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: **PC003**

DATE VERIFIED: **May 24, 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: PC003

PIN: 3110800001C

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

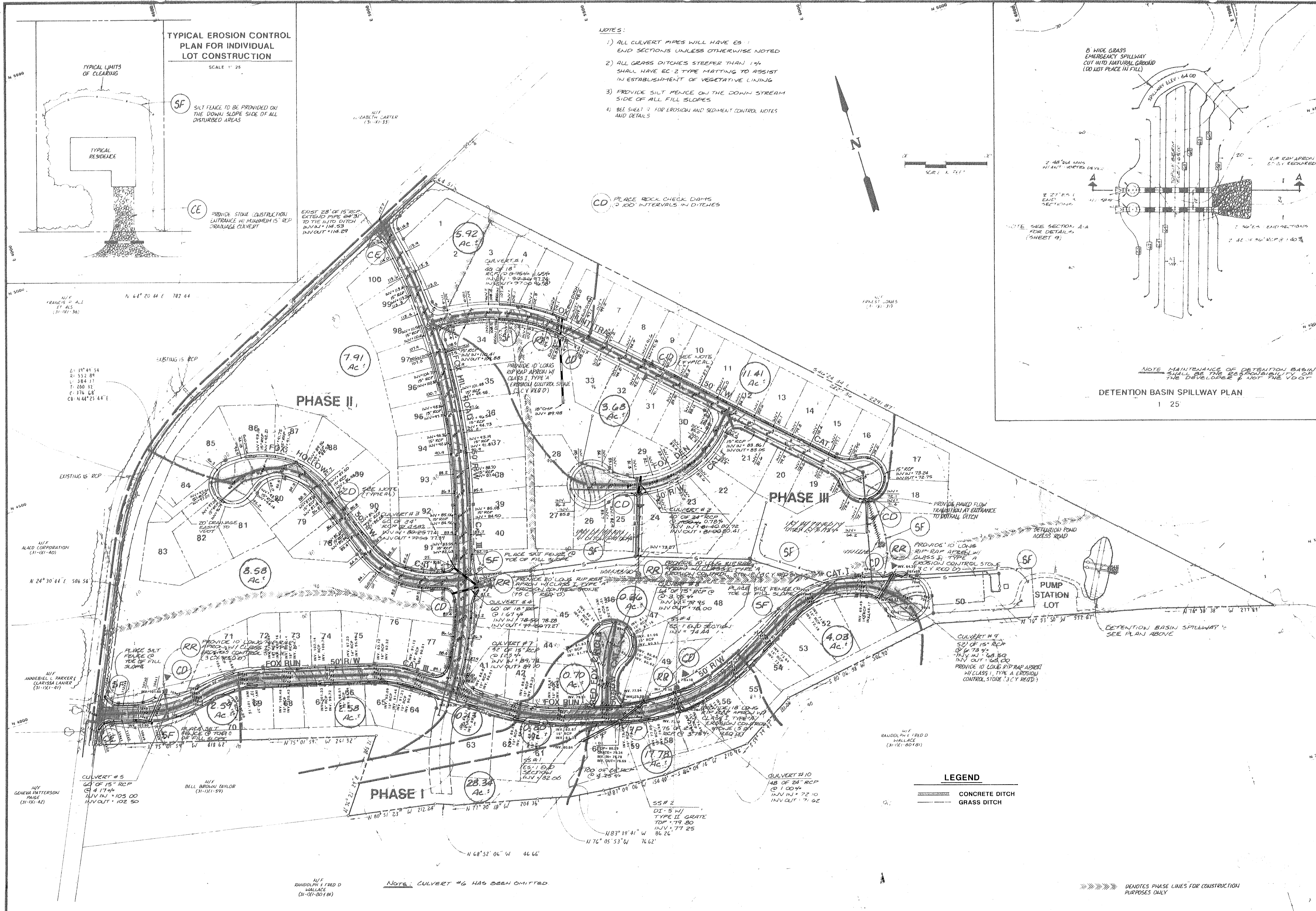
Property Description: Rec Area Parcel 3 Fox Ridge

Site Address: 3955 Fox Hunt Trail

(For internal use only) **Box** 1 **Drawer:** 1

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

Comments



PHASE I DRAINAGE "AS-BUILTS" 10/10/91

PHASE III DRAINAGE "AS-BUILTS" 12/11/92

PHASE II DRAINAGE "AS-BUILTS" 12/21/92

COMMONWEALTH OF VIRGINIA
G. ARCHER MAISTON III
No. 018232
PROFESSIONAL ENGINEER

AES, a professional corporation
1761 Jamestown Road
Williamsburg, Virginia 23185
804-253-0040
Engineering, Planning, Surveying

DRAINAGE AND SEDIMENT & EROSION CONTROL PLAN
FOX RIDGE

OWNER/DEVELOPER: FERRELL GENERAL CONSTRUCTION CORPORATION

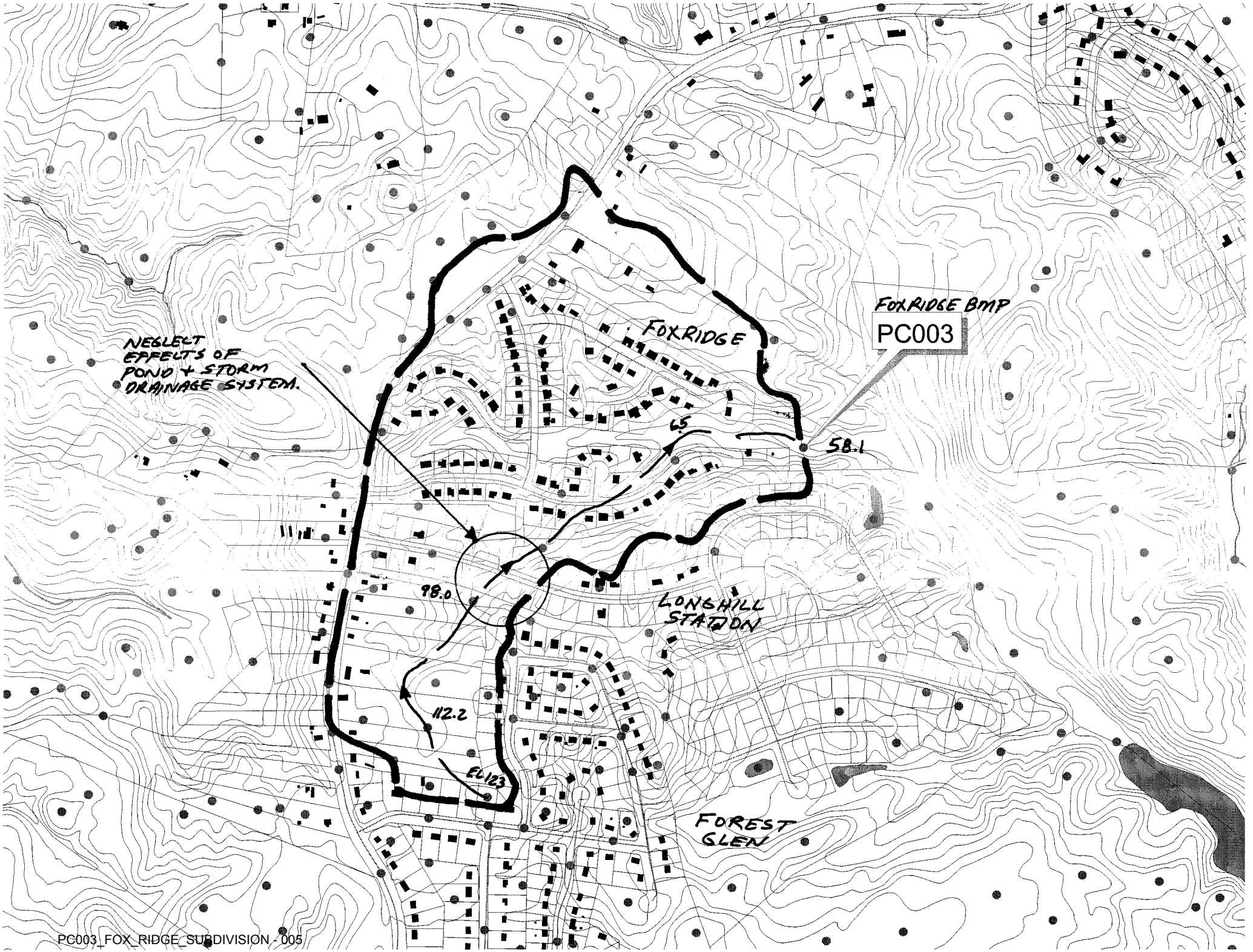
JAMES CITY COUNTY, VIRGINIA

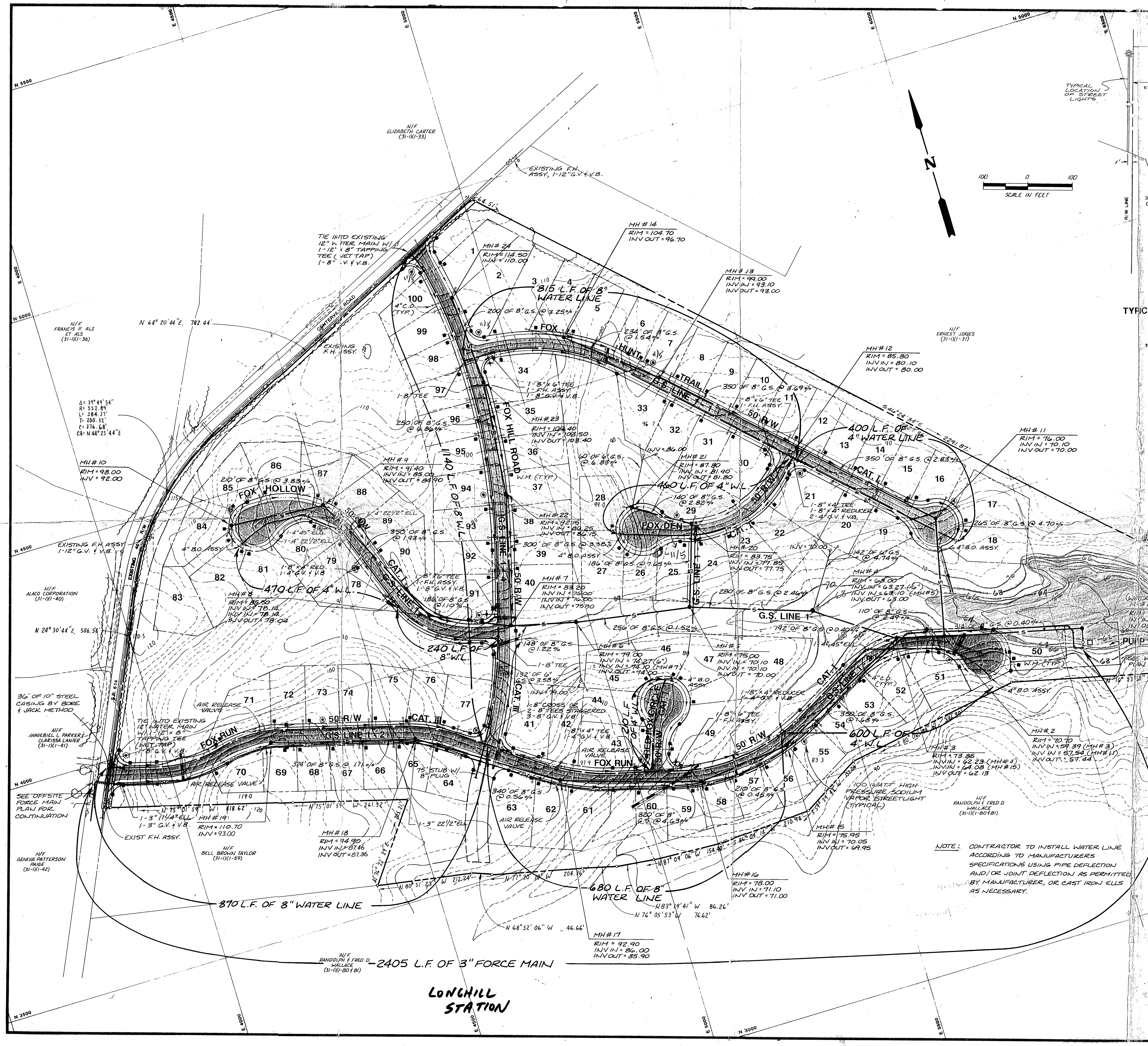
Designed	Drawn
HWP	AES
Scale 1"=100'	Date OCT. 1988
Project No. 7105	
Drawing No. 4	

PC 003

PC003_FOX_RIDGE_SUBDIVISION - 003

PC003_FOX_RIDGE_SUBDIVISION - 004


FOXRIDGE BMP
PC003
NEGLECT EFFECTS OF POND + STORM DRAINAGE SYSTEM.
FOXRIDGE
65
58.1
98.0
LONGHILL STATION
112.2
EL 123
FOREST GLEN



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3	5/17/89	REVISED PER J.C.C. & V.D.O.T. COMMENTS	GAM
2	3/2/89	REVISED PER J.C.C., V.D.O.T. & V.D.O.H. COMMENTS	GAM
1	12/9/88	REVISED PER JCC COMMENTS	GAM

COMMONWEALTH OF VIRGINIA
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UTILITY PLAN
FOX RIDGE

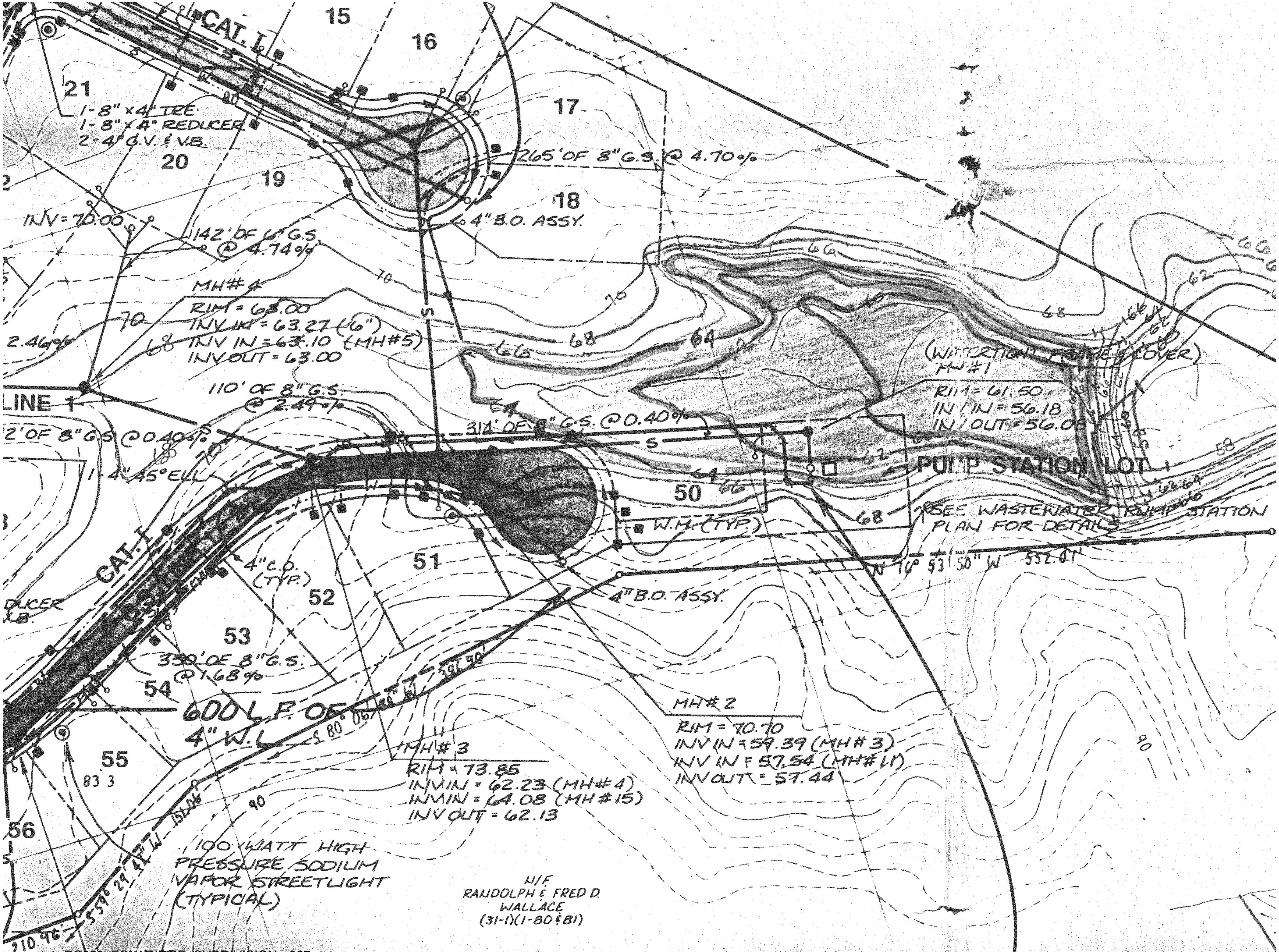
OWNER/DEVELOPER: FERRELL GENERAL CONSTRUCTION CORPORATION

JAMES CITY COUNTY VIRGINIA

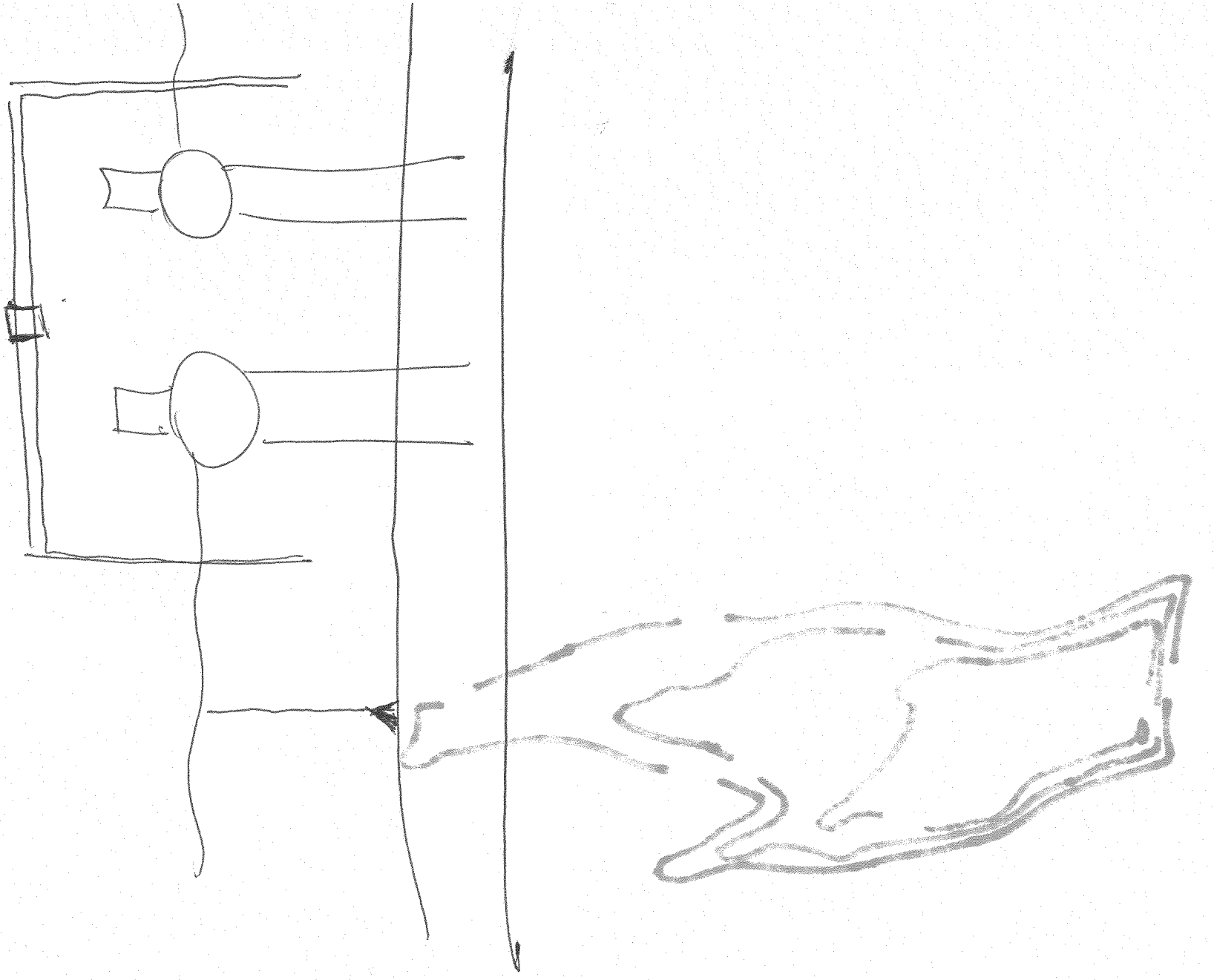
Designed	Drawn
GAM/HWP	AES
Scale	Date
1"=100'	OCT. 1988

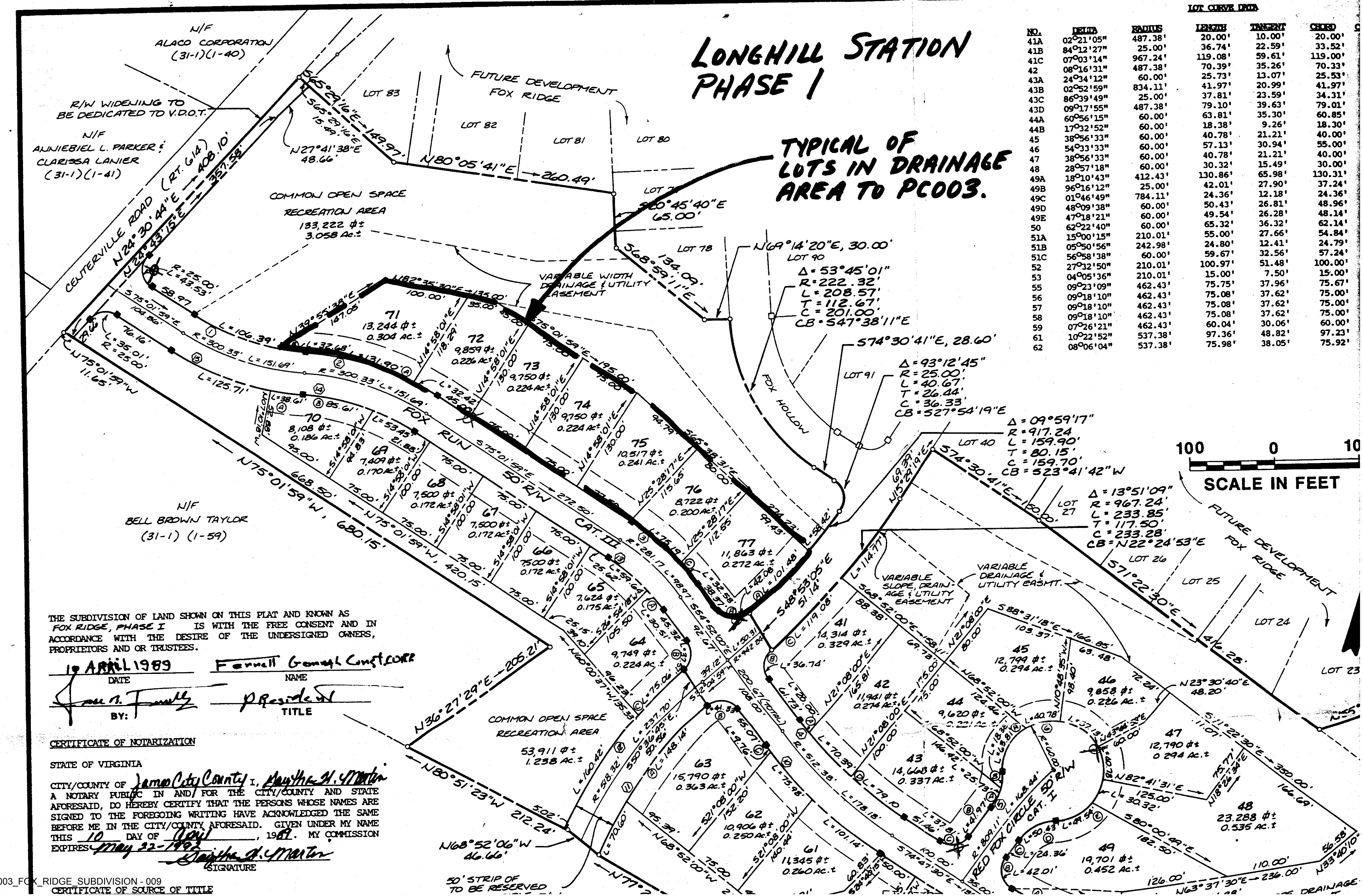
Project No. 7105

Drawing No. 3



CAT. I
15
16
17
21
1-8" x 4" TEE
1-8" x 4" REDUCER
2-4" G.V. & V.B.
20
19
265' OF 8" G.S. @ 4.70%
18
INV = 70.00
142' OF 6" G.S. @ 4.74%
4" B.O. ASSY.
MH#4
RIM = 68.00
INV IN = 63.27 (6")
INV IN = 63.10 (MH#5)
INV OUT = 63.00
2.46%
110' OF 8" G.S. @ 2.49%
LINE 1
2' OF 8" G.S @ 0.40%
1-4" 45° ELL
314' OF 8" G.S. @ 0.40%
(WATERTIGHT FRAME & COVER)
MH#1
RIM = 61.50
IN / IN = 56.18
IN / OUT = 56.08
PUMP STATION LOT
50
SEE WASTEWATER PUMP STATION PLAN FOR DETAILS
W.M. (TYP.)
51
N 16° 53' 50" W 532.01'
4" C.O. (TYP.)
52
4" B.O. ASSY.
DUCER
53
350' OF 8" G.S. @ 1.68%
54
600 L.F. OF 4" W.L.
MH#2
RIM = 70.70
INV IN = 59.39 (MH#3)
INV IN = 57.54 (MH#11)
INV OUT = 57.44
55
MH#3
RIM = 73.85
INV IN = 62.23 (MH#4)
INV IN = 64.08 (MH#15)
INV OUT = 62.13
56
100 WATT HIGH PRESSURE SODIUM VAPOR STREETLIGHT (TYPICAL)
N/F
RANDOLPH & FRED D.
WALLACE
(31-1)(1-80 & 81)
210.96'





LOT CURVE DATA

NO.	DELTA	RADIUS	LENGTH	TANGENT	CHORD
41A	02°21'05"	487.38'	20.00'	10.00'	20.00'
41B	84°12'27"	25.00'	36.74'	22.59'	33.52'
41C	07°03'14"	967.24'	119.08'	59.61'	119.00'
42	08°16'31"	487.38'	70.39'	35.26'	70.33'
43A	24°34'12"	60.00'	25.73'	13.07'	25.53'
43B	02°52'59"	834.11'	41.97'	20.99'	41.97'
43C	86°39'49"	25.00'	37.81'	23.59'	34.31'
43D	09°17'55"	487.38'	79.10'	39.63'	79.01'
44A	60°56'15"	60.00'	63.81'	35.30'	60.85'
44B	17°32'52"	60.00'	18.38'	9.26'	18.30'
45	38°56'33"	60.00'	40.78'	21.21'	40.00'
46	54°33'33"	60.00'	57.13'	30.94'	55.00'
47	38°56'33"	60.00'	40.78'	21.21'	40.00'
48	28°57'18"	60.00'	30.32'	15.49'	30.00'
49A	18°10'43"	412.43'	130.86'	65.98'	130.31'
49B	96°16'12"	25.00'	42.01'	27.90'	37.24'
49C	01°46'49"	784.11'	24.36'	12.18'	24.36'
49D	48°09'38"	60.00'	50.43'	26.81'	48.96'
49E	47°18'21"	60.00'	49.54'	26.28'	48.14'
50	62°22'40"	60.00'	65.32'	36.32'	62.14'
51A	15°00'15"	210.01'	55.00'	27.66'	54.84'
51B	05°50'56"	242.98'	24.80'	12.41'	24.79'
51C	56°58'38"	60.00'	59.67'	32.56'	57.24'
52	27°32'50"	210.01'	100.97'	51.48'	100.00'
53	04°05'36"	210.01'	15.00'	7.50'	15.00'
55	09°23'09"	462.43'	75.75'	37.96'	75.67'
56	09°18'10"	462.43'	75.08'	37.62'	75.00'
57	09°18'10"	462.43'	75.08'	37.62'	75.00'
58	09°18'10"	462.43'	75.08'	37.62'	75.00'
59	07°26'21"	462.43'	60.04'	30.06'	60.00'
61	10°22'52"	537.38'	97.36'	48.82'	97.23'
62	08°06'04"	537.38'	75.98'	38.05'	75.92'

THE SUBDIVISION OF LAND SHOWN ON THIS PLAT AND KNOWN AS *FOX RIDGE, PHASE I* IS WITH THE FREE CONSENT AND IN ACCORDANCE WITH THE DESIRE OF THE UNDERSIGNED OWNERS, PROPRIETORS AND OR TRUSTEES.

10 APRIL 1989 — DATE
Ferrell General Construction — NAME
BY: [signature] — President — TITLE

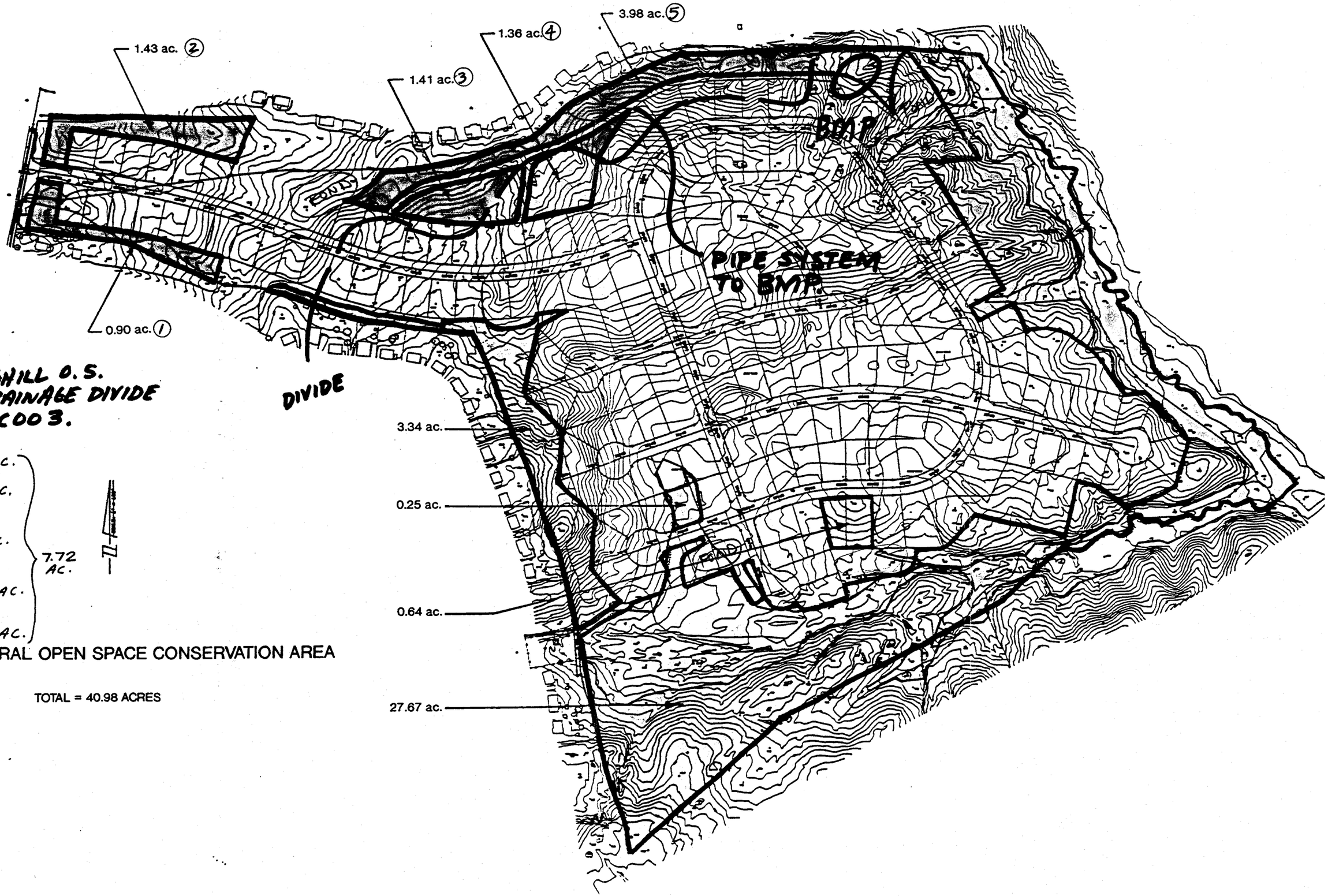
CERTIFICATE OF NOTARIZATION

STATE OF VIRGINIA

CITY/COUNTY OF James City County I, Maythe H. Martin A NOTARY PUBLIC IN AND FOR THE CITY/COUNTY AND STATE AFORESAID, DO HEREBY CERTIFY THAT THE PERSONS WHOSE NAMES ARE SIGNED TO THE FOREGOING WRITING HAVE ACKNOWLEDGED THE SAME BEFORE ME IN THE CITY/COUNTY AFORESAID. GIVEN UNDER MY NAME THIS 10 DAY OF April, 1989. MY COMMISSION EXPIRES May 22-1992

[signature]
SIGNATURE

CERTIFICATE OF SOURCE OF TITLE

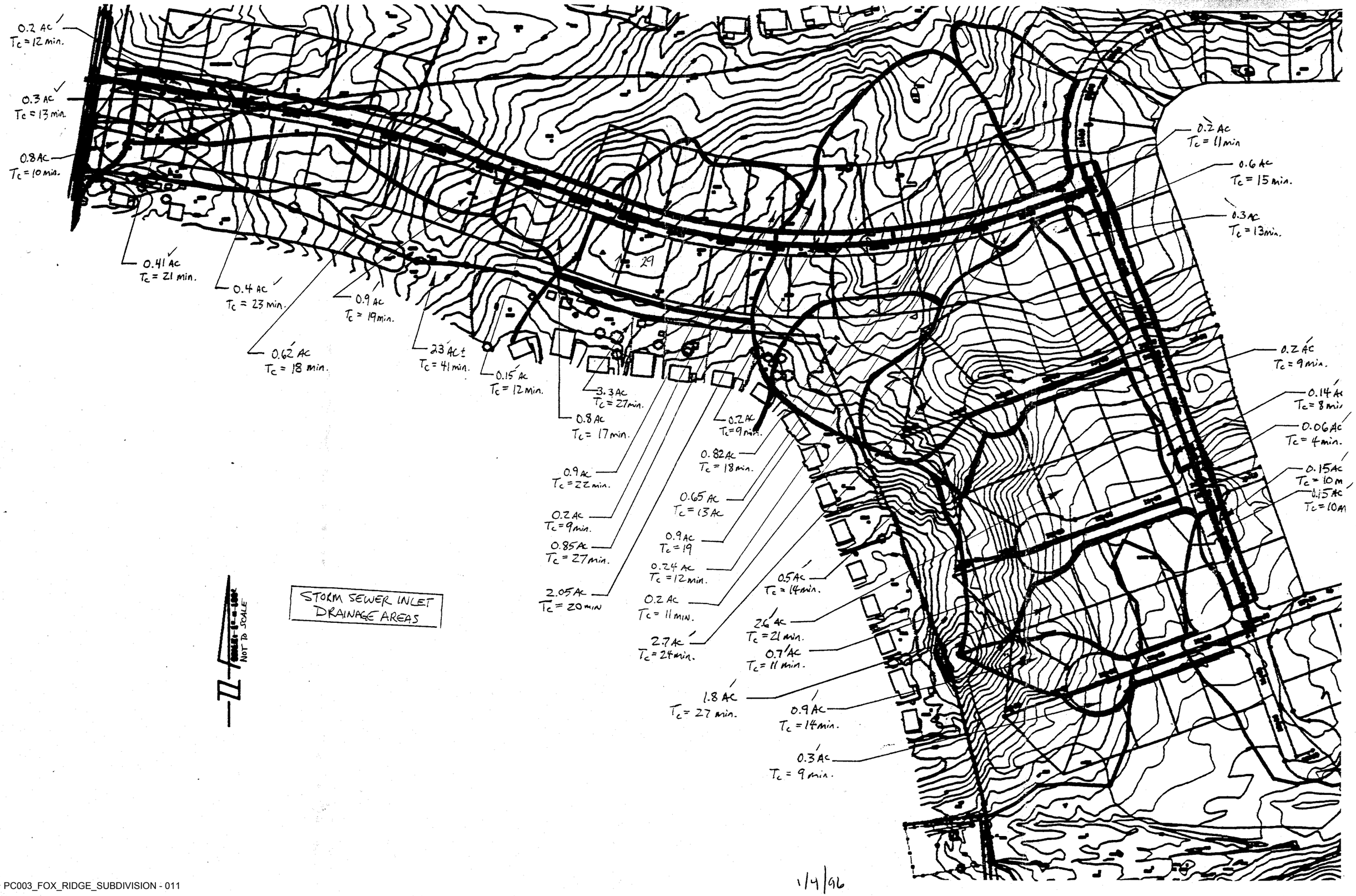


LONGHILL O.S.
IN DRAINAGE DIVIDE
TO PC003.

(1)	0.90AC.	
(2)	1.43AC.	
(3)	1.41AC.	7.72 AC.
(4)	0.00 AC.	
(5)	3.98AC.	

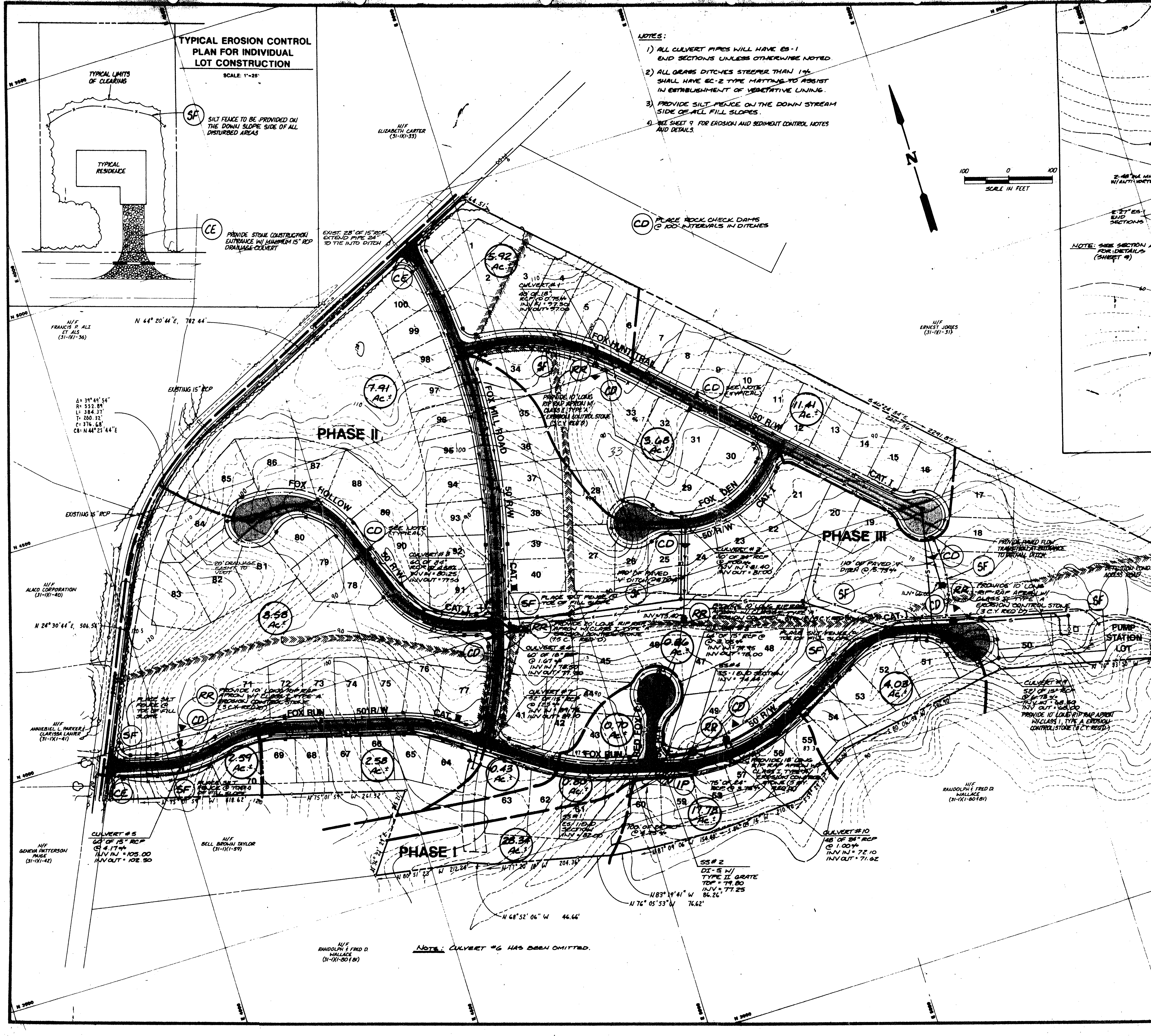
NATURAL OPEN SPACE CONSERVATION AREA

TOTAL = 40.98 ACRES



STORM SEWER INLET
DRAINAGE AREAS

1/4/96



AES, a professional corporation
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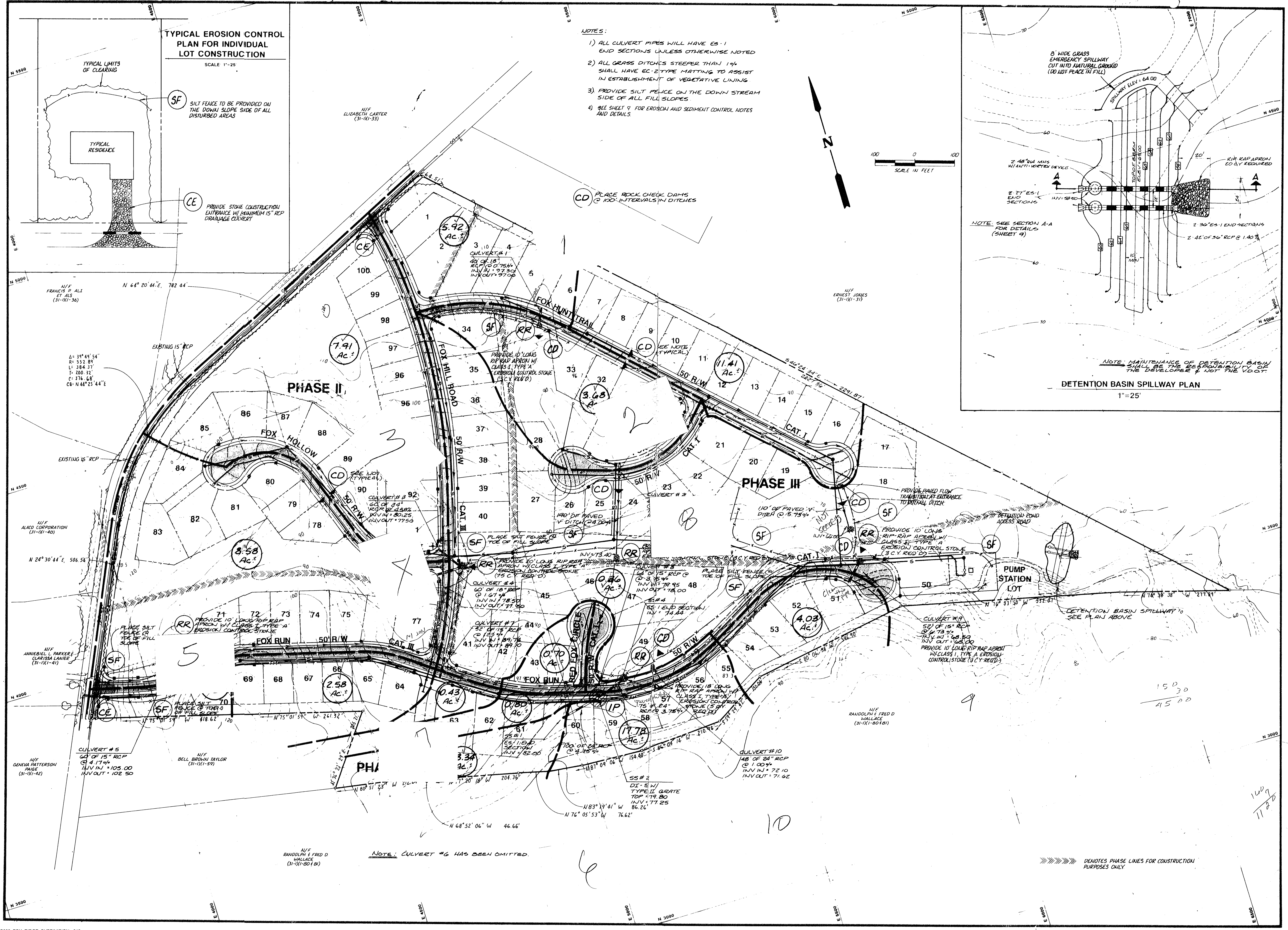
Engineering, Planning, Surveying

COMMONWEALTH OF VIRGINIA — PROFESSIONAL ENGINEER

DRAINAGE AND SEDIMENT & EROSION CONTROL PLAN
FOX RIDGE
OWNER/DEVELOPER: FERRELL GENERAL CONSTRUCTION CORPORATION
JAMES CITY COUNTY, VIRGINIA

Designed	Drawn
HWP	AES
Scale	Date
1"=100'	OCT. 1988

Project No. 7105
Drawing No. 4



No.	DATE	REVISION / COMMENT / NOTE	BY
3	5/17/89	REVISED PER JCC & VDOT COMMENTS	GAM
2	3/27/89	REVISED PER JCC, VDOT & VDOH	GAM
1	12/9/88	REVISED PER JCC COMMENTS	GAM

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

AES, a professional corporation
1761 Jamestown Road
Williamsburg, Virginia 23185
804-253-0040
Engineering, Planning, Surveying

DRAINAGE AND SEDIMENT & EROSION CONTROL PLAN

FOX RIDGE

OWNER/DEVELOPER: FERRELL GENERAL CONSTRUCTION CORPORATION

JAMES CITY COUNTY VIRGINIA

Designed	Drawn
HWP	AES
Scale 1"=100'	Date OCT. 1988
Project No. 7105	
Drawing No. 4	

PC003_FOX_RIDGE_SUBDIVISION - 013

Erosion and Sediment Control Notes

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

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

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

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

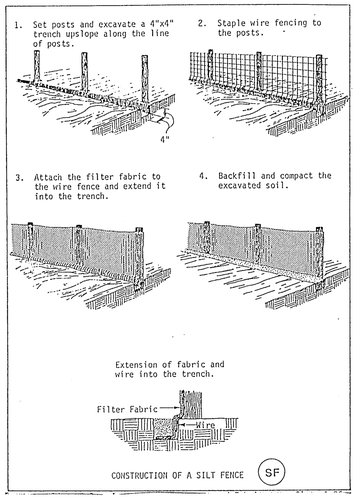
15. Temporary liners, such as polyethylene sheets, shall be provided for all paved ditches until the permanent concrete liner is installed.

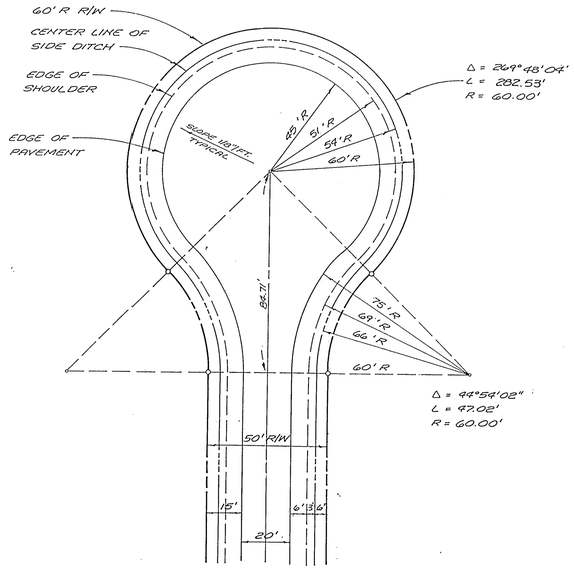
16. Paved ditches shall be required wherever erosion is evident. Particular attention shall be paid to those areas where grades exceed 3%.

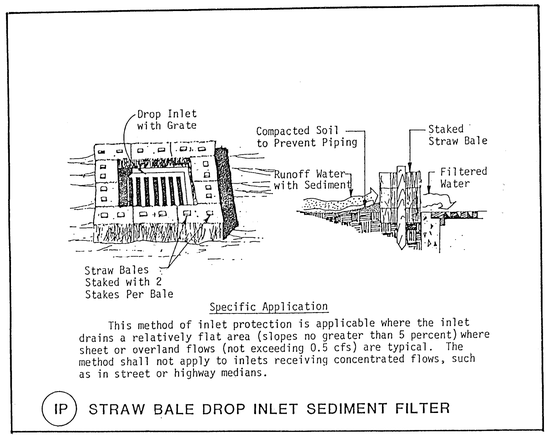
17. Temporary erosion control measures are not to be removed until all disturbed areas are stabilized. After stabilization is complete, all measures shall be removed within 30 days. Trapped sediment shall be spread and seeded.

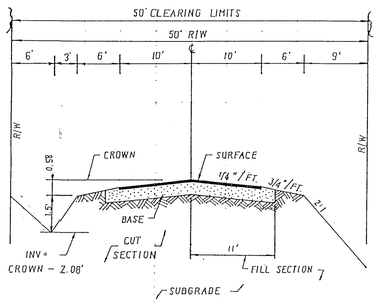
18. Off-site waste or borrow areas shall be approved by James City County prior to the import of any borrow or export of any waste to or from the project site.

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









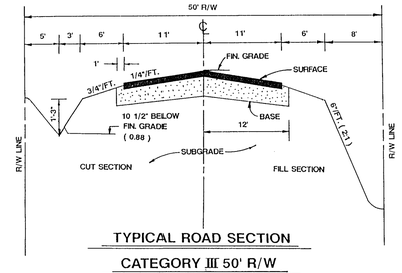
TYPICAL SECTION - CATEGORY I, 50' R/W

SCALE 1"=10' HORIZONTAL, 1"= 3' VERTICAL

1. PROVIDE 2-10' LANES, PAVEMENT WIDTH = 20', SLOPE = 1/4" / FOOT.
2. PROVIDE 6' SHOULDER WIDTH, SLOPE = 3/4" / FOOT.
3. SUBGRADE - CBR OF 10 OR GREATER.
4. BASE 6" OF AGGREGATE; BASE MATERIAL (TYPE I OR TYPE II) OR 4" OF CRUSHER RUN, & 3" OF BITUMINOUS CONCRETE (TYPE B-1).
5. SURFACE - 1 1/2" BITUMINOUS CONCRETE (S-5) OR PRIME AND DOUBLE SEAL.
6. SIDE SLOPES - 6" PER FOOT (2:1) MAXIMUM.

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.
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.



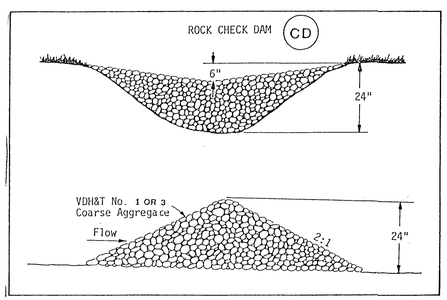
TYPICAL ROAD SECTION

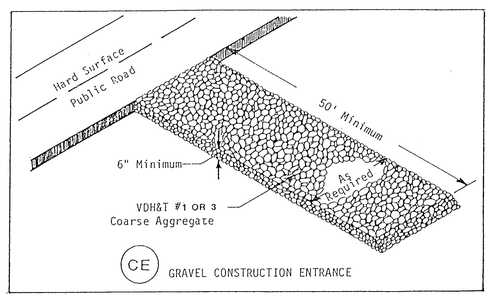
CATEGORY III 50' R/W

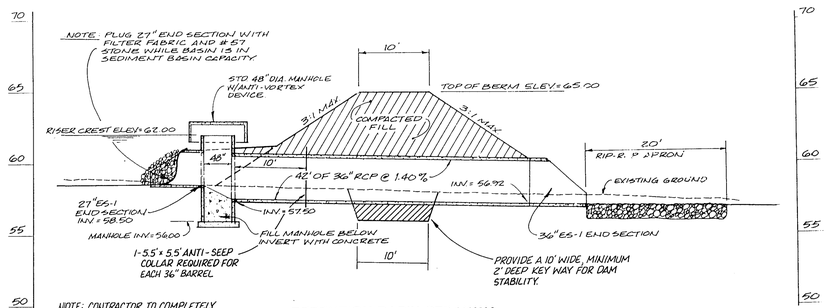
1" = 10' HORIZONTAL
1" = 2' VERTICAL

CATEGORY III - 50' R/W

1. PROVIDE 2-11' LANES, PAVEMENT WIDTH = 22', SLOPE = 1/4" PER. FT.
2. PROVIDE 6' SHOULDER WIDTH, SLOPE = 3/4" PER. FT.
3. SUBGRADE - CBR OF 10 OR GREATER.
4. BASE - 10"OF AGGREGATE BASE MATERIAL (TYPE I OR TYPE II) OR 8" OF CRUSHER RUN OR 4" OF BITUMINUOUS CONCRETE (TYPE B-1 OR B-3)
5. SURFACE-PRIME AND DOUBLE SEAL OR 1" BITUMINUOUS CONCRETE (S-5).
6. SIDE SLOPES - 6" PER. FT. (2:1) MAXIMUM , MAY VARY AS FIELD CONDITIONS PERMIT.







NOTE: CONTRACTOR TO COMPLETELY CLEAR, GRUB AND REMOVE UNSUITABLE MATERIAL FROM DAM AREA PRIOR TO PLACING FILL MATERIAL

DETENTION BASIN SPILLWAY SECTION A - A

SCALE:
1" = 5' VERTICAL
1" = 10' HORIZONTAL

NOTE: DUAL INSTALLATION REQUIRED (SEE PLAN VIEW)

No	DATE	REVISION / COMMENT / NOTE	BY
3	5/1/89	REVISED PER JCC & VDOT COMMENTS	GAM
2	3/15/89	REVISED PER JCC, VDOT & VDH COMMENTS	GAM
1	12/19/88	REVISED PER JCC COMMENTS	GAM

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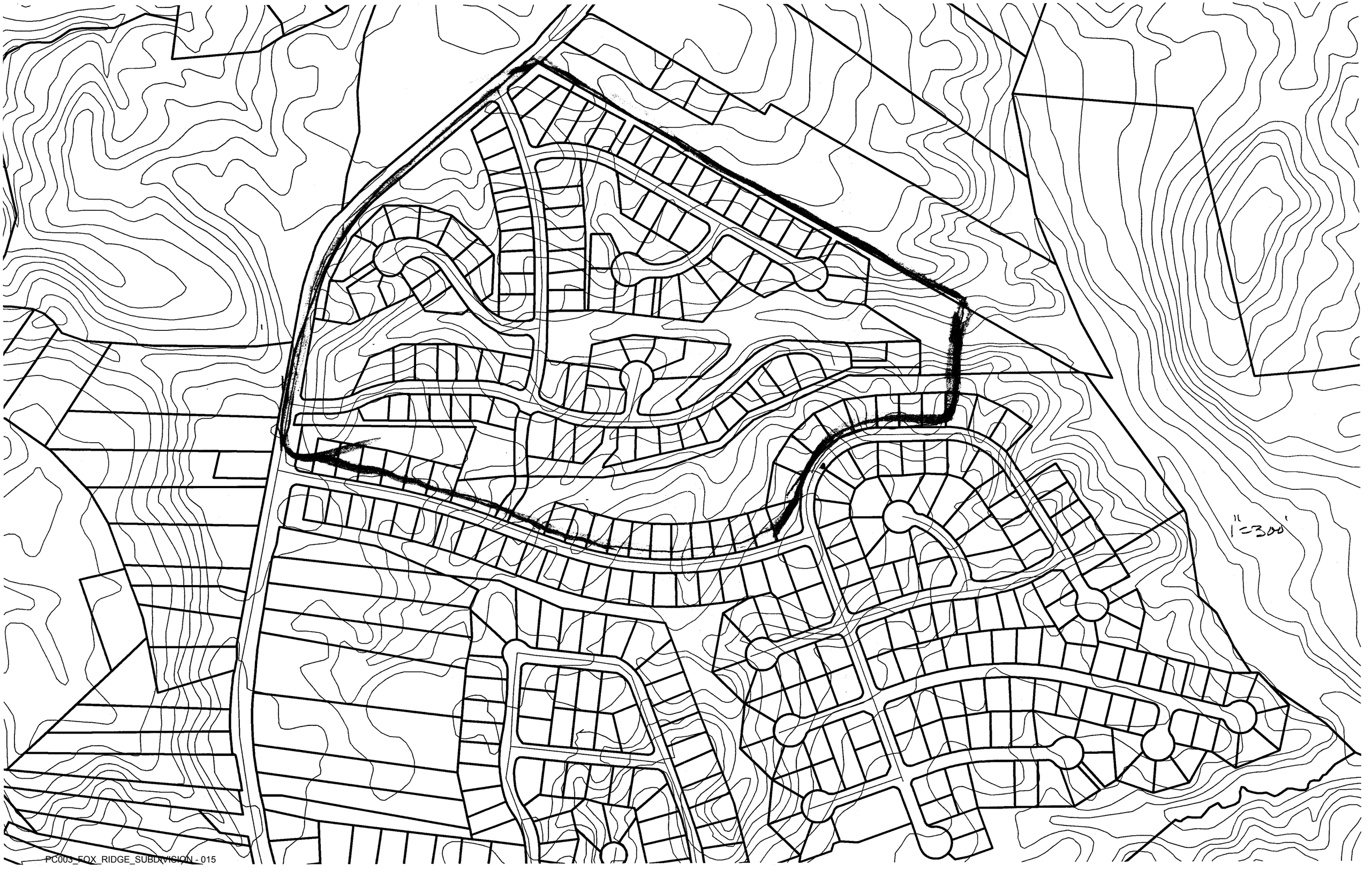
NOTES AND DETAILS

FOX RIDGE

OWNER/DEVELOPER: FERRELL GENERAL CONSTRUCTION CORPORATION

JAMES CITY COUNTY VIRGINIA

Designed	Drawn
—	CMA
Scale NOTED	Date OCT. 1988
Project No. 7105	
Drawing No. 9	


1"=300'

DEVELOPMENT MANAGEMENT

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FOX RIDGE (PC 003, 5-3-90) BMP ANALYSES

- SITE DRAINAGE AREA FROM DRAINAGE PLAN (FOXRIDGE)

  5.92 + 11.41 + 3.68 + 7.91 + 8.58 + 2.59 + 2.58 + 0.43 + 0.36 + 0.70 + 0.80 + 28.34 + 17.78 + 4.03 = 95.11 AC.

- COUNTY GIS (ADJUSTED FOR STORM DRAINAGE SYSTEM IN SECTION 1B LONGHILL STATION) SEE 1" = 800' D.A. MAP

  4,633,368.14 = 106.36 ACRES ∴ USE 106.36 AC.

- IN LOOKING AT THE OVERALL DRAINAGE AREA, LOTS 71-77 ARE REPRESENTATIVE OF TYPICAL LOT DENSITY & ARRANGEMENT OF DEVELOPMENT
- FROM LONGHILL STA. PHASE ONE PLAT, LOTS 71-77 THE AVERAGE LOT SIZE IS 0.24 AC OR 10,522 SF.
- FROM LONGHILL STA. PHASE I PLAT, AVG. LOT SIZE IS 10,778 SF OR 0.2478 AC.
- ASSUME OPEN SPACE IN LONGHILL CAN REMAIN UNDEVELOPED ALL OTHER COULD BECOME SIMILAR TO LONGHILL STA. LOTS, EXCEPT 7-A1 ZONED LOTS.

  APPROX. O.S. WITHIN DIVIDE TO PC003 = 7.72 AC. (SEE MAP)

- USE SCS METHOD SINCE > 20 AC.

CN FACTORS

SOILS: PREDOMINANTLY 11C, 14B, 19B IN DRAINAGE AREA (SOIL MAP SHEET NO. ■13)

	HSG
11C CRAVEN-UCHEE, 6-10%	C/A
14B EMPORIA FINE SANDY LOAM, 2-6%	C
19B KEMPSVILLE-EMPORIA FINE SANDY LOAM, 2-6%	B/C

∴ AVERAGE HSG IS C.

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DA = 106.36

A1 LOTS ALONG CENTERVILLE AVG. 202 x 7 = 14.14 AC.

NOS LONGHILL = 7.72 AC.

SINGLE FAMILY DEV, 0.25 AC AVG = 84.5 AC

106.36 AC.

USING TABLE 2.2D, TR-55, RUNOFF CURVE NO.

CN A1 LOTS, C SOIL = 77 14.14 AC (13.29%)

CN N.O.S, C SOIL = = 70 7.72 AC (7.26%)

CN SF, 0.25 AC, C SOIL = 83 84.5 AC (79.45%)

WEIGHTED CN = 81

TIME OF CONCENTRATION / SCS SEGMENTAL APPROACH FOREST GLEN TO FOXRIDGE

- NEGLECT POND A, PC020 IN LONGHILL STATION
- NEGLECT STORM SYSTEM IN LONGHILL STA. SEC 1

① 100' OVERLAND, YARD n=0.2, S= 3/95 = 0.0316 ft/ft = 9.8 MIN.

② 267' SHALLOW CONC, SWALE, UNPAVED, S= 5/267 = 0.0187 ft/ft = 2 MIN.

③ 365' SH. CONC, UNPAVED, S = 5/367 = 0.0136 ft/ft = 3.2 MIN.

④ 653' SC, UNPAVED, S = 15/653 = 0.023 ft/ft = 4.4 MIN.

⑤ 1454' SC, UNPAVED, S = 39/1454 = 0.0206 ft/ft = 10.5 MIN.

⑥ 722', SC UNPAVED S = $\frac{65-58.1}{722}$ = 0.0096 ft/ft = 7.6 MIN.

37.6 MIN.

T_C = 37.6 MIN.

DEVELOPMENT MANAGEMENT

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INTEGRATED PEST MANAGEMENT (757) 253-2620

HYDROLOGIC DATA

SCS Methodology

1" RAINFALL

AREA = 106.36 AC.

CN = 81

T_c = 37.6 MIN. OR 0.6267 hrs.

106.36

RUNOFF = 0.10"

106.36 × 0.10 × 1/12

= 0.88 AC-FT

38,608 CF

		Q PEAK	VOLUME
1-YEAR	2.8"	87.43 CFS	10.297 AC-FT.
2-YEAR	3.5"	130.66 CFS	15.144 AC-FT.
10-YEAR	5.8"	286.51 CFS	32.813 AC-FT.
25-YEAR	6.4"	328.46 CFS	37.67 AC-FT.
100-YEAR	8.0"	441.06 CFS	50.897 AC-FT.

AVAILABLE VOLUME TO DAM CREST 5.508 AC. FT.

EXISTING POND ROUTING, NO MODIFICATIONS.

	OUTFLOW	ELEV.
1-YR	87.43	61.56
2-YR	88.45	62.65
10-YR	208.60	64.80
25-YR		
100-YR		

DAM OVERTOPS

DESIGNED FOR 10-YEAR!!

2-YEAR PRE-POST CONTROL

File.... C:\HAESTAD\PPKW\SAMPLE\FOXRIDGE.PPW
Title... Current DA

RUNOFF CURVE NUMBER DATA

Current DA

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	%UC	Adjusted CN
A1 Lots, C soil	77	14.140			77.00
NOS, C soil	70	7.720			70.00
SF Lots, 1/4 ac, C soils	83	84.500			83.00
COMPOSITE AREA & WEIGHTED CN --->		106.360			81.26 (81)

File.... C:\HAESTAD\PPKW\SAMPLE\FOXRIDGE.PPW
Title... Travel Path (Forest Glen, Longhill Sta, FoxRidge)

::
TIME OF CONCENTRATION CALCULATOR
::

Travel Path (Forest Glen, Longhill Sta, FoxRidge)

Segment #1: Tc: TR-55 Sheet
Description: Forest Glen

Mannings n	.2000
Hydraulic Length	100.00 ft
2yr, 24hr P	3.5000 in
Slope	.031600 ft/ft

Avg.Velocity .17 ft/sec

Segment #1 Time: .1637 hrs

Segment #2: Tc: TR-55 Shallow
Description: Natural Channel

Hydraulic Length	267.00 ft
Slope	.018700 ft/ft

Unpaved

Avg.Velocity 2.21 ft/sec

Segment #2 Time: .0336 hrs

Segment #3: Tc: TR-55 Shallow
Description: Natural Channel

Hydraulic Length	365.00 ft
Slope	.013600 ft/ft

Unpaved

Avg.Velocity 1.88 ft/sec

Segment #3 Time: .0539 hrs

File.... C:\HAESTAD\PPKW\SAMPLE\FOXRIDGE.PPW
Title... Travel Path (Forest Glen, Longhill Sta, FoxRidge)

Segment #4: Tc: TR-55 Shallow
Description: Natural Channel

Hydraulic Length 653.00 ft
Slope .023000 ft/ft
Unpaved

Avg.Velocity 2.45 ft/sec

Segment #4 Time: .0741 hrs

Segment #5: Tc: TR-55 Shallow
Description: Natural Channel

Hydraulic Length 1454.00 ft
Slope .020600 ft/ft
Unpaved

Avg.Velocity 2.32 ft/sec

Segment #5 Time: .1744 hrs

Segment #6: Tc: TR-55 Shallow
Description: Natural Channel

Hydraulic Length 722.00 ft
Slope .009600 ft/ft
Unpaved

Avg.Velocity 1.58 ft/sec

Segment #6 Time: .1269 hrs

Total Tc: .6266 hrs

NETWORK SUMMARY -- NODES
(Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File,ID = JCC.RNQ JCCSCSdata

Storm Tag Name   = Pre..1
Description: 1-year event

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency   = 1 yr
Total Rainfall Depth= 2.8000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Node ID	Type	HYG Vol ac-ft	Trun.	Qpeak hrs	Qpeak cfs	Max WSEL ft
BMP AREA	AREA	10.297		12.3000	87.43	
Outfall BMP OUTFALL	JCT	10.297		12.3000	87.43	

NETWORK SUMMARY -- NODES
(Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File,ID = JCC.RNQ JCCSCSdata

Storm Tag Name = Pre..2
Description: 2-year storm event

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 2 yr
Total Rainfall Depth= 3.5000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Node ID	Type	HYG Vol ac-ft	Trun.	Qpeak hrs	Qpeak cfs	Max WSEL ft
BMP AREA	AREA	15.144		12.3000	130.66	
Outfall BMP OUTFALL	JCT	15.144		12.3000	130.66	

NETWORK SUMMARY -- NODES
(Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File,ID = JCC.RNQ JCCSCSdata

Storm Tag Name = Pre.10
Description: 10-year storm event

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 10 yr
Total Rainfall Depth= 5.8000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Node ID	Type	HYG Vol ac-ft	Trun.	Qpeak hrs	Qpeak cfs	Max WSEL ft
BMP AREA	AREA	32.813		12.2500	286.51	
Outfall BMP OUTFALL	JCT	32.813		12.2500	286.51	

NETWORK SUMMARY -- NODES
(Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File,ID = JCC.RNQ JCCSCSdata

Storm Tag Name = Pre.25
Description: 25-year storm event

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 25 yr
Total Rainfall Depth= 6.4000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Node ID	Type	HYG Vol ac-ft	Trun.	Qpeak hrs	Qpeak cfs	Max WSEL ft
BMP AREA	AREA	37.670		12.2500	328.46	
Outfall BMP OUTFALL	JCT	37.670		12.2500	328.46	

NETWORK SUMMARY -- NODES
(Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File,ID = JCC.RNQ JCCSCSdata

Storm Tag Name   = Pre100
Description: 100-year storm event

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency   = 100 yr
Total Rainfall Depth= 8.0000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Node ID	Type	HYG Vol ac-ft	Trun.	Qpeak hrs	Qpeak cfs	Max WSEL ft
BMP AREA	AREA	50.897		12.2500	441.06	
Outfall BMP OUTFALL	JCT	50.897		12.2500	441.06	

POINT	PLUS	HI	MINUS	ELEV	NOTES
pump sta step				65.7	assumed
	6.9	72.6			
tp / gate			3.75	68.85	
tp/dam			7.33	65.27	
tp/dam	4.63	69.9			
		69.9			
south wall top of dam		69.9	4.63	65.27	
		69.9		69.9	19.5'
sw toe of slope		69.9	11.28	58.62	
		69.9		69.9	16'
sw corner		69.9	10.67	59.23	
		69.9		69.9	28' swcor to nwcor
south invert in		69.9	11.8	58.1	
		69.9		69.9	
south inlet top		69.9	6.83	63.07	
		69.9		69.9	
north inlet in		69.9	11.76	58.14	
		69.9		69.9	
north inlet top		69.9	6.99	62.91	
		69.9		69.9	
northwest corner		69.9	11.48	58.42	
		69.9		69.9	18'
n/wall toe of slope		69.9	11.62	58.28	
		69.9		69.9	17'
north wall top of dam		69.9	4.98	64.92	
		69.9		69.9	
emergency spillway		69.9	6.2	63.7	
		69.9		69.9	
north inv out		69.9	13.2	56.7	
		69.9		69.9	
south inv out		69.9	13.32	56.58	
tp/gate	1.5	70.35		68.85	
		70.35			
transformer base		70.35	4.98	65.37	
		70.35		70.35	
ne cor lot 50		70.35	8.76	61.59	

58
+3
61

65

24

65.4

61.6

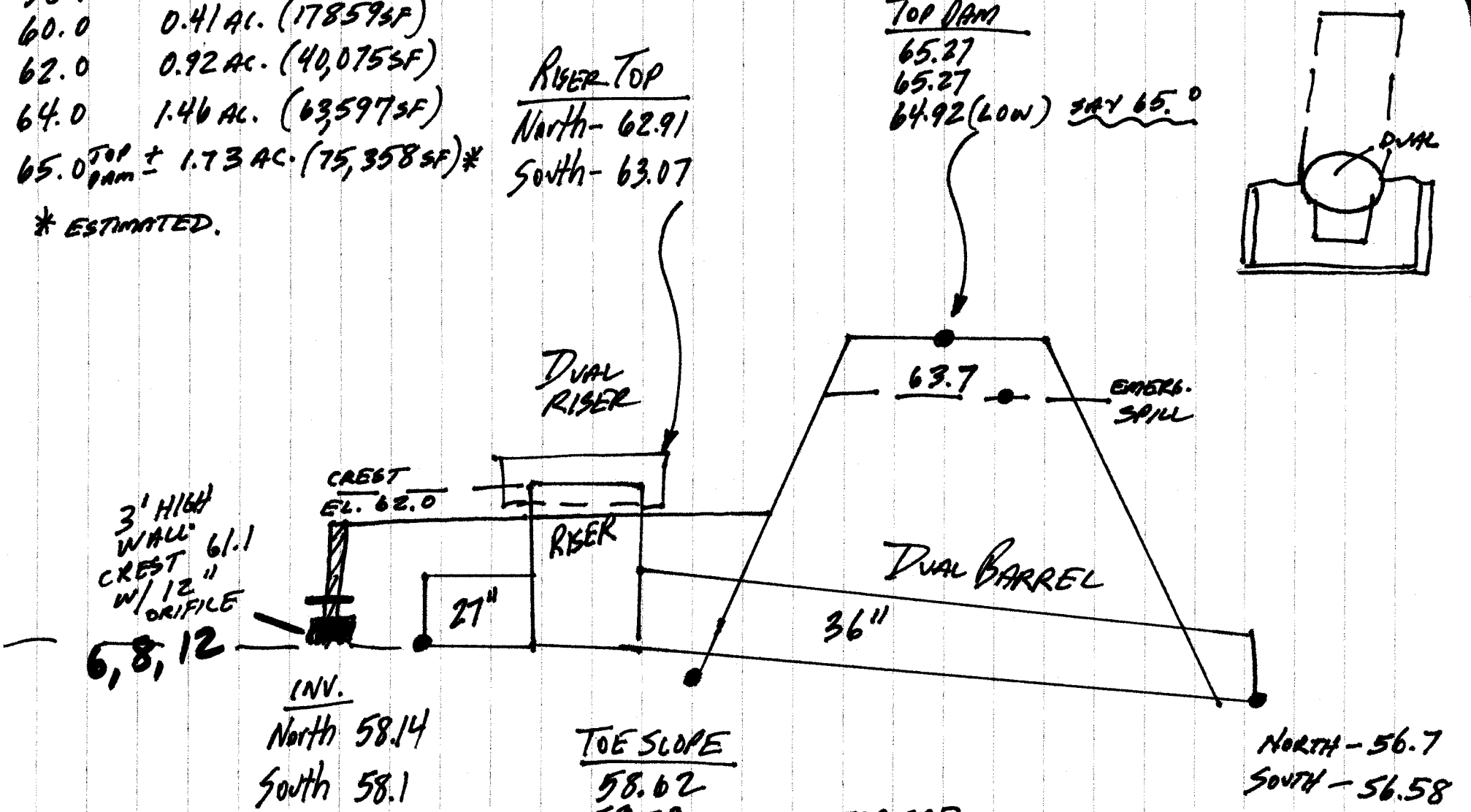
FOX RIDGE RETROFIT

PER ASBUILT SURVEY

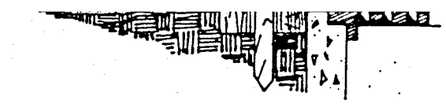
Area

58.1	0
60.0	0.41 Ac. (17859 SF)
62.0	0.92 Ac. (40,075 SF)
64.0	1.46 Ac. (63,597 SF)
65.0 Top Dam	± 1.73 Ac. (75,358 SF)*

* ESTIMATED.



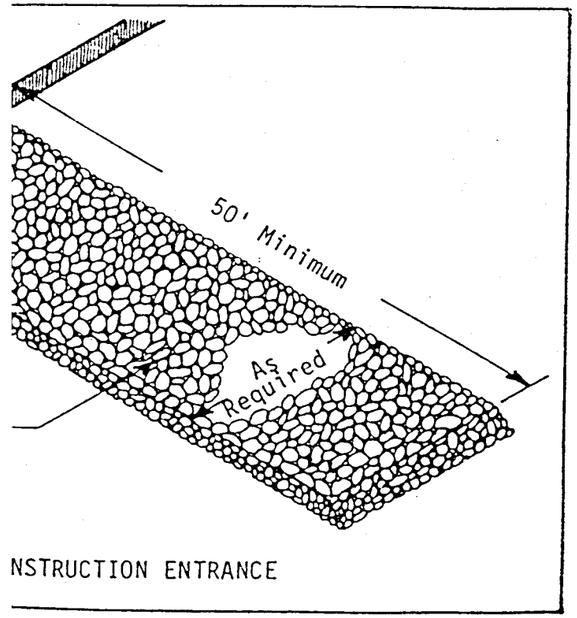
$$\frac{3}{1} = \frac{x - 0.92}{0.54}$$



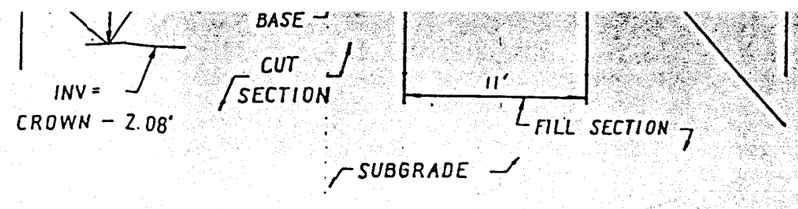
ication

n is applicable where the inlet
es no greater than 5 percent) where
ing 0.5 cfs) are typical. The
ceiving concentrated flows, such

T SEDIMENT FILTER



NSTRUCTION ENTRANCE



TYPICAL SECTION - CATEGORY I, 50' R/W

SCALE 1" = 10' HORIZONTAL, 1" = 3' VERTICAL

1. PROVIDE 2-10' LANES, PAVEMENT WIDTH = 20', SLOPE = 1/4" / FOOT.
2. PROVIDE 6' SHOULDER WIDTH, SLOPE = 3/4" / FOOT.
3. SUBGRADE - CBR OF 10 OR GREATER.
4. BASE 6" OF AGGREGATE BASE MATERIAL (TYPE I OR TYPE II) OR 4" OF CRUSHER RUN, & 3" OF BITUMINOUS CONCRETE (TYPE B-1).
5. SURFACE - 1 1/2" BITUMINOUS CONCRETE (S-5) OR PRIME AND DOUBLE SEAL.
6. SIDE SLOPES - 6" PER FOOT (2:1) MAXIMUM.

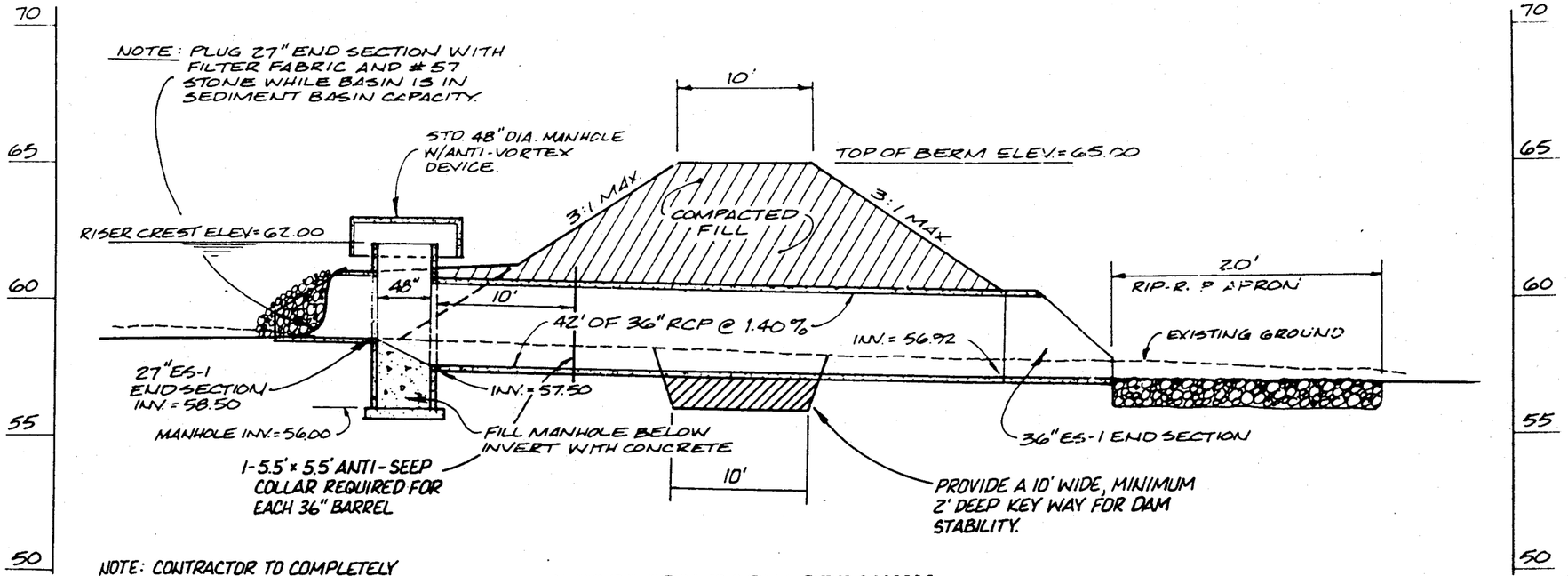
1" = 2' VE

CATEGORY I

1. PROVIDE 2-11' LANES, PAVEMENT WIDTH =
2. PROVIDE 6' SHOULDER WIDTH, SLOPE =
3. SUBGRADE - CBR OF 10 OR GREATER.
4. BASE - 10" OF AGGREGATE BASE MATERIAL OR 4" OF BITUMINOUS CONCRETE (TYP
5. SURFACE-PRIME AND DOUBLE SEAL OR 1½
6. SIDE SLOPES - 6" PER FT. (2:1) MAXIMU

RISER CAP

RISER 48"
CAP 84"
2' DEPTH
+0.5' = EL. 61.50
USE CREST EL. 62.0



NOTE: CONTRACTOR TO COMPLETELY CLEAR, GRUB AND REMOVE UNSUITABLE MATERIAL FROM DAM AREA PRIOR TO PLACING FILL MATERIAL.

DETENTION BASIN SPILLWAY
SECTION A - A

SCALE:
1" = 5' VERTICAL
1" = 10' HORIZONTAL

NOTE: DUAL INSTALLATION REQUIRED
(SEE PLAN VIEW)

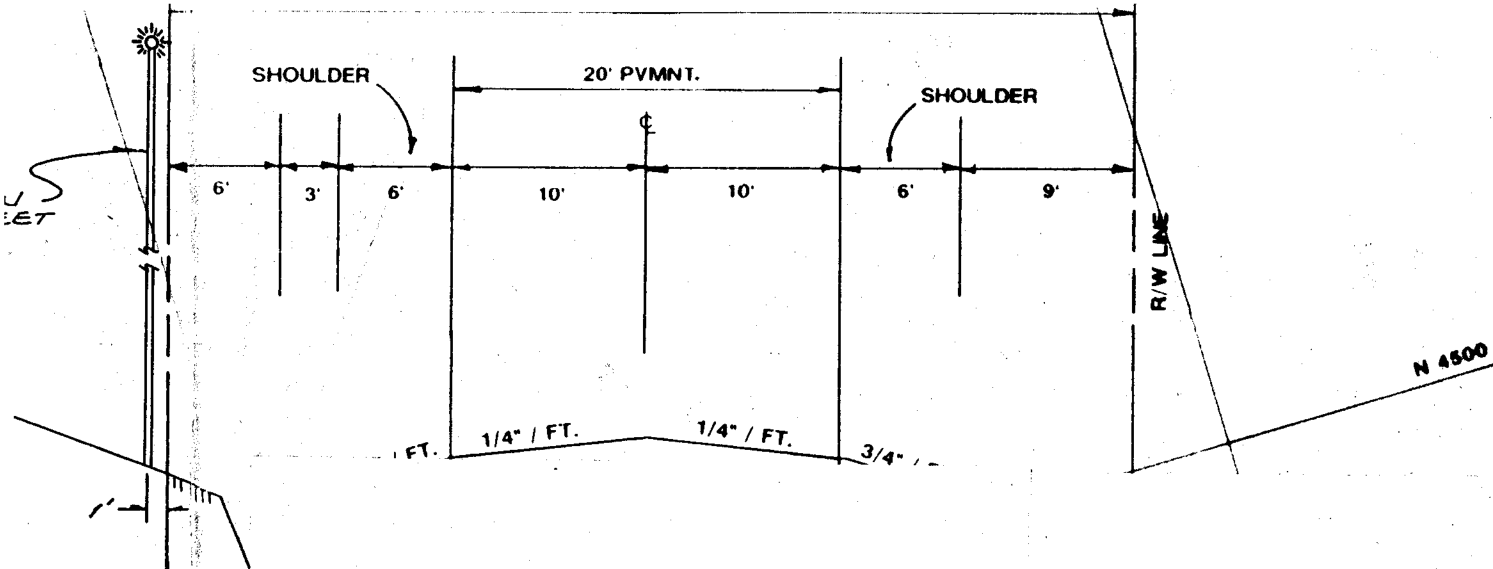
62 0.92
64 1.46
65 x

$\frac{64-62}{65-62} = \frac{1.46-0.92}{x-0.92}$

$\frac{2}{3} = \frac{0.54}{x-0.92}$

$2x - 1.84 = 1.62$

$x = 1.73$ AC.



ELEV		AREA	VOLUME	
60	0.43 INV 0.41 0.41		(INV ≈ 59) =	[illegible]
		0.41	0.41 Ac × 4"/12" =	0.2 AcFt
62	0.92 0.90 0.93	0.92	0.92 Ac × 2 Ft =	1.8 AcFt
EMERGENCY SPILLWAY – 64.				
64	1.46 1.46	1.46	1.46 Ac × 2 Ft =	2.9 AcFt
TOP OF DAM ±5				
Pumping sta. FF ≈ 66.			TOTAL ≈	5 AcFt
66.	2.13 2.01	2.1	2.1 Ac × 2 FT	4 AcFt

AS BUILT INFO SHOWS CHL– DR – SHC DITCH @ 68 –

" S.S. MH TOP @ 62 WTF≈a

No.	DATE	REVISION / COMMENT / NOTE
1	12/9/88	REVISED PER JCC COMMENTS
		J.C.C. & V.D.O.T. COMMENTS
		J.C.C., V.D.O.T. & V.D.O.H. COMMENTS

PROFESSIONAL ENGINEER
No. 010232

Surveying

File.... C:\HAESTAD\PPKW\SAMPLE\FOXRIDGE.PPW
Title... Exist PC 003

Elevation (ft)	Planimeter (sq.in)	Area (acres)	A1+A2+sqr(A1*A2) (acres)	Volume (ac-ft)	Volume Sum (ac-ft)
58.10	-----	.0000	.0000	.000	.000
60.00	-----	.4100	.4100	.260	.260
62.00	-----	.9200	1.9442	1.296	1.556
64.00	-----	1.4600	3.5390	2.359	3.915
65.00	-----	1.7300	4.7793	1.593	5.508

POND VOLUME EQUATIONS

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

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

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

NETWORK SUMMARY -- NODES
(Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File,ID = JCC.RNQ JCCSCSdata

Storm Tag Name = A....1
Description: 1-year event

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 1 yr
Total Rainfall Depth= 2.8000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

	Node ID		Type	HYG Vol ac-ft	Trun.	Qpeak hrs	Qpeak cfs	Max WSEL ft
	CURRENT DA		AREA	10.297		12.3000	87.43	
Outfall	OUTFALL		JCT	10.297		12.6500	47.56	
	POND	IN	POND	10.297		12.3000	87.43	
	POND	OUT	POND	10.297		12.6500	47.56	61.56

NETWORK SUMMARY -- NODES
(Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File,ID = JCC.RNQ JCCSCSdata

Storm Tag Name = A....2
Description: 2-year storm event

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 2 yr
Total Rainfall Depth= 3.5000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

	Node ID		Type	HYG Vol ac-ft	Trun.	Qpeak hrs	Qpeak cfs	Max WSEL ft
	CURRENT DA		AREA	15.144		12.3000	130.66	
Outfall	OUTFALL		JCT	15.144		12.5500	88.45	
	POND	IN	POND	15.144		12.3000	130.66	
	POND	OUT	POND	15.144		12.5500	88.45	62.65

NETWORK SUMMARY -- NODES
(Trun.= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left & Rt)

DEFAULT Design Storm File,ID = JCC.RNQ JCCSCSdata

Storm Tag Name = A...10
Description: 10-year storm event

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF TypeII 24hr
Storm Frequency = 10 yr
Total Rainfall Depth= 5.8000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

	Node ID		Type	HYG Vol ac-ft	Trun.	Qpeak hrs	Qpeak cfs	Max WSEL ft
	CURRENT DA		AREA	32.813		12.2500	286.51	
Outfall	OUTFALL		JCT	32.813		12.5000	208.60	
	POND	IN	POND	32.813		12.2500	286.51	
	POND	OUT	POND	32.813		12.5000	208.60	64.80

VOLUME

(INV = 59)

0.4 Ac x 6"/12" = 0.2 Ac Ft

0.92 Ac x 2 Ft = 1.8 Ac Ft

1.46 Ac x 2 Ft = 2.9 Ac Ft

TOTAL = 5 Ac Ft

2.1 Ac x 2 FT 4 Ac Ft

DI2 - SHC DITCH @ 68 -

ELEV

60 0.43 INV
0.41
0.41

AREA

0.41

62 0.92
0.90
0.93

0.92

EMERGENCY SPILLWAY - 64.

64 1.46
1.41

1.46

TOP OF DAM ±65

Pumping sta. FF ± 66 -

66. 2.13
2.01

2.1

AS BUILT INFO SHOWS CMP -
SS MH TOP @ 62 WTF's

FOX RIDGE #7105

DITCH CALCULATIONS

STA.	D.A. (Ac.)	Q_2 (CFS)	SLOPE (%)	Y_L (FPS)	LINING TYPE	Q_{10} (CFS)	D_{10} (IN)	DESCRIPTION
RD "B"								
24+70 LT	0.12	0.20	1.00	0.85	GRASS	0.26	4.60	GRASS V-DITCH W/2:1 SS, 12" DIA RCP
25+00 RT	5.00	4.05	1.00	1.85	GRASS	5.25	15.00	TRANSITION GRASS V-DITCH W/2:1 SS, 18" DIA RCP TO
				4.50	PAVED		9.00	PAVED V-DITCH W/2:1 SS, 12" DIA RCP
30+30 LT	0.31	0.49	4.00	1.80	GRASS	0.65	5.00	GRASS V-DITCH W/2:1 SS, 18" DIA RCP
30+50 RT	3.16	3.32	4.00	3.00	GRASS	4.26	10.00	GRASS V-DITCH W/2:1 SS, 12" DIA RCP
30+70 LT	0.21	0.33	3.00	1.40	GRASS	0.43	4.60	GRASS V-DITCH W/2:1 SS, 12" DIA RCP
30+70 RT	0.87	0.91	3.00	1.90	GRASS	1.18	6.70	GRASS V-DITCH W/2:1 SS, 12" DIA RCP
RD "F" Red Fox Circle								
10+20 RT	0.21	0.33	2.50	1.45	GRASS	0.44	4.80	GRASS V-DITCH W/2:1 SS, 12" DIA RCP
10+20 LT	0.55	0.87	2.50	1.80	GRASS	1.16	6.90	GRASS V-DITCH W/2:1 SS, 12" DIA RCP

FOX RIDGE ~7105

DITCH CALCULATIONS

STA.	D.A. (Ac.)	Q_2 (CFS)	SLOPE (%)	V_L (FPS)	LINING TYPE	Q_{10} (CFS)	D_{10} (IN)	DESCRIPTION
RD "D"								
12+00 RT	2.81	2.95	1.00	1.70	GRASS	3.80	12.50	TRANSITION GRASS V-DITCH W/2:1 SS, 12" DEEP TO
			2.76	6.25	PAVED		6.60	PAVED V-DITCH W/2:1 SS, 12" DEEP
RD "A"	FOX RUN							
11+70 LT	0.12	0.18	6.53	4.25	PAVED	0.25	2.00	PAVED V-DITCH W/2:1 SS, 12" DEEP
11+70 RT	0.96	1.01	6.53	6.50	PAVED	1.30	3.90	PAVED V-DITCH W/2:1 SS, 12" DEEP
11+80 LT	0.12	0.20	1.20	0.95	GRASS	0.26	4.30	GRASS V-DITCH W/2:1 SS, 12" DEEP
11+60 RT	1.63	1.71	1.20	1.70	GRASS	2.20	9.80	GRASS V-DITCH W/2:1 SS, 12" DEEP
17+00 LT	0.23	0.37	6.00	4.90	PAVED	0.49	2.80	PAVED V-DITCH W/2:1 SS, 12" DEEP
17+00 RT	1.85	2.91	6.00	8.25	PAVED	3.88	5.90	PAVED V-DITCH W/2:1 SS, 12" DEEP
18+75 LT	0.44	0.62	2.60	4.50	PAVED	0.79	3.80	PAVED V-DITCH W/2:1 SS, 12" DEEP
18+75 RT	2.55	3.10	2.60	6.00	PAVED	3.95	6.80	PAVED V-DITCH W/2:1 SS, 12" DEEP
19+10 LT	0.10	0.16	2.13	1.15	GRASS	0.22	3.80	GRASS V-DITCH W/2:1 SS, 12" DEEP
19+10 RT	0.43	0.68	2.13	1.55	GRASS	0.91	6.50	GRASS V-DITCH W/2:1 SS, 12" DEEP
22+50 LT	0.14	0.23	7.00	4.70	PAVED	0.31	2.20	PAVED V-DITCH W/2:1 SS, 12" DEEP
23+20 RT	0.90	1.08	7.00	6.70	PAVED	1.44	4.00	PAVED V-DITCH W/2:1 SS, 12" DEEP
24+50 LT	10.10	8.18	4.50	9.60	PAVED	10.41	9.00	PAVED V-DITCH W/2:1 SS, 12" DEEP
26+50 LT	30.19	24.45	4.50	13.00	PAVED	31.70	14.60	PAVED V-DITCH W/2:1 SS, 18" DEEP

FOX RIDGE #7105

DITCH CALCULATIONS

STA.	D.A (Ac)	Q_2 (CFS)	SLOPE (%)	V_L (FPS)	LINING TYPE	Q_{10} (CFS)	D_{10} (IN)	DESCRIPTION
RD "B" - Fox Hunt Tr.								
15+50 RT	0.16	0.24	5.00	1.60	GRASS	0.33	3.80	GRASS 'V' DITCH w/2:1 SS, 12' DBBP
17+50 RT	0.29	0.41	3.00	1.60	GRASS	0.53	4.80	GRASS 'V' DITCH w/2:1 SS, 12' DBBP
5+50 LT	3.16	3.31	5.00	3.30	GRASS	4.26	9.60	GRASS 'V' DITCH w/2:1 SS, 12' DBBP
19+00 LT	6.43	5.21	3.00	3.00	GRASS	6.75	12.00	TRANSITION TO PAVED 'V' DITCH w/2:1 SS, 12' DBBP
				7.25	PAVED		8.00	
22+00 LT	11.13	9.02	3.00	8.50	PAVED	11.69	9.90	PAVED 'V' DITCH w/2:1 SS, 12' DBBP
22+00 RT	0.28	0.44	3.00	1.60	GRASS	0.58	5.10	GRASS 'V' DITCH w/2:1 SS, 12' DBBP
RD "C" Grey Fox Ct.								
12+85 LT	0.20	0.31	1.02	0.98	GRASS	0.41	5.50	GRASS 'V' DITCH w/2:1 SS, 12' DBBP
12+85 RT	1.03	1.63	1.02	1.40	GRASS	2.17	10.00	GRASS 'V' DITCH w/2:1 SS, 12' DBBP
13+00 LT	0.14	0.23	4.00	1.50	GRASS	0.31	3.80	GRASS 'V' DITCH w/2:1 SS, 12' DBBP
13+00 RT	0.24	0.38	4.00	1.70	GRASS	0.51	4.60	GRASS 'V' DITCH w/2:1 SS, 12' DBBP
RD "D" Fox Chase								
15+00 LT	1.43	2.00	3.50	2.40	GRASS	2.56	8.50	GRASS 'V' DITCH w/2:1 SS, 12' DBBP
15+00 RT	2.07	2.89	3.50	2.70	GRASS	3.69	10.00	GRASS 'V' DITCH w/2:1 SS, 12' DBBP
12+00 LT	2.70	2.82	1.00	1.70	GRASS	3.63	12.00	TRANSITION GRASS 'V' DITCH w/2:1 SS, 12' DBBP TO
			3.00	6.00	PAVED		6.90	PAVED 'V' DITCH w/2:1 SS, 12' DBBP

FOX RIDGE "7105

DITCH CALCULATIONS

STA.	D.A. (Ac.)	Q_2 (CFS)	SLOPE (%)	V_L (FPS)	LINING TYPE	Q_{10} (CFS)	D_{10} (IN)	DESCRIPTION
RD "A"								
12+50 LT	0.17	0.23	1.00	0.88	GRASS	0.31	4.90	GRASS 'V'-DITCH w/2:1 SS, 12" DEEP
12+50 RT	1.15	1.81	1.00	1.50	GRASS	2.41	10.20	GRASS 'V'-DITCH w/2:1 SS, 12" DEEP
13+50 RT	1.38	2.17	4.00	2.60	GRASS	2.89	8.70	TRANSITION GRASS 'V'-DITCH w/2:1 SS, 12" DEEP TO
			7.00	8.00	PAVED		4.90	PAVED 'V'-DITCH w/2:1 SS, 12" DEEP
18+75 RT	3.40	4.23	2.17	6.35	PAVED	5.43	7.90	PAVED 'V'-DITCH w/2:1 SS, 12" DEEP
19+25 LT	0.48	0.67	2.17	4.00	PAVED	0.86	4.00	PAVED 'V'-DITCH w/2:1 SS, 12" DEEP
19+50 RT	3.15	3.85	6.00	8.80	PAVED	4.95	6.20	PAVED 'V'-DITCH w/2:1 SS, 12" DEEP
19+50 LT	0.75	1.18	6.00	6.50	PAVED	1.58	4.20	PAVED 'V'-DITCH w/2:1 SS, 12" DEEP
RD "B"								
11+50 LT	1.03	1.45	2.06	1.90	GRASS	1.84	8.50	TRANSITION GRASS 'V'-DITCH w/2:1 SS, 12" DEEP TO
			7.00	7.20	PAVED		4.30	PAVED 'V'-DITCH w/2:1 SS, 12" DEEP
11+50 RT	0.09	0.14	2.06	1.10	GRASS	0.18	3.60	TRANSITION GRASS 'V'-DITCH w/2:1 SS, 12" DEEP TO
			7.00	4.00	PAVED		1.80	PAVED 'V'-DITCH w/2:1 SS, 12" DEEP
13+20 LT	4.85	4.37	7.00	10.00	PAVED	5.82	6.60	PAVED 'V'-DITCH w/2:1 SS, 12" DEEP
13+90 LT	1.07	0.96	2.00	1.60	GRASS	1.26	7.30	GRASS 'V'-DITCH w/2:1 SS, 12" DEEP
13+20 RT	0.22	0.36	7.00	5.00	PAVED	0.48	2.70	PAVED 'V'-DITCH w/2:1 SS, 12" DEEP
13+90 RT	0.06	0.09	2.00	0.90	GRASS	0.12	3.00	GRASS 'V'-DITCH w/2:1 SS, 12" DEEP

STORM SEWER DESIGN COMPUTATIONS

L & D 229

ROUTE 614 PROJ. FOX RIDGE

COUNTY SAMUS CITY DISTRICT

DESCRIPTION R-3 CLUSTER ON 614 ± 0.5 MILES NW OF FOREST GLENN

SHEET 1 OF

FROM POINT	TO POINT	AREA DRAIN. "A" ACRES	RUN-OFF COEF. C	CA INCREMENT	CA ACCUMULATED	INLET TIME MINUTES	RAIN FALL IN./HR.	RUNOFF Q C.F.S.	INVERT ELEVATIONS UPPER END	INVERT ELEVATIONS LOWER END	LENGTH FT.	SLOPE FT./FT.	DIA. IN.	CAPACITY C.F.S.	VEL. F.P.S.	FLOW TIME SEC.	REMARKS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
~~SS"1~~	SS"2	28.34	0.25	7.09	7.09	50	2.75	19.5	82.00	77.25	100	.0475	18	22.90			
~~SS"2~~	SS"3	2.80	0.36	0.24	7.33	50	2.75	20.16	77.25	74.44	75	.0375	18	20.34			Δ = 0.013

OUTFALL DITCH

OUTFALL DITCH BETWEEN LOTS 24 & 25

FROM PREVIOUS CALCULATION OF CULVERT "2"

Q_2 = 9.07 CFS Q_{10} = 11.76 CFS

USE 190' OF PAVED V-DITCH W/2:1 SS, 12' BOTTOM @ 4.00%.
INV @ CULVERT #2 = 81.00'
INV. OUT: 73.40'

V_2 = 9.0 CFS D_{10} = 9.7 IN.

OUTFALL DITCH BETWEEN LOTS 18 & 19 @ CUL-DE-SAC #8

D.A. = 11.41 AC C = 0.30 T_c = 30 MIN.
I_2 = 2.7 IN/HR I_{10} = 3.5 IN/HR.

$Q_2 = (0.30)(2.7)(11.41) = 9.24$ CFS

$Q_{10} = (0.30)(3.5)(11.41) = 11.98$ CFS

USE 110' OF PAVED 'V' DITCH W/2:1 SS, 12" BOTTOM @ 5.75%
INV @ CUL-DE-SAC = 72.30'
INV. OUT = 66.00'

V_2 = 10.5 FPS D_{10} = 9.00 IN.

CULVERTS

CULVERT #9

D.A. = 4.03 Ac. $C = 0.30$ $T_c = 20$ MIN

$I_2 = 3.5$ IN/HR $I_{10} = 4.5$ IN/HR

$Q_2 = (0.30)(3.5)(4.03) = 4.23$ CFS

$Q_{10} = (0.30)(4.5)(4.03) = 5.44$ CFS

TRY 52' OF 15" @ 6.73%

INLET $HW/D = 1.15$ $HW = 1.44$

OUTLET $H = 1.25$ $h_o = \frac{0.95+1.25}{2} = 1.10$ $LS = (52)(.0673) = 3.50$

$HW = 1.25 + 1.10 - 3.50 = N.A.$ INLET CONTROLS

USE 52' OF 15" RCP @ 6.73%

INV. IN = 68.50'

INV. OUT = 65.00'

CULVERT #10

D.A. = 17.78 Ac. $C = 0.25$ $T_c = 30$ MIN

$I_2 = 2.7$ IN/HR $I_{10} = 3.5$ IN/HR.

$Q_2 = (0.25)(2.7)(17.78) = 12.00$ CFS

$Q_{10} = (0.25)(3.5)(17.78) = 15.56$ CFS

TRY 48' OF 24" RCP @ 1.00%

INLET $HW/D = 1.12$ $HW = 2.24$

OUTLET $H = 0.8$ $h_o = \frac{1.4+2.0}{2} = 1.70$ $LS = (48)(.01) = 0.48$

$HW = 0.8 + 1.70 - 0.48 = 2.02$ INLET CONTROLS

USE 48' OF 24" RCP @ 1.00%

INV. IN = 73.35'

INV. OUT = 72.87'

CULVERTS

CULVERT #7

D.A. = 0.43 Ac ; C = 0.35 T_c = 10 MIN
I_2 = 4.6 IN/HR I_{10} = 6.0 IN/HR

$Q_2 = (0.35)(4.6)(0.43) = 0.69$ CFS

$Q_{10} = (0.35)(6.0)(0.43) = 0.91$ CFS

TRY 64' OF 15" RCP @ 1.00%

INLET HW/D = 0.40 HW = 0.50

OUTLET H = NAT. $h_o = \frac{0.45+1.25}{2} = 0.85$ $LS = (64)(.01) = 0.64$

HW = 0.85 − 0.64 = 0.21 INLET CONTROLS

USE 64' OF 15" RCP @ 1.00%
INV IN = 89.74'
INV OUT = 89.10'

CULVERT #8

D.A. = 0.69 Ac ; C = 0.35 T_c = 10 MIN
I_2 = 4.6 IN/HR I_{10} = 6.0 IN/HR

$Q_2 = (0.35)(4.6)(0.69) = 1.11$ CFS

$Q_{10} = (0.35)(6.0)(0.69) = 1.45$ CFS

TRY 64' OF 15" RCP @ 3.05%

INLET HW/D = 0.54 HW = 0.68

OUTLET H = NAT. $h_o = \frac{0.45+1.25}{2} = 0.85$ $LS = (64)(.0305) = 1.95$

HW = 0.85 − 1.95 = N.A. INLET CONTROLS

USE 64' OF 15" RCP @ 3.05%
INV. IN = 79.95'
INV. OUT = 78.00'

CULVERTS

CULVERT "5

D.A. = 2.59 Ac.: C = 0.30 T_c = 20 MIN

I_2 = 3.5 IN/HR I_{10} = 4.5 IN/HR

$Q_2 = (0.30)(3.5)(2.59) = 2.72$ CFS

$Q_{10} = (0.30)(4.5)(2.59) = 3.50$ CFS

TRY 60' OF 15" RCP @ 4.17%

INLET HW/D = 0.86 HW = 1.08

OUTLET H = 0.35 $h_0 = \frac{1.25+0.75}{2} = 1.0$ $CS_0 = (60)(.0417) = 2.5$

HW = 0.35 + 1.0 − 2.5 = N.A. INLET CONTROLS

USE 60' OF 15" RCP @ 4.17%

INV. IN = 105.00'

INV. OUT = 102.50'

CULVERT "6

D.A. = 2.58 Ac.: C = 0.35 T_c = 15 MIN

I_2 = 4.0 IN/HR I_{10} = 5.1 IN/HR

$Q_2 = (0.35)(4.0)(2.58) = 3.61$ CFS

$Q_{10} = (0.35)(5.1)(2.58) = 4.61$ CFS

TRY 64 OF 15" RCP @ 1.00%

INLET HW/D = 1.05 HW = 1.31

OUTLET H = 0.60 $h_0 = \frac{0.85+1.25}{2} = 1.05$ $CS_0 = (64)(.01) = 0.64$

HW = 0.60 + 1.05 − 0.64 = 1.01 INLET CONTROLS

USE 64' OF 15" RCP @ 1.00%

INV. IN = 89.74'

INV. OUT = 89.10'

CULVERTS

CULVERT #3

DA: 7.91 AC. C: 0.35 T_c: 20 MIN

I_2: 3.5 IN/HR. I_{10}: 4.5 IN/HR

$Q_2 = (0.35)(3.5)(7.91) = 9.69$ CFS

$Q_{10} = (0.35)(4.5)(7.91) = 12.46$ CFS

TRY 64' OF 24" RCP @ 2.73%

INLET HW/D: 0.93 HW: 1.86

OUTLET H: 0.55 $h_o = \frac{2+1.2}{2} = 1.6$ $LS_o = (64)(.0273) = 1.75$

HW: 0.55+1.6-1.75 = 0.40 INLET CONTROLS

USE 64' OF 24" RCP @ 2.73%

INV. IN: 80.25'

INV. OUT: 78.50'

CULVERT #4

DA: 21.67 AC. C: 0.30 T_c: 30 MIN

I_2: 2.7 IN/HR I_{10}: 3.5 IN/HR

$Q_2 = (0.30)(2.7)(21.67) = 17.55$ CFS

$Q_{10} = (0.30)(3.5)(21.67) = 22.75$ CFS

TRY 60' OF 30" RCP @ 1.67%

INLET HW/D: 0.95 HW: 2.38

OUTLET H: 0.70 $h_o = \frac{1.5+2.5}{2} = 2.00$ $LS = (60)(.0167) = 1.00$

HW: 0.70+2.00-1.00 = 1.70 INLET CONTROLS

USE 60' OF 30" RCP @ 1.67%

INV. IN: 78.50

INV. OUT: 77.50'

CULVERTS

CULVERT #1

D.A. = 5.92 Ac. ± C = 0.80 T_c = 25 MIN

I_2 = 3.0 IN/HR. I_{10} = 4.0 IN/HR.

Q_2 = (0.80)(3.0)(5.92) = 5.33 CFS

Q_{10} = (0.80)(4.0)(5.92) = 7.10 CFS

TRY 40' OF 18" RCP @ 2.00%

INLET HW/D = 1.02 HW = 1.58

OUTLET H = 0.52 $t_o = \frac{1.5+1.1}{2}$ = 1.3 LS_o = 40(.020) = 0.80

HW = 0.52 + 1.3 - 0.80 = 1.02 INLET CONTROLS

USE 40' OF 18" RCP @ 2.00%

INV. IN = 98.30'

INV. OUT = 97.50'

CULVERT #2

D.A. = 9.60 Ac. ± C = 0.35 T_c = 30 MIN

I_2 = 2.7 IN/HR. I_{10} = 3.5 IN/HR.

Q_2 = (0.35)(2.7)(9.60) = 9.07 CFS

Q_{10} = (0.35)(3.5)(9.60) = 11.76 CFS

TRY 40' OF 24" RCP @ 1.00%

INLET HW/D = 0.90 HW = 1.80

OUTLET H = 0.56 $t_o = \frac{2+1.2}{2}$ = 1.6 LS_o = (40)(.01) = 0.40

HW = 0.56 + 1.6 - 0.40 = 1.76 INLET CONTROLS

USE 40' OF 24" RCP @ 1.00%

INV. IN = 81.40'

INV. OUT = 81.00'

JCC COPY

FOX RIDGE

#7105

BY

ADS, a PROFESSIONAL CORPORATION

DRAINAGE CALCULATIONS

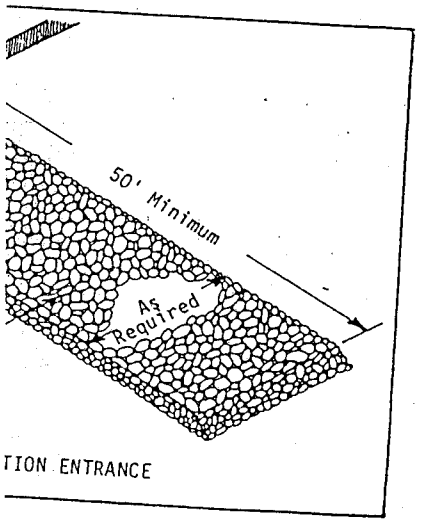
GAM/HWP

PC 003

tion

s applicable where the inlet
no greater than 5 percent) where
0.5 cfs) are typical. The
ring concentrated flows, such

SEDIMENT FILTER



TION ENTRANCE

FILL SECTION
SUBGRADE

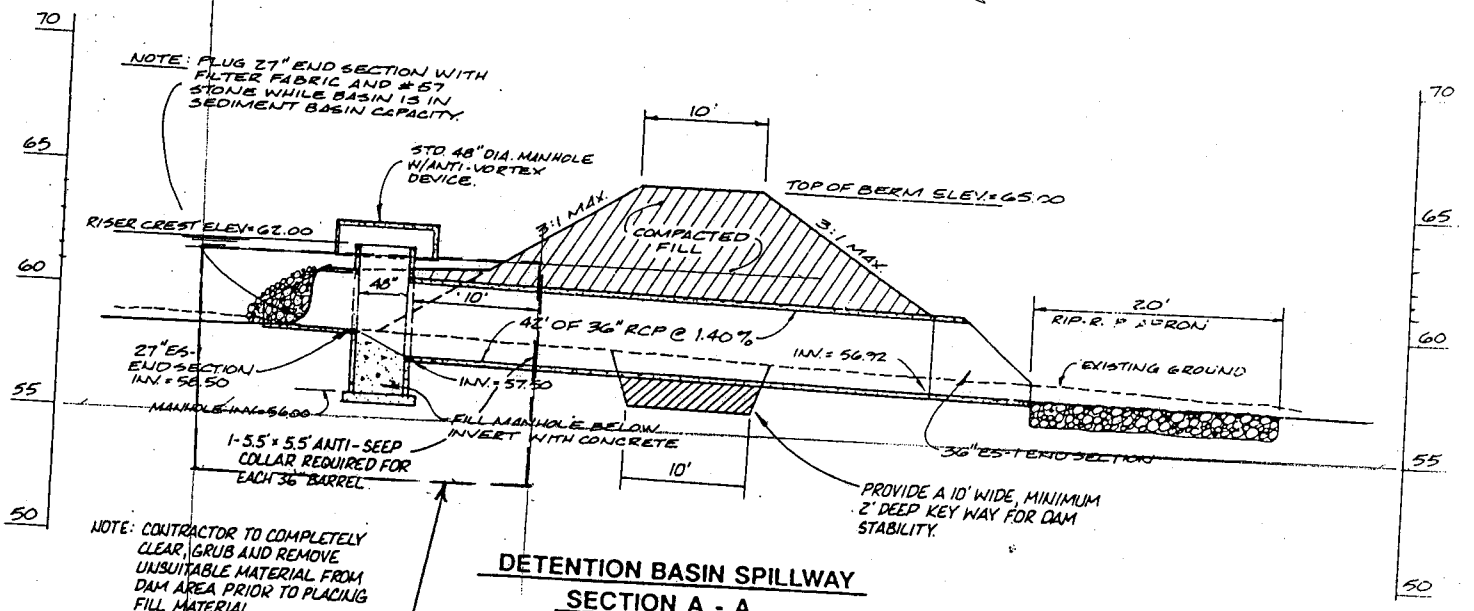
TYPICAL SECTION – CATEGORY I, 50' R/W

SCALE 1" = 10' HORIZONTAL, 1" = 3' VERTICAL

1. PROVIDE 2-10' LANES, PAVEMENT WIDTH = 20', SLOPE = 1/4" / FOOT.
2. PROVIDE 6' SHOULDER WIDTH, SLOPE = 3/4" / FOOT.
3. SUBGRADE - CBR OF 10 OR GREATER.
4. BASE 6" OF AGGREGATE BASE MATERIAL (TYPE I OR TYPE II) OR 4" OF CRUSHER RUN, & 3" OF BITUMINOUS CONCRETE (TYPE B-1).
5. SURFACE - 1 1/2" BITUMINOUS CONCRETE (S-5) OR PRIME AND DOUBLE SEAL.
6. SIDE SLOPES - 6" PER FOOT (2:1) MAXIMUM.

CATEGORY

1. PROVIDE 2-11' LANES, PAVEMENT WIDTH
2. PROVIDE 6' SHOULDER WIDTH, SLOPE =
3. SUBGRADE - CBR OF 10 OR GREATER.
4. BASE - 10" OF AGGREGATE BASE MATERIA OR 4" OF BITUMINUOUS CONCRETE (TYP
5. SURFACE-PRIME AND DOUBLE SEAL OR
6. SIDE SLOPES - 6" PER FT. (2:1) MAXIMU



DETENTION BASIN SPILLWAY
SECTION A - A

SCALE:
1" = 5' VERTICAL
1" = 10' HORIZONTAL

NOTE: DUAL INSTALLATION REQUIRED (SEE PLAN VIEW)

EXHIBIT 4
28' X 28' PLASTIC SHEET PILE BULKHEAD TOP ELEV 61.5; 6' BURY; INSTALL VDOT CLASS I RIP-RAP 12" THICK ON FABRIC INSIDE BULKHEAD; INSTALL 6" DIAMETER LOW FLOW PIPE AT ELEV 58.5

U. S. ARMY CORPS OF ENGINEERS

RECEIVED
APR 17 2003

BY _____

POINT	PLUS	HI	MINUS	ELEV	NOTES
pump sta step				65.7	assumed
	6.9	72.6			
tp / gate			3.75	68.85	
tp/dam			7.33	65.27	
tp/dam	4.63	69.9			
		69.9			
south wall top of dam		69.9	4.63	65.27	
		69.9		69.9	19.5'
sw toe of slope		69.9	11.28	58.62	
		69.9		69.9	16'
sw corner		69.9	10.67	59.23	
		69.9		69.9	28' swcor to nwcor
south invert in		69.9	11.8	58.1	
		69.9		69.9	
south inlet top		69.9	6.83	63.07	
		69.9		69.9	
north inlet in		69.9	11.76	58.14	
		69.9		69.9	
north inlet top		69.9	6.99	62.91	
		69.9		69.9	
northwest corner		69.9	11.48	58.42	
		69.9		69.9	18'
n/wall toe of slope		69.9	11.62	58.28	
		69.9		69.9	17'
north wall top of dam		69.9	4.98	64.92	
		69.9		69.9	
emergency spillway		69.9	6.2	63.7	
		69.9		69.9	
north inv out		69.9	13.2	56.7	
		69.9		69.9	
south inv out		69.9	13.32	56.58	
tp/gate	1.5	70.35		68.85	
		70.35			
transformer base		70.35	4.98	65.37	
		70.35		70.35	
ne cor lot 50		70.35	8.76	61.59	

58
+3
61

65

64

65.4

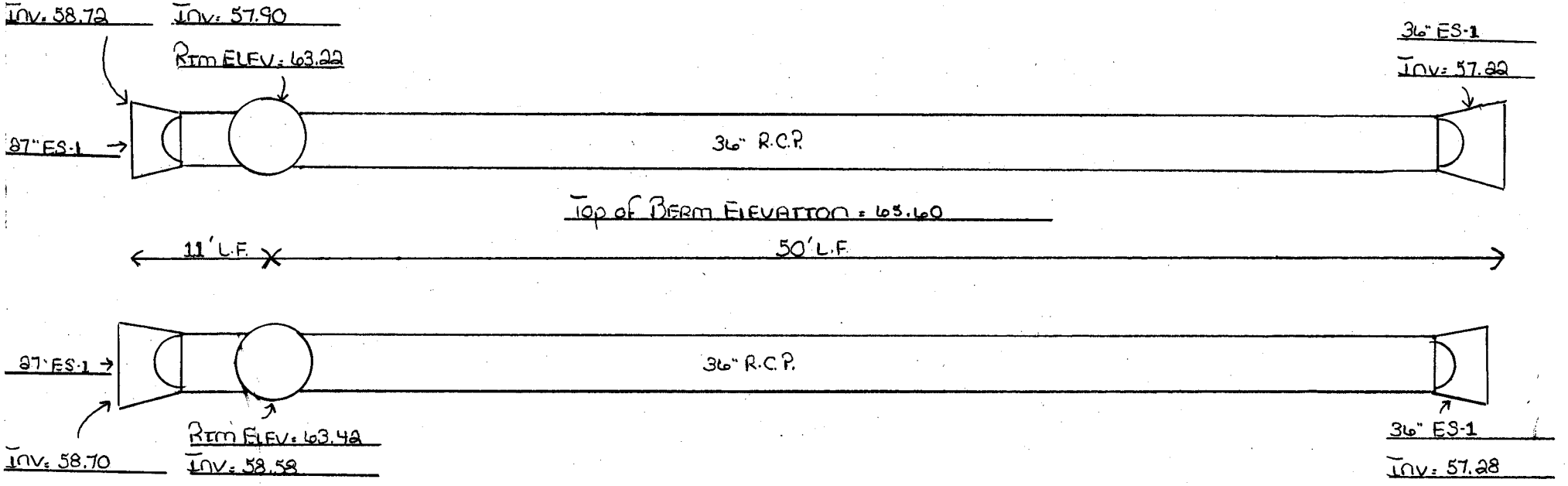
61.6

FOX RIDGE RETROFIT

PC003_FOX_RIDGE_SUBDIVISION - 050

SPILLWAY @ FOX RIDGE

SPILLWAY ELEVATION = 64.22



PREPARED BY: JAY PREVATTE, JR., SUPERINTENDENT CINTER CONSTRUCTION CO. INC.

FOX RIDGE
EXISTING CHANNEL ADEQUACY CALCULATIONS
IN 7105

7/12/88
PC 003

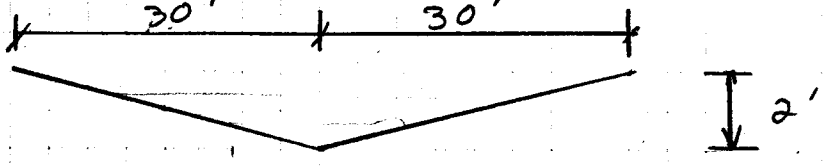
RAVINE BELOW CULVERT NO 1

D.A. = 7.89 Ac C = 0.30 Tc = 25 min
I_2 = 3.0 IN/HR I_{10} = 4.0 IN/HR.

Q_2 = 0.30 (3.0) (7.89) = 7.10 cfs

AVG. CHANNEL SLOPE = 3.75 %

AVG. CHANNEL SECTION



DETERMINE N VALUE

N_1 = 0.024
N_2 = 0.000
N_3 = 0.000
N_4 = 0.015
N_5 = 0.010
N_6 = 0.000

$N = (N_1 + N_2 + N_3 + N_4 + N_5) \times N_6 + (N_1 + N_2 + N_3 + N_4 + N_5)$
N = 0.049

USING MANNINGS EQUATION (MODIFIED)

$Q = \frac{1.49}{N} S^{1/2} R^{2/3} A$

$7.10 = \frac{1.49}{.049} (.0375)^{1/2} \left(\frac{15d}{2\sqrt{15^2+1}}\right)^{2/3} 15d^2$

$7.10 = 5.89 \left(\frac{15}{30.07} d\right)^{2/3} 15d^2$

$\frac{7.10}{5.89} = .63 d^{2/3} \cdot 15 d^2$

$\frac{7.10}{55.44} = d^{2/3} \cdot d^2$

$.128 = d^{8/3}$

d = 0.46'

CHANNEL IS ADEQUATE

$V = Q/A = \frac{7.10}{6.90} = 1.03$ fps

3.17 2.2 fps

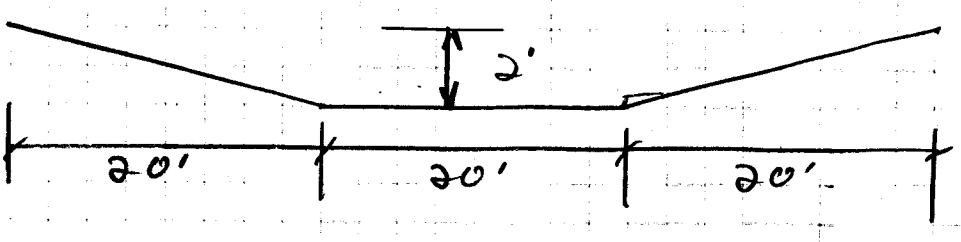
RAVINE BELOW CULVERT NO. 5

O.A. = 420 Ac C = 0.30 TC = 25 MIN
I_2 = 3.0 IN/HR I_{10} = 4.0 IN/HR

$Q_2 = 0.30\ (3.0)\ 420 = 3.78$ cfs

AVG. CHANNEL SLOPE = 2.67%

AVG. CHANNEL SECTION



N VALUE = 0.049 (SAME CHANNEL CHARACTERISTICS AS PREVIOUS CHANNEL)

USING MODIFIED MANNINGS EQUATION

$$Q = \frac{1.49}{N} S^{1/2} R^{2/3} A$$

USING TRIAL AND ERROR PROCESS
CHOOSE d, SOLVE FOR V, A AND Q

d = 0.1' A = 2.1' P = 22.2 R = 0.09

$V = \frac{1.49}{.049} (.0267)^{1/2} (.09)^{2/3} = 0.99$ fps < 3.0 fps ALLOWABLE

Q = .99 x 2.1 = 2.08 cfs

TRY d = 0.2'
A = 4.4 P = 24.02 R = 0.18

$V = \frac{1.49}{0.49} (0.267)^{1/2} (0.18)^{2/3} = 1.57$ fps < 3.0 fps ALLOWABLE

Q = 1.57 (4.4) = 6.93 cfs > 3.78 cfs REQUIRED

CHANNEL IS MORE THAN ADEQUATE

d = .14'
Q = 3.8 cfs
V = 1.25 fps

at

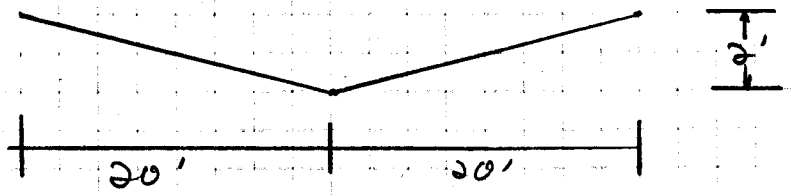
RAVINE BELOW SS #4

D.A. = 48.0 Ac Tc = 30 min C = 0.25
I2 = 2.7 IN/HR

Q_2 = 0.25 (2.7) 48.0 = 32.4 cfs

AVG. CHANNEL SLOPE = 1.58%

AVG CHANNEL SECTION



N = 0.049 (SAME CHANNEL CHARACTERISTICS AS PREVIOUS CHANNEL)

USING MANNINGS EQUATION

$V = \frac{1.49}{N} S^{1/2} R^{2/3}$

CHECK CHANNEL CAPACITY ASSUMING FULL CHANNEL

- d = 2'
  A = 40 SF P = 40.2 R = 1.00

  $V = \frac{1.49}{0.49} (.0158)^{1/2} (1)^{2/3}$ = 3.82 FPS

  Q = 3.82 (40) = 152.90

- TRY D = 1'
  A = 10 SF P = 20.10 R = 0.50

  $V = \frac{1.49}{0.049} (.0158)^{1/2} (0.50)^{2/3}$ = 2.4 fps

  Q = V·A = 2.4 (10) = 24 cfs < 32.4 cfs REQUIRED

- TRY d = 1.25'
  A = 15.63 SF P = 25.12 R = 0.62

  $V = \frac{1.49}{0.049} (.0158)^{1/2} (0.62)^{2/3}$ = 2.77 < 3.0 cfs ALLOWABLE

  Q = 2.77 (15.63) = 43.40 > 32.4 cfs REQ. CHANNEL IS ADEQUATE

D = 1.13' V = 2.56 fps

MAIN BOTTOM (AT END OF CUL-DE-SAC ON FOX HUNT TRAIL)

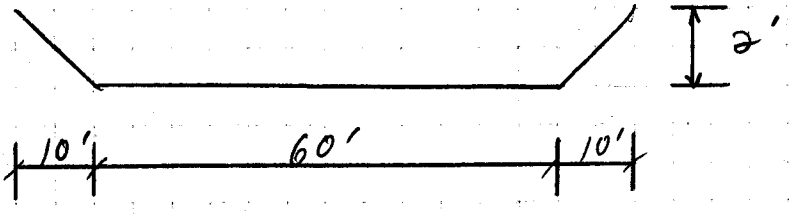
D.A. = 98.00 Ac TC = 40 min C = 0.25

I_2 = 2.20 IN/HR

Q_2 = 0.25 (2.20) 98.00 = 53.90 cfs

AVG CHANNEL SLOPE = 1.86 %

AVG. CHANNEL SECTION



DETERMINE N VALUE

N_1 = 0.02
N_2 = 0.010
N_3 = 0.005
N_4 = 0.010
N_5 = 0.020
N_6 = 0.000

N = 0.065

USING MANNINGS EQUATION AND TRIAL AND ERROR

$V = \frac{1.49}{N} S^{1/2} R^{2/3}$

D = .47'
Q = 53.85
V = 1.8'

TRY d = 0.75'

A = 47.8 SF P = 67.64 R = 0.71

$V = \frac{1.49}{0.065} (0.0186)^{1/2} (0.71)^{2/3} = 2.49$ fps

Q = 2.49 (47.8) = 118.8 cfs

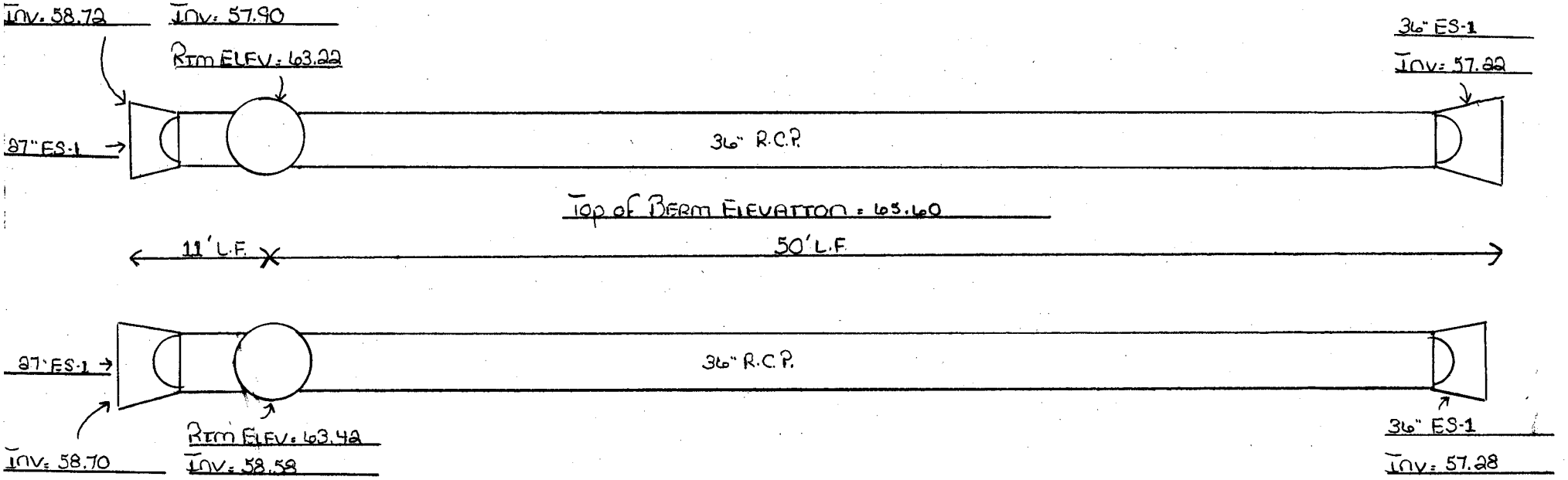
TRY d = 0.50 ft A = 31.25 SF P = 65.1 ft R = 0.48

$V = \frac{1.49}{0.065} (0.0186)^{1/2} (0.48)^{2/3} = 1.91$ fps < 3.0 fps ALLOWABLE

Q = 1.91 (31.25) = 59.75 cfs > Q_2 : CHANNEL IS ADEQUATE

SPILLWAY @ FOX RIDGE

SPILLWAY ELEVATION = 64.22



PREPARED BY: JAY PREVATTE, JR., SUPERINTENDENT CENTER CONSTRUCTION CO. INC.

PC 003
S-3-90

James City County Environmental Division
Stormwater Management / BMP Inspection Report
Detention and Retention Pond Facilities

S-3-90
GPIN 3110800001A

Database Inventory No. (if known): PC-003

Name of Facility: Fox Ridge BMP No.: 1 of 1 Date: 8/8/00

Location: 6010 Fox Ridge Blvd. (END OF FOX RUN ROAD)

Name of Owner: Fox Ridge Associates

Inspector:

Type of Facility: Dry POND

Weather Conditions:

If an inspection item is not applicable, mark NA, otherwise mark the appropriate column.

O.K. - The item checked is in adequate condition and the maintenance program is currently satisfactory.
Routine - The item checked requires attention, but does not present an immediate threat to the function of the BMP.
Urgent - The item checked requires immediate attention to keep the BMP operational and prevent damage to the facility.

Provide an explanation and details in the comment column, if routine or urgent are marked.

Facility Item	O.K.	Routine	Urgent	Comments
Embankments and Side Slopes:				
Grass Height	✓			
Vegetated Condition		✓		SPARSE on dam, mulch (straw) in placed w/ netting
Weed Growth	✓			
Erosion	✓			
Trash & Debris	✓			
Seepage	✓			
Fencing or Benches	NO			
Constructed Wetlands (Interior Landscaped & Planted) Areas:				
Vegetated Conditions	✓			natural veg. well established
Trash & Debris	✓			
Floatables	✓			
Erosion	✓			
Sediment	✓			
Dead Plant	✓			
Aesthetics	✓			
Other				

Facility Item	O.K.	Routine	Urgent	Comments
Water Pools ❒ Permanent Pool (Retention Basin) ❒ Shallow Marsh (Detention Basin)				
Shoreline Erosion	✓			
Algae	✓			light to moderate
Trash & Debris	✓			dead tree trunks, 12"+
Sediment	✓			
Aesthetics	✓			
Other				
Inflow Stuctures (Describe Locations):				
Condition of Structure	✓			
Erosion	✓			
Trash and Debris	✓			
Sediment	✓			
Aesthetics	✓			
Other				
Principal Flow Control Structure - Intake, Riser, etc. (Describe Location):				
Condition of Structure	✓			
Corrosion	✓			
Trash and Debris	✓			
Sediment	✓			
Aesthetics	✓			
Other				
Principal Outlet Structure - Barrel, Conduit, etc. :				
Condition of Structure	✓			
Settlement	✓			
Trash & Debris	✓			
Sediment	✓			
Erosion	✓			
Other				
Emergency Spillway (Overflow):				
Vegetation	✓			sparse, natural woodland floor type
Lining	NO			
Erosion	✓			
Trash & Debris	✓			
Other				

Facility Item	O.K.	Routine	Urgent	Comments
Nuisance Type Conditions:				
Mosquito Breeding	✓			
Animal Burrows	✓			
Graffiti	✓			
Other				
Surrounding Perimeter Conditions:				
Land Uses	✓			
Vegetation	✓			
Trash & Debris	✓			
Aesthetics	✓			
Access /Maintenance Roads or Paths	✓			
Other				

Remarks:

Overall Environmental Division Internal Rating: 4

Signature: W. Dirk Raff **Date:** _____

Title: Environmental Specialist

SWMProg\BMP\CoInspProg\DetRet.wpd

WATERSHED	PC	MAINTENANCE PLAN	No	CTRL STRUC DESC	RCP Riser
BMP ID NO	003	SITE AREA acre	52.2	CTRL STRUC SIZE inches	48
PLAN NO	S-3-90	LAND USE	SF Residential	OTLT BARRL DESC	Dual RCP
TAX PARCEL	(31-1)(08-1A)	old BMP TYP	Dry Pond	OTLT BARRL SIZE inch	36
PIN NO	3110800001A	JCC BMP CODE			
CONSTRUCTION DATE	12/1/1988	POINT VALUE	6	EMERG SPILLWAY	Yes
PROJECT NAME	Fox Ridge Sudivision			DESIGN HW ELEV	
FACILITY LOCATION	6010 Fox Ridge Blvd.			PERM POOL ELEV	
CITY-STATE	Williamsburg, Va. 23188	SVC DRAIN AREA acres	95.58	2-YR OUTFLOW cfs	
CURRENT OWNER	Fox Ridge Associates			10-YR OUTFLOW cfs	
OWNER ADDRESS	2640 Virginia Beach Blvd.			REC DRAWING	Yes
OWNER ADDRESS 2		SERVICE AREA DESCRI	FoxRidge and portion of Forest Glen		
CITY-STATE-ZIP CODE	Virginia Beach, Va. 23452	IMPERV AREA acres		CONSTR CERTI	No
OWNER PHONE		RECV STREAM	UT of Powhatan Creek		
MAINT AGREEMENT	No	EXT DET-WQ-CTRL	No	LAST INSP DATE	8/8/2000
EMERG ACTION PLAN	No	WTR QUAL VOL acre-ft	0	INTERNAL RATING	4
		CHAN PROT CTRL	No	MISC/COMMENTS	
		CHAN PROT VOL acre-ft	0	Dual 27-inch pipes into riser. No H&H data on pond design.	
		SW/FLOOD CONTROL	Yes		
		GEOTECH REPORT	No		

Get Last BMP No

Return to Menu

PC003_FOX_RIDGE_SUBDIVISION - 061

Nationwide Permit (43) Stormwater Management Facilities
(3/18/2002)

Discharges of dredged or fill material into non-tidal waters of the United States, excluding non-tidal wetlands adjacent to tidal waters, for the construction and maintenance of stormwater management facilities, including activities for the excavation of stormwater ponds/facilities, detention basins, and retention basins; the installation and maintenance of water control structures, outfall structures and emergency spillways; and the maintenance dredging of existing stormwater management ponds/facilities and detention and retention basins, provided the activity meets all of the following criteria:

a. The discharge for the construction of new stormwater management facilities does not cause the loss of greater than ½ acre of non-tidal waters of the United States, excluding non-tidal wetlands adjacent to tidal waters;

b. The discharge does not cause the loss of greater than 300 linear-feet of a stream bed, unless for intermittent stream beds this criterion is waived in writing pursuant to a determination by the District Engineer, as specified below, that the project complies with all terms and conditions of this NWP and that any adverse impacts of the project on the aquatic environment are minimal, both individually and cumulatively;

c. For discharges causing the loss of greater than 300 linear feet of intermittent stream beds, the permittee notifies the District Engineer in accordance with the ``Notification" General Condition 13. In such cases, to be authorized the District Engineer must determine that the activity complies with the other terms and conditions of the NWP, determine the adverse environmental effects are minimal both individually and cumulatively, and waive this limitation in writing before the permittee may proceed;

d. The discharges of dredged or fill material for the construction of new stormwater management facilities in perennial streams is not authorized;

e. For discharges or excavation for the construction of new stormwater management facilities or for the maintenance of existing stormwater management facilities causing the loss of greater than 1/10 acre of non-tidal waters, excluding non-tidal wetlands adjacent to tidal waters, provided the permittee notifies the District Engineer in accordance with General Condition 13. In addition, the notification must include:
- **(1) A maintenance plan. The maintenance plan should be in accordance with State and local requirements, if any such requirements exist;**
- **(2) For discharges in special aquatic sites, including wetlands and submerged aquatic vegetation, the notification must include a delineation of affected areas; and**
- **(3) A compensatory mitigation proposal that offsets the loss of waters of the United States. Maintenance in constructed areas will not require mitigation provided such maintenance is accomplished in designated maintenance areas and not within compensatory mitigation areas (i.e., district engineers may designate non-maintenance areas, normally at the downstream end of the stormwater management facility, in existing stormwater management facilities). (No mitigation will be required for activities which are exempt from Section 404 permit requirements);**

f. The permittee must avoid and minimize discharges into waters of the United States at the project site to the maximum extent practicable, and the notification must include a written statement to the District Engineer detailing compliance with this condition (i.e., why the discharge must occur in waters of the United States and why additional minimization cannot be achieved);

g. The stormwater management facility must comply with General Condition 21 and be designed using best management practices (BMPs) and watershed protection techniques. Examples may include forebays (deeper areas at the upstream end of the stormwater management facility that would be maintained through excavation), vegetated buffers, and siting considerations to minimize adverse effects to aquatic resources. Another example of a BMP would be bioengineering methods incorporated into the facility design to benefit water quality and minimize adverse effects to aquatic resources from storm flows, especially downstream of the facility, that provide, to the maximum extent practicable, for long term aquatic resource protection and enhancement;

h. Maintenance excavation will be in accordance with an approved maintenance plan and will not exceed the original contours of the facility as approved and constructed; and

i. The discharge is part of a single and complete project.(Section 404)

GENERAL CONDITIONS:

The following general conditions must be followed in order for any authorization by a NWP to be valid:

1. Navigation. No activity may cause more than a minimal adverse effect on navigation.
2. Proper Maintenance. Any structure or fill authorized shall be properly maintained, including maintenance to ensure public safety.
3. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.
4. Aquatic Life Movements. No activity may substantially disrupt the necessary life-cycle movements of those species of aquatic life indigenous to the waterbody, including those species which normally migrate through the area, unless the activity's primary purpose is to impound water. Culverts placed in streams must be installed to maintain low flow conditions.
5. Equipment. Heavy equipment working in wetlands must be placed on mats, or other measures must be taken to minimize soil disturbance.
6. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions which may have been added by the division engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the State or tribe in its Section 401 water quality certification and Coastal Zone Management Act consistency determination.
7. Wild and Scenic Rivers. No activity may occur in a component of the National Wild and Scenic River System; or in a river officially designated by Congress as a "study river" for possible inclusion in the system, while the river is in an official study status; unless the appropriate Federal agency, with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation, or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).
8. Tribal Rights. No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

9. Water Quality. (a) In certain States and tribal lands an individual 401 water quality certification must be obtained or waived (See 33 CFR 330.4(c)).
(b) For NWPs 12, 14, 17, 18, 32, 39, 40, 42, 43, and 44, where the State or tribal 401 certification (either generically or individually) does not require or approve a water quality management plan, the permittee must include design criteria and techniques that will ensure that the authorized work does not result in more than minimal degradation of water quality (or the Corps determines that compliance with state or local standards, where applicable, will ensure no more than minimal adverse effect on water quality). An important component of water quality management includes stormwater management that minimizes degradation of the downstream aquatic system, including water quality (refer to General Condition 21 for stormwater management requirements). Another important component of water quality management is the establishment and maintenance of vegetated buffers next to open waters, including streams (refer to General Condition 19 for vegetated buffer requirements for the NWPs).

10. Coastal Zone Management. In certain states, an individual state coastal zone management consistency concurrence must be obtained or waived (see 33 CFR 330.4(d)).

11. Endangered Species. (a) No activity is authorized under any NWP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act, or which will destroy or adversely modify the critical habitat of such species. Non-federal permittees shall notify the District Engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or is located in the designated critical habitat and shall not begin work on the activity until notified by the District Engineer that the requirements of the Endangered Species Act have been satisfied and that the activity is authorized. For activities that may affect Federally-listed endangered or threatened species or designated critical habitat, the notification must include the name(s) of the endangered or threatened species that may be affected by the proposed work or that utilize the designated critical habitat that may be affected by the proposed work. As a result of formal or informal consultation with the FWS or NMFS, the District Engineer may add species-specific regional endangered species conditions to the NWPs.
(b) Authorization of an activity by a nationwide permit does not authorize the "take" of a threatened or endangered species as defined under the Federal Endangered Species Act. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the U.S. Fish and Wildlife Service or the National Marine Fisheries Service, both lethal and non-lethal "takes" of protected species are in violation of the Endangered Species Act. Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the U.S. Fish and Wildlife Service and National Marine Fisheries Service or their world wide web pages at http://www.fws.gov/r9endspp/endspp.html and http://www.nmfs.noaa.gov/prot_res/overview/es.html respectively.

12. Historic Properties. No activity which may affect historic properties listed, or eligible for listing, in the National Register of Historic Places is authorized, until the DE has complied with the provisions of 33 CFR Part 325, Appendix C. The prospective permittee must notify the District Engineer if the authorized activity may affect any historic properties listed, determined to be eligible, or which the prospective permittee has reason to believe may be eligible for listing on the National Register of Historic Places, and shall not begin the activity until notified by the District Engineer that the requirements of the National Historic Preservation Act have been satisfied and that the activity is authorized. Information on the location and existence of historic resources can be obtained from the State Historic Preservation Office and the National Register of Historic Places (see 33 CFR 330.4(g)). For activities that may affect historic properties listed in, or eligible for listing in, the National Register of Historic Places, the notification must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property.

13. Notification.
(a) Timing: Where required by the terms of the NWP, the prospective permittee must notify the District Engineer with a preconstruction notification (PCN) as early as possible. The District Engineer must determine if the PCN is complete within 30 days of the date of receipt and can request the additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the District Engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the District Engineer. The prospective permittee shall not begin the activity:

(1) Until notified in writing by the District Engineer that the activity may proceed under the NWP with any special conditions imposed by the District or Division Engineer; or
(2) If notified in writing by the District or Division Engineer that an individual permit is required; or
(3) Unless 45 days have passed from the District Engineer's receipt of the complete notification and the prospective permittee has not received written notice from the District or Division Engineer. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Notification: The notification must be in writing and include the following information:
(1) Name, address, and telephone numbers of the prospective permittee;
(2) Location of the proposed project;
(3) Brief description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP (Sketches usually clarify the project and when provided result in a quicker decision.);
(4) For NWPs 7, 12, 14, 18, 21, 34, 38, 39, 40, 41, 42, and 43, the PCN must also include a delineation of affected special aquatic sites, including wetlands, vegetated shallows (e.g., submerged aquatic vegetation, seagrass beds), and riffle and pool complexes (see paragraph 13(f));
(5) For NWP 7 (Outfall Structures and Maintenance), the PCN must include information regarding the original design capacities and configurations of those areas of the facility where maintenance dredging or excavation is proposed.
(6) For NWP 14 (Linear Transportation Projects), the PCN must include a compensatory mitigation proposal to offset permanent losses of waters of the United States and a statement describing how temporary losses of waters of the United States will be minimized to the maximum extent practicable.
(7) For NWP 21 (Surface Coal Mining Activities), the PCN must include an Office of Surface Mining (OSM) or state-approved mitigation plan, if applicable. To be authorized by this NWP, the District Engineer must determine that the activity complies with the terms and conditions of the NWP and that the adverse environmental effects are minimal both individually and cumulatively and must notify the project sponsor of this determination in writing.
(8) For NWP 27 (Stream and Wetland Restoration Activities), the PCN must include documentation of the prior condition of the site that will be reverted by the permittee.
(9) For NWP 29 (Single-Family Housing), the PCN must also include:
(i)Any past use of this NWP by the individual permittee and/or the permittee's spouse;
(ii)A statement that the single-family housing activity is for a personal residence of the permittee;
(iii)A description of the entire parcel, including its size, and a delineation of wetlands. For the purpose of this NWP, parcels of land measuring ¼ acre or less will not require a formal on-site delineation. However, the applicant shall provide an indication of where the wetlands are and the amount of wetlands that exists on the property. For parcels greater than ¼ acre in size, a formal wetland delineation must be prepared in accordance with the current method required by the Corps. (See paragraph 13(f));
(iv)A written description of all land (including, if available, legal descriptions) owned by the prospective permittee and/or the prospective permittee's spouse, within a one mile radius of the parcel, in any form of ownership (including any land owned as a partner, corporation, joint tenant, co-tenant, or as a tenant-by-the-entirety) and any land on which a purchase and sale agreement or other contract for sale or purchase has been executed;
(10) For NWP 31 (Maintenance of Existing Flood Control Facilties), the prospective permittee must either notify the District Engineer with a PCN prior to each maintenance activity or submit a five year (or less) maintenance plan. In addition, the PCN must include all of the following:
(i) Sufficient baseline information so as to identify the approved channel depths and configurations and existing facilities. Minor deviations are authorized, provided the approved flood control protection or drainage is not increased;
(ii) A delineation of any affected special aquatic sites, including wetlands; and,

(iii) Location of the dredged material disposal site.

(11) For NWP 33 (Temporary Construction, Access, and Dewatering), the PCN must also include a restoration plan of reasonable measures to avoid and minimize adverse effects to aquatic resources.

(12) For NWPs 39, 43, and 44, the PCN must also include a written statement to the District Engineer explaining how avoidance and minimization of losses of waters of the United States were achieved on the project site.

(13) For NWP 39 and NWP 42, the PCN must include a compensatory mitigation proposal to offset losses of waters of the US or justification explaining why compensatory mitigation should not be required. For discharges that cause the loss of greater than 300 linear feet of an intermittent stream bed, to be authorized, the District Engineer must determine that the activity complies with the other terms and conditions of the NWP, determine adverse environmental effects are minimal both individually and cumulatively, and waive the limitation on stream impacts in writing before the permittee may proceed;.

(14) For NWP 40 (Agricultural Activities), the PCN must include a compensatory mitigation proposal to offset losses of waters of the US. This NWP does not authorize the relocation of greater than 300 linear-feet of existing serviceable drainage ditches constructed in non-tidal streams unless, for drainage ditches constructed in intermittent non-tidal streams, the District Engineer waives this criterion in writing, and the District Engineer has determined that the project complies with all terms and conditions of this NWP, and that any adverse impacts of the project on the aquatic environment are minimal, both individually and cumulatively;.

(15) For NWP 43 (Stormwater Management Facilities), the PCN must include, for the construction of new stormwater management facilities, a maintenance plan (in accordance with state and local requirements, if applicable) and a compensatory mitigation proposal to offset losses of waters of the US. For discharges that cause the loss of greater than 300 linear feet of an intermittent stream bed, to be authorized, the District Engineer must determine that the activity complies with the other terms and conditions of the NWP, determine adverse environmental effects are minimal both individually and cumulatively, and waive the limitation on stream impacts in writing before the permittee may proceed;

(16) For NWP 44 (Mining Activities), the PCN must include a description of all waters of the United States adversely affected by the project, a description of measures taken to minimize adverse effects to waters of the United States, a description of measures taken to comply with the criteria of the NWP, and a reclamation plan (for aggregate mining activities in isolated waters and non-tidal wetlands adjacent to headwaters and any hard rock/mineral mining activities).

(17) For activities that may adversely affect Federally-listed endangered or threatened species, the PCN must include the name(s) of those endangered or threatened species that may be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work.

(18) For activities that may affect historic properties listed in, or eligible for listing in, the National Register of Historic Places, the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property.

(c) Form of Notification: The standard individual permit application form (Form ENG 4345) may be used as the notification but must clearly indicate that it is a PCN and must include all of the information required in (b) (1)-(19) of General Condition 13. A letter containing the requisite information may also be used.

(d) District Engineer's Decision: In reviewing the PCN for the proposed activity, the District Engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. The prospective permittee may, optionally, submit a proposed mitigation plan with the PCN to expedite the process and the District Engineer will consider any proposed compensatory mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects to the aquatic environment of the proposed work are minimal. If the District Engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse effects on the aquatic environment are minimal, the District Engineer will notify the permittee and include any conditions the District Engineer deems necessary.

Any compensatory mitigation proposal must be approved by the District Engineer prior to commencing work. If the prospective permittee is required to submit a compensatory mitigation proposal with the PCN, the proposal may be either conceptual or detailed. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the District Engineer will expeditiously review the proposed compensatory mitigation plan. The District Engineer must review the plan within 45 days of receiving a complete PCN and determine whether the conceptual or specific proposed mitigation would ensure no more than minimal adverse effects on the aquatic environment. If the net adverse effects of the project on the aquatic environment (after consideration of the compensatory mitigation proposal) are determined by the District Engineer to be minimal, the District Engineer will provide a timely written response to the applicant stating that the project can proceed under the terms and conditions of the nationwide permit.

If the District Engineer determines that the adverse effects of the proposed work are more than minimal, then he will notify the applicant either: (1) that the project does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (2) that the project is authorized under the NWP subject to the applicant's submission of a mitigation proposal that would reduce the adverse effects on the aquatic environment to the minimal level; or (3) that the project is authorized under the NWP with specific modifications or conditions. Where the District Engineer determines that mitigation is required in order to ensure no more than minimal adverse effects on the aquatic environment, the activity will be authorized within the 45-day PCN period, including the necessary conceptual or specific mitigation or a requirement that the applicant submit a mitigation proposal that would reduce the adverse effects on the aquatic environment to the minimal level. When conceptual mitigation is included, or a mitigation plan is required under item (2) above, no work in waters of the United States will occur until the District Engineer has approved a specific mitigation plan.

(e) Agency Coordination: The District Engineer will consider any comments from Federal and State agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse effects on the aquatic environment to a minimal level.

For activities requiring notification to the District Engineer that result in the loss of greater than ½ acre of waters of the United States, the District Engineer will, upon receipt of a notification, provide immediately (e.g., via facsimile transmission, overnight mail, or other expeditious manner), a copy to the appropriate offices of the Fish and Wildlife Service, State natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO), and, if appropriate, the National Marine Fisheries Service. With the exception of NWP 37, these agencies will then have 10 calendar days from the date the material is transmitted to telephone or fax the District Engineer notice that they intend to provide substantive, site-specific comments. If so contacted by an agency, the District Engineer will wait an additional 15 calendar days before making a decision on the notification. The District Engineer will fully consider agency comments received within the specified time frame, but will provide no response to the resource agency, except as provided below. The District Engineer will indicate in the administrative record associated with each notification that the resource agencies' concerns were considered. As required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act, the District Engineer will provide a response to National Marine Fisheries Service within 30 days of receipt of any Essential Fish Habitat conservation recommendations. Applicants are encouraged to provide the Corps multiple copies of notifications to expedite agency notification.

(f) Wetlands Delineations: Wetland delineations must be prepared in accordance with the current method required by the Corps. For NWP 29 see paragraph (b)(9)(iii) for parcels less than ¼ acre in size. The permittee may ask the Corps to delineate the special aquatic site. There may be some delay if the Corps does the delineation. Furthermore, the 45-day period will not start until the wetland delineation has been completed and submitted to the Corps, where appropriate.

14. Compliance Certification. Every permittee who has received a Nationwide permit verification from the Corps will submit a signed certification regarding the completed work and any required mitigation. The certification will be forwarded by the Corps with the authorization letter. The certification will include: a.) A statement that the authorized work was done in accordance with the Corps authorization, including any general or specific conditions; b.) A statement that any required mitigation was completed in accordance with the permit conditions; and c.) The signature of the permittee certifying the completion of the work and mitigation.

15. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3 acre.
16. Water Supply Intakes. No activity, including structures and work in navigable waters of the United States or discharges of dredged or fill material, may occur in the proximity of a public water supply intake except where the activity is for repair of the public water supply intake structures or adjacent bank stabilization.
17. Shellfish Beds. No activity, including structures and work in navigable waters of the United States or discharges of dredged or fill material, may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWP 4.
18. Suitable Material. No activity, including structures and work in navigable waters of the United States or discharges of dredged or fill material, may consist of unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.) and material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).
19. Mitigation. The District Engineer will consider the factors discussed below when determining the acceptability of appropriate and practicable mitigation necessary to offset adverse effects on the aquatic environment that are more than minimal.
    (a) The project must be designed and constructed to avoid and minimize adverse effects to waters of the US to the maximum extent practicable at the project site (i.e., on site).
    (b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing or compensating) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal.
    (c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland impacts requiring a PCN, unless the District Engineer determines in writing that some other form of mitigation would be more environmentally appropriate and provides a project-specific waiver of this requirement. Consistent with National policy, the District Engineer will establish a preference for restoration of wetlands as compensatory mitigation, with preservation used only in exceptional circumstances.
    (d) Compensatory mitigation (i.e., replacement or substitution of aquatic resources for those impacted) will not be used to increase the acreage losses allowed by the acreage limits of some of the NWPs. For example, \1/4\-acre of wetlands cannot be created to change a \3/4\-acre loss of wetlands to a \1/2\-acre loss associated with NWP 39 verification. However, \1/2\-acre of created wetlands can be used to reduce the impacts of a \1/2\-acre loss of wetlands to the minimum impact level in order to meet the minimal impact requirement associated with NWPs.
    (e) To be practicable, the mitigation must be available and capable of being done considering costs, existing technology, and logistics in light of the overall project purposes. Examples of mitigation that may be appropriate and practicable include, but are not limited to: reducing the size of the project; establishing and maintaining wetland or upland vegetated buffers to protect open waters such as streams; and replacing losses of aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferably in the same watershed.
    (f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the establishment, maintenance, and legal protection (e.g., easements, deed restrictions) of vegetated buffers to open waters. In many cases, vegetated buffers will be the only compensatory mitigation required. Vegetated buffers should consist of native species. The width of the vegetated buffers required will address documented water quality or aquatic habitat loss concerns. Normally, the vegetated buffer will be 25 to 50 feet wide on each side of the stream, but the District Engineers may require slightly wider vegetated buffers to address documented water quality or habitat loss concerns. Where both wetlands and open waters exist on the project site, the Corps will determine the appropriate compensatory mitigation (e.g., stream buffers or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where vegetated buffers are determined to be the most appropriate form of compensatory mitigation, the District Engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland impacts.
    (g) Compensatory mitigation proposals submitted with the "notification" may be either conceptual or detailed. If conceptual plans are approved under the verification, then the Corps will condition the verification to require detailed plans be submitted and approved by the Corps prior to construction of the authorized activity in waters of the US.
    (h) Permittees may propose the use of mitigation banks, in-lieu fee arrangements or separate activity-specific compensatory mitigation. In all cases that require compensatory mitigation, the mitigation provisions will specify the party responsible for accomplishing and/or complying with the mitigation plan.
20. Spawning Areas. Activities, including structures and work in navigable waters of the United States or discharges of dredged or fill material, in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., excavate, fill, or smother downstream by substantial turbidity) of an important spawning area are not authorized.
21. Management of Water Flows. To the maximum extent practicable, the activity must be designed maintain preconstruction downstream flow conditions (e.g., location, capacity, and flow rates). Furthermore, the activity must not permanently restrict or impede the passage of normal or expected high flows (unless the primary purpose of the fill is to impound waters) and the structure or discharge of dredged or fill material must withstand expected high flows. The activity must, to the maximum extent practicable, provide for retaining excess flows from the site, provide for maintaining surface flow rates from the site similar to preconstruction conditions, and provide for not increasing water flows from the project site, relocating water, or redirecting water flow beyond preconstruction conditions. Stream channelizing will be reduced to the minimal amount necessary, and the activity must, to the maximum extent practicable, reduce adverse effects such as flooding or erosion downstream and upstream of the project site, unless the activity is part of a larger system designed to manage water flows. In most cases, it will not be a requirement to conduct detailed studies and monitoring of water flow.
    This condition is only applicable to projects that have the potential to affect waterflows. While appropriate measures must be taken, it is not necessary to conduct detailed studies to identify such measures or require monitoring to ensure their effectiveness. Normally, the Corps will defer to state and local authorities regarding management of water flow..
22. Adverse Effects From Impoundments. If the activity, including structures and work in navigable waters of the United States or discharge of dredged or fill material, creates an impoundment of water, adverse effects on the aquatic system caused by the accelerated passage of water and/or the restriction of its flow shall be minimized to the maximum extent practicable.
23. Waterfowl Breeding Areas. Activities, including structures and work in navigable waters of the United States or discharges of dredged or fill material, into breeding areas for migratory waterfowl must be avoided to the maximum extent practicable.
24. Removal of Temporary Fills. Any temporary fills must be removed in their entirety and the affected areas returned to their preexisting elevation.
25. Designated Critical Resource Waters. Critical resource waters include, NOAA-designated marine sanctuaries, National Estuarine Research Reserves, National Wild and Scenic Rivers, critical habitat for Federally listed threatened and endangered species, coral reefs, State natural heritage sites, and outstanding national resource waters or other waters officially designated by a State as having particular environmental or ecological significance and identified by the District Engineer after notice and opportunity for public comment. The District Engineer may also designate additional critical resource waters after notice and opportunity for comment.
    (a) Except as noted below, discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, and 44 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters. Discharges of dredged or fill materials into waters of the United States may be authorized by the above NWPs in National Wild and Scenic Rivers if the activity complies with General Condition 7. Further, such discharges may be authorized in designated critical habitat for Federally listed threatened or endangered species if the activity complies with General Condition 11 and the U.S. Fish and Wildlife Service or the National Marine Fisheries Service has concurred in a determination of compliance with this condition.
    (b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with General Condition 13, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The District Engineer may authorize activities under these NWPs only after he determines that the impacts to the critical resource waters will be no more than minimal.

26. Fills Within 100-Year Floodplains. For purposes of this general condition, 100-year floodplains will be identified through the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps or FEMA-approved local floodplain maps.
    (a) Discharges in Floodplain; Below Headwaters. Discharges of dredged or fill material into waters of the US within the mapped 100-year floodplain, below headwaters (i.e. five cfs), resulting in permanent above-grade fills, are not authorized by NWPs 39, 40, 42, 43, and 44.
    (b) (b) Discharges in Floodway; Above Headwaters. Discharges of dredged or fill material into waters of the US within the FEMA or locally mapped floodway, resulting in permanent above-grade fills, are not authorized by NWPs 39, 40, 42, and 44.
    (c) The permittee must comply with any applicable FEMA-approved state or local floodplain management requirements.
27. Construction Period. For activities that have not been verified by the Corps and the project was commenced or under contract to commence by the expiration date of the NWP (or modification or revocation date), the work must be completed within 12-months after such date (including any modification that affects the project). For activities that have been verified and the project was commenced or under contract to commence within the verification period, the work must be completed by the date determined by the Corps. For projects that have been verified by the Corps, an extension of a Corps approved completion date maybe requested. This request must be submitted at least one month before the previously approved completion date.

Further Information:

1. District engineers have authority to determine if an activity complies with the terms and conditions of an NWP.
2. NWPs do not obviate the need to obtain other Federal, State, or local permits, approvals, or authorizations required by law.
3. NWPs do not grant any property rights or exclusive privileges.
4. NWPs do not authorize any injury to the property or rights of others.
5. NWPs do not authorize interference with any existing or proposed Federal project.

Section 401 Water Quality Conditions. No additional permit wil be required except in the following cases:

1. When compensatory mitigation is in the form of the purchase of mitigation bank credits and the bank is not located within the same hydrologic unit or an adjacent hydrologic unit within the same river watershed as the impacted site by the Hydrologic Unit Map of the United States, 1980, unless the conditions listed in Section 62.1-44.15:5E of the Code of Virginia relating to bank and impact type and location are met.

2. When compensatory mitigation involves only the preservation of wetlands and/or wetland or upland vegetated buffers without accompanying creation or restoration of wetlands or the purchase of mitigation bank credits, or does not meet the goal of no net loss of wetland acreage and function.

3. For the location of a stormwater management facility in perennial stream or in oxygen or temperature impaired waters.

4. For impacts to perennial streams in excess of 500 linear feet and for impacts to intermittent streams in excess of 1500 linear feet.

5. For any water withdrawal project.

File: PC-003

U.S. Army Corps of Engineers
Norfolk District, Eastern Virginia Regulatory Section
803 Front Street
Norfolk, Virginia 23510

July 7, 2003

Project Number: 03-R0421

Waterway: Powhatan Creek

1. Participant:
Wayland Bass, County Engineer
James City County Development Management
101-E Mounts Bay Road
Williamsburg, VA 23187-8784

2. Authorized Agent:
None

3. Address of Job Site:
3955 Fox Hunt Trail (Parcel ID 3110800001C), located east of Centerville Rd, south of Fox Hunt Trail, north of Fox Run, near the eastern limits of the Fox Ridge subdivision

4. Project Description:
Retrofit of an existing stormwater "dry pond" or BMP to accommodate the 1 year 24 hr storm and to ensure channel protection;. The project includes construction of a vinyl weir wall approximately 10 feet upstream of existing BMP, installation of a 6" low flow outlet pipe, and placement of riprap inside weir wall and at outlet. The project will entail fill of approximately 0.003 acres of waters of the U.S. including wetlands. The location and extent of the proposed work is shown on the attached drawings.

5. Findings

On March 18, 2003, Mr. Steven Martin of my staff examined the proposed work described above accompanied by representatives of James City County's Environmental Division. This project will modify an existing stormwater dry pond to treat the 1 year 24 hour storm event. The planned modifications are intended to improve the quality of waters draining from the Fox Ridge development into an unnamed tributary of Powhatan Creek. The work is also intended to reduce channel scouring downstream of the existing stormwater BMP.

The proposed work described in part 4. above and on the attached drawings will be located in waters of the U.S. (including wetlands). Our basis for this determination is the application of the Corps' of Engineers 1987 Wetland Delineation Manual and the positive indicators of wetland hydrology, hydric soils, and hydrophytic vegetation. The affected wetlands are waters of the United States. Both the wetlands within the design pool of the existing stormwater dry pond and the associated intermittent headwater stream are part of a tributary system to interstate waters (33 CFR 328.3(a)). The waterway has an ordinary high water mark along much of its length. This wetland jurisdictional determination is valid for a period of five years from the date of this letter unless new information warrants revision of the delineation before the expiration date.

Much of the construction work associated with the planned retrofit of the existing stormwater BMP would be conducted in waters of the U.S. (including wetlands). However, the proposed work would impact less than 0.1 acre of waters of the U.S. (including wetlands). This activity has been reviewed and found to satisfy the criteria contained in the Corps Nationwide Permit (NWP) 43, attached. (The Corps Nationwide Permits were published in the Federal Register (67 FR 2020) on January 15, 2002 as corrected by Federal Register (67 FR 6692) on February 13, 2002 and Federal Register (67 FR 8579) on February 25, 2002 and the regulations governing their use can be found in 33 CFR 330 published in Volume 56, Number 226 of the Federal Register dated November 22, 1991.)

Provided the enclosed conditions are met, an individual Department of the Army Permit will not be required. You must also adhere to the 401 certification conditions issued by the Virginia Department of Environmental Quality (DEQ) outlined in their letter of March 29, 2002. The Corps' Nationwide Permit conditions and 401 certification conditions are attached.

Enclosed is a "compliance certification" form, which must be signed and returned within 30 days of completion of the project (see nationwide permit condition number 14). Your signature on this form certifies that you have completed the work in accordance with the nationwide permit terms and conditions.

This verification is valid for five years from the date of this letter, unless the Norfolk District Engineer uses discretionary authority to modify, suspend or revoke this verification. The Chief of Engineers will periodically review the nationwide permits and their conditions and will decide to either modify, reissue or revoke the permits. These nationwides are scheduled to expire on March 18, 2007. If NWP 43 is reissued without modification or if your activity complies with any subsequent nationwide permit, the expiration date of this verification will not change. However, if NWP 43 is modified or revoked so that the activity listed above would no longer be authorized and you have commenced or are under contract to commence the work, you will have twelve months from the date of that permit change to complete the activity. Activities completed under the authorization of a nationwide permit which was in effect at the time the activity was completed continue to be authorized by that nationwide permit. It is your responsibility to remain informed of changes to the nationwide permits. We will issue a special public notice announcing any changes to the nationwide permits when they occur.

Copy Furnished:

Environmental Division, James City County
Planning Department, James City County

6. Corps Contact: Steven Martin at (757) 441-7787.

for Nicholas L. Konchuba
Chief, Eastern Virginia
Regulatory Section

NAO FL 13 REVISED DEC 90

CERTIFICATE OF COMPLIANCE
WITH
ARMY CORPS OF ENGINEERS PERMIT

Permit Number: 03-R0421-18

Name of Permittee: Wayland Bass, County Engineer
James City County

Date of Issuance: July 7, 2003

Permit Type: Nationwide Permit 43 (< 0.1 ac)

Within 30 days of completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the following address:

Steven Martin
c/o Regulatory Branch
Norfolk District Corps of Engineers
803 Front Street
Norfolk, Va. 23510-1096

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification or revocation.

I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation has been completed in accordance with the permit conditions.

_____ _____

Signature of Permittee Date

Scott Thomas

From: Scott Thomas
Sent: Tuesday, April 15, 2003 2:28 PM
To: Wayland Bass
Subject: RE: FOX RIDGE BMP UPGRADE

Since there's not enough volume in the pond to get the "true" 1-year storm volume and release over 24 hours, the minimum pipe size we would allow is 3-inch. Based on my observations of BMPs the smaller sizes tend to clog more, I have seen better success with size 6-inch and up.

I recommend six inch.

> -----Original Message-----
> **From:** Wayland Bass
> **Sent:** Tuesday, April 15, 2003 10:57 AM
> **To:** Scott Thomas
> **Subject:** FOX RIDGE BMP UPGRADE
>
> SCOTT; I HAVE STARTED THE COE PERMIT APPLICATION. WHAT SIZE PIPE DO YOU WANT TO SHOW THROUGH THE BULKHEAD?
>
> THANKS WNB

BMP Retrofit Analyses

Convert Exist BMP with an ED weir Wall Structure.

check discharge stage-data.

Scott Thomas

From: Scott Thomas
Sent: Tuesday, April 15, 2003 3:23 PM
To: Wayland Bass
Subject: FOX RIDGE BMP UPGRADE (2)

I ran through some rough calcs.

If top of wall is at El. 61.1 and base of wall/invert pipe is at El. 58.1, then the wall is around 3 feet high. Storage elevation estimated at this elevation is about 30,077.8 cubic feet. Volume of the 1-year storm for the 106 acre drainage area at CN 81, Tc = 37.6 minutes is 10.297 acre-ft. Therefore, there is no way to store the 1-year storm volume at the top of wall elevation.

The top of wall volume is just under the 1" rainfall applied to the drainage area (runoff 0.10 inches). The 1" rainfall volume is about 38,000 c.f.

Using actual storage volume of 30,077.8 cf at the top of the proposed wall,

1. For 24-hour detention, pipe size is 2-3/4 inch diameter.
2. For 18-hour detention, pipe size is about 3-1/4 inch diameter.
3. For 12-inch pipe, detention time would be about 1.27 hours.
4. For 8-inch pipe, detention time would be about 2.87 hours.
5. For 6-inch pipe, detention time would be about 5.1 hours
6. For 4-inch pipe, detention time would be about 11.5 hours
7. For 3-inch pipe, detention time would be about 20.5 hours
8. Any smaller size would exceed the USACOE detention time of 18 hours

Recommend 6-inch, clogging and lack of maintenance would result in orifice size equal to 3 or 4 inch, giving us about 15 hours of detention time.

Scott

-----Original Message-----
From: Scott Thomas
Sent: Tuesday, April 15, 2003 2:28 PM
To: Wayland Bass
Subject: RE: FOX RIDGE BMP UPGRADE

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PC003_FOX_RIDGE_SUBDIVISION_072

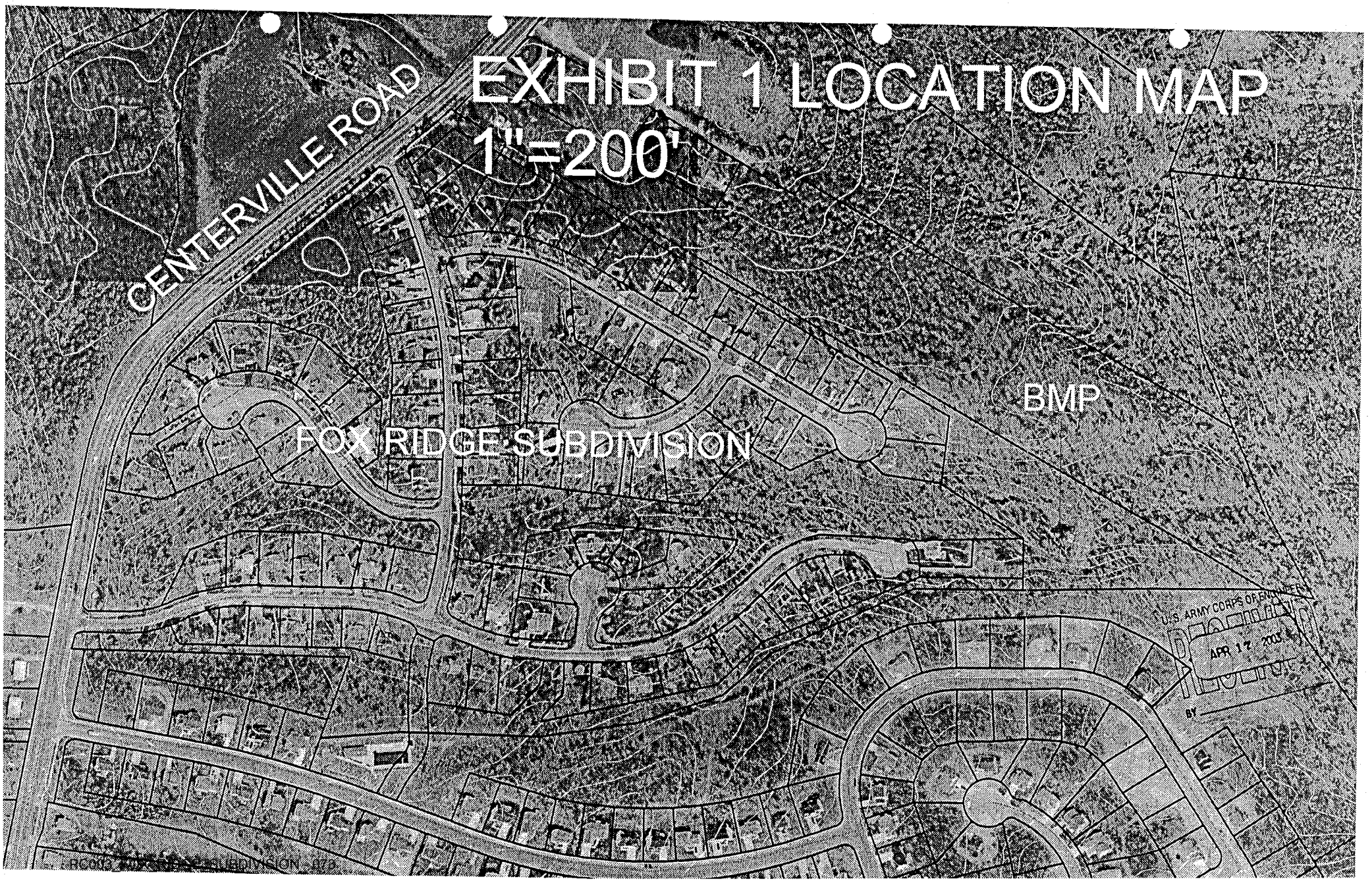
EXHIBIT 1 LOCATION MAP
1"=200'
CENTERVILLE ROAD
BMP
FOX RIDGE SUBDIVISION
U.S. ARMY CORPS OF ENGINEERS
APR 17 2003
BY