

**HISTORY OF CONSTRUCTION FOR EXISTING CCR SURFACE IMPOUNDMENT
PLANT BARRY ASH POND
40 CFR 257.73(c)(1)(i)-(xii)**

(i) Site Name and Ownership Information:

Site Name: James M. Barry Electric Generating Plant

Site Location: Bucks, Alabama
Site Address: 15300 U.S Highway 43 North
Bucks, Alabama 36512

Owner: Alabama Power Company
Owner Address: 600 North 18th Street; Birmingham, AL 35203

CCR Impoundment Name: Plant Barry Ash Pond
NID ID: NA

EPA's "Disposal of Coal Combustion Residuals from Electric Utilities" Final Rule (40 C.F.R. Part 257 and Part 261), §257.73(c)(1), requires the owner or operator of an existing CCR surface impoundment to compile a history of construction. To the extent feasible, the following information is provided:

(ii) Location of CCR Unit:

31.000494, -87.994244
See Location Map in the Appendix

(iii) Purpose of CCR Impoundment:

The James M. Barry Electric Generating Plant is a 7 unit electric generating facility, including 5 coal-fired units. The Plant Barry Ash Pond is designed to receive and store coal combustion residuals produced during the coal-fired electric generating process at Plant Barry. It also serves as a low-volume waste treatment pond for the plant, receiving process water and stormwater from various plant sources, sluiced ash and decant water from the gypsum pond.

(iv) Watershed Description:

Plant Barry is located within the Big Chippewa Lake HUC-12 watershed which has a total area of 48,052 acres. The Big Chippewa Lake Watershed is located within the Mobile-Tensaw HUC-8 watershed which has a drainage area of 583,948 acres. However, there is no uncontrolled run-on into the ash pond from the surrounding watershed. The only water that enters the pond is process water (ash sluice water and low-volume waste), stormwater from various sumps located within the generating plant and rainwater that falls directly into the pond.

(v) Description of physical and engineering properties of CCR impoundment foundation/abutments:

The Plant Barry Ash Pond was built on land located south of the generating units in an area having a bottom elevation of about 3 feet. The underlying soils of the impoundment are made up of naturally existing deposits. The fill utilized to form the original embankments is of varied composition, but can generally be classified as a mixture of silty and sandy clays, clayey fine sands, and sands underlain by soft organic silts and clays. The ash pond is located on the Quaternary-age alluvial (Qalt) geographic area which is indicative of alluvial, coastal, and low terrace deposits consisting of very fine to coarse sands and gravelly sands with some localized instances of clay and sandy clay.

(vi) Summary of Site Preparation and Construction Activities:

The Ash Pond was originally constructed in 1965. The pond was formed with the creation of dikes on the east, south, and west sides of the impoundment. The north side of the impoundment is natural ground that ties into the east and west dikes. There have been modifications to the embankment in 1972, 1992, 1998, and 2005. The embankments were originally constructed to EL 18 ft. In 1992, the east and west embankments were raised a total of 3 feet to EL 21 ft. In 1998, the east and west embankments were raised again to elevations between 23 feet and 24.5 feet. In 1999, a flow diversion dike was added near the southern end of the impoundment at an elevation of 18 feet to create an additional decant area prior to final release through the outlet structure. In 2005, the diversion dike was raised to EL 24.5 ft to increase storage in the main area of the impoundment. At this time, the south embankment was also raised to EL 21.5 ft.

The 1998 embankment augmentation consisted of 2 to 3 feet of bottom ash placed on the inward slope of the existing embankment to a point several feet beyond the proposed new toe of the slope. A double layer of Tensar Bx1200 geogrid 50% side lap was placed on top of the bottom ash extending out to the proposed toe of slope. The existing embankment was reinforced by double keying a layer of bottom ash on top of the geogrid. Another geogrid, Tensar Ux1500HS, was placed on top of the bottom ash and a final clay embankment lift was keyed into the bottom ash and the existing embankment. The side slopes of the new embankment, which was raised a total of 3 feet, were constructed at 2H:1V.

The 2004 augmentation of the south embankment and the diversion dike raised both by approximately 3 to 4 feet. The south embankment was raised 3 feet using an ash bolster with geogrid in combination with

load bearing bottom ash and clay as fill material on the in-board side of the embankment. The diversion dike was raised 4 feet by using well compacted clay and back slopes of 4H:1V with a 30-foot ash booster on either side of the dike.

(vii) Engineering Diagram:

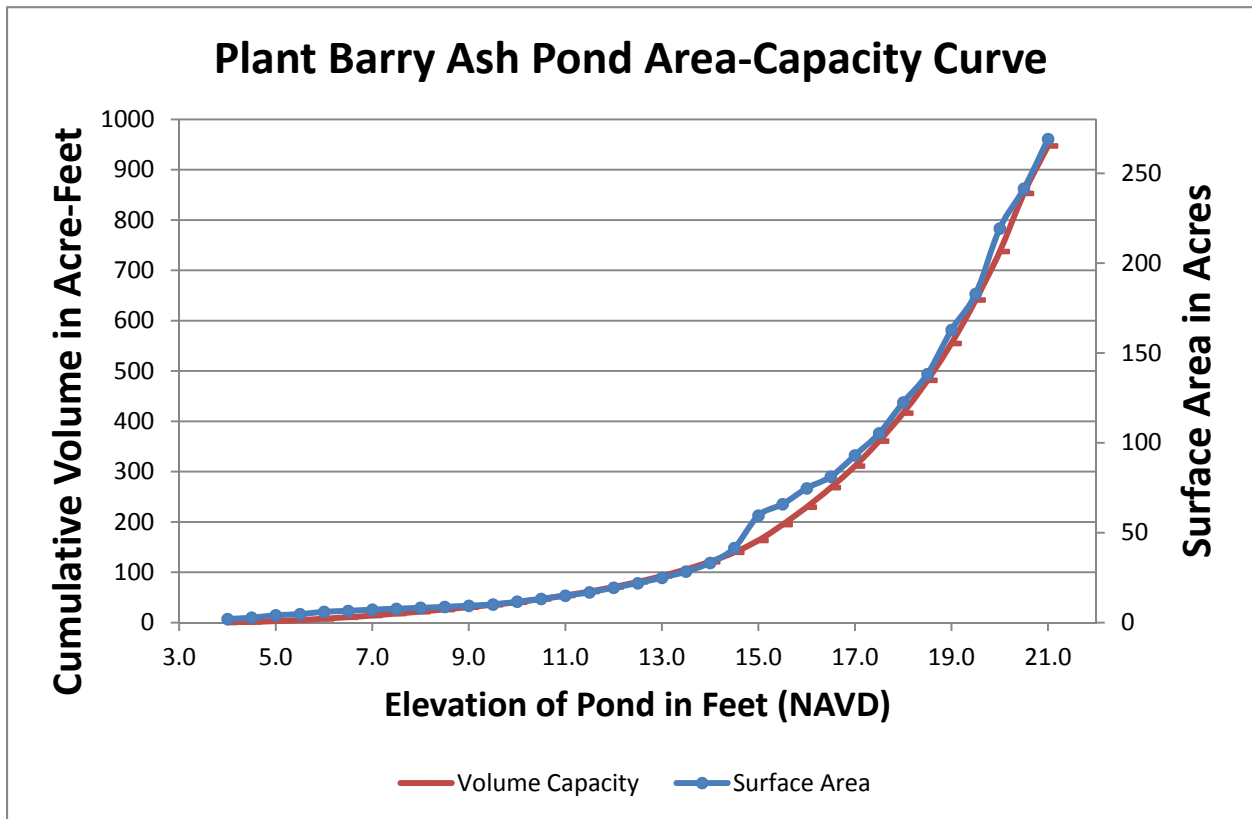
The following drawings reflecting the construction of the Plant Barry Ash Pond can be found in the Appendix:

- 1998 Dike Raise – Existing General Arrangement
- 1998 Dike Raise – East Side Sections
- 1998 Dike Raise – West Side Sections
- 1998 Dike Raise – Diversion Dike Plan and Sections
- 1998 Dike Raise– Completed General Arrangement
- 2005 Dike Raise - Diversion Dike and South Main Dike Plan and Sections
- 2005 Dike Raise – Discharge Structure Plan and Sections

(viii) Description of Instrumentation:

There is currently no instrumentation associated with the Plant Barry Ash Pond.

(ix) Area-capacity curves:



(x) Spillway/Diversion design features and capacity calculations:

Sluiced flows and other low volume wastes enter the ash pond, along with plant stormwater runoff, and rain water that falls directly into the pond. Water meanders along the surface of the ash through the ash pond until it ultimately discharges through the primary discharge structure located on the south end of the pond. In 1999, a flow diversion dike with a crest elevation of EL 18-ft was added near the southern end of the impoundment to create an additional sedimentation or clear pool area prior to release through the outlet structure. In 2004, the diversion dike was raised to EL 24.5-ft to increase storage in the main area of the impoundment. The outfall of the diversion dike consists of an overtopping riprap weir approximately 5 to 10 feet wide.

The primary discharge structure on the south end of the pond consists of a 54-inch diameter corrugated metal pipe connected to a four sided, concrete riser outfall structure. A liner was recently constructed in the discharge pipe, resulting in an effective 51-inch pipe diameter. Flow characteristics remained relatively constant through the pipe even with the slightly reduced diameter as the liner produced a smoother flow path. At full pool elevation, the discharge through the principal spillway pipe has been calculated at about 442 acre-feet per day.

(xi) Provisions for surveillance, maintenance and repair:

Inspections of dams and dikes are critical components and are conducted on a regular basis—at least annually by professional dam safety engineers and at least weekly by trained plant personnel. In addition, inspections are performed after unusual events such as heavy rainfall events. The inspections provide assurance that structures are sound and that action is taken, as needed, based on the findings. Safety inspections include observations of such things as pond levels, weather conditions, rainfall since the prior inspection, conditions of slopes and drains, erosion, animal damage, ant hills, alignment of retaining structures and more. Dam safety engineers inspect any maintenance or remediation performed since the previous inspection, check the status of work recommended at prior inspections, ensure that the posting of emergency notification information is up to date and evaluate any items noted during plant personnel inspections.

Construction specifications:

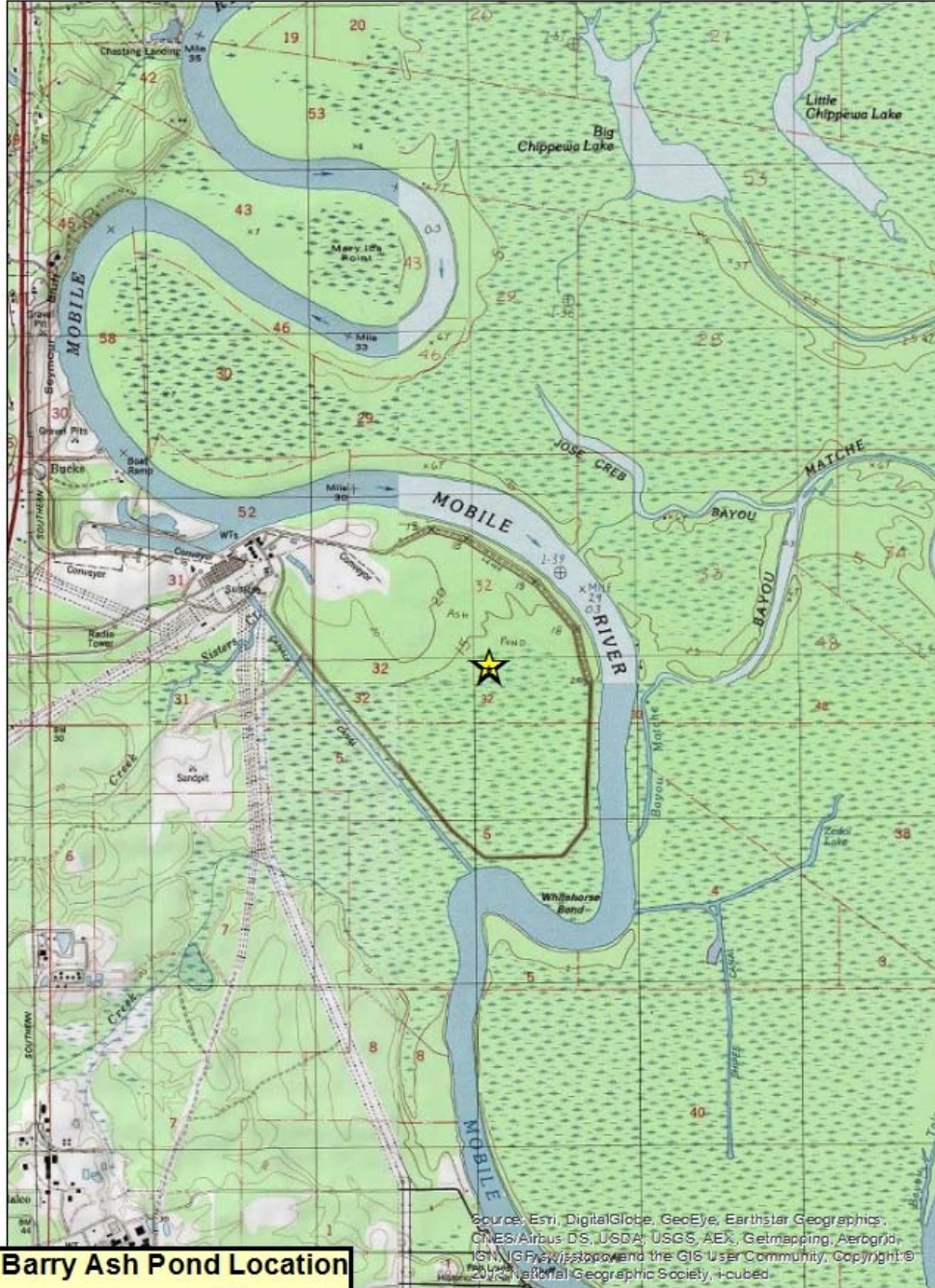
The following specifications relevant to the construction of the Plant Barry Ash Pond can be found in the Appendix:

- 1998 Dike Raise – General Notes
- 2005 Dike Raise – Technical Specifications
- 2005 Dike Raise – Gabion Structure at Outfall

(xii) Known record of structural instability:

There are no known instances of structural instability at the CCR unit.

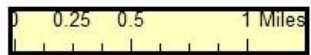
Appendix

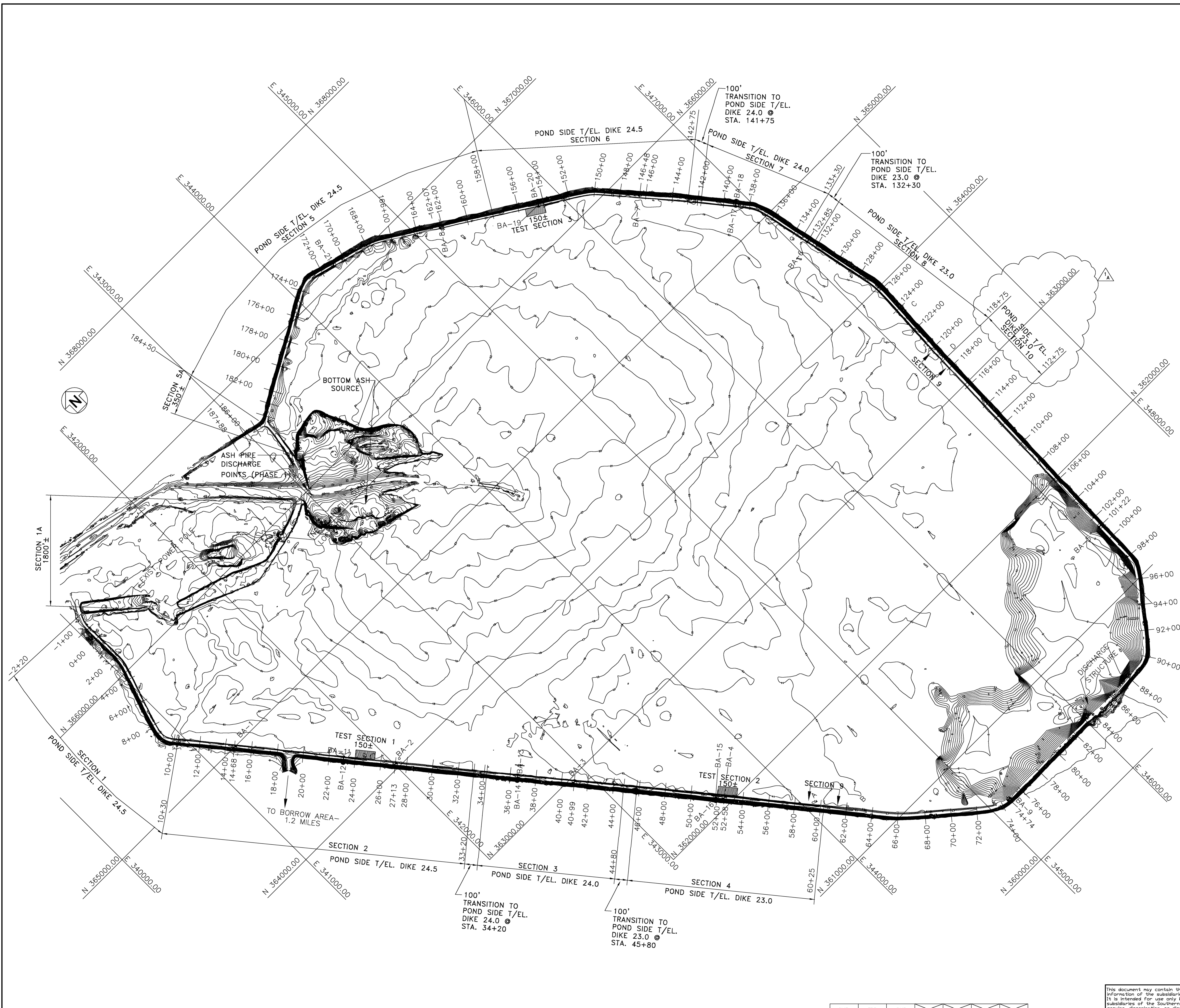


Plant Barry Ash Pond Location

★ Ash Pond Location

USA Topo Maps





BORINGS **COORDINATES**

BORINGS TAKEN IN 1992

BORING LABEL	N	E
BA-1	364999.880	341219.875
BA-2	364031.549	342004.128
BA-3	362956.461	342880.725
BA-4	362057.826	343612.863
BA-5	361495.708	347138.361
BA-6	364639.958	347102.821
BA-7	365796.094	346427.798
BA-8	364999.880	341219.875
BA-9	360500.824	345152.338

BORINGS TAKEN IN 1998

BORING LABEL	N	E
BA-11	364345.412	341755.029
BA-12	364327.948	341734.096
BA-13	363301.329	342606.115
BA-14	363282.545	342582.682
BA-15	362111.456	343573.883
BA-16	362092.553	343553.482
BA-17	365223.403	346902.569
BA-18	365240.613	346922.842
BA-19	366298.340	345828.767
BA-20	366319.529	345844.607
BA-21	367088.602	344388.258

- NOTES:**
- STATIONS WERE TAPED OFF OF THE 1992 BORING LOCATIONS BA-1 THRU BA-9. SEE TABLES FOR COORDINATES OF THE BORINGS.
 - FOR ELEVATIONS OF NEW DIKE SECTIONS SEE DWGS. D-521372, D-521373, AND D-521374 DIKE CREST MODIFICATION SECTIONS.
 - TEST SECTIONS NO. 1, 2, AND 3 SHALL STAY IN PLACE. TIE NEW DIKE MODIFICATIONS TO THE TEST SECTIONS.

- REFERENCES:**
- D-521370 - MECHANICAL PIPING-REVISIONS TO ASH SLUICE LINES
 - D-521371 - MECHANICAL PIPING-REVISIONS TO UNITS 1-5 BLDG., DEMIN. SUMP AND LAGOON POND B DISCHARGE PIPES
 - D-521372 - DIKE CREST MODIFICATIONS SECTIONS - WEST SIDE
 - D-521373 - DIKE CREST MODIFICATIONS SECTIONS - EAST SIDE
 - D-521374 - PLAN AND SECTIONS 1A & 5A
 - D-521380 - BORROW PIT AREA

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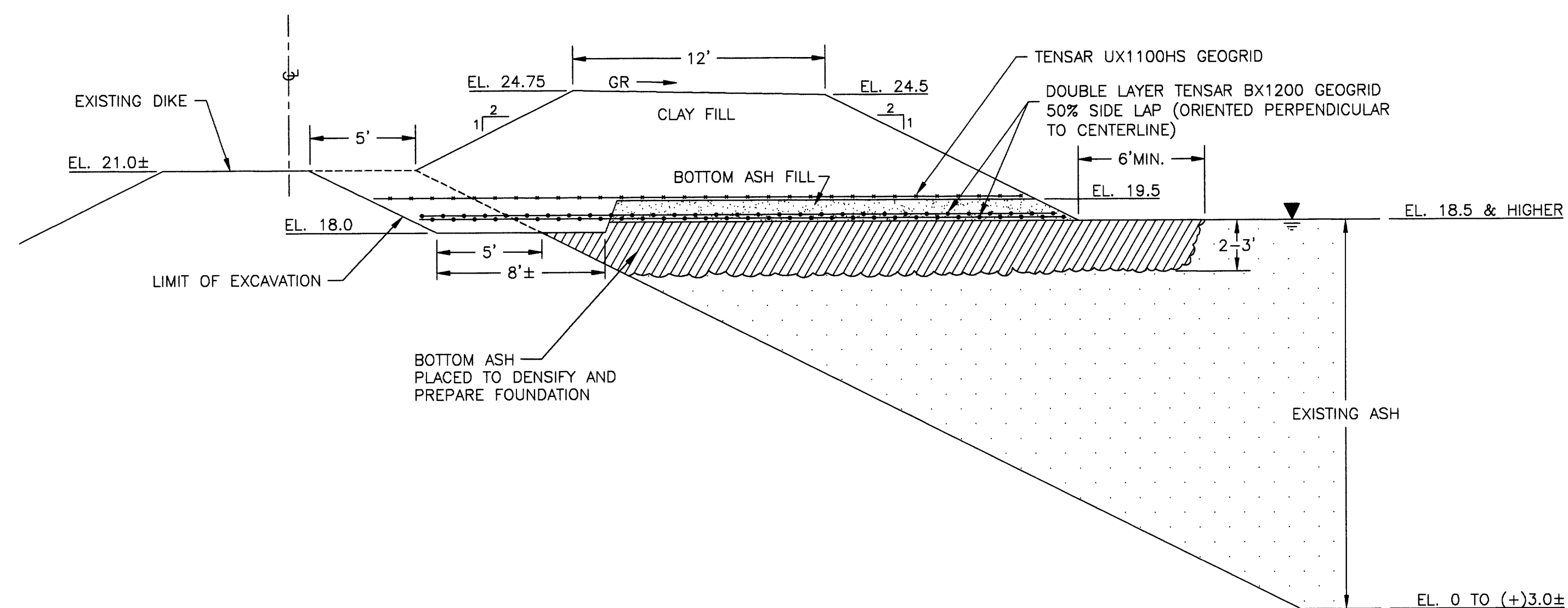
CAD	D521369
ACAD14	CAS-14
Southern Company Services, Inc. for	
ALABAMA POWER COMPANY	

PROJECT: **BARRY ASH POND**
 TITLE: **DIKE EXTENSION-PHASE 1 (1998)**
 GENERAL ARRANGEMENT

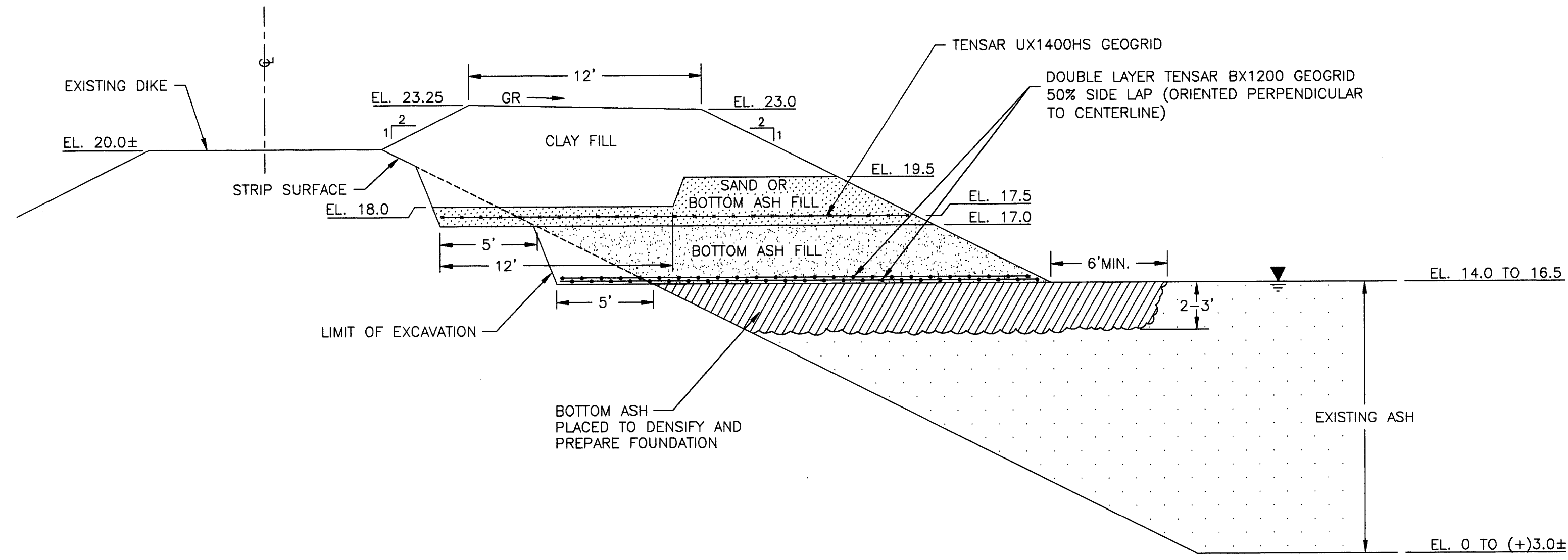
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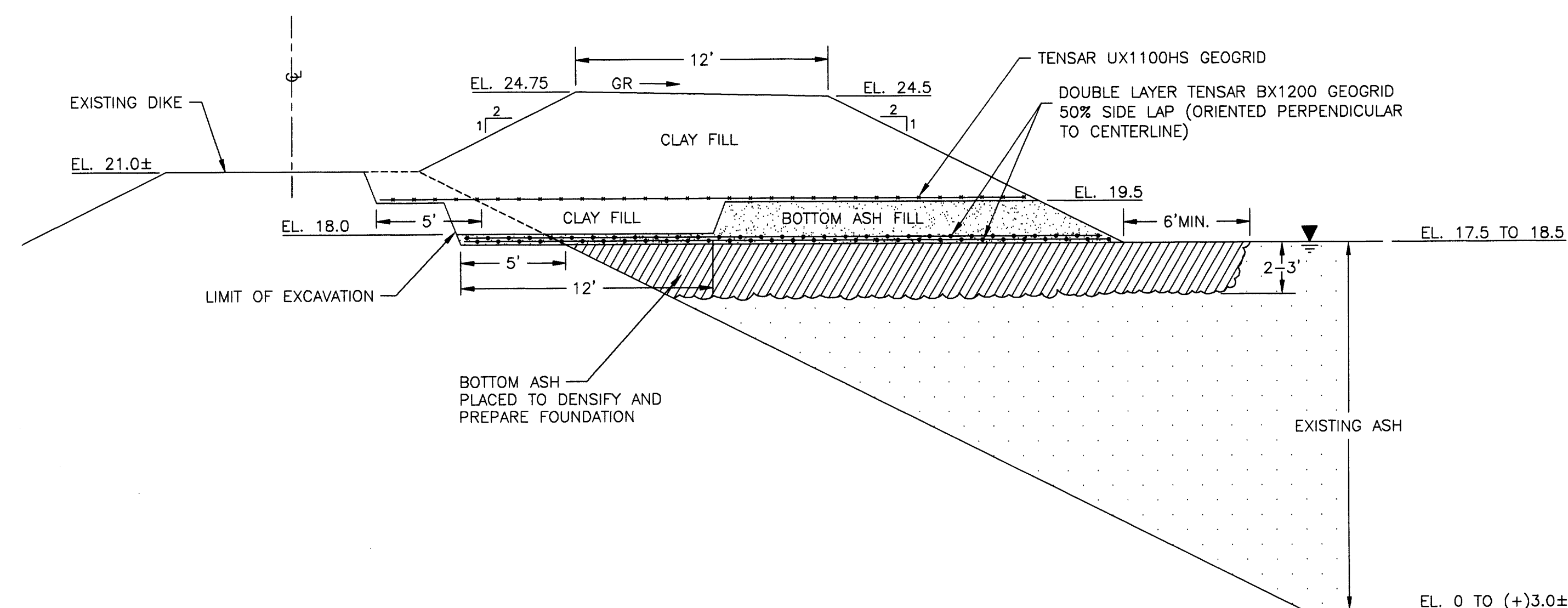
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ISSUED FOR CONSTRUCTION		APPROVED: FDB	DATE:	
RUN FB-98001		APPROVED: RMP	DATE:	



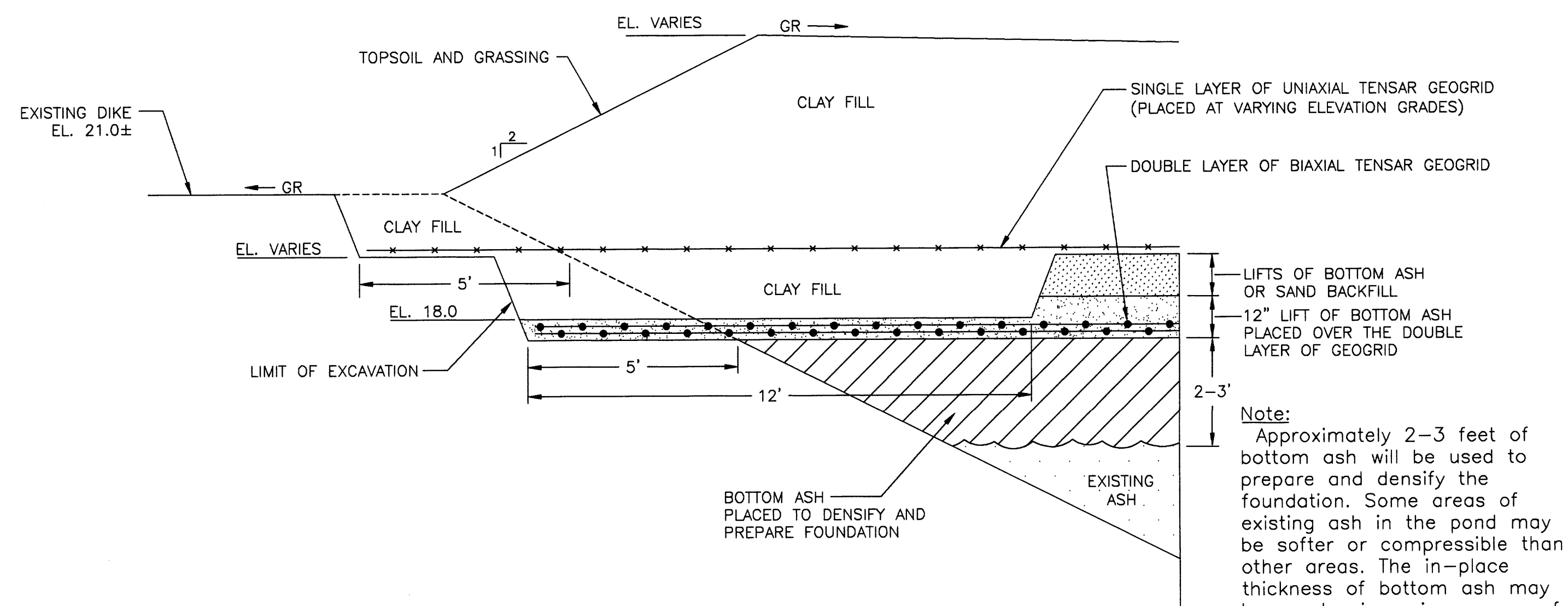
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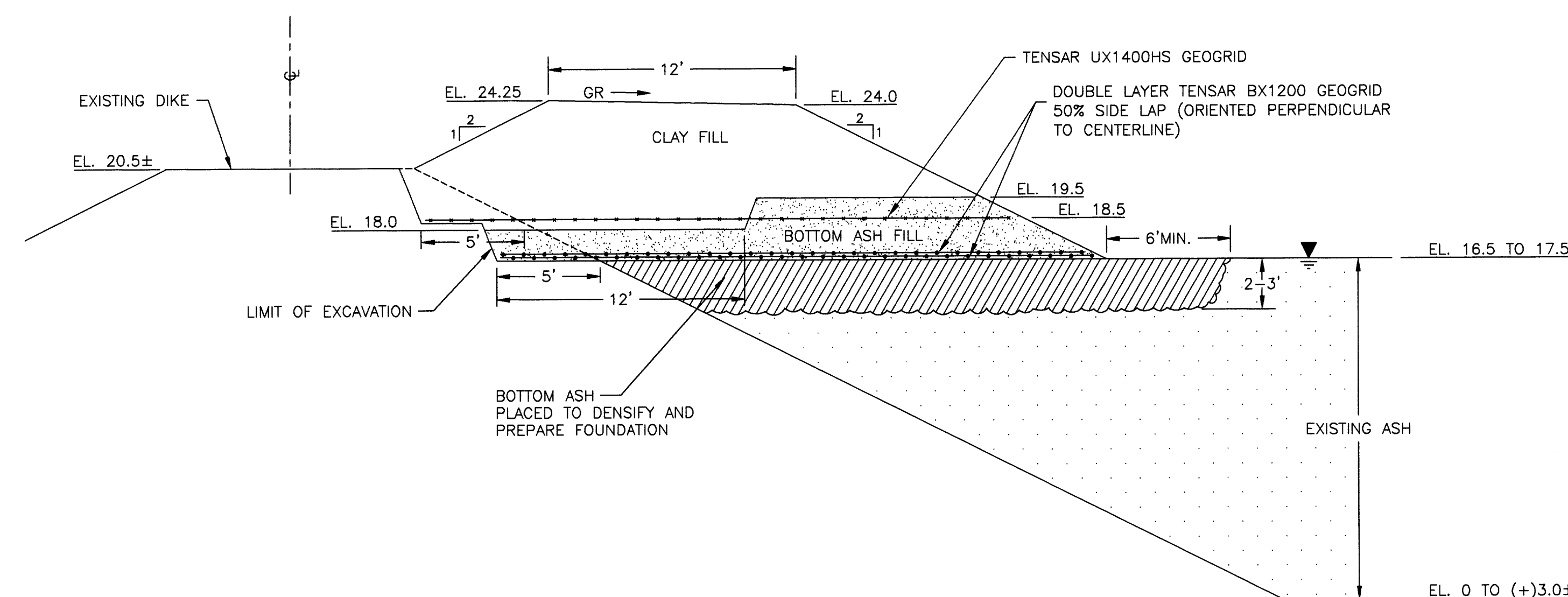
SECTION NO.4
SCALE: 1" = 5'



SECTION NO.2
SCALE: 1" = 5'



TYPICAL EXCAVATION (NOTCH) DETAIL
SCALE: 1" = 2'-6"



SECTION NO.3
SCALE: 1" = 5'

NOTES:

- The surface on which the Tensor BX1200 geogrid is to be placed should be graded smooth to remove ruts and undulations.
- After preparing the surface, the Tensor BX1200 geogrid should be installed with an orientation perpendicular to the dike centerline. The geogrid should be installed with the prescribed amount of overlap of adjacent geogrid strips.
- If the overlap tends to separate during fill placement, adjacent strips of geogrid should be secured together with hog rings or plastic ties on 5 foot to 10 foot centers. The corners of the geogrid strips may be held down with one or two shovelfuls of fill or landscape staples, if necessary.
- After installation of the biaxial geogrid, the initial lift of fill may then be placed. The initial lift of fill should not exceed 12 inches in thickness and be advanced in the same direction as the geogrid orientation (perpendicular to the dike centerline). Other than repeated passes of the dozer, no compaction requirements are specified for this initial lift of fill, unless directed by the Project Manager.
- For the initial lift, a small dozer should be used to spread the fill over the biaxial geogrids. See specifications for equipment details.
- Once the initial lifts of fill is in place, the Tensor uniaxial geogrid should be installed as specified. The uniaxial geogrid should be oriented perpendicular to the dike centerline with no overlap of adjacent geogrid strips. Fill can then be placed and spread directly upon the uniaxial geogrids.
- Tracked construction equipment shall not be operated directly on any geogrid layer. A minimum backfill thickness of 6 inches is required for operation of tracked vehicles over the geogrid. Sharp turning of tracked vehicles should be kept to a minimum to prevent tracks from displacing the fill and/or the geogrid.
- Rubber tired vehicles may pass over the geogrid reinforcement at low speeds, less than 10 MPH. Sudden braking and sharp turning shall be avoided.
- Place topsoil and grass seed on slopes and top surface of dike crest fill.
- Clay fill placed from EL.18.0 to 24.5(±); this fill placed in soil excavation (notch) above EL.18.0.
- The uniaxial Tensor layer shall not be placed at an elevation grade which exceeds three feet above the grade for the biaxial Tensor layer. Typically the grade difference should be 12 to 24 inches between the two geogrid layers.
- The Contractor shall provide dewatering equipment, installation, and operation for placing and compacting backfill to achieve the placement requirements described in the Earthwork Technical Specifications.

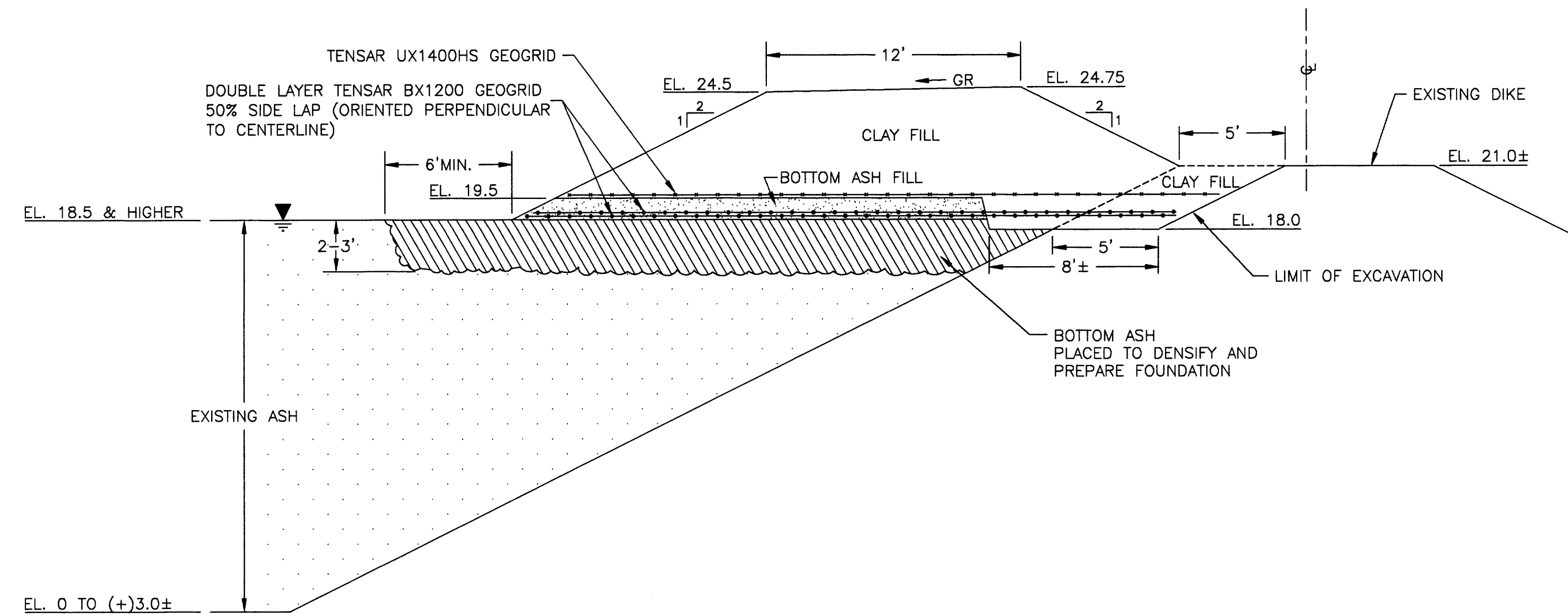
REFERENCES:

- D-521369 DIKE EXTENSION-PHASE 1, GENERAL ARRANGEMENT
- D-521373 DIKE CREST MODIFICATIONS - EAST SECTIONS
- D-521374 PLAN AND SECTION 1A & 5A
- D-521380 BORROW AREA & TEST PIT LOCATIONS

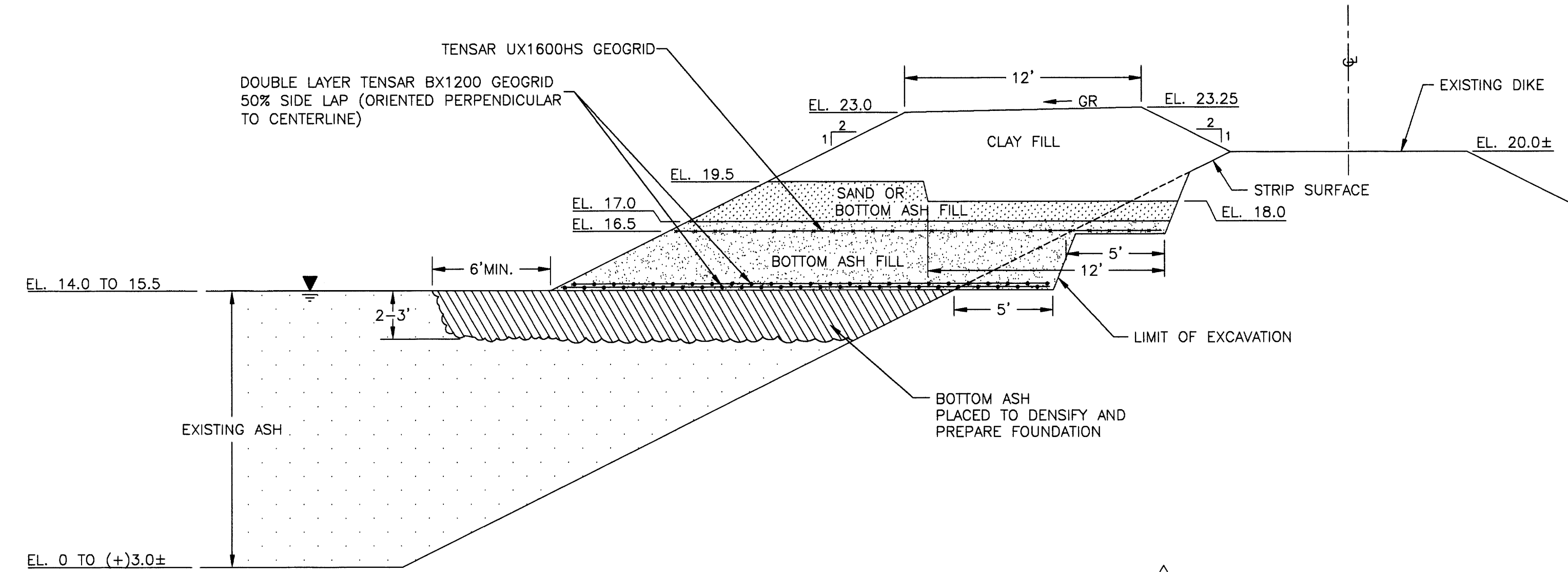
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AUTOCAD14	JAA -01
SOUTHERN COMPANY SERVICES FOR	
ALABAMA POWER COMPANY	
JOB BARRY STEAM PLANT	
DETAIL DIKE CREST MODIFICATIONS	
SECTIONS - WEST SIDE	
SCALE AS SHOWN	9/M
SHEET 1 OF 1 SHEETS	REV 1
SUPersedes	D- 521372

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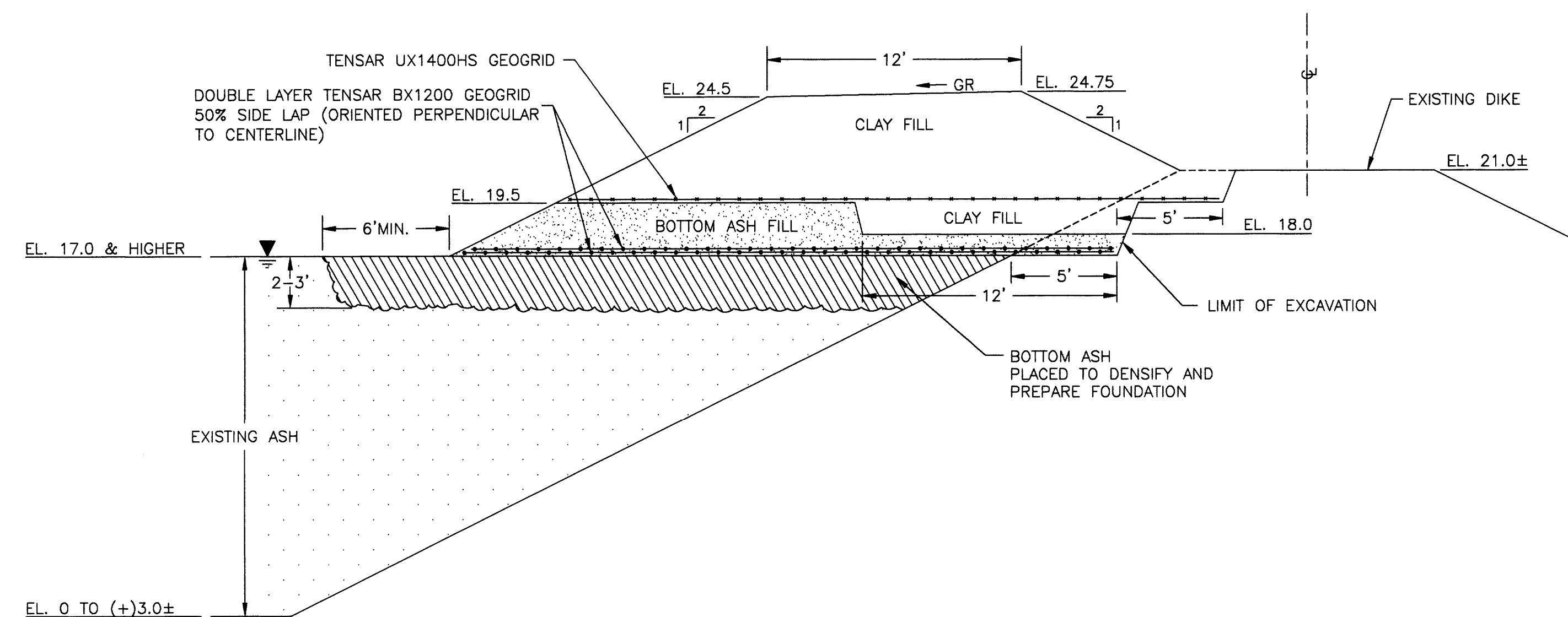
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JAA	JPM	RMF	DWM
APPROVED	APPROVED	APPROVED	APPROVED
DESIGNED	DATE	DATE	DATE
7-23-98	7-23-98	7-23-98	7-23-98



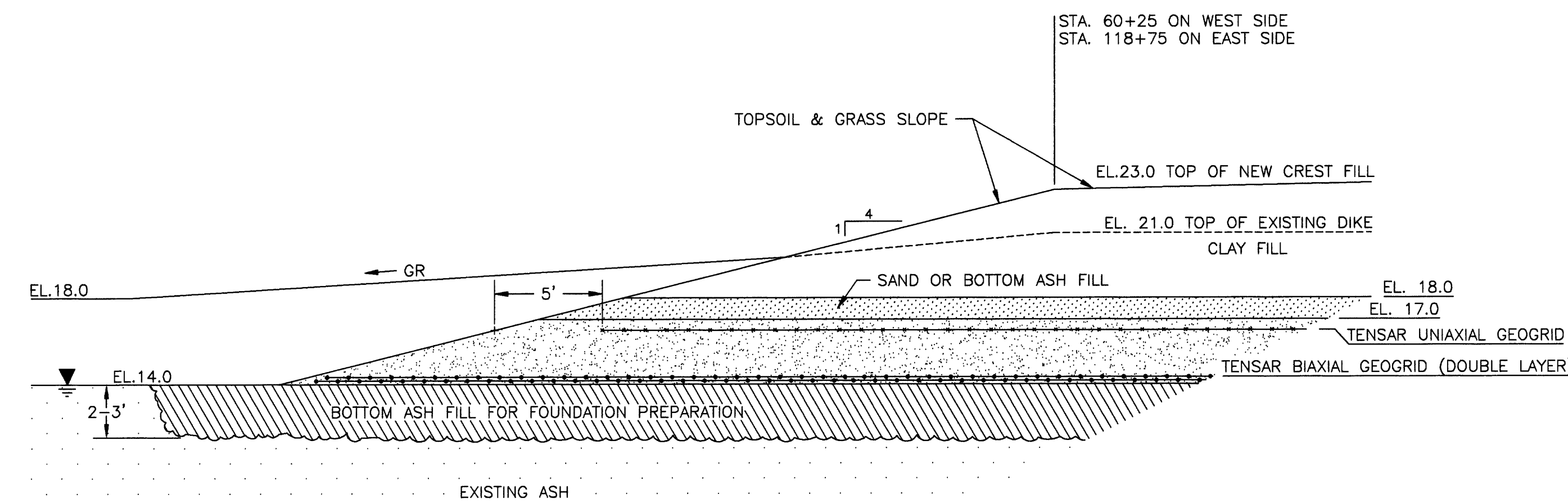
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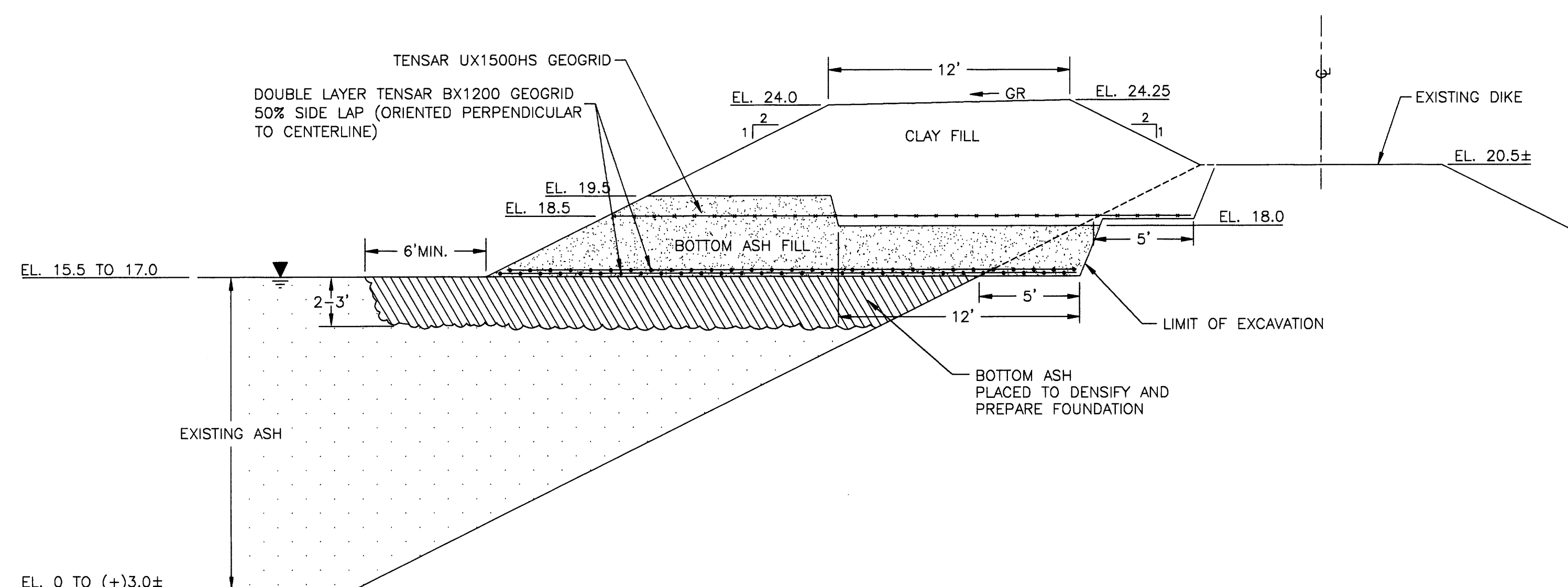
SECTION NO.8 & NO.10
SCALE: 1" = 5'



SECTION NO.6
SCALE: 1" = 5'



SECTION NO.9
UPSTREAM PROFILE ALONG AXIS OF EXISTING DIKE
SCALE: 1" = 5'



SECTION NO.7
SCALE: 1" = 5'

REFERENCES:

- D-521369 DIKE EXTENSION-PHASE 1, GENERAL ARRANGEMENT
- D-521372 DIKE CREST MODIFICATIONS - WEST SECTIONS
- D-521374 PLAN AND SECTIONS 1A & 5A
- D-521380 BORROW AREA & TEST PIT LOCATIONS

CAD	D521373
AUTOCAD14	JAA -01
SOUTHERN COMPANY SERVICES FOR	
ALABAMA POWER COMPANY	
JOB	BARRY STEAM PLANT
DETAIL	DIKE CREST MODIFICATIONS
SECTIONS - EAST SIDE	

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REV. 1	DATE 7-7-99	REV. 0	DATE 7-23-98
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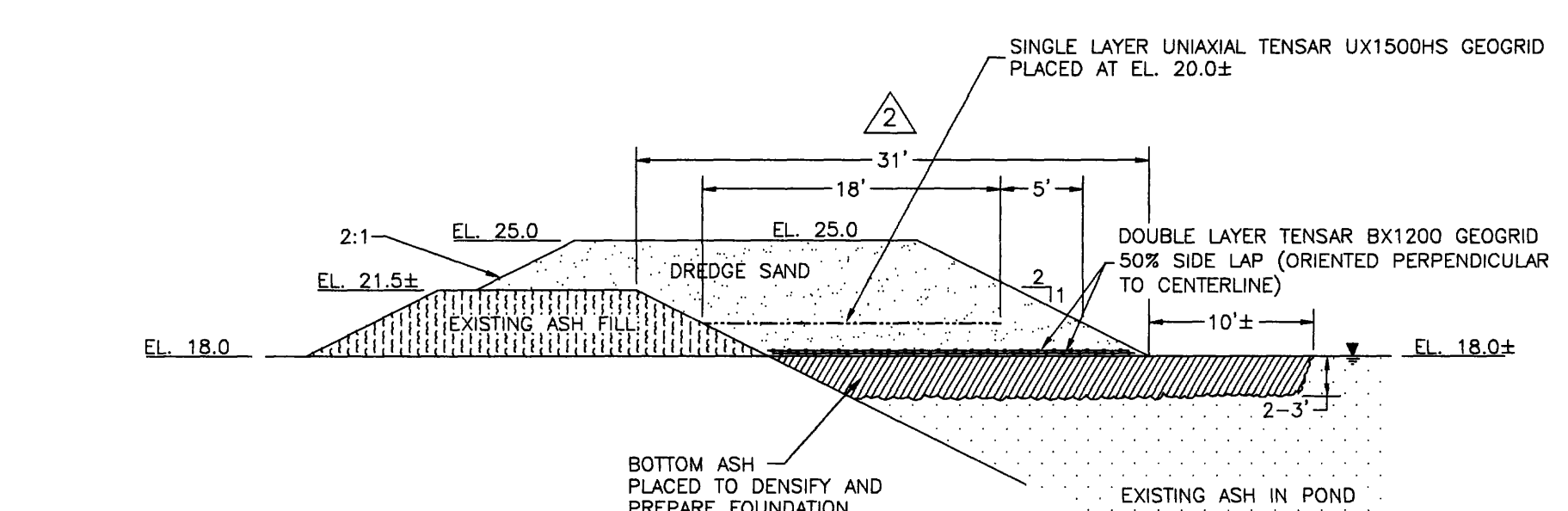
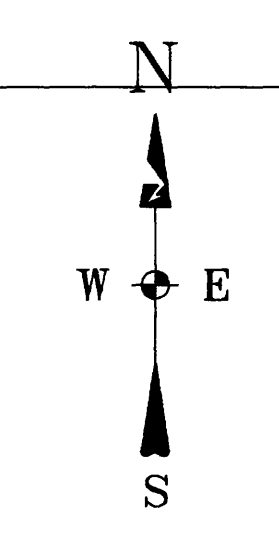
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APPROVED	JPM	DATE	7-23-98		
APPROVED	RMF	DWIM	DATE	7-23-98	7-23-98

SCALE	AS SHOWN	B/W	
SHEET	1 OF 1 SHEETS		
SUPERSEDES			
D-521373			REV 1



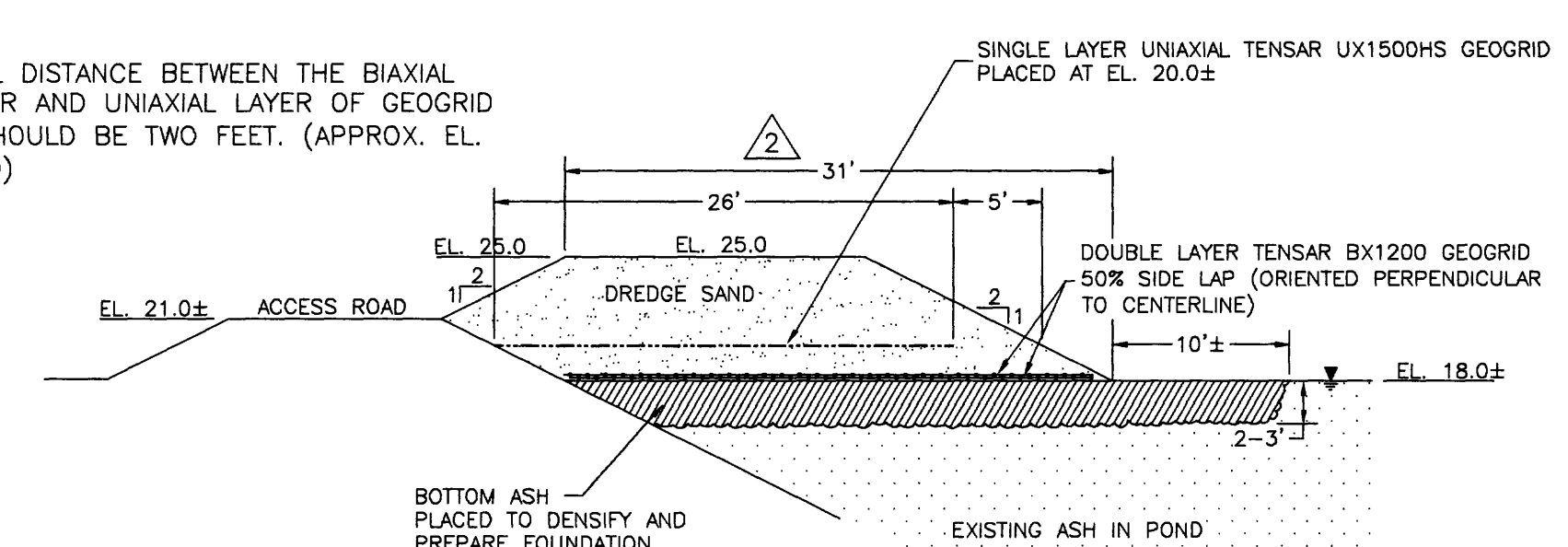
LIMIT OF DREDGE SAND FILL BASED ON CLEARANCE FOR NEW PIPE SYSTEMS. (SEE DRAWING NO. D-521371, SH.1)

STA. 0+00
2+00
4+00
6+00
8+00
10+00



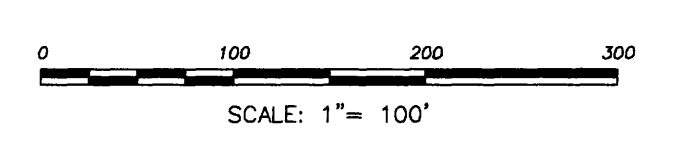
SECTION A-A
SCALE: 1" = 10'

NOTE:
THE VERTICAL DISTANCE BETWEEN THE BIAXIAL DOUBLE LAYER AND UNIAXIAL LAYER OF GEOGRID MATERIALS SHOULD BE TWO FEET. (APPROX. EL. 18.0 TO 20.0)



SECTION B-B
SCALE: 1" = 10'

NOTE:
PLACE TOPSOIL AND GRASSING ON TOP SURFACE AND 2:1 SLOPES.



REFERENCES:

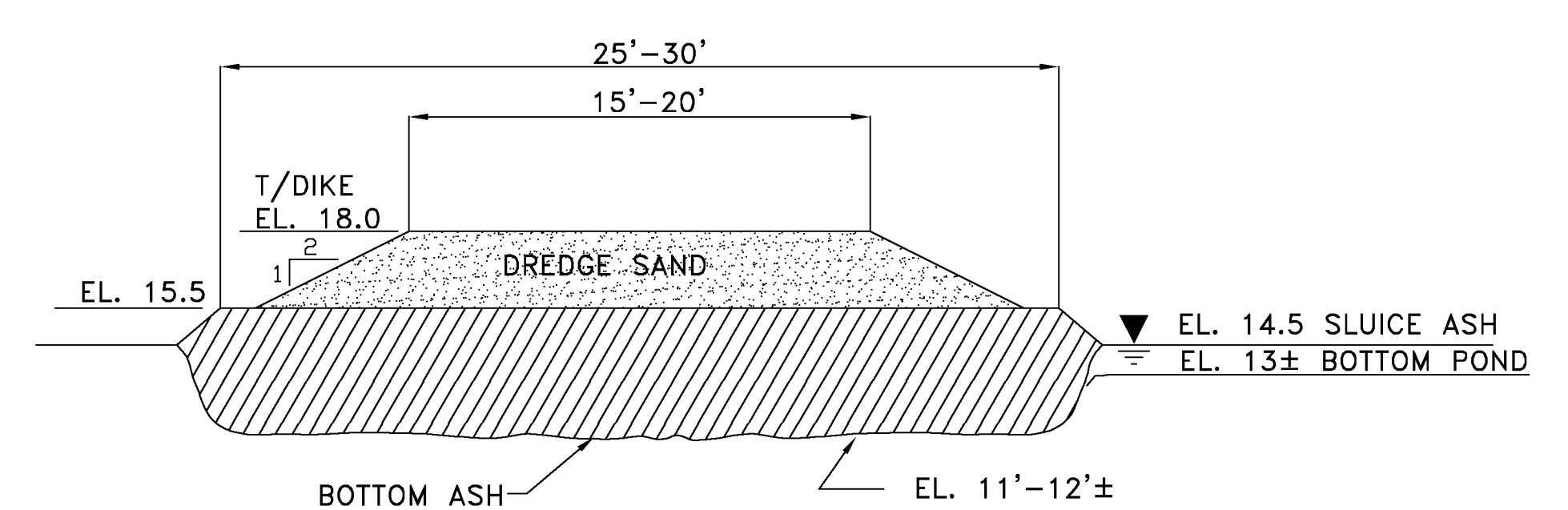
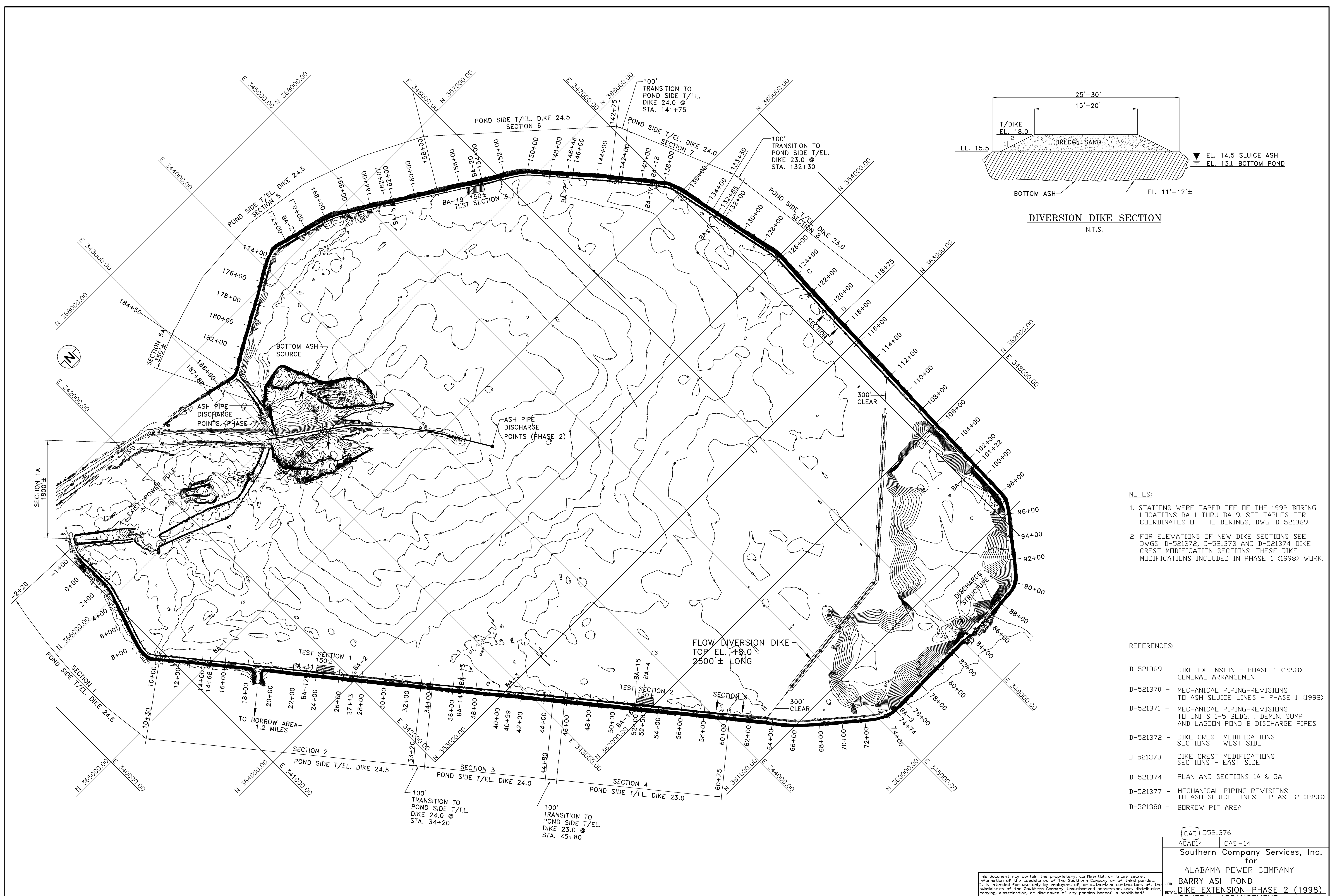
- D-521369 DIKE EXTENSION-PHASE 1, GENERAL ARRANGEMENT
- D-521371 SH.1 DIKE EXTENSION-PHASE 1, MECHANICAL PIPING
- D-521373 DIKE CREST MODIFICATIONS - EAST SECTIONS
- D-521380 BORROW AREA & TEST PIT LOCATIONS

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CAD D521374	
AUTOCAD14	JAA -01
SOUTHERN COMPANY SERVICES FOR	
ALABAMA POWER COMPANY	
JOB BARRY STEAM PLANT	
DETAIL PLAN AND SECTIONS 1A & 5A	
SCALE 1" = 100'	B/M
SHEET 1 OF 1 SHEETS	REV 2
SUPERSEDES D-521374	

REV. 2 DATE 7-7-99 REVISED PER FIELD MARKED PRINT	REV. 1 DATE 8-12-98 A) ADDED UNIAXIAL GEOGRID B) ADDED NOTE C) ADDED 50' DISTANCE	REV. 0 DATE 7-23-98 ISSUED FOR CONSTRUCTION
JAA JPM RMF	JAA JPM RMF	RJN: FB-98001

DRAWN JAA	CHECKED JPM	DESIGNED 7-23-98
APPROVED JPM	DATE 7-23-98	
APPROVED RMF	DWM	DATE 7-23-98 7-23-98



DIVERSION DIKE SECTION
N.T.S.

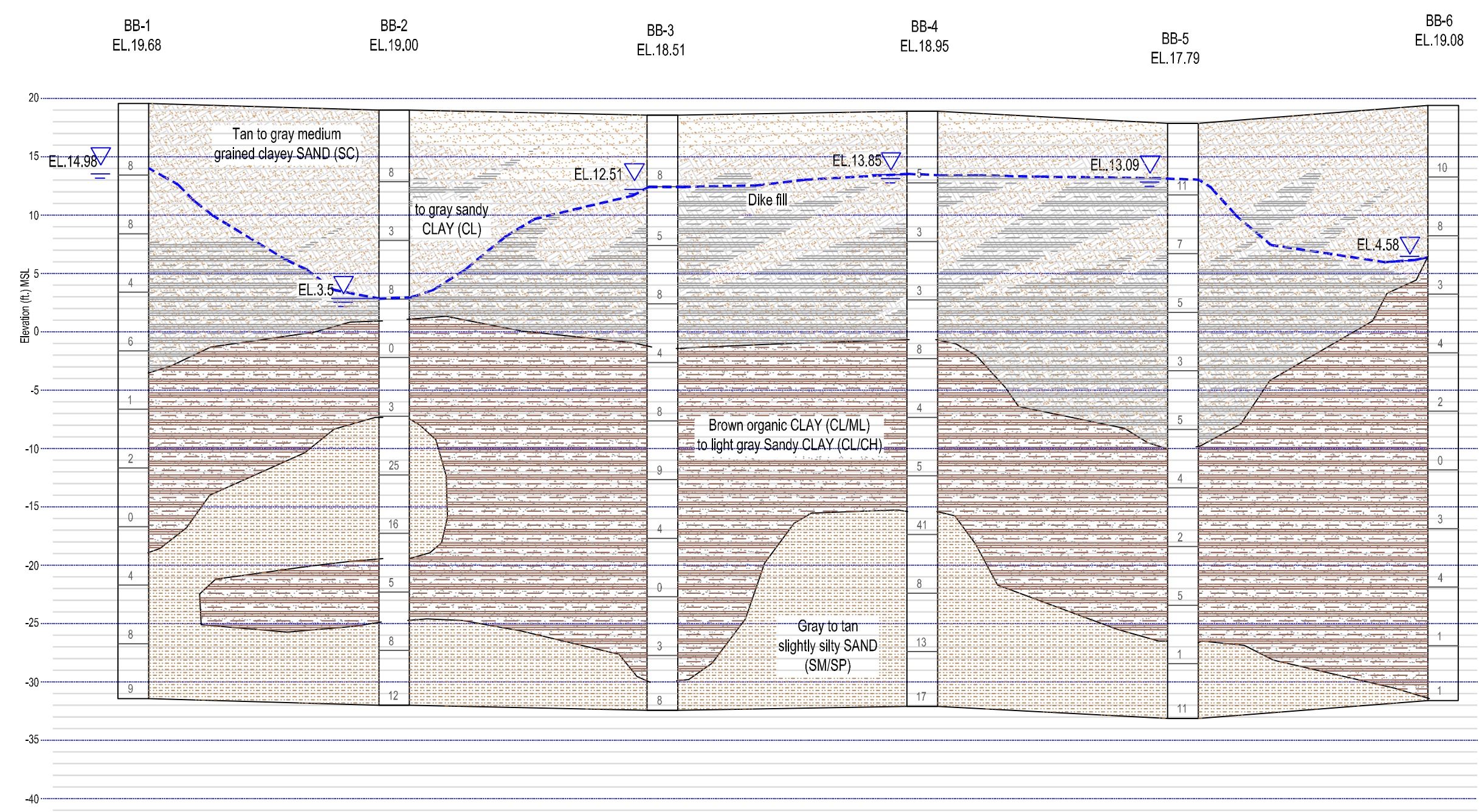
- NOTES:**
1. STATIONS WERE TAPED OFF OF THE 1992 BORING LOCATIONS BA-1 THRU BA-9. SEE TABLES FOR COORDINATES OF THE BORINGS, DWG. D-521369.
 2. FOR ELEVATIONS OF NEW DIKE SECTIONS SEE DWGS. D-521372, D-521373 AND D-521374 DIKE CREST MODIFICATION SECTIONS. THESE DIKE MODIFICATIONS INCLUDED IN PHASE 1 (1998) WORK.

- REFERENCES:**
- D-521369 - DIKE EXTENSION - PHASE 1 (1998) GENERAL ARRANGEMENT
 - D-521370 - MECHANICAL PIPING-REVISIONS TO ASH SLUICE LINES - PHASE 1 (1998)
 - D-521371 - MECHANICAL PIPING-REVISIONS TO UNITS 1-5 BLDG., DEMIN. SUMP AND LAGOON POND B DISCHARGE PIPES
 - D-521372 - DIKE CREST MODIFICATIONS SECTIONS - WEST SIDE
 - D-521373 - DIKE CREST MODIFICATIONS SECTIONS - EAST SIDE
 - D-521374 - PLAN AND SECTIONS 1A & 5A
 - D-521377 - MECHANICAL PIPING REVISIONS TO ASH SLUICE LINES - PHASE 2 (1998)
 - D-521380 - BORROW PIT AREA

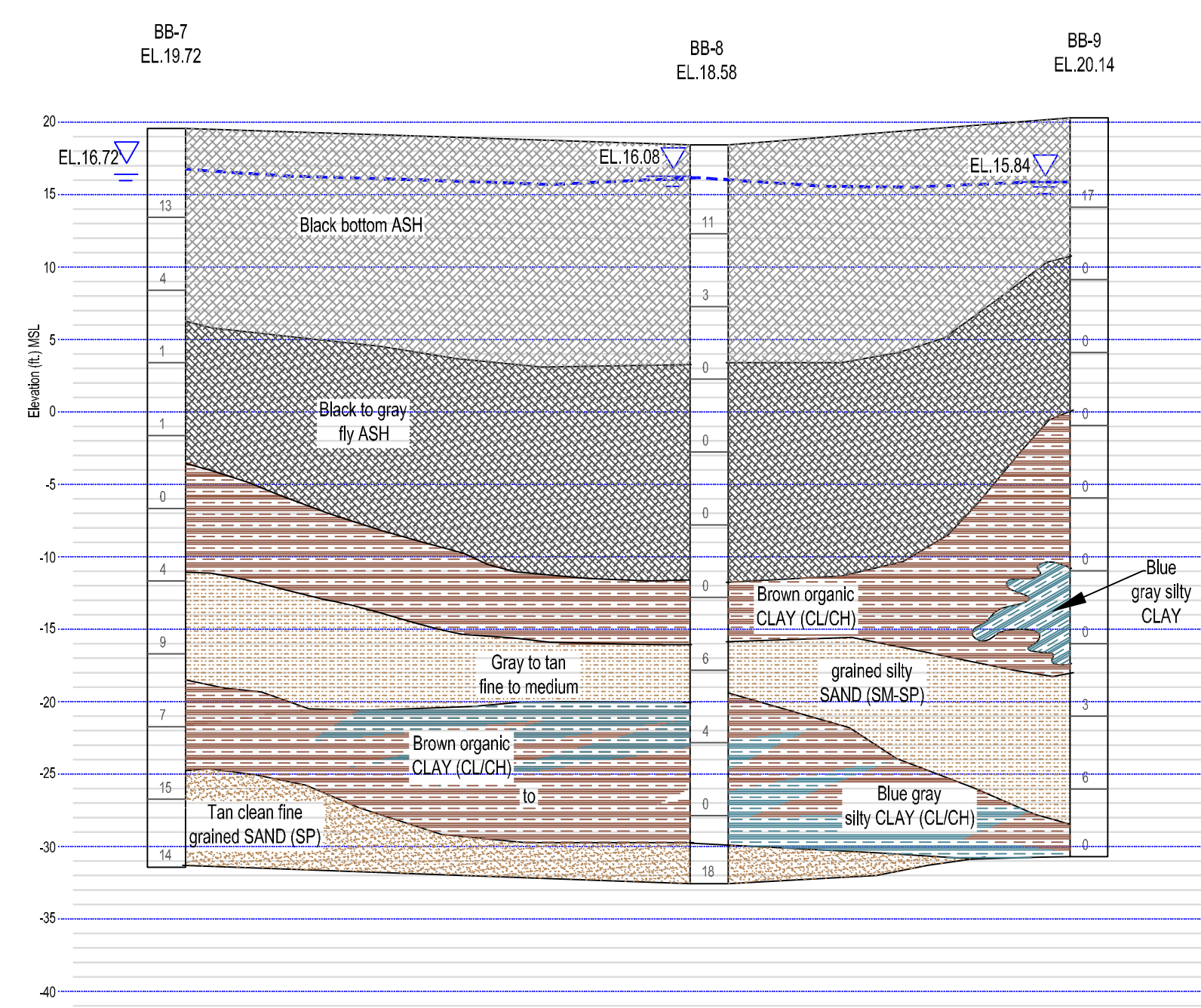
(CAD) D521376
 ACAD14 CAS-14
Southern Company Services, Inc.
 for
 ALABAMA POWER COMPANY
BARRY ASH POND
DIKE EXTENSION-PHASE 2 (1998)
GENERAL ARRANGEMENT

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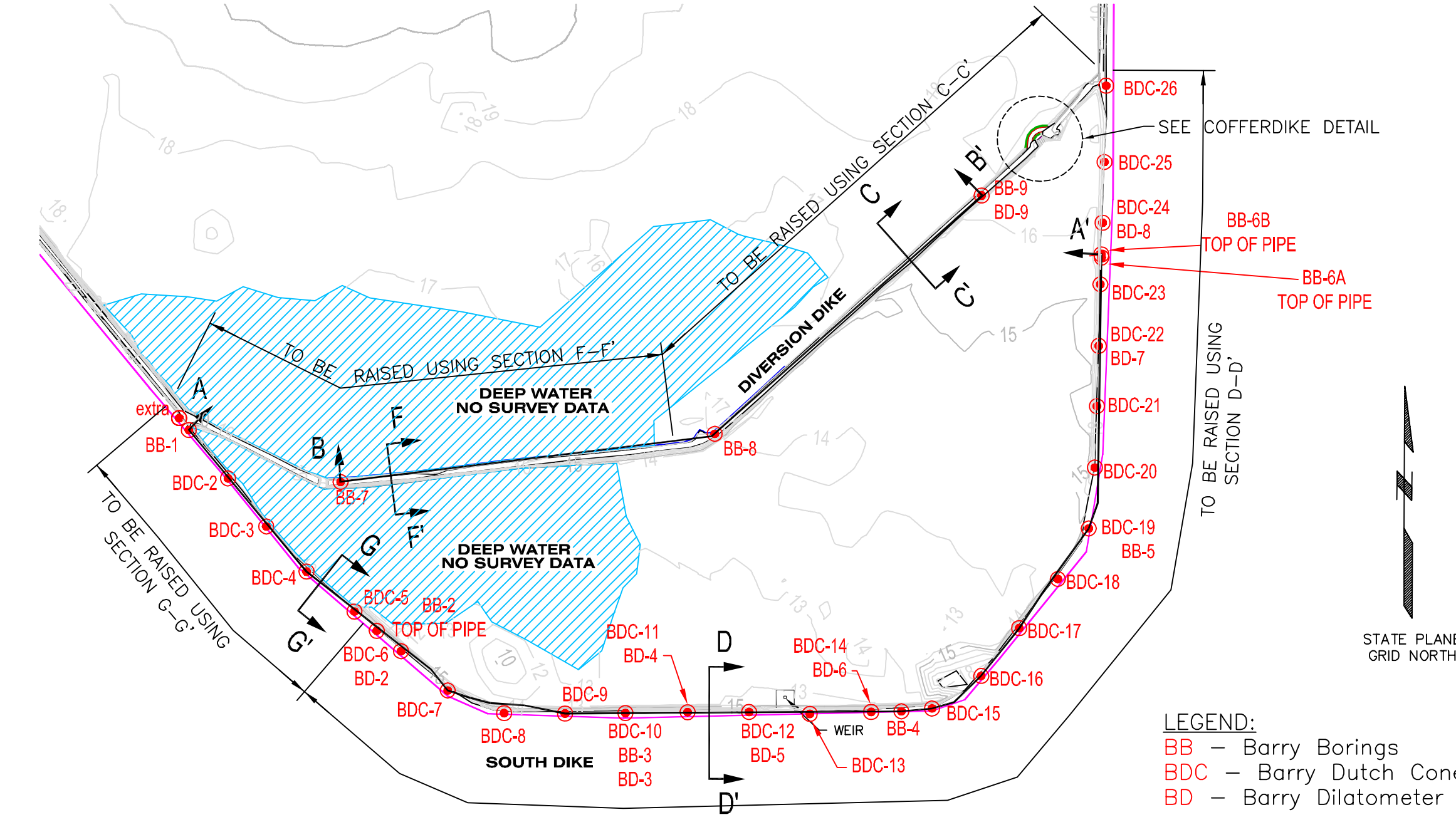
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RJN FB-98001		APPROVED: BNP	BATE:		SUPERSEDES:	D-521376



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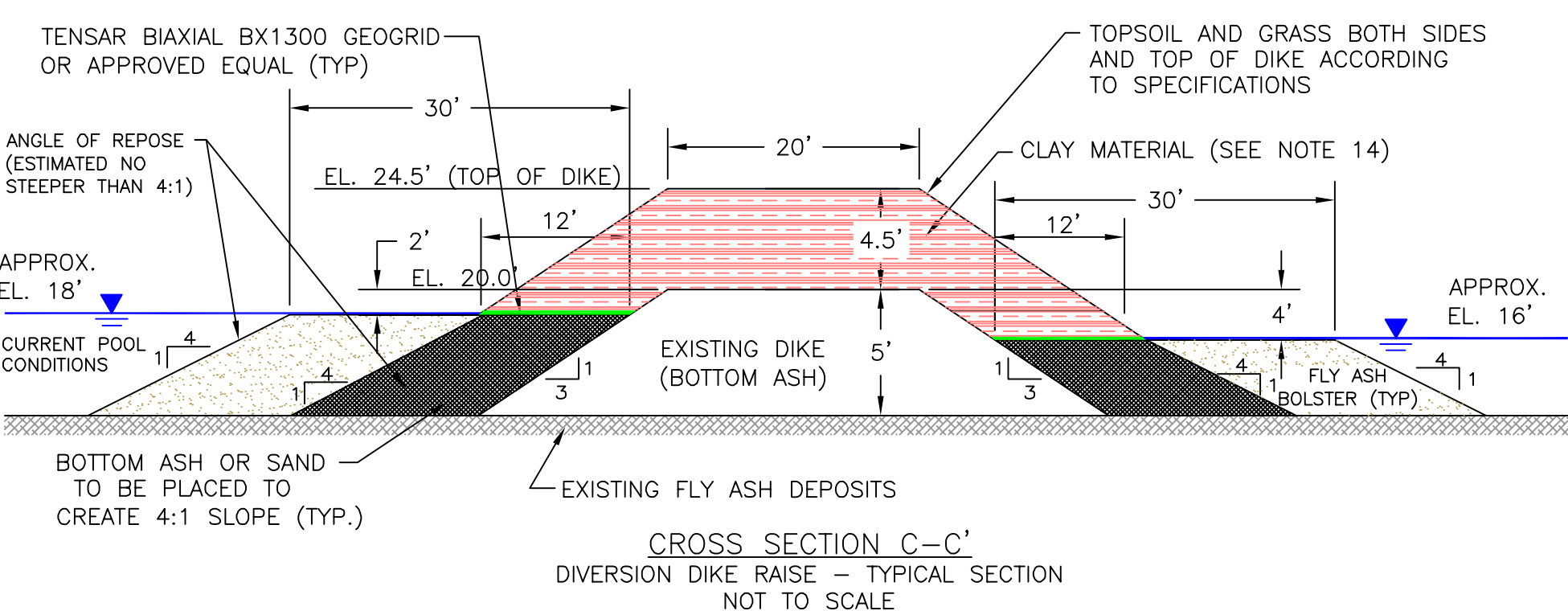


GEOLOGIC CROSS SECTION B-B
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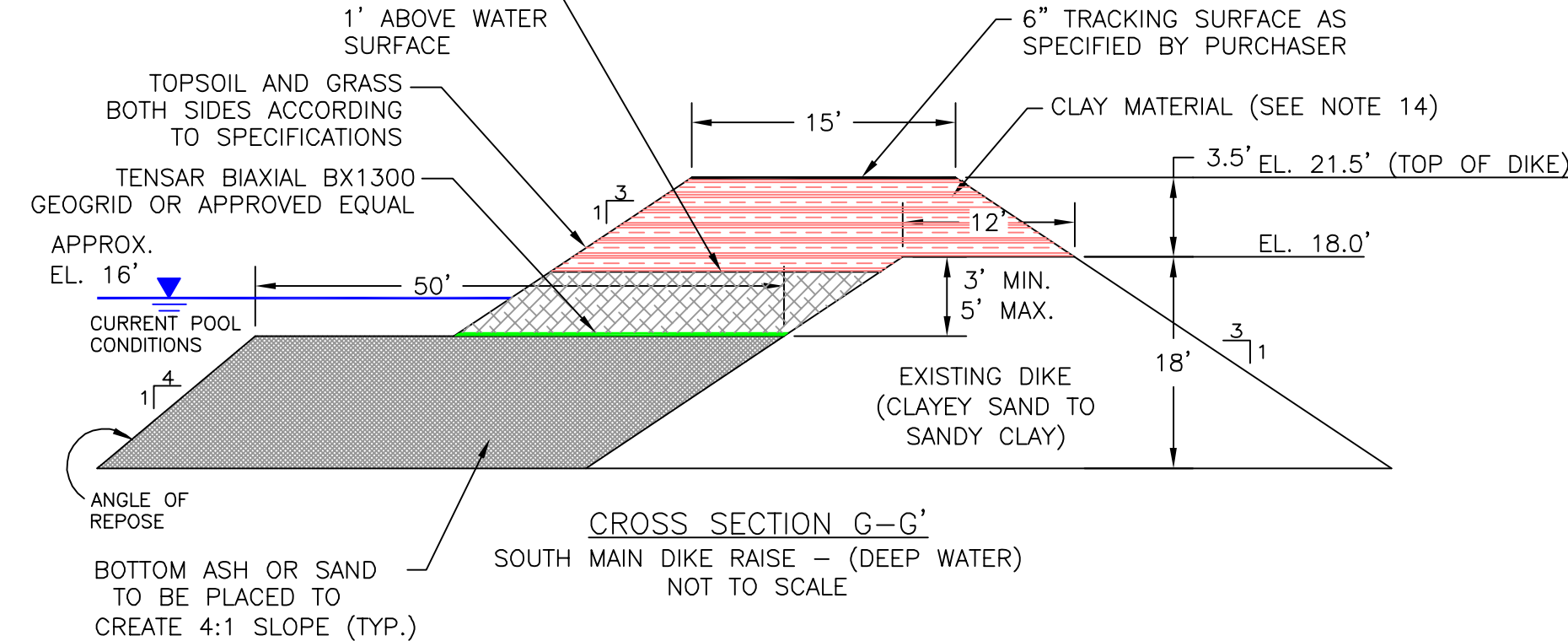


PLAN VIEW
DIVERSION DIKE AND SOUTH MAIN DIKE RAISE
SCALE: 1" = 400'

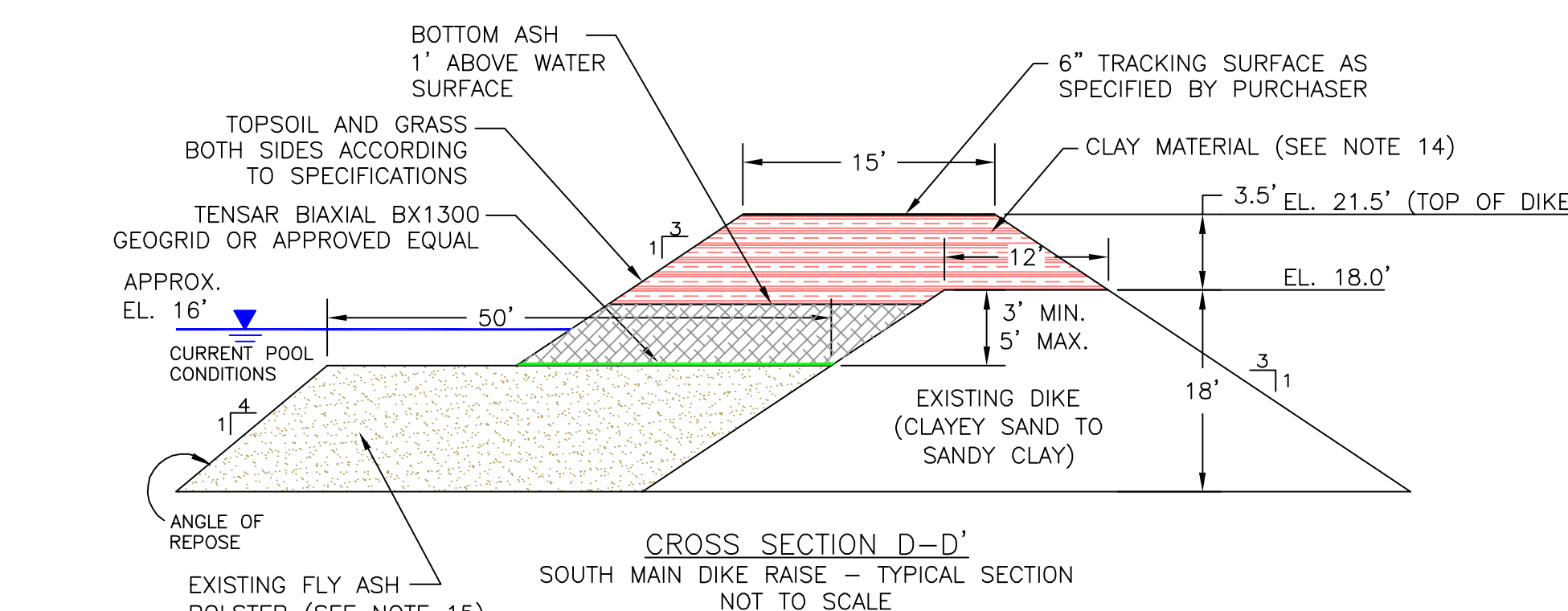
LEGEND:
BB - Barry Borings
BDC - Barry Dutch Cone
BD - Barry Dilatometer



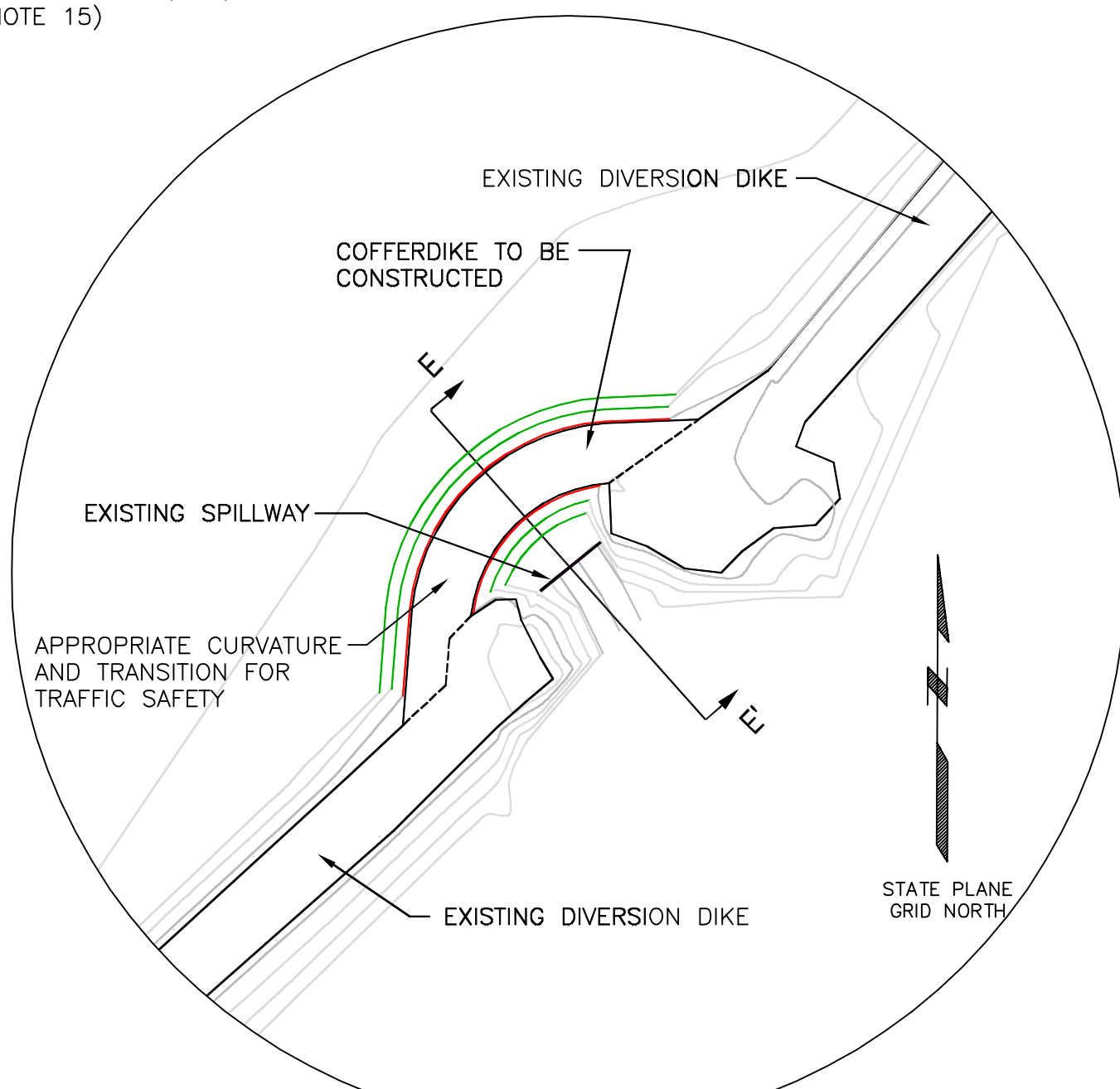
CROSS SECTION C-C
DIVERSION DIKE RAISE - TYPICAL SECTION
NOT TO SCALE



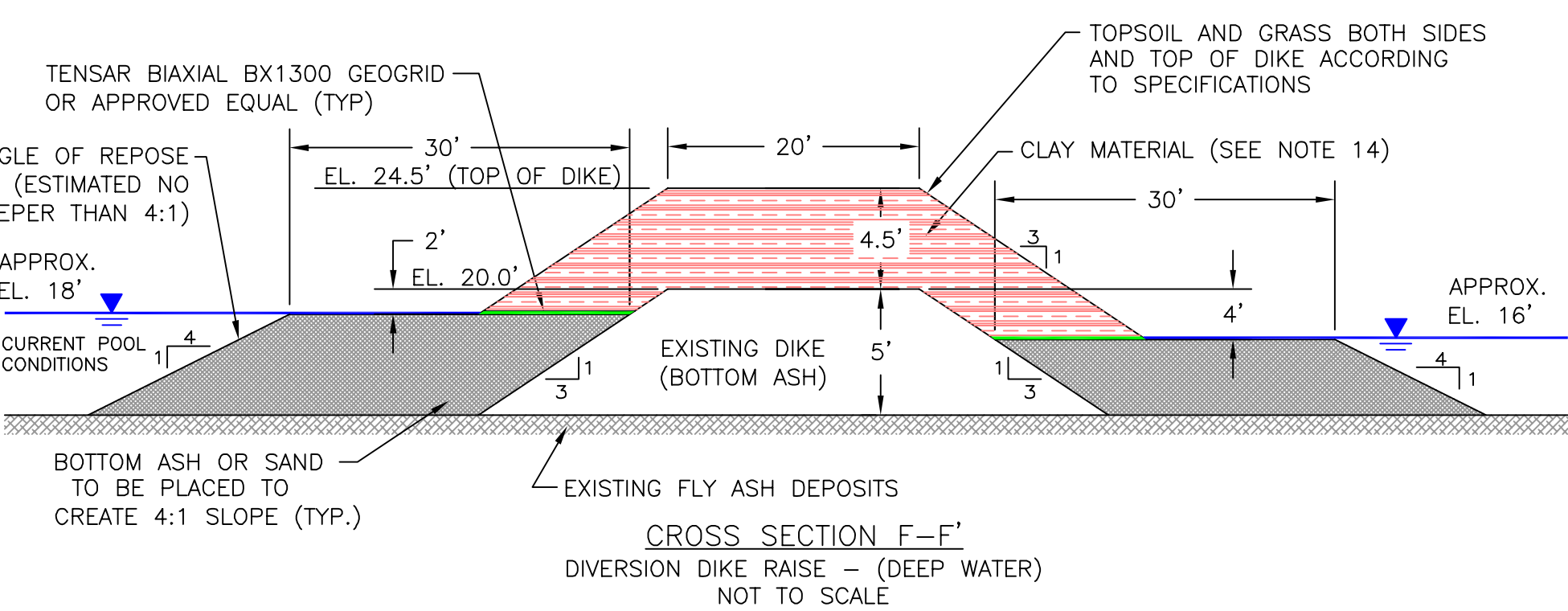
CROSS SECTION G-G
SOUTH MAIN DIKE RAISE - (DEEP WATER)
NOT TO SCALE



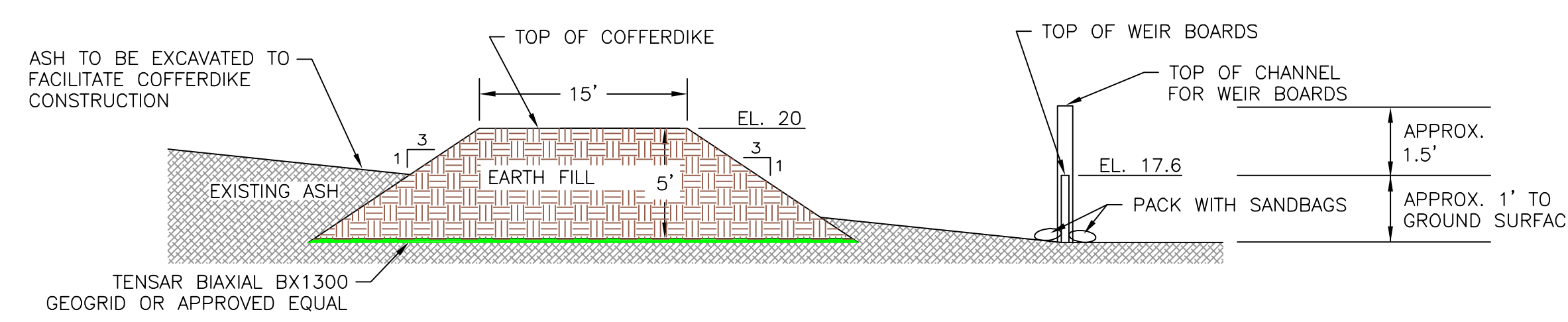
CROSS SECTION D-D
SOUTH MAIN DIKE RAISE - TYPICAL SECTION
NOT TO SCALE



COFFERDIKE DETAIL
SCALE: 1" = 40'



CROSS SECTION F-F
DIVERSION DIKE RAISE - (DEEP WATER)
NOT TO SCALE



CROSS SECTION E-E
DIVERSION DIKE RAISE - COFFERDIKE
NOT TO SCALE

- CONSTRUCTION NOTES:**
- COFFERDIKE**
- ASH DEPOSITS TO BE EXCAVATED FOR COFFERDIKE IN SUCH A WAY THAT WATER REMAINS UNABLE TO FLOW AT THIS OVERFLOW POINT DURING CONSTRUCTION.
 - COFFERDIKE SHOULD BE CONSIDERED TEMPORARY AS CULVERTS WILL NOT BE INSTALLED FOR WATER TO FLOW UPON COMPLETION.
 - COFFERDIKE SHALL BE REMOVED UPON COMPLETION OF DIVERSION DIKE RAISE AND ASH EXCAVATED TO ENSURE FLOW THROUGH AREA.
 - CONSTRUCTION OF COFFERDIKE SHALL NOT COVER OR IMPAIR THE EXISTING SPILLWAY.
- GENERAL**
- CONSTRUCTION SHALL START ON THE DOWNSTREAM SIDE, INCLUDING EXCAVATION OF FLY ASH, PLACEMENT OF BOTTOM ASH AND/OR SAND FILL, PLACEMENT OF FLY ASH, AND PLACEMENT OF GEOGRID.
 - EXCAVATION AND PLACEMENT OF MATERIAL UPSTREAM SHALL BEGIN UPON THE COMPLETION OF DOWNSTREAM MATERIAL PLACEMENT.
 - THE SOIL PROFILES AND ASSOCIATED INFORMATION PRESENT A BEST ESTIMATION OF THE STRATIFICATION ACROSS THE SITE BASED ON TEST BORINGS AT DISCRETE LOCATIONS. IT MAY NOT FULLY DEFINE THE RANGE OF SOIL CONDITIONS ACROSS THE SITE, NOR ANOMALOUS CONDITIONS BETWEEN TEST HOLES.
 - A HYDROGRAPHIC SURVEY SHALL BE PERFORMED IN THE AREA OF "DEEP WATER" WHERE SURVEY INFORMATION WAS PREVIOUSLY UNAVAILABLE. THIS IS TO DETERMINE THE AMOUNT OF FILL NECESSARY IN THOSE AREAS.
 - LIGHT-WEIGHT EQUIPMENT SHALL BE USED AT ALL TIMES.
 - LIFTS MUST BE PLACED IN THIN LONG SECTIONS ALONG THE LENGTH OF THE DIKE BEFORE ADDITIONAL LIFTS ARE MADE.
 - THREE PIEZOMETERS SHALL BE INSTALLED AND MONITORED REGULARLY AT DOWNSTREAM TOE LOCATIONS OF MAIN DIKE: ONE ON EAST SIDE, ONE ON WEST SIDE, AND ONE AT DOWNSTREAM TOE OF BDC-11.
 - THREE INCLINOMETERS SHALL BE INSTALLED AND MONITORED REGULARLY: ONE AT BDC-11, ONE AT BB-6, AND ONE AT BDC-4.
 - INCLINOMETERS TO BE INSTALLED 10 TO 15 FEET INTO FOUNDATION SANDS.
 - CLAY FILL MATERIAL SHALL BE CHARACTERIZED AS CL, ML, CH AND/OR SC MATERIAL.
 - THE EXISTING FLY ASH SHOULD BE CLEARED AND GRADED AS NECESSARY TO FACILITATE GEOGRID PLACEMENT. IN AREAS WHERE FILL IS NEEDED, BOTTOM ASH AND/OR SAND SHALL BE USED TO BRING TO THE APPROPRIATE GRADE.
 - MATERIALS PLACED UNDER WATER SHALL BE PLACED AT A 4:1 SLOPE OR THE ANGLE OF REPOSE OF THE MATERIAL, AS LONG AS THE ANGLE OF REPOSE IS NO STEEPER THAN 4:1. HYDROGRAPHIC SURVEYS SHALL BE TAKEN TO VERIFY PLACEMENT OF MATERIALS.

- OPERATING NOTES:**
- DURING ASH POND OPERATION, THE UPSTREAM AND DOWNSTREAM DIFFERENTIAL WATER LEVEL SHALL BE NO MORE THAN 3 FEET.
 - ASH SHALL NOT BE ALLOWED TO BUILD UP PREVENTING WATER FLOW AROUND DIVERSION DIKE OR DIVERSION OVERFLOWS, EXCEPT AS PER NOTE 1 UNDER "COFFERDIKE".

REFERENCES:
TECHNICAL SPECIFICATIONS FOR ASH POND DIKE STABILIZATION AND RAISE

CAD D-5211916
AutoCAD 2002 DWP-0
for
Southern Company Services, Inc.

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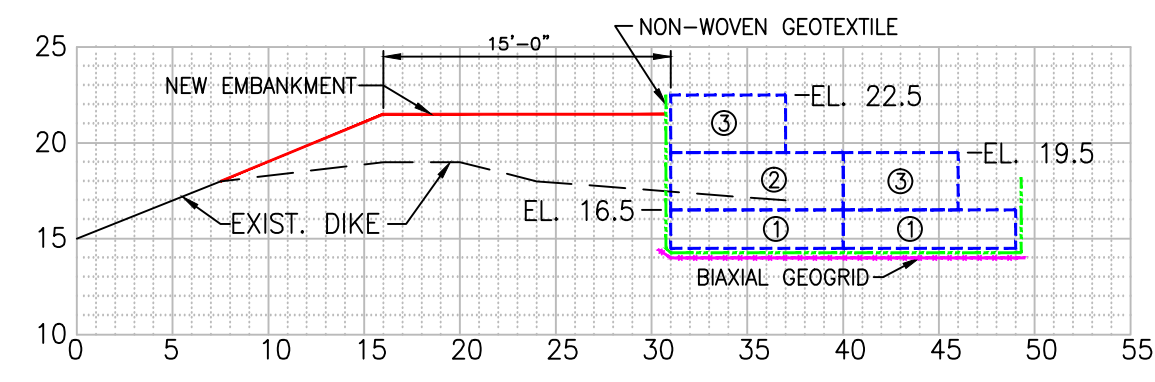
Alabama Power Company
Barry Steam Plant
Diversion Dike & South Main Dike Raise
Geologic Cross Sections & Typ. Dike Raise Sections

DESIGNED	JAA	CHECKED	RMF/PMC	DESIGNED	JSH
ISSUED FOR CONSTRUCTION	JBS	DATE		DATE	
APPROVED		DATE		DATE	

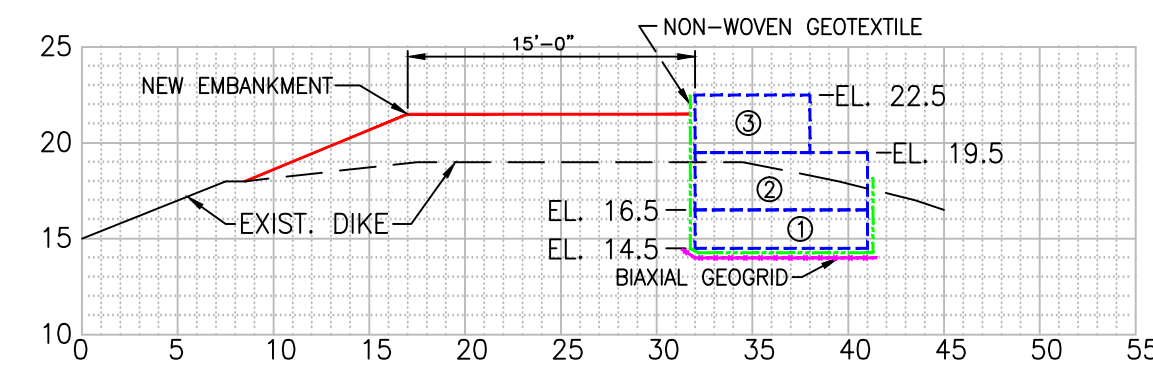
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				D-521916	

CROSS SECTIONS

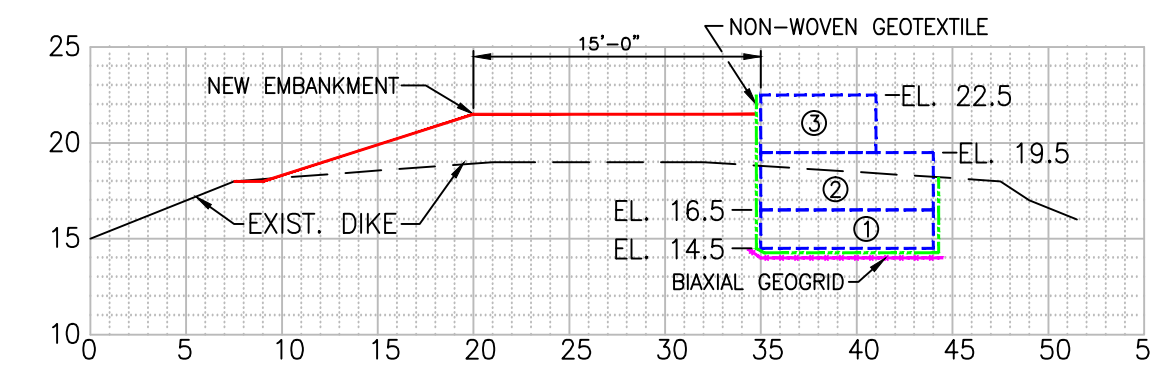
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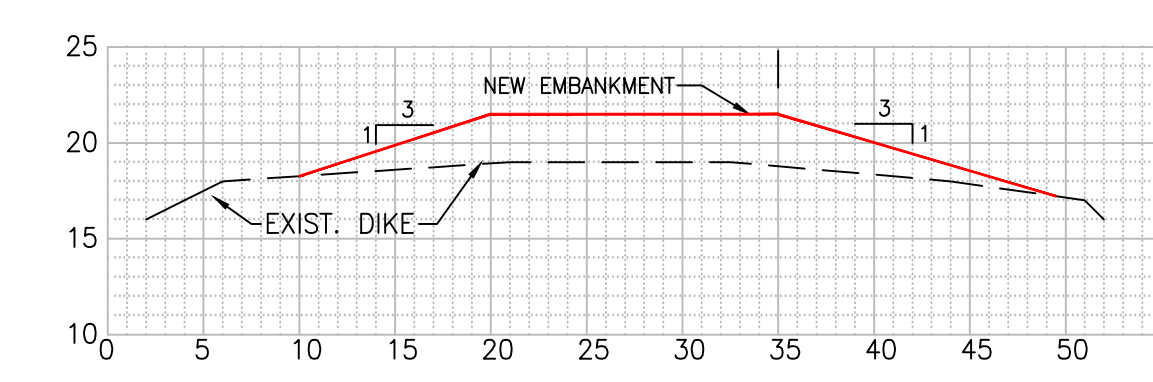
SECTION A-A



SECTION B-B



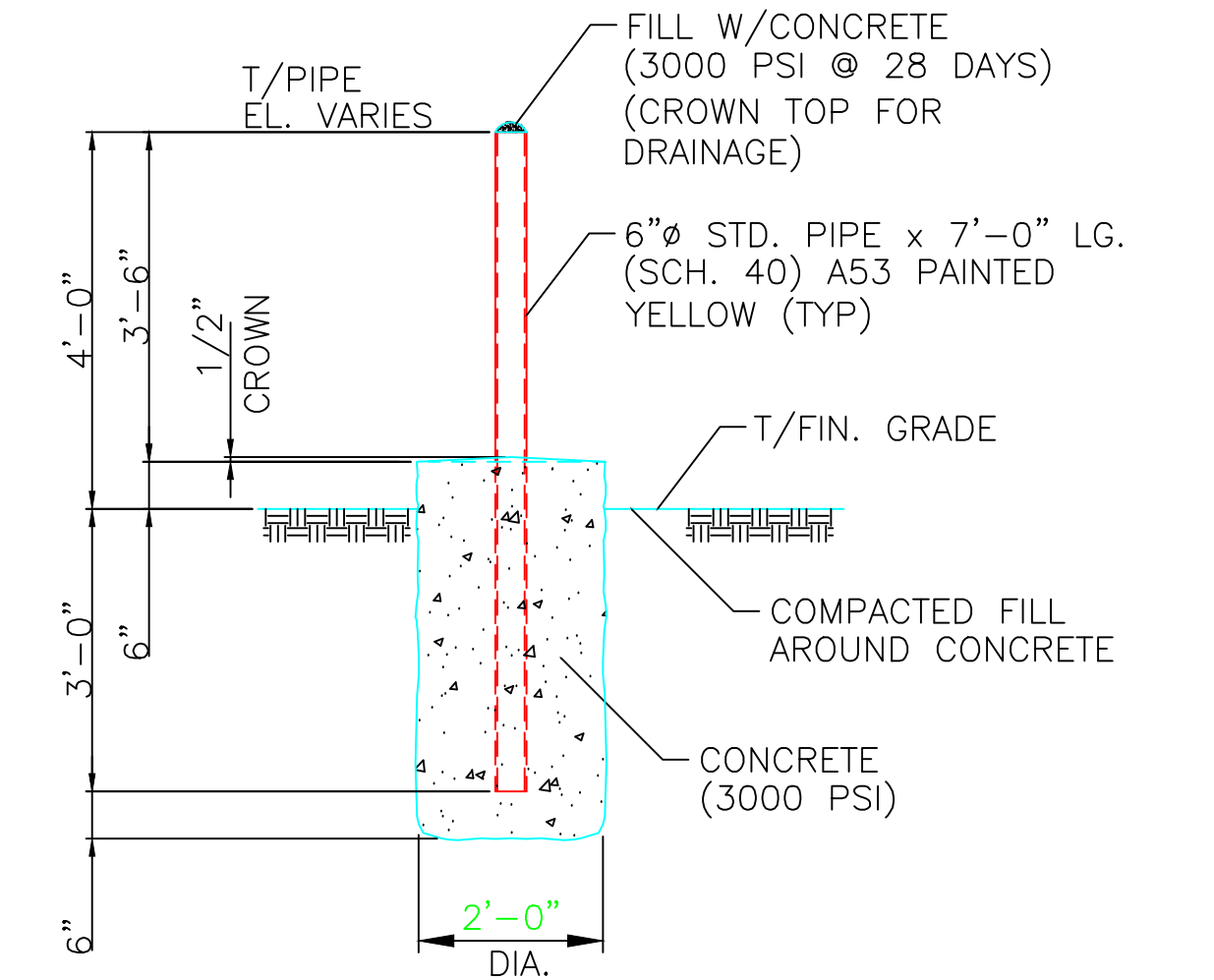
SECTION C-C



SECTION D-D

- ① SACK GABION, 2 FT. x 9 FT. LONG
- ② GABION, 9 FT. LONG X 3 FT. WIDE X 3 FT. HIGH
- ③ GABION, 6 FT. LONG X 3 FT. WIDE X 3 FT. HIGH

NOTE: ALL GABIONS TO BE GALVANIZED AND PVC COATED. GABIONS SHALL BE CONSTRUCTED FROM MACCAFERRI DOUBLE TWIST WOVEN MESH OR APPROVED EQUAL.



TYP. GUARDPOST DETAIL
SCALE: N.T.S.

LEGEND:

- EXISTING CONTOURS
- NEW GRADED CONTOURS

GRID COORDINATES NAD
83 ALABAMA STATE PLANE
WEST ZONE

NOTES:

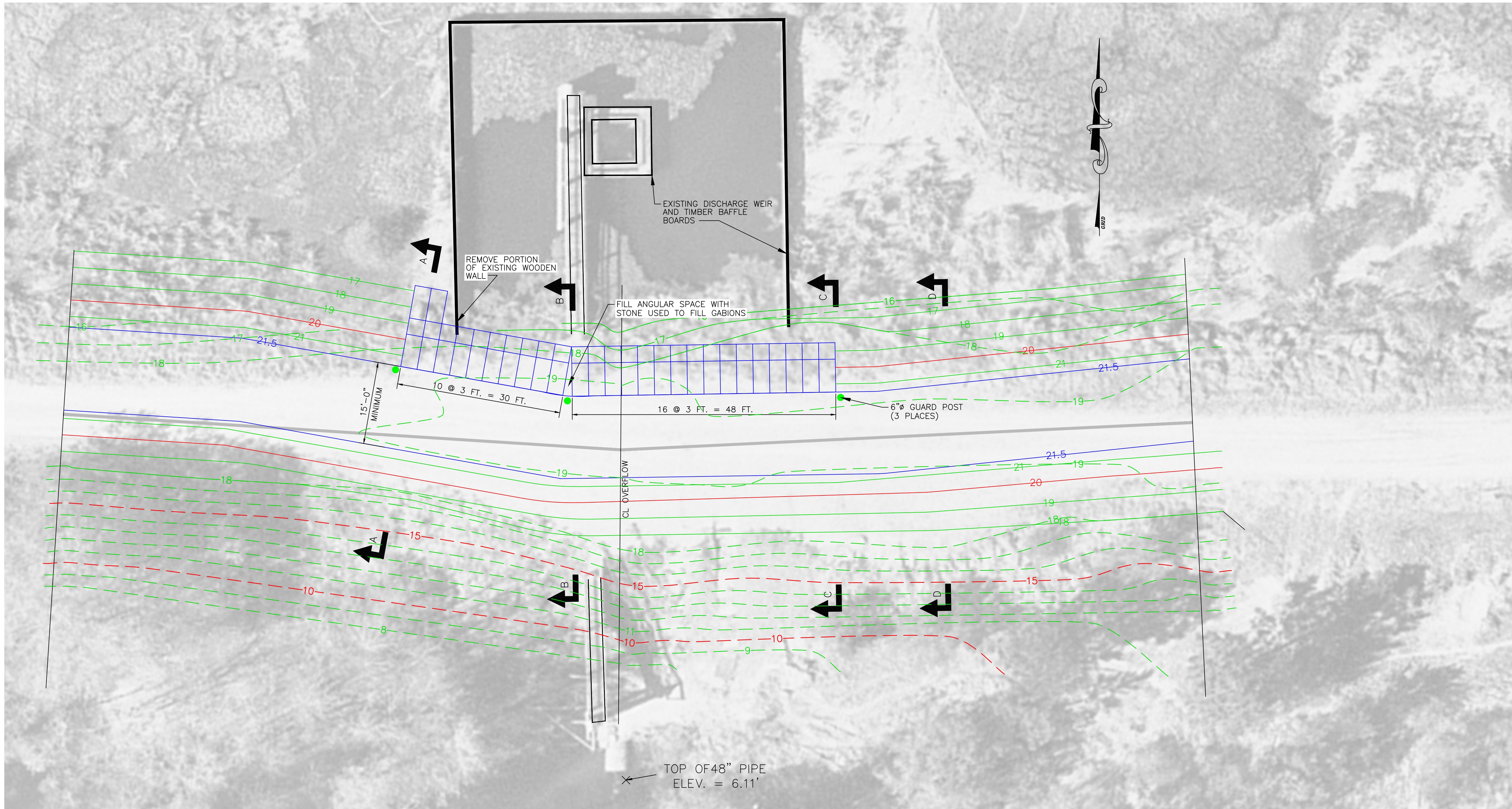
- 1) SURVEY DATA COLLECTED 02/15/05 SCGEM SURVEY AND MAPPING
- 2) DATE OF PHOTOGRAPHY 03/27/02
- 3) DRAWING IS ACCURATE ONLY AT ORIGINAL SCALE.

CONSTRUCTION SEQUENCE:

1. EXCAVATE EXISTING DIKE TO EL. 14.5 FT. WITHIN THE FOOTPRINT OF THE WALL TO FORM A RELATIVELY LEVEL FOUNDATION. SIDES OF THE EXCAVATION SHOULD BE NO STEEPER THAN 1H:1V TO ALLOW FOR BACKFILLING AGAINST GABIONS. THE BOTTOM OF THE EXCAVATION MAY BE BELOW THE WATER LEVEL. DO NOT EXCAVATE EXISTING EMBANKMENT AT THE TOE OF THE EXISTING EMBANKMENT ON THE UPSTREAM (INBOARD) SIDE OF WALL FOOTPRINT EXCEPT TO ACHIEVE SPECIFIED SLOPE.
2. INSTALL GEOGRID ON LEVEL FOUNDATION EXCAVATION BENEATH THE FOOTPRINT OF THE WALL. THEN INSTALL GEOTEXTILE ALONG THE SIDES AND BOTTOM OF THE EXCAVATION TO SEPERATE GABIONS FROM SOIL FOUNDATION AND BACKFILL.
3. PLACE SACK GABIONS, WHICH HAVE BEEN FILLED IN THE STAGING AREA, ON TOP OF GEOGRID AND GEOTEXTILE. THE TOP OF THE SACK GABION SHOULD BE ABOVE THE ASH POND WATER SURFACE. MAINTAIN A RELATIVELY LEVEL SURFACE AT THE TOP OF THE SACK GABION LAYER AT APPROXIMATELY EL. 16.5.
4. BEGIN CONSTRUCTION OF THE REMAINDER OF THE GABION WALL BY FILLING THE BASKETS IN ACCORDANCE WITH THE MANUFACTURER'S GUIDELINES AND THE PROJECT SPECIFICATIONS. MAINTAIN INTEGRITY OF GEOTEXTILE FOR SEPERATION BETWEEN CONSTRUCTED GABION AND BACKFILL.
5. AFTER COMPLETION OF GABION CONSTRUCTION, BACKFILL AGAINST THE GABIONS WITH APPROVED DIKE RAISE SOIL USING HAND GUIDED COMPACTION EQUIPMENT WITHIN 3 FEET OF GABION SURFACE.

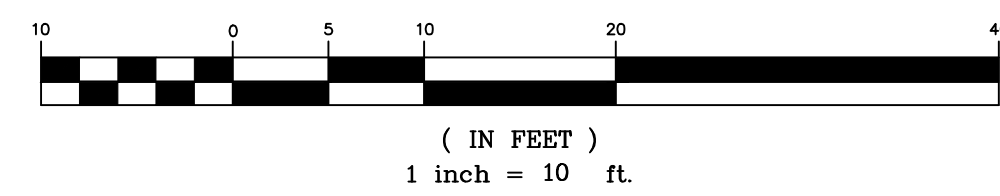
REFERENCES:

D-552579 - ASH POND DIKE DISCHARGE STRUCTURE - EXISTING CONDITIONS
TECHNICAL SPECIFICATIONS FOR ASH POND DIKE GABION WALL



PLAN VIEW

GRAPHIC SCALE



CAD D-552580.dwg
AutoCAD JAB-04

REVISION	DATE	REVISION	DATE	REVISION	DATE	REVISION	DATE	REVISION	DATE	REVISION	DATE

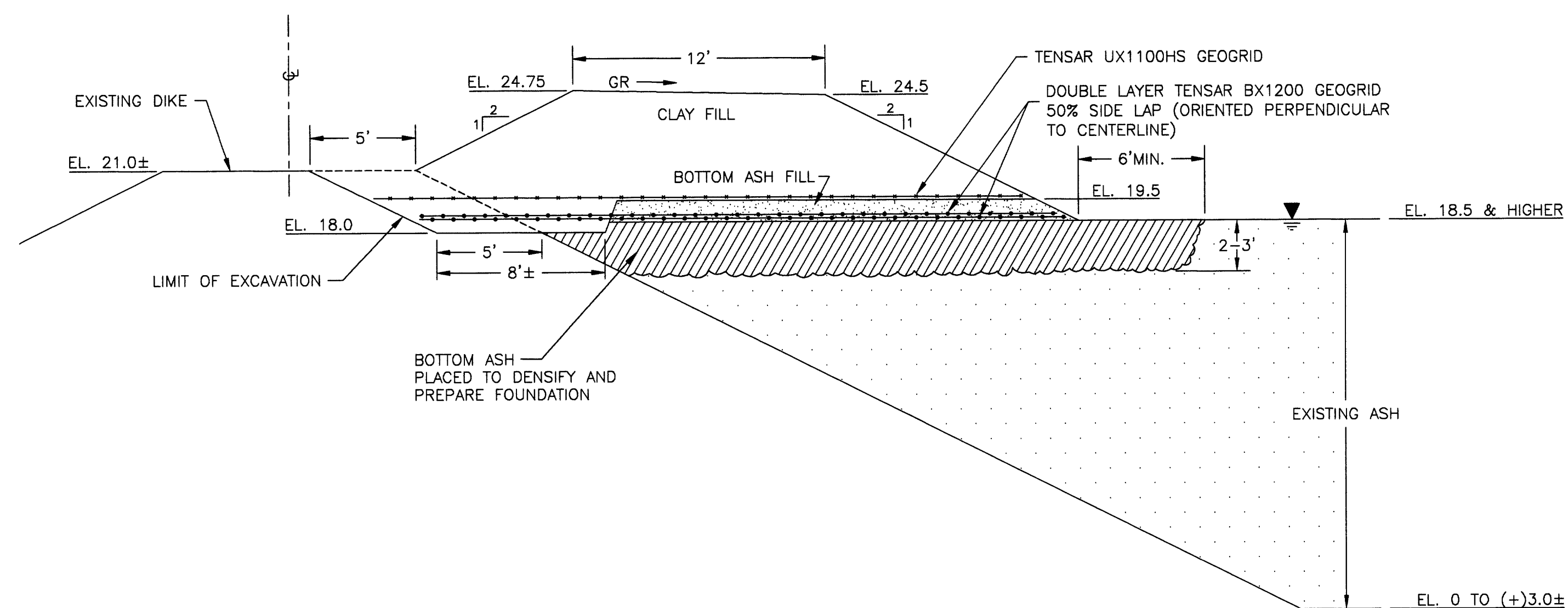
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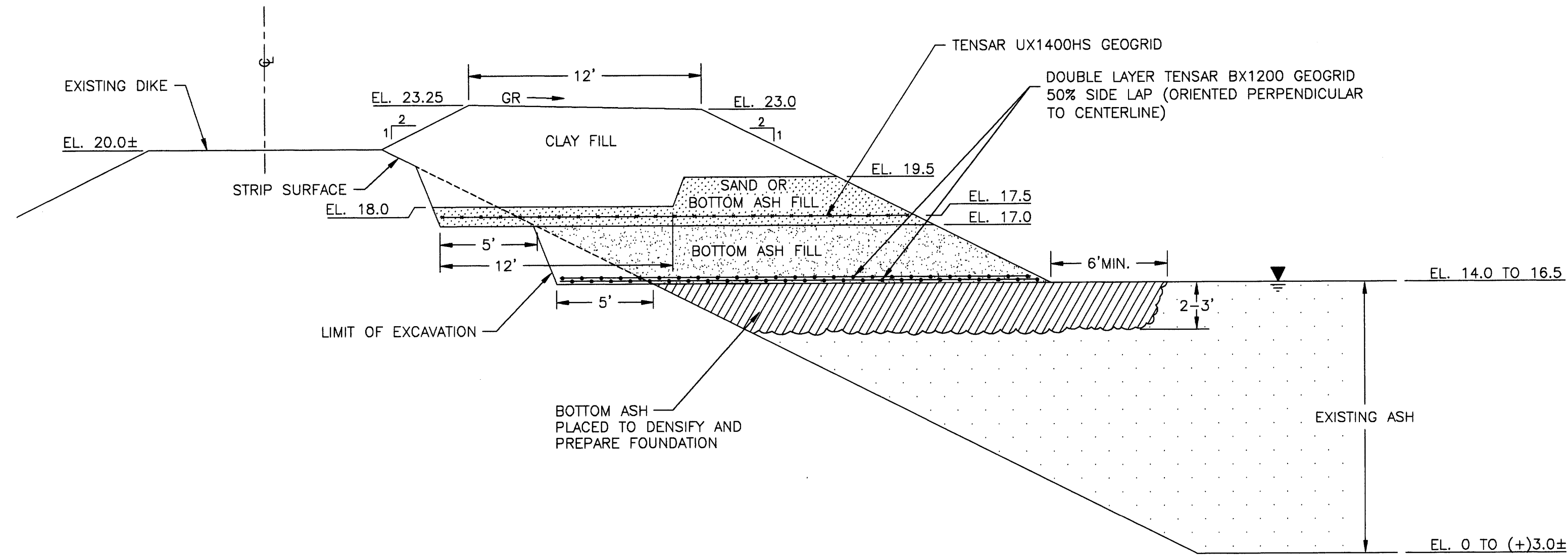
JOB NO. 2108MF

Southern Company Services, Inc.
FOR
Alabama Power Company
PLANT BARRY
ASH POND DIKE
GABION WALL AND
CROSS SECTIONS AT DISCHARGE

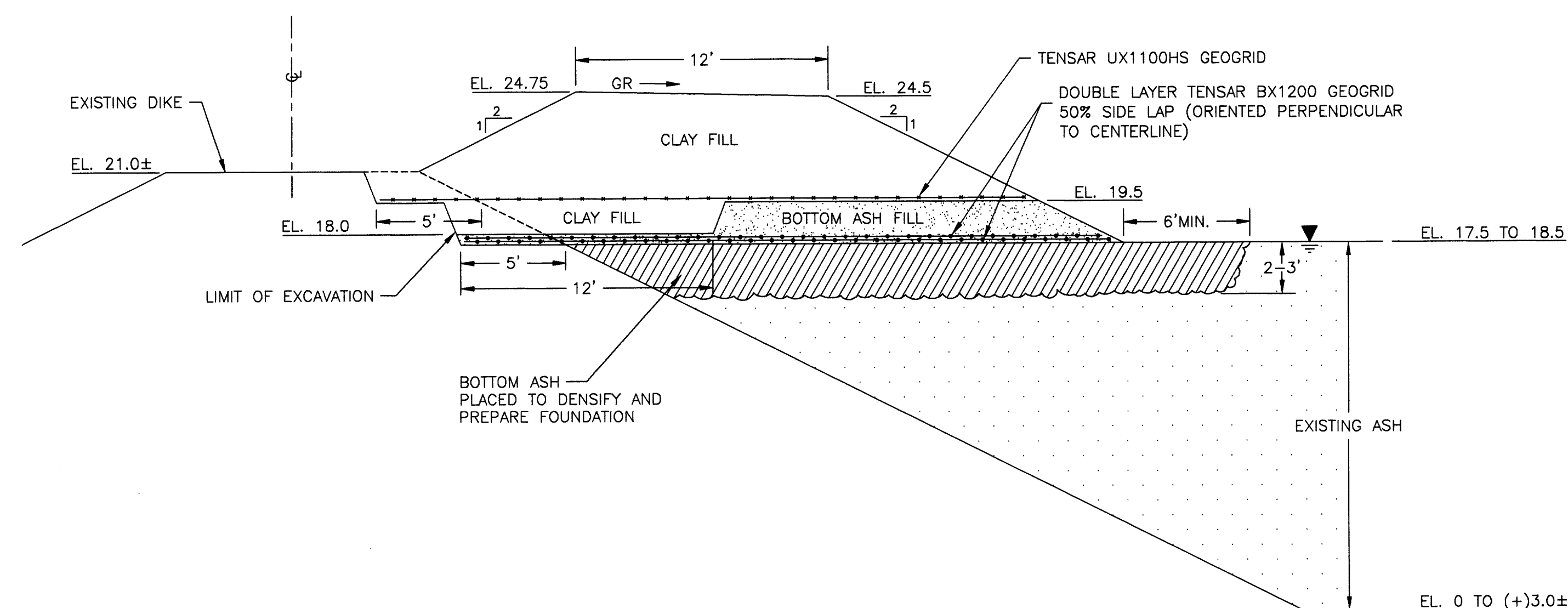
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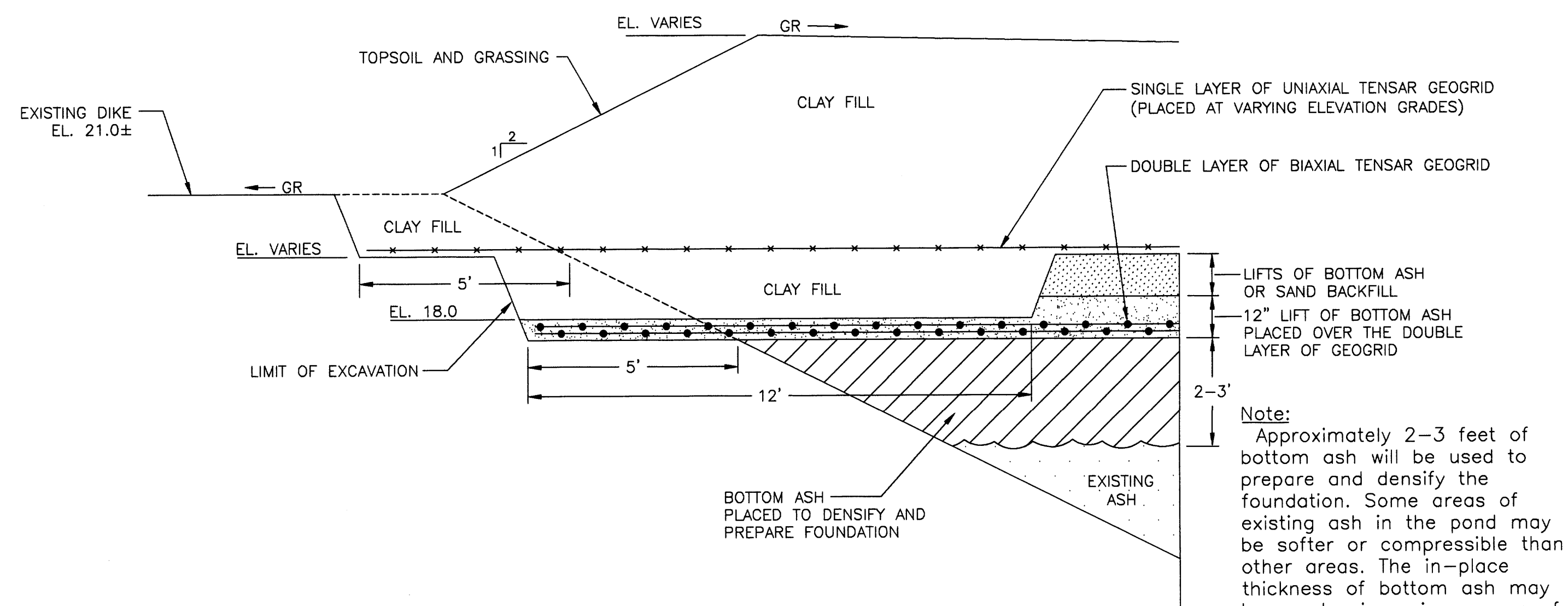
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SCALE: 1" = 5'



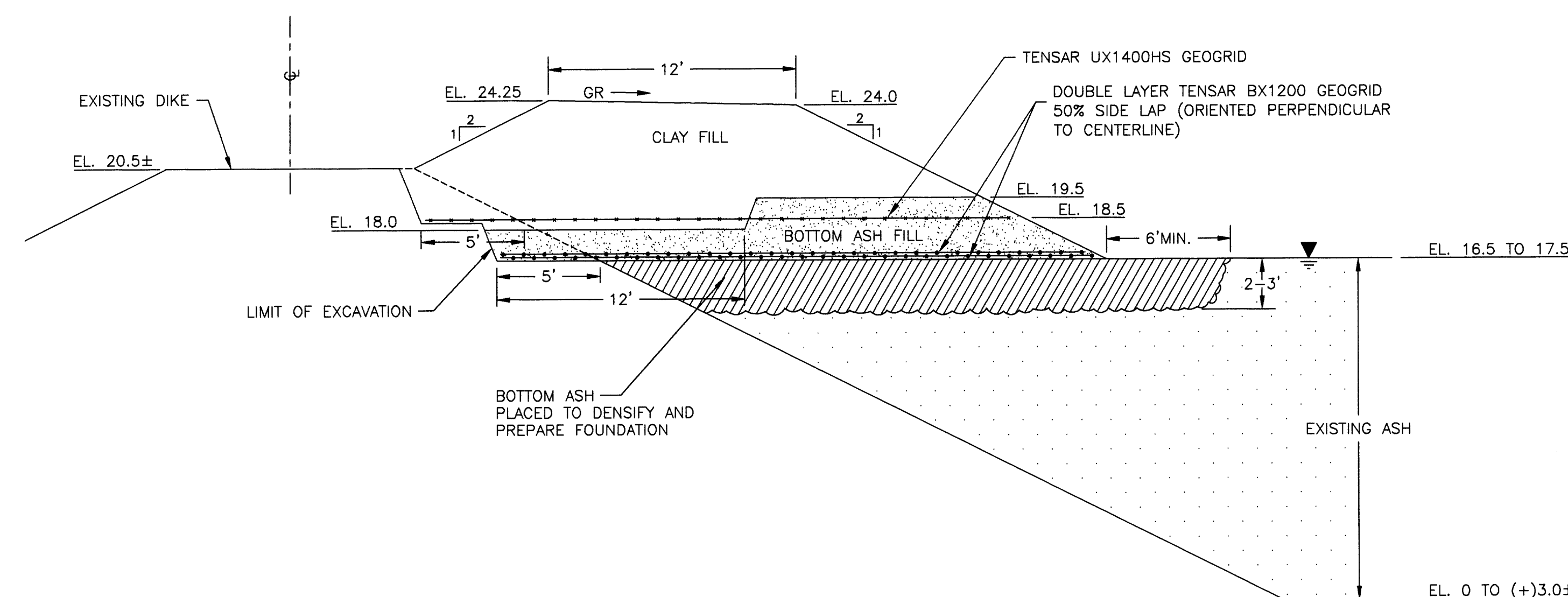
SECTION NO.4
SCALE: 1" = 5'



SECTION NO.2
SCALE: 1" = 5'



TYPICAL EXCAVATION (NOTCH) DETAIL
SCALE: 1" = 2'-6"



SECTION NO.3
SCALE: 1" = 5'

NOTES:

1. The surface on which the Tensor BX1200 geogrid is to be placed should be graded smooth to remove ruts and undulations.
2. After preparing the surface, the Tensor BX1200 geogrid should be installed with an orientation perpendicular to the dike centerline. The geogrid should be installed with the prescribed amount of overlap of adjacent geogrid strips.
3. If the overlap tends to separate during fill placement, adjacent strips of geogrid should be secured together with hog rings or plastic ties on 5 foot to 10 foot centers. The corners of the geogrid strips may be held down with one or two shovelfuls of fill or landscape staples, if necessary.
4. After installation of the biaxial geogrid, the initial lift of fill may then be placed. The initial lift of fill should not exceed 12 inches in thickness and be advanced in the same direction as the geogrid orientation (perpendicular to the dike centerline). Other than repeated passes of the dozer, no compaction requirements are specified for this initial lift of fill, unless directed by the Project Manager.
5. For the initial lift, a small dozer should be used to spread the fill over the biaxial geogrids. See specifications for equipment details.
6. Once the initial lifts of fill is in place, the Tensor uniaxial geogrid should be installed as specified. The uniaxial geogrid should be oriented perpendicular to the dike centerline with no overlap of adjacent geogrid strips. Fill can then be placed and spread directly upon the uniaxial geogrids.
7. Tracked construction equipment shall not be operated directly on any geogrid layer. A minimum backfill thickness of 6 inches is required for operation of tracked vehicles over the geogrid. Sharp turning of tracked vehicles should be kept to a minimum to prevent tracks from displacing the fill and/or the geogrid.
8. Rubber tired vehicles may pass over the geogrid reinforcement at low speeds, less than 10 MPH. Sudden braking and sharp turning shall be avoided.
9. Place topsoil and grass seed on slopes and top surface of dike crest fill.
10. Clay fill placed from EL.18.0 to 24.5(±); this fill placed in soil excavation (notch) above EL.18.0.
11. The uniaxial Tensor layer shall not be placed at an elevation grade which exceeds three feet above the grade for the biaxial Tensor layer. Typically the grade difference should be 12 to 24 inches between the two geogrid layers.
12. The Contractor shall provide dewatering equipment, installation, and operation for placing and compacting backfill to achieve the placement requirements described in the Earthwork Technical Specifications.

REFERENCES:

- D-521369 DIKE EXTENSION-PHASE 1, GENERAL ARRANGEMENT
- D-521373 DIKE CREST MODIFICATIONS - EAST SECTIONS
- D-521374 PLAN AND SECTION 1A & 5A
- D-521380 BORROW AREA & TEST PIT LOCATIONS

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DESIGNED	JPM	DATE	7-23-98
CHECKED	JPM	DATE	7-23-98
APPROVED	JPM	DATE	7-23-98
APPROVED	RMF	DATE	7-23-98

CAD D521372	
AUTOCAD14	JAA -01
SOUTHERN COMPANY SERVICES FOR	
ALABAMA POWER COMPANY	
JOB BARRY STEAM PLANT	
DETAIL DIKE CREST MODIFICATIONS	
SECTIONS - WEST SIDE	
SCALE AS SHOWN	9/M
SHEET 1 OF 1 SHEETS	REV 1
SUPersedes	D- 521372

REV. 1	DATE 7-7-99	REV. 0	DATE 7-23-98
REVISED PER FIELD MARKED PRINT		ISSUED FOR CONSTRUCTION	
JAA JPM RMF		R/JN: FB-98001	

INQUIRY NO. 04-1969-C-APC

**SOUTHERN COMPANY SERVICES, INC.
BIRMINGHAM, ALABAMA**

SECTION II - TECHNICAL SPECIFICATIONS

for

ASH POND DIKE STABILIZATION AND RAISE

**BARRY STEAM PLANT
ALABAMA POWER COMPANY
BUCKS, ALABAMA**

PREPARED BY: Jamie S. Harper DATE: 10/04/2004

REVIEWED BY: Richard M. Franke DATE: 10/04/2004

APPROVALS:

	INITIAL	DATE
J. B. SMITH Civil Engineering Supervisor – Fossil and Hydro Projects Engineering and Construction	JBS	10/5/04

REVISIONS:

NO	DESCRIPTION	BY	REVIEW	APPROVED	DATE
0	Issued for Construction	JSH	RMF/PMG	JBS	10/8/04

INQUIRY NO. 04-1969-C-APC

SOUTHERN COMPANY SERVICES, INC.
BIRMINGHAM, ALABAMA

SECTION II - TECHNICAL SPECIFICATIONS

for

ASH POND DIKE STABILIZATION AND RAISE

BARRY STEAM PLANT
ALABAMA POWER COMPANY
BUCKS, ALABAMA

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INQUIRY 04-1969-C-APC

SECTION II - TECHNICAL SPECIFICATIONS
FOR
ASH POND STABILIZATION AND RAISE
FOR
BARRY STEAM PLANT
ALABAMA POWER COMPANY

1.0 SCOPE

The work performed under this contract includes the earthwork construction, quality control, and supervision to raise the south ash pond dike crest and the diversion dike crest. The Contractor shall provide all labor, materials, equipment, fuel, tools, and supervision required to perform the work activities described in this Specification and the design drawings.

1.1 GENERAL

The following is a list of general items of work, materials, equipment, personnel, and facilities which shall be furnished by the Contractor:

- A. Provide a qualified field supervisor and workmen (skilled and unskilled) in sufficient numbers to complete the work as specified, meeting the labor laws of the State of Alabama.
- B. All equipment, fuel, and tools necessary to complete the work as specified.
- C. All temporary facilities, health and safety equipment and supplies, expendable materials, and all other materials not furnished by the Purchaser.
- D. Unloading, handling, storage, and transport at the jobsite of all manufactured materials for this work.
- E. The loading, hauling, transport, and placement of all material from borrow or deposition location to new installation location.
- F. All non-destructive testing and examinations required.
- G. Provide traffic control during roadway related construction activities and material deliveries. If within active and congested areas around the plant, traffic control shall include flag persons, barriers, and other control aids to provide for the safe routing of traffic in the affected area.
- H. Provide all temporary structures and amenities required for staff or storage.

- I. Provide labor for security of materials and equipment utilized for the work. The Purchaser will not be responsible for loss of equipment or materials.

1.2 DEFINITIONS OF TERMS

The following definitions are in addition to the definitions set forth in the General Conditions. The terms used in these Specifications shall be interpreted and understood as stated:

- A. "Project Manager" means the onsite manager of the project or his designated representative. The Project Manager is the authorized representative at the site for the Purchaser.
- B. "Engineer" means the Southern Company Services, Inc. representative for the design and alternate design review of the work.
- C. "Manufacturer" means the entity who furnishes the geogrid material.
- D. "Inspector" means the entity who provides Quality Assurance inspection of work in progress and completed work.
- E. The term "geogrid" refers to a synthetic planar structure formed by a regular network of tensile strength elements with apertures of sufficiently large size to allow for interlocking with the surrounding soil so as to perform the primary function of reinforcement.

1.3 WORK INCLUDED

Work to be performed by the Contractor for the ash pond modifications shall include all work described in these Specifications and drawings. The Contractor shall furnish all labor, materials, equipment, fuel, tools, and supervision required to perform the work. The Contractor shall inspect the work performed by his laborers and subcontractors to verify that all work is complete and that the work meets the requirement of these Specifications. This work includes, but is not limited to, the following:

- A. Mobilization and demobilization
- B. Obtaining all permits required to conduct the work covered by these Specifications.
- C. Performing all work required by these Specifications and the associated bid documents.
- D. Establishing all initial lines and grades, base lines, stationing along dike, and survey control for slopes and grades.

- E. Procuring geogrid materials (by Tensar Company or approved equal) and planning the delivery of the materials to the site to meet the project schedule.
- F. Developing borrow areas for obtaining clay and sand backfill materials. This work includes haul roads, stripping and clearing, erosion and sediment control, dust control, groundwater and seepage control, grading and reclaiming the borrow areas at the end of work.
- G. Excavating, loading, hauling, and placing ponded bottom ash and/or sand in the areas where used as bolster.
- H. Excavating, stacking, and placing ponded fly ash along the upstream and downstream toe of the diversion dike.
- I. Excavating, loading, hauling, placing, and compacting clay.
- J. Grading existing fly ash along the south main dike.
- K. Constructing coffer dike at east overflow on diversion dike.
- L. Inspecting all rolls of geogrid material delivered to the site for damage, quantity/number of rolls, type of geogrid material, and general quality of fabrication to assure that all materials meet the requirements of the Specification.
- M. Placing geogrid reinforcement and compacted clay to raise the south main dike elevation to 21.5 feet MSL.
- N. Placing bottom ash and/or sand to lay the upstream and downstream toe of the diversion dike back from 3:1 to 4:1.
- O. Placing geogrid reinforcement and compacted clay to raise the diversion dike elevation to 24.5 feet MSL.
- P. Removing coffer dike at completion of raise.
- Q. Quality controlling all work for foundation preparation, backfill materials, backfill placement, grading, geogrid placement, and grassing activities. This includes hydrographic surveys as necessary to ensure proper placement of materials underwater.
- R. Placing topsoil, fertilizer, and grass seed on dike surfaces.
- S. Performing all site clean-up activities to satisfy the Project Manager and meet the requirements of the Specification.

- T. Performing all work activities in a safe manner.
- U. Performing all work activities to prevent damage to the existing earth dike structure and not allow such activities to produce an unstable dike structure which results in leakage, ash spills, ash overtopping, excessive rutting and potholes, or slumps/sides in the dike slope.
- V. Maintaining the dike crest at present elevations. Maintaining roads from all borrows, office, storage, and laydown areas to the dike construction area.
- W. Providing and maintaining erosion and sediment control.
- X. Providing dust control on roads and construction areas.
- Y. Maintaining all earthwork and compaction equipment to operate properly during the entire contract period.
- Z. Providing field office, communications, storage buildings, toilets, etc. Refer to Section 16.0.

1.4 WORK EXCLUDED

Work to be performed by the Purchaser or Project Manager shall include, but is not limited to, the following:

- A. Establishing survey control points/monuments of known northing, easting, elevation (relative to mean sea level) for use by the Contractor under Section 1.3.
- B. Providing electrical service to the field office.
- C. Providing a source of potable water to the field office.
- D. Providing overall site management during construction to ensure that the Contractor's work follows the requirements of these Specifications.
- E. Quality control testing on soil and bottom ash fill placement by the Purchaser and associated engineering inspections.
- F. Installing and monitoring inclinometer casings and piezometers.

2.0 CONTRACTOR SUBMITTALS

The Contractor shall submit the following information and details with his bid:

- A. Detailed cost proposal for the dike modification work.
- B. List of all Subcontractors, if any, and their principal personnel who will be working on the job.
- C. Resumes of key personnel working for the Contractor, especially the field supervisor in charge of the job. The field supervisor should have a minimum of five years of working experience in earthwork/dike construction. This supervisor shall not be replaced with an individual of lesser experience during the course of the work.
- D. Plan for material storage and handling, laydown location and size, and for traffic control measures.
- E. Sediment and Erosion Control Plan.
- F. List of equipment and materials to be used on the job.
- G. Plan for maintaining existing road and dike crest. Refer to Section 12.0.
- H. Plan to route equipment around the dike during the earthwork construction.
- I. Schedule (bar chart method showing milestones) for performing the earthwork construction.
- J. Certification and data described in Section 10.0 for grassing activities.

3.0 APPLICABLE DOCUMENTS

3.1 CODES AND STANDARDS

The following codes are considered to be a part of these Specifications in the areas where they apply to material, fabrication, workmanship, examination, testing, and documentation. The latest revision in effect at the time of issuance of the Inquiry shall be applicable unless otherwise noted. Omission of any codes and standards does not relieve the Contractor of his responsibility to the applicable codes and standards. In the event of a conflict between the following codes and standards and these Specifications and/or accompanying drawings or diagrams, these Specifications and drawings shall govern to the extent of such conflicts. Any deviations contained in these Specifications and/or accompanying drawings from the following regulations have been made to better address the specifics of this particular facility. Specific standards are referenced within the appropriate section of the Specifications.

- A. American Society for Testing and Materials (ASTM) Standards, 1990 Edition

- B. Occupational Safety and Health Act (OSHA) of 1970, as amended
- C. Codes specific to the local county and city.
- D. Alabama Department of Environmental Management (ADEM) Regulations
- E. Environmental Protection Agency (EPA) Regulations
- F. American Water Works Association (AWWA)
- G. Geosynthetic Research Institute Standards
- H. DOT Federal Highway Administration Standards

3.2 CIVIL DRAWINGS

The following drawing is hereby made a part of this Specification and sets forth the scope and details of the work to be performed by the Contractor:

D521916, Rev. A Barry Steam Plant Ash Pond Diversion Dike and South Main Dike Raise Geologic Cross Sections and Typical Dike Raise Sections

3.3 GEOTECHNICAL REPORT

Soils information can be found in the report, "Plant Barry Ash Pond South Dike and Diversion Dike Slope Stability Report." This report is issued as a portion/exhibit to the Inquiry Package and should be read in its entirety in order that the Contractor is aware of soil types and engineering characteristics of soils to be encountered as well as design rationale.

The soil profiles and associated information present a best estimation of the stratification across the site based on test borings at discrete locations. It may not fully define the range of soil conditions across the site, nor anomalous conditions between test holes.

If the Contractor judges that the subsurface information is inadequate in any regard, he has the right to perform any additional investigation to supplement the provided information at no expense to the Purchaser. The Purchaser shall not be liable for any oversight made by the Contractor regarding the subsurface conditions.

4.0 SITE CONDITIONS AND FIELD INVESTIGATIONS

Prior to mobilization and execution of any work described in these Specifications, the Contractor shall become thoroughly familiar with the plant facilities, the site

conditions at the ash pond, and the other features of the site described in the Specifications and drawings.

Field investigations for available borrow have not been performed.

Subsurface investigations of the south main dike and the diversion dike have been performed. Included in these investigations were test borings, Dutch cone soundings (DCP), and dilatometer soundings (DMT).

Drawing D521916 shows the locations of all borings, DCP soundings, and DMT soundings, as well as a soil profile of each dike. Survey information, such as hydrographic contours are also provided.

The field testing, drilling, and measurements performed by the Purchaser have been conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions. The Purchaser assumes no responsibility for the accuracy of the investigations, the resulting data, or the interpretation; nor does the Purchaser guarantee that the materials and conditions will not vary from those indicated by the investigations. In addition, the Purchaser will not be responsible for any deduction, interpretation, or conclusion drawn by the Contractor.

The Contractor may perform such additional field investigations in the ash pond dike area as he deems necessary to augment previous investigation work. Prior to the start of the additional field investigations, the Contractor should state in writing his justification for this work and must obtain the approval of the Project Manager. All field and laboratory data obtained by the Contractor shall be transmitted to the Project Manager for his records.

5.0 CONSTRUCTION REQUIREMENTS

5.1 CLEARING AND GRUBBING

The ash foundation surfaces at the diversion dike and main dike shall be cleared and grubbed of trees, stumps, and heavy vegetation. This work should occur during foundation preparation work as the bottom ash fill is dumped and spread onto the ash surface. The vegetation, trees, and stumps may either be removed from the foundation surface and disposed, cut and pushed out into the pond just ahead of the prepared surface, or cutoff twelve inches below the prepared surface and the materials buried into the ash to a depth of twelve inches below the prepared surface.

5.2 STRIPPING AND DIKE EXCAVATION

The upstream slope of the existing south dike shall be stripped of gravel, vegetation, and organic topsoil to a depth of six inches normal to the slope and to

expose the clayey backfill soils. The stripping shall occur from the upstream crest down to the ash/water surface. This work shall occur in all areas of dike modifications.

Soils along the crest and downstream slope shall not be excavated.

5.3 DISPOSAL OF MATERIALS

The Contractor shall dispose the stripped and excavated materials only within a designated area of the ash pond.

The Contractor shall notify the Project Manager of his plans to dispose materials, along with the type and quality of material for disposal. The Contractor shall not allow any spillage of materials from hauling vehicles from the point of excavation to the final disposal location. The Contractor shall be responsible for cleaning the road surface where the spillage occurs and as directed by the Project Manager. All controlled burning of materials shall meet the requirements established by state, county, and local laws.

5.4 FOUNDATION PREPARATION

5.4.1 South Main Dike

The Contractor shall prepare the ash foundation prior to placing geogrid and earth fill materials. In most areas, the fly ash will already be deposited along the main dike. In this case, the fly ash must be cleaned, grubbed, stripped, and graded as necessary to facilitate geogrid placement. This may include moving fly ash material or adding bottom ash material to accomplish this.

In the areas where “deep water” is estimated, bottom ash must be placed as a bolster from the pond bottom to within five feet from the top of the dike unless a hydrographic survey shows that the fly ash continues to run along the dike in a similar manner as the typical cross section. The bolster shall be 50 feet in width.

Once the bolster is completely in place around the dike, the geogrid should be placed. Drawing D521916 presents cross-sections which show the bottom ash placed to an approximate thickness of two to three feet below and one foot above the existing ash/water surface, occurring at the start of construction. This zone of bottom ash will vary in thickness along the dike due to saturation level in the ash or the in situ density and strength of the ash.

5.4.2 Diversion Dike

The Contractor shall first excavate the fly ash materials on the downstream side of the diversion dike. The fly ash can be stacked in a nearby area within the ash pond designated by the Project Manager. The excavation can be done using a

long reach backhoe or similar equipment. Excavation shall not be performed using a cutter-suction excavator. It is estimated that no excavation will be performed along the “deep water” section of the dike. Once excavation is complete, bottom ash and/or sand fill shall be placed to facilitate laying the toe back from 3:1 to 4:1 as shown on Drawing D521916. This will be done along the downstream toe first. When the toe is complete, the fly ash material may be placed along the new bottom ash to create a 30 foot bolster. In areas of “deep water”, bottom ash and/or sand fill material shall be used to bolster the dike.

Once the downstream modifications have been made, the same modifications shall be made upstream. As shown in the cross sections on Drawing D521916, the bolster shall be placed to the top of the water surface.

5.4.3 General

The foundation preparation work shall be considered complete when the dozer can operate on the bottom ash surface without pumping large quantities of water to the surface, sinking down into the bottom ash, producing a wave effect when operating on the bottom ash, and when workers can walk safely on the bottom ash.

The prepared foundation surface shall be graded to a relatively level grade from upstream to downstream and along an axis parallel to existing dike. Loose soil and ash materials/clods should be removed from the prepared surface. The Project Manager shall be responsible for approving the foundation preparation work for each section along the axis of the dike crest raise. All work shall be complete and approved prior to placing the first lift of clay fill material and the initial lift of bottom ash/soil over the geogrid layer.

5.5 EARTH FILL MATERIALS

The earth fill materials to be used in constructing the dike crest raise shall consist of clay, sand, bottom ash, and topsoil. The cross-sections presented on Drawing D521916 show the zones of each fill. The Contractor shall be responsible for obtaining these materials from designated on-site sources or from off-site sources, which meet the requirements of the Specifications.

5.5.1 Clay Fill

- A. Clay fill should be obtained from a designated on-site source or from an off-site source determined by the Contractor.
- B. Clay fill shall consist of soils having a minimum of 45 percent by weight passing the U.S. Standard No. 200 Sieve (per ASTM D-422). These soils shall be classified as SC, CL, ML, or CH materials based on ASTM D-4318 and D-2487).

- C. The Contractor shall obtain three soil samples from the on-site clay borrow source to verify the soil properties described in Section 5.5.1B. Soil testing shall be performed in accordance with ASTM D-422, D-698, D-2487, and D-4318. This testing work shall be performed and completed at least five days prior to the start of clay fill placement activities. All test data shall be submitted to the Project Manager within two to five days prior to the start of clay fill placement activities.
- D. If the Contractor is required to locate an off-site clay fill borrow source to complete the placement work, the Contractor shall perform the same soil sampling, testing, and submittal activities as stated above. The Project Manager shall approve the new off-site borrow source prior to the Contractor utilizing these clay soils in the dike construction.
- E. Soil sampling and testing shall be performed on each observed change in soil consistency (determined by the Contractor's field supervisor or the Project Manager) or for each 5000 cubic yards of clay soil used in the dike construction, whichever occurs first. The Contractor shall perform all sampling and testing work at no cost to the Purchaser.

5.5.2 Sand Fill

Two sources of sand fill may be available for use in the dike work:

- 1) Sand from an on-site borrow area.
- 2) Dredge sand near intake canal/coal barge unloading area.

The Contractor shall receive instruction from the Project Manager stating where the sand fill is available on site. Sand fill may be placed in specific sections/locations of the dike raise construction.

The sand fill will consist of silty sand, clayey sand, or sandy soils. The dredge sand source will probably have coal particles and clay clods included in these sandy soils.

No plastic clays, organic soils, organic debris/wood, or topsoil materials shall be used in the zone of sand fill. The Contractor shall remove these materials from the sand fill at the borrow location prior to hauling and placing the soil in the dike crest raise.

The Contractor shall obtain three soil samples from the sand fill source to verify the soil properties described in this Section above. Soil testing shall be performed in accordance with ASTM D-422, D-698, D-2487, and D-4318. This testing work shall be performed and completed at least five days prior to the start of sand fill

placement activities. All test data shall be submitted to the Project Manager within two to five days prior to the start of sand fill placement activities.

Soil sampling and testing shall be performed on each observed change in soil consistency (determined by the Contractor's field supervisor or the Project Manager) or for each 5000 cubic yards of sandy soil used in the dike construction, whichever occurs first. The Contractor shall perform all sampling and testing work at no cost to the Purchaser.

5.5.3 Bottom Ash

Bottom ash should be obtained from the on-site source located at the discharge point for the ash sluice lines at the northeast end of the ash pond or as designated by the Project Manager. The bottom ash shall be used to prepare the foundation and for backfill above the prepared foundation surface.

Bottom ash is the by-product of burning the coal/fuel source at the power plant. The ash has a consistency similar to a fine to coarse sand with a minor fraction of fines passing by weight the U.S. Standard No. 200 sieve.

No plastic clays, organic soils, debris/wood, or topsoil materials shall be used in the zone of bottom ash fill. The Contractor shall remove these materials from the bottom ash at the borrow source prior to hauling and placing the bottom ash in the dike crest raise.

The Contractor shall obtain three soil samples from the bottom ash source to verify the soil properties described in this Section above. Soil testing shall be performed in accordance with ASTM D-422, D-698, D-2487, and D-4318. This testing work shall be performed and completed at least five days prior to the start of bottom ash placement activities. All test data shall be submitted to the Project Manager within two to five days prior to the start of bottom ash placement activities.

Soil sampling and testing shall be performed on each observed change in soil consistency (determined by the Contractor's field supervisor or the Project Manager) or for each 5000 cubic yards of bottom ash used in the dike construction, whichever occurs first. The Contractor shall perform all sampling and testing work at no cost to the Purchaser.

5.5.4 Fly Ash

Fly ash should be obtained and used only in the areas where it was previously excavated using a backhoe or similar piece of equipment and dry stacked.

5.5.5 Topsoil

Refer to Section 10.3.3 for a description and placement of topsoil.

5.5.6 Borrow Area Development

There is no site drawing available showing the location of the fill materials. The Project Manager will direct the Contractor in locating on-site borrow areas for clay, sand, and bottom ash.

The Contractor shall clear, grub, and strip the borrow area to uncover and locate the clayey and sandy soils. Only those sections of the borrow area to obtain fill for immediate dike construction should be developed. The Contractor shall be responsible for planning the borrow area activities to support the dike construction.

The Contractor shall install and maintain erosion control measures in the borrow areas to prevent sediment and erosion activities from affecting wetlands, streams, and surface waters. Section 11.5 discusses erosion control measures.

The Contractor shall construct and maintain access roads to and within borrow areas. These roads must be maintained to allow the hauling and vehicle traffic to travel to the active borrow operations. Erosion control measures shall be installed and maintained along access roads to prevent sediment and erosion activities from affecting wetlands, streams, and surface waters.

The Contractor shall be responsible for providing and planning dust control measures in the borrow area. The Project Manager shall direct the Contractor to implement these measures when the Project Manager determines a dust problem exists (example is the bottom ash source). Section 11.3 discusses dust control measures for the borrow areas and access roads.

When the Contractor anticipates an upcoming rainfall event, the Contractor shall grade, slope, ditch, and prevent the borrow area from affecting nearby wetlands, streams, and surface waters. The Contractor shall construct surface water/sediment runoff ponds, as necessary, to control runoff from rainfall events. The Contractor shall provide a runoff control plan to the Project Manager within two to five days prior to the start of borrow operations.

5.6 GEOGRID REINFORCING MATERIALS

Biaxial geogrid types have been selected for the dike raise construction:

- A. Biaxial Geogrid - This material will consist of the BX1300 Series material fabricated by the Tensar Corporation or approved equal. The geogrid shall be placed onto the prepared bottom ash foundation surface. A single layer of this

geogrid shall be placed along the entire length of dike raise construction. Drawing D521916 shows the location of the biaxial geogrid material.

- B. The Contractor shall obtain a copy of the fabrication specifications for the biaxial geogrid materials. All geogrid materials/rolls delivered to the site shall meet the minimum specification requirements for tensile strength, thickness of fabric, puncture resistance, etc. The Contractor shall replace any roll of damaged geogrid material delivered to the site by the fabricator, at no additional cost to the Purchaser. A damaged geogrid roll or material not meeting specification shall not be placed in the dike crest construction.

5.7 PLACEMENT

5.7.1 Earth Fill Materials

The Contractor shall be responsible for the placement of fill materials, which includes: the excavation and loading of materials from a borrow source into hauling equipment, transporting the materials to the active placement area, dumping and spreading the materials into lifts, and compacting the material to the designated density level.

The Contractor shall provide an adequate number of laborers to remove roots and other unacceptable debris from each lift of soil.

When the Contractor anticipates an upcoming rainfall event, the top surface of the compacted lift of fill (clay, sand, or bottom ash) should be rolled with a smooth-drum roller or a blade with the dozer to seal the lift surface to facilitate rainfall runoff.

5.7.1.1 Lift Thickness

- A. Clay Fill – The lift of clay fill, including the initial lift, shall be placed in a loose lift thickness not to exceed 8 inches.
- B. Bottom Ash Fill – The lift of bottom ash fill, including the initial lift, shall be placed in a loose lift thickness not to exceed 12 inches.

5.7.1.2 In-Place Density after Compaction

For the clay fill, the in-place density shall be a minimum of ninety-five percent (95%) of the material's maximum dry density as per the Standard Proctor designation, ASTM D-698. The in-place density should be obtained by using the conventional compaction equipment described in Section 8.2.

5.7.1.3 Moisture Content

- A. Clay Fill – The moisture content of the clay fill during placement and compaction activities shall be in the range of three percent below to three percent above the optimum moisture content of the soil, based on the ASTM D-698 designation.
- B. Bottom Ash Fill –The bottom ash fill shall be moist (near optimum) during placement and compaction activities. The Contractor may be required to add water to facilitate compaction activities.
- C. If the water content is less than the specified level for compaction, the compaction operations shall not proceed until the water content is brought into an acceptable range. Moistening of the clay and bottom ash materials shall be performed at the site of compaction. If the water content is greater than the specified level for compaction, the compaction operations shall be delayed until such time as the material has dried to the specified water content. Drying of the material may be performed by utilizing a harrow, disc, or similar equipment.

5.7.2 Geogrid Reinforcing Material

- A. The biaxial geogrid shall be placed on the prepared foundation surfaces. The geogrid shall be positioned perpendicular to the centerline/axis of the existing dike when unrolled on the surface.
- B. The geogrid shall be placed in a single layer having a 0% overlap of seams between layers.
- C. Metal pins, stakes, or small piles of soil/ash may be used to hold the geogrid layers in place prior to and during the placement of lifts directly on top of the geogrid.
- D. Spreading the initial lift of soil and bottom ash on top of the geogrid layer shall be performed in a manner to avoid movement, distortion, tearing, puncturing, and repositioning of the geogrid. If the Contractor should damage, move, or distort the geogrid during spreading operations, the Contractor shall remove the lift of soil and reposition the geogrid to its original position aligned perpendicular to the dike centerline. Or the

Contractor shall replace the geogrid if the material is damaged during placement operations. All work described in this paragraph shall be performed by the Contractor at no additional cost to the Purchaser.

- E. The Project Manager shall direct the Contractor to replace and reposition geogrid layers which do not meet the requirements of the Specification and drawings. All work directed by the Project Manager to ensure a quality installation and good workmanship shall be performed by the Contractor at no additional cost to Purchaser.

5.8 TESTING

The Purchaser shall employ and pay for the services of an independent testing laboratory to perform specified earthwork testing. The Contractor shall cooperate with the laboratory to facilitate the execution of its required services.

Employment of the laboratory shall in no way relieve the Contractor of his obligations to perform the work and supply the materials in accordance with the Specifications. The Contractor shall have the following responsibilities:

- A. Cooperation with laboratory personnel and provision of access to the work area and to the Contractor's operations;
- B. Securing for the laboratory personnel adequate quantities of representative samples of materials proposed to be used and which require testing;
- C. Furnishing copies of the product test reports as required;
- D. Notification to the laboratory 48 hours in advance of operations to allow for laboratory assignment of personnel and scheduling of tests. When tests or inspections cannot be performed after such notice, reimbursing the Purchaser for laboratory personnel and travel expenses incurred due to the Contractor's negligence;
- E. Employment and payment for the services of a separate, equally qualified independent testing laboratory to perform additional inspections, sampling, and testing required for the Contractor's convenience, or when initial tests indicate that the work does not comply with the Specifications; and,
- F. Testing associated with any section of the reinforced dike or the raised dike which fails to meet quality, strength, and permeability requirements, as set forth in these Specifications, shall be removed and replaced by the Contractor until satisfactory to the Project Manager at no additional cost to the Purchaser.

5.8.1 Earth Fill

- A. Field density and moisture content testing shall be performed by the Project Manager to verify that compaction requirements have been achieved. In-place field density testing of the compacted soil and bottom ash shall be performed in accordance with the procedure, ASTM D 1556-82, the sand cone method. Test results reported should include both the moisture content and dry density, along with other data such as location, elevation, and Proctor curve used for comparison, etc.
- B. Testing of in-place density and moisture content by nuclear methods ASTM D 2922-81 and ASTM D 3017-88, respectively, describe these testing procedures and may be used provided: 1) acceptable correlation with sand cone density test results can be obtained according to the guidelines of Section 7, "Calibration", of ASTM D-2922, and 2) the initial correlation results are reviewed and use of the nuclear device is approved by the Engineer. In addition, it shall be required that the Project Manager or his testing agency or representative have the necessary licenses to operate a nuclear energy source, and to take all safety precautions per Section 6 of ASTM D-2922.
- C. In the event of repeated failures, or water content and density test values plotting far from the Proctor curves used for comparison in computing percent compaction, it shall be the option of the Project Manager to require one or two-point Proctor checks (on the dry side of optimum) to verify that the proper Proctor curve is being referenced. If not, a new Proctor curve determined by a five-point test shall be required. The Contractor shall sample and perform the five-point testing, all at the Contractor's expense.
- D. If the compaction requirements for a lift have not been achieved, the Project Manager shall direct the Contractor to either rework the lift to obtain the compaction requirements or remove and replace with a new lift for compaction, all at the Contractor's expense.
- E. The in-place density testing frequency for the soil and ash shall be one test for each 20,000 square feet of lift area or portion thereof for each lift.

5.8.2 Geogrid Reinforcing Materials

The Project Manager shall inspect the geogrid placement activities to ensure that a quality installation and workmanship is performed by the Contractor. The Project Manager shall inspect the following placement activities:

- overlay of layers
- seam separation
- quality of material
- length of geogrid section relative to upstream slope

- longitudinal tie of geogrid sections
- damage, distortion, etc. of geogrid
- surface condition upon which the geogrid is placed
- lift placement on the geogrid layer.

As discussed in Paragraph 5.7.2E, the Project Manager has the authority to direct the Contractor to replace and reposition the geogrid layers which do not meet the requirements of the Specifications and drawings. All changes and corrections made by the Contractor and authorized by the Project Manager shall be performed by the Contractor at no additional cost by the Purchaser.

6.0 RIGHT OF FIELD INSPECTION

The Engineer shall have the right to inspect the Contractor's work as deemed necessary. The Engineer shall have the right to inspect the Contractor's work locations, the materials in use, and to follow the progress of the work and the manner in which it is being done. The Engineer shall have the authority to reject materials or suspend any work not being properly performed or that is not in accordance with these Specifications. The Contractor has the responsibility for his work being performed properly and in accordance with these Specifications and the presence of an inspection shall not relieve the Contractor or his responsible agents of that responsibility.

7.0 QUALITY CONTROL AND QUALITY ASSURANCE

The Contractor is responsible for the implementation of his standard quality plans, program or practices, and shall institute any additional controls or procedures in accordance with proven industry practice to assure compliance with these Specifications and the drawings.

8.0 COMPACTION EQUIPMENT

8.1 GENERAL

The Earthwork Contractor shall be responsible for providing all compaction equipment necessary to perform the work set forth in these Specifications. The Contractor shall be responsible for maintaining the equipment during the contract period. Any delays in work activities due to equipment maintenance must be reported to the Project Manager for determination of impacts on the schedule.

The Contractor shall be responsible for the cleaning of haul vehicles. The Contractor shall wash down the wheels, outside body, cab, undercarriage, etc., of all haul vehicles to prevent spreading of material during transit of the equipment out of the boundary of the working area, which includes the ash pond and haul roads.

All the Contractor's equipment shall be operated in a safe, careful manner in accordance with these Specifications.

All equipment used on geogrid materials shall conform to any specifications required by the Manufacturer.

8.2 TYPES OF EQUIPMENT

8.2.1 Tamping Roller

The use of self-propelled, non-vibratory tamping rollers, conforming to the following specification, shall be permitted to compact the clay backfill material. Their design and operation shall be subject to the approval of the Project Manager. If use of self-propelled tamping rollers causes shearing planes in the fill, laminations in the fill, or results in inadequate compaction, the Project Manager may direct that such rollers be removed from use. Two-drum or four-drum equipment separated by cab and differential and arranged in tandem must have its static weight equally distributed to all compaction drums and must have the tandem drums positioned such that the prints of the tamping feet produced by the tandem drums are staggered. The surface on which the tamping feet are mounted shall have a minimum outside diameter of four feet and one (1) tamping foot for approximately each 100 square inches of drum surface. The distance between the centers of any two adjacent tamping feet shall be not less than nine inches. The length of each tamping foot from the outside mounting surface of the drum shall be not more than eight inches and shall be maintained at not less than six inches based on compaction of the clay fill placed in eight (8) inch loose lifts. During rolling operations, the spaces between the tamping feet shall be maintained clear of materials which would impair the effectiveness of the tamping roller.

The weight of all roller drums during compaction of fill material shall be maintained uniform. Rollers should be less than 20,000 lbs, especially in working on the diversion dike, which is founded on soft ash materials. Equipment heavier than 20,000 pounds may be considered only if submitted and approved by the Engineer. For self-propelled rollers in which steering is accomplished through the use of rubber-tired wheels, the tire pressure shall not exceed 40 psi. The use of a compactor shall be discontinued if the rubber tires leave ruts that prevent uniform compaction by the tamping roller and the substitution of appropriate towed tamping rollers shall be operated at a speed not to exceed 5.0 miles per hour.

8.2.2 Tamping Compactors

Compaction of materials in areas where it is impractical to utilize conventional compaction equipment shall be performed by the use of hand tampers or manually-guided sled/plate-type vibratory or ramming tampers which have been approved for use by the Project Manager.

8.2.3 Vibratory Rollers

Vibratory rollers, utilized for compacting sand and bottom ash materials, shall be equipped with a smooth steel compaction drum and shall be operated at a frequency of vibration during compaction operations between 1,100 and 1,500 vibrations per minute. Vibratory rollers may be either towed or self-propelled and shall have an unsprung drum weight that is a minimum of 60 percent of the rollers' static weight. Towed rollers shall have at least 90 percent of their weight transmitted to the ground through the compaction drum hitched to the towing vehicle. Rollers shall have a maximum static weight of 20,000 pounds. However, heavier equipment may be considered if submitted and approved by the Engineer.

The vibratory mode may not be required for compacting the bottom ash fill. The Contractor shall operate the compactor in the vibratory and non-vibratory modes to determine the mode which effectively compacts and densifies the bottom ash.

The level of amplitude and vibration frequency during compaction will be maintained uniform. Rollers shall be operated at speeds not to exceed 1.5 miles per hour. The Contractor shall furnish sufficient compactor manufacturer's data, drawings, and computations for verification of the above specifications to the Project Manager and the character and efficiency of this equipment shall be subject to the approval of the Project Manager.

9.0 SAFETY

9.1 AVOID UNSAFE CONSTRUCTION ACTIVITIES

The Contractor shall perform all work activities in a safe manner. All work shall be performed to avoid the following occurrences:

- A. Equipment and vehicular traffic do not damage the existing dike crest.
- B. Equipment and vehicular traffic operates on the prepared/slightly densified ash foundation in a manner that the equipment, vehicle, and operator do not overturn or sink into the relatively soft and compressible ash.
- C. Equipment and vehicular traffic do not damage the overflow weirs.
- D. Borrow operations do not affect any existing structures.
- E. Sand and clay borrow operations do not damage any monitoring wells.
- F. Equipment and vehicular traffic do not damage the bridge, which crosses the discharge canal.

G. Equipment and vehicular traffic do not damage the ash pond discharge structure.

9.2 SAFETY FOR WORKERS

The Contractor shall perform all work activities to assure worker safety in the following areas:

- A. Traffic lanes around the ash pond dike.
- B. Foundation preparation for the dike surface.
- C. Transmission power lines.
- D. Borrow area.

10.0 GRASSING

10.1 GENERAL

- A. Grassing shall be performed on all slopes and top surface of the dike crest raise. Grassing shall be performed along the entire length of slope from the crest to the toe of the slope. The Project Manager may direct the Contractor to grass other areas of the site at an additional cost decided upon by the Project Manager and Contractor.
- B. Coordinate seeding with other work.
- C. Contractor must comply with regulatory agencies for fertilizer and herbicide composition. The Contractor must have a certificate of compliance from authority having jurisdiction indicating approval of seed mixture.
- D. Grass seed and all associated products shall be delivered, stored, protected, and handled as follows:
 - 1. Deliver grass seed in sealed containers. Seed in damaged packing is not acceptable.
 - 2. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.
- E. For Quality Assurance purposes, the seed shall be provided in sealed containers showing percentages of seed mix, year of production, net weight, date of packaging, and location of packaging. Seed shall meet the requirements of Paragraphs 10.2.1 of this Section.

F. The Contractor shall submit maintenance data to the Purchaser within 5 days after seeding. Maintenance data to be submitted shall include the following, at a minimum:

1. Cutting method and maximum grass height.
2. Types, chemical composition, application frequency, and recommended coverage of fertilizer.
3. Watering requirements.

G. The Contractor shall be responsible for maintaining seeded areas immediately after placement until grass is well established and exhibits a vigorous growing condition for 6 months. A stand of grass shall be considered adequate if scattered bare spots are no larger than one square foot and do not exceed 3% of the seeded area.

10.2 MATERIALS

10.2.1 Seed

A. For planting between January 1 and August 31, seed shall be composed of the combinations shown below to yield a stand of Deep Root Coastal Bermuda:

<u>Variety</u>	<u>Lbs. of Seed Per Acre</u>
Common Bermuda grass (Hulled)	10
Common Bermuda grass (Unhulled)	10
Pensacola Bahiagrass	50

B. For planting between September 1 and December 31, seed shall be composed of the combinations shown below to yield a stand of Deep Root Coastal Bermuda:

<u>Variety</u>	<u>Lbs. of Seed Per Acre</u>
Common Bermuda grass (Hulled)	10
Common Bermuda grass (Unhulled)	10
Pensacola Bahia grass	50
Annual Rye grass	15
Weeping Love grass	20

C. Seed shall have a minimum of 98 percent pure seed and 85 percent germination by weight, and shall contain no noxious weed seeds. Seed wetted or damaged in transit or storage shall not be acceptable, and shall be replaced

at no expense to the Purchaser. Seed shall be packaged and labeled in accordance with Paragraph 10.1E of this Section.

- D. All seed shall meet the requirements of the Alabama State Department of Agriculture and all applicable State and local codes, and shall be approved by the Purchaser prior to planting.

10.2.2 Topsoil Material

Topsoil shall be free of subsoil, clay, weeds, roots, and impurities. Topsoil shall have a minimum pH value of 5.4 and a maximum value of 7.0.

10.2.3 Accessories

- A. Fertilizer: Fertilizer shall be commercial grade, conforming to all applicable State and local codes and ordinances. The Contractor may select 10-10-10, 6-12-12, 5-10-15, or any other analysis required for the topsoil (when tested in accordance with Paragraphs 10.2.4 of this Section) within the following limits: Nitrogen 5-10%, Phosphorous 10-15%, and Potassium 10-15%.
- B. Lime: As required for the topsoil (when tested in accordance with Paragraphs 10.2.4 of this Section) to meet the pH limits specified in Paragraph 10.2.2 of this Section. Lime shall be dolomite type agricultural grade limestone, with a minimum of 85 percent carbonates. Lime shall be ground to such fineness that a minimum of 90 percent will pass a No. 10 sieve and a minimum of 25 percent will pass a No. 100 sieve, by weight.
- C. Mulch: Mulch cover shall consist of straw from threshed rice, oats, wheat, barley, or rye; wood excelsior; or hay obtained from various legumes or grasses. Mulch shall be free of weeds or foreign matter which is detrimental to plant life. No green mulch may be used.
- D. Additional Nitrogen: As required by Paragraph 10.3.12 of this Section.
- E. Water: Clean, fresh, and free of harmful chemicals, alkalines, or any substances or matter which could inhibit vigorous growth of grass.
- F. Erosion Fabric: Jute mesh, combination straw and coir with plastic netting, or other acceptable fabricated material commonly used for erosion control.
- G. Herbicide: As required. Application and type used shall be accordance with all local codes and ordinances.
- H. Stakes: Softwood lumber, chisel pointed.
- I. Edging: Contractor's option.

10.2.4 Tests

- A. Submit a minimum 10 ounce sample of the proposed onsite topsoil to an approved testing laboratory in a sealed container to prevent contamination.
- B. Provide analysis of topsoil to the Project Manager.
- C. Topsoil analysis shall include a determination of percentage of nitrogen, phosphorous, potash, soluble salt content, organic matter content, and pH value.

10.3 PLACEMENT

10.3.1 Examination

Verify that prepared subsoil is ready to receive the work of this Section.

10.3.2 Preparation of Subsoil

- A. Prepare subsoil to eliminate uneven areas and low spots. Maintain lines, levels, profiles, and contours specified. Make changes in grade gradual. Blend slopes into level areas.
- B. Remove foreign materials, weeds, and undesirable plants and their roots. Remove contaminated subsoil.
- C. Scarify subsoil to a depth of 3 inches where topsoil is to be placed. In areas where subsoil is subsequently compacted during hauling and spreading of topsoil, repeat cultivation of subsoil.
- D. Seed shall never be sown into subsoil, but shall be sown into topsoil.

10.3.3 Placement of Topsoil

- A. Spread topsoil to a minimum depth of 3 inches over entire area to be seeded as directed by the Purchaser. Rake until smooth.
- B. Place topsoil during dry weather on dry, unfrozen subgrade.
- C. Remove any subsoil, vegetable matter, and foreign non-organic material from topsoil while spreading.
- D. Grade topsoil to eliminate rough, low, or soft areas, and to insure positive drainage.

10.3.4 Preparation of In-Place Topsoil

- A. In those areas which are not described in Paragraph 10.1A, which includes stripping and excavation, particularly along the slopes of the site where the topsoil may not have been removed but which are to be seeded (as specified on the Drawings), the in-place topsoil shall be treated prior to seeding
- B. The upper 3 inches of in-place topsoil shall be scarified and subsequently raked until smooth. Removal of vegetable matter and foreign non-organic material, grading of topsoil, and edging of periphery shall be in accordance with Paragraphs 10.3.3 of this Section.
- C. Care shall be taken to insure that a minimum of 3 inches of topsoil exists at all locations, and that scarification does not uncover the subsoil beneath the topsoil. Seed shall not be sown into subsoil.

10.3.5 Fertilizer

- A. After smooth raking of topsoil, apply fertilizer specified in Paragraph 10.2.3.A of this Section in accordance with manufacturer's instructions at an approximate rate of 1,200 pounds per acre.
- B. Apply fertilizer no more than 48 hours prior to planting seed.
- C. Fertilizer shall not be applied with seed or with same machine as will be used to apply seed.
- D. Mix fertilizer thoroughly into upper 3 inches of topsoil with a suitable harrow, rotary tiller, or other equipment approved by the Project Manager.
- E. Fertilizer shall never be applied by hand.
- F. Fertilizer shall not be applied when wind velocities exceed 15 miles per hour.
- G. Lightly water to aid the dissipation of fertilizer.

10.3.6 Application of Lime

- A. Agricultural lime shall also be applied to the topsoil if required based on the pH test required by Paragraphs 10.2.4 of this Section and/or if required by the Project Manager. The rate of application shall be as determined necessary by the Purchaser.
- B. Lime shall be uniformly mixed into the upper 3 inches of topsoil with a suitable harrow, rotary tiller, or other equipment approved by the Project Manager. Lime may be mixed in conjunction with the fertilizer.
- C. Lime shall never be applied by hand.
- D. Lime shall not be applied when wind velocities exceed 15 miles per hour.

10.3.7 Seeding

- A. Apply seed of the varieties and at the rates specified in Paragraphs 10.2.1 of this Section. Seed varieties shall be applied separately as a general rule; however, seeds of approximately the same size and weight may be mixed and applied together.
- B. Apply seed evenly in two intersecting directions with the use of mechanical seed drills, rotary seed spreaders, hydraulic equipment, or other equipment approved by the Project Manager. Rake seed in lightly.
- C. Seed shall never be applied by hand.
- D. Seed shall not be applied to an area larger than that which can be mulched on the same day.
- E. Seed shall not be applied immediately following rain, when ground is too dry, when ground is frozen, or when wind velocities exceed 15 miles per hour.
- F. Except on steep slopes where rollers cannot operate satisfactorily, roll seeded area with roller not exceeding 112 pounds.
- G. Immediately following seeding and rolling, apply mulch as specified in Paragraph 10.2.3.C and in accordance with Paragraphs 10.3.9 of this Section.

10.3.8 Hydros seeding

- A. If preferred by the Contractor, hydros seeding may be used as a method of applying the seed.

- B. The Contractor shall apply the seed and fertilizer, at the rates specified in Paragraphs 10.2.1 and 10.3.5.A of this Section, respectively, with a Wood Fiber Mulch over the area to be seeded in the form of a slurry. Seeds of all sizes may be mixed together. Apply seed evenly in two intersecting directions.
- C. The use of Wood Fiber Mulch is required as a metering agent and seedbed for hydroseeding. The application rate for Wood Fiber Mulch in hydroseeding shall be approximately 500 pounds per acre, and is required regardless of the subsequent mulching method to be used.
- D. Equipment for mixing and applying the slurry shall be especially designed for this purpose. It shall be capable of applying a uniform mixture over the entire area to be seeded. The slurry mixture shall be agitated during application to keep the ingredients thoroughly mixed. All materials shall be discharged within one hour after being combined in the hydroseeder. The equipment manufacturer's instructions shall be closely observed unless modifications in methods of application are ordered by the Purchaser.
- E. Hydroseeding shall not be performed when wind velocity exceeds 15 miles per hour or otherwise prevents an even, thorough application.
- F. Hydroseeding shall not be completed on an area larger than that which can be mulched on the same day.
- G. Except on steep slopes where rollers cannot operate satisfactorily, roll seeded area with a light roller, approved by the Purchaser.
- H. Immediately following seeding and rolling, apply mulch in accordance with Paragraphs 10.3.9 of this Section.

10.3.9 Mulching

- A. All seeded areas shall be mulched with material as specified in Paragraph 10.2.3.C of this Section.
- B. Mulch shall be uniformly applied manually or with special blower equipment designed for that purpose. When a blower is used, baled material shall be thoroughly loosened before it is fed into the machine. After initial distribution, thick clumps which are dense enough to prevent the new grass from emerging shall be loosened and redistributed to bare or inadequately covered areas.
- C. Where straw or hay mulch is used, the quantity of mulch to be applied shall be that required to evenly cover the ground to a minimum depth of 3/4 inch and a

maximum depth of 1 1/2 inch, depending on the texture and moisture content of the mulch material.

- D. Mulch shall allow some sunlight to penetrate and air to circulate, at the same time shading the ground, reducing erosion, and conserving soil moisture.
- E. Where hydroseeding is used, additional Wood Fiber Mulch may be used in the slurry instead of subsequent application of straw or hay mulch, but only during the following times of the year: February 15 to May 15 and September 1 to November 15. The rate of Wood Fiber Mulch used in the slurry shall be increased to 1,500 pounds per acre and a tackifier listed in the Laboratory Qualified Products Manual shall be used, at manufacturer's recommended rates.
- F. Mulch shall not be applied on windy days when the wind velocity is sufficient to prevent uniform distribution.
- G. Any mulch blown away shall be immediately replaced.
- H. If the Contractor experiences difficulty in keeping the mulch in place, asphalt binder may be applied in sufficient quantity to prevent the problem. Asphalt shall be applied immediately following or during application of the mulch cover. Care shall be taken at all times to protect the public, adjacent property, or existing structures from discoloration.
- I. Mulch shall be kept clear of trees and shrubs.
- J. Apply water with a fine spray immediately after each area has been mulched. Saturate the upper 4 inches of soil.

10.3.10 Seed Protection

- A. Cover seeded slopes where grade is 4 inches per foot or greater with erosion fabric as specified in Paragraph 10.2.3.F. Roll fabric onto slopes without stretching or pulling.
- B. Lay fabric smoothly on surface. Excavate a 6 inch deep trench at the top end of each fabric section. Allow top end of fabric to extend to bottom of 6 inch trench. Subsequently bury top end of fabric by backfilling trench and raking smooth, level with adjacent soil. Provide a 12 inch overlap of adjacent fabric rolls.
- C. Secure outside edges and overlaps of fabric at 36 inch intervals with stakes.
- D. Lightly dress slopes with topsoil to insure close contact between fabric and soil.

- E. At sides of ditches, lay fabric laps in direction of water flow. Lap ends and edges a minimum of 6 inches.

10.3.11 Application of Additional Nitrogen

Apply nitrogen at the rate of approximately 50 pounds per acre when seeded grass is 2 inches high. The one application is mandatory for Final Acceptance of Work. Nitrogen shall be applied with mechanical hand spreaders or other approved spreaders capable of producing uniform coverage. Nitrogen shall not be applied on windy days or when grass is damp or wet.

10.3.12 Maintenance

- A. The maintenance period shall be as established in Paragraphs 10.1G of this Section.
- B. Immediately reseed areas which show bare spots in excess of those allowed by Paragraph 10.1G of this Section. The area shall be scarified and refertilized prior to reseeding.
- C. Repair any eroded areas for a 6 month period after seeding.

11.0 ENVIRONMENTAL CONTROL MEASURES

11.1 ENVIRONMENTAL OPERATING PARAMETERS

The Contractor shall comply with and abide by all environmental laws, regulations, and permit stipulations which govern the operation of Plant Barry. These include but are not limited to the following permits:

- NPDES Permit No. AL-0002879.

The rules and regulations include but are not limited to the following:

- The Clean Air Act of 1990, as amended
- The Federal Water Pollution Control Act
- Alabama Solid Waste Regulations

The Contractor shall be solely responsible for any penalties and restoration costs associated with the failure to comply with the above stipulations. Failure of the Contractor to conform to the Environmental Operation Parameters, as determined by the Project Manager or Purchaser's representative shall constitute a breach of contract.

The Contractor shall provide equipment and personnel to perform emergency measures required to contain any spillages and to remove contaminated soils or liquids and shall excavate and dispose of any soil contaminated by the construction operations off-site, and replace such soil with suitable compacted fill and topsoil as directed by the Project Manager.

The Contractor shall take special measures to prevent harmful substances from entering public waters and shall prevent disposal of wastes, effluents, chemicals, sediments, or other such substances adjacent to streams, or in sanitary or storm sewers.

11.2 CLEANING

The Contractor shall conduct cleaning and disposal operations to comply with all codes, ordinances, regulations, and anti-pollution laws. Disposal of acceptable materials shall be to the ash pond, as determined by the Project Manager. Only those cleaning materials which will not create hazards to health or property and which will not damage surfaces shall be used. Only those cleaning materials and methods recommended by the manufacturer of the surface material to be cleaned shall be used and cleaning materials shall be used only on those surfaces recommended by the material manufacturer.

The Contractor shall perform periodic cleaning to keep the work, the site, and adjacent properties free from accumulation of waste materials, rubbish, and windblown debris resulting from construction operations. The Contractor shall provide on-site containers for the collection of waste and shall periodically remove waste materials from the site and dispose of such materials in legal disposal areas away from the site.

11.3 DUST CONTROL

The Contractor shall continually take steps necessary to minimize dust created by all equipment, vehicles, work activities, or storage areas. These steps shall include, but not be limited to, watering roads and work areas. Open-bodied trucks handling sand, stone, gravel, or earth shall be covered if the truck is traveling off site. The Contractor shall not deposit mud or debris on public road, plant roads, or adjacent properties.

11.4 POLLUTION CONTROL

The Contractor shall provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious and/or toxic substances, fueling stations, and pollutants produced by construction operations.

Toxic liquids, chemicals, fuels, lubricants, etc., shall be deposited into containers for subsequent removal offsite in accordance with all applicable Federal, State, and local codes and standards.

11.5 EROSION AND SEDIMENT CONTROL

The Contractor shall provide, implement, and maintain the sediment and erosion control measures described in the plan submitted with the bid (refer to Section 5.0E). The plan and associated measures will be approved by the Project Manager prior to the start of construction. The Contractor shall provide the measures for the entire contract period.

12.0 HAUL ROADS

It shall be the responsibility of the Contractor to maintain the existing haul roads, ramps, and associated culverts and ditching, and, with the express approval of the Project Manager, to design and construct any additional necessary ramps and/or haul roads, as required for his use and mode of operation. The ramps and haul roads shall be maintained in good condition throughout the contract period. The Project Manager must approve the source of materials required to construct and maintain the haul roads and ramps.

The Contractor shall refer to the geologic sections and soil strength parameters in the process of designing or planning any earthen sections (e.g., ramps, road embankments) which could fail due to the presence of soft organic soils. The Contractor shall exercise similar due care in the design of ramps and haul roads as with the working platform and restored portions of the dike which also require stabilization or earth reinforcement.

The Contractor shall be responsible for preventing dust problems, equipment tracking mud and soil clods onto county roads and highways, and the cleaning of the road surface from equipment usage as per the direction and to the satisfaction of the Project Manager.

The Contractor shall maintain all access roads used by the Contractor's hauling and vehicular equipment. The Contractor shall grade and repair roads daily to remove potholes, ruts, irregularities and slumps which develop in the road surface. The access road on top of the existing dike shall be constantly maintained during the daily construction activities to prevent excessive wear, damage, slumping along the downstream crest. Hauling equipment will damage the road surface. The Contractor shall submit a plan with the bid (refer to Section 2.0.G) to describe how the Contractor will maintain the road to present elevations and not affect the integrity and safety of the existing dike structure during the entire period of earthwork construction. The plan shall include the description/details for replacing the gravel on the road at the end of the construction work. The Project Manager may direct the Constructor to maintain

or repair roads damaged by the Contractor's operations, at no additional cost to the Purchaser.

13.0 OFFICE AND SUPPORT EQUIPMENT

The Contractor shall provide all office, telephone, toilet, storage buildings, power connections, potable water connections, and other support functions to perform the work described in these specifications.

Other power and water issues should be directed to the Project Manager prior to the start of construction.

14.0 SURVEYING

The Contractor shall be responsible for all survey activities to support the dike raise construction. These activities will include, but are not limited to, the following:

- Lines and grades for the outer slopes and top surface of the dike
- Grade and thickness for each lift of backfill
- Stationing along dike
- Dike material zones for possible measurement and payment
- Borrow operations
- Setting grades for existing dike repair/maintenance
- Quality control field testing locations
- Dredge sand borrow activities (i.e. excavation quantities)
- Set grades for geogrid materials.

All survey information shall be made available to the Project Manager during the construction period.

15.0 TRAFFIC CONTROL MEASURES

The Contractor shall be responsible for the safe and adequate site traffic control for all work described in these Specifications. The Contractor shall furnish a Traffic Control Plan to the Purchaser for approval. The Contractor and his subcontractors shall comply with this Traffic Control Plan and all traffic control regulations of the Purchaser. This includes, but is not limited to, access roads, use of locked and unlocked gates, hours of operations, security requirements, and strict coordination with plant operations and with other contractors performing work on site.

The Contractor shall control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, and the Purchaser's operations, or construction operations. The Contractor shall comply with any

instructions given by the Project Manager relating to speed control and safe operation of all equipment and vehicles.

16.0 HANDLING, SHIPPING, AND STORAGE

The Contractor is responsible for the handling, shipping, and storing of all materials used in the earthwork construction. The Contractor shall ensure that all materials are handled, shipped, and stored so as to prevent any damage. Materials damaged during handling, shipping, or storage shall be replaced at no cost or expense to the Purchaser. The Contractor shall store materials only in areas as directed by the Project Manager.

17.0 FINAL INSPECTION AND CERTIFICATION

The work in this inquiry shall be considered complete after the following:

- A. All newly constructed improvements have been turned over to the Purchaser's representative for final inspection and acceptance.
- B. A stand of grass shall be established such that there is a live, healthy grass plant not more than two inches apart in any direction 6 months from the time of planting. Furthermore, a stand of grass is established by "end of project plus eight weeks" per D. O. T. specifications.
- C. The survival rate for installed vegetation is at least 80% one year from the time of planting.
- D. Contractor's work area is orderly and properly restored.
- E. Contractor's equipment and materials have been removed from site.
- F. The Contractor shall submit to the Purchaser a Project Completion Report including the following:
 - Summary of slope stabilization work by area, along with progress and finish photos.
 - QA/QC documentation
 - As built drawings.
 - Soils testing results.
 - Applicable permits.
 - Other documents as considered applicable and as notified to the Contractor by Purchaser at least 2 weeks prior to the estimated completion date or stop of work location.

**SOUTHERN COMPANY SERVICES, INC.
BIRMINGHAM, ALABAMA**

TECHNICAL SPECIFICATIONS

for

ASH POND DIKE GABION WALL

**BARRY STEAM PLANT
ALABAMA POWER COMPANY
BUCKS, ALABAMA**

PREPARED BY: James C. Pegues DATE: 04/04/2005

REVIEWED BY: Richard M. Franke DATE: 04/04/2005

APPROVALS:

	INITIAL	DATE
J. B. SMITH Civil Engineering Supervisor – Fossil and Hydro Projects Engineering and Construction	JBS	04/04/05

REVISIONS:

NO	DESCRIPTION	BY	REVIEW	APPROVED	DATE
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SOUTHERN COMPANY SERVICES, INC.
BIRMINGHAM, ALABAMA

TECHNICAL SPECIFICATIONS

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TECHNICAL SPECIFICATIONS
FOR
ASH POND DIKE GABION WALL
FOR
BARRY STEAM PLANT
ALABAMA POWER COMPANY

1.0 SCOPE

The work performed under this contract includes the earthwork construction, gabion wall construction, quality control, and supervision to raise the south ash pond dike crest in the immediate vicinity of the existing ash pond outfall structure. The Contractor shall provide all labor, materials, equipment, fuel, tools, and supervision required to perform the work activities described in this Specification and the design drawings.

1.1 GENERAL

The following is a list of general items of work, materials, equipment, personnel, and facilities which shall be furnished by the Contractor:

- A. Provide a qualified field supervisor and workmen (skilled and unskilled) in sufficient numbers to complete the work as specified, meeting the labor laws of the State of Alabama.
- B. All equipment, fuel, and tools necessary to complete the work as specified.
- C. All temporary facilities, health and safety equipment and supplies, expendable materials, and all other materials not furnished by the Purchaser.
- D. Unloading, handling, storage, and transport at the jobsite of all manufactured materials for this work.
- E. Preparation of a laydown and fabrication area for sack gabions.
- F. The loading, hauling, transport, and placement of all material from borrow or deposition location to new installation location.
- G. All non-destructive testing and examinations required.
- H. Provide traffic control during roadway related construction activities and material deliveries. If within active and congested areas around the plant, traffic control shall include flag persons, barriers, and other control aids to provide for the safe routing of traffic in the affected area.
- I. Provide all temporary structures and amenities required for staff or storage.

- J. Provide labor for security of materials and equipment utilized for the work.
The Purchaser will not be responsible for loss of equipment or materials.

1.2 DEFINITIONS OF TERMS

The following definitions are in addition to the definitions set forth in the General Conditions. The terms used in these Specifications shall be interpreted and understood as stated:

- A. “Project Manager” means the onsite manager of the project or his designated representative. The Project Manager is the authorized representative at the site for the Purchaser.
- B. “Engineer” means the Southern Company Services, Inc. representative for the design and alternate design review of the work.
- C. “Manufacturer” means the respective entity who furnishes the gabion, geogrid or geotextile material.
- D. “Inspector” means the entity who provides Quality Assurance inspection of work in progress and completed work.
- E. The term “geogrid” refers to a synthetic planar structure formed by a regular network of tensile strength elements with apertures of sufficiently large size to allow for interlocking with the surrounding soil so as to perform the primary function of reinforcement.
- F. The term “gabion” refers to wire mesh structure filled with stone to form a flexible, permeable, retaining wall.
- G. The term “geotextile” refers to a non-woven polypropylene fabric used as a separator between soil foundation or backfill and the gabion structures.

1.3 WORK INCLUDED

Work to be performed by the Contractor for the ash pond dike gabion wall construction shall include all work described in these Specifications and drawings. The Contractor shall furnish all labor, materials, equipment, fuel, tools, and supervision required to perform the work. The Contractor shall inspect the work performed by his laborers and subcontractors to verify that all work is complete and that the work meets the requirement of these Specifications. This work includes, but is not limited to, the following:

- A. Mobilization and demobilization

- B. Obtaining all permits required to conduct the work covered by these Specifications.
- C. Performing all work required by these Specifications and the associated bid documents.
- D. Establishing all initial lines and grades, base lines, stationing along dike, and survey control for slopes and grades.
- E. Procuring gabion materials (by Maccaferri or approved equal) and planning the delivery of the materials to the site to meet the project schedule.
- F. Procuring geogrid materials (by Tensar Company or approved equal) and planning the delivery of the materials to the site to meet the project schedule.
- G. Procuring geotextile materials and planning the delivery of the materials to meet the project schedule.
- H. Procuring gabion stone materials that meet gradation requirements of the project specifications and drawings and planning the delivery of the stone to meet the project schedule.
- I. Establishing and developing a stockpile area for storing rock and gabion materials and fabricating the sack gabions for transport to the site of the planned retaining wall.
- J. Excavating and preparing foundation area for sack gabion placement.
- K. Placing geogrid and geotextile on prepared foundation area.
- L. Placing sack gabions for wall foundation below waterline.
- M. Constructing gabion wall to EL 22.5.
- N. Placing stone in wedge-shaped space at turn in wall between gabions.
- O. Placing and compacting clay for new embankment behind the gabion wall.
- P. Constructing guard posts along the gabion wall.
- Q. Performing all site clean-up activities to satisfy the Project Manager and meet the requirements of the Specification.
- R. Performing all work activities in a safe manner.

- S. Performing all work activities to prevent damage to the existing earth dike structure and not allow such activities to produce an unstable dike structure which results in leakage, ash spills, ash overtopping, excessive rutting and potholes, or slumps/sides in the dike slope.
- T. Maintaining the dike crest at present elevations. Maintaining roads from all office, storage, and laydown areas to the dike construction area.
- U. Providing and maintaining erosion and sediment control.
- V. Providing dust control on roads and construction areas.
- W. Maintaining all equipment to operate properly during the entire contract period.
- X. Providing field office, communications, storage buildings, toilets, etc. Refer to Section 13.0.

1.4 WORK EXCLUDED

Work to be performed by the Purchaser or Project Manager shall include, but is not limited to, the following:

- A. Establishing survey control points/monuments of known northing, easting, elevation (relative to mean sea level) for use by the Contractor under Section 1.3.
- B. Providing electrical service to the field office.
- C. Providing a source of potable water to the field office.
- D. Providing overall site management during construction to ensure that the Contractor's work follows the requirements of these Specifications.
- E. Quality control testing by the Purchaser and associated engineering inspections.

2.0 CONTRACTOR SUBMITTALS

The Contractor shall submit the following information and details with his bid:

- A. Detailed cost proposal for the gabion wall construction and related work.
- B. List of all Subcontractors, if any, and their principal personnel who will be working on the job.

- C. Resumes of key personnel working for the Contractor. At least one member of the Contractor's team shall have documented experience in the construction of gabion walls and/or other gabion structures. This person shall be present during all phases of gabion construction.
- D. Plan for material storage and handling, laydown location and size, and for traffic control measures.
- E. Sediment and Erosion Control Plan.
- F. List of equipment and materials to be used on the job.
- G. Plan for maintaining existing road and dike crest. Refer to Section 12.0.
- H. Plan to route equipment around the outfall structure area during the wall construction.
- I. Schedule (bar chart method showing milestones) for performing the construction.

3.0 APPLICABLE DOCUMENTS

3.1 CODES AND STANDARDS

The following codes are considered to be a part of these Specifications in the areas where they apply to material, fabrication, workmanship, examination, testing, and documentation. The latest revision in effect at the time of issuance of the Inquiry shall be applicable unless otherwise noted. Omission of any codes and standards does not relieve the Contractor of his responsibility to the applicable codes and standards. In the event of a conflict between the following codes and standards and these Specifications and/or accompanying drawings or diagrams, these Specifications and drawings shall govern to the extent of such conflicts. Any deviations contained in these Specifications and/or accompanying drawings from the following regulations have been made to better address the specifics of this particular facility. Specific standards are referenced within the appropriate section of the Specifications.

- A. ASTM International Standards
- B. Occupational Safety and Health Act (OSHA) of 1970, as amended
- C. Codes specific to the local county and city.
- D. Alabama Department of Environmental Management (ADEM) Regulations
- E. Environmental Protection Agency (EPA) Regulations

F. American Water Works Association (AWWA)

G. Geosynthetic Research Institute Standards

H. DOT Federal Highway Administration Standards

3.2 CIVIL DRAWINGS AND SPECIFICATIONS

The following drawings are hereby made a part of this Specification and sets forth the scope and details of the work to be performed by the Contractor:

D-552579 Plant Barry Ash Pond Dike Discharge Structure, Existing Conditions

D-552580 Plant Barry Ash Pond Dike Gabion Wall and Cross Sections at Discharge

Also, the “Technical Specifications for Ash Pond Dike Stabilization and Raise, Barry Steam Plant” (Inquiry No. 04-1969-C-APC) are incorporated as a part of these specifications.

3.3 GEOTECHNICAL REPORT

Soils information can be found in the report, “Plant Barry Ash Pond South Dike and Diversion Dike Slope Stability Report.” This report was issued as a portion/exhibit to the aforementioned Inquiry Package and should be read in its entirety in order that the Contractor is aware of soil types and engineering characteristics of soils to be encountered as well as design rationale.

The soil profiles and associated information present a best estimation of the stratification across the site based on test borings at discrete locations. It may not fully define the range of soil conditions across the site, nor anomalous conditions between test holes.

If the Contractor judges that the subsurface information is inadequate in any regard, he has the right to perform any additional investigation to supplement the provided information at no expense to the Purchaser. The Purchaser shall not be liable for any oversight made by the Contractor regarding the subsurface conditions.

4.0 SITE CONDITIONS AND FIELD INVESTIGATIONS

Prior to mobilization and execution of any work described in these Specifications, the Contractor shall become thoroughly familiar with the plant facilities, the site conditions at the ash pond, and the other features of the site described in the Specifications and drawings.

Subsurface investigations of the south main dike have been performed. Included in these investigations were test borings, Dutch cone soundings (DCP), and dilatometer soundings (DMT). Copies of those documents were provided in the aforementioned Inquiry Package for the Dike Stabilization Project. Additional copies can be provided upon request.

The field testing, drilling, and measurements performed by the Purchaser have been conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions. The Purchaser assumes no responsibility for the accuracy of the investigations, the resulting data, or the interpretation; nor does the Purchaser guarantee that the materials and conditions will not vary from those indicated by the investigations. In addition, the Purchaser will not be responsible for any deduction, interpretation, or conclusion drawn by the Contractor.

The Contractor may perform such additional field investigations in the gabion wall area as he deems necessary to augment previous investigation work. Prior to the start of the additional field investigations, the Contractor should state in writing his justification for this work and must obtain the approval of the Project Manager. All field and laboratory data obtained by the Contractor shall be transmitted to the Project Manager for his records.

5.0 CONSTRUCTION REQUIREMENTS

5.1 CLEARING AND GRUBBING

The foundation surfaces within the footprint of the gabion wall and the adjoining backfill areas shall be cleared and grubbed of trees, stumps, and heavy vegetation. This work should occur prior to foundation preparation work for the wall. Any vegetation, trees, and stumps removed from the foundation surface shall be disposed of outside the limits of the wall and outfall structure in accordance with the provisions of Section 5.1 of the Dike Stabilization specifications.

5.2 STRIPPING AND DIKE EXCAVATION

The upstream slope of the existing south dike shall be stripped of any gravel, vegetation, and organic topsoil to a depth of six inches normal to the slope and to expose the clayey backfill soils. The stripping shall occur from the upstream crest down to the ash/water surface. This work shall occur in all areas of gabion wall construction where dike raise slopes will adjoin the new wall.

Soils along the crest and downstream slope shall be excavated as needed to construct the new gabion wall and associated new slopes.

5.3 DISPOSAL OF MATERIALS

The Contractor shall dispose the stripped and excavated materials only within designated areas of the ash pond.

The Contractor shall notify the Project Manager of his plans to dispose materials, along with the type and quality of material for disposal. The Contractor shall not allow any spillage of materials from hauling vehicles from the point of excavation to the final disposal location. The Contractor shall be responsible for cleaning the road surface where the spillage occurs and as directed by the Project Manager. All controlled burning of materials shall meet the requirements established by state, county, and local laws.

5.4 FOUNDATION PREPARATION

The Contractor shall prepare the foundation of the wall prior to placing geogrid and geotextile. The existing dike shall be excavated to EL 14.5 within the footprint of the wall to form a relatively level foundation. The bottom of the excavation may be below the current ash pond/water level. The toe of the existing dike should not be excavated except as required to achieve the foundation footprint as shown on the drawings.

Once the excavation is complete, the geogrid should be placed on the excavated and prepared foundation. Then, geotextile shall be placed prior to the placement of the sack gabions.

5.5 GABIONS

Gabions are baskets made of double twisted steel woven wire mesh filled with stone or rock at the project site to form flexible, permeable, monolithic structures such as retaining walls. The conventional gabions are constructed by filling the baskets in-place. Sack gabions are cylindrical shaped units that are filled with stone remote from their installation location, closed and then transported and placed.

5.5.1 Galvanized and PVC Coated Gabions Manufacturing

5.5.1.1 Wire

Tensile Strength: both the wire used for the manufacture of gabions and the lacing wire shall have a tensile strength of 54,000 to 70,000 psi, in accordance with ASTM A641-98.

Elongation: the test must be carried out on a sample at least 12 inches long. Elongation shall not be less than 12%, in accordance with ASTM A370-97.

Zinc coating: minimum quantities of zinc according to ASTM A641-98, Class III soft temper coating.

Adhesion of zinc coating: the adhesion of the zinc coating to the wire shall be such that, when the wire is wrapped six turns around a mandrel having four times the diameter of the wire, it does not flake or crack when rubbing it with bare fingers, in accordance with ASTM A641-98.

5.5.1.2 PVC Coating

Specific Gravity: the PVC coating shall have a density of 81 to 84 pcf in accordance with ASTM D792, Table 1

Hardness: between 50 and 60 Shore D, according to ASTM D2240

Tensile Strength: not less than 2,985 psi, according to ASTM D412-92

Modulus of elasticity: not less than 2,700 psi, in accordance with ASTM D412-92

Abrasion resistance: the percentage of weight loss shall be less than 12 percent, according to ASTM D1242-92

5.5.1.3 Galvanized & PVC Coated Wire Mesh Gabions

Internal Wire Diameter – 0.106 inches

External Wire Diameter – 0.146 inches

Selvedge Internal Wire Diameter – 0.134 inches

Selvedge External Wire Diameter – 0.174 inches

Mesh Opening: Nominal Dimension D = 3.25 inches

5.5.1.4 Galvanized & PVC Coated Lacing Wire

Lacing wire: Internal Wire Diameter – 0.087 inches
 External Wire Diameter – 0.127 inches

5.5.1.5 Spenax Fasteners (Overlapping Fasteners)

Stainless Steel overlapping fasteners may be used in lieu of lacing wire for basket assembly and installation. The spacing of the fasteners during all phases of assembly and installation shall be in accordance with spacing based on 1,400

lbs. pull-apart resistance for galvanized mesh, with nominal spacing of 4 inches, and not to exceed 6 inches.

Stainless Steel Fasteners: Diameter = 0.120 inch according to ASTM A313, Type 302, Class I. Tensile strength: 222,000 to 253,000 psi in accordance with ASTM A313-92.

Proper installation of rings: A properly formed Spenax fastener shall have a nominal overlap of one (1) inch after closure.

5.5.1.6 Tolerances

Gabion sizes: $\pm 5\%$ on the length, width, and height.

Mesh opening: Tolerances on the hexagonal, double twisted wire mesh opening shall not exceed $\pm 10\%$ on the nominal dimension D values.

5.5.1.7 Manufacturing

Gabions shall be manufactured with all components mechanically connected at the production facility. The front, base, back, and lid of the gabions shall be woven into a single unit. The ends and diaphragm(s) shall be factory connected to the base. The lid may be a separate piece made of the same type mesh as the basket. All perimeter edges of the mesh forming the basket and top, or lid, shall be selvaged with wire having a larger diameter.

The gabion shall be divided into cells by means of diaphragms positioned at approximately three (3) foot centers. The diaphragms shall be secured in position to the base so that no additional lacing is necessary at the jobsite.

5.5.2 Stone Fill

The stone used to fill the gabions shall be hard, angular to round, durable and of such quality that it will not disintegrate on exposure to water or weathering during the life of the structure. Gabion rock shall range in size between 4-inches and 8-inches.

5.5.3 Woven Mesh Gabions Fabrication and Installation

5.5.3.1 Assembly

Gabions shall be assembled in accordance with the manufacturer's specifications.

5.5.3.2 Filling

Baskets shall be filled with rock/stone as specified in Section 5.5.2. The cells shall be filled in stages so that local deformation shall be avoided. At no time shall any cell be filled to a depth exceeding one-foot higher than the adjoining cell. Contractor shall slightly overfill each basket to allow for settlement of the rock.

Three (3) feet high gabions shall be filled in three layers, one foot at a time. Connecting wires shall be installed after the placement of each layer, that is, at one foot high and two feet high.

Sack gabions shall be filled by tying one end of the gabion with wire, filling the gabion with the specified stone, and closing the remaining end of the gabion with wire.

5.5.3.3 Internal Connecting Wires

Internal connecting wires shall be used when a structure requires layers of gabions to be stacked on top of each other. Internal connecting wires shall connect the exposed face of a cell to the opposite side of the cell. An exposed face is any side of a gabion cell that will be exposed or unsupported after the structure is completed. Lacing wire or prefabricated internal connecting wires shall be used.

5.5.3.4 Lid Closing

Gabion lids shall be pulled tight until the lid meets the perimeter edges of the basket subsequent to filling as specified in Section 5.5.3.2. Each lid shall then be tightly laced and/or fastened along all edges, ends and tops.

5.5.3.5 Mesh Cutting and Folding

Where necessary, Contractor shall cut, fold and fasten together the basket mesh to suit existing site conditions. The mesh must be cleanly cut and surplus mesh either folded back or overlapped so that it can be securely fastened together with lacing wire or fasteners. All reshaped gabions shall be assembled, installed, filled, and closed as specified in the previous sections.

5.6 GEOGRID REINFORCING MATERIALS

Biaxial geogrids will be used to reinforce the foundation subgrade below the gabions.

- A. Biaxial Geogrid - This material will consist of the BX1300 Series material fabricated by the Tensar Corporation or approved equal. The geogrid shall be

placed onto the prepared foundation surface. A single layer of this geogrid shall be placed along the entire footprint of the gabion wall.

- B. The Contractor shall obtain a copy of the fabrication specifications for the biaxial geogrid materials. All geogrid materials/rolls delivered to the site shall meet the minimum specification requirements for tensile strength, thickness of fabric, puncture resistance, etc. The Contractor shall replace any roll of damaged geogrid material delivered to the site by the fabricator, at no additional cost to the Purchaser. A damaged geogrid roll or material not meeting specification shall not be placed in the dike crest construction.

5.7 GEOTEXTILE MATERIALS

The contractor shall supply a geotextile to be placed between the geogrid and the sack gabions, as well as between the sides of the gabions and any backfill. The geotextile shall be a 7.0 oz/yd², non-woven, polypropylene geotextile such as Evergreen TG 650 or equivalent. All geotextile shall be installed as indicated on the drawings.

5.8 EARTH FILL MATERIALS

Earth fill materials will need to be used in constructing the dike crest raise around the gabion wall structure. The Contractor is referred to Section 5.8 of the “Technical Specifications for Ash Pond Dike Stabilization and Raise, Barry Steam Plant” (Inquiry No. 04-1969-C-APC dated October 4, 2004) for the requirements and specifications relating to earth fill materials.

5.9 PLACEMENT

5.9.1 Earth Fill Materials

The Contractor is referred to Section 5.9.1 (and all sub-sections) of the “Technical Specifications for Ash Pond Dike Stabilization and Raise, Barry Steam Plant” (Inquiry No. 04-1969-C-APC dated October 4, 2004) for the requirements and specifications relating to placement of the earth fill materials.

5.9.2 Geogrid Reinforcing Material

- A. The biaxial geogrid shall be placed on the prepared foundation surfaces. The geogrid can be positioned either parallel or perpendicular to the rear face of the gabion wall.
- B. The geogrid shall be placed in a single layer having a 0% overlap of seams between layers.

- C. Metal pins, stakes, or small piles of soil/ash may be used to hold the geogrid layers in place prior to and during the placement of geotextile and sack gabions on top of the geogrid.
- D. Placement of the geotextile, and subsequent placement of the sack gabions, shall be performed in a manner to avoid movement, distortion, tearing, puncturing, and repositioning of the geogrid. If the Contractor should damage, move, or distort the geogrid during spreading operations, the Contractor shall remove and placed materials and reposition the geogrid to its original position aligned perpendicular to the gabion wall face. The Contractor shall replace the geogrid if the material is damaged during placement operations. All work described in this paragraph shall be performed by the Contractor at no additional cost to the Purchaser.
- E. The Project Manager shall direct the Contractor to replace and reposition geogrid layers which do not meet the requirements of the Specification and drawings. All work directed by the Project Manager to ensure a quality installation and good workmanship shall be performed by the Contractor at no additional cost to Purchaser.

5.9.3 Geotextile Material

- A. The geotextile is to be placed on top of the biaxial geogrid, prior to placement of the sack gabions.
- B. The geotextile shall be positioned perpendicular to the rear face of the gabion wall so sufficient length can be provided to wrap the geotextile up the inboard/upstream side of the gabion wall as well as the outboard/downstream side. Splicing/overlapping of the geotextile on the downstream side of the gabion wall is acceptable as long as backfilling against the gabions does not move or distort the geotextile.

5.9.4 Sack Gabions

- A. The sack gabions are to be placed on the geotextile to form the foundation for the basket gabions.
- B. The sack gabions are to be placed perpendicular to the rear face of the gabion wall to form a relatively level foundation at about EL 16.5. These gabions are placed after filling and closing at a remote location.

5.9.5 Basket Gabions

- A. After placement of the sack gabions to form the foundation, the initial layer of basket gabions is to be placed and filled in accordance with Section 5.5.3 and the gabion manufacturers installation/construction guidelines.

5.10 TESTING

The Purchaser shall employ and pay for the services of an independent testing laboratory to perform specified earthwork testing. The Contractor shall cooperate with the laboratory to facilitate the execution of its required services.

Employment of the laboratory shall in no way relieve the Contractor of his obligations to perform the work and supply the materials in accordance with the Specifications. The Contractor shall have the following responsibilities:

- A. Cooperation with laboratory personnel and provision of access to the work area and to the Contractor's operations;
- B. Securing for the laboratory personnel adequate quantities of representative samples of materials proposed to be used and which require testing;
- C. Furnishing copies of the product test reports as required;
- D. Notification to the laboratory 48 hours in advance of operations to allow for laboratory assignment of personnel and scheduling of tests. When tests or inspections cannot be performed after such notice, reimbursing the Purchaser for laboratory personnel and travel expenses incurred due to the Contractor's negligence;
- E. Employment and payment for the services of a separate, equally qualified independent testing laboratory to perform additional inspections, sampling, and testing required for the Contractor's convenience, or when initial tests indicate that the work does not comply with the Specifications; and,
- F. Testing associated with any section of the reinforced dike or the raised dike which fails to meet quality, strength, and permeability requirements, as set forth in these Specifications, shall be removed and replaced by the Contractor until satisfactory to the Project Manager at no additional cost to the Purchaser.

The Contractor is referred to Sections 5.10.1 of the "Technical Specifications for Ash Pond Dike Stabilization and Raise, Barry Steam Plant" (Inquiry No. 04-1969-C-APC dated October 4, 2004) for additional requirements and specifications relating to testing of the earth fill materials.

6.0 RIGHT OF FIELD INSPECTION

The Engineer shall have the right to inspect the Contractor's work as deemed necessary. The Engineer shall have the right to inspect the Contractor's work locations, the materials in use, and to follow the progress of the work and the manner in which it is being done. The Engineer shall have the authority to reject materials or suspend any work not being properly performed or that is not in accordance with these Specifications. The Contractor has the responsibility for

his work being performed properly and in accordance with these Specifications and the presence of an inspection shall not relieve the Contractor or his responsible agents of that responsibility.

7.0 QUALITY CONTROL AND QUALITY ASSURANCE

The Contractor is responsible for the implementation of his standard quality plans, program or practices, and shall institute any additional controls or procedures in accordance with proven industry practice to assure compliance with these Specifications and the drawings.

8.0 EQUIPMENT

8.1 GENERAL

The Contractor is referred to Section 8.0 (and all sub-sections) of the “Technical Specifications for Ash Pond Dike Stabilization and Raise, Barry Steam Plant” (Inquiry No. 04-1969-C-APC dated October 4, 2004) for the requirements and specifications relating to equipment.

Particular attention is to be given to the reference to Section 8.2.2, “Tamping Compactors.” Compaction of materials within 3 feet of the gabions shall be performed by the use of hand tampers or manually-guided sled/plate-type vibratory or ramming tampers which have been approved for use by the Project Manager.

9.0 SAFETY

9.1 AVOID UNSAFE CONSTRUCTION ACTIVITIES

The Contractor shall perform all work activities in a safe manner. All work shall be performed to avoid the following occurrences:

- A. Equipment and vehicular traffic do not damage the existing dike crest.
- B. Equipment and vehicular traffic operates on the prepared/slightly densified ash foundation in a manner that the equipment, vehicle, and operator do not overturn or sink into the relatively soft and compressible ash.
- C. Equipment and vehicular traffic do not damage the overflow weirs.
- D. Borrow operations do not affect any existing structures.
- E. Sand and clay borrow operations do not damage any monitoring wells.

- F. Equipment and vehicular traffic do not damage the bridge, which crosses the discharge canal.
- G. Equipment and vehicular traffic do not damage the ash pond discharge structure.

9.2 SAFETY FOR WORKERS

The Contractor shall perform all work activities to assure worker safety in the following areas:

- A. Traffic lanes around the ash pond dike.
- B. Foundation preparation for the dike surface.
- C. Transmission power lines.
- D. Borrow area.

10.0 GRASSING

The Contractor is referred to Section 10.0 (and all sub-sections) of the “Technical Specifications for Ash Pond Dike Stabilization and Raise, Barry Steam Plant” (Inquiry No. 04-1969-C-APC dated October 4, 2004) for the requirements and specifications relating to grassing of slopes and top surfaces of the dike in the vicinity of the gabion wall.

11.0 ENVIRONMENTAL CONTROL MEASURES

11.1 ENVIRONMENTAL OPERATING PARAMETERS

The Contractor shall comply with and abide by all environmental laws, regulations, and permit stipulations which govern the operation of Plant Barry. These include but are not limited to the following permits:

- NPDES Permit No. AL-0002879.

The rules and regulations include but are not limited to the following:

- The Clean Air Act of 1990, as amended
- The Federal Water Pollution Control Act
- Alabama Solid Waste Regulations

The Contractor shall be solely responsible for any penalties and restoration costs associated with the failure to comply with the above stipulations. Failure of the Contractor to conform to the Environmental Operation Parameters, as determined by the Project Manager or Purchaser's representative shall constitute a breach of contract.

The Contractor shall provide equipment and personnel to perform emergency measures required to contain any spillages and to remove contaminated soils or liquids and shall excavate and dispose of any soil contaminated by the construction operations off-site, and replace such soil with suitable compacted fill and topsoil as directed by the Project Manager.

The Contractor shall take special measures to prevent harmful substances from entering public waters and shall prevent disposal of wastes, effluents, chemicals, sediments, or other such substances adjacent to streams, or in sanitary or storm sewers.

11.2 CLEANING

The Contractor shall conduct cleaning and disposal operations to comply with all codes, ordinances, regulations, and anti-pollution laws. Disposal of acceptable materials shall be to the ash pond, as determined by the Project Manager. Only those cleaning materials which will not create hazards to health or property and which will not damage surfaces shall be used. Only those cleaning materials and methods recommended by the manufacturer of the surface material to be cleaned shall be used and cleaning materials shall be used only on those surfaces recommended by the material manufacturer.

The Contractor shall perform periodic cleaning to keep the work, the site, and adjacent properties free from accumulation of waste materials, rubbish, and windblown debris resulting from construction operations. The Contractor shall provide on-site containers for the collection of waste and shall periodically remove waste materials from the site and dispose of such materials in legal disposal areas away from the site.

11.3 DUST CONTROL

The Contractor shall continually take steps necessary to minimize dust created by all equipment, vehicles, work activities, or storage areas. These steps shall include, but not be limited to, watering roads and work areas. Open-bodied trucks handling sand, stone, gravel, or earth shall be covered if the truck is traveling off site. The Contractor shall not deposit mud or debris on public road, plant roads, or adjacent properties.

11.4 POLLUTION CONTROL

The Contractor shall provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious and/or toxic substances, fueling stations, and pollutants produced by construction operations.

Toxic liquids, chemicals, fuels, lubricants, etc., shall be deposited into containers for subsequent removal offsite in accordance with all applicable Federal, State, and local codes and standards.

11.5 EROSION AND SEDIMENT CONTROL

The Contractor shall provide, implement, and maintain the sediment and erosion control measures described in the plan submitted with the bid (refer to Section 5.0E). The plan and associated measures will be approved by the Project Manager prior to the start of construction. The Contractor shall provide the measures for the entire contract period.

12.0 HAUL ROADS

It shall be the responsibility of the Contractor to maintain the existing haul roads, ramps, and associated culverts and ditching, and, with the express approval of the Project Manager, to design and construct any additional necessary ramps and/or haul roads, as required for his use and mode of operation. The ramps and haul roads shall be maintained in good condition throughout the contract period. The Project Manager must approve the source of materials required to construct and maintain the haul roads and ramps.

The Contractor shall refer to the geologic sections and soil strength parameters in the process of designing or planning any earthen sections (e.g., ramps, road embankments) which could fail due to the presence of soft organic soils. The Contractor shall exercise similar due care in the design of ramps and haul roads as with the working platform and restored portions of the dike which also require stabilization or earth reinforcement.

The Contractor shall be responsible for preventing dust problems, equipment tracking mud and soil clods onto county roads and highways, and the cleaning of the road surface from equipment usage as per the direction and to the satisfaction of the Project Manager.

The Contractor shall maintain all access roads used by the Contractor's hauling and vehicular equipment. The Contractor shall grade and repair roads daily to remove potholes, ruts, irregularities and slumps which develop in the road surface. The access road on top of the existing dike shall be constantly maintained during the daily construction activities to prevent excessive wear, damage, slumping along the downstream crest. Hauling equipment will damage the road surface. The Contractor shall submit a plan with the bid (refer to Section

2.0.G) to describe how the Contractor will maintain the road to present elevations and not affect the integrity and safety of the existing dike structure during the entire period of earthwork construction. The plan shall include the description/details for replacing the gravel on the road at the end of the construction work. The Project Manager may direct the Constructor to maintain or repair roads damaged by the Contractor's operations, at no additional cost to the Purchaser.

13.0 OFFICE AND SUPPORT EQUIPMENT

The Contractor shall provide all office, telephone, toilet, storage buildings, power connections, potable water connections, and other support functions to perform the work described in these specifications.

Other power and water issues should be directed to the Project Manager prior to the start of construction.

14.0 SURVEYING

The Contractor shall be responsible for all survey activities to support the gabion wall construction and adjoining dike raise construction. These activities will include, but are not limited to, the following:

- Lines and grades for the foundation and top surfaces of the gabion wall
- Lines and grades for the outer slopes and top surface of the dike adjacent to the gabion wall
- Grade and thickness for each lift of backfill
- Stationing along dike at the gabion wall location
- Dike material zones for possible measurement and payment
- Borrow operations
- Quality control field testing locations

All survey information shall be made available to the Project Manager during the construction period.

15.0 TRAFFIC CONTROL MEASURES

The Contractor shall be responsible for the safe and adequate site traffic control for all work described in these Specifications. The Contractor shall furnish a Traffic Control Plan to the Purchaser for approval. The Contractor and his subcontractors shall comply with this Traffic Control Plan and all traffic control regulations of the Purchaser. This includes, but is not limited to, access roads, use of locked and unlocked gates, hours of operations, security requirements, and strict coordination with plant operations and with other contractors performing work on site.

The Contractor shall control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, and the Purchaser's operations, or construction operations. The Contractor shall comply with any instructions given by the Project Manager relating to speed control and safe operation of all equipment and vehicles.

16.0 HANDLING, SHIPPING, AND STORAGE

The Contractor is responsible for the handling, shipping, and storing of all materials used in the earthwork construction. The Contractor shall ensure that all materials are handled, shipped, and stored so as to prevent any damage. Materials damaged during handling, shipping, or storage shall be replaced at no cost or expense to the Purchaser. The Contractor shall store materials only in areas as directed by the Project Manager.

17.0 FINAL INSPECTION AND CERTIFICATION

The work in this inquiry shall be considered complete after the following:

- A. All newly constructed improvements have been turned over to the Purchaser's representative for final inspection and acceptance.
- B. A stand of grass shall be established such that there is a live, healthy grass plant not more than two inches apart in any direction 6 months from the time of planting. Furthermore, a stand of grass is established by "end of project plus eight weeks" per D. O. T. specifications.
- C. The survival rate for installed vegetation is at least 80% one year from the time of planting.
- D. Contractor's work area is orderly and properly restored.
- E. Contractor's equipment and materials have been removed from site.
- F. The Contractor shall submit to the Purchaser a Project Completion Report including the following:
 - Summary of wall construction work, along with progress and finish photos.
 - QA/QC documentation
 - As built drawings.
 - Soils testing results.
 - Applicable permits.
 - Other documents as considered applicable and as notified to the Contractor by Purchaser at least 2 weeks prior to the estimated completion date or stop of work location.