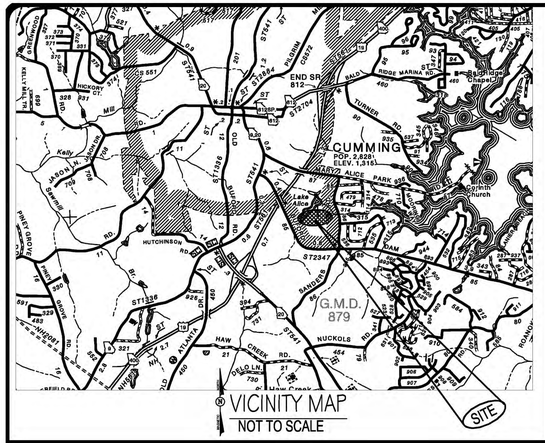


LAKE ALICE DAM BREACH REMEDIATION PLAN

FOR

CITY OF CUMMING

LEGEND

ASP	ASPHALT PAVING	JB	JUNCTION BOX
BC	BACK OF CURB	LL	LAND LOT
BM	BENCHMARK	LLL	LAND LOT LINE
BL	BUILDING LINE	LP	LIGHT POLE
CIP	CAST IRON PIPE	NIF	NOW OR FORMERLY
CB	CATCH BASIN	PC	POINT OF CURVATURE
CL	CENTERLINE	PT	POINT OF TANGENCY
CLF	CHAIN LINK FENCE	POC	POINT ON CURVE
CH	CHORD	POT	POINT ON TANGENT
CONC	CONCRETE	POL	POINT ON LINE
CM	CONCRETE MONUMENT	PVC	POLYVINYLCHLORIDE
CMP	CORRUGATED METAL PIPE	PW	POWER LINE
	DIVERSION DITCH	PP	POWER POLE
DD	DOWNDRAIN	PTB	POWER TRANSFORMER BOX
DE	DRAINAGE EASEMENT	PL	PROPERTY LINE
	DRAINAGE SWALE	XX	PROPOSED CONTOUR
DI	DROP INLET	R	RADIUS
DIP	DUCTILE IRON PIPE	RCP	REINFORCED CONCRETE PIPE
EL	ELEVATION	R/W	RIGHT OF WAY
EOP	EDGE OF PAVEMENT	SS	SANITARY SEWER
ES	EMERGENCY SPILLWAY	SSE	SANITARY SEWER EASEMENT
	EXISTING CONTOUR		SEDIMENT BARRIER
FF	FINISHED FLOOR ELEVATION	SB	SETBACK
FH	FIRE HYDRANT		SLOPE DOWN (1/4)'FOOT)
FES	FLARED END SECTION	SD	STORM DRAIN
G	GAS LINE	TL	TELEPHONE LINE
GP	GUY POLE	TP	TELEPHONE POLE
HW	HEADWALL	TBM	TEMPORARY BENCHMARK
IE	INVERT ELEVATION	W	WATER LINE
INT	INTERSECTION	WM	WATER METER
IPF	IRON PIN FOUND	WV	WATERVALVE
IPS	IRON PIN SET	WI	WEIR INLET

Project Narrative:

Project Name: LAKE ALICE DAM BREACH REMEDIATION PLAN
Site Address / Location: AT SANDERS RD AT LAKE LANIER UPSTREAM TO MARKET PLACE BLVD
Tax Map Number: C29-012,C38-013,C39-001 District: 2nd Land Lot(s): 78 & 139

Item A: Property Owner: CITY OF CUMMING/MASHBURN
Address: 100 N. MAIN ST- CUMMING GA 300040
Phone Number: (678)773-1535

Item B: Persons to be contacted by county in case of development or construction problems:
Name: DANNY BENNETT Title:PROJECT ENGINEER Phone # (678)773-1535 (24 HRS.)
Address: SAME AS ABOVE
Alternate Name: Title: Phone #

Item C: Proposed Use of Land: N/A
Size of disturbed work area: 1.5 ACRES Total site area: N/A ACRES
Cubic Yards of Soil to be moved: N/A New location of excess soil: N/A

Item D: See Construction Schedule, this sht

Item E: Zoning of Property: Ag/cbd Zoning of Adjoining Properties: Ag/CBD

NewFields

CONTACT INFO:
Brian Wellington, Ph.D., P.E.
NewFields Companies LLC
1349 W. Peachtree St. Suite 2000
Atlanta, GA 30309
Ph: (404)969-0987
Fax: (404)969-0988
www.newfields.com

CONTRACTING ENGINEERS INCORPORATED

CONTACT INFO:
D.M. Bennett, P.E.
Contracting Engineers Inc.
6420 Jewell Bennett Rd
Dawsonville, GA 30534
Ph: (678)773-1535
Fax: (678)807-2698

ACTIVITY/WEEKS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
CLEARING AND GRUBBING	N/A																							
EROSION CONTROL IMPLEMENTATION																								
EROSION CONTROL MAINTENANCE																								
CUT & FILL																								
GRASSING (LIMIT EXP TO 7 DAYS)																								
UTILITY INSTALLATION																								
CONSTRUCTION																								
FINISH GRADING																								
FINAL STABILIZATION																								

SOILS INFORMATION

SOIL SYMBOL	NAME	SLOPE %	ERO FACTOR	LIMITATION	PERMEABILITY
N/A	CUT & FILL	10-20	N/A	N/A	N/A

CONTRACTING ENGINEERS INCORPORATED
6420 JEWELL BENNETT RD
DAWSONVILLE, GEORGIA 30534
678-773-1535

SHEET INDEX

"I CERTIFY THAT A QUALIFIED PERSON FROM CONTRACTING ENGINEERS, EITHER THE PLAN PREPARER OR THE DESIGNEE, HAS VISITED THE SUBJECT SITE PRIOR TO THE CREATION OF THIS PLAN."

D.M. BENNETT, P.E. 19,305- LEVEL II CERTIFIED DESIGN PROFESSIONAL #28,293

MAINTENANCE SCHEDULE

FOR A PERIOD OF 18 MONTHS FROM DATE OF BEGINNING INITIAL PHASE

(1) MONITOR ON A QUARTERLY BASIS THE "LAKE BED CHANNELS" AND RESEED AND HANDWORK AREAS AS NECESSARY TO INSURE REVEGETATION.

(2) MONITOR ON A BI-QUARTERLY BASIS LITTLE RIDGE CREEK AND REMOVE (AS PER PERMIT DRAWINGS) ANY SEDIMENTS DEPOSITED AS A RESULT OF EROSION FROM THE "LAKE BED CHANNELS".

(3) MONITOR ON A QUARTERLY BASIS ALL DISTURBED AREAS CAUSED BY CONSTRUCTION AND RESEED AS NECESSARY TO INSURE PERMANENT VEGETATION.

*(4) AFTER ALL AREAS AFFECTED BY THE BREACH ARE PERMANENTLY STABILIZED, PROCEED TO SHEET 3.5 AND REMOVE ALL INSTALLED BMP'S EXCEPT AS NOTED. **IN THE EVENT ALL AREAS ARE NOT STABILIZED TO THE SATISFACTION OF ALL INVOLVED JURISDICTIONAL AUTHORITIES, THE PLANS SHALL BE MODIFIED AS NECESSARY TO ACHIEVE FINAL STABILIZATION AND RE-SUBMITTED FOR APPROVAL AND IMPLEMENTATION.***

IF YOU DIG GEORGIA...
CALL US FIRST!
1-800-282-7411
(770) 623-4344
(METRO ATLANTA ONLY)
UTILITIES PROTECTION CENTER
IT'S THE LAW

CAUTION

THE UTILITIES SHOWN ARE SHOWN FOR THE CONTRACTOR'S CONVENIENCE ONLY. THERE MAY BE OTHER UTILITIES NOT SHOWN ON THESE PLANS. THE PREPARER ASSUMES NO RESPONSIBILITY FOR THE LOCATIONS SHOWN AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATIONS OF ALL UTILITIES WITHIN THE LIMITS OF THE WORK. ALL DAMAGE MADE TO EXISTING UTILITIES BY THE CONTRACTOR SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

GEORGIA REGISTERED PROFESSIONAL ENGINEER D. M. BENNETT

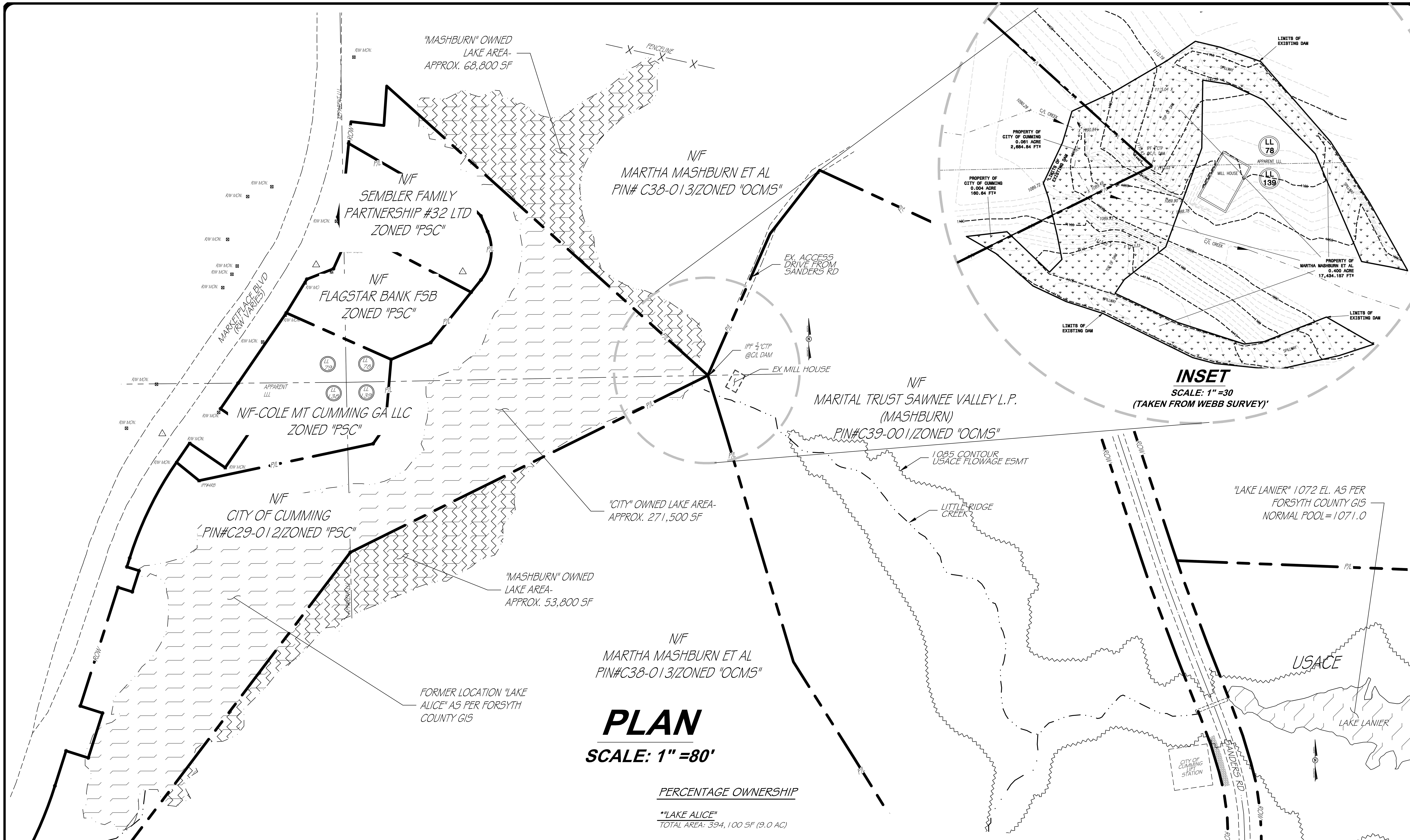
CONTRACTING ENGINEERS INCORPORATED
6420 JEWELL BENNETT RD
DAWSONVILLE, GEORGIA 30534
678-773-1535

LAKE ALICE DAM BREACH REMEDIATION

* COVER

REVISIONS:

Date AUG 28, 2013
Scale 1"= NTS
JOB NO. baseSANDERSCUMMING
Sheet 1.0 of 1.0 Sheets



"MASHBURN" OWNED LAKE AREA- APPROX. 68,800 SF
FENCELINE
N/F MARTHA MASHBURN ET AL PIN# C38-013/ZONED "OCMS"
N/F SEMBLER FAMILY PARTNERSHIP #32 LTD ZONED "PSC"
N/F FLAGSTAR BANK FSB ZONED "PSC"
N/F-COLE MT CUMMING GA LLC ZONED "PSC"
N/F CITY OF CUMMING PIN#C29-012/ZONED "PSC"
MARKETPLACE BLVD (R/W VARIES)
EX. ACCESS DRIVE FROM SANDERS RD
EX MILL HOUSE
N/F MARITAL TRUST SAWNEE VALLEY L.P. (MASHBURN) PIN#C39-001/ZONED "OCMS"
1085 CONTOUR USACE FLOWAGE ESMT
LITTLE RIDGE CREEK
"CITY" OWNED LAKE AREA- APPROX. 271,500 SF
"MASHBURN" OWNED LAKE AREA- APPROX. 53,800 SF
N/F MARTHA MASHBURN ET AL PIN#C38-013/ZONED "OCMS"
FORMER LOCATION "LAKE ALICE" AS PER FORSYTH COUNTY GIS
"LAKE LANIER" 1072 EL. AS PER FORSYTH COUNTY GIS NORMAL POOL=1071.0
USACE
LAKE LANIER
SANDERS RD
CITY OF CUMMING LIFT STATION
LITTLE RIDGE CREEK
LIMITS OF EXISTING DAM
PROPERTY OF CITY OF CUMMING 0.061 ACRE 2,684.84 FT²
PROPERTY OF CITY OF CUMMING 0.004 ACRE 160.84 FT²
PROPERTY OF MARTHA MASHBURN ET AL 0.400 ACRE 17,434.157 FT²
MILL HOUSE
LL 78
LL 139
INSET
SCALE: 1" =30
(TAKEN FROM WEBB SURVEY)'

PLAN

SCALE: 1" =80'

PERCENTAGE OWNERSHIP

*"LAKE ALICE"
TOTAL AREA: 394,100 SF (9.0 AC)

TOTAL AREA OWNED BY "CITY": 271,500 SF
PERCENTAGE OWNED BY "CITY":%68.9= 271,500/394,100 X 100

TOTAL AREA OWNED BY "MASHBURN":53,800 SF+68,800 SF=122,600 SF
PERCENTAGE OWNED BY "MASHBURN":%31.1= 122,600/394,100 X 100
* BASED ON FORSYTH COUNTY GIS INFO

**"LAKE ALICE DAM"
TOTAL AREA: 20,280 SF (0.5 AC)

TOTAL AREA OWNED BY "CITY": 161+2,685=2,846 SF
PERCENTAGE OWNED BY "CITY":%14.0 = 2,846/20,280 X 100

TOTAL AREA OWNED BY "MASHBURN":17,434 SF
PERCENTAGE OWNED BY "MASHBURN": %86.0= 17,434/20,280 X 100
* *BASED ON WEBB SURVEY

NOTES

1) SOME EXISTING STRUCTURES OUTSIDE LIMITS OF WORK NOT SHOWN

80 0 80 160 240
GRAPHIC SCALE-FEET

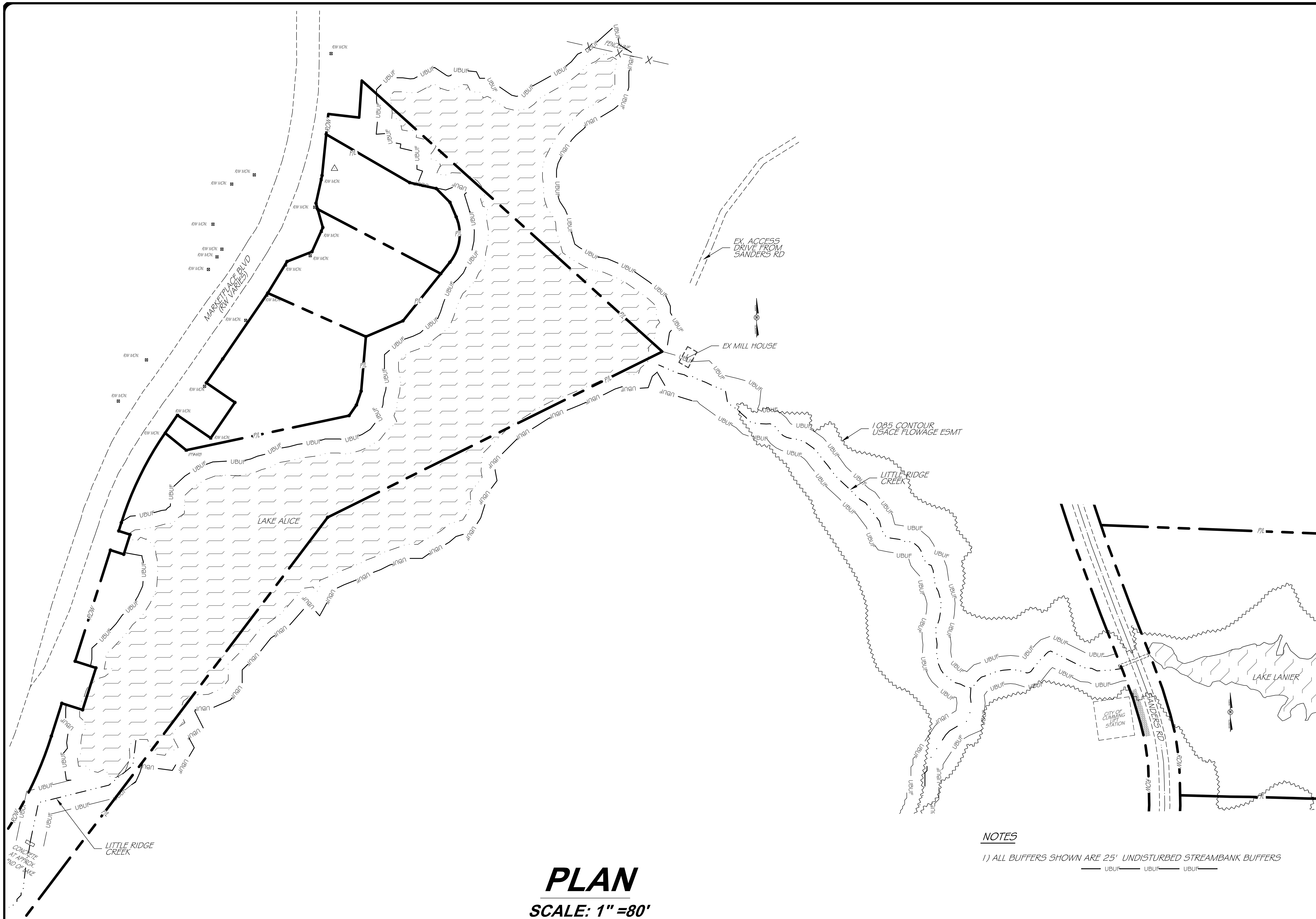
CONTRACTING ENGINEERS INCORPORATED
6420 JEWELL BENNETT RD
DAWSONVILLE GA 30534
678-773-1535

LAKE ALICE DAM BREACH REMEDIATION

* PROPERTY OWNER INFORMATION

REVISIONS:

Date AUG 28, 2013
Scale 1"= 80'
JOB NO. baseSANDERSCUMMING
Sheet 2.1 of 2.4 Sheets



PLAN

SCALE: 1" =80'

NOTES

1) ALL BUFFERS SHOWN ARE 25' UNDISTURBED STREAMBANK BUFFERS

—— UBUF—— UBUF—— UBUF——

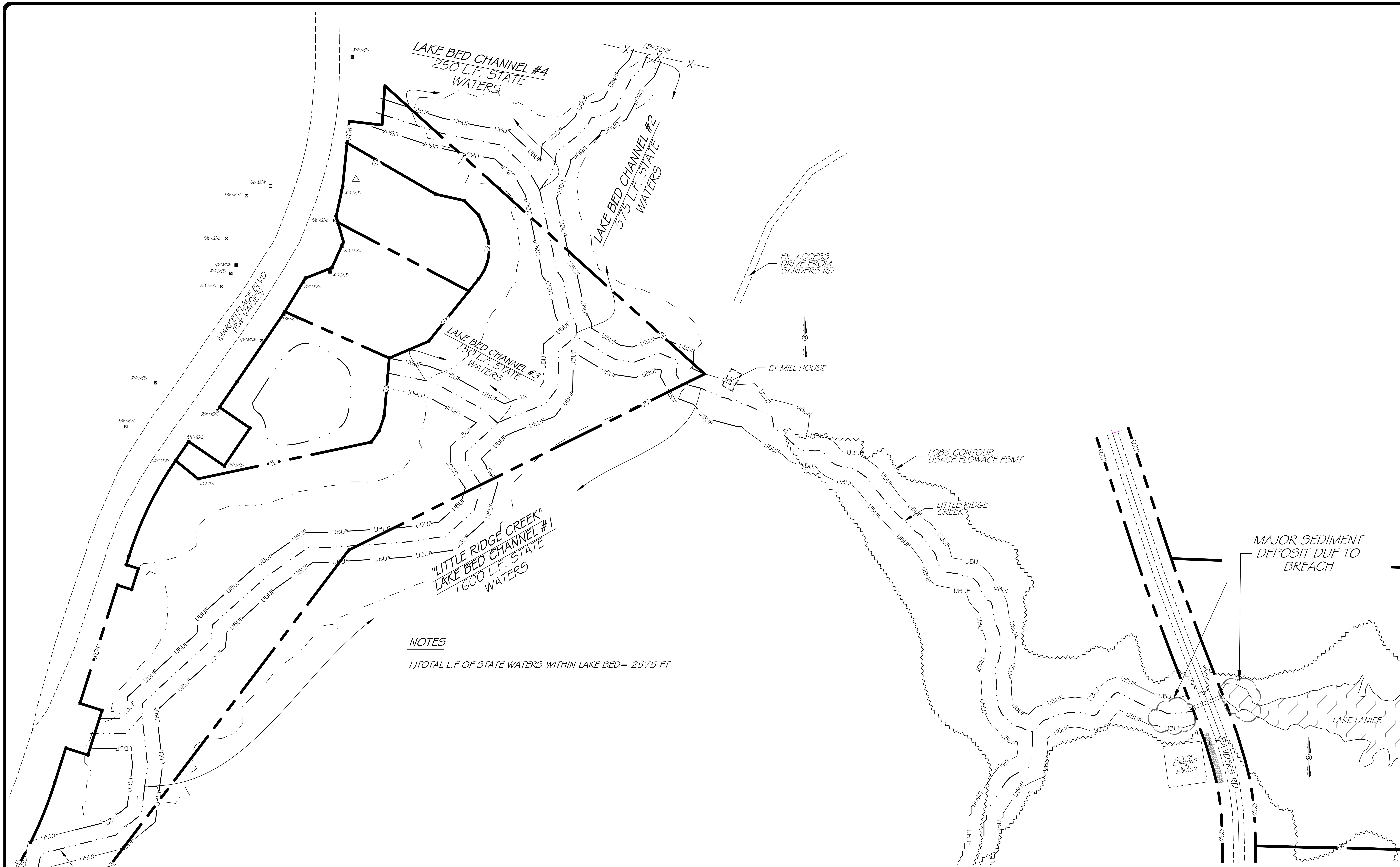
LAKE ALICE DAM BREACH REMEDIATION

* STATE WATERS
PRE BREACH

CONTRACTING ENGINEERS INCORPORATED

REVISIONS:

Date AUG 28, 2013
Scale 1"= 80'
JOB NO. baseSANDERSCUMMING
Sheet 2.2 of 2.4 Sheets



NOTES

1)TOTAL L.F OF STATE WATERS WITHIN LAKE BED= 2575 FT

PLAN

SCALE: 1" =80'

NOTES

1) ALL BUFFERS SHOWN ARE 25' UNDISTURBED STREAMBANK BUFFERS

— UBUF — UBUF — UBUF —

80 0 80 160 240
GRAPHIC SCALE-FEET

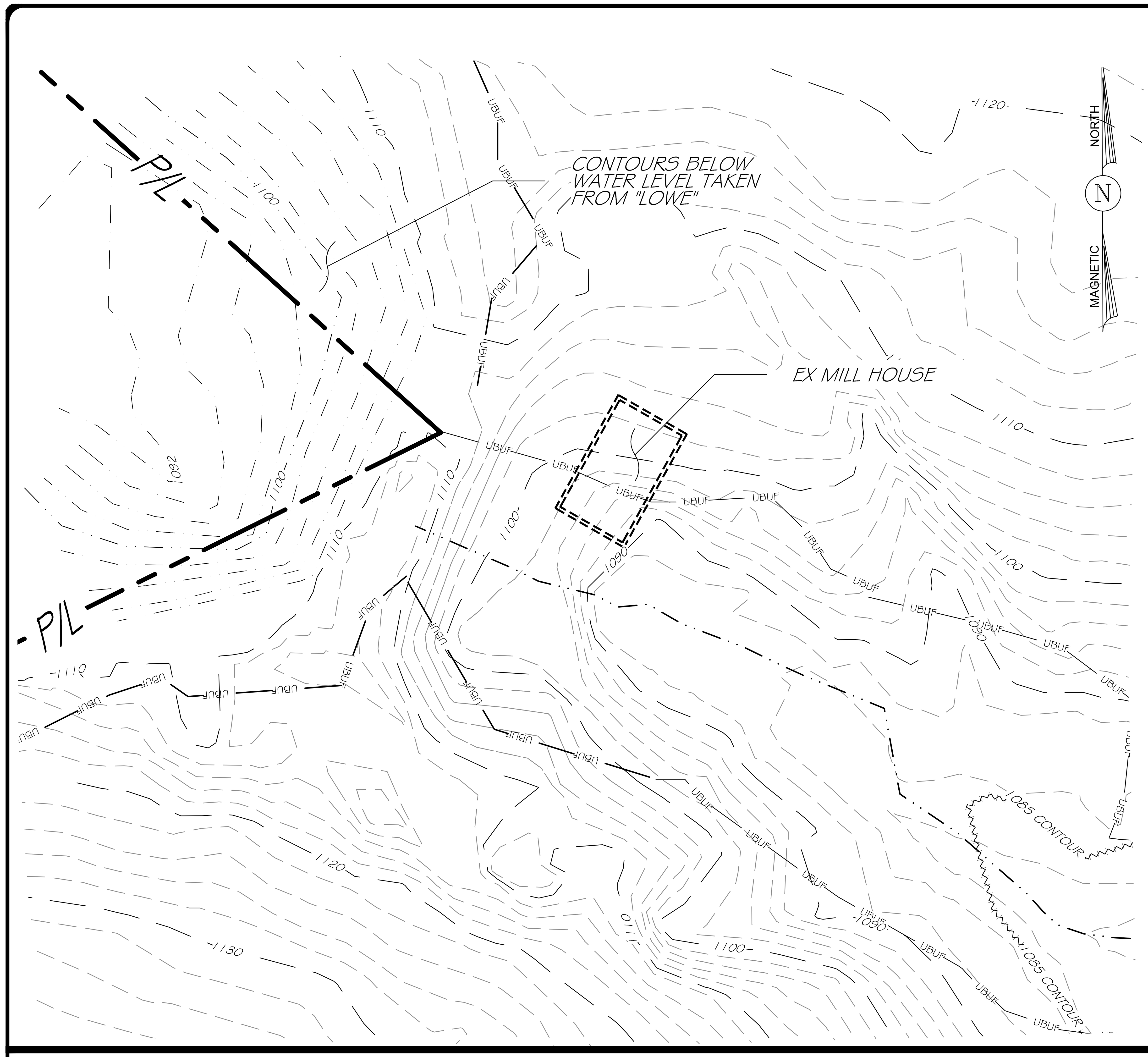
CONTRACTING ENGINEERS INCORPORATED

LAKE ALICE DAM BREACH REMEDIATION

* STATE WATERS POST BREACH

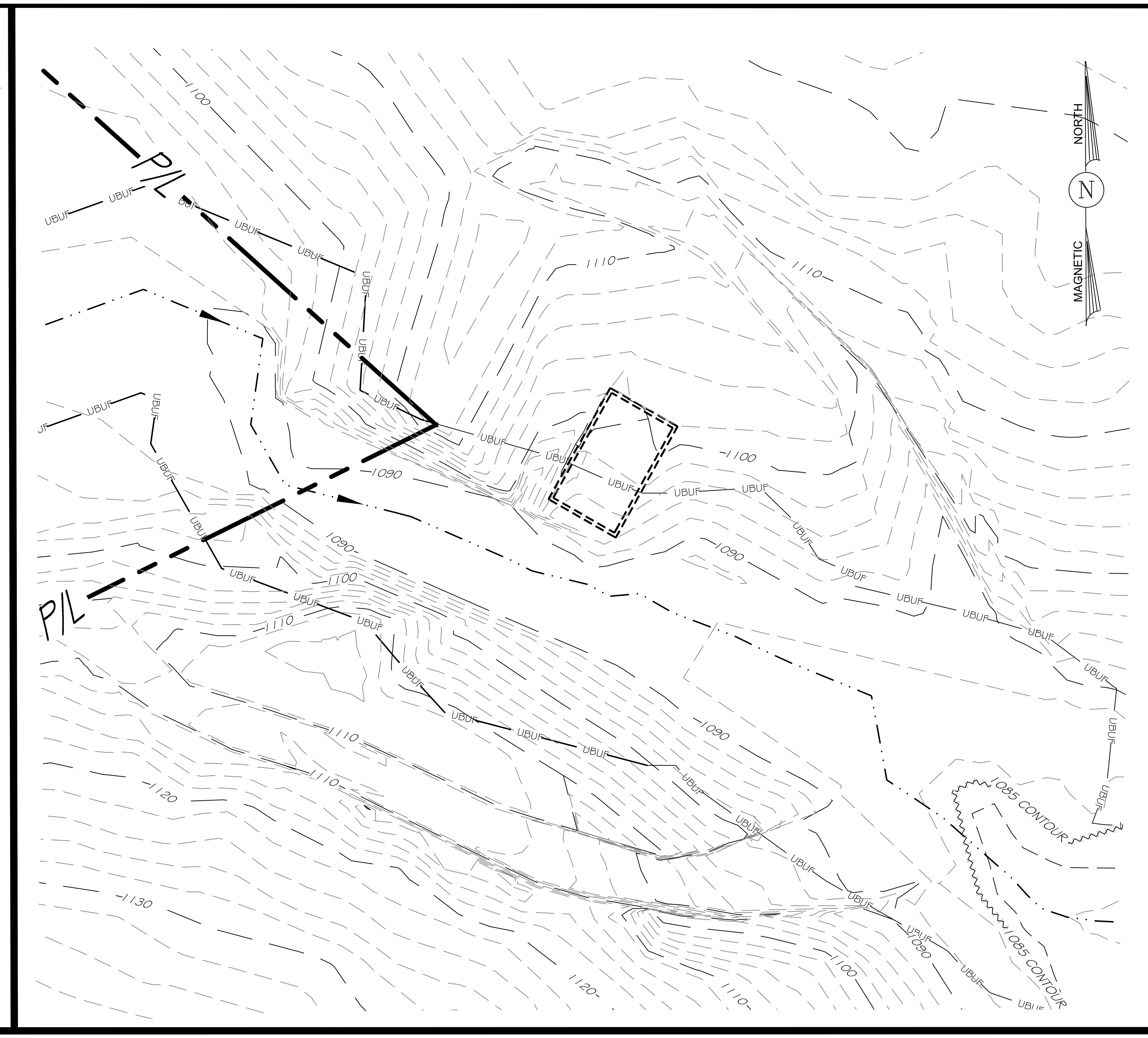
REVISIONS:

Date AUG 28, 2013
Scale 1"= 80'
JOB NO. baseSANDERSCUMMING
Sheet 2.3 of 2.4 Sheets



TOPO:PRE-DAM BREACH

SCALE: 1" =20'



TOPO:POST-DAM BREACH

SCALE: 1" =20'

20 0 20 40 60
GRAPHIC SCALE-FEET

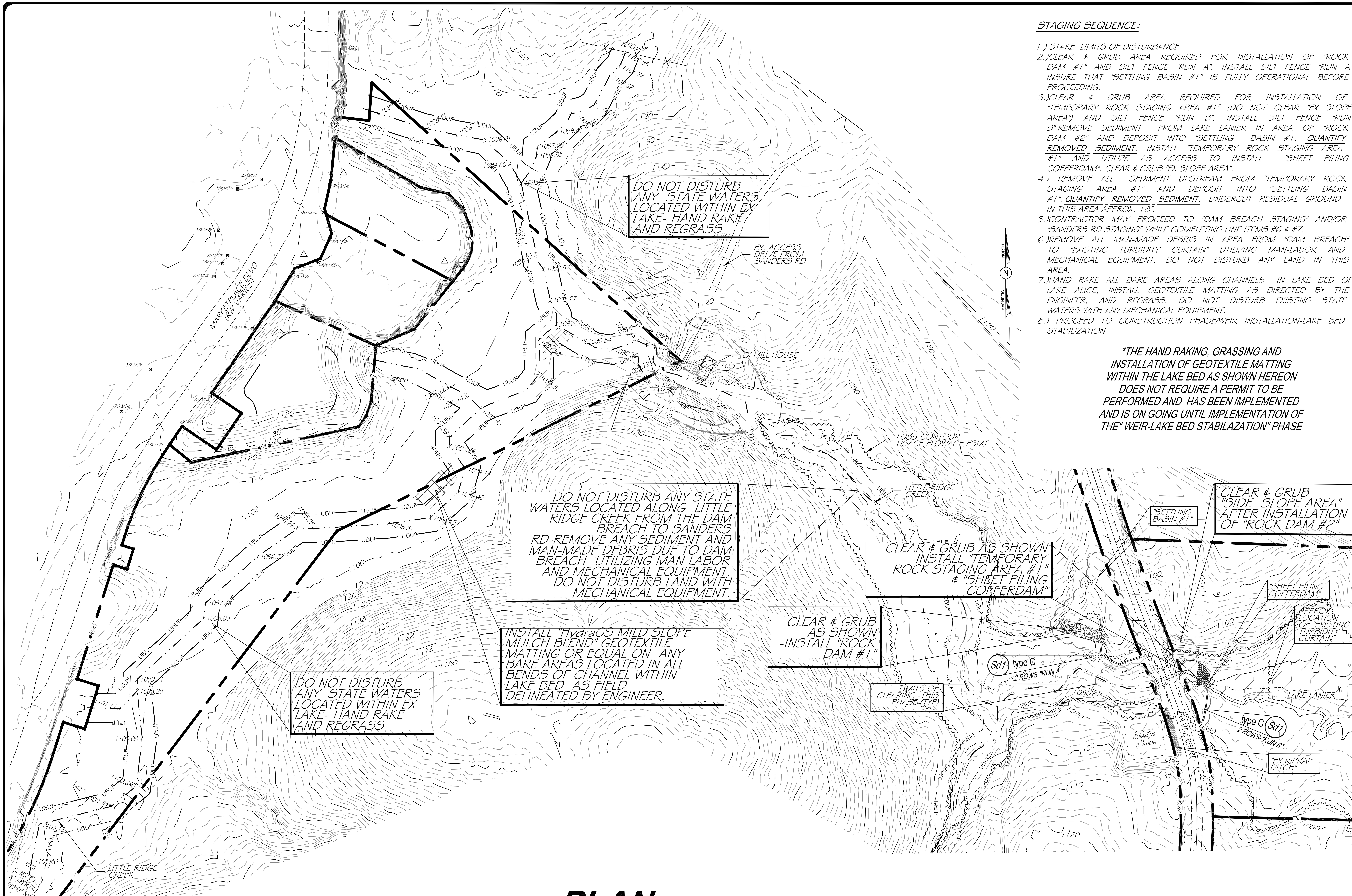
LAKE ALICE DAM BREACH REMEDIATION

* DAM TOPO
PRE/POST BREACH
* SEDIMENT LOSS/GAIN CALCS

CONTRACTING ENGINEERS INCORPORATED

REVISIONS:

Date AUG 28, 2013
Scale 1"= 20'
JOB NO. baseSANDERSCUMMING
Sheet 24 of 24 Sheets



PLAN

SCALE: 1" =80'

80 0 80 160 240
GRAPHIC SCALE-FEET

STAGING SEQUENCE:

1.) STAKE LIMITS OF DISTURBANCE

2.)CLEAR & GRUB AREA REQUIRED FOR INSTALLATION OF "ROCK DAM #1" AND SILT FENCE "RUN A". INSTALL SILT FENCE "RUN A". INSURE THAT "SETTLING BASIN #1" IS FULLY OPERATIONAL BEFORE PROCEEDING.

3.)CLEAR & GRUB AREA REQUIRED FOR INSTALLATION OF "TEMPORARY ROCK STAGING AREA #1" (DO NOT CLEAR "EX SLOPE AREA") AND SILT FENCE "RUN B". INSTALL SILT FENCE "RUN B".REMOVE SEDIMENT FROM LAKE LANIER IN AREA OF "ROCK DAM #2" AND DEPOSIT INTO "SETTLING BASIN #1. QUANTIFY REMOVED SEDIMENT. INSTALL "TEMPORARY ROCK STAGING AREA #1" AND UTILIZE AS ACCESS TO INSTALL "SHEET PILING COFFERDAM". CLEAR & GRUB "EX SLOPE AREA".

4.) REMOVE ALL SEDIMENT UPSTREAM FROM "TEMPORARY ROCK STAGING AREA #1" AND DEPOSIT INTO "SETTLING BASIN #1". QUANTIFY REMOVED SEDIMENT. UNDERCUT RESIDUAL GROUND IN THIS AREA APPROX. 18".

5.)CONTRACTOR MAY PROCEED TO "DAM BREACH STAGING" AND/OR "SANDERS RD STAGING" WHILE COMPLETING LINE ITEMS #6 & #7.

6.)REMOVE ALL MAN-MADE DEBRIS IN AREA FROM "DAM BREACH" TO "EXISTING TURBIDITY CURTAIN" UTILIZING MAN-LABOR AND MECHANICAL EQUIPMENT. DO NOT DISTURB ANY LAND IN THIS AREA.

7.)HAND RAKE ALL BARE AREAS ALONG CHANNELS IN LAKE BED OF LAKE ALICE, INSTALL GEOTEXTILE MATTING AS DIRECTED BY THE ENGINEER, AND REGRASS. DO NOT DISTURB EXISTING STATE WATERS WITH ANY MECHANICAL EQUIPMENT.

8.) PROCEED TO CONSTRUCTION PHASE/WEIR INSTALLATION-LAKE BED STABILIZATION

*THE HAND RAKING, GRASSING AND INSTALLATION OF GEOTEXTILE MATTING WITHIN THE LAKE BED AS SHOWN HEREON DOES NOT REQUIRE A PERMIT TO BE PERFORMED AND HAS BEEN IMPLEMENTED AND IS ON GOING UNTIL IMPLEMENTATION OF THE" WEIR-LAKE BED STABILAZATION" PHASE

GEORGIA ... D. M. BENN...

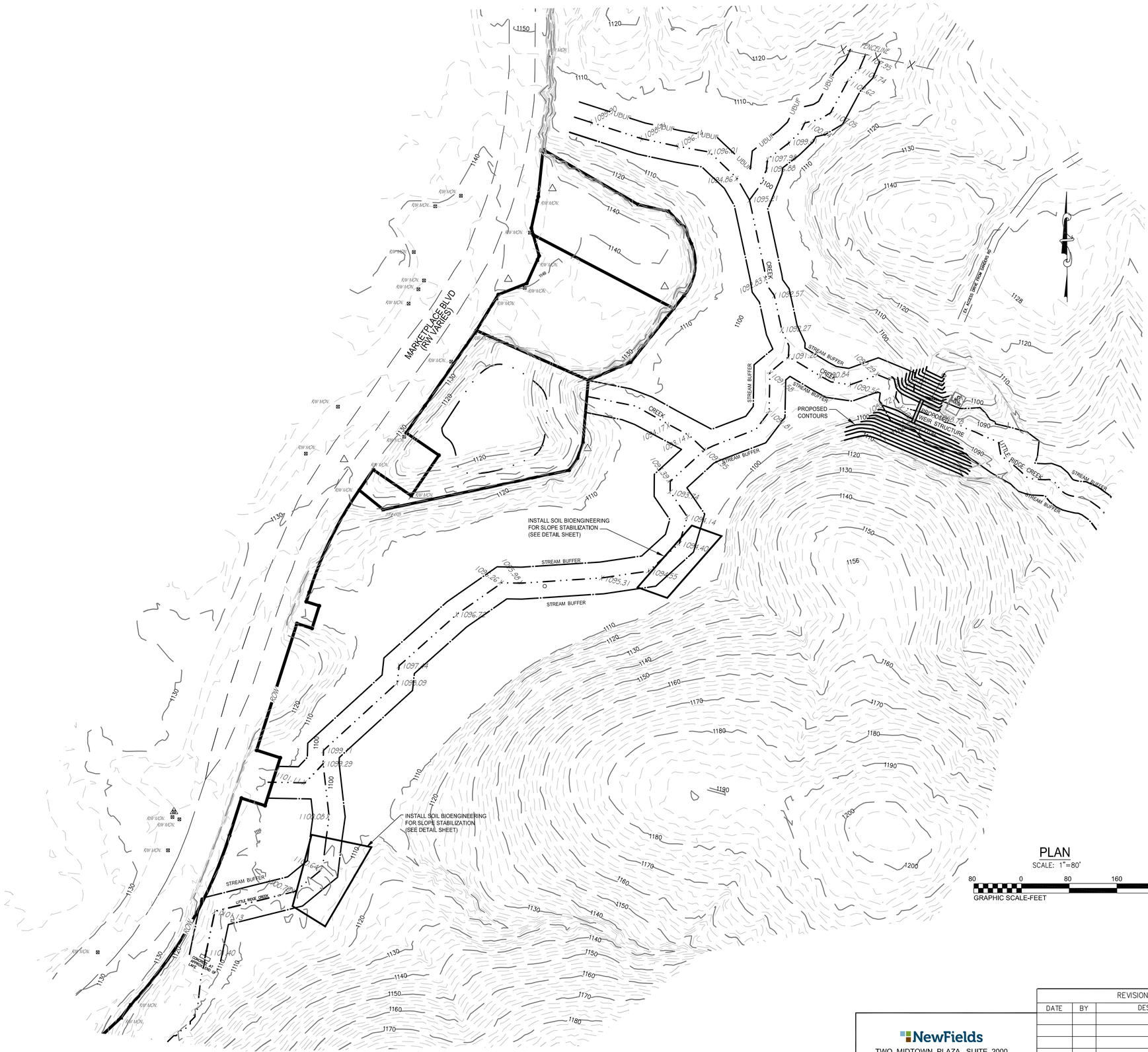
CONTRACTING ENGINEERS INCORPORATED
6420 JEWELL BENNETT RD
DAWSONVILLE GA 30534
678-773-1535

LAKE ALICE DAM BREACH REMEDIATION

* INITIAL PHASE

REVISIONS:

Date AUG 28, 2013
Scale 1"= 80'
JOB NO. baseSANDERSCUMMING
Sheet 3.1 of 3.5 Sheets



NOTES

1. THE DESIGN OF THE WEIR WILL BE PRECEDED BY FIELD INVESTIGATIONS TO IDENTIFY THE DEPTH BEDROCK ALONG THE LONGITUDINAL AXIS OF THE DAM, AND CHARACTERIZE THE ENGINEERING PROPERTIES OF THE OVERBURDEN SOILS AND UNDERLYING ROCK.

2. VARIOUS WEIR TYPES WILL BE CONSIDERED FOR THE SITE INCLUDING COMBINATION SHEET PILE WALL, GROUTED ROCK FILL EMBANKMENT, GABIONS, AND CONCRETE. THE FINAL SELECTION OF WEIR TYPE AND ITS SIZE WILL BE BASED ON THE RESULTS OF THE FIELD INVESTIGATIONS AND HYDROLOGIC REQUIREMENTS.

3. STREAM BANKS SUSCEPTIBLE TO EROSION WILL BE STABILIZED USING APPROPRIATE SOIL BIOENGINEERING METHODS (SEE DETAIL SHEET). THE FINAL METHOD SELECTION WILL BE BASED ON EXPECTED FUTURE HYDROLOGIC CONDITIONS.

NewFields
TWO MIDTOWN PLAZA, SUITE 2000
1349 WEST PEACHTREE STREET
ATLANTA, GEORGIA 30308

REVISIONS		
DATE	BY	DESCRIPTION

SCALE: AS SHOWN
DESIGN BY: BIW
DRAWN BY: LCH
CHECKED BY: BIW
CAD FILE
LakeAlice\LakeAlice13.dwg
12/19/13

LAKE ALICE DAM BREACH REMEDIATION

PHASE 1
WEIR INSTALLATION AND LAKE BED STABILIZATION

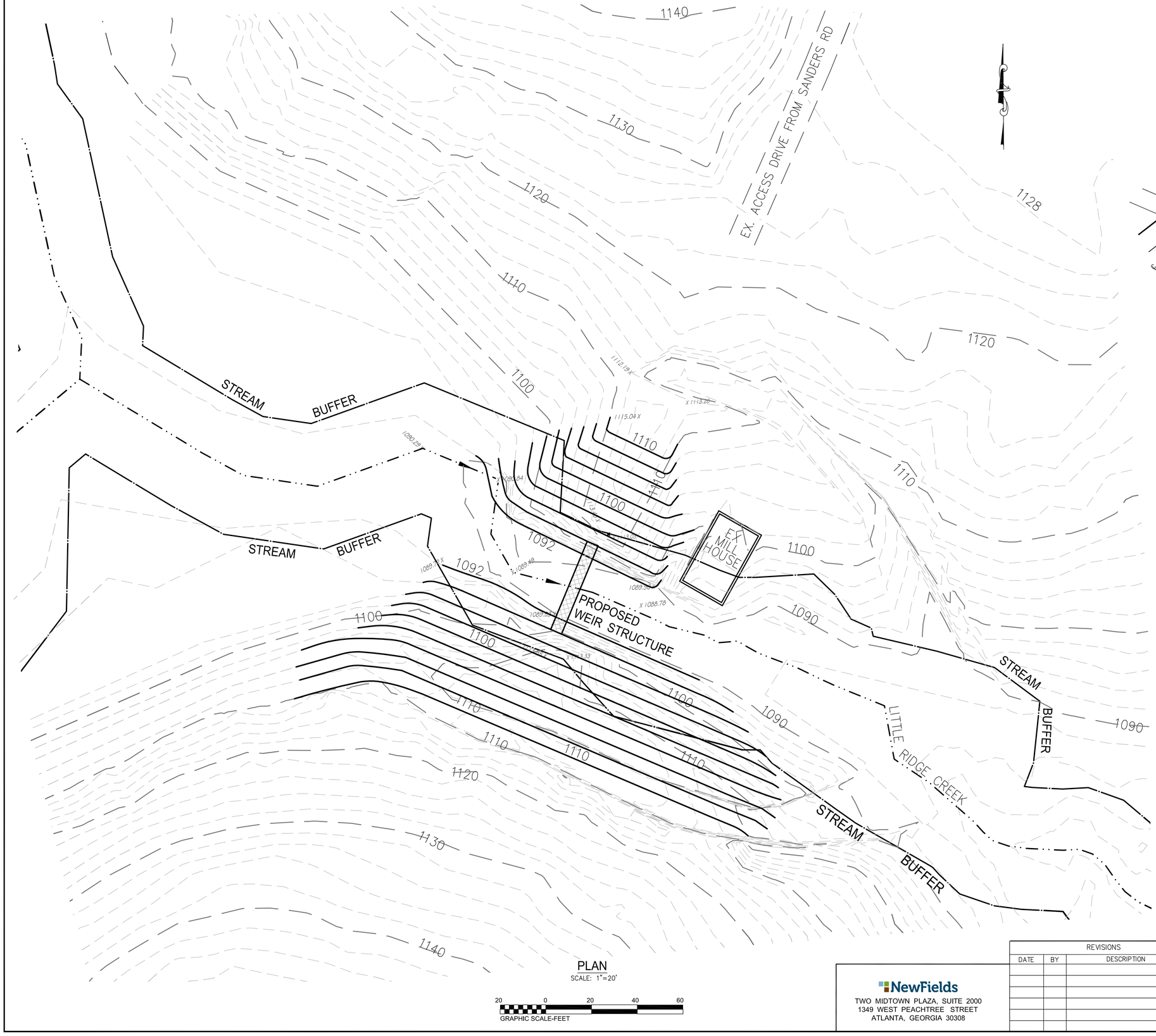
SITE PLAN

PROJECT NO.

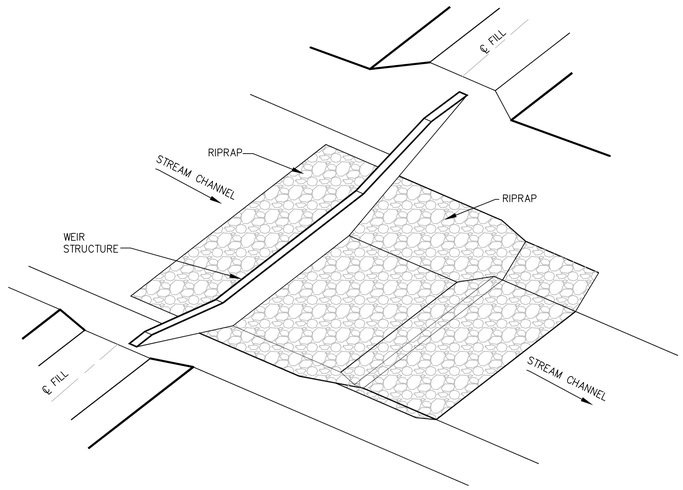
DATE:
DECEMBER 2013

DRAWING NO.
1

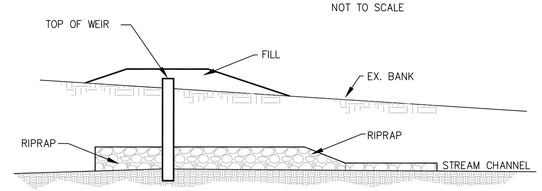
SHEET 1 OF 3



PLAN
SCALE: 1"=20'



WEIR - ISOMETRIC VIEW
NOT TO SCALE



WEIR - SECTION
NOT TO SCALE

NOTES

1. THE DESIGN OF THE WEIR WILL BE PRECEDED BY FIELD INVESTIGATIONS TO IDENTIFY THE DEPTH BEDROCK ALONG THE LONGITUDINAL AXIS OF THE DAM, AND CHARACTERIZE THE ENGINEERING PROPERTIES OF THE OVERBURDEN SOILS AND UNDERLYING ROCK.
2. VARIOUS WEIR TYPES WILL BE CONSIDERED FOR THE SITE INCLUDING COMBINATION SHEET PILE WALL, GROUTED ROCK FILL EMBANKMENT, GABIONS, AND CONCRETE. THE FINAL SELECTION OF WEIR TYPE AND ITS SIZE WILL BE BASED ON THE RESULTS OF THE FIELD INVESTIGATIONS AND HYDROLOGIC REQUIREMENTS.
3. STREAM BANKS SUSCEPTIBLE TO EROSION WILL BE STABILIZED USING APPROPRIATE SOIL BIOENGINEERING METHODS (SEE DETAIL SHEET). THE FINAL METHOD SELECTION WILL BE BASED ON EXPECTED FUTURE HYDROLOGIC CONDITIONS.

NewFields
TWO MIDTOWN PLAZA, SUITE 2000
1349 WEST PEACHTREE STREET
ATLANTA, GEORGIA 30308

REVISIONS		
DATE	BY	DESCRIPTION

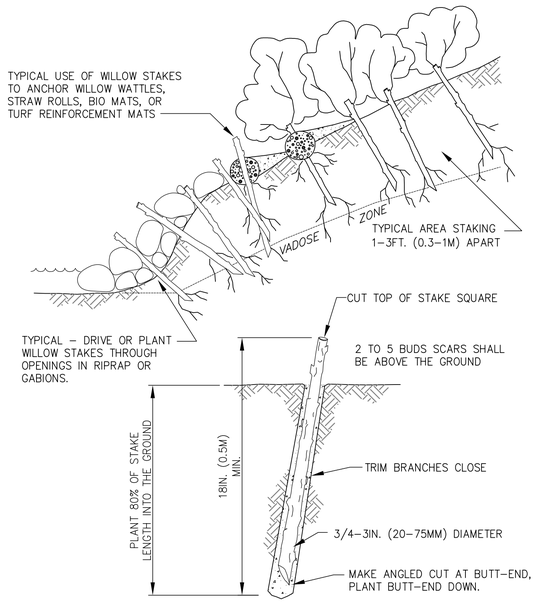
SCALE: AS SHOWN
DESIGN BY: BIW
DRAWN BY: LCH
CHECKED BY: BIW
CAD FILE
LakeAlice\LakeAlice13.dwg
12/19/13

LAKE ALICE DAM BREACH REMEDIATION

PHASE 1
WEIR INSTALLATION AND LAKE BED STABILIZATION

DETAILED SITE PLAN AND DETAILS

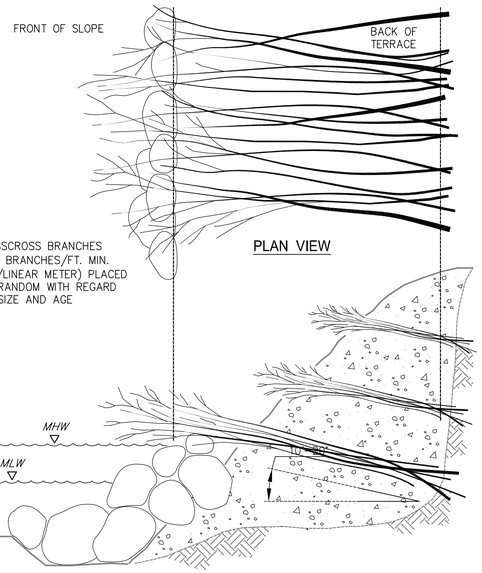
PROJECT NO.
DATE: DECEMBER 2013
DRAWING NO. 2
SHEET 2 OF 3



NOTES:
1. HARVEST AND PLANT STAKES DURING THE DORMANT SEASON.
2. USE HEALTHY, STRAIGHT AND LIVE WOOD AT LEAST 1 YEAR OLD.
3. MAKE CLEAN CUTS AND DO NOT DAMAGE STAKES OR SPLIT ENDS DURING INSTALLATION, USE A PILOT BAR IN FIRM SOILS.
4. SOAK CUTTINGS FOR 24 HOURS (MIN.) PRIOR TO INSTALLATION.
5. TAMP THE SOIL AROUND THE STAKE.

LIVE STAKING AND JOINT PLANTING

NOT TO SCALE

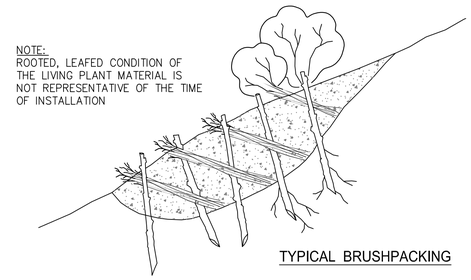


PLAN VIEW

NOTES:
1. TILT BRANCHES DOWN INTO THE SLOPE 10°–20° MIN.
2. BRUSHLAYERING MAY BE CONSTRUCTED WITH NON–COMPACTED OR COMPACTED BACKFILL WITHOUT DAMAGE TO THE BRUSH LAYER.
3. BRANCHES IRRESPECTIVE OF LENGTH, SHOULD PROTRUDE 8–18IN. (0.20–0.50 METERS) BEYOND THE FACE OF THE SLOPE.

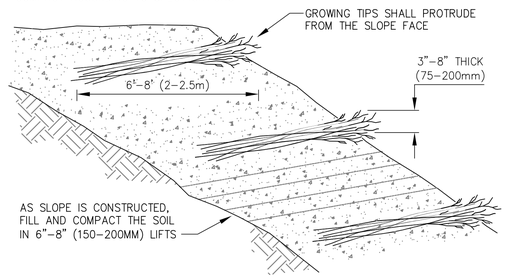
BRUSHLAYERING WITH ROCK TOE PROTECTION

NOT TO SCALE



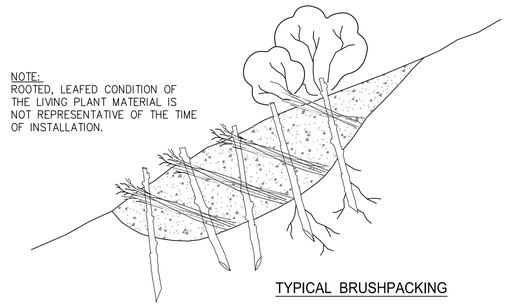
NOTE:
ROOTED, LEAFED CONDITION OF THE LIVING PLANT MATERIAL IS NOT REPRESENTATIVE OF THE TIME OF INSTALLATION

TYPICAL BRUSHPACKING



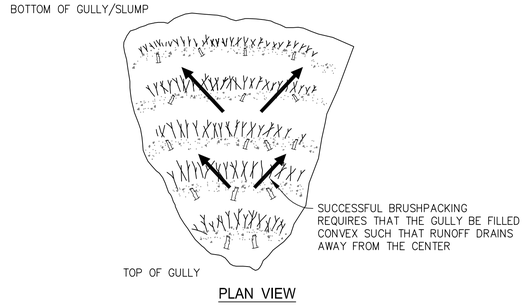
TYPICAL BRUSHLAYERING WITH SLOPE CONSTRUCTION

NOT TO SCALE



NOTE:
ROOTED, LEAFED CONDITION OF THE LIVING PLANT MATERIAL IS NOT REPRESENTATIVE OF THE TIME OF INSTALLATION.

TYPICAL BRUSHPACKING



PLAN VIEW

BRUSHPACKING FOR SLUMP / GULLY REPAIR

NOT TO SCALE

NewFields
TWO MIDTOWN PLAZA, SUITE 2000
1349 WEST PEACHTREE STREET
ATLANTA, GEORGIA 30308

REVISIONS		
DATE	BY	DESCRIPTION

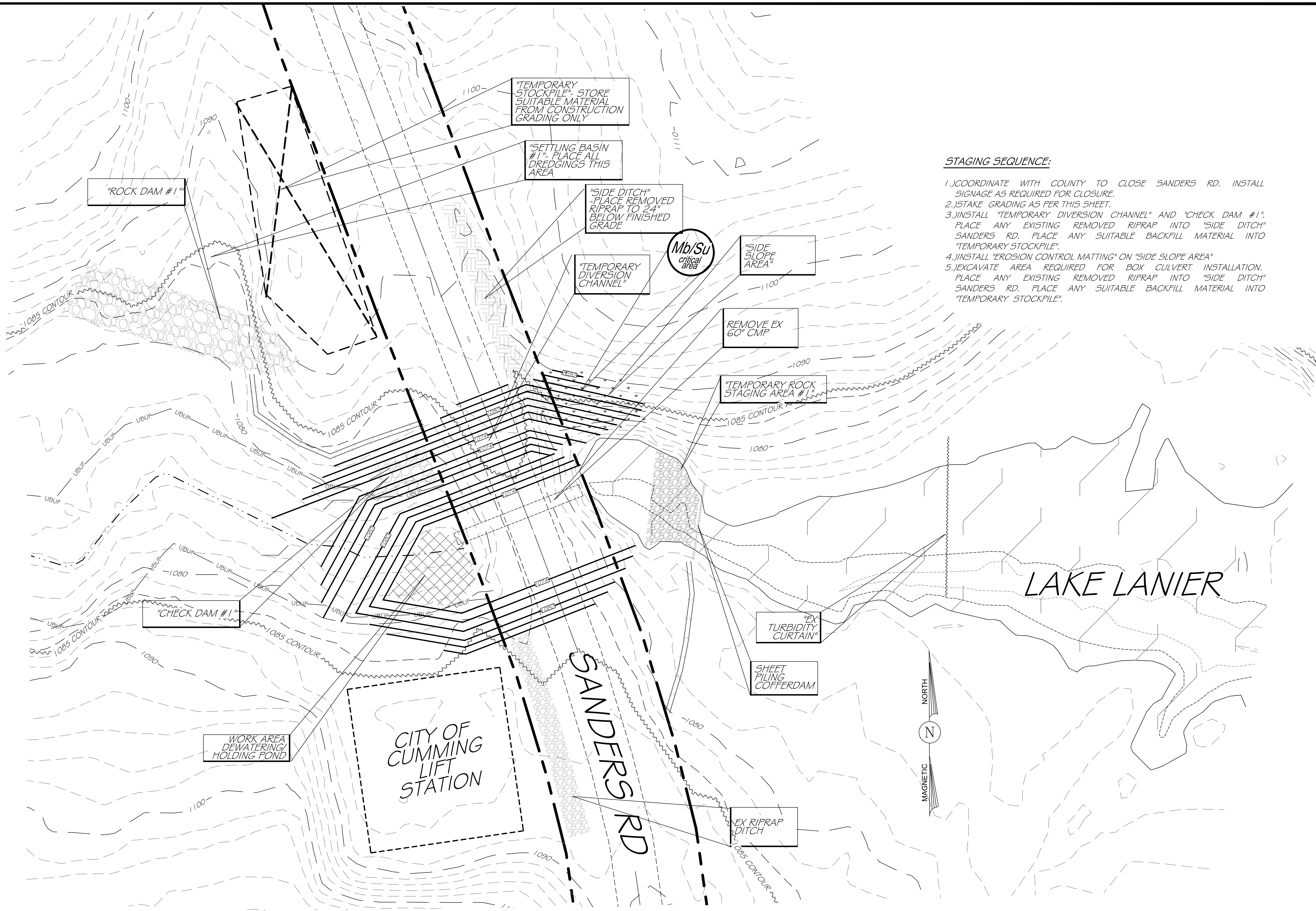
SCALE: AS SHOWN
DESIGN BY: BIW
DRAWN BY: LCH
CHECKED BY: BIW
CAD FILE NewFields\LakeAliceDtls13R.dwg\12/20/13

LAKE ALICE DAM BREACH REMEDIATION

PHASE 1
WEIR INSTALLATION AND LAKE BED STABILIZATION

DETAILS

PROJECT NO.
DATE: DECEMBER 2013
DRAWING NO. 3
SHEET 3 OF 3



PLAN

SCALE: 1" =20'

20 0 20 40 60
GRAPHIC SCALE-FEET

STAGING SEQUENCE:

1.)COORDINATE WITH COUNTY TO CLOSE SANDERS RD. INSTALL SIGNAGE AS REQUIRED FOR CLOSURE.
2.)STAKE GRADING AS PER THIS SHEET.
3.)INSTALL "TEMPORARY DIVERSION CHANNEL" AND "CHECK DAM #1". PLACE ANY EXISTING REMOVED RIPRAP INTO "SIDE DITCH" SANDERS RD. PLACE ANY SUITABLE BACKFILL MATERIAL INTO "TEMPORARY STOCKPILE".
4.)INSTALL "EROSION CONTROL MATTING" ON "SIDE SLOPE AREA"
5.)EXCAVATE AREA REQUIRED FOR BOX CULVERT INSTALLATION. PLACE ANY EXISTING REMOVED RIPRAP INTO "SIDE DITCH" SANDERS RD. PLACE ANY SUITABLE BACKFILL MATERIAL INTO "TEMPORARY STOCKPILE".

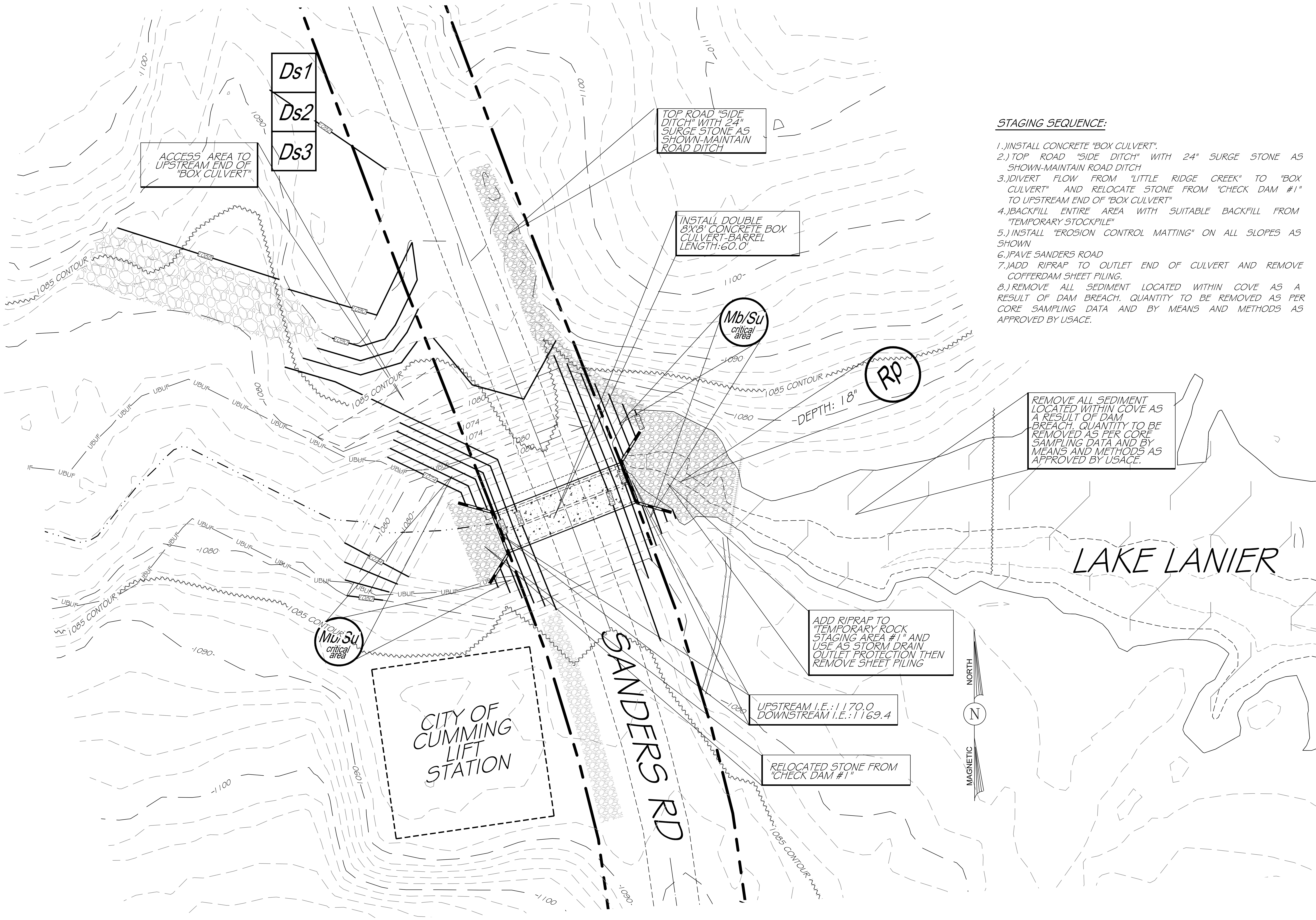
CONTRACTING ENGINEERS INCORPORATED

LAKE ALICE DAM BREACH REMEDIATION

INTERMEDIATE PHASE
SANDERS ROAD STAGING

REVISIONS:

Date AUG 28, 2013
Scale 1"= 20'
JOB NO. baseSANDERSCUMMING
Sheet 3.3 of 3.5 Sheets



STAGING SEQUENCE:

1.)INSTALL CONCRETE "BOX CULVERT".
2.) TOP ROAD "SIDE DITCH" WITH 24" SURGE STONE AS SHOWN-MAINTAIN ROAD DITCH
3.)DIVERT FLOW FROM "LITTLE RIDGE CREEK" TO "BOX CULVERT" AND RELOCATE STONE FROM "CHECK DAM #1" TO UPSTREAM END OF "BOX CULVERT"
4.)BACKFILL ENTIRE AREA WITH SUITABLE BACKFILL FROM "TEMPORARY STOCKPILE"
5.) INSTALL "EROSION CONTROL MATTING" ON ALL SLOPES AS SHOWN
6.)PAVE SANDERS ROAD
7.)ADD RIPRAP TO OUTLET END OF CULVERT AND REMOVE COFFERDAM SHEET PILING.
8.) REMOVE ALL SEDIMENT LOCATED WITHIN COVE AS A RESULT OF DAM BREACH. QUANTITY TO BE REMOVED AS PER CORE SAMPLING DATA AND BY MEANS AND METHODS AS APPROVED BY USACE.

PLAN

SCALE: 1" =20'

20 0 20 40 60
GRAPHIC SCALE-FEET

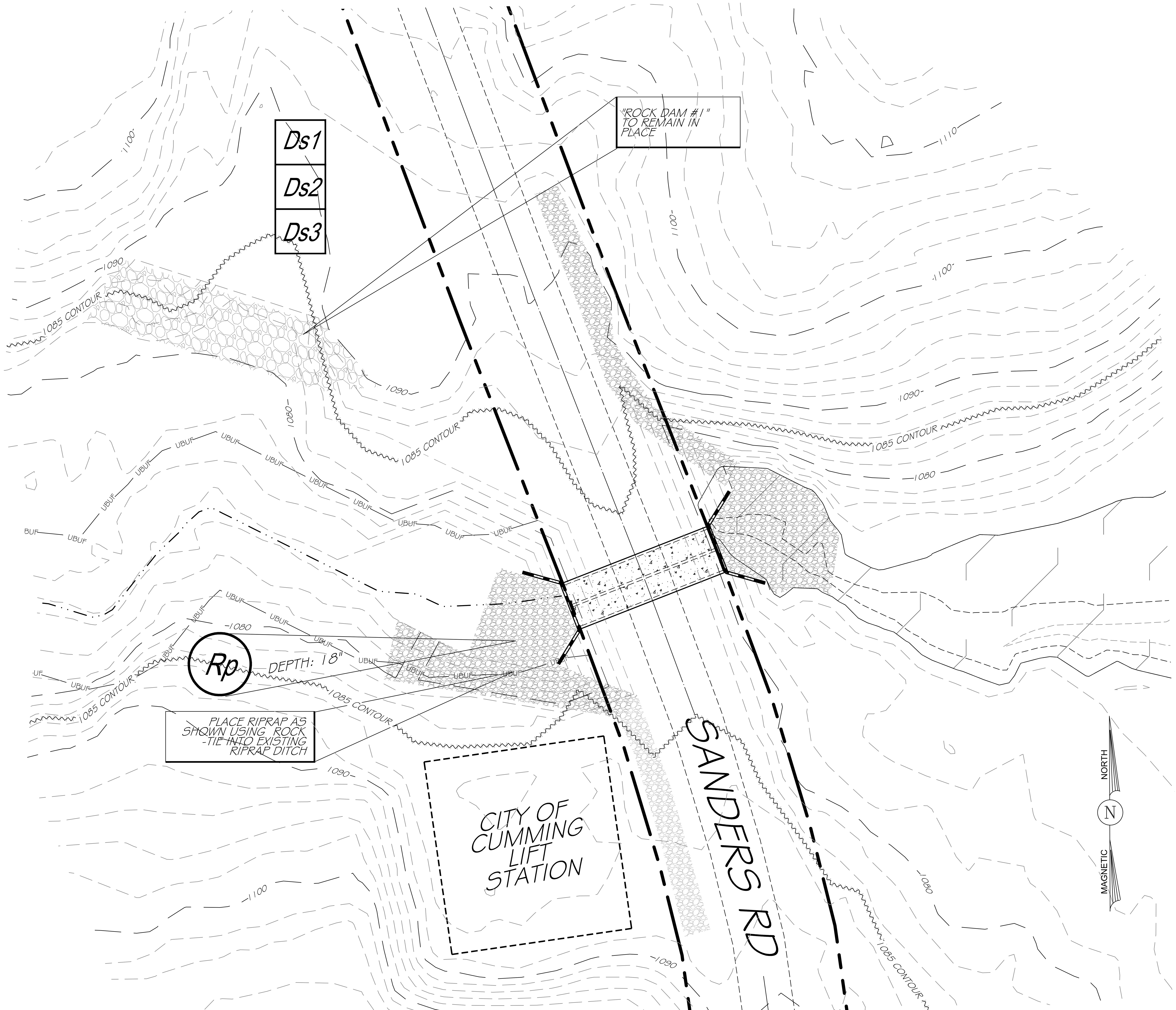
CONTRACTING ENGINEERS INCORPORATED

LAKE ALICE DAM BREACH REMEDIATION

CONSTRUCTION PHASE
SANDERS ROAD STAGING

REVISIONS:

Date AUG 28, 2013
Scale 1"= 20'
JOB NO. baseSANDERSCUMMING
Sheet 3.4 of 3.5 Sheets



PLAN

SCALE: 1" =20'

20 0 20 40 60
GRAPHIC SCALE-FEET

STAGING SEQUENCE:

1.)PERMANENTLY GRASS "SETTLING POND #1"
2.)INSTALL ADDITIONAL RIPRAP AS SHOWN
3.)REMOVE "RUN A" AND "RUN B" SILT FENCE, AND THE EXISTING "TURBIDITY CURTAIN"

CONTRACTING ENGINEERS INCORPORATED
6420 JEWELL BENNETT RD
DAWSONVILLE GA 30534
678-773-1535

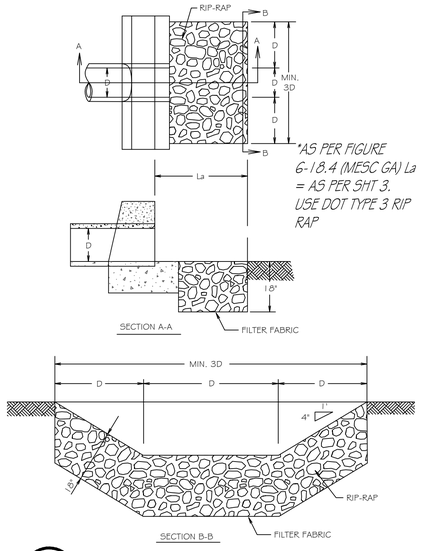
LAKE ALICE DAM BREACH REMEDIATION

* FINAL PHASE
SANDERS ROAD STAGING

REVISIONS:

Date AUG 28, 2013
Scale 1"= 20'
JOB NO. baseSANDERSCUMMING
Sheet 3.5 of 3.5 Sheets

HEADWALL PLAN



St **Outlet Protection**

Rp **Rip Rap**

SOIL CONDITIONS

Due to grading and construction, the areas to be treated are mainly subsoil and substrata. Fertility is low and the physical characteristics of the exposed material are unfavorable to all but the most handy plants.

TREATMENT SPECIFICATIONS

A.) **Hydraulic Seeding Equipment (Hydroseeding):** When hydraulic seeding and fertilizing equipment is used, no grading and shaping or seedbed preparation will be required. The fertilizer, seed and wood cellulose fiber mulch will be mixed with water and applied in a slurry. All slurry ingredients must be combined to form a homogeneous mixture, and spread uniformly over the area, leaving about 25% of the ground surface exposed.

B.) **Conventional Seeding Equipment (Hand seeding):** Grade, shape and smooth where needed to provide for safe equipment operation at seeding time and for maintenance purposes. The lime and fertilizer in dry form will be spread uniformly over the area immediately before seedbed preparation. A seedbed will be done with cultipacker-seeder, drill, rotary seeder or other mechanical or hand seeder. Seed will be distributed uniformly over a freshly prepared seedbed and covered lightly. Within 24 hours after seeding, straw or hay mulch will be spread with blower-type mulch equipment or by hand and achored immediatedly after is spread. A disk harrow with the disk set straight or a special packer disk may be used to press the mulch into the soil

PREPARATION APPLICATION RATES

Agricultural limestone	4000 lbs/acre	
Fertilizer, 5-10-15		1500 lbs/acre
Mulch, straw or hay	5000 lbs/acre	
Fiber mulch **		1000 lbs/acre

**req'd only if hydroseeded

SEED SPECIES OPTIONS	APPLICATION	PLANTING DATES
Hulled Common Bermudagrass	10 lbs/acre	3/1-6/15
Fescue	50 lbs/acre	9/1-10/31
Fescue, Rye Grass	50 lbs/acre	11/1-2/28
Hay mulch temp. cover	5000 lbs/acre	6/17-8/31

TOPDRESSING

To be applied when plants are 2 to 4 inches tall.

Fertilizer (Ammonium Nitrate 33.5%)	300 lbs/acre

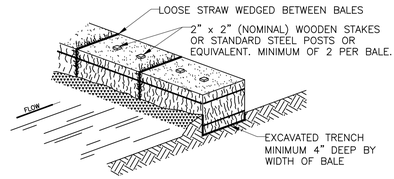
SECOND YEAR FERTILIZER

0-20-20 OR EQUIVALENT**	500 lbs/acre
5-10-15 or equivalent	800 lbs/acre

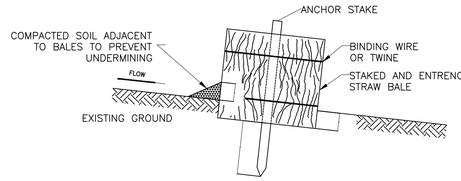
**hydroseeded application

Disturbed Area Stabilization

Ds3	(With Permanent Vegetation)	
Ds2	(With Temporary Vegetation)	11/1-2/28
Ds1	(With Mulch)	6/17-8/31



ISOMETRIC VIEW



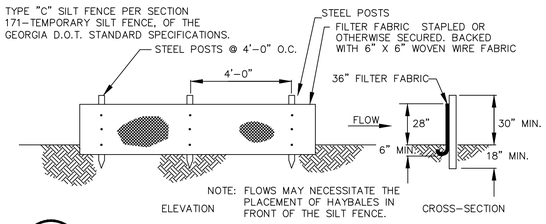
SECTION

NOTES:

1. TURN THE ENDS OF THE STRAW BALE SEDIMENT TRAP UPSLOPE 1 TO 2 FEET IN ELEVATION TO PREVENT FLANKING.
2. THE STRAW BALES SHALL BE BUTTED TOGETHER AS TIGHTLY AS POSSIBLE.
3. THE FIRST ANCHOR STAKE SHALL BE DRIVEN TOWARD THE PREVIOUSLY ANCHORED BALE TO HELP CREATE A TIGHT FIT.

Sd1 **Sediment Barrier – HAYBALES**

N.T.S.



Sd1 **Sediment Barrier – TYPE "C"**

N.T.S.

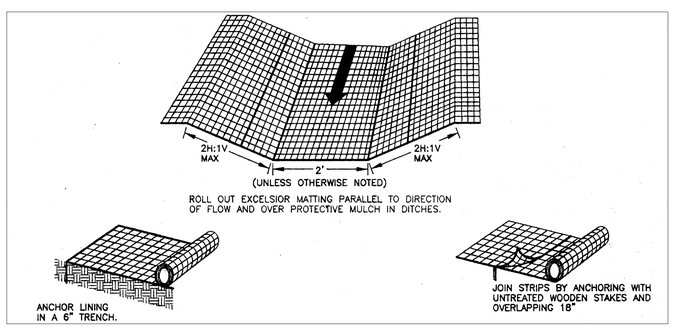
NOTES:

1.) FLOWS MAY NECESSITATE THE PLACEMENT OF HAYBALES IN FRONT OF THE SILT FENCE.

2.) TYPE "C" SILT FENCE PER SECTION 171–TEMPORARY SILT FENCE, OF THE GEORGIA D.O.T. STANDARD SPECIFICATIONS.

3.) SILT FENCE SHALL BE CLEANED OUT WHEN 1/3 OF THE SILT FENCE FACE IS COVERED WITH SEDIMENT.

Su **Surface Roughening**



Mb **Erosion Control Matting**

NOTE: INSTALL ON ALL SLOPES STEEPER THAN 3:1

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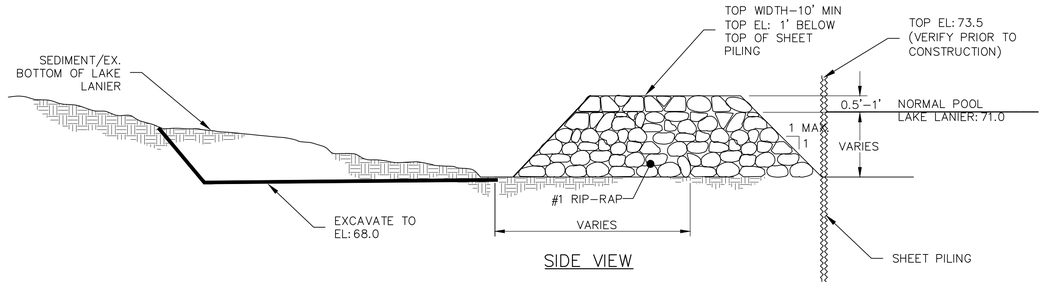
620 JEWELL BENNETT RD
DAWSONVILLE GA 30534
678-737-1455

LAKE ALICE DAM BREACH REMEDIATION

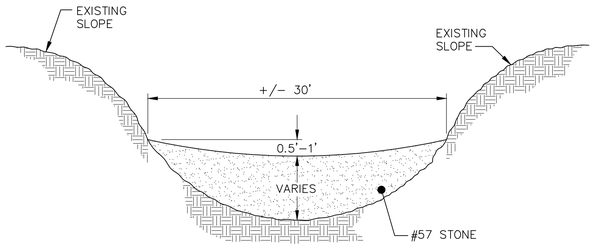
* EROSION DETAILS

REVISIONS:

Date AUG 28, 2013
Scale 1"= AS NOTED
JOB NO. base SANDERSCUMMING
Sheet 4.1 of 4.5 Sheets

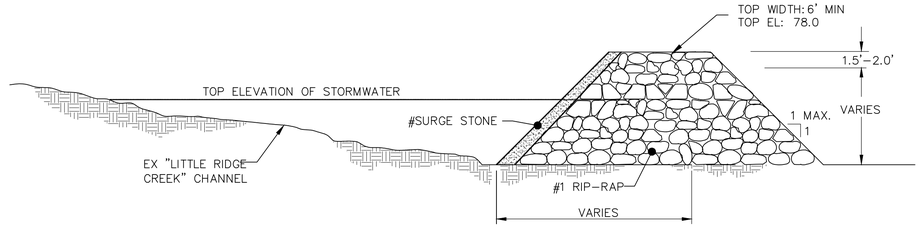


SIDE VIEW

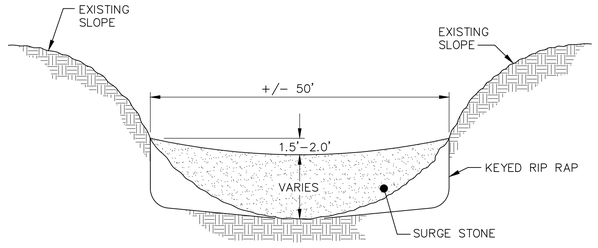


FRONT VIEW

Temporary Rock Staging Area #1



SIDE VIEW



FRONT VIEW

NOTES:

1. HEIGHT & WIDTH DETERMINED BY EXISTING TOPOGRAPHY AND SEDIMENT STORAGE REQUIRED.
2. KEY RIP RAP INTO THE DAM FOR STABILIZATION.

Check Dam #1

NOTES:

INSTALLATION

DIVERT RUNOFF FROM UNDISTURBED AREAS AWAY FROM THE BASIN (REFERENCE DETAIL 04000.09 "STANDARD DIVERSION BERM") DELAY CLEANING POND AREA UNTIL DAM IS IN PLACE.
EXCAVATE FOUNDATION FOR APRON AND USE IT AS A TEMPORARY SEDIMENT BASIN DURING CONSTRUCTION OF DAM.
CLEAR AND GRUB AREA UNDER DAM, REMOVING ALL ROOT MATTER AND OTHER OBJECTIONABLE MATERIAL. GRADE EARTH ABUTMENTS NO STEEPER THAN 1:1. DISPOSE OF MATERIAL IN APPROVED LOCATION.
IF CUTOFF TRENCH IS REQUIRED, EXCAVATE AT CENTER LINE OF DAM EXTENDING ALL THE WAY UP EARTH ABUTMENTS.

PROTECTION FROM PIPING

THE ENTIRE FOUNDATION INCLUDING BOTH EARTH ABUTMENTS MUST BE COVERED BY FILTER FABRIC, OVERLAP 1 FT AT ALL JOINTS, UPSTREAM STRIPS OVER DOWNSTREAM STRIP (SEE CROSS SECTION).

SMOOTH THE FOUNDATION AREA BEFORE PLACING FILTER FABRIC. BE CAREFUL PLACING ROCK ON FABRIC, IT MAY BE HELPFUL TO PLACE A 4–INCH LAYER OF SAND OVER FABRIC BEFORE PLACING ROCK.

EMBANKMENT AND POOL

CONSTRUCT EMBANKMENT TO DIMENSIONS SHOWN ON PLANS, USE WELL GRADED HARD, ANGULAR, WEATHER–RESISTANT ROCK. ABUTMENTS MUST BE AT LEAST 2 FT HIGHER THAN THE SPILLWAY CREST AND AT LEAST 1 FT HIGHER THAN THE DOWNSTREAM FACE OF DAM AT ALL POINTS. (SEE PLAN)

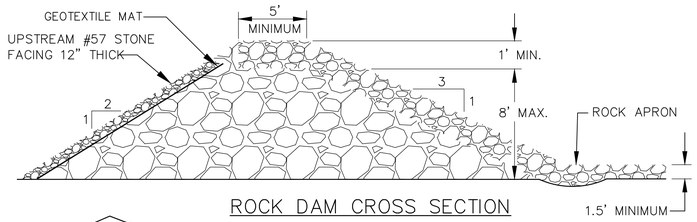
DIVERT SEDIMENT–LADEN FLOW TO UPPER END OF BASIN.

SET MARKER STAKE TO INDICATE CLEAN OUT ELEVATION WHERE SEDIMENT POOL IS 50% FULL.

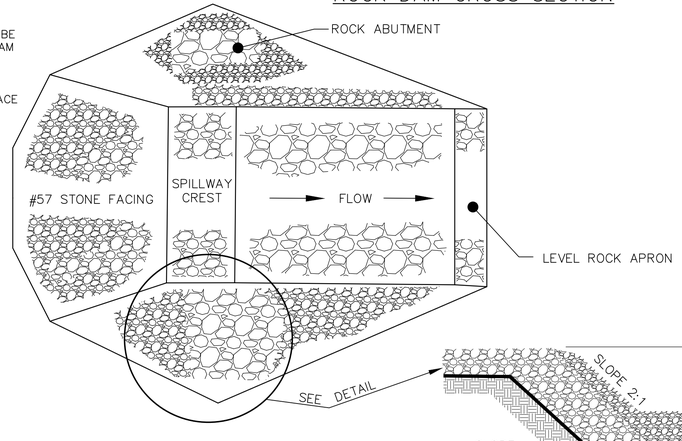
STABILIZE ALL DISTURBED AREAS EXCEPT THE LOWER ONE–HALF OF SEDIMENT POOL AS SHOWN IN THE VEGETATION PLAN.

SAFETY

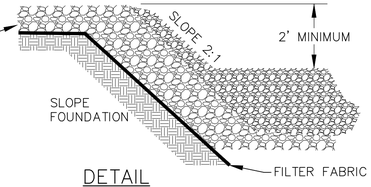
SEDIMENT BASINS THAT IMPOUND WATER ARE HAZARDOUS. BASINS SHOULD BE DEWATERED BETWEEN STORMS. AVOID STEEP SLOPES. FENCES WITH WARNING SIGNS MAY BE NECESSARY IF TRESPASSING IS LIKELY. STATE AND LOCAL REQUIREMENTS MUST BE FOLLOWED.



ROCK DAM CROSS SECTION



PLAN WITH SPILLWAY DETAIL



DETAIL

Rock Dam #1

GEORGIA REGISTERED PROFESSIONAL ENGINEER L. M. BENNETT
CONTRACTING ENGINEERS INCORPORATED
620 JEWELL BENNETT RD
DAWSONVILLE GA 30534
678-710-1555

LAKE ALICE DAM BREACH REMEDIATION

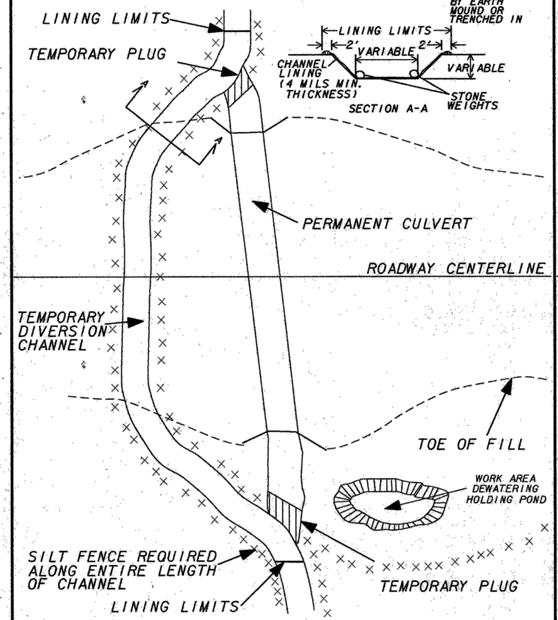
ROCK/CHECK DAM DETAILS

*

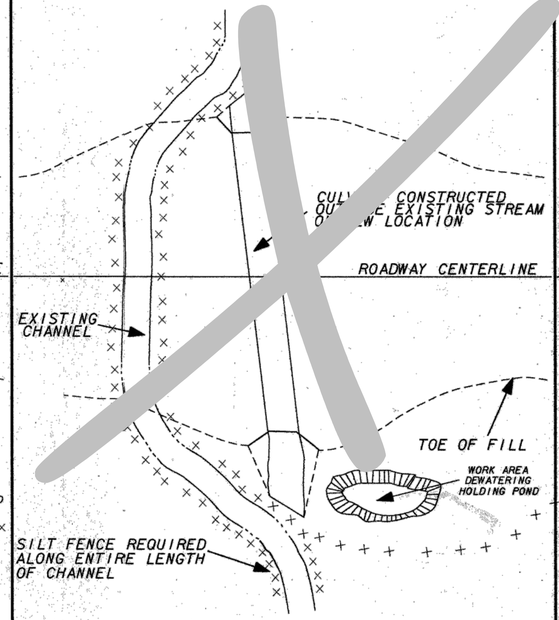
REVISIONS:

Date AUG 28, 2013
Scale 1"= AS NOTED
JOB NO. baseSANDERSCUMMING
Sheet 4.2 of 4.5 Sheets

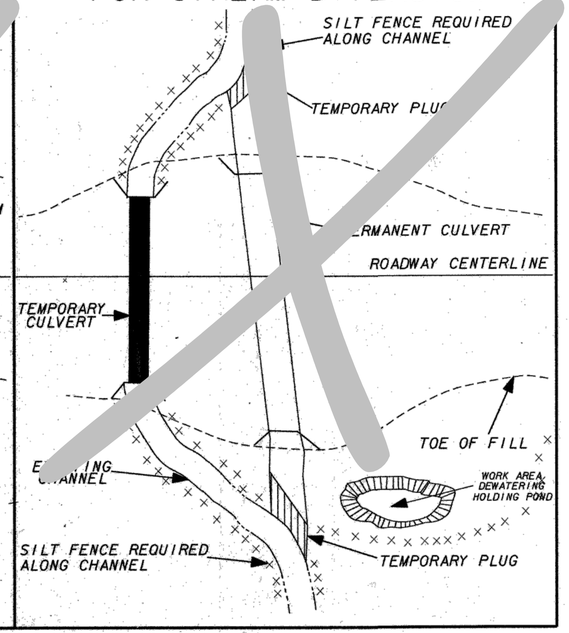
TEMPORARY DIVERSION CHANNEL PLASTIC LINING



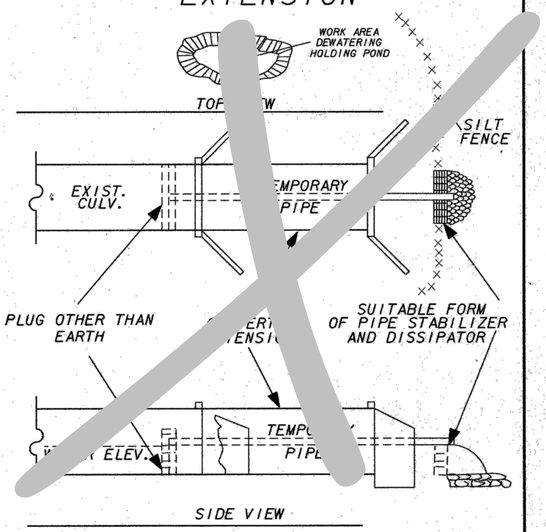
CULVERT CONSTRUCTED OUTSIDE EXISTING STREAM



TEMPORARY CULVERT FOR STREAM DIVERSION



PIPE OR BOX CULVERT EXTENSION



STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.			

1. THESE DETAILS ARE NOT CONSTRUCTION DRAWINGS. THEY ARE ROUGH SKETCHES OF IDEAS. ALTERNATES MAY BE SUBMITTED BY THE CONTRACTOR IN THE EROSION CONTROL PLAN.
2. DIVERSION CHANNELS TO BE INCLUDED IN THE COST OF CULVERT. WHEN REQUIRED.
3. THE PLASTIC LINING SHALL BE PVC OR PE MATERIAL WITH A MINIMUM THICKNESS OF 6 MILS.
4. THE LAP OF THE SHEETS OF PLASTIC LINING SHALL BE A MINIMUM OF 2 FEET.
5. THE DIVERSION CHANNEL SHOULD BE THE SAME WIDTH AND DEPTH AS THE EXISTING CHANNEL.

BY	REVISION DATE
M.W.	JUNE 28, 1989
M.W.	OCTOBER 23, 1992
M.W.	MAY 14, 1993
M.W.	JUNE 28, 1993

GEORGIA DEPARTMENT OF TRANSPORTATION

EXAMPLES OF DIVERSION CHANNELS

D-38

GEORGIA REGISTERED PROFESSIONAL ENGINEER J. M. BENNETT

CONTRACTING ENGINEERS INCORPORATED
620 JEWELL BENNETT RD
DAWSONVILLE GA 30534
678-735-1555

LAKE ALICE DAM BREACH REMEDIATION

* TEMPORARY DIVERSION DETAIL

REVISIONS:

Date AUG 28, 2013
Scale 1"= AS NOTED
JOB NO. base SANDERSCUMMING
Sheet 4.3 of 4.5 Sheets

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.			

REINFORCING STEEL - BARRELS

BARREL DESIGN NO. I

FOR 1.5' TO 12.0 DEPTH OF FILL OVER BBL. INCL. PAVING

	CLEAR SPAN	CLEAR HEIGHT	"A" BARS				"G" BARS				"H" BARS				"B" DIA.				"C" 1/2" DIA.			"D" 1/2" DIA.		
			SIZE	NO.	LENGTH	SPACE	SIZE	NO.		SPACE	SIZE	NO.	LENGTH	SPACE	SIZE	NO.	LENGTH	SPACE	NO.	LENGTH	SPACE	NO.	LENGTH	SPACE
DOUBLE	7'	4'	3/4" DIA.	2x ("L" IN INCHES / SPACING) + 2 BARS	16'-2"	15'	7/8" DIA.	2x ("L" IN INCHES / SPACING)	16'-5"	15"	7/8" DIA.	SAME AS "A" BARS	5'-0"	15"	1/2" DIA.	3x(L IN INCHES/SPACING) + 3 BARS	5'-2"	12"	32	1/2 AT "L" IN FT. + 5'-6" + 2'-0" FOR EACH LAP. 1/2 AT "L" IN FT. + 5'-7" + 2'-0" FOR EACH LAP.	12"	12	2/3 AT "L" IN FT. + 4'-6" + 2'-0" FOR EACH LAP. 1/3 AT "L" IN FT. + 1'-8" + 2'-0" FOR EACH LAP.	12"
		5'			16'-2"	15'			16'-5"	15"			5'-0"	15"			6'-2"	12"	32		12"	15		12"
		6'			16'-2"	15'			16'-5"	15"			5'-0"	15"	5/8" DIA.		7'-2"	12"	32		12"	18		12"
		7'			16'-2"	15'			16'-5"	15"			5'-0"	15"			8'-3"	10"	32		12"	21		12"
	8'	4'	5/8" DIA.		18'-2"	13"	7/8" DIA.		18'-6"	13"	7/8" DIA.		5'-6"	13"	1/2" DIA.		5'-4"	12"	36		12"	12		12"
		5'			18'-2"	13"			18'-6"	13"			5'-6"	13"			6'-4"	12"	36		12"	15		12"
		6'			18'-2"	13"			18'-6"	13"			5'-6"	13"	5/8" DIA.		7'-4"	12"	36		12"	18		12"
		7'			18'-2"	13"			18'-6"	13"			5'-6"	13"			8'-4"	10"	36		12"	21		12"
		8'			18'-8"	13"			19'-0"	13"			5'-6"	13"	3/4" DIA		9'-5"	12"	36		12"	24		12"
	9'	4'	5/8" DIA.		20'-2"	12"	7/8" DIA.		20'-6"	12"	7/8" DIA.		6'-0"	12"	1/2" DIA.		5'-6"	12"	40		12"	12		12"
		5'			20'-2"	12"			20'-6"	12"			6'-0"	12"			6'-6"	12"	40		12"	15		12"
		6'			20'-2"	12"			20'-6"	12"			6'-0"	12"	5/8" DIA.		7'-6"	12"	40		12"	18		12"
		7'			20'-2"	12"			20'-6"	12"			6'-0"	12"			8'-6"	10"	40		12"	21		12"
		8'			20'8"	12"			21'-0"	12"			6'-0"	12"	3/4" DIA.		9'-7"	12"	40		12"	24		12"
		9'			20'8"	12"			21'-0"	12"			6'-0"	12"			10'-7"	10"	40		12"	27		12"
		10'			20'8"				21'-0"	12"			6'-0"	12"			11'-7"	10"	40		12"	30		12"
TRIPLE	7'	4'	3/4" DIA.	2x ("L" IN INCHES / SPACING) + 2 BARS	24'-0"	15'	7/8" DIA.	2x ("L" IN INCHES / SPACING)	24'-6"	15"	7/8" DIA.	SAME AS "A" BARS	13'-0"	15"	1/2" DIA.	4x(L IN INCHES/SPACING) + 4 BARS	5'-2"	12"	48	1/2 AT "L" IN FT. + 5'-6" + 2'-0" FOR EACH LAP. 1/2 AT "L" IN FT. + 5'-7" + 2'-0" FOR EACH LAP.	12"	16	1/2 AT "L" IN FT. + 4'-6" + 2'-0" FOR EACH LAP. 1/2 AT "L" IN FT. + 1'-8" + 2'-0" FOR EACH LAP.	12"
		5'			24'-0"	15'			24'-6"	15"			13'-0"	15"			6'-2"	12"	48		12"	20		12"
		6'			24'-0"	15'			24'-6"	15"			13'-0"	15"	5/8" DIA.		7'-2"	12"	48		12"	24		12"
		7'			24'-0"	15'			24'-7"	15"			13'-0"	15"			8'-3"	10"	48		12"	28		12"
	8'	4'	5/8" DIA.		27'-0"	13"	7/8" DIA.		27'-7"	13"	7/8" DIA.		14'-6"	13"	1/2" DIA.		5'-4"	12"	54		12"	16		12"
		5'			27'-0"	13"			27'-7"	13"			14'-6"	13"			6'-4"	12"	54		12"	20		12"
		6'			27'-0"	13"			27'-7"	13"			14'-6"	13"	5/8" DIA.		7'-4"	12"	54		12"	24		12"
		7'			27'-0"	13"			27'-7"	13"			14'-6"	13"			8'-4"	10"	54		12"	28		12"
		8'			27'-8"	13"			28'-4"	13"			14'-6"	13"	3/4" DIA		9'-5"	12"	54		12"	32		12"
	9'	4'	5/8" DIA.		30'-0"	12"	7/8" DIA.		30'-7"	12"	7/8" DIA.		16'-0"	12"	1/2" DIA.		5'-6"	12"	60		12"	16		12"
		5'			30'-0"	12"			30'-7"	12"			16'-0"	12"			6'-6"	12"	60		12"	20		12"
		6'			30'-0"	12"			30'-7"	12"			16'-0"	12"	5/8" DIA.		7'-6"	12"	60		12"	24		12"
		7'			30'-0"	12"			30'-7"	12"			16'-0"	12"			8'-6"	10"	60		12"	28		12"
		8'			30'-8"	12"			31'-4"	12"			16'-0"	12"	3/4" DIA.		9'-7"	12"	60		12"	32		12"
		9'			30'-8"	12"			31'-4"	12"			16'-0"	12"			10'-7"	10"	60		12"	36		12"
		10'			30'-8"	12"			31'-4"	12"			16'-0"	12"			11'-7"	10"	60		12"	40		12"

BARREL DESIGN NO. 2

FOR 12.1 TO 20.0 DEPTH OF FILL

	CLEAR SPAN	CLEAR HEIGHT	"A" BARS				"G" BARS				"H" BARS				B		C		"D" 1/2" DIA.		
			SIZE	NO.	LENGTH	SPACE	SIZE	NO.	LENGTH	SPACE	SIZE	NO.	LENGTH	SPACE		LENGTH		LENGTH	NO.	LENGTH	SPACE
DOUBLE	7'	4'	5/8" DIA.	2x ("L" IN INCHES / SPACING) + 2 BARS	17'-10"	13"	3/4" DIA.	2x ("L" IN INCHES / SPACING)	18'-3"	13"	1" DIA.	SAME AS "A" BARS	5'-0"	13"	NUMBER, SIZE & SPACING SAME AS DESIGN I	5'-6"	NUMBER, SIZE & SPACING SAME AS DESIGN I	1/2 AT "L" IN FT. + 5'-10" + 2'-0" FOR EACH LAP. 1/2 AT "L" IN FT. + 5'-6" + 2'-0" FOR EACH LAP.	12	2/3 AT "L" IN FT. + 4'-6" + 2'-0" FOR EACH LAP. 1/3 AT "L" IN FT. + 1'-8" + 2'-0" FOR EACH LAP.	12
		5'			18'-2"	12"			18'-7"	12"			5'-0"	12"		6'-6"			15		12
		6'			18'-2"	12"			18'-7"	12"			5'-0"	12"		7'-6"			18		12
		7'			18'-6"	12"			18'-11"	12"			5'-0"	12"		8'-7"			21		12
	8'	4'	5/8" DIA.		19'-10"	13"	7/8" DIA.		20'-3"	13"	1" DIA.		5'-6"	13"		5'-8"			12		12
		5'			20'-2"	12"			20'-8"	12"			5'-6"	12"		6'-9"			15		12
		6'			20'-2"	12"			20'-8"	12"			5'-6"	12"		7'-9"			18		12
		7'			20'-6"	12"			21'-0"	12"			5'-6"	12"		8'-9"			21		12
		8'			20'-8"	11"			21'-2"	11"			5'-6"	11"		9'-9"			24		12
	9'	4'	5/8" DIA.		22'-2"	11"	7/8" DIA.		22'-9"	11"	1" DIA.		6'-0"	11"		5'-11"			12		12
		5'			22'-6"	11"			23'-1"	11"			6'-0"	11"		6'-11"			15		12
		6'			22'-6"	11"			23'-1"	11"			6'-0"	11"		7'-11"			18		12
		7'			22'10"	10"			23'-5"	10"			6'-0"	10"		9'-0"			21		12
		8'			23'-0"	10"			23'-7"	10"			6'-0"	10"		10'-0"			24		12
		9'			23'-2"	10"			23'-9"	10"			6'-0"	10"		11'-0"			27		12
		10'			23'-6"	10"			24'-1"	10"			6'-0"	10"		12'-1"			30		12
TRIPLE	7'	4'	5/8" DIA.	2x ("L" IN INCHES / SPACING) + 2 BARS	25'-8"	13"	3/4" DIA.	2x ("L" IN INCHES / SPACING)	26'-6"	13"	1" DIA.	SAME AS "A" BARS	13'-0"	13"	NUMBER, SIZE & SPACING SAME AS DESIGN I	5'-6"	NUMBER, SIZE & SPACING SAME AS DESIGN I	1/2 AT "L" IN FT. + 5'-10" + 2'-0" FOR EACH LAP. 1/2 AT "L" IN FT. + 5'-6" + 2'-0" FOR EACH LAP.	16	1/2 AT "L" IN FT. + 4'-6" + 2'-0" FOR EACH LAP. 1/2 AT "L" IN FT. + 1'-8" + 2'-0" FOR EACH LAP.	12
		5'			26'-0"	12"			26'-10"	12"			13'-0"	12"		6'-6"			20		12
		6'			26'-0"	12"			26'-10"	12"			13'-0"	12"		7'-6"			24		12
		7'			26'-4"	12"			27'-3"	12"			13'-0"	12"		8'-7"			28		12
	8'	4'	5/8" DIA.		28'-8"	13"	7/8" DIA.		29'-7"	13"	1" DIA.		14'-6"	13"		5'-8"			16		12
		5'			29'-0"	12"			29'-11"	12"			14'-6"	12"		6'-9"			20		12
		6'			29'-0"	12"			29'-11"	12"			14'-6"	12"		7'-9"			24		12
		7'			29'-4"	12"			30'-3"	12"			14'-6"	12"		8'-9"			28		12
		8'			29'-8"	11"			30'-7"	11"			14'-6"	11"		9'-9"			32		12
	9'	4'	5/8" DIA.		32'-0"	11"	7/8" DIA.		33'-0"	11"	1" DIA.		16'-0"	11"		5'-11"			16		12
		5'			32'-4"	11"			33'-4"	11"			16'-0"	11"		6'-11"			20		12
		6'			32'-4"	11"			33'-4"	11"			16'-0"	11"		7'-11"			24		12
		7'			32'-8"	10"			33'-9"	10"			16'-0"	10"		9'-0"			28		12
		8'			33'-0"	10"			34'-1"	10"			16'-0"	10"		10'-0"			32		12
		9'			33'-2"	10"			34'-3"	10"			16'-0"	10"		11'-0"			36		12
		10'			33'-6"	10"			34'-7"	10"			16'-0"	10"		12'-1"			40		12

DIMENSIONS / QUANTITIES

	CLEAR SPAN	CLEAR HEIGHT	BARREL DESIGN NO. I				BARREL DESIGN NO. 2				REINFORCING STEEL			CONCRETE			
											LBS. PER LIN. FT. OF BARREL		WINGWALLS AND PARAPETS TOTAL LBS.	CU.YDS. PER LINEAR FT. OF BARREL		WINGWALLS & PARAPETS	
			T_1	T_2	V	P	T_1	T_2	V	P	DES. NO. I	DES. NO. 2		DES. NO. I	DES. NO. 2	CU.YDS. CONC.	Z
DOUBLE	7'	4'	9"	10"	5'-6"	16'-6"	11"	10"	5'-10"	16'-6"	155.8	157.1	599	1.306	1.509	15.46	2'-1"
		5'	9"	10"	6'-6"	16'-6"	11"	12"	6'-10"	16'-10"	160.1	172.0	731	1.398	1.686	18.04	2'-1"
		6'	9"	10"	7'-6"	16'-6"	11"	12"	7'-10"	16'-10"	172.7	185.0	856	1.491	1.791	20.82	2'-1"
		7'	9½"	10"	8'-7"	16'-6"	11½"	14"	8'-11"	17'-2"	183.6	197.9	1019	1.634	2.058	23.96	2'-1½"
	8'	4'	10"	10"	5'-8"	18'-6"	12"	10"	6'-0"	18'-6"	175.9	193.2	628	1.531	1.759	16.30	2'-2"
		5'	10"	10"	6'-8"	18'-6"	12½"	12"	7'-1"	18'-10"	180.3	211.4	762	1.623	1.996	18.90	2'-2"
		6'	10"	10"	7'-8"	18'-6"	12½"	12"	8'-1"	18'-10"	193.1	224.7	886	1.716	2.101	21.70	2'-2"
		7'	10"	10"	8'-8"	18'-6"	12½"	14"	9'-1"	19'-2"	203.8	237.7	1052	1.809	2.318	24.82	2'-2"
		8'	10½"	12"	9'-9"	19'-0"	12½"	14"	10'-1"	19'-4"	220.5	268.4	2698	2.139	2.498	29.77	2'-2½"
	9'	4'	11"	10"	5'-10"	20'-6"	13½"	10"	6'-3"	20'-6"	204.2	243.2	682	1.781	2.097	17.47	2'-3"
		5'	11"	10"	6'-10"	20'-6"	13½"	12"	7'-3"	20'-10"	208.6	249.8	798	1.873	2.279	20.13	2'-3"
		6'	11"	10"	7'-10"	20'-6"	13½"	12"	8'-3"	20'-10"	221.6	263.3	948	1.966	2.384	23.00	2'-3"
		7'	11"	10"	8'-10"	20'-6"	14"	14"	9'-4"	21'-2"	232.4	294.5	1093	2.059	2.669	26.14	2'-3"
		8'	11½"	12"	9'-11"	21'-0"	14"	14"	10'-4"	21'-4"	249.5	309.7	2806	2.398	2.850	31.17	2'-3½"
		9'	11½"	12"	10'-11"	21'-0"	14"	15"	11'-4"	21'-6"	265.9	327.7	3239	2.509	3.043	35.00	2'-3½"
		10'	11½"	12"	11'-11"	21'-0"	14½"	17"	12'-5"	21'-10"	273.7	338.6	3812	2.620	3.393	40.23	2'-3½"
TRIPLE	7'	4'	9"	10"	5'-6"	24'-4"	11"	10"	5'-10"	24'-4"	247.8	255.7	681	1.873	2.174	18.40	2'-1"
		5'	9"	10"	6'-6"	24'-4"	11"	12"	6'-10"	24'-8"	253.5	278.4	813	1.997	2.382	21.04	2'-1"
		6'	9"	10"	7'-6"	24'-4"	11"	12"	7'-10"	24'-8"	270.3	295.7	938	2.120	2.517	23.87	2'-1"
		7'	9½"	10"	8'-7"	24'-4"	11½"	14"	8'-11"	25'-0"	284.9	312.3	1101	2.319	2.840	27.08	2'-1½"
	8'	4'	10"	10"	5'-8"	27'-4"	12"	10"	6'-0"	27'-4"	283.6	312.6	720	2.209	2.546	19.57	2'-2"
		5'	10"	10"	6'-8"	27'-4"	12½"	12"	7'-1"	27'-8"	289.4	340.1	854	2.332	2.842	22.24	2'-2"
		6'	10"	10"	7'-8"	27'-4"	12½"	12"	8'-1"	27'-8"	306.4	357.7	978	2.456	2.977	25.10	2'-2"
		7'	10"	10"	8'-8"	27'-4"	12½"	14"	9'-1"	28'-0"	320.7	374.4	1144	2.579	3.225	28.29	2'-2"
		8'	10½"	12"	9'-9"	28'-0"	12½"	14"	10'-1"	28'-4"	343.0	421.2	2792	3.028	3.498	33.46	2'-2½"
	9'	4'	11"	10"	5'-10"	30'-4"	13½"	10"	6'-3"	30'-4"	331.0	395.4	784	2.581	3.049	21.10	2'-3"
		5'	11"	10"	6'-10"	30'-4"	13½"	12"	7'-3"	30'-8"	336.7	403.5	901	2.705	3.262	23.81	2'-3"
		6'	11"	10"	7'-10"	30'-4"	13½"	12"	8'-3"	30'-8"	354.0	421.8	1051	2.828	3.398	26.75	2'-3"
		7'	11"	10"	8'-10"	30'-4"	14"	14"	9'-4"	31'-0"	358.4	468.0	1196	2.952	3.744	29.95	2'-3"
		8'	11½"	12"	9'-11"	31'-0"	14"	14"	10'-4"	31'-4"	391.5	489.1	2910	3.414	4.019	35.20	2'-3½"
		9'	11½"	12"	10'-11"	31'-0"	14"	15"	11'-4"	31'-6"	413.3	512.7	3344	3.562	4.250	39.10	2'-3½"
		10'	11½"	12"	11'-11"	31'-0"	14½"	17"	12'-5"	31'-10"	426.7	526.3	3916	3.710	4.667	44.41	2'-3½"

SECTION OF BARREL

SECTION OF SLAB SHOWING REINFORCING

HALF SECTION OF BARREL

BARS D

BARS E

TOP BARS C BOTTOM

BENDING FOR G BARS

BOX CULVERT REQUIREMENTS:

MINIMUM FILL HEIGHT FROM TOP OF CULVERT TO BOTTOM OF BASE WITHIN TRAVELWAY SHALL BE 12 INCHES.

MAXIMUM POUR LENGTH SHALL NOT EXCEED 30 FEET ALONG THE LENGTH OF THE CULVERT.

TRANSVERSE CONSTRUCTION JOINTS SHALL BE PLACED IN THE BARREL, NORMAL TO THE CENTERLINE OF CULVERT, AT THE OUTSIDE SHOULDER BREAK POINTS. LONGITUDINAL BARREL REINFORCING STEEL SHALL NOT BE CONTINUOUS THROUGH THESE JOINTS, PROVIDED THAT THE JOINTS ARE MORE THAN 15 FEET FROM THE BARREL ENDS.
WHEN TRANSVERSE CONSTRUCTION JOINTS OCCUR WITHIN 15 FEET OF THE BARREL ENDS OR WITHIN THE LIMITS OF THE PAVEMENT, THE LONGITUDINAL BARREL REINFORCING SHALL THEN BE CONTINOUS THROUGH SUCH JOINTS. THE MINIMUM LENGTH OF LAP SPLICE FOR LONGITUDINAL REINFORCING SHALL BE 24 INCHES.

TRANSVERSE CONSTRUCTION JOINTS PLACED AT ANY OTHER LOCATION NOT SPECIFIED ABOVE SHALL BE FORMED WITH NO LONGITUDINAL REINFORCING STEEL PASSING THROUGH THE JOINTS.

GENERAL NOTES

1. CHAMFER-CHAMFER ALL EXPOSED EDGES ¾".
2. APRON WALLS MAY BE OMITTED IF ENGINEER APPROVES. ENGINEER MAY ALSO REQUIRE BOTTOM SLAB TO EXTEND TO END OF WINGS AND APRON PLACED AT THIS POINT.
3. QUANTITIES FOR STEEL SHOWN ARE COMPUTED CONSIDERING ALL A,B,C,D,G AND H BARS AS PART OF BARREL QUANTITIES. STEEL PER LIN. FT. IS AN AVERAGE VALUE FOR A CULVERT OF 40' LENGTH ALLOWING ONE LAP IN LONGITUDINAL BARS.
4. SIZE OF CULVERT - IN DESIGNATION SIZES OF CULVERTS STATE CLEAR SPAN FIRST, I.E., A 9' X 4' CULVERT HAS A 9' CLEAR SPAN AND A 4' CLEAR HEIGHT.
5. COVER-CULVERT TO HAVE MINIMUM OF 1.0' BELOW BOTTOM OF BASE OR CONCRETE PAVEMENT.

DATE
REVISION
BY

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

STANDARD
REINFORCED CONCRETE BOX CULVERTS
DOUBLE 7' X 4' TO TRIPLE 9' X 10'
FOR DEPTHS OF FILL UP TO 20 FEET

NO SCALE
REV. & REDR. NOV., 2001

DES. ____
DRW. ____
TRA. ____
CHK. ____

(SUBMITTED) ____
STATE ROAD & AIRPORT DESIGN ENGR.
(APPROVED) ____
CHIEF ENGINEER

NUMBER
2326
SHEET 1 OF 2

D. M. BENNETT

CONTRACTING
ENGINEERS
INCORPORATED
6420 JEWELL BENNETT RD
DAWSONVILLE GA 30534
678-773-1535

LAKE ALICE DAM BREACH REMEDIATION

* DOUBLE 8X8 BOX CULVERT
BARREL DETAIL

REVISIONS:

Date AUG 28, 2013
Scale 1"= AS NOTED
JOB NO. baseSANDERSCUMMING
Sheet 4.4 of 4.5 Sheets

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.			

WINGWALLS AND PARAPETS

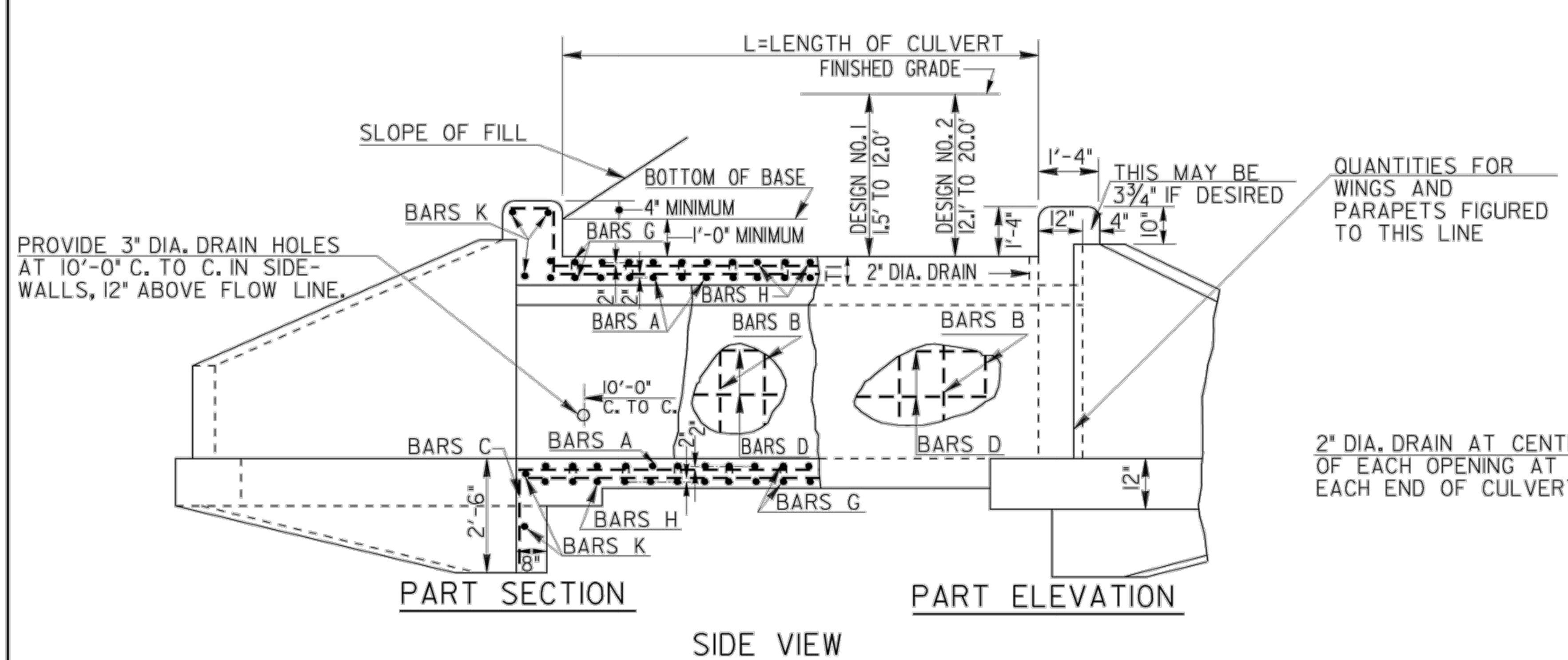
DOUBLES AND TRIPLES

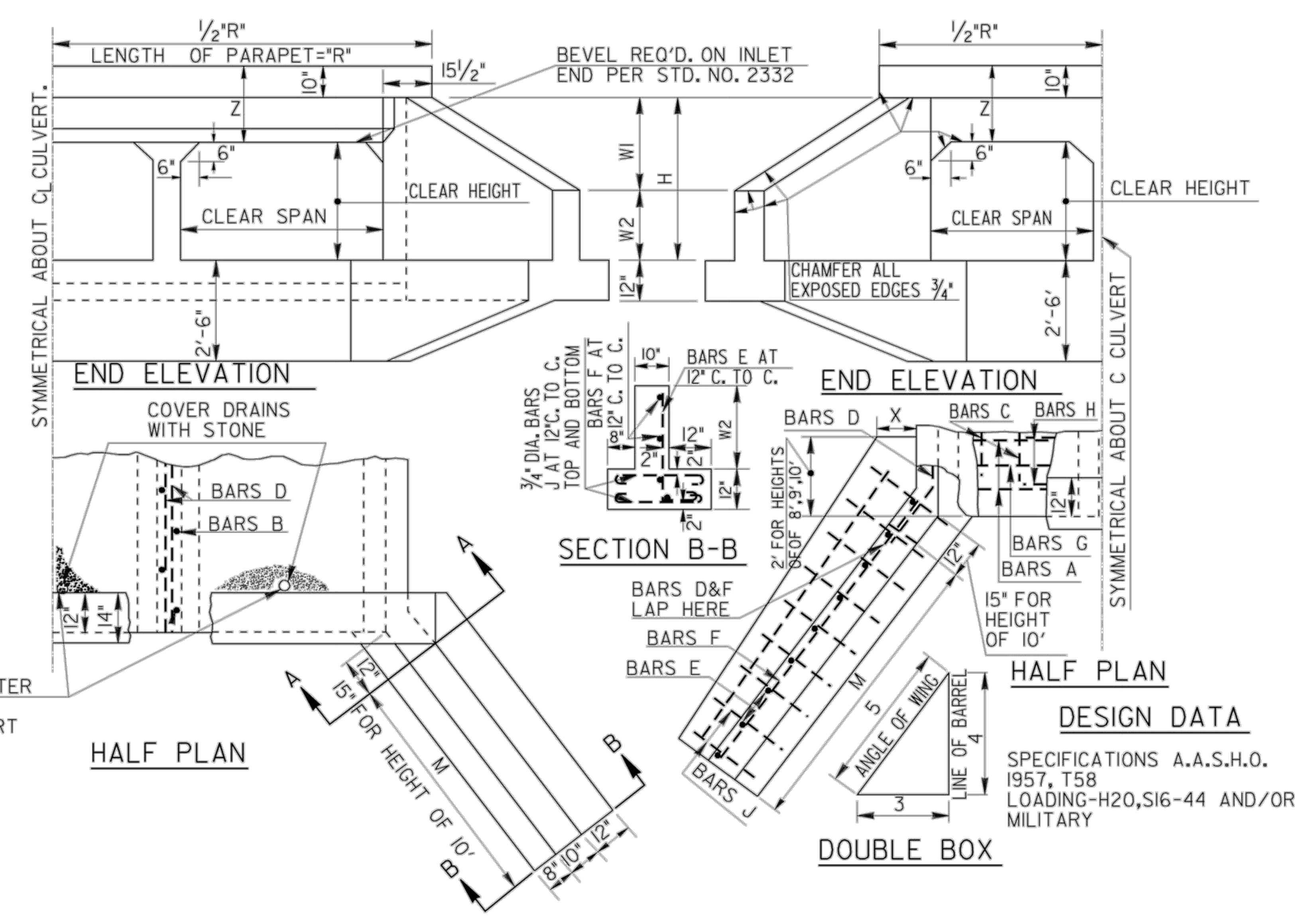
DIMENSIONS

CLEAR SPAN	CLEAR HEIGHT	DESIGN NO. 1 H	DESIGN NO. 1 W1	DESIGN NO. 2 H	DESIGN NO. 2 W1	FOR ALL DESIGNS W2	M	R DOUBLE	R TRIPLE	X
7'	4'	5'-3"	3'-1½"	5'-5"	3'-3½"	2'-1½"	9'-0"	17'-0"	24'-10"	0
7'	5'	6'-3"	3'-8½"	6'-5"	3'-10½"	2'-6½"	10'-6"	17'-4"	25'-2"	0
7'	6'	7'-3"	4'-4"	7'-5"	4'-6"	2'-11"	12'-0"	17'-4"	25'-2"	0
7'	7'	8'-3½"	4'-11½"	8'-5½"	5'-1½"	3'-4"	13'-6"	17'-8"	25'-6"	0
8'	4'	5'-4"	3'-0½"	5'-6"	3'-2½"	2'-3½"	9'-0"	19'-0"	27'-10"	0
8'	5'	6'-4"	3'-7½"	6'-6½"	3'-10"	2'-8½"	10'-6"	19'-4"	28'-2"	0
8'	6'	7'-4"	4'-3"	7'-6½"	4'-5½"	3'-1"	12'-0"	19'-4"	28'-2"	0
8'	7'	8'-4"	4'-10"	8'-6½"	5'-0½"	3'-6"	13'-6"	19'-8"	28'-6"	0
8'	8'	9'-4½"	5'-5½"	9'-6½"	5'-7½"	3'-11"	15'-0"	19'-10"	28'-10"	1'-0"
9'	4'	5'-5"	3'-2"	5'-7½"	3'-4½"	2'-3"	9'-6"	21'-0"	30'-10"	0
9'	5'	6'-5"	3'-9"	6'-7½"	3'-11½"	2'-8"	11'-0"	21'-4"	31'-2"	0
9'	6'	7'-5"	4'-4"	7'-7½"	4'-6½"	3'-1"	12'-6"	21'-4"	31'-2"	0
9'	7'	8'-5"	4'-11½"	8'-8"	5'-2½"	3'-5½"	14'-0"	21'-8"	31'-6"	0
9'	8'	9'-5½"	5'-7"	9'-8"	5'-9½"	3'-10½"	15'-6"	21'-10"	31'-10"	1'-0"
9'	9'	10'-5½"	6'-0"	10'-8"	6'-2½"	4'-5½"	16'-6"	22'-0"	32'-0"	1'-6"
9'	10'	11'-5½"	6'-7"	11'-8½"	6'-9"	4'-10½"	18'-0"	22'-4"	32'-4"	2'-0"

REINFORCING STEEL FOR 4 WINGWALLS & 2 PARAPETS

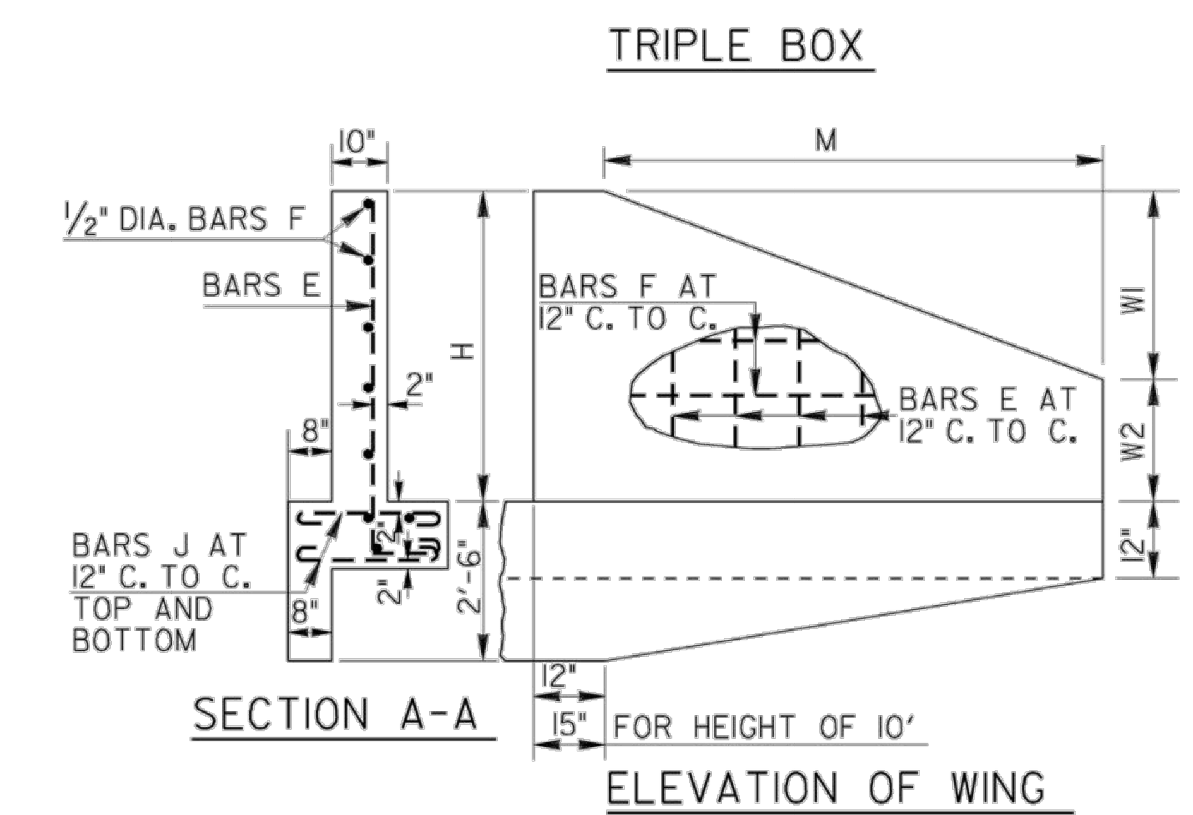
CLEAR SPAN	CLEAR HEIGHT	SIZE		"E" BARS AT 12" C. TO C.										"F" BARS AT ½" DIA. AT 12" C. TO C.							"J" BARS ¾" DIA. AT 12" C. TO C. IN TOP AND BOTTOM							K ⅝" DIA. DOUBLE	K ⅝" DIA. TRIPLE
7'	4'	⅝"	NUMBER	8	8	8	8	8						20	4	4	4											10	10
		DIA.	LENGTH	7'-7"	6'-10"	6'-2"	5'-6"	4'-10"						9'-8"	7'-7"	4'-8"	1'-9"											16'-8"	24'-6"
7'	5'	⅝"	NUMBER	8	8	8	8	8	8					20	4	4	4	4										10	10
		DIA.	LENGTH	8'-7"	7'-10"	7'-2"	6'-5"	5'-9"	5'-0"					11'-2"	10'-4"	7'-5"	4'-7"	1'-9"										17'-0"	24'-10"
7'	6'	⅝"	NUMBER	8	8	8	8	8	8	4				24	4	4	4	4										10	10
		DIA.	LENGTH	9'-7"	8'-10"	8'-1"	7'-5"	6'-8"	6'-0"	5'-7"				12'-8"	10'-1"	7'-4"	4'-7"	1'-9"										17'-0"	24'-10"
7'	7'	⅝"	NUMBER	8	8	8	8	8	8	8	4			24	4	4	4	4	4									10	10
		DIA.	LENGTH	10'-7"	9'-10"	9'-1"	8'-5"	7'-8"	6'-11"	6'-3"	5'-10"			14'-2"	12'-9"	10'-0"	7'-3"	4'-6"	1'-9"									17'-4"	25'-2"
8'	4'	⅝"	NUMBER	8	8	8	8	8						20	4	4	4											10	10
		DIA.	LENGTH	7'-8"	7'-0"	6'-3"	5'-8"	5'-0"						9'-8"	8'-0"	5'-0"	2'-0"											18'-8"	27'-6"
8'	5'	⅝"	NUMBER	8	8	8	8	8	8					20	4	4	4	4										10	10
		DIA.	LENGTH	8'-8"	7'-11"	7'-3"	6'-7"	5'-11"	5'-2"					11'-2"	10'-9"	7'-10"	4'-11"	2'-0"										19'-0"	27'-10"
8'	6'	⅝"	NUMBER	8	8	8	8	8	8	4				24	4	4	4	4										10	10
		DIA.	LENGTH	9'-8"	8'-11"	8'-3"	7'-6"	6'-10"	6'-1"	5'-9"				12'-8"	10'-6"	7'-8"	4'-10"	2'-0"										19'-0"	27'-10"
8'	7'	⅝"	NUMBER	8	8	8	8	8	8	8	4			24	4	4	4	4	4									10	10
		DIA.	LENGTH	10'-8"	9'-11"	9'-3"	8'-6"	7'-10"	7'-1"	6'-4"	6'-0"			14'-2"	13'-2"	10'-4"	7'-7"	4'-9"	2'-0"									19'-4"	28'-2"
8'	8'	⅞"	NUMBER	8	8	8	8	8	8	8	8			28	4	4	4	4	4		24	24	24	24	32			10	10
		DIA.	LENGTH	12'-10"	11'-11"	11'-0"	10'-2"	9'-4"	8'-5"	7'-7"	6'-8"			15'-8"	13'-1"	10'-4"	7'-6"	4'-10"	2'-0"		4'-10"	4'-7"	4'-4"	4'-1"	3'-10"			19'-6"	28'-6"
9'	4'	⅝"	NUMBER	8	8	8	8	8	4					20	4	4	4											10	10
		DIA.	LENGTH	7'-9"	7'-1"	6'-5"	5'-9"	5'-1"	4'-9"					10'-2"	8'-4"	5'-4"	2'-4"											20'-8"	30'-6"
9'	5'	⅝"	NUMBER	8	8	8	8	8	8					20	4	4	4	4										10	10
		DIA.	LENGTH	8'-9"	8'-1"	7'-4"	6'-8"	6'-0"	5'-4"					11'-8"	11'-2"	8'-2"	5'-3"	2'-3"										21'-0"	30'-10"
9'	6'	⅝"	NUMBER	8	8	8	8	8	8	8				24	4	4	4	4										10	10
		DIA.	LENGTH	9'-9"	9'-0"	8'-4"	7'-8"	7'-0"	6'-4"	5'-7"				13'-2"	10'-11"	8'-1"	5'-2"	2'-3"										21'-0"	30'-10"
9'	7'	⅝"	NUMBER	8	8	8	8	8	8	8	4			24	4	4	4	4	4									10	10
		DIA.	LENGTH	10'-9"	10'-0"	9'-4"	8'-8"	7'-11"	7'-3"	6'-6"	6'-2"			14'-8"	13'-7"	10'-8"	7'-11"	5'-1"	2'-3"									21'-4"	31'-2"
9'	8'	⅞"	NUMBER	8	8	8	8	8	8	8	8	4		28	4	4	4	4	4		24	24	24	28	28			10	10
		DIA.	LENGTH	12'-11"	12'-0"	11'-2"	10'-4"	9'-6"	8'-7"	7'-9"	6'-11"	6'-5"		16'-2"	13'-5"	10'-4"	7'-10"	5'-1"	2'-3"		4'-10"	4'-7"	4'-4"	4'-1"	3'-10"			21'-6"	31'-6"
9'	9'	⅞"	NUMBER	8	8	8	8	8	8	8	8	8		28	4	4	4	4	4	4	16	24	16	24	24	40		10	10
		DIA.	LENGTH	14'-4"	13'-4"	12'-5"	11'-6"	10'-8"	9'-10"	8'-10"	7'-11"	7'-0"		17'-2"	16'-0"	13'-4"	10'-6"	7'-9"	5'-0"	2'-3"	5'-4"	5'-1"	4'-10"	4'-7"	4'-4"	3'-10"		21'-8"	31'-8"
9'	10'	⅞"	NUMBER	8	8	8	8	8	8	8	8	8	8	32	4	4	4	4	4	4	24	32	16	16	16	16	40	10	10
		DIA.	LENGTH	15'-10"	14'-10"	13'-11"	12'-11"	12'-0"	11'-1"	10'-1"	9'-3"	8'-3"	7'-4"	18'-11"	16'-3"	13'-5"	10'-9"	7'-11"	5'-2"	2'-6"	5'-7"	5'-4"	5'-1"	4'-10"	4'-7"	4'-4"	3'-10"	22'-0"	32'-0"





DESIGN DATA

SPECIFICATIONS A.A.S.H.O. 1957, T58
LOADING-H20,S16-44 AND/OR MILITARY



DATE	DEPARTMENT OF TRANSPORTATION STATE OF GEORGIA
REVISION	STANDARD REINFORCED CONCRETE BOX CULVERTS DOUBLE 7' X 4' TO TRIPLE 9' X 10' FOR DEPTHS OF FILL UP TO 20 FEET NO SCALE — REV. & REDR. NOV., 2001
BY	DES. ___ DRW. ___ TRA. ___ CHK. ___ (SUBMITTED) STATE ROAD & AIRPORT DESIGN ENGR. (APPROVED) CHIEF ENGINEER NUMBER 2326 SHEET 2 OF 2

LAKE ALICE DAM BREACH REMEDIATION

* DOUBLE 8X8 BOX CULVERT WINGWALLS & PARAPET DETAIL

CONTRACTING ENGINEERS INCORPORATED

REVISIONS:

Date AUG 28, 2013
Scale 1"= AS NOTED
JOB NO. base5ANDERSCUMMIN
Sheet 4.5 of 4.5 Sheets