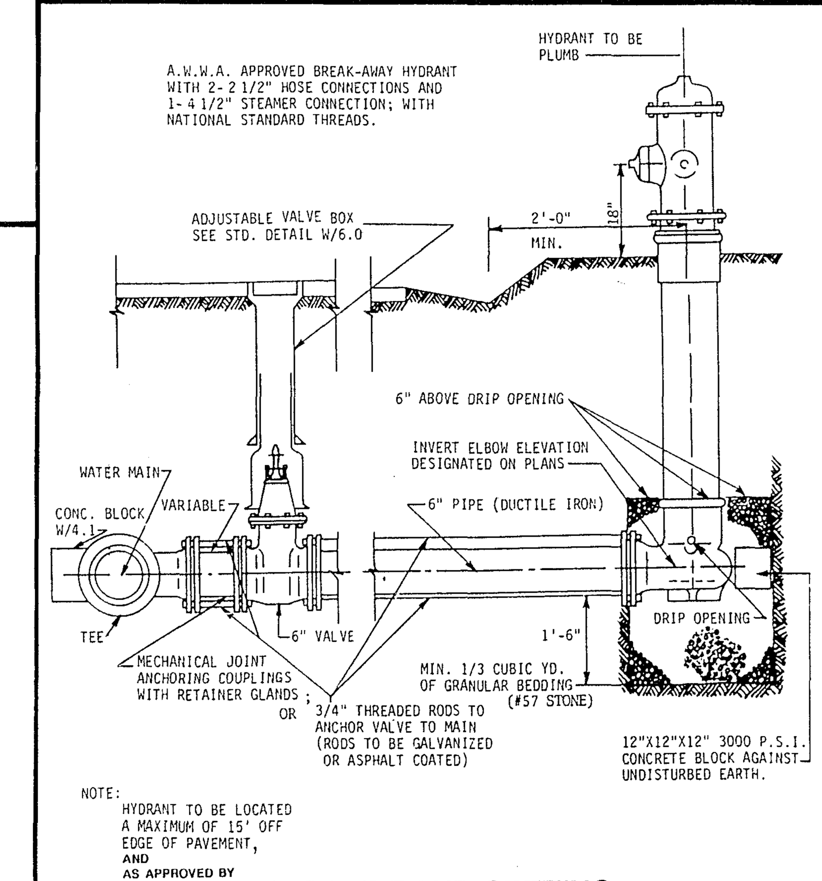
BUTTRESSES AND ANCHORAGES



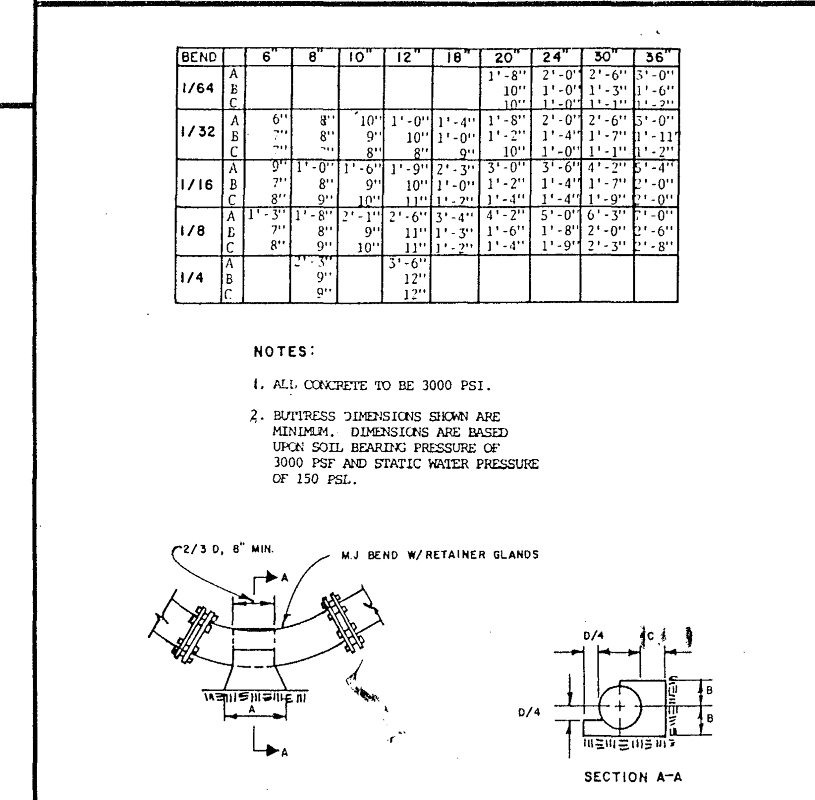
HORIZONTAL VALVE INSTALLATION



DEAD END BLOW-OFF

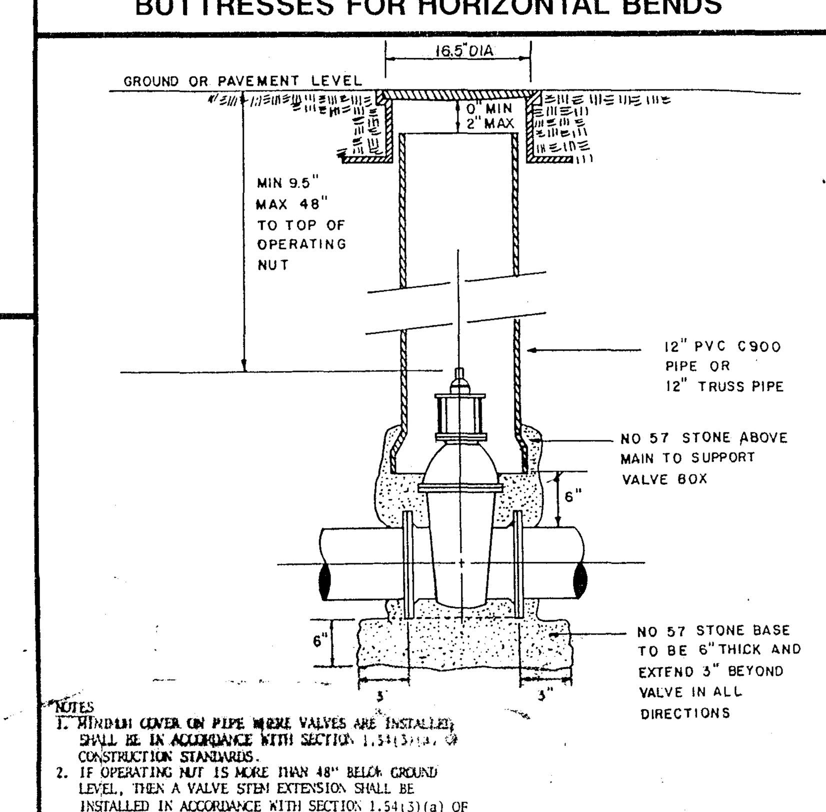


FIRE HYDRANT SETTING



NOTES:
1. ALL CONCRETE TO BE 3000 PSI.
2. BUTTRESS DIMENSIONS SHOWN ARE MINIMUM. DIMENSIONS ARE BASED UPON SOIL BEARING PRESSURE OF 3000 PSF AND STATIC WATER PRESSURE OF 150 PSI.

BUTTRESSES FOR HORIZONTAL BENDS



TYPICAL VALVE SETTING

GENERAL NOTES - WATER DISTRIBUTION MAINS

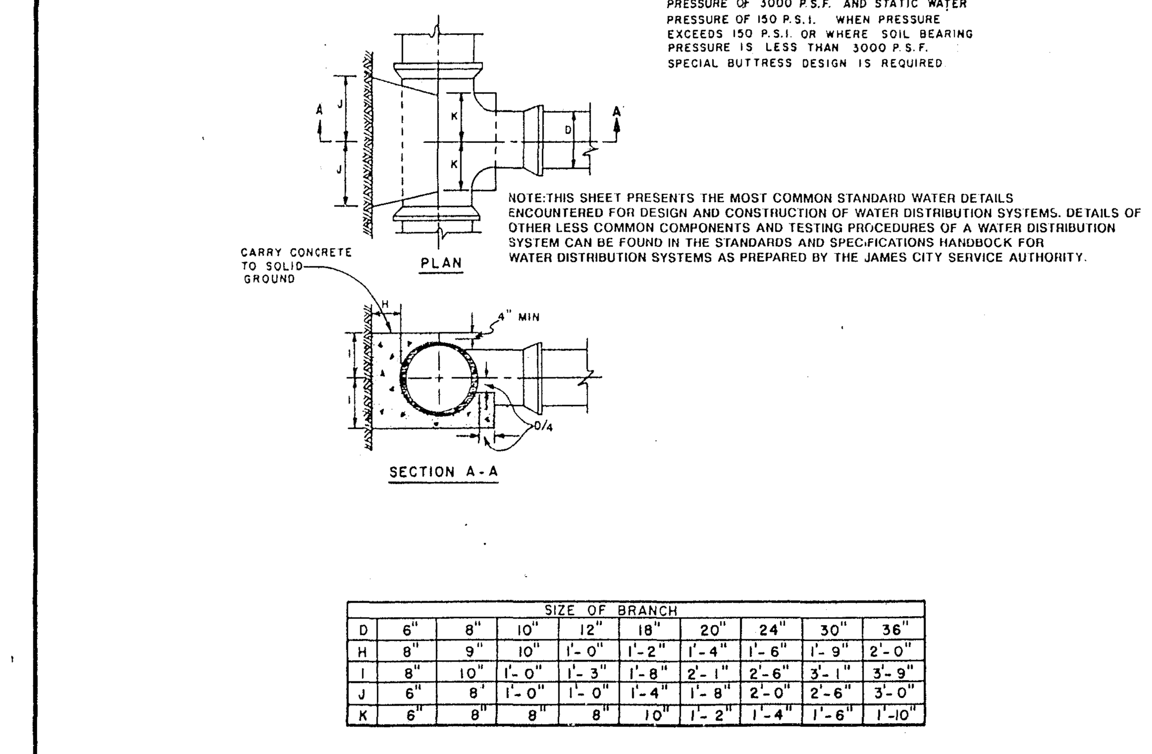
1. All components of the water distribution system shall be installed and tested in accordance with the latest edition of the James City Service Authority Standards and Specifications for Water Distribution Systems and the Virginia Waterworks Regulations.
2. The developer's representative shall submit a list of materials for approval to the James City Service Authority prior to commencement of construction.
3. Water mains shall be installed after rough grading and prior to placement of base material.
4. All approved Erosion and Sediment Control requirements shall be observed during water main construction.
5. All water mains shall be disinfected and pressure tested, and satisfactory bacteriological samples obtained, in accordance with James City Service Authority standards.
6. After testing is complete and all components of the water system are acceptable to the James City Service Authority, as-built drawings shall be submitted to the Service Authority. No water meters will be installed until as-built drawings are received and checked for accuracy by the James City Service Authority. Any discrepancies noted during the as-built inspection shall be corrected by the developer's representatives within 30 days.
7. Routine periodic inspections during construction will be provided by the James City Service Authority. These inspections do not relieve the developer from his obligation and responsibility for constructing a water distribution system in strict accordance with the Standards and Specifications of the James City Service Authority.
8. Any changes to the final plans shall be approved by the James City Service Authority and shall be accurately indicated on the as-built drawings.
9. All lots shall be provided with water service connections. The connections shall be extended from the main to the property line or easement line, and shall terminate with a yoke in a meter box set at final finished grade. Meters for all lots (units) shall be furnished by the developer and installed by the JCSA.
10. The developer is required to submit water data sheets and shall acquire a certificate to construct prior to commencement of construction.
11. Any required easements, permits and approvals shall be acquired by the developer prior to commencement of water main construction.
12. The water main contractor shall comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. He shall erect and maintain, as required by the conditions and progress of the work, all necessary safeguards for safety and protection. He shall also notify "Miss Utility" prior to performing any underground excavation.

NOTE:

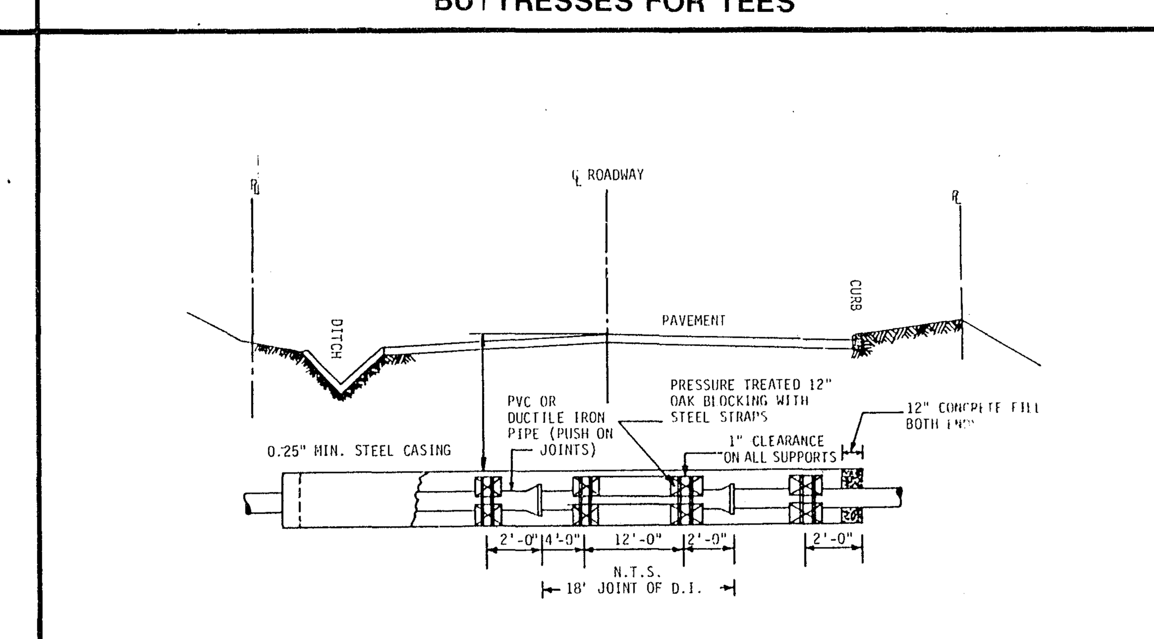
THE CONTRACTOR IS TO DISREGARD ALL DETAILS NOT APPLICABLE TO THIS CONTRACT.

NOTE: THIS SHEET PRESENTS THE MOST COMMON STANDARD WATER DETAILS ENCOUNTERED FOR DESIGN AND CONSTRUCTION OF WATER DISTRIBUTION SYSTEMS. DETAILS OF OTHER LESS COMMON COMPONENTS AND TESTING PROCEDURES OF A WATER DISTRIBUTION SYSTEM CAN BE FOUND IN THE STANDARDS AND SPECIFICATIONS HANDBOOK FOR WATER DISTRIBUTION SYSTEMS AS PREPARED BY THE JAMES CITY SERVICE AUTHORITY.

1. ALL CONCRETE TO BE 3000 P.S.I.
2. BUTTRESS DIMENSIONS SHOWN ARE MINIMUM. DIMENSIONS ARE BASED UPON SOIL BEARING PRESSURE OF 3000 P.S.F. AND STATIC WATER PRESSURE OF 150 P.S.I. WHEN PRESSURE EXCEEDS 150 P.S.I. OR WHERE SOIL BEARING PRESSURE IS LESS THAN 3000 P.S.F. SPECIAL BUTTRESS DESIGN IS REQUIRED



BUTTRESSES FOR TEES



NOTE: STEEL CASING TO EXTEND TO BACK OF CURB, DITCH, SIDEWALK, ETC. OR A MINIMUM OF 3' BEYOND THE EDGE OF PAVEMENT.

IN LIEU OF TIMBER CHOCKS, POWERSEAL PIPELINE PRODUCTS MODEL NO. 4810, OR EQUAL, MAY BE USED.

TYPICAL HIGHWAY CROSSING

No.	DATE	REVISION / COMMENT / NOTE	BY

COMMONWEALTH OF VIRGINIA · PAUL C. SMALL · CERTIFICATE NO. 04267 · CERTIFIED PROFESSIONAL ENGINEER

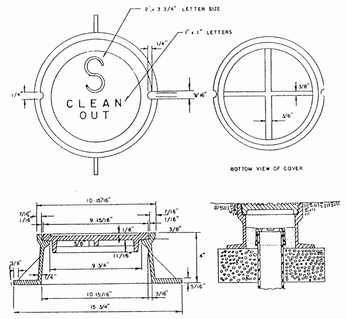
AES CONSULTING ENGINEERS

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

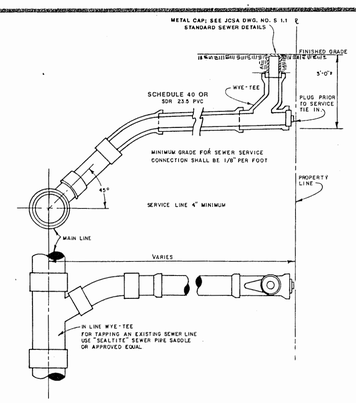
STANDARD WATER DETAILS

JAMES CITY COUNTY · VIRGINIA

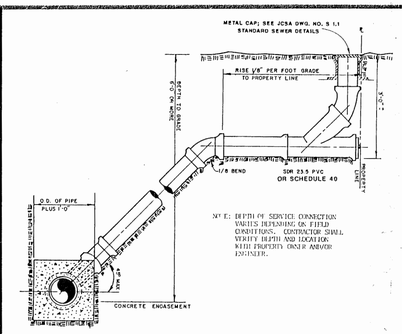
Designed	Drawn C.A.N.
Scale NONE	Date APRIL 1989
Project No.	
Drawing No. SD-3e	



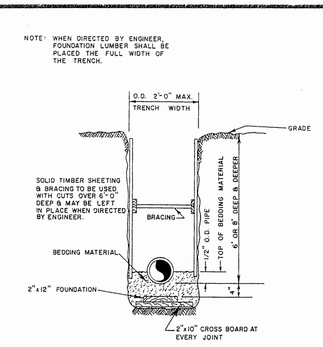
CLEANOUT COVER ASSEMBLY



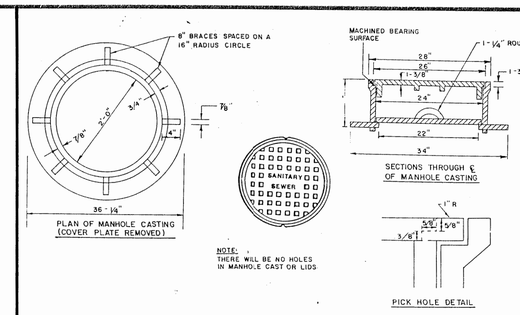
TYPICAL SEWER LATERAL CONNECTION



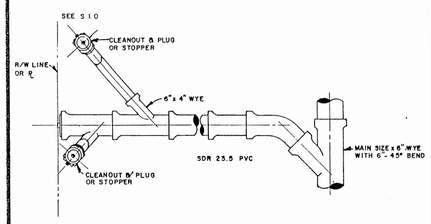
SERVICE CONNECTION FOR DEPTHS OVER 8'



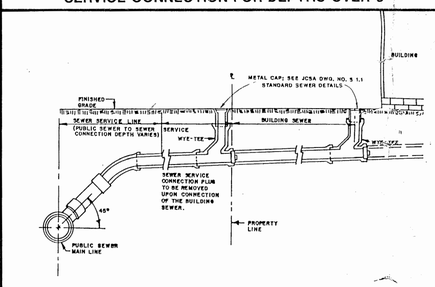
UNSTABLE TRENCH SEWER PIPE FOUNDATION



STANDARD MANHOLE FRAME COVER

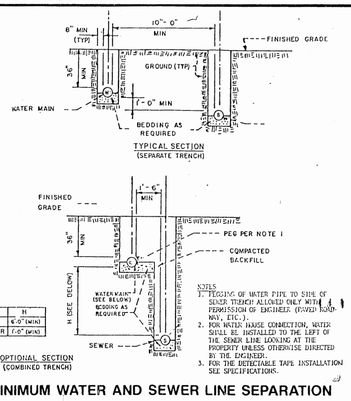


TYPICAL 6" LATERAL SERVING TWO DWELLINGS



MATERIALS FOR LATERALS TO BE DEDICATED TO THE SERVICE AUTHORITY SHALL BE PVC SDR 23.5 OR SCHEDULE 40

TYPICAL SEWER SERVICE

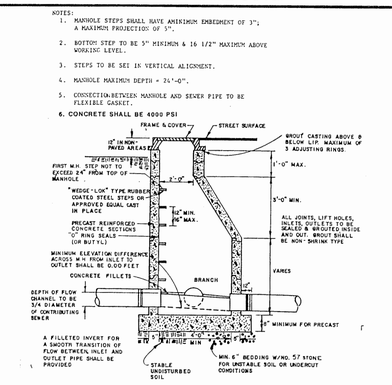


	W	H
D.I.	6'-0" (MIN)	
COPPER	1'-0" (MIN)	

MINIMUM WATER AND SEWER LINE SEPARATION

NOTES:

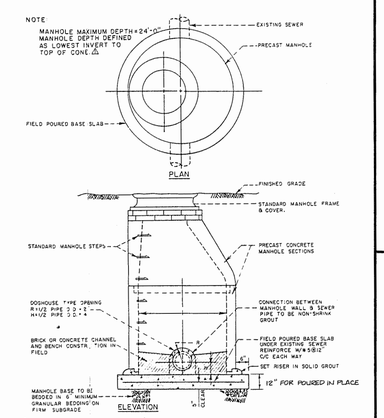
1. MANHOLE STEPS SHALL HAVE A MINIMUM EMBEDMENT OF 3", A MAXIMUM PROJECTION OF 5".
2. BOTTOM STEP TO BE 5" MINIMUM & 16 1/2" MAXIMUM ABOVE WORKING LEVEL.
3. STEPS TO BE SET IN VERTICAL ALIGNMENT.
4. MANHOLE MAXIMUM DEPTH = 24'-0".
5. CONNECTION BETWEEN MANHOLE AND SEWER PIPE TO BE FLEXIBLE GASKET.
6. CONCRETE SHALL BE 4000 PSI



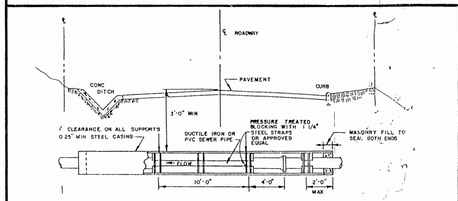
NOTE:
IN HIGH WATER TABLE AREAS, RAMNECK MAY BE USED IN LIEU OF GROUT ON EXTERNAL SIDE ONLY.

EXTENDED BASE IS OPTIONAL

STANDARD MANHOLE



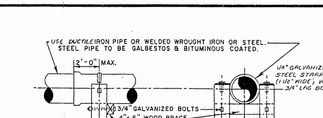
STRADDLE MANHOLE



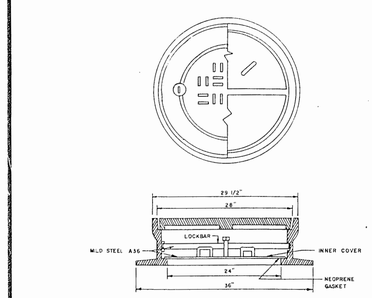
NOTE: STEEL CASING TO EXTEND TO BACK OF CURB, CONC. DITCH, SIDEWALK, ETC. OR A MINIMUM OF 3' BEYOND THE EDGE OF THE PAVEMENT. SUPPORT SPACINGS WILL VARY WITH PIPE SIZE.

MAY SUBSTITUTE CASING CHOCKS AS MANUFACTURED BY POWERSEAL PIPELINE PRODUCTS, OR EQUAL, IN PLACE OF TIMBER CHOCKS.

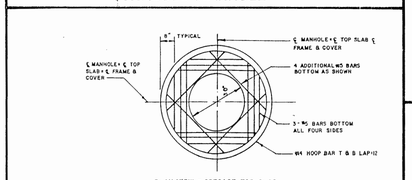
TYPICAL HIGHWAY CROSSING

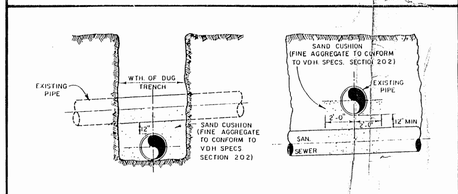


DETAIL OF SEWER BRIDGE

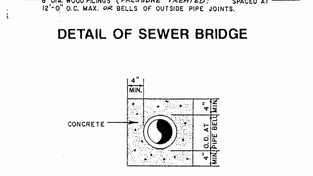


WATERTIGHT MANHOLE FRAME AND COVER

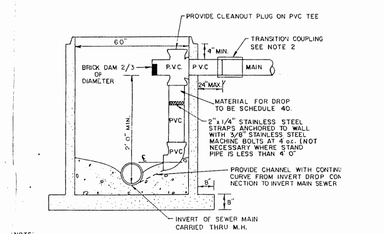




FORCE MAIN AND UTILITY CROSSING

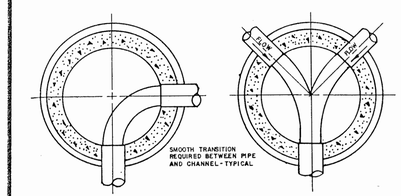


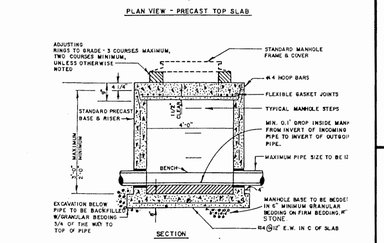
TYPICAL SEWER PIPE ENCASEMENT



NOTE:
EXTENDED BASE IS OPTIONAL.

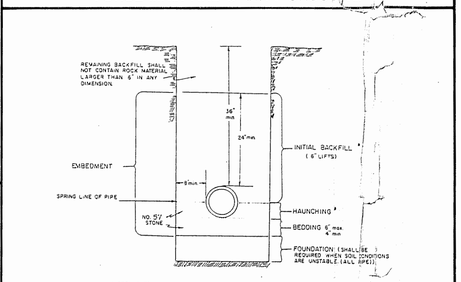
INSIDE DROP CONNECTION





NOTE
EXTENDED BASE IS OPTIONAL

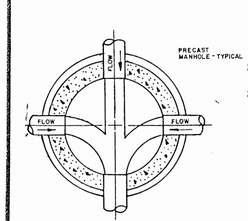
SHALLOW MANHOLE



1. OPEN CUTS IN PAVED AREAS SHALL BE BACKFILLED ENTIRELY WITH NO. 57 STONE
2. DUCTILE IRON PIPE MAY BE INSTALLED WITH LIMITED BEDDING AS APPROVED BY THE J.C.S.A.
3. WHERE ROCK IS ENCOUNTERED DUCTILE IRON PIPE SHALL BE INSTALLED ON A MINIMUM 6" BEDDING OF NO. 57 STONE

*THOROUGHLY COMPACTED BY HAND OR APPROVED MECHANICAL TAMPER

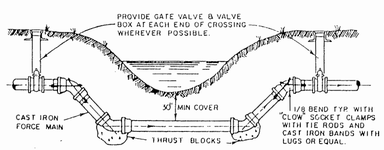
SEWER TRENCH INSTALLATION



CHANNEL LINING NOTES:

1. CHANNEL LININGS SHALL BE CONCRETE, 4" MINIMUM THICK.
2. CHANNEL LINING WIDTH SHALL MATCH INSIDE DIAMETER OF INCOMING AND OUTGOING PIPES. BLEND CHANNEL LINING FOR SMOOTH CONTOUR BETWEEN PIPES.
3. CONCRETE CHANNELS SHALL BE FORMED AS SHOWN AND SHALL HAVE 3000 PSI AT 28 DAYS.

PLANS FOR MANHOLES



TYPICAL CREEK CROSSING

JAMES CITY SERVICE AUTHORITY

GENERAL NOTES - SANITARY SEWER

1. All components of the sanitary sewer system shall be installed and tested in accordance with the latest edition of the James City Service Authority Standards and Specifications for Sanitary Sewer Systems and the Virginia Sewerage Regulations.
2. The developer's representative shall submit a list of materials for approval to the James City Service Authority prior to commencement of construction.
3. Sewer lines shall be installed after rough grading and prior to placement of base material.
4. All approved Erosion and Sediment Control requirements shall be observed during sewer line construction.
5. All sewers shall be mirrored and pressure tested in accordance with James City Service Authority standards.
6. After testing is complete and all components of the sewer system are acceptable to the James City Service Authority, as-built drawings shall be submitted to the Service Authority. No wastewater flow shall be allowed to enter the sanitary sewer system until as-built drawings are received and checked for accuracy by the James City Service Authority. Any discrepancies noted, during the as-built inspection, shall be corrected by the developer's representatives within 30 days.
7. Routine periodic inspections during construction will be provided by the James City Service Authority. These inspections do not relieve the developer from his obligation and responsibility for constructing a sanitary sewer system in strict accordance with the standards and specifications of the James City Service Authority.
8. Any changes to the final plans shall be approved by the James City Service Authority and shall be accurately indicated on the as-built drawings.
9. All lots shall be provided with sewer service connections. The connections shall be extended from the main to the property line or easement line, and shall terminate with a wye, fitting, plug and clean out with removable plug extending six inches above finished grade.
10. The developer is required to submit sewer data sheets and shall acquire a certificate to construct prior to commencement of construction.
11. Any required easements, permits and approvals shall be acquired by the developer prior to commencement of sanitary sewer construction.
12. The sewer main contractor shall comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. He shall erect and maintain, as required by the conditions and progress of the work, all necessary safeguards for safety and protection. He shall also notify "Miss Utility" prior to performing any underground excavation.

CONSTRUCTION NOTES:

1. ALL PIPE MATERIAL SHALL BE PVC SDR 35 TO COUPLING.
2. MAIN TO PVC TRANSITION TO BE MADE WITH APPROVED COUPLING
3. CROWN OF MAIN AND ℄ OF DROP 90° TO MATCH
4. DROP MAY BE ONE SIZE SMALLER THAN MAIN (6" MIN).
5. PLACEMENT OF DROP NOT TO CONFLICT WITH STEPS.
6. BOTTOM 90° BEND TO BE AT 45° TO DOWNSTREAM FLOW

NOTE: THIS SHEET PRESENTS THE MOST COMMON STANDARD SEWER DETAIL ENCOUNTERED FOR DESIGN AND CONSTRUCTION OF SANITARY SEWER. DETAILS OF OTHER LESS COMMON COMPONENTS AND TESTING PROCEDURES OF A SANITARY SEWER SYSTEM CAN BE FOUND IN THE STANDARDS AND SPECIFICATION HANDBOOK FOR SANITARY SEWER SYSTEMS AS PREPARED BY THE JAMES CITY SERVICE AUTHORITY.

NOTE #1:
MANHOLE FRAMES & COVERS SHALL CONFORM TO RICHARDS FOUNDARY DESIGN NO. B-1340, WITH BOTTOM RING, OR EQUAL, IN ROADWAYS & SHOULDERS. USE SAME NO. WITHOUT DUST COVERS IN ALL OTHER AREAS.

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.

NOTE #3:
THE CONTRACTOR SHALL INSTALL SERVICE CONNECTS FROM THE SEWER MAIN TO THE PROPERTY LINE OR EASEMENT LINE. THE END OF THE SERVICE CONNECTION SHALL CONSIST OF WYE, FITTING, PLUG AND CLEANOUT WITH REMOVABLE PLUG AND METAL COVER.

NOTE #4:
MINIMUM SLOPE OF 1/8" PER FOOT FOR SERVICE CONNECTIONS. USE GREATER SLOPE WHERE POSSIBLE.

NOTE #5:
MANHOLE COVERS SHOULD BE 12" ABOVE GRADE IN ALL AREAS EXCEPT IN YARDS & ROAD SHOULDERS, OR PAVED AREAS.

NOTE: THE CONTRACTOR IS TO DISREGARD ALL DETAILS NOT APPLICABLE TO THIS CONTRACT.

No.	DATE	REVISION / COMMENT / NOTE	BY

COMMONWEALTH OF VIRGINIA
PAUL C. SMALL
CERTIFICATE NO. 04267
PROFESSIONAL ENGINEER

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

STANDARD SEWER DETAILS

JAMES CITY COUNTY VIRGINIA

Designed	Drawn
	P.A.N.
Scale NONE	Date APRIL 1989
Project No.	
Drawing No. SD-2b	

SP-060-01

Powhatan Park Phase II Site Plan Amendment to SP-41-97 and SP-62-00

COUNTY OF JAMES CITY
FINAL SITE PLAN

APPROVALS	DATE
File Copy	
Health Dept	
VDOT	
Planning	6/21/01
Environ	DEC/JS 6.15.01
Zoning	6/21/01
JCSA	
County Atty	
PEA	
Other	

March 9, 2001

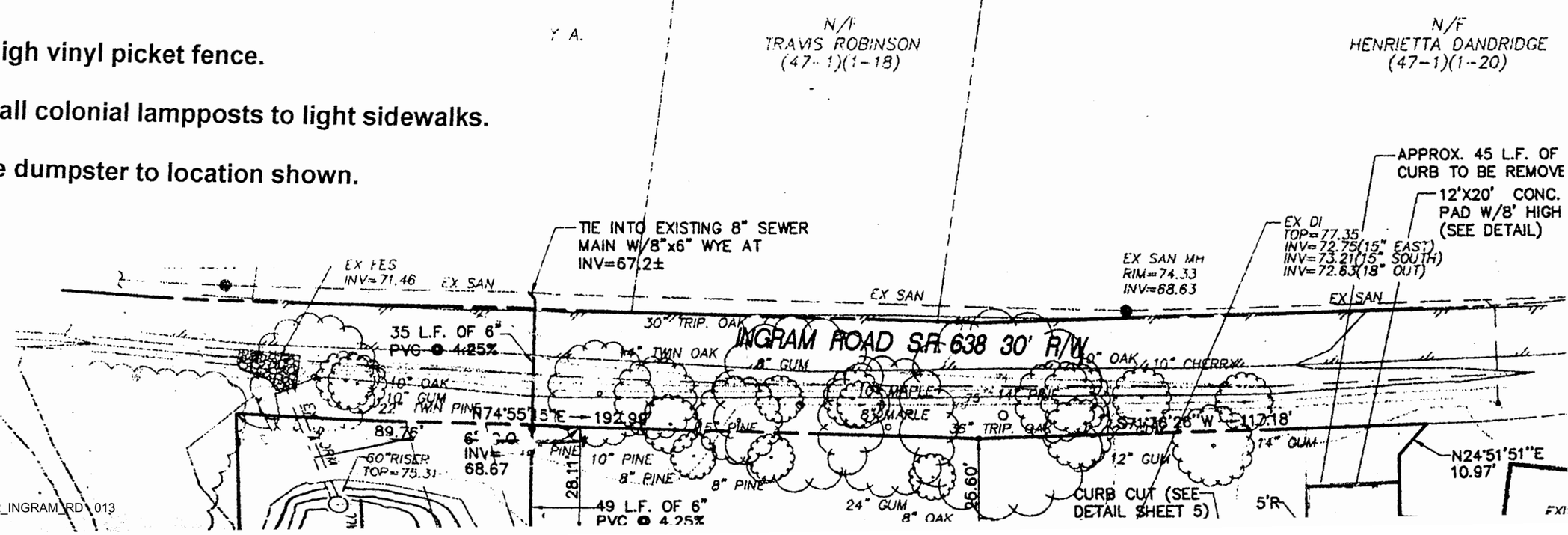
Prepared By: Kenny Spencer, President
Spencer Bros. Builders

Index of Requested Changes

(A) 3' high vinyl picket fence.

(B) 78" tall colonial lampposts to light sidewalks.

(C) Move dumpster to location shown.



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Index of Requested Changes

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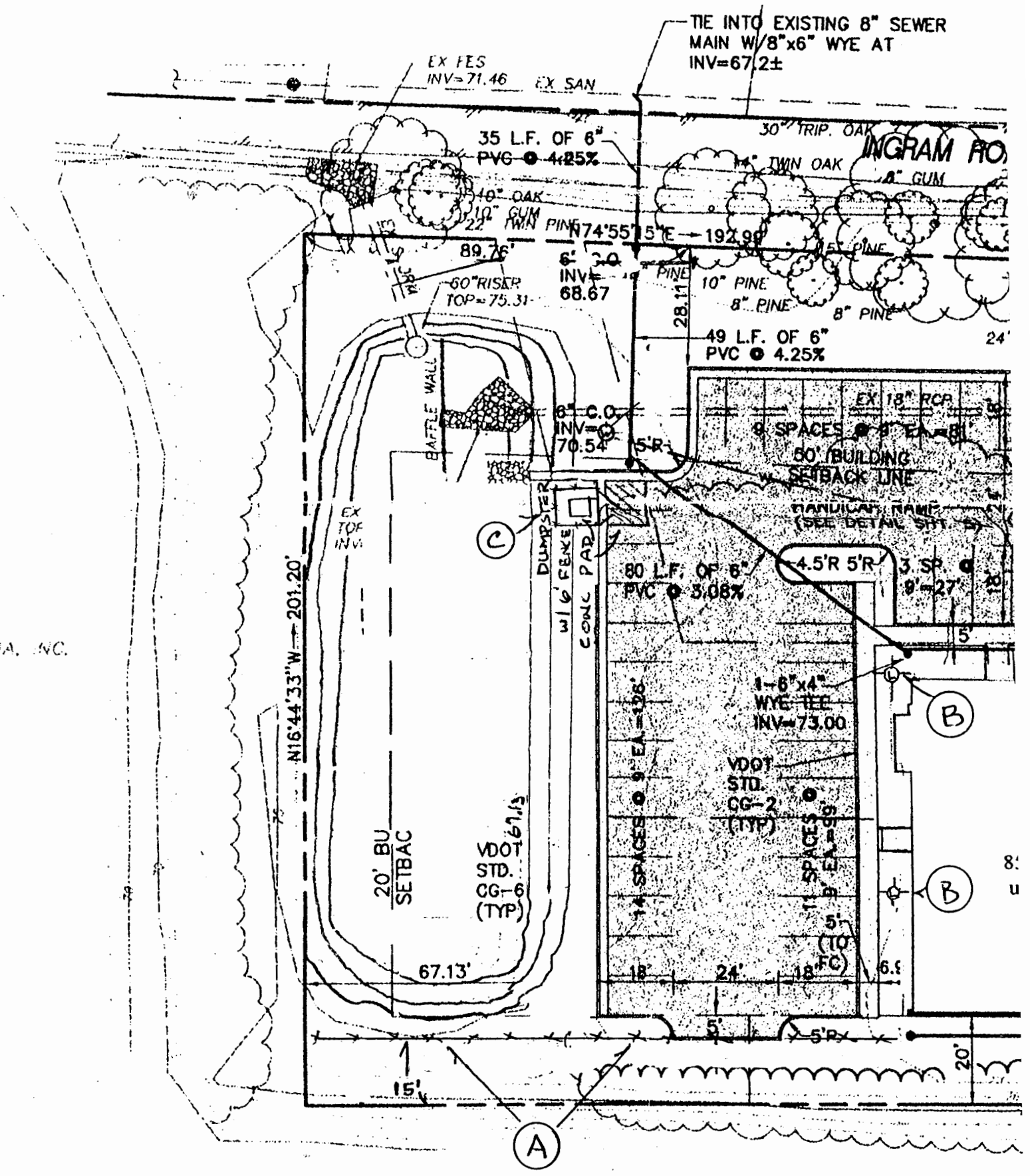


RK PHASE II

LAN

ROTHERS BUILDERS, INC.

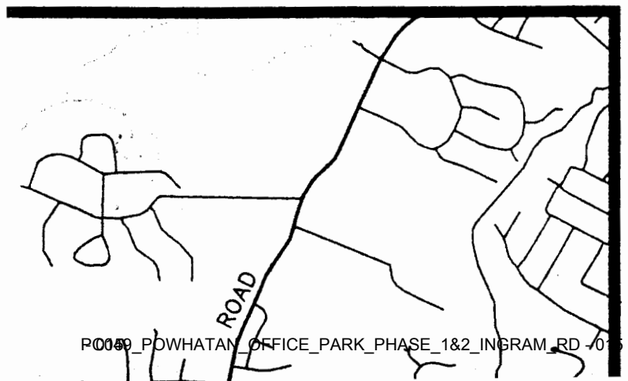
1997

JUN 1997
RECEIVED
PLANNING DEPARTMENT

S-41-97

COUNTY OF JAMES CITY
FINAL SITE PLAN
Received .....

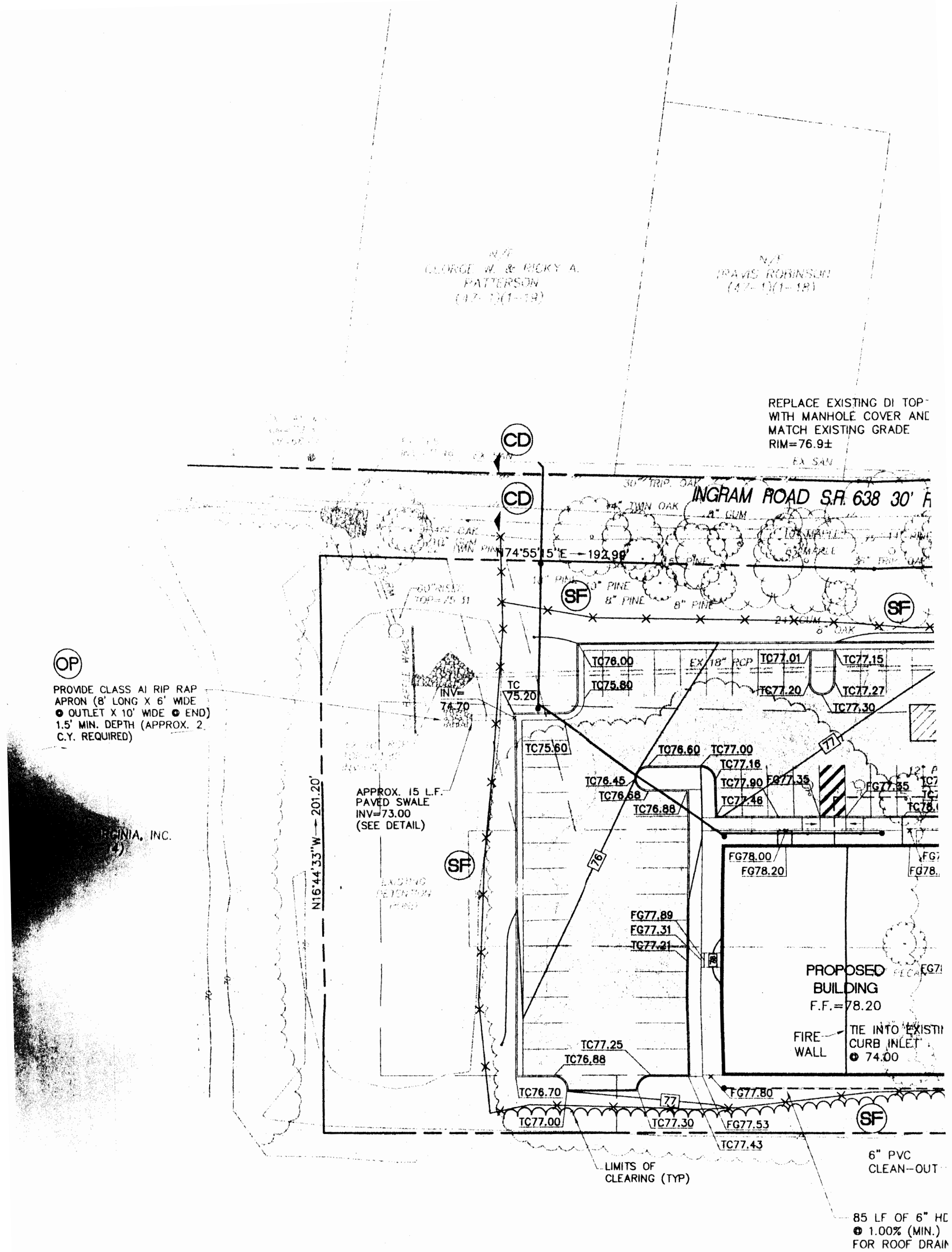
APPROVALS	DATE
Fire Dept. J.D.	4/24/97 GAP
Health Dept.	
Highway Dept.	
Plan. Comm.	2/21/97
Pub. Wks. Dept. DEC	2/18/97 GAP
Zoning Adm.	2/21/97
JCSA JCD	2/17/97 GAP
Other	



P:\0159_POWHATAN_OFFICE_PARK_PHASE_1&2_INGRAM_RD -01

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
	COVER SHEET
1.	SITE AND UTILITY PLAN
2.	DRAINAGE, GRADING & EROSION AND SEDIMENT CONTROL PLAN
3.	LANDSCAPING AND LIGHTING PLAN

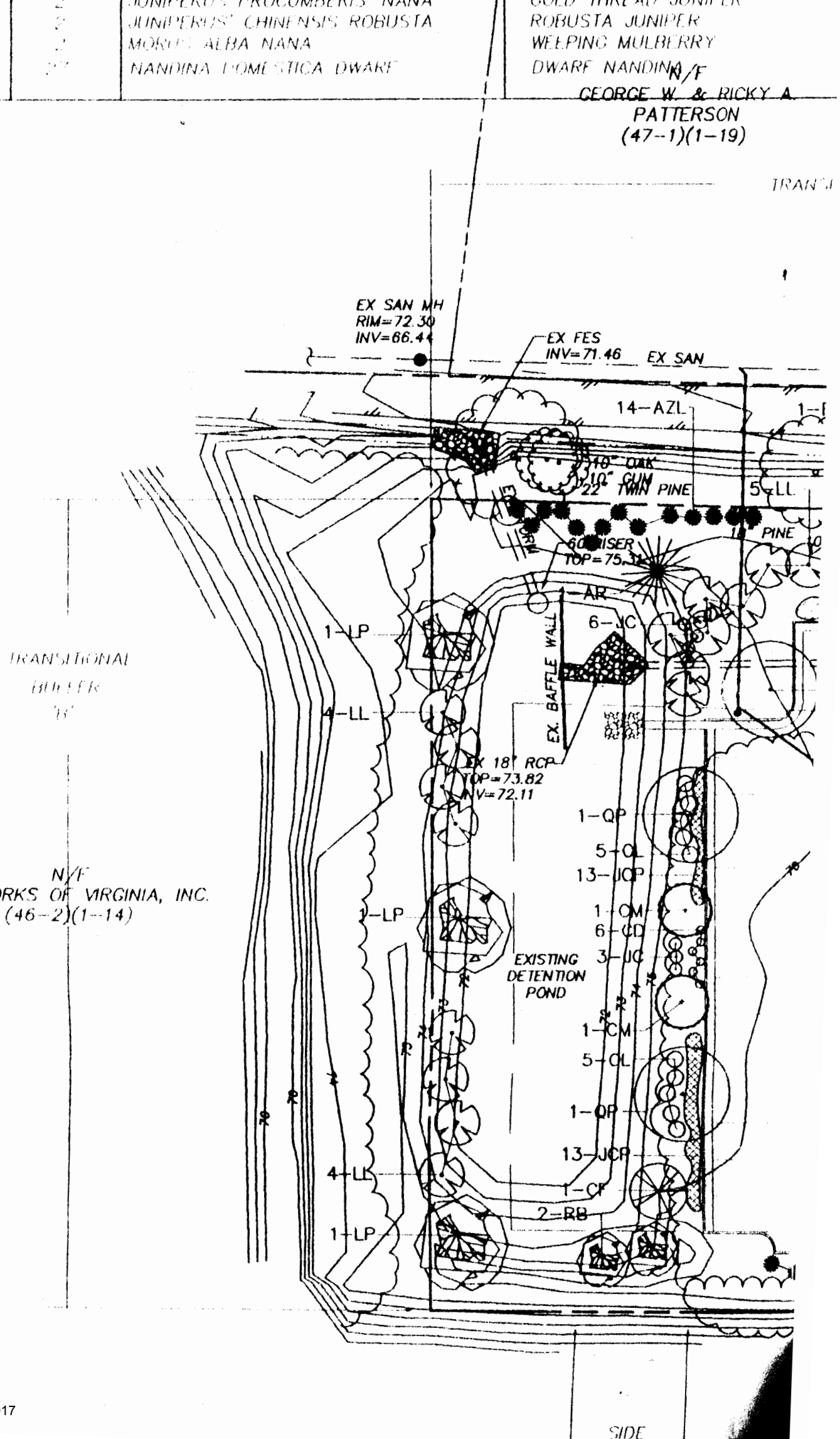


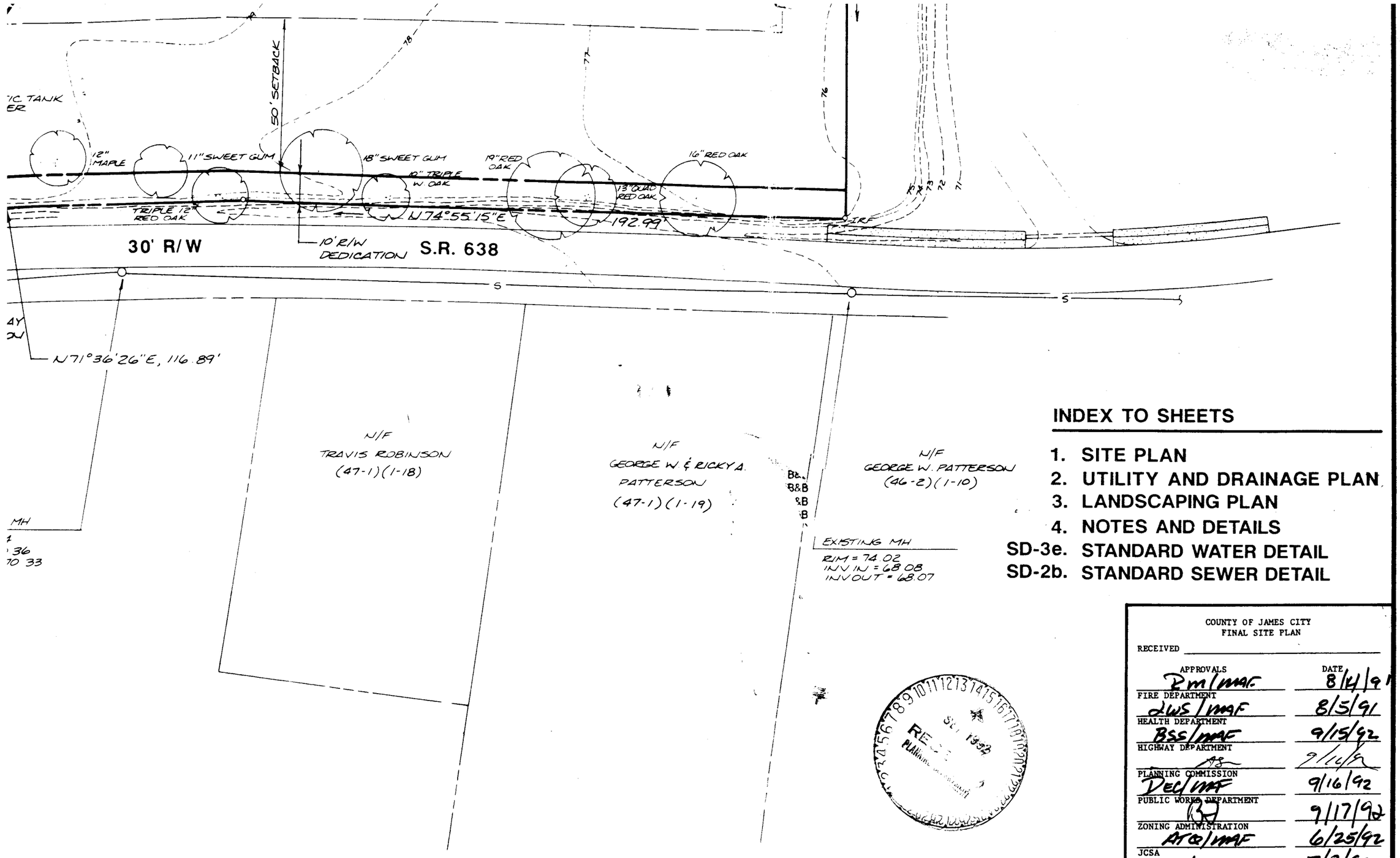
NOTE:

1. ALL DRAINAGE IMPROVEMENTS SHALL BE INSTALLED IN ACCORDANCE WITH CURRENT VDOT STANDARDS AND SPECIFICATIONS.
2. ALL EARTHWORK SHALL BE COMPLETED IN ACCORDANCE WITH CURRENT VDOT STANDARDS AND SPECIFICATIONS.
3. ALL ASPHALT AND CONCRETE PAVEMENT MATERIALS AND CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH CURRENT VDOT STANDARDS AND SPECIFICATIONS.
4. A SOIL STOCKPILE AND EQUIPMENT STAGING AREA WILL BE PROVIDED EITHER IN THE PARKING LOT JUST WEST OF THE PROPOSED BUILDING OR ON THE PROPOSED BUILDING PAD.

PREVIOUS LANDSCAPING ON SITE

SYMBOL	QUANTITY	BOTANICAL NAME	COMMON NAME
QP	2	QUERCUS PHELLOS	WILLOW OAK
LP	2	PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE
AR	5	ACER RUBRUM	RED MAPLE
CM	5	LAGERSTROEMIA INDICA	CREPE MYRTLE
PY	9	PRUNUS X YEDOENSIS	YOSHINO CHERRY
MS	7	MAGNOLIA STELLATA	STAR MAGNOLIA
RB	3	CERCIS CANADENSIS	REDBUD
CF	1	CORNUS FLORIDA	DOGWOOD
CL	1	CUNNINGHAMIA LANCEOLATA	CHINA FIR
LC	6	CUPRESSOCYPARIS LEYLANDII	LEYLAND CYPRESS
AZL	4	AZALEA SPECIES LARGE	LARGE ALAZEAS
JST	4	JUNIPERUS SP 'TOPIARY'	TOPIARY JUNIPER
IGN	17	ILEX GLABRA NANA	DWARF INKBERRY
HS	6	HYDRANGEA SPECIES	HYDRANGEA
PH	3	PHOTINIA FRASERI	RED TIP PHONTINIA
AJ	2	AUCUBA JAPONICA	AUCUBA
BS	9	BUXUS SEMPERVIRENS	BOXWOOD
JS	5	JUNIPERUS SP	JUNIPER
AZD	18	AZALEA SP. DWARF	DWARF AZALEA
BTA	14	BERBERIS THUNBERGII ATROPURPUREA	JAPANESE REDLEAF BARBERRY
ICH	29	ILEX CRENATA HELLERI	HELLER'S HOLLY
JPN	2	JUNIPERUS PROCUMBERIS 'NANA'	GOLD THREAD JUNIPER
JCR	2	JUNIPERUS CHINENSIS ROBUSTA	ROBUSTA JUNIPER
MA	2	MORUS ALBA NANA	WEEPING MULBERRY
ND	27	NANDINA DOMESTICA DWARF	DWARF NANDINA





INDEX TO SHEETS

1. SITE PLAN
2. UTILITY AND DRAINAGE PLAN
3. LANDSCAPING PLAN
4. NOTES AND DETAILS

SD-3e. STANDARD WATER DETAIL
SD-2b. STANDARD SEWER DETAIL

COUNTY OF JAMES CITY
FINAL SITE PLAN

RECEIVED _____

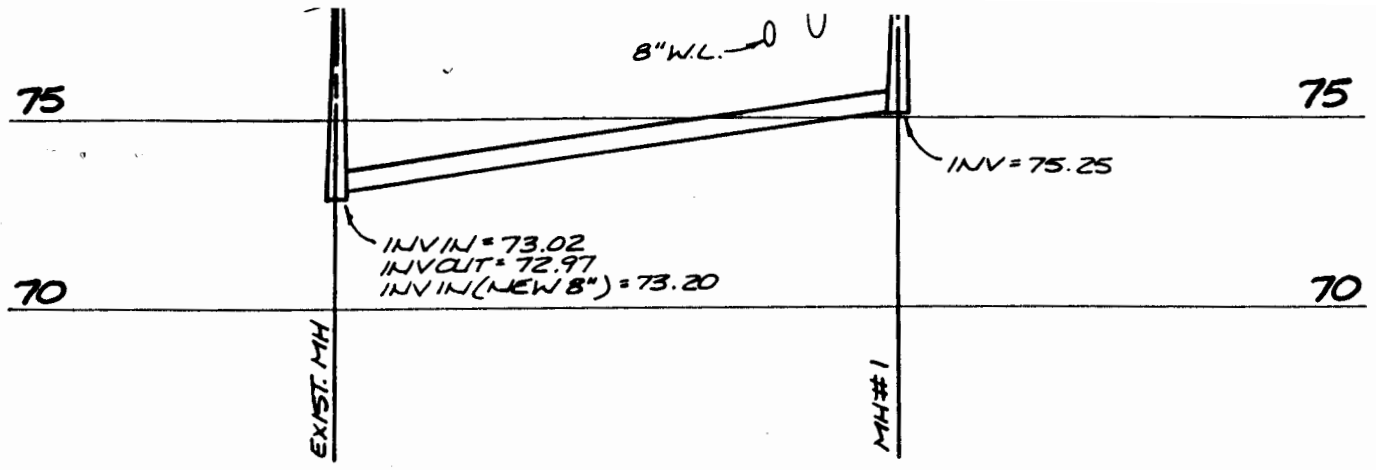
APPROVALS	DATE
Rm/MAF	8/4/91
FIRE DEPARTMENT: DWS/MAF	8/5/91
HEALTH DEPARTMENT: BSS/MAF	9/15/92
HIGHWAY DEPARTMENT: AS	9/16/92
PLANNING COMMISSION: DEC/MAF	9/16/92
PUBLIC WORKS DEPARTMENT: [illegible]	9/17/92
ZONING ADMINISTRATION: AT Q/MAF	6/25/92
JCSA: WB/MAF	7/3/92
OTHER	
OTHER	

SP-73-91
JAMES CITY COUNTY SITE PLAN NUMBER

CONSULTING ENGI

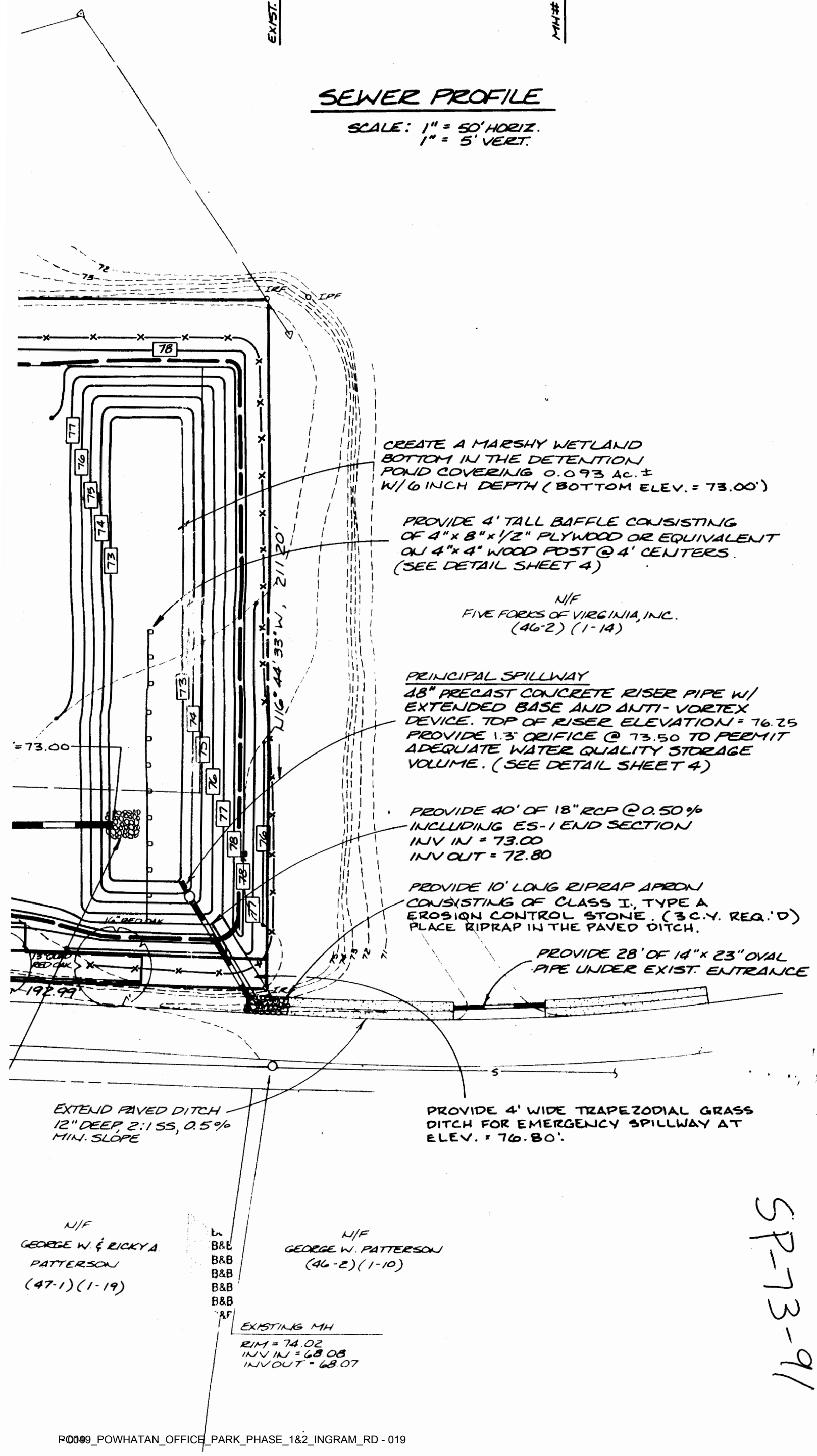
SITE PLAN
POWHATAN OFFICE PARK
OWNER/DEVELOPER: C. LEWIS WALTRIP II, INC.
BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

Designed	Drawn
GAM/HWP	RMJ
Scale 1"=30'	Date AUG.,1991
Project No. 7309	
Drawing No. 1	



SEWER PROFILE

SCALE: 1" = 50' HORIZ.
1" = 5' VERT.



SP-73-91

No.	DATE	REVISION
1	9/9/92	REVISED PER J.

COMMONWEALTH OF VIRGINIA
G. ARCHER MARSTON III
No. 016232
PROFESSIONAL ENGINEER

5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(804) 253-0040
FAX: (804)220-8994
CONSULTING ENGINEERS

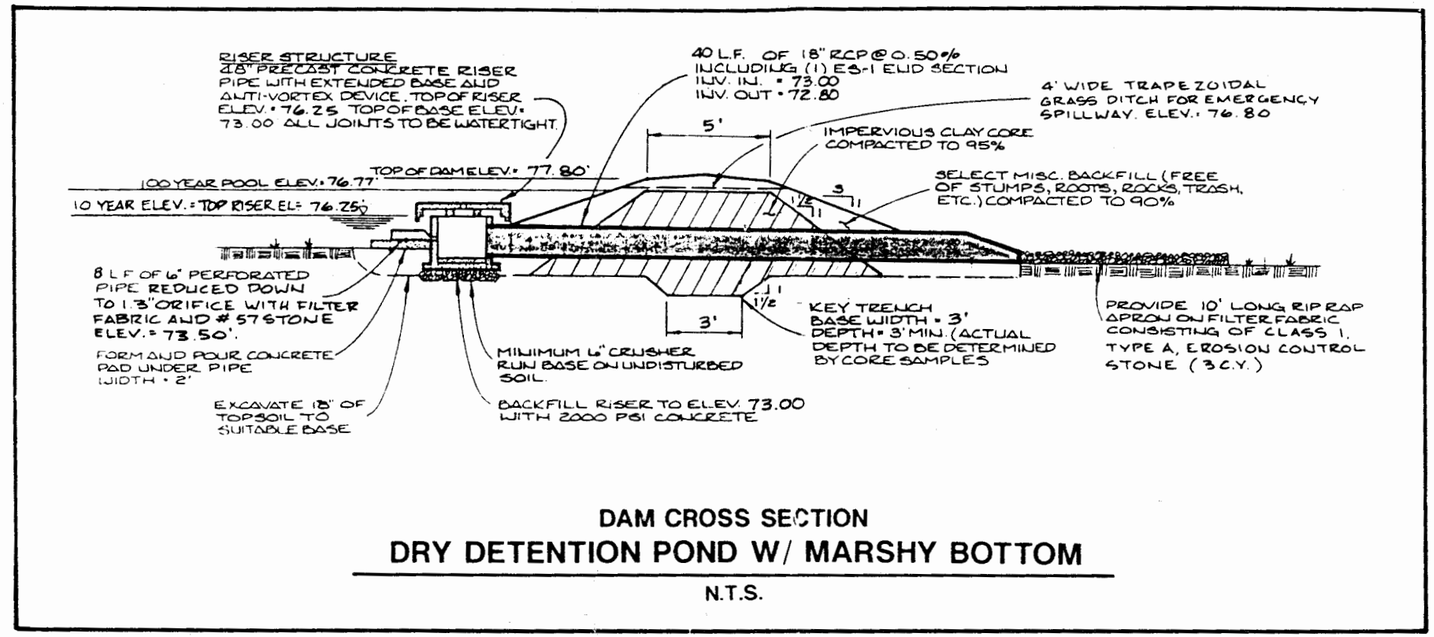
LITY AND DRAINAGE PLAN

POWHATAN OFFICE PARK

R/DEVELOPER: C. LEWIS WALTRIP II, INC.

RICT JAMES CITY COUNTY VIRGINIA

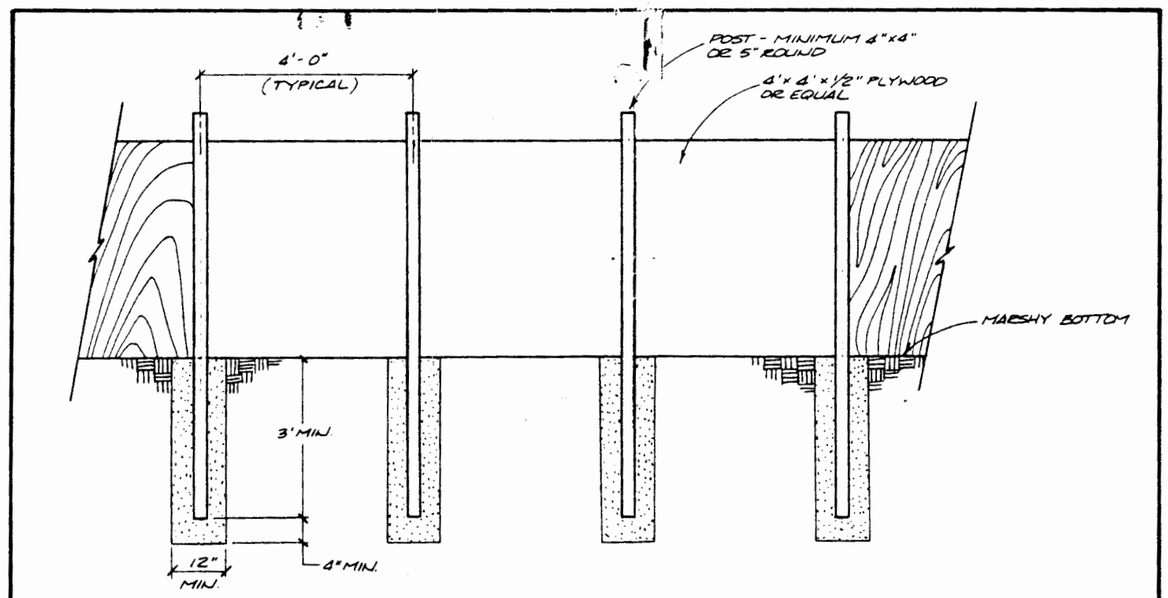
22. All roadways and shoulders shall be stabilized with at least six inches of crusher run aggregate immediately after grading. Crusher run aggregate shall be the material specified in Section 206 of the Virginia Department of Transportation Road and Bridge Specifications.



DAM CROSS SECTION

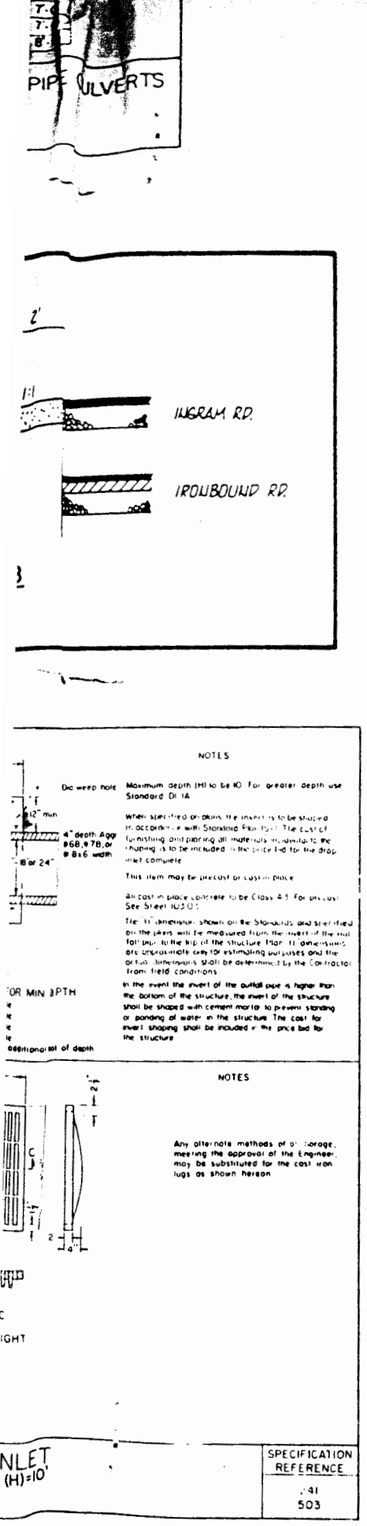
DRY DETENTION POND W/ MARSHY BOTTOM

N.T.S.



BAFFLE SECTION

N.T.S.



NOTES AND DETAILS
POWHATAN

Designe
Scale
Pr
Dr

WORKS PROPERTY
DETENTION BASIN DESIGN
JN 7309

AM
9/5/89 18:00 PM

— DESIGN BASIN TO RELEASE 2yr. PRE-DEV. DISCHARGE AND STORE THE 2yr. POST-DEV. STORM VOLUME.

D.A. TO BASIN = 1.93 Ac

1.93
Tc .42
Tc .25

PRE-DEVELOPMENT RUNOFF RATE

SITE IS 36% PINE WOODS AND 64% OPEN WOODS W/ TWO BUILDINGS AND DRIVES.

$C_{comp} = .36 \times 0.25 + .64 \times 0.30 = 0.28$

.36 x .70 + .64 x .77 = .76

TIME OF CONCENTRATION (tc) = 25 min

C soils
SCS - JTYLROFF.DAT

RAINFALL CONSTANTS $a_2 = 126.3$ $b_2 = 17.3$

Q_2 pre = 1.5
Q_2 post = 3.9
Max dev = 75.9 - ok
Q_{10} pre = 3.1
Q_{10} post = 5.9 cfs
Q_{out} = 4.8
Max dev = 77.0

$$I_2 = \frac{a_2}{b_2 + t_c} = \frac{126.3}{17.3 + 25} = 2.99 \text{ IN/HR.}$$

$$Q_{2\,pre} = 0.28\,(2.99 \text{ IN/HR})\,1.93 = 1.62 \text{ cfs} = q_0 = \text{ALLOWABLE PEAK DISCHARGE}$$

POST-DEVELOPMENT

$C_{comp} = 0.2 \times .25 + 0.9 \times .75 = 0.73$

TIME OF CONCENTRATION (tc) = 14 min OVERLAND + 1 min PIPE FLOW = 15 min

— CRITICAL STORM DURATION = $T_c = \sqrt{2CAa\,(b - t_c/4)} - b$

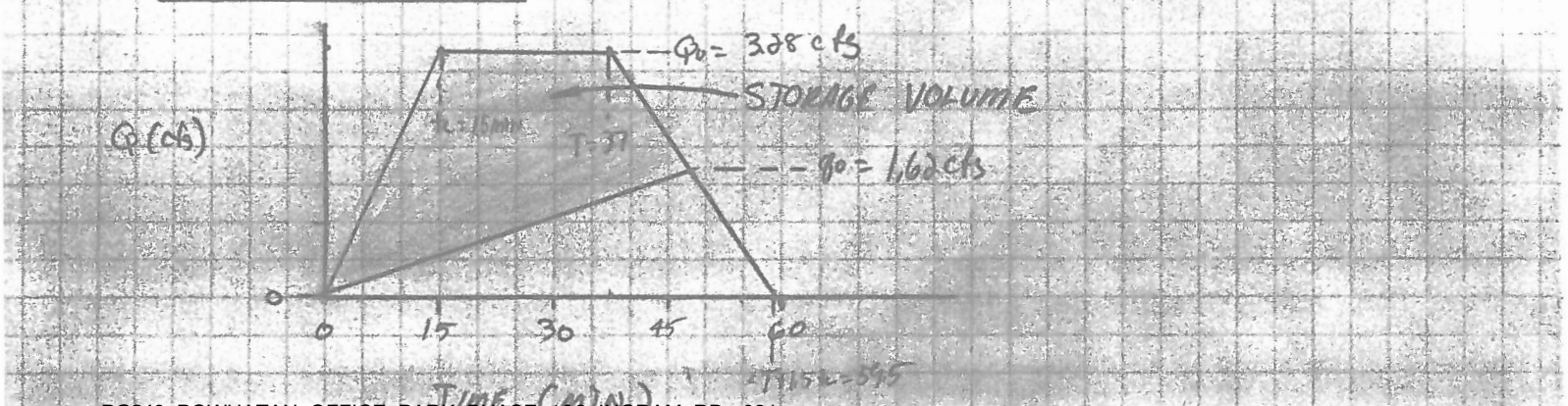
13.55

$$T_c = \sqrt{\frac{2(0.73)(1.93)(126.3)(17.3 - 15/4)}{1.62}} - 17.3 = 37 \text{ min}$$

$$I_{2\,post} = \frac{126.3}{17.3 + 37} = 2.33 \text{ IN/HR}$$

$$Q_{2\,post} = 0.73\,(2.33)\,1.93 = 3.28 \text{ cfs}$$

STORAGE VOLUME



A.M. 9/5/89

STORAGE VOLUME = $\left[\frac{22+55.5}{2} \text{ min} \times 3.28 \text{ cfs} \times 60\right] - \left[\frac{1.62 \times 55.5}{2} \times 60\right]$

$= 8020 - 2892 = 5128$ cf

$= 190$ CY

PROVIDE 60' x 35' x 3' POND (SEE detail)

STORAGE VOLUME PROVIDED = 6300 cf

- SIZE EMERGENCY / SEDIMENT BASIN SPILLWAY TO CARRY 10 yr POST DEVELOPMENT STORM.

$t_c = 15$ MIN $a_{10} = 201.0$ $b_{10} = 23.9$ $C = 0.73$

$I_{10} = \frac{201.0}{23.9 + 15} = 5.17$ IN/HR.

$Q_{10} = 0.73(5.17)\,1.93 = 7.28$ cfs

USE DI-1 TOP ON 4' MANHOLE w/ .5' OF DEPTH ABOVE GRATE => HW = 76.50
Q = 9 cfs

- OUTFLOW BARREL MUST CARRY 10 yr. STORM

H = 3.5' FOR 15" RCP FROM TABLE 1.26 cfs BROSED HANDBOOK
Q = 12 cfs

PRINCIPAL SPILLWAY — INADEQUATE ORIFICE

TRY 6" DIA HOLE IN MANHOLE A =

ORIFICE EQUATION $Q = 0.62(A)\sqrt{2gh}$

$Q = 0.62(.20)\sqrt{2(32.2)\,2.5} = 1.57$ cfs $\leq$ 1.62 cfs ALLOWABLE

close enough

Pow Off Park

1. 1.23 Ac redevelopment — 1.75 ac new dev.

Pre Imp = 16-17% → 0.2 ac

Post Imp = 0.2 + 0.48 → 0.68 = 55%

Pre Load = 0.57 lbs Post = 6.65

20% - Preload = 2.8 " - 62% removal

— BMP - 1.97 ac d.a. — 1.5 ac of new devel + 0.47 ac of redev.

wetland marsh - 1.97 ac d.a. - % Imp = 60

area = .102 provided

- this would be 5" deep @ .102 ac surface area) - 0.044 ac ft

- could be as small as 8.5" deep w/ 0.062 ac surf. area

- would serve 70% imp @ 6" deep

" " 80% imp @ 7" deep

90% imp @ 7.5" deep

" " 100% " @ 8.4" deep

Bldgs - 15×50 + ½(36×36) = 1400 SF

1400 SF @ 65% red ⇒ 4% of redev. - uncontrolled - 0.76 ac

.76 ac - 96% @ .3 ⇒ 0.22 lbs .22

.76 ac × 4% @ 1.6 = 0.05 lbs ⇒ 65% red .02

L Ches Bay - 2.27 lb/ac 0.27 lbs = 10% red = 0.24 .24 lbs

1.97/2.21 = .89 × 9 = 8 Pts

2.21 × ⇒ .44 ac or 19,250 ft² = 2 Pts or 100' × 192'

BMP

$\frac{1.97}{2.98}(9) = 5.95$

11 RODEV. @ 10% → PROVIDING 60% +6

5.95
1.81
7.76 TOTAL STRUCT.

? $\boxed{\frac{.6}{2.98}(9) = 1.81}$

NAT. OPEN SPACE → 0.91 PTS

0.91
8.67 TOTAL

SUBTRACT REM. 0.97 AC → 2.51 AC LEFT

$\frac{1.87}{2.51}(9) = 6.71$ PTS

1.1 REM 10% → PROVIDING 60% +6

6.71
2.15
8.86 PTS STRUC

? $\boxed{\frac{.6}{2.51}(9) = 2.15}$

GRASS FILTER STRIP FOR 0.97 REM. AC PROVIDING 10% REM.

NAT OPEN SPACE → 1.08 PTS.

9.9 PTS

---

11 AT TRENCH (NOT REALLY FEASIBLE)

$\frac{1.97}{2.98}(11) = 7.27$ PTS STRUC.

8.18 PTS

NAT OPEN → 0.91

HWP
5/12/92

POWHATAN OFFICE PARK #7309

EXTENDED DRY DETENTION POND
DESIGN TYPE 4

PHASE I & II D.A = 1.97 Ac

CREATE A MARSHY BOTTOM ADEQUATE TO REMOVE POLLUTANTS.

FIND ANNUAL NUTRIENT LOAD TO THE LOWER STAGE
P = 43.90 RAINFALL DEPTH (IN INCHES) FOR 1 YR
PJ = 0.90 CORRECTION FACTOR FOR P FOR STORMS WITH NO RUNOFF.
FLOW WEIGHTED MEAN CONCENTRATION OF THE POLLUTANT IN URBAN RUNOFF IN mg/L. CN: NITROGEN, CP: PHOSPHORUS.

CN = 2.00 mg/L
CP = 0.26 mg/L

$N = [(P)(PJ)(R_v)/12](CN)(A)2.72$

$R_v = 0.05 + .009(\%\ IMP.)$
$= 0.05 + .009(60\%)$
$= 0.05 + 0.54 = \underline{0.59}$

$N = [(43.9)(0.9)(0.59)/12](2.00)(1.97)(2.72)$
$= 20.82$ lbs/YEAR

$P = [(P)(PJ)(R_v)/12](CP)(A)2.72$
$= [(43.9)(0.9)(0.59)/12](0.26)(1.97)(2.72)$
2.71 lbs/YEAR

RECOMMENDED LIMITS $N = 225$ lbs/Ac/YR
$P = 45$ lbs/Ac/YR

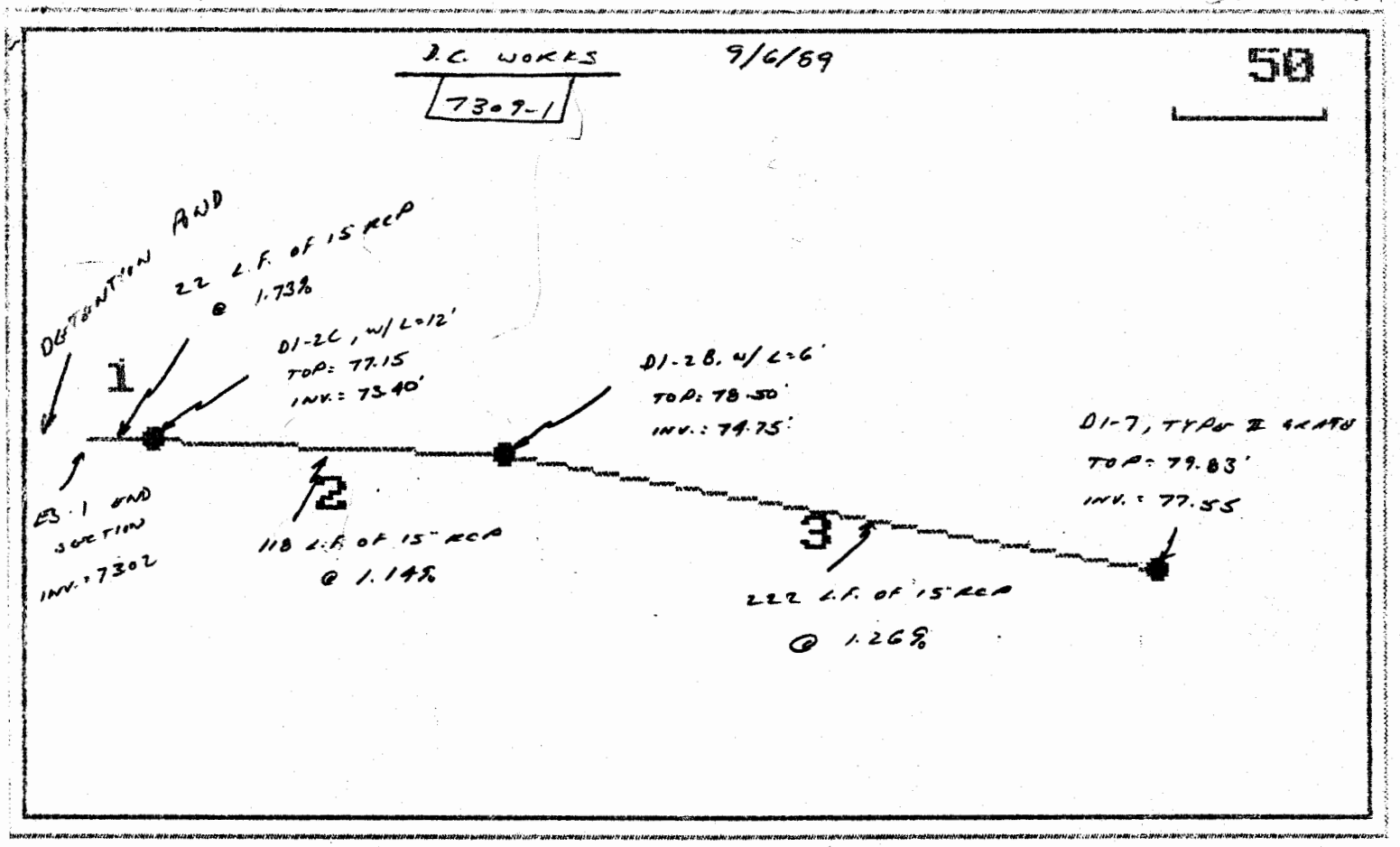
$N \Rightarrow \frac{(20.82)}{x} = 225$ $x = 0.0925$ Ac

$P \Rightarrow \frac{(2.71)}{x} = 45$ $x = 0.0602$ Ac

USE $\underline{0.0925\ Ac}$

WE SIZED OUR LOWER STAGE AT 0.1019 Ac
THEREFORE, ANNUAL LOADING PER WETLAND ACRE IS:
$N \Rightarrow (20.82\ lbs/YEAR)/(.1019\ Ac) = 204.3\ lbs/Acre/YR < 225\ lbs/Acre/YR$ ✓
$P \Rightarrow (2.71\ lbs/YEAR)/(.1019\ Ac) = 26.6\ lbs/Ac/YR < 45\ lbs/Ac/YR$ ✓

SP-104-89



[← ↑ → ↓] Move [Spc] #'s [Home] Reset

[PgUp] Enlarge [PgDn] Reduce [Esc] Exit

HYDRAULIC ANALYSIS

Run date: 09-06-1989
File: 7309-1

Return Period = 10 Yrs
Rainfall file: Your County

222

LINE 1 / Q = 7.0 / HT = 15 / WID = 15 / N = .013 / L = 22 / JLC = 1.1

..... / Outfall

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	74.11	13.03	73.02	6.16	74.70	10.13	2.33	1.13
UPSTRM	74.49	13.06	73.40	6.15	75.08	10.08	2.5	1.13

Drainage area (ac)	= .61	Slope of invert (%)	= 1.727
Runoff coefficient	= .73	Slope energy grade line (%)	= 1.729
Time of conc (min)	= 12	Critical depth (in)	= 13.03
Inlet time (min)	= 5	Req'd length curb inlet (ft)	= 2.3
Intensity (in/hr)	= 5.62	Req'd grate area (sf)	= 0.7
Cumulative C*A	= 1.2	Depth at inlet opening (in)	= 6
Flow contrib (cfs)	= 2.5	Confluence angle (deg)	= 0
Default Q (cfs)	= 0	Natural ground elev (ft)	= 77.15
Line capac. (cfs)	= 8.5	Line storage (cuft)	= 25

LINE 2 / Q = 4.6 / HT = 15 / WID = 15 / N = .013 / L = 118 / JLC = 1.2

..... / DNLN = 1

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	75.13	15.00	73.40	3.72	75.35	0.00	2.5	1.23
UPSTRM	75.67	10.99	74.75	4.73	76.01	13.28	2.5	0.96

Drainage area (ac)	= .65	Slope of invert (%)	= 1.144
Runoff coefficient	= .73	Slope energy grade line (%)	= 0.564
Time of conc (min)	= 11	Critical depth (in)	= 10.62
Inlet time (min)	= 5	Req'd length curb inlet (ft)	= 2.5
Intensity (in/hr)	= 5.73	Req'd grate area (sf)	= 0.7
Cumulative C*A	= 0.8	Depth at inlet opening (in)	= 6
Flow contrib (cfs)	= 2.7	Confluence angle (deg)	= 3
Default Q (cfs)	= 0	Natural ground elev (ft)	= 78.5
Line capac. (cfs)	= 4.9	Line storage (cuft)	= 129

LINE 3 / Q = 1.9 / HT = 15 / WID = 15 / N = .013 / L = 222 / JLC = .9

..... / DNLN = 2

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	76.08	15.00	74.75	1.56	76.12	0.00	2.5	1.23
UPSTRM	78.30	7.01	77.55	3.41	78.48	14.97	1.02	0.56

Drainage area (ac)	= .44	Slope of invert (%)	= 1.261
Runoff coefficient	= .73	Slope energy grade line (%)	= 0.988
Time of conc (min)	= 10	Critical depth (in)	= 6.97
Inlet time (min)	= 10	Req'd length curb inlet (ft)	= 0.0
Intensity (in/hr)	= 5.96	Req'd grate area (sf)	= 0.0
Cumulative C*A	= 0.3	Depth at inlet opening (in)	= 0
Flow contrib (cfs)	= 1.9	Confluence angle (deg)	= 8
Default Q (cfs)	= 0	Natural ground elev (ft)	= 79.83
Line capac. (cfs)	= 7.3	Line storage (cuft)	= 199

HWA

POWHATAN OFFICE PARK #7309 5/12/92

EXTENDED DRY DETENTION POND

DESIGN TYPE 4

PRE-DEVELOPMENT

DRAINAGE AREA: 1.35 Ac ±

SOIL GROUP C - WOODED CN: 78

POST-DEVELOPMENT

DRAINAGE AREA: 1.97 Ac ±

SOIL GROUP C - WOODED 50% CN: 78 CN: 85
DEV. 50% CN: 92

SEE HYDROLOGIC REPORT FOR POND INFORMATION

WATER QUALITY IS OBTAINED BY STORING FIRST FLUSH VOLUME.

FIRST FLUSH VOLUME $= (1 in)(R_v)(D.A)$

$$= \frac{(1/12)(0.59)(1.97 Ac)(43,560 ft^3/Ac)}{12 in/ft} = 4219 ft^3$$

THIS STORAGE OCCURS AT ELEVATION 74.43

SIZE ORIFICE TO CARRY 2 YR PRE-DEV. FLOW

Q_2: 2.88 CFS

$Q = CA\sqrt{2gh}$ $h = 76.95 - 74.43 = 2.52$ FT

$g = 32.2$ FT/SEC^2

$C = 0.60$

$2.88 = (0.60)(A)\sqrt{2(32.2)(2.52)}$

$A = 0.3768$ FT^2 $= \frac{\pi d^2}{4}$ $d = 0.6926$ FT $= 8.31$ IN.

USE 8" ORIFICE

HWP
5/12/92

POWHATAN OFFICE PARK #7309

EXTENDED DRY DETENTION POND
DESIGN TYPE 4

PHASE I & II D.A = 1.97 ac

CREATE A MARSHY BOTTOM ADEQUATE TO REMOVE POLLUTANTS.

FIND ANNUAL NUTRIENT LOAD TO THE LOWER STAGE
P = 43.90 RAINFALL DEPTH (IN INCHES) FOR 1 YR
PJ = 0.90 CORRECTION FACTOR FOR P FOR STORMS WITH NO RUNOFF.
FLOW WEIGHTED MEAN CONCENTRATION OF THE POLLUTANT IN URBAN RUNOFF IN mg/L. CN: NITROGEN, CP: PHOSPHORUS.

CN = 2.00 mg/L
CP = 0.26 mg/L

$N = [(P)(PJ)(R_v)/12](CN)(A)\,2.72$

$R_v = 0.05 + .009\,(\%\ IMP)$
$= 0.05 + .009\,(60\%)$
$= 0.05 + 0.54 = \underline{0.59}$

$N = [(43.9)(0.9)(0.59)/12](2.00)(1.97)(2.72)$
$= 20.82$ lbs/YEAR

$P = [(P)(PJ)(R_v)/12](CP)(A)\,2.72$
$= [(43.9)(0.9)(0.59)/12](0.26)(1.97)(2.72)$
2.71 lbs/YEAR

RECOMMENDED LIMITS N = 225 lbs/ac/yr
P = 45 lbs/ac/yr

$N \Rightarrow \frac{(20.82)}{x} = 225$ x = 0.0925 AC

$P \Rightarrow \frac{(2.71)}{x} = 45$ x = 0.0602 ac

USE 0.0925 ac.

WE SIZED OUR LOWER STAGE AT 0.1019 ac
THEREFORE, ANNUAL LOADING PER WETLAND ACRE IS:
N ⇒ (20.82 lbs/YEAR) / (.1019 ac) = 204.3 lbs/acre/yr < 225 lbs/acre/yr ✓
P ⇒ (2.71 lbs/YEAR) / (.1019 ac) = 26.6 lbs/ac/yr < 45 lbs/ac/yr ✓

HWP

POWHATAN OFFICE PARK #7309 5/12/92

EXTENDED DRY DETENTION POND

DESIGN TYPE 4

PRE-DEVELOPMENT

DRAINAGE AREA: 1.35 Ac ±

SOIL GROUP C - WOODED CN: 78

POST-DEVELOPMENT

DRAINAGE AREA: 1.97 Ac

SOIL GROUP C - WOODED 50% CN: 78 CN: 85
DEV. 50% CN: 92

SEE HYDROLOGIC REPORT FOR POND INFORMATION.

WATER QUALITY IS OBTAINED BY STORING FIRST FLUSH VOLUME.

FIRST FLUSH VOLUME $= (1 IN)(R_v)(D.A.)$

$$= \frac{(1 IN)(0.59)(1.97 Ac)(43,560 FT^2/Ac)}{12 IN/FT} = 4219 FT^3$$ ✓ OK

THIS STORAGE OCCURS AT ELEVATION 74.43'

SIZE ORIFICE TO CARRY 2 YR PRE-DEV. FLOW

$Q_2 = 2.88 CFS$

$Q = CA\sqrt{2gh}$ $h = 76.95 - 74.43 = 2.52 FT$

$g = 32.2 FT/SEC^2$

$C = 0.60$

$2.88 = (0.60)(A)\sqrt{2(32.2)(2.52)}$

$A = 0.3768 FT^2 = \frac{\pi d^2}{4}$ $d = 0.6926 FT = 8.31 IN.$

USE 8" ORIFICE

HWP
6/3/92

POWHATAN OFFICE PARK #7309

SITE = 2.98 Ac ±

REDEVELOPED AREA = 1.23 Ac ± → NEEDS 10% REDUCTION IN POLLUTANTS.
NEW DEVELOPMENT = 1.75 Ac ± → NEEDS 10 PTS.

1.50 Ac OF NEW DEVELOPMENT DRAINS TO 9 PT POND
0.47 Ac OF REDEVELOPED AREA DRAINS TO 9 PT POND.

9 PT POND = 60% REMOVAL RATE

D.A. = 1.97 Ac: REQUIRES 4219 FT^3 STORAGE FOR FIRST FLUSH (WATERSHED)
D.A. = 1.50 Ac: REQUIRES 3213 FT^3 STORAGE FOR FIRST FLUSH (NEW DEV. ONLY)
D.A. = 0.47 Ac ± @ 10% REQUIRES 201 FT^3 STORAGE FOR FIRST FLUSH (RED. TO POND)
REDEVELOPED AREA INCREASES VOLUME BY 605 FT^3 ≈ 19.08% MORE VOLUME

BMP: $\left(\frac{1.50}{2.98}\right) 9 = 4.53$ PTS NEW DEVELOPMENT

$\left(\frac{0.47}{2.98}\right) 19.08 = 3.08$ PTS (1.42) $\left(\frac{0.76}{2.98}\right) 10 = 2.55$ PTS REDEVELOPED AREA

TOTAL: 4.53 + 3.01 + 2.55 = 10.09 PTS

10% REDUCTION FOR REDEVELOPED AREA OF 1.23 Ac:

PRE-DEV.

SEDIMENT
1.23 Ac @ 16% IMP. = 0.15 TONS/Ac/YR
(1.23)(0.15) = 0.18 TONS/Ac/YR

PHOSPHOROUS
1.23 Ac @ 16% IMP = 0.95 LBS/Ac/YR
(1.23)(0.95) = 1.17 LBS/Ac/YR

POST-DEV. DIVERT 0.47 Ac TO POND

SEDIMENT
0.76 Ac @ 16% IMP = 0.15 TONS/Ac/YR
(0.76)(0.15) = 0.11 TONS/Ac/YR
$\left(\frac{0.18 - 0.11}{0.18}\right)$ = 38.90% REDUCTION - GOOD ✓

PHOSPHOROUS
0.76 Ac @ 16% IMP = 0.95 LBS/Ac/YR
(0.76)(.95) = 0.72 LBS/Ac/YR
$\left(\frac{1.17 - 0.72}{1.17}\right)$ = 38.46% REDUCTION - GOOD ✓

$\boxed{\left(\frac{0.76}{2.98}\right) 10 = 2.55}$

KOD. 0.47 Ac @ 10%

TOTAL 1.97 Ac. → 4219

NEW DEV. 1.50 Ac → 3213

POND

DIFF = 1006 FT^3 → 60% TO 10%

1/6 (1006) = 168 FT^3

1.50 Ac + 0.47 Ac KOD DEV. = 3213 + 168 = 3381 FT^3

$\left(\frac{4219 - 3381}{4219}\right)$ = 19.86 %

OR 25% KOD. → $\frac{(1/2\ IN)(0.59)(0.47)(43,560)}{12}$ = 503 FT^3

$\frac{10\%}{25\%} = \frac{x}{503}$ x = 201 FT^3

3213 + 201 = 3414 FT^3

$\left(\frac{4219 - 3414}{4219}\right)$ = 19.08 % — USE THIS

OR

10% WATER QUALITY INLET

400 FT^3 PER IMP. AC (WQT)

(0.47) (400) = 188 FT^3

ok

HYDRAULIC REPORT FOR

POWHATAN OFFICE PARK

Job No. 7309

SYSTEM 1 (SS#1-SS#4)

DRY POND #1

prepared by

AES,a professional corp.
5248 Olde Towne Rd.Suite 1
Williamsburg, VA. 23188
Revised Date: 08/31/92

Run date: 09-13-1992
File: A:7309-1.ST3

Return Period = 10 Yrs
Rainfall file: JAMES CITY CO.....

LINE 1 / Q = 5.9 / HT = 18 / WID = 18 / N = .013 / L = 180 / JLC = 1.2

..... / Outfall

10 YR EL = 76.25

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	74.99	18.00	73.00	3.35	75.17	0.00	2.09	1.77
UPSTRM	75.53	13.50	74.40	4.16	75.79	15.58	3.09	1.42

Drainage area (ac)	= .26	Slope of invert (%)	= 0.778
Runoff coefficient	= .75	Slope energy grade line (%)	= 0.349
Time of conc (min)	= 6	Critical depth (in)	= 11.91
Inlet time (min)	= 5	Req'd length curb inlet (ft)	= 1.2
Intensity (in/hr)	= 6.74	Req'd grate area (sf)	= 0.3
Cumulative C*A	= 0.9	Depth at inlet opening (in)	= 6
Flow contrib (cfs)	= 1.3	Confluence angle (deg)	= 0
Default Q (cfs)	= 0	Natural ground elev (ft)	= 79
Line capac. (cfs)	= 9.3	Line storage (cuft)	= 287

LINE 2 / Q = 3.5 / HT = 15 / WID = 15 / N = .013 / L = 124 / JLC = 1.1

..... / DNLN = 1

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	75.85	14.37	74.65	2.91	75.98	5.72	3.09	1.21
UPSTRM	76.16	12.95	75.08	3.13	76.31	10.30	2.66	1.13

Drainage area (ac)	= .25	Slope of invert (%)	= 0.347
Runoff coefficient	= .75	Slope energy grade line (%)	= 0.268
Time of conc (min)	= 6	Critical depth (in)	= 9.57
Inlet time (min)	= 5	Req'd length curb inlet (ft)	= 1.2
Intensity (in/hr)	= 6.92	Req'd grate area (sf)	= 0.3
Cumulative C*A	= 0.5	Depth at inlet opening (in)	= 6
Flow contrib (cfs)	= 1.2	Confluence angle (deg)	= 12
Default Q (cfs)	= 0	Natural ground elev (ft)	= 79
Line capac. (cfs)	= 3.8	Line storage (cuft)	= 145

LINE 3 / Q = 2.3 / HT = 15 / WID = 15 / N = .013 / L = 108 / JLC = 1

..... / DNLN = 2

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	76.33	14.97	75.08	1.86	76.38	1.37	2.66	1.23
UPSTRM	76.79	7.76	75.95	3.57	76.99	14.99	2.75	0.64

Drainage area (ac)	= .43	Slope of invert (%)	= 0.806
Runoff coefficient	= .75	Slope energy grade line (%)	= 0.566
Time of conc (min)	= 5	Critical depth (in)	= 7.72
Inlet time (min)	= 5	Req'd length curb inlet (ft)	= 2.1
Intensity (in/hr)	= 7.09	Req'd grate area (sf)	= 0.6
Cumulative C*A	= 0.3	Depth at inlet opening (in)	= 6
Flow contrib (cfs)	= 2.2	Confluence angle (deg)	= 0
Default Q (cfs)	= 0	Natural ground elev (ft)	= 79.95
Line capac. (cfs)	= 5.8	Line storage (cuft)	= 101

LINE 4 / Q = 1.2 / HT = 15 / WID = 15 / N = .013 / L = 140 / JLC = .9

..... / DNLN = 1

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	75.85	14.37	74.65	1.01	75.86	5.72	3.09	1.21
UPSTRM	75.92	9.75	75.08	1.45	75.95	14.31	2.66	0.84

Drainage area (ac)	= .23	Slope of invert (%)	= 0.307
Runoff coefficient	= .75	Slope energy grade line (%)	= 0.044
Time of conc (min)	= 5	Critical depth (in)	= 5.49
Inlet time (min)	= 5	Req'd length curb inlet (ft)	= 0.0
Intensity (in/hr)	= 7.09	Req'd grate area (sf)	= 0.0
Cumulative C*A	= 0.2	Depth at inlet opening (in)	= 0
Flow contrib (cfs)	= 1.2	Confluence angle (deg)	= 88
Default Q (cfs)	= 0	Natural ground elev (ft)	= 79
Line capac. (cfs)	= 3.6	Line storage (cuft)	= 144

HYDRAULIC REPORT FOR

POWHATAN OFFICE PARK

Job No. 7309

SYSTEM 1 (HGL=10 YR ELEV)

DRY POND #1

prepared by

AES CONSULTING ENGINEERS

5248 Olde Towne Rd.Suite 1

Williamsburg, VA. 23188

Revised Date: 08/31/92

Run date: 09-13-1992
File: A:7309-2.ST3

Return Period = 10 Yrs
Rainfall file: JAMES CITY CO.....

LINE 1 / Q = 5.9 / HT = 18 / WID = 18 / N = .013 / L = 180 / JLC = 1.2

..... / Outfall

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	76.43	18.00	73.00	3.35	76.60	0.00	2.09	1.77
UPSTRM	77.00	18.00	74.40	3.35	77.18	0.00	3.09	1.77

Drainage area (ac)	= .26	Slope of invert (%)	= 0.778
Runoff coefficient	= .75	Slope energy grade line (%)	= 0.318
Time of conc (min)	= 6	Critical depth (in)	= 11.91
Inlet time (min)	= 5	Req'd length curb inlet (ft)	= 1.2
Intensity (in/hr)	= 6.74	Req'd grate area (sf)	= 0.3
Cumulative C*A	= 0.9	Depth at inlet opening (in)	= 6
Flow contrib (cfs)	= 1.3	Confluence angle (deg)	= 0
Default Q (cfs)	= 0	Natural ground elev (ft)	= 79
Line capac. (cfs)	= 9.3	Line storage (cuft)	= 318

LINE 2 / Q = 3.5 / HT = 15 / WID = 15 / N = .013 / L = 124 / JLC = 1.1

..... / DNLN = 1

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	77.21	15.00	74.65	2.88	77.34	0.00	3.09	1.23
UPSTRM	77.58	15.00	75.08	2.88	77.71	0.00	2.66	1.23

Drainage area (ac)	= .25	Slope of invert (%)	= 0.347
Runoff coefficient	= .75	Slope energy grade line (%)	= 0.299
Time of conc (min)	= 6	Critical depth (in)	= 9.57
Inlet time (min)	= 5	Req'd length curb inlet (ft)	= 1.2
Intensity (in/hr)	= 6.92	Req'd grate area (sf)	= 0.3
Cumulative C*A	= 0.5	Depth at inlet opening (in)	= 6
Flow contrib (cfs)	= 1.2	Confluence angle (deg)	= 12
Default Q (cfs)	= 0	Natural ground elev (ft)	= 79
Line capac. (cfs)	= 3.8	Line storage (cuft)	= 152

LINE 3 / Q = 2.3 / HT = 15 / WID = 15 / N = .013 / L = 108 / JLC = 1

..... / DNLN = 2

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	77.72	15.00	75.08	1.86	77.78	0.00	2.66	1.23
UPSTRM	77.91	15.00	75.95	1.86	77.97	0.00	2.75	1.23

Drainage area (ac) =	.43	Slope of invert (%)	= 0.806
Runoff coefficient =	.75	Slope energy grade line (%)	= 0.175
Time of conc (min) =	5	Critical depth (in)	= 7.72
Inlet time (min) =	5	Req'd length curb inlet (ft)	= 2.1
Intensity (in/hr) =	7.09	Req'd grate area (sf)	= 0.6
Cumulative C*A =	0.3	Depth at inlet opening (in)	= 6
Flow contrib (cfs) =	2.2	Confluence angle (deg)	= 0
Default Q (cfs) =	0	Natural ground elev (ft)	= 79.95
Line capac. (cfs) =	5.8	Line storage (cuft)	= 133

LINE 4 / Q = 1.2 / HT = 15 / WID = 15 / N = .013 / L = 140 / JLC = .9

..... / DNLN = 1

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	77.21	15.00	74.65	1.00	77.23	0.00	3.09	1.23
UPSTRM	77.27	15.00	75.08	1.00	77.29	0.00	2.66	1.23

Drainage area (ac) =	.23	Slope of invert (%)	= 0.307
Runoff coefficient =	.75	Slope energy grade line (%)	= 0.036
Time of conc (min) =	5	Critical depth (in)	= 5.49
Inlet time (min) =	5	Req'd length curb inlet (ft)	= 0.0
Intensity (in/hr) =	7.09	Req'd grate area (sf)	= 0.0
Cumulative C*A =	0.2	Depth at inlet opening (in)	= 0
Flow contrib (cfs) =	1.2	Confluence angle (deg)	= 88
Default Q (cfs) =	0	Natural ground elev (ft)	= 79
Line capac. (cfs) =	3.6	Line storage (cuft)	= 172

DARRYL COOK

HYDROLOGIC REPORT FOR

POWHATAN OFFICE PARK

Job No. 7309

DRY DETENTION POND

DESIGN TYPE 4

prepared by:

AES CONSULTING ENGINEERS

5248 Olde Towne Rd,Suite 1

Williamsburg, VA. 23188

REVISED: 8/31/92

HWP
5/12/92

POWHATAN OFFICE PARK #7309

EXTENDED DRY DETENTION POND
DESIGN TYPE 4

PHASE I & II D.A = 1.97 Ac

CREATE A MARSHY BOTTOM ADEQUATE TO REMOVE POLLUTANTS.

FIND ANNUAL NUTRIENT LOAD TO THE LOWER STAGE
P = 43.90 RAINFALL DEPTH (IN INCHES) FOR 1 YR
PJ = 0.90 CORRECTION FACTOR FOR P FOR STORMS WITH NO RUNOFF.
FLOW WEIGHTED MEAN CONCENTRATION OF THE POLLUTANT IN URBAN RUNOFF IN mg/L. CN: NITROGEN, CP: PHOSPHORUS.

CN = 2.00 mg/L
CP = 0.26 mg/L

$N = [(P)(PJ)(R_v)/12](CN)(A)\,2.72$

$R_v = 0.05 + .009\,(\%\ IMP.)$
$= 0.05 + .009\,(60\%)$
$= 0.05 + 0.54 = \underline{0.59}$

$N = [(43.9)(0.9)(0.59)/12](2.00)(1.97)(2.72)$
$= 20.82$ lbs/YEAR

$P = [(P)(PJ)(R_v)/12](CP)(A)\,2.72$
$= [(43.9)(0.9)(0.59)/12](0.26)(1.97)(2.72)$
2.71 lbs/YEAR

RECOMMENDED LIMITS $N = 225$ lbs/ac/yr
$P = 45$ lbs/ac/yr

$N \Rightarrow \frac{(20.82)}{x} = 225$ $x = 0.0925$ AC

$P \Rightarrow \frac{(2.71)}{x} = 45$ $x = 0.0602$ ac

USE $\underline{0.0925\ ac}$. ✓

WE SIZED OUR LOWER STAGE AT 0.093 ac!
THEREFORE, ANNUAL LOADING PER WETLAND ACRE IS:
$N \Rightarrow (20.82$ lbs/YEAR$)/(.093$ ac$) = 223.8$ lbs/acre/yr < 225 lbs/acre/yr ✓
$P \Rightarrow (2.71$ lbs/YEAR$)/(.093$ ac$) = 29.1$ lbs/ac/yr < 45 lbs/ac/yr —

TO STORE MEAN STORM (0.45")

$\frac{(0.45)(0.59)(1.97)(43.560)}{12} = \underline{1899\ FT^3} \approx 5.5"$ OF MARSHLAND ✓

SET ORIFICE @ 73.50' (6" DEPTH FOR MARSH) ✓

HWP
5/12/92

POWHATAN OFFICE PARK #7309

EXTENDED DRY DETENTION POND
DESIGN TYPE 4

PRE-DEVELOPMENT

DRAINAGE AREA: 1.35 Ac ±

SOIL GROUP C - WOODED CN: 78

POST-DEVELOPMENT

DRAINAGE AREA: 1.97 Ac ±

SOIL GROUP C - WOODED 50% CN: 78 CN: 85
DEV. 50% CN: 92

SEE HYDROLOGIC REPORT FOR POND INFORMATION.

WATER QUALITY IS OBTAINED BY STORING FIRST FLUSH VOLUME.

$$\text{FIRST FLUSH VOLUME} = (1\,in)(R_v)(D.A)$$

$$= \frac{(1\,in)(0.59)(1.97\,Ac)(43{,}560\,ft^2/Ac)}{12\,in/ft} = \underline{4219\,ft^3}$$

THIS STORAGE OCCURS AT ELEVATION 74.43 → RISER @ 74.50 ✓

SIZE ORIFICE TO RELEASE REMAINDER OF WATER QUALITY VOLUME (1" STORM) THAT WILL BE RELEASED IN 24 HOURS.

TO RELEASE IN 24 HOURS

$$\frac{4219\,ft^3}{(24\,hrs)(60\,min/hr)(60\,sec/min)} = \underline{0.0488\,cfs}$$

SIZE ORIFICE

$$q = 0.6\,a\sqrt{2gh} \qquad h = 74.50 - 73.50 = 1.00\,ft.$$
$$g = 32.2\,ft/sec^2$$

$$0.0488 = 0.6\,a\sqrt{2(32.2)(1.00)}$$
$$0.0488 = 4.815\,a$$
$$a = 0.0101 = \frac{\pi d^2}{4} \qquad d = 0.1136\,ft = 1.36\,in.$$

✓

USE 1.30" ORIFICE

HYDROLOGIC REPORT

PRE-DEVELOPMENT.....
2 YR. STORM.....
POW. OFFICE PARK.....

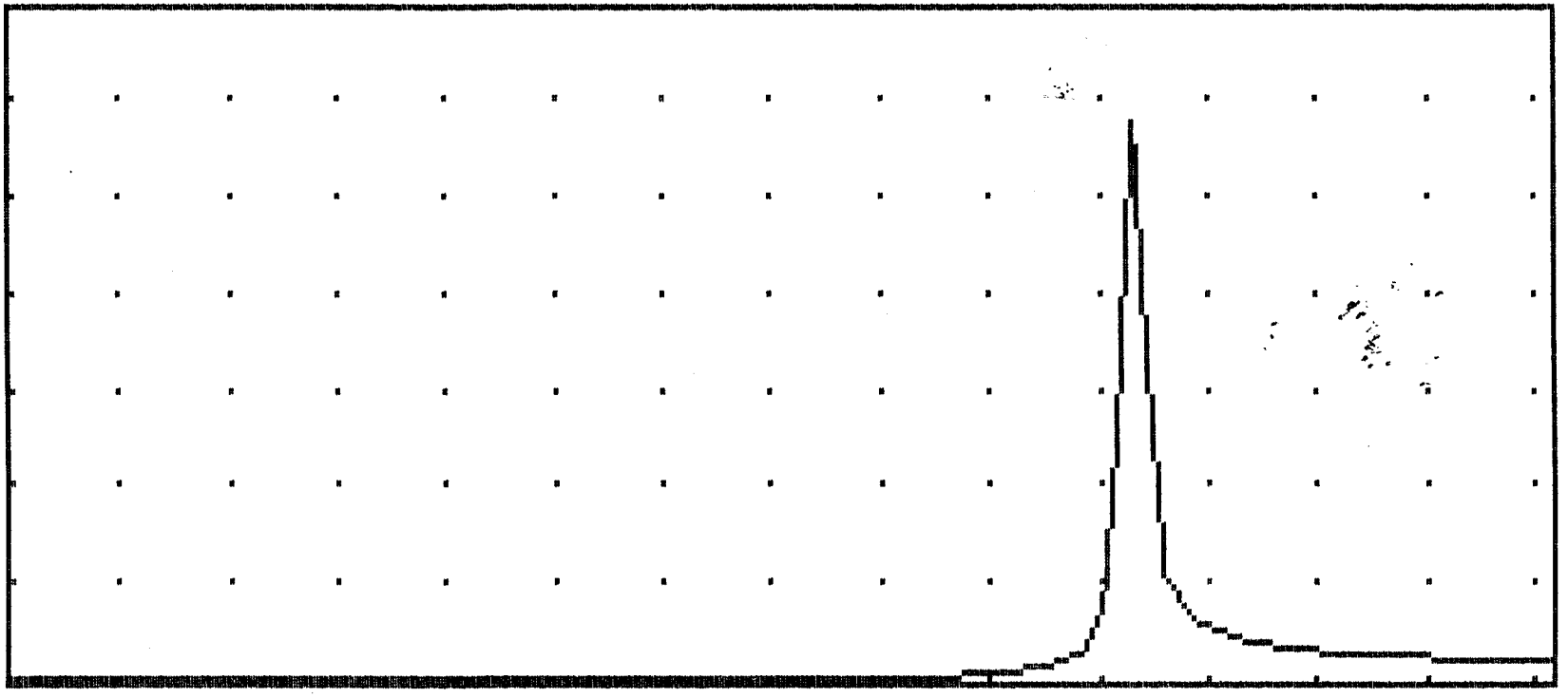
Hyd. No. 1

Hydrograph type	= S.C.S. RUNOFF	Peak discharge	= 2.88 cfs
Storm frequency	= 2 yr	Time interval	= 10 min
Basin area	= 1.35 ac	Basin curve No.	= 78
Ave basin slope	= 1.25 %	Hydraulic len	= 400 ft
Basin lag	= 8.7 min	Time of concen	= 14.55 min
Total precip.	= 3.50 in	Distribution	= S.C.S. II

HYDROGRAPH DISCHARGE TABLE

TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfS)	
11.50	0.13	11.67	0.38	11.83	1.32	12.00	2.88
12.17	1.56	12.33	0.54	12.50	0.41	12.67	0.32

Qp = 2.9 S.C.S. RUNOFF To = 0



HGU = 70 min 1 VGU = 0.5 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Menu

[F5] S dn [F6] S up [F7] Enl [F8] Red

HYDROLOGIC REPORT

POST-DEVELOPMENT.....
10 YR. STORM.....
PHASE I.....

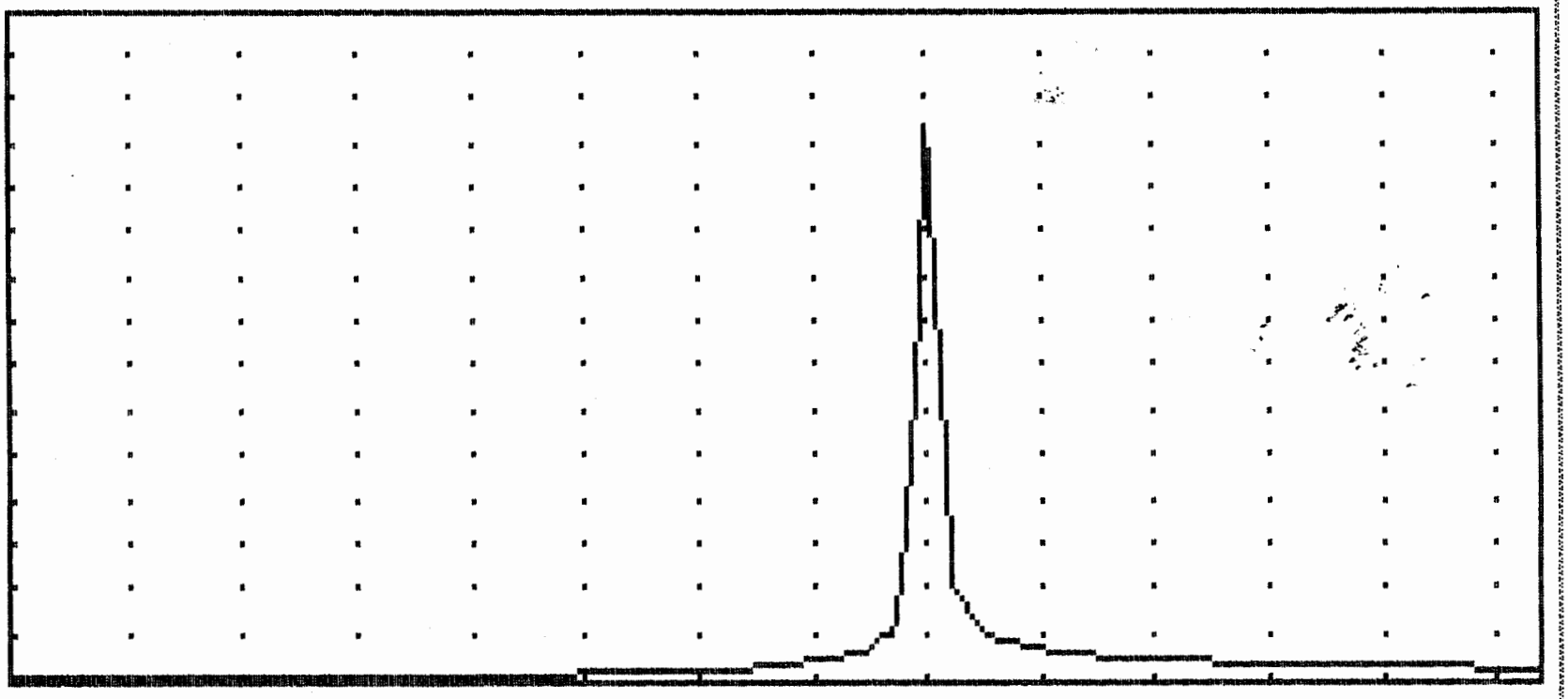
Hyd. No. 2

Hydrograph type	= S.C.S. RUNOFF	Peak discharge	= 6.16 cfs
Storm frequency	= 10 yr	Time interval	= 10 min
Basin area	= 1.1 ac	Basin curve No.	= 85
Ave basin slope	= .5 %	Hydraulic len	= 300 ft
Basin lag	= 8.7 min	Time of concen	= 14.57 min
Total precip.	= 5.70 in	Distribution	= S.C.S. II

HYDROGRAPH DISCHARGE TABLE

TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfS)	
11.50	0.48	11.67	1.23	11.83	3.45	12.00	6.16
12.17	3.12	12.33	1.00	12.50	0.76	12.67	0.58

Qp = 6.2 S.C.S. RUNOFF To = 0



HGU = 90 min 2 VGU = 0.5 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Menu

[F5] S dn [F6] S up [F7] Enl [F8] Red

HYDROLOGIC REPORT

POST-DEVELOPMENT.....
10 YR. STORM.....
FUTURE PHASE II.....

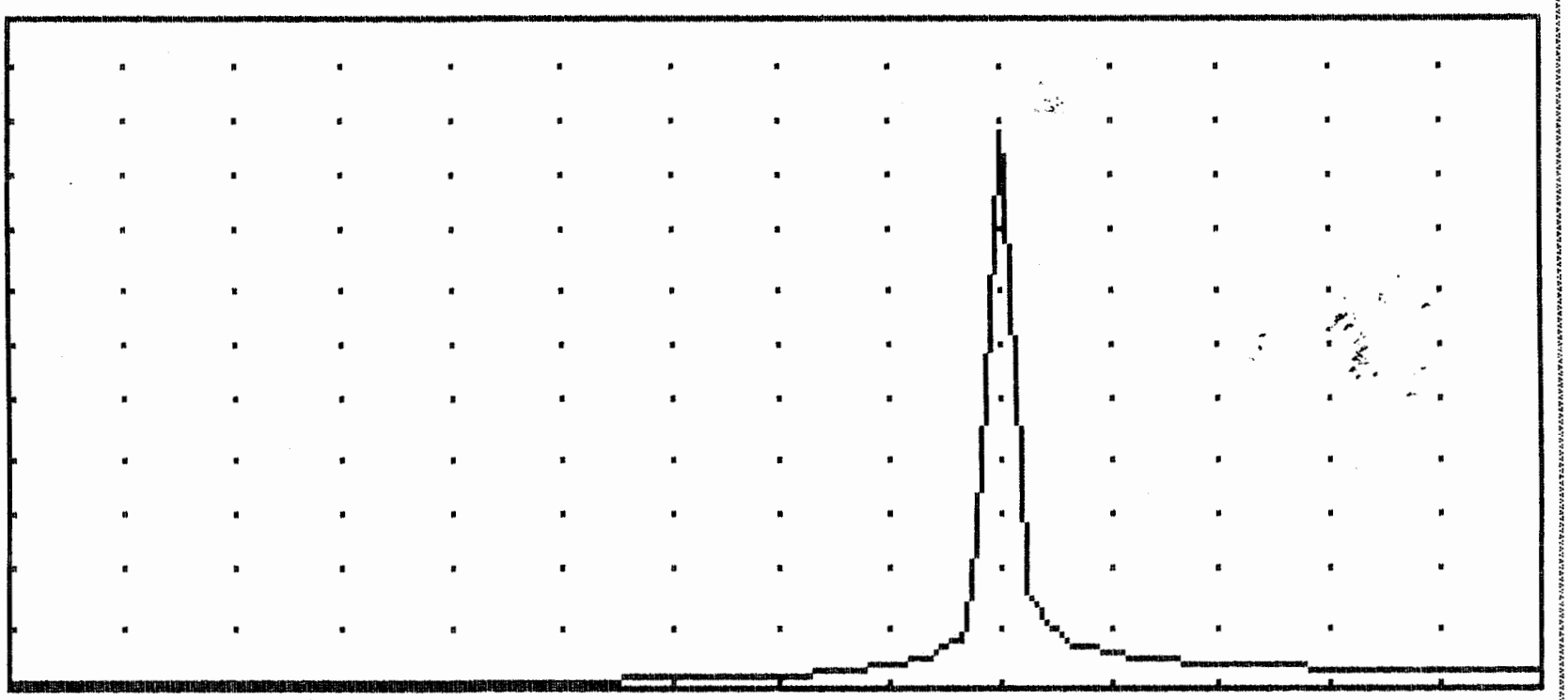
Hyd. No. 3

Hydrograph type	= S.C.S. RUNOFF	Peak discharge	= 4.88 cfs
Storm frequency	= 10 yr	Time interval	= 10 min
Basin area	= .87 ac	Basin curve No.	= 85
Ave basin slope	= 2.2 %	Hydraulic len	= 220 ft
Basin lag	= 3.2 min	Time of concen	= 5.42 min
Total precip.	= 5.70 in	Distribution	= S.C.S. II

HYDROGRAPH DISCHARGE TABLE

TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfS)	
11.50	0.38	11.67	0.97	11.83	2.73	12.00	4.88
12.17	2.47	12.33	0.79	12.50	0.60	12.67	0.46

Qp = 4.9 S.C.S. RUNOFF To = 0



HGU = 80 min 3 VGU = 0.5 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Menu

[F5] S dn [F6] S up [F7] Enl [F8] Red

HYDROLOGIC REPORT

POST-DEVELOPMENT.....
10 YR. STORM.....
PHASES I & II.....

Hyd. No. 4

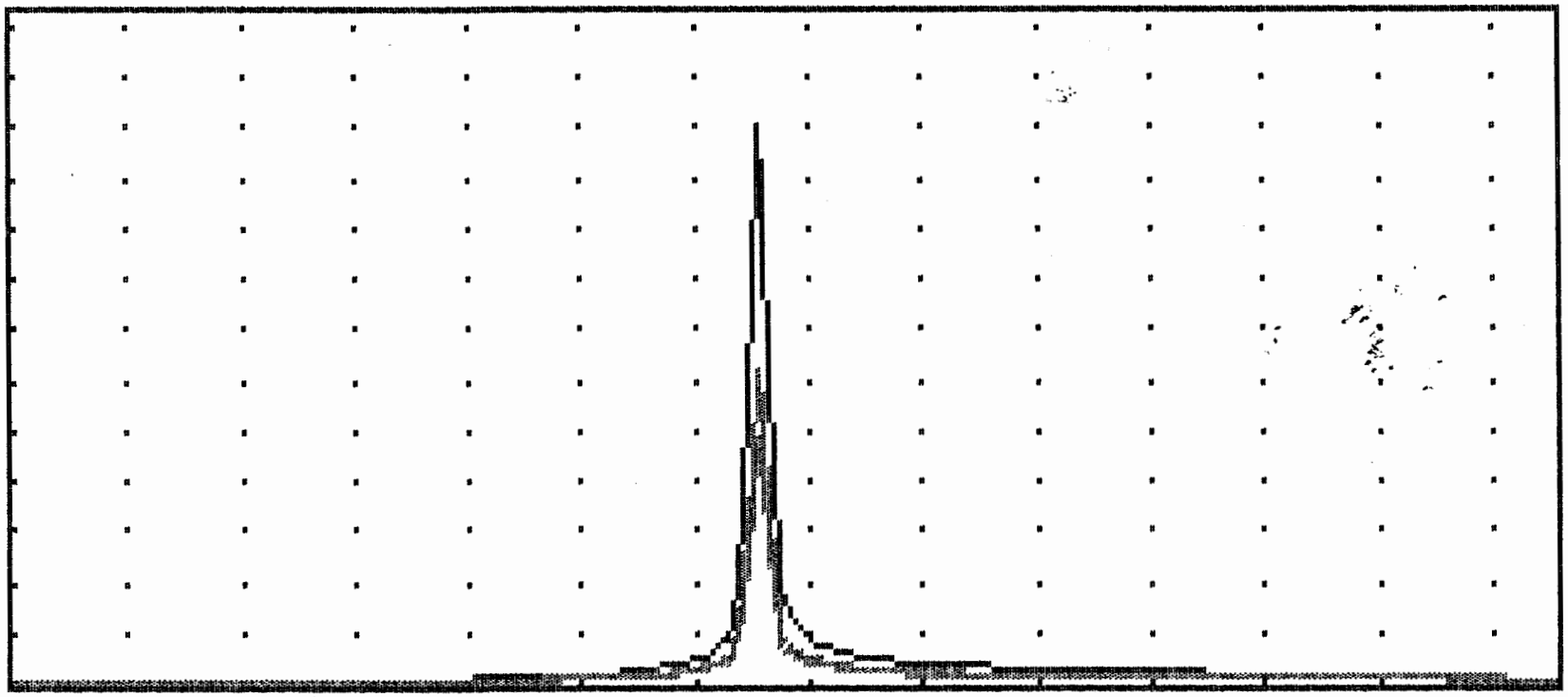
Hydrograph type = COMBINED
Storm frequency = 10 yr
Inflow hyd no's = 2 & 3

Peak discharge = 11.04 cfs
Time interval = 10 min

HYDROGRAPH DISCHARGE TABLE

TIME hrs	INFLOW cfs	HYDROGRAPHS cfs	OUTFLOW HYDROGRAPH cfs
11.67	1.23	0.97	2.20
11.83	3.45	2.73	6.18
12.00	6.16	4.88	11.04
12.17	3.12	2.47	5.59
12.33	1.00	0.79	1.78
12.50	0.76	0.60	1.36
12.67	0.58	0.46	1.04

Qp = 11.0 COMBINED To = 0



HGU = 110 min 4 VGU = 1.0 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Menu

[F5] S dn [F6] S up [F7] Enl [F8] Red

HYDROLOGIC REPORT

10 YR. STORM.....
THRU STRUCTURE.....
POST-DEV.....

Hyd. No. 5

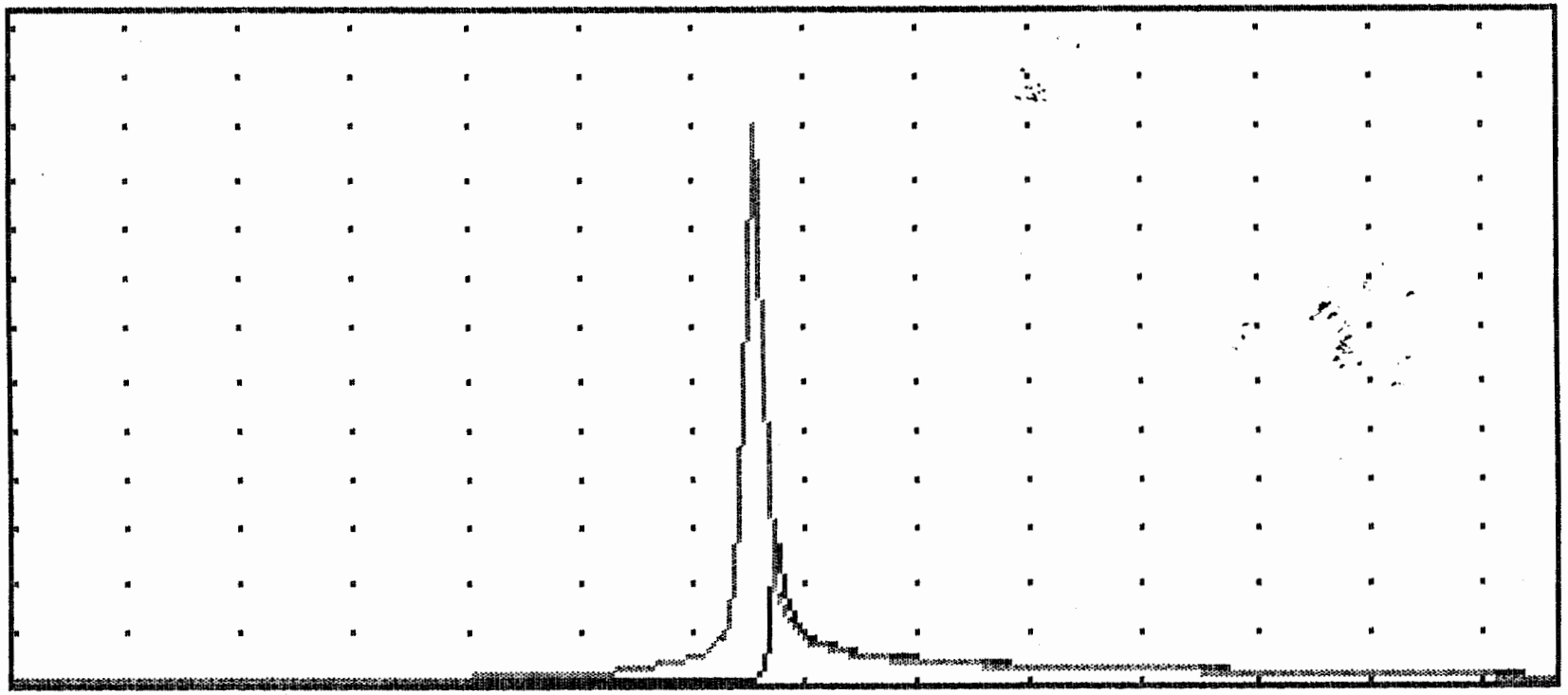
Hydrograph type = RESERVOIR ROUTE Peak discharge = 2.88 cfs
Storm frequency = 10 yr Time interval = 10 min
Inflow hyd. no. = 4 Reservoir no. = 1

HYDROGRAPH DISCHARGE TABLE

TIME hrs	INFLOW (i) cfs	INFLOW (j) cfs	2S/dt-O (i) cfs	2S/dt+O (j) cfs	OUTFLOW cfs
11.67	2.20	6.18	15.37	15.42	0.03
11.83	6.18	11.04	23.68	23.75	0.03
12.00	11.04	5.59	40.82	40.90	0.04
12.17	5.59	1.78	56.90	57.44	0.27
12.33	1.78	1.36	58.52	64.27	2.88
12.50	1.36	1.04	58.32	61.66	1.67
12.67	1.04	0.89	58.17	60.71	1.27
12.83	0.89	0.79	58.07	60.09	1.01

Maximum outflow (cfs) = 2.88 - vs 2.15 cfs
Maximum storage (cu ft) = 18418
Maximum elevation (ft) = 76.43 - vs 76.4

Qp = 2.9 RESERVOIR ROUTE To = 0



HGU = 110 min 5 VGU = 1.0 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Menu

[F5] S dn [F6] S up [F7] Enl [F8] Red

HYDROLOGIC REPORT

POST-DEVELOPMENT.....
100 YR. STORM.....
PHASE I .....

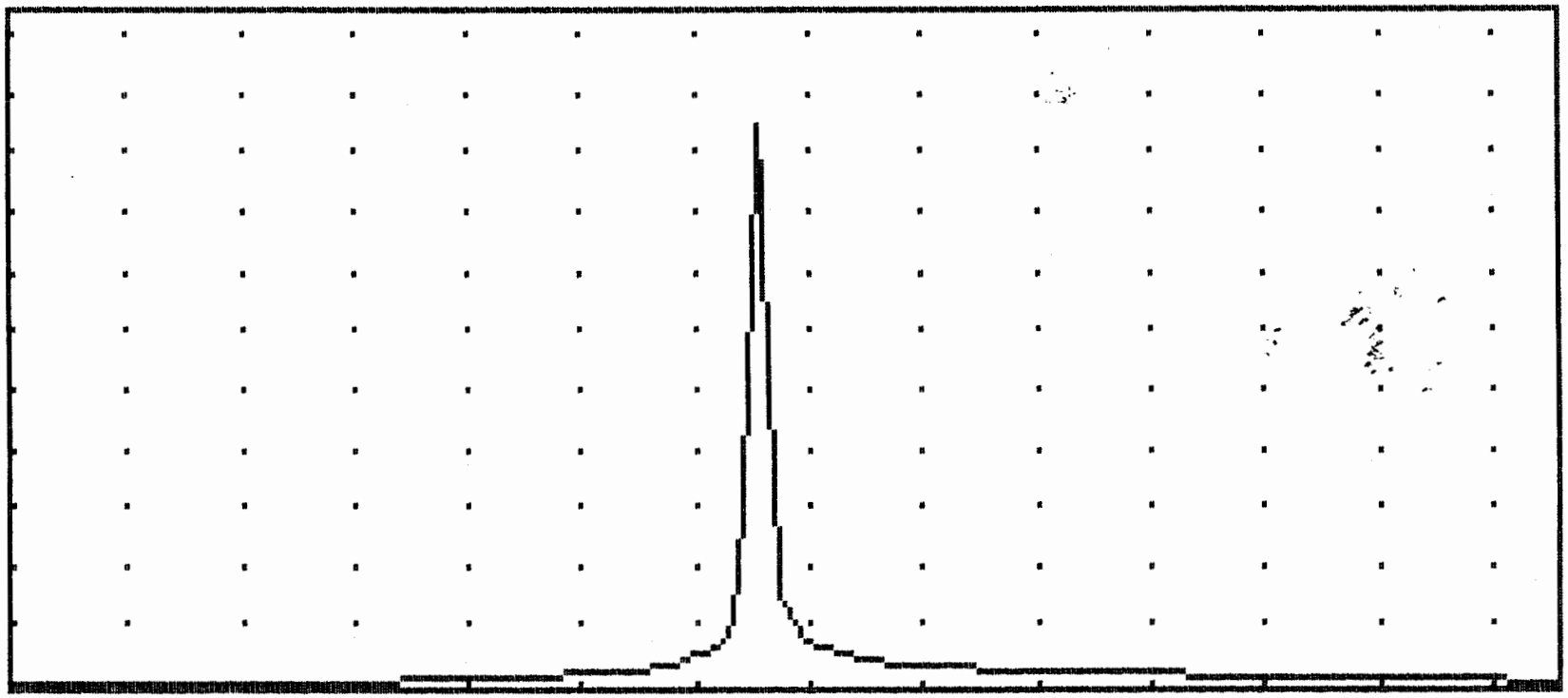
Hyd. No. 7

Hydrograph type	= S.C.S. RUNOFF	Peak discharge	= 9.45 cfs
Storm frequency	= 100 yr	Time interval	= 10 min
Basin area	= 1.1 ac	Basin curve No.	= 85
Ave basin slope	= .5 %	Hydraulic len	= 300 ft
Basin lag	= 8.7 min	Time of concen	= 14.57 min
Total precip.	= 8.10 in	Distribution	= S.C.S. II

HYDROGRAPH DISCHARGE TABLE

TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfS)	
11.50	0.82	11.67	2.02	11.83	5.47	12.00	9.45
12.17	4.72	12.33	1.49	12.50	1.13	12.67	0.86

Qp = 9.4 S.C.S. RUNOFF To = 0



HGU = 110 min 7 VGU = 1.0 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Menu

[F5] S dn [F6] S up [F7] Enl [F8] Red

HYDROLOGIC REPORT

POST-DEVELOPMENT.....
100 YR. STORM .....
FUTURE PHASE II

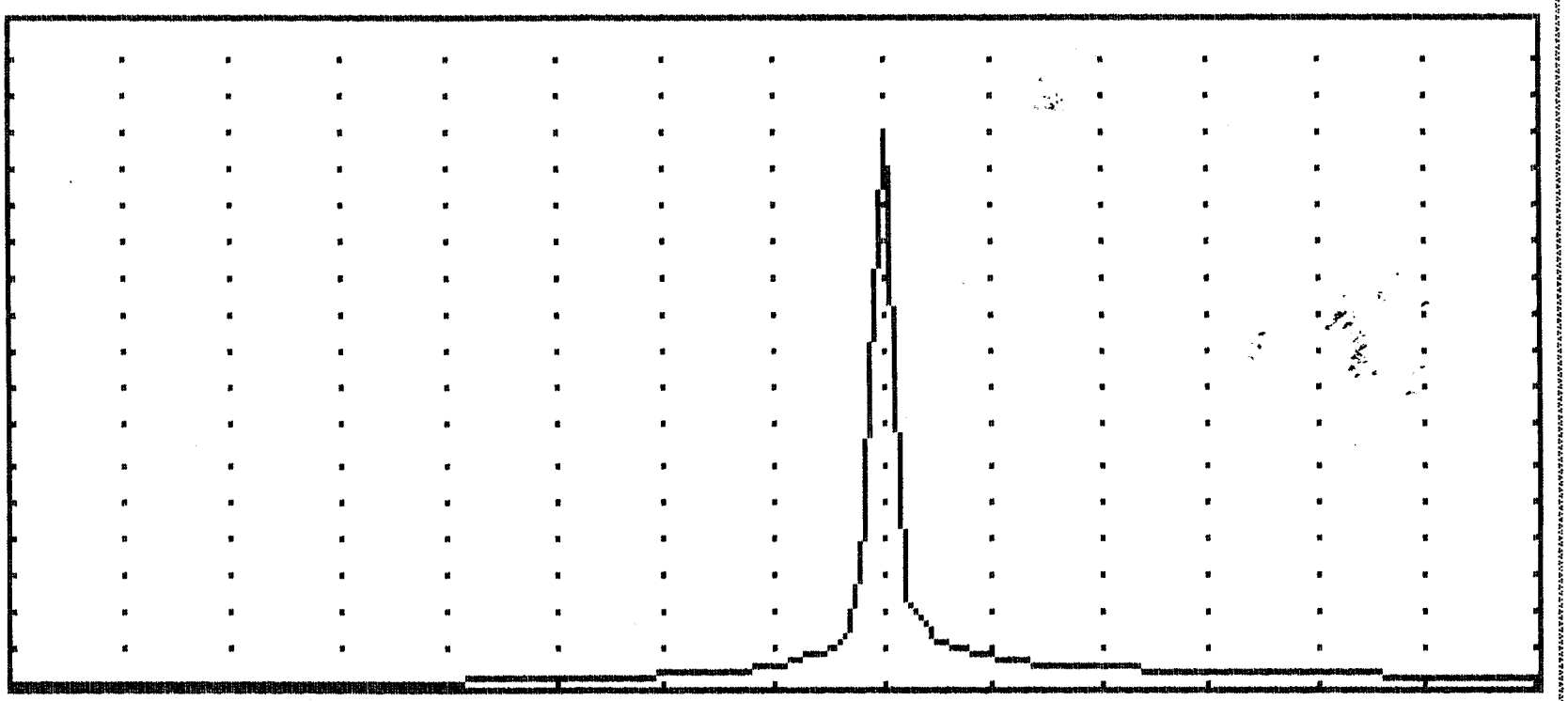
Hyd. No. 8

Hydrograph type	= S.C.S. RUNOFF	Peak discharge	= 7.47 cfs
Storm frequency	= 100 yr	Time interval	= 10 min
Basin area	= .87 ac	Basin curve No.	= 85
Ave basin slope	= 2.2 %	Hydraulic len	= 220 ft
Basin lag	= 3.2 min	Time of concen	= 5.42 min
Total precip.	= 8.10 in	Distribution	= S.C.S. II

HYDROGRAPH DISCHARGE TABLE

TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfS)	
11.50	0.65	11.67	1.60	11.83	4.33	12.00	7.47
12.17	3.73	12.33	1.18	12.50	0.89	12.67	0.68

Qp = 7.5 S.C.S. RUNOFF To = 0



HGU = 90 min 8 VGU = 0.5 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Menu

[F5] S dn [F6] S up [F7] Enl [F8] Red

HYDROLOGIC REPORT

POST-DEVELOPMENT.....
100 YR. STORM.....
PHASE I & II.....

Hyd. No. 9

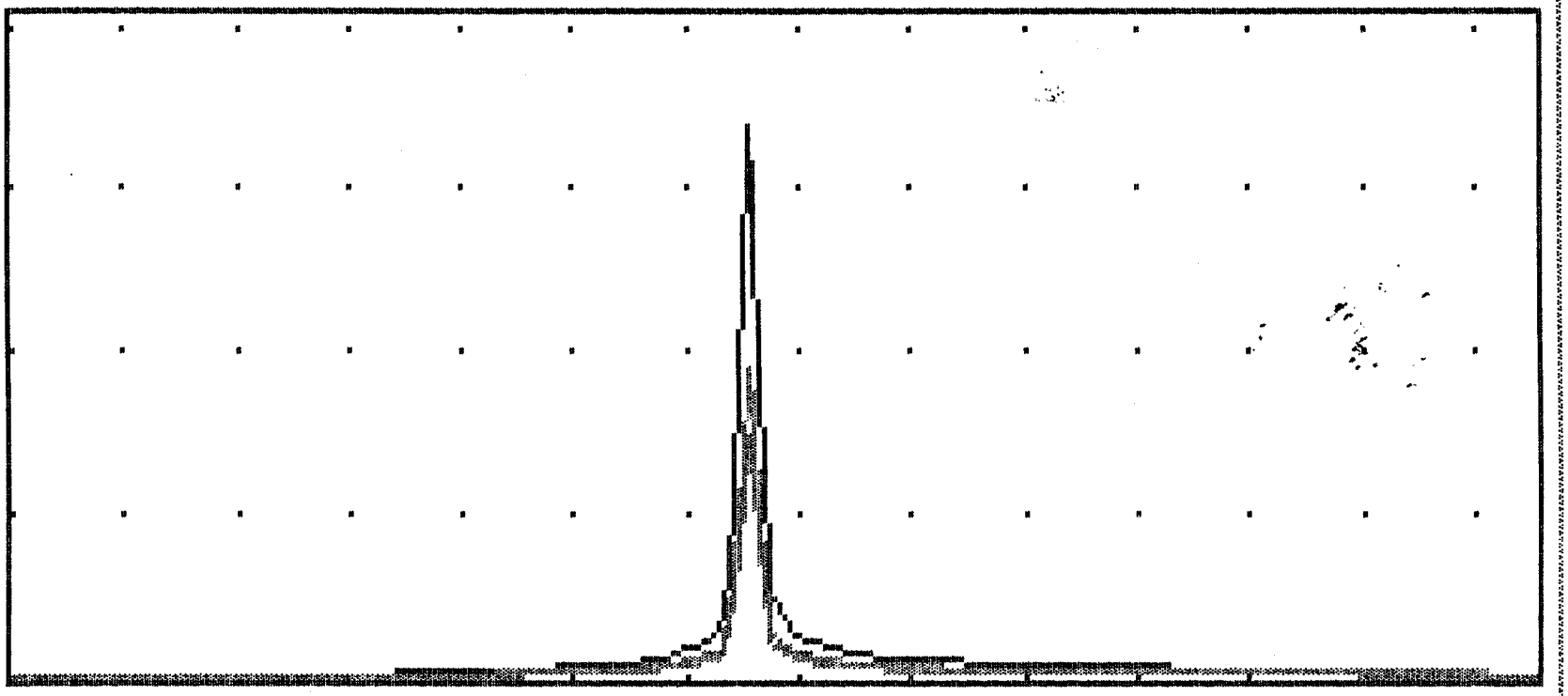
Hydrograph type = COMBINED
Storm frequency = 100 yr
Inflow hyd no's = 7 & 8

Peak discharge = 16.92 cfs
Time interval = 10 min

HYDROGRAPH DISCHARGE TABLE

TIME hrs	INFLOW cfs	HYDROGRAPHS cfs	OUTFLOW HYDROGRAPH cfs
11.33	0.66	0.52	1.18
11.50	0.82	0.65	1.46
11.67	2.02	1.60	3.62
11.83	5.47	4.33	9.80
12.00	9.45	7.47	16.92
12.17	4.72	3.73	8.46
12.33	1.49	1.18	2.66
12.50	1.13	0.89	2.02
12.67	0.86	0.68	1.54
12.83	0.73	0.58	1.31
13.00	0.65	0.52	1.17
13.17	0.58	0.46	1.04

Qp = 16.9 COMBINED To = 0



HGU = 110 min 9 VGU = 5.0 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Menu

[F5] S dn [F6] S up [F7] Enl [F8] Red

HYDROLOGIC REPORT

POST-DEVELOPMENT.....
100 YR. STORM.THRU....
STRUCTURE.NO SPILLWAY.

Hyd. No. 10

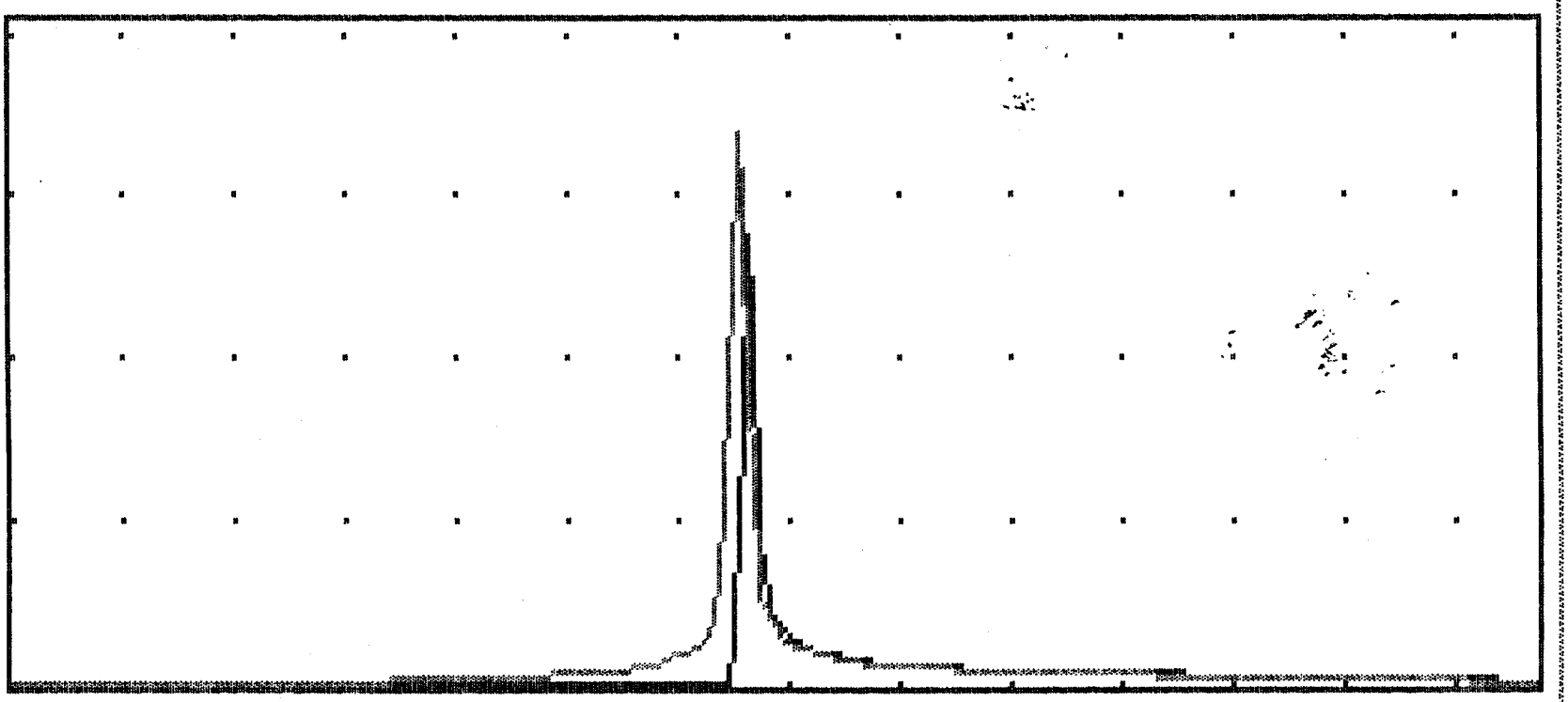
Hydrograph type = RESERVOIR ROUTE Peak discharge = 13.85 cfs
Storm frequency = 100 yr Time interval = 10 min
Inflow hyd. no. = 9 Reservoir no. = 1

HYDROGRAPH DISCHARGE TABLE

TIME hrs	INFLOW (i) cfs	INFLOW (j) cfs	2S/dt-O (i) cfs	2S/dt+O (j) cfs	OUTFLOW cfs
11.33	1.18	1.46	21.38	21.44	0.03
11.50	1.46	3.62	23.96	24.03	0.03
11.67	3.62	9.80	28.97	29.04	0.04
11.83	9.80	16.92	42.31	42.39	0.04
12.00	16.92	8.46	58.33	69.03	5.35
12.17	8.46	2.66	56.00	83.70	13.85
12.33	2.66	2.02	58.46	67.12	4.33
12.50	2.02	1.54	58.54	63.14	2.30
12.67	1.54	1.31	58.39	62.10	1.85
12.83	1.31	1.17	58.26	61.25	1.50
13.00	1.17	1.04	58.17	60.74	1.28
13.17	1.04	0.95	58.12	60.38	1.13
13.33	0.95	0.87	58.07	60.11	1.02

Maximum outflow (cfs) = 13.85 vs 13.5 cfs
Maximum storage (cu ft) = 20956
Maximum elevation (ft) = 76.77 vs 76.85

Qp = 13.9 RESERVOIR ROUTE To = 0



HGU = 110 min 10 VGU = 5.0 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Menu

[F5] S dn [F6] S up [F7] Enl [F8] Red

HYDROLOGIC REPORT

100 YR STORM.....
THRU STRUCTURE.....
W/EM. SPILLWAY.....

Hyd. No. 11

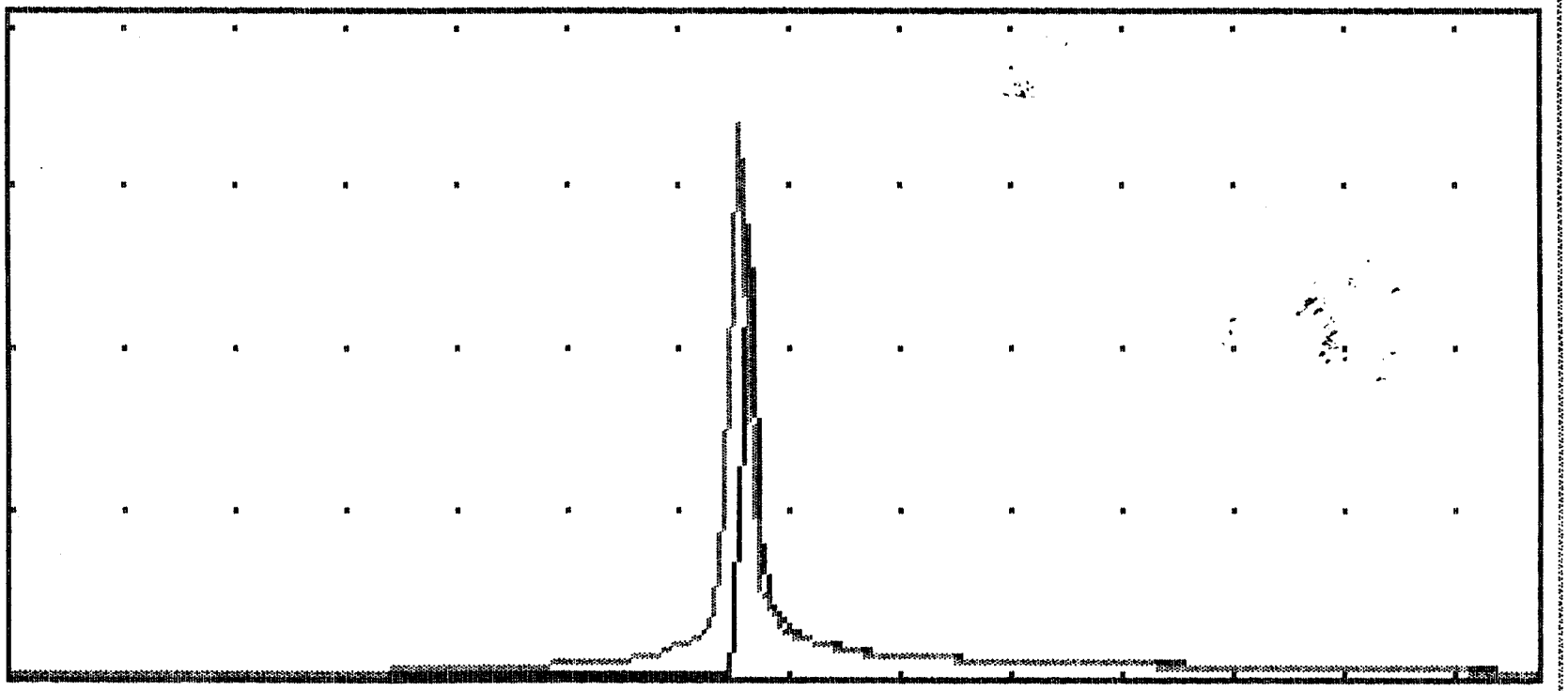
Hydrograph type = RESERVOIR ROUTE Peak discharge = 13.85 cfs
Storm frequency = 100 yr Time interval = 10 min
Inflow hyd. no. = 9 Reservoir no. = 1

HYDROGRAPH DISCHARGE TABLE

TIME hrs	INFLOW (i) cfs	INFLOW (j) cfs	2S/dt-O (i) cfs	2S/dt+O (j) cfs	OUTFLOW cfs
11.33	1.18	1.46	21.38	21.44	0.03
11.50	1.46	3.62	23.96	24.03	0.03
11.67	3.62	9.80	28.97	29.04	0.04
11.83	9.80	16.92	42.31	42.39	0.04
12.00	16.92	8.46	58.33	69.03	5.35
12.17	8.46	2.66	56.00	83.70	13.85
12.33	2.66	2.02	58.46	67.12	4.33
12.50	2.02	1.54	58.54	63.14	2.30
12.67	1.54	1.31	58.39	62.10	1.85
12.83	1.31	1.17	58.26	61.25	1.50
13.00	1.17	1.04	58.17	60.74	1.28
13.17	1.04	0.95	58.12	60.38	1.13
13.33	0.95	0.87	58.07	60.11	1.02

Maximum outflow (cfs) = 13.85 vs 13.52
Maximum storage (cu ft) = 20956
Maximum elevation (ft) = 76.77 vs 76.85

Qp = 13.9 RESERVOIR ROUTE To = 0



HGU = 110 min 11 VGU = 5.0 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Menu

[F5] S dn [F6] S up [F7] Enl [F8] Red

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 Option 1                          STAGE / STORAGE TABLE                          R to res
IMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
: 1. RESERVOIR No = 1.     2. RESERVOIR NAME = POND #1......
: 3. S = Ks * Z^b
:      Ks = 0............     b = 0..........
:      START ELEV = 0.....    INCREMENT = 0...
:
:      STAGE      ELEVATION      CO AREA       INC STORAGE      TOT STORAGE
:      ft         ft             sq ft         cu ft            cu ft
:
:  4    0.00        73.00.       3915....                0                0
:  5    1.00        74.00.       4440....             4177             4177
:  6    2.00        75.00.       5540....             4990             9167
:  7    3.00        76.00.       6720....             6130            15297
:  8    4.00        77.00.       7968....             7344            22641
:  9    5.00        78.00.       12900...            10434            33075
: 10    0.00         0.00.       0.......                0                0
: 11    0.00         0.00.       0.......                0                0
: 12    0.00         0.00.       0.......                0                0
: 13    0.00         0.00.       0.......                0                0
: 14    0.00         0.00.       0.......                0                0
:
:
HMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
Change item number: 0                                                          DY to co

 Reservoir No. 1                     OUTLET STRUCTURES
IMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
: CULVERT STRUC  A. Q=CoA[2gh/k]^.5     CULVERT STRUC  B. Q=CoA[2gh/k]^.5
:
: 1. WIDTH  (in)     = 18.              9. WIDTH  (in)     = 1.3
: 2. HEIGHT (in)     = 18.             10. HEIGHT (in)     = 1.3
: 3. No. BARRELS     = 1..             11. No. BARRELS     = 1..
: 4. INVERT ELEV.    = 73.......       12. INVERT ELEV.    = 73.5.....
: 5. Co = 0.60                         13. Co = 0.60
: 6. CULVERT LENGTH (ft) = 40.         14. CULVERT LENGTH (ft) = 8...
: 7. CULVERT SLOPE (%)   = .5...       15. CULVERT SLOPE (%)   = 3...
: 8. MANNING'S N-VALUE   = .013        16. MANNING'S N-VALUE   = .013
:                                      17. MULTI-STAGE OPTION ? (Y/N) Y
:
: WEIR STRUCTURE A.        Q=CwLH^EXP  WEIR STRUCTURE B.        Q=CwLH^EXP
:
: 18. CREST LENGTH (ft)  = 12.5664     23. CREST LENGTH (ft)  = 4......
: 19. CREST ELEVATION    = 76.25...    24. CREST ELEVATION    = 76.8...
: 20. Cw = 3.00                        25. Cw = 3.00
: 21. EXP = 1.50                       26. EXP = 1.50
: 22. MULTI-STAGE OPTION ? (Y/N) Y     27. MULTI-STAGE OPTION ? (Y/N) N
:
:
HMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
Change item number: 0                                                          DY to co
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HYDROLOGIC REPORT FOR

POWHATAN OFFICE PARK

Job No. 7309

DRY DETENTION POND

DESIGN TYPE 4

old - see revised calcs.

prepared by

AES CONSULTING ENGINEERS

5248 Olde Towne Rd,Suite 1

Williamsburg, VA. 23188

REVISED: 5/14/92

HWP
5/12/92

POWHATAN OFFICE PARK #7309

EXTENDED DRY DETENTION POND
DESIGN TYPE 4

PHASE I & II D.A = 1.97 Ac

CREATE A MARSHY BOTTOM ADEQUATE TO REMOVE POLLUTANTS.

FIND ANNUAL NUTRIENT LOAD TO THE LOWER STAGE
P = 43.90 RAINFALL DEPTH (IN INCHES) FOR 1 YR
PJ = 0.90 CORRECTION FACTOR FOR P FOR STORMS WITH NO RUNOFF,
FLOW WEIGHTED MEAN CONCENTRATION OF THE POLLUTANT
IN URBAN RUNOFF IN mg/L. CN: NITROGEN, CP: PHOSPHORUS.

CN = 2.00 mg/L
CP = 0.26 mg/L

$N = [(P)(PJ)(R_v)/12](CN)(A)\,2.72$

$R_v = 0.05 + .009\,(\%\ IMP)$
$= 0.05 + .009\,(60\%)$
$= 0.05 + 0.54 = \underline{0.59}$

$N = [(43.9)(0.9)(0.59)/12](2.00)(1.97)(2.72)$
$= 20.82$ lbs/YEAR

$P = [(P)(PJ)(R_v)/12](CP)(A)\,2.72$
$= [(43.9)(0.9)(0.59)/12](0.26)(1.97)(2.72)$
$= 2.71$ lbs/YEAR

0.044 acft - marsh
0.097 acft - storage for storm
- 12" deep

RECOMMENDED LIMITS N = 225 lbs/Ac/YR
P = 45 lbs/Ac/YR

$N \Rightarrow \frac{(20.82)}{x} = 225$ x = 0.0925 AC

$P \Rightarrow \frac{(2.71)}{x} = 45$ x = 0.0602 Ac

USE 0.0925 Ac.

WE SIZED OUR LOWER STAGE AT 0.1019 Ac
THEREFORE, ANNUAL LOADING PER WETLAND ACRE IS:
N ⇒ (20.82 lbs/YEAR) / (.1019 Ac) = 204.3 lbs/Acre/YR < 225 lbs/Acre/YR ✓
P ⇒ (2.71 lbs/YEAR) / (.1019 Ac) = 26.6 lbs/Ac/YR < 45 lbs/Ac/YR ✓

HWP
5/12/92

POWHATAN OFFICE PARK #7309

EXTENDED DRY DETENTION POND
DESIGN TYPE 4

PRE-DEVELOPMENT

DRAINAGE AREA: 1.35 Ac ±

SOIL GROUP C - WOODED CN = 78

POST-DEVELOPMENT

DRAINAGE AREA: 1.97 Ac

SOIL GROUP C - WOODED 50% CN = 78 CN = 85
DEV. 50% CN = 92

SEE HYDROLOGIC REPORT FOR POND INFORMATION.

WATER QUALITY IS OBTAINED BY STORING FIRST FLUSH VOLUME.
FIRST FLUSH VOLUME = (1 IN)(R_v)(D.A)

$$= \frac{(1/12)(0.59)(1.97\,Ac)(43{,}560\,FT^2/Ac)}{12\,IN/FT} = \underline{4219\,FT^3}$$

- 1900 ft³ marsh

THIS STORAGE OCCURS AT ELEVATION 74.43 ✓

SIZE ORIFICE TO CARRY 2 YR PRE-DEV. FLOW

Q_2 = 2.88 CFS

$Q = CA\sqrt{2gh}$ $h = 76.95 - 74.43 = 2.52$ FT
$g = 32.2$ FT/SEC²
$C = 0.60$

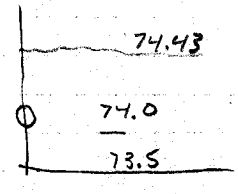
$2.88 = (0.60)(A)\sqrt{2(32.2)(2.52)}$

$A = 0.3768\,FT^2 = \frac{\pi d^2}{4}$ $d = 0.6926$ FT = 8.31 IN.

✓ USE 8" ORIFICE

release - 4200
- 1900
2300 ft³ over 24 hrs - 0.03 cfs
use 1.22" orifice

@ elev -



HYDROLOGIC REPORT

PRE-DEVELOPMENT.....
2 YR. STORM.....
POW. OFFICE PARK.....

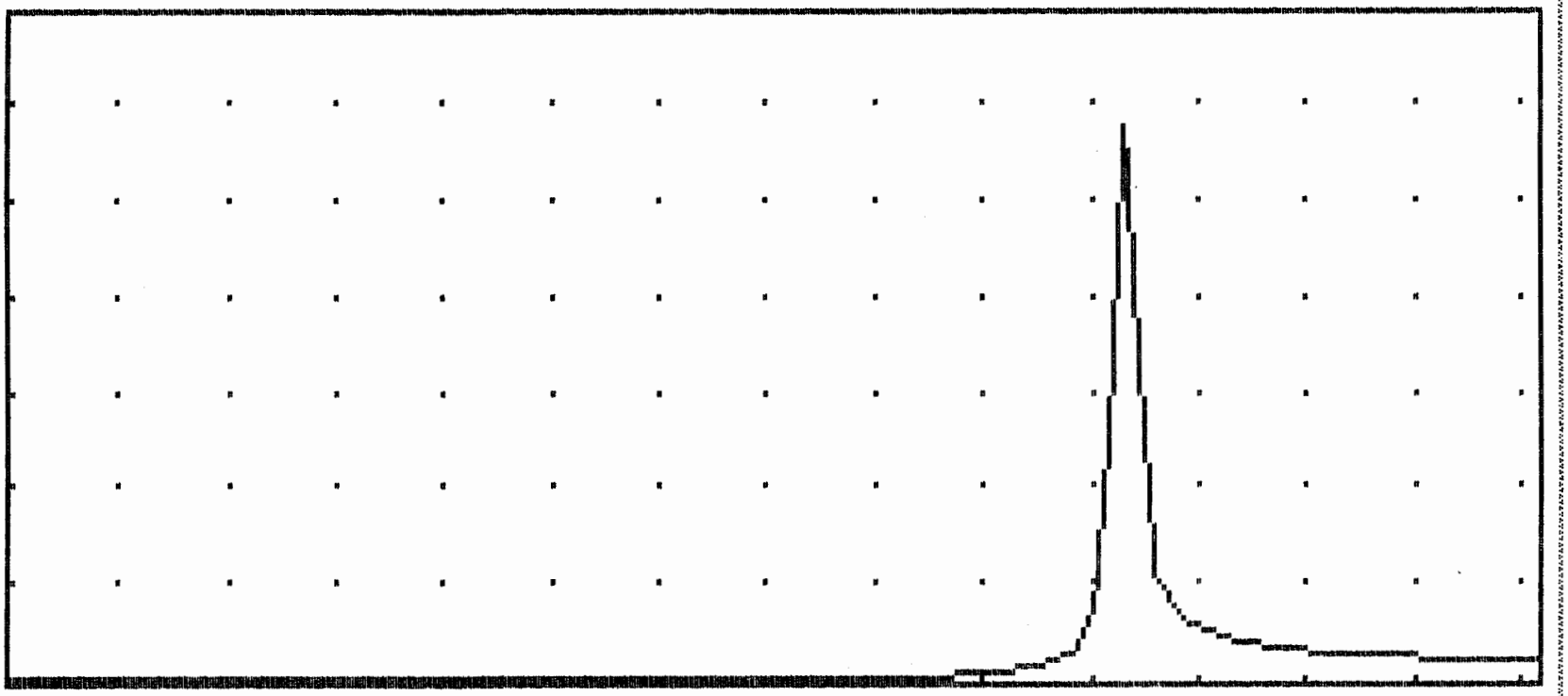
Hyd. No. 1

Hydrograph type	= S.C.S. RUNOFF	Peak discharge	= 2.88 cfs
Storm frequency	= 2 yr	Time interval	= 10 min
Basin area	= 1.35 ac	Basin curve No.	= 78
Ave basin slope	= 1.25 %	Hydraulic len	= 400 ft
Basin lag	= 8.7 min	Time of concen	= 14.55 min
Total precip.	= 3.50 in	Distribution	= S.C.S. II

HYDROGRAPH DISCHARGE TABLE

TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfS)	
11.50	0.13	11.67	0.38	11.83	1.32	12.00	2.88
12.17	1.56	12.33	0.54	12.50	0.41	12.67	0.32

Qp = 2.9 S.C.S. RUNOFF To = 0



HGU = 70 min 1 VGU = 0.5 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Menu

[F5] S dn [F6] S up [F7] Enl [F8] Red

HYDROLOGIC REPORT

POST-DEVELOPMENT.....
10 YR. STORM.....
PHASE I.....

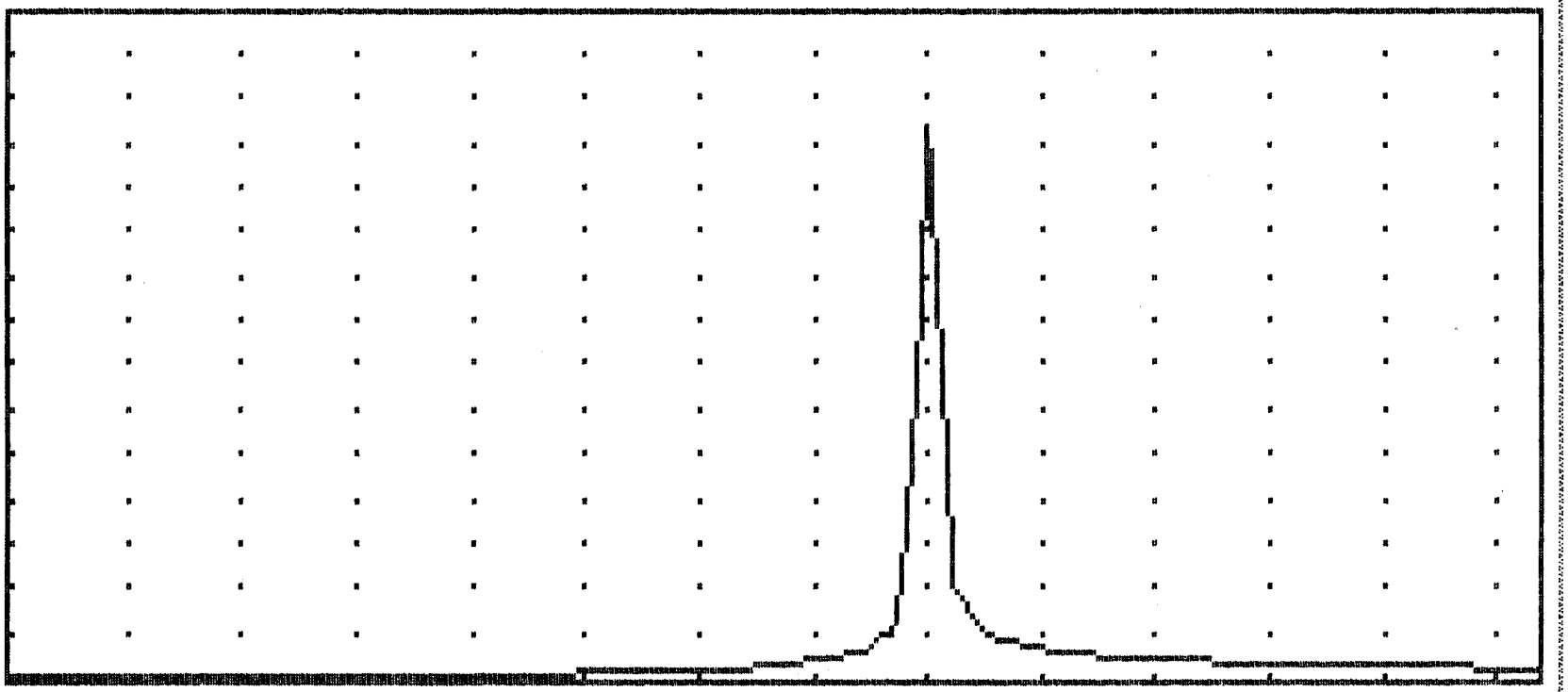
Hyd. No. 2

Hydrograph type	= S.C.S. RUNOFF	Peak discharge	= 6.16 cfs
Storm frequency	= 10 yr	Time interval	= 10 min
Basin area	= 1.1 ac	Basin curve No.	= 85
Ave basin slope	= .5 %	Hydraulic len	= 300 ft
Basin lag	= 8.7 min	Time of concen	= 14.57 min
Total precip.	= 5.70 in	Distribution	= S.C.S. II

HYDROGRAPH DISCHARGE TABLE

TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfS)	
11.50	0.48	11.67	1.23	11.83	3.45	12.00	6.16
12.17	3.12	12.33	1.00	12.50	0.76	12.67	0.58

Qp = 6.2 S.C.S. RUNOFF To = 0



HGU = 90 min 2 VGU = 0.5 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Menu

[F5] S dn [F6] S up [F7] Enl [F8] Red

HYDROLOGIC REPORT

POST-DEVELOPMENT.....
10 YR. STORM.....
FUTURE PHASE II.....

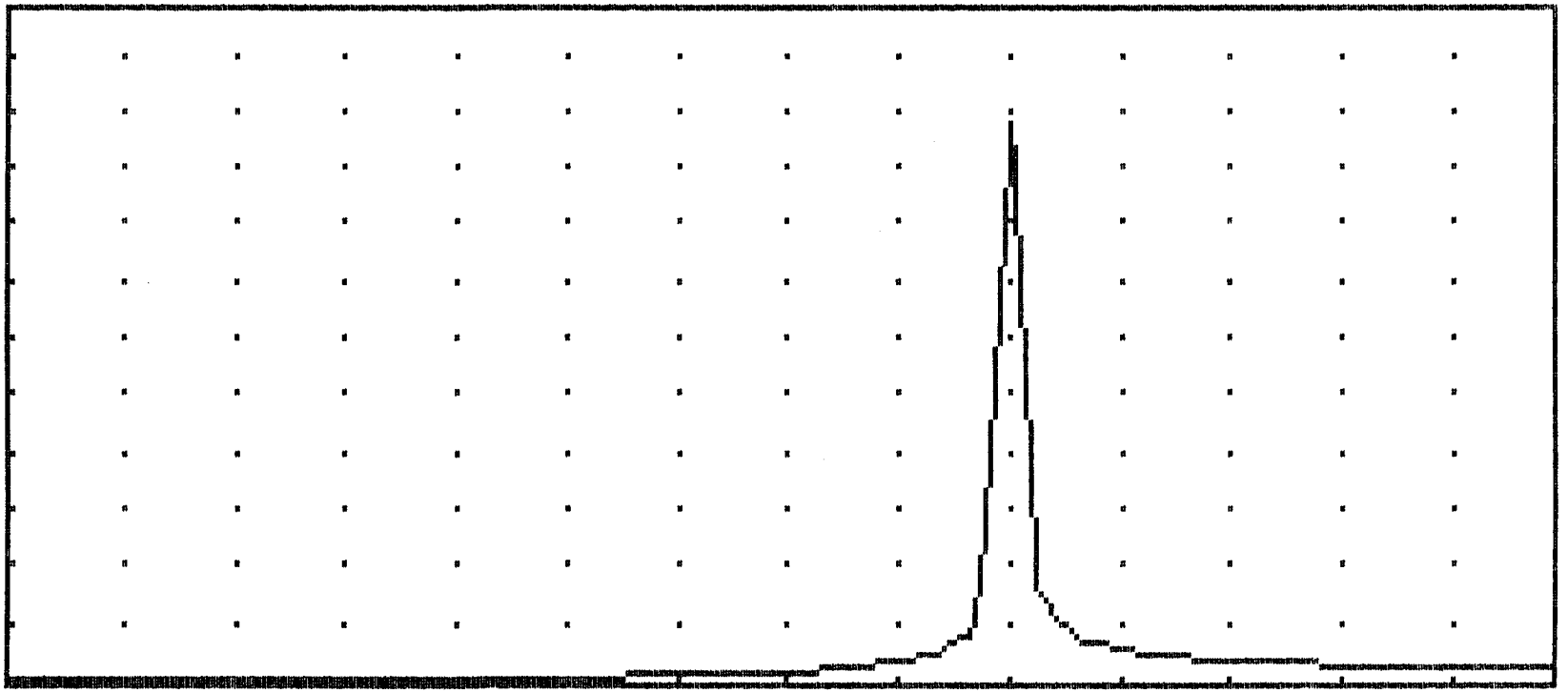
Hyd. No. 3

Hydrograph type	= S.C.S. RUNOFF	Peak discharge	= 4.88 cfs
Storm frequency	= 10 yr	Time interval	= 10 min
Basin area	= .87 ac	Basin curve No.	= 85
Ave basin slope	= 2.2 %	Hydraulic len	= 220 ft
Basin lag	= 3.2 min	Time of concen	= 5.42 min
Total precip.	= 5.70 in	Distribution	= S.C.S. II

HYDROGRAPH DISCHARGE TABLE

TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfS)	
11.50	0.38	11.67	0.97	11.83	2.73	12.00	4.88
12.17	2.47	12.33	0.79	12.50	0.60	12.67	0.46

Qp = 4.9 S.C.S. RUNOFF To = 0



HGU = 80 min 3 VGU = 0.5 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Menu

[F5] S dn [F6] S up [F7] Enl [F8] Red

HYDROLOGIC REPORT

POST-DEVELOPMENT.....
10 YR. STORM.....
PHASES I & II.....

Hyd. No. 4

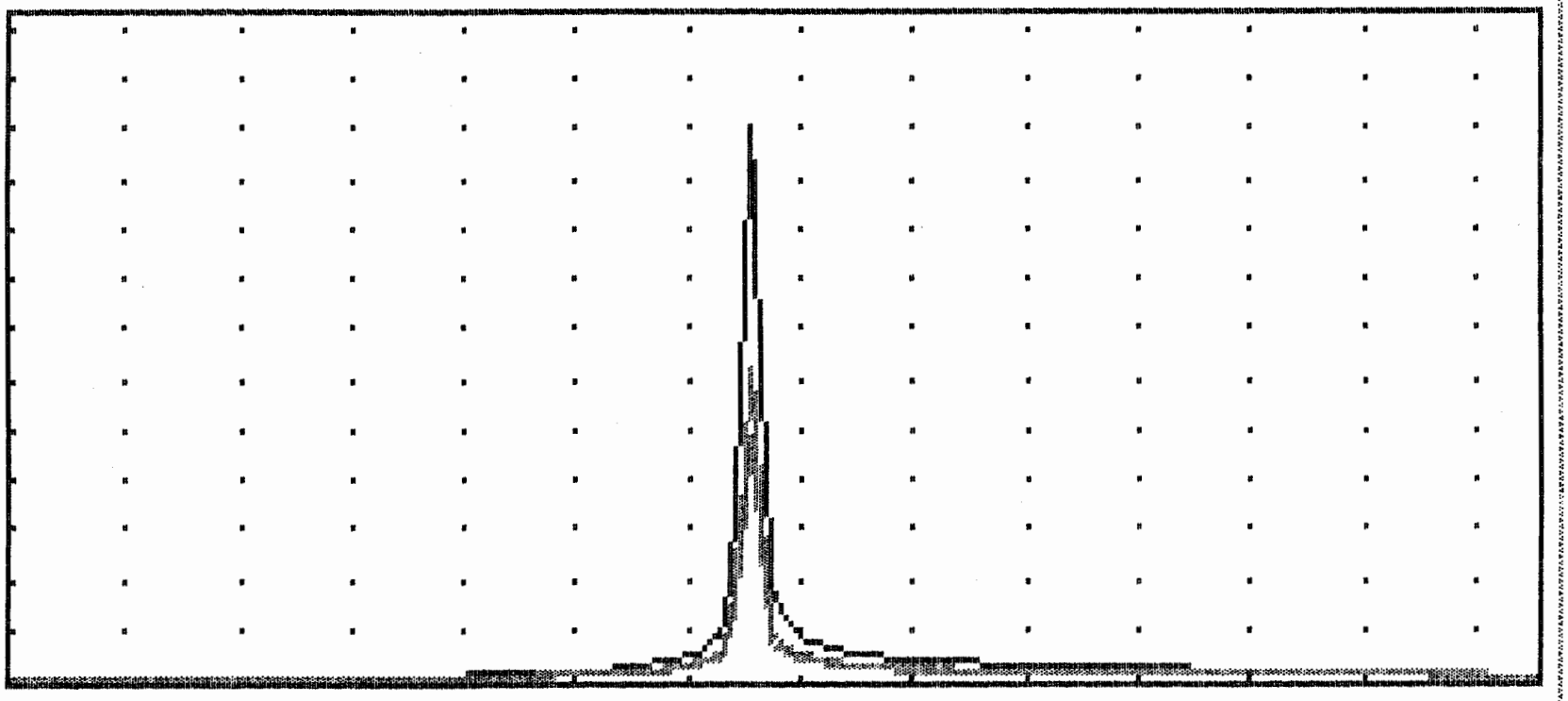
Hydrograph type = COMBINED
Storm frequency = 10 yr
Inflow hyd no's = 2 & 3

Peak discharge = 11.04 cfs
Time interval = 10 min

HYDROGRAPH DISCHARGE TABLE

TIME hrs	INFLOW cfs	HYDROGRAPHS cfs	OUTFLOW HYDROGRAPH cfs
11.67	1.23	0.97	2.20
11.83	3.45	2.73	6.18
12.00	6.16	4.88	11.04
12.17	3.12	2.47	5.59
12.33	1.00	0.79	1.78
12.50	0.76	0.60	1.36
12.67	0.58	0.46	1.04

Qp = 11.0 COMBINED To = 0



HGU = 110 min 4 VGU = 1.0 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Menu

[F5] S dn [F6] S up [F7] Enl [F8] Red

HYDROLOGIC REPORT

10 YR. STORM.....
THRU STRUCTURE.....
POST-DEV.....

Hyd. No. 5

Hydrograph type = RESERVOIR ROUTE
Storm frequency = 10 yr
Inflow hyd. no. = 4

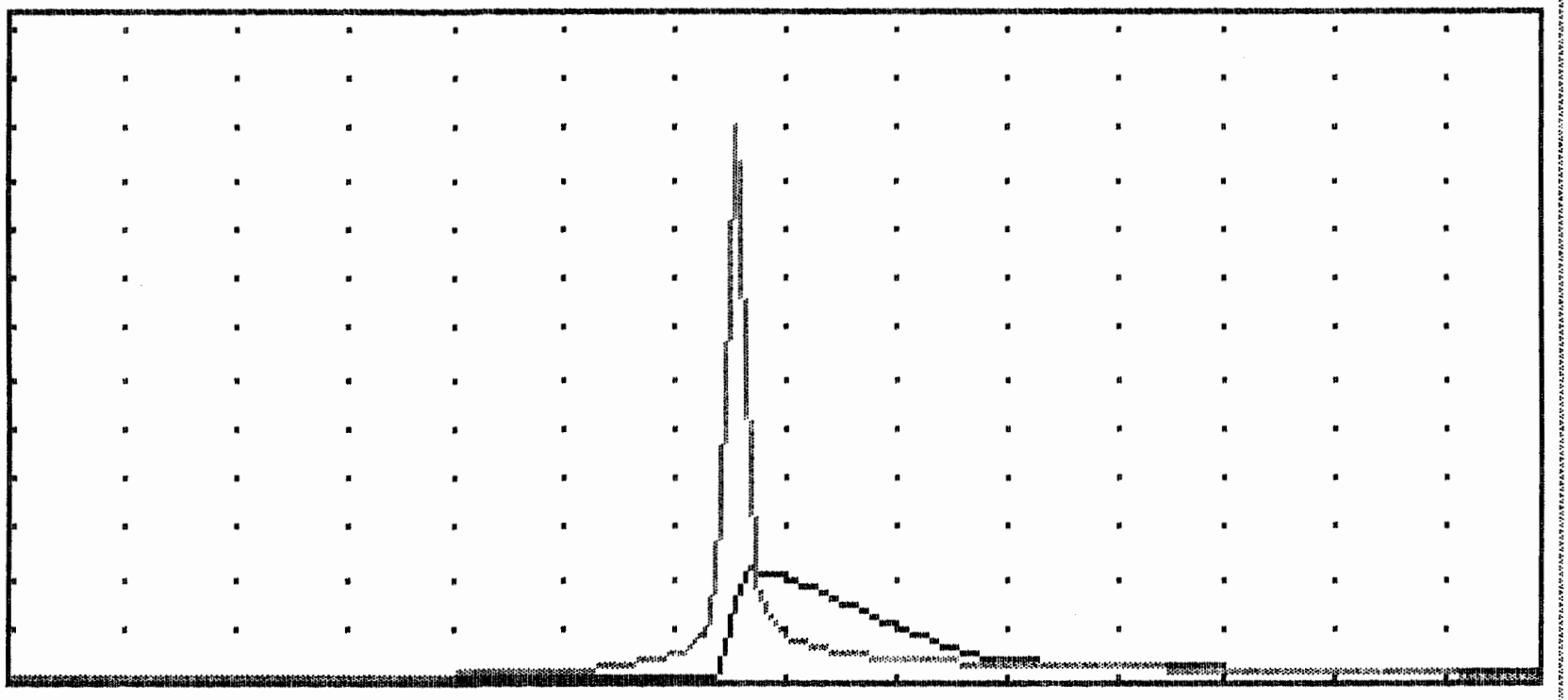
Peak discharge = 2.15 cfs
Time interval = 10 min
Reservoir no. = 1

HYDROGRAPH DISCHARGE TABLE

TIME hrs	INFLOW (i) cfs	INFLOW (j) cfs	2S/dt-O (i) cfs	2S/dt+O (j) cfs	OUTFLOW cfs
11.67	2.20	6.18	15.51	15.56	0.03
11.83	6.18	11.04	22.42	23.90	0.74
12.00	11.04	5.59	36.41	39.64	1.61
12.17	5.59	1.78	48.92	53.04	2.06
12.33	1.78	1.36	52.00	56.29	2.15
12.50	1.36	1.04	50.91	55.14	2.12
12.67	1.04	0.89	49.17	53.30	2.07
12.83	0.89	0.79	47.08	51.09	2.01
13.00	0.79	0.70	44.87	48.75	1.94
13.17	0.70	0.64	42.62	46.36	1.87
13.33	0.64	0.59	40.41	43.97	1.78
13.50	0.59	0.54	38.25	41.64	1.69
13.67	0.54	0.50	36.18	39.39	1.60
13.83	0.50	0.46	34.21	37.23	1.51
14.00	0.46	0.43	32.34	35.17	1.42
14.17	0.43	0.42	30.58	33.23	1.33
14.33	0.42	0.40	28.97	31.43	1.23
14.50	0.40	0.39	27.50	29.79	1.14
14.67	0.39	0.38	26.19	28.30	1.05

Maximum outflow (cfs) = 2.15
Maximum storage (cu ft) = 16244
Maximum elevation (ft) = 76.40

Qp = 2.1 RESERVOIR ROUTE To = 0



HGU = 110 min 5 VGU = 1.0 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Menu

[F5] S dn [F6] S up [F7] Enl [F8] Red

HYDROLOGIC REPORT

POST-DEVELOPMENT.....
100 YR. STORM.....
PHASE I .....

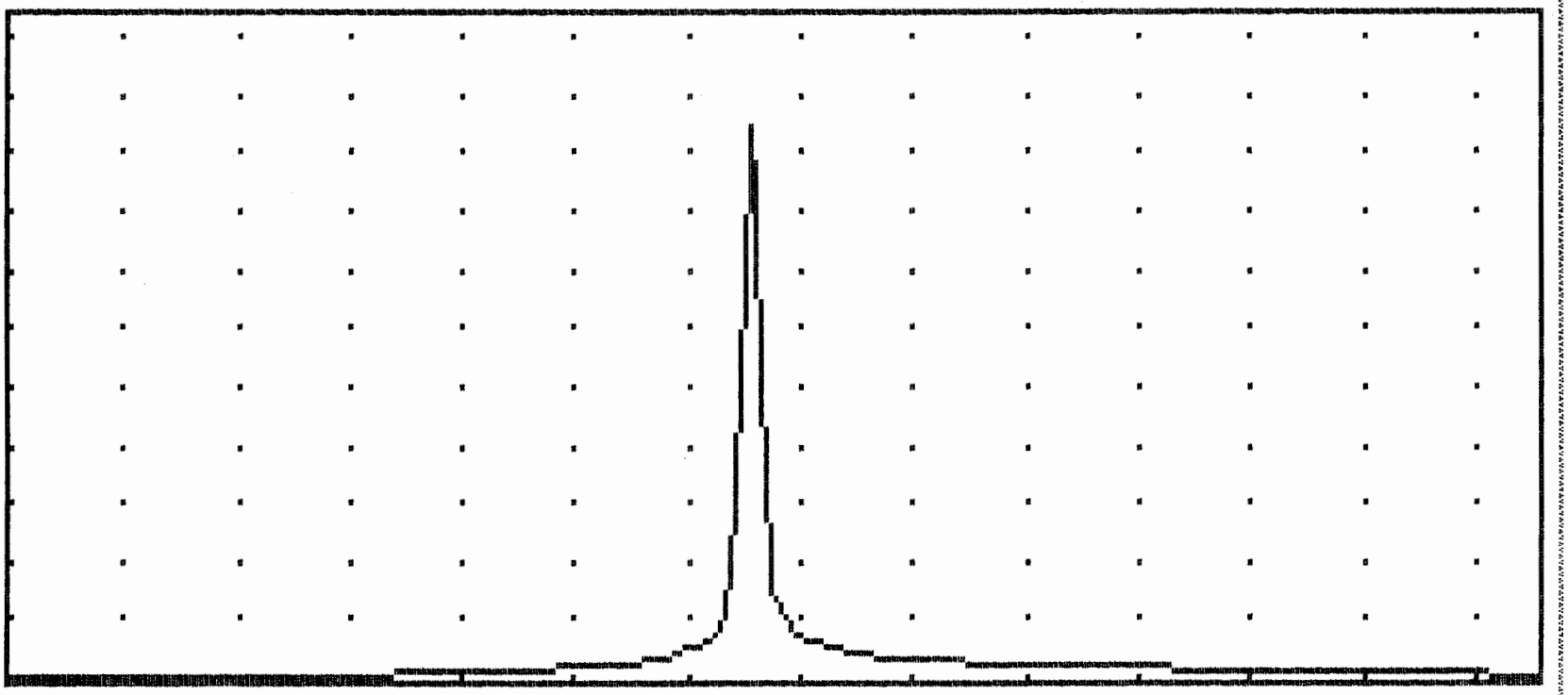
Hyd. No. 7

Hydrograph type	= S.C.S. RUNOFF	Peak discharge	= 9.45 cfs
Storm frequency	= 100 yr	Time interval	= 10 min
Basin area	= 1.1 ac	Basin curve No.	= 85
Ave basin slope	= .5 %	Hydraulic len	= 300 ft
Basin lag	= 8.7 min	Time of concen	= 14.57 min
Total precip.	= 8.10 in	Distribution	= S.C.S. II

HYDROGRAPH DISCHARGE TABLE

TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfS)	
11.50	0.82	11.67	2.02	11.83	5.47	12.00	9.45
12.17	4.72	12.33	1.49	12.50	1.13	12.67	0.86

Qp = 9.4 S.C.S. RUNOFF To = 0



HGU = 110 min 7 VGU = 1.0 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Menu

[F5] S dn [F6] S up [F7] Enl [F8] Red

HYDROLOGIC REPORT

POST-DEVELOPMENT.....
100 YR. STORM .....
FUTURE PHASE II

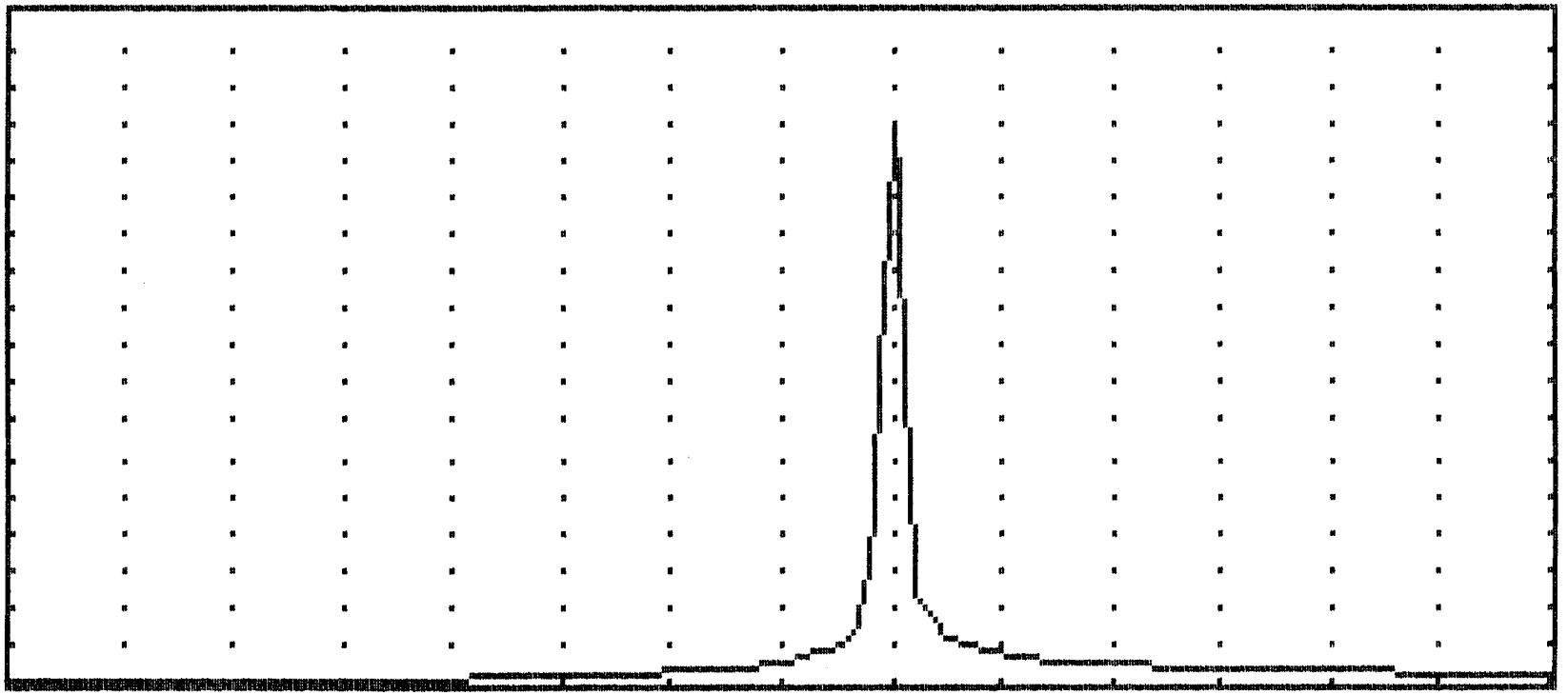
Hyd. No. 8

Hydrograph type	= S.C.S. RUNOFF	Peak discharge	= 7.47 cfs
Storm frequency	= 100 yr	Time interval	= 10 min
Basin area	= .87 ac	Basin curve No.	= 85
Ave basin slope	= 2.2 %	Hydraulic len	= 220 ft
Basin lag	= 3.2 min	Time of concen	= 5.42 min
Total precip.	= 8.10 in	Distribution	= S.C.S. II

HYDROGRAPH DISCHARGE TABLE

TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfs)		TIME--OUTFLOW (hrs cfS)	
11.50	0.65	11.67	1.60	11.83	4.33	12.00	7.47
12.17	3.73	12.33	1.18	12.50	0.89	12.67	0.68

Qp = 7.5 S.C.S. RUNOFF To = 0



HGU = 90 min 8 VGU = 0.5 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Menu

[F5] S dn [F6] S up [F7] Enl [F8] Red

HYDROLOGIC REPORT

POST-DEVELOPMENT.....
100 YR. STORM.....
PHASE I & II.....

Hyd. No. 9

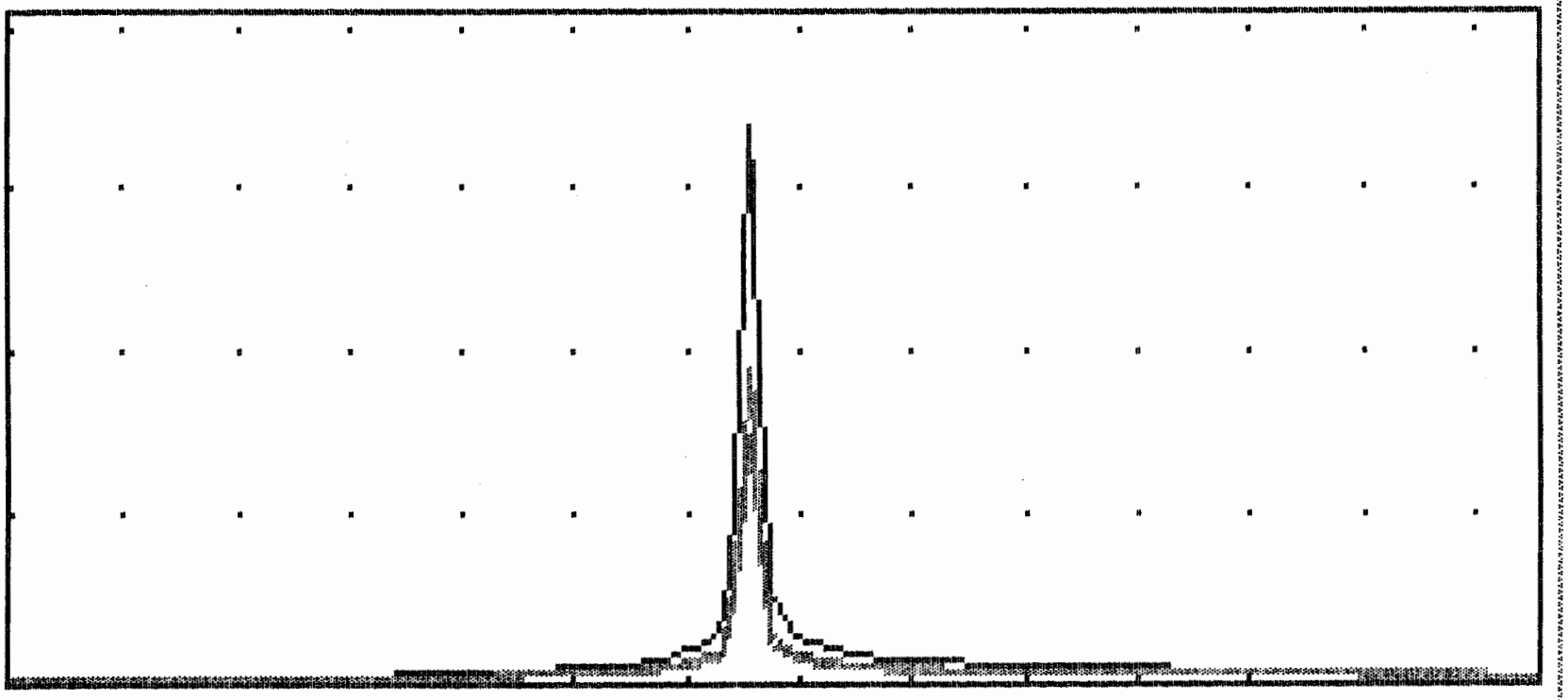
Hydrograph type = COMBINED
Storm frequency = 100 yr
Inflow hyd no's = 7 & 8

Peak discharge = 16.92 cfs
Time interval = 10 min

HYDROGRAPH DISCHARGE TABLE

TIME hrs	INFLOW cfs	HYDROGRAPHS cfs	OUTFLOW HYDROGRAPH cfs
11.33	0.66	0.52	1.18
11.50	0.82	0.65	1.46
11.67	2.02	1.60	3.62
11.83	5.47	4.33	9.80
12.00	9.45	7.47	16.92
12.17	4.72	3.73	8.46
12.33	1.49	1.18	2.66
12.50	1.13	0.89	2.02
12.67	0.86	0.68	1.54
12.83	0.73	0.58	1.31
13.00	0.65	0.52	1.17
13.17	0.58	0.46	1.04

Qp = 16.9 COMBINED To = 0



HGU = 110 min 9 VGU = 5.0 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Menu

[F5] S dn [F6] S up [F7] Enl [F8] Red

HYDROLOGIC REPORT

POST-DEVELOPMENT.....
100 YR. STORM.THRU....
STRUCTURE.NO SPILLWAY.

Hyd. No. 10

Hydrograph type = RESERVOIR ROUTE Peak discharge = 13.52 cfs
Storm frequency = 100 yr Time interval = 10 min
Inflow hyd. no. = 9 Reservoir no. = 1

HYDROGRAPH DISCHARGE TABLE

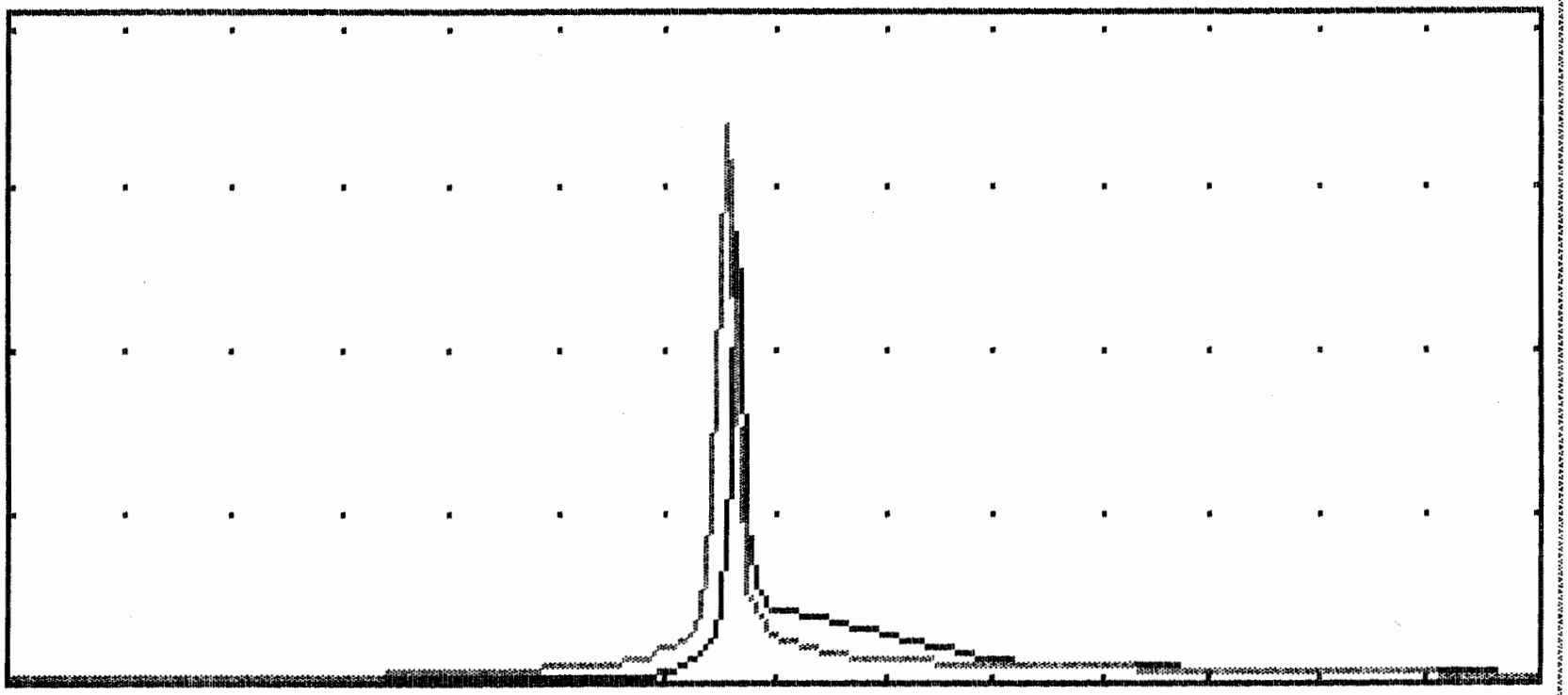
TIME hrs	INFLOW (i) cfs	INFLOW (j) cfs	2S/dt-O (i) cfs	2S/dt+O (j) cfs	OUTFLOW cfs
11.33	1.18	1.46	20.15	20.99	0.42
11.50	1.46	3.62	21.58	22.80	0.61
11.67	3.62	9.80	24.75	26.66	0.95
11.83	9.80	16.92	35.07	38.18	1.55
12.00	16.92	8.46	53.37	61.80	4.21
12.17	8.46	2.66	51.71	78.75	13.52
12.33	2.66	2.02	53.42	62.82	4.70
12.50	2.02	1.54	52.65	58.10	2.72
12.67	1.54	1.31	51.93	56.22	2.14
12.83	1.31	1.17	50.57	54.78	2.11
13.00	1.17	1.04	48.93	53.05	2.06
13.17	1.04	0.95	47.13	51.14	2.01
13.33	0.95	0.87	45.23	49.13	1.95
13.50	0.87	0.80	43.27	47.05	1.89
13.67	0.80	0.74	41.31	44.95	1.82
13.83	0.74	0.69	39.38	42.86	1.74
14.00	0.69	0.64	37.48	40.80	1.66
14.17	0.64	0.61	35.65	38.81	1.58
14.33	0.61	0.59	33.92	36.91	1.50
14.50	0.59	0.57	32.29	35.13	1.42
14.67	0.57	0.56	30.79	33.46	1.34
14.83	0.56	0.54	29.41	31.92	1.26
15.00	0.54	0.52	28.13	30.50	1.18
15.17	0.52	0.50	26.97	29.18	1.11
15.33	0.50	0.48	25.91	27.98	1.03

HYDROGRAPH DISCHARGE TABLE Cont'd

TIME hrs	INFLOW (i) cfs	INFLOW (j) cfs	2S/dt-O (i) cfs	2S/dt+O (j) cfs	OUTFLOW cfs

Maximum outflow (cfs) = 13.52
Maximum storage (cu ft) = 19569
Maximum elevation (ft) = 76.85

Qp = 13.5 RESERVOIR ROUTE To = 0



HGU = 110 min 10 VGU = 5.0 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Menu

[F5] S dn [F6] S up [F7] Enl [F8] Red

HYDROLOGIC REPORT

100 YR STORM.....
THRU STRUCTURE.....
W/EM. SPILLWAY.....

Hyd. No. 11

Hydrograph type = RESERVOIR ROUTE Peak discharge = 13.52 cfs
Storm frequency = 100 yr Time interval = 10 min
Inflow hyd. no. = 9 Reservoir no. = 1

HYDROGRAPH DISCHARGE TABLE

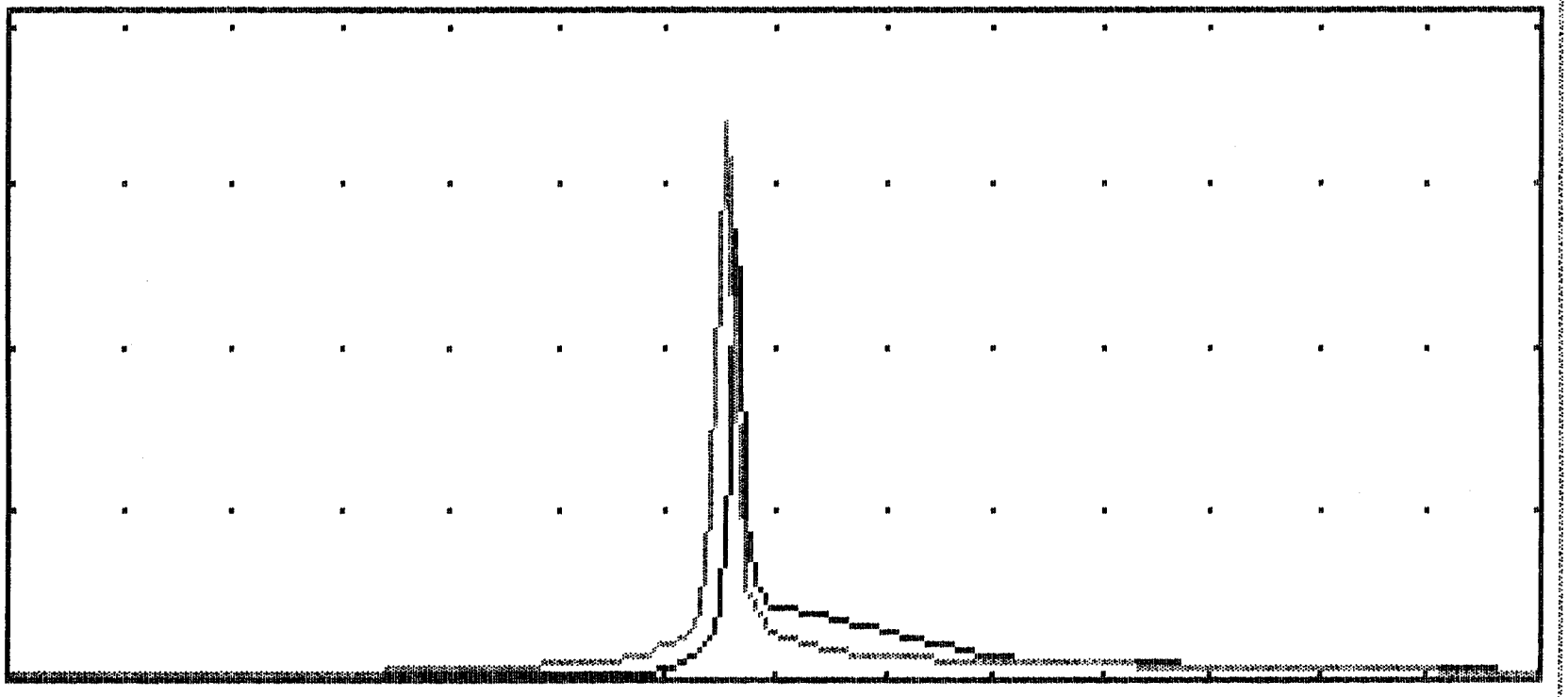
TIME hrs	INFLOW (i) cfs	INFLOW (j) cfs	2S/dt-O (i) cfs	2S/dt+O (j) cfs	OUTFLOW cfs
11.33	1.18	1.46	20.15	20.99	0.42
11.50	1.46	3.62	21.58	22.80	0.61
11.67	3.62	9.80	24.75	26.66	0.95
11.83	9.80	16.92	35.07	38.18	1.55
12.00	16.92	8.46	53.37	61.80	4.21
12.17	8.46	2.66	51.71	78.75	13.52
12.33	2.66	2.02	53.42	62.82	4.70
12.50	2.02	1.54	52.65	58.10	2.72
12.67	1.54	1.31	51.93	56.22	2.14
12.83	1.31	1.17	50.57	54.78	2.11
13.00	1.17	1.04	48.93	53.05	2.06
13.17	1.04	0.95	47.13	51.14	2.01
13.33	0.95	0.87	45.23	49.13	1.95
13.50	0.87	0.80	43.27	47.05	1.89
13.67	0.80	0.74	41.31	44.95	1.82
13.83	0.74	0.69	39.38	42.86	1.74
14.00	0.69	0.64	37.48	40.80	1.66
14.17	0.64	0.61	35.65	38.81	1.58
14.33	0.61	0.59	33.92	36.91	1.50
14.50	0.59	0.57	32.29	35.13	1.42
14.67	0.57	0.56	30.79	33.46	1.34
14.83	0.56	0.54	29.41	31.92	1.26
15.00	0.54	0.52	28.13	30.50	1.18
15.17	0.52	0.50	26.97	29.19	1.11
15.33	0.50	0.48	25.91	27.98	1.03

HYDROGRAPH DISCHARGE TABLE Cont'd

TIME hrs	INFLOW (i) cfs	INFLOW (j) cfs	2S/dt-O (i) cfs	2S/dt+O (j) cfs	OUTFLOW cfs

Maximum outflow (cfs) = 13.52
Maximum storage (cu ft) = 19569
Maximum elevation (ft) = 76.85

Qp = 13.5 RESERVOIR ROUTE To = 0



HGU = 110 min 11 VGU = 5.0 cfs

[F1] Scr [F2] Prt [F3] Edt [F4] Menu

[F5] S dn [F6] S up [F7] Enl [F8] Red

Option 1 — STAGE / STORAGE TABLE

1. RESERVOIR No = 1.   2. RESERVOIR NAME = POND #1.....

3. S = Ks * Z^b

Ks = 0............   b = 0..........

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

	STAGE ft	ELEVATION ft	CO AREA sq ft	INC STORAGE cu ft	TOT STORAGE cu ft
4	0.00	73.00.	0.......	0	0
5	1.00	74.00.	4440....	2220	2220
6	2.00	75.00.	5540....	4990	7210
7	3.00	76.00.	6720....	6130	13340
8	4.00	77.00.	7968....	7344	20684
9	5.00	78.00.	12900...	10434	31118
10	0.00	0.00.	0.......	0	0
11	0.00	0.00.	0.......	0	0
12	0.00	0.00.	0.......	0	0
13	0.00	0.00.	0.......	0	0
14	0.00	0.00.	0.......	0	0

Change item number: 0

Reservoir No. 1 — OUTLET STRUCTURES

CULVERT STRUC A. Q=CoA[2gh/k]^.5

1. WIDTH (in) = 18.
2. HEIGHT (in) = 18.
3. No. BARRELS = 1..
4. INVERT ELEV. = 73.......
5. Co = 0.60
6. CULVERT LENGTH (ft) = 40..
7. CULVERT SLOPE (%) = .5..
8. MANNING'S N-VALUE = .013

CULVERT STRUC B. Q=CoA[2gh/k]^.5

9. WIDTH (in) = 8..
10. HEIGHT (in) = 8..
11. No. BARRELS = 1..
12. INVERT ELEV. = 74.43....
13. Co = 0.60
14. CULVERT LENGTH (ft) = 8...
15. CULVERT SLOPE (%) = 3...
16. MANNING'S N-VALUE = .013
17. MULTI-STAGE OPTION ? (Y/N) Y

WEIR STRUCTURE A. Q=CwLH^EXP

18. CREST LENGTH (ft) = 12.5664
19. CREST ELEVATION = 76.4...
20. Cw = 3.00
21. EXP = 1.50
22. MULTI-STAGE OPTION ? (Y/N) Y

WEIR STRUCTURE B. Q=CwLH^EXP

23. CREST LENGTH (ft) = 4......
24. CREST ELEVATION = 76.85..
25. Cw = 3.00
26. EXP = 1.50
27. MULTI-STAGE OPTION ? (Y/N) N

Change item number: 0

DARRYL COOK

TABLE 3

WORKSHEET FOR BMP POINT SYSTEM

POWHATAN OFFICE PARK
PHASE I

A. STRUCTURAL BMP POINT ALLOCATION

BMP	BMP Points		Fraction of Site Served by BMP		Weighted BMP Points
DRY DETENTION POND (DESIGN 4)	9	x	1.97 / 2.95 66.11%	=	5.95
		x		=	
		x		=	
		x		=	

TOTAL WEIGHTED STRUCTURAL BMP POINTS: 5.95

B. NATURAL OPEN SPACE CREDIT

Fraction of Site		Natural Open Space Credit		Points for Natural Open Space
42.15%	x	0.10 (0.1 per 1%)	=	4.22

C. TOTAL WEIGHTED POINTS

5.95	+	4.22	=	10.17
Structural BMP Points		Natural Open Space Points		TOTAL

TABLE 3

WORKSHEET FOR BMP POINT SYSTEM

POWHATAN OFFICE PARK
PHASE I & II

A. STRUCTURAL BMP POINT ALLOCATION

BMP	BMP Points		Fraction of Site Served by BMP		Weighted BMP Points
DRY DETENTION POND (DESIGN 4)	9	x	66.11%	=	5.95
		x		=	
		x		=	
		x		=	

TOTAL WEIGHTED STRUCTURAL BMP POINTS: 5.95

B. NATURAL OPEN SPACE CREDIT

Fraction of Site		Natural Open Space Credit		Points for Natural Open Space
~~42.15%~~ 7.50%	x	0.10 (0.1 per 1%)	=	~~4.22~~ 0.75

C. TOTAL WEIGHTED POINTS

5.95	+	~~4.22~~ 0.75	=	~~10.17~~ 6.70
Structural BMP Points		Natural Open Space Points		TOTAL

☆ REVISED 6/16/92
REQUEST FOR EXCEPTION

CONSULTING ENGINEERS

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

August 6, 2003

AUG 2003 RECEIVED ENVIRONMENTAL DIVISION

Mr. Scott Thomas, P.E.
James City County
Environmental Division
101- E Mounts Bay Road
Williamsburg, Virginia 23187-8784

RE: Powhatan Park Phase I
JCC S-73-91
AES Project No. 7309-03

Dear Scott:

We have made the necessary change to the 1997 plan for Powhatan Office Park by adding the note, as agreed.

Enclosed with this letter are record versions of the drawing "As Built Drawing POWHATAN OFFICE PARK FIVE FORKS, C. LEWIS WALTRIP II, Berkeley District, James City County, Virginia":

- One (1) reproducible
- One (1) copy
- One (1) scanned image digital file (.tif) on floppy disk

If you have any questions or concerns, feel free to contact me at any time.

Sincerely,

AES Consulting Engineers

Richard A. Costello, P.E.
President
rcostello@aesva.com

Enclosures: see above

R:\OldJobs from CD\7309\03\WORDPROC\DOCUMENT\730903L03.doc

Scott Thomas

From: Scott Thomas
Sent: Tuesday, April 30, 2002 2:42 PM
To: 'rcostello@aesva.com'
Subject: Powhatan Office Park

Rich

We are trying to close out the project for Phase I of Powhatan Office Park, County Project SP-73-91. Phase II (S-41-97) has been closed out already.

In order to do so, I need the 1997 plan sheet with the statement that you indicated on your March 8th 2002 letter to me. In case you have forgotten, we decided that the Phase II plan with the statement per your March 8th letter (AES 730903L02.rac.doc) would suffice as the record drawing for Phase I of the project.

Please forward ~~to~~ the drawing to our office to my attention so I can review and proceed with closeout.

Scott J. Thomas, P.E.
James City County
Environmental Division

CONSULTING ENGINEERS

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

March 8, 2002

MAR 2002
RECEIVED
ENVIRONMENTAL DIVISION

Mr. Scott Thomas, P.E.
James City County
Environmental Division
101 – E Mounts Bay Road
Williamsburg, Virginia 23187-8784

Re: Powhatan Park Phase II
JCC S-41-97
AES Project 7309-03

Dear Scott:

This letter is written to address and satisfy the James City County requirements imposed upon this project when approved in 1997. James City County required the following note to be added to the 1997 plans:

> "As–built drawings must be provided for all Detention/BMP facilities. Also upon completion, the construction of all Detention/BMP facilities shall be certified by a Professional Engineer who inspected the structure during construction. The certification shall state to the best of his/her, knowledge, belief, the structure was constructed in accordance with the approved plans and specifications."

The detention pond this refers to is the same that was approved on September 19, 1992, as part of the Phase I portion of this project. AES performed a very detailed survey at the start of the Phase II project; therefore the April 1997 plan can be used as the "As-Built" survey. This pond was not revised for the July 21, 1997 Phase II approval nor was it modified during construction of the project.

As this Detention/BMP facility was built in accordance with the 1992 plans that did not require inspection during construction, we will not be able to certify that it was inspected **during** construction. The following certification on the 1997 plans can be provided:

"I hereby certify to the best of my knowledge and belief that this Stormwater Management/BMP facility was constructed in accordance with the provisions of the approved design plan, specifications and stormwater management plan as approved on September 19, 1992 by James City County."

Assuming that statement is satisfactory, I will send over copies of our 1997 plan sheet containing the pond with the above certification added.

Sincerely yours,

AES Consulting Engineers

Richard A. Costello, P.E.
President

OK. SA.

cc: Bob Oliver (email only)

\\AES\Administration\jobs\7309\03\WordProc\Document\730903L02.rac.doc

OK SAT 3-14-02

DEVELOPMENT MANAGEMENT

101-E MOUNTS BAY ROAD, P.O. BOX 8784, WILLIAMSBURG, VIRGINIA 23187-8784
(757) 253-6671 Fax: (757) 253-6850 E-MAIL: devtman@james-city.va.us

CODE COMPLIANCE (757) 253-6626 codecomp@james-city.va.us
ENVIRONMENTAL DIVISION (757) 253-6670 environ@james-city.va.us
PLANNING (757) 253-6685 planning@james-city.va.us
COUNTY ENGINEER (757) 253-6678
INTEGRATED PEST MANAGEMENT (757) 259-4116

Reinspect 12-6-01 SAT

November 8, 2001

C. Lewis Waltrip II, Incorporated
Post Office Box 3522
Williamsburg, Virginia 23187
Attention: Mr. Stan Dykstra

Re: Project: Powhatan Office Park
BMP ID Code: PC 049
County Plan Numbers: SP-73-91 (Phase I) and S-41-97 (Phase II)

To Whom It May Concern:

Inspections of the above referenced project were conducted on October 30, 2001 by Scott Thomas, P.E., Civil Engineer, and November 8, 2001 by Beth Davis, Environmental Inspector, for possible release of the surety bond. Below are the items that need to be corrected prior to the release of the bond.

1. In accordance with Note # 18 on Sheet 4 of the approved Phase 2 plan (County Plan No. S-41-97), an as-built drawing and construction certification are required for the BMP facility upon completion. It does not appear an as-built or construction certification were provided. (Note: In addition, based on my review of the file for the Phase 1 plan, our comment # 2 dated August 14th 1991 for SP-73-91 required as-built drawings for the detention facility following completion. The engineer's response to this comment, via their response letter, item # 2 dated June 19, 1992 stated that when the detention basin is complete, as-built drawings will be provided.) Letter 3/8/02 Awaiting AB = Pt 2

2. Remove silt fence along the downstream toe of dam and from within the interior front and back portions of the basin (bottom).

✓ 3. Remove wood and paper trash and large concrete debris from along the downstream embankment surface. 12-6

✓ 4. Remove all trash from within the interior of the basin including large plastic toys, chairs, wood debris, carpets and tires. 12-6

✓ 5. Clean and remove trash, leaves, debris and sediment from the outfall ends of the 18 inch storm drain pipe and concrete paved flume which enter into the basin. Following 12-6

cleaning, re-establish outlet protection rock according to design specifications. Also clear and remove trees and vegetation from within 10 feet of the outfalls. Vegetation, sediment and trash shall not obstruct inflow into the basin.

✓ 12-6 6. Clear and remove vegetation from within 10 feet of the riser structure. Vegetation shall not obstruct flow into the riser.

✓ 12-6 7. Fill the 18 inch diameter, 2 foot deep drill boring hole present about one half way along the emergency spillway. This is a potential spot for erosion to begin should the emergency spillway experience flow.

✓ 12-6 8. The plywood baffle present in the bottom of the basin should remain to prevent short-circuiting of flow within the basin. However, this feature is in need of replacement or repair. Portions of the plywood sheeting were loose or detached from support posts. Remove any trees or dense vegetation along the baffle which threaten its integrity. (within 5 feet).

✓ 12-6 9. Remove dead grass and shrub clippings in the northeast corner of the basin near the storm drain inflow pipe.

✓ 12-6 In general, cattail vegetation in the front (north) part of the basin is very dense and obstructing flow from stormwater water conveyances into the facility, around the baffle and around the 48-inch riser pipe. This vegetation should be cleared to provide positive and unobstructed flow through the basin by clearing as necessary at the pipe and flume outfalls, along the baffle and around the riser.

You are welcome to schedule an appointment with an Environmental Inspector to discuss this matter further. Please contact our office if you have any questions or comments at (757) 253-6670.

Sincerely,

12-6 cmp capt pulled off Riser 3' deep clean inside

Darryl E. Cook, P.E.
Environmental Division Director

Beth Davis

From: Scott Thomas
Sent: Tuesday, January 29, 2002 9:41 AM
To: 'Bob Oliver'
Cc: Beth Davis
Subject: RE: Mulberry/ Powhatan Park

Hello Bob. Good to hear from you. I have not received anything recently to address outstanding issues for either of the projects.

Powhatan Office Park (PC049)
1. Items 1 & 2 from our letter dated November 8th still remain. Items 3-9 completed per reinspection 12-6-01.

Mulberry Place (PC137)
1. Need revised record drawings, to address comments # 2 - 5 per our comment letter dated Nov 19th 2001.
2. Item # 8 per (silt fence) not complete based on my reinspection 12-6-01.
3. Item # 13 (plantings) not complete based on reinspection.
4. Item # 15 not addressed (ie. riser-emerg spillway). I presume rework and record drawings will address this.
5. Item # 16 not addressed (ie. use of larger riser size). Have not received any hydraulics to confirm pond's performance due to riser size increase.
6. Item # 19 not addressed (ie. BMP access road/adjacent slope erosion) not addressed nor resolved. Although the plan may have not incorporated specific drainage control features, at a minimum any erosion at or along these areas needs corrected.

I think this should answer your questions. I think I will be performing a final inspection on Greensprings Plantation Clubhouse (PC 165) and the Greeensprings Plantation Maint Facility (JR 053) this week.

Scott J. Thomas, P.E.
James City County
Environmental Division

-----Original Message-----
From: Bob Oliver [mailto:boliver@tni.net]
Sent: Friday, January 25, 2002 1:20 PM
To: Scott Thomas
Subject: Mulberry/ Powhatan Park

Scott,
Have you received what you need from AES for Mulberry and Powhatan Park BMPs
Howard was supposed to right you a letter on the riser. Costello was going to write a letter on the as-builts for the Powhatan BMP.
Let me know what you still need.
Bob

Beth Davis

From: Scott Thomas
Sent: Thursday, November 08, 2001 2:16 PM
To: Beth Davis
Subject: Powhatan Office Park (Revised)

Project: Powhatan Office Park
BMP ID Code: PC 049
County Plan Numbers: SP-73-91 (Phase I) and S-41-97 (Phase II)

These would be my comments relative to the dry pond BMP at the back end of Powhatan Office Park.

1. In accordance with Note # 18 on Sheet 4 of the approved Phase 2 plan (County Plan No. S-41-97), an as-built drawing and construction certification are required for the BMP facility upon completion. It does not appear an as-built or construction certification were provided. (Note: In addition, based on my review of the file for the Phase 1 plan, our comment # 2 dated August 14th 1991 for SP-73-91 required as-built drawings for the detention facility following completion. The engineer's response to this comment, via their response letter, item # 2 dated June 19, 1992 stated that when the detention basin is complete, as-built drawings will be provided.)

2. Remove silt fence along the downstream toe of dam and from within the interior front and back portions of the basin (bottom).

3. Remove wood and paper trash and large concrete debris from along the downstream embankment surface.

4. Remove all trash from within the interior of the basin including large plastic toys, chairs, wood debris, carpets and tires.

5. Clean and remove trash, leaves, debris and sediment from the outfall ends of the 18 inch storm drain pipe and concrete paved flume which enter into the basin. Following cleaning, re-establish outlet protection rock according to design specifications. Also clear and remove trees and vegetation from within 10 feet of the outfalls. Vegetation, sediment and trash shall not obstruct inflow into the basin.

6. Clear and remove vegetation from within 10 feet of the riser structure. Vegetation shall not obstruct flow into the riser.

7. Fill the 18 inch diameter, 2 foot deep drill boring hole present about one half way along the emergency spillway. This is a potential spot for erosion to begin should the emergency spillway experience flow.

8. The plywood baffle present in the bottom of the basin should remain to prevent short-circuiting of flow within the basin. However, this feature is in need of replacement or repair. Portions of the plywood sheeting were loose or detached from support posts. Remove any trees or dense vegetation along the baffle which threaten it's integrity. (within 5 feet).

9. Remove dead grass and shrub clippings in the northeast corner of the basin near the storm drain inflow pipe.

In general, cattail vegetation in the front (north) part of the basin is very dense and obstructing flow from stormwater water conveyances into the facility, around the baffle and around the 48-inch riser pipe. This vegetation should be cleared to provide positive and unobstructed flow through the basin by clearing as necessary at the pipe and flume outfalls, along the baffle and around the riser.

Scott J. Thomas, P.E.
James City County
Environmental Division

CONSULTING ENGINEERS

5248 Olde Towne Road, Suite 1, Williamsburg, Virginia 23188

June 19, 1992

Mr. Michael A. Freda
James City County Planning Department
101-E Mounts Bay Road
Williamsburg, VA 23187

RE: Powhatan Office Park
AES Project No. 7309

Dear Michael:

To facilitate your review of this project, we are providing the following list of revisions which correspond to your review comments dated September 17, 1991:

PLANNING

1. Per section 20-14 of the Zoning Ordinance, the parking lot which was within the 15' landscape strip has now been moved back to leave a minimum of 15' to the property line.

2. Typical light fixtures are shown and labelled on the site plan.

3-9. All landscaping comments are either incorporated in the plans or addressed in the requests for modification letter to Marvin.

CODE COMPLIANCE

1. The owner is responsible for obtaining a Land Disturbing Permit and Siltation Agreement, with surety.

2. When the detention basin is complete, as-built drawings will be provided.

3. The owner has been informed to build the sediment basin prior to any other construction upon receipt of the Land Disturbing Permit.

4. The owner is also responsible for executing an Inspection/Maintenance Agreement with the County for the detention basin.

Paul C. Small, P.E., P.L.S. • Richard A. Costello, P.E. • Andrew M. Snyder, P.E.
G. T. Wilson, Jr., C.L.S. • G. Archer Marston, III, P.E. • Steven O. Wigley, P.E. • G. Donald Gartrell III, P.E.
804-253-0040 FAX 804-220-8994

5. All pertinent information for the pond has been labelled.

6. Construction easements for natural open space is shown on the site plan.

COUNTY ENGINEER

1-2. When we submit the plan, natural open space in a conservation easement to James City County will clearly be labelled and described.

SERVICE AUTHORITY

1. All water meter sizes are labelled on the utility sheet.

VDOT

1. The paved ditch on Ingram Road has been extended in lieu of rip-rap.

If you have any further comments, please feel free to contact us at your convenience.

Sincerely,

AES Consulting Engineers

Howard W. Price

Howard W. Price
Designer

HWP:lcb
7309F19.HWP

Scott Thomas

From: Scott Thomas
Sent: Tuesday, April 30, 2002 2:42 PM
To: 'rcostello@aesva.com'
Subject: Powhatan Office Park

Rich

We are trying to close out the project for Phase I of Powhatan Office Park, County Project SP-73-91. Phase II (S-41-97) has been closed out already.

In order to do so, I need the 1997 plan sheet with the statement that you indicated on your March 8th 2002 letter to me. In case you have forgotten, we decided that the Phase II plan with the statement per your March 8th letter (AES 730903L02.rac.doc) would suffice as the record drawing for Phase I of the project.

Please forward ~~to~~ the drawing to our office to my attention so I can review and proceed with closeout.

Scott J. Thomas, P.E.
James City County
Environmental Division

Scott Thomas

From: Scott Thomas
Sent: Thursday, July 19, 2001 5:36 PM
To: Beth Davis
Subject: Powhatan Office Park

I reviewed the case file for Powhatan Office Park (SP-73-91; amend SP-110-96) and updated the BMP databases. Although I could not find our standard as-built drawing/construction certification (or any other kind of similar note) on the plans requiring an "as-built" plan; I did find 3 separate correspondences in the file which required as-builts for the facility.

1. Comments from Code Compliance (DEC) dated Sept 20th 1989 under site plan review for SP-107-89 John Tyler Office Park. Comment # 2 required as-builts.
2. Comments from Code Compliance (DEC) dated August 14th 1991 under site plan review for SP-73-91 Powhatan Office Park. Comment # 2 required as-builts.
3. A response letter from AES dated June 19th 1992, which addresses Code Compliance comment # 2 dated Sept 17th 1991 by saying " when the detention basin is complete, as-built drawings will be provided.

Therefore, I would require as-built drawings for this facility as it was requested as a condition of the plan approval.

I created an "as-built" file for the project under Powhatan Creek PC 049 and put the active file back in Joan's files. I put a copy of the correspondences above in your box.

Scott

CONSULTING ENGINEERS

5248 Olde Towne Road, Suite 1, Williamsburg, Virginia 23188

DARRYL cook

June 15, 1992

Mr. Bernard M. Farmer, Jr.
Director of Code Compliance
James City County
P.O. Box JC
Williamsburg, Virginia 23187

RE: Powhatan Office Park
AES Project No. 7309

Dear Bernie:

AES Consulting Engineers, on behalf of C. Lewis Waltrip, II, Inc. respectfully requests an exception to the stormwater management plan for a 10 point BMP. Having spent the last month examining several alternatives with Darryl Cook, we derived that 10 points can not feasibly be achieved for final development of this site.

Our site is 2.98 Ac.± with 1.97 Ac.± draining to an extended dry pond with a marshy bottom. Included in this 1.97 Ac.± is nearly all the impervious area and all new development for phases one and two. This yields 5.95 points of our 10 needed, however, even if we were to put the remainder of the site in a natural open space easement, we could only obtain 3.39 more points for a total of 9.34 points. This solution appears to be the most logical of all the alternatives we studied. Consequently, we feel we meet the intent of the law.

Please review this plan and advise me of your decision on this exception at your earliest convenience.

Respectfully requested,

AES Consulting Engineers

Howard W. Price
Designer

cc: Mr. Darryl Cook
Mr. Wayland Bass

HWP/jlc
7309F12.HWP

Paul C. Small, P.E., P.L.S. • Richard A. Costello, P.E. • Andrew M. Snyder, P.E.
G. T. Wilson, Jr., C.L.S. • G. Archer Marston, III, P.E. • Steven O. Wigley, P.E. • G. Donald Gartrell III, P.E.
804-253-0040 FAX 804-220-8994

WATERSHED	PC	MAINTENANCE PLAN	No	CTRL STRUC DESC	RCP Riser
BMP ID NO	049	SITE AREA acre	2.983	CTRL STRUC SIZE inches	48
PLAN NO	SP-73-91	LAND USE		OTLT BARRL DESC	RCP Barrel
TAX PARCEL	(47-1)(1-31D)	old BMP TYP	Dry Pond	OTLT BARRL SIZE inch	18
PIN NO	4710100031D	JCC BMP CODE			
CONSTRUCTION DATE	1/1/1992	POINT VALUE	9	EMERG SPILLWAY	Yes
PROJECT NAME	Powhatan Office Park			DESIGN HW ELEV	76.77
FACILITY LOCATION	3204 Ironbound Road			PERM POOL ELEV	None
CITY-STATE	Williamsburg, Va. 23188	SVC DRAIN AREA acres	1.93	2-YR OUTFLOW cfs	288.00
CURRENT OWNER	C. Lewis Waltrip II			10-YR OUTFLOW cfs	2.88
OWNER ADDRESS	129 Roger Smith			REC DRAWING	No
OWNER ADDRESS 2		SERVICE AREA DESCRI	Phase 1&2 Building & Parking		
CITY-STATE-ZIP CODE	Williamsburg, Va. 23185	IMPERV AREA acres	1.97	CONSTR CERTI	No
OWNER PHONE		RECV STREAM	UT of Powhatan Creek		
MAINT AGREEMENT	Yes	EXT DET-WQ-CTRL	Yes	LAST INSP DATE	9/13/2000
		WTR QUAL VOL acre-ft	0.0969		
EMERG ACTION PLAN	No			INTERNAL RATING	2
		CHAN PROT CTRL	No	MISC/COMMENTS	
		CHAN PROT VOL acre-ft	0	Bond not Released yet. Phase 2 SP-41-97.	
		SW/FLOOD CONTROL	Yes		
		GEOTECH REPORT	No		

Get Last BMP No

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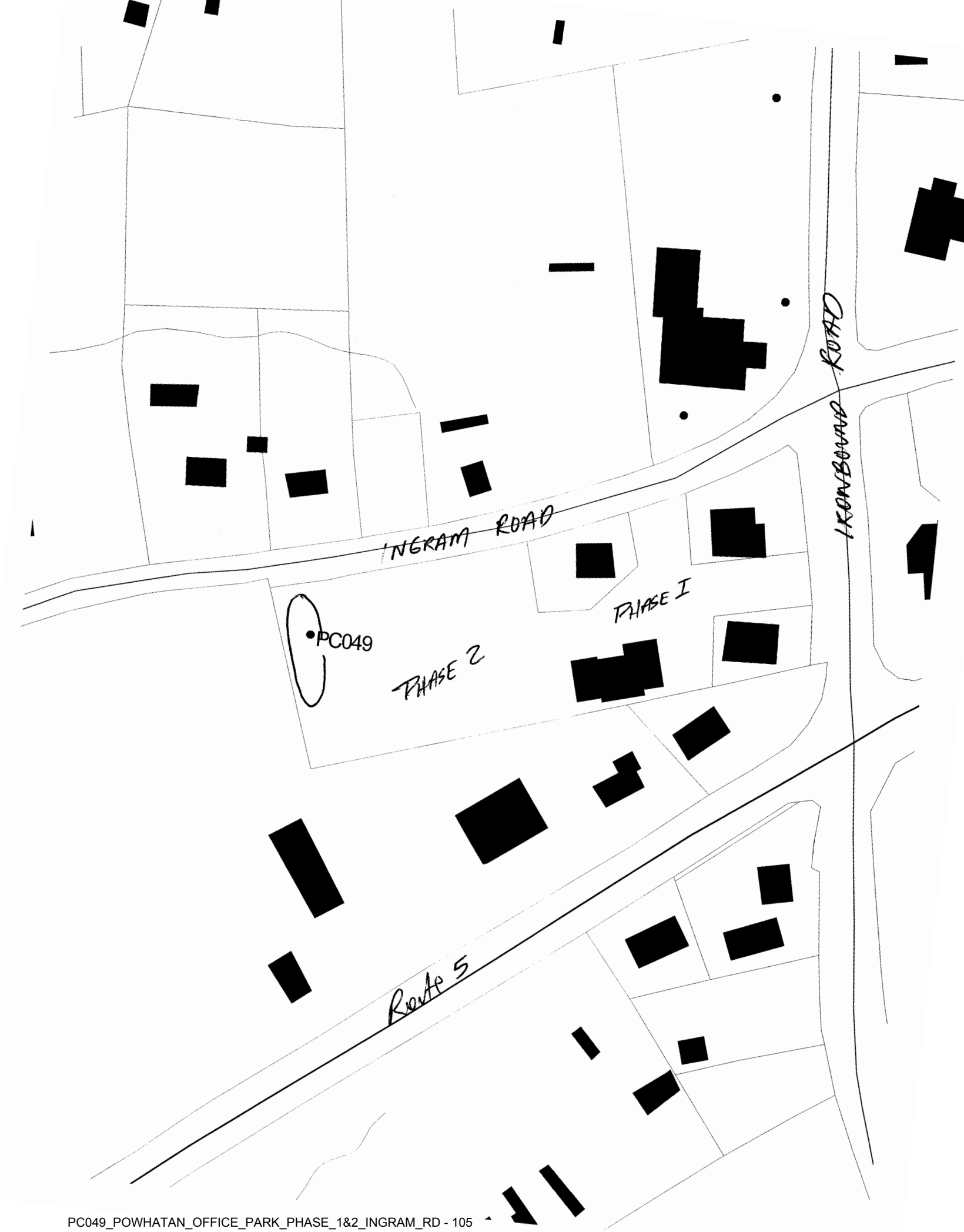
INGRAM ROAD
CAPE COD ROAD
PC049
PHASE 2
PHASE I
Route 5

CODE COMPLIANCE PLAN REVIEW COMMENTS
POWHATAN OFFICE PARK
PLAN NO. SP-73-91 DEC
August 14, 1991

1. A Land Disturbing Permit and Siltation Agreement, with surety, are required for this project.

2. As-built drawings shall be provided for the detention basin upon completion.

3. The Land Disturbing Permit when issued will require construction of the sediment basin prior to any other construction activities on the remainder of the project.

4. An Inspection/Maintenance Agreement shall be executed with the County for the detention basin prior to final site plan approval.

5. Specify the bottom evaluation of the pond on the plan.

6. The areas of natural open space must be identified on the plan and shown in conservation easements.

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5156c

CODE COMPLIANCE PLAN REVIEW COMMENTS
JOHN TYLER OFFICE PARK
PLAN NO. SP-107-89 DEL
September 20, 1989

1. A Land Disturbing Permit and Siltation Agreement, with surety, are required for this project.

2. As-built drawings shall be provided for the detention basin upon completion.

3. A preconstruction conference shall be held on-site between the County, the Developer, the Project Engineer and the Contractor prior to issuance of a Land Disturbing Permit.

4. The Land Disturbing Permit when issued will require construction of the sediment basin prior to any other construction activities on the remainder of the project.

5. Provide another streetlight on the project entrance from Ironbound Road.

6. There is not an existing culvert at the end of the proposed paved ditch along Ingram Road. Either install a culvert or extend the paved ditch approximately 50 feet to provide positive drainage along the road. Provide drainage calculations for the drainage ditch.

7. Use concrete retaining wall rather than timber to construct the detention basin. Also provide a fence around the basin as a safety feature because of the vertical drop involved. Recommend using a modular concrete retaining wall system.

8. Provide silt fence behind the proposed building on Parcel B and along Ironbound Road in those areas where grading is to occur on parcels A and B near the road.

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PC 049 PC 049

POWHATAN OFFICE PARK

SP-73-91 SP-110-96

2.983AC DH1 1.68VAC

2.15TAC 2 1.126AC

0.87AC imperv I/MAIN-YES

ZONED B1 GEN BUS

GPIN 4710100031D

3201 Ironbound Rd

Spencer Brother Builders Inc

3630 G.W MEM HWY Suite H

Yorktown VA 23693