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: **PC058**

DATE VERIFIED: **May 22, 2012**

QUALITY ASSURANCE TECHNICIAN: **Leah Hardenbergh**

Leah Hardenbergh

LOCATION: WILLIAMSBURG, VIRGINIA

Stormwater Division

MEMORANDUM

DATE: February 24, 2010

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

FROM: Jo Anna Ripley, Stormwater

PO: 270712

RE: Files Approved for Scanning

BMP ID or General File ID PC058

PIN: 3640100018

Subdivision, Tract, Business or Owner Name (if known): Greensprings General: Greenpsrings Apartments & Condos; Greensprings Plantation; Greensprings West; Legacy Golf Links; Williamsburg National Golf Course; Greensprings Office Park

Property Description: Parcel F Legacy Golf Links @ Greenprings

Site Address: 3700 Centerville Road

(For internal use only) **Box:** GP001 **Drawer:** 1

Agreements: (in file as of scan date) **Y** **Book or Doc#:** 701 **Page:** 664-667

Comments:

013625

DECLARATION OF COVENANTS

COPY

INSPECTION/MAINTENANCE OF RUNOFF CONTROL FACILITY

THIS DECLARATION, made this 11th day of July, 1994, between Greensprings Plantation, Inc. & Legacy (Greensprings Limited Partnership), and all successors in interest, hereinafter referred to as the "COVENANTOR(S)," owner(s) of the LAKE "C" (As shown in Yellow on Exhibit "A") following property: Legacy Golf Links at Greensprings (Plat Book 58, Pages 96-102), and James City County, Virginia, hereinafter referred to as the "COUNTY."

WITNESSETH:

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

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

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

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

1-5

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

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

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

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

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

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

IN WITNESS WHEREOF, the COVENANTOR(S) have executed this DECLARATION OF COVENANTS as of this 11th day of July, 199_.

COVENANTOR(S)
GREENSPRINGS PLANTATION, INC.

Marc B. Sharp
MARC B. SHARP, President

ATTEST:

Michele Z. Ball

COVENANTOR(S)
LEGACY (GREENSPRINGS) LIMITED PARTNERSHIP

M. W. Sanders
By: Club Development Associates, Inc.
i/e: Managing General Partner
By: Michael W. Sanders
i/e: President

ATTEST:

Barry Embley

STATE OF VIRGINIA
~~CITY~~/COUNTY OF James City

I hereby certify that on this 11th day of July 1994, before the subscribed, a Notary Public of the State of Virginia, and for the ~~City~~/County of James City, aforesaid personally appeared before me Marc B. Sharp
(Name of Acknowledging Party)
and did acknowledge the aforegoing instrument to be their Act.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal this 11th day of July, 1994.

Lisa N. Stroud
Notary Public

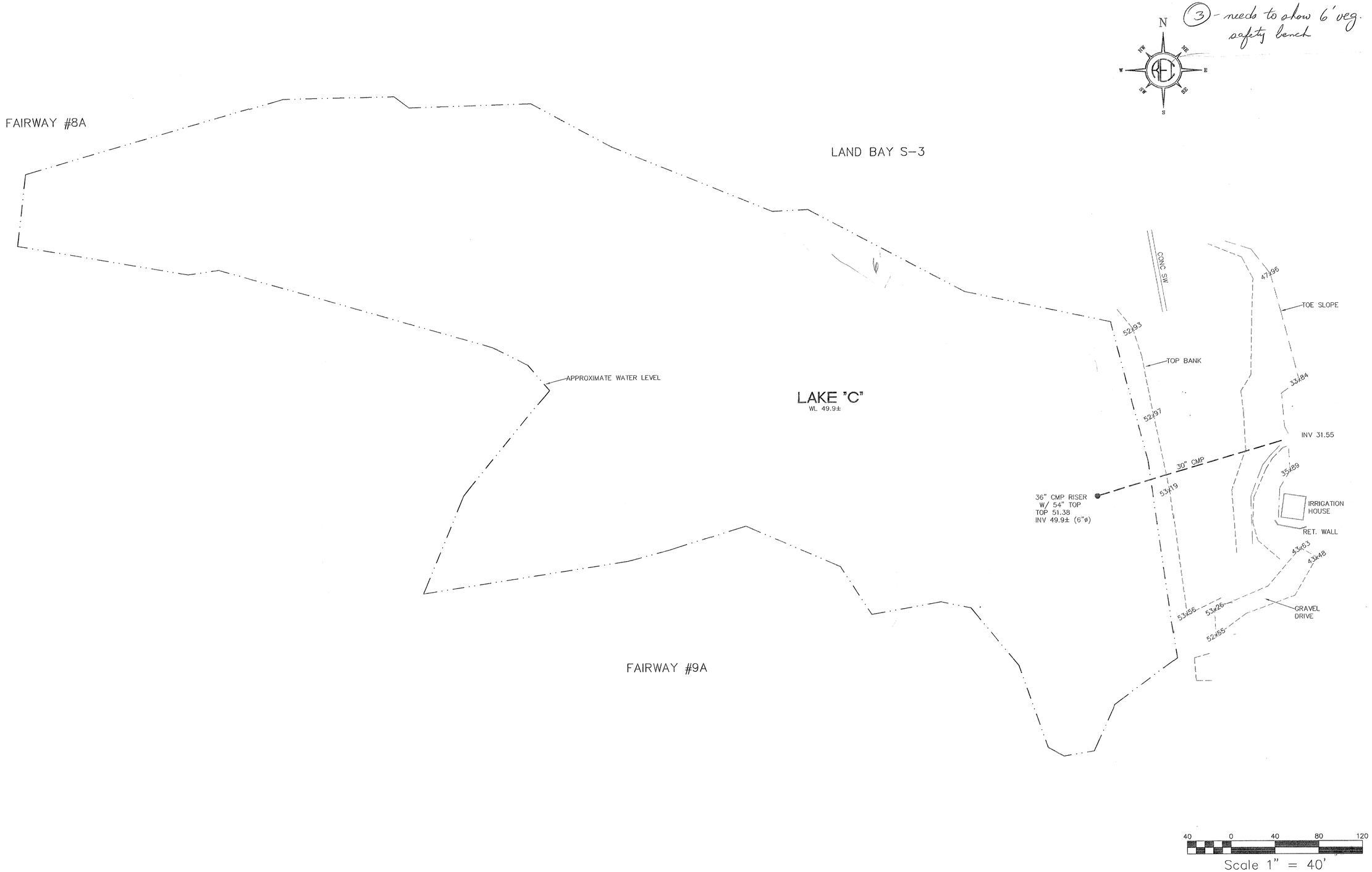
My commission expires: 10-31-97

3-5

① - needs to show Emer. spillway on natural veg. ground

② - needs to show 3:1 slopes on the dam

③ - needs to show 6' veg. safety bench



Rickmond Engineering, Inc.

Engineering
Surveying
Land Planning
www.rickmond.com

1643 Merrimac Trail
Williamsburg VA 23185
Voice: (757)229-1776
Fax No. (757) 229-4683

Designed By:	Drawn By:	Scale:	Date:	Job No.:
KMJ	KMJ	1" = 40'	12/8/98	98218

No.	By	Revision	App.	Date

GREENSPRINGS PLANTATION RETENTION PONDS

RECORD DRAWINGS

JAMES CITY COUNTY VIRGINIA

Job Number	Sheet No.
98218	C1

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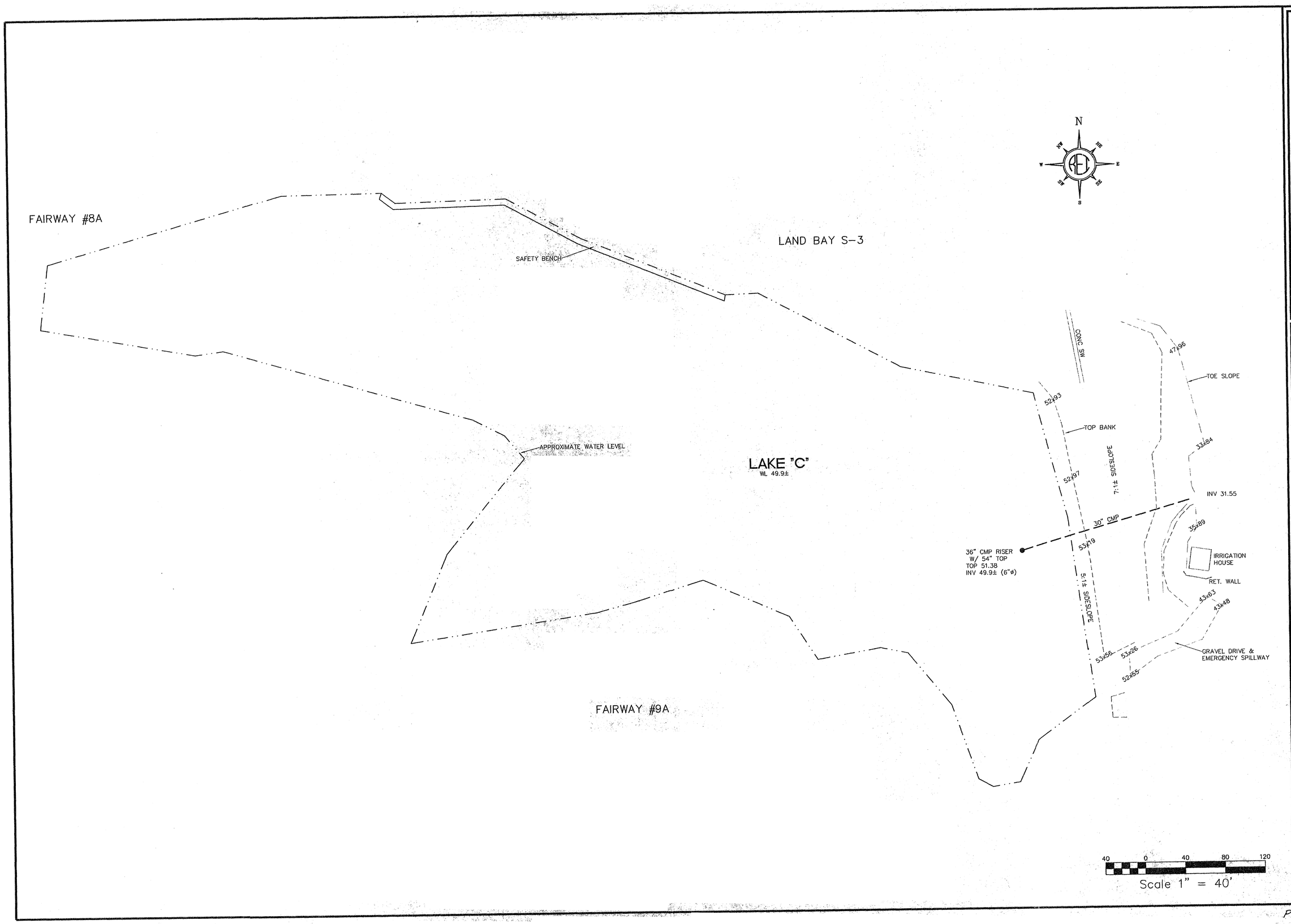
PC058_GREENSPRINGS_LEGACY_GOLF_COURSE - 006



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Surveying
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Designed By:	Drawn By:	Scale:	Date:	Job No.:
KMJ	KMJ	1" = 40'	12/8/98	98218

COMMONWEALTH OF VIRGINIA
K.M. JENKINS II
No. 022572
PROFESSIONAL ENGINEER
2/4/00

No.	By	Revision	Date	App.
1	KMJ	REV PER COUNTY COMMENTS TELECON 1/4/00	1/6/00	KMJ

GREENSPRINGS PLANTATION RETENTION PONDS

RECORD DRAWINGS

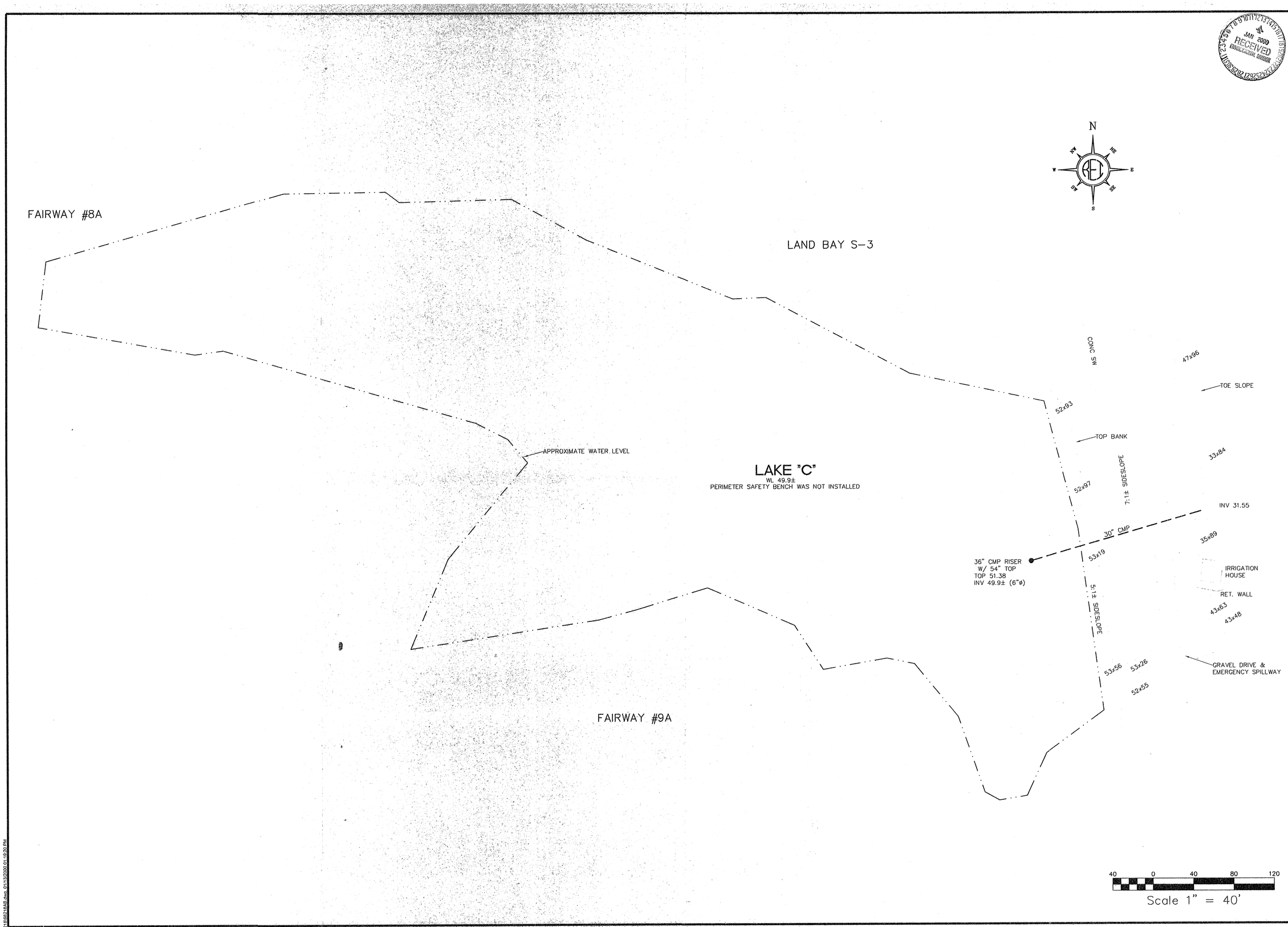
JAMES CITY COUNTY VIRGINIA

Job Number 98218

Sheet No. C1

PC 058

PC058_GREENSPRINGS_LEGACY_GOLF_COURSE - 007



JAN 2000
RECEIVED
ENVIRONMENTAL DIVISION

Rickmond Engineering, Inc.
1643 Merrimac Trail
Williamsburg, VA 23185
Voice: (757) 229-1776
Fax No. (757) 229-4683
Engineering
Surveying
Land Planning
www.rickmond.com

Designed By:	Drawn By:	Scale:	Date:	Job No.:
KMJ	KMJ	1" = 40'	12/8/98	98218

COMMONWEALTH OF VIRGINIA
KARL JENKINS II
No. 022872
PROFESSIONAL ENGINEER

No.	By	Revision	App.	Date
1	KMJ	REV PER COUNTY COMMENTS TELECON 1/4/00	KMJ	1/6/00

GREENSPRINGS PLANTATION RETENTION PONDS

RECORD DRAWINGS

JAMES CITY COUNTY VIRGINIA

Job Number	Sheet No.
98218	C1

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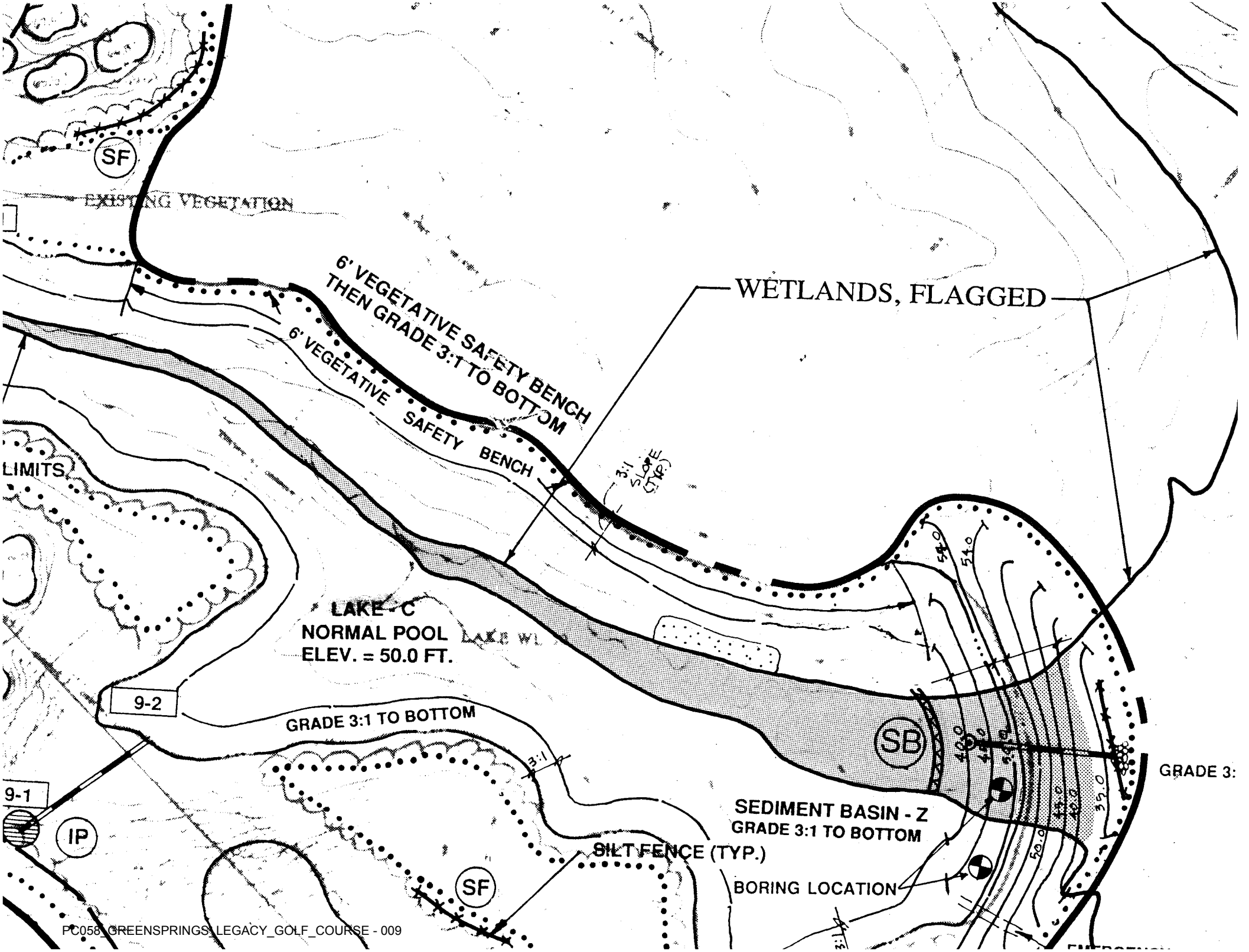
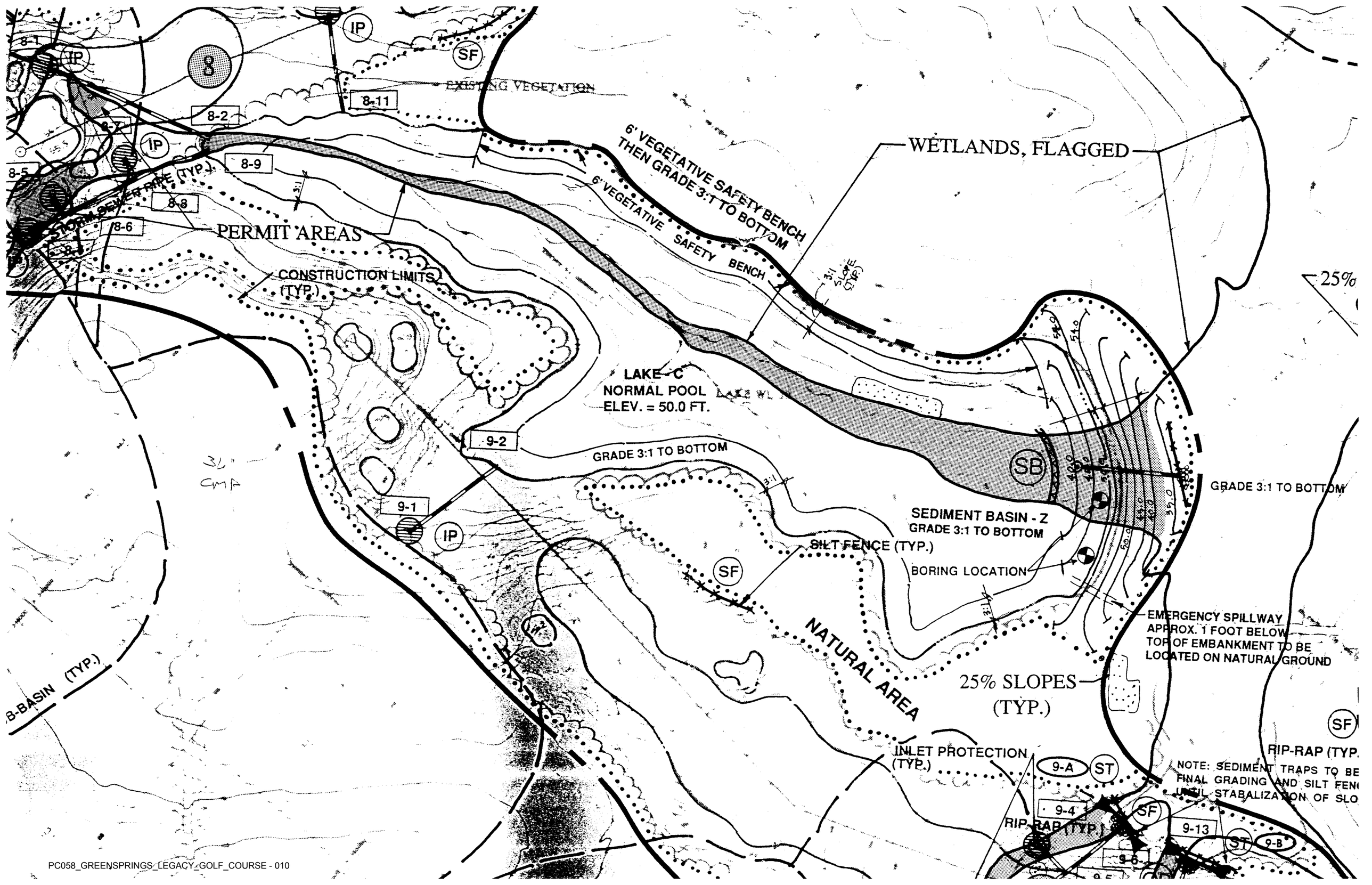
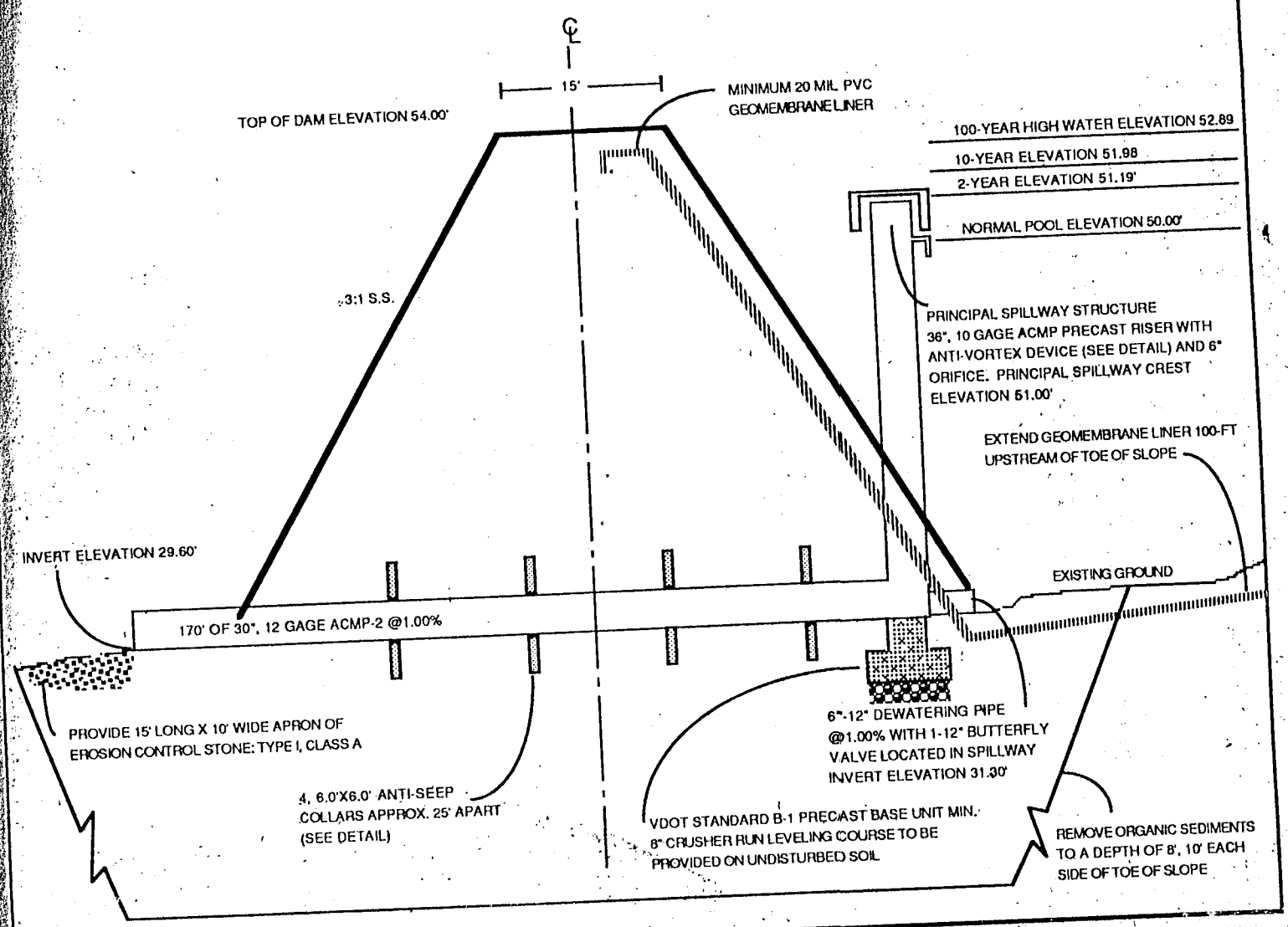

SF
EXISTING VEGETATION
6' VEGETATIVE SAFETY BENCH
THEN GRADE 3:1 TO BOTTOM
6' VEGETATIVE SAFETY BENCH
WETLANDS, FLAGGED
3:1 SLOPE (TYP.)
LIMITS
LAKE - C
NORMAL POOL
ELEV. = 50.0 FT.
9-2
GRADE 3:1 TO BOTTOM
SB
GRADE 3:
9-1
IP
SEDIMENT BASIN - Z
GRADE 3:1 TO BOTTOM
SILT FENCE (TYP.)
SF
BORING LOCATION
PC058_GREENSPRINGS_LEGACY_GOLF_COURSE - 009



PC058_GREENSPRINGS_LEGACY_GOLF_COURSE - 010

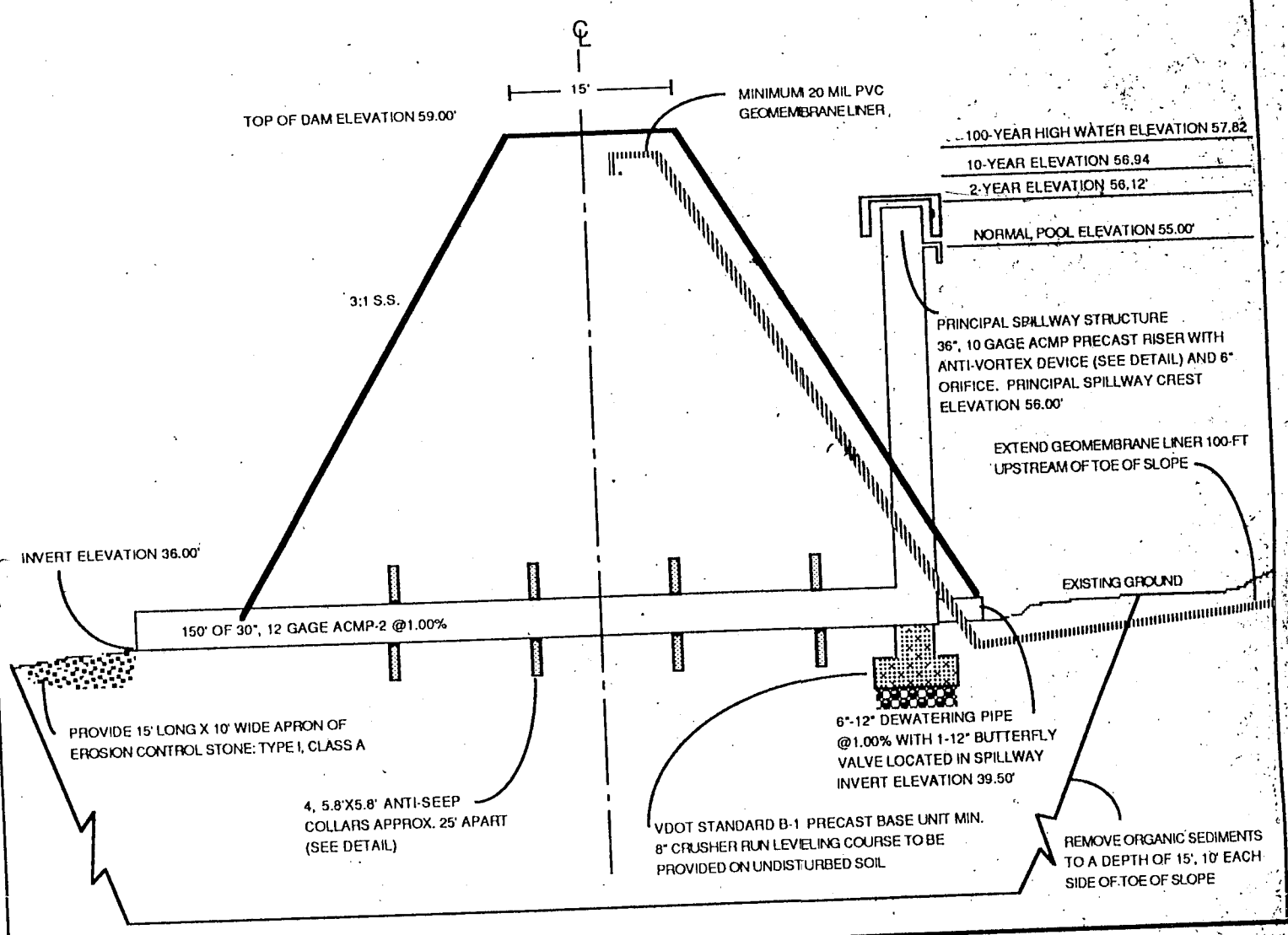
DAM CROSS-SECTION
LAKE C

1"=15' HORIZ.
1"=5' VERT.



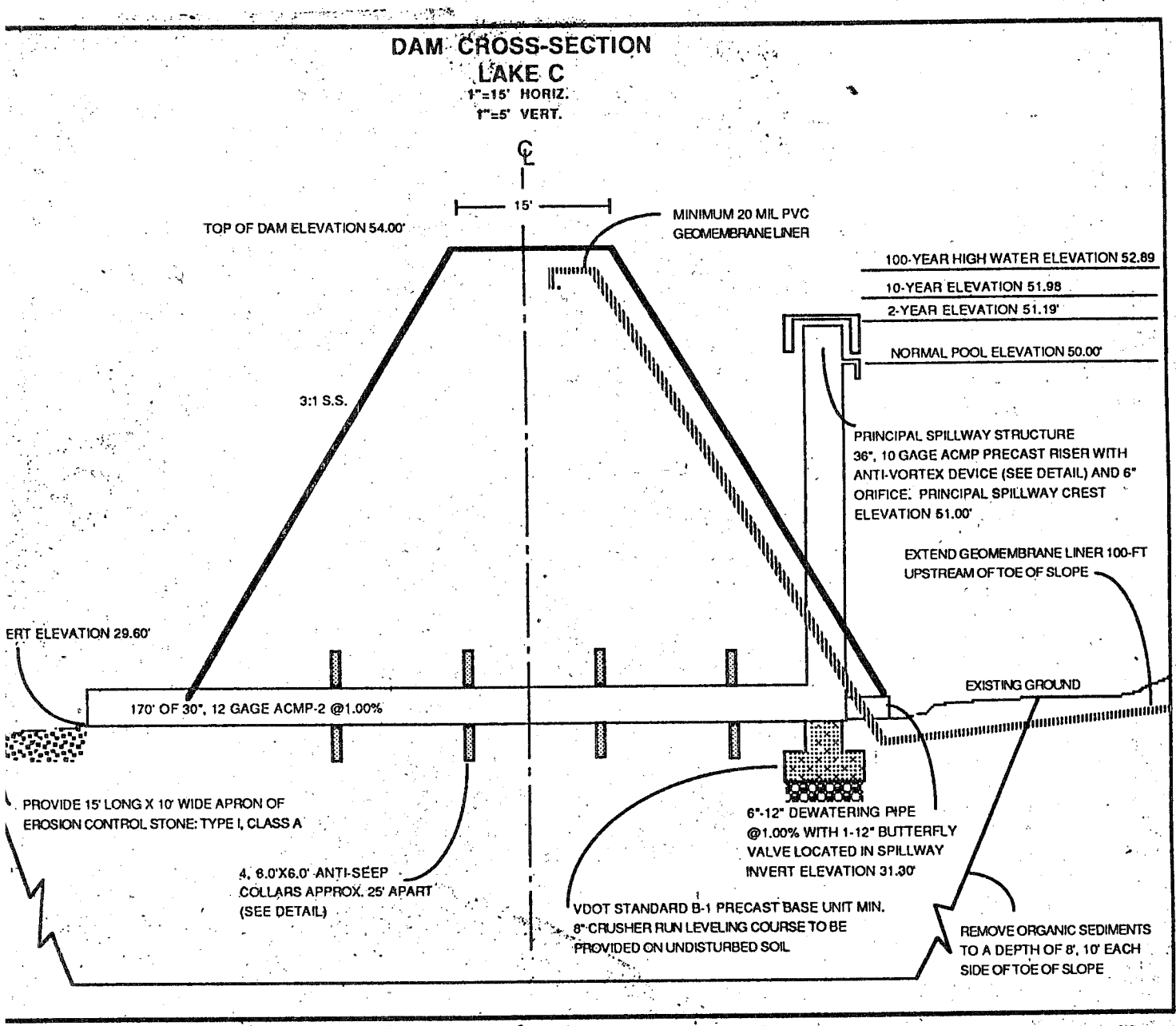
DAM CROSS-SECTION
LAKE G

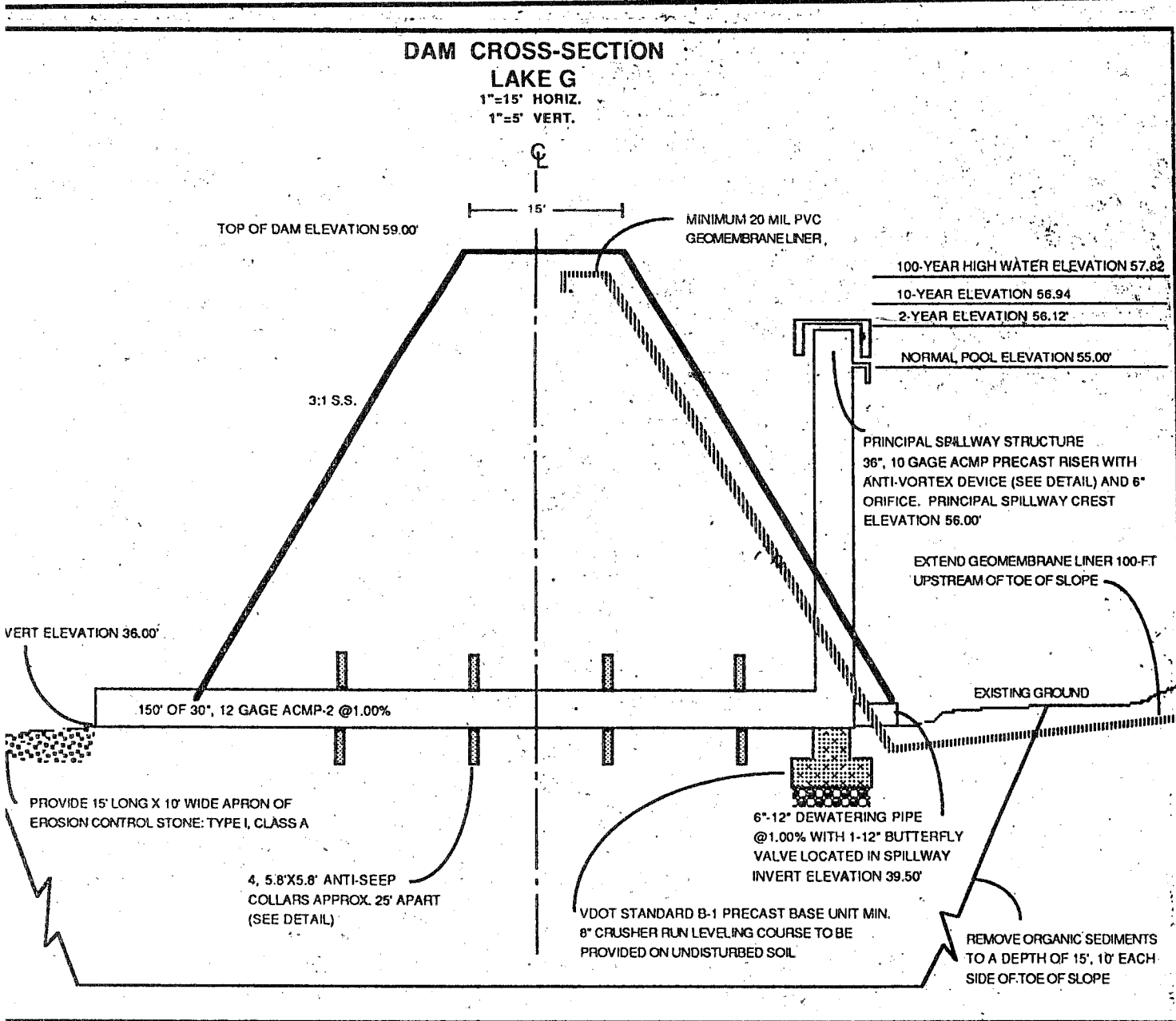
1"=15' HORIZ.
1"=5' VERT.

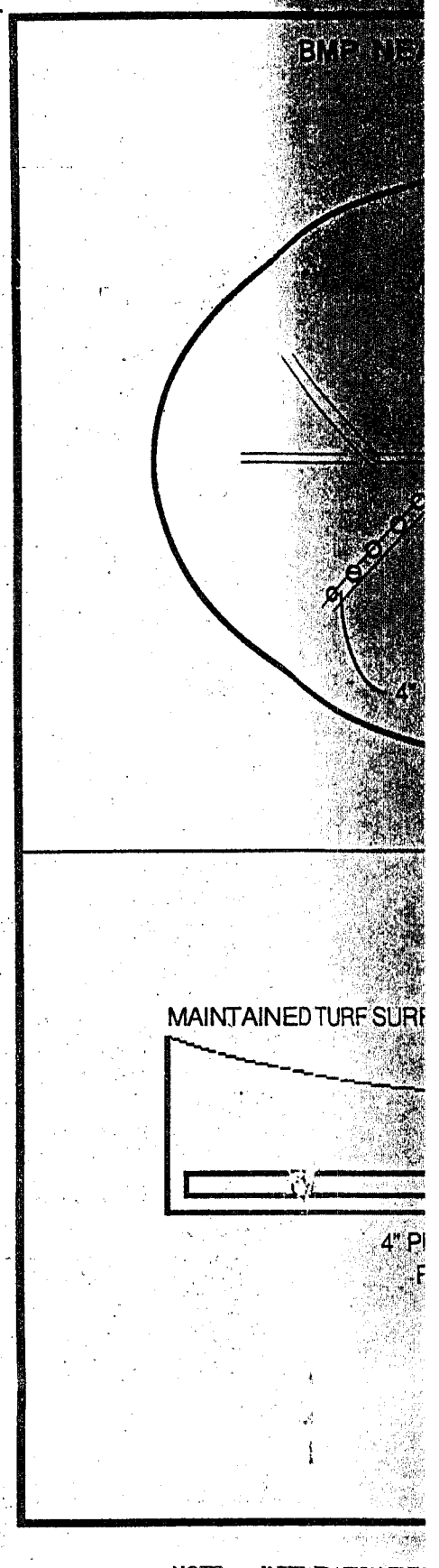


LAKE AND BMP SPECIFICATIONS: CORRUGATED STEEL PIPE SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM A760 (AASHTO M36). COATING SHALL BE ALUMINIZED TYPE 2 CONFORMING TO ASTM A819 (AASHTO M274). PIPE SHALL HAVE A MINIMUM OF TWO FACTORY ROLLED ANNULAR CORRUGATIONS AT EACH END. PIPE MAY BE ASPHALT COATED IN ACCORDANCE WITH AASHTO M190 OR EQUIVALENT. CONNECTING BANDS SHALL BE FURNISHED WITH HUGGER RINGS WITH O-RING GASKETS OR FLAT GASKETS.

PROTECTION FOR 6 INCH





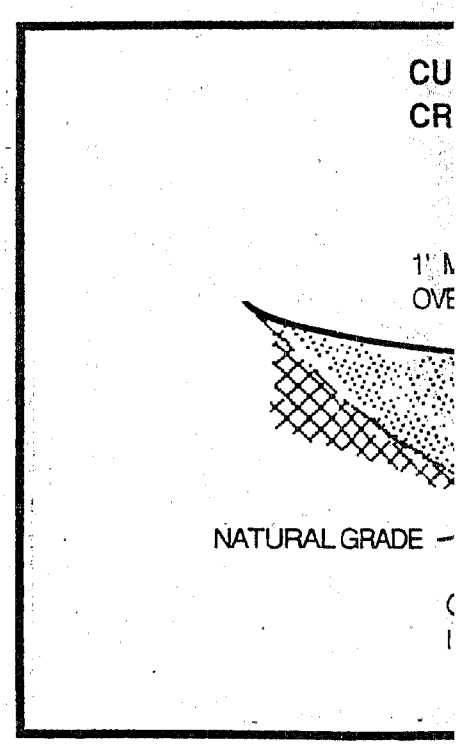


E AND BMP SPECIFICATIONS: CORRUGATED STEEL PIPE SHALL BE MANUFACTURED IN ORDANCE WITH ASTM A760 (AASHTO M36). COATING SHALL BE ALUMINIZED TYPE 2 IFORMING TO ASTM A819 (AASHTO M274). PIPE SHALL HAVE A MINIMUM OF TWO TORY ROLLED ANNULAR CORRUGATIONS AT EACH END. PIPE MAY BE ASPHALT COATED IN ORDANCE WITH AASHTO M190 OR EQUIVALENT. CONNECTING BANDS SHALL BE FURNISHED H HUGGER RINGS WITH O-RING GASKETS OR FLAT GASKETS.

NOTE: INFILTRATION TYPI THE TWO YEAR DES FOR THIS TYPE OF I

SEDIMEN TOTAL PH TOTAL NI (MWC

THIS LEVEL OF WA THE RPA BUFFER. T PRESUMED TO BE 7



ASH PROTECTION FOR 6 INCH FICE PROVIDED BY SUBMERGED ET. ELBOW IN PIPE ESTABLISHES RMAL POOL ELEVATION WHILE NTAINING APPROXIMATELY 1 OT OF COVERAGE TO AVOID GGING.

ANTI-S

Install collar wit corrugations verti

Continuous

AT GREENSPRINGS
BEING A
SUBDIVISION OF PROPERTY OF
GREENSPRINGS PLANTATION, INC
BERKELEY DISTRICT
JAMES CITY COUNTY, VIRGINIA
FEBRUARY 18, 1994
SCALE: 1"=600'
SHEET 1 OF 7

Langley and McDo

Engineers – Surveyors – P
Landscape Architects – Environmen

VIRGINIA BEACH

GRAPHIC SCALE IN FEET

0 300 600 1200 1800

SPECIAL FLOOD HAZARD AREAS INUNDATED B

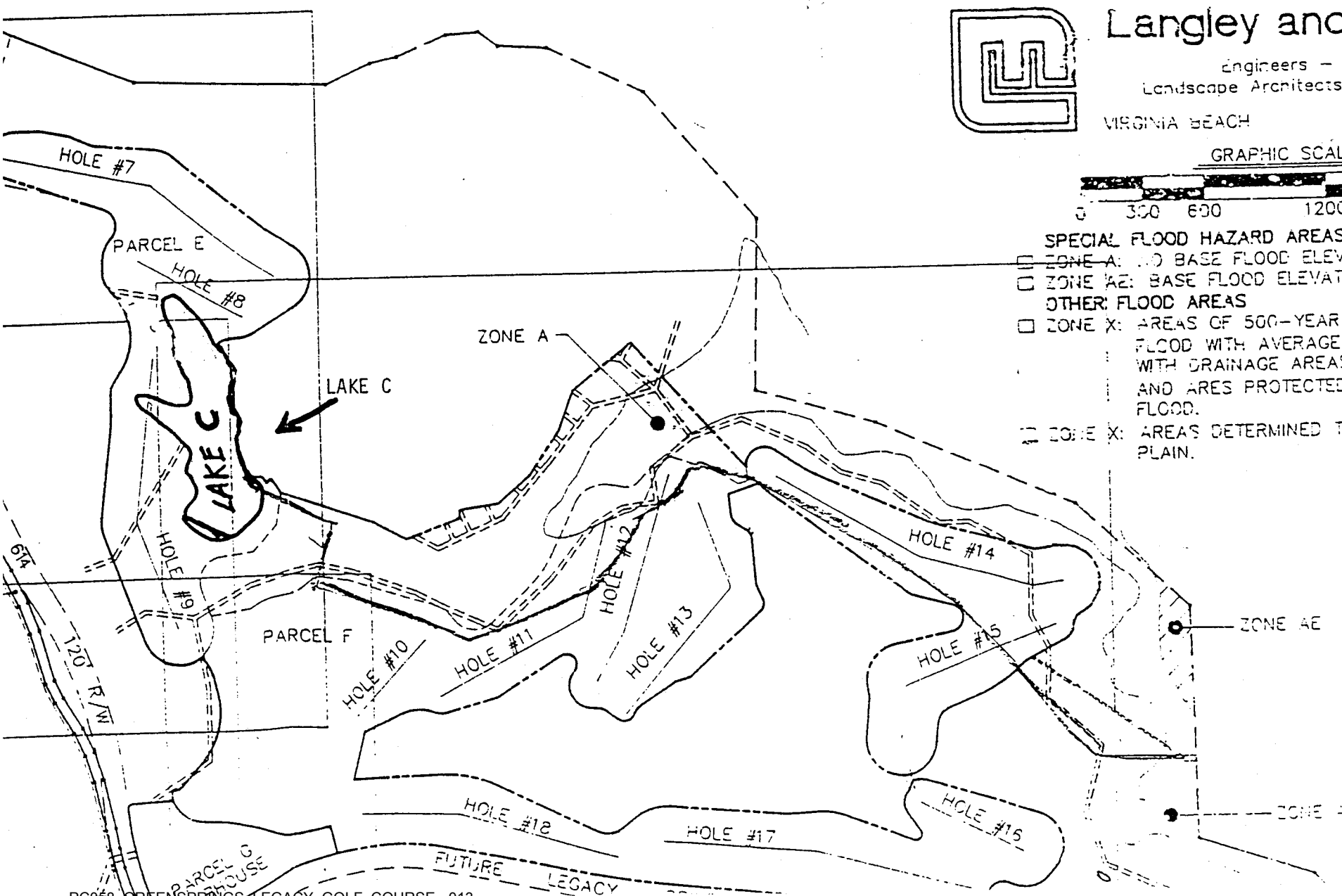
☐ ZONE A: NO BASE FLOOD ELEVATIONS DETER

☐ ZONE AE: BASE FLOOD ELEVATIONS DETERMIN

OTHER FLOOD AREAS

☐ ZONE X: AREAS OF 500-YEAR FLOOD, AREA FLOOD WITH AVERAGE DEPTHS OF L WITH DRAINAGE AREAS LESS THAN AND ARES PROTECTED BY LEVEES F FLOOD.

☐ ZONE X: AREAS DETERMINED TO BE OUTSIDE PLAIN.

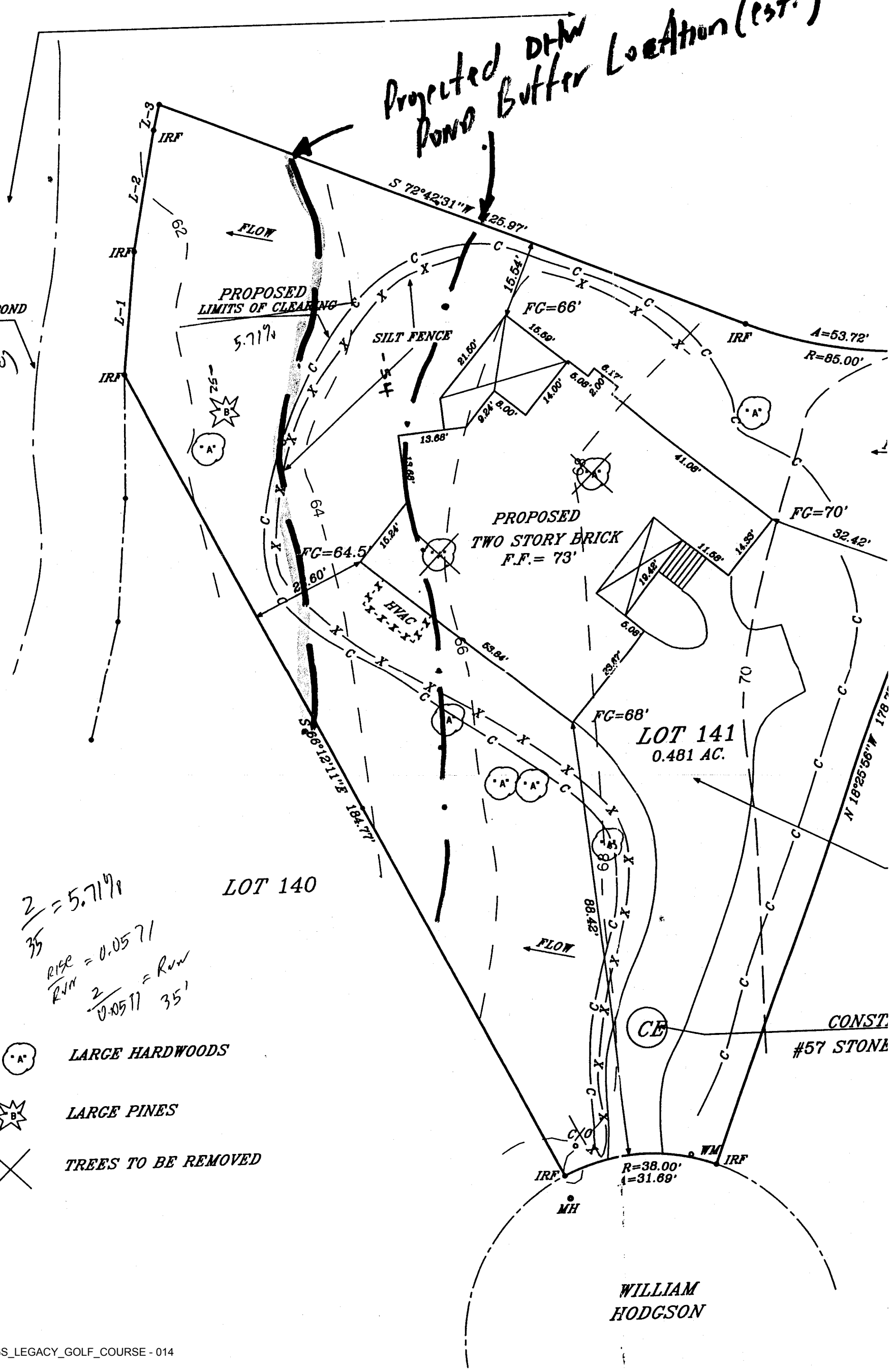


COURSE	BEARING	DISTANCE
L-1	N 33°20'38"W	25.00'
L-2	N 28°33'22"W	25.00'
L-3	N 25°46'41"W	5.40'

PER P.B.62, PG.63, FRONT, SIDE AND REAR SETBACKS ARE ZERO
BUILDER: EVAN SAWYER, MASTER BLD INC.
ELEVATIONS ARE ASSUMED FOR TOPO PURPOSE.

MUST TIE TO POND & SHOW BUFFER.

LEGACY GOLF CLUB



2/35 = 5.71%
RISE/RUN = 0.0571
2/0.0571 = RUN 35'

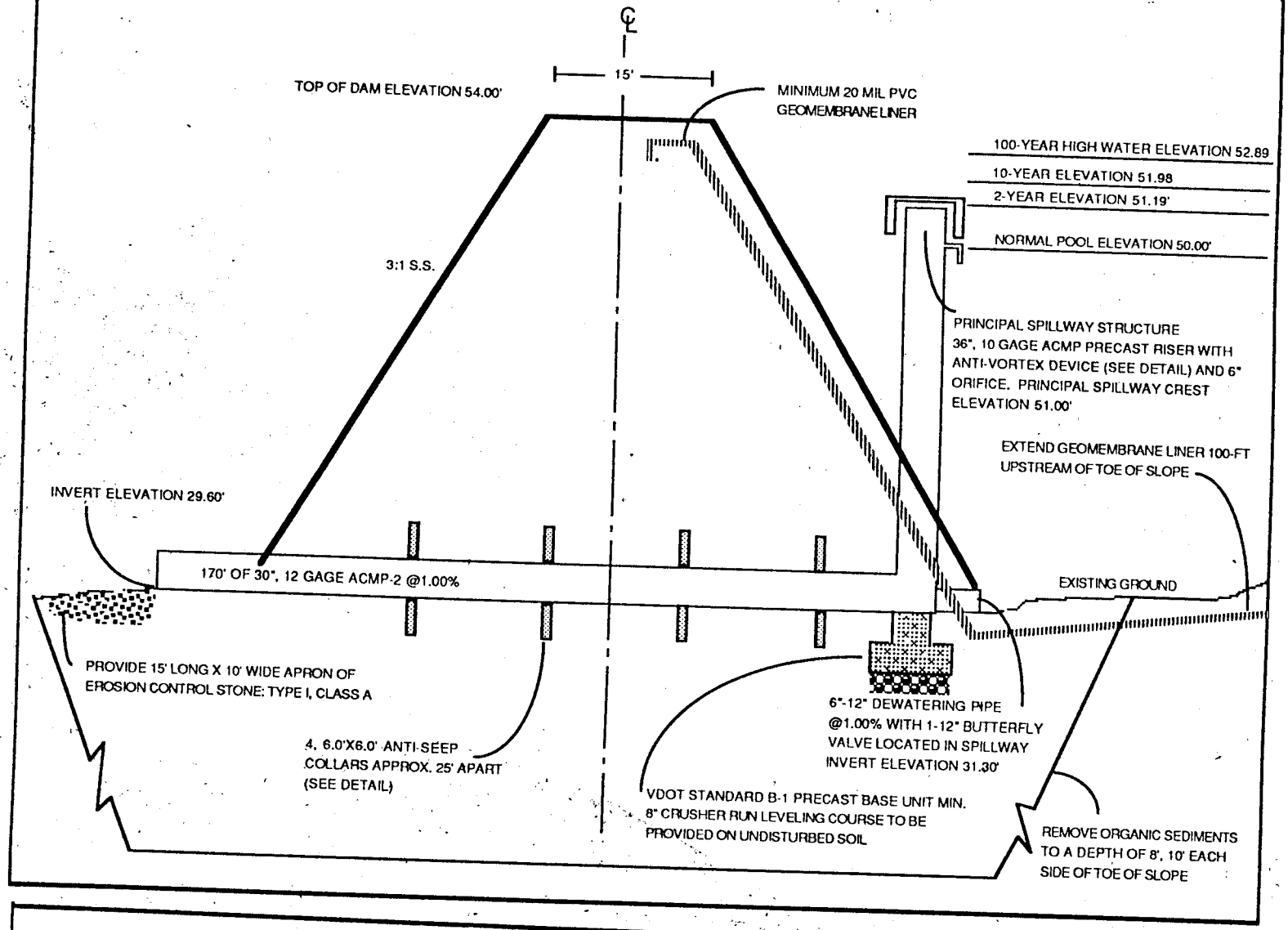
LARGE HARDWOODS

LARGE PINES

TREES TO BE REMOVED

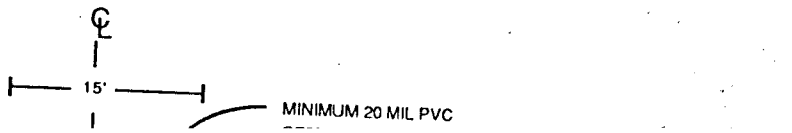
DAM CROSS-SECTION
LAKE C

1"=15' HORIZ.
1"=5' VERT.



DAM CROSS-SECTION
LAKE G

1"=15' HORIZ.
1"=5' VERT.



GEOTECHNICAL ANALYSIS

ENGINEERING CONSULTING SERVICES, LTD. (1600 MOUNTAIN ROAD, GLEN ALLEN VA 23060) COMPILED A GEOTECHNICAL STUDY FOR THE PROPOSED DAMS FOR LAKES C AND G AT THE LEGACY OF GREENSPRINGS GOLF COURSE NO. 1 IN JAMES CITY COUNTY, VIRGINIA. THIS INVESTIGATION WAS ACCOMPLISHED BY PERFORMING A TOTAL OF TWO BORINGS AT EACH OF THE TWO DAM SITES TO ASCERTAIN FOUNDATION BEARING QUALITY OF THE IN-SITU SOILS. IN ADDITION, HANDAUGER BORINGS WERE PERFORMED AT VARIOUS LOCATIONS AROUND THE IMPOUNDMENTS TO EXPLORE THE QUALITY OF FILL SOILS AVAILABLE FROM CUTS PERFORMED IN THESE AREAS.

THE RESULTS OF THE SOIL TEST BORINGS INDICATE THE SUBSURFACE SOILS ARE PRIMARILY GRANULAR IN NATURE AND THEREFORE HIGHLY PERMEABLE. CONSIDERING THE LOW TOLERANCE FOR SEEPAGE FROM THE IMPOUNDMENTS, IT DOES NOT APPEAR THAT TYPICAL DAM CONSTRUCTION EMPLOYING A CLAY CORE WITH CLAY KEY WOULD CONSTITUTE AN ACCEPTABLE BARRIER TO WATER LOSS FROM THE IMPOUNDMENTS. THEREFORE, RECOMMENDED DAM DESIGNS INCLUDE TWO METHODS EMPLOYING GROUTED CURTAIN WALLS AND GEOMEMBRANE LINERS.

GROUNDWATER WAS ENCOUNTERED AT BOTH DAM SITES IN THE BOTTOM OF THE IMPOUNDMENT RAVINES. THEREFORE, DEWATERING AND DIVERTING OF WATER WILL BE OF CONCERN DURING CONSTRUCTION. FURTHERMORE, THE PRESENCE OF HEAVY ORGANICS WITHIN THE EMBANKMENT BEARING SOILS WILL REQUIRE SUBSTANTIAL UNDERCUTTING FROM BELOW BOTH DAMS.

THE CONCLUSIONS AND RECOMMENDATIONS CONTAINED IN THIS REPORT ARE BASED UPON A TOTAL OF FOUR BORINGS (C-1 AND 2, G-1 AND 2) DRILLED TO DEPTHS OF 25 FEET BELOW THE EXISTING GRADES AND SEVERAL HANDAUGER BORINGS PERFORMED TO DEPTHS OF 4 TO 8 FEET, A SITE RECONNAISSANCE PERFORMED BY THE GEOTECHNICAL ENGINEER, LABORATORY TEST RESULTS OF BORING AND BULK SAMPLES, AND SITE PLANS INDICATING IMPOUNDMENT BOUNDARIES AND DAM PROFILES. THE PROPOSED FIELD SAMPLING LOCATIONS WERE SELECTED BY THE PROJECT GEOTECHNICAL ENGINEER.

FOUNDATION PREPARATION

THE PRESENCE OF SOFT, ORGANIC SEDIMENTS IN THE BOTTOM OF THE RAVINES AT BOTH DAM SITES MAKES FOUNDATION CONDITIONS AT BOTH SITES UNSUITABLE FOR SUPPORT OF THE EARTHEN EMBANKMENTS. THESE ORGANIC MATERIALS SHOULD BE REMOVED FROM BELOW THE DAMS AND TO A DISTANCE OF AT LEAST 10 FEET BEYOND THE TOE OF THE EMBANKMENTS. THE SOIL BORINGS PERFORMED AT DAM C INDICATE UNSUITABLE DEPOSITS EXTEND AS DEEP AS ABOUT 8 FEET AND LIKELY MORE BELOW THE BOTTOM OF THE RAVINE. AT DAM G, UNSUITABLE MATERIALS WERE ENCOUNTERED AS DEEP AS ABOUT 15 FEET.

IT IS RECOMMENDED THAT PROVISIONS FOR DEWATERING BE MADE, THEN THE UNDERCUT PERFORMED TO THE REQUIRED GRADE AND DIMENSIONS. THE EXCAVATION SHOULD BE BACKFILLED UTILIZING AN APPROVED BACKFILL MATERIAL. SUCH A MATERIAL SHOULD CONSIST OF A SOIL CLASSIFIED AS SM, SC, OR CL CONTAINING AT LEAST 15% BY WEIGHT FINES (SILT OR CLAY) AND HAVING A MAXIMUM PLASTICITY INDEX (PI) OF 30%. THE FILL SHOULD BE COMPACTED IN MAXIMUM 10 INCH LIFTS TO A DRY DENSITY OF AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D698). IN ORDER TO ATTAIN THIS COMPACTION, IT WILL BE NECESSARY TO EMPLOY HEAVY COMPACTION EQUIPMENT IN THE BASE OF THE CUT. THE CONTRACTOR SHOULD PROVIDE THE METHODS NECESSARY TO ATTAIN ADEQUATE DEWATERING AND EXCAVATION STABILITY.

DAM EMBANKMENT AND CORE

ONCE THE UNSUITABLE DAM BASE SOILS HAVE BEEN REMOVED AND REPLACED, CONSTRUCTION OF THE EARTHEN EMBANKMENTS CAN PROCEED. BECAUSE CONSTRUCTION OF THESE DAMS WILL INCLUDE PLACEMENT OF A FABRIC LINER, THE CONSTRUCTION OF A KEY TRENCH IS NOT CONSIDERED NECESSARY. A CLAY CORE ALSO WILL NOT BE REQUIRED SINCE A FABRIC LINER IS TO BE EMPLOYED IN THE CONSTRUCTION.

GEOMEMBRANE LINER

THE IMPOUNDMENT CAN BE CREATED EMPLOYING AN EARTHEN EMBANKMENT COVERED IN A GEOMEMBRANE LINER. SPECIFIC INSTALLATION METHODS SHOULD BE SPECIFIED BY THE LINER SUPPLIER. THIS WOULD INCLUDE SEAM CONSTRUCTION AND EDGE ANCHORING. IN GENERAL, LINER CONSTRUCTION SHOULD PROCEED AS FOLLOWS:

A) BURY THE LINER AT A DEPTH OF APPROXIMATELY 3 FEET BELOW AND PARALLEL TO THE DAM EMBANKMENT SURFACE. BURY THE LINER AT LEAST 1 FOOT BELOW THE SURFACE NEAR THE IMPOUNDMENT PERIMETER. LINER MAY BE EXPOSED IF SUBMERGED WITHIN THE LAKE BED.

B) WHERE DAM STRUCTURES PENETRATE THE LINER, SUCH AS THE VERTICAL SPILLWAY RISER AND DEWATERING PIPE. THE LINER MUST BE SEALED AROUND THAT STRUCTURE TO PREVENT LEAKAGE.

C) THE LINER SHOULD EXTEND INTO THE IMPOUNDMENT A DISTANCE OF 100 FEET OUTWARD BEYOND THE UPSTREAM TOE OF THE DAM. THE EDGES OF THE LINER SHOULD EXTEND UP THE SIDES OF THE IMPOUNDMENT WITHIN THIS ZONE TO AN ELEVATION AT LEAST 2 FEET ABOVE THE 100 YEAR FLOOD ELEVATION.

GROUNDWATER SEEPAGE CONTROL

IN ORDER TO CONTROL SEEPAGE IN THE DOWNHILL TOE OF THE DAMS, A DRAINAGE BLANKET SHOULD BE EMPLOYED AT EMBANKMENT SUBGRADE ELEVATIONS; THAT IS, AN ELEVATION CONSISTENT WITH THE GROUND SURFACE ELEVATION JUST BEYOND THE EMBANKMENT TOE. THIS BLANKET SHOULD EXTEND INTO THE DAM FROM THE TOE A DISTANCE EQUAL TO ABOUT 20% OF THE EMBANKMENT WIDTH AT ITS BASE. THE DRAINAGE BLANKET SHOULD EXTEND UP THE SHOULDERS OF THE RAVINE A VERTICAL DISTANCE OF AT LEAST 3 FEET. SEEPAGE INTO THIS DRAINAGE BLANKET SHOULD BE COLLECTED IN A TOE DRAIN ALIGNED PARALLEL TO THE DOWNSTREAM TOE OF THE EMBANKMENT WITH DISCHARGE THROUGH A PERPENDICULAR DRAIN INTO THE OUTLET PIPE. THE DRAINAGE BLANKET SHOULD CONSIST OF A 12 INCH THICK LAYER OF COARSE GRADED AGGREGATE SUCH AS VDOT SIZE NO. 57 STONE WRAPPED IN A MEDIUM DUTY, NONWOVEN GEOTEXTILE FILTER FABRIC. THE TOE DRAIN PIPE SHOULD CONSIST OF A 6 INCH SLOTTED POLYETHYLENE TUBING WHICH SATISFIES THE REQUIREMENTS OF ASTM F-405.

IN ORDER TO MINIMIZE EROSION DUE TO SEEPAGE ALONG THE SPILLWAY CONDUIT, IT IS RECOMMENDED THAT SEEPAGE COLLARS BE SPACED AT INTERVALS ALONG THAT PIPE UPSTREAM OF THE DRAINAGE BLANKET. THE COLLARS SHOULD REST DIRECTLY ON THE DRAINAGE BLANKET IN THAT PORTION OF THE EMBANKMENT WHERE THE DRAINAGE BLANKET IS EMPLOYED.

DEWATERING DURING CONSTRUCTION WILL BE DIFFICULT, PARTICULARLY IF WORK IS PERFORMED IN OTHER THAN THE DRIER SUMMER MONTHS. SURFACE GRADE STREAM FLOWS ARE RELATIVELY LOW AND TEMPORARY DETENTION OF SURFACIAL FLOWS MIGHT BE ATTAINED BY TEMPORARY BERMS AND DAMS UPSTREAM OF THE WORK AREA. FOR EXCAVATION BELOW GRADE IN ORDER TO REMOVE AND REPLACE ORGANIC DEPOSITS, DEWATERING COULD BE MORE COMPLICATED. IT IS ANTICIPATED THAT STAGED EXCAVATION SUPPORTED BY DEWATERING PUMPS OF SUBSTANTIAL CAPACITY WILL BE REQUIRED TO ACCOMPLISH THE UNDERCUTS, PARTICULARLY AT LAKE G WHERE ORGANIC DEPOSITS EXTEND AS DEEP AS 15 FEET AND POSSIBLY MORE. THE CONTRACTOR SHOULD PROVIDE DEWATERING BY APPROPRIATE METHODS AND HAVE THESE METHODS APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION. ONCE THE EMBANKMENT BASE ELEVATIONS HAVE BEEN ESTABLISHED, THE PRINCIPAL SPILLWAY RISER AND CONDUIT CAN BE INSTALLED AND THE WATER COURSE DIVERTED THROUGH IT.

CONSTRUCTION CONTROL

FILL SHOULD BE PLACED AND COMPACTED TO A DRY DENSITY OF AT LEAST 95% OF THAT SOIL'S STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D698). THE COMPACTION SHOULD BE ACCOMPLISHED BY PLACING FILL IN 6 TO 10 INCH LOOSE LIFTS AND MECHANICALLY COMPACTING EACH LIFT TO THE REQUIRED DENSITY PRIOR TO PLACEMENT OF SUBSEQUENT LIFTS. AT LEAST A 5 TON DRUM ROLLER SHOULD BE EMPLOYED TO ATTAIN GENERAL EMBANKMENT COMPACTION. HAND OPERATED EQUIPMENT SHOULD BE EMPLOYED AROUND AND IMMEDIATELY ABOVE PIPES AND FOUNDATION. SOILS SHOULD BE COMPACTED AT MOISTURE CONTENTS WITHIN 3% ABOVE AND 1% BELOW OPTIMUM MOISTURE CONTENT FOR THE MATERIAL USED.

THE SURFACE OF EACH COMPACTED LIFT SHOULD BE SCARIFIED BY BACKDRAGGING TO A DEPTH OF 2 INCHES PRIOR TO PLACEMENT OF THE NEXT LIFT, THIS TO PREVENT DEVELOPMENT OF HORIZONTAL SEEPAGE PLANES. EMBANKMENT FILL SHOULD BE PLACED IN HORIZONTAL LIFTS WITH SLOPES NO STEEPER THAN 1 VERTICAL TO 4 HORIZONTAL. WHERE GREATER SLOPES EXIST, THEY SHOULD BE BENCHED TO RECEIVE FILL. BENCH HEIGHTS SHOULD BE LIMITED TO 4 FEET. THE [illegible]

Legacy Golf Links

BMP 1
Sheet 8
Spillway 1' deep
20' Wide

OWNER: GREENSPRINGS PLANTATION, INCORPORATED
4029 IRONBOUND ROAD
SUITE 200
WILLIAMSBURG, VIRGINIA 23188
CONTACT: MR. MARC B. SHARP
(804) 220-2874

DEVELOPER: CLUB DEVELOPMENT ASSOCIATES, INCORPORATED
P.O. BOX 3230
PINEHURST, NORTH CAROLINA 28374
CONTACT: MR. ALLEN JORDON
(919) 944-8838

ZONING R-4

BASE TOPOGRAPHY AND LAND PLAN PROVIDED BY
LANGLEY MCDONALD ENGINEERS
VIRGINIA BEACH, VIRGINIA

STATISTICS

TOTAL GREENSPRINGS PLANTATION SITE IS 1402 ACRES AND THE TOTAL AREA OF THE PROPOSED LEGACY GOLF LINKS CORRIDOR IS APPROXIMATELY 190 ACRES.

THE LIMITS OF CONSTRUCTION FOR COMPLETE CLEARING ARE APPROXIMATELY 117 ACRES WITH APPROXIMATELY 12 ACRES OF LAKES AND 30 ACRES OF OPTIONAL PARK CLEARING.

THE SITE OF THE LEGACY GOLF LINKS IS ZONED R-4, PLANNED RESIDENTIAL COMMUNITY.

THE SITE OF THE LEGACY GOLF LINKS IS PART OF TAX PARCEL (46-1)(1-1).

MAY 1993
RECEIVED
PLANNING DEPARTMENT

Multi-family Attached (C)
132 DU (MAX.) 11.0 AC

COMMONWEALTH OF VIRGINIA
Ronald J. Boyd
No. 020970
PROFESSIONAL ENGINEER

COUNTY OF JAMES CITY
FINAL SITE PLAN

Received .....

APPROVALS		DATE
Fire Dept.	RM/MAT.	4/14/92
Health Dept.	HB/MAT	4/20/92
Hghwy. Dept.	MGT/MAT	5/6/93
Plan. Comm.	RM/MAT	5/12/93
Pub. Wks. Dept.	DC	5/12/93
Zoning Adm.	BJ	5/14/93

Quick TR-55 Ver.5.44 S/N:1315400034
Executed: 16:07:03 04-13-1992

RUNOFF CURVE NUMBER SUMMARY

Subarea Description	Area (acres)	CN (weighted)
LAKE - C	91.30	78

PC 058 - LAKE C

DA 91.3AC
CN 78
TC 0.48 hrs.

36" RISER
CREST EL. 51

Routing	INFLOW	OUTFLOW	WSEL
		4.33CFS	51.19
2-	107CFS	28.89CFS	51.98
10-	257CFS	47.29CFS	52.89 DHW
100-	407CFS		

Quick TR-55 Ver.5.44 S/N:1315400034
Executed: 16:07:03 04-13-1992

RUNOFF CURVE NUMBER DATA

::

Composite Area:

SURFACE DESCRIPTION	AREA (acres)	CN	
RESIDENTIAL- SF LOTS	47.80	81	
GOLF	21.30	74	
OPEN SPACE	22.20	74	
RESIDENTIAL- TIME SHARES	0.00	90	
COMMERCIAL	0.00	94	
COMPOSITE AREA --->	91.30	77.7	(78)

::

Quick TR-55 Ver.5.44 S/N:1315400034
Executed: 16:08:53 04-13-1992 b:LAKEC-D.TCT

Tc COMPUTATIONS FOR:

SHEET FLOW (Applicable to Tc only)

Segment ID			
Surface description		Lawn	
Manning's roughness coeff., n		0.2400	
Flow length, L (total < or = 300)	ft	200.0	
Two-yr 24-hr rainfall, P2	in	3.500	
Land slope, s	ft/ft	0.0200	

$$T = \frac{.007 * (n*L)^{0.8}}{P2^{0.5} * s^{0.4}}$$ hrs 0.40 = 0.40

SHALLOW CONCENTRATED FLOW

Segment ID			
Surface (paved or unpaved)?		Paved	
Flow length, L	ft	800.0	
Watercourse slope, s	ft/ft	0.0188	

$$Avg.V = Csf * (s)^{0.5}$$ ft/s 2.7873

where: Unpaved Csf = 16.1345
Paved Csf = 20.3282

T = L / (3600*V) hrs 0.08 = 0.08

CHANNEL FLOW

Segment ID			
Cross Sectional Flow Area, a	sq.ft	2.77	2.77
Wetted perimeter, Pw	ft	2.36	2.36
Hydraulic radius, r = a/Pw	ft	1.174	1.174
Channel slope, s	ft/ft	0.0140	0.0065
Manning's roughness coeff., n		0.0110	0.4000

$$V = \frac{1.49 * r^{2/3} * s^{1/2}}{n}$$ ft/s %17.8335 0.3342

Flow length, L ft 150

T = L / (3600*V) hrs 0.00 = 0.00

::

TOTAL TIME (hrs) 0.48

Quick TR-55 Ver.5.44 S/N:1315400034
Executed: 16:08:53 04-13-1992 b:LAKEC-D.TCT

SUMMARY SHEET FOR Tc or Tt COMPUTATIONS
(Solved for Time using TR-55 Methods)

Subarea descr.	Tc or Tt	Time (hrs)
LAKE-C	Tc	0.48

Outlet Structure File: LAKEC .STR

POND-2 Version: 5.15 S/N: 1295100016
Date Executed: Time Executed:

Outlet Structure File: c:\pondfile\LAKEC .STR
Planimeter Input File: c:\pondfile\LAKE-C .VOL
Rating Table Output File: c:\pondfile\LAKEC .PND

Min. Elev.(ft) = 48 Max. Elev.(ft) = 54 Incr.(ft) = .5

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

****
SYSTEM CONNECTIVITY
****

Structure	No.	Q Table		Q Table
ORIFICE-VC	1		->	1
STAND PIPE	2		->	2

Outflow rating table summary was stored in file:
c:\pondfile\LAKEC .PND

Outlet Structure File: LAKEC .STR

POND-2 Version: 5.15 S/N: 1295100016
Date Executed: Time Executed:

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

ORIFICE-VC
Orifice - Vertical Circular

E1 elev.(ft)?	50.1
E2 elev.(ft)?	54.001
Orifice coeff.?	.6
Invert elev.(ft)?	50.1
Datum elev.(ft)?	50.1
Diameter (ft)?	.3

Outlet Structure File: LAKEC .STR

POND-2 Version: 5.15 S/N: 1295100016
Date Executed: Time Executed:

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

STAND PIPE
Stand Pipe with weir or orifice flow

E1 elev.(ft)? 51
E2 elev.(ft)? 54.001
Crest elev.(ft)? 51
Diameter (ft)? 3
Weir coefficient? 3.1
Orifice coefficient? .6
Start transition elev.(ft) @ ? 51
Transition height (ft)? 1

where is Barrel? in model

Outlet Structure File: LAKEC .STR

POND-2 Version: 5.15 S/N: 1295100016
Date Executed: Time Executed:

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

Elevation (ft)	Q (cfs)	Contributing Structures
48.00	0.0	
48.50	0.0	
49.00	0.0	
49.50	0.0	
50.00	0.0	
50.50	0.2	1
51.00	0.3	1 +2
51.50	10.7	1 +2
52.00	29.7	1 +2
52.50	42.2	1 +2
53.00	48.7	1 +2
53.50	54.4	1 +2
54.00	59.6	1 +2

Outlet Structure File: LAKEC .STR

POND-2 Version: 5.15 S/N: 1295100016
Date Executed: Time Executed:

Outflow Rating Table for Structure #1
ORIFICE-VC Orifice - Vertical Circular

Elevation (ft)	Q (cfs)	Computation Messages
48.00	0.0	E < E1= 50.1
48.50	0.0	E < E1= 50.1
49.00	0.0	E < E1= 50.1
49.50	0.0	E < E1= 50.1
50.00	0.0	E < E1= 50.1
50.50	0.2	H =.4
51.00	0.3	H =.9
51.50	0.4	H =1.4
52.00	0.5	H =1.9
52.50	0.5	H =2.4
53.00	0.6	H =2.9
53.50	0.6	H =3.4
54.00	0.7	H =3.9

C = .6 A = 7.068585E-02 sq.ft.
H (ft) = Table elev. - Datum elev. (50.1 ft)
Q (cfs) = C * A * sqr(2g * H)

Outlet Structure File: LAKEC .STR

POND-2 Version: 5.15 S/N: 1295100016
Date Executed: Time Executed:

Outflow Rating Table for Structure #2
STAND PIPE Stand Pipe with weir or orifice flow

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

Elevation (ft)	Q (cfs)	Computation Messages
48.00	0.0	E < Inv.El.= 51
48.50	0.0	E < El= 51
49.00	0.0	E < El= 51
49.50	0.0	E < El= 51
50.00	0.0	E < El= 51
50.50	0.0	E < El= 51
51.00	0.0	Weir: H =0.0
51.50	10.3	Weir: H =.5
52.00	29.2	Weir: H =1.0
52.50	41.7	Orifice: H =1.5
53.00	48.1	Orifice: H =2.0
53.50	53.8	Orifice: H =2.5
54.00	59.0	Orifice: H =3.0

Weir Cw = 3.1 Weir length = 9.424779 ft
Orifice Co = .6 Orifice area = 7.068584 sq.ft.
Q (cfs) = (Cw * L * H**1.5) or (Co * A * sqr(2*g*H))
No transition used, transition zone ends below 52.16491 ft
Weir equation = Orifice equation @ elev.= 52.16491 ft

Inflow Hydrograph: C:\JOBFILES\LAKECD2 .HYD
Rating Table file: C:\JOBFILES\LAKE C .PND

----INITIAL CONDITIONS----
Elevation = 50.00 ft
Outflow = 0.00 cfs
Storage = 2,371,744 cu-ft

GIVEN POND DATA			INTERMEDIATE ROUTING COMPUTATIONS	
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)	2S/t (cfs)	2S/t + O (cfs)
48.00	0.0	1,825,317	10140.6	10140.6
48.50	0.0	1,956,635	10870.2	10870.2
49.00	0.0	2,091,448	11619.2	11619.2
49.50	0.0	2,229,802	12387.8	12387.8
50.00	0.0	2,371,744	13176.4	13176.4
50.50	0.2	2,518,757	13993.1	13993.3
51.00	0.3	2,672,295	14846.1	14846.4
51.50	10.7	2,833,970	15744.3	15755.0
52.00	29.7	3,005,447	16696.9	16726.6
52.50	42.2	3,184,018	17689.0	17731.2
53.00	48.7	3,366,964	18705.4	18754.1
53.50	54.4	3,553,939	19744.1	19798.5
54.00	59.6	3,744,590	20803.3	20862.9

Time increment (t) = 0.100 hrs.

structure table

Pond File: C:\JOBFILES\LAKE C .PND
Inflow Hydrograph: C:\JOBFILES\LAKECD2 .HYD
Outflow Hydrograph: C:\JOBFILES\LAKEC2 O.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
11.000	3.00	-----	13176.4	13176.4	0.00	50.00
11.100	3.00	6.0	13182.4	13182.4	0.00	50.00
11.200	3.00	6.0	13188.3	13188.4	0.00	50.01
11.300	3.00	6.0	13194.3	13194.3	0.00	50.01
11.400	4.00	7.0	13201.3	13201.3	0.01	50.02
11.500	4.00	8.0	13209.3	13209.3	0.01	50.02
11.600	5.00	9.0	13218.3	13218.3	0.01	50.03
11.700	6.00	11.0	13229.3	13229.3	0.01	50.03
11.800	8.00	14.0	13243.2	13243.3	0.02	50.04
11.900	9.00	17.0	13260.2	13260.2	0.02	50.05
12.000	15.00	24.0	13284.1	13284.2	0.03	50.07
12.100	29.00	44.0	13328.1	13328.1	0.04	50.09
12.200	56.00	85.0	13412.9	13413.1	0.06	50.14
12.300	90.00	146.0	13558.8	13558.9	0.09	50.23
12.400	107.00	197.0	13755.5	13755.8	0.14	50.35
12.500	104.00	211.0	13966.1	13966.5	0.19	50.48
12.600	85.00	189.0	14154.7	14155.1	0.22	50.59
12.700	64.00	149.0	14303.2	14303.7	0.24	50.68
12.800	49.00	113.0	14415.7	14416.2	0.25	50.75
12.900	40.00	89.0	14504.2	14504.7	0.26	50.80
13.000	31.00	71.0	14574.6	14575.2	0.27	50.84
13.100	26.00	57.0	14631.1	14631.6	0.27	50.87
13.200	22.00	48.0	14678.5	14679.1	0.28	50.90
13.300	20.00	42.0	14719.9	14720.5	0.29	50.93
13.400	17.00	37.0	14756.4	14756.9	0.29	50.95
13.500	16.00	33.0	14788.8	14789.4	0.29	50.97
13.600	14.00	30.0	14818.2	14818.8	0.30	50.98
13.700	13.00	27.0	14844.6	14845.2	0.30	51.00
13.800	12.00	25.0	14868.5	14869.6	0.57	51.01
13.900	12.00	24.0	14890.8	14892.5	0.83	51.03
14.000	11.00	23.0	14911.7	14913.8	1.07	51.04
14.100	11.00	22.0	14931.1	14933.7	1.30	51.05
14.200	10.00	21.0	14949.0	14952.1	1.51	51.06
14.300	10.00	20.0	14965.6	14969.0	1.70	51.07
14.400	10.00	20.0	14981.8	14985.6	1.89	51.08

Pond File: C:\JOBFILES\LAKE C .PND
Inflow Hydrograph: C:\JOBFILES\LAKECD2 .HYD
Outflow Hydrograph: C:\JOBFILES\LAKEC2 O.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
14.500	9.00	19.0	14996.7	15000.8	2.07	51.08
14.600	9.00	18.0	15010.3	15014.7	2.23	51.09
14.700	9.00	18.0	15023.5	15028.3	2.38	51.10
14.800	8.00	17.0	15035.4	15040.5	2.52	51.11
14.900	8.00	16.0	15046.2	15051.4	2.65	51.11
15.000	8.00	16.0	15056.6	15062.2	2.77	51.12
15.100	8.00	16.0	15066.8	15072.6	2.89	51.12
15.200	8.00	16.0	15076.8	15082.8	3.01	51.13
15.300	7.00	15.0	15085.6	15091.8	3.11	51.14
15.400	7.00	14.0	15093.2	15099.6	3.20	51.14
15.500	7.00	14.0	15100.6	15107.2	3.29	51.14
15.600	7.00	14.0	15107.9	15114.6	3.37	51.15
15.700	7.00	14.0	15115.0	15121.9	3.45	51.15
15.800	6.00	13.0	15120.9	15128.0	3.52	51.15
15.900	6.00	12.0	15125.8	15132.9	3.58	51.16
16.000	6.00	12.0	15130.5	15137.8	3.64	51.16
16.100	6.00	12.0	15135.1	15142.5	3.69	51.16
16.200	6.00	12.0	15139.6	15147.1	3.74	51.17
16.300	6.00	12.0	15144.1	15151.6	3.79	51.17
16.400	6.00	12.0	15148.4	15156.1	3.84	51.17
16.500	6.00	12.0	15152.6	15160.4	3.89	51.17
16.600	6.00	12.0	15156.7	15164.6	3.94	51.18
16.700	6.00	12.0	15160.7	15168.7	3.99	51.18
16.800	5.00	11.0	15163.7	15171.7	4.02	51.18
16.900	5.00	10.0	15165.6	15173.7	4.05	51.18
17.000	5.00	10.0	15167.4	15175.6	4.07	51.18
17.100	5.00	10.0	15169.3	15177.4	4.09	51.18
17.200	5.00	10.0	15171.0	15179.3	4.11	51.18
17.300	5.00	10.0	15172.8	15181.0	4.13	51.18
17.400	5.00	10.0	15174.5	15182.8	4.15	51.19
17.500	5.00	10.0	15176.1	15184.5	4.17	51.19
17.600	5.00	10.0	15177.8	15186.1	4.19	51.19
17.700	5.00	10.0	15179.3	15187.8	4.21	51.19
17.800	5.00	10.0	15180.9	15189.3	4.23	51.19
17.900	5.00	10.0	15182.4	15190.9	4.24	51.19
18.000	5.00	10.0	15183.9	15192.4	4.26	51.19
18.100	5.00	10.0	15185.3	15193.9	4.28	51.19
18.200	5.00	10.0	15186.7	15195.3	4.29	51.19
18.300	5.00	10.0	15188.1	15196.7	4.31	51.19
18.400	5.00	10.0	15189.5	15198.1	4.33	51.19
18.500	4.00	9.0	15189.8	15198.5	4.33	51.19
18.600	4.00	8.0	15189.2	15197.8	4.32	51.19
18.700	4.00	8.0	15188.5	15197.2	4.32	51.19
18.800	4.00	8.0	15187.9	15196.5	4.31	51.19
18.900	4.00	8.0	15187.3	15195.9	4.30	51.19
19.000	4.00	8.0	15186.7	15195.3	4.29	51.19

Pond File: C:\JOBFILES\LAKE C .PND
Inflow Hydrograph: C:\JOBFILES\LAKECD2 .HYD
Outflow Hydrograph: C:\JOBFILES\LAKEC2 O.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
19.100	4.00	8.0	15186.2	15194.7	4.29	51.19
19.200	4.00	8.0	15185.6	15194.2	4.28	51.19
19.300	4.00	8.0	15185.0	15193.6	4.27	51.19
19.400	4.00	8.0	15184.5	15193.0	4.27	51.19
19.500	4.00	8.0	15184.0	15192.5	4.26	51.19
19.600	4.00	8.0	15183.5	15192.0	4.26	51.19
19.700	4.00	8.0	15183.0	15191.5	4.25	51.19
19.800	4.00	8.0	15182.5	15191.0	4.24	51.19
19.900	4.00	8.0	15182.0	15190.5	4.24	51.19
20.000	4.00	8.0	15181.5	15190.0	4.23	51.19
20.100	4.00	8.0	15181.1	15189.5	4.23	51.19
20.200	4.00	8.0	15180.6	15189.1	4.22	51.19
20.300	4.00	8.0	15180.2	15188.6	4.22	51.19
20.400	4.00	8.0	15179.8	15188.2	4.21	51.19
20.500	4.00	8.0	15179.4	15187.8	4.21	51.19
20.600	4.00	8.0	15179.0	15187.4	4.20	51.19
20.700	4.00	8.0	15178.6	15187.0	4.20	51.19
20.800	4.00	8.0	15178.2	15186.6	4.19	51.19
20.900	4.00	8.0	15177.8	15186.2	4.19	51.19
21.000	4.00	8.0	15177.4	15185.8	4.18	51.19
21.100	3.00	7.0	15176.1	15184.4	4.17	51.19
21.200	3.00	6.0	15173.8	15182.1	4.14	51.18
21.300	3.00	6.0	15171.6	15179.8	4.12	51.18
21.400	3.00	6.0	15169.4	15177.6	4.09	51.18
21.500	3.00	6.0	15167.3	15175.4	4.07	51.18
21.600	3.00	6.0	15165.2	15173.3	4.04	51.18
21.700	3.00	6.0	15163.1	15171.2	4.02	51.18
21.800	3.00	6.0	15161.2	15169.1	3.99	51.18
21.900	3.00	6.0	15159.2	15167.2	3.97	51.18
22.000	3.00	6.0	15157.3	15165.2	3.95	51.18
22.100	3.00	6.0	15155.5	15163.3	3.93	51.17
22.200	3.00	6.0	15153.6	15161.5	3.91	51.17
22.300	3.00	6.0	15151.9	15159.6	3.89	51.17
22.400	3.00	6.0	15150.1	15157.9	3.87	51.17
22.500	3.00	6.0	15148.4	15156.1	3.85	51.17
22.600	3.00	6.0	15146.8	15154.4	3.83	51.17
22.700	2.00	5.0	15144.2	15151.8	3.80	51.17
22.800	2.00	4.0	15140.7	15148.2	3.75	51.17
22.900	2.00	4.0	15137.3	15144.7	3.71	51.16
23.000	2.00	4.0	15133.9	15141.3	3.68	51.16
23.100	2.00	4.0	15130.6	15137.9	3.64	51.16
23.200	2.00	4.0	15127.4	15134.6	3.60	51.16
23.300	2.00	4.0	15124.3	15131.4	3.56	51.16
23.400	2.00	4.0	15121.3	15128.3	3.53	51.16
23.500	2.00	4.0	15118.3	15125.3	3.49	51.15
23.600	2.00	4.0	15115.4	15122.3	3.46	51.15

Pond File: C:\JOBFILES\LAKE C .PND
Inflow Hydrograph: C:\JOBFILES\LAKECD2 .HYD
Outflow Hydrograph: C:\JOBFILES\LAKEC2 O.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
23.700	2.00	4.0	15112.5	15119.4	3.42	51.15
23.800	2.00	4.0	15109.7	15116.5	3.39	51.15
23.900	2.00	4.0	15107.0	15113.7	3.36	51.15
24.000	2.00	4.0	15104.4	15111.0	3.33	51.15
24.100	1.00	3.0	15100.8	15107.4	3.29	51.14
24.200	1.00	2.0	15096.3	15102.8	3.23	51.14
24.300	1.00	2.0	15091.9	15098.3	3.18	51.14
24.400	1.00	2.0	15087.7	15093.9	3.13	51.14
24.500	1.00	2.0	15083.5	15089.7	3.08	51.13
24.600	1.00	2.0	15079.4	15085.5	3.04	51.13
24.700	1.00	2.0	15075.4	15081.4	2.99	51.13
24.800	1.00	2.0	15071.6	15077.4	2.94	51.13
24.900	1.00	2.0	15067.8	15073.6	2.90	51.13
25.000	1.00	2.0	15064.0	15069.8	2.86	51.12
25.100	1.00	2.0	15060.4	15066.0	2.81	51.12
25.200	1.00	2.0	15056.9	15062.4	2.77	51.12
25.300	1.00	2.0	15053.4	15058.9	2.73	51.12
25.400	0.00	1.0	15049.0	15054.4	2.68	51.11
25.500	0.00	0.0	15043.8	15049.0	2.62	51.11
25.600	0.00	0.0	15038.7	15043.8	2.56	51.11
25.700	0.00	0.0	15033.7	15038.7	2.50	51.11
25.800	0.00	0.0	15028.8	15033.7	2.44	51.10
25.900	0.00	0.0	15024.0	15028.8	2.39	51.10

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

Pond File: C:\JOBFILES\LAKE C .PND
Inflow Hydrograph: C:\JOBFILES\LAKECD2 .HYD
Outflow Hydrograph: C:\JOBFILES\LAKEC2 O.HYD

Starting Pond W.S. Elevation = 50.00 ft

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

Peak Inflow = 107.00 cfs
Peak Outflow = 4.33 cfs
Peak Elevation = 51.19 ft

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

Initial Storage = 2,371,744 cu-ft
Peak Storage From Storm = 363,201 cu-ft

Total Storage in Pond = 2,734,945 cu-ft

Warning: Inflow hydrograph truncated on left side.

Inflow Hydrograph: C:\JOBFILES\LAKECD10.HYD
Rating Table file: C:\JOBFILES\LAKE C .PND

----INITIAL CONDITIONS----
Elevation = 50.00 ft
Outflow = 0.00 cfs
Storage = 2,371,744 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
48.00	0.0	1,825,317
48.50	0.0	1,956,635
49.00	0.0	2,091,448
49.50	0.0	2,229,802
50.00	0.0	2,371,744
50.50	0.2	2,518,757
51.00	0.3	2,672,295
51.50	10.7	2,833,970
52.00	29.7	3,005,447
52.50	42.2	3,184,018
53.00	48.7	3,366,964
53.50	54.4	3,553,939
54.00	59.6	3,744,590

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
10140.6	10140.6
10870.2	10870.2
11619.2	11619.2
12387.8	12387.8
13176.4	13176.4
13993.1	13993.3
14846.1	14846.4
15744.3	15755.0
16696.9	16726.6
17689.0	17731.2
18705.4	18754.1
19744.1	19798.5
20803.3	20862.9

Time increment (t) = 0.100 hrs.

Table

Pond File: C:\JOBFILES\LAKE C .PND
Inflow Hydrograph: C:\JOBFILES\LAKECD10.HYD
Outflow Hydrograph: C:\JOBFILES\LAKEC100.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
11.000	8.00	-----	13176.4	13176.4	0.00	50.00
11.100	9.00	17.0	13193.3	13193.4	0.00	50.01
11.200	10.00	19.0	13212.3	13212.3	0.01	50.02
11.300	11.00	21.0	13233.3	13233.3	0.01	50.03
11.400	13.00	24.0	13257.3	13257.3	0.02	50.05
11.500	14.00	27.0	13284.2	13284.3	0.03	50.07
11.600	16.00	30.0	13314.1	13314.2	0.03	50.08
11.700	20.00	36.0	13350.1	13350.1	0.04	50.11
11.800	24.00	44.0	13394.0	13394.1	0.05	50.13
11.900	28.00	52.0	13445.8	13446.0	0.07	50.17
12.000	46.00	74.0	13519.6	13519.8	0.08	50.21
12.100	82.00	128.0	13647.4	13647.6	0.12	50.29
12.200	149.00	231.0	13878.1	13878.4	0.17	50.43
12.300	227.00	376.0	14253.6	14254.1	0.23	50.65
12.400	257.00	484.0	14737.0	14737.6	0.29	50.94
12.500	246.00	503.0	15230.4	15240.0	4.81	51.22
12.600	195.00	441.0	15651.9	15671.4	9.74	51.45
12.700	144.00	339.0	15960.3	15990.9	15.31	51.62
12.800	110.00	254.0	16174.9	16214.3	19.68	51.74
12.900	89.00	199.0	16328.3	16373.9	22.80	51.82
13.000	68.00	157.0	16435.4	16485.3	24.98	51.88
13.100	57.00	125.0	16507.5	16560.4	26.45	51.91
13.200	47.00	104.0	16556.6	16611.5	27.45	51.94
13.300	42.00	89.0	16589.4	16645.6	28.12	51.96
13.400	36.00	78.0	16610.3	16667.4	28.54	51.97
13.500	33.00	69.0	16621.7	16679.3	28.77	51.98
13.600	30.00	63.0	16627.0	16684.7	28.88	51.98
13.700	28.00	58.0	16627.2	16685.0	28.89	51.98
13.800	26.00	54.0	16623.6	16681.2	28.81	51.98
13.900	24.00	50.0	16616.2	16673.6	28.66	51.97
14.000	23.00	47.0	16606.3	16663.2	28.46	51.97
14.100	22.00	45.0	16594.9	16651.3	28.23	51.96
14.200	21.00	43.0	16581.9	16637.9	27.96	51.95
14.300	20.00	41.0	16567.6	16622.9	27.67	51.95
14.400	19.00	39.0	16551.9	16606.6	27.35	51.94

Pond File: C:\JOBFILES\LAKE C .PND
Inflow Hydrograph: C:\JOBFILES\LAKECD10.HYD
Outflow Hydrograph: C:\JOBFILES\LAKEC100.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
14.500	18.00	37.0	16534.9	16588.9	27.01	51.93
14.600	17.00	35.0	16516.6	16569.9	26.63	51.92
14.700	17.00	34.0	16498.1	16550.6	26.26	51.91
14.800	16.00	33.0	16479.3	16531.1	25.88	51.90
14.900	16.00	32.0	16460.4	16511.3	25.49	51.89
15.000	16.00	32.0	16442.1	16492.4	25.12	51.88
15.100	16.00	32.0	16424.6	16474.1	24.76	51.87
15.200	15.00	31.0	16406.8	16455.6	24.40	51.86
15.300	15.00	30.0	16388.7	16436.8	24.03	51.85
15.400	14.00	29.0	16370.4	16417.7	23.66	51.84
15.500	14.00	28.0	16351.8	16398.4	23.28	51.83
15.600	14.00	28.0	16334.0	16379.8	22.92	51.82
15.700	14.00	28.0	16316.9	16362.0	22.57	51.81
15.800	13.00	27.0	16299.4	16343.9	22.22	51.80
15.900	13.00	26.0	16281.7	16325.4	21.85	51.79
16.000	13.00	26.0	16264.7	16307.7	21.51	51.78
16.100	13.00	26.0	16248.4	16290.7	21.18	51.78
16.200	12.00	25.0	16231.7	16273.4	20.84	51.77
16.300	12.00	24.0	16214.7	16255.7	20.49	51.76
16.400	11.00	23.0	16197.4	16237.7	20.14	51.75
16.500	11.00	22.0	16179.9	16219.4	19.78	51.74
16.600	11.00	22.0	16163.0	16201.9	19.44	51.73
16.700	11.00	22.0	16146.8	16185.0	19.11	51.72
16.800	10.00	21.0	16130.2	16167.8	18.77	51.71
16.900	10.00	20.0	16113.4	16150.2	18.43	51.70
17.000	10.00	20.0	16097.2	16133.4	18.10	51.69
17.100	10.00	20.0	16081.6	16117.2	17.78	51.69
17.200	10.00	20.0	16066.6	16101.6	17.48	51.68
17.300	10.00	20.0	16052.3	16086.6	17.19	51.67
17.400	10.00	20.0	16038.5	16072.3	16.90	51.66
17.500	10.00	20.0	16025.2	16058.5	16.63	51.66
17.600	10.00	20.0	16012.4	16045.2	16.38	51.65
17.700	10.00	20.0	16000.2	16032.4	16.13	51.64
17.800	9.00	19.0	15987.5	16019.2	15.87	51.64
17.900	9.00	18.0	15974.3	16005.5	15.60	51.63
18.000	9.00	18.0	15961.6	15992.3	15.34	51.62
18.100	9.00	18.0	15949.4	15979.6	15.09	51.62
18.200	9.00	18.0	15937.7	15967.4	14.85	51.61
18.300	9.00	18.0	15926.4	15955.7	14.62	51.60
18.400	9.00	18.0	15915.6	15944.4	14.40	51.60
18.500	8.00	17.0	15904.3	15932.6	14.17	51.59
18.600	8.00	16.0	15892.4	15920.3	13.93	51.59
18.700	8.00	16.0	15881.0	15908.4	13.70	51.58
18.800	8.00	16.0	15870.1	15897.0	13.48	51.57
18.900	8.00	16.0	15859.5	15886.1	13.26	51.57
19.000	8.00	16.0	15849.4	15875.5	13.06	51.56

Pond File: C:\JOBFILES\LAKE C .PND
Inflow Hydrograph: C:\JOBFILES\LAKECD10.HYD
Outflow Hydrograph: C:\JOBFILES\LAKEC100.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
19.100	8.00	16.0	15839.7	15865.4	12.86	51.56
19.200	8.00	16.0	15830.4	15855.7	12.67	51.55
19.300	8.00	16.0	15821.4	15846.4	12.49	51.55
19.400	8.00	16.0	15812.8	15837.4	12.31	51.54
19.500	8.00	16.0	15804.5	15828.8	12.14	51.54
19.600	7.00	15.0	15795.6	15819.5	11.96	51.53
19.700	7.00	14.0	15786.0	15809.6	11.77	51.53
19.800	7.00	14.0	15776.9	15800.0	11.58	51.52
19.900	7.00	14.0	15768.1	15790.9	11.40	51.52
20.000	7.00	14.0	15759.6	15782.1	11.23	51.51
20.100	7.00	14.0	15751.5	15773.6	11.06	51.51
20.200	7.00	14.0	15743.7	15765.5	10.91	51.51
20.300	7.00	14.0	15736.2	15757.7	10.75	51.50
20.400	7.00	14.0	15728.9	15750.2	10.64	51.50
20.500	7.00	14.0	15721.7	15742.9	10.56	51.49
20.600	7.00	14.0	15714.8	15735.7	10.48	51.49
20.700	7.00	14.0	15708.0	15728.8	10.40	51.49
20.800	7.00	14.0	15701.3	15722.0	10.32	51.48
20.900	7.00	14.0	15694.8	15715.3	10.25	51.48
21.000	6.00	13.0	15687.5	15707.8	10.16	51.47
21.100	6.00	12.0	15679.4	15699.5	10.07	51.47
21.200	6.00	12.0	15671.5	15691.4	9.97	51.47
21.300	6.00	12.0	15663.7	15683.5	9.88	51.46
21.400	6.00	12.0	15656.1	15675.7	9.79	51.46
21.500	6.00	12.0	15648.7	15668.1	9.71	51.45
21.600	6.00	12.0	15641.5	15660.7	9.62	51.45
21.700	6.00	12.0	15634.4	15653.5	9.54	51.44
21.800	6.00	12.0	15627.5	15646.4	9.46	51.44
21.900	6.00	12.0	15620.7	15639.5	9.38	51.44
22.000	6.00	12.0	15614.1	15632.7	9.30	51.43
22.100	6.00	12.0	15607.7	15626.1	9.22	51.43
22.200	6.00	12.0	15601.4	15619.7	9.15	51.43
22.300	6.00	12.0	15595.2	15613.4	9.08	51.42
22.400	5.00	11.0	15588.2	15606.2	9.00	51.42
22.500	5.00	10.0	15580.4	15598.2	8.91	51.41
22.600	5.00	10.0	15572.8	15590.4	8.82	51.41
22.700	5.00	10.0	15565.3	15582.8	8.73	51.41
22.800	5.00	10.0	15558.0	15575.3	8.64	51.40
22.900	5.00	10.0	15550.9	15568.0	8.56	51.40
23.000	4.00	9.0	15543.0	15559.9	8.47	51.39
23.100	4.00	8.0	15534.2	15551.0	8.36	51.39
23.200	4.00	8.0	15525.7	15542.2	8.26	51.38
23.300	4.00	8.0	15517.4	15533.7	8.17	51.38
23.400	4.00	8.0	15509.2	15525.4	8.07	51.37
23.500	4.00	8.0	15501.3	15517.2	7.98	51.37
23.600	4.00	8.0	15493.5	15509.3	7.89	51.36

Pond File: C:\JOBFILES\LAKE C .PND
Inflow Hydrograph: C:\JOBFILES\LAKECD10.HYD
Outflow Hydrograph: C:\JOBFILES\LAKEC100.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
23.700	3.00	7.0	15484.9	15500.5	7.79	51.36
23.800	3.00	6.0	15475.6	15490.9	7.68	51.35
23.900	3.00	6.0	15466.4	15481.6	7.57	51.35
24.000	3.00	6.0	15457.5	15472.4	7.47	51.34
24.100	3.00	6.0	15448.8	15463.5	7.36	51.34
24.200	3.00	6.0	15440.2	15454.8	7.26	51.33
24.300	3.00	6.0	15431.9	15446.2	7.17	51.33
24.400	2.00	5.0	15422.8	15436.9	7.06	51.32
24.500	2.00	4.0	15412.9	15426.8	6.94	51.32
24.600	2.00	4.0	15403.2	15416.9	6.83	51.31
24.700	2.00	4.0	15393.8	15407.2	6.72	51.31
24.800	2.00	4.0	15384.6	15397.8	6.61	51.30
24.900	2.00	4.0	15375.6	15388.6	6.51	51.30
25.000	2.00	4.0	15366.8	15379.6	6.40	51.29
25.100	1.00	3.0	15357.2	15369.8	6.29	51.29
25.200	1.00	2.0	15346.8	15359.2	6.17	51.28
25.300	1.00	2.0	15336.7	15348.8	6.05	51.28
25.400	1.00	2.0	15326.9	15338.7	5.94	51.27
25.500	1.00	2.0	15317.2	15328.9	5.82	51.27
25.600	1.00	2.0	15307.8	15319.2	5.71	51.26
25.700	0.00	1.0	15297.6	15308.8	5.59	51.25
25.800	0.00	0.0	15286.7	15297.6	5.46	51.25
25.900	0.00	0.0	15276.0	15286.7	5.34	51.24

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

Pond File: C:\JOBFILES\LAKE C .PND
Inflow Hydrograph: C:\JOBFILES\LAKECD10.HYD
Outflow Hydrograph: C:\JOBFILES\LAKEC100.HYD

Starting Pond W.S. Elevation = 50.00 ft

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

Peak Inflow = 257.00 cfs
Peak Outflow = 28.89 cfs
Peak Elevation = 51.98 ft

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

Initial Storage = 2,371,744 cu-ft
Peak Storage From Storm = 626,349 cu-ft

Total Storage in Pond = 2,998,093 cu-ft

Warning: Inflow hydrograph truncated on left side.

Inflow Hydrograph: C:\JOBFILES\LAKECD00.HYD
Rating Table file: C:\JOBFILES\LAKE C .PND

----INITIAL CONDITIONS----
Elevation = 50.00 ft
Outflow = 0.00 cfs
Storage = 2,371,744 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
48.00	0.0	1,825,317
48.50	0.0	1,956,635
49.00	0.0	2,091,448
49.50	0.0	2,229,802
50.00	0.0	2,371,744
50.50	0.2	2,518,757
51.00	0.3	2,672,295
51.50	10.7	2,833,970
52.00	29.7	3,005,447
52.50	42.2	3,184,018
53.00	48.7	3,366,964
53.50	54.4	3,553,939
54.00	59.6	3,744,590

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
10140.6	10140.6
10870.2	10870.2
11619.2	11619.2
12387.8	12387.8
13176.4	13176.4
13993.1	13993.3
14846.1	14846.4
15744.3	15755.0
16696.9	16726.6
17689.0	17731.2
18705.4	18754.1
19744.1	19798.5
20803.3	20862.9

Time increment (t) = 0.100 hrs.

Pond File: C:\JOBFILES\LAKE C .PND
Inflow Hydrograph: C:\JOBFILES\LAKECD00.HYD
Outflow Hydrograph: C:\JOBFILES\LAKEC000.HYD

INFLOW HYDROGRAPH

TIME (hrs)	INFLOW (cfs)
11.000	13.00
11.100	15.00
11.200	16.00
11.300	18.00
11.400	20.00
11.500	23.00
11.600	25.00
11.700	31.00
11.800	38.00
11.900	44.00
12.000	72.00
12.100	131.00
12.200	237.00
12.300	359.00
12.400	407.00
12.500	390.00
12.600	309.00
12.700	228.00
12.800	174.00
12.900	141.00
13.000	108.00
13.100	91.00
13.200	74.00
13.300	65.00
13.400	57.00
13.500	52.00
13.600	47.00
13.700	44.00
13.800	41.00
13.900	38.00
14.000	36.00
14.100	35.00
14.200	33.00
14.300	32.00
14.400	31.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
-----	13176.4	13176.4	0.00	50.00
28.0	13204.3	13204.4	0.01	50.02
31.0	13235.3	13235.3	0.01	50.04
34.0	13269.3	13269.3	0.02	50.06
38.0	13307.2	13307.3	0.03	50.08
43.0	13350.1	13350.2	0.04	50.11
48.0	13398.0	13398.1	0.05	50.14
56.0	13453.9	13454.0	0.07	50.17
69.0	13522.7	13522.9	0.08	50.21
82.0	13604.5	13604.7	0.10	50.26
116.0	13720.2	13720.5	0.13	50.33
203.0	13922.9	13923.2	0.18	50.46
368.0	14290.4	14290.9	0.23	50.67
596.0	14884.9	14886.4	0.76	51.02
766.0	15631.9	15650.9	9.51	51.44
797.0	16381.1	16428.9	23.88	51.85
699.0	17011.9	17080.1	34.10	52.18
537.0	17469.0	17548.9	39.93	52.41
402.0	17784.9	17871.0	43.09	52.57
315.0	18010.8	18099.9	44.54	52.68
249.0	18168.7	18259.8	45.56	52.76
199.0	18275.2	18367.7	46.24	52.81
165.0	18346.8	18440.2	46.71	52.85
139.0	18391.8	18485.8	47.00	52.87
122.0	18419.4	18513.8	47.17	52.88
109.0	18433.9	18528.4	47.27	52.89
99.0	18438.3	18532.9	47.29	52.89
91.0	18434.8	18529.3	47.27	52.89
85.0	18425.3	18519.8	47.21	52.89
79.0	18410.1	18504.3	47.11	52.88
74.0	18390.1	18484.1	46.98	52.87
71.0	18367.5	18461.1	46.84	52.86
68.0	18342.1	18435.5	46.68	52.84
65.0	18314.1	18407.1	46.50	52.83
63.0	18284.5	18377.1	46.30	52.82

Pond File: C:\JOBFILES\LAKE C .PND
Inflow Hydrograph: C:\JOBFILES\LAKECD00.HYD
Outflow Hydrograph: C:\JOBFILES\LAKEC00O.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
14.500	29.00	60.0	18252.3	18344.5	46.10	52.80
14.600	28.00	57.0	18217.6	18309.3	45.87	52.78
14.700	27.00	55.0	18181.3	18272.6	45.64	52.76
14.800	26.00	53.0	18143.5	18234.3	45.40	52.75
14.900	26.00	52.0	18105.2	18195.5	45.15	52.73
15.000	25.00	51.0	18066.4	18156.2	44.90	52.71
15.100	24.00	49.0	18026.1	18115.4	44.64	52.69
15.200	24.00	48.0	17985.4	18074.1	44.38	52.67
15.300	23.00	47.0	17944.1	18032.4	44.11	52.65
15.400	23.00	46.0	17902.4	17990.1	43.85	52.63
15.500	22.00	45.0	17860.3	17947.4	43.57	52.61
15.600	22.00	44.0	17817.7	17904.3	43.30	52.58
15.700	21.00	43.0	17774.6	17860.7	43.02	52.56
15.800	21.00	42.0	17731.2	17816.6	42.74	52.54
15.900	20.00	41.0	17687.2	17772.2	42.46	52.52
16.000	20.00	40.0	17642.9	17727.2	42.15	52.50
16.100	20.00	40.0	17599.7	17682.9	41.60	52.48
16.200	19.00	39.0	17556.6	17638.7	41.05	52.45
16.300	19.00	38.0	17513.6	17594.6	40.50	52.43
16.400	18.00	37.0	17470.7	17550.6	39.95	52.41
16.500	18.00	36.0	17427.9	17506.7	39.41	52.39
16.600	18.00	36.0	17386.2	17463.9	38.87	52.37
16.700	17.00	35.0	17344.5	17421.2	38.34	52.35
16.800	17.00	34.0	17302.9	17378.5	37.81	52.32
16.900	16.00	33.0	17261.3	17335.9	37.28	52.30
17.000	16.00	32.0	17219.8	17293.3	36.75	52.28
17.100	16.00	32.0	17179.3	17251.8	36.23	52.26
17.200	16.00	32.0	17139.9	17211.3	35.73	52.24
17.300	15.00	31.0	17100.4	17170.9	35.23	52.22
17.400	15.00	30.0	17061.0	17130.4	34.72	52.20
17.500	15.00	30.0	17022.5	17091.0	34.23	52.18
17.600	15.00	30.0	16985.0	17052.5	33.75	52.16
17.700	15.00	30.0	16948.4	17015.0	33.29	52.14
17.800	15.00	30.0	16912.7	16978.4	32.83	52.13
17.900	15.00	30.0	16878.0	16942.7	32.39	52.11
18.000	15.00	30.0	16844.0	16908.0	31.96	52.09
18.100	15.00	30.0	16811.0	16874.0	31.53	52.07
18.200	14.00	29.0	16777.8	16840.0	31.11	52.06
18.300	14.00	28.0	16744.4	16805.8	30.68	52.04
18.400	14.00	28.0	16711.8	16772.4	30.27	52.02
18.500	14.00	28.0	16680.1	16739.8	29.86	52.01
18.600	13.00	27.0	16648.5	16707.1	29.32	51.99
18.700	13.00	26.0	16617.1	16674.5	28.68	51.97
18.800	13.00	26.0	16587.0	16643.1	28.07	51.96
18.900	12.00	25.0	16557.1	16612.0	27.46	51.94
19.000	12.00	24.0	16527.4	16581.1	26.85	51.93

Pond File: C:\JOBFILES\LAKE C .PND
Inflow Hydrograph: C:\JOBFILES\LAKECD00.HYD
Outflow Hydrograph: C:\JOBFILES\LAKEC00O.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
19.100	12.00	24.0	16498.8	16551.4	26.27	51.91
19.200	12.00	24.0	16471.4	16522.8	25.71	51.90
19.300	12.00	24.0	16445.0	16495.4	25.18	51.88
19.400	12.00	24.0	16419.7	16469.0	24.66	51.87
19.500	12.00	24.0	16395.4	16443.7	24.17	51.85
19.600	11.00	23.0	16371.0	16418.4	23.67	51.84
19.700	11.00	22.0	16346.7	16393.0	23.18	51.83
19.800	11.00	22.0	16323.3	16368.7	22.70	51.82
19.900	11.00	22.0	16300.8	16345.3	22.24	51.80
20.000	11.00	22.0	16279.2	16322.8	21.80	51.79
20.100	11.00	22.0	16258.4	16301.2	21.38	51.78
20.200	11.00	22.0	16238.5	16280.4	20.97	51.77
20.300	11.00	22.0	16219.3	16260.5	20.58	51.76
20.400	11.00	22.0	16200.9	16241.3	20.21	51.75
20.500	10.00	21.0	16182.2	16221.9	19.83	51.74
20.600	10.00	20.0	16163.3	16202.2	19.45	51.73
20.700	10.00	20.0	16145.2	16183.3	19.08	51.72
20.800	10.00	20.0	16127.7	16165.2	18.72	51.71
20.900	10.00	20.0	16111.0	16147.7	18.38	51.70
21.000	10.00	20.0	16094.9	16131.0	18.05	51.69
21.100	10.00	20.0	16079.4	16114.9	17.74	51.69
21.200	10.00	20.0	16064.5	16099.4	17.43	51.68
21.300	10.00	20.0	16050.2	16084.5	17.14	51.67
21.400	10.00	20.0	16036.5	16070.2	16.86	51.66
21.500	10.00	20.0	16023.3	16056.5	16.60	51.66
21.600	9.00	19.0	16009.7	16042.3	16.32	51.65
21.700	9.00	18.0	15995.6	16027.7	16.03	51.64
21.800	9.00	18.0	15982.1	16013.6	15.76	51.63
21.900	9.00	18.0	15969.1	16000.1	15.49	51.63
22.000	9.00	18.0	15956.6	15987.1	15.24	51.62
22.100	9.00	18.0	15944.6	15974.6	15.00	51.61
22.200	9.00	18.0	15933.1	15962.6	14.76	51.61
22.300	8.00	17.0	15921.1	15950.1	14.52	51.60
22.400	8.00	16.0	15908.6	15937.1	14.26	51.59
22.500	8.00	16.0	15896.5	15924.6	14.02	51.59
22.600	8.00	16.0	15885.0	15912.5	13.78	51.58
22.700	7.00	15.0	15872.9	15900.0	13.54	51.57
22.800	7.00	14.0	15860.3	15886.9	13.28	51.57
22.900	7.00	14.0	15848.3	15874.3	13.03	51.56
23.000	7.00	14.0	15836.7	15862.3	12.80	51.56
23.100	7.00	14.0	15825.5	15850.7	12.57	51.55
23.200	6.00	13.0	15813.9	15838.5	12.33	51.54
23.300	6.00	12.0	15801.7	15825.9	12.09	51.54
23.400	6.00	12.0	15790.0	15813.7	11.85	51.53
23.500	6.00	12.0	15778.8	15802.0	11.62	51.52
23.600	5.00	11.0	15767.0	15789.8	11.38	51.52

Pond File: C:\JOBFILES\LAKE C .PND
Inflow Hydrograph: C:\JOBFILES\LAKECD00.HYD
Outflow Hydrograph: C:\JOBFILES\LAKEC000.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
23.700	5.00	10.0	15754.7	15777.0	11.13	51.51
23.800	5.00	10.0	15743.0	15764.7	10.89	51.51
23.900	5.00	10.0	15731.6	15753.0	10.68	51.50
24.000	4.00	9.0	15719.5	15740.6	10.54	51.49
24.100	4.00	8.0	15706.8	15727.5	10.39	51.48
24.200	4.00	8.0	15694.3	15714.8	10.24	51.48
24.300	4.00	8.0	15682.1	15702.3	10.10	51.47
24.400	4.00	8.0	15670.2	15690.1	9.96	51.46
24.500	3.00	7.0	15657.6	15677.2	9.81	51.46
24.600	3.00	6.0	15644.2	15663.6	9.65	51.45
24.700	3.00	6.0	15631.2	15650.2	9.50	51.44
24.800	3.00	6.0	15618.5	15637.2	9.35	51.44
24.900	2.00	5.0	15605.2	15623.5	9.20	51.43
25.000	2.00	4.0	15591.1	15609.2	9.03	51.42
25.100	2.00	4.0	15577.3	15595.1	8.87	51.41
25.200	2.00	4.0	15563.9	15581.3	8.71	51.40
25.300	2.00	4.0	15550.8	15567.9	8.56	51.40
25.400	1.00	3.0	15537.0	15553.8	8.40	51.39
25.500	1.00	2.0	15522.6	15539.0	8.23	51.38
25.600	1.00	2.0	15508.4	15524.6	8.06	51.37
25.700	1.00	2.0	15494.6	15510.4	7.90	51.37
25.800	0.00	1.0	15480.2	15495.6	7.73	51.36
25.900	0.00	0.0	15465.1	15480.2	7.55	51.35

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

Pond File: C:\JOBFILES\LAKE C .PND
Inflow Hydrograph: C:\JOBFILES\LAKECD00.HYD
Outflow Hydrograph: C:\JOBFILES\LAKEC000.HYD

Starting Pond W.S. Elevation = 50.00 ft

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

Peak Inflow = 407.00 cfs
Peak Outflow = 47.29 cfs
Peak Elevation = 52.89 ft DHW

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

Initial Storage = 2,371,744 cu-ft
Peak Storage From Storm = 955,664 cu-ft

Total Storage in Pond = 3,327,408 cu-ft

Warning: Inflow hydrograph truncated on left side.

Legacy Golf Course
Anti-seep collar calculations
for Lakes C and G

Procedure from the Virginia Erosion Control Handbook
Design to increase length of flow path by 10%
Collars to be the same gage as the barrel
Attached figure from Handbook shows collar dimension calculations

Lake C	Unit	
Barrel length	feet	170
Normal pool	msl	50.0
Invert	msl	31.3
Saturated length	feet	136
Pipe diameter	feet	2.5
# of collars	no.	4
Collar dimensions	feet	6.0 x 6.0
Minimum separatior	feet	24.5

Lake G	Unit	
Barrel length	feet	150
Normal pool	msl	55.0
Invert	msl	39.5
Saturated length	feet	113
Pipe diameter	feet	2.5
# of collars	no.	4
Collar dimensions	feet	5.8 x 5.8
Minimum separatior	feet	23.1

PC058 - LAKE C
GREENSPRINGS

July 20, 2005

RECEIVED
JUL 20 2005
ENVIRONMENTAL DIVISION

JCC Environmental Division
Attn: Scott Thomas
101 E Mounts Bay Road
Williamsburg, VA 23187

Re: Construction of Foley residence
3408 William Hodgson
Greensprings Plantation

Dear Mr. Thomas:

I am requesting a variance regarding violation of the 25 ft. buffer beyond high water elevation at 3408 William Hodgson in Greensprings Plantation. The intent is to minimize clearing and grading at the buffer zone and to replace any disturbed areas with grass and shrubs common to this area. Thank you for your consideration of this matter.

Sincerely,

William M. Foley

William M. Foley

LOCATION: Lot 141, Greensprings Phase 1, 3408 William Hodgson (County BMP ID Code: PC 058)

Variance request as submitted on July 20th 2005 by the Owner/Applicant for clearing, grading and structure in the pond buffer/setback reviewed and found to be acceptable. Efforts should be made to preserve existing trees and vegetation in the buffer during construction and to landscape or stabilize impacted buffer to resemble meadow or forest area with native trees, shrubs and ground cover to the greatest extent possible.

Scott J. Thomas
Senior Engineer
Environmental Division

07-25-05
Date

July 20, 2005

RECEIVED
JUL 20 2005
ENVIRONMENTAL DIVISION

JCC Environmental Division
Attn: Scott Thomas
101 E Mounts Bay Road
Williamsburg, VA 23187

Re: Construction of Foley residence
3408 William Hodgson
Greensprings Plantation

Dear Mr. Thomas:

I am requesting a variance regarding violation of the 25 ft. buffer beyond high water elevation at 3408 William Hodgson in Greensprings Plantation. The intent is to minimize clearing and grading at the buffer zone and to replace any disturbed areas with grass and shrubs common to this area. Thank you for your consideration of this matter.

Sincerely,

William M. Foley

William M. Foley

Scott Thomas

From: Scott Thomas
Sent: Tuesday, July 19, 2005 5:21 PM
To: 'Foley, Mike CIV LANTORDCOM, Command Projects & Infrastructure'
Subject: RE: Draft Variance Letter for Review

Looks ok, go ahead and get me a signed copy. I can start processing this from your email request too. One of the main reasons why I ask the home buyer to supply the variance request is for educational purposes, to make you aware of the pond buffer. If the builder/contractor supplied the letter, sometimes the house could be sold without the owner ever knowing it was present. Thank you.

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

Visit:
http://www.james-city.va.us/resources/devmgmt/div_devmgmt_environ.html
and
www.protectedwithpride.org

-----Original Message-----
From: Foley, Mike CIV LANTORDCOM, Command Projects & Infrastructure [mailto:mike.foley@navy.mil]
Sent: Tuesday, July 19, 2005 3:20 PM
To: Scott Thomas
Cc: Evan Sawyer
Subject: Draft Variance Letter for Review

Mr. Thomas,
Thank you for reviewing our construction permit application that was submitted by our residence builder Evan Sawyer. I have prepared the attached letter in draft form which I am hoping you could quickly review. If it meets the requirements for a variance request I would plan to hand carry a signed original to your office.

Thank you for your review.

William Foley

<<3408WilliamHodgsonLtr.doc>>

WMSBG NATIONAL LLC

James City County Stormwater Division Stormwater Management Facility (SWMF)Inspection Report

Score Definitions: 0-N/A, 1-Adequate, 2-Routine Maintenance, 3-Non-routine repair, 4-Urgent repair(s), item has failed or is failing.

BMP ID # PC058 PIN 3640100018 Responsible Party: GREENSPRINGS PLANTATION 3

Site Address: 3700 CENTERVILLE RD District: 3

Location (other): LAKE C

Date: 3/2/2009 Inspector: MM

Structure Type: **Retention**

(3 or 4 requires attention):

Total Score **2**

Criteria	Score	Comments: (Listed below are the items/tasks that should be rectified/ completed prior to re-inspection)
1. Forebay Score:	0	
2. Inlet(s):	1	
*3. Outlet:	2	**Erosion at the outlet discharge point**
*4. Principal Spillway:	1	
5. Emergency Spillway:	2	**Woody vegetation growing in spillway**
6. Basin Bottom and Side Slopes:	1	
7. Safety Devices:	0	
*8. Embankments:	1	
*9. Structural Components:	1	
*10. Media:	0	

James City County Stormwater Division Stormwater Management Facility (SWMF)Inspection Report

Score Definitions: 0-N/A, 1-Adequate, 2-Routine Maintenance, 3-Non-routine repair, 4-Urgent repair(s), item has failed or is failing.

Criteria	Score	Comments: (Listed below are the items/tasks that should be rectified/ completed prior to re-inspection)
11. Routine Maintenance:	1	
12. Condition of Aquatic Environment:	1	
13. Vegetation:	1	
*14. Storage Volume:	1	
15. Debris/Sediment Accumulation:	1	
16. Standing Water:	1	
17. Safety and Aquatic Bench:	0	
18. Side Slope Vegetation:	1	
19. Other:		

Checked below identify corrective work required on your stormwater management facility.

- ☐ Remove all trees and other woody vegetation from the embankment (earthen dam) and also within 10' of the toe of the embankment slope.
- ☐ Remove all trees and other woody vegetation from within 10' of the principal spillway, any principal inlet devices, and the principal outfall.
- ☐ Remove all trees and other woody vegetation from within 10' of any inlet structures, such as: pipes, end sections, concrete channels, flumes, rip rap channels, etc.
- ☐ Remove all trees and other woody vegetation from within the emergency spillway and also from within 10' of the spillway.
- ☐ Investigate the cause of any settlement, sink holes, subsidence, or erosion, noted on the report and develop and implement an appropriate plan to correct the deficiencies noted permanently.
- ☐ Remove all accumulated sediment, leaves and debris from within any pipes, end sections, concrete channels, emergency spillways, flumes, rip rap channels, etc. and dispose of the material in an appropriate method and location.
- ☐ Stabilize any disturbed, unstable, denuded or bare soil areas, by installing top soil and planting a permanent grass seed to establish an effective grass ground cover over these areas.
- ☐ All grassed areas of the BMP such as: access roads, emergency spillways, embankments (earthen dam), or other non-treed areas, shall be maintained at a minimum grass height of 8", and should not be subjected to low mowing.
- ☐ Trees and woody vegetation should be cut flush with the ground, and smaller trees and limbs (less than 4" dia) may be processed with a wood chipper and dispersed in natural areas.

APPLICATION FOR BUILDING PERMIT

101 Mounts Bay Road, P.O. Box 8784, Williamsburg, VA 23187-3627

(757) 253-6626
FAX: (757) 253-6850

Office Hours: Mon-Fri 8:30 a.m. - 5:00 p.m.

CONTRACTOR INFORMATION
License No. 2705 023916A
Company Name EVANSAWYER MASTER BUILDER
Street Address P.O. BOX 3713
City WILLIAMSBURG State VA Zip 23187
Phone No. (757) 259-5900 Fax. No. (757) 258-7748

Signature:
Print Name: WARREN BARNES

OWNER INFORMATION
Name William M. & LISA G. FOLEY
Address ~~3012 GARDEN GROVE~~ 3020 CEDAR RUN
City WILLIAMSBURG State VA Zip 23185
Phone No. ( ) 258-3411 Fax. No. ( )

Signature:
Print Name:

Agent: ESMB
Print Name: WARREN BARNES

DESCRIPTION OF WORK
SINGLE FAMILY DWELLING

SAME AS PLAN NUMBER _____ (Lists Options)

(For Commercial Projects Only)
Site Plan No. _____ Date Approved _____

RECEIVED
JUL 12 2005
ENVIRONMENTAL DIVISION

LOCATION OF WORK
Tax Map No. (36-4) (03-0-0141-)
Street Address 3408 William Hodgson
Zoned _____ Subdiv GREENSPRINGS PLANTATION

MECHANICS' LIEN AGENT
Name: BANKERS ~~TITLE~~
Address: 1403 GREENBRIAR PKWY ST 285
City CHESAPEAKE State VA Zip 23320
Phone No. (757) 424-5440 Fax. No. ( )

BUILDING INFORMATION
Stories 1½ No. Rooms 9 No. Baths 4 No.Bath Fix. 12
No. Fireplaces (Wood, Prefab, Gas FP, Gaslog, Other)
Exterior Finish: (Vinyl, Brick, Wood, Other)
Interior Finish: (Gypsum wallboard, Wood, Other)
Flooring: (Carpet, Wood, Vinyl, Other TILE)
Roofing: (Asphalt, Fiberglass, Wood, Other)
Heat Type: (Gas, Heatpump, Electric, Other)
Air Conditioning-Type (Central, Window, None)

Estimated Value 140K (Do not include Lot $)

Floor Area (sq.ft.) 2277
(Do not include Basement, Garage, and Deck/Porch)
Deck (sq.ft.) 207
Porch (sq.ft.) 232
Basement Area (sq.ft.) N/A
Garage Area (sq.ft.) 484
Total Area (sq.ft.) 3200

Septic _____ Public Sewer ✓ Grinder Pump _____
Well _____ Public H_2O ✓

OFFICE USE ONLY

REJECTED

Lot Width _____
Lot Depth _____
Front Property Line _____
Right Property Line _____
Left Property Line _____
Rear Property Line _____

PERMIT NO. _____
LINE NO. 05 1280

Date/Time In _____
Date Plan Reviewed _____

Improvement Code _____
Structure Used As _____
Use Group _____
Occupancy Load _____
Type Construction _____
Zoning Approved _____
Zoning Disapproved _____
Plan Approved _____
Plan Disapproved _____

PLAN REVIEW FEE _____

PERMIT FEE _____

Notes: POND BUFFER.

GREENSPRING PLANTATION

WATERSHED	PC	MAINTENANCE PLAN	No	CTRL STRUC DESC	CMP Riser
BMP ID NO	058 58	SITE AREA acre	1402	CTRL STRUC SIZE inches	26 36"
PLAN NO	SP-85-94	LAND USE	SF Res	OTLT BARRL DESC	CMP Barrel
TAX PARCEL	(36-4)(01-18)	old BMP TYP	Wet Pond-Lake	OTLT BARRL SIZE inch	30
PIN NO	3640100018	JCC BMP CODE			
CONSTRUCTION DATE	6/1/1994	POINT VALUE	11	EMERG SPILLWAY	Yes
PROJECT NAME	Greensprings Legacy Golf Course			DESIGN HW ELEV	52.89
FACILITY LOCATION	Lake C			PERM POOL ELE	50.0
CITY-STATE	Williamsburg, Va. 23188	SVC DRAIN AREA acres	91.3	2-YR OUTFLOW cfs	4.33
CURRENT OWNER	Legacy Greensprings Limited Partnership			10-YR OUTFLOW cfs	28.99
OWNER ADDRESS	4029 Ironbound Road			REC DRAWING	Yes
OWNER ADDRESS 2	Suite 200	SERVICE AREA DESCRI	Greensprings Plant SF		
CITY-STATE-ZIP CODE	Williamsburg, Va. 23188	IMPERV AREA acres		CONSTR CERTI	No
OWNER PHONE		RECV STREAM	UT of Powhatan Creek		
MAINT AGREEMENT	Yes	EXT DET-WQ-CTRL	No	LAST INSP DATE	9/14/2000
EMERG ACTION PLAN	No	WTR QUAL VOL acre-ft	54.4	INTERNAL RATING	3
		CHAN PROT CTRL	No	MISC/COMMENTS	
		CHAN PROT VOL acre-ft	8.34	Near Fairway # 8a & # 9a.	
		SW/FLOOD CONTROL	No		
		GEOTECH REPORT	No		

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SJT

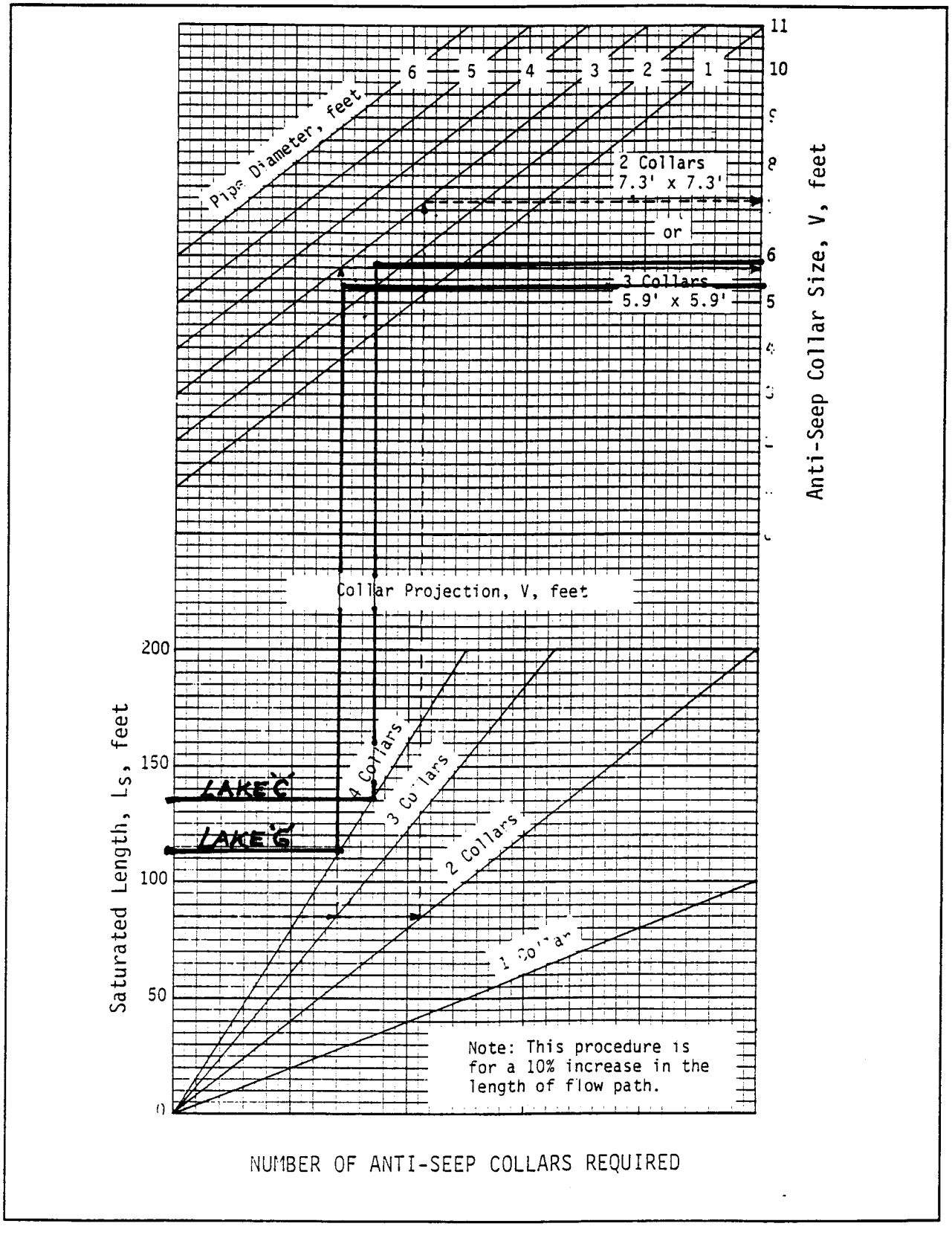
James City County
Environmental Division
Single Family Plan Submittal - Miscellaneous

Lot # 141, Greensprings Plantation Phase 1 (3408 William Hodgson)

Design high water elevation for the adjacent stormwater management/BMP facility and the 25 ft. pond buffer/setback must be shown on the single-family site plan. It is unclear if clearing, grading and the location of structures as proposed are situated in the design high water elevation or the pond buffer/setback. As the site plan indicates that elevations are assumed (arbitrary) for topographical purposes, the plan preparer must estimate the locations of design high water and the pond buffer/setback on the lot, if applicable, based on design and record drawing information for the stormwater management/BMP. The pond buffer/setback is 25 feet outward from the maximum water surface elevation of the design high water elevation of the pond. Based on information as available in our record files, it appears the 100-year design high water surface elevation for the adjacent stormwater management facility (Lake C, County Plan No. SP-85-94, County BMP ID Code: PC 058) is at Elevation 52.89.

If clearing limits, grading and/or structures are situated within the design high water level and/or the pond buffer/setback, the plan must be reconfigured to avoid these areas; or alternatively, waiver requests must be submitted, in writing, to the Environmental Division. Waiver requests must provide information to support the request including: the correct delineation of the design high water and 25 ft. buffer/setback; acknowledgment from the owner/tenant; and an engineering analyses that the proposed lot fill material will have no adverse impact on the storage volume or function of the adjacent stormwater management facility (if within the design high water). Pond buffer variance requests needs to be from the owner or tenant, current or future, rather than from the builder/contractor.

If there are any questions, contact Scott Thomas, Senior Engineer with the Environmental Division at 757-253-6639 or Earl Croft, Environmental Division inspector at 757-253-6752.



Source: USDA-SCS

Plate 3.14-12

STATE OF North Carolina
CITY/COUNTY OF Moore

I hereby certify that on this 11th day of July 1994, before the subscribed, a Notary Public of the State of Virginia, and for the City/County of Moore, aforesaid personally appeared before me Michael W Sanders
(Name of Acknowledging Party)
and did acknowledge the aforegoing instrument to be their Act.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal this 11th day of July, 1994.

Bonnie C Bates
Notary Public

My commission expires: November 6, 1994

Approved as to form:

Leo P. Rogers

0621U
Revised 3/91

VIRGINIA: City of Williamsburg and County of James City, to Wit:
In the Clerk's office of the Circuit Court of the City of Williamsburg and County of James City, the 23 day of July 1994. This Covenants was presented with certificate annexed and admitted to record at 3:45 o'clock
Teste: Helene S. Ward, Clerk
by
Deputy Clerk