FOR SAFE DAMS REVIEW

OPERATION AND MAINTENANCE MANUAL

SPIVEY LAKE DAM

HENRY COUNTY, GEORGIA

LAKE SPIVEY CIVIC ASSOCIATION, INC.

SEPTEMBER 2017

WALDEN, ASHWORTH & ASSOCIATES, INC.
Consulting Engineers

FOR SAFE DAMS REVIEW

OPERATION & MAINTENANCE MANUAL (O & M)

SPIVEY LAKE DAM

Henry County, GA

NATIONAL INVENTORY OF DAMS (NID) NO.: GA04533
STATE ID NO.: 075-047-00092

LAKE SPIVEY CIVIC ASSOCIATION, INC.

Prepared By:

WALDEN, ASHWORTH & ASSOCIATES, INC.

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SPIVEY LAKE DAM

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NATIONAL INVENTORY OF DAMS (NID) NO.: GA04533
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Prepared By:

Walden, Ashworth & Associates, Inc.
P.O. Box 6462
Marietta, GA 30062

For:

LAKE SPIVEY CIVIC ASSOCIATION, INC.

Version 1.0

September, 2017

REVISION SHEET
Operation and Maintenance Manual
for
Spivey Lake Dam
Henry County, GA

No.	Description of Revision Made	By	Date

DISTRIBUTION LIST
Operation and Maintenance Manual
for
Spivey Lake Dam
Henry County, GA

Copy No.	Location
1	Lake Spivey Civic Association, 3301 Bay View Drive, Lake Spivey, GA 30236
2	Georgia Safe Dams Program, 2 Martin Luther King Jr Drive, SE, Suite 1362 Atlanta, GA 30334
3	Walden, Ashworth & Associates, Inc., 1827 Powers Ferry Road, Bldg. 23, Ste. 300, Marietta, GA 30339

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SPIVEY LAKE DAM

Project Data Sheet

General

Dam Name:	Spivey Lake Dam
NID ID #	GA04533
STATE ID #	075-047-00092
Owner & Operator:	Lake Spivey Civic Association, Inc.
Location:	Lat 33.52; Long -84.28
	Henry County, GA
Purpose of Project:	Recreation
Construction History:	Lake Spivey Dam was built to provide a reservoir for recreation. Construction of the dam began in December of 1956 and was completed in September 1957. The owner of the dam is Lake Spivey Civic Association Inc. In 1996 a new concrete labyrinth spillway was constructed and alterations to the existing emergency spillway were made. The 1996 design and construction plans were prepared by Jordan, Jones & Goulding.
Downstream Hazard Class:	Category I (High Hazard)
Project Datum:	Mean Sea Level

Reservoir

Watershed:	Located on Rum Creek			
Drainage Area:	11.59 square miles			
	Elevation (ft)	Surface Area (Ac)	Total Storage (AF)	Active Storage (AF)
Minimum Operating Pool:	1000.5	551	8,534	N/A
Normal Full Pool:	1000.5	551	8,534	N/A
Maximum Flood Pool:	1006.9	610	13,238	N/A
Maximum Reservoir Contour:	1008.5	860	14,409	N/A

Dam

Dam Type:	Earthen Embankment	
Height:	Structural: 46 ft.	Hydraulic: 50 ft.
Crest Elevation:	1000.5 ft.	
Crest Length:	2,350 ft.	Crest Width: 18 ft.
Upstream Slope:	3:1	
Downstream Slope:	3:1	

Outlet Works

Conduit:	Concrete chamber with (2) 48” CMP
Control Gate (s)	48” Slide headgate

Spillway

Primary Spillway: 45’ Wide Concrete Labyrinth Secondary Spillway: 230’ Weir Wall

LOCATION MAP

1.0 GENERAL INFORMATION

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1.0 GENERAL INFORMATION

1.1 OPERATION AND MAINTENANCE MANUAL

This document is the Operation and Maintenance (O&M) Manual for Spivey Lake Dam. The document provides procedures, guidance and standard forms for the normal operation and maintenance of the facilities. **THE EMERGENCY ACTION PLAN (EAP) SHOULD BE UTILIZED FOR UNUSUAL AND EMERGENCY CONDITIONS**. The purpose of the O&M Manual is to ensure adherence to approved operating procedures over long periods of time and during changes in operating personnel. The instructions will permit personnel, knowledgeable in reservoir operations but unfamiliar with the conditions at a particular dam, to operate the dam and reservoir at times when regular operating personnel cannot perform their normal duties.

1.2 PURPOSE AND DESCRIPTION OF PROJECT

Spivey Lake is used for recreation uses and is located on Rum Creek in Henry County, Georgia. The Dam is an earthen embankment that is 2,350± feet long and has a top width that is approximately 18 feet. The dam is 46 feet high. The Lake Spivey Civic Association is the owner of the dam. The Dam is regulated by the Safe Dams Program (SDP), a section of the Watershed Protection Branch (WPB) of the Environmental Protection Division (EPD) of the Department of Natural Resources. Operation of the dam shall be in conformance with the current SDP Operating Permit.

1.3 LOCATION AND ACCESS TO THE DAM AND FACILITIES

The dam is located in Henry County, Georgia on Rum Creek. The dam is approximately 3 miles Southwest of Stockbridge, along Blackhall Road. Access to the dam is within the Lost Valley Subdivision.

1.4 ASSIGNMENT OF RESPONSIBILITY

The Spivey Lake Civic Association has final authority and responsibility for the safety, operation, and maintenance of Fort Yargo Lake Dam. The Lake Spivey Civic Association performs dam operation responsibilities for manually adjusting gates and valves as well as performing maintenance.

1.5 ATTENDANCE AND COMMUNICATIONS

1.5.1 Attendance

Spivey Lake Dam is unattended. The nearest operating personnel are at the Spivey Lake Civic Association offices in Lake Spivey, Georgia.

1.5.2 Communication

There is no phone or radio at the Spivey Lake Dam. Spivey Lake Civic Association personnel ("the dam owner") may be phoned at 404-392-9800.

1.6 PUBLIC SAFETY AND HEALTH

Safety of the public and all personnel is a primary concern. The only access to the dam is off of Lost Valley Drive and needs to be coordinated with the owner. The outlet gate valve is secured.

1.7 RESTRICTED AREAS

Access to the dam is from Lost Valley Drive. Access to the lake and dam needs to be coordinated with the owner. The outlet gate valve is accessible on the upstream slope of the dam only from the low level drain concrete chamber.

2.0 OPERATION PROCEDURES

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2.0 OPERATION PROCEDURES

2.1 RESERVOIR OPERATIONS

Reservoir operating data, such as Elevation-Storage and Emergency Spillway Rating Curve, are provided in Appendix A and B respectively.

2.2 FILLING SCHEDULE

Spivey Lake is operated at its normal pool elevation year round.

2.3 RELEASE SCHEDULE

Releases from the lake are made only for periodic shore line maintenance.

2.4 FLOOD OPERATION

At the earliest possible indication of potential dam failure or overtopping, the dam owner/operator should station himself at the dam and open the deep water release gate to begin lowering the lake level. If it appears likely that high outflows from the emergency spillway will occur, a warning should be given to downstream residents to prepare for evacuation as outlined in the Emergency Action Plan.

2.5 CONTROL PRIMARY SPILLWAY

The principal spillway system consists of a concrete labyrinth weir structure with a concrete chute. The concrete labyrinth weir is located at the crest of the dam at the normal pool elevation of 1000.5 mean sea level. The concrete labyrinth weir releases flow into a downstream concrete chute that directs the flow through the downstream side of the dam and into a rip rap basin. The labyrinth weir controls the normal pool level and carries low flows over the weir wall. The structure also has a reservoir drain gate with a 48” slide headgate. The drain gate is controlled from a pedestal lift located on the top of the concrete weir and is accessible by a concrete pad located at the crest of the dam.

3.0 MONITORING & INSPECTION

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3.0 MONITORING & INSPECTION

3.1 GENERAL

Dam Instrumentation refers to a variety of devices installed within, on, or near the dam to monitor structural behavior during construction, initial filling and subsequent operation. Instruments provide a means for detecting abnormal conditions which could lead to major problems.

This section describes the instrumentation at Spivey Lake Dam, the methods and frequency of data collection, transmittal of data, and procedures to evaluate the data. Timely evaluation of instrumentation readings is critical if an abnormal condition is to be detected to allow for effective corrective action.

The Dam Owner is primarily responsible for collecting and reporting any instrumentation readings. Periodic Owner Inspections should be performed by the Dam Owner.

3.2 OBSERVATION WELLS

There are no monitoring wells at Spivey Lake Dam.

3.3 DRAINS AND SEEPAGE

Remove debris in and around drain outlets. Any buildup of sediment or precipitate, such as iron ochre, shall also be removed.

3.4 OPERATIONAL INSPECTIONS

The Dam Owner shall be responsible for conducting routine inspection and maintenance of the dam as necessary to:

a) Prevent the growth of trees or brush on the embankment of the dam and on the spillway system;

(b) Prevent the accumulation of debris, obstructions, or other deleterious materials from the spillway system;

(c) Insure that all gates, orifices, dissipators, trash racks, and other appurtenances that affect the proper operation of the dam and reservoir are kept in good repair and working order, and that spillway and outlet gates necessary to pass flood flows shall be test operated at least once each year. The dam owner shall file an affidavit with the Director certifying that such gates and other appurtenances are in good repair and working order;

(d) Maintain adequate and suitable vegetation to prevent erosion of the embankment and earthen spillway for the dam;

(e) Determine that any seepage on the downstream slopes of the dam does not exceed normal amounts and does not present a situation indicative of potential dam failure. At any time where there is a question regarding seepage and potential dam failure, the Director shall be notified in writing and provided a description of the situation; and

(f) Dam owners shall immediately notify EPD when symptoms of failure, including but not limited to, erosion, surface cracks, seepage, settlement, or movement occur.

3.5 QUARTERLY OWNER INSPECTIONS

The Rules for Dam Safety states, "Dam owners are required to inspect their dam each calendar quarter. The four calendar quarters are January 1st – March 31st, April 1st – June 30th, July 1st – September 30th, and October 1st – December 31st. This inspection may be conducted by the dam owner or the dam owner may hire someone with dam safety experience to do the inspection on their behalf." These inspections are performed based on techniques provided by the Safe Dams Program. The inspection form and instructions for performing the inspection can be found towards the bottom of the following web page: http://epd.georgia.gov/watershed-protection-branch. A copy of the inspection form is in Appendix E. The inspection reports are to be sent to the Safe Dams Program as one package for the entire year. The entire yearly package including April 1st of the prior year through March 31st of the current year must be mailed in by April 30th. The mailing address for the Safe Dams Program is: 2 Martin Luther King Drive, S.E., Suite 1362, Atlanta, Georgia, 30334. These reports can also be hand delivered to the above address if a meeting is set with the Safe Dams Program.

3.6 ENGINEER INSPECTIONS

The dam owner shall have the dam inspected by a Professional Engineer (P.E.) in Georgia at least every two years. This inspection shall be conducted between October 1 and March 31, commencing with October 1, 2017. This inspection shall satisfy the inspection requirement for the October 1 through December 31 and January 1 through March 31 quarterly inspections. For any dam that is less than 50 feet tall and the dam owner has conducted at least four consecutive quarterly inspections as outlined above, the owner may submit to the Division a waiver request by October 1 for one two-year cycle of the engineer inspections. The waiver request shall be approved unless the Division denies the request in writing within 30 days of receipt of the waiver request. Reasons to deny the waiver request include, but are not limited to, inspection reports showing

deficiencies or Division enforcement actions within the past twenty-four (24) months. There is no waiver for dams 50 feet and taller. The engineer's inspection can be completed on the same inspection form used by the owner or they can use an equivalent form. The engineer's inspection report must have a summary of findings including outlining areas that need additional maintenance and those areas requiring additional investigation or design by an engineer.

3.7 CRITICAL EVENT INSPECTIONS

The dam should be inspected during or immediately following the occurrence of critical events, such as severe rain or wind, earthquakes or periods of extremely high reservoir elevation. If emergency conditions are observed, the responses outlined in the Emergency Action Plan should be implemented. Emergency conditions include erosion threatening the integrity of the dam, seepage that is cloudy or excessive and/or extremely high water surfaces. Inspection by a qualified engineer should be performed to evaluate the impact of critical events on the dam.

Even if the water surface level is not at a high elevation at the time of an earthquake, it is possible that the dam could suffer some ill-effects from the earthquake (associated with seepage performance) that will not show up until higher reservoir elevations are subsequently reached. Therefore, heightened awareness and possible monitoring would be appropriate following an earthquake whenever the reservoir is rising to elevations that have not been previously experienced since the occurrence of the earthquake. Specific changes to monitoring schedules would need to be established on a case-by-case basis in light of the magnitude of the earthquake, reservoir elevation at the time of the earthquake, and apparent damage sustained by the dam as a result of the earthquake.

4.0 MAINTENANCE

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4.0 MAINTENANCE

4.1 CRITICAL CONDITIONS

The following conditions are critical and require immediate repair or maintenance under the direction of a qualified engineer. The critical repairs or maintenance need to address the specific conditions encountered and are not covered in this O&M Manual. Critical conditions should trigger a response as outlined in the Emergency Action Plan.

- Erosion, slope failure or other conditions which are endangering the integrity of the dam.
- Piping or internal erosion as evidenced by increasingly cloudy seepage or other symptoms.
- Spillway blockage or restriction.
- Excessive or rapidly increasing seepage appearing anywhere near the dam site.

4.2 PERIODIC MAINTENANCE

The following items should be noted in the operations log and added to the work schedule whenever they are noted during Operation Inspections or Periodic Inspections. The following maintenance items should be completed as soon as possible after identification (at least quarterly):

- Remove bushes and trees from the embankment and abutments.
- Repair erosion gullies.
- Repair defective gates or valves.
- Repair deteriorated concrete or metal components.
- Maintain riprap or other erosion protection.

Continued maintenance should also be performed for the following items:

- Test, clean and lubricate gates and valves.
- Inspect and maintain instrumentation and gaging equipment.
- Remove debris from embankment face and from areas around the intake structures.

4.3 EMBANKMENT MAINTENANCE

1. Fill erosion gullies with properly compacted cohesive soil material. Seed or riprap repaired area to stabilize from future erosion.
2. Fill rodent burrows with slurry of soil, cement and water. Remove the rodents.
3. Maintain grass cover by spraying weeds, fertilizing and watering as needed.
4. Remove brush, bushes and trees from embankment and from within 25 feet of the groins and 50 feet of the toe of embankment. Remove tree roots, fill with compacted soil and re-seed area.
5. Add or repair riprap where displacement or other damage occurs.
6. Maintain grading of the embankment crests to prevent potholes, rutting or other potential for standing water to accumulate.
7. Repair and re-vegetate damaged embankment surfaces.
8. Perform regular inspections of the embankments and abutments to identify potential maintenance items.

4.4 OUTLET MAINTENANCE

1. Test gates and valves annually.
2. Lubricate gates and valves annually or as recommended by the manufacturer.
3. Repair defective gates and valves to ensure smooth operation and prevent leakage.
4. Repair deteriorated concrete or metalwork.
5. Remove debris from the outlet channels, inspect and repair erosion protection.
6. Repair and verify calibration of water measurement equipment.

APPENDIX A – RESERVOIR STORAGE

SPIVEY LAKE DAM		
RESERVOIR STAGE/STORAGE		
ELEVATION AREA		
Elevation (ft)	**Surface Area (acre)**	**Storage (acre-foot)**
1000.5	551	8534
1006.9	610	13238
1008.5	860	14409

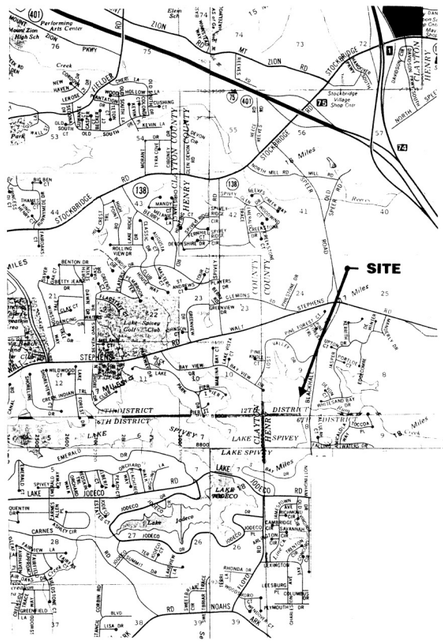
APPENDIX B – OUTLET WORKS RATING

SPIVEY LAKE DAM			
EXISTING SPILLWAY RATING CURVES			
ELEVATION (ft)	**PRIMARY SPILLWAY 45' LABYRINTH WEIR (cfs)**	**AUXILIARY SPILLWAY 230' CONCRETE WEIR (cfs)**	**TOTAL DISCHARGE (cfs)**
1000.5	0	0	0
1003.7	2400	0	2310
1006.9	7941	2347	10288

APPENDIX C – PROJECT DRAWINGS

LABYRINTH SPILLWAY AT LAKE SPIVEY

LAKE SPIVEY CIVIC ASSOCIATION



LOCATION MAP

GENERAL NOTES

1. OWNER: LAKE SPIVEY CIVIC ASSOCIATION
   P.O. BOX 1041
   JONESBORO, GEORGIA 30237
   (770) 478-2065
   CONTACT: DON WHITMAN, JIM DIXON
2. ENGINEER: JORDAN, JONES & GOULDING, INC
   2000 CLEARVIEW AVENUE
   ATLANTA, GEORGIA 30340
   (770) 455-8555
3. PROJECT LOCATION: 12th DISTRICT, LAND LOT 9
   JONESBORO, HENRY COUNTY, GEORGIA
4. ACREAGE: 0.88 ACRES (DISTURBED AREA)
5. ALL CONSTRUCTION TO CONFORM TO HENRY COUNTY STANDARDS AND SPECIFICATIONS.
6. NOTIFY THE GEORGIA SAFE DAMS PROGRAM (PH: 404-362-2678) 24 HOURS PRIOR TO CONSTRUCTION.

INDEX OF DRAWINGS

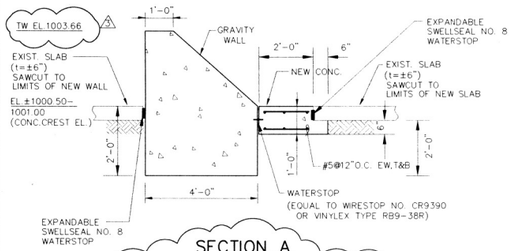
Jordan Jones & Goulding

JUNE 1996

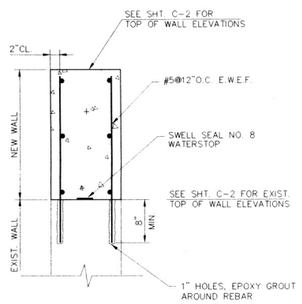
(REVISED AUGUST 1996)

APPROVED
STATE OF GEORGIA
SEP 9 1996
SAFE DAMS PROGRAM
ENVIRONMENTAL PROTECTION DIVISION
By Frances E. Fuchs II, PE

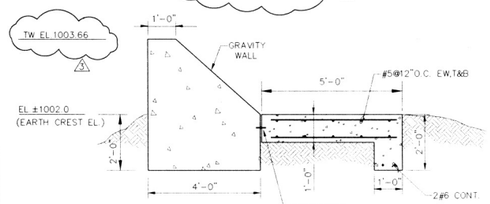
RECEIVED
SEP 9 1996
DAM SAFETY



SECTION A
PROPOSED WALL AT EXISTING CONCRETE SPILLWAY CREST
SCALE: 1/2" = 1'-0"
SEE NOTE 4 (THIS SHEET)

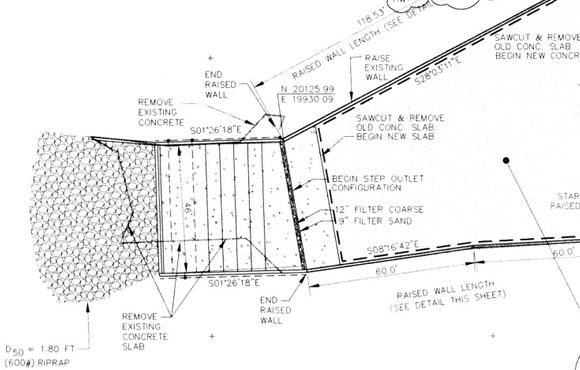


TYPICAL DETAIL OF WALL EXTENSION
1" = 1'-0"

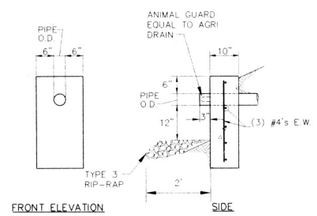


SECTION B
PROPOSED WALL AT EXISTING EARTH SPILLWAY CREST
SCALE: 1/2" = 1'-0"
SEE NOTE 4 (THIS SHEET)

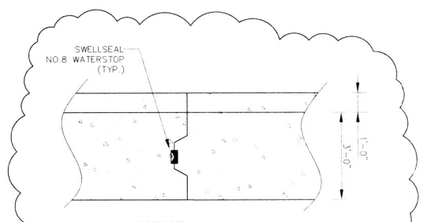
ANIMAL GUARD DETAIL
NTS
NOTE: ANIMAL GUARD TO BE EQUAL TO AGRI-DRAIN



EXISTING CONCRETE SLAB
NOTES:
1. CONTRACTOR TO HIGH PRESSURE WASH EXISTING SLAB. LOOSE SPALLING CONCRETE TO BE WATER BLASTED FOR REMOVAL.
2. CONTRACTOR TO REMOVE ALL VEGETATION AND DELETERIOUS MATERIAL.
3. CONTRACTOR TO APPLY CONCRETE EPOXY GROUT TO ALL CRACKS AND DAMAGED AREAS.
4. ANY VOIDS DISCOVERED WHEN SAW CUTTING FOR TYING IN OF THE PROPOSED CHUTE AND/OR STEP OUTLET STRUCTURE SHALL BE PRESSURE GROUTED.



TOE DRAIN HEADWALL
NTS
NOTE: DESIGNATED AS "HW" ON PLANS



CONSTRUCTION JOINT
KJ C-1
NOTE: FOR PROPOSED WEIR WALLS @ EXISTING EARTHEN & CONCRETE SPILLWAYS ONLY. LOCATED @ 40'-0" CENTERS.

N 20594.20
E 20096.67
B.M. = R/R SPIKE IN PINE
ELEV: 1010.28

APPROVED
STATE OF GEORGIA
SEP 3 1996
SAFE DAMS PROGRAM
ENVIRONMENTAL PROTECTION DIVISION
By Francis E. Tuggle II, P.E.

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft

NOTES:
1. WALL COORDINATES SHOWN REFER TO INSIDE WALL FACE.
2. ACTUAL WALL THICKNESS SHOWN ON SHEET C-4, S-2.
3. DETAILED LAYOUTS OF SPILLWAY AND OUTLET CHANNEL SHOWN ON SHEET C-3, C-4.
4. PROVIDE CONSTRUCTION JOINTS AT 40' CENTERS (MAX) FOR PROPOSED WALLS AT EXISTING EARTH AND CONCRETE SPILLWAYS.
5. ALL CONCRETE SHALL BE CLASS A.
6. HW = HEADWALL ; C/O = CLEANOUT

NO	DATE	DESCRIPTION OF REVISION
3	08-15-96	REVISIONS PER GEORGIA SAFE DAMS COMMENTS
2	06-06-96	REVISIONS PER GEORGIA SAFE DAMS COMMENTS
1	06-23-95	REVISIONS PER GEORGIA SAFE DAMS COMMENTS
0	04-06-95	INITIAL ISSUE

Jordan Jones & Goulding

LAKE SPIVEY CIVIC ASSOCIATION

LAKE SPIVEY DAM & SPILLWAY

STAKING PLAN

DESIGNED: JED	CHECKED:	DATE: JUNE 1995	C-1	3
DRAWN: SFH	JOB NO. 656.3.001	SCALE: 1" = 20'	SHEET	REV.

N

NOTE: CONTRACTOR SHALL BE RESPONSIBLE FOR LOWERING THE LAKE LEVEL 3' BELOW EXCAVATION LIMITS AND MAINTAINING THE LAKE LEVEL BELOW EXCAVATION LIMITS DURING THE CONSTRUCTION PERIOD UNTIL WORK IS COMPLETE AND ACCEPTED BY THE GEORGIA SAFE DAMS PROGRAM AND THE ENGINEER COORDINATE LOWERING OF THE LAKE LEVEL WITH THE OWNER

PROPOSED CONCRETE LABYRINTH SPILLWAY

PROPOSED CONCRETE

LAKE SPIVEY
(NORMAL POOL ELEV = 1000.50)
(50-YEAR STORM ELEV = 1003.66)
(1/2 PMP ELEV = 1006.91)

TOP: 1000.95

994.00

TW 998.00
SLAB 991.50

200# RIPRAP

FLOW

GROUT EXISTING 48" CMP

48" WALL PIPE & 4'-6" x 4'-6" SLUICE GATE (INV = 992.00)

FILTER COLLAR

10LF-6"PVC @ 2.00%-(2)

ALL DISTURBED AREAS

TW 995.00
SLAB 987.75

118 LF-6"PVC @ 1.00%

86LF-6"PVC @ 1.00%

70LF-6"PVC @ 1.00%

TW 1008.50
SLAB 991.50

SEDIMENT BARRIER TYPE A

(TOP OF DAM = ±1008.5 feet)

EXTEND WALL APPROX 10' INTO EARTH ABUTMENT

PROPOSED SPILLWAY ACCESS

PROPOSED CONCRETE WALL (TW = 1003.66)

BEGIN EARTH SPILLWAY WALL (CONTINUE TO END OF EARTH SPILLWAY ±100 FT)

REMOVE EXIST CONC SLAB

REMOVE WALLS

TW 995.00
SLAB 987.00

TW 992.00
SLAB 984.00

LIMITS OF NEW CONCRETE

EXISTING WALL
TW 985.00
SLAB EL 983.89
RAISED WALL
TW 992.00

RAISE EXISTING WALL (SEE NOTE 5)

RAISED WALL
TW 988.0
(SEE NOTE 5)

EXISTING WALL
TW 981.54
SLAB EL 978.81
RAISED WALL
TW 983.75

EXISTING WALL
TW 984.67
SLAB EL 982.20
RAISED WALL
TW 988.00

EXISTING CONCRETE SPILLWAY

EXISTING EARTH SPILLWAY

B-1 R=986
B-2 R=988
B-3 R=983.5
B-4 R=974
B-5 R=986
B-6 R=982
B-7 R=990
B-8 R=990
B-9 R=990

HEADWALL
INV 984.60

HEADWALL
INV 988.07

HEADWALL
INV 983.30

HEADWALL
INV 981.55

EXISTING WALL
TW 983.25
SLAB 981.65

EXISTING WALL
TW 978.42
SLAB 976.44

EXISTING WALL
TW 974.33
SLAB 972.66
RAISED WALL
TW 979.50
SLAB 977.00

HEADWALL
INV 968.40

TW 974.50
SLAB 964.50

BEGIN NEW SLAB

BEGIN STEP OUTLET CONFIGURATION

12" FILTER COARSE
9" FILTER SAND

EXISTING WALL
TW 978.17
SLAB EL 975.18

RAISED WALL
TW 979.50
BW 963.00±
(SEE NOTE 2)

TW 974.50
BW 963.00±
(SEE NOTE 2)

REMOVE EXISTING CONCRETE

PERMANENT EROSION CONTROL BLANKET (ENKAMAT 7020, TM 3000 OR EQUIVALENT)

ALL DISTURBED AREAS

SEDIMENT BARRIER TYPE C

SEDIMENT BARRIER TYPE A

TEMPORARY ROCK FILTER DAM (H=2')

NOTE: TO BE REMOVED WHEN CONSTRUCTION IS COMPLETE

D_{50} = 1.80 FT
(600# RIPRAP)

Co (SEE NOTE 4)

B.M. = R/R SPIKE IN PINE
ELEV. 1010.28

+ E 19800
N 20600

+ E 20100
N 20200

+ E 20100
N 19961

+ E 20100
N 20605

APPROVED
STATE OF GEORGIA
SEP 3 1996
SAFE DAMS PROGRAM
ENVIRONMENTAL PROTECTION DIVISION
By Francis E. Voight II, P.E.

GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft

NOTES:

1. SOIL BORINGS (B1-B9) SHOW RESIDUAL SOIL ELEVATION.
2. BOTTOM OF WALL ELEVATION IS APPROXIMATE (FOOTING WILL BE EXTENDED TO TOP OF ROCK).
3. UNDERDRAIN SYSTEM DETAILED ON SHT. C-3, C-4.
4. CONTRACTOR SHALL PROVIDE CONSTRUCTION EXIT BETWEEN EXISTING EARTHEN SPILLWAY AND PUBLIC ROADWAY.
5. HORIZONTAL LIMITS OF RAISED WALL ON SHT C-1.

NO	DATE	DESCRIPTION OF REVISION
3	08-15-96	REVISIONS PER GEORGIA SAFE DAMS COMMENTS
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0	04-06-95	INITIAL ISSUE

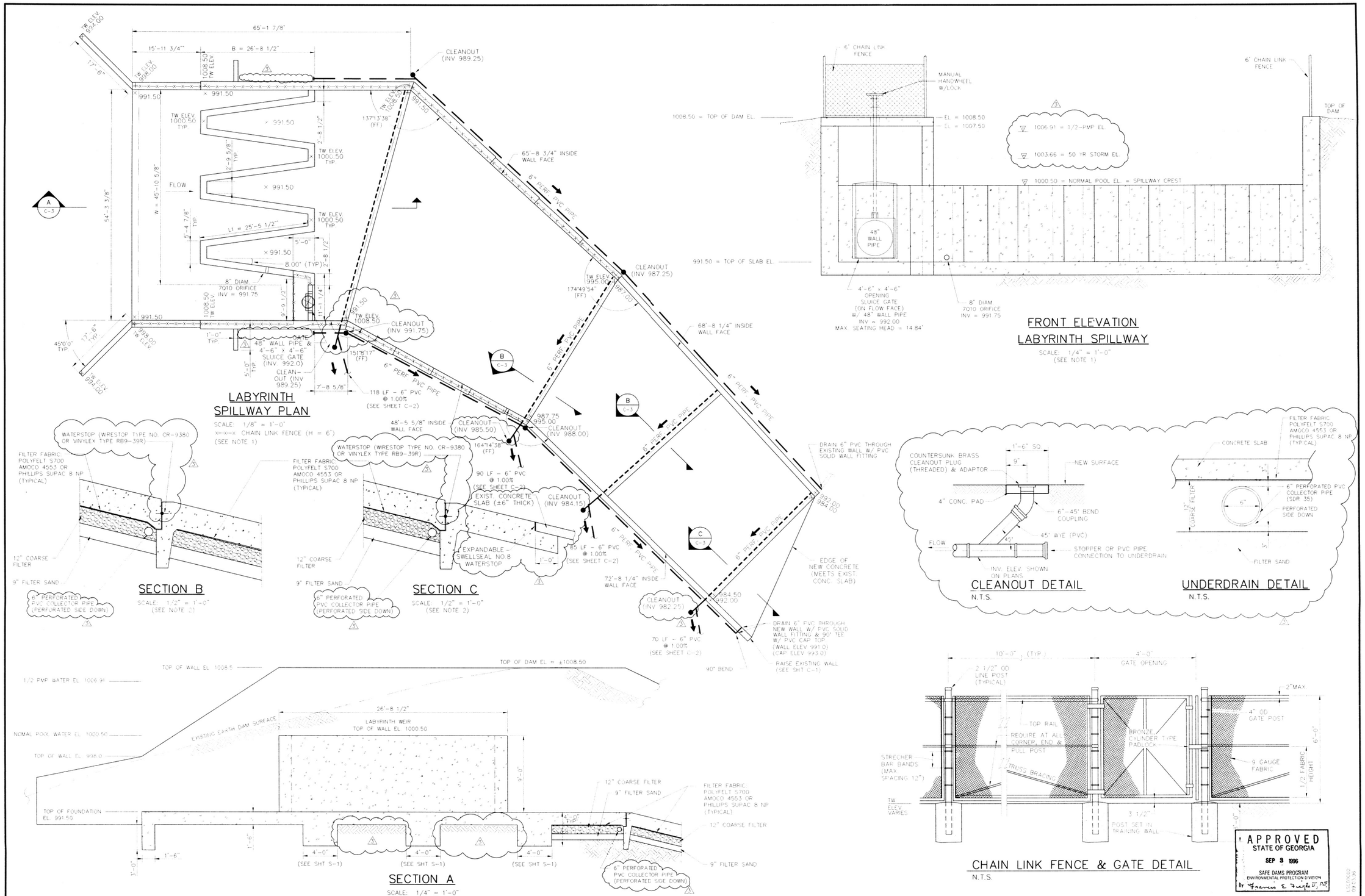
Jordan Jones & Goulding

LAKE SPIVEY CIVIC ASSOCIATION

LAKE SPIVEY DAM & SPILLWAY

GRADING AND EROSION CONTROL PLAN

DESIGNED: JED	CHECKED:	DATE: JUNE 1995	C-2 SHEET	3 REV
DRAWN: SFH	JOB NO. 6563.001	SCALE: 1" = 20'		



NOTES:

1. WALL SECTIONS AND STRUCTURAL DETAILS SHOWN ON SHT S-1, S-2.
2. FOR CUTOFF WALL DIMENSIONS & CONCRETE REINFORCEMENT PLACEMENT, SEE SHT S-1.

NO.	DATE	DESCRIPTION OF REVISION
3	08-15-96	REVISIONS PER GEORGIA SAFE DAMS COMMENTS
2	06-06-96	REVISIONS PER GEORGIA SAFE DAMS COMMENTS
1	06-23-95	REVISIONS PER GEORGIA SAFE DAMS COMMENTS
0	04-06-95	INITIAL ISSUE

Jordan Jones & Goulding

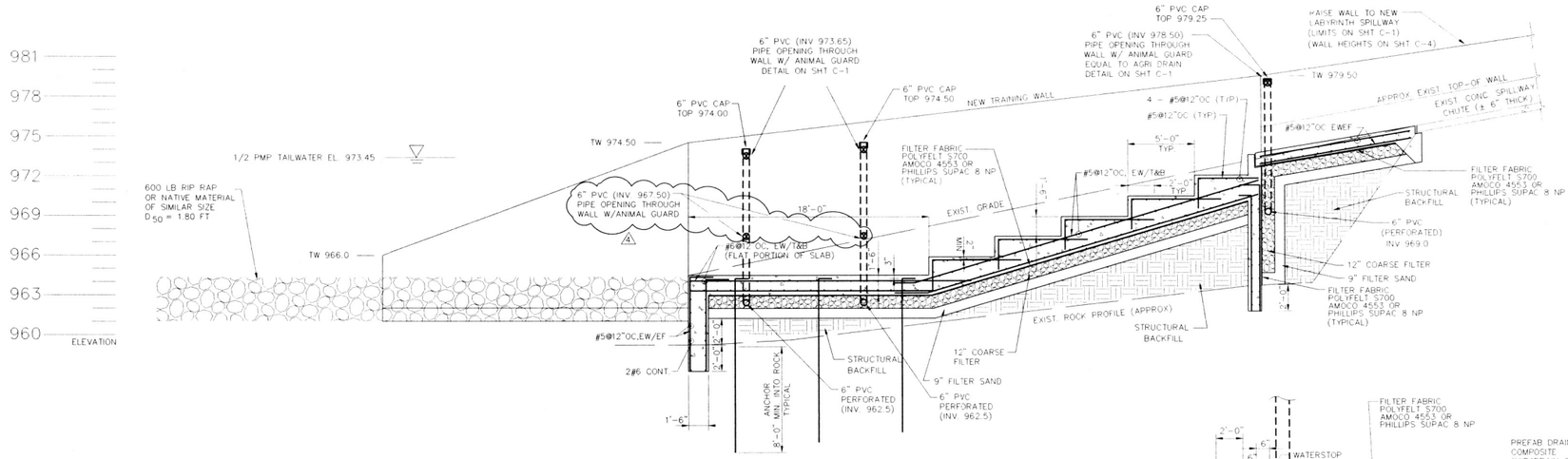
LAKE SPIVEY CIVIC ASSOCIATION

LABYRINTH SPILLWAY AT LAKE SPIVEY

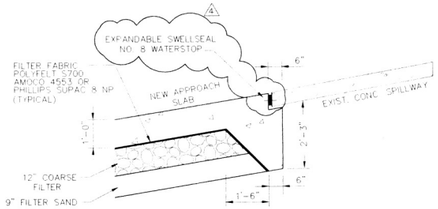
LABYRINTH SPILLWAY
LAYOUT & ELEVATIONS

DESIGNED: JED	CHECKED:	DATE: JUNE 1995	C-3	3
DRAWN: JED/SFH	JOB NO. 656.1.001	SCALE: AS SHOWN	SHEET	REV.

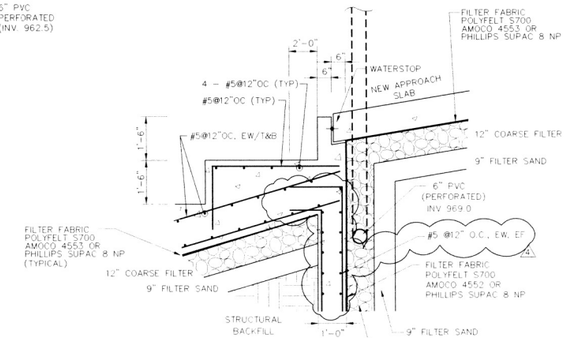
SHEETS!



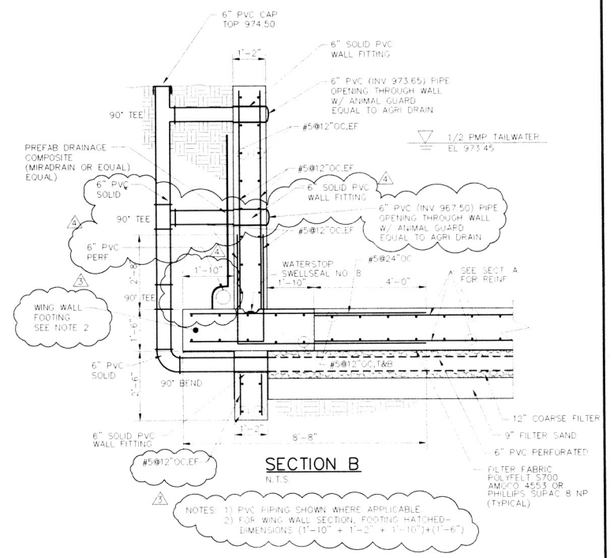
SECTION A
CONCRETE STEP OUTLET CONFIGURATION
1/4" = 1'-0"



SECTION C
1/2" = 1'-0"

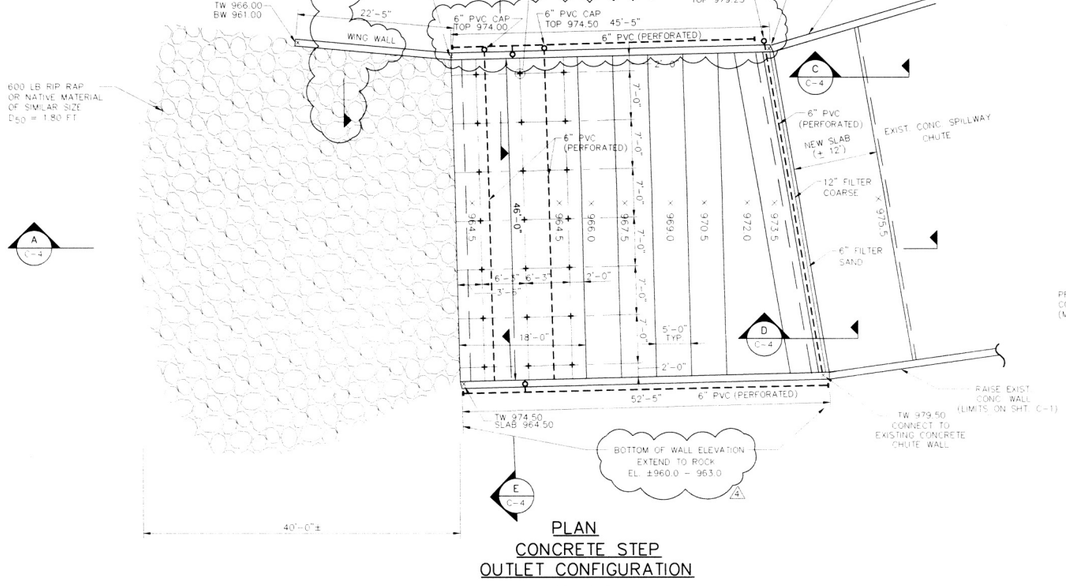


SECTION D
1/2" = 1'-0"

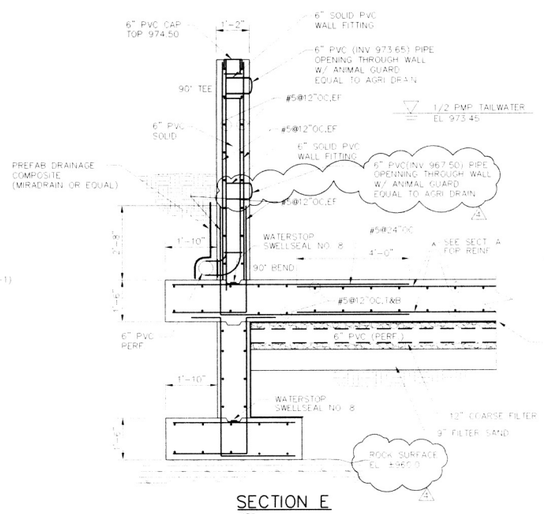


SECTION B
N.T.S.

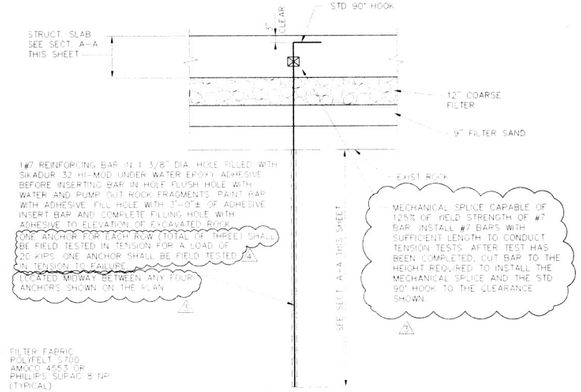
NOTES: 1) PVC PIPING SHOWN WHERE APPLICABLE
2) FOR WING WALL SECTION, FOOTING HATCHED— DIMENSIONS (1'-10" + 1'-2" + 1'-10")+(1'-6")



PLAN
CONCRETE STEP OUTLET CONFIGURATION
1/8" = 1'-0"



SECTION E
NTS



DETAIL FOR ANCHORING SLAB TO ROCK
N.T.S.

APPROVED
STATE OF GEORGIA
SEP 3 1996
SAFE DAMS PROGRAM
ENVIRONMENTAL PROTECTION DIVISION
By Frances E. Tuggle II, PE

NOTES:
1. ALL CONCRETE SHALL BE CLASS A

NO.	DATE	DESCRIPTION OF REVISION
4	08-15-96	REVISIONS PER GEORGIA SAFE DAMS COMMENTS
3	07-29-96	CLARIFICATIONS PER CONTRACTORS QUESTIONS
2	06-06-96	REVISIONS PER GEORGIA SAFE DAMS COMMENTS
1	06-23-95	REVISIONS PER GEORGIA SAFE DAMS COMMENTS
0	04-06-95	INITIAL ISSUE

Jordan Jones & Goulding

LAKE SPIVEY CIVIC ASSOCIATION

REGISTERED ENGINEER MARK KILGO

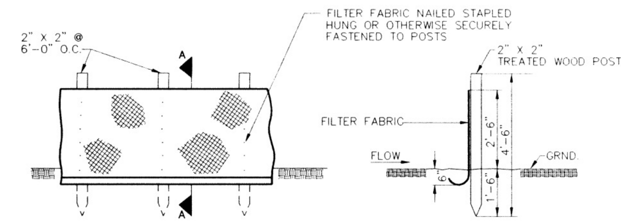
LAKE SPIVEY DAM & SPILLWAY

CONCRETE STEP OUTLET DETAILS

DESIGNED JED/JOB	CHECKED:	DATE JUNE 1995	C-4	4
DRAWN SFH	JOB NO 6563.001	SCALE AS SHOWN	SHEET	REV.

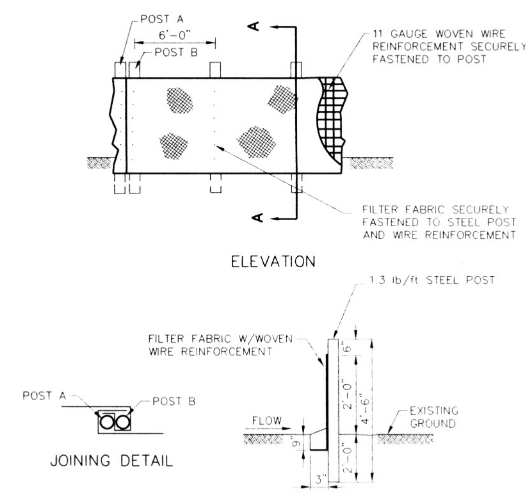
EROSION CONTROL NOTES

1. OWNER LAKE SPIVEY CIVIC ASSOCIATION
2. EMERGENCY NAME: JIM DIXON
   24-HOUR CONTACT PHONE NO. 478-2065
3. DISTURBED AREA, 0.88 ACRES
4. EROSION CONTROL MEASURES SHOWN ON THE DRAWINGS ARE MINIMUM REQUIREMENTS. ADDITIONAL EROSION CONTROL MEASURES SHALL BE EMPLOYED BY THE CONTRACTOR WHERE DETERMINED NECESSARY BY LOCAL AUTHORITIES OR THE OWNER BASED UPON ACTUAL SITE CONDITIONS.
5. EROSION CONTROL MEASURES MAY HAVE TO BE ALTERED FROM THOSE SHOWN ON THE DRAWINGS IF DRAINAGE PATTERNS DURING CONSTRUCTION ARE DIFFERENT FROM THE DRAINAGE PATTERNS SHOWN ON THE DRAWINGS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ACCOMPLISH EROSION CONTROL FOR ALL DRAINAGE PATTERNS CREATED AT VARIOUS STAGES DURING CONSTRUCTION.
6. PROVISIONS TO PREVENT EROSION OF SOIL FROM SITE SHALL BE, AS A MINIMUM, IN CONFORMANCE WITH THE LATEST REVISION OF THE "MANUAL FOR EROSION AND SEDIMENTATION CONTROL IN GEORGIA."
7. FAILURE TO INSTALL, OPERATE OR MAINTAIN ALL EROSION CONTROL MEASURES WILL RESULT IN ALL CONSTRUCTION BEING STOPPED ON THE JOB SITE UNTIL SUCH MEASURES ARE CORRECTED.
8. IF FINES OR PENALTIES ARE LEVIED AGAINST THE PROPERTY OR THE PROPERTY OWNER BECAUSE OF A LACK OF EROSION OR SEDIMENTATION CONTROL, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYMENT OF SUCH FINES OR PENALTIES, OR THE COST OF SUCH FINES OR PENALTIES SHALL BE DEDUCTED FROM THE CONTRACT AMOUNT.
9. ALL MATERIALS SPILLED, DROPPED, WASHED OR TRACKED FROM VEHICLE OR SITE ONTO PUBLIC ROADWAYS OR INTO STORM DRAINS SHALL BE REMOVED BY THE END OF THE DAY.
10. PRIOR TO COMMENCING LAND DISTURBANCE ACTIVITY, THE LIMITS OF LAND DISTURBANCE SHALL BE CLEARLY AND ACCURATELY DEMARCATED WITH STAKES, RIBBONS, OR OTHER APPROPRIATE MEANS. THE LOCATION AND EXTENT OF ALL AUTHORIZED LAND DISTURBANCE ACTIVITY SHALL BE DEMARCATED FOR THE DURATION OF THE CONSTRUCTION ACTIVITY. NO DISTURBANCE ACTIVITY SHALL OCCUR OUTSIDE THE LIMITS INDICATED ON THE DRAWINGS.
11. THE INSTALLATION OF EROSION CONTROL MEASURES AND PRACTICES SHALL BE INSTALLED PRIOR TO OR CONCURRENT WITH LAND DISTURBING ACTIVITIES.
12. EROSION CONTROL MEASURES WILL BE MAINTAINED AT ALL TIMES. ADDITIONAL EROSION AND SEDIMENT CONTROL WILL BE INSTALLED IF DEEMED NECESSARY BY ONSITE INSPECTION.
13. TEMPORARY OR PERMANENT VEGETATIVE STABILIZATION SHALL BE PROVIDED IMMEDIATELY AFTER REACHING FINAL GRADE FOR ALL AREAS.
14. PERMANENT VEGETATION SHALL BE PROVIDED AT THE EARLIEST SUITABLE GROWING SEASON.
15. TEMPORARY STABILIZATION SHALL BE PROVIDED TO DISTURBED AREAS NOT TO RECEIVE PERMANENT STABILIZATION WITHIN 14 CALENDAR DAYS OF COMPLETION OF CONSTRUCTION IN THAT AREA.
16. THE CONTRACTOR SHALL NOT DEPOSIT ANY EXCAVATION SPOIL DIRT, CONSTRUCTION TRASH OR DEBRIS, ETC. IN THE DRAINAGE COURSE OR ASSOCIATED FLOODPLAIN.
17. DISCHARGE OF STORM-WATER RUNOFF FROM DISTURBED AREAS TO A STREAM SHALL BE CONTROLLED TO THE EXTENT THAT TURBIDITY OF THE STREAM DOWNSTREAM FROM THE DISCHARGE SHALL NOT EXCEED 100 NEPHELOMETRIC TURBIDITY UNITS HIGHER THAN THE TURBIDITY LEVEL OF THE RECEIVING STREAM IMMEDIATELY UPSTREAM FROM THE STORM-WATER RUNOFF DISCHARGE AT THE TIME OF SUCH DISCHARGE.
18. DISPOSE OF WASTE SOILS, CLEARED AND GRUBBED MATERIALS OFF-SITE AT A LOCATION SECURED BY THE CONTRACTOR, AND IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.
19. SEDIMENT AND EROSION CONTROL MEASURES TO BE INSPECTED AND REPAIRED OR REPLACED DAILY
20. ALL DISTURBED AREAS TO BE GRASSED AS SOON AS CONSTRUCTION PHASES PERMIT.
21. CUT AND FILL SLOPES NOT TO EXCEED 2H:1V.



ELEVATION SECTION A–A

TYPE A SILT FENCE
DEKALB STD. 900



TYPE "C" SILT FENCE

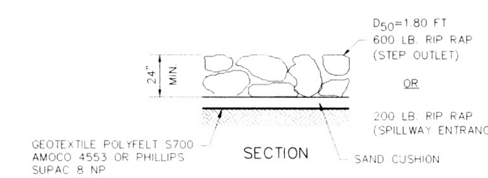
SEDIMENT BARRIERS (Sd1)
N.T.S.

SEEDING REQUIREMENTS

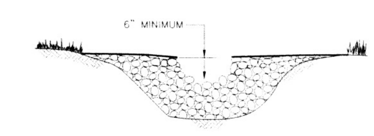
		Area	Sowing Season	Species	Seed	Fertilizer	Limestone (3)	Maintenance
					Rates per 1,000 Square Feet			
Ds2	Temporary	Flat to rolling terrain with slopes less than 3:1	8/16 – 2/14 2/15 – 8/15	Ryegrass Common Bermuda (Unhulled)	4.0 lbs. 0.2 lbs.	12 lbs. (10-10-10) 35 lbs. (6-12-12)	45 lbs. 45 lbs.	7 lbs. (10-10-10) 10 lbs. (10-10-10)
		Embankments with slopes greater than 3:1	3/1 – 7/31 8/1 – 2/29	Tall Fescue	0.10 lbs. 0.70 lbs.	12 lbs. (10-10-10) 35 lbs. (6-12-12)	45 lbs. 45 lbs.	7 lbs. (10-10-10) 10 lbs. (10-10-10)
Ds3	Permanent	Flat to rolling terrain with slopes 3:1 or Less	2/15 – 8/15	Common Bermuda (Hulled Seed) Common Bermuda (Unhulled Seed) White Dutch Clover(1)	0.2 lbs. 0.2 lbs. 0.1 lbs.	35 lbs. (6-12-12)	45 lbs.	10 lbs. (10-10-10)
			8/16 – 2/14	Common Bermuda (Unhulled)(4) Ryegrass	0.2 lbs. 0.3 lbs.	12 lbs. (10-10-10)	45 lbs.	10 lbs. (10-10-10)
		Embankments with slopes greater than 3:1	3/1 – 7/31 8/1 – 2/29	Tall Fescue	0.09 lbs. 0.70 lbs.	35 lbs. (6-12-12)	45 lbs.	10 lbs. (10-10-10)

Notes:

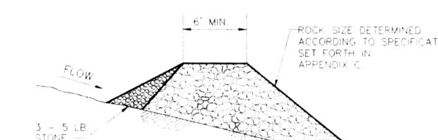
(1) Delete in residental areas as directed by engineer
(2) Inoculate seed with EL inoculate
(3) Omit lime application in permanent grass establishment if it follows temporary grass established in the same area.
(4) As soon as the weather is suitable (March or April), permanent grass (Common bermuda) shall be provided in all areas greater than 0.25 acre not having permanent ground cover.



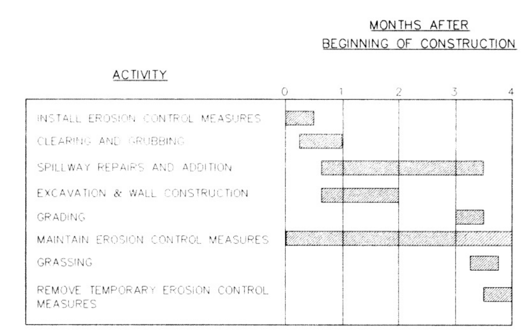
RIP RAP DETAIL (Rp)
N.T.S.



NOTE: SEDIMENT TRAP IS TO BE CLEANED OUT WHEN VOLUME BECOMES HALF FULL.

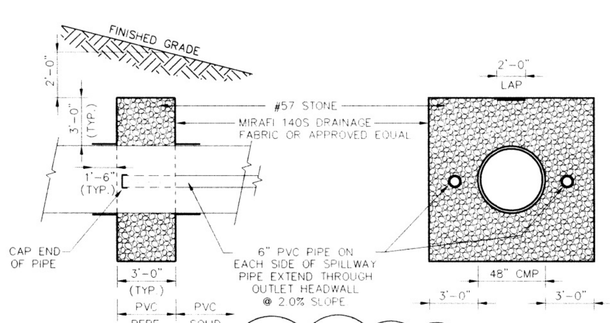


ROCK FILTER DAM (Rd)
N.T.S.
NOTE: 1) NATIVE ROCK MATERIAL MAY BE USED FOR TEMPORARY DAM
2) TO BE REMOVED WHEN CONSTRUCTION COMPLETE

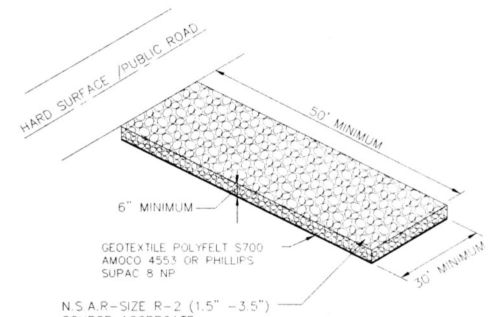


NOTE: THE INSTALLATION OF EROSION CONTROL MEASURES AND PRACTICES SHALL BE INSTALLED PRIOR TO OR CONCURRENT WITH LAND DISTURBING ACTIVITIES.

CONSTRUCTION SEQUENCE



FILTER COLLAR DETAIL
N.T.S.



CONSTRUCTION EXIT (Co)
N.T.S.
NOTE: CONTRACTOR SHALL PROVIDE CONSTRUCTION EXIT BETWEEN EXISTING EARTHEN SPILLWAY AND PUBLIC ROADWAY.

APPROVED
STATE OF GEORGIA
SEP 3 1996
SAFE DAMS PROGRAM
ENVIRONMENTAL PROTECTION DIVISION
By Francis E. Fiegle II, P.E.

NOTES:

NO.	DATE	DESCRIPTION OF REVISION
3	08-15-96	REVISIONS PER GEORGIA SAFE DAMS COMMENTS
2	06-06-96	REVISIONS PER GEORGIA SAFE DAMS COMMENTS
1	06-23-95	REVISIONS PER GEORGIA SAFE DAMS COMMENTS
0	04-06-95	INITIAL ISSUE

Jordan Jones & Goulding

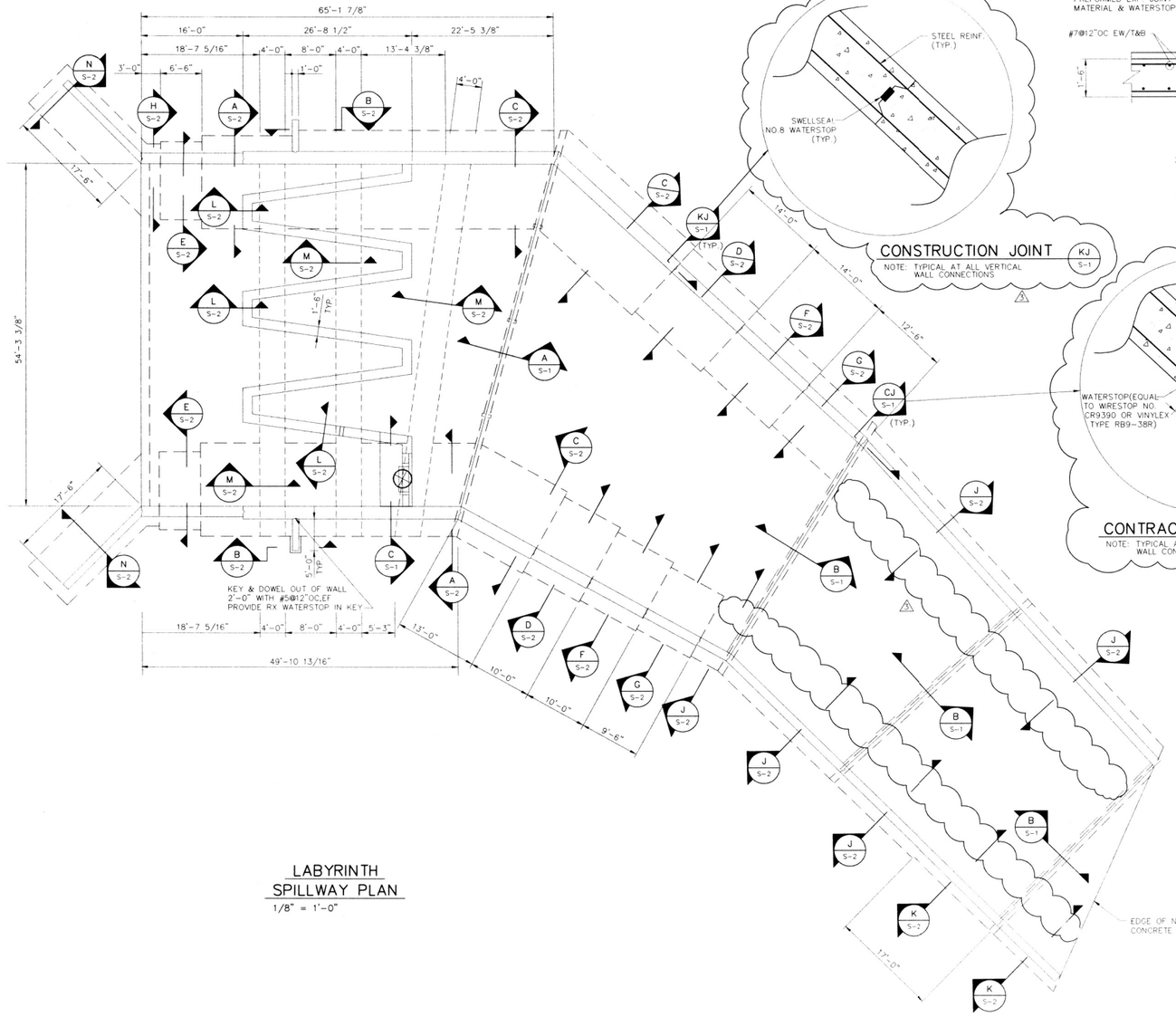
LAKE SPIVEY CIVIC ASSOCIATION

GEORGIA REGISTERED PROFESSIONAL ENGINEER MARK KILB

LAKE SPIVEY DAM & SPILLWAY

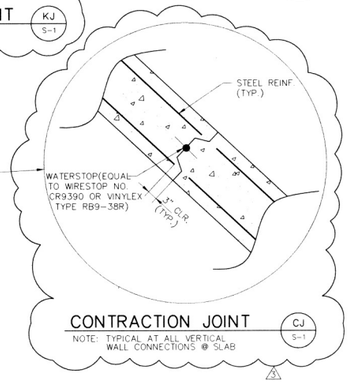
EROSION CONTROL DETAILS

DESIGNED: JED	CHECKED:	DATE: JUNE 1995	C-5 SHEET	3 REV
DRAWN: SFH	JOB NO. 6563.001	SCALE: AS SHOWN		

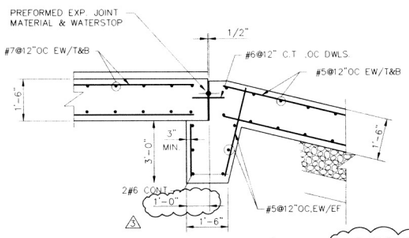


LABYRINTH
SPILLWAY PLAN
1/8" = 1'-0"

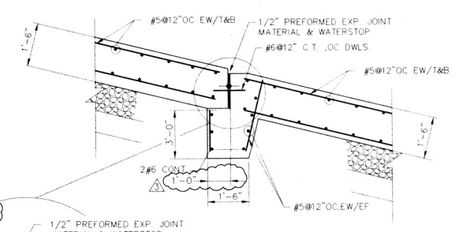
CONSTRUCTION JOINT KJ S-1
NOTE: TYPICAL AT ALL VERTICAL WALL CONNECTIONS



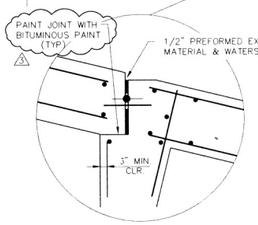
CONTRACTION JOINT CJ S-1
NOTE: TYPICAL AT ALL VERTICAL WALL CONNECTIONS @ SLAB

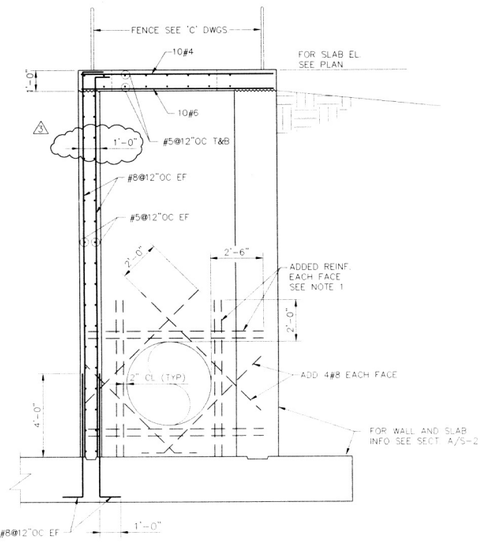


SECTION A S-1
N.T.S.



SECTION B S-1
N.T.S.





NOTES:
1. THE EQUIVALENT OF ALL BARS INTERRUPTED BY OPENINGS SHALL BE PROVIDED BY EXTRA REINFORCING ON ALL SIDES OF THE OPENING.
2. MAINTAIN NOT LESS THAN 1 1/4" CLEAR BETWEEN ADJACENT PARALLEL BARS.

SECTION C S-1
N.T.S.

APPROVED
STATE OF GEORGIA
SEP 3 1996
SAFE DAMS PROGRAM
ENVIRONMENTAL PROTECTION DIVISION
By Francis E. Tuggle II, PE

LSOD1101
29113.96

NOTES:
1. ALL CONCRETE SHALL BE CLASS A.

NO.	DATE	DESCRIPTION OF REVISION
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Jordan Jones & Goulding

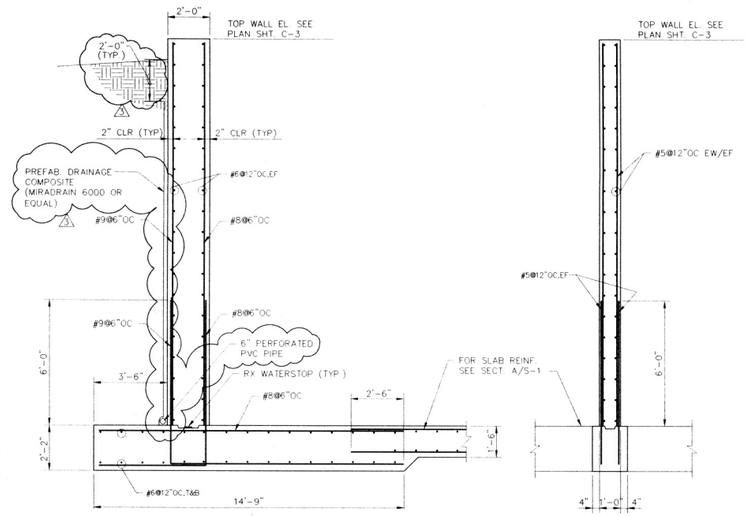
LAKE SPIVEY CIVIC ASSOCIATION

GEORGIA REGISTERED PROFESSIONAL ENGINEER Mark Kilby

LABYRINTH SPILLWAY AT LAKE SPIVEY

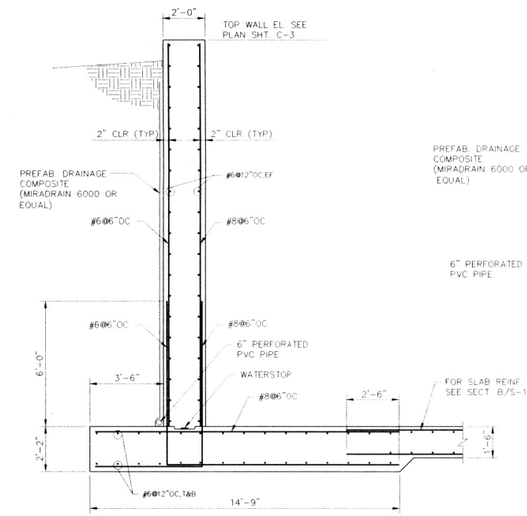
LABYRINTH SPILLWAY
PLAN, SECTIONS AND DETAILS

DESIGNED: JOB	CHECKED:	DATE:	S-1	3
DRAWN: WL	JOB NO. 6563.001	SCALE: AS SHOWN	SHEET	REV.

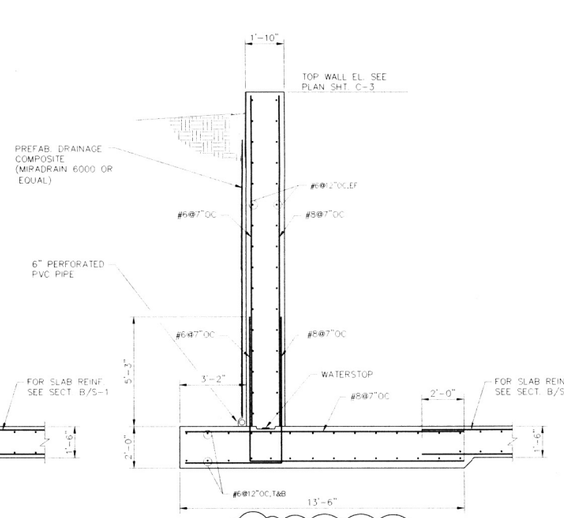


SECTION A
3/8" = 1'-0"
S-1

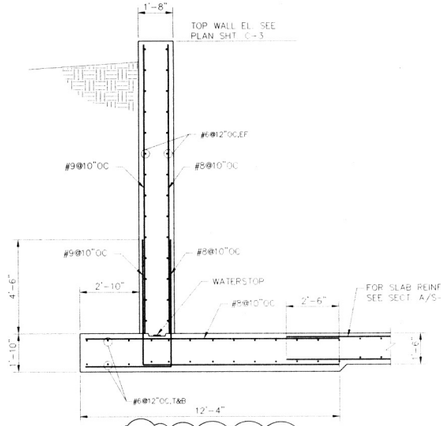
SECTION B
3/8" = 1'-0"
S-1



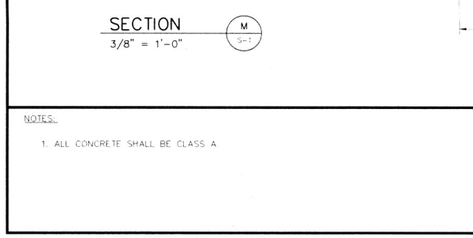
SECTION C
3/8" = 1'-0"
S-1



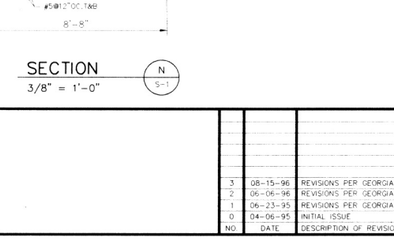
SECTION D
3/8" = 1'-0"
S-1



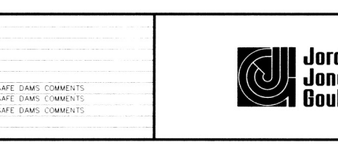
SECTION E
3/8" = 1'-0"
S-1



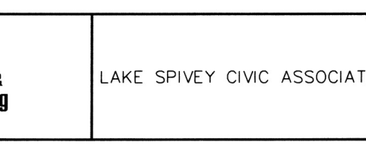
SECTION F
3/8" = 1'-0"
S-1



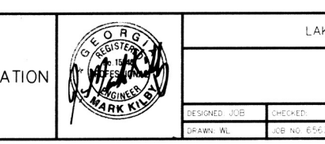
SECTION G
3/8" = 1'-0"
S-1



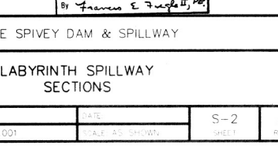
SECTION H
3/8" = 1'-0"
S-1



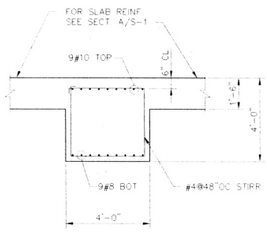
SECTION J
3/8" = 1'-0"
S-1



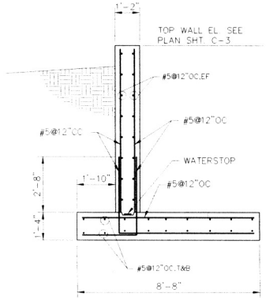
SECTION K
3/8" = 1'-0"
S-1



SECTION L
3/8" = 1'-0"
S-1



SECTION M
3/8" = 1'-0"
S-1



SECTION N
3/8" = 1'-0"
S-1

APPROVED
STATE OF GEORGIA
SEP 3 1996
SAFE DAMS PROGRAM
ENVIRONMENTAL PROTECTION DIVISION
By Frances E. Trigg II, PE

NOTES:

1. ALL CONCRETE SHALL BE CLASS A

NO.	DATE	DESCRIPTION OF REVISION
3	08-15-96	REVISIONS PER GEORGIA SAFE DAMS COMMENTS
2	06-06-96	REVISIONS PER GEORGIA SAFE DAMS COMMENTS
1	06-23-95	REVISIONS PER GEORGIA SAFE DAMS COMMENTS
0	04-06-95	INITIAL ISSUE

Jordan Jones & Goulding

LAKE SPIVEY CIVIC ASSOCIATION

GEORGIA REGISTERED No. 15... PROFESSIONAL ENGINEER MARK KILBY

LAKE SPIVEY DAM & SPILLWAY

LABYRINTH SPILLWAY SECTIONS

DESIGNED: JOB	CHECKED:	DATE:	S-2	3
DRAWN: WL	JOB NO: 6563.001	SCALE: AS SHOWN	SHEET	REV.

APPENDIX D – GLOSSARY

GLOSSARY

Abutment, dam: That part of the valley wall against which the dam is constructed. Defined in terms of left and right as looking downstream from the reservoir.

Acre-foot: A term used in measuring the volume of water, or amount of water needed to cover 1 acre (43,560 square feet) 1 foot deep (325,851 gallons).

Afterbay: The body of water immediately downstream from a power plant or pumping plant (also referred to as tailrace)

Air release valve: A valve, usually manually operated, which is used to release air from a pipe or fitting.

Alkali-aggregate reaction: A deterioration of concrete by which the alkali in cement reacts chemically with the silica present in some aggregates.

Apron: A level section of concrete or riprap constructed upstream or downstream from a control structure to prevent undercutting of the structure.

Associated facility: These facilities include most carriage, distribution, and drainage systems, small diversion works, small pumping plants and power plants, open and closed conduits, tunnels, siphons, small regulating reservoirs, waterways, and bridges.

Axis, dam: A plane or curved surface, appearing as a line in plan or cross section, to which horizontal dimensions can be referred.

Axis, dam (concrete): A vertical reference surface coincident with the upstream face at the top of the dam.

Baffle block: One of a series of upright obstructions designed to dissipate energy as in the case of a stilling basin or drop structure (also referred to as dentate).

Balanced head condition: The condition in which the water pressure on the upstream and downstream sides of an object are equal (such as an emergency or regulating gate).

Ball-milling: The repeated churning action of cobbles, gravel, and sand caused by the force of water in a stilling basin or other structure by which severe concrete abrasion can occur.

Bank storage: Water that has infiltrated from a reservoir into the surrounding land where it remains in storage until water level in the reservoir is lowered.

Beaching: The action of water waves by which beach materials settle into the water because of removal of finer materials.

Benchmark: A permanent or temporary monument of known elevation above sea level, used for vertical control at construction site.

Berm: A horizontal strip or shelf built into an embankment or cut to break the continuity of the slope, usually for the purpose of reducing erosion or to increase the thickness of the embankment at a point of change in slope or defined water surface elevation. Usually 10 to 15 feet in width.

Bulkhead: A one-piece fabricated steel unit which is lowered into guides and seals against a frame to close a water passage in a dam, conduit, spillway, etc.

Camber: The extra height added to the crest of embankment dams to ensure that the freeboard will not be diminished by foundation settlement or embankment consolidation. The amount of camber is different for each dam and is dependent on the amount of foundation settlement and embankment expected to occur.

Canal: A channel, usually open, that conveys water by gravity to farms, municipalities, etc.

Canal prism: The shape of the canal as seen in cross section.

Cavitation: The formation of partial vacuums in fast-flowing water caused by sub-atmospheric pressures immediately downstream from an obstruction or offset. Usually accompanied by noise and vibration.

Cavitation damage: The attack on surfaces caused by the implosion of bubbles of water vapor.

Check structure: A structure used to regulate the upstream water surface and control the downstream flow in a canal.

Chute: A conduit for conveying free-flowing materials at high velocity to lower elevations.

Clearance: A procedure used to establish a safe environment for maintenance, repair, or inspection. It includes systematically isolating pertinent equipment from all sources of hazardous energy (hydraulic, electrical, mechanical, pneumatic, and chemical) and attaching safety tags or locks to the appropriate controls. Also, it includes a written statement that documents isolation of the equipment. (also referred to as “lockout” or "tagout")

Coating: The protective material applied to the outer surface of metalwork.

Conduit: A pipe, box, or horseshoe structure, or natural channel that is constructed by means of "cut and cover". A conduit can convey water or house other conduits or pipes.

Corps of Engineers (COE): The District Engineer, located at the savannah District, Georgia Corps of Engineers, determines flood control and flood control regulation for reservoirs which have been allocated storage space for flood control.

Crest: The top surface of the dam. A roadway may be constructed across the crest to permit vehicular traffic or facilitate operation, maintenance, and examination of the dam. Also the high point of the spillway control section.

Crown: The highest point of the interior of a circular conduit, pipe, or tunnel.

Cubic feet per second (cfs): A unit of discharge for measurement of a flowing liquid equal to a flow of 1 cubic foot per second, 449 gallons per minute, 1.98 acre-foot per day.

Curtain grouting: The process of pressure grouting deep holes under a dam or in an abutment to form a watertight barrier and effectively seal seams, fissures, fault zones, or fill cavities in the foundation or abutment.

Cutoff (keyway) trench: An excavation in the foundation of an embankment (earth or rockfill) dam, usually located upstream of the dam axis or centerline crest which extends to bedrock or to an impervious stratum. The excavation is backfilled with impervious material to reduce percolation under the dam.

Cutoff wall: A wall of impervious material (e.g., concrete, asphaltic concrete, timber, steel sheet piling, or impervious grout curtain) located in the foundation beneath the dam which forms a water barrier and reduces seepage under a dam or spillway.

Dam: A barrier built across a watercourse to impound or divert water.

Dam Operator: The person responsible for the daily or routine operation and maintenance activities of a dam and its appurtenant structures. The dam operator commonly resides at or near the dam.

Deflection: Upstream or downstream movement of a dam or dike, or lateral movement of a wall.

Dentate: See “baffle block”.

Designated frequency flood: See “flood”.

Designers' Operating Criteria (DOC): Detailed operating criteria which stresses the designers' intended use and operation of equipment and structures in the interest of safe, proper, and efficient use of the facilities. Includes drawings, tables, etc.

Design Report: A document that summarizes the designers’ development of the design that results in the specifications. It may include a section on the Designers’ Operating Criteria.

Differential head condition: The condition in which the water pressure on the upstream and downstream sides of an object differ (also called unbalanced head).

Downstream face: The inclined surface of the dam away from the reservoir.

Drain, blanket: A layer of pervious material placed to facilitate drainage of the foundation and/or embankment.

Drop structure: A structure that conveys water to a lower elevation and dissipates the excess energy resulting from the drop.

Elevation-Storage table: A table giving reservoir storage capacity in terms of elevation increments.

Emergency Action Plan (EAP): A formal plan of procedures designed to minimize an emergency situation or unusual occurrence at a given dam or reservoir.

Emergency reserve fund: Money reserved or required by contract to be reserved by an operating entity for use in emergency situations involving facilities under the entity's jurisdiction.

Epicenter, earthquake: Focal point on earth's surface directly above the origin of seismic disturbance.

Erosion, concrete: Surface disturbance caused by abrasion from moving particles in water, impact of pedestrian or vehicular traffic, or impact of ice flows.

Erosion, soil: Surface displacement of soil caused by weathering, dissolution, abrasion, or other transporting.

Examination report: A written report that documents the condition of the facility during the examination, operation and maintenance activities accomplished since the last examination, and recommendations necessary for the continued safe and efficient operation of the facility.

Face, dam: Exposed surface of dam materials (earth, rockfill, or concrete), upstream and downstream.

Facility review, comprehensive: A detailed examination performed on dams with a senior dam engineer. State-of-the-art design characteristics are also evaluated.

Facility review, periodic: An examination on dams generally without the involvement of a senior dam engineer.

Failure: An incident resulting in the uncontrolled release of water from a dam.

Fault, earthquake: A fracture in rock along which the adjacent rock surfaces are differentially displaced.

Flashboard: Wooden board or structural panel anchored to the crest of a spillway used as a means of increasing the reservoir storage.

Flood, designated frequency and its probability: A 100-year flood is often considered in the design of diversion dams and for diversion-during-construction requirements. Service spillways, stilling basins, and some outlet works components may also be designed to pass certain level of floods designated by a return period. The return period should be thought as the chance that such a flood will be equaled or exceeded in any one year. For example, the 100-year flood is the flow level with a 0.01 annual exceedance probability, or there is 1 chance in 100 that this flood flow level will be equaled or exceeded in any given year.

Flood, inflow design (IDF): That flood used for design of a safe structure. It may be the PMF (probable maximum flood), but in sparsely developed areas where judgment indicates minimal property damage and no probable loss of life, the design flood may be less than the PMF.

Flood, moderate frequency: A flood of lesser magnitude than the IDF used for the service spillway design when supplemented by a separate auxiliary spillway.

Flood, probable maximum (PMF): The largest flood reasonably expected at a point on a stream because of a probable maximum precipitation (PMP) and favorable runoff conditions.

Flume: Flumes are shaped, open-channel flow sections that force flow to accelerate. Acceleration is produced by convergence of the sidewalls, raising the bottom, or a combination of both.

Long-throated: Long-throated flumes control discharge rate in a throat that is long enough to cause nearly parallel flow lines in the region of flow control. Parallel flow allows these flumes to be accurately rated by analysis using fluid flow concepts. The energy principle, critical depth relationships, and boundary layer theory are combined to rate flumes and broad-crested weirs by Ackers et al. (1978) and Bos et al. (1991). Thus, these flumes and modified broad-crested weirs are amenable to computer calibrations. Long throated flumes can have nearly any desired cross-sectional shape and can be custom fitted into most canal-site geometries. The Ramp flumes also considered a version of broad-crested weirs is an example of this kind of flume.

Parshall Flume: A Parshall flume is a specially shaped open channel flow section that may be installed in a drainage lateral or ditch to measure the rate of flow of water.

Short-throated: Short-throated flumes are considered short because they control flow in a region that produces curvilinear flow. While they may be termed short-throated, the overall specified length of the finished structure including transitions may be relatively long. The Parshall flume is the main example of this kind of flume. These flumes would require detailed accurate and accurate knowledge of the individual streamline curvatures for calculated ratings which is usually considered impractical. Thus short-throated flumes are determined empirically by comparison with other more precise and accurate water measuring systems.

Forebay: The body of water immediately upstream from the dam.

Foundation, dam: The excavated surface upon which a dam is placed.

Foundation, drains: Tile or pipe for collecting internal seepage water of dam.

Freeboard: The difference in elevation between the maximum reservoir water surface and the dam crest.

Freeze-thaw damage: Damage to concrete caused by extreme temperature variations as noted by random pattern cracking. Damage is accelerated by the presence of water and commonly more severe on the south-facing side of structures.

Gallery: A passageway within the body of a dam, its foundation, or abutments.

Gate: A device that controls the flow in a conduit, pipe, or tunnel without obstructing any portion of the passageway when in the fully open position.

Gate chamber: A chamber in which a guard gate in a pressurized outlet works or both the guard and regulating gates in a free-flow outlet works is located.

Gate, emergency (guard): The first gate in a series of flow controls, remaining open while downstream gates or valves are operative.

Gate, high-pressure: A gate consisting of a rectangular leaf encased in a body and bonnet and equipped with a hydraulic hoist for moving the gate leaf.

Gate, operating (or regulating): A gate used to regulate the rate of flow through an outlet works.

Gate, slide: A steel gate that upon opening or closing slides on its bearings in edge guide slots.

Gate hanger: A device used to maintain a set gate opening.

Groin: The contact between the upstream or downstream face of the dam and abutments.

Grout: A fluid mixture of cement and water or sand, cement, and water used to seal joints and cracks in rock foundation.

Hazard classification: The rating for a dam based on the potential consequences of failure. The rating is based on potential loss of life that failure of the dam causes. Such classification is related to habitable structures downstream of a dam.

Head: The difference in number of feet between two water surface elevations.

Head loss: The energy per unit weight of water lost due to transitions, bends, etc.

Heave: The upward movement of land surfaces or structures due to subsurface expansion of soil or rock, or vertical faulting of rock.

Hydraulic height: Height to which water rises behind the dam and is the difference between the lowest point in the original stream bed at the axis or the centerline crest of the dam and the maximum controllable water surface.

Hydrograph: A graph showing for a given point on a stream or conduit, the discharge, stage, velocity, available power, or other property of water with respect to time.

Hydromet: A network of automated remote-monitoring stations which collect hydrologic and meteorologic field data, and transmit the data via satellite to a computer for processing and storage. Hydromet makes near real-time data available for easy access by computer.

Hydrology: The science that treats the occurrence, circulation properties, and distribution of the waters of the earth and their reaction to the environment.

Inflow, reservoir: The amount of water entering a reservoir expressed in acre-feet per day or cubic feet per second.

Instrumentation: Any device used to monitor the performance of the structure during its construction and/or throughout its useful life.

Inundation map: A map of the ground surfaces downstream of a dam showing the probable encroachment by water released because of failure of the dam or from abnormal flood flows released through a dam's spillway.

Invert: The lowest point of the interior of a circular conduit, pipe, or tunnel.

Job hazard analysis: A study of a job or activity to identify hazards or potential accidents associated with each step or task, and develop solutions that will eliminate, nullify, or prevent such hazards or accidents.

Joint, contraction: Contraction joints are placed in concrete to provide for volumetric shrinkage of a monolithic unit or movement between monolithic units.

Joint, construction: Construction joints are purposely placed in concrete to facilitate construction; to reduce initial shrinkage stresses and cracks; to allow time for the installation of embedded metalwork; or to allow for the subsequent placing of other concrete.

Joint, expansion: A separation between adjoining parts of a concrete structure which is provided to allow small relative movements, such as those caused by temperature changes, to occur independently.

Lateral: A channel that conveys water from a canal to a farm, municipality, etc.

Lift line: Horizontal construction joint created when new concrete is placed on previously placed concrete.

Lining: Any protective material used to line the interior surface of a conduit, pipe, or tunnel.

Lockout: Clearance procedure in which physical locks replace Safety Tags (see "clearance").

Log boom: A device used to prevent floating debris from obstructing spillways and intakes.

Logbook: A dated, written record of performed operation and maintenance items or observations pertinent to a structure.

Maintenance management system: Any organized system used to ensure that all preventive maintenance at a facility is accomplished and documented

Major facility: Major facilities include storage dams and reservoirs, diversion dams with significant storage or where major equipment and operation are complex, large pumping plants and power plants, large canal systems, large complex closed conduit systems, and Type 1 bridges.

Maximum credible earthquake (MCE): The severest earthquake that is believed to be possible at the site on the basis of geologic and seismological evidence. It is determined by regional and local studies that include a complete review of all historic earthquake data of events sufficiently nearby to influence the project, all faults in the area, and attenuations from causative faults to the site.

Multipurpose project: A project designed for irrigation, power, flood control, municipal and industrial, recreation, and fish and wildlife benefits, in any combinations of two or more. Contrasted to single-purpose projects serving only one need.

O&M: Acronym for operation and maintenance.

Ogee crest: The shape of the concrete spillway crest that represents the lower profile of the under-nappe of a jet of water flowing over a sharp-crested weir at a design depth.

Outflow: The amount of water passing a given point downstream of a structure, expressed in acre-feet per day or cubic feet per second.

Outlet works: A series of components located in a dam through which normal releases from the reservoir are made.

Piezometer: An instrument which measures pressure head or hydraulic pressures in a conduit or hydraulic pressures within the fill of an earth dam or the abutment; at the foundation because of seepage or soil compression; or on a flow surface of a spillway, gate, or valve.

Pattern cracking: Fine cracks in the form of a pattern on a concrete surface.

Pipe: A circular conduit constructed of any one of a number of materials that conveys water by gravity or under pressure.

Piping: The action of water passing through or under an embankment dam and carrying with it to the surface at the downstream face some of the finer material.

Pore-water pressure: Internal hydrostatic pressure in an embankment caused by the level of water in the reservoir acting through pressure-transmitting paths between soil particles in the fill.

Posted operating instructions: The O&M instructions taken from the Standing Operating Procedures that pertain to the mechanical/electrical features in the immediate area.

Pound per square inch (psi): A pressure designation for pounds per square inch.

Reach: The area of a canal or lateral between check structures.

Remote operation: Operation of mechanical features from an on-site location other than at the feature.

Reservoir: The body of water (pool) impounded by a dam.

Reservoir Capacity Allocations (RCA): Shows a summary of acre-feet allocations of water, to such purposes as surcharge, exclusive flood control, joint use, active conservation, inactive storage, and dead storage.

Richter scale: A scale of numerical values of earthquake magnitude ranging from 1 to 9.

Riprap: The broken rock or boulders placed on upstream and downstream faces of embankment dams to provide protection from erosion caused by wind or wave action.

RO&M: The Review of Operation and Maintenance program; a periodic evaluation of O&M activities at a particular facility. Also see “facility review”.

Sand Boil: Seepage characterized by a boiling action at the surface surrounded by a cone of material from deposition of foundation and embankment material carried by the seepage.

Seepage: The slow movement or percolation of water through small cracks, pores, interstices, etc., from an embankment, abutment, or foundation.

Seismic: Of or related to movement in the earth's crust caused by natural relief of rock stresses.

Settlement: The sinking of land surfaces because of subsurface compaction, usually occurring when moisture added deliberately or by nature, causes a reduction in void volumes.

Sinkhole: A steep-sided depression formed when removal of subsurface embankment or foundation material causes overlying material to collapse into the resulting void.

Slough: Movement of a soil mass downward along a slope because of a slope angle too great to support the soil, wetness reducing internal friction among particles, or seismic activity. It is also called a slope failure, usually a rather shallow failure.

SDP: Acronym for Safe Dams Program.

Soil Cement: A mixture of Portland cement and pulverized soil placed in layers on the upstream face of a dam to provide slope protection.

Spalling: The loss of surface concrete usually caused by impact, abrasion, or compression.

SPCC: Acronym for spill prevention control and countermeasure plan.

Spillway: A structure that passes normal and/or flood flows in a manner that protects the structural integrity of the dam.

Splitter wall: A wall or pier parallel to the direction of flow in a channel that separates flows released from different sources as a means of energy dissipation.

Springline: An imaginary reference line located at mid-height of a circular conduit, pipe, or tunnel. Also the maximum horizontal dimension of a circular conduit, pipe, or tunnel.

Standing Operating Procedures (SOP): A comprehensive single-source document covering all aspects of dam and reservoir operation and maintenance and emergency procedures. Its purpose is to ensure adherence to approved operating procedures.

Stilling basin: A pool, usually lined with reinforced concrete, located below a spillway, gate, or valve into which the discharge dissipates energy to avoid downstream channel degradation.

Stilling pool: A pool located below a spillway, gate, or valve into which the discharge dissipates energy to avoid downstream channel degradation.

Stoplogs: A set of interchangeable fabricated steel or wood units lowered between walls or piers to close a water passage in a dam, conduit, spillway, etc. The logs are inserted in slots one at a time. A lifting beam may be used for their installation.

Structural height: Distance between the lowest point in the excavated foundation (excluding narrow fault zones) and the top of dam.

-The structural height of an embankment (earth or rockfill) dam is the vertical distance between the top of the embankment and the lowest point in the excavated foundation area, including the main cutoff trench, if any, but excluding small trenches or narrow backfilled areas. The top elevation does not include the camber, crown, or roadway surfacing.

-The structural height of a concrete dam is the vertical distance between the top of the dam and lowest point of the excavated foundation area, excluding narrow fault zones.

Sulfate attack: Damage to concrete caused by the effects of a chemical reaction between sulfates in soils or ground water and hydrated lime and hydrated calcium aluminate in cement paste. The attack results in considerable expansion and disruption of paste.

Supervisory control: A system used to monitor conditions and operate mechanical/electrical features associated with a facility from a location other than at the site.

Tailwater: The water in the natural stream immediately downstream from a dam. The elevation of water varies with discharge from the reservoir.

Toe: The contact between the upstream or downstream face of the dam and natural ground.

Toe drain(s): Open-jointed tile or perforated pipe located at the toe of the dam used in conjunction with horizontal drainage blankets to collect seepage from the embankment and foundation and conveys the seepage to a location downstream from the dam.

Trash rake: A device that is used to remove debris which has collected on a trashrack to prevent blocking the associated intake.

Trashrack: A metal or reinforced concrete structure placed at the intake of a conduit, pipe, or tunnel that prevents entrance of debris over a certain size.

Tunnel: An enclosed channel that is constructed by excavating through natural ground. A tunnel can convey water or house conduits or pipes.

Turnout: A structure used to divert water from a supply channel to a smaller channel.

USGS: An acronym used for U.S. Geological Survey, the agency that monitors stream flows, river hydrology, and seismic activity.

Unbalanced head condition: See "differential head condition".

Uplift pressure: See "pore-water pressure".

Upstream face: The inclined surface of the dam that is in contact with the reservoir.

Valve: A device used to control the flow in a conduit, pipe, or tunnel that permanently obstructs a portion of the waterway.

Vortex: A revolving mass of water in which the streamlines are concentric circles and in which the total head is the same.

Water conveyance structure: Any structure that conveys water from one location to another.

Water stage recorder: A motor-driven (spring wound or electric) instrument for monitoring water surface elevation.

Waterstop: A continuous strip of waterproof material placed at concrete joints designed to control cracking and limit moisture penetration.

Weep hole: A drain embedded in a concrete or masonry structure intended to relieve pressure caused by seepage behind the structure.

Weir: An overflow structure built across an open channel to measure the flow of water and is calibrated for depth of flow over the crest.

Cipolletti: A contracted weir of trapezoidal shape in which the sides of the notch are given a slope of 1 horizontal to 4 vertical.

Rectangular: A contracted or suppressed weir with horizontal crest, rectangular in shape, having vertical sides.

V-notch: A weir that is V-shaped, with its apex downward, used to accurately measure small rates of flow.

LIST OF ACRONYMS

AOP	Annual Operating Plan
CFS or cfs	Cubic feet per second
COE	United States Army Corps of Engineers
DCP	Data Collection Platform
DNR	Department of Natural Resources
EAP	Emergency Action Plan
EPA	Environmental Protection Agency
EPD	Environmental Protection Division
g	acceleration due to gravity (32 ft/s^2)
gpm	Gallons per minute
IDS	Inflow Design Storm
M&I	Municipal and Industrial
GA	Georgia
NRCS	Natural Resource Conservation Service
NWS	National Weather Service
PMP	Probable Maximum Precipitation
SDP	Safe Dams Program
SOP	Standing Operating Procedures
USGS	United States Geological Survey

APPENDIX E - SDP INSPECTION FORMS

Embankment (Earth) Dam Inspection Form

Name of Dam:_____ Date:_____

Location of Dam (County):_____ Weather:_____

Inspected by (Print Name):_____

If an inspection item requires further action on your part, place a check mark to the left of the number of the item

A. Crest (refer to Glossary for description)

☐ 1. How would you describe the vegetation on the crest? (Check all that apply)

Recently Mowed_____ Overgrown_____ Good Cover_____ Sparse_____

Other/Corrective Action (describe):_____

_____

☐ 2. Are there any trees or other inappropriate or excessive vegetation on the crest? Yes_____ No_____

If yes, describe (type of vegetation, size, location, etc.)/Corrective Action:_____

_____

☐ 3. Is there a paved road or driveway on the crest? Yes_____ No_____

If yes, describe the condition (for example, good condition, numerous cracks, newly paved)/Corrective Action:_____

_____

☐ 4. Are there any depressions, ruts or holes on the crest? Yes_____ No_____

If yes, describe (size, location, etc)/Corrective Action:_____

_____

☐ 5. Are there any cracks on the crest? Yes_____ No_____

If yes, describe (length and width, location, direction of cracking, etc.)/Corrective Action:_____

_____

☐ 6. Other observations on the crest/Corrective Action:_____

_____

B. Upstream Slope (refer to Glossary for description)

1. What is the reservoir level today? At Normal Pool____ Above Normal Pool_____Feet Below Normal Pool_____Feet

☐ 2. How would you describe the vegetation on the upstream slope? (Check all that apply)

Recently Mowed_____ Overgrown_____ Good Cover_____ Sparse_____

Other/Corrective Action (describe):_____

_____

☐ 3. Are there any trees or other inappropriate or excessive vegetation on the slope? Yes_____ No_____

If yes, describe (type of vegetation, size, location, etc.)/Corrective Action:_____

_____

☐ 4. Are there any depressions, bulges, ruts or holes (such as animal burrows) on the slope? Yes_____ No_____

If yes, describe (size, location, etc.)/Corrective Action:_____

_____

☐ 5. Are there any eroded areas on the slope (such as wave erosion along the shoreline)? Yes_____ No_____

If yes, describe (size of area, location, severity, etc.)/Corrective Action:_____

_____

☐ 6. Are there any cracks, sloughs or slides (vertical cliffs) on the slope? Yes_____ No_____

If yes, describe (length, width, height, location, etc.)/Corrective Action:_____

_____

Upstream Slope (continued)

☐ 7. Is there any type of slope protection along the shoreline (such as riprap)? Yes_____ No_____

If yes, describe what type and its condition (for example, riprap - adequate, inadequate, sparse)/Corrective Action:_____

☐ 8. Other observations on the upstream slope/Corrective Action:_____

C. Downstream Slope (refer to Glossary for description)

☐ 1. How would you describe the vegetation on the downstream slope? (Check all that apply)

Recently Mowed_____ Overgrown_____ Good Cover_____ Sparse_____

Other/Corrective Action (describe):_____

☐ 2. Are there any trees or other inappropriate or excessive vegetation on the slope? Yes_____ No_____

If yes, describe (type of vegetation, size, location, etc.)/Corrective Action:_____

☐ 3. Are there any depressions, bulges, ruts or holes (such as animal burrows) on the slope? Yes_____ No_____

If yes, describe (size, location, etc.)/Corrective Action:_____

☐ 4. Are there any eroded areas on the slope (such as along abutment contacts)? Yes_____ No_____

If yes, describe (size of area, location, severity, etc.)/Corrective Action:_____

☐ 5. Are there any cracks, sloughs or slides (vertical cliffs) on the slope? Yes_____ No_____

If yes, describe (length, width, height, location, etc.)/Corrective Action:_____

☐ 6. Are there any wet areas or areas of hydrophilic (lush, water-loving) vegetation? Yes_____ No_____

If yes, describe (size of area, location, etc.)/Corrective Action:_____

☐ 7. Do any wet areas indicate seepage through the dam (such as rust-colored, stained water)? Yes_____ No_____ N/A_____

If yes, describe (for example, new area of seepage, no change from past observations, size of area, location) /Corrective Action:_____

☐ 8. Are there any leaks (flowing water) from the slope or beyond the toe of the dam? Yes_____ No_____

If yes, describe (location, rate of flow, turbidity of flow)/Corrective Action:_____

☐ 9. Other observations on the downstream slope/Corrective Action:_____

D. Plunge Pool (refer to Glossary for description)

☐ 1. Is there any type of erosion protection around the plunge pool (such as riprap)? Yes_____ No_____

If yes, describe what type and its condition (for example, riprap - adequate, inadequate, obstructed by vegetation) /Corrective Action:_____

☐ 2. Is there any erosion and or seeps around or going into the plunge pool? Yes_____ No_____

If yes, describe (size of area, location, severity, etc.) /Corrective Action:_____

☐ 3. Other observations around the plunge pool/Corrective Action:_____

Name of Dam:_____ Date:_____

E. Principal and Emergency Spillways (refer to Glossary for description)

☐ 1. What types of spillways does the dam have (such as corrugated metal, concrete or siphon pipe; concrete or earth channel)?
Principal Spillway_____ Emergency Spillway_____
Other/Corrective Action:_____

☐ 2. Has the emergency spillway activated (had flow) since the last inspection? Yes_____ No_____
If yes describe (date(s) of flow, reason for activation, depth of flow) /Corrective Action:_____

☐ 3. For pipe spillways, is the intake obstructed in any way (such as with excessive debris)? Yes_____ No_____
If yes, describe (type of debris, reason for obstruction, etc.) /Corrective Action:_____

☐ 4. For pipe spillways, what is the condition of any trash racks (for example, adequate, inadequate, damaged)? /Corrective Action:

☐ 5. For pipe spillways, are there any visible cracks, separations or holes in the pipe(s) (intake or outlet)? Yes_____ No_____
If yes, describe (location, width of crack or separation, etc.)/Corrective Action:_____

☐ 6. For pipe spillways, are there any apparent leaks in the pipe(s)? Yes_____ No_____
If yes, describe (location, rate of flow from leak, etc.)/Corrective Action:_____

7. For pipe spillways, how would you describe the overall condition of the pipe(s)? (Check all that apply)
Functioning Normally____ Not Functional____ Deteriorated____ Damaged____ Adequate____ Inadequate____

☐ 8. For concrete or earth channel spillways, is the entrance or channel obstructed in any way? Yes_____ No_____
If yes, describe (type of obstruction, location, etc.)/Corrective Action:_____

☐ 9. For earth channel spillways, how would you describe the vegetation in the spillway? (Check all that apply)
Recently Mowed_____ Overgrown_____ Good Cover_____ Sparse_____
Other (describe)/Corrective Action:_____

☐ 10. For earth channel spillways, are there any trees or other inappropriate vegetation in the spillway? Yes_____ No_____
If yes, describe (type of vegetation, size, location, etc.)/Corrective Action:_____

☐ 11. For earth channel spillways, are there any eroded areas in the spillway? Yes_____ No_____
If yes, describe (size of area, location, severity, etc.)/Corrective Action:_____

☐ 12. For concrete channel spillways, are there any cracks or holes in the spillway? Yes_____ No_____
If yes, describe (width of crack or hole, location, etc.)/Corrective Action:_____

☐ 13. For concrete channel spillways, are there any leaks or evidence of undermining (flow under the concrete)? Yes_____ No_____
If yes, describe (location, rate of flow from leak, indicators of undermining, etc.)/Corrective Action:_____

Principal and Emergency Spillways (continued)

14. For earth or concrete channel spillways, how would you describe the overall condition of the spillway? (Check all that apply)

Functioning Normally____ Not Functional____ Deteriorated____ Damaged____ Adequate____ Inadequate____

☐ 15. Other observations on the spillways/Corrective Action:_____

_____

F. Instrumentation (refer to Glossary for description)

☐ 1. Are there any toe drains at the downstream toe or any other seepage drains on the dam? Yes_____ No_____

If yes, describe the condition (for example, clogged, free flowing, deteriorated, good condition) /Corrective Action:_____

_____

☐ 2. For drains, is an animal guard installed at the outlet of each drain? Yes_____ No_____

If no, which drains lack animal guards? /Corrective Action:_____

_____

☐ 3. For drains, measure the rate of flow from each drain and record below (use additional pages if necessary):

Designation/Location of Drain	Flow Rate	Flow Rate in GPM*	Turbidity of Flow (describe – clear, muddy, etc.)

☐ 4. Are there any piezometers on the dam? Yes_____ No_____

If yes, describe the condition (for example, good condition, damaged, etc.)/Corrective Action:_____

_____

☐ 5. For piezometers, does each piezometer have a cap with a lock? Yes_____ No_____

If no, which piezometers need caps (to prevent rain water intrusion) and/or locks (to prevent tampering)? /Corrective Action:_____

☐ 6. For piezometers, are you able to take a measurement (depth to water) in each piezometer? Yes_____ No_____

If yes, record depth to water (in feet) in each piezometer, record on a separate page, and attach to this form.

☐ 7. Are there any other monitoring devices on the dam? Yes_____ No_____

If yes, describe what type and the condition (for example, monitoring wells - good condition, damaged) /Corrective Action:

_____

☐ 8. Other observations on instrumentation/Corrective Action:_____

_____

G. Photographs

At a minimum, photographs should be taken of the crest, upstream slope, downstream slope and any other notable features.

List of photographs (be sure to date stamp the photos): _____

_____

_____

_____

**GPM (gallons per minute): to convert from oz/sec multiply by 0.4688; to convert from ml/sec multiply by 0.01585*