TENNESSEE VALLEY AUTHORITY

Received: 12/10/2021

1101 Market Street, BR 2C, Chattanooga, Tennessee 37402

Sent Via Electronic Transmittal

December 10, 2021

Mr. S. Scott Story, P.E.
Chief, Solid Waste Engineering Section
Division of Solid Waste Management
Alabama Department of Environmental Management (ADEM)
1400 Coliseum Boulevard
Montogomery, AL 36110

Dear Mr. Story:

TENNESSEE VALLEY AUTHORITY (TVA) – COLBERT FOSSIL PLANT (COF) – ASH POND 4 PERMIT APPLICATION

TVA is submitting an updated Solid Waste Disposal Facility CCR Unit Permit Application Package (including Form 439) for Ash Pond 4 at the TVA Colbert Fossil Plant in Colbert County, AL. The originally submitted Closure/Post Closure Plan for this facility was approved by the Alabama Department of Environmental Management (ADEM) in a letter dated August 22, 2017. The Closure Certification package for Ash Pond 4 was submitted to ADEM with a letter dated September 18, 2018. This updated package is to support issuance of a permit under the ADEM CCR Rule.

The current application is accompanied by an updated Form 439. ADEM confirmed that resubmission of fees is not necessary as fees were submitted previously on December 20, 2018.

If you have any questions, please contact Suama Bolden at snbolden@tva.gov

Sincerely,

Anna Fisher
Manager, Ash and Groundwater
Waste Permits, Compliance, and Monitoring

Enclosure

Enclosures
cc (Electronic Distribution w/ Enclosures):

Heather Jones
Chief Compliance and Enforcement Section
Division of Solid Waste Management
Alabama Department of Environmental Management (ADEM)
1400 Coliseum Boulevard
Montogomery, AL 36110

Devin Jenkins
Environmental Engineering Specialist
Division of Solid Waste Management
Alabama Department of Environmental Management (ADEM)
1400 Coliseum Boulevard
Montogomery, AL 36110

Patrick “Dusty” Hawkins
Hydrogeologist
Division of Solid Waste Management
Alabama Department of Environmental Management (ADEM)
1400 Coliseum Boulevard
Montogomery, AL 36110

Billie Jean Wascher
Chief Groundwater Protection Unit
Division of Solid Waste Management
Alabama Department of Environmental Management (ADEM)
1400 Coliseum Boulevard
Montogomery, AL 36110

Nichole Shaw
Compliance and Enforcement
Division of Solid Waste Management
Alabama Department of Environmental Management (ADEM)
1400 Coliseum Boulevard
Montogomery, AL 36110

PERMIT APPLICATION FOR CCR SURFACE IMPOUNDMENT
TVA COLBERT FOSSIL PLANT ASH DISPOSAL AREA 4
TUSCUMBIA, ALABAMA
TENNESSEE VALLEY AUTHORITY

PERMIT APPLICATION FOR CCR SURFACE IMPOUNDMENT
TVA COLBERT FOSSIL PLANT ASH DISPOSAL AREA 4
335-13-15-.09(1)(C)

1. Introduction

Tennessee Valley Authority (TVA) owns and operates the Colbert Fossil Plant located in Colbert County, Alabama. The plant property is on the south bank of the Tennessee River, approximately 8 miles west of Tuscumbia, Alabama. The Colbert Fossil Plant was fully idled and stopped generating electricity in March 2016. The plant had 5 generating units with a combined generating capacity of 1,204 megawatts.

In accordance with the Alabama Department of Environmental Management (ADEM), Land Division, Solid Waste Program, Standards for Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments, Chapter 335-13-15-.02, Ash Disposal Area 4 (also called Ash Pond 4) is classified as an Existing CCR Surface Impoundment. Ash Disposal Area 4 is located on the southern portion of the plant property, approximately 3,000 feet south of the powerhouse. The CCR Surface Impoundment is bounded to the west by Colbert Steam Plant Road, to the east by Cane Creek, and to the south by Lee Highway.

The total capacity of Ash Disposal Area 4 is approximately 2.6 million cubic yards, covering approximately 52 acres. The disposal area was closed in early 2018, with the installation of the final cover system.

Rule 335-13-15-.08 requires a website address for information required to be posted by 40 CFR 257.107. The information required to be posted and applicable to the TVA Colbert Fossil Plant Ash Disposal Area 4 is found on TVA's CCR Rule Compliance Data and Information website at:

https://www.tva.com/environment/environmental-stewardship/coal-combustion-residuals/colbert

TVA is submitting the attached information in support of an application for a permit for post-closure in accordance with Rule 335-13-15-.09(1)(a) for an existing CCR surface impoundment. Each section includes a narrative portion describing the basis of design of the project, applicable regulatory requirements, and each of the engineering analyses performed to support the design and permitting of the facility.

2. Application Form

A solid waste permit application form in compliance with 335-13-15-.09(1)(a)1. is provided as Attachment A.

3. Boundary Plat and Legal Description

A boundary plat and legal property description in compliance with 335-13-15-.09(1)(a)2. for Ash Disposal Area 4 is provided in Attachment B.

4. Location Requirements

Technical data and reports documenting compliance with the requirements with 335-13-15-.03 are required in the permit application package.

Ash Disposal Area 4 is closed. TVA did not post demonstrations associated with the location restrictions at 335-13-15-.03(2) through 335-13-15-.03(5) because the results of not posting these demonstrations was that TVA must stop placing CCR in the unit and initiate closure and the unit was already closed. Therefore, these requirements are not applicable due to the closure of Ash Disposal Area 4. TVA has conducted extensive comprehensive groundwater investigations of the site under the oversight of ADEM through the First Amended Consent Order. The results have been submitted to ADEM in annual reports.

5. Geological and Hydrogeological Presentation

A detailed presentation of geological and hydrogeological units within the disposal site, including typical cross-sections and disposal methods used is required under 335-13-15-.04. The presentation is included in the History of Construction for Coal Combustion Residuals report dated December 9, 2016. A copy of the report is provided in Attachment C. The geology and hydrogeology are discussed in the Ash Pond 4 Groundwater Monitoring Plan dated November 3, 2021, provided in Attachment H.

6. Determination of Liner Design

A technical determination of the liner design and type required by 335-13-15-.04(2). The site is an unlined facility.

7. Hazard Potential Classification

A technical report for the hazard potential of the facility as outlined in 335-13-15-.04(4)(a)2. is required in the permit application. The initial hazard potential classification assessment was completed in 2016, and a periodic assessment was completed in 2021. The hazard potential classification for the site is ‘significant’. A copy of the Hazard Potential Classification Assessment which included the initial assessment as an attachment is provided in Attachment D. The site Emergency Action Plan (EAP) for Ash Disposal Area A, Revision 2, dated February 21, 2019, is also provided in Attachment D.

8. Structural Stability Assessment

A structural stability assessment is required following 335-13-15-.04(4), because the site has a height of greater than 5 feet, and a storage volume greater than 20 acre-feet. The initial structural stability assessment was completed in 2016 and a periodic assessment was completed in 2021. The structural stability assessment is provided in Attachment E.

A Safety Factor Assessment Report demonstrating the stability safety factors for Ash Pond 4 in its final configuration are met is included in Attachment E.

TVA has previously requested a variance from ADEM Admin Codes r. 335-13-15-.07(3)(d)3(i)(III-V) which requires the minimum final grade of the final cover system shall not be less than 5 percent, the maximum final grade of the final cover system shall not exceed 25 percent to minimize erosion, and the slopes longer than 25 feet shall require horizontal terraces

of sufficient width for equipment operation, for every 20 feet rise in elevation or utilize other erosion control measures approved by the Department. ADEM reviewed the request and asked for additional information regarding the above-mentioned variance, specifically asking TVA to submit further documentation demonstrating adequacy of the slope stability of the layered final cover system utilizing the requested slope by a registered Professional Engineer in Alabama.

Additional engineering analyses demonstrating the adequacy of the slope stability of the layered final cover system were performed and included in Attachment E.

9. Topographical Maps and Control Points

On-site control points are required to provide an accurate means of horizontal and vertical control for the facility construction, operation, closure, and post-closure. Additionally, topographical maps and contour intervals no more than five feet for the existing ground surface elevation, final disposal area elevation, and buffer zones are required. The control points and contours are identified on the applicable sheets in the drawings titled:

- Colbert Fossil Plant Ash Pond 4 Site Plan October 2021

The drawing is provided in Attachment F.

10. QA/QC Plan

A quality assurance/quality control (QA/QC) plan is required for all components of the final cover system. The QA/QC plan dated July 2016 is included in Attachment G.

11. Operations Plan

An operations plan is required that include the following:

- A CCR fugitive dust control plan in accordance with 335-13-15-.05(1),
- An inflow design flood control system in accordance with 335-13-15-.05(3),
- A groundwater monitoring and analysis program in accordance with 335-13-15-.06
- Recordkeeping procedures in compliance with 335-13-15-.08, and
- Procedures for updating sections of the plans periodically as required.

The CCR Fugitive Dust Control Plan dated December 13, 2019, the Inflow Design Flood Control System Plan dated October 12, 2021, and the Groundwater Monitoring Plan dated November 3, 2021, are provided in Attachment H.

12. Closure and Post-Closure Plans

A written closure and post-closure plans are required in accordance with 335-13-15-.07.

The Closure/Post-Closure Plan for Ash Pond 4 dated February 2017 was submitted to ADEM under state requirements. ADEM approved the Ash Pond 4 closure plan on August 22, 2017. The approval letter from ADEM and the Closure/Post-Closure Plan are included as Attachment I. After receiving approval of the closure plan, TVA completed the construction of the final cover system and closure of Ash Pond 4 in accordance with the approved plan and prepared and submitted a certification report documenting closure Ash Pond 4. That report was submitted to ADEM on September 18, 2018.

13. Adjacent Property Owners

The name and address of all property owners whose property is adjacent to the CCR surface impoundment is required in accordance with 335-13-15-.09(14). The requirement for Ash Pond 4 is not applicable, because TVA owns and controls all the property adjacent to Ash Pond 4.

14. Certification

I hereby certify that the information contained within this permit application is accurate and correct based on the available information.

John M. Trast, P.E., D.GE
Alabama Licensed Professional Engineer No. 22334

Attachment A

Solid Waste Permit Application Forms

PERMIT APPLICATION
SOLID WASTE DISPOSAL FACILITY
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
(Submit in Triplicate)

1. **Facility type:**
   - _____ Municipal Solid Waste Landfill (MSWLF)
   - _____ Industrial Landfill (ILF)
   - _____ CCR Landfill (CCRLF)
   - __X__ CCR Surface Impoundment (CCRSI)
   - _____ Other (explain)_____

2. **Facility Name:** TVA Colbert Fossil Plant Ash Disposal Area 4

3. **Applicant:**

   Name: Tennessee Valley Authority Colbert Fossil Plant

   Address: 900 Colbert Steam Plant Road
   Tuscumbia, Alabama 35674

   Telephone: (256) 389-0698

4. **Location: (include county highway map or USGS map)**

   Township T.4. South **Range** R.12.W
   Section 6., 7. **County** Colbert

5. **Land Owner:**

   Name: Tennessee Valley Authority Attn: Scott Turnbow

   Address: 1101 Market Street
   Chattanooga, TN 37402

   Telephone: 423-751-3031

   (Attach copy of agreement from landowner if applicable.)

6. Contact Person:

Name Anna Fisher

Position or
Affiliation Manager, Ash and Groundwater Compliance

Address: 1101 Market Street BR-2A
Chattanooga, TN 37402

Telephone: 423-751-3357

7. Size of Facility: 71.67 Acres

Size of Disposal Area(s): 52 Acres

8. Identify proposed service area or specific industry that waste will be received from:

This impoundment received only site specific dedicated waste streams coming from operations of a coal burning power plant.

9. Proposed maximum average daily volume to be received at landfill (choose one):

N/A-CLOSED Tons/Day N/A-CLOSED Cubic Yards/Day

10. List all waste streams to be accepted at the facility (i.e., household solid waste, wood boiler ash, tires, trees, limbs, stumps, etc.):

CCR impoundment completed capping in January 2018. It received coal combustion products produced by the TVA Colbert Fossil Plant, in addition to plant process water, gray water and waters from the coal yard runoff pond.

SIGNATURE 12/10/2021 DATE

Attachment B

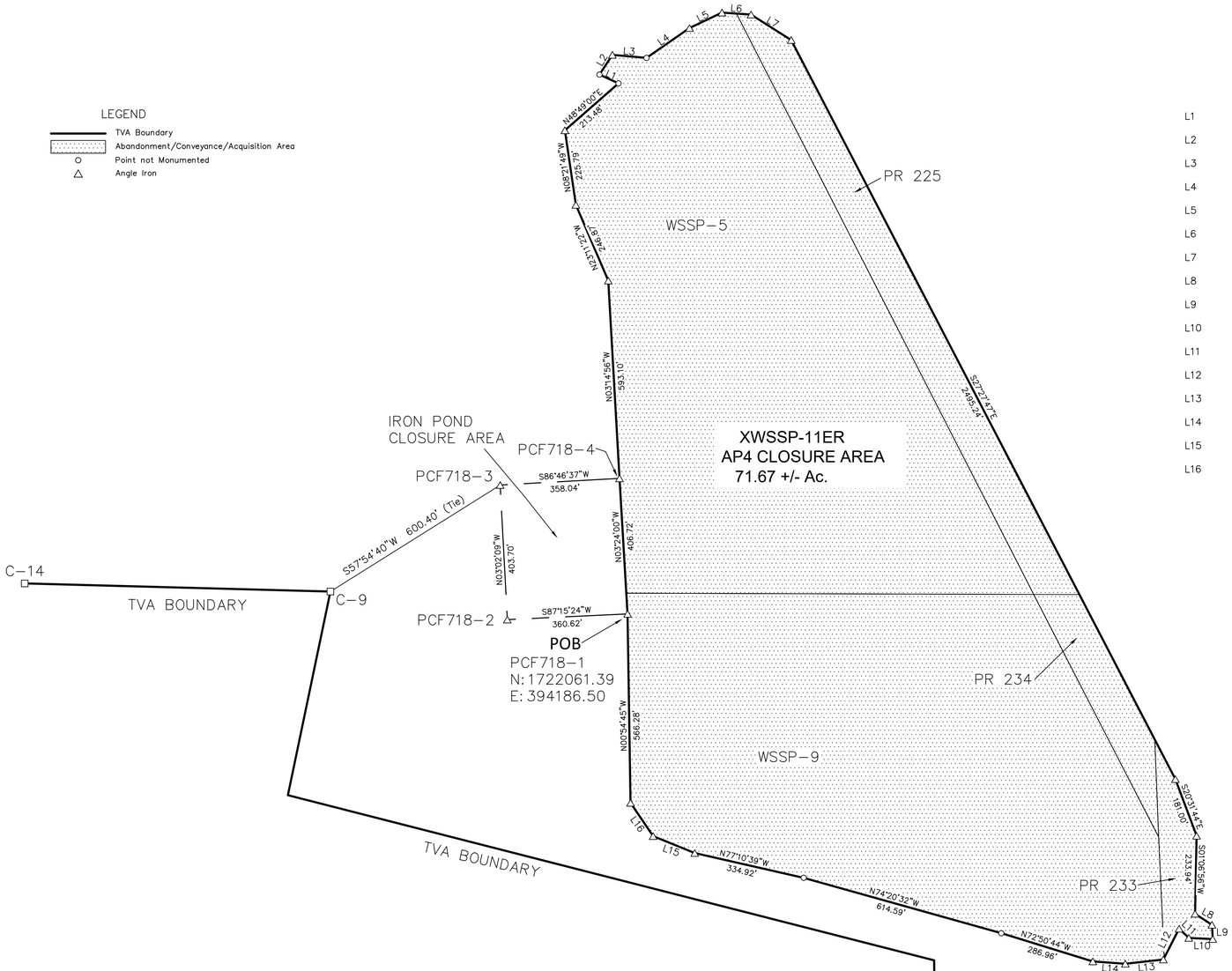
Boundary Plat and Legal Description

Boundary Survey AP4 Area Closure by TVA, dated July 23, 2019

Exhibit A – AP4 Closure Area Description prepared by TVA Surveying dated October 08, 2021

LEGEND

- TVA Boundary
- Abandonment/Conveyance/Acquisition Area
- Point not Monumented
- Angle Iron



TRACT #	
L1	N65°11'23"W – 62.97'
L2	N33°12'50"E – 70.76'
L3	N84°49'03"E – 102.82'
L4	N55°09'59"E – 156.69'
L5	N64°29'54"E – 107.72'
L6	S86°03'15"E – 87.33'
L7	S57°36'54"E – 142.55'
L8	S56°59'48"E – 60.22'
L9	S03°12'28"E – 42.98'
L10	N87°22'31"W – 71.78'
L11	N46°03'35"W – 40.34'
L12	S27°03'21"W – 103.73'
L13	S83°40'13"W – 114.52'
L14	N86°01'25"W – 97.63'
L15	N67°58'44"W – 134.49'
L16	N34°02'45"W – 120.40'

Metadata

Horizontal Projection: COF-Plant Local Ground
COF-Plant Local Ground coordinates are based on the NAD 27 Alabama Lambert Projection, but represent locations on the ground.
They are not equivalent to grid positions
Horizontal Datum: Local
Vertical Datum: NGVD 29
H&V Accuracy: GPS RTK
Units: US Survey Feet (sft)

Compiled from Reservation Map 37MS461 B 566-D R0 & Map 37MS 421 P 504-1 R.1,

Basis for Coordinates: PCF718_1

FIELD SURVEY PCF1065 DATE 07-23-19
GENERATED NLB DATE 09-12-19
CHECK CJM DATE 09-12-19

BOUNDARY SURVEY

AP4 Area Closure

COLBERT COUNTY, ALABAMA
Sec. 1, T. 4 S., R. 13 W.

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
SURVEYING & PROJECT SERVICES

GRAPHIC SCALE 1"=200'

0 200 400 600

CHATTANOOGA	Date of Survey: 07/23/19	37	MS	422 D 508 (D)

COF192166_20190723

TVA Tract No. XWSSP-11ER

EXIHBIT A
AP4 Closure Area
COLBERT STEAM PLANT

A parcel of land located in Section 1, Township 4 South, Range 13 West, Huntsville Meridian, located in Colbert County, State of Alabama, as shown on US-TVA drawing number 37 MS 422 D 508 (D), R.0, sheet one of one, and being more particularly described as follows:

Beginning at an angle iron (Coordinates: N. 1,722,061.39', E. 394,186.50'), said point being corner PCF718-1 and the southeast corner of the Iron Pond Closure. Thence with eastern boundary line of said Iron Pond Closure Area N03°24'00"W, 406.72 feet to an angle iron (found), said point being the northeast corner of said Iron Pond Closure Area; thence leaving said Iron Pond Closure Area N03°14'56"W, 593.10 feet to an angle iron (set); thence N23°11'22"W, 246.87 feet to an angle iron (set); thence N08°21'49"W, 225.79 feet to an angle iron (set); thence N48°49'00"E, 213.48 feet to a point; thence N65°11'23"W, 62.97 feet to a point: thence N33°12'50"E, 70.76 feet to an angle iron (set): thence N84°49'03"E, 102.82 feet to a point; thence N55°09'59"E, 156.69 feet to an angle iron (set): thence N64°29'54"E, 107.72 feet to an angle iron (set): thence S86°03'15"E, 87.33 feet to an angle iron (set); thence S57°36'54"E, 142.55 feet to an angle iron (set); thence S27°27'47"E, 2,495.24 feet to an angle iron (set); thence S20°31'44"E, 181.00 feet to an angle iron (set); thence S01°06'56"W, 233.94 feet to an angle iron (set); thence S56°59'48"E, 60.22 feet to an angle iron (set); thence S03°12'28"E, 42.98 feet to an angle iron (set); thence N87°22'31"W, 71.78 feet to an angle iron (set); thence N46°03'35"W, 40.34 feet to an angle iron (set): thence S27°03'21"W, 103.73 feet to an angle iron (set); thence S83°40'13"W, 114.52 feet to an angle iron (set); thence N86°01'25"W, 97.63 feet to an angle iron (set); thence N72°50'44"W, 286.96 feet to a point; thence N74°20'32"W, 614.59 feet to a point; thence N77°10'39"W, 334.92 feet to an angle iron (set); thence N67°58'44"W, 134.49 feet to an angle iron (set); thence N34°02'45"W, 120.40 feet to an angle iron (set); thence N00°54'45"W, 566.28 feet to the point of beginning and containing 71.67 acres, more or less.

Positions of corners and directions of lines are referred to the Alabama West State Coordinate System and NAD 27 Horizontal Datum.

This description was prepared from Reservation Map 37 MS 421 P 504-1, R.1 and 37 MS 461 B 566-D R.0

TVA Surveying
Tennessee Valley Authority
1101 Market Street
Chattanooga, TN 37402-2801

10/08/2021

Attachment C

Geological and Hydrogeological Presentation

History of Construction for Coal Combustion Residuals Existing Surface Impoundment - Ash Disposal Area 4 by AECOM dated December 9, 2016

COAL COMBUSTION PRODUCT DISPOSAL PROGRAM

TENNESSEE VALLEY AUTHORITY – ASH DISPOSAL AREA 4
COLBERT FOSSIL PLANT
COLBERT COUNTY, ALABAMA

HISTORY OF CONSTRUCTION (40 CFR 257.73(c)) FOR COAL COMBUSTION RESIDUALS (CCR)

EXISTING SURFACE IMPOUNDMENT

Prepared for

Tennessee Valley Authority
1101 Market Street
Chattanooga, TN 37402-2801

December 9, 2016 – Rev0

Prepared by

AECOM

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FIGURES

Figure 1: Overview of Ash Disposal Area 4

Figure 2: TVA Drawing 10N290 - Cross Section of the Dike

Figure 3: Ash Disposal Area 4 - Area/Capacity Curves

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Table 1: List of Drawings Containing Information Requested in §257.73(c)(1)(vii)

Table 2: Ash Disposal Area 4 - Area/Capacity Curves

APPENDICES

Appendix A USGS Location Map

Appendix B Slope Stability Section

Appendix C Construction Drawings

10N290 – Ash Disposal Area No. 4 Plan

10N291 – Ash Disposal Area No. 4 Spillway & Channel Plan

10N292 – Ash Disposal Area No.4 Sections & Details

10N295-1 – Ash Disposal Area No. 4 Misc. Details Sheet 1

10W503-01 to 07 – Temporary Rock Buttress and Sheet Pile Wall

10W290-01 to 21 – High Hazard Removal & Spillway Replacement

10W291-01 to 09 – Seepage Remediation

10W504-01 to 14 – Slope Improvement

10W395-1 to 38 – East Dike Seismic Improvement

Appendix D Unit History Exhibit

Appendix E Instrumentation Plan

1.0 INTRODUCTION/ RULE REQUIREMENTS

1.1 OBJECTIVE

The purpose of this History of Construction report is to document compliance with 40 CFR 257.73(c) of the Environmental Protection Agency Final Coal Combustion Residual Rule (EPA Final CCR Rule). This History of Construction is based on existing documentation such as construction drawings, record drawings, and any other pertinent data and/or investigations to support historic conditions and operations at Ash Disposal Area 4 at the Tennessee Valley Authority (TVA) Colbert Fossil Plant (COF). All supporting documentation is located in the attached appendices.

1.2 RULE REQUIREMENTS

According to §257.73(c) of the EPA Final CCR Rule, compilation of a history of construction is required for each existing CCR surface impoundment that meets either of the following conditions:

1. Has a height of five feet or more and a storage volume of 20 acre-feet or more; or
2. Has a height of 20 feet or more.

This report contains the information outlined in paragraphs (1)(i) through (2) of **§ 257.73(c)** of the EPA Final CCR Rule, which is stated throughout this document for clarity.

2.0 §257.73(c)(1)(i) - OWNER CONTACT/ CCR UNIT IDENTIFICATION INFORMATION

Per **Rule §257.73(c)(1)(i),** the name and address of the owner(s) or operator(s) of the CCR unit, the name associated with the CCR unit, and the identification number of the CCR unit if one has been assigned by the state are documented below.

Owner:	Tennessee Valley Authority (TVA), as agent of the United States
Contact:	Civil Projects & CCP Management, Strategy, and Engineering
Address:	1101 Market Street Chattanooga, TN 37402-2801
Email:	tvainfo@tva.com
Phone:	844-342-0012

3.0 §257.73(c)(1)(ii) - CCR UNIT LOCATION

Per **Rule §257.73(c)(1)(ii),** a map showing the location of the CCR unit on the most recent USGS 7 ½ minute topographic quads is provided in **Appendix A.**

The COF facility is located at 900 Steam Plant Road in Colbert County, Alabama on the south bank of the Tennessee River, approximately 12 miles west of the center of the City of Tuscumbia. Ash Disposal Area 4 is located in the southern portion of the COF Reservation, approximately 3,000 feet south of the COF powerhouse. The Unit is bounded to the west by Colbert Steam Plant Road, to the east by Cane Creek, and to the south by Lee Highway (See **Figure 1**).

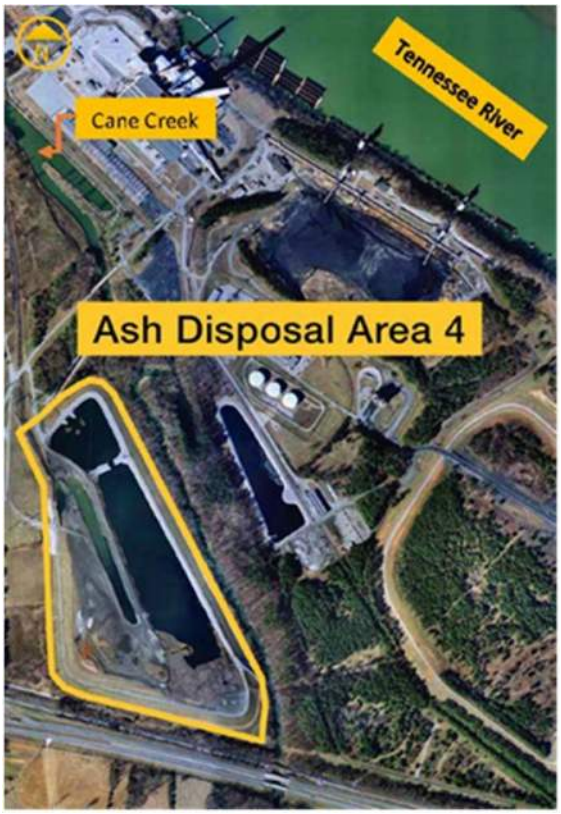


Figure 1: Overview of Ash Disposal Area 4

4.0 §257.73(c)(1)(iii) - Statement of Purpose for the CCR Unit

Per **Rule §257.73(c)(1)(iii),** a statement of the purpose for which the CCR unit is being used is provided below.

Ash Disposal Area 4 is not in use. The Unit was built in 1972 to receive sluiced bottom ash and minor amounts of fly ash from the COF. From 1994 to March 2016, the pond has only received bottom ash due to the installation of a bag house and the subsequent management of the fly ash in a dry manner. When it was in operation, Ash Disposal Area 4 consisted of a sluicing area for bottom ash management, a main pond and adjoining stilling pond. Area 4 also receives COF process water, gray water, and waters from the Coal Yard Runoff Pond.

The COF ceased coal burning operations on March 23, 2016. As a result, bottom ash is no longer sluiced to Ash Disposal Area 4. Ash Disposal Area 4 is considered to be an inactive surface impoundment and closure activities are scheduled to begin during December 2016.

5.0 §257.73(c)(1)(iv) - Watershed Description

Per **Rule §257.73(c)(1)(iv),** the name and size (in acres) of the watershed where the CCR unit is located is provided below.

The contributing drainage of Ash Disposal Area 4 consists only of the impoundment surface area, approximately 52 acres in size. There is no offsite run on contributing to the drainage area.

6.0 §257.73(c)(1)(v) – Foundation and Abutment Materials

Per **Rule §257.73(c)(1)(v),** a description of the physical and engineering properties of the foundation and abutment materials on which the CCR unit is constructed is provided below.

Colbert Fossil Plant is underlain by the Tuscumbia Limestone formation. The Tuscumbia Limestone is of Mississippian age and consists of light to medium gray, fine- to medium-grained fossiliferous (primarily crinoid stems), cherty limestone. Chert occurs as light gray to dark bluish gray, sub-rounded nodules in layers throughout the unit. Cherty layers are laterally discontinuous, and no marker beds exist in the formation. Fractures occur commonly within the Tuscumbia Limestone. Horizontal fractures along bedding planes are the most common orientation. No faults were detected on or in the vicinity of the site.

The soils primarily consist of residual clays including silty clays and moderate to high plasticity clays. Chert fragments generally increase near the bedrock interface. Additionally, alluvial deposits can be encountered near Cane Creek.

More information on engineering properties of the foundation and abutment materials can be found in AECOM's Initial Structural Stability Assessment prepared for CCR Certification,2016.

7.0 §257.73(c)(1)(vi) – Embankment Construction

7.1 Embankment Materials

Per **Rule §257.73(c)(1)(vi),** a statement of the type, size, range, and physical and engineering properties of the materials used in constructing each zone or stage of the CCR unit is provided below.

The Ash Disposal Area 4 perimeter dike consists of both an original and raised dike. The original dike, built from the existing ground to the approximate elevation of 440 feet MSL consists primarily of compacted clay taken from within the footprint of the impoundment. Specifically, the fill material has a USCS classification of lean clay (CL), described as sandy lean clay and lean clay with sand being reddish brown in color. Such clay is reported to have strength consistencies primarily ranging from medium to stiff, with isolated zones ranging from soft to medium. The raised dike built atop the original dike (440 feet) to approximately 460 feet MSL was also constructed with compacted clay material. The USCS soil classification of the raised dike is lean clay with sand (CL) and fat clay with sand (CH) being reddish brown in color. The raised dike clay has consistencies ranging from medium stiff to very stiff.

7.2 Site Preparation and Construction

Per **Rule §257.73(c)(1)(vi),** a statement of the methods of site preparation and construction of each zone of the CCR unit; and the approximate dates of construction of each successive stage of construction of the CCR unit is provided below.

Construction of the Ash Disposal Area 4 began in 1972. Original construction at this time included the development of the perimeter dike, internal divider dikes and outlet spillway structure. The original perimeter and divider dikes were originally built to the elevation of 440 feet MSL using clay fill taken from within the footprint of the impoundment. The original internal deflector dike began at the northwest corner of the perimeter dike leading south to divide the pond in half, and rounded off before meeting the southern dike in order to allow water flow to the east half. An additional divider dike and channel was constructed in the northwest corner of the impoundment, creating the Stilling Pond. The original dike crests were 16 feet wide, graded at 5% to crown in the center for utilization as access roads. Dike side slopes were graded at 2 Horizontal(H):1Vertical(V) for the internal divider dike and upstream perimeter dike face, and 3H:1V for the downstream perimeter dike. Based on design drawings, the clay fill used to construct the dike was to be compacted to at least 95% of standard compaction maximum density, and have moisture content with no more than 2% above optimum, as determined by laboratory testing.

In 1984 the perimeter and internal divider dike of Ash Disposal Area 4 was raised to elevation 460 feet MSL to increase storage capacity. The raised dike was primarily built over top of existing ash that had been built up to an approximate elevation of 436 feet. The downstream toe of the raised dike started at the center point of the original dike, leaving an 8 foot wide bench of the original dike. Construction of the raised dike was similar to the original dike having similar soil characteristics, identical side slope grades of 2:1 and 3:1, and an identical 16 foot wide crest width with 5% crowned access roads. Construction drawing 10N290, in Appendix B provides information on the raised dike. Based on design drawings, the clay fill used to construct the raised dike was to be compacted to at least 95% of standard compaction maximum density, and have moisture content with no more than 2% above optimum, as determined by laboratory testing. **Figure 2** illustrates a typical section of the original and raised dike.

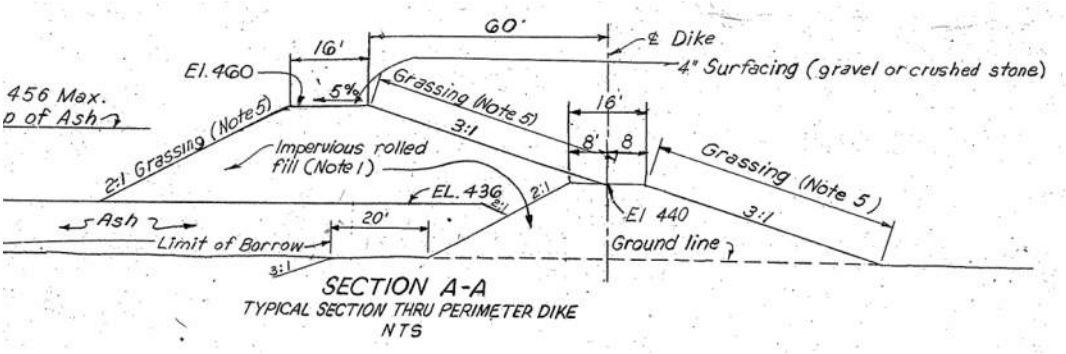


Figure 2: TVA Drawing 10N290 showing the cross section of the dike

During 2010 and 2011, the existing spillway riser structures were grouted in-place and a replacement spillway was constructed. During that time, an 800 foot long segment of the northeastern dike crest was lowered to elevation 458 to provide an emergency spillway and eliminate the “High Hazard” classification. Both of these projects also facilitated the lowering of the normal pool in Ash Disposal Area 4 from elevation 456 to elevation 453.

In 2013, a seepage remediation project was constructed with a seepage collection and conveyance system to address seepage at the interface of the original and raised embankment. This project was constructed as preventative maintenance.

In 2015, a rock buttress was installed along the eastern toe of the perimeter dike to improve the slopes along the toe and provide an access road at the base of the dike. This project was constructed as preventative maintenance.

In 2015 and 2016, construction of deep mixing method walls installed as part of improvements for the embankment.

More information on the construction of Ash Disposal Area 4 can be found in the Construction Documents in **Appendix C**.

7.3 CONSTRUCTION TIMELINE

See **Appendix D** for a detailed historical timeline of Ash Disposal Area 4.

8.0 §257.73(C)(1)(VII) – CONSTRUCTION DRAWINGS

Per Rule §257.73(c)(1)(vii) requires the following: At a scale that details engineering structures and appurtenances relevant to the design, construction, operation, and maintenance of the CCR unit, detailed dimensional drawings of the CCR unit, including a plan view and cross sections of the length and width of the CCR unit, showing all zones, foundation improvements, drainage provisions, spillways, diversions ditches, outlets, instrument locations, and slope protection, in addition to the normal operating pool surface elevation and the maximum pool surface elevation following peak discharge from the inflow design flood, the expected maximum depth of CCR within the CCR surface impoundment, and any identifiable natural or manmade features that could adversely affect operation of the CCR unit due to malfunction or mis-operation.

See **Appendix C** for scaled, detailed engineering drawings of structures, appurtenances relevant to design, construction, operation and maintenance of Ash Disposal Area 4. **Appendix B** contains slope stability sections. See **Table of Contents** for a list of all available historical construction drawings. **Table 1** provides a list of drawings containing specific information requested in **§257.73(c)(1)(vii).** All drawings listed in **Table 1** are available in **Appendix C** unless otherwise noted.

Table 1: List of Drawings Containing Information Requested in §257.73(c)(1)(vii)

	Ash Disposal Area 4
Dimensional Plan View	Various dimensional plan views shown throughout Appendix C, 10N290 provides original construction, 10WXXX-X of Appendix E provides a current Plan View
Dimensional Cross Sections	Various dimensional cross sections shown throughout Appendix C
Foundation Improvements	East Dike Seismic Improvement (drawing set 10W395)
Drainage Provisions	Seepage Remediation (drawing set 10W291)
Spillways	10N292, High Hazard Removal & Spillway Replacement (drawing set 10W290)
Diversion Ditches	Not Applicable
Outlets	10N291 (original construction), 10N295-1 (original construction), High Hazard Removal & Spillway Replacement (drawing set 10W290)
Instrument Locations	**Appendix E**, 10W290-4, 10W291-3, 10W504-3, 10395-6
Slope Protection	10N290 (original construction), Slope Improvement (drawing set 10W504), East Dike Seismic Improvement (drawing set 10W395)
Normal Operating Pool Elevation	See Initial Inflow Design Flood Control System Plan prepared for CCR Certification
Maximum Pool Elevation	See Initial Inflow Design Flood Control System Plan prepared for CCR Certification
Expected Maximum Depth of CCR	10N291 (original construction), 10W504-03 provides bathymetric survey information from 2011

9.0 §257.73(c)(1)(viii) - INSTRUMENTATION

Per **Rule §257.73(c)(1)(viii)**, a description of the type, purpose, and location of existing instrumentation is provided below.

Piezometers and inclinometers are located at Ash Disposal Area 4 to monitor piezometric elevations and verify slope movements. Settlement monitoring plates are also located in Ash Disposal Area 4 in the southwest corner of the pond. The locations of the instruments are shown in the Instrumentation Location Map plan contained in **Appendix E**.

10.0 §257.73(c)(1)(ix) – UNIT STORAGE CAPACITY

Per **Rule §257.73(c)(1)(ix)**, area-capacity curves for Ash Disposal Area 4 are provided in **Figure 3** and **Table 2**. This curve reflects stage/storage data for water in Ash Disposal Area 4 based on aerial and bathymetric survey with a starting elevation of 435 feet (Normal Pool Elevation). The graph shows the surface area of the water in the pond at corresponding water surface elevations, as well as the corresponding storage volume.

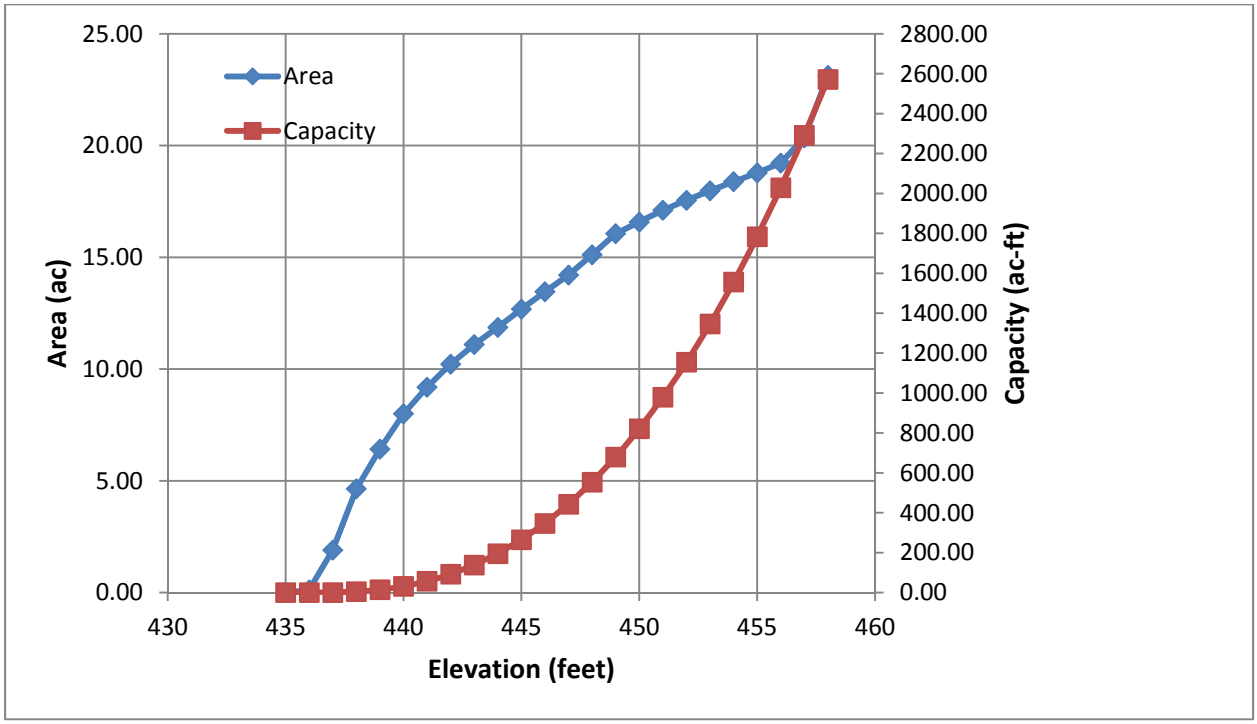


Figure 3: Ash Disposal Area 4 - Area/Capacity Curves

Table 2: Ash Disposal Area 4 – Area/Capacity Curves

Elevation (ft)	Surface Area (acres)	Volume(ac-ft)	Cum. Volume (ac-ft)
435	0.00	0.00	0.00
436	0.12	0.01	0.01
437	1.90	0.77	0.78
438	4.64	4.19	4.97
439	6.42	9.72	14.69
440	8.00	16.93	31.62
441	9.19	25.50	57.12
442	10.22	35.15	92.27
443	11.10	45.77	138.04
444	11.87	57.19	195.23
445	12.68	69.38	264.61
446	13.46	82.33	346.94
447	14.21	96.04	442.98
448	15.12	110.57	553.55
449	16.06	125.91	679.46
450	16.58	141.88	821.34
451	17.11	158.29	979.63
452	17.55	175.08	1154.71
453	17.98	192.22	1346.93
454	18.39	209.66	1556.59
455	18.78	227.33	1783.92
456	19.22	245.22	2029.14
457	20.35	263.29	2292.43
458	23.14	279.76	2572.19

11.0 §257.73(c)(1)(x) – Unit Outlet Analysis

Per **Rule §257.73(c)(1)(x),** a description of each spillway and diversion design features and capacities and calculations used in their determination is provided below.

The spillway structure consists of four chambers with stop log weirs in the pond and the associated outlet headwall is located near the toe of the pond embankment. The spillway and headwall were constructed in 2011. The original risers were grouted full and decommissioned after construction of the new spillway structure. The spillway structure is constructed of cast-in-place concrete. The front wall incorporates a stop log weir of adjustable height. Also affixed to the front of each chamber is a skimmer structure consisting of a half circle of 8 foot corrugated metal pipe. Twenty-seven inch HDPE pipes run from the rear wall of the spillway chambers, through an underground filter diaphragm, and out the headwall structure at the toe of the embankment. The headwall sits on a large slab, which has 12-inch high sills for energy dissipation. The pond water flowing from the headwall flows into a culvert beneath an access road and then into a concrete lined discharge channel to Cane Creek.

Ash Disposal Area 4 is equipped with an emergency spillway that consists of an 800 ft. long lowered dike section with an elevation of 458 feet.

AECOM performed an H&H analysis of Ash Disposal Area 4 for AECOM's Initial Inflow Design Flood Control System Plan for CCR Certification. The purpose of the analysis was to examine the adequacy of the pond to safely store and pass stormwater flows resulting from the 1000-year, 6-hour storm event.

The outlet structure of Ash Disposal Area 4 was found to pass the design storm flows with a maximum water surface elevation of 452.3 feet. This elevation leaves approximately 5.7-feet of freeboard remaining in the pond.

The results indicate that the Ash Disposal Area 4 would not overtop during a 1000-year, 6-hour design storm and that the freeboard during this storm event for the pond is acceptable.

12.0 §257.73(c)(1)(xi) - Maintenance Provisions

Section **§257.73(c)(1)(xi**) requires that the history of construction include construction specifications and provisions for surveillance, maintenance, and repair of the CCR unit.

Construction specifications are available as notes on the drawings in **Appendix C.**

This CCR unit is subject to TVA's CCP Storage Facilities Inspection Program. The inspection program includes scheduled formal, intermediate, and informal inspections as well as unscheduled special (emergency) inspections. Additionally, TVA plant personnel make daily observations and perform weekly reviews of the disposal areas. Maintenance is performed on an as-needed basis, and TVA documents all repair and maintenance activities.

13.0 §257.73(c)(1)(xii) - Structural Instabilities

Per **Rule §257.73(c)(1)(xii)**, included below is any record or knowledge of structural instability of Ash Disposal Area 4.

No record or knowledge of structural instability has been identified for Ash Disposal Area 4.

14.0 §257.73(c)(2) - CHANGES TO HISTORY OF CONSTRUCTION

Per **Rule §257.73(c)(2),** if there is a significant change to any information compiled in the history of construction, TVA must update the relevant information and place it in the facility's operating record within 30 days of the change.

15.0 REFERENCES

1. Environmental Protection Agency, "Final Rule: Disposal of Coal Combustion Residuals from Electric Utilities", Federal Register, April 17, 2015.
2. AECOM, Ash Disposal Area 4 Initial Inflow Design Flood Control System Plan (40 CFR §257.82) for CCR Certification, 2016.
3. AECOM, Ash Disposal Area 4, Initial Structural Stability Assessment (40 CFR §257.73(d)) for CCR Certification, 2016.
4. TVA, GCP&S-SPP-27.4.1, Coal Combustion Products Inspection of CCP Storage Facilities, 2015.

APPENDIX A
USGS LOCATION MAP

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map US Topo

PRIDE QUADRANGLE
ALABAMA
7.5-MINUTE SERIES

Ash Disposal Area 4

Produced by the United States Geological Survey

North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid: Universal Transverse Mercator, Zone 16S
10 000-foot ticks: Alabama Coordinate System of 1983 (west zone)

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, December 2013
Roads.....HERE, ©2013
Names.....GNIS, 2013
Hydrography.....National Hydrography Dataset, 2013
Contours.....National Elevation Dataset, 2013
Boundaries.....Multiple sources; see metadata file 1972 - 2013

UTM GRID AND 2014 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET
MN 2° 33' 45 MILS GN 0° 28' 8 MILS

U.S. National Grid
100,000-m Square ID
DD
Grid Zone Designation
16S

SCALE 1:24 000
1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1 MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 FEET

CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.16

ALABAMA
QUADRANGLE LOCATION

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

1	2	3
4		5
6	7	8

1 Cherokee
2 Sinking Creek
3 Florence
4 Barton
5 Tuscumbia
6 Pleasant Grove
7 Frankfort
8 Russellville
ADJOINING QUADRANGLES

PRIDE, AL
2014

76430163525525
NSN 7643016352525
NGA REF NO. USGSX24K36435

APPENDIX B
SLOPE STABILITY SECTION

Tennessee Valley Authority
Colbert Fossil Plant
Ash Pond 4

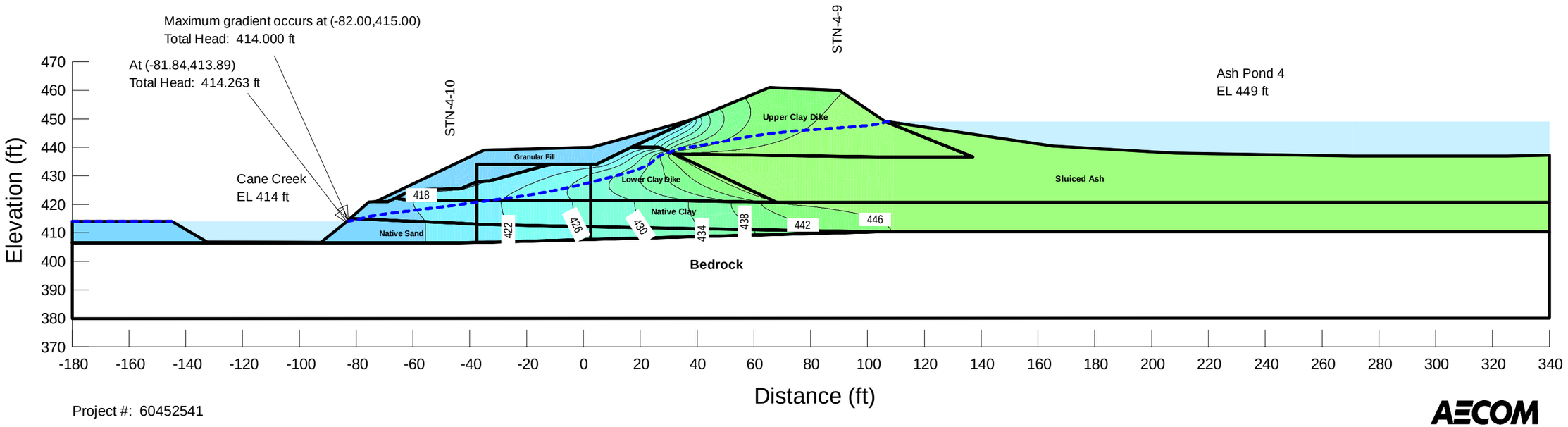
Steady-State Seepage Analysis
Long-Term Existing Conditions
Cross-Section D-D'

Date: 11/30/2016
Contour parameter: Total Head ft
Method: Steady-State

Critical gradient: i(crit) = 0.93
Exit gradient: i(exit) = ΔH/ΔL = 0.24

FS against piping = 3.9

Color	Name	Model	Sat Kx (ft/sec)	Ky'/Kx' Ratio	Volumetric Water Content (ft^3/ft^3)
	Native Clay (Saturated)	Saturated Only	3e-006	0.1	0.37
	Upper Clay Dike (Saturated)	Saturated Only	3e-009	0.4	0.4
	Lower Clay Dike (Saturated)	Saturated Only	1.5e-009	0.02	0.37
	Sluiced Ash (Saturated)	Saturated Only	4e-005	0.1	0.46
	Bedrock	(none)			
	Native Sand (Saturated)	Saturated Only	1e-005	0.5	0.46
	Granular Fill	Saturated Only	1e-005	0.5	0.15



Project #: 60452541

APPENDIX C
CONSTRUCTION DRAWINGS

32813/R7

37 | C | 4 | 10N290

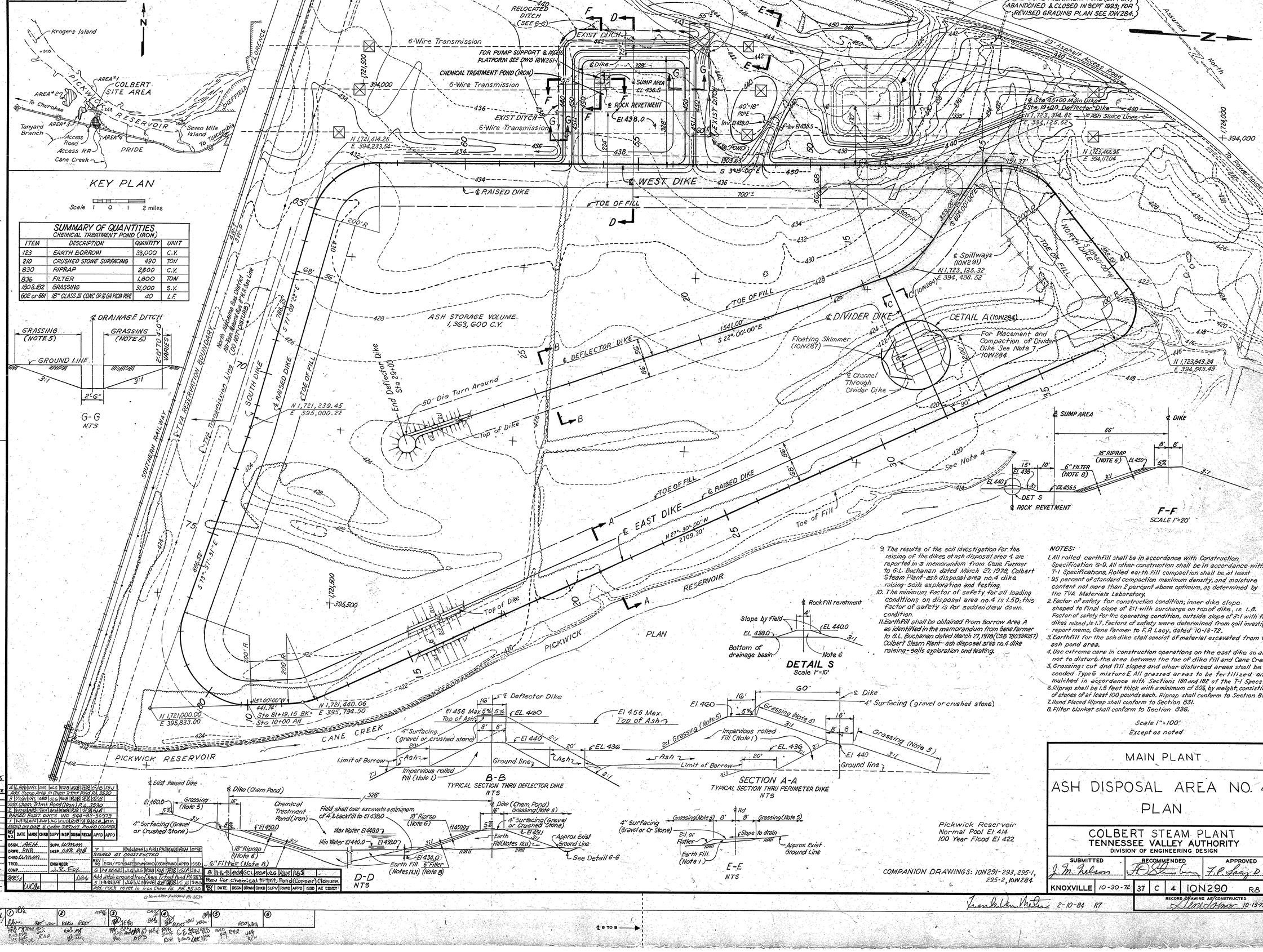
KEY PLAN

Scale 1 0 1 2 miles

SUMMARY OF QUANTITIES
CHEMICAL TREATMENT POND (IRON)

ITEM	DESCRIPTION	QUANTITY	UNIT
123	EARTH BORROW	33,000	C.Y.
210	CRUSHED STONE SURFACING	490	TON
830	RIPRAP	2,600	C.Y.
836	FILTER	1,600	TON
1B0 & 1B2	GRASSING	31,000	S.Y.
602 or 661	18" CLASS III CONC OR 16 GA PICM PIPE	40	L.F.

G-G
NTS



NOTES:

1. All rolled earthfill shall be in accordance with Construction Specification G-9. All other construction shall be in accordance with T-1 Specifications. Rolled earth fill compaction shall be at least 95 percent of standard compaction maximum density, and moisture content not more than 2 percent above optimum, as determined by the TVA Materials Laboratory.
2. Factor of safety for construction condition; inner dike slope shaped to final slope of 2:1 with surcharge on top of dike, is 1.8. Factor of safety for the operating condition, outside slope of 2:1 with future dikes raised, is 1.7. Factors of safety were determined from soil investigation report memo, Gene Farmer to F. P. Lacy, dated 10-13-72.
3. Earthfill for the ash dike shall consist of material excavated from the ash pond area.
4. Use extreme care in construction operations on the east dike so as not to disturb the area between the toe of dike fill and Cane Creek.
5. Grassing: cut and fill slopes and other disturbed areas shall be seeded Type 6 mixture E. All grassed areas to be fertilized and mulched in accordance with Sections 180 and 182 of the T-1 Specs.
6. Riprap shall be 1.5 feet thick with a minimum of 30%, by weight, consisting of stones of at least 100 pounds each. Riprap shall conform to Section 830.
7. Hand Placed Riprap shall conform to Section 831.
8. Filter blanket shall conform to Section 836.

Scale 1"=100'
Except as noted

9. The results of the soil investigation for the raising of the dikes at ash disposal area 4 are reported in a memorandum from Gene Farmer to G.L. Buchanan dated March 27, 1976, Colbert Steam Plant-ash disposal area no.4 dike raising-soils exploration and testing.
10. The minimum factor of safety for all loading conditions on disposal area no.4 is 1.50, this factor of safety is for sudden draw down condition.
11. Earthfill shall be obtained from Borrow Area A as identified in the memorandum from Gene Farmer to G.L. Buchanan dated March 27, 1976 (CSB 180324057) Colbert Steam Plant-ash disposal area no.4 dike raising-soils exploration and testing.

PRINTS REQD-R 6
BR or PROJ

DWG	SIZE F	SIZE H
ME		
EE		
CE		
AD		
CD		3
ED		
MD		
BF		
SW		
BL		
PA		1

REV NO.	DATE	MADE	CHKD	SUPV	INSP	SUBM	RECM	APPD	APPD
4	11/10/81	VRL	DRG	WLG	KWB	RJB	FPB	GLP	SBJ
	Add Sump Area in Chem Trtmt Pond RA 3580								
3	1/12/81	VRL	ARD	WLG	KWB	RJB	FPB	GLP	
	Add Chem. Trtmt. Pond (Iron) R.A. 3580								
2	10-17-78	AWS	DAV	AGH	KWB	RJB	FPB	GLP	
	RAISED EXIST DIKES WO 544-82-30979								
1	11-15-76	AWS	RAP	LMG	KWB	RJB	FPB	GLP	
	ADDED DIVIDING & CHEM. TRTMT. POND COMPLE								

DSGN. AGH — SUPV. WMM
DRWN. RWR — INSP. DWR, RJB
CHKD WMM
TRCD.
COMP. — ENGINEER J.E. Fox

SIGNED AS CONSTRUCTED

REV NO	ECN/FCR	DATE	DRWN	CHKD	DSGN	RVWD	APPD	ISSD
6	19-4-84	AWS	JLG	JLG	WMB	RJB	FPB	GLP	SBJ
	Add Work around from Dike T to Ash Pond RA 3630								
5	11-8-83	CE	WLG	WLG	RJB	RJB	FPB	GLP	SBJ
	Add rock revet in Iron Chem Pd RA 3530								
8	11-16-93	RDM	GCL	RDM	WLG	WMB	RBJ		
	Rev for chemical Trmt. Pond (Copper) Closure.								

REV NO | DATE | DSGN | DRWN | CHKD | SUPV | RVWD | APPD | ISSD | AS CONST

MAIN PLANT

ASH DISPOSAL AREA NO. 4 PLAN

COLBERT STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

SUBMITTED	RECOMMENDED	APPROVED
J. M. Nelson	A. D. Thomason	F. P. Lacy

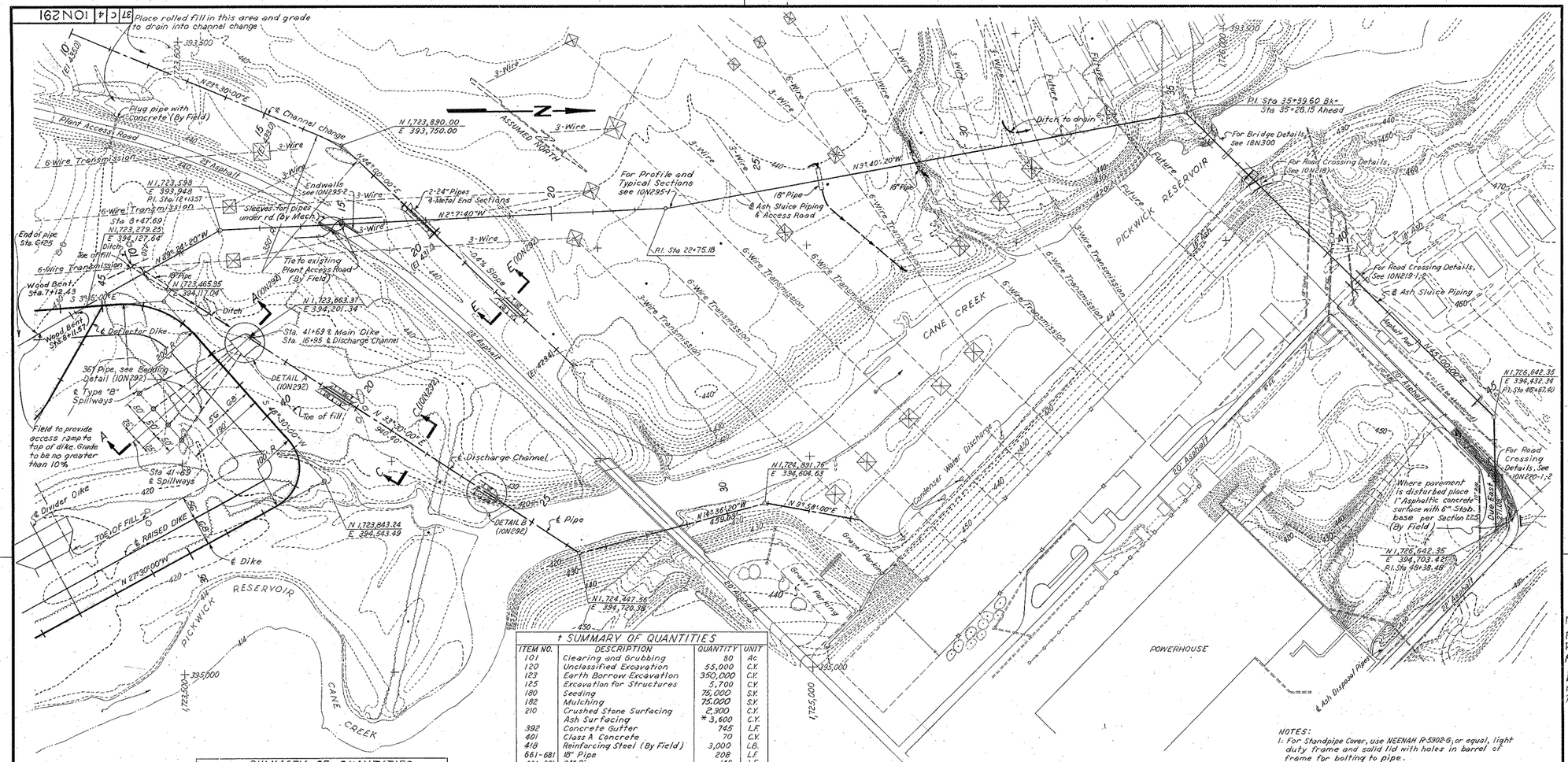
KNOXVILLE | 10-30-72 | 37 | C | 4 | 10N290 R8

RECORD DRAWING AS CONSTRUCTED 10-15-75 R4

Transcribed Van Meter 2-10-84 R7

K&E HERCULENE® 7123 7124 7125 7126 7127 7128 7129 7130 7131 7132 7133 7134 7135 7136 7137 7138 7139 7140 7141 7142 7143 7144 7145 7146 7147 7148 7149 7150 7151 7152 7153 7154 7155 7156 7157 7158 7159 7160 7161 7162

37 C 4 10N291



† SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
101	Clearing and Grubbing	80	Ac.
120	Unclassified Excavation	55,000	C.Y.
123	Earth Borrow Excavation	350,000	C.Y.
125	Excavation for Structures	5,700	C.Y.
180	Seeding	75,000	S.Y.
182	Mulching	75,000	S.Y.
210	Crushed Stone Surfacing	2,900	C.Y.
	Ash Surfacing	* 3,600	C.Y.
392	Concrete Gutter	745	L.F.
401	Class A Concrete	70	C.Y.
418	Reinforcing Steel (By Field)	3,000	LB.
661-681	18" Pipe	208	L.F.
661-681	24" Pipe	140	L.F.
661-681	24" Metal End Sections	4	Ea
662-682	42" Pipe	940	L.F.
660	120° 12g CMP	20	L.F.
830	Riprap	950	C.Y.
836	Filter Blanket	515	TON
125	Excav. for Structures - Rock	225	C.Y.
345	Asphaltic Conc. Surface Course	25	TON
662-682	30" Pipe	4	L.F.
	Cast iron frame & lid	230	LB.
662-682	15° Elbow, 42"	3	Ea
662-682	30° Elbow, 42"	1	Ea
662-682	45° Elbow, 42"	1	Ea
662-682	42" Tee with 30" Standpipe	1	Ea

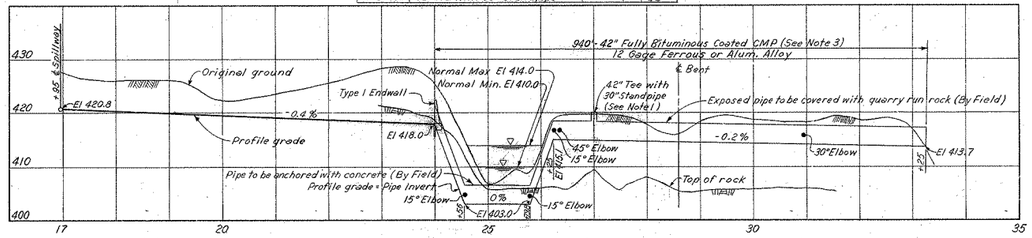
† For additional quantities see 10N293, 297

* Includes 2,900 C.Y. Alternate for Crushed Stone Surfacing

SUMMARY OF QUANTITIES (FOR RAISING ASH DIKE)

ITEM NO	DESCRIPTION	QUANTITY	UNIT
123	EARTH BORROW EXCAVATION	913,700	C.Y.
	ASH FILL	100,300*	C.Y.
180	SEEDING	100,000	S.Y.
182	MULCHING	100,000	S.Y.
210	CRUSHED STONE SURFACING	2,600	TONS
830	RIPRAP	920	C.Y.
836	FILTER BLANKET	215	TONS

* INCLUDES 7000 C.Y. FOR DIVIDER DIKE



PROFILE - DISCHARGE CHANNEL & PIPE

NOTES:
1. For Standpipe Cover, use NEENAH R-5902-G, or equal, light duty frame and solid lid with holes in barrel of frame for bolting to pipe.
2. Use extreme care in construction operations at ash sluice piping & stations 39+38 and 40+12 so as not to disturb existing 18" concrete storm sewer and 8" vcp sanitary outfall sewer.
3. All exposed metal, joints, elbows, and tee shall be coated with the type and kind of bitumen used in coating the pipe originally.

Scale 1"=100'

COMPANION DRAWINGS: 10N290, 292, 293, 295-1, 295-2

MAIN PLANT

ASH DISPOSAL AREA NO. 4 SPILLWAY & CHANNEL PLAN

COLBERT STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

SUBMITTED	RECOMMENDED	APPROVED
J. M. Nelson	H. D. Shamblin	F. P. Lang
9-12-74		

KNOXVILLE | 10-30-72 | 37 | C | 4 | 10N291R4

RECORD DRAWING AS CONSTRUCTED 10-15-76 R3

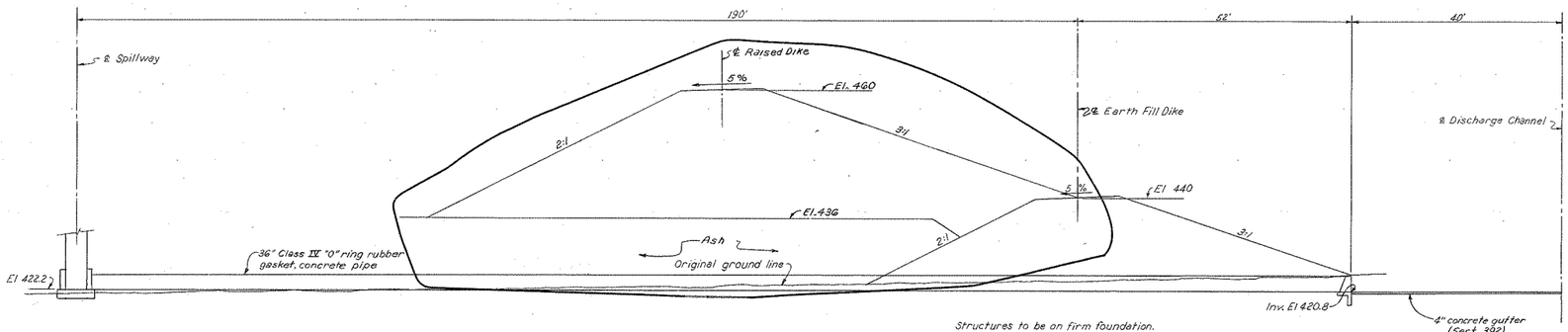
W.O. 82-31537
P.A. 2568

REV. NO.	DATE	MADE	CHKD	SUPV	INSP	SUBM	RECM	APP	APPR
4	9/27/76	AMS	DAT	DWB	JCB	JCB	WCB		
	Revised EXCP DIKES W.O. 82-31537-R								
3	10/6/76	AEM	WC	WCB	JCB	JCB	WCB		
	Final Field Revisions								
2	10/6/76	SDW	AEM	ARF	SWM	JCB			
	Added Endwalls Sta 15+00 Rev. ℄ Sta 22+17.35=20 Ah, Rev Qty's. W.O. 82-31537 P.A. 2568								
1	10/27/75	SDW	AEM	ARF	SWM	JCB			
	General Revision W.O. 82-31537 P.A. 2568								

DSGN. AEM
DRWN. SDW
CHKD. W.M.M.
TRCD.
COMP.
SUPV. W.M.M.
INSP. P.A. 198
ENGINEER
APP. W.C. Fox

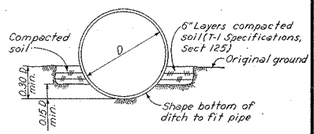
MFR0 R1 R2 R3 R3 R4

37 | C | 4 | 10N292

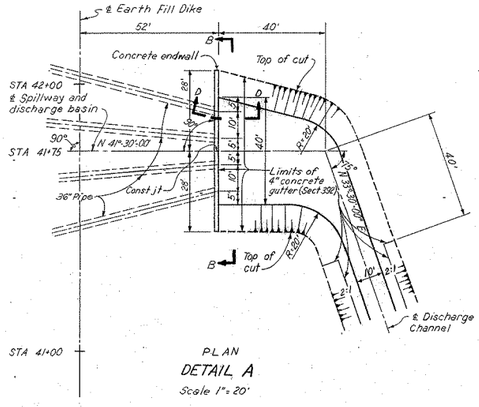


SECTION A-A
4 REQD

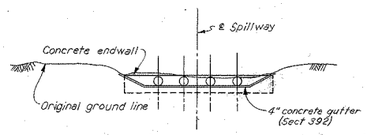
Structures to be on firm foundation. If natural ground is not firm, remove and replace with compacted fill, per Section 125, T-1 Specifications.



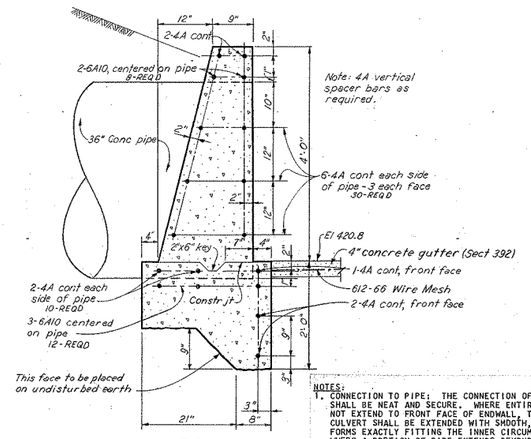
DETAIL CLASS "B" BEDDING
Not to scale



PLAN
DETAIL A
Scale 1"=20'



SECTION B-B
Scale 1"=20'



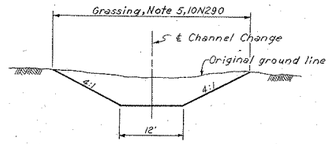
D-D

Locate vertical construction joint with 2"x6" key at half point of the concrete endwall. Chamfer all exposed edges ¾". Lap reinforcing bars a minimum distance of 36 diameters. Dimensions to reinforcement are to ℄ of bars. All reinforcement by field.

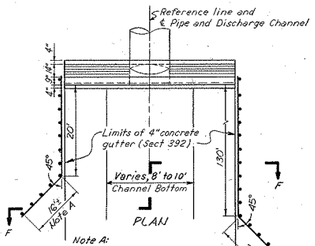
Scale 1"=1'-0"

NOTES:
1. CONNECTION TO PIPE: THE CONNECTION OF PIPE TO ENDWALLS SHALL BE NEAT AND SECURE. WHERE ENTIRE END OF PIPE DOES NOT EXTEND TO FRONT FACE OF ENDWALL, THE BARREL OF THE CULVERT SHALL BE EXTENDED WITH SMOOTH, RIGID, CIRCULAR FORMS EXACTLY FITTING THE INNER CIRCUMFERENCE OF THE PIPE. WHERE A PORTION OF PIPE EXTENDS BEYOND THE REQUIRED FRONT FACE OF ENDWALL, IT SHALL BE CUT OFF SMOOTH AND FLUSH THEREWITH. BELL AND SPIGOT PIPE SHALL BE USED. THE BELL END IS TO BE PLACED UPSTREAM WITH THE END OF THE PIPE FLUSH WITH FACE OF WALL, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
2. ENDWALL IN ROCK: WHERE SOLID ROCK IS ENCOUNTERED THE APRON AND CUTOFF WALL SHALL BE OMITTED AND THE ENDWALL OTHERWISE MODIFIED AS REQUIRED. PROVIDE ADEQUATE CONSTRUCTION KEYWAYS BETWEEN CONCRETE AND THE ROCK FOUNDATION.
3. ALL CONCRETE SHALL BE CLASS A IN ACCORDANCE WITH SECTION 401.
4. REINFORCING STEEL: BARS SHALL CONFORM TO LATEST ASTM SPECIFICATION FOR HIGH STRENGTH BARS, DESIGNATION A615-60. ALL DIMENSIONS RELATIVE TO REINFORCED STEEL ARE TO CENTER OF BARS. ALL BARS SHALL BE 3" CLEAR UNLESS OTHERWISE NOTED.
5. ALL REINFORCEMENT BY FIELD.
6. FOR ADDITIONAL NOTES SEE 10N290.
7. SHEET PILING TO BE DRIVEN TO ROCK WHERE SHOWN IN DETAIL B AND BOLTED OR OTHERWISE ANCHORED TO ENDWALL AND CONCRETE GUTTER WHERE AND AS REQUIRED. AFTER SHEET PILING IS DRIVEN, SECURED AND BACKFILL PLACED AS SHOWN IN SECTION F-F, THE FIELD SHALL SEAL BETWEEN CONCRETE AND PILING BY GROUTING OR OTHER SATISFACTORY METHOD. EXACT LOCATION AND LENGTHS TO BE DETERMINED BY FIELD TO PREVENT BY-PASS FLOW.

Scale 1"=10'
Except as noted

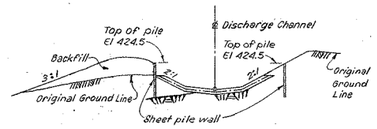


E-E

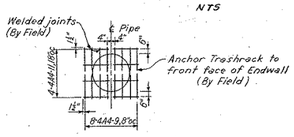


PLAN

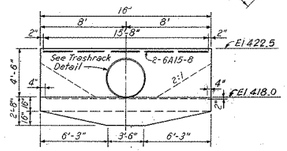
Note A:
Sheet Pile wall by Field, length to prevent by-pass flow, see Note 7.



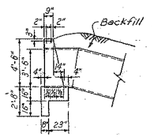
F-F
NTS



TRASHRACK DETAIL

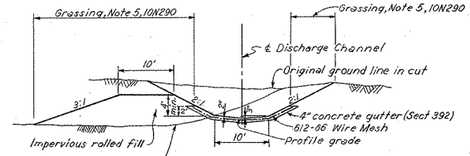


FRONT ELEVATION



END ELEVATION

DETAIL B
CONCRETE ENDWALL
Scale 1"=5'



C-C
NTS

COMPANION DRAWINGS: 10N290, 291, 293, 295-1, 295-2

REV NO.	DATE	MADE	CHKD	SUPV	INSP	SUBM	RECM	APPD
R2								
R1								

R2 Added sheet pile wall on DET B, Sect F-F and Note 7.
R1 General Revision W.O. 82-31537 P.A. 2568

DSGN. SUPV. WMM
DRWN. ENR INSP. DWR, RJB
CHKD. ACH
TRCG.
COMP. ENGINEER N. S. Eq.
APVD. WCO DATE

CONST ACCT NO. 999-37-2-960
SUBORDER NO. 82-55
P.A. 2568

W.O. 82-31537
P.A. 2568

MAIN PLANT

ASH DISPOSAL AREA NO. 4 SECTIONS AND DETAILS

COLBERT STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

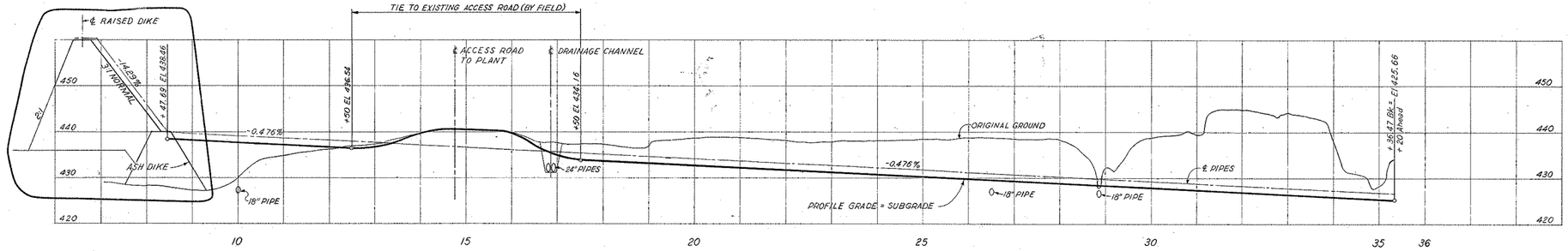
SUBMITTED	RECOMMENDED	APPROVED
J. M. Nelson	A. C. Hall	F. P. Leary, D

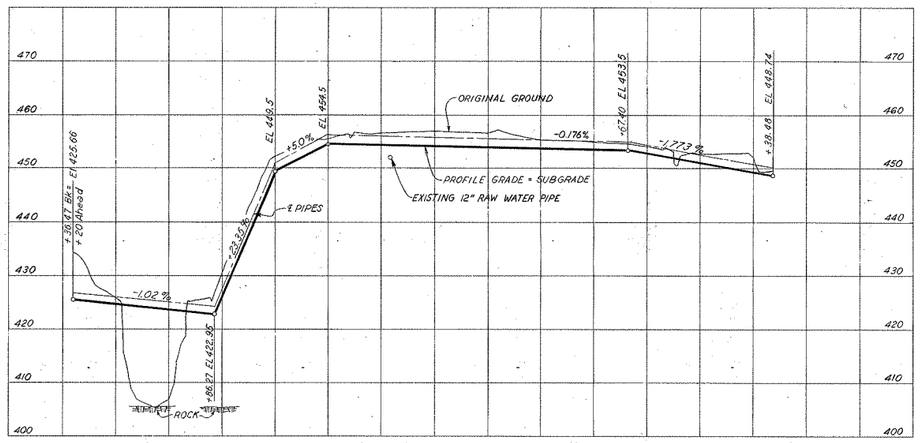
KNOXVILLE | 10-30-72 | 37 | C | 4 | 10N292 R3

RECORD DRAWING AS CONSTRUCTED
A. C. Hall Jr. 10-15-76 R2

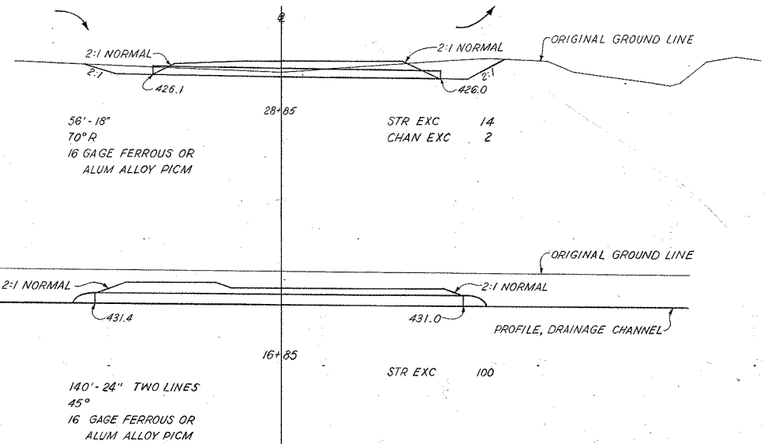
MF R0 R1 R2 R2 R2 R3

37 | C | 4 | 10N295-1



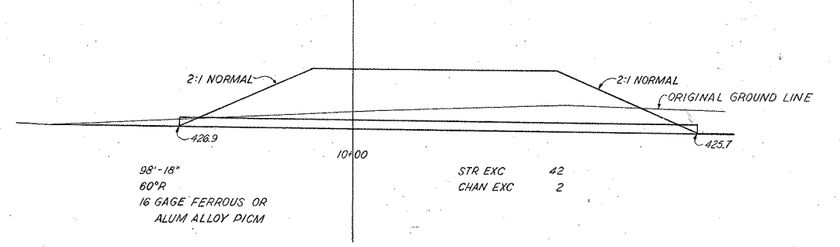


ASH SLUICE PIPE LINE & ACCESS ROAD - PROFILE



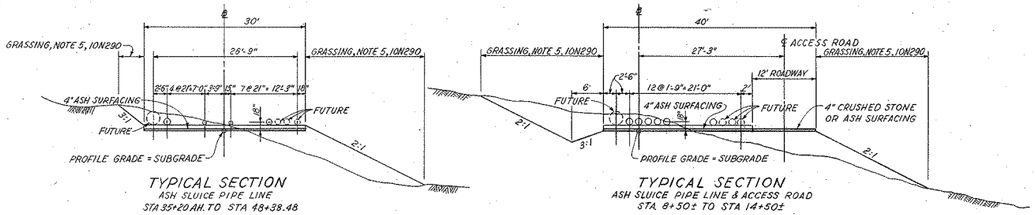
56' - 18"
70° R
16 GAGE FERROUS OR
ALUM ALLOY PICM

STR EXC 14
CHAN EXC 2



140' - 24" TWO LINES
45°
16 GAGE FERROUS OR
ALUM ALLOY PICM
4 METAL END SECTIONS

STR EXC 100



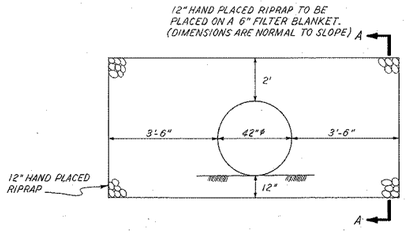
TYPICAL SECTION
ASH SLUICE PIPE LINE
STA 35+20 AH. TO STA 48+38.48

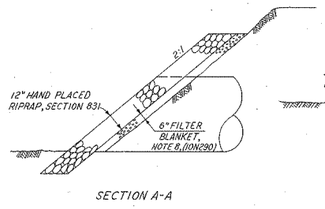
TYPICAL SECTION
ASH SLUICE PIPE LINE & ACCESS ROAD
STA 9+50± TO STA 14+50±

98' - 18"
60° R
16 GAGE FERROUS OR
ALUM ALLOY PICM

STR EXC 42
CHAN EXC 2

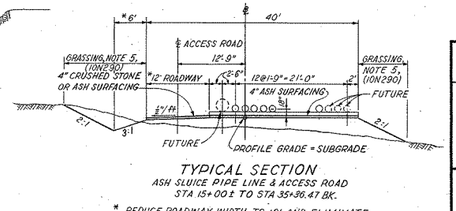
PIPE SECTIONS
ASH SLUICE PIPE LINE & ACCESS ROAD





SECTION A-A

DETAIL OF RIPRAP AT OUTLET OF 42" PIPE
NOT TO SCALE



TYPICAL SECTION
ASH SLUICE PIPE LINE & ACCESS ROAD
STA 15+00± TO STA 35+36.47 BK.

* REDUCE ROADWAY WIDTH TO 10' AND ELIMINATE DITCH, STA 26+60 TO STA 27+40

COMPANION DRAWINGS: 10N290 - 293, 295-2, 296

SCALE: 1" = 10'
EXCEPT AS NOTED

NO	DATE	MADE	CHKD	SUPV	INSP	SUBM	RECM
2	12-27-72	WHS	HAV	GW/PDR	RJB	1/24/73	
1	7/10/72	LRC	HAV			1/24/73	KSM

Revised profile grade
Revised profile & minor revision W.O. 82-31537 P.A. 2568

NO	DATE	MADE	CHKD	SUPV	INSP	SUBM	RECM

DSGN. WHS/HAV — SUPV. HAV/WHS
DRWN. RJB/B — INSP. PDR/RJB
CHKD. AEH — SUBM.
TRCD. — ENGINEER J.C.S. 1/24/73
COMP. — RECM.
PASS/L — APPD. PDR

W.O. 82-31537
P.A. 2568

MAIN PLANT

ASH DISPOSAL AREA NO. 4
MISC DETAILS SHEET 1

COLBERT STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

SUBMITTED	RECOMMENDED	APPROVED
J. M. Nelson	J. D. Bethune	F. L. Lacy Jr.

KNOXVILLE | 2-14-73 | 37 | C | 4 | 10N295-1 R3

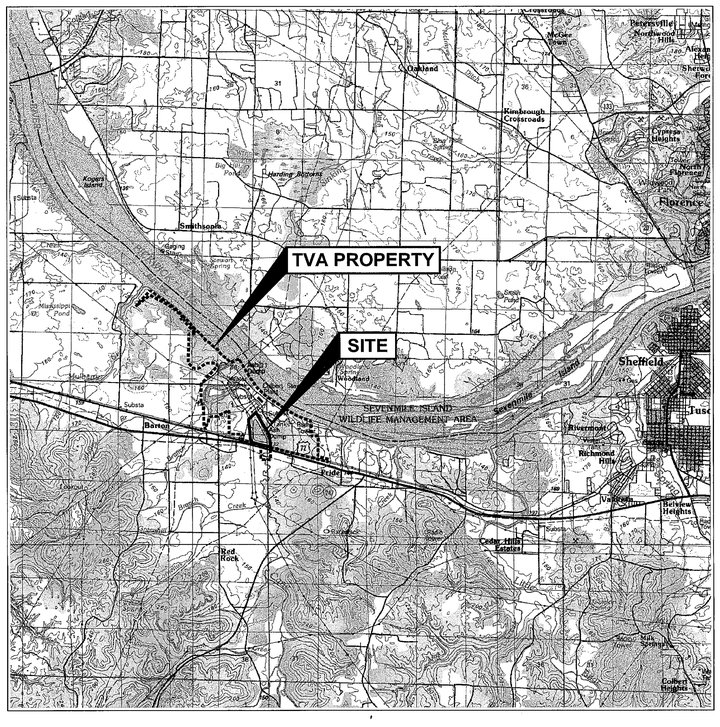
RECORD DRAWING AS CONSTRUCTED

NF RD 71 R2 R3

1	LRC & Bond	2	WHS	USCOE mkg	3	Bldg & Str
4		5		6		

TENNESSEE VALLEY AUTHORITY
COLBERT FOSSIL PLANT - ASH POND 4
TEMPORARY ROCK BUTTRESS AND SHEET PILE WALL

COLBERT COUNTY, ALABAMA



SITE VICINITY MAP

0 6000 12000

SCALE: 1"=6000'

DWG. NO.	DWG. DESCRIPTION
10W503-01	TITLE SHEET
10W503-02	GENERAL NOTES
10W503-03	OVERALL SITE PLAN AND HAUL ROUTE
10W503-04	PLAN VIEW
10W503-05	SECTIONS 1-1' & 2-2'
10W503-06	SECTION 3-3'
10W503-07	ELEVATION A-A'

PREPARED FOR:

TENNESSEE VALLEY AUTHORITY
1101 MARKET STREET
CHATTANOOGA, TN 37402-2801

PREPARED BY:

URS CORPORATION
1375 EUCLID AVENUE, SUITE 600
CLEVELAND, OH 44115
PHONE (216) 622-2400
ATTN: MICHAEL STEPIC, P.E.

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION.

2 WORKING DAYS
BEFORE YOU DIG
205-353-2636
ALABAMA UTILITIES PROTECTION SERVICE

FOR SUPPORTING DESIGN CALCULATIONS SEE: FPGCOFFESCDX000000201000006

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 0	8/10/11	SW/SP	TG/KV	GD/VG	MJS	JCB	MST	JCK	WO 111112081	
R	RECORD DRAWING									
	ISSUED FOR CONSTRUCTION									

SCALE: NONE EXCEPT AS NOTED

RECORD DRAWING

ALABAMA LICENSED No. 30571 PROFESSIONAL ENGINEER MICHAEL J. STEPIC

TITLE SHEET

ASH POND 4 – TEMPORARY
ROCK BUTTRESS & SHEET PILE WALL

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SEP	KV	VKG	MJS	JCB	MST	JCK

URS

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2010	DATE 8/10/11	47	C	10W503-01	R 0

URS CORPORATION | 0
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

K:\Projects\TVA\318511J1\DWGs\Record\Sheets\10W503-01 R0.dwg User:chris_backus Aug 10, 2011 – 2:57pm

GENERAL NOTES

SUMMARY OF WORK

THE WORK CONSISTS OF CONSTRUCTING A ROCK BUTTRESS AND SHEET PILE CUT-OFF WALL ACROSS THE AREA OF THE EXISTING FINGER DIKES THAT DIVIDE THE STILLING POND (NORTH) FROM THE MAIN POND 4 (SOUTH). THE STRUCTURE WILL TEMPORARILY SEPARATE THE TWO POND AREAS, IN ORDER TO ALLOW THE WATER LEVEL IN THE STILLING POND TO BE LOWERED TO FACILITATE CONSTRUCTION OF THE NEW SPILLWAY, WHILE MAINTAINING NORMAL OPERATING POOL LEVEL IN THE MAIN POND. THE ROCK BUTTRESS WILL BE CONSTRUCTED USING IMPORTED CRUSHED GRAVEL, SIZES NO. 1 THROUGH NO. 4. THE SHEET PILE WALL WILL PROVIDE HYDRAULIC CUT-OFF BETWEEN THE TWO POND AREAS AND WILL PROVIDE INCREASED STABILITY TO THE BUTTRESS STRUCTURE.

DURING SPILLWAY CONSTRUCTION (WHICH IS COVERED IN A SEPARATE WORK PLAN) THE WATER LEVEL IN THE MAIN POND WILL BE MAINTAINED BY THE BUTTRESS/SHEET PILE CLOSE TO THE NORMAL POOL ELEVATION OF 456.6 FT. AS PART OF THE SPILLWAY PROJECT, SIPHONS WILL BE CONSTRUCTED IN THE STILLING POND, AND THE WATER LEVEL IN THE STILLING POND WILL BE LOWERED TO EL. 447. A LOWERED CENTER OPENING SECTION WILL BE PROVIDED THROUGH THE CREST OF THE BUTTRESS. INFLOWS COMING INTO THE POND DURING CONSTRUCTION WILL PASS OVER THIS LOWERED SECTION, ACROSS THE BUTTRESS AND INTO THE STILLING POND, ULTIMATELY BEING DISCHARGED TO CANE CREEK VIA THE SIPHONS.

GENERALLY, THE SCOPE OF WORK FOR THE BUTTRESS CONSISTS OF THE FOLLOWING STEPS:

1. COORDINATE RELOCATION OF THE EXISTING CO2 SPARGER PIPING WITH TVA. TVA WILL PERFORM THE RELOCATION.
2. PLACE BUTTRESS ROCK IN THE WET TO FINAL PROPOSED GRADES.
3. SURVEY BUTTRESS GRADES AND CORRECT ANY DEFICIENCIES.
4. INSTALL SHEET PILE WALL ACROSS CREST OF BUTTRESS.
5. ALLOW A PRELOADING PERIOD OF AT LEAST TWO WEEKS BETWEEN THE END OF FILLING AND THE START OF STILLING POND LOWERING.
6. LOWER WATER LEVEL IN STILLING POND TO EL. 447; MONITOR BUTTRESS AND SHEET PILE WALL FOR SEVERAL MONTHS AFTER STILLING POND LEVEL HAS BEEN LOWERED AND WHILE NEW SPILLWAY CONSTRUCTION IS ONGOING.
7. AT THE CLOSE OF SPILLWAY CONSTRUCTION, LOWER THE CENTER OPENING SECTION OF THE ROCK BUTTRESS AND SHEET PILE WALL TO FINAL EL. 452.

SOME ASPECTS OF THE NEW SPILLWAY CONSTRUCTION WILL NEED TO BE PERFORMED SIMULTANEOUSLY WITH ROCK BUTTRESS AND SHEET PILE CONSTRUCTION. THESE MAY INCLUDE INITIAL SITE PREPARATION, SIPHON CONSTRUCTION, AND CONSTRUCTION OF SOME DOWNSTREAM FEATURES OF THE SPILLWAY. OTHER ASPECTS OF THE SPILLWAY CONSTRUCTION MUST FOLLOW THE CONSTRUCTION OF THE BUTTRESS/SHEET PILE – SUCH AS LOWERING THE WATER LEVEL OF THE STILLING POND AND INSTALLATION OF THE SPILLWAY CONTROL STRUCTURE, SPILLWAY PIPING, ETC. CONTRACTOR SHALL COORDINATE BETWEEN THE TWO PROJECTS AND SCHEDULE WORK APPROPRIATELY.

ESTIMATED MATERIAL QUANTITIES

ESTIMATED MATERIAL QUANTITIES ARE PROVIDED IN THE TABLE BELOW:

ITEM	QUANTITY
ROCK BUTTRESS*	4300 CY
PZ-22 SHEET PILE	5860 SF

*QUANTITY IS BASED ON PROPOSED FINAL DIKE GRADES ABOVE EXISTING GRADE AND DOES NOT INCLUDE ANY WASTE QUANTITY OR EXTRA ROCK REQUIRED TO ACCOMMODATE BUTTRESS SETTLEMENT OR DISPLACEMENT OF POND SEDIMENTS/ASH DURING PLACEMENT. 1 FT POST CONSTRUCTION SETTLEMENT AND 1 TO 3 FT THICKNESS OF DISPLACED ASH IS CONSIDERED PLAUSIBLE.

GENERAL

1. ALL HORIZONTAL COORDINATES GIVEN ON THESE DRAWINGS ARE ALABAMA WEST NAD27. ELEVATION DATA ARE IN NGVD 29. BATHYMETRIC CONTOURS AND EXISTING DIKE GRADES ARE BASED ON A TVA SURVEY DATED AUGUST 4, 2009.
2. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL SUBMIT THE FOLLOWING INFORMATION FOR REVIEW AND APPROVAL BY ENGINEER AND OWNER:
   - A DETAILED CONSTRUCTION PLAN AND SCHEDULE, DETAILING THE MEANS AND METHODS TO BE USED TO CONSTRUCT THE ROCK BUTTRESS AND SHEET PILE WALL, AND TO CUT THE CENTER OPENING SECTION TO ITS FINAL ELEVATION.
   - CERTIFICATION LETTER OR MATERIAL CUT SHEETS THAT CERTIFY THAT CRUSHED ROCK MATERIALS MEET THE REQUIREMENTS ON TYPE AND GRADATION GIVEN IN THESE PLANS AND SPECIFICATIONS.
   - MILL CERTIFICATES FOR ALL SHEET PILING DELIVERED TO THE SITE.
   - HEALTH AND SAFETY PLAN
3. HEALTH AND SAFETY: THE CONTRACTOR IS RESPONSIBLE FOR THE HEALTH AND SAFETY OF ITS PERSONNEL, AND SHALL PERFORM ALL WORK TO MEET OSHA STANDARDS, OTHER FEDERAL, STATE, OR LOCAL STANDARDS, AND SITE-SPECIFIC TVA SAFETY STANDARDS.
4. TURBIDITY CURTAIN SHALL BE INSTALLED PER THE REQUIREMENTS OF THE CONSTRUCTION BEST MANAGEMENT PRACTICES PLAN DRAWINGS FOR THE PROJECT. NO WORK IN THE POND SHALL BEGIN UNTIL THE TURBIDITY CURTAIN HAS BEEN INSTALLED.
5. CONTRACTOR TO VERIFY ALL EXISTING UTILITIES THAT MAY BE AFFECTED BY THE WORK.
6. CONTRACTOR TO COORDINATE RELOCATION OF THE CO2 SPARGER PIPE WITH TVA PRIOR TO BEGINNING CONSTRUCTION. CONTRACTOR TO PROTECT CO2 BUILDING, TANK, AND OTHER FEATURES DURING CONSTRUCTION.
7. THERE IS SOME POTENTIAL FOR DISPLACEMENT/RELEASE OF LIMITED PETROLEUM IMPACTED SEDIMENTS DURING THE BUTTRESS PLACEMENT OPERATION. CONTRACTOR SHALL HAVE OIL CONTROL EQUIPMENT (ABSORBENT BOOMS, ETC) ON HAND DURING CONSTRUCTION. CONTRACTOR SHALL VISUALLY MONITOR THE STILLING POND AREA DURING BUTTRESS PLACEMENT AND SHEET PILE INSTALLATION OPERATIONS. IF SHEENS OR OTHER INDICATIONS OF PETROLEUM RELEASE ARE OBSERVED, CONTRACTOR SHALL MOBILIZE OIL CONTROL EQUIPMENT IMMEDIATELY. SAMPLING OF NPDES POINT DSN001 SHALL BE PERFORMED AS SOON AS POSSIBLE, IF OIL RELEASES ARE NOTED. CONTRACTOR TO COORDINATE WITH TVA ENVIRONMENTAL.

SUBSURFACE INFORMATION

SOURCES OF SUBSURFACE INFORMATION IN THE PROJECT AREA INCLUDE THE ORIGINAL POND 4 AS-BUILT DRAWING 10N290-R8 (DATED 10-30-72) AND THE REPORT ENTITLED "REPORT OF GEOTECHNICAL EXPLORATION AND SLOPE STABILITY EVALUATION, ASH POND 4 COLBERT FOSSIL PLANT TUSCUMBIA, ALABAMA", BY STANTEC CONSULTING SERVICES, INC., DATED 1/22/2010.

ACCORDING TO THE ORIGINAL POND 4 AS-BUILT DRAWING, THE EAST FINGER DIKE IS COMPRISED OF EARTHEN FILL. BASED ON THE STANTEC REPORT, THE FILL IS ANTICIPATED TO BE CLAY SOIL WITH USCS CLASSIFICATIONS OF CL AND CH, AND WITH TEXTURAL DESCRIPTIONS OF LEAN CLAY WITH SAND AND FAT CLAY WITH SAND. THE CLAYS ARE MOIST IN MOISTURE CONTENT AND PREDOMINATELY REDDISH BROWN IN COLOR. BASED ON SPT N-VALUES AND LABORATORY STRENGTH TESTING, THE DIKE CLAYS HAVE STRENGTH CONSISTENCIES RANGING FROM MEDIUM TO VERY STIFF.

ACCORDING TO THE ORIGINAL POND 4 AS-BUILT DRAWING, THE WEST FINGER DIKE IS COMPRISED OF COMPACTED BOTTOM ASH.

THE EXISTING POND BOTTOM MATERIALS ARE ANTICIPATED TO CONSIST OF SLUICED FLY ASH (PERHAPS MIXED WITH SOME BOTTOM ASH NEAR THE TOP OF THE DEPOSIT). THE FLY ASH IS LIKELY IN A VERY LOOSE CONDITION AND LIKELY POSSESSES A HIGH MOISTURE CONTENT. THE TOTAL THICKNESS OF FLY ASH WITHIN THE AREA OF THE PROPOSED ROCK BUTTRESS IS ANTICIPATED TO BE ON THE ORDER OF 15–20 FT.

BASED ON INFORMATION GIVEN IN THE STANTEC REPORT, IT IS ANTICIPATED THAT NATIVE CLAY SOILS UNDERLIE BOTH THE DIKES AND THE SLUICED FLY ASH. BASED ON LABORATORY TESTS AND ON VISUAL CLASSIFICATIONS, THE NATIVE CLAY HAS USCS CLASSIFICATIONS OF CL OR CH AND PRIMARY TEXTURAL DESCRIPTIONS OF LEAN CLAY OR FAT CLAY. THESE HORIZONS ARE TYPICALLY DARK BROWN, REDDISH BROWN OR BROWN IN COLOR (WITH OCCASIONAL TAN, GRAY, AND/OR ORANGE-BROWN MOTTLING), AND MOIST IN MOISTURE CONTENT WITH SOME ISOLATED WET ZONES. BASED ON SPT N-VALUES AND LABORATORY STRENGTH TESTING, THE CLAYS AND SILTS HAVE STRENGTH CONSISTENCIES RANGING MOSTLY FROM SOFT TO STIFF.

ROCK BUTTRESS NOTES

1. ROCK FOR BUTTRESS SHALL CONSIST OF WASHED AND CRUSHED GRAVEL, MEETING ALABAMA DEPARTMENT OF TRANSPORTATION ITEM 801.03 REQUIREMENTS. THE CRUSHED GRAVEL SHALL CONFORM TO ALDOT ITEM 801.11, COARSE AGGREGATE GRADATION TABLE, SIZES NO. 1, 2, 3, OR 4, OR ANY COMBINATION THEREOF.
2. PRIOR TO BEGINNING BUTTRESS FILL ACTIVITIES, THE CONTRACTOR SHALL PROBE THE AREA OF BOTH EAST AND WEST FINGER DIKES, TO CHECK FOR THE PRESENCE OF LARGE ROCK OR OTHER OBSTRUCTIONS ALONG THE ALIGNMENT OF THE PROPOSED SHEETING. PROBING SHALL BE PERFORMED WITH AN EXCAVATOR WORKING FROM THE FINGER DIKE AT OR ABOVE THE WATER LINE AND SHALL CONSIST OF RAKING THE FACE OF THE FINGER DIKES UNDER WATER WITH THE EXCAVATOR BUCKET. THESE FINGER DIKE FACES ARE THE MOST LIKELY PLACES WHERE PROTECTIVE STONE, CONCRETE, OR OTHER MATERIALS MAY HAVE BEEN PLACED TO PROTECT THE FINGER DIKES FROM EROSION. THE ENGINEER SHALL OBSERVE THE PROBING OPERATION AND THE CONTRACTOR AND ENGINEER SHALL COLLECTIVELY DECIDE ON PATH FORWARD, SHOULD LARGE OBSTRUCTIONS BE FOUND. THE CONTRACTOR MAY PROPOSE AN ALTERNATE PROBING METHOD, TO BE APPROVED BY THE ENGINEER.
3. THE WATER LEVEL IN THE POND SHALL BE MAINTAINED AT NORMAL POOL (EL. 456.6) DURING BUTTRESS CONSTRUCTION.
4. ACCESS AND STOCKPILING: ACCESS FOR HAUL TRUCKS AND OTHER EQUIPMENT TO BOTH THE EAST AND WEST WORK AREAS IS AS SHOWN ON DRAWING C-01. CONTRACTOR TO LEAVE SUFFICIENT ROOM FOR HAUL TRUCKS TO TURN AROUND AT THE EAST WORK AREA. TO THE EXTENT POSSIBLE, CONTRACTOR SHALL SCHEDULE WORK OPERATIONS AND ROCK DELIVERIES SUCH THAT A LOAD DELIVERED IS COMPLETELY PLACED INTO THE POND BEFORE THE NEXT LOAD ARRIVES. MINOR STOCKPILING OF ROCK ON THE POND 4 DIKE CREST WILL BE ALLOWED, SO LONG AS THE TOTAL HEIGHT OF THE STOCKPILED MATERIAL DOES NOT EXCEED 4 FT.
5. BUTTRESS SHALL BE CONSTRUCTED IN THE POND BY INCREMENTALLY DUMPING, PUSHING, AND WORKING/SHAPING THE CRUSHED GRAVEL FROM ONE END OF THE PROPOSED FILL LIMITS TO THE OTHER. THE CONTRACTOR SHALL ANTICIPATE SOME DISPLACEMENT OF THE POND BOTTOM SEDIMENTS AND/OR FLY ASH AS ROCK FILL IS PLACED OVER THEM. 1 TO 3 FT OF DISPLACEMENT IS CONSIDERED PLAUSIBLE.
6. TEMPORARY OR INTERIM SLOPES FROM THE WORKING EDGE OF THE FILL SHALL BE MAINTAINED AT NOT STEEPER THAN 2 HORIZONTAL TO 1 VERTICAL.
7. TOLERANCES FOR FILL PLACEMENT ARE +/– 1 FT FOR HORIZONTAL POSITION, AND +1 FT AND – 0.5 FT VERTICAL.
8. FINAL GRADE SURVEY: FINAL (AS-BUILT) GRADES OF THE BUTTRESS SHALL BE VERIFIED BY SURVEYING, UPON COMPLETION OF THE FILLING ACTIVITIES. TOPOGRAPHIC/BATHYMETRIC SURVEY SHALL BE PERFORMED ON A REGULAR GRID ACROSS THE BUTTRESS LIMITS. SPACING OF SURVEY POINTS SHALL BE NOT LESS THAN 25 FT. THE SURVEY METHOD SHALL BE CAPABLE OF ESTABLISHING NORTHING, EASTING AND ELEVATION TO WITHIN 1/10 OF A FOOT. PROVIDE THE ENGINEER WITH A FULL-SIZE HARD COPY DRAWING AND ELECTRONIC CAD FILE SHOWING CONTOURS OF THE COMPLETED BUTTRESS. ALL SURVEY WORK SHALL BE PERFORMED/REPORTED IN ALABAMA WEST NAD27 (HORIZONTAL) AND NGVD 29 (VERTICAL).
   THE ENGINEER WILL DETERMINE WHETHER THE FINAL GRADES HAVE BEEN MET, BASED ON THE FINAL GRADE SURVEY PROVIDED BY THE CONTRACTOR. CONTRACTOR SHALL CORRECT ANY DISCREPANCIES IN THE WORK, AT NO ADDITIONAL COST, AND RE-SURVEY THE CORRECTED GRADES.
9. PRELOADING PERIOD: A PRELOADING PERIOD SHALL BE INCORPORATED INTO THE CONSTRUCTION SCHEDULE, TO ALLOW THE ROCK BUTTRESS FOUNDATION SOILS TO CONSOLIDATE AND GAIN STRENGTH. THE PRELOADING PERIOD SHALL BEGIN UPON COMPLETION OF ALL ROCK FILLING ACTIVITIES TO FINAL GRADES, AND SHALL BE A MINIMUM OF TWO WEEKS LONG. THE START OF LOWERING OF THE STILLING POND WITH THE SIPHONS SHALL NOT BE ALLOWED UNTIL THE END OF THE MINIMUM PRELOAD PERIOD. SHEET PILING CONSTRUCTION MAY OCCUR DURING THE PRELOADING PERIOD.
10. BUTTRESS MONITORING REQUIREMENTS: FOUR POINTS ALONG THE TOP OF THE SHEET PILE WALL, AS SHOWN IN THESE PLANS, SHALL BE SURVEYED AT REGULAR INTERVALS TO MONITOR FOR DISPLACEMENTS OF THE WALL/BUTTRESS. THE TOP OF THE SHEET PILE SHALL BE EXPOSED AT THE LOCATION OF EACH POINT, AND EACH POINT SHALL BE PROVIDED WITH A PERMANENT, MARKING, WHICH WILL DEFINE THE SURVEY POINT. THE MARKING SHALL BE CLEARLY VISIBLE, SHALL BE UNYIELDING, AND SHALL ENSURE THAT THE SAME POINT IS SURVEYED DURING EACH MONITORING EVENT. NORTHING, EASTING, AND ELEVATION SHALL BE DETERMINED FOR EACH POINT, AT THE FOLLOWING INTERVALS:
    - BASELINE READING, IMMEDIATELY FOLLOWING CONSTRUCTION OF THE SHEET PILE WALL
    - AT THE END OF THE PRELOAD PERIOD
    - IMMEDIATELY UPON COMPLETION OF LOWERING THE STILLING POND
    - WEEKLY READINGS FOR 2 MONTHS AFTER LOWERING THE STILLING POND.

   SURVEY DATA SHALL BE PROVIDED TO THE ENGINEER A MINIMUM OF 24 HOURS AFTER EACH READING. A CLEARLY DEFINED AND CONSISTENT POINT ID AND NORTHING, EASTING, AND ELEVATION FOR EACH POINT SHALL BE PROVIDED IN A MICROSOFT EXCEL TABLE FORMAT.
10. POST-CONSTRUCTION BUTTRESS CREST SURVEY: THE BUTTRESS IS ANTICIPATED TO SETTLE UP TO 1 FT FOLLOWING CONSTRUCTION. THE CREST OF THE BUTTRESS SHALL BE SURVEYED AFTER A PERIOD OF THREE MONTHS FOLLOWING THE COMPLETION OF FILL ACTIVITIES. AREAS OF THE CREST OUTSIDE OF THE CENTER OPENING SECTION THAT HAVE SETTLED BELOW EL. 458 SHALL BE RE-FILLED TO ACHIEVE EL. 458. THE CENTER OPENING SECTION SHALL BE RE-FILLED TO ACHIEVE EL. 456.

SHEET PILING NOTES

1. SHEET PILING SHALL BE PZ-22 HOT-ROLLED PILING, ASTM A572 GR50.
2. CONTRACTOR TO SELECT HAMMER, OTHER DRIVING EQUIPMENT, MOUNT VEHICLES, ETC TO MEET THE NEEDS OF THE PROJECT. EQUIPMENT SHALL BE CAPABLE OF DRIVING THE PILING TO THE SPECIFIED POSITION AND ELEVATION WITHOUT DAMAGING THE PILING OR BUTTRESS.
3. EXISTING SHEET PILE WALL AND ANY ASSOCIATED HARDWARE AND MATERIALS SHALL BE PROTECTED DURING THE DRIVING OF NEW SHEETING.
4. THE FINAL POSITION OF EACH SHEET PILE SHALL DEVIATE FROM ITS SPECIFIED POSITION BY: NO MORE THAN 6-INCHES IN A HORIZONTAL PLANE; NO MORE THAN 3-INCHES FROM THE PLAN TIP AND TOP ELEVATION; PILING SHALL NOT BE DRIVEN MORE THAN 1.0 PERCENT OUT OF PLUMB.
5. STRONG, HEAVY-DUTY TEMPLATES SHALL BE PROVIDED TO ADEQUATELY MAINTAIN THE ALIGNMENT OF THE WALL DURING PILE DRIVING.
6. PILE DRIVING RECORDS: THE CONTRACTOR SHALL RECORD THE FOLLOWING INFORMATION FOR EACH PILE DRIVEN, AND PROVIDE TO THE ENGINEER FOR REVIEW AND APPROVAL:
   - FINAL TIP AND TOP OF PILE ELEVATION
   - LENGTH OF PILE CUT-OFF OR EXTENSION AT THE TOP (IF ANY)
   - DESCRIPTION OF ANY DRIVING DIFFICULTIES OR DAMAGE TO THE PILE DURING DRIVING (IF ANY)
7. FINAL SURVEY: THE FINAL AS-BUILT ALIGNMENT OF THE SHEET PILE WALL SHALL BE ESTABLISHED BY SURVEYING. COLLECT A MINIMUM OF 8 SURVEY POINTS ALONG THE WALL ALIGNMENT, AND PROVIDE TO THE ENGINEER THE LOCATION ON A FULL-SIZE PLAN DRAWING AND IN ELECTRONIC CAD FORMAT.

TURBIDITY CURTAIN NOTES

1. INSTALL TURBIDITY CURTAINS AT THE LOCATIONS AND ALIGNMENTS SHOWN IN THE DRAWINGS.
2. TURBIDITY CURTAIN SHALL SELECTED BY THE CONTRACTOR AND DETAILS OF THE CURTAIN APPROVED BY TVA AND THE ENGINEER PRIOR TO ORDERING.
3. SELECTED TURBIDITY CURTAINS SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:
   3.1. TURBIDITY CURTAIN A IS 625 FEET LONG. IT SHALL BE TYPE II CURTAIN FABRICATED IN 25-SECTIONS WITH 22 OUNCE PVC COATED POLYESTER SKIRT FOR THE TOP ONE FOOT AND AN ADDITIONAL FIVE FEET OF WOVEN POLYPROPYLENE FABRIC (TOTAL CURTAIN DEPTH OF SIX FEET), UNIVERSAL SLIDE CONNECTORS, TOP TENSION CABLES, AND CHAIN BALLAST. CURTAIN TO BE ANCHORED AT ENDPOINTS AS SHOWN ON THE DRAWINGS. SUPPLIER TO RECOMMEND AND FURNISH SUITABLE MIDPOINT ANCHOR(S) FOR THE CURTAIN.
   3.2. TURBIDITY CURTAIN B IS 300 FEET LONG. IT SHALL BE TYPE II CURTAIN FABRICATED IN 25-SECTIONS WITH 22 OUNCE PVC COATED POLYESTER SKIRT, UNIVERSAL SLIDE CONNECTORS, TOP TENSION CABLES, AND CHAIN BALLAST. CURTAIN TO BE ANCHORED AT ENDPOINTS AS SHOWN ON THE DRAWINGS. SUPPLIER TO RECOMMEND AND FURNISH SUITABLE MIDPOINT ANCHOR(S) FOR THE CURTAIN.

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION.

FOR SUPPORTING DESIGN CALCULATIONS SEE: FPGCOFFESCDX000000201000006

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 0	8/10/11	SW/SP	TG/KV	GD/VG	MJS	JCB	MST	JCK	WO 111112081	J
R	RECORD DRAWING									
	ISSUED FOR CONSTRUCTION									

SCALE: EXCEPT AS NOTED

RECORD DRAWING

GENERAL NOTES

ASH POND 4 – TEMPORARY ROCK BUTTRESS & SHEET PILE WALL

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SEP	KV	VKG	MJS	JCB	MST	JCK

URS

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2010 | DATE 8/10/11 | 47 | C | 10W503-02 | R 0

URS CORPORATION | 0
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:XX
W_TVA

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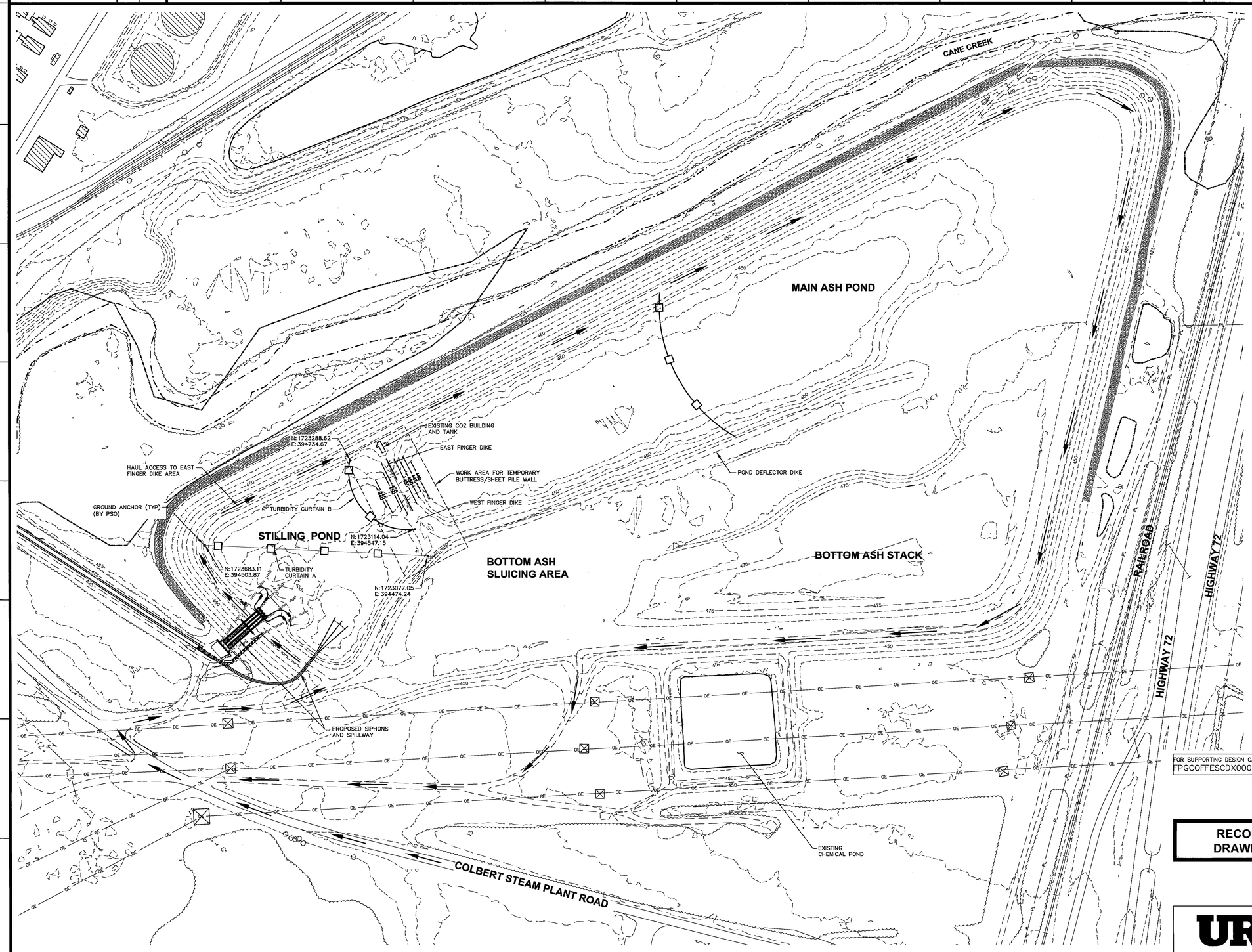

0 100 200

SCALE: 1"= 100'

LEGEND

- EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- EXISTING HAUL ROAD
- EXISTING TREE LINE/VEGETATION
- EXISTING CREEK
- EXISTING WETLAND
- 440 PROPOSED CONTOUR MAJOR
- PROPOSED DIRECTION OF HAUL

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION.

ALABAMA LICENSED No. 30571 PROFESSIONAL ENGINEER MICHAEL J. STEVENS

FOR SUPPORTING DESIGN CALCULATIONS SEE: FPGCOFFESCDX000000201000006

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 0	8/10/11	SW/SH	TG/KV	GD/VG	MJS	JCB	MST	JCK	WO 111112081	J
	RECORD DRAWING.									
R										
	ISSUED FOR CONSTRUCTION									

SCALE: AS SHOWN EXCEPT AS NOTED

RECORD DRAWING

OVERALL SITE PLAN AND HAUL ROUTES

ASH POND 4 – TEMPORARY ROCK BUTTRESS & SHEET PILE WALL

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SEP	KV	VKG	MJS	JCB	MST	JCK

URS

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2010	DATE: 8/10/11	47	C	10W503-03	R 0

URS CORPORATION	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX W_TVA

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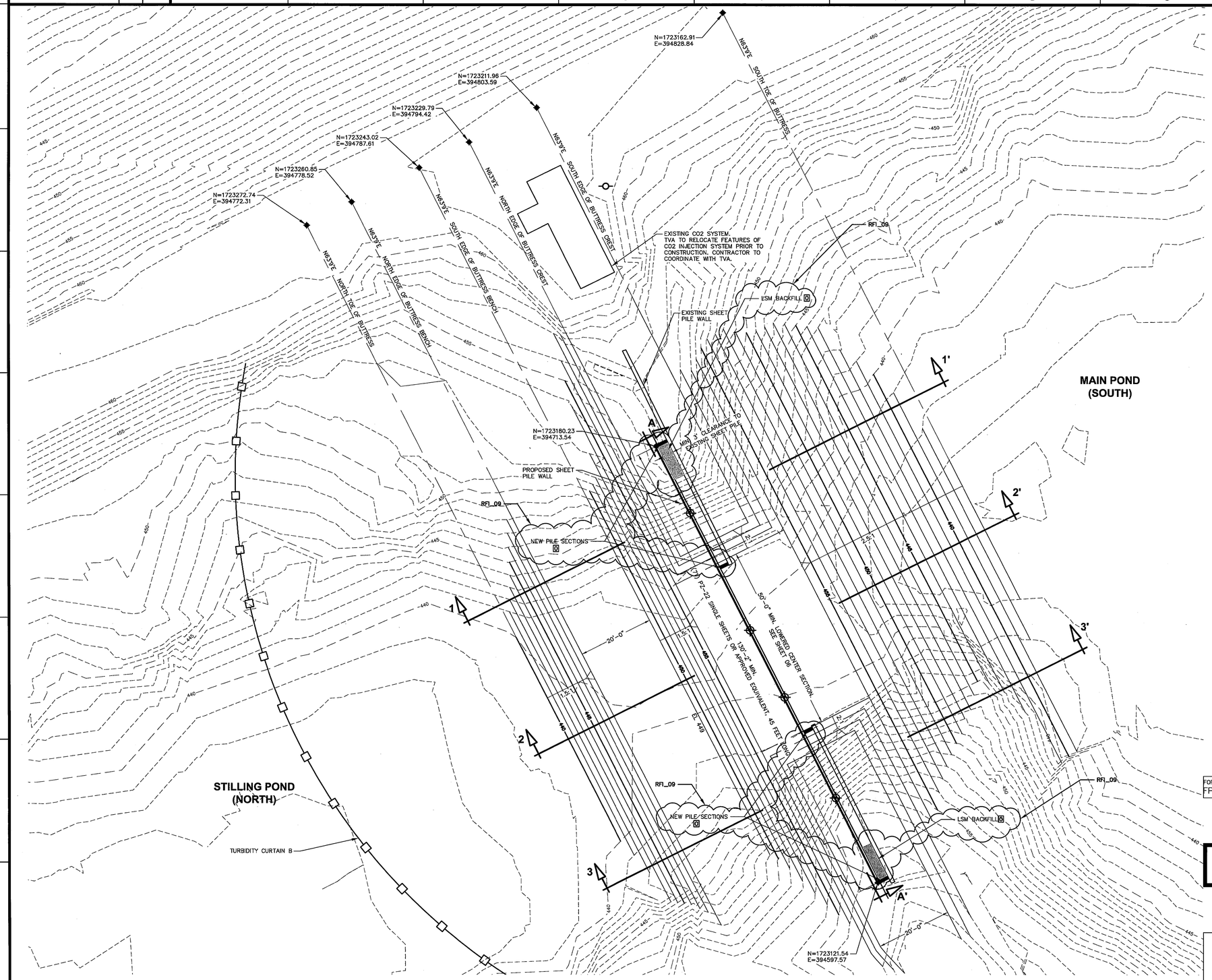

0 10 20

SCALE: 1"= 10'

LEGEND

- EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- EXISTING HAUL ROAD
- PROPOSED CONTOUR MINOR
- PROPOSED CONTOUR MAJOR
- CROSS SECTION LOCATION (A–A' PROFILE LOCATION)
- BUTTRESS MONITORING SURVEY POINTS (TO BE ON TOP OF SHEET PILE)
- EXISTING POWER POLE

PROPOSED CONSTRUCTION SEQUENCE

1. INSTALL TURBIDITY CURTAINS A AND B, AS SHOWN ON SHEET 10W503–03.
2. CONSTRUCT ROCK BUTTRESS TO CREST EL. 456 BY PUSHING MATERIAL FROM ONE SIDE TO THE OTHER.
3. DRIVE SHEET PILE TO EL. 458 OUTSIDE OF CENTER OPENING AND TO EL. 456 WITHIN CENTER OPENING SECTION.
4. RAISE EMBANKMENT CREST TO EL. 459 ON EITHER SIDE OF CENTER OPENING SECTION.
5. IMPLEMENT PRELOAD PERIOD OF TWO WEEKS.
6. LOWER NORTH POND TO EL. 447 WITH SIPHONS AND IMPLEMENT SPILLWAY CONSTRUCTION AND SURVEY MONITORING AS REQUIRED HEREIN.
7. FOLLOWING COMPLETION OF SPILLWAY CONSTRUCTION, LOWER CENTER OPENING SECTION AS FOLLOWS (CONTINUE TO OPERATE SIPHONS TO KEEP NORTH POND AT EL. 447 DURING THIS PROCESS. WATER WILL CONTINUE TO FLOW OVER THE BUTTRESS. CONTRACTOR TO APPROPRIATELY MANAGE/DIVERT FLOWS AS APPROPRIATE TO MAINTAIN SAFE WORKING CONDITIONS):
   - DOZE OFF 8–INCHES OF THE BUTTRESS CREST ON NORTH SIDE OF SHEET PILE AT CENTER SECTION – TO EL. 455.33
   - IN SMALL SEGMENTS, MANUALLY CUT AND REMOVE SHEET PILE ACROSS ENTIRE CENTER SECTION TO EL. 455.33.
   - DOZE DIKE CREST ON SOUTH SIDE OF SHEET PILE TO MATCH AT EL. 455.33
   - ALLOW WATER LEVEL IN SOUTH POND TO DROP TO NEW EL. 455.33 (DROP IS ESTIMATED TO OCCUR OVER A PERIOD OF A FEW HOURS).
8. REPEAT THE ABOVE PROCESS IN 8–INCH VERTICAL INCREMENTS, UP TO THE FINAL DESIGN ELEVATION OF THE CENTER OPENING (EL. 452).
9. ONCE THE CENTER SECTION ELEVATION REACHES EL. 452, TURN OFF SIPHONS. WATER LEVELS WILL SLOWLY EQUALIZE ON BOTH SIDES OF BUTTRESS TO EL. 453 (THE NEW SPILLWAY ELEVATION).

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ALABAMA LICENSED PROFESSIONAL ENGINEER No. 30571 MICHAEL J. STOKE

FOR SUPPORTING DESIGN CALCULATIONS SEE: FPGCOFFESCDX000000201000006

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT "0"	AS CONST
R 0	8/10/11	SEP	KV	VKG	MJS	JCB	MST	JCK	WO 111112081	
R	RECORD DRAWING									

SCALE: AS SHOWN EXCEPT AS NOTED

RECORD DRAWING

PLAN VIEW

ASH POND 4 – TEMPORARY ROCK BUTTRESS & SHEET PILE WALL

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SEP	KV	VKG	MJS	JCB	MST	JCK

URS

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2010	DATE 8/10/11	47	C	10W503–04	R 0

URS CORPORATION	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX W_TVA

C.A.D. DRAWING DO NOT ALTER MANUALLY

RAIL SITE PLAN AND HAUL ROUTES

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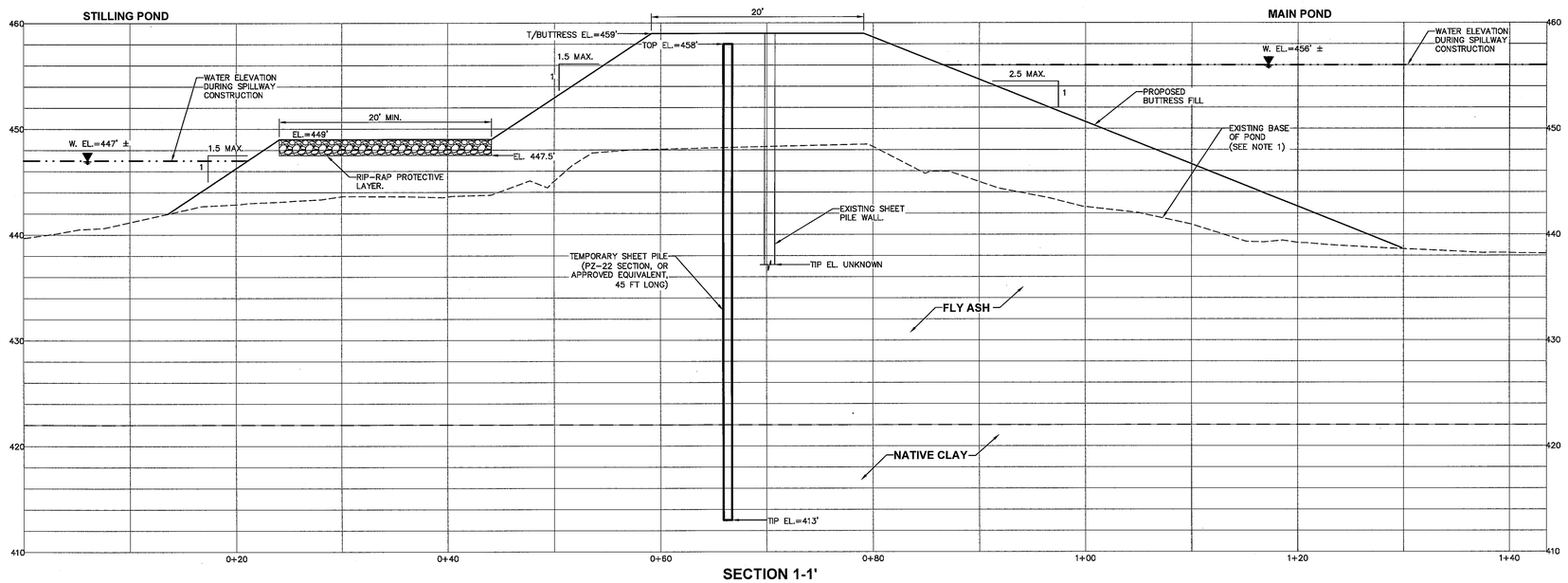
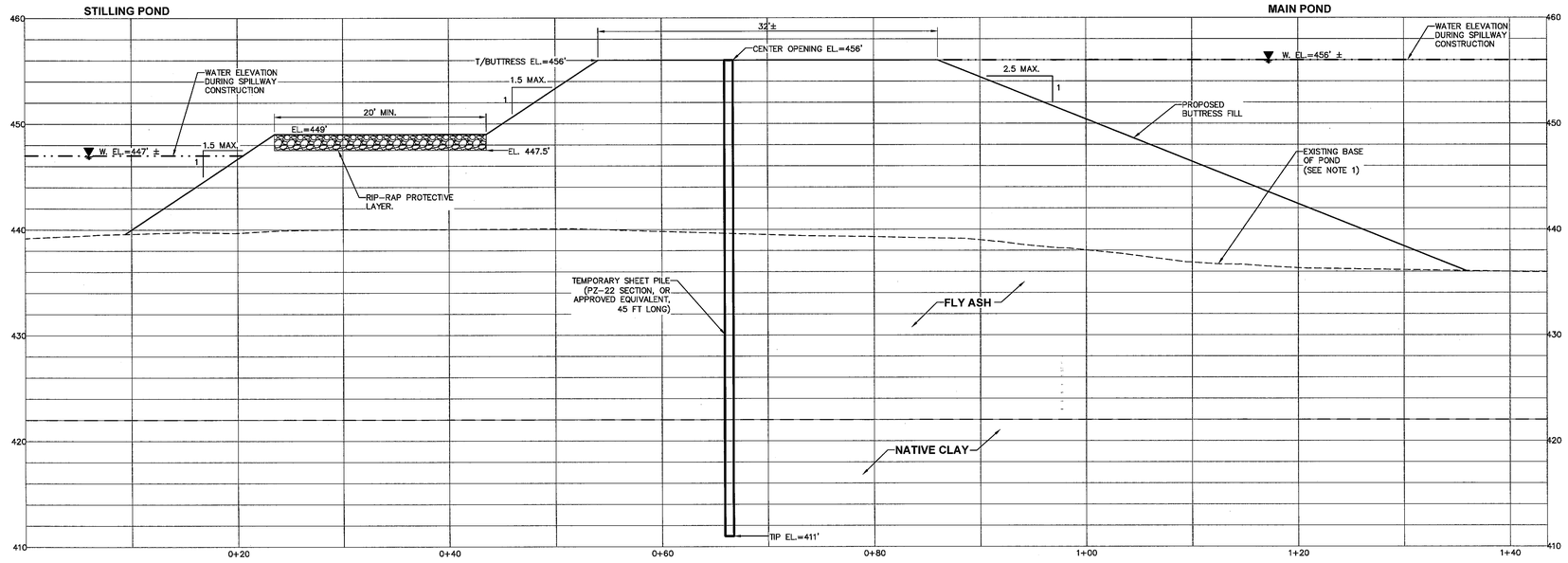


SECTION 1-1'



SECTION 2-2'

NOTE:

1. SOME DISPLACEMENT OF POND BOTTOM MATERIAL SHOULD BE ANTICIPATED, AS BUTTRESS ROCK IS PLACED. 1 TO 3 FEET OF DISPLACEMENT (VERTICALLY) IS CONSIDERED PLAUSIBLE.
2. RIP-RAP PROTECTIVE LAYER TO CONSIST OF CLASS 2 RIPRAP (ALDOT ITEM 610)

0 5 10

SCALE: 1"= 5'

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION.

ALABAMA LICENSED No. 30571 PROFESSIONAL ENGINEER MICHAEL J. BRYC

FOR SUPPORTING DESIGN CALCULATIONS SEE: FPGCOFFESCDX000000201000006

R 0	8/10/11	SW/SH TG/KV GD/VG MJS	JCB	MST	JCK	WO 111112081	J
R	RECORD DRAWING						

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ED	AS CONST	REV. NO.

SCALE: AS SHOWN EXCEPT AS NOTED

RECORD DRAWING

SECTIONS 1-1' & 2-2'

ASH POND 4 – TEMPORARY ROCK BUTTRESS & SHEET PILE WALL

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SEP	KV	VKG	MJS	JCB	MST	JCK

URS

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2010	DATE 6/03/10	47	C	10W503-05	R 0

URS CORPORATION	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

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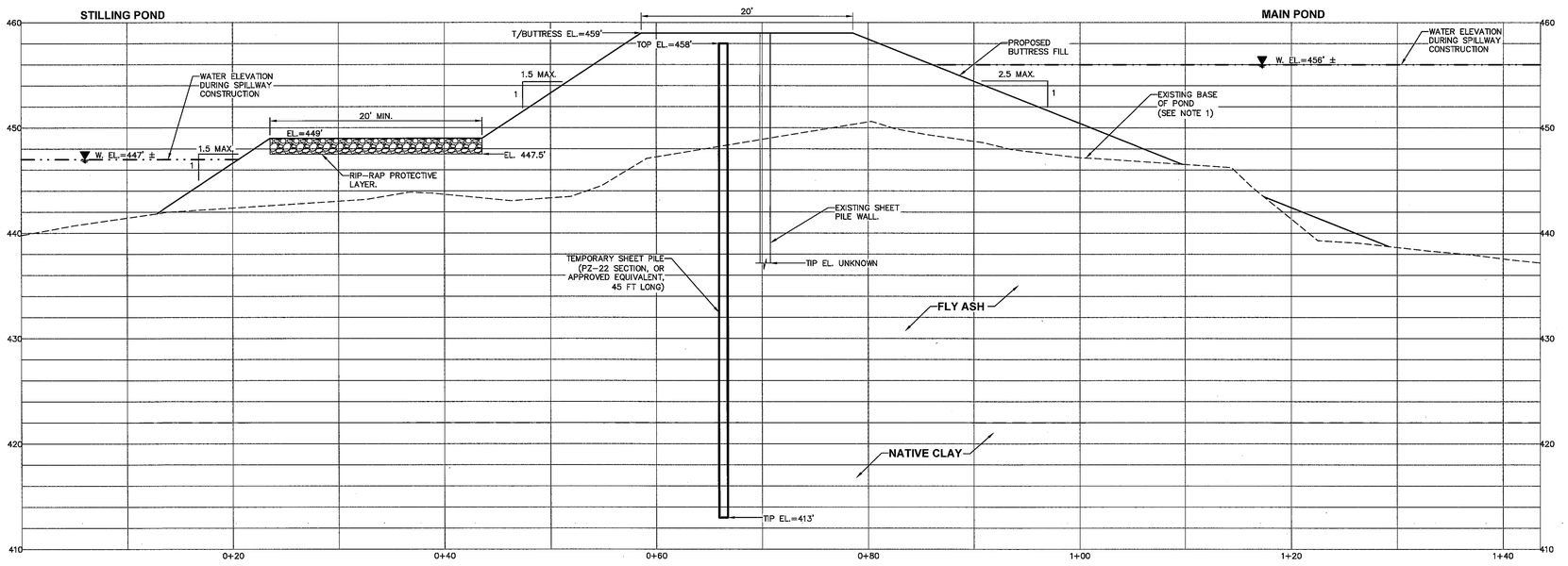

SECTION 3-3'

0 5 10

SCALE: 1"= 5'

NOTE:

1. SOME DISPLACEMENT OF POND BOTTOM MATERIAL SHOULD BE ANTICIPATED, AS BUTTRESS ROCK IS PLACED. 1 TO 3 FEET OF DISPLACEMENT (VERTICALLY) IS CONSIDERED PLAUSIBLE.
2. RIP-RAP PROTECTIVE LAYER TO CONSIST OF CLASS 2 RIPRAP (ALDOT ITEM 610)

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ALABAMA LICENSED No. 30571 PROFESSIONAL ENGINEER MICHAEL J. STEPP

FOR SUPPORTING DESIGN CALCULATIONS SEE: FPGCOFFESCDX000000201000006

R 0	SEP	KV	VKG	MJS	MJS	JCB	MST	JCK	WO 111112081	J
R	RECORD DRAWING									

REV. NO.	DATE	DSGN	DRWN	CKWD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST

SCALE: AS SHOWN EXCEPT AS NOTED

RECORD DRAWING

POND 4 – TEMPORARY ROCK BUTTRESS & SHEET PILE WALL SECTION 3-3'

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SEP	KV	VKG	MJS	JCB	MST	JCK

URS

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2010	DATE 8/10/11	47	C	10W503-06	R 0

URS CORPORATION	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX W_TVA

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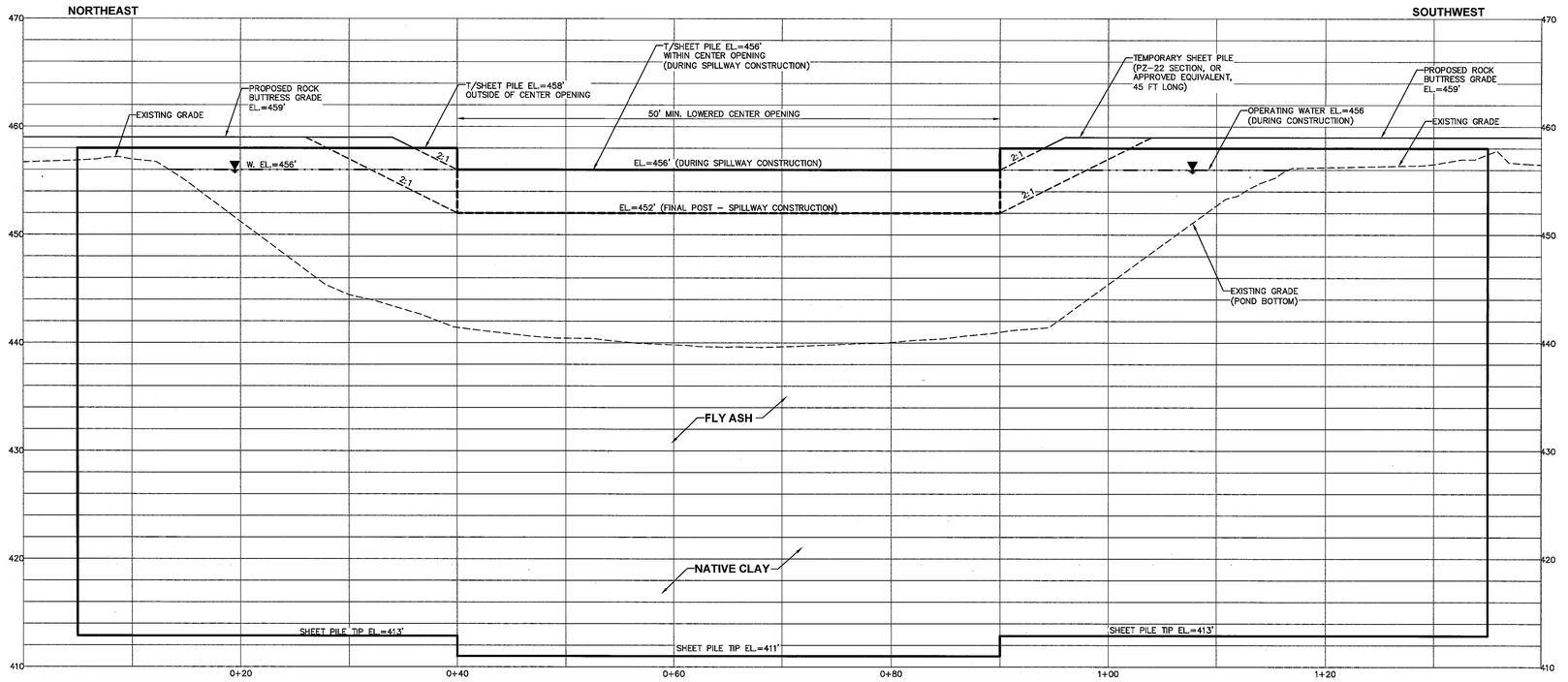

SHEET PILE WALL ELEVATION

0 5 10

SCALE: 1"= 5'

NOTE:

1. EXISTING SHEET PILE NOT SHOWN FOR CLARITY.

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION.

ALABAMA LICENSED No. 30571 PROFESSIONAL ENGINEER MICHAEL J. STOCK

FOR SUPPORTING DESIGN CALCULATIONS SEE: FPGCOFFESCDX000000201000006

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 0	8/10/11	SEP	KV	VKG	MJS	JCB	MST	JCK	WO 111112081	J
R	RECORD DRAWING									

SCALE: AS SHOWN EXCEPT AS NOTED

RECORD DRAWING

POND 4 – TEMPORARY ROCK BUTTRESS & SHEET PILE WALL ELEVATION A–A'

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SEP	KV	VKG	MJS	JCB	MST	JCK

URS

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2010	DATE 8/10/11	47	C	10W503-07	R 0

URS CORPORATION	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX W_TVA

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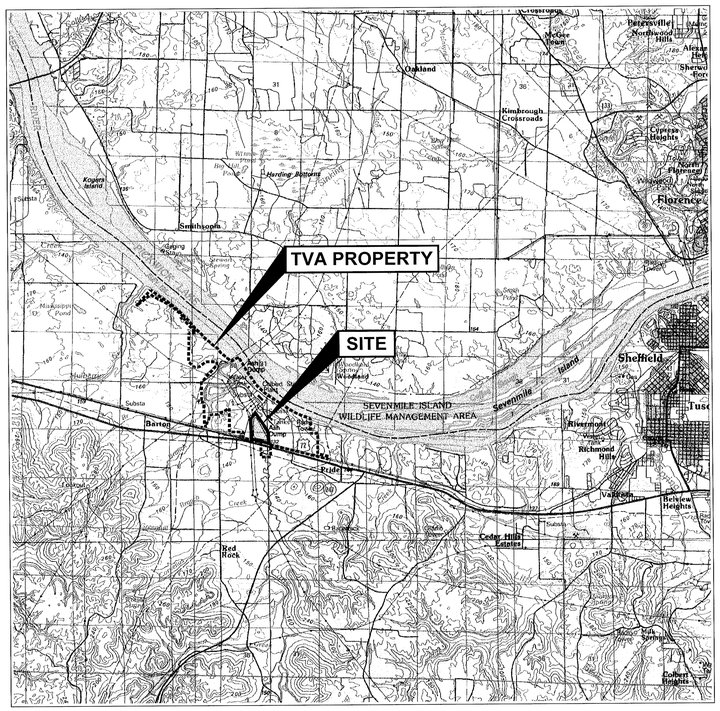
TENNESSEE VALLEY AUTHORITY
COLBERT FOSSIL PLANT - ASH POND 4
SEEPAGE REMEDIATION
RECORD DRAWINGS

COLBERT COUNTY, ALABAMA
JANUARY 4, 2013



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W E

SITE VICINITY MAP

0 6000 12000

SCALE: 1"=6000'

DWG. NO.	DWG. DESCRIPTION
01	TITLE SHEET
02	GENERAL NOTES
03	EXISTING CONDITIONS
04	PROPOSED OVERALL SITE PLAN
05	PROPOSED SOUTH SEEPAGE PLAN
06	PROPOSED EAST SEEPAGE PLAN STA. 0+00 TO 17+50
07	PROPOSED EAST SEEPAGE PLAN STA. 17+50 TO 29+55
08	TYPICAL DIKE DETAILS
09	DETAILS

PREPARED FOR:

TENNESSEE VALLEY AUTHORITY
1101 MARKET STREET
CHATTANOOGA, TN 37402-2801

PREPARED BY:

URS CORPORATION
1375 EUCLID AVENUE, SUITE 600
CLEVELAND, OH 44115
PHONE (216) 622-2400
ATTN: MICHAEL STEPIC, P.E.

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RECORD DRAWING

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REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. NO.
R 2	01/04/13	CM/MD	DV/CM	RB	MJS	RSH	MST	JCK	203996		J
RECORD DRAWING											
R 0	05/20/10	CM/MD	KV/CM	RB	MJS	JCB	MST	JCK	203996		D
ISSUED FOR CONSTRUCTION											

DISCIPLINE INTERFACE

SCALE: AS SHOWN EXCEPT AS NOTED

TITLE SHEET

ALABAMA LICENSED No. 30041 PROFESSIONAL ENGINEER MICHAEL J. STEPIC

2 WORKING DAYS
BEFORE YOU DIG
205-353-2636
ALABAMA UTILITIES PROTECTION SERVICE

ASH POND 4
SEEPAGE REMEDIATION

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
CM/MD	KV/CM	RB	MJS	JCB	MST	JCK

URS

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2010	DATE 01/04/13	47	C	10W291-01	R 2

DELIVERABLE ID: COLBERT FACILITY-P4SR-00003

URS CORPORATION	2
TASK COMPLETED BY:	REV NO

PLOT FACTOR:XX
W_TVA

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DO NOT ALTER MANUALLY

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GENERAL PROVISIONS

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH OSHA SAFETY STANDARDS AND IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL LAWS AND TVA REQUIREMENTS.
2. ENGINEER REFERS TO URS CORPORATION, WHICH HAS BEEN CONTRACTED BY TVA FOR CONSTRUCTION QUALITY ASSURANCE FOR THE DURATION OF THE PROJECT.
3. WHENEVER REFERENCE IS MADE TO THE ALABAMA DEPARTMENT OF TRANSPORTATION (ALDOT) STANDARD SPECIFICATIONS, AMERICAN CONCRETE INSTITUTE(ACI), AMERICAN WATER WORKS ASSOCIATION, AMERICAN SOCIETY OF TESTING AND MATERIALS (ASTM) AND OTHER PUBLISHED STANDARDS OR SPECIFICATIONS, IT SHALL MEAN THE LATEST VERSION IN ITS ENTIRETY.
4. THE CONTRACTOR SHALL SECURE THE LATEST EDITION OF ALABAMA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS WHEN PERFORMING WORK WHICH IS PRESCRIBED HEREIN. COPIES MAY BE OBTAINED FROM:

   PROPOSALS ENGINEER
   ALABAMA DEPARTMENT OF TRANSPORTATION
   1409 COLISEUM BOULEVARD
   MONTGOMERY, ALABAMA 36130–3050
5. HORIZONTAL AND VERTICAL SURVEY CONTROL EXISTS AT THE SITE. IT SHALL BE THE RESPONSIBILITY OF THE OWNER TO PROVIDE CONTROL POINT INFORMATION TO THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SURVEYING AND STAKING NECESSARY FOR LAYOUT AND CONSTRUCTION OF THE PROJECT.
6. ACCEPTABLE CONSTRUCTION TOLERANCES FROM PLAN DIMENSIONS, ELEVATIONS, AND GRADES SHALL BE AS FOLLOWS:
   - EXCAVATIONS AND FINAL GRADES FOR EARTH SURFACES AND SLOPES: ±0.25 FEET VERTICAL; ±1 FT IN A HORIZONTAL PLANE.
   - PIPES AND APPURTENANCES: ± 1–INCH OF PLAN ELEVATION.
7. NO DEVIATIONS FROM THE PLANS OR APPROVED SHOP DRAWINGS SHALL BE MADE WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE CONTRACTOR SHALL KEEP A RECORD OF ALL DEVIATIONS OF ANY INSTALLATION FROM THAT SHOWN ON THE PLANS, AND ANY DEVIATIONS IN INSTALLATIONS FROM APPROVED SHOP DRAWINGS AND PROVIDE COPIES OF THESE RECORDS TO ENGINEER. AT COMPLETION OF THE PROJECT A SET OF FINAL RECORD DRAWINGS SHALL BE PREPARED BY THE ENGINEER TO ENSURE THAT THE OWNER HAS A PERMANENT RECORD OF THE PROJECT AS IT WAS CONSTRUCTED. CONTRACTOR SHALL ASSIST THE ENGINEER WITH ANY MEASUREMENTS OR INTERPRETATIONS NECESSARY FOR PREPARATION OF THE FINAL RECORD DRAWINGS.

GENERAL SITEWORK REQUIREMENTS

1. ACCESS INTO THE WORK AREA FOR DELIVERY OF EQUIPMENT, MATERIALS AND WORKFORCE SHALL BE REVIEWED DAILY BY THE CONTRACTOR, AND CONTROLLED AS NEEDED TO PREVENT ANY DAMAGE TO THE CREST OR SLOPES OF THE DIKES SURROUNDING THE ASH PONDS. IF EQUIPMENT OR MATERIAL HAULING CAUSES UNACCEPTABLE DAMAGE IN THE OPINION OF THE ENGINEER, THE DAMAGE SHALL BE IMMEDIATELY REPAIRED BY THE CONTRACTOR, AND THE METHODS FOR HAULING SHALL BE ALTERED TO PREVENT FURTHER DAMAGE. THE CONTRACTOR SHALL NOT MAKE ANY UNPLANNED EXCAVATIONS INTO THE DIKE WITHOUT THE APPROVAL OF THE OWNER OR THE ENGINEER. DURING CONSTRUCTION THE CONTRACTOR IS RESPONSIBLE FOR PRECAUTIONS REQUIRED TO PROTECT THE INTEGRITY OF THE DIKES AND APPURTENANCES NEEDED FOR THE SAFE OPERATION OF THE ASH POND.
2. CONTRACTOR SHALL TAKE EVERY PRECAUTION TO ENSURE THAT THERE ARE NO OIL EXCURSIONS INTO THE ASH POND OR INTO CANE CREEK DURING CONSTRUCTION. CONTRACTOR SHALL HAVE OIL CONTROL EQUIPMENT (ABSORBENT BOOMS, ETC) ON SITE AT ALL TIMES. IF OIL IS RELEASED OR OBSERVED DURING CONSTRUCTION, CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND DEPLOY OIL CONTROL EQUIPMENT. CONTRACTOR SHALL COORDINATE WITH ENGINEER AND OWNER ON OIL CLEANUP, AS NECESSARY.
3. THE CONTRACTOR SHALL INSTALL, MAINTAIN AND INSPECT SILT FENCE AND OTHER EROSION CONTROL FEATURES AS REQUIRED IN THE CONSTRUCTION BEST MANAGEMENT PRACTICES PLAN (CBMPP). EROSION CONTROL FEATURES SHALL BE INSTALLED PRIOR TO BEGINNING ANY EARTHMOVING ACTIVITIES.
4. WEEKLY DELIVERIES OF CARBON DIOXIDE ARE MADE BY TANKER TRUCK TO THE CO2 SYSTEM LOCATED ON THE EAST DIKE. FULL ACCESS TO DELIVERY VEHICLES MUST BE MAINTAINED THROUGHOUT THE DURATION OF THE SEEPAGE COLLECTION SYSTEM CONSTRUCTION.
5. OWNER WILL MONITOR PH AND WATER QUALITY AT DISCHARGE TO CANE CREEK THROUGHOUT CONSTRUCTION. CONTRACTOR MAY NEED TO ADJUST CONSTRUCTION PRACTICES IF WATER QUALITY ISSUES ARISE. CONTRACTOR TO COORDINATE WITH TVA AND ENGINEER.
6. APPROXIMATE LOCATIONS FOR STAGING AND STOCKPILE AREAS ARE SHOWN IN THE CONSTRUCTION BEST MANAGEMENT PLAN DRAWINGS. HOWEVER, THE CONTRACTOR SHALL COORDINATE WITH THE OWNER TO DETERMINE THE FINAL LOCATION OF STAGING AREAS FOR EQUIPMENT OR MATERIAL STORAGE AND FOR OTHER CONSTRUCTION LAY DOWN ACTIVITY. LAY DOWN ACTIVITY FOR THE SEEPAGE CONTROL PROJECT SHALL BE APPROPRIATELY COORDINATED WITH ACTIVITIES FOR OTHER PROJECTS OCCURRING SIMULTANEOUSLY.
7. CONVEYANCE LINE TO BE INSTALLED PRIOR TO CONSTRUCTION OF SEEPAGE COLLECTION DRAIN. INSTALL COLLECTION DRAIN FIRST THEN FOLLOW WITH INSTALLATION OF CONVEYANCE LINE. [2] — RFI_06

EARTHWORK NOTES

1. AREAS WHICH WILL BE EXCAVATED SHALL BE CLEARED OF TREES, STUMPS, BRUSH, PROJECTING ROOTS, WEEDS, LOGS AND OTHER PROTRUDING OBSTRUCTIONS. ALL TREES, STUMPS, BRUSH, PROJECTING ROOTS, WEEDS LOGS, AND PROTRUDING OBSTRUCTIONS SHALL BE CUT TO WITHIN 3 INCHES OF EXISTING GROUND. THE AREA SHALL BE GRUBBED TO A DEPTH OF 6 INCHES TO REMOVE GRASS, ROOTS AND OTHER ORGANIC MATERIAL. ALL CLEARED AND GRUBBED MATERIAL SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT AN APPROVED DISPOSAL SITE AND IN ACCORDANCE WITH APPLICABLE LAWS. IF ENCOUNTERED, TOPSOIL SHALL BE STRIPPED TO A DEPTH OF 4 INCHES. TOPSOIL SHALL BE STORED AT THE DESIGNATED STOCKPILE AREA AS NOTED IN THE CONSTRUCTION BEST MANAGEMENT PRACTICES PLAN (CBMPP) AND AS ALLOWED BY THE OWNER.
2. SLOPE EXCAVATIONS AND TRENCHING FOR THE SEEPAGE COLLECTION TRENCH/PIPE SHALL BE OPENED IN SECTIONS NO MORE THAN 100 FT IN LENGTH ALONG THE PROPOSED ALIGNMENT. COLLECTION PIPE, CLEANOUT, AND LATERAL PIPE LAYING, TRENCH BACKFILLING, AND SLOPE BACKFILLING FOR EACH 100 FT SECTION SHALL BE COMPLETED PRIOR TO BEGINNING WORK ON THE ADJACENT 100 FT SECTION.
3. ALL EXCAVATIONS SHALL BE SLOPED, BENCHED, OR SHORED TO PERMIT SAFE WORKING CONDITIONS PER OSHA REQUIREMENTS FOR PROTECTIVE SYSTEMS (29 CFR 1926.652). EXISTING DIKE MATERIALS SHALL BE CONSIDERED OSHA TYPE C MATERIALS.
4. EXCAVATIONS IMPLEMENTED ALONG THE SLOPES OF THE EXISTING DIKE AND ANY MISCELLANEOUS EXCAVATIONS GREATER THAN 4 FT IN DEPTH THAT WILL REMAIN OPEN FOR A PERIOD OF GREATER THAN 1 WEEK SHALL BE SLOPED AT NO GREATER THAN 2H:1V, UNLESS OTHERWISE ALLOWED BY THE ENGINEER.
5. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING DRAINAGE WAYS, SUMP PITS AND PUMPS, OR OTHER METHODS AND PRACTICES TO KEEP EXCAVATIONS IN A DRAINED CONDITION AT ALL TIMES. SURFACES ABOVE EXCAVATIONS SHALL BE GRADED OR PROTECTED SUCH THAT SURFACE RUNOFF IS DIRECTED AWAY FROM OPEN EXCAVATIONS.
6. PRIOR TO PLACING FILLS AGAINST THE OUTER SLOPE OF THE DIKE, THE BOTTOM SHALL BE BENCHED LEVEL TO PROVIDE A LEVEL SURFACE TO BEGIN THE FILLING ACTIVITIES. SLOPING SURFACES AGAINST WHICH FILL MATERIAL WILL BE PLACED SHALL BE DISCED, BENCHED OR SERRATED, TO ENHANCE BONDING OF THE FILL TO THE EXCAVATION FACE.
7. SUITABLE FILL MATERIALS: SOIL MATERIALS TO BE PLACED AS BACKFILL AGAINST THE OUTSIDE SLOPE OF THE DIKE, OR TO BACKFILL EXCAVATIONS WITHIN THE DIKE, SHALL CONSIST OF CLAY SOILS THAT EXHIBIT A CLASSIFICATION OF CL, CL–ML, CL–CH, OR CH IN ACCORDANCE WITH ASTM D–2487. THE MATERIAL SHALL BE FREE OF ORGANIC MATTER, TOPSOIL, RUBBISH, DEBRIS, WASTE MATERIALS, AND ROCK PIECES GREATER THAN 3 INCHES (MAXIMUM DIMENSION) IN SIZE, AND SHALL BE AT A MOISTURE CONTENT THAT IS SUITABLE FOR ACCEPTABLE COMPACTION, AS REQUIRED HEREIN. EXISTING SOILS REMOVED FROM THE EXCAVATIONS MAY BE REUSED AS FILL, TO THE EXTENT THAT THEY MEET THE REQUIREMENTS GIVEN HEREIN. MOISTURE CONDITIONING (DRYING) OF THESE EXISTING SOILS MAY BE NECESSARY, PRIOR TO REUSE.
8. COMPACTION REQUIREMENTS: FILL MATERIALS SHALL BE PLACED AND SPREAD IN HORIZONTAL LOOSE LIFTS THAT DO NOT EXCEED 8 INCHES IN THICKNESS. EACH LIFT SHALL BE THOROUGHLY COMPACTED TO ACHIEVE A MINIMUM DENSITY OF 98% OF ITS MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D–698. THE MOISTURE CONTENT DURING COMPACTION SHALL BE WITHIN A RANGE OF +2 TO −2 PERCENT OF THE OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D–698. FIELD COMPACTION TESTS, BY THE ENGINEER, SHALL BE PERFORMED ON EACH LIFT TO VERIFY THAT SPECIFIED LEVELS OF COMPACTION ARE ACHIEVED. ENGINEER SHALL PERFORM PROCTOR TESTING.

HDPE PIPE

1. HIGH DENSITY POLYETHYLENE PIPE (HDPE) AND FITTINGS SHALL MEET THE REQUIREMENTS OF AASHTO M 252, TYPE C AND SHALL BE ADS N–12 WT/IB (GASKETED WATERTIGHT) OR APPROVED EQUIVALENT.
2. HDPE PIPE FOR THE SEEPAGE COLLECTION LINE SHALL BE PERFORATED WITH A MAXIMUM SLOT WIDTH OF 0.120" AND MAXIMUM SLOT LENGTH OF 0.875" WITH 3" SPACING, AS SHOWN IN THESE PLANS.

FILTER GRAVEL MATERIAL

1. FILTER GRAVEL MATERIAL USED AT THE SEEPAGE COLLECTION TRENCH SHALL MEET ALDOT NO. 327.02 MIX NO. 1 FILTER GRAVEL SPECIFICATIONS.

PIPE BEDDING AND BACKFILL MATERIALS

1. PIPE BEDDING MATERIAL SHALL BE SAND OR PEA GRAVEL UNLESS A SPECIFIC MATERIAL IS DESIGNATED ON THE DRAWINGS. SOIL FILTER MATERIAL – 327 MIX [2] — UNDOCUMENTED FIELD CHANGE
2. INITIAL BACKFILL MATERIAL SHALL BE ALDOT 327.01 STONE AND MEET THE REQUIREMENTS OF ALDOT SPECIFICATION 327 APPROVED EQUAL UNLESS A SPECIFIC MATERIAL IS DESIGNATED ON THE DRAWINGS. 3/4" CRUSHER RUN [2] — RFI_08
3. FINAL BACKFILL MATERIAL SHALL BE "SUITABLE FILL MATERIALS" AS SPECIFIED IN THE EARTHWORK NOTES, UNLESS A SPECIFIC MATERIAL IS DESIGNATED ON THE DRAWINGS. FLOWABLE FILL [2] — RFI_09

SUBGRADE FOR PIPE TRENCHES

1. SUBGRADES FOR TRENCH BOTTOMS SHALL BE FIRM, DENSE, AND THOROUGHLY COMPACTED AND CONSOLIDATED
2. SUBGRADE SHALL BE FREE FROM MUD, ORGANICS, AND OTHER SOFT OR UNSUITABLE MATERIALS; AND SHALL REMAIN FIRM AND INTACT UNDER ALL CONSTRUCTION OPERATIONS
3. SUBGRADES WHICH ARE OTHERWISE SOLID, BUT WHICH BECOME SOFT OR MUCKY ON TOP DUE TO CONSTRUCTION OPERATIONS, SHALL BE EXCAVATED AND REPLACED OR OTHERWISE IMPROVED AS DIRECTED BY THE ENGINEER.

PIPE TRENCH PREPARATION

1. EXCAVATE TRENCHES TO DEPTH REQUIRED TO MEET PIPE INVERT ELEVATIONS AND TO SUPPORT BOTTOM OF PIPE. TRENCHES FOR CONVEYANCE PIPE SHALL BE EXCAVATED IN NO LONGER THAN 250 FT. INCREMENTS. PIPE LAYING AND INSPECTIONS AT EACH INCREMENT SHALL BE COMPLETED PRIOR TO STARTING THE NEXT INCREMENT.
2. TRENCH GEOMETRY SHALL BE AS SHOWN ON THESE PLANS, AT A MINIMUM. TRENCH DIMENSIONS MAY BE INCREASED FROM THOSE SHOWN ON THESE PLANS IF REQUIRED FOR THE FOLLOWING REASONS AND IF APPROVED BY THE ENGINEER:
   2.a. TO PROVIDE SUFFICIENT ROOM FOR INSTALLING, JOINTING, AND INSPECTING PIPING,
   2.b. ENLARGEMENTS AT PIPE JOINTS MAY BE MADE IF REQUIRED AND APPROVED BY THE ENGINEER.
   2.c. TO PROVIDE ROOM FOR ANY SHEETING, BRACING, SLOPING AND DEWATERING THAT MAY BECOME NECESSARY.
   2.d. TO ALLOW THOROUGH COMPACTING OF BACKFILL ADJACENT TO BOTTOM HALF OF PIPE.
3. ALL TRENCHES SHALL BE KEPT FREE OF STANDING WATER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THESE CONDITIONS. SUBGRADE SOILS THAT BECOME SOFT, LOOSE, OR UNSATISFACTORY AS A RESULT OF INADEQUATE DEWATERING AND CANNOT BE STABILIZED OR RECOMPACTED TO THE ENGINEERS SATISFACTION SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.
4. DO NOT BACKFILL TRENCHES UNTIL TESTS AND INSPECTIONS HAVE BEEN MADE. USE CARE IN BACKFILLING TO AVOID DAMAGE OR DISPLACEMENT OF PIPE SYSTEMS. WORK WHICH IS COVERED OR CONCEALED WITHOUT THE KNOWLEDGE AND CONSENT OF THE ENGINEER SHALL BE UNCOVERED OR EXPOSED FOR INSPECTION AND REFILLED AT NO ADDITIONAL COST TO THE OWNER.

LAYING OF PIPES

1. ALL PIPES SHALL BE LAID IN STRICT CONFORMITY WITH THE APPLICABLE REQUIREMENTS OF THESE NOTES. THE CONTRACTOR SHALL EXCAVATE TO THE EXCAVATION LIMITS BELOW THE BOTTOM OF THE PIPE, REFILL THE ENTIRE BOTTOM OF THE TRENCH WITH PIPE BEDDING MATERIAL, SO THAT WHEN COMPACTED, THE TROUGH FORMED TO RECEIVE THE PIPE WILL CORRESPOND TO THAT ELEVATION REQUIRED FOR THE CORRECT GRADE OF THE PIPE. SUITABLE FILL MATERIALS SHALL THEN BE PLACED AND COMPACTED TO SPECIFIED REQUIREMENTS.
2. BEFORE PIPE IS LOWERED INTO THE TRENCH, IT SHALL BE CHECKED FOR ROUNDNESS AND SHAPE SO THAT JOINTS CAN BE PROPERLY MADE. ANY PIPE UNDULY OUT OF ROUND OR OUT OF SHAPE WILL BE REJECTED.
3. WHEN THE PIPE IS READY FOR LAYING, THE JOINT SURFACES SHALL BE SCRUPULOUSLY CLEANED OF ALL DIRT AND FOREIGN MATERIAL.
4. ALL PIPES SHALL BE LAID TRUE TO THE LINE AND GRADE WITH FORM AND EVEN BEARING UPON A PROPER AND DRY FOUNDATION, SHAPED TO RECEIVE THE PIPE. CARE SHALL BE TAKEN TO SECURE CLOSENESS OF JOINTS AND SMOOTHNESS AND CONTINUITY OF INVERT.
5. UNDER NO CONDITION WILL IT BE PERMITTED TO ADJUST PIPE INVERT TO GRADE BY PACKING BEDDING UNDER ONE END. IF GRADE IS TOO LOW, PIPE IS TO BE REMOVED, BEDDING REPAIRED, AND RE–LAID.
6. PARTICULAR CARE SHALL BE TAKEN THAT THE PIPE IS NOT PERMITTED TO REST UPON OR AGAINST EITHER SOLID ROCK OR PROJECTING PORTIONS OF ROCK, AND NO ROCK OR BOULDERS SHALL PROJECT WITHIN 6 INCHES OF ANY PIPE.
7. COMMENCE AT THE LOWEST POINT AND PROCEED TO THE UPPER END WHERE APPLICABLE. LAY DRAIN PIPE WITH BELL–END POINTING UP–GRADE, IF APPLICABLE.
8. REST EACH PIPE ON THE FULL LENGTH OF ITS BARREL.

QUANTITY LIST

THE FOLLOWING IS A LIST OF ITEMS AND APPROXIMATE QUANTITIES TO BE USED FOR COMPLETION OF THIS PROJECT. FINAL QUANTITIES TO BE VERIFIED BY CONTRACTOR.

DESCRIPTION	QUANTITY
• SOIL FILTER MATERIAL	4235 CY
• 6" CORRUGATED HDPE SLOTTED PIPE	4310 LF
• 6" CORRUGATED HDPE SOLID PIPE	4640 LF
• SUITABLE BACKFILLMATERIALS	8685 CY

SUBMITTALS

THE CONTRACTOR SHALL MAKE THE FOLLOWING SUBMITTALS FOR REVIEW AND APPROVAL BY THE ENGINEER. UNLESS NOTED OTHERWISE, SUBMITTALS SHALL BE MADE A MINIMUM OF TWO WEEKS PRIOR TO BEING NEEDED FOR A GIVEN OPERATION. WORK ON ANY COMPONENT OF THE PROJECT SHALL NOT BEGIN UNTIL THE SUBMITTAL(S) CORRESPONDING TO THAT WORK HAVE BEEN APPROVED:

1. A DETAILED CONSTRUCTION PLAN OUTLINING:
   - SPECIFIC EQUIPMENT TO BE USED AND ITS PURPOSE
   - A DESCRIPTION OF METHODS TO BE USED TO IMPLEMENT TRENCHING AND PIPE INSTALLATION
   - LOCATION OF STAGING AREAS
   - METHODS FOR DELIVERING FILTER GRAVEL, CLAY BACKFILL, PIPING AND OTHER CONSTRUCTION MATERIALS TO THEIR FINAL LOCATIONS
   - A DETAILED CONSTRUCTION SCHEDULE AND SEQUENCE
2. MANUFACTURERS CUT SHEETS AND CERTIFICATION FOR ALL PIPING TO BE DELIVERED TO THE SITE.
3. SUPPLIER CERTIFICATION FOR FILTER GRAVEL MATERIAL, INCLUDING GRADATION AND METHODS USED TO ENSURE THAT THE MATERIAL MEETS SPECIFIED REQUIREMENTS.
4. SUPPLIER CERTIFICATION FOR ALL AGGREGATE AND RIP–RAP TO BE DELIVERED TO THE SITE. CERTIFICATION SHOULD INDICATE THAT THE MATERIAL MEETS THE CORRESPONDING GRADATION AND REQUIREMENTS INCLUDING ALDOT SPECIFICATIONS.
5. MATERIAL CHARACTERIZATION TESTING FOR ALL SOIL MATERIALS TO BE RECOMPACTED TO BACKFILL EXCAVATIONS. CHARACTERIZATION TESTING SHALL INCLUDE MOISTURE CONTENT (ATM D 2216), ATTERBERG LIMITS ANALYSIS (ASTM D 4318), PARTICLE SIZE ANALYSIS (ASTM D 422), AND STANDARD PROCTOR TEST (ASTM D 698). MATERIAL SUBMITTED FOR TESTING SHOULD BE A REPRESENTATIVE SAMPLE, AND TEST RESULTS SHALL BE SUBMITTED TO ENGINEER A MINIMUM OF 48 HOURS PRIOR TO THE START OF FILL PLACEMENT.
6. IF IMPORTED FILL IS TO BE USED, CONTRACTOR SHALL SUBMIT BULK SAMPLES OF EACH PROPOSED MATERIAL TO THE ENGINEER. ENGINEER WILL PERFORM SOILS CHARACTERIZATION TESTING OF THE FILL MATERIAL, INCLUDING MOISTURE CONTENT (ASTM D 2216), ATTERBERG LIMITS ANALYSIS (ASTM D 4318), PARTICLE SIZE ANALYSIS (ASTM D 422), AND STANDARD PROCTOR TEST RESULTS (ASTM D 698). SEPARATE CHARACTERIZATION TESTING SHALL BE DONE FOR EACH SEPARATE BORROW SOURCE THAT IS PROPOSED BY THE CONTRACTOR. TEST SAMPLES SHALL BE SUBMITTED TO ENGINEER A MINIMUM OF 96 HOURS PRIOR TO THE START OF FILL PLACEMENT.

REFERENCE SYMBOLS

INDICATES DIRECTION OF CUTTING PLANE

NO. C-34 — LETTER INDICATES SECTION DESIGNATION; DRAWING NO. WHERE SECTION IS DRAWN

NO. C-34/C-23 — LETTER INDICATES SECTION/DETAIL DESIGNATION; DRAWING NO. WHERE SECTION/DETAIL IS DRAWN; DRAWING NO. WHERE SECTION/DETAIL IS TAKEN

NO. 1/W — NUMBER INDICATES DETAIL DESIGNATION; DRAWING NO. WHERE DETAIL IS DRAWN

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ISSUED FOR CONSTRUCTION										

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GENERAL NOTES

ASH POND 4
SEEPAGE REMEDIATION

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
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URS

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TASK COMPLETED BY: | REV NO.

PLOT FACTOR:XX
W_TVA

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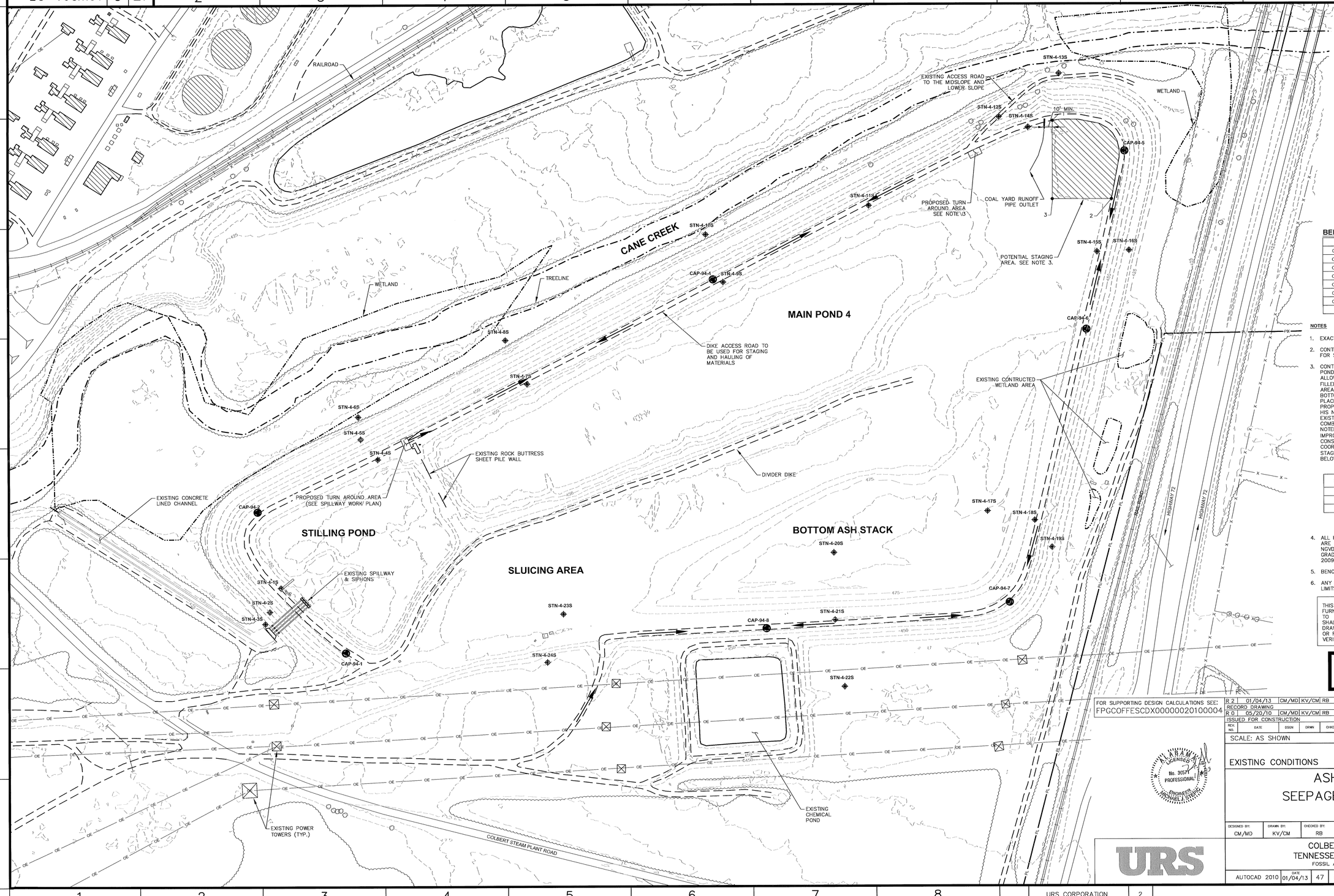

N

0 100 200

SCALE: 1"=100'

LEGEND

- EXISTING VEGETATION
- PL — EXISTING PROPERTY LINE
- X — EXISTING FENCE
- OE — EXISTING OVERHEAD ELECTRIC LINE
- EXISTING HAUL ROAD
- EXISTING CREEK
- EXISTING WETLANDS
- PROPOSED DIRECTION OF HAUL
- EXISTING BENCH MARKS
- EXISTING PIEZOMETERS

BENCHMARKS

BM	NORTHING	EASTING	ELEV.
CAP-94-1	1723412.00	394167.55	460.71
CAP-94-2	1723667.57	394584.41	459.53
CAP-94-4	1722336.05	395268.44	460.88
CAP-94-5	1721139.73	395645.40	460.10
CAP-94-6	1721250.71	395119.15	460.59
CAP-94-7	1721476.07	394313.49	460.41
CAP-94-8	1722183.72	394237.70	461.77

NOTES

1. EXACT LOCATION OF EXISTING UTILITIES TO BE VERIFIED.
2. CONTRACTOR TO COORDINATE HAUL ROUTES AND ACCESS FOR SEEPAGE PROJECT WITH NEEDS OF OTHER PROJECTS.
3. CONTRACTOR MAY USE SOUTHEAST CORNER AREA OF POND FOR STAGING MATERIALS AND EQUIPMENT, AS ALLOWED BY TVA. CORNER AREA WILL LIKELY NEED TO BE FILLED/IMPROVED TO CREATE A DRY AND LEVEL STAGING AREA. CONTRACTOR MAY COORDINATE WITH TVA TO USE BOTTOM ASH FROM STACK FOR FILL. NO FILL SHALL BE PLACED WITHIN 10 FEET OF THE COAL YARD PIPE OUTLET. PROPOSED TURNAROUND AREA BY CONTRACTOR TO SUIT HIS NEEDS. CONTRACTOR TO MODIFY TURNING RADIUS OF EXISTING ACCESS ROAD INTERSECTION AS NECESSARY IN COMBINATION WITH THE PROPOSED TURN AROUND AREA NOTED TO ACCOMMODATE SAFE OPERATIONS. THESE IMPROVEMENTS SHALL BE APPROVED BY TVA'S CONSTRUCTION MANAGER PRIOR TO IMPLEMENTATION. COORDINATES OF THE CORNER POINTS OF THE PROPOSED STAGING/TURNAROUND AREA ARE INCLUDED IN THE TABLE BELOW.

POINT	NORTHING	EASTING
1	1721348.98	395734.30
2	1721177.27	395503.29
3	1721348.98	395503.29

4. ALL HORIZONTAL COORDINATES GIVEN ON THESE DRAWINGS ARE ALABAMA WEST NAD27. ELEVATION DATA ARE IN NGVD 29. BATHYMETRIC CONTOURS AND EXISTING DIKE GRADES ARE BASED ON TVA SURVEYS DATED AUGUST 2009 AND DECEMBER 2011.
5. BENCHMARK COORDINATES PROVIDED BY TVA.
6. ANY EXISTING PIEZOMETERS OR MONITORING WELLS IN THE LIMITS OF WORK SHALL BE PROTECTED.

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SCALE: AS SHOWN EXCEPT AS NOTED

ALABAMA LICENSED No. 30571 PROFESSIONAL ENGINEER MICHAEL J. STRICK

EXISTING CONDITIONS

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SEEPAGE REMEDIATION

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CM/MD	KV/CM	RB	MJS	JCB	MST	JCK

URS

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

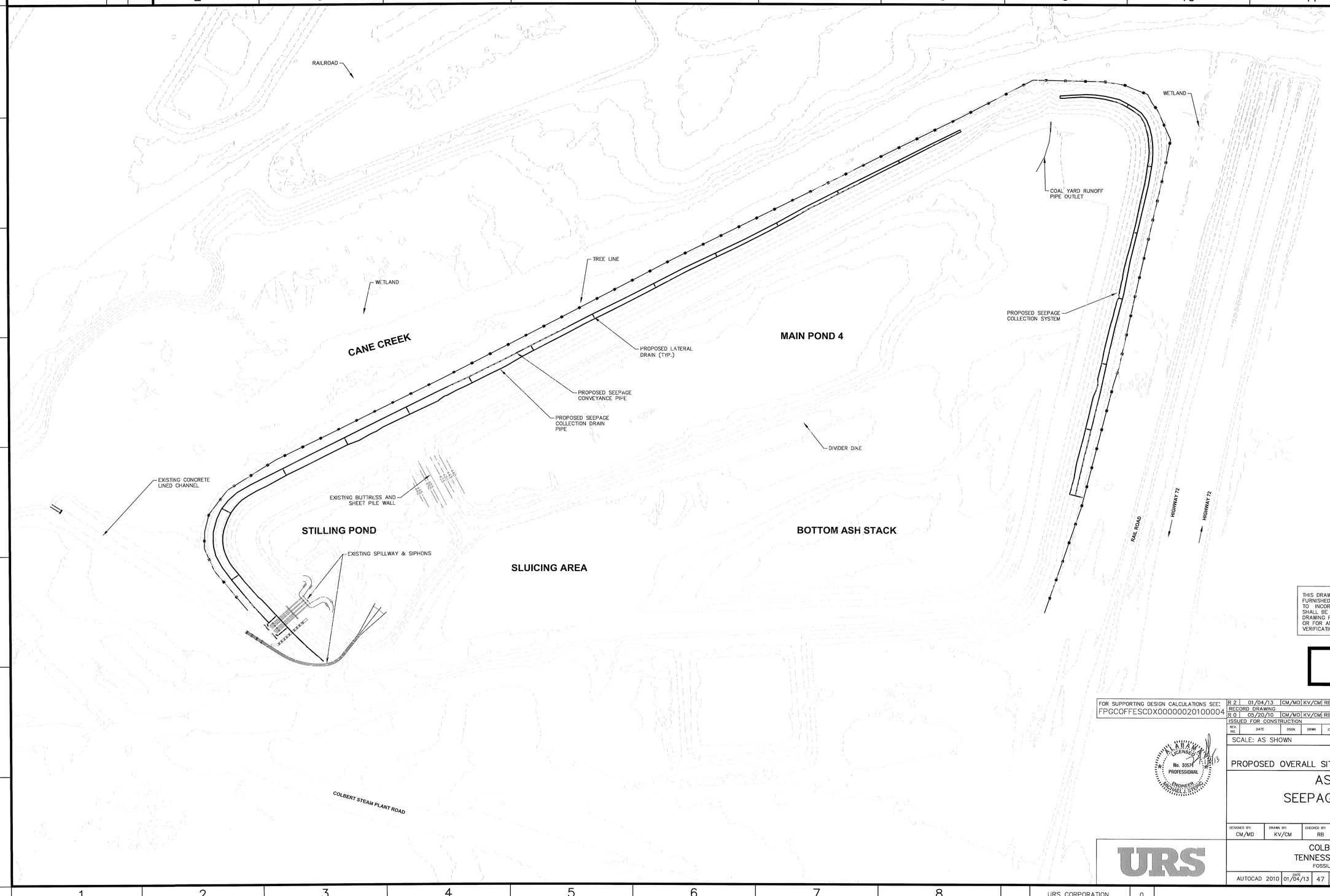
AUTOCAD 2010 | DATE 01/04/13 | 47 | C | 10W291-03 | R 2

URS CORPORATION | 2
TASK COMPLETED BY: | REV NO

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

K:\Projects\TVTVA_31851161\DWGs\CA\Record\Final\03-existing conditions_coord.dwg User:alleen_wenco Jan 11, 2013 - 10:37am DELIVERABLE ID: COLBERT FACILITY-PASR-00003



LEGEND

- EXISTING VEGETATION
- EXISTING PROPERTY LINE
- EXISTING FENCE
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING HAUL ROAD
- EXISTING CREEK
- EXISTING WETLAND
- PROPOSED SILT FENCE (SEE CBMPP)
- EXISTING PIEZOMETERS

N

0 100 200

SCALE: 1"=100'

NOTES

1. INSTALL SILT FENCE AND TEMPORARY DIVERSION AS PER REQUIREMENTS OF CBMPP.

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION.

RECORD DRAWING

FOR SUPPORTING DESIGN CALCULATIONS SEE: FPGCOFFESCDX00000020100004

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 2	01/04/13	CM/MD	KV/CM	RB	MJS	RSH	MST	JCK	203996	J
RECORD DRAWING										
R 0	05/20/10	CM/MD	KV/CM	RB	MJS	JCB	MST	JCK	203996	D
ISSUED FOR CONSTRUCTION										

DISCIPLINE INTERFACE

SCALE: AS SHOWN EXCEPT AS NOTED

ALABAMA LICENSED No. 30571 PROFESSIONAL ENGINEER JAMES S. SIMPSON 3/29/13

PROPOSED OVERALL SITE PLAN

ASH POND 4
SEEPAGE REMEDIATION

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
CM/MD	KV/CM	RB	MJS	JCB	MST	JCK

URS

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

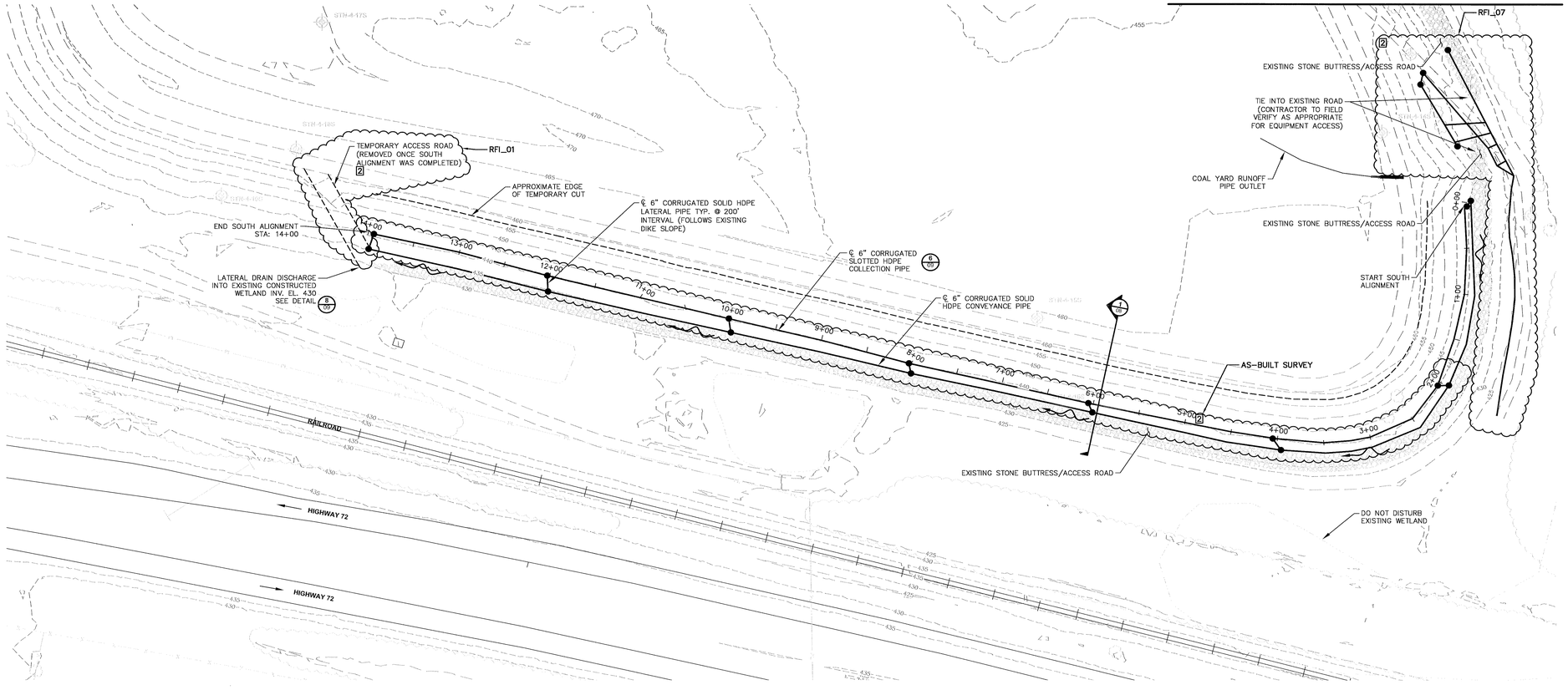
AUTOCAD 2010	DATE 01/04/13	47	C	10W291-04	R 2

URS CORPORATION | 0
TASK COMPLETED BY: | REV NO

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

K:\Projects\TVTIA\3185161\DWGs\C\Record\Final\04-overall plan.dwg User:slleen_yenco Jan 11, 2013 - 10:58am DELIVERABLE ID: COLBERT FACILITY-PASR-00003



LEGEND

- EXISTING VEGETATION
- EXISTING PROPERTY LINE
- EXISTING FENCE
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING HAUL ROAD
- EXISTING WETLAND
- DIRECTION OF FLOW
- EXISTING PIEZOMETERS
- CLEAN OUTS

NOTES

1. BEGINING AT STATION 0+00 AND EVERY 200' THERE AFTER CONTRACTOR SHALL INSTALL TYPICAL CLEANOUTS. SEE DETAIL 3 ON SHEET 08.
2. ALIGNMENT STATIONS BASED ON CENTER LINE OF SEEPAGE COLLECTION PIPE.

Segment	Collection Pipe				Conveyance Pipe			
	Station (ft)	Northing Coordinate	Easting Coordinate	Pipe Invert Elevation (ft)	Northing Coordinate	Easting Coordinate	Pipe Invert Elevation (ft)	2
South Segment	0+00	721341.00	395804.70	438.00	721345.00	395811.90	436.04	AS-BUILT SURVEY
	1+00	721245.43	395805.42		721244.00	395814.90	435.75	
	2+00	721150.00	395776.30	438.07	721143.00	395784.70	435.57	
	3+00	721090.85	395703.50		721080.00	395705.80	435.19	
	4+00	721089.00	395602.90	437.95	721078.00	395601.40	435.07	
	5+00	721107.25	395506.08		721096.00	395503.60	434.70	
	6+00	721128.00	395406.10	438.03	721118.00	395403.90	434.57	
	7+00	721152.56	395311.38		721139.00	395309.30	434.32	
	8+00	721170.00	395212.70	438.02	721161.00	395210.30	434.03	
	9+00	721198.39	395117.93		721183.00	395114.70	433.70	
	10+00	721219.00	395020.50	437.98	721206.00	395017.50	433.53	
	11+00	721242.92	394924.21		721226.00	394920.60	433.29	
	12+00	721266.00	394826.10	438.06	721249.00	394821.90	433.07	
	13+00	721290.58	394730.04		721273.00	394726.00	432.70	
	14+00	721312.00	394634.10	438.00	721296.00	394628.40	432.55	

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION.

RECORD DRAWING

FOR SUPPORTING DESIGN CALCULATIONS SEE: FPGCOFFESCDX0000002010004

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 2	01/04/13	CM/MD	KV/CM	RB	MJS	RSH	MST	JCK	203996	
RECORD DRAWING										
R 0	05/20/10	CM/MD	KV/CM	RB	MJS	JCB	MST	JCK	203996	
ISSUED FOR CONSTRUCTION										

SCALE: AS SHOWN — EXCEPT AS NOTED

ALABAMA LICENSED No. 30571 PROFESSIONAL ENGINEER MICHAEL S. ESTES

PROPOSED SOUTH SEEPAGE PLAN

ASH POND 4
SEEPAGE REMEDIATION

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
CM/MD	KV/CM	RB	MJS	JCB	MST	JCK

URS

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

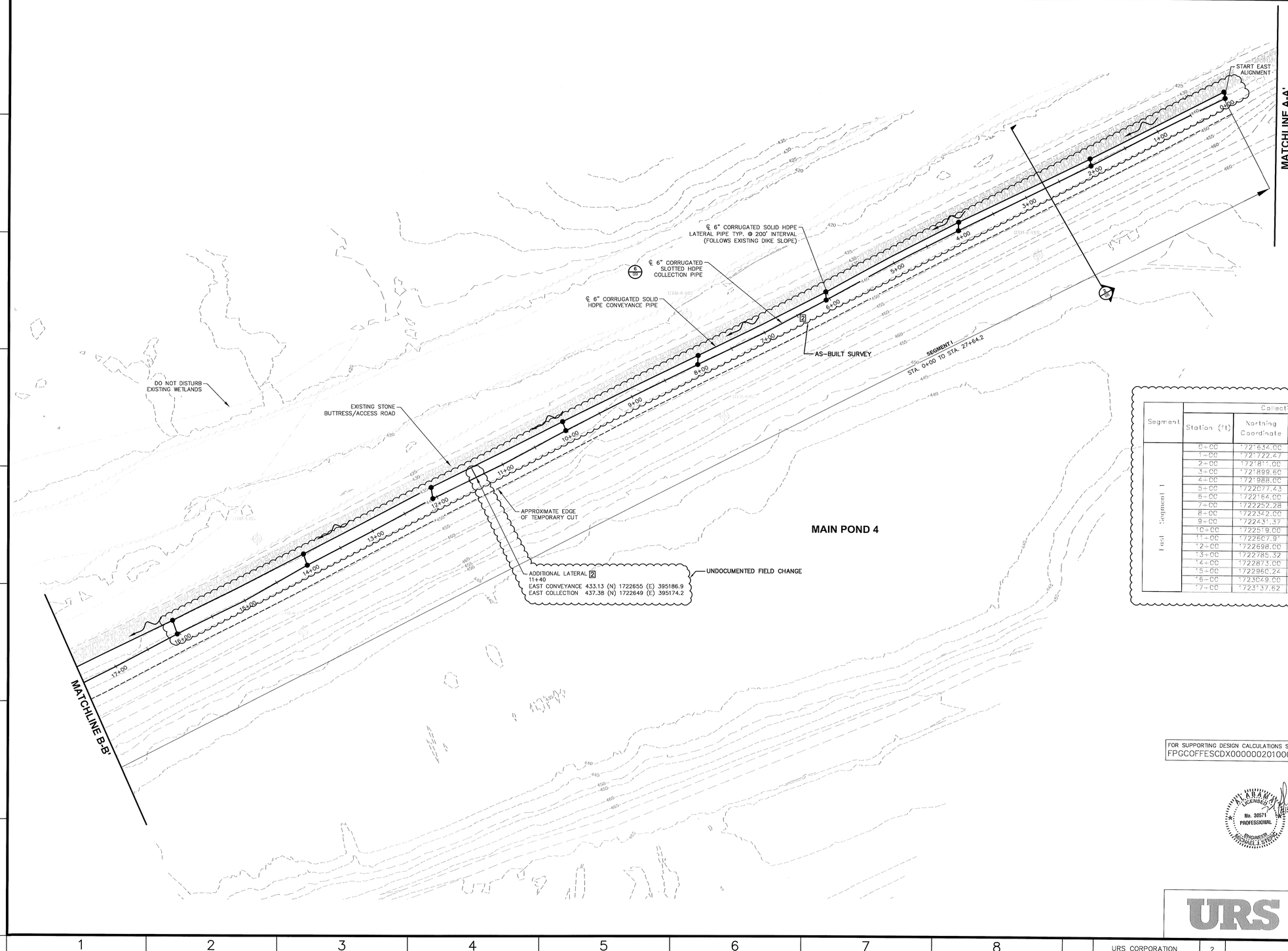
AUTOCAD 2010 | DATE 01/04/13 | 47 | C | 10W291-05 | R 2

URS CORPORATION	2
TASK COMPLETED BY:	REV NO

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

K:\Projects\TVA\3185161\DWGs\C\Record\Final\05-07-site plan.dwg User:aileen_yenco Jan 11, 2013 - 10:40am DELIVERABLE ID: COLBERT FACILITY-PASR-00003



LEGEND

- EXISTING VEGETATION
- OE — EXISTING OVERHEAD ELECTRIC LINE
- EXISTING HAUL ROAD
- EXISTING WETLAND
- DIRECTION OF FLOW
- EXISTING PIEZOMETERS
- CLEAN OUTS

N

0 50 100

SCALE: 1"=50'

NOTES

1. BEGINING AT STATION 0+00 AND EVERY 200' THERE AFTER CONTRACTOR SHALL INSTALL TYPICAL CLEANOUTS. SEE DETAIL 3 ON SHEET 08.
2. ALIGNMENT STATIONS BASED ON CENTER LINE OF SEEPAGE COLLECTION PIPE.

AS-BUILT SURVEY 2

Segment	Collection Pipe				Conveyance Pipe		
	Station (ft)	Northing Coordinate	Easting Coordinate	Pipe Invert Elevation (ft)	Northing Coordinate	Easting Coordinate	Pipe Invert Elevation (ft)
East Segment 1	0+00	1721634.00	395703.40	437.97	1721635.00	395721.10	436.68
	1+00	1721722.47	395657.62		1721726.00	395684.30	435.74
	2+00	1721811.00	395609.60	438.05	1721816.00	395617.50	435.48
	3+00	1721899.60	395564.78		1721904.00	395573.20	435.27
	4+00	1721988.00	395519.30	438.07	1721993.00	395528.80	435.02
	5+00	1722077.43	395473.31		1722082.00	395480.80	434.73
	6+00	1722164.00	395424.00	438.02	1722172.00	395437.20	434.52
	7+00	1722252.28	395376.33		1722258.00	395386.50	434.26
	8+00	1722342.00	395331.50	437.95	1722345.00	395342.90	433.96
	9+00	1722431.37	395287.33		1722437.00	395297.40	433.75
	10+00	1722519.00	395240.70	437.96	1722526.00	395252.70	433.45
	11+00	1722607.97	395193.35		1722619.00	395205.10	433.21
	12+00	1722698.00	395148.00	438.05	1722708.00	395160.10	433.06
	13+00	1722785.32	395101.05		1722794.00	395115.40	432.78
	14+00	1722873.00	395053.90	438.00	1722882.00	395067.80	432.52
	15+00	1722960.24	395004.19		1722973.00	395020.70	432.22
	16+00	1723049.00	394958.80	438.05	1723063.00	394975.10	432.05
	17+00	1723137.62	394912.39		1723149.00	394932.30	431.72

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION.

RECORD DRAWING

FOR SUPPORTING DESIGN CALCULATIONS SEE: FPGCOFFESCDX000000020100004

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APVD	ISSD	PROJECT ID	AS CONST	REV. ISS
R 2	01/04/13	CM/MD	KV/CM	RB	MJS	RSH	MST	JCK	203996		J
RECORD DRAWING											
R 0	05/20/10	CM/MD	KV/CM	RB	MJS	JCB	MST	JCK	203996		D
ISSUED FOR CONSTRUCTION											

DISCIPLINE INTERFACE

SCALE: AS SHOWN EXCEPT AS NOTED

PROPOSED EAST SEEPAGE PLAN STA. 0+00 TO 17+50

ASH POND 4 SEEPAGE REMEDIATION

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
CM/MD	KV/CM	RB	MJS	JCB	MST	JCK

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2010 | DATE 01/04/13 | 47 | C | 10W291-06 | R 2

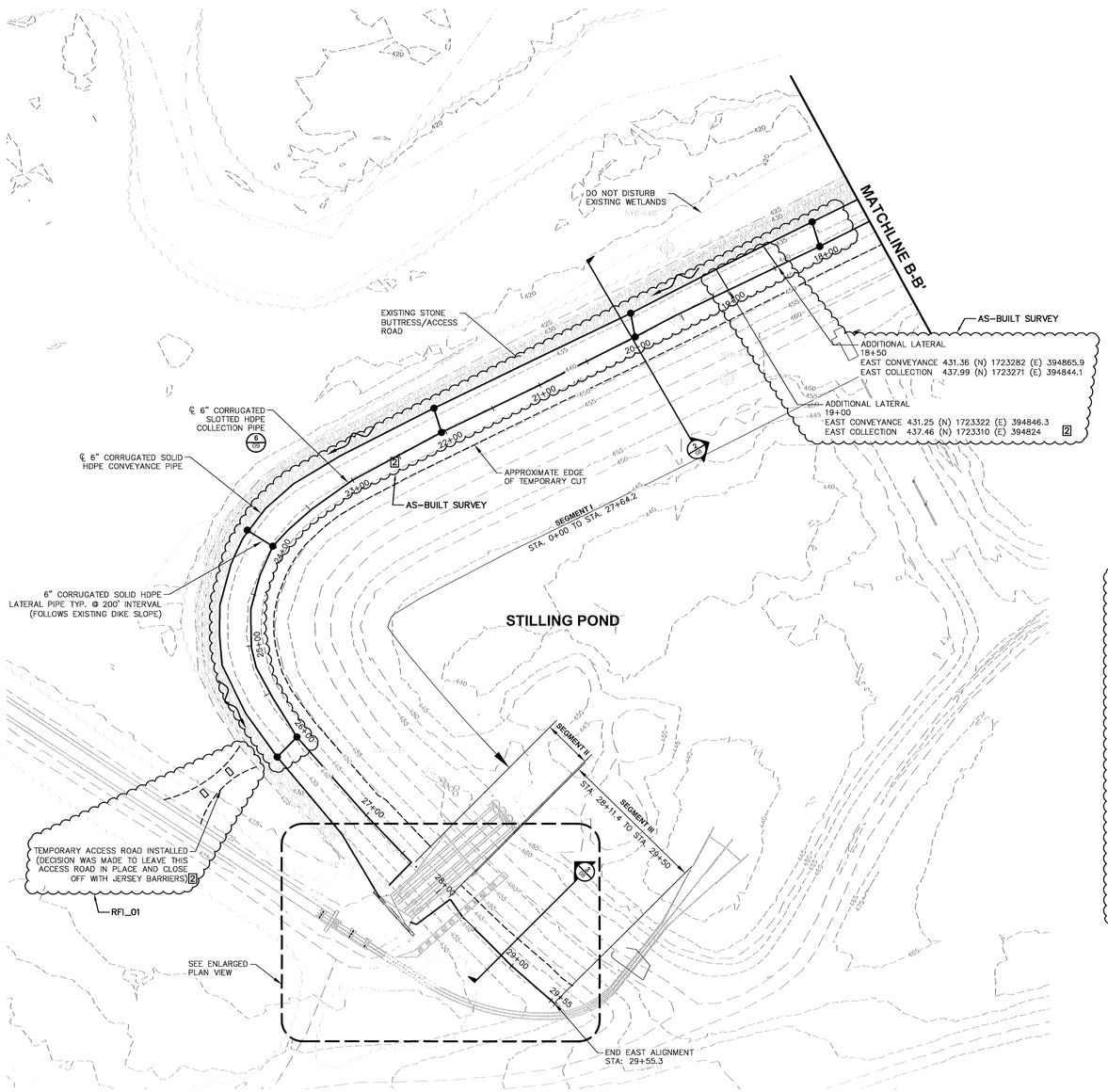
URS

URS CORPORATION | 2
TASK COMPLETED BY: | REV NO

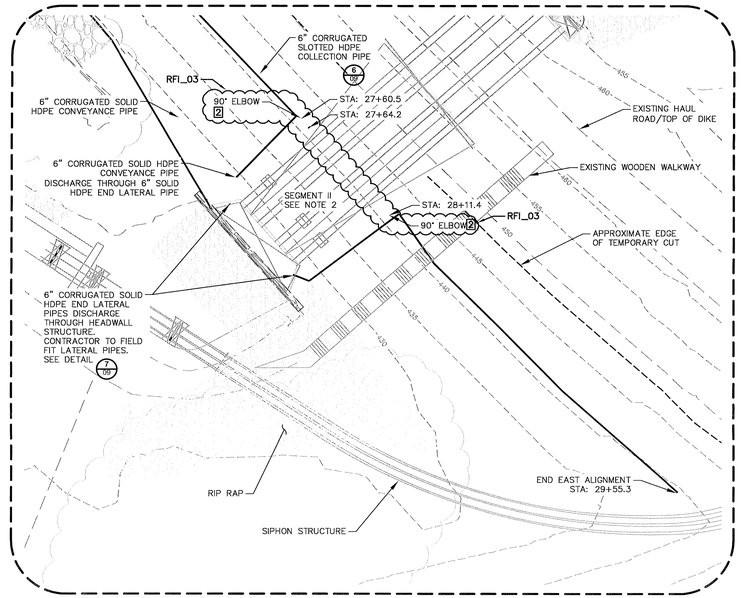
PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

K:\Projects\TVA\38585161\GWSa\C\Record\Final\05-07-site plan.dwg User:aleen_yemco Jan 11, 2013 - 10:40am DELIVERABLE ID: COLBERT FACILITY-P4SR-00003



PLAN VIEW



ENLARGED PLAN VIEW

N
0 20 40
SCALE: 1"=20'

Segment	Station (ft)	Collection Pipe Northing Coordinate	Collection Pipe Easting Coordinate	Collection Pipe Pipe Invert Elevation (ft)	Conveyance Pipe Northing Coordinate	Conveyance Pipe Easting Coordinate	Conveyance Pipe Pipe Invert Elevation (ft)
East Segment 2	18+00	723226.00	394867.20	438.07	723238.00	394888.23	431.52
	19+00	723314.91	394821.56		723322.00	394846.23	431.28
	20+00	723401.00	394779.30	438.02	723411.00	394800.50	431.07
	21+00	723493.53	394732.76		723505.00	394754.20	430.73
	22+00	723582.00	394687.80	438.06	723596.00	394709.90	430.52
	23+00	723671.45	394641.53		723683.00	394664.90	430.29
	24+00	723747.00	394577.94	438.06	723771.00	394595.30	430.05
	25+00	723769.73	394482.11		723796.00	394463.70	429.76
	26+00	723725.00	394395.86	437.99	723745.00	394378.40	429.56
	27+00	723557.84	394320.31		723682.00	394301.53	429.29
	27+64.2	723618.00	394274.20	438.03	723635.00	394252.00	429.02
East Segment 3	28+11.4	723579.00	394238.91	438.02			
	29+00	723520.62	394174.92				
	29+55.3	723483.00	394141.50	437.95			

2 AS-BUILT SURVEY

LEGEND

- EXISTING VEGETATION
- EXISTING PROPERTY LINE
- EXISTING FENCE
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING HAUL ROAD
- EXISTING WETLAND
- DIRECTION OF FLOW
- EXISTING PIEZOMETERS
- CLEAN OUTS

NOTES

1. ALIGNMENT STATIONS BASED ON CENTERLINE OF SEEPAGE COLLECTION PIPE.
2. NO COLLECTION SYSTEM BETWEEN STATION 27+64.2 AND STATION 28+11.4 (SEGMENT II).
3. IN SEGMENT III ONLY SEEPAGE COLLECTION DRAIN TO BE INSTALLED SEE CROSS-SECTION 3 ON SHEET 07.
4. CONTINUE INSTALLATION OF CLEANOUTS EVERY 200' FROM PREVIOUS PLAN DRAWING SEE DETAIL 1 ON SHEET 08.

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION.

RECORD DRAWING

FOR SUPPORTING DESIGN CALCULATIONS SEE: FPGCOFFESCDX000000201000O4

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT NO	AS CONST	REV NO
R 2	01/04/13	CM/MD	KV/CM	RB	MJS	RSH	MST	JCK	203996		J
RECORD DRAWING											
R 0	05/20/10	CM/MD	KV/CM	RB	MJS	JCB	MST	JCK	203996		D
ISSUED FOR CONSTRUCTION											

DISCIPLIN INTERFAC

SCALE: AS SHOWN EXCEPT AS NOTED

PROPOSED EAST SEEPAGE PLAN STA. 17+50 TO 29+55

ASH POND 4
SEEPAGE REMEDIATION

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
CM/MD	KV/CM	RB	MJS	JCB	MST	JCK

URS

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

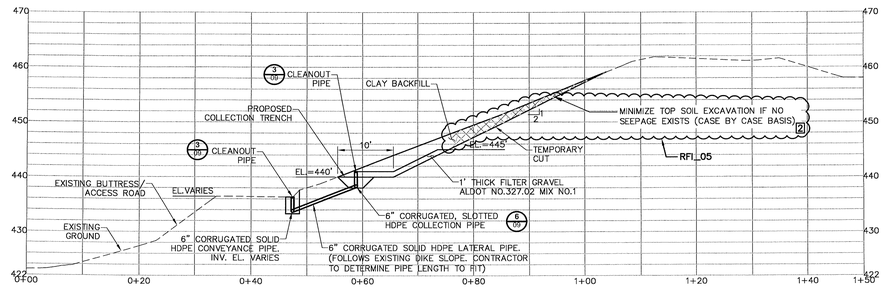
AUTOCAD 2010 | DATE 01/04/13 | 47 | C | 10W291-07 | R 2

URS CORPORATION | 2
TASK COMPLETED BY: | REV NO

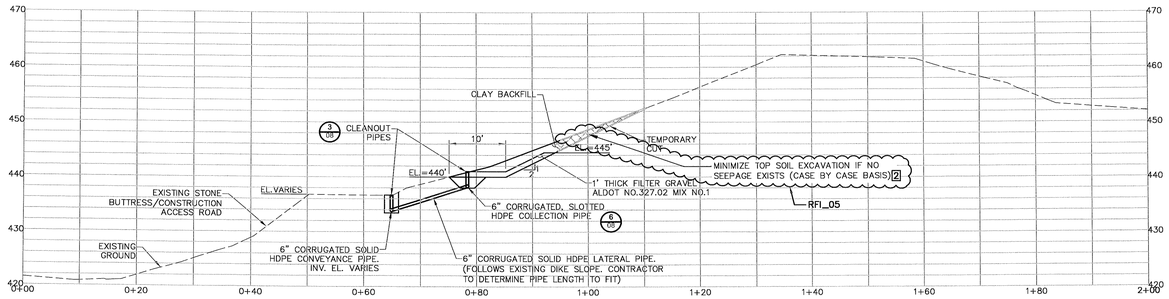
PLOT FACTOR:XX W_TVA

C.A.D. DRAWING DO NOT ALTER MANUALLY

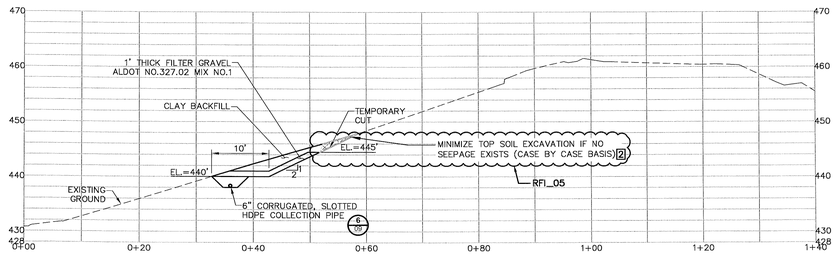
K:\Projects\TVA\3185161\DWGs\C\Records\Final\05-07-site plan.dwg User:aileen_wenco Jan 11, 2013 - 10:41am DELIVERABLE ID: COLBERT FACILITY-P4SR-00003



1 / SC-05 TYPICAL SEEPAGE DIKE SECTION - SOUTH ALIGNMENT
STA. 0+00 TO 14+00



2 / SC-06/07 TYPICAL SEEPAGE DIKE SECTION - EAST ALIGNMENT SEGMENT I
STA. 0+00 TO 27+64.2



3 / SC-07 TYPICAL SEEPAGE DIKE SECTION EAST ALIGNMENT - SEGMENT III
STA. 28+11.4 TO 29+55.3

0 10 20
SCALE: 1"= 10'
VERTICAL EXAGERATION = NONE

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION.

RECORD DRAWING

FOR SUPPORTING DESIGN CALCULATIONS SEE: FPGCOFFESCDX00000020100004

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 2	01/04/13	CM/MD	KV/CM	RB	MJS	RSH	MST	JCK	203996	
RECORD DRAWING										
R 0	05/20/10	CM/MD	KV/CM	RB	MJS	JCB	MST	JCK	203996	
ISSUED FOR CONSTRUCTION										

DISCIPLINE INTERFACE

SCALE: AS SHOWN EXCEPT AS NOTED

TYPICAL DIKE SECTIONS

ASH POND 4
SEEPAGE REMEDIATION

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
CM/MD	KV/CM	RB	MJS	JCB	MST	JCK

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

URS

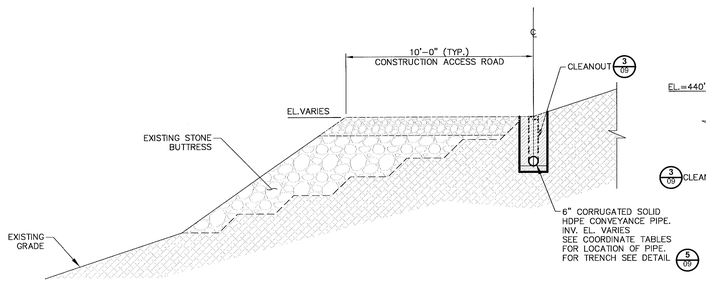
AUTOCAD 2010 | DATE 01/04/13 | 47 | C | 10W291-08 | R 2

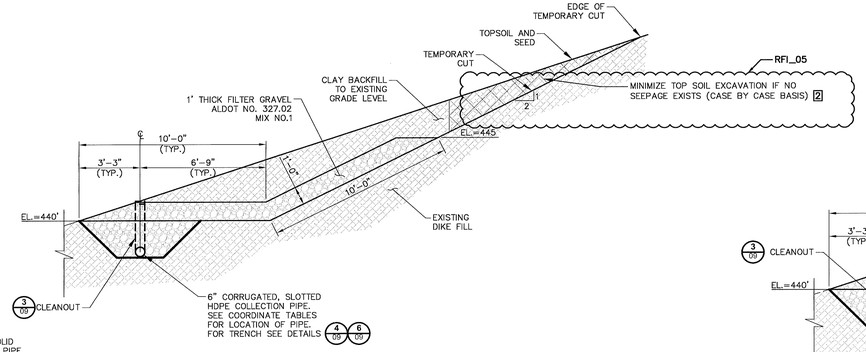
PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

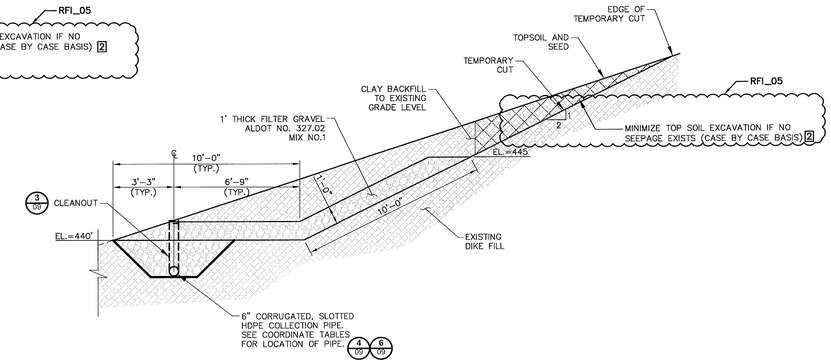
URS CORPORATION | 2
TASK COMPLETED BY: | REV NO

K:\Projects\TVA\38516161\DWGs\C\Record\Final\08-xsections.dwg User:colleen_yenco Jan 11, 2013 - 10:42am DELIVERABLE ID: COLBERT FACILITY-PASH-00003

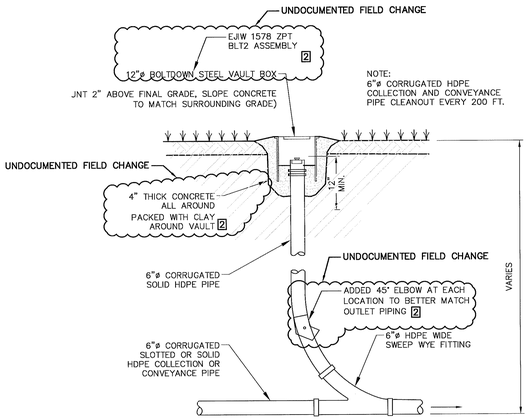




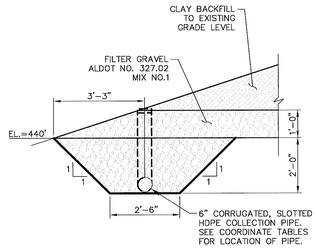
1 08/09 TYPICAL ROAD, CONVEYANCE & COLLECTION TRENCH SECTION - SOUTH ALIGNMENT & EAST ALIGNMENT SEGMENT I
N.T.S.



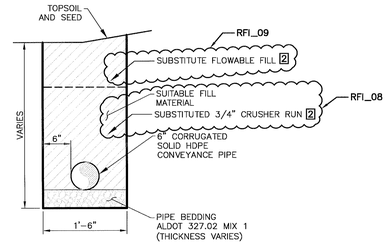
2 08/09 TYPICAL COLLECTION TRENCH SECTION - SEGMENT III
N.T.S.



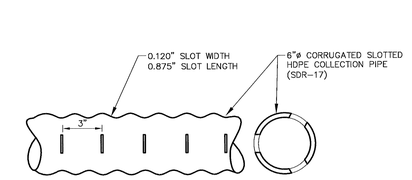
3 08/09 09 PIPE CLEAN-OUT DETAIL
N.T.S.



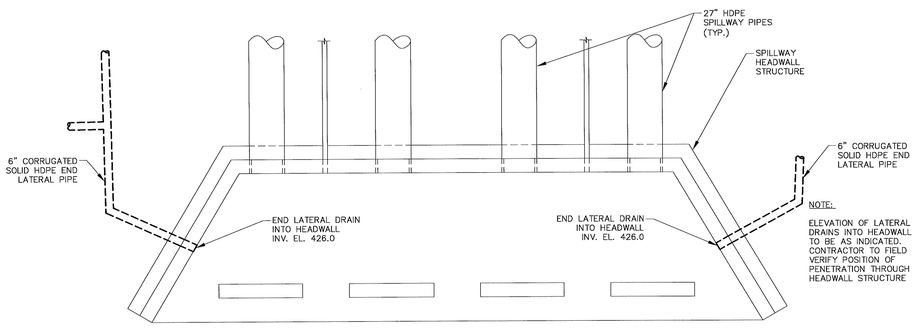
4 09/09 COLLECTION TRENCH DETAIL
N.T.S.



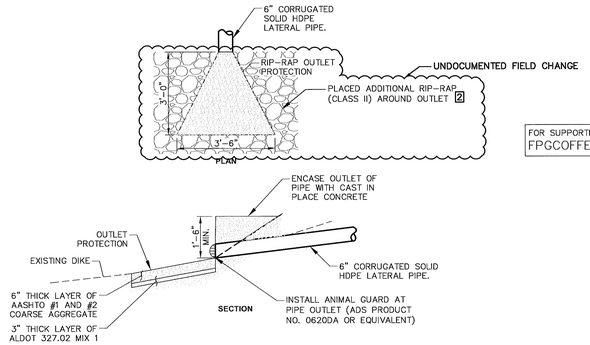
5 08/09 09 CONVEYANCE TRENCH DETAIL
N.T.S.



6 07/09 08 CORRUGATED SLOTTED PIPE DETAIL
N.T.S.



7 09/09 LATERAL DRAIN MEETS OUTLET HEAD WALL DETAIL
N.T.S.



8 05/09 OUTLET PROTECTION DETAILS AT CONSTRUCTED WETLANDS
N.T.S.

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RECORD DRAWING

FOR SUPPORTING DESIGN CALCULATIONS SEE: FPGCOFFESCDX00000020100004

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV CH
R 2	01/04/13	CM/MD	KV/CM	RB	MJS	RSH	MST	JCK	203996		J
R 0	05/20/10	CM/MD	KV/CM	RB	MJS	JCB	MST	JCK	203996		D

RECORD DRAWING
ISSUED FOR CONSTRUCTION

SCALE: AS SHOWN EXCEPT AS NOTED

DETAILS

ASH POND 4 SEEPAGE REMEDIATION

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
CM/MD	KV/CM	RB	MJS	JCB	MST	JCK

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2010 | DATE 01/04/13 | 47 | C | 10W291-09 | R 2

URS CORPORATION | 2
TASK COMPLETED BY: | REV NO

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING DO NOT ALTER MANUALLY

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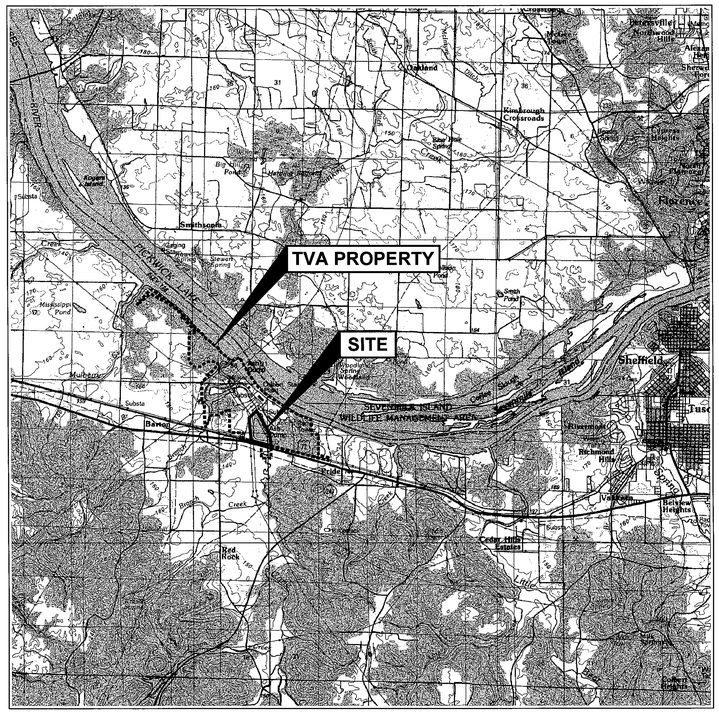
TENNESSEE VALLEY AUTHORITY
COLBERT FOSSIL PLANT - ASH POND 4
HIGH HAZARD REMOVAL & SPILLWAY REPLACEMENT

COLBERT COUNTY, ALABAMA



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SITE VICINITY MAP

0 6000 12000
SCALE: 1"=6000'

DWG. NO.	DWG. DESCRIPTION
10W290-01	TITLE SHEET
10W290-02	GENERAL NOTES
10W290-03	GENERAL NOTES
10W290-04	OVERALL SITE PLAN AND HAUL ROUTE
10W290-05	DIKE LOWERING, SIPHON, AND SPILLWAY PLAN
10W290-06	DIKE LOWERING PLAN AND PROFILE
10W290-07	TYPICAL DIKE SECTIONS AND DETAILS
10W290-08	SIPHON PLAN AND PROFILE
10W290-09	SPILLWAY PLAN AND PROFILE
10W290-10	SIPHON PIPE SECTION AND DETAILS
10W290-11	SPILLWAY STRUCTURE DETAILS
10W290-12	OUTLET HEADWALL DETAILS
10W290-13	FILTER DIAPHRAGM DETAILS
10W290-14	SPILLWAY ABANDONMENT PLAN
10W290-15	DOWNSTREAM IMPROVEMENTS PLAN AND PROFILE
10W290-16	SURVEY CONTROL PLAN
10W290-17	CBMPP-OVERALL SITE
10W290-18	CBMPP-POND 4 IMPROVEMENTS
10W290-19	CBMPP-DETAILS 1
10W290-20	CBMPP-DETAILS 2
10W290-21	A130-2004 WOODEN WALKWAY [0] — SUBMITTAL_05

2 WORKING DAYS
BEFORE YOU DIG
205-353-2636
ALABAMA UTILITIES PROTECTION SERVICE

PREPARED FOR:

TENNESSEE VALLEY AUTHORITY
1101 MARKET STREET
CHATTANOOGA, TN 37402-2801

PREPARED BY:

URS CORPORATION
1375 EUCLID AVENUE, SUITE 600
CLEVELAND, OH 44115
PHONE (216) 622-2400
ATTN: MICHAEL STEPIC, P.E.

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ALABAMA LICENSED No. 30571 PROFESSIONAL ENGINEER MICHAEL W. STEPIC

RECORD DRAWING

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REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST

SCALE: NONE EXCEPT AS NOTED

TITLE SHEET

ASH POND 4 –
HIGH HAZARD REMOVAL
& SPILLWAY REPLACEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SW/SP	TJG/KV	GD/VKG	MJS	JCB	MST	JCK

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2010	DATE 8/10/11	47	C	10W290-01	R 0

URS

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TASK COMPLETED BY:	REV. NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

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WORK TO BE DONE

THE WORK DESCRIBED IN THIS DRAWING SET CONSISTS OF CONSTRUCTION OF PERMANENT SIPHON AND SPILLWAY STRUCTURES, ABANDONMENT OF THE EXISTING SPILLWAY STRUCTURES, AND LOWERING THE NORMAL POOL ELEVATION AND A PORTION OF THE EXISTING DIKE TO REMOVE THE HIGH HAZARD CLASSIFICATION AT ASH POND 4 AT TVA'S COLBERT FOSSIL PLANT. SIPHONS WILL BE INSTALLED TO TEMPORARILY LOWER THE POOL OF THE STILLING POND AND CONVEY THE DAILY PROCESS FLOW DURING CONSTRUCTION AND ALLOW THE NEW PERMANENT SPILLWAY CONSTRUCTION TO TAKE PLACE IN THE DRY. FOLLOWING CONSTRUCTION AND OPERATION OF THE NEW PERMANENT SPILLWAYS, THE EXISTING SPILLWAY STRUCTURES WILL BE ABANDONED BY GROUTING THE OUTLET PIPES AND 10 VERTICAL FEET OF THE RISER.

GENERAL PROVISIONS

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH OSHA SAFETY STANDARDS AND IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL LAWS AND TVA REQUIREMENTS.
2. ENGINEER REFERS TO URS CORPORATION, WHICH HAS BEEN CONTRACTED BY TVA FOR CONSTRUCTION QUALITY ASSURANCE FOR THE DURATION OF THE PROJECT.
3. WHENEVER REFERENCE IS MADE TO THE ALABAMA DEPARTMENT OF TRANSPORTATION (ALDOT) STANDARD SPECIFICATIONS, AMERICAN CONCRETE INSTITUTE(ACI), AMERICAN WATER WORKS ASSOCIATION, AMERICAN SOCIETY OF TESTING AND MATERIALS (ASTM) AND OTHER PUBLISHED STANDARDS OR SPECIFICATIONS, IT SHALL MEAN THE LATEST VERSION IN ITS ENTIRETY.
4. THE CONTRACTOR SHALL SECURE THE LATEST EDITION OF ALABAMA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS WHEN PERFORMING WORK WHICH IS PRESCRIBED HEREIN. COPIES MAY BE OBTAINED FROM:

   PROPOSALS ENGINEER
   ALABAMA DEPARTMENT OF TRANSPORTATION
   1409 COLISEUM BOULEVARD
   MONTGOMERY, ALABAMA 36130-3050

5. HORIZONTAL AND VERTICAL SURVEY CONTROL EXISTS AT THE SITE. IT SHALL BE THE RESPONSIBILITY OF THE OWNER TO PROVIDE CONTROL POINT INFORMATION TO THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SURVEYING AND STAKING NECESSARY FOR LAYOUT AND CONSTRUCTION OF THE PROJECT.
6. ACCEPTABLE CONSTRUCTION TOLERANCES FROM PLAN DIMENSIONS, ELEVATIONS, AND GRADES SHALL BE AS FOLLOWS:
   - EXCAVATIONS AND FINAL GRADES FOR EARTH SURFACES AND SLOPES: ±0.25 FEET VERTICAL; ±1 FT IN A HORIZONTAL PLANE.
   - RIP RAP: FINAL GRADE ±0.5 FEET, THICKNESS ZERO TO +0.5 FEET; ±1 FT IN A HORIZONTAL PLANE.
   - FINAL GRADE TOP OF DIKE: ZERO TO +0.25 FEET VERTICAL; ±1 FT IN A HORIZONTAL PLANE.
   - CONCRETE SPILLWAY STRUCTURES: ±0.10 FEET, AND ALL STRUCTURES WITHIN 1/2" OF THE SAME ELEVATION. ALL OTHER MEASUREMENTS WITHIN 1/2" OF PLAN DIMENSIONS.
   - STOP LOGS: ALL WITHIN 1/2" OF SAME ELEVATION AND NO MORE THAN 1/8" VARIATION (LEVELNESS) ACROSS A SINGLE STOP LOG.
   - PIPES AND APPURTENANCES: ± 0.10 FEET OF PLAN ELEVATION.
7. NO DEVIATIONS FROM THE PLANS OR APPROVED SHOP DRAWINGS SHALL BE MADE WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE CONTRACTOR SHALL KEEP A RECORD OF ALL DEVIATIONS OF ANY INSTALLATION FROM THAT SHOWN ON THE PLANS, AND ANY DEVIATIONS IN INSTALLATIONS OR FROM APPROVED SHOP DRAWINGS AND PROVIDE COPIES OF THESE RECORDS TO ENGINEER. AT COMPLETION OF THE PROJECT A SET OF FINAL RECORD DRAWINGS SHALL BE PREPARED BY THE ENGINEER TO ENSURE THAT THE OWNER HAS A PERMANENT RECORD OF THE PROJECT AS IT WAS CONSTRUCTED. CONTRACTOR SHALL ASSIST THE ENGINEER WITH ANY MEASUREMENTS OR INTERPRETATIONS NECESSARY FOR PREPARATION OF THE FINAL RECORD DRAWINGS.
8. EXISTING SPILLWAY STRUCTURE SHALL BE KEPT INTACT AND IN AN OPERABLE CONDITIONS UNTIL CONSTRUCTION OF THE NEW SPILLWAY SYSTEM IS COMPLETE. THE CONTRACTOR SHALL CONDUCT ALL WORK IN SUCH A MANNER AS TO PREVENT DAMAGE TO THE EXISTING SPILLWAY STRUCTURE DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE SPILLWAY CAUSED BY THEIR OPERATIONS.
9. UNLESS OTHERWISE INDICATED, THESE DRAWINGS WERE COMPILED USING SURVEY INFORMATION PROVIDED BY TVA. THE MAPPING IS BASED ON HORIZONTAL NORTH AMERICAN DATUM 27 USING THE ALABAMA WEST COORDINATE SYSTEM AND NATIONAL GEODETIC VERTICAL DATUM 29.
10. THE ENGINEER WILL PROVIDE QUALITY ASSURANCE TESTING AND WILL OBSERVE CONSTRUCTION ACTIVITIES, IN ACCORDANCE WITH THE PROJECT-WIDE QUALITY ASSURANCE/QUALITY CONTROL PLAN .

GENERAL SITEWORK REQUIREMENTS

1. ACCESS INTO THE WORK AREA FOR DELIVERY OF EQUIPMENT, MATERIALS AND WORKFORCE SHALL BE REVIEWED DAILY BY THE CONTRACTOR, AND CONTROLLED AS NEEDED TO PREVENT ANY DAMAGE TO THE CREST OR SLOPES OF THE DIKES SURROUNDING THE ASH PONDS. IF EQUIPMENT OR MATERIAL HAULING CAUSES DAMAGE, THE DAMAGE SHALL BE IMMEDIATELY REPAIRED BY THE CONTRACTOR, AND THE METHODS FOR HAULING SHALL BE ALTERED TO PREVENT FURTHER DAMAGE. THE CONTRACTOR SHALL NOT MAKE ANY UNPLANNED EXCAVATIONS INTO THE DIKE WITHOUT THE APPROVAL OF THE OWNER OR THE ENGINEER. DURING CONSTRUCTION THE CONTRACTOR IS RESPONSIBLE FOR PRECAUTIONS REQUIRED TO PROTECT THE INTEGRITY OF THE DIKES, EXISTING SPILLWAY SYSTEM AND APPURTENANCES NEEDED FOR THE SAFE OPERATION OF THE ASH POND.
2. CONTRACTOR SHALL TAKE EVERY PRECAUTION TO ENSURE THAT THERE ARE NO OIL EXCURSIONS INTO THE ASH POND DURING CONSTRUCTION. CONTRACTOR SHALL HAVE OIL CONTROL EQUIPMENT (ABSORBENT BOOMS, ETC) ON SITE AT ALL TIMES. IF OIL IS RELEASED OR OBSERVED DURING CONSTRUCTION, CONTRACTOR SHALL IMMEDIATELY NOTIFY THE PLANT AND DEPLOY OIL CONTROL EQUIPMENT. CONTRACTOR SHALL COORDINATE WITH ENGINEER AND OWNER ON OIL CLEANUP, AS NECESSARY.
3. THE CONTRACTOR SHALL INSTALL, MAINTAIN AND INSPECT SILT FENCE AND OTHER EROSION CONTROL FEATURES AS REQUIRED IN THE CONSTRUCTION BEST MANAGEMENT PRACTICES PLAN (CBMPP). EROSION CONTROL FEATURES SHALL BE INSTALLED PRIOR TO BEGINNING ANY EARTHMOVING ACTIVITIES.
4. WEEKLY DELIVERIES OF CARBON DIOXIDE ARE MADE BY TANKER TRUCK TO THE CO2 SYSTEM LOCATED ON THE EAST DIKE. FULL ACCESS TO DELIVERY VEHICLES MUST BE MAINTAINED THROUGHOUT THE DURATION OF SPILLWAY CONSTRUCTION.
5. OWNER WILL MONITOR PH AND WATER QUALITY AT DISCHARGE TO CANE CREEK THROUGHOUT CONSTRUCTION. CONTRACTOR MAY NEED TO ADJUST CONSTRUCTION PRACTICES IF WATER QUALITY ISSUES ARISE. CONTRACTOR TO COORDINATE WITH TVA AND ENGINEER.
6. APPROXIMATE LOCATIONS FOR STAGING AND STOCKPILE AREAS ARE SHOWN ON THESE DRAWINGS AND IN THE CONSTRUCTION BEST MANAGEMENT PLAN DRAWINGS. HOWEVER, THE CONTRACTOR SHALL COORDINATE WITH THE OWNER TO DETERMINE THE FINAL LOCATION OF STAGING AREAS FOR EQUIPMENT OR MATERIAL STORAGE AND FOR OTHER CONSTRUCTION LAY DOWN ACTIVITY.

POND LEVEL MONITORING AND EMERGENCY PROCEDURES

1. THE OUTLETS OF THE EXISTING SPILLWAYS ARE A PERMITTED DISCHARGE, -OUTFALL 001-, FOR ALABAMA NPDES DISCHARGE PERMIT AL0003867. DURING CONSTRUCTION, WORK IN THE ASH POND MAY CAUSE CHANGES IN PERMITTED EFFLUENT CHARACTERISTICS. THE CONTRACTOR SHALL EXERCISE EVERY REASONABLE PRECAUTION AT ALL TIMES TO PREVENT WATER POLLUTION BY DEPOSITION OF SEDIMENT INTO THE ASH POND.
2. PRIOR TO ACTIVATION OF SIPHONS, THE CONTRACTOR SHALL INSTALL A STAFF GAUGE ON THE EXISTING SPILLWAY TO MONITOR WATER LEVELS. STAFF GAUGE SHALL HAVE CLEARLY IDENTIFIABLE MARKS AT 0.1 FT INTERVALS, AND WHOLE FOOT CALLOUTS GIVING THE ELEVATION OF THE POND. THE GAUGE SHALL BE LOCATED AND CONSTRUCTED SUCH THAT THE POND WATER LEVEL CAN BE OBSERVED FROM A VEHICLE PARKED AT THE PARKING AREA.
3. INITIAL LOWERING OF STILLING POND: THE WATER LEVEL IN THE STILLING POND SHALL BE INITIALLY LOWERED USING THE SIPHONS. SIPHON DISCHARGE SHALL BE ADJUSTED SUCH THAT THE POND LEVEL IS LOWERED AT A RATE OF NO MORE THAN 1 FT PER DAY TO A FINAL ELEVATION OF 447.0 FT. THE INTERIOR SLOPES OF THE POND DIKES SHALL BE MONITORED DURING THE INITIAL LOWERING. IF SIGNS OF INSTABILITY OF THE POND DIKES ARE OBSERVED, POND LOWERING SHALL BE HALTED IMMEDIATELY AND THE ENGINEER SHALL BE NOTIFIED.
4. AFTER INITIAL LOWERING, CONTRACTOR SHALL MONITOR POND LEVEL USING THE STAFF GAUGE CONTINUOUSLY DURING CONSTRUCTION. THE SIPHON DISCHARGE RATE SHALL BE CONTINUOUSLY ADJUSTED TO ACCOUNT FOR POND INFLOWS, SUCH THAT THE WATER LEVEL IN THE STILLING POND REMAINS WITHIN +/- 0.5 FT OF THE CONSTRUCTION OPERATING ELEVATION OF 447.0 FT.

POND LEVEL MONITORING AND EMERGENCY PROCEDURES (CONT'D)

5. THE CONTRACTOR SHALL CONTINUOUSLY MONITOR WEATHER CONDITIONS AND FORECASTS DURING CONSTRUCTION. WHEN SEVERE STORMS ARE PREDICTED, WORKMEN AND EQUIPMENT SHALL BE MOVED OUT OF THE WORK AREAS, AND THE SITE SHALL BE PREPARED AND PROTECTED FOR THE STORM EVENT. THE SITE CREW WILL KEEP AND MAINTAIN A DAILY LOG OF POND LEVEL READINGS DURING AND AFTER STORM EVENTS UNTIL STEADY STATE WATER LEVELS HAVE BEEN REACHED. WATER LEVELS WILL THEN BE MONITORED AT MAXIMUM OF 2 TO 3 HOUR INTERVALS THEREAFTER. THE SIPHON DISCHARGE RATE SHALL BE ADJUSTED TO MAINTAIN WATER LEVEL IN THE STILLING POND WITHIN THE ALLOWED TOLERANCE. MONITORING SHALL BE IMPLEMENTED IN SUCH A MANNER AS TO MAINTAIN SAFETY OF WORKMEN (SUCH AS FROM A VEHICLE PARKED AT THE TOP OF THE POND DIKE).
6. IF MONITORING AND ADJUSTMENT OF SIPHONS CANNOT BE SAFELY PERFORMED DURING VERY LARGE STORM EVENTS, THE WATER LEVEL IN THE STILLING POND MAY RISE TO THE LEVEL OF THE EXISTING MORNING GLORY SPILLWAYS. THESE SPILLWAYS WILL PREVENT OVERTOPPING OF THE POND DIKES. HOWEVER, IN THIS CASE ELEMENTS UNDER CONSTRUCTION MAY BE DAMAGED OR LOST.

EARTHWORK NOTES

1. AREAS WHICH WILL BE EXCAVATED SHALL BE CLEARED OF TREES, STUMPS, BRUSH, PROJECTING ROOTS, WEEDS, LOGS AND OTHER PROTRUDING OBSTRUCTIONS. ALL TREES, STUMPS, BRUSH, PROJECTING ROOTS, WEEDS LOGS, AND PROTRUDING OBSTRUCTIONS SHALL BE CUT TO WITHIN 3 INCHES OF EXISTING GROUND. THE AREA SHALL BE GRUBBED TO A DEPTH OF 6 INCHES TO REMOVE GRASS, ROOTS AND OTHER ORGANIC MATERIAL. ALL CLEARED AND GRUBBED MATERIAL SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT AN APPROVED DISPOSAL SITE AND IN ACCORDANCE WITH APPLICABLE LAWS. IF ENCOUNTERED, TOPSOIL SHALL BE STRIPPED TO A DEPTH OF 4 INCHES. TOPSOIL SHALL BE STORED AT THE DESIGNATED STOCKPILE AREA AS NOTED IN THE CONSTRUCTION BEST MANAGEMENT PRACTICES PLAN (CBMPP) AND AS ALLOWED BY THE OWNER.
2. ALL EXCAVATIONS SHALL BE SLOPED, BENCHED, OR SHORED TO PERMIT SAFE WORKING CONDITIONS PER OSHA REQUIREMENTS FOR PROTECTIVE SYSTEMS (29 CFR 1926.652). EXISTING DIKE MATERIALS SHALL BE CONSIDERED OSHA TYPE C MATERIALS.
3. MAJOR EXCAVATIONS IMPLEMENTED ALONG THE SLOPES OF THE EXISTING DIKE (SUCH AS REQUIRED TO INSTALL THE INLET AND OUTLET STRUCTURES), AND ANY MISCELLANEOUS EXCAVATIONS GREATER THAN 4 FT IN DEPTH THAT WILL REMAIN OPEN FOR A PERIOD OF GREATER THAN 1 WEEK SHALL BE SLOPED AT NO GREATER THAN 2H:1V, UNLESS OTHERWISE ALLOWED BY THE ENGINEER.
4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING DRAINAGEWAYS, SUMP PITS AND PUMPS, OR OTHER METHODS AND PRACTICES TO KEEP EXCAVATIONS IN A DRAINED CONDITION AT ALL TIMES. SURFACES ABOVE EXCAVATIONS SHALL BE GRADED OR PROTECTED SUCH THAT SURFACE RUNOFF IS DIRECTED AWAY FROM OPEN EXCAVATIONS.
5. PRIOR TO PLACING FILLS AGAINST THE INSIDE AND OUTSIDE SLOPES OF THE DIKE, THE BOTTOM SHALL BE BENCHED LEVEL TO PROVIDE A LEVEL SURFACE TO BEGIN THE FILLING ACTIVITIES. SLOPING SURFACES AGAINST WHICH FILL MATERIAL WILL BE PLACED SHALL BE DISCED, BENCHED OR SERRATED, TO ENHANCE BONDING OF THE FILL TO THE EXCAVATION FACE.
6. SUITABLE FILL MATERIALS: SOIL MATERIALS TO BE PLACED AS BACKFILL AGAINST EITHER THE OUTSIDE SLOPE OF THE DIKE, OR TO BACKFILL EXCAVATIONS WITHIN THE DIKE, SHALL CONSIST OF CLAY SOILS THAT EXHIBIT A CLASSIFICATION OF CL, CL-ML, CL-CH, OR CH IN ACCORDANCE WITH ASTM D-2487. THE MATERIAL SHALL BE FREE OF ORGANIC MATTER, TOPSOIL, RUBBISH, DEBRIS, WASTE MATERIALS, AND ROCK PIECES GREATER THAN 3 INCHES (MAXIMUM DIMENSION) IN SIZE, AND SHALL BE AT A MOISTURE CONTENT THAT IS SUITABLE FOR ACCEPTABLE COMPACTION, AS REQUIRED HEREIN. EXISTING SOILS REMOVED FROM THE EXCAVATIONS MAY BE REUSED AS FILL, TO THE EXTENT THAT THEY MEET THE REQUIREMENTS GIVEN HEREIN.
7. NO MATERIAL SHALL BE PLACED IN ANY SECTION OF THE EMBANKMENT UNTIL THE FOUNDATION FOR THAT SECTION H AS BEEN APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL KEEP THE FOUNDATION AND SUBGRADE FREE FROM WATER OR UNACCEPTABLE MATERIALS AFTER FILL OPERATIONS HAVE STARTED.
8. NEW FILL SHALL NOT BE PLACED ON SUBGRADES OF EXISTING SOILS OR PREVIOUSLY PLACED FILL LAYERS, IF IN THE OPINION OF THE ENGINEER THE SUBGRADE IS UNSUITABLE. SUBGRADE SHALL BE REWORKED OR REPLACED TO THE SATISFACTION OF THE ENGINEER, PRIOR TO PLACEMENT OF ADDITIONAL FILLS.
9. COMPACTION REQUIREMENTS: FILL MATERIALS SHALL BE PLACED AND SPREAD IN HORIZONTAL LOOSE LIFTS THAT DO NOT EXCEED 8 INCHES IN THICKNESS. EACH LIFT SHALL BE THOROUGHLY COMPACTED TO ACHIEVE A MINIMUM DENSITY OF 98% OF ITS MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-698 (CONTRACTOR TO PERFORM PROCTOR TESTING AND SUBMIT RESULTS TO ENGINEER). THE MOISTURE CONTENT DURING COMPACTION SHALL BE WITHIN A RANGE OF 0 TO +3 PERCENT OF THE OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D-698. FIELD COMPACTION TESTS, BY THE ENGINEER, SHALL BE PERFORMED ON EACH LIFT TO VERIFY THAT SPECIFIED LEVELS OF COMPACTION ARE ACHIEVED.
10. MATERIAL THAT IS PLACED ADJACENT TO AND LESS THAN 3 FEET ABOVE THE TOP OF SPILLWAY PIPES SHALL BE COMPACTED USING LIGHTWEIGHT COMPACTORS. COMPACTION OF FILLS WITHIN 5 FT OF ANY STRUCTURE (WALLS, SLABS, ETC) SHALL BE PERFORMED WITH LIGHTWEIGHT COMPACTION EQUIPMENT.
11. RIP-RAP: RIPRAP SHALL COMPLY WITH SECTION 610 OF THE ALDOT SPECIFICATIONS. THE CONTRACTOR SHALL INSTALL LOOSE RIPRAP OF THE TYPE AND QUANTITY SPECIFIED, AT THE LOCATIONS SHOWN IN THE PLANS
12. DIKE CREST TREATMENT: WITHIN THE AREA OF THE SPILLWAY AND DIKE LOWERING, THE FINAL TOP OF DIKE SHALL BE SURFACED ACROSS THE ENTIRE CREST WIDTH USING A LAYER OF COMPACTED NO. 57 STONE AGGREGATE BASE MEETING REQUIREMENTS OF SECTION 430 OF THE ALDOT STANDARD SPECIFICATIONS. PRIOR TO PLACEMENT OF THE AGGREGATE BASE, THE SURFACE OF THE SUBGRADE SHALL BE PROOFROLLED USING A DUMP TRUCK OR OTHER PNEUMATIC-TIRED PIECE OF EQUIPMENT WEIGHING A MINIMUM OF 25 TONS AND WITH MINIMUM TIRE PRESSURE OF 90 PSI. THE ENGINEER WILL OBSERVE THE PROOFROLL. AREAS OF SUBGRADE THAT ARE DEEMED DEFICIENT BY THE ENGINEER SHALL BE REPAIRED PRIOR TO PLACEMENT OF THE STONE BASE, AS REQUIRED IN THESE DRAWINGS.
13. AREAS OF THE DOWNSTREAM DIKE SLOPE THAT ARE DISTURBED DURING CONSTRUCTION SHALL BE FINISHED TO PRECONSTRUCTION GRADES AND TO A SMOOTH AND COMPACT SURFACE AND REVEGETATED. SEEDBED PREPARATION, FERTILIZING, SEEDING, AND MULCHING SHALL BE IN ACCORDANCE WITH TVA'S T-1 CONSTRUCTION SPECIFICATIONS.
14. EXISTING TOPSOIL THAT IS REMOVED AND STOCKPILED SHALL BE REUSED TO THE EXTENT POSSIBLE.
15. RIPRAP SHALL BE PLACED BY MECHANICAL MEANS USING AN EXCAVATOR OR LOADER. THE MAXIMUM ALLOWABLE DROP HEIGHT FOR RIPRAP PLACEMENT IS 2 FEET (1 FT WHEN DROPPING DIRECTLY ONTO A GEOTEXTILE). THE ROCK SHALL BE PLACED TO THE DEPTHS AND EXTENTS SHOWN IN THE DRAWINGS. THE SURFACE OF THE LINING, UPON COMPLETION, SHALL BE GRADED AS PRACTICABLE INTO FINAL POSITION TO ENSURE PROPER THICKNESS AND A UNIFORM SURFACE. LARGER ROCKS SHALL BE UNIFORMLY DISTRIBUTED WITH THE SMALL ROCKS AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER ROCKS.

SIPHON SPILLWAYS

1. CONTRACTOR IS RESPONSIBLE FOR SELECTING AND PROVIDING A SUITABLE PUMP TO PRIME THE SIPHON SYSTEM. THE PUMP SHALL BE AVAILABLE ON SITE FOR THE DURATION OF CONSTRUCTION.
2. CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR SIPHON SUPPORT STRUCTURES AND OBTAIN ENGINEER APPROVAL PRIOR TO CONSTRUCTION.
3. PRESSURE TEST ALL SIPHON PIPING AS DESCRIBED IN SECTION ENTITLED "HDPE PIPE".
4. SIPHON PIPING AT DOWNSTREAM END (DISCHARGE INTO EXISTING CONCRETE CHANNEL TO CANE CREEK) WILL BE TEMPORARILY EXTENDED DURING CONSTRUCTION PERIOD. AFTER CONSTRUCTION, REMOVE PORTIONS OF SIPHONS INDICATED IN THESE DRAWINGS. REMAINDER OF SIPHON SYSTEM TO REMAIN IN PLACE PERMANENTLY AFTER CONSTRUCTION.
5. SPECIFICATIONS FOR GATE VALVES. ORBINOX GT SERIES 20 GATE VALVE (8) — RFI_01
6. GATE OPERATORS SHALL BE HAND WHEEL TYPE OPERATORS AND LOCATED ADJACENT TO THE PLATFORM FOR EASE OF OPERATION.

CONCRETE STRUCTURE CONSTRUCTION

1. THE SPILLWAY AND HEADWALL STRUCTURES SHALL BE CAST-IN-PLACE CONCRETE IN ACCORDANCE WITH THE SPECIFICATIONS BELOW.
2. CONNECTION OF 27" HDPE PIPE TO CONCRETE STRUCTURES SHALL BE MADE USING CAST-IN CONNECTOR, CAST-A-SEAL 802 FROM PRESS-SEAL CORPORATION, OR APPROVED EQUAL. CONTRACTOR TO FOLLOW ALL MANUFACTURER INSTRUCTIONS AND SPECIFICATIONS WHEN INSTALLING.
3. WHERE ANCHOR BOLTS ARE SPECIFIED TO ATTACH METAL ELEMENTS TO CONCRETE, ANCHORS SHALL BE GALVANIZED STEEL ADHESIVE TYPE CONCRETE ANCHORS THAT ARE INSTALLED INTO HOLES DRILLED AFTER THE UNIT IS CAST. MINIMUM EMBEDMENT SHALL BE 6 INCHES. DRILL HOLES SHALL BE OF THE DIAMETER RECOMMENDED BY THE MANUFACTURER AND SHALL BE THOROUGHLY CLEANED PRIOR TO INSTALLING ANCHORS AND ANCHORS SHALL BE INSTALLED PER MANUFACTURER'S DIRECTIONS.
4. IT IS INTENDED TO KEEP THE EXISTING SPILLWAYS SERVICEABLE FOR THE LONGEST TIME POSSIBLE DURING CONSTRUCTION. EXCAVATIONS MADE FOR THE NEW SPILLWAY STRUCTURE SHALL BE CONFIGURED SUCH THAT THE SOUTH EDGE OF EXCAVATION REMAINS AT LEAST 30 FT AWAY FROM THE EXISTING SPILLWAYS. EXCAVATION FOR AND INSTALLATION OF THE RIP-RAP APPROACH CHANNEL TO THE NEW SPILLWAY SHALL BE IMPLEMENTED AFTER THE END OF SPILLWAY STRUCTURE CONSTRUCTION AND BACKFILL.

STOP LOGS

1. THE CONTRACTOR SHALL FURNISH FIBERGLASS REINFORCED PLASTIC (FRP) STOP LOGS DESIGNED TO WITHSTAND A MAXIMUM DIFFERENTIAL HEAD OF 6 FEET.
2. STOP LOGS LEAK RATE SHALL BE IN ACCORDANCE WITH AWWA C563 DURING THE WARRANTY PERIOD (2 YEARS).
3. THE STOP LOG SUPPLIER SHALL PROVIDE TWO SETS OF SHOP DRAWINGS FOR APPROVAL PRIOR TO FABRICATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING DIMENSIONS.
4. STOP LOGS AND GUIDE FRAMES SHOWN ON THESE PLANS ARE FOR CONCEPTUAL PURPOSE. THE CONTRACTOR WILL BE REQUIRED TO FURNISH FIBERGLASS REINFORCED PLASTIC (FRP) STOP LOGS DESIGNED TO WITHSTAND A MAXIMUM DIFFERENTIAL HEAD OF 6 FEET. STOPLOGS SHALL BE AS MANUFACTURED BY PLASTI-FAB OR ENGINEER APPROVED EQUIVALENT.
5. THE STOP LOG COVER SHALL BE FABRICATED SO AS TO TOTALLY SURROUND THE INTERNAL STRUCTURAL MATRIX AND PROTECT IT AGAINST CORROSION FROM MOISTURE OR CHEMICAL DETERIORATION. STOP LOGS SHALL BE DESIGNED SO THAT THE MAXIMUM FIBER STRESS (ULTIMATE OR YIELD, WHICHEVER APPLIES) DOES NO EXCEED 2.5 TIMES THE WORKING STRESS. STOP LOGS SHALL BE SUITABLY REINFORCED TO WITHSTAND THE MAXIMUM SEATING HEAD WITH A DEFLECTION LESS THAN ¼ INCH. STOP LOG COVERS THAT ARE FABRICATED FROM PRESSED OR LAMINATED SHEET MATERIAL AND GLUED TO A SUBSTRUCTURE SHALL NOT BE ACCEPTABLE.
6. ALL STOP LOGS SHALL BE FLAT AND LEVEL. WARPAGE THROUGHOUT THE ENTIRE STOP LOG SHALL NOT PRODUCE A CROWN OF MORE THAN 1/16 INCH IN ANY DIRECTION. VISUAL INSPECTION FOR DEFECTS SHALL BE MADE WITHOUT THE AID OF MAGNIFICATION. DEFECTS SHALL BE CLASSIFIED AS TO TYPE AND LEVEL AS IN TABLE 1 OF ANSI / ASTM D2563-0, APPROVED 1977, OR ANY SUBSEQUENT REVISION.
7. THE STOP LOGS SHALL BE EQUIPPED WITH ELASTOMERIC BOTTOM SEALS TO SEAL BETWEEN THE LOGS. A SPECIAL LABYRINTH SEAL SHALL ALSO BE FASTENED TO THE GUIDE TO FORM A WATERTIGHT JOINT WITH THE STOP LOGS. SEALS SHALL BE MADE OF MOLDED OR EXTRUDE VIRGIN NEOPRENE HAVING A HARDNESS OF 55 - 65 SHORE A DUROMETER, CONFORMING TO ASTM D-2000, WITH A MAXIMUM COMPRESSION SET OF 25% AND LOW TEMPERATURE BRITTLENESS TO MEET SUFFIX F-17 (-40 DEGREES F). GUIDES SHALL BE STYLED FOR WALL MOUNTING AS SHOWN ON THESE PLANS. GUIDES SHALL BE FABRICATED FROM T-304 STAINLESS STEEL OR FIBERGLASS AND SHALL HAVE A SLOT SUITABLE FOR MATING WITH THE STOP LOG. GUIDES TO BE BOLTED TO THE HEAD WALL SHALL BE EQUIPPED WITH HEAVY DUTY MOUNTING ANGLE FOR EASE OF MOUNTING TO THE CHANNEL WALL BY MEANS OF T-304 STAINLESS STEEL ANCHOR BOLTS.
8. GUIDES SHALL BE FITTED WITH A NEOPRENE SEAL HAVING TWO RAISED SEATING POINTS FASTENED TO THE GUIDE WITH A UHMW CLAMPING BAR AND STAINLESS STEEL FLAT HEAD MACHINE SCREWS. SEALS SHALL BE ON EACH SIDE OF THE GUIDE GROOVE.
9. STOP LOG LEAK SHALL NOT EXCEED 0.20 GPM / FT OF WETTED PERIMETER DURING THE WARRANTY PERIOD (2 YEARS).
10. THE STOP LOG SUPPLIER SHALL PROVIDE TWO SETS OF SHOP DRAWING FOR CONTRACTOR AND ENGINEER APPROVAL PRIOR TO FABRICATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL DIMENSIONS. PRIOR TO DELIVERY, THE CONTRACTOR SHALL SUBMIT DOCUMENTATION FROM THE SUPPLIER REGARDING ACCEPTABILITY OF THE SUBJECT MATERIALS FOR THE PROJECT TO THE QC MANAGER AND THAT THE SUPPLIED STOPLOGS MEET THE LEAKAGE RATE SPECIFICATION IN THE CONSTRUCTION PLANS.
11. AS THE POOL LEVEL IS RAISED TO AN ELEVATION JUST BELOW THE TOP STOPLOG CREST, THE CONTRACTOR SHALL CONFIRM THAT THE STOPLOGS MEET THE LEAKAGE RATE SPECIFICATION BY CONDUCTING LEAKAGE TESTING OF INSTALLED STOPLOGS. ANY OPENINGS NOT MEETING THE LEAKAGE RATE SPECIFICATIONS SHALL BE REPAIRED BY THE SUPPLIER. THE CONTRACTOR SHALL PROVIDE FOUR (4) ADDITIONAL STOPLOGS IN ADDITION TO THE 16 DEPICTED ON THESE PLANS THAT WILL REMAIN ONSITE FOLLOWING CONSTRUCTION TO BE USED FOR TEMPORARILY SHUTTING OFF FLOW TO SELECTED STRUCTURES FOR INSPECTION AND MAINTENANCE PURPOSES.

STRUCTURAL GENERAL NOTES

1. IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE TO INSURE THE SAFETY OF THE STRUCTURE, ITS COMPONENT PARTS, AND WORKMEN AND EQUIPMENT DURING ERECTION. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE-DOWNS MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER COMPLETION OF THE PROJECT.
2. ALL DIMENSIONS AND ELEVATIONS SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE VERIFIED BY THE CONTRACTOR.
3. NO STRUCTURAL CHANGES FROM THE APPROVED PLANS SHALL BE MADE IN THE FIELD UNLESS, PRIOR TO MAKING CHANGES, WRITTEN APPROVAL IS OBTAINED FROM THE ENGINEER. IF CHANGES ARE MADE WITHOUT WRITTEN APPROVAL SUCH CHANGES SHALL BE THE LEGAL AND FINANCIAL RESPONSIBILITY OF THE PARTY MAKING THE CHANGE.
4. STRUCTURAL DESIGN SHOWN ON THESE PLANS DO NOT INCLUDE CONSTRUCTION LOADINGS. IF THE CONTRACTOR'S MEANS AND METHODS WILL APPLY SIGNIFICANT SURCHARGE LOADS, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INFORM THE ENGINEER AHEAD OF TIME AND OBTAIN APPROVAL PRIOR TO USING SUCH MEANS AND METHODS.

CAST-IN-PLACE CONCRETE

1. CAST_IN_PLACE CONCRETE WORK SHALL CONFORM TO THE AMERICAN CONCRETE INSTITUTE CODES AND STANDARDS. ACI 301_96 "STANDARD SPECIFICATIONS FOR STRUCTURAL CONCRETE" IS HEREBY MADE A PART OF THESE DRAWINGS. ALL CONCRETE CONSTRUCTION SHALL CONFORM TO ACI 301_96, EXCEPT AS EXPLICITLY MODIFIED HEREIN.
2. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH ACI 318-83, -THE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE-.
3. CONCRETE SHALL HAVE THE FOLLOWING MINIMUM COMPRESSIVE STRENGTHS AT 28 DAYS:

   A. 4000 PSI WITH AN ENTRAINED AIR ADMIXTURE CONFORMING WITH ASTM C260 FOR ALL CONCRETE. THE AMOUNT OF ENTRAINED AIR SHALL BE 6% ± 1%.

4. SLUMP OF CONCRETE AT THE POINT OF PLACEMENT SHALL BE 4" +/- 1".
5. REINFORCING BARS TO BE ASTM A615, GRADE 60 KSI YIELD STRENGTH.
6. TACK WELDING OF THE REINFORCING SHALL NOT BE PERMITTED.
7. CALCIUM CHLORIDE SHALL NOT BE PERMITTED NOR SHALL ANY ADMIXTURE CONTAINING CALCIUM CHLORIDE BE PERMITTED.

CAST-IN-PLACE CONCRETE (CONT'D)

8. ALL CONCRETE SHALL CONTAIN A WATER REDUCING ADMIXTURE CONFORMING TO ASTM C494, TYPE A, F OR G.
9. ALUMINUM PIPE SHALL NOT BE USED WITH CONCRETE PUMPS.
10. CONCRETE SHALL BE DISCHARGED AT THE SITE WITHIN 1_1/2 HOURS AFTER WATER HAS BEEN ADDED TO THE CEMENT AND AGGREGATES. ADDITION OF WATER TO THE MIX AT THE PROJECT SITE WILL NOT BE ALLOWED. ALL WATER MUST BE ADDED AT THE BATCH PLANT.
11. REINFORCING BARS REQUIRED FOR PROPER SUPPORT OF PRINCIPAL REINFORCING SHALL BE DETAILED AND SUPPLIED BY THE CONTRACTOR WHETHER OR NOT THEY ARE INDICATED ON THE DRAWINGS. THE MINIMUM BAR SIZE SHALL BE #4 AND MAXIMUM SPACING SHALL BE 36" ON CENTER. WELDED WIRE FABRIC SHALL NOT BE USED FOR THE SUPPORT OF PRINCIPAL REINFORCING. CON

GRADED FILTER/FILTER DIAPHRAGM

1. FILTERS SHALL BE INSTALLED AS SOON AS PRACTICABLE FOLLOWING GROUTING OPERATIONS, AND AS DESCRIBED USING THE CONSTRUCTION SEQUENCE OUTLINED ON THESE DRAWINGS.
2. FILTER GRAVEL MATERIAL USED AT THE SPILLWAY OUTLET PIPES SHALL MEET ALDOT NO. 327.02 MIX NO. 1 FILTER GRAVEL SPECIFICATIONS.

CLOSED CIRCUIT TELEVISION (CCTV)

1. AFTER CLEANING AND PRIOR TO FILLING THE EXISTING SPILLWAY PIPES WITH GROUT, THE SPILLWAY PIPES ARE TO BE INSPECTED VIA A CLOSED CIRCUIT TELEVISION (CCTV). THE INSPECTION SHALL BE CONDUCTED IN SUCH A MANNER AS TO DETERMINE THAT THE LINE IS CLEAN AND TO LOCATE LEAKING JOINTS, BREAKS, AND FAULTS IN THE PIPE. TELEVISION CAMERA MOVEMENT SHALL BE HALTED AT EACH VISIBLE POINT SOURCE OF INFILTRATION/INFLOW.
2. IF AT ANYTIME THE PIPE IS FOUND TO NOT BE CLEAN, THE CCTV WILL BE REMOVED AND THE CONTRACTOR SHALL RE-CLEAN THE PIPE UNTIL VIDEO FOOTAGE SHOWS THAT IT HAD BEEN ADEQUATELY CLEANED.
3. MINIMUM CCTV SPEED SHALL BE 10 FEET PER MINUTE.
4. THE CCTV TRUCK SHALL HAVE CERTIFIED PIPELINE ASSESSMENT AND CERTIFICATION PROGRAM (PACP) SOFTWARE (CURRENT VERSION IS 4.4 OR NEWER). THE CAMERA OPERATOR SHALL ALSO BE CERTIFIED.
5. THE PIPE INSPECTIONS PERFORMED SHALL BE CAPTURED AND SUBMITTED TO TVA IN A MOVING PICTURE EXPERT GROUP (MPEG) FORMAT. A SEPARATE MPEG FILE SHALL BE PRODUCED FOR EACH PIPE INSPECTED. MPEG FILE NAMES SHALL BE THE SAME AS THE SPILLWAY PIPE NAMES ON THESE DRAWINGS (I.E. SPILLWAY PIPE 4, ETC.) THE MPEG FILES SHALL BE DELIVERED TO TVA ON DVD DISCS OR AN EXTERNAL HARD DRIVE (USB 2.0).
6. DURING THE ENTIRE VIDEO OF THE PIPELINE. THE FOLLOWING INFORMATION SHALL BE CONTINUOUSLY DISPLAYED.

a. AUTOMATIC UPDATE OF THE CAMERA'S FOOTAGE POSITION IN THE PIPELINE FROM ADJUSTED ZERO (ZERO BEING THE POINT OF ENTRY OF PIPE).
b. PIPE DIMENSION IN INCHES
c. SPILLWAY PIPE NAME
d. DATE AND TIME OF VIDEO

THE SIZE AND POSITION OF THE DATA DISPLAY SHALL BE SUCH AS NOT TO INTERFERE WITH THE MAIN SUBJECT OF THE PICTURE.

7. THE ENGINEER SHALL BE PRESENT DURING THE INTERNAL TELEVISION INSPECTION AND SHALL MONITOR THE LIVE VIDEO FEED DURING FILMING. NO INSPECTION SHALL BE PERFORMED WITHOUT THE ENGINEER PRESENT.

GEOTEXTILE

1. GEOTEXTILE USED BENEATH STONE SHALL BE A NON-WOVEN, POLYESTER OR POLYPROPYLENE FABRIC MEETING THE FOLLOWING MINIMUM PHYSICAL PROPERTIES: BURST STRENGTH – 300 PSI; TENSILE STRENGTH – 160 PSI; PUNCTURE STRENGTH – 45 LBS.; PERMEABILITY – 2X10-1 CM/SEC; APPARENT OPENING SIZE – 0.15 MM – 0.21 MM; FABRIC WEIGHT – 8 OZ / SQ. YD. AN ACCEPTABLE PRODUCT IS MIRAFI 180N.
2. DURING ALL PERIODS OF SHIPMENT AND STORAGE, THE GEOTEXTILE SHALL BE PROTECTED FROM DIRECT SUNLIGHT, ULTRA-VIOLET RAYS, TEMPERATURE GREATER THAN 140 DEGREES FAHRENHEIT, MUD, DIRT, DUST AND DEBRIS. TO THE EXTENT POSSIBLE, THE GEOTEXTILE SHALL BE MAINTAINED WRAPPED IN A HEAVY DUTY PROTECTIVE COVERING.
3. THE CONTRACTOR SHALL ADHERE TO THE MANUFACTURER'S RECOMMENDATIONS AND THESE SPECIFICATIONS DURING INSTALLATION OF THE GEOTEXTILE.
4. THE SURFACE TO RECEIVE GEOTEXTILE SHALL BE PREPARED TO A RELATIVELY SMOOTH CONDITION FREE OF OBSTRUCTIONS, DEPRESSIONS, DEBRIS, AND SOFT OR LOW DENSITY POCKETS OF MATERIAL.
5. THE GEOTEXTILE SHALL BE PLACED WITH THE LONG DIMENSION PARALLEL WITH THE CENTERLINE OF THE DITCH, EMBANKMENT, OR ROAD AND SHALL BE LAID SMOOTH, AND FREE OF TENSION, STRESS, FOLDS, WRINKLES, OR CREASES.
6. GEOTEXTILE SHALL BE COVERED WITHIN 15 DAYS OF DEPLOYMENT. ANY GEOTEXTILE EXPOSED FOR MORE THAN 15 DAYS SHALL BE REMOVED AND REPLACED AT NO COST TO THE OWNER.

GROUT FOR EXISTING SPILLWAY ABANDONMENT

1. THE GROUT MIX SHALL BE DETERMINED BY THE CONTRACTOR. GROUT MAY BE COMPOSED OF PORTLAND CEMENT, FINE AGGREGATE (SAND) WATER, AND OTHER ADMIXTURES. THE USE OF ADMIXTURES SHALL BE APPROVED IN WRITING BY THE ENGINEER. THE DESIGN OF THE GROUT MIXTURE SHALL BE BASED ON THE WATER-CEMENT RATIO NECESSARY TO SECURE (1) A PLASTIC, FLOWABLE MIXTURE SUITABLE FOR THE SPECIFIC CONDITION OF PLACEMENT; (2) PROVIDE LESS THAN ONE-HALF PERCENT SHRINKAGE AND NO MORE THAN ONE-HALF PERCENT EXPANSION; AND (3) RETARD THE SETTING TIME TO AT LEAST THE TIME REQUIRED BY THE CONTRACTOR TO COMPLETE FILLING OF THE PIPE IN ONE, UNINTERRUPTED OPERATION. THE GROUT MIXTURE SHALL BE DESIGNED SO THAT IT WILL PRODUCE A MINIMUM LABORATORY COMPRESSIVE STRENGTH OF 1000 PSI OR GREATER AT 28 DAYS. THE GROUT SHALL BE CHEMICALLY COMPATIBLE WITH THE PIPE MATERIALS.
2. PORTLAND CEMENT SHALL MEET THE REQUIREMENTS OF ASTM C-150 FOR THE TYPE OF CEMENT SPECIFIED. PROVIDE TYPE 1 CEMENT UNLESS OTHERWISE DIRECTED BY THE ENGINEER. CEMENT SHALL BE PROPERLY STORED AND PROTECTED FROM WEATHER, DAMPNESS, OR OTHER DESTRUCTIVE AGENTS. ANY CEMENT WHICH IS DAMAGED WILL BE REJECTED AND NOT PERMITTED TO BE USED IN THE WORK. PORTLAND CEMENT SHALL BE SUBJECT TO SAMPLING AND TESTING IN ACCORDANCE WITH ASTM C-150.
3. WATER USED IN MIXING GROUT SHALL BE POTABLE WATER IN ACCORDANCE WITH ASTM C-94.
4. GROUTING SHALL COMMENCE USING THE PRIMARY PIPE. GAUGES TO MONITOR GROUT PRESSURE SHALL BE INSTALLED INTO THE INJECTION PIPING AND IMMEDIATELY ADJACENT TO THE CONCRETE BLOCK. THE GAUGES SHALL CONFORM TO AN ACCURACY OF NO MORE THAN ONE-HALF PERCENT ERROR OVER THE FULL RANGE, AND THE FULL RANGE SHALL NOT BE MORE THAN 100 PERCENT GREATER THAN THE MAXIMUM DESIGN PRESSURE. PRESSURE GAUGES SHALL BE INSTRUMENT OIL-FILLED, AND ATTACHED TO A SADDLE-TYPE DIAPHRAGM SEAL (GAUGE SAVER) TO PREVENT CLOGGING WITH GROUT. GAUGES SHALL BE CERTIFIED AND CALIBRATED IN ACCORDANCE WITH ANSI B40, GRADE 2A.
5. PRIOR TO FIRST PLACEMENT, A TEST BATCH OF GROUT DELIVERED TO OR PREPARED ON SITE SHALL BE SAMPLED AND TESTED BY THE ENGINEER TO CHECK FOR ADEQUATE FLUIDITY, SHRINKAGE, STRENGTH CHARACTERISTICS, AND INITIAL SET TIME. CONTRACTOR SHALL ASSIST THE ENGINEER AS REQUIRED TO PERFORM THIS TESTING.
6. GROUT SHALL BE INJECTED THROUGH THE PRIMARY PORT, WHICH DISCHARGES INTO THE SPILLWAY PIPE JUST UPSTREAM OF THE CONCRETE BLOCK. DURING GOUT INJECTION THE GROUT PRESSURE SHALL BE MONITORED. IF ELEVATED PRESSURES ARE DETECTED INDICATING THAT THE PRIMARY PORT HAS CLOGGED, THEN THE GROUT INJECTION SHALL BE DIVERTED AND CONTINUED THROUGH THE SECONDARY PIPE. GROUT PRESSURE SHALL NOT EXCEED 25 PSI. GROUT INJECTION SHALL BE TERMINATED WHEN GROUT FILLS THE RISER AT LEAST 10 FEET ABOVE THE INVERT OF THE RISER PIPE
7. EACH SPILLWAY PIPE SHALL BE FILLED IN ONE CONTINUOUS, UNINTERRUPTED OPERATION. EQUIPMENT USED TO MIX, DELIVER, AND PLACE THE GROUT SHALL BE OF SUFFICIENT SIZE AND CAPACITY TO IMPLEMENT THIS REQUIREMENT.
8. THE CONTRACTOR SHALL MONITOR THE SLOPES AROUND AND ABOVE THE SPILLWAY PIPE. GROUND HEAVE OR DISTURBANCE WILL INDICATE THAT THE PIPING HAS BEEN BREACHED. IF HEAVE OCCURS DURING OPERATION OF THE PRIMARY GROUT PIPE, GROUTING OPERATIONS SHALL IMMEDIATELY BE SWITCHED TO THE SECONDARY PIPE.
9. THE GROUTING EQUIPMENT SHALL BE EQUIPPED WITH GAUGES OR FLOWMETERS THAT ALLOW CONTINUOUS MEASUREMENT OF THE GROUT TAKE DURING OPERATION.

SUBMITTALS

THE CONTRACTOR SHALL MAKE THE FOLLOWING SUBMITTALS FOR REVIEW AND APPROVAL BY THE ENGINEER. UNLESS NOTED OTHERWISE, SUBMITTALS SHALL BE MADE A MINIMUM OF TWO WEEKS PRIOR TO MOBILIZATION. WORK ON ANY COMPONENT OF THE PROJECT SHALL NOT BEGIN UNTIL THE SUBMITTAL(S) CORRESPONDING TO THAT WORK HAVE BEEN APPROVED:

1. A DETAILED CONSTRUCTION PLAN OUTLINING:
   - SPECIFIC EQUIPMENT TO BE USED AND ITS PURPOSE,
   - METHODS TO BE USED TO IMPLEMENT DAM LOWERING, INCLUDING CONTRACTOR'S PROPOSED HAUL ROUTES
   - LOCATION OF STAGING AREAS
   - METHODS FOR DELIVERING CONCRETE AND GROUT TO ITS DISCHARGE POINT
   - METHODS OF DELIVERING CONSTRUCTION MATERIALS TO THEIR PROPOSED LOCATIONS
   - PROPOSED METHOD OF CONTROLLING POND WATER LEVEL USING SIPHONS.
   - A DETAILED CONSTRUCTION SCHEDULE AND SEQUENCE
2. WELDING CERTIFICATIONS FOR PERSONNEL THAT WILL PERFORM WELDING ON THIS PROJECT.
3. MANUFACTURERS CUT SHEETS AND CERTIFICATION FOR ALL PIPING TO BE DELIVERED TO THE SITE (SIPHONS, 27-INCH PIPING, PVC DRAINS, ETC).
4. SUPPLIER CERTIFICATION FOR ALL CRUSHED STONE AND RIP-RAP TO BE DELIVERED TO THE SITE. CERTIFICATION SHOULD INDICATE THAT THE MATERIAL MEETS THE CORRESPONDING ALDOT REQUIREMENTS.
5. MIX DESIGN AND AT LEAST THREE (3) UNCONFINED COMPRESSIVE STRENGTH TEST RESULTS AT 28-DAYS FOR THE CONCRETE PROPOSED FOR USE. ALSO INCLUDE ADDRESS/LOCATION OF THE CONCRETE PLANT THAT THE MATERIAL WILL BE COMING FROM.
6. MANUFACTURER'S PRODUCT DATA FOR PROPOSED CONCRETE ADHESIVE ANCHORS.
7. DETAILED GROUTING PLAN DESCRIBING CONTRACTOR'S MEANS AND METHODS FOR GROUTING AND ABANDONING THE EXISTING SPILLWAYS. PLAN SHALL ALSO INCLUDE THE MIX DESIGN AND THREE (3) SAMPLE 28-DAY COMPRESSION TEST RESULTS FOR THE GROUT TO BE DELIVERED ON SITE.
8. SHOP DRAWINGS FOR ALL PROPOSED CAST-IN-PLACE CONCRETE STRUCTURES, SHOWING REINFORCEMENT PLACEMENT, TIES, CHAIRS, LOCATION OF ANCHORS AND EMBEDMENTS, ETC.
9. SHOP DRAWINGS AND PRODUCT DATA FOR METAL PEDESTRIAN GRATING AT SPILLWAY STRUCTURE – INCLUDE LOAD RATING.
10. SHOP DRAWINGS AND MANUFACTURER INFORMATION FOR FRP STOP LOGS.
11. SHOP DRAWINGS AND RELATED PRODUCT DATA FOR SIPHON SUPPORT STRUCTURES.
12. SHOP DRAWINGS FOR THE PROPOSED WOOD FRAME STAIRWAY/WALKWAY.
13. MATERIAL CHARACTERIZATION TESTING FOR ALL ON-SITE SOIL MATERIALS TO BE RECOMPACTED TO BACKFILL EXCAVATIONS. CHARACTERIZATION TESTING SHALL INCLUDE STANDARD PROCTOR TEST (ASTM D 698). MATERIAL SUBMITTED FOR TESTING SHOULD BE A REPRESENTATIVE SAMPLE, AND TEST RESULTS SHALL BE SUBMITTED TO ENGINEER A MINIMUM OF 48 HOURS PRIOR TO THE START OF FILL PLACEMENT.
14. IF IMPORTED FILL IS TO BE USED, SOILS CHARACTERIZATION TEST RESULTS OF THE FILL MATERIAL, INCLUDING MOISTURE CONTENT (ASTM D 2216), ATTERBERG LIMITS ANALYSIS (ASTM D 4318), PARTICLE SIZE ANALYSIS (ASTM D 422), AND STANDARD PROCTOR TEST RESULTS (ASTM D 698) SHALL BE SUBMITTED TO THE ENGINEER. SEPARATE CHARACTERIZATION TESTING SHALL BE DONE FOR EACH SEPARATE BORROW SOURCE THAT IS PROPOSED BY THE CONTRACTOR. TEST RESULTS SHALL BE SUBMITTED TO ENGINEER A MINIMUM OF 48 HOURS PRIOR TO THE START OF FILL PLACEMENT.

QUANITY LIST

THE FOLLOWING IS A LIST OF ITEMS TO BE COMPLETED FOR THIS PROJECT. SPECIFICATION NUMBERS ARE BASED ON THE ALABAMA DEPARTMENT OF TRANSPORTATION'S STANDARD SPECIFICATIONS, UNLESS OTHERWISE NOTED AS "SPECIAL". SPECIFICATIONS FOR ITEMS THAT ARE NOTED AS "SPECIAL" ARE DESCRIBED WITHIN THESE PLANS.

SPEC.	DESCRIPTION	QUANTITY
610	RIPRAP, CLASS 1	130 CY
610	RIPRAP, CLASS 3	350 CY
430	AGGREGATE SURFACING (NO. 1 AND 2 STONE)	200 CY
533	27" HDPE CONDUIT	520 LF
533	18" HDPE CONDUIT	100 LF
533	12" HDPE CONDUIT FOR SIPHONS	1370 LF
533	4" PVC CONDUIT	200 LF
534	CLEANING EXISTING PIPE, 48" OR UNDER	1000 LF
430	AGGREGATE SURFACING (NO. 57 STONE)	1100 CY
501	STRUCTURAL PORTLAND CEMENT CONCRETE:	
	SIPHON HEADWALL	2 CY
	SPILLWAY OUTLET HEADWALL	42 CY
	SPILLWAY STRUCTURE	30 CY
501	STRUCTURAL PORTLAND CEMENT CONCRETE:	
	CONDUIT ENCASEMENT	100 CY
	THRUST BLOCKS	11 CY
SPECIAL	CONCRETE FOR SPILLWAY ABANDONMENT (GROUT)	300 CY
509	TREATED TIMBER (FOR WALKWAY)	1 LUMP
502	STEEL REINFORCEMENT	1 LUMP
508	STRUCTURAL STEEL AND MISCELLANEOUS METALS	1 LUMP
SPECIAL	30" FLOAT BALL	6 EACH
SPECIAL	CLEVIS HANGER	6 EACH
SPECIAL	TORPEDO STRAINERS	3 EACH
201	CLEARING AND GRUBBING	1 LUMP
205	REMOVAL AND RELOCATION OF STRUCTURES (FOOTBRIDGE, DOCKS)	2 EACH
600	MOBILIZATION	1 LUMP
603	ENGINEER'S FIELD OFFICE	1 LUMP
650	TOPSOIL	1210 CY
651	GROUND PREPARATION	1.5 ACRES
651	COMMERCIAL FERTILIZER	1 TON
652	SEEDING	1.5 ACRES
652	MOWING	1.5 ACRES
656	MULCHING	1.5 ACRES
665	SILT FENCE	3057 LF
665	SAND BAGS	1 LUMP
SPECIAL	DIVERSION BERM, AS PER PLAN	1200 LF
SPECIAL	CONSTRUCTION ENTRANCE, AS PER PLAN	2 EACH
SPECIAL	VACUUM FILL PORT	3 EACH
SPECIAL	TURBIDITY CURTAINS	1 LUMP
SPECIAL	FILTER DIAPHRAGM	1 EACH
	~~No. 7 STONE~~ ALDOT No. 327.02, MIX No. 1	10 CY
	~~C-33 SAND~~	60 CY
	4" PERFORATED PVC CONDUIT, SCH. 40	60 LF
SPECIAL	8" VENT TEE MANIFOLD HDPE	1 LUMP
	SADDLE TEE	4 EACH
	8" HDPE CONDUIT	60 LF
SPECIAL	6" GALVANIZED PIPE BOLLARDS	6 EACH
	CLASS C CONCRETE	3 CY
SPECIAL	CLOSED CIRCUIT TELEVISION	1 LUMP
SPECIAL	STOP LOGS WITH GUIDE FRAMING	4 EACH
SPECIAL	GALVANIZED 96" CMP SKIMMERS	4 EACH
SPECIAL	TRASH RACK	1 EACH
SPECIAL	DAVIT CRANE	2 EACH
SPECIAL	HANDRAIL	
	1-1/2" SCH 40 GALV STEEL RAIL	74 LF
	1-1/2" SCH 40 GALV STEEL POST	16 LF
	4" SCH 40 PIPE SLEEVE	4 EACH

RFI_08

RFI_02

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION.

ALABAMA LICENSED No. 30577 PROFESSIONAL ENGINEER MICHAEL T. STITT

RECORD DRAWING

For Supporting Design Calculations see

FPGCOFFESCDX000000020100003
FPGCOFFESCDX000000020100005

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 0	6/17/10	SP/SW	KV	GD	MJS	JCB	MST	JCK	WO 111112081	J
R	RECORD DRAWING									

SCALE: NONE EXCEPT AS NOTED

GENERAL NOTES

ASH POND 4 – HIGH HAZARD REMOVAL & SPILLWAY REPLACEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SP/SW	KV	GD	MJS	JCB	MST	JCK

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2010	DATE 8/10/11	47	C	10W290-03	R 0

URS

URS	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:NTS
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

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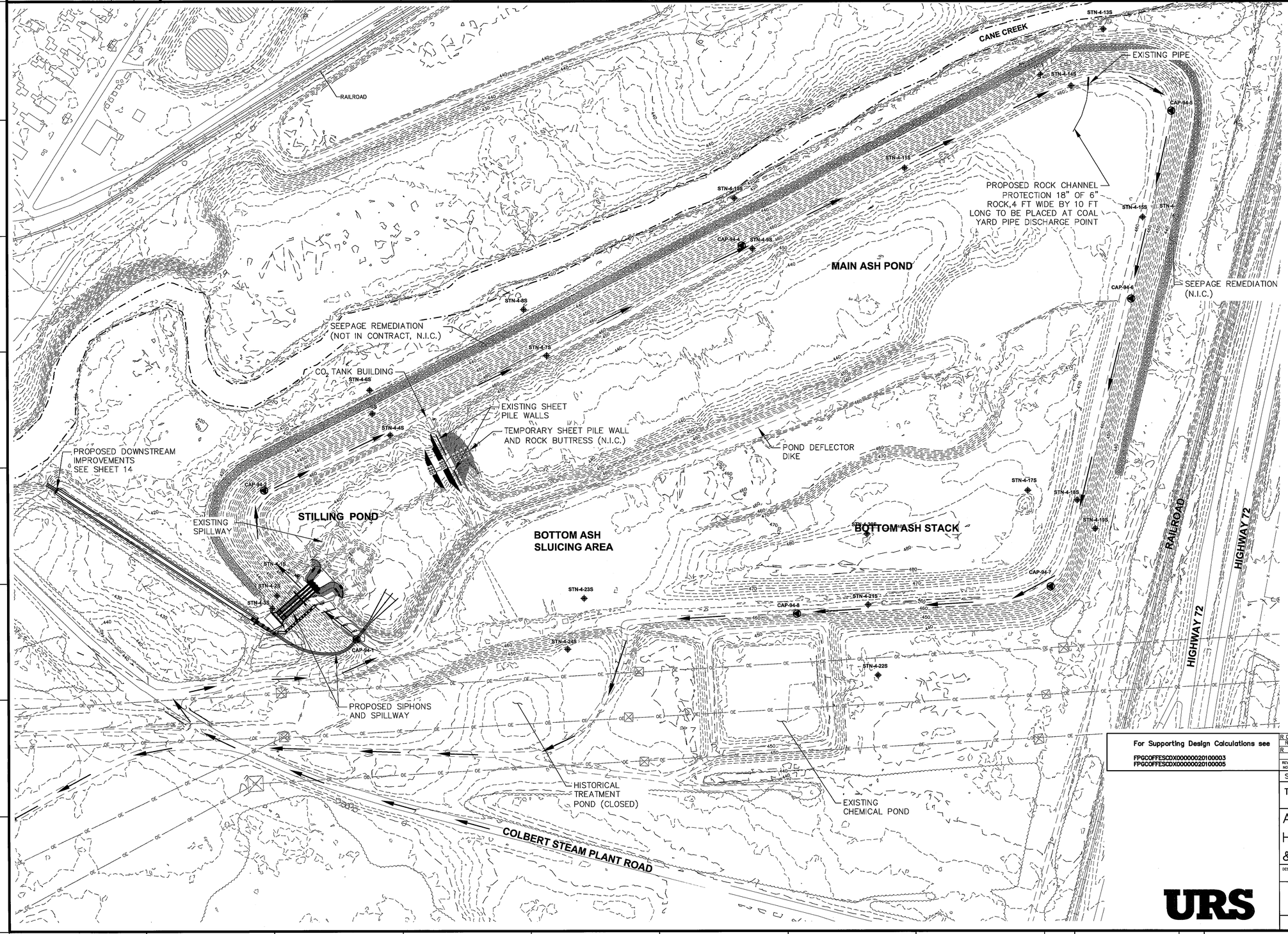

0 150 300

SCALE: 1"= 150'

LEGEND

- EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- EXISTING ROAD
- EXISTING TREE LINE/VEGETATION
- EXISTING CREEK
- EXISTING WETLAND
- 440 PROPOSED CONTOUR MAJOR
- PROPOSED DIRECTION OF HAUL
- EXISTING BENCHMARK
- EXISTING PIEZOMETERS (SEE NOTE 2)

BENCHMARK LOCATIONS

BM	NORTHING	EASTING	ELEV.
CSP-216	1724522.36	394501.83	438.53
CAP-94-1	1723412.00	394167.55	460.71
CAP-94-2	1723667.57	394584.41	459.53
CAP-94-4	1722336.05	395268.44	460.88
CAP-94-5	1721139.73	395645.40	460.10
CAP-94-6	1721250.71	395119.15	460.59
CAP-94-7	1721476.07	394313.49	460.41
CAP-94-8	1722183.72	394237.70	461.77

NOTES:

1. BENCHMARK LOCATIONS PROVIDED BY TVA SURVEYING & PROJECT SERVICES GROUP. IF BENCHMARKS ARE DISTURBED, CONTRACTOR SHALL COORDINATE WITH SURVEYING & PROJECT SERVICES TO RE-ESTABLISH BENCHMARKS.
2. ALL EXISTING PIEZOMETERS SHALL BE PROTECTED BY CONTRACTOR DURING CONSTRUCTION ACTIVITIES.
3. BENCHMARK CAP-94-1 WAS REMOVED DURING THE CONSTRUCTION OF THE SIPHONS. D

UNDOCUMENTED FIELD CHANGE

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ALABAMA LICENSED No. 30571 PROFESSIONAL ENGINEER MICHAEL J. STICH

RECORD DRAWING

For Supporting Design Calculations see

FPGCOFFESCDX000000020100003
FPGCOFFESCDX000000020100005

URS

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 0	8/10/11	SW/SR	TG/KV	GD/VG	MJS	JCB	MST	JCK	WO 111112081	
R	RECORD DRAWING									

SCALE: AS SHOWN EXCEPT AS NOTED

TITLESHEET

ASH POND 4 – HIGH HAZARD REMOVAL & SPILLWAY REPLACEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SP	KV	VKG	MJS	JCB	MST	JCK

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2010	DATE 8/10/11	47	C	10W290–04	R 0

URS	0
TASK COMPLETED BY:	REV NO.

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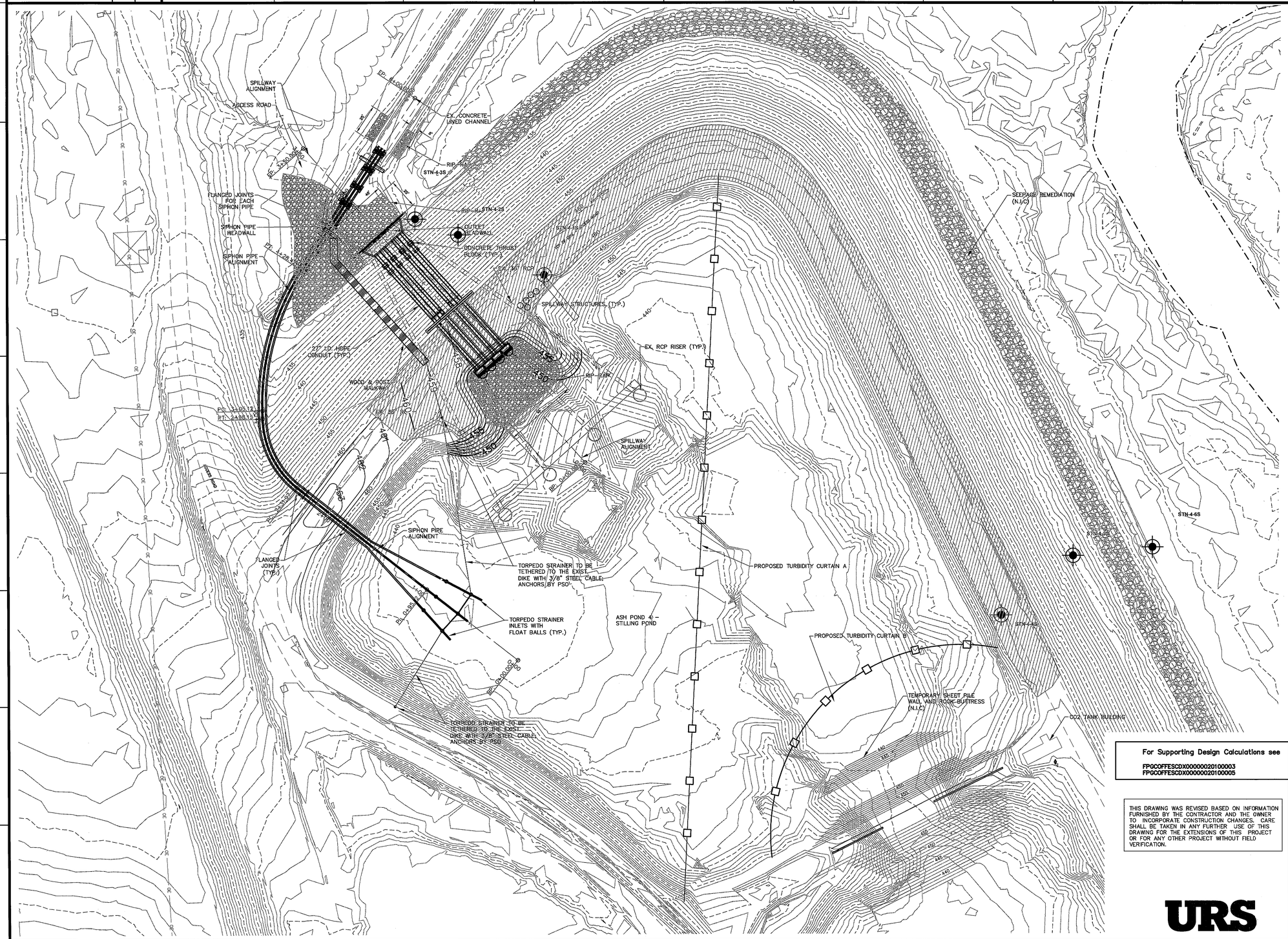

N

0 30 60

SCALE: 1"=30'

LEGEND

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING SHEET PILE WALL
- EXISTING ROAD
- PROPOSED RIP RAP
- EXISTING TREE-LINE/ VEGETATION
- PROPOSED DIKE LOWERING
- EXISTING PIEZOMETERS

PROPOSED CONSTRUCTION SEQUENCE

1. INSTALL TURBIDITY CURTAIN "A" NORTH OF FINGER DIKE AREA AND CURTAIN "B" UPSTREAM OF THE SPILLWAY AND SIPHON WORK AREA. TURBIDITY CURTAIN "A" DIAGONALLY THROUGH THE STILLING POND AND CURTAIN "B" NORTH OF THE FINGER DIKE AREA WILL BE IN PLACE FROM PREVIOUS CONTRACT WORK. THE CURTAINS SHALL BE INSPECTED AND REPAIRED AS NECESSARY TO MAKE THEM SERVICEABLE FOR THIS CONTRACT WORK.
2. CONSTRUCT TEMPORARY BUTTRESS AND SHEET PILING (SEE SEPARATE WORK PLAN).
3. INSTALL OTHER CONTROLS PER CONSTRUCTION BEST MANAGEMENT PRACTICIES PLAN (CBMPP) – CAN BE DONE SIMULTANEOUSLY WITH BUTTRESS CONSTRUCTION.
4. PREPARE ACCESS TO BASE OF DIKE AT DISCHARGE CHANNEL.
5. START CONSTRUCTING DOWN-SLOPE PORTION OF SIPHON PIPES.
6. AFTER COMPLETION OF TEMPORARY BUTTRESS AND SHEET PILE, MOVE TURBIDITY CURTAIN "A" TO SOUTH OF NEW BUTTRESS/SHEETPILING.
7. FINISH CONSTRUCTING SIPHONS AND PERFORM VERIFICATION TESTING.
8. UPON COMPLETION OF THE REQUIRED BUTTRESS PRELOAD PERIOD (SEE BUTTRESS AND SHEET PILE WORK PLAN), DEWATER STILLING BASIN TO ELEVATION 447.0' USING SIPHONS. MAINTAIN WATER LEVEL IN STILLING BASIN WITH SIPHONS CONTINUOUSLY THROUGHOUT REMAINDER OF CONSTRUCTION UNTIL NEW SPILLWAY SYSTEM IS PUT INTO SERVICE.
9. IMPLEMENT DIKE LOWERING AS REQUIRED IN THESE PLANS.
10. PLACE SANDBAGS ACROSS THE CONCRETE CHANNEL, UPSTREAM FROM THE SIPHON OUTLETS, TO ALLOW INSPECTION OF EXISTING OUTLET PIPES AND RISERS IN THE DRY.
11. CLEAN AND INSPECT EXISTING OUTLET PIPES AND RISERS USING CCTV METHOD.
12. EXCAVATE AND INSTALL NEW HEADWALL STRUCTURE FOR OUTLET PIPES.
13. EXCAVATE AND INSTALL NEW SPILLWAY STRUCTURE IN THE NORTH FACE OF THE DIKE.
14. INSTALL NEW SPILLWAY PIPES, CONNECTING SPILLWAY STRUCTURE TO HEADWALL STRUCTURE AND INSTALL FILTER DIAPHRAGM AND PIPES. STUBS FOR SEEPAGE COLLECTION PIPING (SEE SEPARATE WORK PLAN) SHALL ALSO BE PROVIDED IN THE HEADWALL AT THIS TIME.
15. WHEN CURING OF CAST-IN-PLACE CONCRETE STRUCTURES IS COMPLETE (CONCRETE HAS REACHED DESIGN STRENGTH), BACKFILL BOTH SPILLWAY AND HEADWALL STRUCTURES TO FINAL GRADE.
16. REGRADE AND INSTALL NEW RIPRAP UPSTREAM OF SPILLWAY STRUCTURE AND DOWNSTREAM OF HEADWALL STRUCTURE.
17. CLEAN, GROUT AND ABANDON THE EXISTING SPILLWAY PIPES AND RISERS AS REQUIRED HEREIN.
18. IMPLEMENT CUTTING AND LOWERING OF CENTER SECTION OF TEMPORARY BUTTRESS AND SHEET PILE TO EL. 452 (SEE SEPARATE WORK PLAN).
19. THROTTLE BACK SIPHONS TO ALLOW WATER LEVEL TO COME BACK UP IN STILLING POND.
20. REMOVE SANDBAGS AT MOST OPPORTUNE TIME – SHUT OFF SIPHONS SLIGHTLY BEFORE WATER STARTS SPILLING OVER NEW SPILLWAYS TO REMOVE THE SANDBAGS IN THE DRY.
21. WHEN STILLING POND REACHES EL. 453, THE NEW SPILLWAY WILL BE IN SERVICE AND WILL BE THE NEW CONTROL FOR THE POND SYSTEM.
22. MOVE TURBIDITY CURTAIN "B" TO FRONT OF NEW ENTRANCE CHANNEL.
23. REMOVE EXTENDED SECTIONS OF SIPHON PIPES AND INSTALL TURN-UP ENDS TO DISCHARGE INTO RIPRAP AREA OF BASIN.
24. REMOVE SWPPP CONTROLS.

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RECORD DRAWING

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0	8/10/11	SW/SP	TJG	GD/VG	MJS	JCB	MST	JCK	WO 111112081	
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SCALE: 1" = 30' EXCEPT AS NOTED

DIKE LOWERING, SIPHON AND SPILLWAY PLAN

ASH POND 4 – HIGH HAZARD REMOVAL & SPILLWAY REPLACEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SW/SP	TJG	GD/VG	MJS	JCB	MST	JCK

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AUTOCAD 2010	DATE 8/10/11	47	C	10W290-05	R 0

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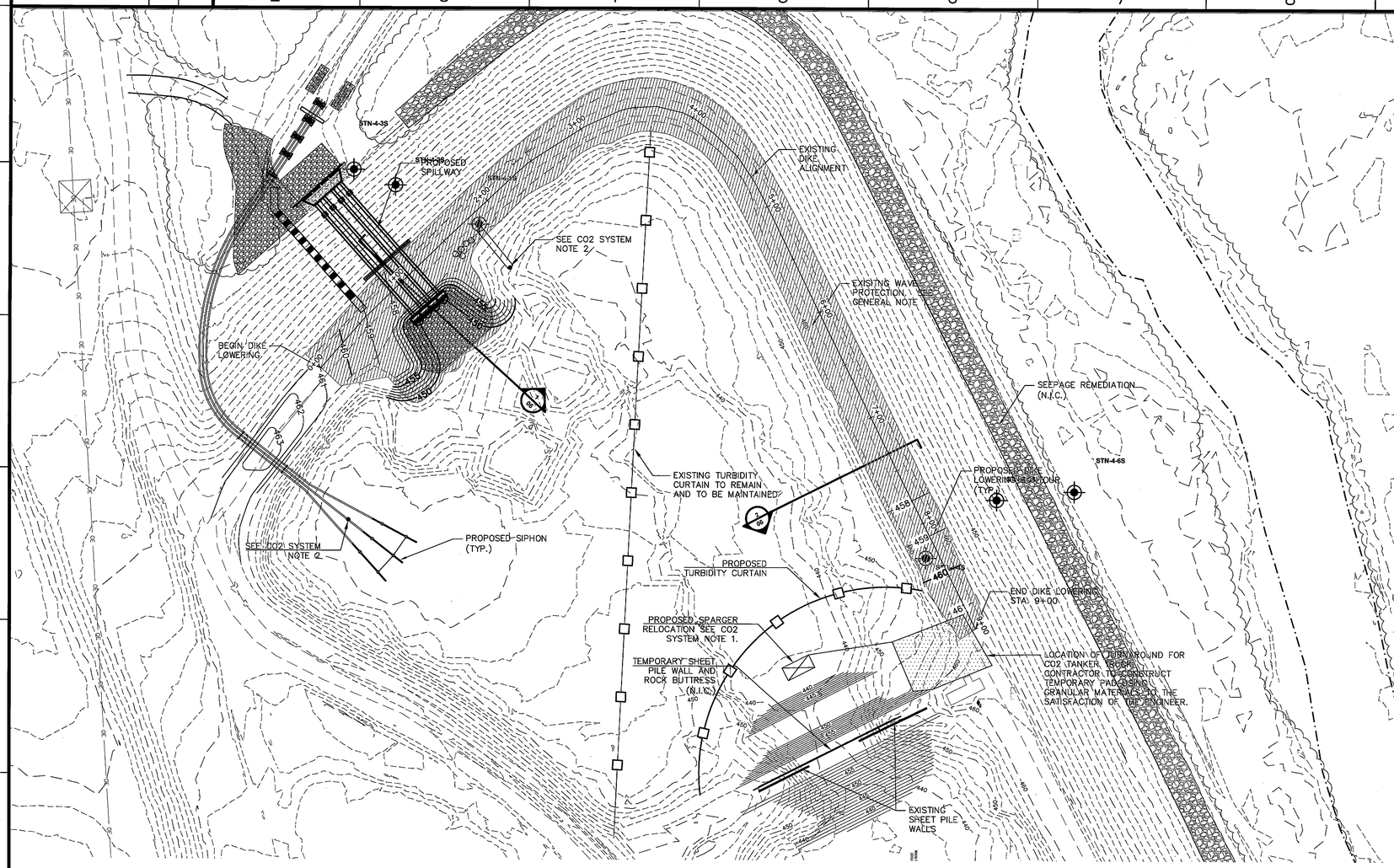
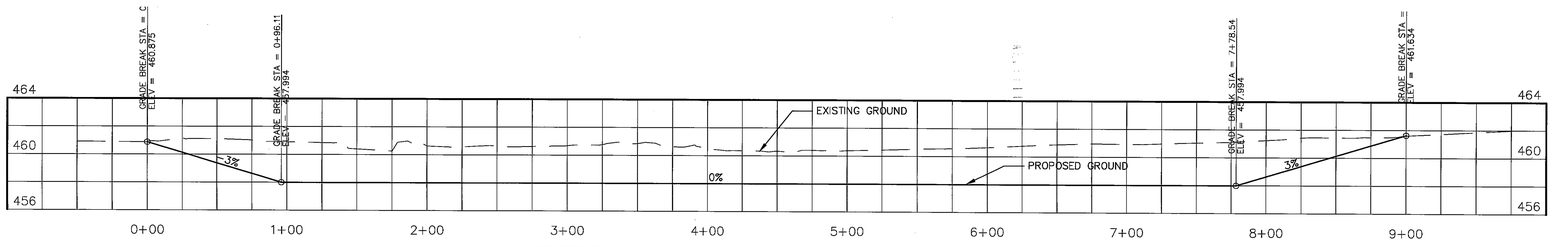


PLAN VIEW

0 40 80

SCALE: 1"= 40'



PROFILE VIEW ALONG CENTERLINE OF LOWERED SECTION OF DIKE

HORIZONTAL SCALE: 1"=40'
VERTICAL EXAGERATION = 10x

LEGEND

- 440 — EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- EXISTING ROAD
- PROPOSED CONTOUR MINOR
- 460 PROPOSED CONTOUR MAJOR
- 2/05 CROSS SECTION LOCATION (SECTION NUMBER/SHEET NUMBER WHERE IT IS DRAWN)
- PROPOSED DIKE LOWERING
- EXISTING PIEZOMETERS (SEE GENERAL NOTE 2)

GENERAL NOTES

1. EXISTING WAVE EROSION PROTECTION ABOVE EL. 458 TO BE REMOVED AND REPLACED IN SAME CONFIGURATION BELOW THE LOWEST ELEVATION OF EXISTING PROTECTION.
2. ALL EXISTING PIEZOMETERS SHALL BE PROTECTED BY CONTRACTOR DURING CONSTRUCTION ACTIVITIES.

CO2 SYSTEM NOTES

1. PLANT WILL PROVIDE ADDITIONAL BRAIDED STAINLESS STEEL CABLE AS NECESSARY TO SECURE CO2 SPARGER.
2. PH SENSOR CURRENTLY LOCATED AT DOCK STRUCTURE TO BE MOVED TO MIDDLE TORPEDO STRAINER. RELOCATION SHALL OCCUR PRIOR TO LOWERING OF WATER LEVEL. PLANT TO PROVIDE ADDITIONAL CABLE AS NECESSARY TO CONNECT TO CONTROL SYSTEM.
3. FINAL LOCATION OF PH SENSOR TO BE AT NEW SPILLWAY.

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SCALE: AS SHOWN EXCEPT AS NOTED

DIKE LOWERING PLAN AND PROFILE

ASH POND 4 – HIGH HAZARD REMOVAL & SPILLWAY REPLACEMENT

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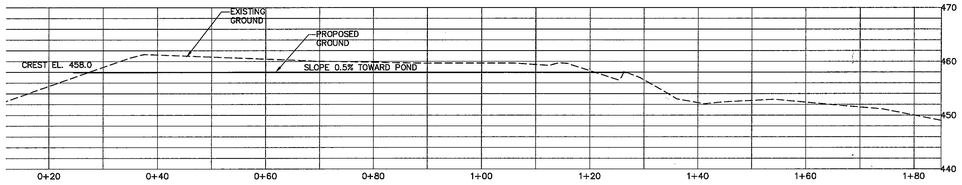
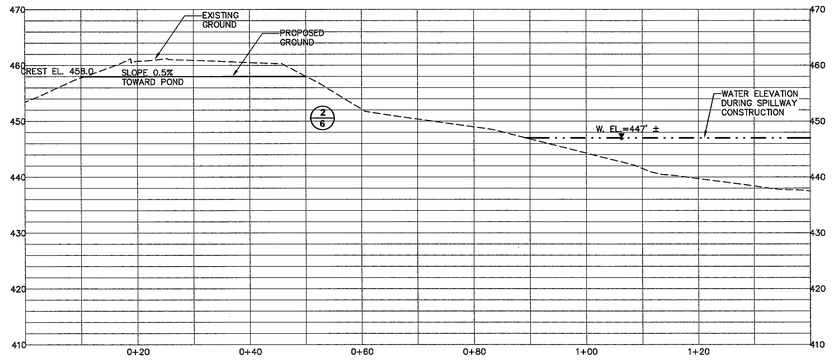


DIKE LOWERING SECTION 1

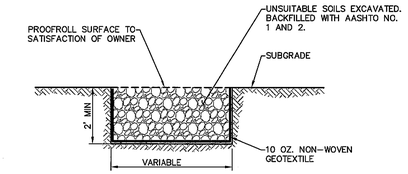
DIKE CROSS SECTION AT SPILLWAY- SECTION 1 - SHEET 5

HORIZONTAL SCALE: 1"=10'
VERTICAL EXAGERATION = NONE

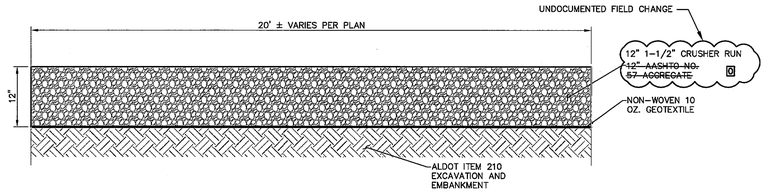


TYPICAL DIKE CROSS SECTION 2 - SHEET 5

HORIZONTAL SCALE: 1"=10'
VERTICAL EXAGERATION = NONE



1/6 **SUBGRADE REPAIR**
N.T.S.



2/6 **TYPICAL PAVEMENT DETAIL**
N.T.S.

Detail No.
Sheet Where Shown

REFERENCE KEY

0 10 20
SCALE: 1"= 10'

ALABAMA REGISTERED No. 30571 PROFESSIONAL ENGINEER MICHAEL J. STOUT

RECORD DRAWING

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R 0	8/10/11	SW/SP	TG/KV	GD/VG	MJS	JCB	MST	JCK	WO 111112081	
	RECORD DRAWING									
R										

SCALE: AS SHOWN EXCEPT AS NOTED

TYPICAL DIKE SECTIONS AND DETAILS

ASH POND 4 –
HIGH HAZARD REMOVAL
& SPILLWAY REPLACEMENT

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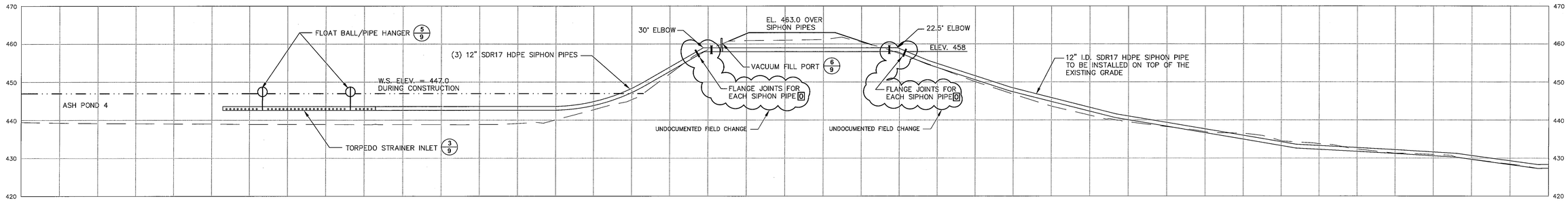
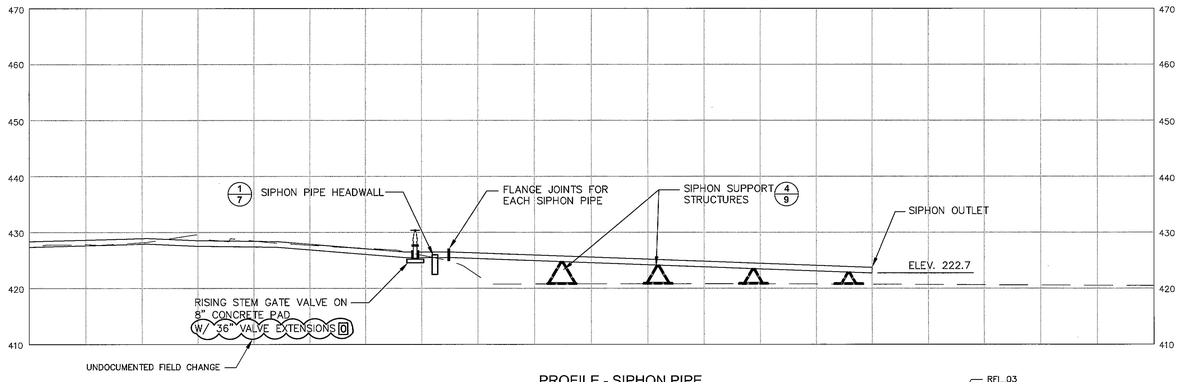


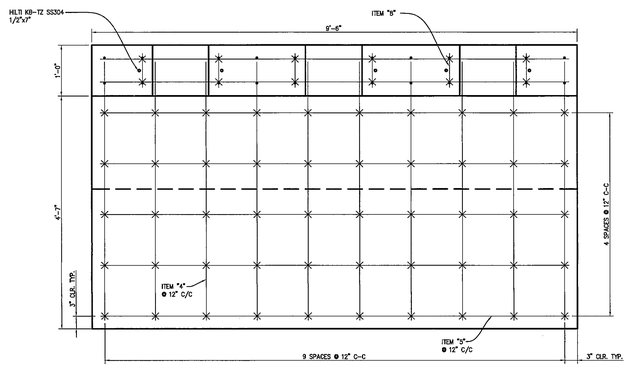


PROFILE - SIPHON PIPE

SCALE: 1" - 10' HORIZ.
1" - 10' VERT.

BILL OF MATERIAL REINFORCING STEEL													
ITEM	GRADE	NO. PIECES	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G
1	60	6	#5	9'-2"		STR							
2	60	10	#5	3'-6"		2	5"	3'-1"					
3	60	10	#5	3'-6"		2	5"	3'-1"					
4	60	10	#5	7'-0"		20			5'-0"	2'-0"			
5	60	5	#5	9'-2"		STR							
6	60	4	#5	10 1/2"		STR							
7	60	4	#5	1'-7"		STR							
8	60	6	#5	8"		STR							

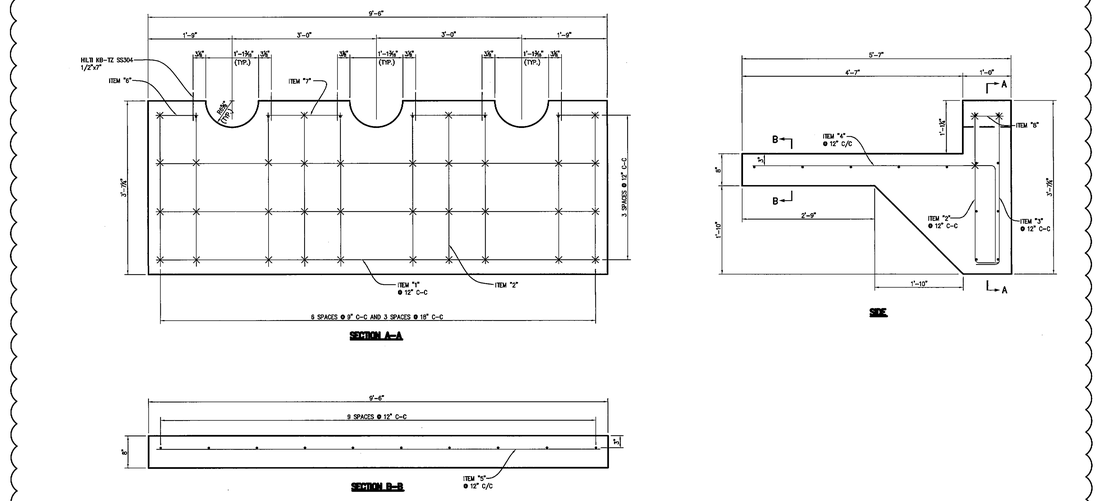
0



PLAN

RFI_03

2/7 PLAN VIEW DETAIL OF SIPHON GATE VALVE AREA
SCALE: 1" = 2'



GATE VALVE CONCRETE PAD / SIPHON PIPE HEADWALL DETAIL
SCALE : 1 1/2"=1'-0"

1/7 SIPHON PIPE HEADWALL DETAILS
SCALE: 3/4" = 1'

Detail No.
Sheet Where Shown

REFERENCE KEY

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R 0	8/10/11	SW/SP	TG/KV	GD/VG	MJS	JCB	MST	JCK	WO 111112081	
R	RECORD DRAWING									

SCALE: SHOWN ON PLAN — EXCEPT AS NOTED

SIPHON PIPE PROFILE AND DETAILS

ASH POND 4 – HIGH HAZARD REMOVAL & SPILLWAY REPLACEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SW/SEP	TJG	GD	MJS	JCB	MST	JCK

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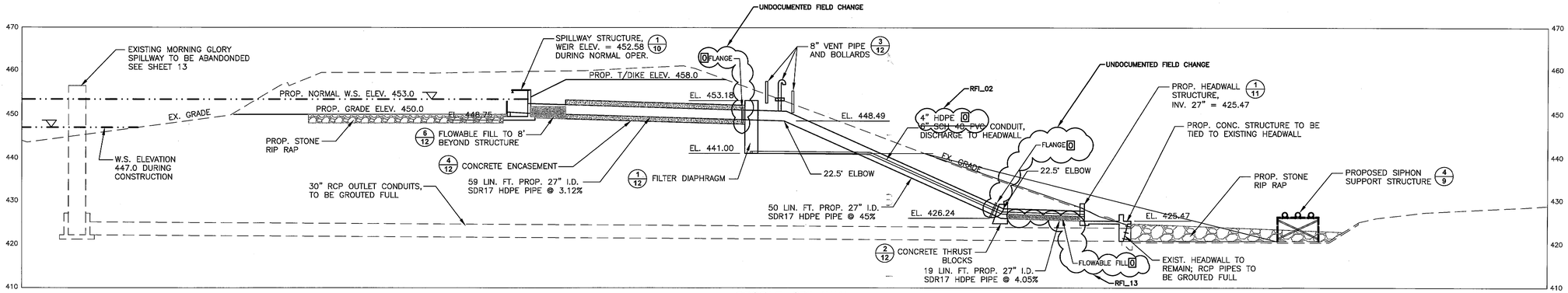
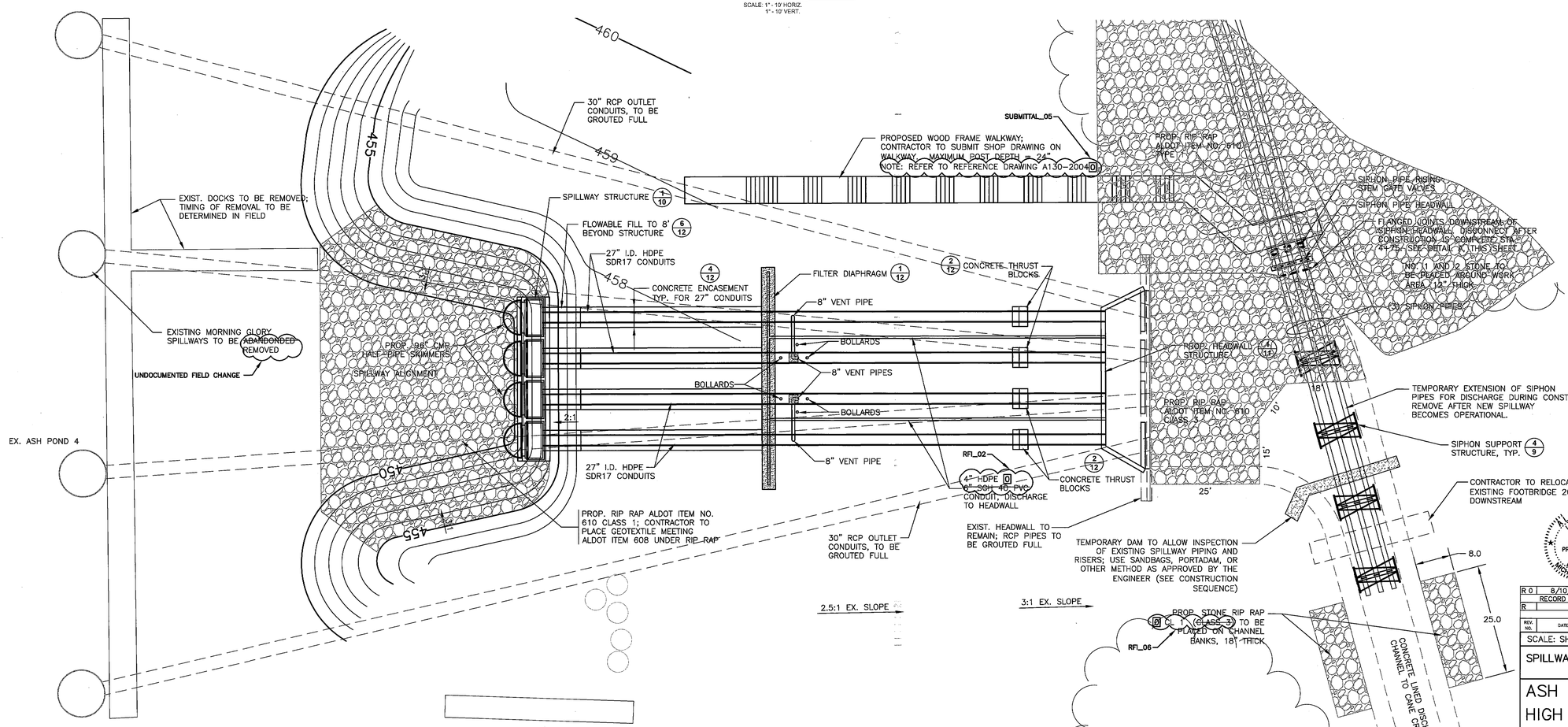


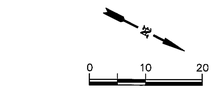
PROFILE - SPILLWAY

SCALE 1" - 10' HORIZ.
1" - 10' VERT.



PLAN - SPILLWAY

SCALE: 1" - 10'

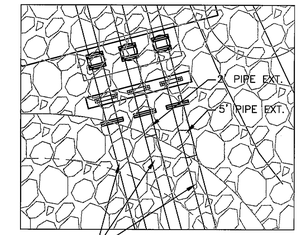


LEGEND

- 450 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 450 — PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING SHEET PILE WALL
- EXISTING HAUL ROAD
- PROPOSED RIP RAP
- EXISTING TREE–LINE/ VEGETATION

DETAIL A

SCALE: 1" = 5'



CONTRACTOR TO REMOVE DOWNSTREAM SIPHON PIPES AND SUPPORT STRUCTURES AFTER CONSTRUCTION; ADD PIPE EXTENSIONS AS NECESSARY

Detail No.
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R 0	8/10/11	SW/SH	TG/KV	GD/VG	MJS	JCB	MST	JCK	WO 111112081		J
	RECORD DRAWING										
R											

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SPILLWAY PROFILE AND DETAILS

ASH POND 4 – HIGH HAZARD REMOVAL & SPILLWAY REPLACEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SW	TJG	GD	MJS	JCB	MST	JCK

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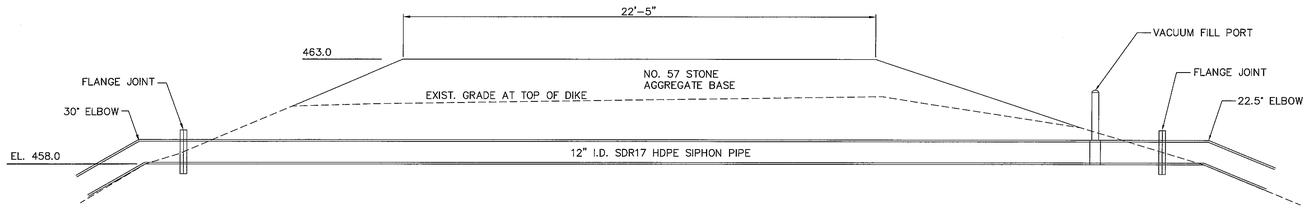
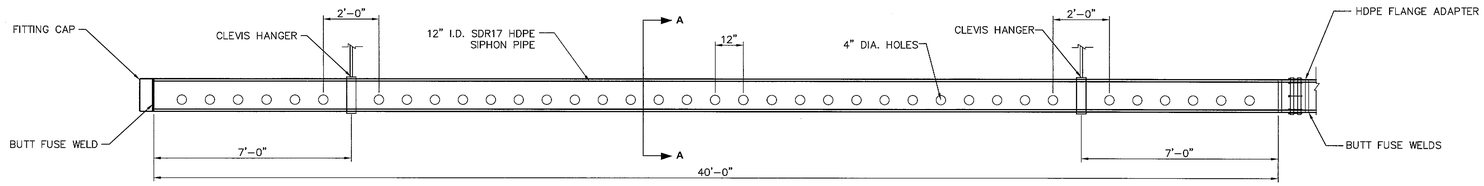


NOTES

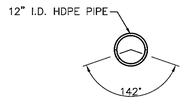
1. THE SIPHON SYSTEM SHALL BE INSTALLED AND OPERATED FOR THE NEW SPILLWAY INSTALLATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING, PERIODICALLY PRIMING, MAINTAINING AND REGULATING THE FLOW OF THE SIPHON IN A MANNER THAT ENSURES SAFETY AND STABILITY OF THE ASH POND DIKES AT ALL TIMES DURING CONSTRUCTION. AT A MINIMUM THE CONTRACTOR WILL NOT REDUCE THE POOL LEVEL MORE THAN 1 FOOT PER DAY DURING DRAWDOWN AND WILL IMMEDIATELY HALT POOL LOWERING IF ANY SIGN OF SLOPE INSTABILITY IS NOTED.

2. THE CONTRACTOR SHALL INSTALL A STAFF GAUGE WITH ALTERNATING MARKS AT 0.1 INCREMENTS AND WHOLE FOOT CALL-OUTS. THE CONTRACTOR SHALL MONITOR THE GAUGE AND REGULATE THE SIPHON FLOWS TO MAINTAIN THE POND AT ELEVATION 447.0 FEET (±0.5 FEET) DURING CONSTRUCTION OF THE NEW PERMANENT SPILLWAY.

1/9 SIPHON PROFILE UNDER DIKE
SCALE: 3/8" = 1'



PLAN

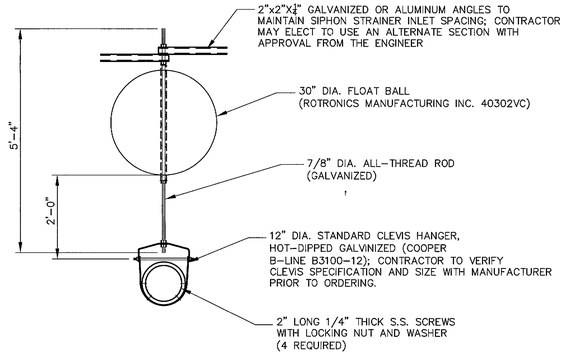


SECTION A-A'

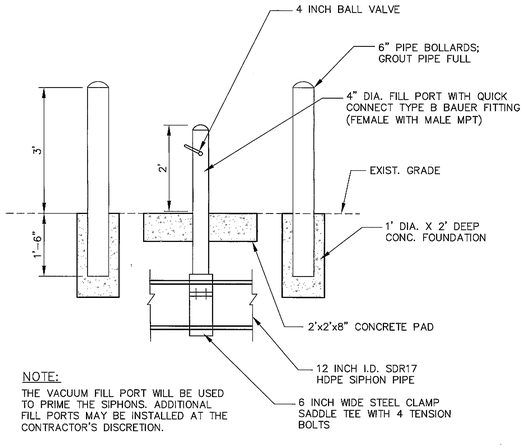
TORPEDO STRAINER NOTES

1. ALL HOLES ARE TO BE 4 INCH DIAMETER AND SHALL BE SPACED AT 12 INCHES CENTER TO CENTER. HOLES SHALL BE ORIENTED TOWARDS THE "BOTTOM" OF THE PIPE, AS SHOWN IN SECTION A-A.
2. CONTRACTOR TO PROVIDE 72 HOLES PER STRAINER (2 ROWS WITH 36 HOLES EACH).
3. CONTRACTOR TO PROVIDE 2 FOOT LENGTH W/O HOLES AT 7 FEET FROM EACH END FOR FLOAT HANGERS.

3/9 TORPEDO STRAINER INLET
SCALE: 1/2" = 1'

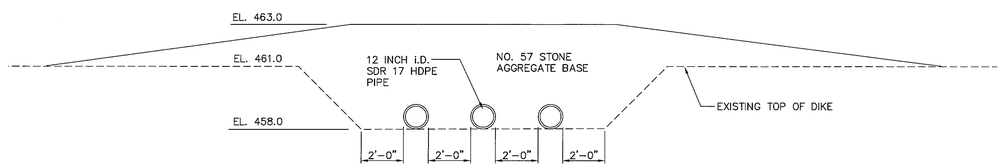


5/9 DETAIL - FLOAT BALL HANGER
SCALE: 3/4" = 1'

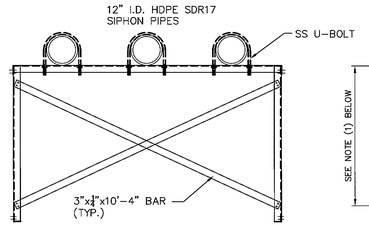


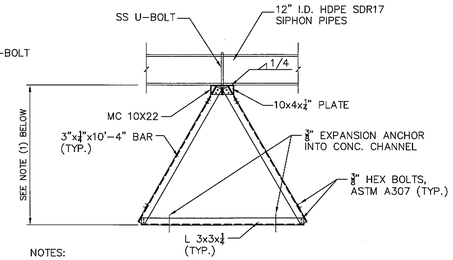
NOTE:
THE VACUUM FILL PORT WILL BE USED TO PRIME THE SIPHONS. ADDITIONAL FILL PORTS MAY BE INSTALLED AT THE CONTRACTOR'S DISCRETION.

6/9 VACUUM FILL PORT
SCALE: 3/4" = 1'



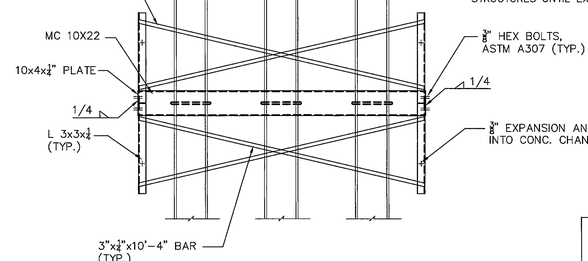
2/9 SIPHON SECTION UNDER DIKE
SCALE: 3/8" = 1'





NOTES:

1. HEIGHT OF SUPPORT STRUCTURES VARY FROM APPROXIMATELY 5' TO 2' AT THE OUTLET; CONTRACTOR TO VERIFY IN THE FIELD. SEE SIPHON PROFILE VIEW FOR SUPPORT STRUCTURE CONFIGURATION.
2. CONTRACTOR MAY ELECT TO WELD THE TEMPORARY SUPPORT STRUCTURES RATHER THAN USE 3/8" HEX BOLTS.
3. SANDBAGS MAY BE USED TO TEMPORARILY SECURE SUPPORT STRUCTURES UNTIL EXPANSION ANCHORS CAN BE INSTALLED.



4/9 SIPHON PIPE BRACING DETAILS
SCALE: 1/2" = 1'

SUBMITTAL_06

NOTE: REFER TO REFERENCE DRAWING A130-2002 0

Detail No.
Sheet Where Shown

REFERENCE KEY

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION.

STATE OF ALABAMA LICENSED PROFESSIONAL ENGINEER No. 30571 REGISTERED

RECORD DRAWING

For Supporting Design Calculations see FPGCOFFESCDX00000020100003

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. NO.
R 0	8/10/11	SW/SP	TG/KV	GD/VG	MJS	JCB	MST	JCK	WO 111112081		J
R	RECORD DRAWING										DISCIPLIN INTERFA

SCALE: SHOWN ON PLAN EXCEPT AS NOTED

SIPHON PIPE SECTION AND DETAILS

ASH POND 4 – HIGH HAZARD REMOVAL & SPILLWAY PROJECT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SW	TJG	GD	MJS	JCB	MST	JCK

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R12	DATE 8/10/11	47	C	10W290-10	R 0

URS

URS	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

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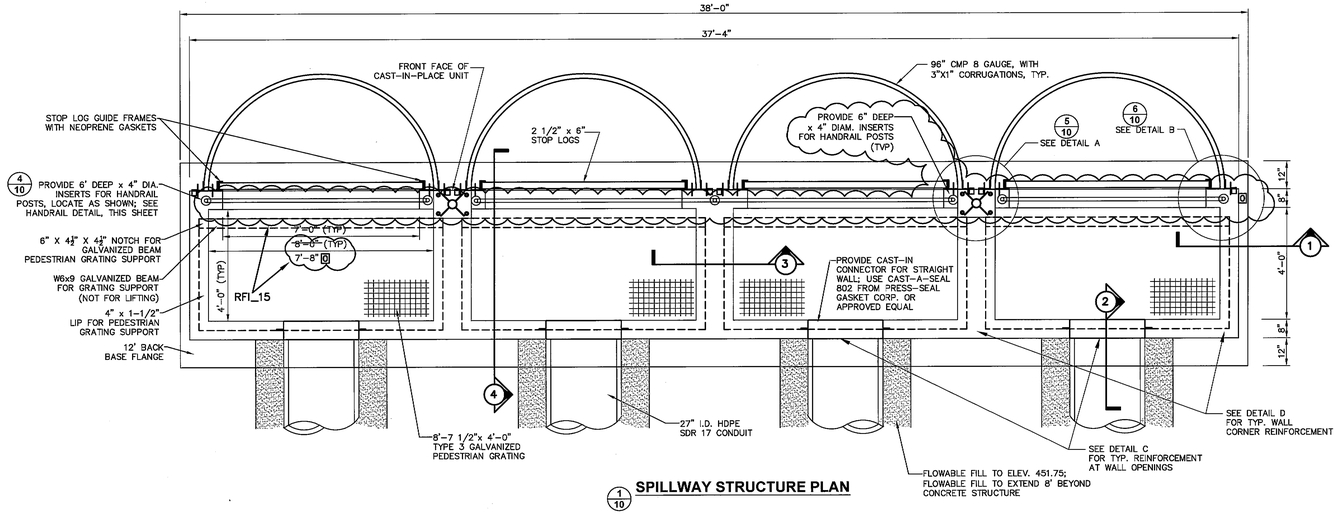
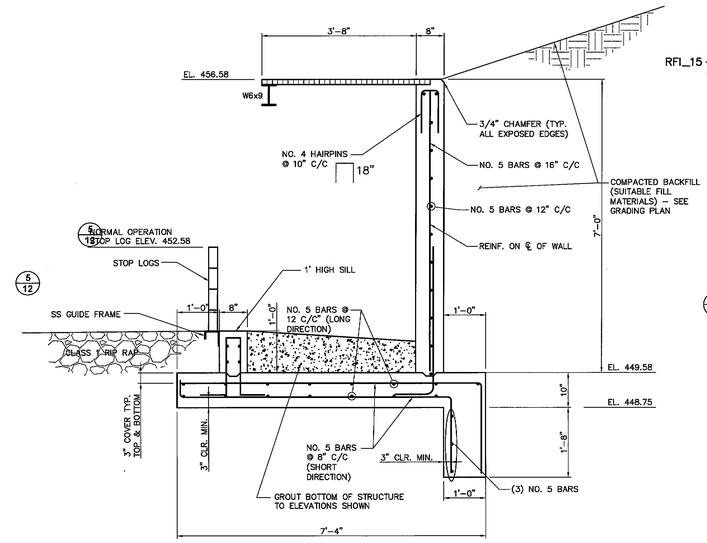
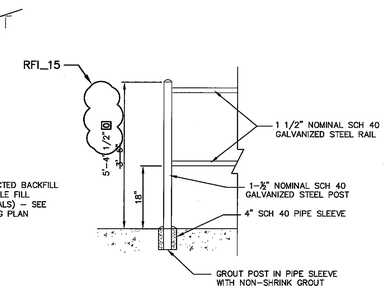
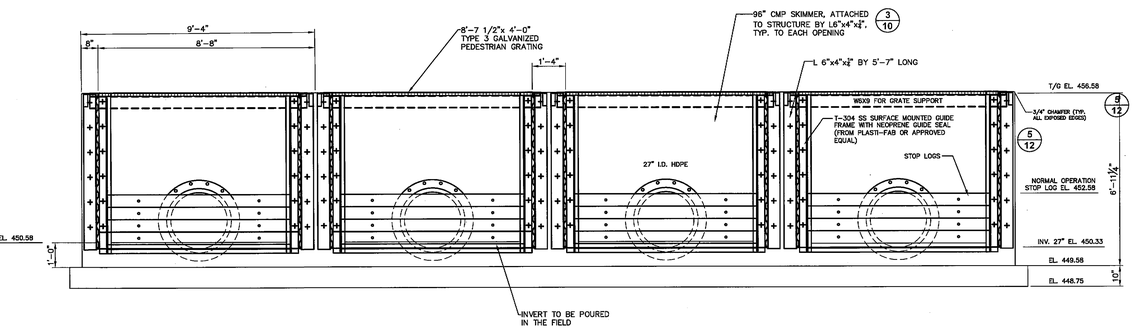


1/10 **SPILLWAY STRUCTURE PLAN**

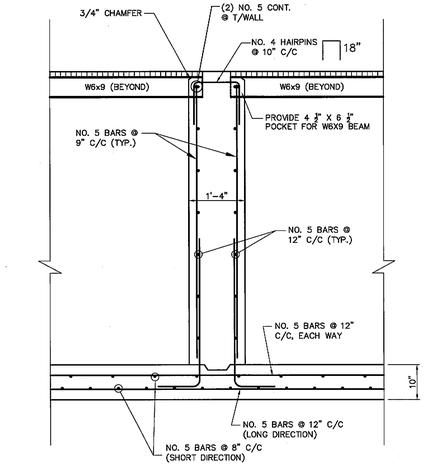




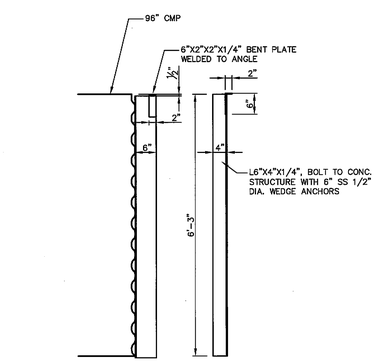
4/10 **DETAIL C - SAFETY RAIL AND POST**



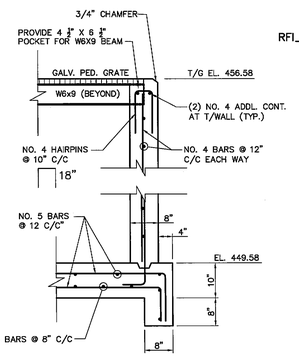
2/10 **SPILLWAY STRUCTURE ELEVATION**



SECTION 3



3/10 **DETAIL - 96" CMP SKIMMER ATTACHMENT ANGLES**



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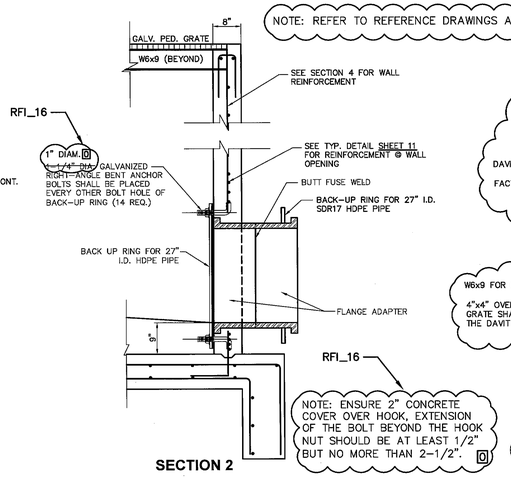
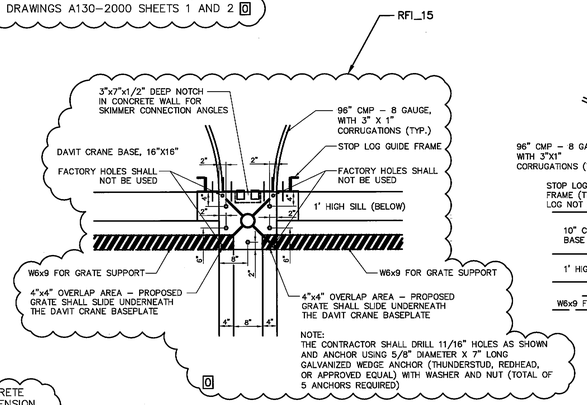


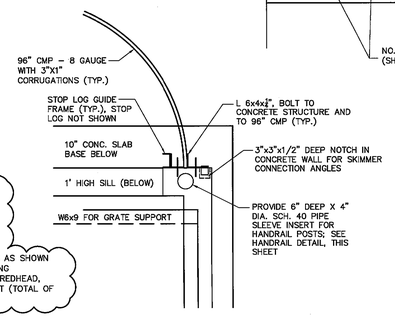
SECTION 2

SUBMITTAL_19

NOTE: REFER TO REFERENCE DRAWINGS A130-2000 SHEETS 1 AND 2 0



5/10 **REVISED DAVIT CRANE BASEPLATE DETAIL**



6/10 **DETAIL B**

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REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV CD
											1
											2
											3
											4

DISCIPLINE INTERFACE

SCALE: AS SHOWN EXCEPT AS NOTED

SPILLWAY STRUCTURE DETAILS

ASH POND 4 – HIGH HAZARD REMOVAL & SPILLWAY REPLACEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SW/SEP	TJG/KV	GD/VKG	MJS	JCB	MST	JCK

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2010	DATE 8/10/11	47	C	10W290-11	R 0

ALABAMA LICENSED No. 30571 PROFESSIONAL ENGINEER MICHAEL J. STEPP

URS

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TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX W_TVA

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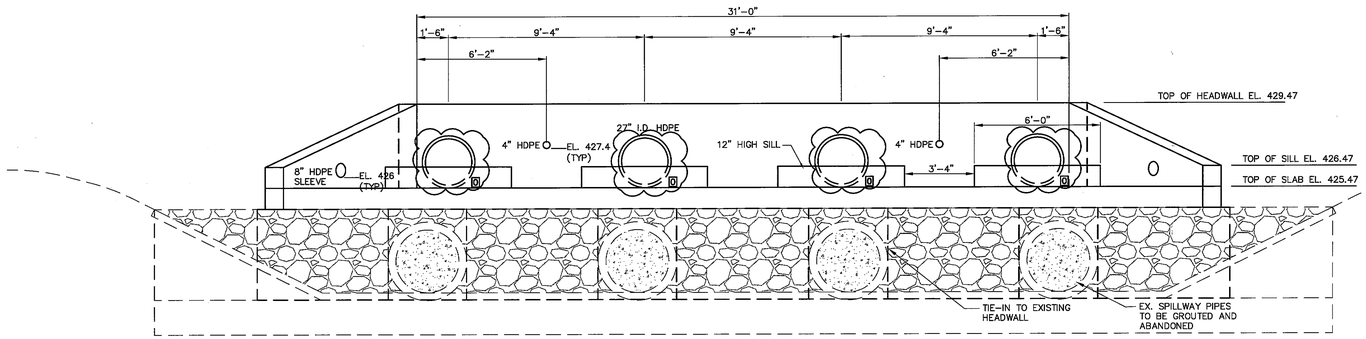
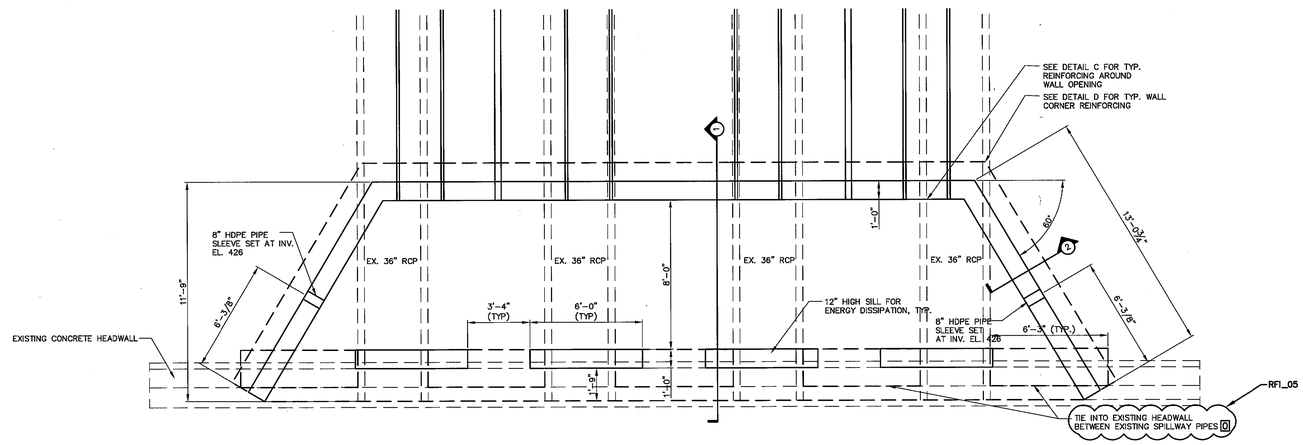


1/11 ELEVATION - OUTLET HEADWALL DETAILS

SCALE: 3/8" = 1'

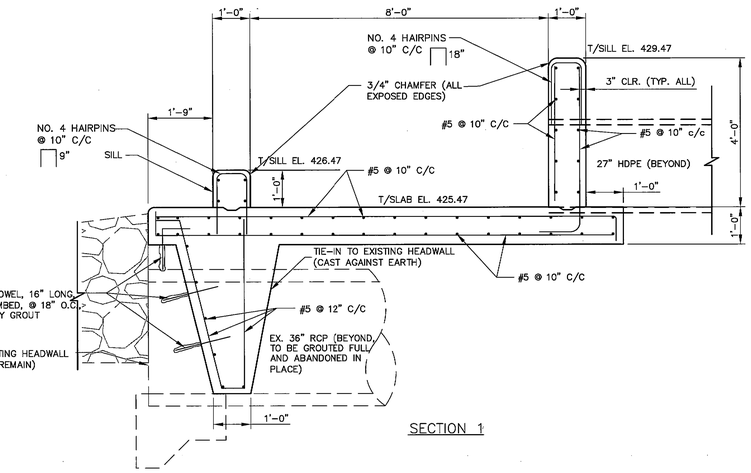


2/11 PLAN - OUTLET HEADWALL DETAILS

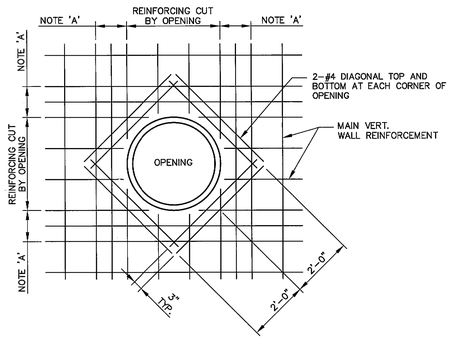
SCALE: 3/8" = 1'

SUBMITTAL_11

NOTE: REFER TO REFERENCE DRAWINGS A103-2001 SHEETS 1 AND 2

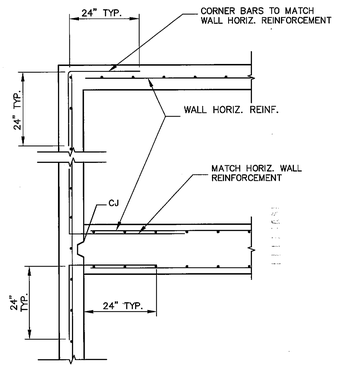


SECTION 1

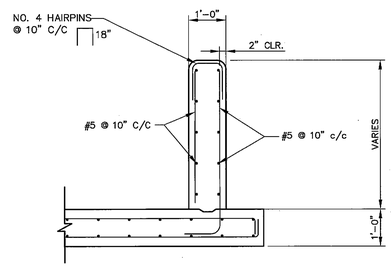


NOTE 'A':
ALL REINFORCING, TOP AND BOTTOM WHICH IS CUT BY THE OPENING SHALL BE ADDED EQUALLY TO EACH SIDE OF THE OPENING AND PLACED BETWEEN NORMAL SLAB REINFORCING. THE ADDED REINFORCING SHALL BE THE SAME LENGTH AS THE NORMAL REINFORCING.

DETAIL C
TYPICAL REINFORCING AROUND OPENING IN FLAT SLAB/WALL



DETAIL D
TYPICAL CONCRETE WALL CORNER REINFORCING



SECTION 2

Detail No.
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R 0	8/10/11	SW/SP	TG/KV	GD/VG	MJS	JCB	MST	JCK	WO 111112081	
R	RECORD DRAWING									

SCALE: AS SHOWN EXCEPT AS NOTED

OUTLET HEADWALL DETAILS

ASH POND 4 – HIGH HAZARD REMOVAL & SPILLWAY REPLACEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SW	TJG	GD	MJS	JCB	MST	JCK

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R12	DATE 8/10/11	47	C	10W290-12	R 0

ALABAMA LICENSED No. 30571 PROFESSIONAL ENGINEER

URS

URS	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
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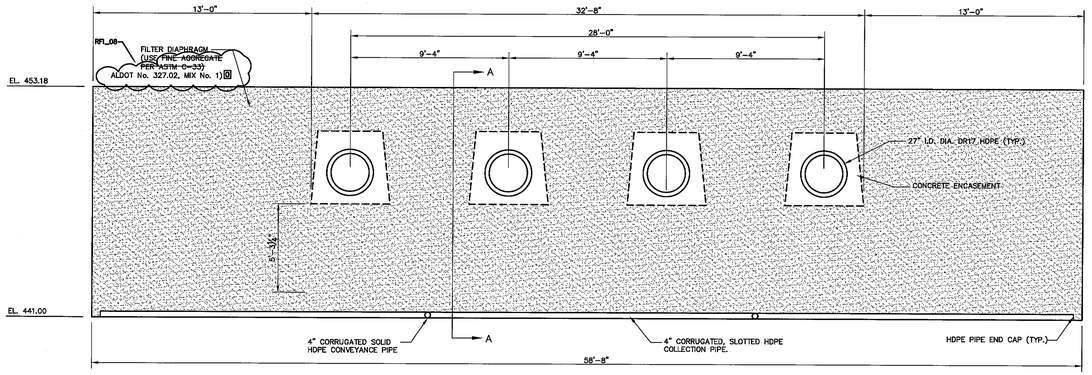
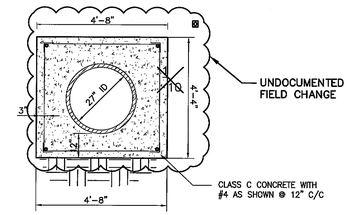


1/11 ELEVATION - FILTER DIAPHRAGM
SCALE: 1"=5'

1/12 ELEVATION - FILTER DIAPHRAGM
SCALE: 1" = 5'

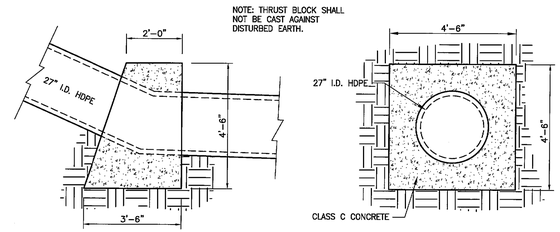


NOTE: PIPE ENCASEMENT OF THE 27" CONDUITS SHALL START 8' BEYOND THE SPILLWAY STRUCTURE AND SHALL EXTEND TO THE FILTER DIAPHRAGM. FLOWABLE FILL TO BE PLACED FROM THE SPILLWAY STRUCTURE TO 8' BEYOND THE SPILLWAY STRUCTURE. SEE DETAIL 6, THIS SHEET.

NOTE: BOTTOM OF PIPE ENCASEMENT SHALL NOT BE CAST AGAINST DISTURBED EARTH.

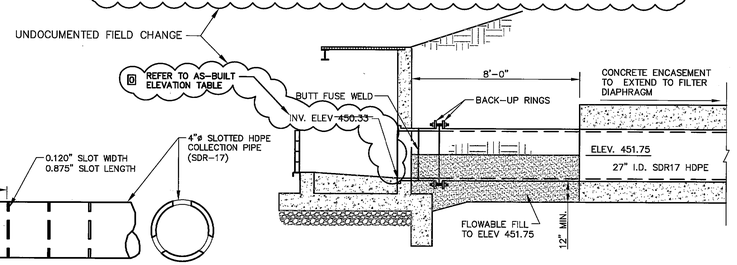
4/12 DETAIL - PIPE ENCASEMENT
SCALE: 1/2" = 1'

NOTE: THRUST BLOCK SHALL NOT BE CAST AGAINST DISTURBED EARTH.

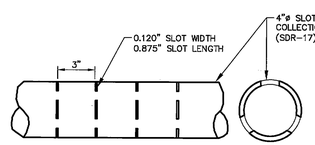


2/12 DETAIL - CONCRETE THRUST BLOCK
SCALE: 1/2" = 1'

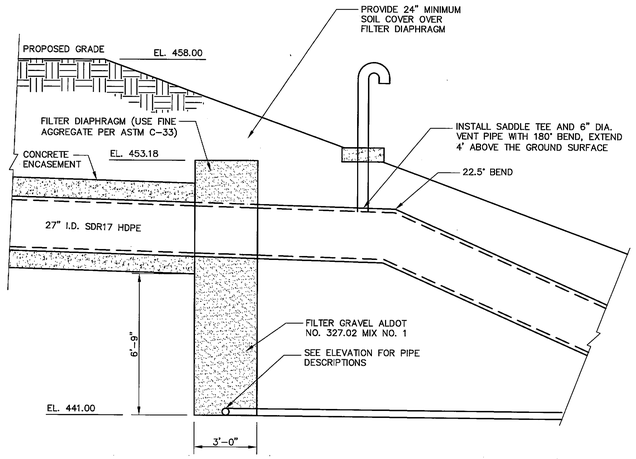
AS-BUILT PIPE INVERT ELEVATION TABLE			
PIPE 1	PIPE 2	PIPE 3	PIPE 4
450.41	450.36	450.31	450.30



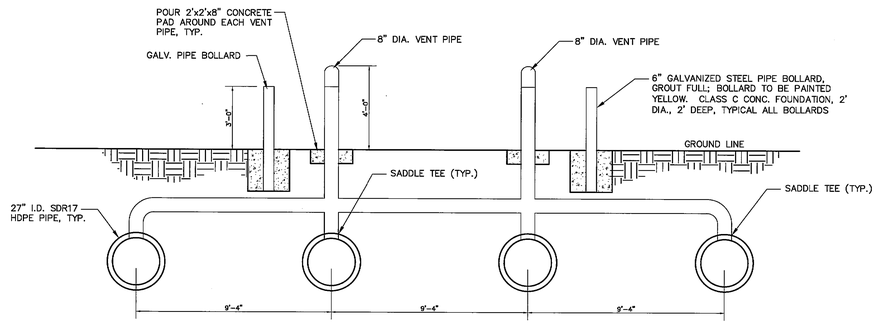
6/12 FLOWABLE FILL AND CONCRETE ENCASEMENT DETAIL
SCALE: 1/2" = 1'



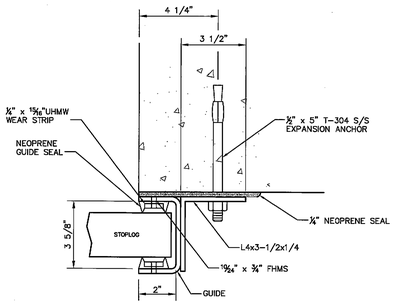
7/12 CORRUGATED SLOTTED PIPE DETAIL
N.T.S.

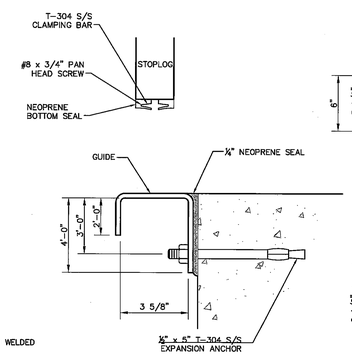


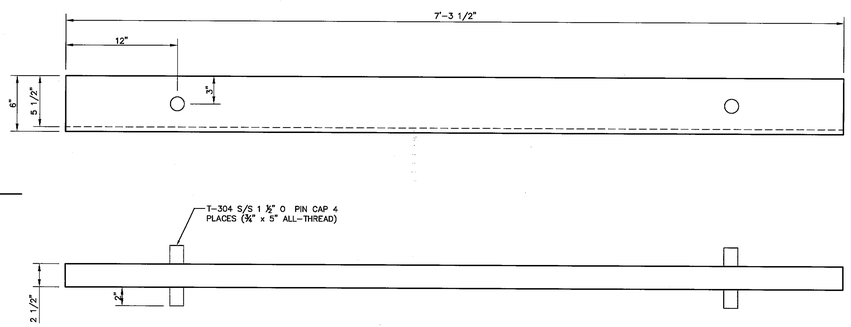
SECTION A-A



3/12 SECTION - VENT TEE MANIFOLD
SCALE: 3/8" = 1'







NOTES:
1. GUIDE FRAME MATERIAL IS FORMED AND WELDED T-304 S/S.
2. STOPLOG IS FRP (FIBERGLASS REINFORCED POLYESTER) WITH INTERNAL STEEL REINFORCING.
3. ALL HARDWARE IS T-304 S/S.

5/12 DETAIL -STOP LOG
SCALE: 2" = 1'-0

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Detail No.
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REFERENCE KEY

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REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 0	8/10/11	SW/SR	TG/KV	GD/VG	MJS	JCB	MST	JCK	WO 111118021	
R	RECORD DRAWING									

SCALE: AS SHOWN EXCEPT AS NOTED

FILTER DIAPHRAGM DETAIL

ASH POND 4 – HIGH HAZARD REMOVAL & SPILLWAY REPLACEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SW	TJG	GD	MJS	JCB	MST	JCK

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R12 | DATE 8/10/11 | 47 | C | 10W290-13 | R 0

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TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

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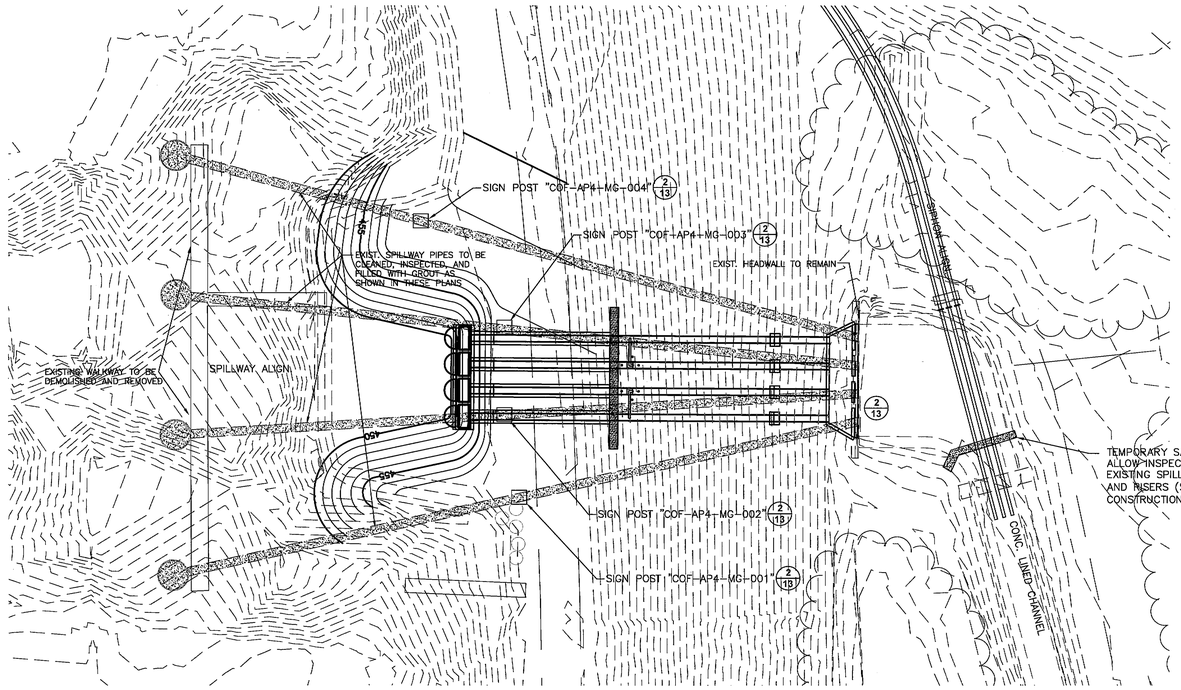
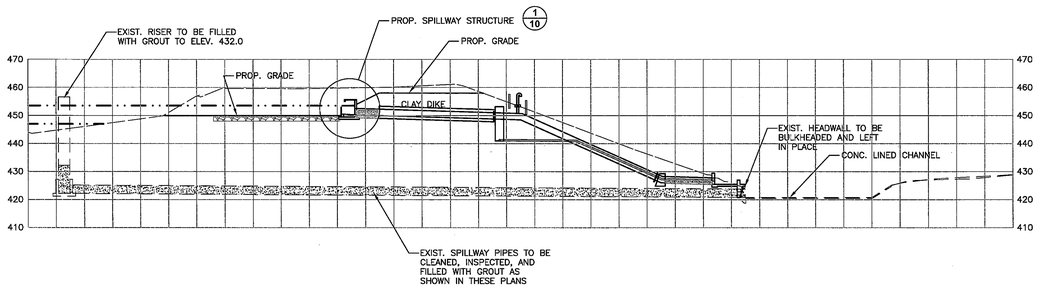


PLAN - SPILLWAY ABANDONMENT
SCALE: 1" = 20'



PROFILE - SPILLWAY ABANDONMENT
SCALE: 1" = 20'

ABANDONMENT SEQUENCING

1. PROPOSED SPILLWAY STRUCTURE TO BE OPERATIONAL FOR NO LESS THAN 7 DAYS PRIOR TO BEGINNING ANY ABANDONMENT ACTIVITIES.

2. INSTALL BERM (SANDBAGS) FOR SEDIMENT CONTROL WITHIN DOWNSTREAM CHANNEL.

3. CLEAN PIPES IN ACCORDANCE WITH THE GENERAL NOTES.

4. INSPECT PIPES IN ACCORDANCE WITH THE GENERAL NOTES.

5. INSTALL INJECTION PIPES AS SHOWN IN THESE PLANS.

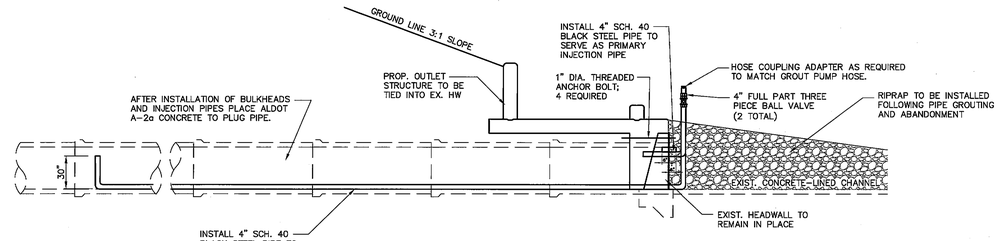
6. INSTALL STEEL BULKHEAD.

7. INJECT GROUT TO FILL REMAINING PIPES. FILL RISER TO NO GREATER THAN 10' FROM THE INVERT OF THE RISER.

8. REMOVE STEEL SKIMMER STRUCTURES AND WALKWAY.

9. REMOVE TEMPORARY EQUIPMENT AND MATERIALS.

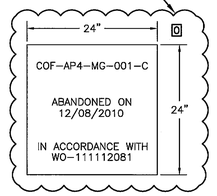
10. INSTALL POST WITH STEEL PLATE DOCUMENTING SPILLWAY ABANDONMENT.



1/13 SECTION - BULKHEAD AND PIPE ABANDONMENT
SCALE: 1"=4'

BULKHEADS HAVE BEEN REMOVED. 0

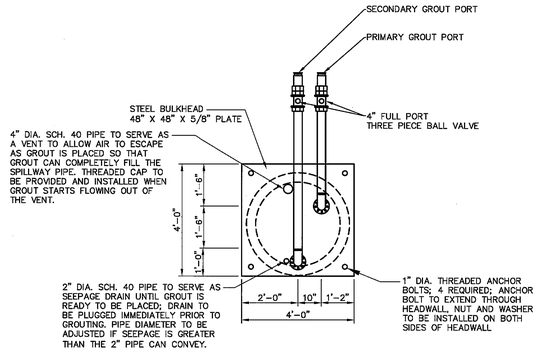
SUBMITTAL_27



NOTES:
DETAILS FOR "X" LABELS TO BE PROVIDED BY URS/TVA DURING CONSTRUCTION.

CONTRACTOR TO PROVIDE SIGN POST INDICATING SPILLWAY IDENTIFICATION AS SHOWN FOLLOWING ABANDONMENT; SIGN POST IN ACCORDANCE WITH TVA STANDARD DRAWING 105D855 – MODEL NO. 1.

2/13 DETAIL - SIGNAGE LAYOUT
SCALE: 1/2" = 1'



3/13 ELEVATION - STEEL BULKHEAD
SCALE: 1/2" = 1'

NOTE:
REFER TO REFERENCE DRAWING A130-2005 0

SUBMITTAL_20B

Detail No.
Sheet Where Shown
REFERENCE KEY

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION.

RECORD DRAWING

For Supporting Design Calculations see FPGCOFFESCDX00000020100003

R 0	8/10/11	SW/SR	TG/KV	GD/VG	MJS	JCB	MST	JCK	WO 111112081	J
RECORD DRAWING										
R 0										

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. ID
											1
											2
											3
											4

DISCIPLINE INTERFACE

SCALE: AS SHOWN EXCEPT AS NOTED

SPILLWAY ABANDONMENT PLAN

ASH POND 4 – HIGH HAZARD REMOVAL & SPILLWAY REPLACEMENT

ALABAMA LICENSED No. 30571 PROFESSIONAL ENGINEER MICHAEL T. STEVENS

URS

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SW	TJG	GD	MJS	JCB	MST	JCK

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R12	DATE 8/10/11	47	C	10W290-14	R 0

URS	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

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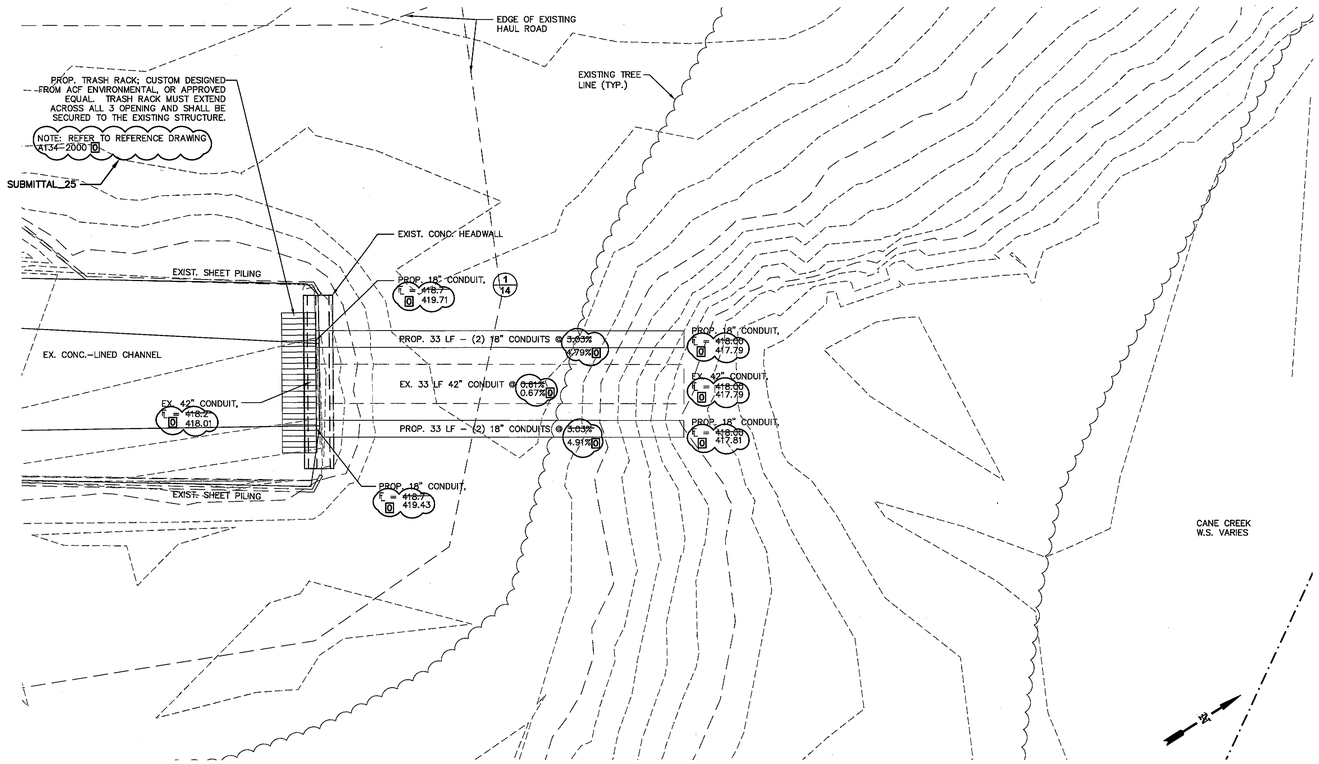
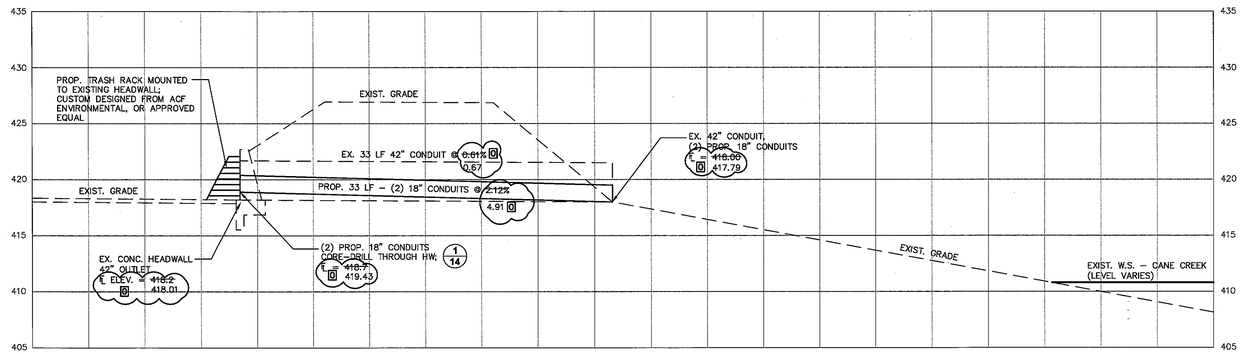
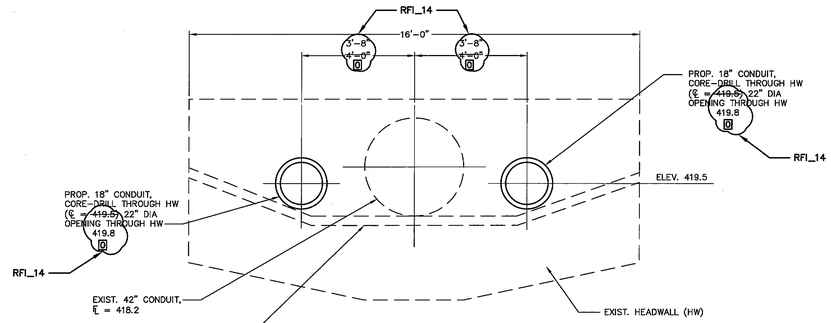


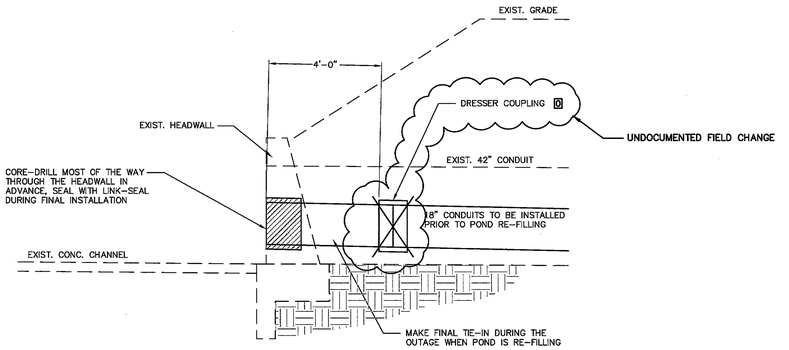
PLAN - CHANNEL OUTLET
SCALE: 1" = 5'



PROFILE - CHANNEL OUTLET
SCALE: 1" = 5' HORIZ.
1" = 5' VERT.



1/14 OUTLET CHANNEL HEADWALL DETAIL
SCALE: 1" = 2'



2/14 PROPOSED 18" CONNECTION DETAIL
SCALE: 1" = 2'

NOTE: THIS DETAIL PROVIDES AN APPROACH TO ACCOMPLISH FINAL TIE-IN OF THE NEW 18" CONDUITS IN THE DRY WHILE POND IS RE-FILLING. CONTRACTOR TO CONFIRM EXPECTED FILL TIME AND PROVIDE WORK PLAN FOR ENGINEER REVIEW.

Detail No.
Sheet Where Shown
REFERENCE KEY

ALABAMA LICENSED PROFESSIONAL ENGINEER No. 30571 MICHAEL J. STRICKLAND

RECORD DRAWING

For Supporting Design Calculations see FPGCOFFESCDX00000020100003

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION.

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 0	8/10/11	SW/SP	TG/KV	GD/VG	MJS	JCB	MST	JCK	WO 111112081	
R	RECORD DRAWING									

SCALE: AS SHOWN EXCEPT AS NOTED

DOWNSTREAM IMPROVEMENTS

ASH POND 4 – HIGH HAZARD REMOVAL & SPILLWAY REPLACEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SW/SP	TJG	GD	MJS	JCB	MST	JCK

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

URS

AUTOCAD 2010	DATE 8/10/11	47	C	10W290-15	R 0

URS	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

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DO NOT ALTER MANUALLY

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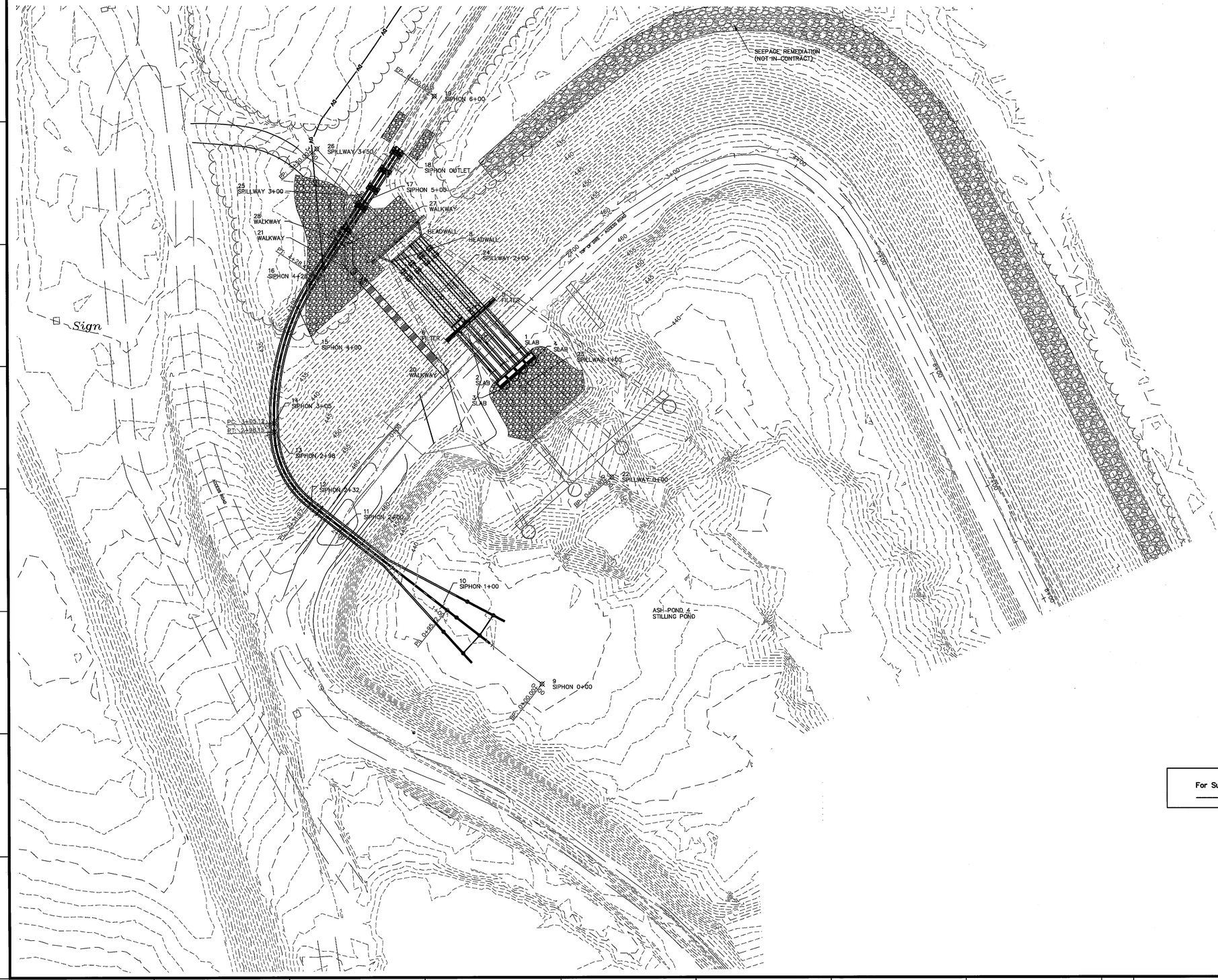

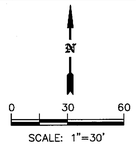

LEGEND

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING SHEET PILE WALL
- EXISTING HAUL ROAD
- PROPOSED RIP RAP
- EXISTING TREE-LINE/ VEGETATION

Point Table

Point #	Elevation	Northing	Easting	Description
1	448.75	1723543.90	394329.25	SLAB
2	448.75	1723519.09	394301.36	SLAB
3	448.75	1723513.61	394306.23	SLAB
4	448.75	1723538.42	394334.13	SLAB
5	443.25	1723585.37	394301.18	FILTER
6	443.25	1723551.81	394263.44	FILTER
7		1723635.72	394244.12	HEADWALL
8		1723614.42	394220.18	HEADWALL
9		1723278.65	394337.64	SIPHON 0+00
10		1723340.54	394259.09	SIPHON 1+00
11		1723402.43	394180.54	SIPHON 2+00
12		1723422.22	394155.43	SIPHON 2+32
13		1723479.49	394126.68	SIPHON 2+98
14		1723486.46	394126.50	SIPHON 3+05
15		1723578.47	394145.81	SIPHON 4+00
16		1723603.25	394159.68	SIPHON 4+28
17		1723663.10	394198.94	SIPHON 5+00
18		1723704.91	394228.36	SIPHON OUTLET
19		1723746.72	394253.79	SIPHON 6+00
20		1723523.98	394260.56	WALKWAY
21		1723610.71	394183.30	WALKWAY
22		1723443.43	394393.63	SPILLWAY 0+00
23		1723518.15	394327.17	SPILLWAY 1+00
24		1723592.87	394260.71	SPILLWAY 2+00
25		1723667.59	394194.25	SPILLWAY 3+00
26		1723704.95	394161.02	SPILLWAY 3+50
27		1723627.80	394183.27	WALKWAY
28		1723635.89	394170.93	WALKWAY

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ALABAMA LICENSED No. 30571 PROFESSIONAL ENGINEER MICHAEL S. SWEET

RECORD DRAWING

For Supporting Design Calculations see

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 0	8/10/11	SW/SH	TG/KV	GD/VC	MJS	JCB	MST	JCK	WO 111112081	
R	RECORD DRAWING									

SCALE: 1" = 30' EXCEPT AS NOTED

SURVEY CONTROL PLAN

ASH POND 4 – HIGH HAZARD, DIKE LOWERING, SIPHON, AND SPILLWAY PLAN

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SW	TJG	GD	MJS	JCB	MST	JCK

URS

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R10	DATE 8/10/11	47	C	10W290-16	R 0

URS	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
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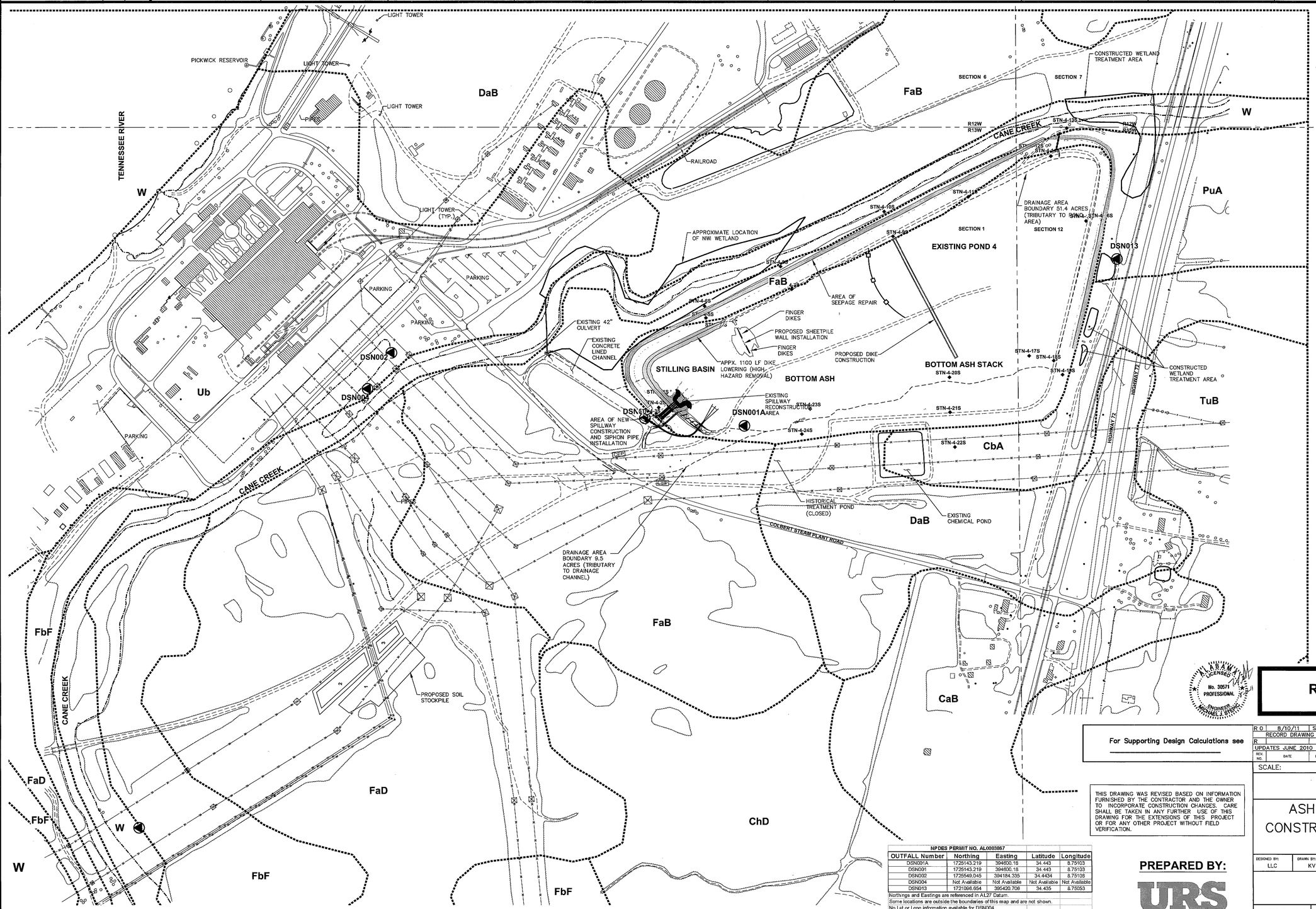

0 200 400

SCALE: 1"=200'

TENNESSEE VALLEY AUTHORITY
COLBERT STEAM PLANT
COLBERT COUNTY
MAP AREA SHOWN ON THIS DRAWING IS LOCATED WITHIN TOWNSHIP 4 SOUTH, RANGE 13 WEST AND TOWNSHIP 4 SOUTH, RANGE 12 WEST, SECTIONS 1, 6, 12, AND 7
URS CORPORATION
DATE OF INITIAL ISSUE: 2/25/2010
REVISION DATE: 6/3/2010

LEGEND

- EXISTING VEGETATION
- EXISTING FENCE
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING HAUL ROAD
- PROPERTY LINE
- EXISTING RAILROAD
- TRANSMISSION TOWER
- PERMITTED DISCHARGE LOCATION
- SECTION BREAK

NOTES

1. EXACT LOCATION OF EXISTING UTILITIES TO BE VERIFIED.
2. WORK AREAS ARE IN FLOOD ZONE A ACCORDING TO FEMA, COLBERT COUNTY PANEL, 300 OF 550. POND AREAS ARE IN FLOOD ZONE X.
3. THERE ARE NO CONTAMINATED SITES, THREATENED OR ENDANGERED SPECIES, OR CULTURAL RESOURCES WITHIN THE LIMITS OF CONSTRUCTION.
4. CONTRACTOR TO BE CAREFUL WORKING IN RIPARIAN CORRIDOR ASSOCIATED WITH CANE CREEK. WORK AT ELEVATION 420 OR LOWER SHOULD BE AVOIDED. CONTACT TVA BEFORE WORKING IN THESE AREAS.

SOIL SYMBOLS

- CaB CAPSHAW SILT LOAM, 2 TO 6 PERCENT SLOPES
- CbA CHENNEBY SILT LOAM, 0 TO 2 PERCENT SLOPES, OCCASIONALLY FLOODED
- ChD CHISCA LOAM, 6 TO 15 PERCENT SLOPES
- DaB DECATUR SILT LOAM, 6 TO 10 PERCENT SLOPES, ERODED
- FaB FULKERTON CHERTY SILT LOAM, 6 TO 15 PERCENT SLOPES
- FaD FULLERTON CHERTY SILT LOAM, 6 TO 15 PERCENT SLOPES
- FbF FULLERTON–BODINE COMPLEX, 15 TO 45 PERCENT SLOPES
- PuA PRIUTTON AND SULLIVAN SILT LOAMS, 0 TO 2 PERCENT SLOPES, OCCASIONALLY FLOODED
- TuB TUPELO–COLBERT COMPLEX, 0 TO 4 PERCENT SLOPES
- Ub URBAN LAND
- W WATER

RECORD DRAWING

For Supporting Design Calculations see

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NPDES PERMIT NO. AL0003867

OUTFALL Number	Northing	Easting	Latitude	Longitude
DSN001A	1725143.219	394600.18	34.443	8.75103
DSN001	1725143.219	394600.18	34.443	8.75103
DSN002	1725549.045	394184.335	34.4434	8.75108
DSN004	Not Available	Not Available	Not Available	Not Available
DSN013	1721066.654	395420.709	34.435	8.75053

Northings and Eastings are referenced in AL27 Datum.
Some locations are outside the boundaries of this map and are not shown.
No Lat or Long information available for DSN004.

PREPARED BY:

URS

ALABAMA LICENSED No. 30571 PROFESSIONAL ENGINEER MICHAEL J. PEST

REV	DATE	SW/SH	TG/KV	GD/VC	MJS	JCB	MST	JCK	WO 111112081	
R 0	8/10/11	RECORD DRAWING								J
R 1	UPDATES JUNE 2010									

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV

DISCIPLINE INTERFACE

SCALE: EXCEPT AS NOTED

ASH POND 4–OVERALL SITE CONSTRUCTION BEST MANAGEMENT PRACTICES PLAN

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
LLC	KV	MJS	MJS	JCB	MST	JCK

TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2010	DATE 8/10/11	47	C	10W290–17	R 2

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
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URS	0
TASK COMPLETED BY:	REV NO

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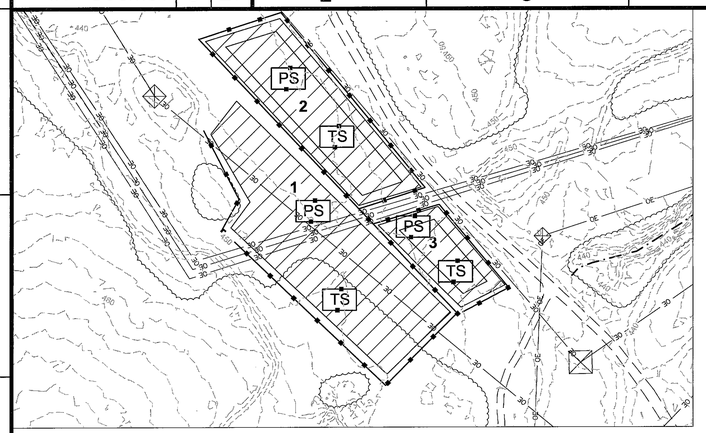

STOCKPILE LOCATION

COAL YARD RUN OFF POND

CANE CREEK

APPX. LOCATOIN OF WETLAND TREATMENT AREA

EXISTING POND 4

PROPOSED DIKE CONSTRUCTION

AREA OF SEEPAGE REPAIR

PIPE INSTALLATION

FINGER DIKES

EXISTING 42" CULVERT

EXISTING SHEET PILE WALL

DIKE LOWERING (HIGH HAZARD REMOVAL)

PROPOSED TURBIDITY CURTAIN "B"

PROPOSED SHEET PILE WALL INSTALLATION

EXISTING CONCRETE LINED CHANNEL

STILLING BASIN

EXISTING SPILLWAY RECONSTRUCTION AREA

PROPOSED TURBIDITY CURTAIN "A"

AREA OF NEW SPILLWAY CONSTRUCTION

BOTTOM ASH

BOTTOM ASH STACK

DSN001

DSN001A

DSN013

SANDBAG AND RIPRAP INSTALLATION LOCATION

SIPHON PIPES

CEP

HISTORICAL TREATMENT POND (CLOSED)

EXISTING CHEMICAL POND

CONSTRUCTION ACCESS PAD AND WASHOUT AREA

COLBERT STEAM PLANT ROAD

HIGHWAY 72

CONSTRUCTED WETLAND TREATMENT AREA

STN-4-4S
STN-4-5S
STN-4-6S
STN-4-7S
STN-4-8S
STN-4-11S
STN-4-12S
STN-4-13S
STN-4-14S
STN-4-15S
STN-4-16S
STN-4-17S
STN-4-18S
STN-4-19S
STN-4-20S
STN-4-21S
STN-4-22S
STN-4-23S

0 100 200
SCALE: 1"=100'

TENNESSEE VALLEY AUTHORITY
COLBERT STEAM PLANT
COLBERT COUNTY
MAP AREA SHOWN ON THIS DRAWING IS LOCATED WITHIN TOWNSHIP 4 SOUTH, RANGE 13 WEST AND TOWNSHIP 4 SOUTH, RANGE 12 WEST, SECTIONS 1, 6, 12, AND 7
URS CORPORATION
DATE OF INITIAL ISSUE: 2/25/2010
REVISED: 6/3/2010

LEGEND

- STONE FILTER PROTECTION
- SILT FENCE
- DV — TEMPORARY DIVERSION WITH ROCK CHECK DAMS
- LG — LIMIT OF CONSTRUCTION AND GRADING
- EXISTING WETLAND
- EXISTING VEGETATION
- X — EXISTING FENCE
- OE — EXISTING OVERHEAD ELECTRIC LINE
- EXISTING HAUL ROAD
- EXISTING RAILROAD
- STOCKPILE LOCATION
- TRANSMISSION TOWER
- TS — TEMPORARY SEEDING
- CEP — CONSTRUCTION EXIT PAD
- PS — PERMANENT SEEDING
- PERMITTED DISCHARGE LOCATION

NOTES

1. EXACT LOCATION OF EXISTING UTILITES TO BE VERIFIED BY TVA.
2. ENTIRE SITE IS IN THE JURISDICTIONAL FLOOD PLAIN.
3. THERE ARE NO CONTAMINATED SITES, THREATENED OR ENDANGERED SPECIES, OR CULTURAL RESOURCES WITHIN THE LIMITS OF CONSTRUCTION.
4. THE INFORMATION SHOWN HEREIN IS CURRENT AS OF JUNE 2010. WORK IS SUBJECT TO CHANGE AND CBMPP WILL CHANGE TO REFLECT THESE CHANGES.
5. CONTRACTOR SHALL BE CAREFUL WORKING IN RIPARIAN CORRIDOR ASSOCIATED WITH CANE CREEK. WORK AT ELEVATION 420 OR LOWER SHOULD BE AVOIDED. CONTACT TVA BEFORE WORKING IN THESE AREAS.

NPDES PERMIT NO. AL0003867				
OUTFALL Number	Northing	Easting	Latitude	Longitude
DSN001A	1725143.219	394800.18	34.443	8.75103
DSN001	1725143.219	394800.18	34.443	8.75103
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DSN004	Not Available	Not Available	Not Available	Not Available
DSN013	1721096.654	395420.708	34.435	8.75053
Northings and Eastings are referenced in AL27 Datum.				
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No Lat or Long information available for DSN004.				

ALABAMA LICENSED No. 30571 PROFESSIONAL ENGINEER MICHAEL J. STOCK

RECORD DRAWING

For Supporting Design Calculations see _____

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REV	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ENGR	AS CONST
R 0	8/10/11	SW/SH	TG/KV	GD/VG	MJS	JCB	MST	JCK	WO 111112081	J
R	RECORD DRAWING									
	UPDATES JUNE 2010									

SCALE: NONE — EXCEPT AS NOTED

PREPARED BY: URS

ASH POND 4 IMPROVEMENTS CONSTRUCTION BEST MANAGEMENT PRACTICES PLAN

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
LLC	KV	MJS	MJS	JCB	MST	JCK

TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2010	DATE 8/10/11	##	C	10W290-18	R 0

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING DO NOT ALTER MANUALLY

URS	0
TASK COMPLETED BY:	REV. NO.

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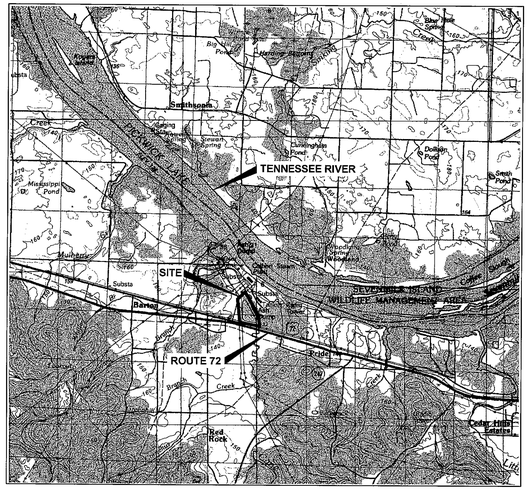

PRODUCED BY TENNESSEE VALLEY AUTHORITY IN COOPERATION WITH UNITED STATES GEOLOGICAL SURVEY
NAD 27
AERIAL PHOTOGRAPHS TAKEN 1981
MAP EDITED 1986
CONTOUR INTERVAL 10 METERS

0 2000 4000
SCALE IN METERS

N

CBMPP REQUIREMENTS

PROJECT NAME AND LOCATION:

COLBERT FOSSIL PLANT
900 COLBERT STEAM PLANT ROAD
TUSCUMBIA, AL 35674-6905

OWNER NAME AND ADDRESS:

TENNESSEE VALLEY AUTHORITY (TVA)
1101 MARKET STREET
CHATTANOOGA, TN 37402-2801

GENERAL NOTES:

1. A NOTICE OF REGISTRATION (NOR) HAS BEEN SUBMITTED FOR THIS PROJECT.
2. ALL CONSTRUCTION ACTIVITIES MUST COMPLY WITH STATE OF ALABAMA AND COLBERT COUNTY REGULATIONS.
3. ALL EROSION AND SEDIMENT CONTROL PRACTICES MUST MEET THE STANDARDS AND SPECIFICATIONS OF THE ALABAMA HANDBOOK FOR EROSION CONTROL, SEDIMENT CONTROL, AND STORMWATER MANAGEMENT ON CONSTRUCTION SITES AND URBAN AREAS.
4. ALL STORM INLETS/CATCH BASINS THAT ARE MADE OPERATIONAL DURING CONSTRUCTION SHALL BE PROTECTED SO THAT SEDIMENT-LADEN WATER WILL NOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT.
5. PERIMETER SEDIMENT CONTROLS SHALL BE IMPLEMENTED AS THE FIRST STEP OF GRADING AND WITHIN 7 DAYS FROM THE START OF GRUBBING. THESE SHALL CONTINUE TO FUNCTION UNTIL DISTURBED AREAS ARE RE-STABILIZED.
6. MINIMIZE TRACKING OF SEDIMENTS BY VEHICLES BY UTILIZING THE CONSTRUCTION ENTRANCES AS THE ONLY ENTRANCES FOR VEHICLES. MAINTAIN THIS ENTRANCES WITH STONE AS NEEDED TO PREVENT DIRT AND MUD FROM TRACKING ONTO THE ROADWAY. REGULAR SWEEPING OF THE ROADWAY MAY BE NECESSARY TO ENSURE ROADWAY DOES NOT BUILD UP WITH SEDIMENTS.
7. OTHER EROSION AND SEDIMENT CONTROL ITEMS MAY BE NECESSARY DUE TO ENVIRONMENTAL CONDITIONS AND MAY BE REQUIRED AT THE DISCRETION OF THE COLBERT COUNTY ENGINEER'S OFFICE.
8. NO SOLID OR LIQUID WASTE SHALL BE DISCHARGED INTO STORM WATER RUNOFF. (THIS INCLUDES WASHING OUT OF CEMENT TRUCKS.) WASH PIT AREAS SHALL BE APPROVED BY OWNER, AWAY FROM AREAS OF STORM WATER RUNOFF.
9. SITE STABILIZATION EITHER PERMANENT OR TEMPORARY MUST FOLLOW THE REQUIREMENTS AS APPLICABLE ON THE CHARTS ON CBMPP PLAN SHEETS.

OFFSITE VEHICLE / SEDIMENT TRACKING:

A STABILIZED CONSTRUCTION ENTRANCE SHALL BE PROVIDED TO HELP REDUCE VEHICLE TRACKING OF SEDIMENTS. ALL PAVED STREETS ADJACENT TO THE SITE ARE BE SWEPT DAILY TO REMOVE ANY EXCESS MATERIAL TRACKED FROM THE SITE. A TIRE WASH IS TO BE INSTALLED AT NO ADDITIONAL COST TO THE PROJECT IF DEEMED NECESSARY BY LOCAL OFFICIALS. DUMP TRUCKS HAULING MATERIAL FROM THE CONSTRUCTION SITE MUST TO BE COVERED WITH A TARPAULIN.

TIMING OF CONTROLS / MEASURES

AS INDICATED IN THE SCHEDULE OF CONSTRUCTION ACTIVITIES, STABILIZED CONSTRUCTION ENTRANCE AND SILT FENCE WILL BE CONSTRUCTED PRIOR TO CLEARING OR GRADING OF ANY OTHER PORTIONS OF THE SITE. AREAS WHERE CONSTRUCTION ACTIVITY TEMPORARILY CEASES FOR MORE THAN 14 DAYS WILL BE STABILIZED WITH A TEMPORARY SEED AND MULCH WITHIN 7 DAYS OF THE LAST DISTURBANCE. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN AN AREA, THAT AREA WILL BE STABILIZED WITH PERMANENT SEED AND MULCH.

SOIL PROTECTION CHART

STABILIZATION TYPE	J	F	M	A	M	J	J	A	S	O	N	D
PERMANENT SEEDING			●	●	●	*	*	*	●	●		
DORMANT SEEDING	●	●	●							●	●	●
TEMPORARY SEEDING			●	●	●	*	*	*	●	●		
SODDING			**	**	**	**	**	**	**	**		
MULCHING	●	●	●	●	●	●	●	●	●	●	●	●

* – IRRIGATION NEEDED

** – IRRIGATION NEEDED FOR 2-3 WEEKS AFTER SOD IS APPLIED

PRODUCT SPECIFIC PRACTICES

THE FOLLOWING PRODUCT SPECIFIC PRACTICES SHALL BE FOLLOWED WHILE ONSITE:

PETROLEUM PRODUCTS – ALL ONSITE VEHICLES WILL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE THE CHANCE OF LEAKAGE. PETROLEUM PRODUCTS MUST BE STORED IN APPROVED SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT SUBSTANCES USED ONSITE ARE TO BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.

FERTILIZERS – FERTILIZERS USED SHALL BE APPLIED IN THE MINIMUM AMOUNTS RECOMMENDED BY THE MANUFACTURER. ONCE APPLIED, FERTILIZER WILL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORM WATER. STORAGE OF ALL MATERIAL SHALL BE IN A COVERED SHED. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER MUST BE TRANSFERRED TO A SEALABLE CONTAINER, MADE OF A SUITABLE MATERIAL TO PREVENT SPILLS.

PAINTS – ALL CONTAINERS SHALL BE TIGHTLY SEALED AND PROPERLY STORED WHEN NOT IN USE. EXCESS PAINT IS NOT BE DISCHARGED TO THE STORM SEWER SYSTEM, BUT PROPERLY DISPOSED OF ACCORDING TO MANUFACTURERS' INSTRUCTIONS OR STATE, LOCAL, OR FEDERAL REGULATIONS.

FINAL STABILIZATION

A SITE IS CONSIDERED STABILIZED WHEN ALL OF THE FOLLOWING CRITERIA ARE MET:

- A PERENNIAL, VEGETATED COVER (OR OTHER PERMANENT STABILIZATION PRACTICE) HAS GROWN TO A 70% DENSITY THROUGHOUT THE ENTIRE DISTURBED AREA.
- ALL TEMPORARY EROSION AND SEDIMENT CONTROLS HAVE BEEN REMOVED AND DISPOSED OF PROPERLY.
- ALL TRAPPED SEDIMENT HAS BEEN PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION OR RE-SUSPENSION.
- ALL CONSTRUCTION ACTIVITIES HAVE CEASED.

ANTICIPATED SEQUENCE OF CONSTRUCTION

1. INSTALL TURBIDITY CURTAIN TO PROTECT EXISTING SPILLWAY.
2. INSTALL TURBIDITY CURTAIN NORTH OF FINGER DIKE AREA.
3. INSTALL OTHER CONTROLS PER SWPPP.
4. PREPARE ACCESS TO BASE OF DIKE AT DISCHARGE CHANNEL.
5. DRIVE SHEETING AT FINGER DIKES
6. START CONSTRUCTING DOWN-SLOPE PORTION OF SIPHON PIPES.
7. AFTER DRIVING OF SHEETPILING IS COMPLETE, MOVE TURBIDITY CURTAIN SOUTH OF NEW SHEETPILING.
8. CUT DOWN TOP OF DIKE TO ELEVATION 458.0' ALONG NORTH AND EAST SIDES OF THE STILLING BASIN.
9. FINISH CONSTRUCTING THE POND-SIDE PORTION OF THE SIPHONS.
10. MOVE TURBIDITY CURTAIN FROM IN FRONT OF EXISTING SPILLWAYS TO THE NORTHWEST CORNER OF THE STILLING BASIN TO PROTECT DURING SIPHON OPERATION.
11. DEWATER POND AND STILLING BASIN TO ELEVATION 453.0' AT MAIN POND AND 447.0' IN THE STILLING BASIN AREA.
12. SANDBAG INLET FROM OUTLET BASIN TO OUTLET CHANNEL.
13. INSPECT EXISTING OUTLET PIPES AND RISERS.
14. EXCAVATE AND INSTALL NEW SPILLWAY STRUCTURE IN THE NORTH FACE OF THE DIKE.
15. CONSTRUCT NEW HEADWALL FOR OUTLET PIPES.
16. INSTALL NEW SPILLWAY PIPES, CONNECTING SPILLWAY STRUCTURE TO HEADWALL.
17. ABANDON THE EXISTING SPILLWAY PIPES AND RISERS.
18. EXCAVATE AND RIPRAP NEW APPROACH CHANNEL TO THE SPILLWAYS
19. FILL DISCHARGE BASIN WITH RIPRAP.
20. RAISE WATER LEVEL TO COME BACK UP TO ELEVATION 453.0' AND START OPERATING THROUGH THE NEW SPILLWAYS.
21. REMOVE SANDBAGS.
22. MOVE TURBIDITY CURTAIN TO FRONT OF NEW ENTRANCE CHANNEL.
23. REMOVE EXTENDED SECTIONS OF SIPHON PIPES AND INSTALL TURN-UP ENDS TO DISCHARGE INTO RIPRAP AREA OF BASIN.
24. REMOVE NO LONGER NEEDED CONTROLS.

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION.

RECORD DRAWING

For Supporting Design Calculations see _____

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV ID
R 0	8/10/11	SW/SR	TG/KV	GC/VG	MJS	JCB	MST	JCK	WO 111112081		J
RECORD DRAWINGS											
R											

SCALE: NONE EXCEPT AS NOTED

ALABAMA LICENSED No. 30571 PROFESSIONAL ENGINEER MICHAEL J. SISKO

PREPARED BY: URS

ASH POND 4 – NOTES AND DETAILS CONSTRUCTION BEST MANAGEMENT PRACTICES PLAN

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
LLC	KV	MJS	MJS	JCB	MST	JCK

TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2010	DATE 8/10/11	47	C	10W290-19	R 0

URS	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

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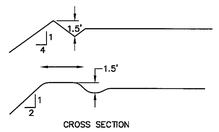
TEMPORARY DIVERSION

DESCRIPTION

A TEMPORARY DIVERSION IS A DIKE AND/OR CHANNEL CONSTRUCTED TO:
- DIRECT SEDIMENT-LADEN RUNOFF TO A SETTLING POND.
- ROUTE CLEAN RUNOFF AWAY FROM DISTURBED AREAS.
- DIVERT RUNOFF TO REDUCE THE EFFECTIVE LENGTH OF THE SLOPE.
- DIRECT RUNOFF AWAY FROM STEEP CUT OR FILL SLOPES.



CROSS SECTION

SPECIFICATIONS FOR TEMPORARY DIVERSION

1. DRAINAGE AREA SHOULD NOT EXCEED 10 ACRES. LARGER AREAS REQUIRE A MORE EXTENSIVE DESIGN.
2. THE CHANNEL CROSS SECTION MAY BE PARABOLIC OR TRAPEZOIDAL. DISK THE BASE OF THE DIKE BEFORE PLACING FILL. BUILD THE DIKE 10% HIGHER THAN DESIGNED FOR SETTLEMENT. THE DIKE SHALL BE COMPACTED BY TRAVERSING WITH TRACKED EARTH-MOVING EQUIPMENT.
3. THE MINIMUM CROSS SECTION OF THE LEVEE OR DIKE WILL BE AS FOLLOWS: (MINIMUM DESIGN FREEBOARD SHALL BE 0.3 FOOT.) WHERE CONSTRUCTION TRAFFIC WILL CROSS, THE TOP WIDTH MAY BE MADE WIDER AND THE SIDE SLOPES FLATTER THAN SPECIFIED ABOVE.

DIKE TOP WIDTH (FT.)	HEIGHT (FT.)	SIDE SLOPES	SHAPE
0	1.5	4.1	TRAPEZOIDAL
4	1.5	2.1	PARABOLIC

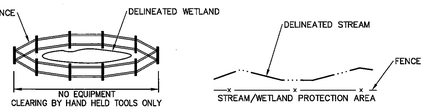
4. THE GRADE MAY BE VARIABLE DEPENDING UPON THE TOPOGRAPHY, BUT MUST HAVE A POSITIVE DRAINAGE TO THE OUTLET AND BE STABILIZED TO BE NON-EROSIVE.
5. DIVERT OUTLET RUNOFF ONTO A STABILIZED AREA, INTO A PROPERLY DESIGNED WATERWAY, GRADE STABILIZATION STRUCTURE, OR SEDIMENT TRAPPING FACILITY.
6. DIVERSIONS SHALL BE SEEDED AND MULCHED, IN ACCORDANCE WITH THE REQUIREMENTS FOR TEMPORARY SEEDING (OR PERMANENT SEEDING) AND MULCHING, AS SOON AS THEY ARE CONSTRUCTED IN ORDER TO PRESERVE DIKE HEIGHT AND REDUCE MAINTENANCE.

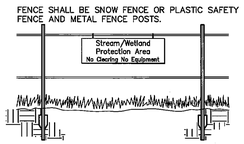
TEMPORARY DIVERSION STABILIZATION TREATMENT			
DIVERSION SLOPE	< 2 ac.	2 – 5 ac.	5 – 10 ac.
0 – 3%	SEED AND STRAW	SEED AND STRAW	SEED AND STRAW
3 – 5%	SEED AND STRAW	SEED AND STRAW	MATTING
5 – 8%	SEED AND STRAW	MATTING	MATTING
8 – 20%	SEED AND STRAW	MATTING	ENGINEERED

WETLAND PROTECTION

DESCRIPTION

WETLANDS THAT EXIST ON-SITE PRIOR TO DEVELOPMENT MAY BE PROTECTED SO THAT WILL CONTINUE TO SURVIVE AFTER CONSTRUCTION.





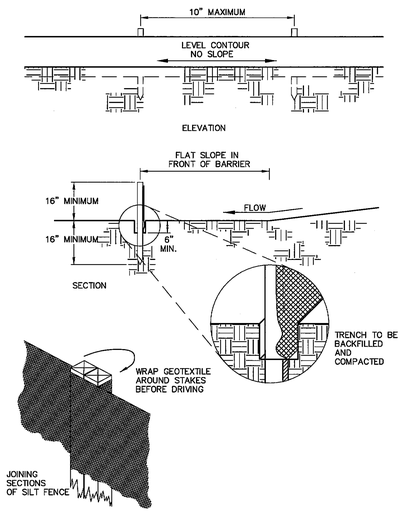
SPECIFICATIONS FOR WETLAND PRESERVATION AREA

1. PRESERVATION AREAS SHALL BE FENCED PRIOR TO BEGINNING CLEARING OPERATIONS.
2. FENCE MATERIALS SHALL BE METAL FENCE POSTS WITH PLASTIC SAFETY FENCE OR SNOW FENCE.
3. SIGNAGE SHALL CLEARLY IDENTIFY THE STREAM/WETLAND PROTECTION AREA AND STATE THAT NO CLEARING OR EQUIPMENT IS ALLOWED WITHIN IT.
4. FENCE SHALL REMAIN AROUND THE PROTECTION AREAS UNTIL AFTER FINAL GRADING HAS BEEN COMPLETED.
5. FENCE SHALL BE PLACED AS SHOWN ON PLANS.
6. IF ANY CLEARING IS DONE AROUND THE PROTECTED AREAS IT SHALL BE DONE BY CUTTING AT GROUND LEVEL WITH HAND HELD TOOLS AND SHALL NOT BE GRUBBED OR PULLED OUT.

SILT FENCE

DESCRIPTION

SILT FENCE IS A SEDIMENT-TRAPPING PRACTICE UTILIZING A GEOTEXTILE FENCE, TOPOGRAPHY AND VEGETATION TO CAUSE SEDIMENT DEPOSITION. SILT FENCE REDUCES RUNOFF'S ABILITY TO TRANSPORT SEDIMENT BY PONDING RUNOFF AND DISSIPATING SMALL RILLS OF CONCENTRATED FLOW INTO UNIFORM SHEET FLOW.



SPECIFICATIONS FOR SILT FENCE

1. SILT FENCE SHALL BE CONSTRUCTED BEFORE UPSLOPE LAND DISTURBANCE BEGINS.
2. ALL SILT FENCE SHALL BE PLACED AS CLOSE TO THE CONTOUR AS POSSIBLE SO THAT WATER WILL NOT CONCENTRATE AT LOW POINTS IN THE FENCE AND SO THAT SMALL SWALES OR DEPRESSIONS WHICH MAY CARRY SMALL CONCENTRATED FLOWS TO THE SILT FENCE ARE DISSIPATED ALONG ITS LENGTH.
3. TO PREVENT WATER PONDED BY THE SILT FENCE FROM FLOWING AROUND THE ENDS, EACH END SHALL BE CONSTRUCTED UPSLOPE SO THAT THE ENDS ARE AT A HIGHER ELEVATION.
4. WHERE POSSIBLE, SILT FENCE SHALL BE PLACED ON THE FLATTEST AREA AVAILABLE.
5. WHERE POSSIBLE, VEGETATION SHALL BE PRESERVED FOR 5 FEET (OR AS MUCH AS POSSIBLE) UPSLOPE FROM THE SILT FENCE. IF VEGETATION IS REMOVED, IT SHALL BE REESTABLISHED WITHIN 7 DAYS FROM THE INSTALLATION OF THE SILT FENCE.
6. THE HEIGHT OF THE SILT FENCE SHALL BE A MINIMUM OF 16 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
7. THE SILT FENCE SHALL BE PLACED IN A TRENCH CUT A MINIMUM OF 6 INCHES DEEP. THE TRENCH SHALL BE CUT WITH A TRENCHER, CABLE LAYING MACHINE, OR OTHER SUITABLE DEVICE WHICH WILL ENSURE AN ADEQUATELY UNIFORM TRENCH DEPTH.
8. THE SILT FENCE SHALL BE PLACED WITH THE STAKES ON THE DOWNSLOPE SIDE OF THE GEOTEXTILE AND SO THAT 8 INCHES OF CLOTH ARE BELOW THE GROUND SURFACE. EXCESS MATERIAL SHALL LAY ON THE BOTTOM OF THE 6 INCH DEEP TRENCH. THE TRENCH SHALL BE BACKFILLED AND COMPACTED.
9. SEAMS BETWEEN SECTION OF SILT FENCE SHALL BE OVERLAPPED WITH THE END STAKES OF EACH SECTION WRAPPED TOGETHER BEFORE DRIVING INTO THE GROUND.
10. MAINTENANCE--SILT FENCE SHALL ALLOW RUNOFF TO PASS ONLY AS DIFFUSE FLOW THROUGH THE GEOTEXTILE. IF RUNOFF OVERTOPS THE SILT FENCE, FLOWS UNDER OR AROUND THE ENDS, OR IN ANY OTHER WAY BECOMES A CONCENTRATED FLOW, ONE OF THE FOLLOWING SHALL BE PERFORMED, AS APPROPRIATE:
    - THE LAYOUT OF THE SILT FENCE SHALL BE CHANGED,
    - ACCUMULATED SEDIMENT SHALL BE REMOVED, OR
    - OTHER PRACTICES SHALL BE INSTALLED.

CRITERIA FOR SILT FENCE MATERIALS:

1. FENCE POSTS---THE LENGTH SHALL BE A MINIMUM OF 32 INCHES LONG. WOOD POSTS WILL BE 2-BY-2 INCH HARDWOOD OF SOUND QUALITY. THE MAXIMUM SPACING BETWEEN POSTS SHALL BE 10 FEET.
2. SILT FENCE FABRIC (SEE CHART BELOW):

Fabric Properties	Values	Test Method
Grab Tensile Strength	90 lb. minimum	ASTM D 1682
Mullen Burst Strength	190 psi minimum	ASTM D 3786
Slurry Flow Rate	0.3 gal./min./ft ^{2}maximum	
Equivalent Opening Size	40-80	US Std. sieve CW-02215
Ultraviolet Radiation Stability	90% minimum	ASTM-G-26

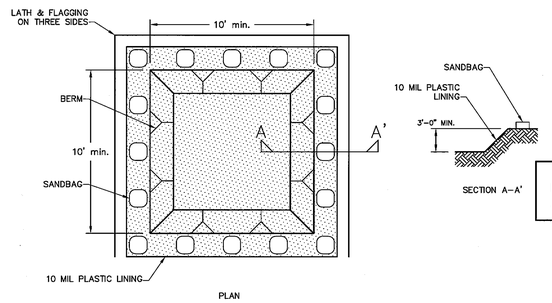
CONCRETE WASHOUT AREA

DESCRIPTION

A CONCRETE WASH OUT AREA IS A STABILIZED LINED COLLECTION AREA WHERE TRUCKS, PANS AND TOOLS CAN BE WASHED OFF AFTER WORKING WITH CONCRETE.

SPECIFICATIONS FOR CONCRETE WASHOUT AREA

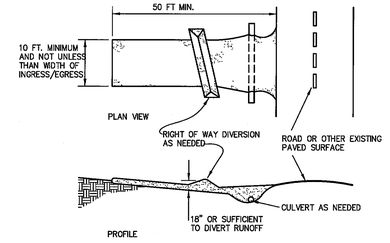
1. FINAL LOCATION AND SIZE TO BE DETERMINED IN THE FIELD.
2. A CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30 FEET OF THE TEMPORARY CONCRETE WASHOUT FACILITY. THE SIGN SHALL BE A MIN. OF 24"X24" WITH 4" MIN. LETTER HEIGHT MOUNTED 72" MIN. ABOVE GRADE.



CONSTRUCTION ENTRANCE

DESCRIPTION

A CONSTRUCTION ENTRANCE IS A STABILIZED PAD OF AGGREGATE OVER A GEOTEXTILE BASE AND IS USED TO REDUCE THE AMOUNT OF MUD TRACKED OFF-SITE WITH CONSTRUCTION TRAFFIC.



SPECIFICATIONS FOR CONSTRUCTION ENTRANCE

1. STONE SIZE--TWO-INCH WASHED STONE SHALL BE USED, OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH--THE CONSTRUCTION ENTRANCE SHALL BE AS LONG AS REQUIRED TO STABILIZE HIGH TRAFFIC AREAS BUT NOT LESS THAN 50 FEET.
3. THICKNESS--THE STONE LAYER SHALL BE AT LEAST 6 INCHES THICK.
4. WIDTH--THE ENTRANCE SHALL BE AT LEAST 10 FEET WIDE, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
5. BEDDING--A NON-WOVEN 10 OZ. GEOTEXTILE SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING STONE. IT SHALL HAVE A GRAB TENSILE STRENGTH OF AT LEAST 200 LB. AND A MULLEN BURST STRENGTH OF AT LEAST 190 LB.
6. CULVERT--A PIPE OR CULVERT SHALL BE CONSTRUCTED UNDER THE ENTRANCE IF NEEDED TO PREVENT SURFACE WATER FLOWING ACROSS THE ENTRANCE FROM BEING DIRECTED OUT ONTO PAVED SURFACES.
7. WATER BAR--A WATER BAR SHALL BE CONSTRUCTED AS PART OF THE CONSTRUCTION ENTRANCE IF NEEDED TO PREVENT SURFACE RUNOFF FROM FLOWING THE LENGTH OF THE CONSTRUCTION ENTRANCE AND OUT ONTO PAVED SURFACES.
8. MAINTENANCE--TOP DRESSING OF ADDITIONAL STONE SHALL BE APPLIED AS CONDITIONS DEMAND. MUD SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADS, OR ANY SURFACE WHERE RUNOFF IS NOT CHECKED BY SEDIMENT CONTROLS, SHALL BE REMOVED IMMEDIATELY. REMOVAL SHALL BE ACCOMPLISHED BY SCRAPING OR SWEEPING.
9. CONSTRUCTION ENTRANCES SHALL NOT BE RELIED UPON TO REMOVE MUD FROM VEHICLES AND PREVENT OFF-SITE TRACKING. VEHICLES THAT ENTER AND LEAVE THE CONSTRUCTION SITE SHALL BE RESTRICTED FROM MUDDY AREAS.

GENERAL NOTE:

1. TEMPORARY CONSTRUCTION ENTRANCES MUST BE INSTALLED AT EACH CONSTRUCTION TRAFFIC ENTRANCE / EXIT. THESE LOCATIONS WILL BE COORDINATED BY THE CONSTRUCTION MANAGER.
2. CONTRACTOR TO WASH OFF WHEELS IN GRAVEL CONSTRUCTION ENTRANCE PRIOR TO ENTERING CITY STREETS. IF MUD ACCUMULATES IN STREETS, THEN THE CONTRACTOR SHALL BE RESPONSIBLE TO CLEAN STREETS AS REQUESTED BY THE CITY OR CONSTRUCTION MANAGER.

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RECORD DRAWING

For Supporting Design Calculations see

R 0	8/10/11	SW/SP	TG/VK	GD/VG	MJS	JCB	MST	JCK	WO 111112081	J
RECORD DRAWINGS										
R										

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV

SCALE: NONE EXCEPT AS NOTED

PREPARED BY:

URS

ASH POND 4 – DETAILS–2 CONSTRUCTION BEST MANAGEMENT PRACTICES PLAN

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
LLC	KV	MJS	MJS	JCB	MST	JCK

TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2010	DATE 8/10/11	47	C	10W290-20	R 0

URS	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:NTS
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

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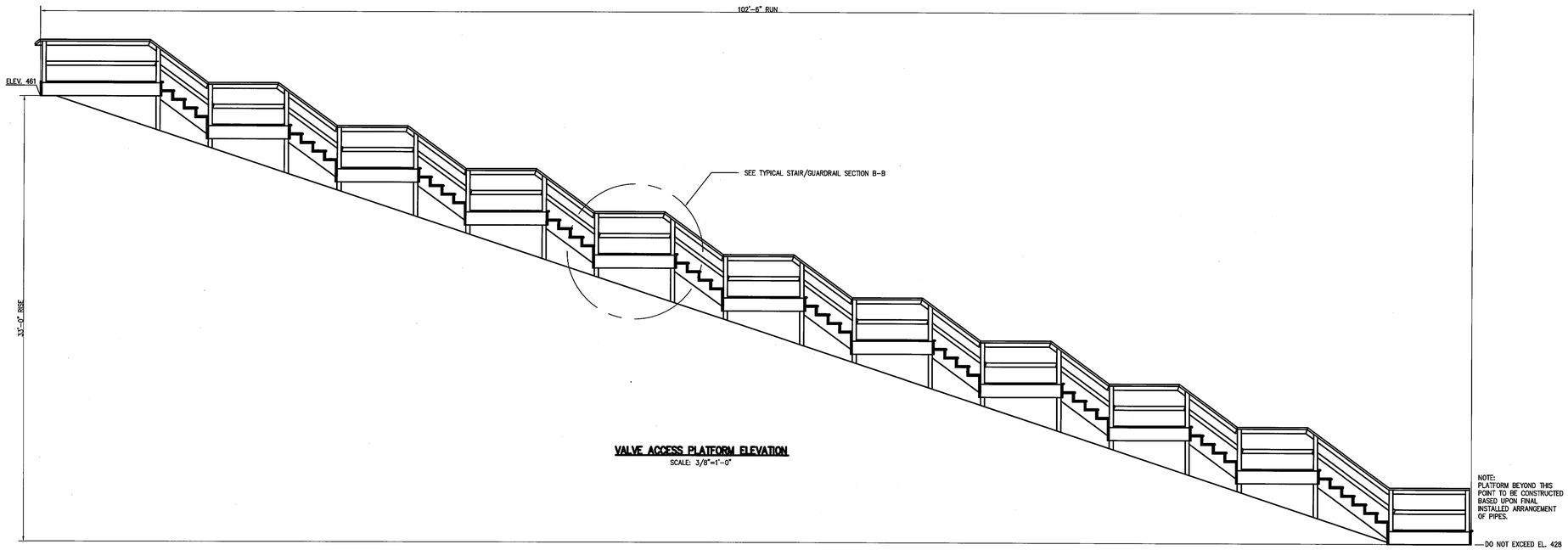
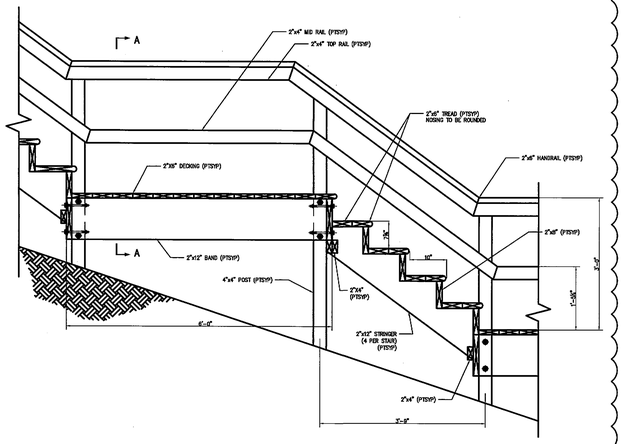
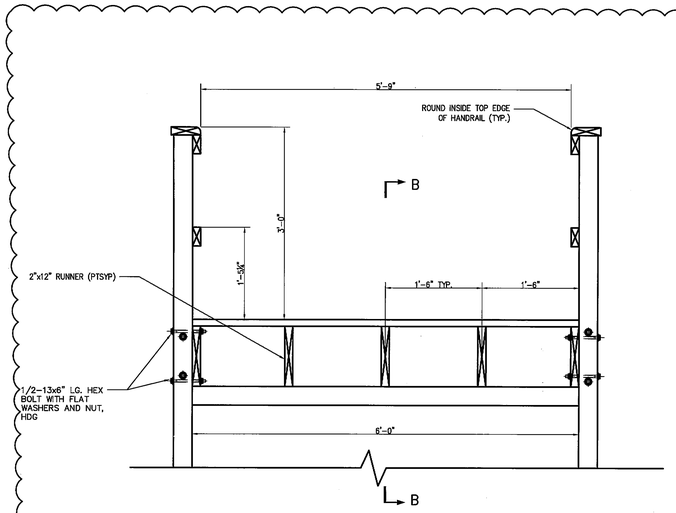


VALVE ACCESS PLATFORM ELEVATION
SCALE: 3/8"=1'-0"

SUBMITTAL_05



TYPICAL STAIR/HANDRAIL SECTION B-B
SCALE: 1 1/2"=1'-0"



SECTION A-A
SCALE: 1 1/2"=1'-0"

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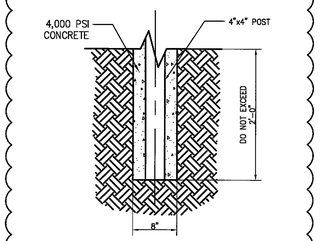

TYPICAL POST DETAIL
SCALE: 1 1/2"=1'-0"

ALABAMA LICENSED No. 30571 PROFESSIONAL ENGINEER MICHAEL J. STRICK

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RECORD DRAWING

FOR SUPPORTING DESIGN CALCULATIONS SEE _____

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ED	AS CONST
R 0	8/10/11	SW/SP	TJG/KV	GD/VG	MJS	JCB	MST	JCK	WO 111112081	
RECORD DRAWING										
R										

SCALE: NONE EXCEPT AS NOTED

A130-2004 WOODEN WALKWAY

ASH POND 4 – HIGH HAZARD REMOVAL & SPILLWAY REPLACEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SW/SP	TJG/KV	GD/VKG	MJS	JCB	MST	JCK

TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2010	DATE 8/10/11	47	C	10W290-21	R 0

URS

URS Corporation	
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
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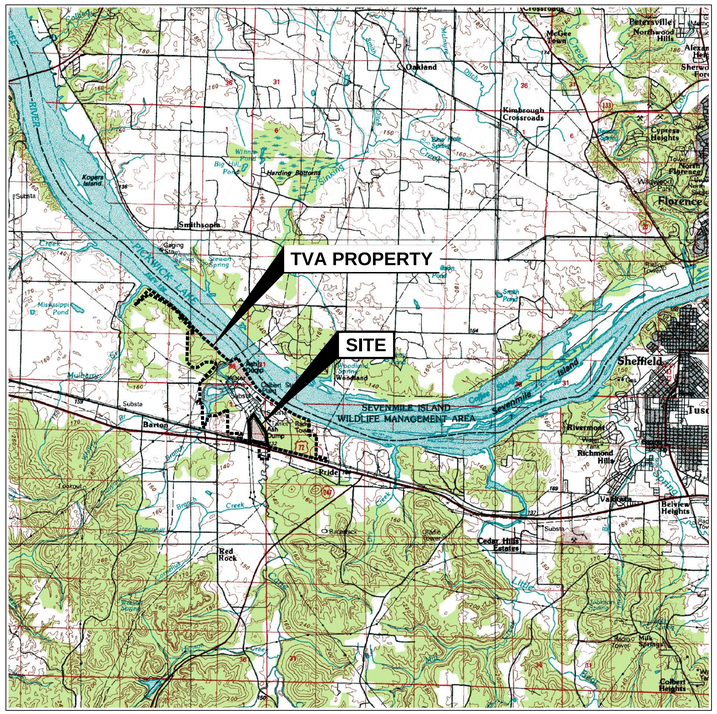
TENNESSEE VALLEY AUTHORITY
COLBERT FOSSIL PLANT - ASH POND 4
SLOPE IMPROVEMENT
RECORD DRAWINGS

COLBERT COUNTY, ALABAMA
APRIL 9, 2015



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SITE VICINITY MAP

0 6000 12000

SCALE: 1"=6000'

DWG. NO.	DWG. DESCRIPTION
01	TITLE SHEET
02	GENERAL NOTES
03	EXISTING CONDITIONS
04	PROPOSED OVERALL SITE PLAN
05	PROPOSED GRADING PLAN
06	SURVEY CONTROL PLAN
07	SURVEY CONTROL
08	CROSS SECTIONS STA 0+00 TO 20+00
09	CROSS SECTIONS STA 22+00 TO 27+00
10	TYPICAL SECTION & DETAILS
11	INSTRUMENTATION MODIFICATION PLAN & DETAILS
12	CBMPP-EXISTING SITE PLAN
13	CBMPP-SLOPE IMPROVEMENT
14	CBMPP-NOTES AND DETAILS

PREPARED FOR:

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THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION

RECORD DRAWING

2 WORKING DAYS
BEFORE YOU DIG
205-353-2636
ALABAMA UTILITIES PROTECTION SERVICE

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV'D
R 1	04/09/15	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694		J
RECORD DRAWING											
R 0	07/09/14	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694		D
ISSUE FOR CONSTRUCTION											

DISCIPLINE INTERFACE

SCALE: NONE EXCEPT AS NOTED

TITLE SHEET

ASH POND 4

SLOPE IMPROVEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SEB	CMA	MJS	MJS	RSH	MST	JCK

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD	2013	DATE 04/09/15	47	C	10W504-01	R 1

DELIVERABLE ID: COLBERT FACILITY-P4SI-00014

URS Corporation	1
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

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GENERAL PROVISIONS

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH OSHA SAFETY STANDARDS AND IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL LAWS AND TVA REQUIREMENTS.

2. ENGINEER REFERS TO URS CORPORATION, WHICH HAS BEEN CONTRACTED BY TVA FOR CONSTRUCTION QUALITY ASSURANCE FOR THE DURATION OF THE PROJECT.

3. WHENEVER REFERENCE IS MADE TO THE ALABAMA DEPARTMENT OF TRANSPORTATION (ALDOT) STANDARD SPECIFICATIONS, AMERICAN SOCIETY OF TESTING AND MATERIALS (ASTM) AND OTHER PUBLISHED STANDARDS OR SPECIFICATIONS, IT SHALL MEAN THE LATEST VERSION IN ITS ENTIRETY.

4. THE CONTRACTOR SHALL SECURE THE LATEST EDITION OF ALABAMA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS WHEN PERFORMING WORK WHICH IS PRESCRIBED HEREIN. COPIES MAY BE OBTAINED FROM:

   PROPOSALS ENGINEER
   ALABAMA DEPARTMENT OF TRANSPORTATION
   1409 COLISEUM BOULEVARD
   MONTGOMERY, ALABAMA 36130-3050
   WWW.DOT.STATE.AL.US/CONWEB/SPECIFICATIONS.HTM

5. HORIZONTAL AND VERTICAL SURVEY CONTROL EXISTS AT THE SITE. IT SHALL BE THE RESPONSIBILITY OF THE OWNER TO PROVIDE CONTROL POINT INFORMATION TO THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SURVEYING AND STAKING NECESSARY FOR LAYOUT AND CONSTRUCTION OF THE PROJECT.

6. ACCEPTABLE CONSTRUCTION TOLERANCES FROM PLAN DIMENSIONS, ELEVATIONS, AND GRADES SHALL BE AS FOLLOWS:

   - EXCAVATIONS AND FINAL GRADES FOR EARTH SURFACES AND SLOPES: ±0.25 FEET VERTICAL; ±1 FT IN A HORIZONTAL PLANE.

7. NO DEVIATIONS FROM THE PLANS OR APPROVED SHOP DRAWINGS SHALL BE MADE WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE CONTRACTOR SHALL KEEP A RECORD OF ALL DEVIATIONS OF ANY INSTALLATION FROM THAT SHOWN ON THE PLANS, AND ANY DEVIATIONS IN INSTALLATIONS FROM APPROVED SHOP DRAWINGS AND PROVIDE COPIES OF THESE RECORDS TO ENGINEER. AT COMPLETION OF THE PROJECT A SET OF FINAL RECORD DRAWINGS SHALL BE PREPARED BY THE ENGINEER TO ENSURE THAT THE OWNER HAS A PERMANENT RECORD OF THE PROJECT AS IT WAS CONSTRUCTED. CONTRACTOR SHALL ASSIST THE ENGINEER WITH ANY MEASUREMENTS OR INTERPRETATIONS NECESSARY FOR PREPARATION OF THE FINAL RECORD DRAWINGS.

GENERAL SITEWORK REQUIREMENTS

1. ACCESS INTO THE WORK AREA FOR DELIVERY OF EQUIPMENT, MATERIALS AND WORKFORCE SHALL BE REVIEWED DAILY BY THE CONTRACTOR, AND CONTROLLED AS NEEDED TO PREVENT ANY DAMAGE TO THE CREST OR SLOPES OF THE DIKES SURROUNDING THE ASH POND. IF EQUIPMENT OR MATERIAL HAULING CAUSES UNACCEPTABLE DAMAGE IN THE OPINION OF THE ENGINEER, THE DAMAGE SHALL BE IMMEDIATELY REPAIRED BY THE CONTRACTOR, AND THE METHODS FOR HAULING SHALL BE ALTERED TO PREVENT FURTHER DAMAGE. THE CONTRACTOR SHALL NOT MAKE ANY UNPLANNED EXCAVATIONS INTO THE DIKE WITHOUT THE APPROVAL OF THE OWNER OR THE ENGINEER. DURING CONSTRUCTION THE CONTRACTOR IS RESPONSIBLE FOR PRECAUTIONS REQUIRED TO PROTECT THE INTEGRITY OF THE DIKES AND APPURTENANCES NEEDED FOR THE SAFE OPERATION OF THE ASH POND.

2. CONTRACTOR SHALL TAKE EVERY PRECAUTION TO ENSURE THAT THERE ARE NO OIL EXCURSIONS INTO THE ASH POND OR INTO CANE CREEK DURING CONSTRUCTION. CONTRACTOR SHALL HAVE OIL CONTROL EQUIPMENT (ABSORBENT BOOMS, ETC) ON SITE AT ALL TIMES. IF OIL IS RELEASED OR OBSERVED DURING CONSTRUCTION, CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND DEPLOY OIL CONTROL EQUIPMENT. CONTRACTOR SHALL COORDINATE WITH ENGINEER AND OWNER ON OIL CLEANUP, AS NECESSARY.

3. THE CONTRACTOR SHALL INSTALL, MAINTAIN AND INSPECT SILT FENCE AND OTHER EROSION CONTROL FEATURES AS REQUIRED IN THE CONSTRUCTION BEST MANAGEMENT PRACTICES PLAN (CBMPP). EROSION CONTROL FEATURES SHALL BE INSTALLED PRIOR TO BEGINNING ANY EARTHMOVING ACTIVITIES.

4. WEEKLY DELIVERIES OF CARBON DIOXIDE ARE MADE BY TANKER TRUCK TO THE CO2 SYSTEM LOCATED ON THE EAST DIKE. FULL ACCESS TO DELIVERY VEHICLES MUST BE MAINTAINED THROUGHOUT THE DURATION OF THE SLOPE IMPROVEMENT CONSTRUCTION.

5. OWNER WILL MONITOR PH AND WATER QUALITY AT DISCHARGE TO CANE CREEK THROUGHOUT CONSTRUCTION. CONTRACTOR MAY NEED TO ADJUST CONSTRUCTION PRACTICES IF WATER QUALITY ISSUES ARISE. CONTRACTOR TO COORDINATE WITH TVA AND ENGINEER.

6. APPROXIMATE LOCATIONS FOR STAGING AND STOCKPILE AREAS ARE SHOWN IN THE CONSTRUCTION BEST MANAGEMENT PLAN DRAWINGS. HOWEVER, THE CONTRACTOR SHALL COORDINATE WITH THE OWNER TO DETERMINE THE FINAL LOCATION OF STAGING AREAS FOR EQUIPMENT OR MATERIAL STORAGE AND FOR OTHER CONSTRUCTION LAY DOWN ACTIVITY. LAY DOWN ACTIVITY FOR THE SLOPE IMPROVEMENT PROJECT SHALL BE APPROPRIATELY COORDINATED WITH ACTIVITIES FOR OTHER PROJECTS OCCURRING SIMULTANEOUSLY.

GENERAL CONSTRUCTION SEQUENCE

RFI 002

1. ALL TEMPORARY SEDIMENTATION AND EROSION CONTROL ITEMS SHALL BE INSTALLED PRIOR TO EARTHWORK.
2. INSTALL STABILIZED CONSTRUCTION ENTRANCE AND GRAVEL ENTRANCE TO WORK AREAS.

RFI 001

3. BEGIN CLEARING/GRUBBING. NOTE THAT IT IS ASSUMED THAT BAT TREES WILL BE MARKED BY TVA. CONTRACTOR TO COORDINATE WORK AROUND BAT TREES. BAT TREES MAY NOT BE DISTURBED BETWEEN MARCH 31 AND OCTOBER 15TH.
4. STRIP AND STOCKPILE TOPSOIL AT LOCATION DESIGNATED BY CBMPP.
5. BEGIN MINOR EXCAVATION AND GRADING ACTIVITIES.
6. PLACE FILTER SAND AND GRAVEL MATERIALS, AND ROCK BUTTRESS. IN THE LOCATION OF BAT TREES, ALL PLACEMENT OF MATERIALS SHALL BE DONE BY HAND.
7. THE SITE WILL BE CONSIDERED SUFFICIENTLY STABLE WHEN FINAL VEGETATION IS ESTABLISHED. THE TEMPORARY SEDIMENTATION AND EROSION CONTROL ITEMS SHALL BE REMOVED ONCE THE SITE IS STABLE.
8. AT THE COMPLETION OF WORK, THE CONTRACTOR SHALL REMOVE FROM SITE AND DISPOSE OF DEBRIS AND WASTE MATERIALS RESULTING FROM THE CONTRACTORS CONSTRUCTION ACTIVITIES.

EARTHWORK NOTES

1. AREAS WHICH WILL BE EXCAVATED SHALL BE CLEARED OF TREES (EXCEPT FOR BAT HABITAT TREES AS INDICATED), STUMPS, BRUSH, PROJECTING ROOTS, WEEDS, LOGS AND OTHER PROTRUDING OBSTRUCTIONS. ALL TREES, STUMPS, BRUSH, PROJECTING ROOTS, WEEDS LOGS, AND PROTRUDING OBSTRUCTIONS SHALL BE CUT TO WITHIN 3 INCHES ABOVE EXISTING GROUND. THE AREA SHALL BE GRUBBED TO A DEPTH OF 6 INCHES TO REMOVE GRASS, STUMPS, ROOTS AND OTHER ORGANIC MATERIAL. ALL CLEARED AND GRUBBED MATERIAL SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT AN APPROVED DISPOSAL SITE AND IN ACCORDANCE WITH APPLICABLE LAWS. IF ENCOUNTERED, TOPSOIL SHALL BE STRIPPED TO A DEPTH OF 4 INCHES. TOPSOIL SHALL BE STORED AT THE DESIGNATED STOCKPILE AREA AS NOTED IN THE CONSTRUCTION BEST MANAGEMENT PRACTICES PLAN (CBMPP) AND AS ALLOWED BY THE OWNER.

2. NOTE THAT IT IS ASSUMED THAT BAT TREES WILL BE MARKED BY TVA. CONTRACTOR TO COORDINATE WORK AROUND BAT TREES. BAT TREES MAY NOT BE DISTURBED BETWEEN MARCH 31 AND OCTOBER 15TH.

3. IN WET/UNSUITABLE AREAS WHERE EXCAVATIONS ARE REQUIRED, SLOPE EXCAVATIONS FOR THE IMPROVEMENTS SHALL BE OPENED IN SECTIONS NO MORE THAN 100 FT IN LENGTH ALONG THE PROPOSED ALIGNMENT. SLOPE BACKFILLING FOR EACH 100 FT SECTION SHALL BE COMPLETED PRIOR TO BEGINNING WORK ON THE ADJACENT 100 FT SECTION.

4. ALL EXCAVATIONS SHALL BE SLOPED OR BENCHED TO PERMIT SAFE WORKING CONDITIONS PER OSHA REQUIREMENTS FOR PROTECTIVE SYSTEMS (29 CFR 1926.652). EXISTING DIKE MATERIALS SHALL BE CONSIDERED OSHA TYPE C MATERIALS.

5. EXCAVATIONS IMPLEMENTED ALONG THE SLOPES OF THE EXISTING DIKE AND ANY MISCELLANEOUS EXCAVATIONS GREATER THAN 4 FT IN DEPTH THAT WILL REMAIN OPEN FOR A PERIOD OF GREATER THAN 1 WEEK SHALL BE SLOPED AT NO GREATER THAN 2H:1V, UNLESS OTHERWISE ALLOWED BY THE ENGINEER.

6. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING DRAINAGE WAYS, SUMP PITS AND PUMPS, OR OTHER METHODS AND PRACTICES TO KEEP EXCAVATIONS IN A DRAINED CONDITION AT ALL TIMES. SURFACES ABOVE EXCAVATIONS SHALL BE GRADED OR PROTECTED SUCH THAT SURFACE RUNOFF IS DIRECTED AWAY FROM OPEN EXCAVATIONS.

7. PRIOR TO PLACING FILLS AGAINST THE OUTER SLOPE OF THE DIKE, THE BOTTOM SHALL BE BENCHED LEVEL TO PROVIDE A LEVEL SURFACE TO BEGIN THE FILLING ACTIVITIES. SLOPING SURFACES AGAINST WHICH FILL MATERIAL WILL BE PLACED SHALL BE DISCED, BENCHED OR SERRATED, TO ENHANCE BONDING OF THE FILL TO THE EXCAVATION FACE.

RFI_003

8. SUITABLE FILL MATERIALS: IF UNSUITABLE MATERIALS ARE ENCOUNTERED, DURING THE COURSE OF EXCAVATION AT THE SUBGRADE ON WHICH THE FILTER MEDIA WILL BE PLACED, THE UNSUITABLE SOILS SHOULD BE UNDERCUT AND REPLACED WITH SUITABLE BACKFILL. SUITABLE BACKFILL SHALL CONSIST OF CLAY SOILS THAT EXHIBIT A CLASSIFICATION OF CL, CL-ML, CL-CH, OR CH IN ACCORDANCE WITH ASTM D-2487. THE MATERIAL SHALL BE FREE OF ORGANIC MATTER, TOPSOIL, RUBBISH, DEBRIS, WASTE MATERIALS, AND ROCK PIECES GREATER THAN 3 INCHES (MAXIMUM DIMENSION) IN SIZE, AND SHALL BE AT A MOISTURE CONTENT THAT IS SUITABLE FOR ACCEPTABLE COMPACTION, AS REQUIRED HEREIN. EXISTING SOILS REMOVED FROM THE EXCAVATIONS MAY BE REUSED AS FILL, TO THE EXTENT THAT THEY MEET THE REQUIREMENTS GIVEN HEREIN. MOISTURE CONDITIONING (DRYING) OF THESE EXISTING SOILS MAY BE NECESSARY, PRIOR TO REUSE.
   AGGREGATE MATERIALS MAY BE USED AS SUITABLE FILL MATERIALS UPON APPROVAL OF THE ENGINEER.
9. COMPACTION REQUIREMENTS: SUITABLE FILL MATERIALS SHALL BE PLACED AND SPREAD IN HORIZONTAL LOOSE LIFTS THAT DO NOT EXCEED 8 INCHES IN THICKNESS. EACH LIFT SHALL BE THOROUGHLY COMPACTED TO ACHIEVE A MINIMUM DENSITY OF 98% OF ITS MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-698. THE MOISTURE CONTENT DURING COMPACTION SHALL BE WITHIN A RANGE OF +2 TO -2 PERCENT OF THE OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D-698. FIELD COMPACTION TESTS, BY THE ENGINEER, SHALL BE PERFORMED ON EACH LIFT TO VERIFY THAT SPECIFIED LEVELS OF COMPACTION ARE ACHIEVED. ENGINEER SHALL PERFORM PROCTOR TESTING.
10. AREAS OUTSIDE OF THE ROCK BUTTRESS/FILTER BLANKET LIMITS THAT ARE DISTURBED DURING CONSTRUCTION MUST BE FINISHED TO GRADES AND TO A SMOOTH AND COMPACT SURFACE AND RE-VEGETATED. SEED AND FERTILIZER UTILIZED SHALL BE AS FOLLOWS ON A PER ACRE BASIS:

    SPRING/SUMMER HYDRO SEEDING MIX (APRIL-AUG):
    250 POUNDS OF 19-19-19 GRANULAR FERTILIZER
    150 POUNDS OF KENTUCKY 31 TALL FESCUE
    50 POUNDS OF COMMON HULLED BERMUDA
    50 POUNDS OF ANNUAL RYEGRASS
    LIME AS RECOMMENDED PER SOIL TEST RESULTS

    FALL/WINTER HYDRO SEEDING MIX (SEP-MAR):
    250 POUNDS OF 19-19-19 GRANULAR FERTILIZER
    200 POUNDS OF KENTUCKY 31 TALL FESCUE
    50 POUNDS OF ANNUAL RYEGRASS
    LIME AS RECOMMENDED PER SOIL TEST RESULTS

    SPRING OVER SEEDING:
    250 POUNDS OF 19-19-19 GRANULAR FERTILIZER
    150 POUNDS OF KENTUCKY 31 TALL FESCUE
    25 POUNDS OF COMMON HULLED BERMUDA
    LIME AS RECOMMENDED PER SOIL TEST RESULTS

    FALL OVER SEEDING:
    250 POUNDS OF 19-19-19 GRANULAR FERTILIZER
    200 POUNDS OF KENTUCKY 31 TALL FESCUE
    LIME AS RECOMMENDED PER SOIL TEST RESULTS

FILTER SAND & GRAVEL MATERIALS

1. FILTER SAND AND GRAVEL MATERIALS WILL BE PLACED AS SHOWN ON DETAIL 2, SHEET 10W504-10. CROSS SECTIONS AND SURVEY CONTROL ARE PROVIDED IN THESE PLANS. FILTER MATERIAL USED SHALL CONSIST OF THE FOLLOWING:
   - 1 FOOT OF CONCRETE SAND MEETING THE SPECIFICATIONS OF ALDOT SECTION 802.09 CONCRETE SAND (SIZE NO. 100)
   - 1 FOOT OF ALDOT NO. 89 STONE MEETING THE SPECIFICATIONS OF ALDOT SECTION 801.11
2. PRIOR TO PLACING FILTER SAND (CONCRETE SAND), UNSUITABLE SOILS SHOULD BE EXCAVATED AND THE SURFACE PREPARED TO THE APPROVAL OF THE ENGINEER. THE BOTTOM SHALL BE LEVEL TO PROVIDE A LEVEL SURFACE DURING CONSTRUCTION ACTIVITIES. SLOPING SURFACES AGAINST WHICH SAND WILL BE PLACED SHALL BE DISCED, BENCHED OR SERRATED, TO ENHANCE STABILITY OF THE SAND AGAINST THE EXISTING SLOPE.
3. CONCRETE SAND SHALL BE PLACED IN 4-INCH LIFTS AND COMPACTED WITH 4 PASSES OF APPROVED COMPACTION EQUIPMENT.
4. UPON APPROVAL FROM THE OWNER'S ENGINEER OF THE PREPARED SURFACE, OPEN EXCAVATED AREAS SHALL BE COVERED WITH SAND IMMEDIATELY TO PREVENT SOFTENING AT THE PREPARED SURFACE.
5. IN THE LOCATION OF BAT TREES, ALL PLACEMENT OF GRAVEL MATERIAL SHALL BE DONE BY HAND. BAT TREES MAY NOT BE DISTURBED BETWEEN MARCH 31 AND OCTOBER 15TH.

ROCK BUTTRESS

1. THE ROCK BUTTRESS OVERLYING THE FILTER GRAVEL MATERIAL SHALL BE CONSTRUCTED USING RIPRAP MEETING THE REQUIREMENTS OF ALDOT SPECIFICATION 601, CLASS 1 RIP-RAP.

SURFACE GRAVEL

RFI_007

RFI_008

1. THE DRIVING SURFACE OVERLYING THE ROCK BUTTRESS WILL CONSIST OF 6-INCHES OF CRUSHER-RUN OR APPROVED EQUIVALENT. THE SURFACE GRAVEL SHALL MEET THE FOLLOWING REQUIREMENTS:
   - BROADLY-GRADED STONE
   - 100% PASSING THE 1" SIEVE
   - LESS THAN 15% PASSING THE NO. 200 SIEVE.

QUANTITY LIST

THE FOLLOWING IS A LIST OF ITEMS AND APPROXIMATE QUANTITIES TO BE USED FOR COMPLETION OF THIS PROJECT. FINAL QUANTITIES TO BE VERIFIED BY CONTRACTOR.

DESCRIPTION	QUANTITY
• INSTRUMENTATION MODIFICATION	3 ITEM
• CLEARING AND GRUBBING	120,000 SF
• EXCAVATION (UNSUITABLE SOILS)	450 CY
• SUITABLE BACKFILL MATERIALS	450 CY
• FILTER GRAVEL MATERIAL-ALDOT CONCRETE SAND	4500 CY
• FILTER GRAVEL MATERIAL-ALDOT NO. 89 STONE	4500 CY
• ROCK BUTTRESS	6680 CY
• CRUSHER-RUN	800 CY

SUBMITTALS

THE CONTRACTOR SHALL MAKE THE FOLLOWING SUBMITTALS FOR REVIEW AND APPROVAL BY THE ENGINEER. UNLESS NOTED OTHERWISE, SUBMITTALS SHALL BE MADE A MINIMUM OF TWO WEEKS PRIOR TO BEING NEEDED FOR A GIVEN OPERATION. WORK ON ANY COMPONENT OF THE PROJECT SHALL NOT BEGIN UNTIL THE SUBMITTAL(S) CORRESPONDING TO THAT WORK HAVE BEEN APPROVED:

1. A DETAILED CONSTRUCTION PLAN OUTLINING:
   - SPECIFIC EQUIPMENT TO BE USED AND ITS PURPOSE
   - HAUL ROUTES AND TEMPORARY ACCESS ROADS
   - LOCATION OF STAGING AREAS
   - METHOD FOR PROTECTING BAT HABITATS
   - A DESCRIPTION OF METHODS TO BE USED TO IMPLEMENT EXCAVATION
   - A DESCRIPTION OF METHODS FOR COMPACTION
   - METHODS FOR DELIVERING FILTER SAND AND GRAVEL, ROCK BUTTRESS, SUITABLE BACKFILL, AND OTHER CONSTRUCTION MATERIALS TO THEIR FINAL LOCATIONS
   - METHODS AND EQUIPMENT USED FOR EXTENDING PIEZOMETERS
   - A DETAILED CONSTRUCTION SCHEDULE AND SEQUENCE
2. CLEARING AND GRUBBING-SUBMITTALS TO INCLUDE DOCUMENTATION OF EXISTING TREES CLEARED
3. SUPPLIER CERTIFICATION FOR FILTER SAND AND GRAVEL MATERIAL, INCLUDING GRADATION AND METHODS USED TO ENSURE THAT THE MATERIAL MEETS CORRESPONDING GRADATION AND REQUIREMENTS INCLUDING ALDOT SPECIFICATIONS.
4. SUPPLIER CERTIFICATION FOR ALL RIP-RAP TO BE DELIVERED TO THE SITE. CERTIFICATION SHOULD INDICATE THAT THE MATERIAL MEETS THE CORRESPONDING GRADATION AND REQUIREMENTS INCLUDING ALDOT SPECIFICATIONS.
5. MATERIAL CHARACTERIZATION TESTING FOR ALL SOIL MATERIALS TO BE RECOMPACTED AS SUITABLE FILL, IF NEEDED. CHARACTERIZATION TESTING SHALL INCLUDE MOISTURE CONTENT (ATM D 2216), ATTERBERG LIMITS ANALYSIS (ASTM D 4318), PARTICLE SIZE ANALYSIS (ASTM D 422), AND STANDARD PROCTOR TEST (ASTM D 698). MATERIAL SUBMITTED FOR TESTING SHOULD BE A REPRESENTATIVE SAMPLE FROM EACH BORROW SOURCE, AND TEST RESULTS SHALL BE SUBMITTED TO ENGINEER A MINIMUM OF 48 HOURS PRIOR TO THE START OF FILL PLACEMENT.
6. AS-BUILT SURVEYS.
7. A SET OF REDLINED AS-BUILT (REDLINE) DRAWINGS, PRIOR TO THE CLOSE OF THE PROJECT.

REFERENCE SYMBOLS

INDICATES DIRECTION OF CUTTING PLANE

NO. 207 — LETTER INDICATES SECTION DESIGNATION; DRAWING NO. WHERE SECTION IS DRAWN

NO. C-34 C-23 — LETTER INDICATES SECTION/DETAIL DESIGNATION; DRAWING NO. WHERE SECTION/DETAIL IS DRAWN; DRAWING NO. WHERE SECTION/DETAIL IS TAKEN

NO. 1007 — NUMBER INDICATES DETAIL DESIGNATION; DRAWING NO. WHERE DETAIL IS DRAWN

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RECORD DRAWING

REV. NO.	DATE	DSGN	DRAWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV CD
R 1	04/09/15	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694		J
RECORD DRAWING											
R 0	07/09/14	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694		D
ISSUE FOR CONSTRUCTION											

DISCIPLINE INTERFACE

SCALE: NONE — EXCEPT AS NOTED

GENERAL NOTES

ASH POND 4

SLOPE IMPROVEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SEB	CMA	MJS	MJS	RSH	MST	JCK

URS

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2013 | DATE 04/09/15 | 47 | C | 10W504-02 | R 1

URS Corporation	1
TASK COMPLETED BY:	REV NO.

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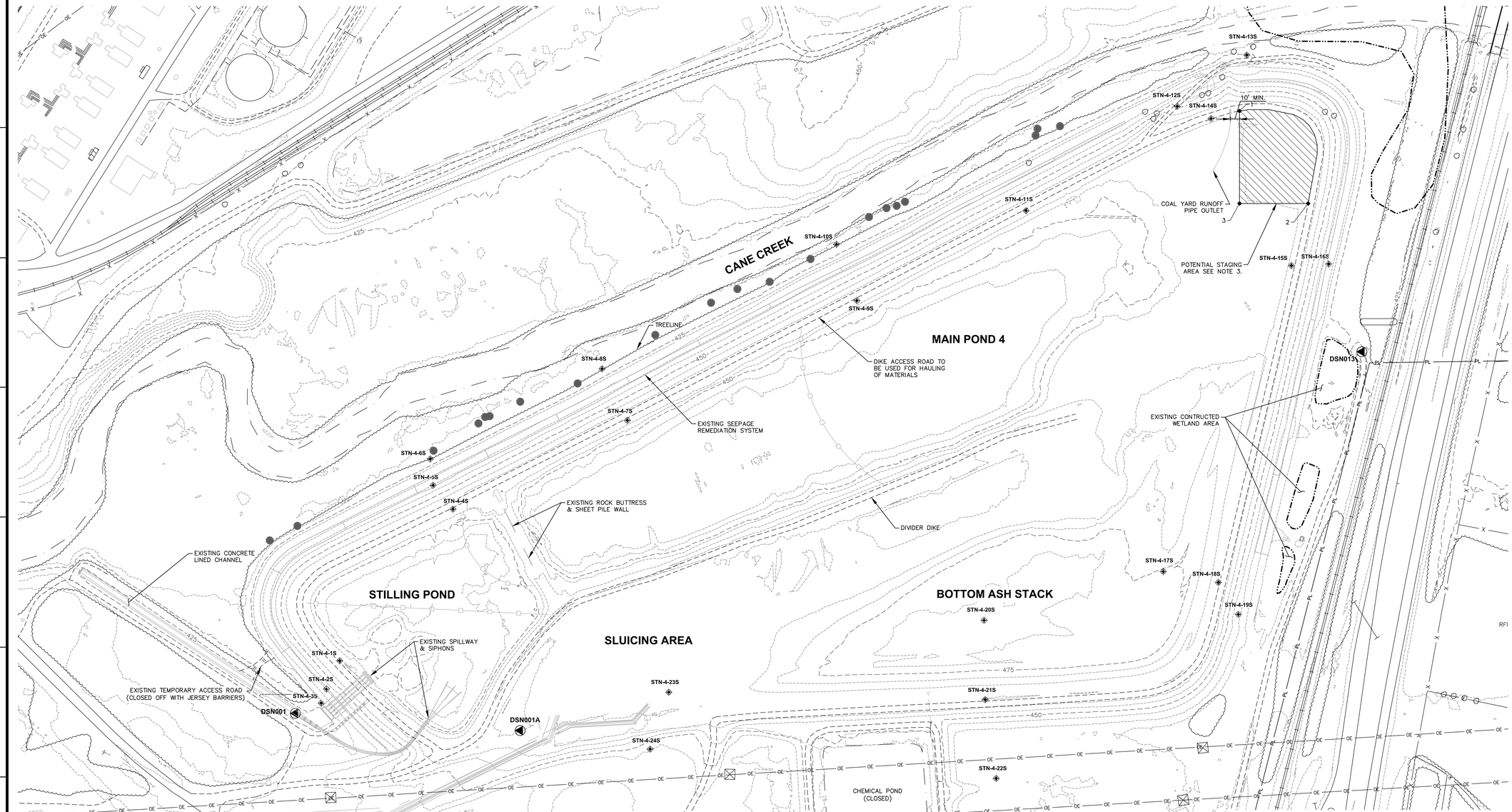


N

0 100 200

SCALE IN FEET

LEGEND

- EXISTING VEGETATION
- EXISTING PROPERTY LINE
- EXISTING FENCE
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING HAUL ROAD
- EXISTING CREEK
- EXISTING WETLANDS
- EXISTING TURBIDITY CURTAIN
- EXISTING BENCH MARKS
- EXISTING PIEZOMETERS
- EXISTING BAT HABITATS (PROTECT FROM DAMAGE)

BENCHMARKS

BM	NORTHING	EASTING	ELEV.
CAP-□4-1	17□□41.□□	□□4167.□□	46□.71
CAP-□4-□	17□□667.□7	□□4□□4.41	4□□.□□
CAP-□4-4	17□□□8.□□	□□□□6□.44	46□.□□
CAP-□4-□	17□1□□□.7□	□□□84□.4□	46□.1□
CAP-□4-6	17□1□□□.71	□□□11□.1□	46□.□□
CAP-□4-7	17□1476.□7	□□4□1□.4□	46□.41
CAP-□4-□	17□□1□□.7□	□□4□□7.7□	461.77

NOTES

1. EXACT LOCATION OF EXISTING UTILITIES TO BE VERIFIED.
2. CONTRACTOR TO COORDINATE HAUL ROUTES AND ACCESS FOR SLOPE IMPROVEMENT PROJECT WITH NEEDS OF OTHER PROJECTS.
3. CONTRACTOR MAY USE SOUTHEAST CORNER AREA OF POND FOR STAGING MATERIALS AND EQUIPMENT, AS ALLOWED BY TVA. CORNER AREA MAY NEED TO BE FILLED/IMPROVED TO CREATE A DRY AND LEVEL STAGING AREA. CONTRACTOR MAY COORDINATE WITH TVA TO USE BOTTOM ASH FROM STACK FOR FILL. NO FILL SHALL BE PLACED WITHIN 10 FEET OF THE COAL YARD PIPE OUTLET. CONTRACTOR TO MODIFY TURNING RADIUS OF EXISTING ACCESS ROAD INTERSECTION AS NECESSARY IN COMBINATION WITH THE PROPOSED TURN AROUND AREA NOTED TO ACCOMMODATE SAFE OPERATIONS. THESE IMPROVEMENTS SHALL BE APPROVED BY TVA'S CONSTRUCTION MANAGER PRIOR TO IMPLEMENTATION. COORDINATES OF THE CORNER POINTS OF THE PROPOSED STAGING/TURNAROUND AREA ARE INCLUDED IN THE TABLE BELOW.

POINT	NORTHING	EASTING
1	1721348.98	395734.30
2	1721177.27	395503.29
3	1721348.98	395503.29

4. ALL HORIZONTAL COORDINATES GIVEN ON THESE DRAWINGS ARE IN COLBERT PLANT COORDINATES. ELEVATION DATA ARE IN NGVD 29. BATHYMETRIC CONTOURS AND EXISTING DIKE GRADES ARE BASED ON TVA SURVEYS DATED AUGUST 2009 AND DECEMBER 2011.
5. BENCHMARK COORDINATES PROVIDED BY TVA.
6. ANY EXISTING PIEZOMETERS OR MONITORING WELLS IN THE LIMITS OF WORK SHALL BE PROTECTED AND EXTENDED AS SHOWN ON SHEET 10W504-11. RFI 001
7. EXISTING BAT HABITATS (ROOST TREES OR BAT TREES) BASED ON SURVEY DATA PROVIDED FROM TVA DATED MAY 2014. ROOST TREES SHALL ONLY BE REMOVED BETWEEN OCTOBER 15 AND MARCH 31, AND SHALL BE COORDINATED WITH TVA ENVIRONMENTAL APPROPRIATELY AND DOCUMENTED. IF WORK OCCURS PRIOR TO OCTOBER 15 IN THE LOCATION OF BAT TREES, ALL PLACEMENT OF MATERIALS SHALL BE BY HAND TO MINIMIZE DISTURBANCE TO BAT TREES.

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION

RECORD DRAWING

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 1	04/09/15	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694	
RECORD DRAWING										
R 0	07/09/14	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694	
ISSUE FOR CONSTRUCTION										

DISCIPLINE INTERFACE: 1 CIV, 2, 3, 4

SCALE: 1"= 200' EXCEPT AS NOTED

EXISTING CONDITIONS

ASH POND 4

SLOPE IMPROVEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SEB	CMA	MJS	MJS	RSH	MST	JCK

URS

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

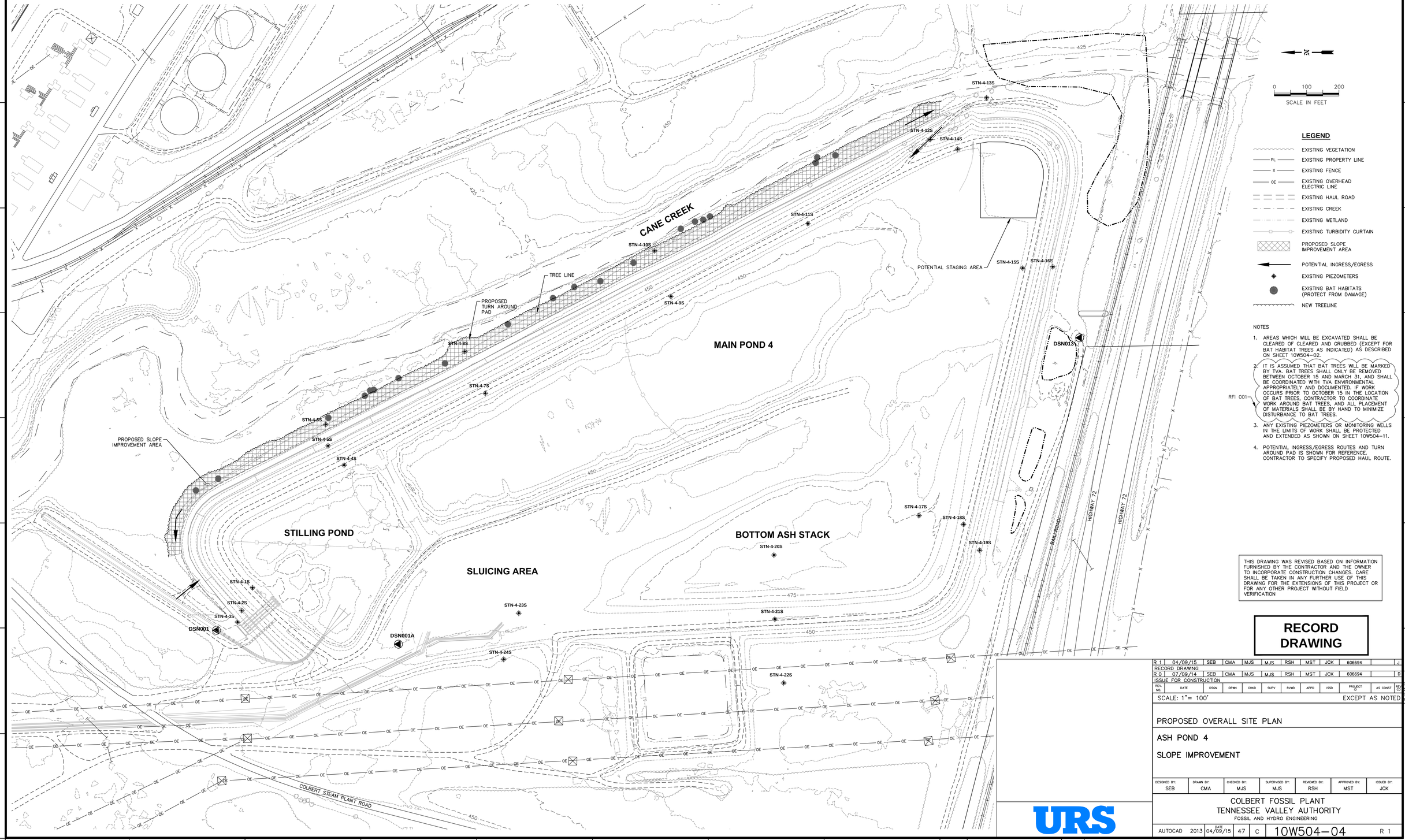
AUTOCAD	2013	DATE 04/09/15	47	C	10W504-03	R 1

URS Corporation	1
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

I:\Projects\TVA-COF\31851331_TVAP4Ph3\DWGs\Record\Final\10W504-03 R1.dwg User:tyler_johnson Apr 10, 2015 - 11:13am DELIVERABLE ID: COLBERT FACILITY-P4SI-00014



LEGEND

- EXISTING VEGETATION
- PL — EXISTING PROPERTY LINE
- X — EXISTING FENCE
- OE — EXISTING OVERHEAD ELECTRIC LINE
- EXISTING HAUL ROAD
- EXISTING CREEK
- EXISTING WETLAND
- EXISTING TURBIDITY CURTAIN
- PROPOSED SLOPE IMPROVEMENT AREA
- POTENTIAL INGRESS/EGRESS
- EXISTING PIEZOMETERS
- EXISTING BAT HABITATS (PROTECT FROM DAMAGE)
- NEW TREELINE

NOTES

1. AREAS WHICH WILL BE EXCAVATED SHALL BE CLEARED OF CLEARED AND GRUBBED (EXCEPT FOR BAT HABITAT TREES AS INDICATED) AS DESCRIBED ON SHEET 10W504-02.
2. IT IS ASSUMED THAT BAT TREES WILL BE MARKED BY TVA. BAT TREES SHALL ONLY BE REMOVED BETWEEN OCTOBER 15 AND MARCH 31, AND SHALL BE COORDINATED WITH TVA ENVIRONMENTAL APPROPRIATELY AND DOCUMENTED. IF WORK OCCURS PRIOR TO OCTOBER 15 IN THE LOCATION OF BAT TREES, CONTRACTOR TO COORDINATE WORK AROUND BAT TREES, AND ALL PLACEMENT OF MATERIALS SHALL BE BY HAND TO MINIMIZE DISTURBANCE TO BAT TREES. RFI 001
3. ANY EXISTING PIEZOMETERS OR MONITORING WELLS IN THE LIMITS OF WORK SHALL BE PROTECTED AND EXTENDED AS SHOWN ON SHEET 10W504-11.
4. POTENTIAL INGRESS/EGRESS ROUTES AND TURN AROUND PAD IS SHOWN FOR REFERENCE. CONTRACTOR TO SPECIFY PROPOSED HAUL ROUTE.

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION

RECORD DRAWING

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 1	04/09/15	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694	
RECORD DRAWING										
R 0	07/09/14	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694	
ISSUE FOR CONSTRUCTION										

SCALE: 1"= 100' EXCEPT AS NOTED

PROPOSED OVERALL SITE PLAN

ASH POND 4

SLOPE IMPROVEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SEB	CMA	MJS	MJS	RSH	MST	JCK

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD	2013	DATE 04/09/15	47	C	10W504-04	R 1

URS

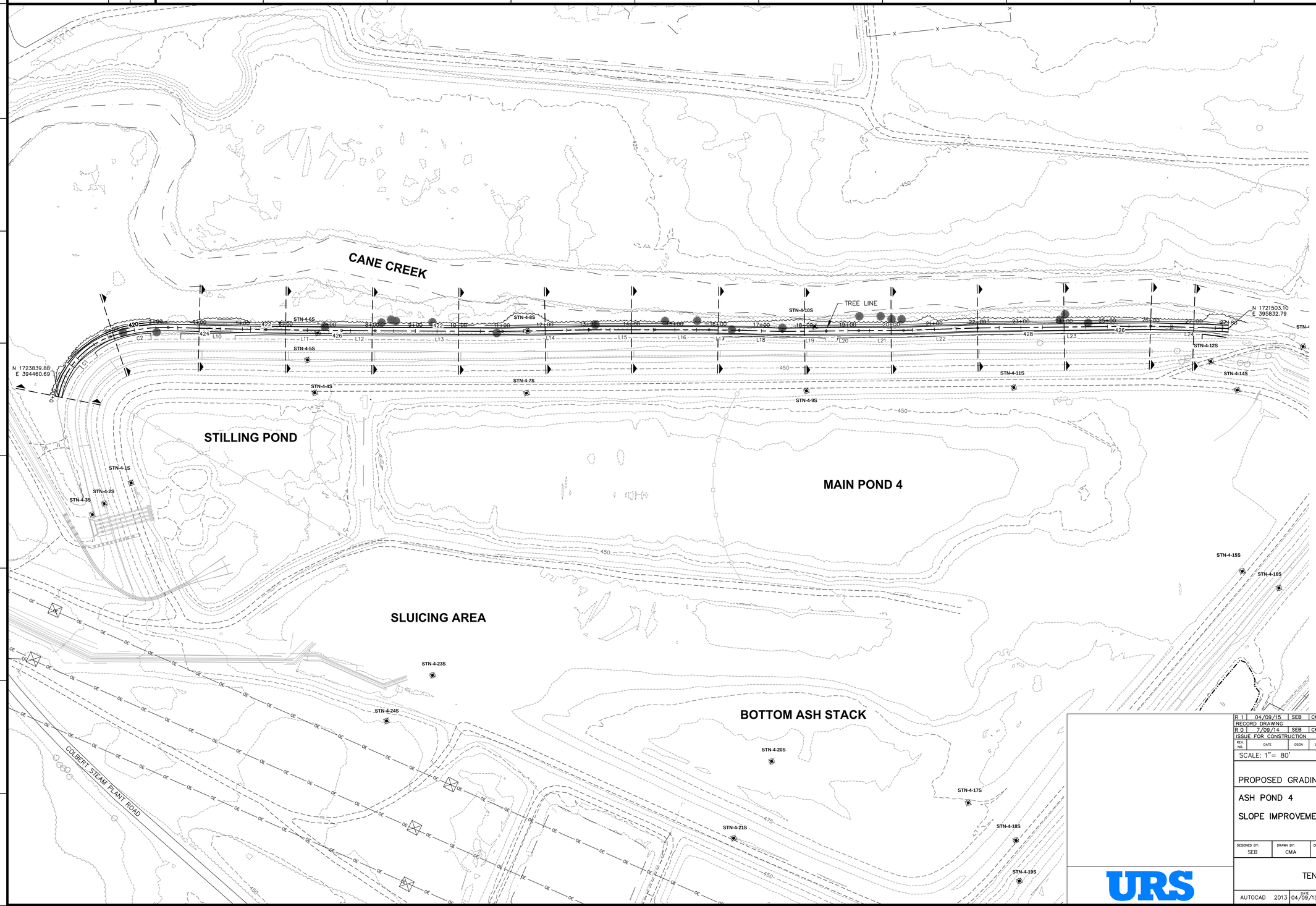
URS Corporation	1
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

DISCIPLINE INTERFACE

I:\Projects\TVA-COF\31851331_TVAP4Ph3\DWGs\Record\Final\10W504-04 R1.dwg User:tyler_yohman Apr 10, 2015 - 11:14am DELIVERABLE ID: COLBERT FACILITY-P4SI-00014



LEGEND

- PROPOSED MAJOR CONTOURS
- PROPOSED MINOR CONTOURS
- NEW TREELINE
- EXISTING VEGETATION
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING HAUL ROAD
- EXISTING CREEK
- EXISTING WETLAND
- EXISTING TURBIDITY CURTAIN
- EXISTING PIEZOMETERS
- EXISTING BAT HABITATS (PROTECT FROM DAMAGE)

CLP_02_BUTTRESS			
Number	Radius	Length	Line/Chord Direction
C1	185.00	192.64	S76° 09' 46.01"E
C2	378.00	135.63	S36° 03' 08.37"E
L10		226.30	S25° 46' 23.49"E
L11		174.68	S26° 27' 25.88"E
L12		77.50	S26° 34' 55.19"E
L13		294.95	S26° 50' 21.02"E
L14		200.06	S28° 05' 50.22"E
L15		152.31	S27° 05' 15.76"E
L16		125.00	S27° 05' 15.76"E
L17		69.03	S26° 15' 27.64"E
L18		99.99	S25° 31' 14.37"E
L19		101.90	S27° 37' 14.88"E
L20		75.00	S27° 50' 52.11"E
L21		103.50	S27° 20' 58.29"E
L22		171.49	S28° 58' 33.00"E
L23		400.00	S27° 42' 31.88"E
L24		180.06	S25° 16' 54.48"E

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION

RECORD DRAWING

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 1	04/09/15	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694	J
RECORD DRAWING										
R 0	7/09/14	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694	D
ISSUE FOR CONSTRUCTION										

DISCIPLINE INTERFACE

SCALE: 1"= 80' EXCEPT AS NOTED

PROPOSED GRADING PLAN

ASH POND 4

SLOPE IMPROVEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SEB	CMA	MJS	MJS	RSH	MST	JCK

URS

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2013	DATE 04/09/15	47	C	10W504-05	R 1

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

URS Corporation | 1
TASK COMPLETED BY: | REV NO.

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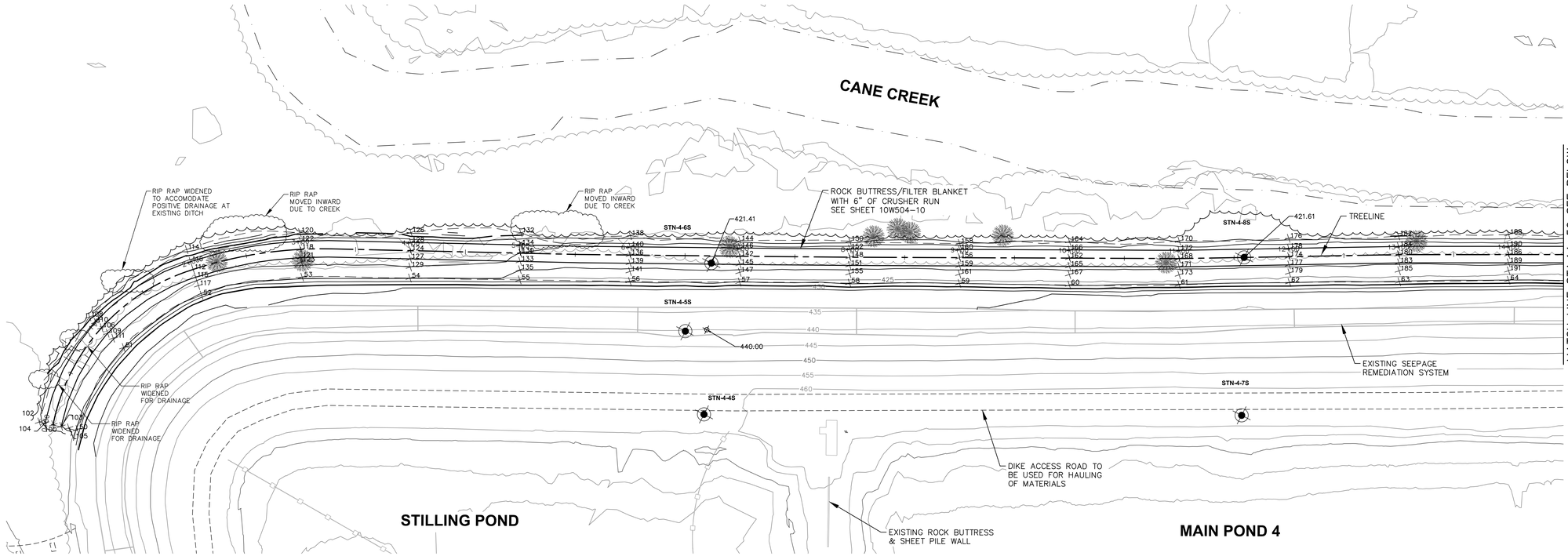

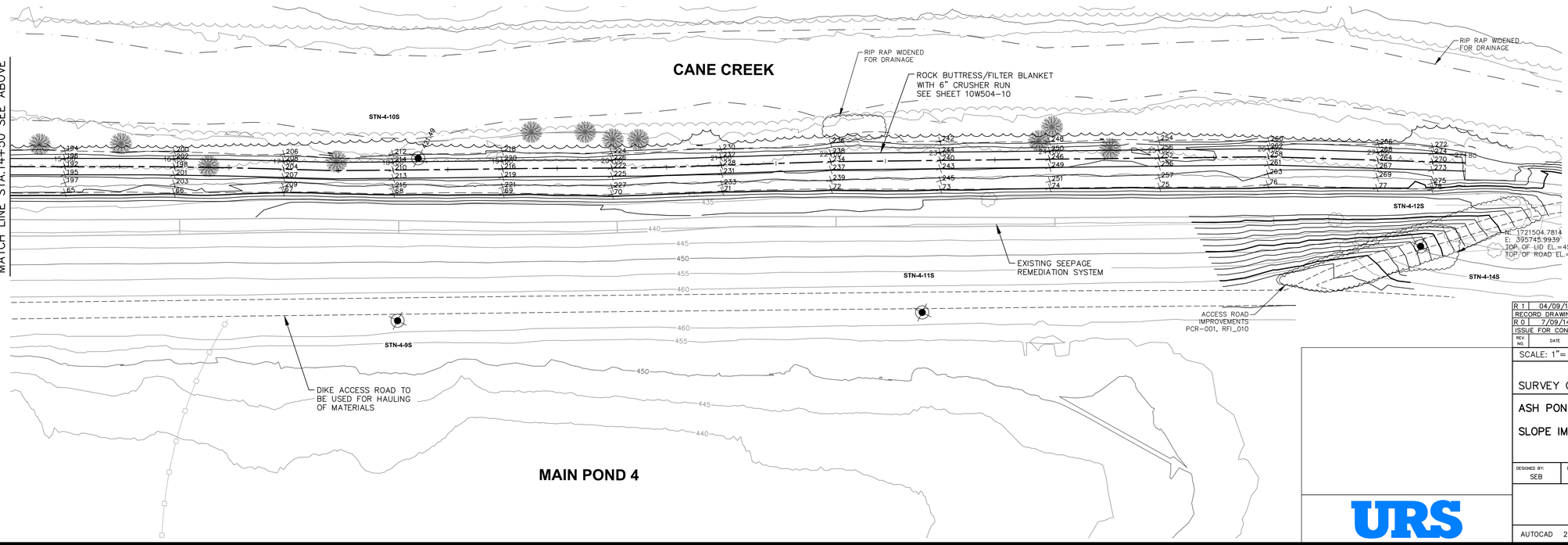

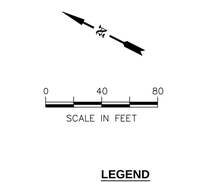

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION

RECORD DRAWING

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 1	04/09/15	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694	J
RECORD DRAWING										
R 0	7/09/14	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694	D
ISSUE FOR CONSTRUCTION										

DISCIPLINE INTERFACE

SCALE: 1"= 40' EXCEPT AS NOTED

SURVEY CONTROL PLAN

ASH POND 4

SLOPE IMPROVEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SEB	CMA	MJS	MJS	RSH	MST	JCK

URS

TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD	2013	DATE 04/09/15	47	C	10W504-06	R 1

URS Corporation | 1
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

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AS-BUILT SURVEY

Point Table				
Point #	Elevation	Northing	Easting	Description
50	426.73	1723818.23	394466.90	P1
51	423.48	1723814.68	394552.50	P1
52	426.93	1723773.20	394627.28	P1
53	424.83	1723699.05	394683.60	P1
54	425.98	1723611.34	394727.49	P1
55	426.94	1723521.55	394771.52	P1
56	427.57	1723431.63	394815.92	P1
57	428.29	1723342.31	394860.90	P1
58	427.58	1723252.77	394905.55	P1
59	427.26	1723163.51	394950.86	P1
60	427.67	1723073.82	394995.10	P1
61	428.43	1722984.84	395040.74	P1
62	427.83	1722896.34	395088.42	P1
63	428.32	1722807.58	395134.49	P1
64	428.13	1722719.56	395181.05	P1
65	428.24	1722630.31	395226.14	P1
66	429.34	1722541.51	395271.38	P1
67	428.32	1722453.04	395317.47	P1
68	429.22	1722362.68	395362.04	P1
69	428.65	1722273.75	395407.96	P1
70	428.85	1722184.33	395452.33	P1
71	428.54	1722096.10	395500.81	P1
72	429.38	1722008.41	395547.73	P1
73	429.83	1721919.19	395592.94	P1
74	429.74	1721830.73	395639.58	P1
75	429.25	1721742.10	395685.89	P1
76	428.36	1721655.03	395732.84	P1
77	430.08	1721564.57	395775.47	P1
78	430.99	1721519.69	395797.51	P1
100	423.65	1723839.88	394460.69	CL
102	420.84	1723852.22	394457.15	TOE
103	423.67	1723832.67	394462.76	EG
104	423.01	1723847.09	394458.63	EG
105	425.43	1723825.83	394464.72	P2
106	422.04	1723840.75	394559.48	CL
108	419.18	1723855.01	394563.29	TOE
109	422.19	1723833.51	394557.54	EG
110	422.09	1723848.00	394561.41	EG
111	419.94	1723827.06	394555.81	P2
112	422.79	1723790.73	394644.68	CL
114	416.54	1723804.22	394658.07	TOE
115	423.35	1723785.40	394639.40	EG
116	422.85	1723796.05	394649.96	EG
117	424.94	1723779.71	394633.75	P2
118	419.75	1723711.77	394705.57	CL
120	418.75	1723719.37	394718.70	TOE
121	423.05	1723708.01	394699.08	EG
122	417.19	1723715.52	394712.06	EG
123	423.64	1723706.04	394695.67	P2
124	422.73	1723622.20	394749.99	CL

Point Table				
Point #	Elevation	Northing	Easting	Description
126	417.66	1723629.39	394764.88	TOE
127	423.04	1723618.94	394743.23	EG
128	422.67	1723625.46	394756.74	EG
129	423.64	1723615.70	394736.54	P2
130	423.91	1723532.15	394793.47	CL
131	423.91	1723532.15	394793.47	CL
132	418.18	1723540.22	394810.18	TOE
133	424.01	1723528.89	394786.72	EG
134	423.88	1723535.41	394800.22	EG
135	425.03	1723525.56	394779.83	P2
136	425.09	1723442.33	394837.44	CL
138	420.94	1723450.22	394853.29	TOE
139	425.17	1723438.99	394830.72	EG
140	425.08	1723445.67	394844.15	EG
141	427.07	1723435.64	394823.98	P2
142	425.09	1723352.81	394881.99	CL
144	421.98	1723359.06	394894.55	TOE
145	425.22	1723349.46	394875.28	EG
146	425.11	1723356.15	394888.71	EG
147	426.89	1723346.25	394868.82	P2
148	425.10	1723263.35	394926.68	CL
150	421.01	1723269.90	394939.77	TOE
151	425.27	1723259.99	394919.97	EG
152	425.14	1723266.70	394933.39	EG
155	426.19	1723256.69	394913.37	P2
156	425.23	1723174.11	394971.80	CL
158	422.41	1723179.93	394983.32	TOE
159	425.50	1723170.72	394965.11	EG
160	425.16	1723177.49	394978.50	EG
161	426.62	1723167.35	394958.45	P2
162	425.36	1723084.88	395016.95	CL
164	421.67	1723091.71	395030.45	TOE
165	425.70	1723081.49	395010.26	EG
166	424.58	1723088.26	395023.64	EG
167	427.02	1723078.15	395003.65	P2
168	425.55	1722995.65	395062.10	CL
170	421.86	1723002.89	395076.40	TOE
171	425.80	1722992.26	395055.41	EG
172	424.93	1722999.04	395068.79	EG
173	426.93	1722988.95	395048.85	P2
174	425.77	1722907.42	395109.16	CL
176	420.98	1722915.28	395123.90	TOE
177	425.66	1722903.89	395102.55	EG
178	425.77	1722910.95	395115.78	EG
179	426.59	1722900.45	395096.11	P2
180	425.84	1722819.20	395156.26	CL
182	419.93	1722827.24	395171.31	TOE
183	426.69	1722815.67	395149.65	EG
184	425.47	1722822.74	395162.88	EG
185	427.60	1722812.26	395143.26	P2

Point Table				
Point #	Elevation	Northing	Easting	Description
186	425.91	1722730.19	395201.82	CL
188	420.00	1722738.52	395218.13	TOE
189	425.96	1722726.77	395195.15	EG
190	425.93	1722733.60	395208.50	EG
191	426.86	1722723.50	395188.76	P2
192	425.78	1722641.16	395247.36	CL
194	421.88	1722647.73	395260.21	TOE
195	426.78	1722637.74	395240.68	EG
196	425.70	1722644.57	395254.04	EG
197	426.93	1722634.46	395234.26	P2
198	425.65	1722551.99	395292.62	CL
200	422.37	1722558.00	395304.82	TOE
201	425.71	1722548.67	395285.90	EG
202	425.64	1722555.31	395299.35	EG
203	427.89	1722545.17	395278.80	P2
204	425.60	1722462.02	395336.26	CL
206	422.36	1722467.95	395348.68	TOE
207	425.89	1722458.79	395329.50	EG
208	424.71	1722465.25	395343.03	EG
209	428.30	1722455.07	395321.72	P2
210	425.52	1722372.62	395381.05	CL
212	420.89	1722379.36	395393.92	TOE
213	425.62	1722369.15	395374.40	EG
214	424.34	1722376.10	395387.69	EG
215	428.71	1722365.18	395366.83	P2
216	425.60	1722284.11	395427.59	CL
218	422.24	1722291.51	395441.58	TOE
219	425.60	1722280.61	395420.96	EG
220	425.43	1722287.62	395434.22	EG
221	428.44	1722276.25	395412.71	P2
222	425.68	1722195.39	395473.72	CL
224	422.93	1722201.55	395485.63	TOE
225	425.64	1722191.95	395467.06	EG
226	425.54	1722198.84	395480.38	EG
227	428.35	1722187.18	395457.84	P2
228	425.78	1722107.53	395521.45	CL
230	422.82	1722114.51	395534.05	TOE
231	425.90	1722103.89	395514.89	EG
232	425.69	1722111.16	395528.01	EG
233	428.49	1722098.99	395506.03	P2
234	425.87	1722020.04	395569.90	CL
236	421.88	1722027.87	395584.79	TOE
237	426.04	1722016.56	395563.26	EG
238	425.84	1722023.53	395576.54	EG
239	428.57	1722012.22	395554.99	P2
240	425.93	1721931.51	395616.39	CL
242	420.27	1721939.77	395632.11	TOE
243	426.06	1721928.03	395609.75	EG
244	425.88	1721935.00	395623.03	EG
245	429.09	1721922.92	395600.04	P2

Point Table				
Point #	Elevation	Northing	Easting	Description
246	426.00	1721842.98	395662.89	CL
248	420.64	1721850.48	395677.16	TOE
249	426.09	1721839.49	395656.25	EG
250	425.93	1721846.47	395669.53	EG
251	429.58	1721833.64	395645.10	P2
252	426.20	1721754.45	395709.39	CL
254	422.26	1721761.91	395723.59	TOE
255	426.27	1721750.96	395702.75	EG
256	426.20	1721757.94	395716.03	EG
257	429.08	1721746.08	395693.45	P2
258	426.39	1721665.92	395755.89	CL
260	423.98	1721671.98	395768.73	TOE
261	426.44	1721662.71	395749.11	EG
262	426.49	1721669.12	395762.67	EG
263	428.59	1721659.11	395741.48	P2
264	427.23	1721575.49	395798.59	CL
266	424.57	1721581.72	395811.78	TOE
267	427.45	1721572.29	395791.81	EG
268	427.54	1721578.70	395805.38	EG
269	429.53	1721568.88	395784.59	P2
270	426.71	1721530.28	395819.95	CL
272	424.35	1721536.06	395832.18	TOE
273	426.90	1721527.08	395813.17	EG
274	426.75	1721533.49	395826.73	EG
275	429.31	1721521.94	395802.29	P2

Point Table				
Point #	Elevation	Northing	Easting	Description
300	423.22	1723846.61	394458.76	TCR
301	423.54	1723833.15	394462.62	TCR
302	422.09	1723847.52	394561.28	TCR
303	422.18	1723833.99	394557.67	TCR
304	422.84	1723795.59	394649.71	TCR
305	422.80	1723785.86	394639.65	TCR
306	417.50	1723715.27	394711.63	TCR
307	422.98	1723708.26	394699.51	TCR
308	422.68	1723625.24	394756.29	TCR
309	423.05	1723619.15	394743.69	TCR
310	423.89	1723535.19	394799.77	TCR
311	424.00	1723529.10	394787.17	TCR
312	425.08	1723445.45	394843.70	TCR
313	425.16	1723439.21	394831.17	TCR
314	425.11	1723355.92	394888.26	TCR
315	425.21	1723349.69	394875.72	TCR
316	425.13	1723266.48	394932.94	TCR
317	425.26	1723260.22	394920.42	TCR
318	425.16	1723177.27	394978.05	TCR
319	425.48	1723170.95	394965.56	TCR
320	424.73	1723088.04	395023.20	TCR
321	425.67	1723081.72	395010.71	TCR
322	425.06	1722998.81	395068.35	TCR
323	425.70	1722992.49	395055.85	TCR
324	425.77	1722910.72	395115.34	TCR
325	425.70	1722904.12	395102.99	TCR
326	425.74	1722822.50	395162.44	TCR
327	426.63	1722815.91	395150.09	TCR
328	425.96	1722733.37	395208.06	TCR
329	425.96	1722727.00	395195.59	TCR
330	425.81	1722644.34	395253.59	TCR
331	426.64	1722637.97	395241.13	TCR
332	425.66	1722555.09	395298.90	TCR
333	425.71	1722548.89	395286.35	TCR
334	424.85	1722465.03	395342.58	TCR
335	425.71	1722459.00	395329.95	TCR
336	424.37	1722375.87	395387.25	TCR
337	425.56	1722369.38	395374.85	TCR
338	425.44	1722287.38	395433.78	TCR
339	425.61	1722280.84	395421.40	TCR
340	425.55	1722198.61	395479.94	TCR
341	425.65	1722192.18	395467.50	TCR
342	425.69	1722110.92	395527.58	TCR
343	425.84	1722104.14	395515.33	TCR
344	425.84	1722023.30	395576.09	TCR
345	426.02	1722016.79	395563.70	TCR
346	425.89	1721934.77	395622.59	TCR
347	426.06	1721928.26	395610.20	TCR
348	425.93	1721846.24	395669.09	TCR
349	426.09	1721839.73	395656.69	TCR
350	426.20	1721757.70	395715.59	TCR
351	426.26	1721751.19	395703.19	TCR
352	426.48	1721668.90	395762.22	TCR
353	426.44	1721662.92	395749.55	TCR
354	427.53	1721578.48	395804.92	TCR
355	427.43	1721572.50	395792.27	TCR
356	426.74	1721533.27	395826.28	TCR
357	426.89	1721527.29	395813.62	TCR

POINT LEGEND

CL = CENTERLINE ROCK BUTTRESS / TOP OF RIP-RAP

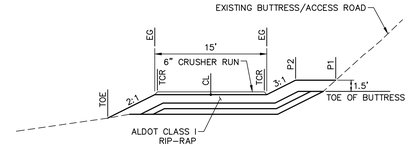
EG = EDGE OF 15 FT ROCK BUTTRESS / TOP OF RIP-RAP

P1 = TOP OF RIP-RAP AT INTERSECTION OF ROCK BUTTRESS/FILTER BLANKET AND EXISTING BUTTRESS/ACCESS ROAD

P2 = TOP OF RIP-RAP ROCK BUTTRESS/FILTER BLANKET AT 3 TO 1 SLOPE BREAK

TOE = TOE OF SLOPE ROCK BUTTRESS/FILTER BLANKET

TCR = TOP OF 6" CRUSHER RUN



ROC□ □U□RESS/□L□ER □LA□□E□

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION

RECORD DRAWING

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV QA
R 1	04/09/15	SEB	CMA	MJS	MJS	RSH	MST	JCK	60669		J
RECORD DRAWING											
R 0	7/09/14	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694		D
ISSUE FOR CONSTRUCTION											

DISCIPLINE INTERFACE

SCALE: NONE EXCEPT AS NOTED

SURVEY CONTROL

ASH POND 4

SLOPE IMPROVEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SEB	CMA	MJS	MJS	RSH	MST	JCK

URS

TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2013	DATE 04/09/15	47	C	10W504-07	R 1

URS Corporation | 1
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

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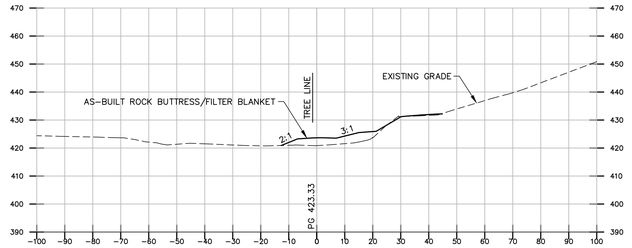
0+00



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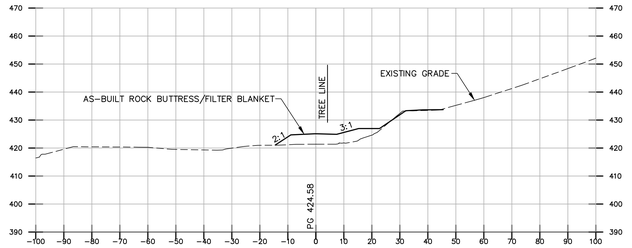

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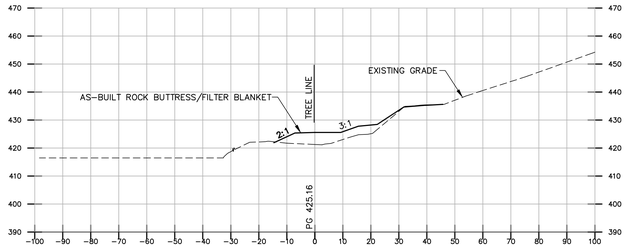
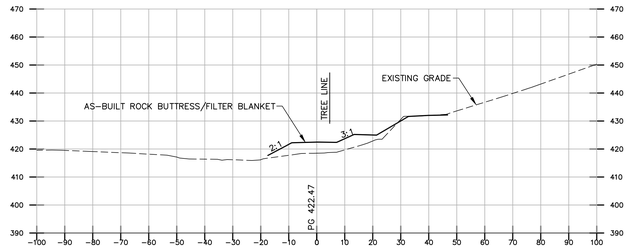


AS-BUILT SURVEY

2+00



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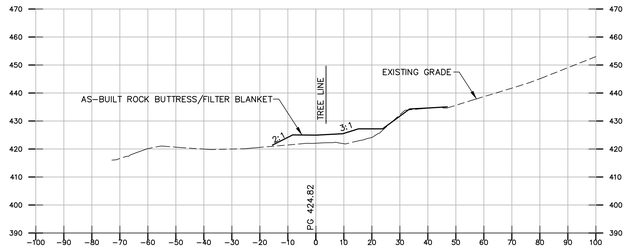

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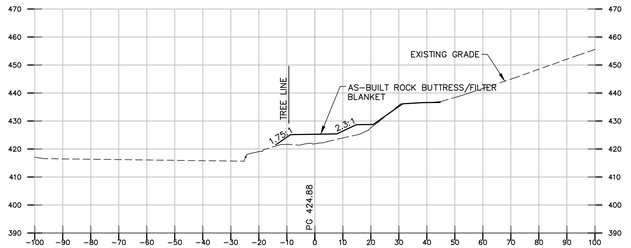

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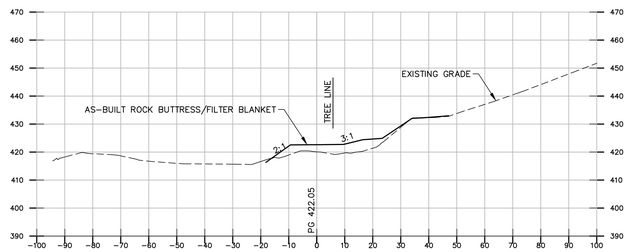

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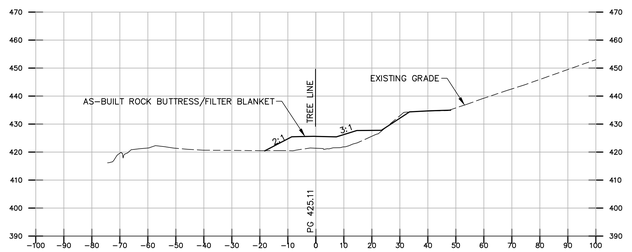

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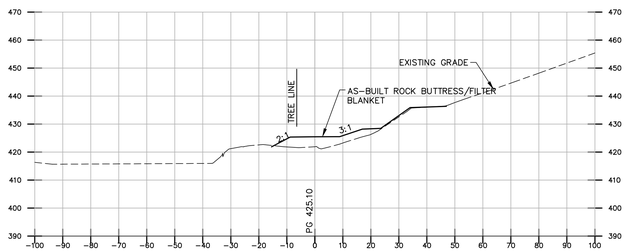

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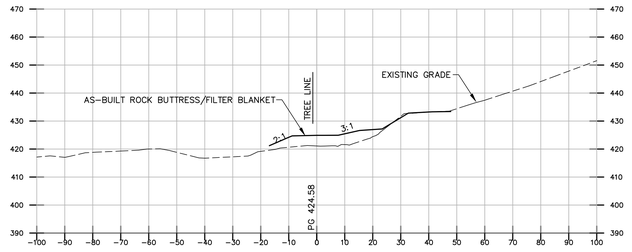
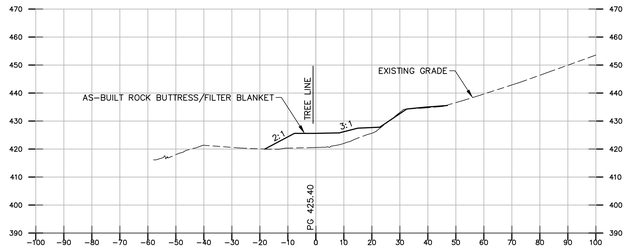
RECORD DRAWING

6+00



14+00



0 20 40
SCALE IN FEET

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV CD
R 1	04/09/15	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694		J
RECORD DRAWING											
R 0	07/09/14	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694		D
ISSUE FOR CONSTRUCTION											

DISCIPLINE INTERFACE

SCALE: 1"= 20' EXCEPT AS NOTED

CROSS SECTIONS STA 0+00 TO 20+00

ASH POND 4

SLOPE IMPROVEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SEB	CMA	MJS	MJS	RSH	MST	JCK

URS

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2013	DATE 04/09/15	47	C	10W504-08	R 1

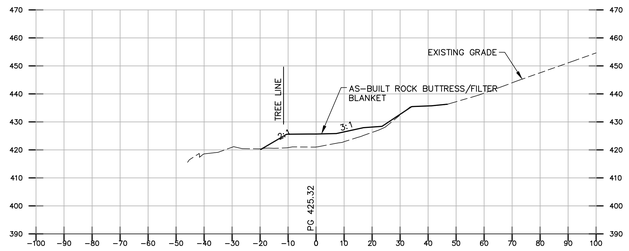
URS Corporation	1
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

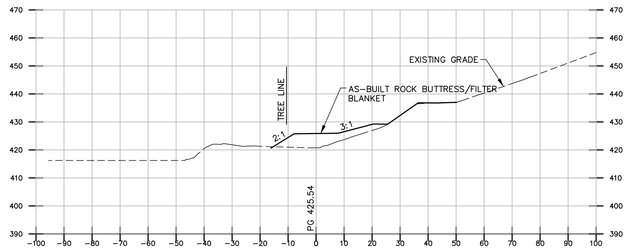
i:\Projects\TVA-COF\3185\331_TVAP4Ph3\DWGs\Record\Final\10W504-08 R1.dwg User:tyler_yohnan Apr 10, 2015 - 10:08am DELIVERABLE ID: COLBERT FACILITY-P4SI-00014

22+00

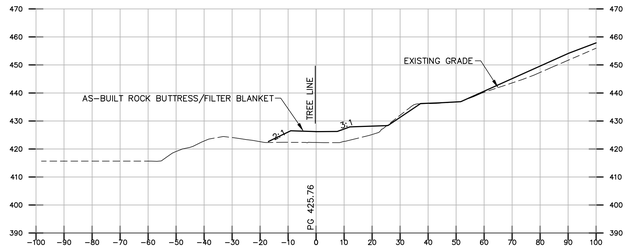


AS-BUILT SURVEY

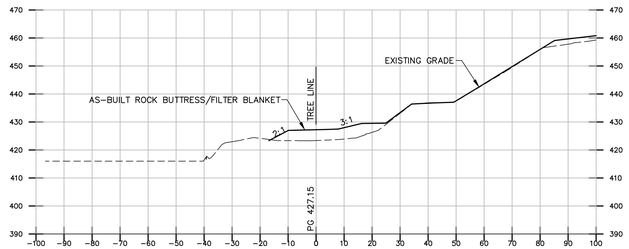
24+00



26+00



27+00



0 20 40
SCALE IN FEET

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION

RECORD DRAWING

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ENGR	AS CONST	REV CD
R 1	04/09/15	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694		J
RECORD DRAWING											
R 0	07/09/14	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694		D
ISSUE FOR CONSTRUCTION											

DISCIPLINE INTERFACE

SCALE: 1"= 20' EXCEPT AS NOTED

CROSS SECTIONS STA 22+00 TO 27+00

ASH POND 4

SLOPE IMPROVEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SEB	CMA	MJS	MJS	XXX	XXX	XXX

URS

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD	2013	DATE 04/09/15	47	C	10W504-09	R 1

URS Corporation | 1
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

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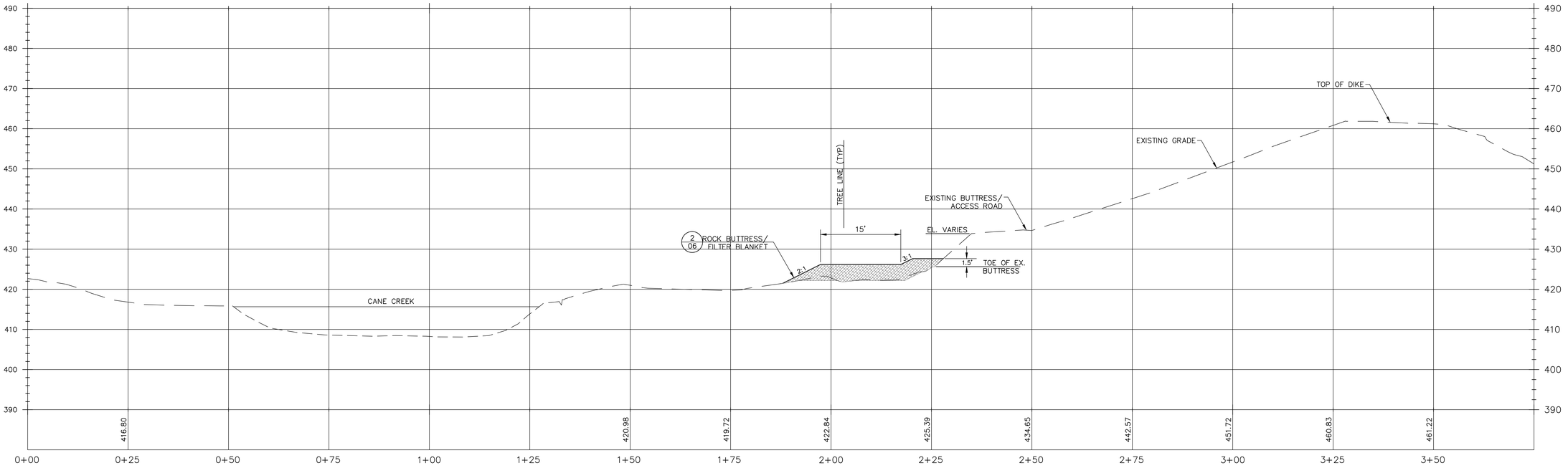
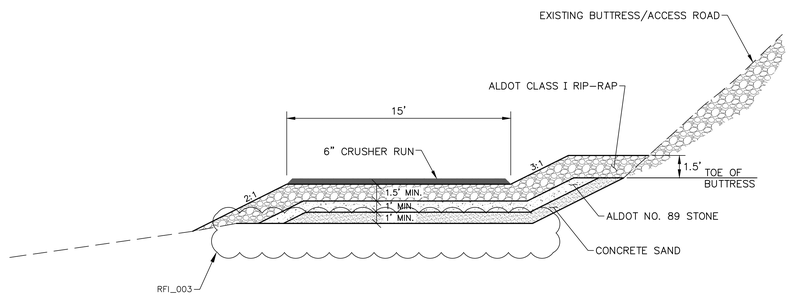


1/10 TYPICAL SLOPE IMPROVEMENT SECTION



2/10 ROCK BUTTRESS/FILTER BLANKET

NOTES:
1. BASE OF ROCK BUTTRESS/FILTER BLANKET SHALL BE IN SUITABLE SOILS AND BELOW TOPSOIL.

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION

RECORD DRAWING

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ENG.	AS CONST
R 1	04/09/15	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694	J
RECORD DRAWING										
R 0	07/09/14	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694	D
ISSUE FOR CONSTRUCTION										

DISCIPLINE INTERFACE
REV. NO. 1
REV. NO. 2
REV. NO. 3
REV. NO. 4

SCALE: 1"= 10' EXCEPT AS NOTED

TYPICAL SECTION & DETAILS

ASH POND 4

SLOPE IMPROVEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SEB	CMA	MJS	MJS	RSH	MST	JCK

URS

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD	2013	DATE 04/09/15	47	C	10W504-10	R 1

URS Corporation	1
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

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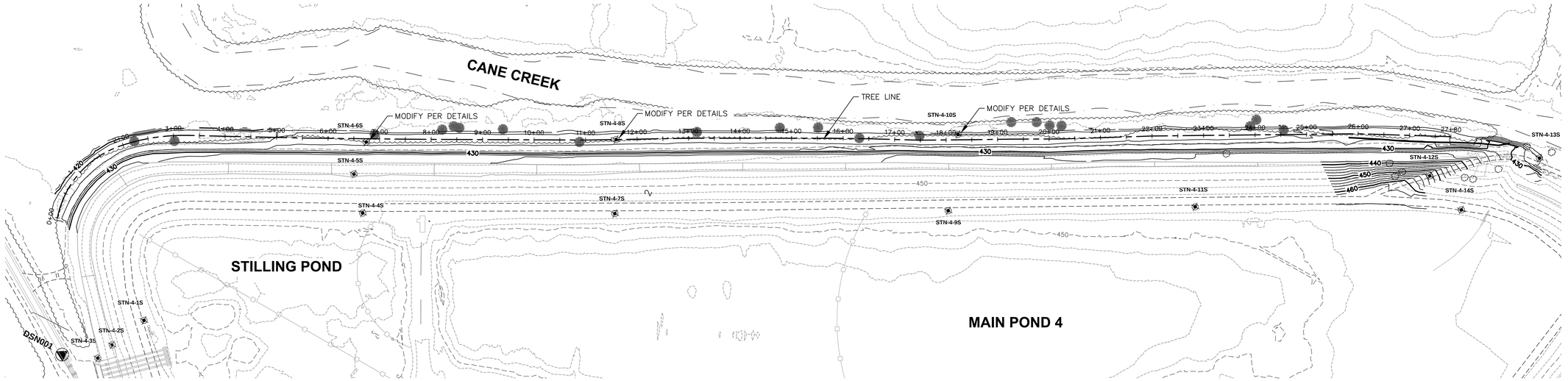
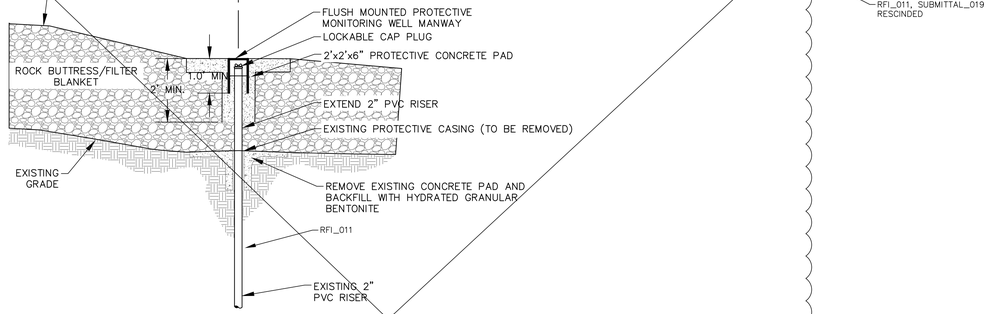


INSTRUMENTATION MODIFICATION PLAN VIEW



RFI_011, SUBMITTAL_019 RESCINDED

1 PIEZOMETER MODIFICATION DETAIL

N.T.S.

PIEZOMETER STATION MODIFICATION PROCEDURE:

1. EXISTING PAD AND PROTECTIVE CASING TO BE DEMOLISHED. DEMOLISHED CONCRETE TO BE DISPOSED OF AS DIRECTED BY THE OWNER. CARE MUST BE TAKEN TO PREVENT ANY DAMAGE TO THE INSTRUMENT, AND PIEZOMETER PIPE.
2. ANY DOWN HOLE INSTRUMENTS TO REMOVED AND STORED AS DIRECTED BY THE OWNER.
3. EXISTING PIEZOMETER TO BE RAISED TO 4" BELOW DESIGN GRADE, USING PVC COUPLER, PVC CEMENT AND PVC PIPE PRIOR TO REGRADING AND CONSTRUCTION OF THE ROCK BUTTRESS/FILTER BLANKET .
4. MATERIAL TO BE HAND PLACED AROUND EXTENDED PIEZOMETER DURING CONSTRUCTION TO PROTECT FROM DAMAGE.
5. UPON COMPLETION OF CONSTRUCTION OF ROCK BUTTRESS/FILTER BLANKET, CLEAR AN AREA FOR THE CONCRET PAD AND FLUSHMOUNT MANWAY TO BE PLACED.
6. CONSTRUCT CONCRETE PAD (QUIKRETE OR APPROVED EQUIVALENT).
7. BOLTED LOCKING, STEEL, PROTECTIVE COVER (MANWAY) SHALL BE INSTALLED OVER EACH WELL AND SHALL BE INSTALLED FLUSH WITH THE GROUND SURFACE TO PROTECT THE WELL FROM DAMAGE.

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION

RECORD DRAWING

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 1	04/09/15	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694	
RECORD DRAWING										
R 0	07/09/14	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694	
ISSUE FOR CONSTRUCTION										

SCALE: 1"= 80' EXCEPT AS NOTED

INSTRUMENTATION MODIFICATION PLAN AND DETAILS

ASH POND 4

SLOPE IMPROVEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SEB	CMA	MJS	MJS	RSH	MST	JCK

URS

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2013 | DATE 04/09/15 | 47 | C | 10W504-11 | R 1

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

URS Corporation | 1
TASK COMPLETED BY: | REV NO.

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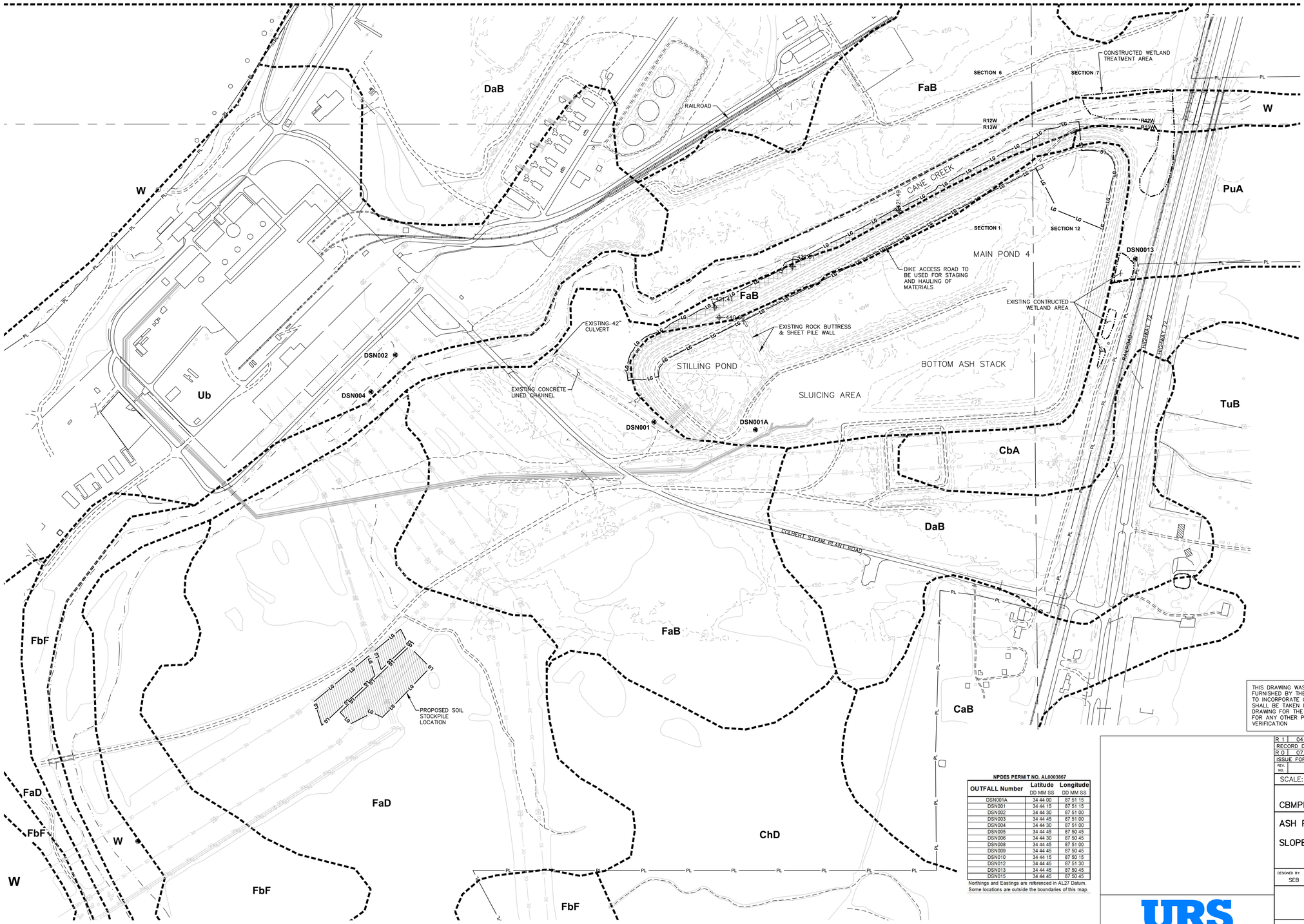

0 200 400

SCALE: 1"=200'

TENNESSEE VALLEY AUTHORITY
COLBERT STEAM PLANT
COLBERT COUNTY
MAP AREA SHOWN ON THIS DRAWING IS LOCATED WITHIN TOWNSHIP 4 SOUTH, RANGE 13 WEST, SECTIONS 1 AND 12
URS CORPORATION
DATE OF INITIAL ISSUE: 2/25/2010
REVISION DATE: 5/09/2014

LEGEND

- EXISTING VEGETATION
- EXISTING FENCE
- EXISTING WETLANDS
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING HAUL ROAD
- PL — PROPERTY LINE
- EXISTING RAILROAD
- TRANSMISSION TOWER
- SECTION LINE
- PERMITTED DISCHARGE LOCATION
- LG — LIMIT OF CONSTRUCTION AND GRADING
- PROPOSED SLOPE IMPROVEMENT AREA
- PROPOSED SOIL STOCKPILE LOCATION

NOTES

1. THIS PROJECT CONSIST OF SLOPE IMPROVEMENT ALONG THE EAST SIDE OF EXISTING ASH POND 4.
2. SITE IS IN JURISDICTIONAL FLOOD PLAIN. WORK AREAS ARE IN FLOOD ZONE A ACCORDING TO FEMA, COLBERT COUNTY PANEL, 300 OF 550. POND AREAS ARE IN FLOOD ZONE X.
3. THERE ARE NO CONTAMINATED SITES, OR CULTURAL RESOURCES WITHIN THE LIMITS OF CONSTRUCTION.
4. CONTRACTOR TO BE CAREFUL WORKING IN RIPARIAN CORRIDOR ASSOCIATED WITH CANE CREEK. CONTACT TVA BEFORE WORKING IN THESE AREAS.
5. LIMIT OF DISTURBANCE INDICATES THE MAXIMUM ALLOWABLE PERMITTED. ACTUAL LIMITS FOR CONSTRUCTION WILL BE MINIMIZED.
6. THE RECEIVING WATER FOR ALL DISTURBED AREAS IS CANE CREEK.

SOIL SYMBOLS

CaB CAPSHAW SILT LOAM, 2 TO 6 PERCENT SLOPES
CbA CHENNEBY SILT LOAM, 0 TO 2 PERCENT SLOPES, OCCASIONALLY FLOODED
ChD CHISCA LOAM, 6 TO 15 PERCENT SLOPES
DaB DECATUR SILT LOAM, 6 TO 10 PERCENT SLOPES, ERODED
FaB FULKERTON CHERTY SILT LOAM, 6 TO 15 PERCENT SLOPES
FaD FULLERTON CHERTY SILT LOAM, 6 TO 15 PERCENT SLOPES
FBF FULLERTON–BODINE COMPLEX, 15 TO 45 PERCENT SLOPES
PuA PRIUTTON AND SULLIVAN SILT LOAMS, 0 TO 2 PERCENT SLOPES, OCCASIONALLY FLOODED
TuB TUPELO–COLBERT COMPLEX, 0 TO 4 PERCENT SLOPES
Ub URBAN LAND
W WATER

NPDES PERMIT NO. AL0003867

OUTFALL Number	Latitude DD MM SS	Longitude DD MM SS
DSN001A	34 44 00	87 51 15
DSN001	34 44 15	87 51 15
DSN002	34 44 30	87 51 00
DSN003	34 44 45	87 51 00
DSN004	34 44 30	87 51 00
DSN005	34 44 45	87 50 45
DSN006	34 44 30	87 50 45
DSN008	34 44 45	87 51 00
DSN009	34 44 45	87 50 45
DSN010	34 44 15	87 50 15
DSN012	34 44 45	87 51 30
DSN013	34 44 45	87 50 45
DSN015	34 44 45	87 50 45

Northings and Eastings are referenced in AL27 Datum.
Some locations are outside the boundaries of this map.

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION

RECORD DRAWING

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ENGR	AS CONST
R 1	04/09/15	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694	
R 0	07/09/14	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694	

RECORD DRAWING
ISSUE FOR CONSTRUCTION

DISCIPLINE INTERFACE

SCALE: 1"= 200' EXCEPT AS NOTED

CBMPP– EXISTING SITE PLAN

ASH POND 4

SLOPE IMPROVEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SEB	CMA	MJS	MJS	RSH	MST	JCK

COLBERT STEAM PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD	2013	DATE 04/09/15	47	C	10W504–12	R 1

URS

URS Corporation	1
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING DO NOT ALTER MANUALLY

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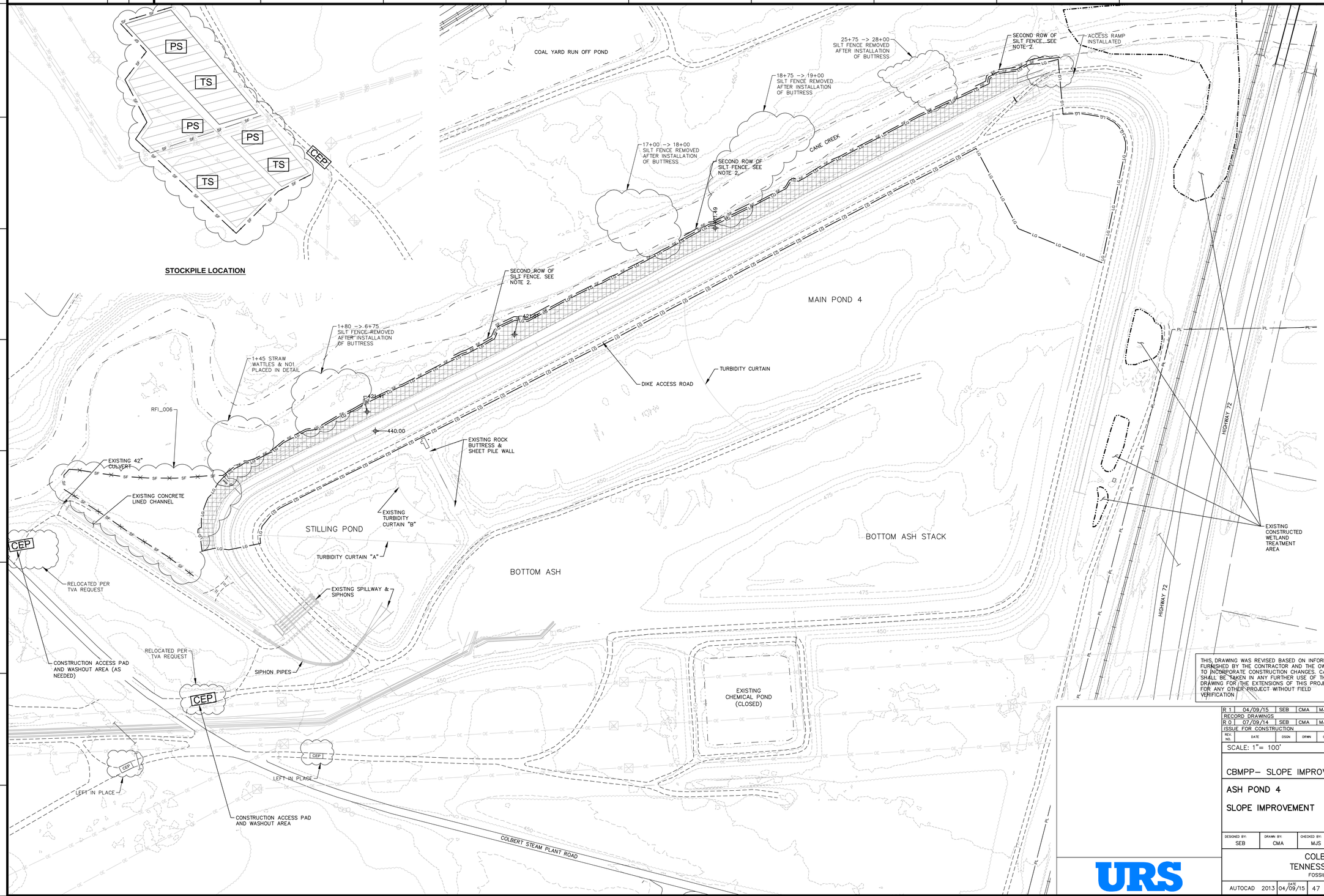

TENNESSEE VALLEY AUTHORITY
COLBERT STEAM PLANT
COLBERT COUNTY
MAP AREA SHOWN ON THIS DRAWING IS LOCATED WITHIN TOWNSHIP 4 SOUTH, RANGE 13 WEST, SECTIONS 1 AND 12
URS CORPORATION
DATE OF INITIAL ISSUE: 2/25/2010
REVISED: 5/09/2014

LEGEND

- EXISTING WETLAND
- OE — EXISTING OVERHEAD ELECTRIC LINE
- EXISTING HAUL ROAD
- EXISTING RAILROAD
- TRANSMISSION TOWER
- PERMITTED DISCHARGE LOCATION
- PL — PROPERTY LINE
- L — LIMIT OF CONSTRUCTION AND GRADING
- S — REINFORCED SILT FENCE
- S — TEMPORARY SEEDING
- CEP — CONSTRUCTION EXIT PAD
- PS — PERMANENT SEEDING
- STOCKPILE LOCATION
- SLOPE IMPROVEMENT AREA

GENERAL NOTES / CONSTRUCTION SEQUENCE

1. ALL TEMPORARY SEDIMENTATION AND EROSION CONTROL ITEMS SHALL BE INSTALLED PRIOR TO EARTHWORK.
2. IN AREAS WHERE CONSTRUCTION WILL OCCUR NEAR CANE CREEK, A SECOND ROW OF SILT FENCE, SPACED APPROXIMATELY 3' FROM THE FIRST ROW WILL BE ADDED.
3. INSTALL STABILIZED CONSTRUCTION ENTRANCE AND GRAVEL ENTRANCE TO WORK AREAS.
4. BEGIN CLEARING / GRUBBING.
5. STRIP AND STOCKPILE TOPSOIL.
6. BEGIN MINOR EXCAVATION AND GRADING ACTIVITIES.
7. PLACE ROCK BUTTRESS FILTER.
8. THE SITE SHALL BE CONSIDERED SUFFICIENTLY STABLE WHEN FINAL VEGETATION IS ESTABLISHED. THE TEMPORARY SEDIMENTATION AND EROSION CONTROL ITEMS SHALL BE REMOVED ONCE THE SITE IS STABLE.
9. AT THE COMPLETION OF WORK, THE CONTRACTOR SHALL REMOVE FROM SITE AND DISPOSE OF DEBRIS AND WASTE MATERIALS RESULTING FROM THE CONTRACTORS CONSTRUCTION ACTIVITIES.
10. FINAL ACCEPTANCE OF THE COMPLETION OF ACTIVITIES SHALL FOLLOW THE QA ENGINEER'S SITE INSPECTION.

NOTES

1. EXACT LOCATION OF EXISTING UTILITES TO BE VERIFIED BY TVA.
2. SITE IS IN THE JURISDICTIONAL FLOODPLAIN.
3. THE INFORMATION SHOWN HEREIN IS CURRENT AS OF MAY 2014. WORK IS SUBJECT TO CHANGE AND CBMPP WILL CHANGE TO REFLECT THESE CHANGES.

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION

RECORD DRAWING

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 1	04/09/15	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694	J
RECORD DRAWINGS										
R 0	07/09/14	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694	D
ISSUE FOR CONSTRUCTION										

DISCIPLINE INTERFACE: 1 CIV, 2, 3, 4

SCALE: 1"= 100' EXCEPT AS NOTED

CBMPP– SLOPE IMPROVEMENT

ASH POND 4

SLOPE IMPROVEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SEB	CMA	MJS	MJS	RSH	MST	JCK

URS

COLBERT STEAM PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2013 | DATE 04/09/15 | 47 | C | 10W504–13 | R 1

URS Corporation	1
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

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GENERAL NOTES:

1. A NOTICE OF INTENT (NOI) HAS BEEN SUBMITTED FOR THIS PROJECT.
2. ALL CONSTRUCTION ACTIVITIES MUST COMPLY WITH STATE OF ALABAMA AND COLBERT COUNTY REGULATIONS.
3. ALL EROSION AND SEDIMENT CONTROL PRACTICES MUST MEET THE STANDARDS AND SPECIFICATIONS OF THE ALABAMA HANDBOOK FOR EROSION CONTROL, SEDIMENT CONTROL, AND STORMWATER MANAGEMENT ON CONSTRUCTION SITES AND URBAN AREAS.
4. ALL STORM INLETS/CATCH BASINS THAT ARE MADE OPERATIONAL DURING CONSTRUCTION SHALL BE PROTECTED SO THAT SEDIMENT-LADEN WATER WILL NOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT.
5. PERIMETER SEDIMENT CONTROLS SHALL BE IMPLEMENTED AS THE FIRST STEP OF GRADING AND WITHIN 7 DAYS FROM THE START OF GRUBBING. THESE SHALL CONTINUE TO FUNCTION UNTIL DISTURBED AREAS ARE RE-STABILIZED.
6. MINIMIZE TRACKING OF SEDIMENTS BY VEHICLES BY UTILIZING THE CONSTRUCTION ENTRANCES AS THE ONLY ENTRANCES FOR VEHICLES. MAINTAIN THIS ENTRANCES WITH STONE AS NEEDED TO PREVENT DIRT AND MUD FROM TRACKING ONTO THE ROADWAY. REGULAR SWEEPING OF THE ROADWAY MAY BE NECESSARY TO ENSURE ROADWAY DOES NOT BUILD UP WITH SEDIMENTS.
7. OTHER EROSION AND SEDIMENT CONTROL ITEMS MAY BE NECESSARY DUE TO ENVIRONMENTAL CONDITIONS AND MAY BE REQUIRED AT THE DISCRETION OF THE COLBERT COUNTY ENGINEER'S OFFICE.
8. NO SOLID OR LIQUID WASTE SHALL BE DISCHARGED INTO STORM WATER RUNOFF. (THIS INCLUDES WASHING OUT OF CEMENT TRUCKS.) WASH PIT AREAS SHALL BE APPROVED BY OWNER, AWAY FROM AREAS OF STORM WATER RUNOFF.
9. SITE STABILIZATION EITHER PERMANENT OR TEMPORARY MUST FOLLOW THE REQUIREMENTS AS APPLICABLE ON THE CHARTS ON CBMPP PLAN SHEETS.

TIMING OF CONTROLS / MEASURES

AS INDICATED IN THE CONSTRUCTION SEQUENCE, STABILIZED CONSTRUCTION ENTRANCE AND SILT FENCE WILL BE CONSTRUCTED PRIOR TO CLEARING OR GRADING OF ANY OTHER PORTIONS OF THE SITE. AREAS WHERE CONSTRUCTION ACTIVITY TEMPORARILY CEASES FOR MORE THAN 14 DAYS WILL BE STABILIZED WITH A TEMPORARY SEED AND MULCH WITHIN 7 DAYS OF THE LAST DISTURBANCE. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN AN AREA, THAT AREA WILL BE STABILIZED WITH PERMANENT SEED AND MULCH.

PRODUCT SPECIFIC PRACTICES

THE FOLLOWING PRODUCT SPECIFIC PRACTICES SHALL BE FOLLOWED WHILE ONSITE:

PETROLEUM PRODUCTS – ALL ONSITE VEHICLES WILL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE THE CHANCE OF LEAKAGE. PETROLEUM PRODUCTS MUST BE STORED IN APPROVED SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT SUBSTANCES USED ONSITE ARE TO BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.

FERTILIZERS – FERTILIZERS USED SHALL BE APPLIED IN THE MINIMUM AMOUNTS RECOMMENDED BY THE MANUFACTURER. ONCE APPLIED, FERTILIZER WILL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORM WATER. STORAGE OF ALL MATERIAL SHALL BE IN A COVERED SHED. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER MUST BE TRANSFERRED TO A SEALABLE CONTAINER, MADE OF A SUITABLE MATERIAL TO PREVENT SPILLS.

PAINTS – ALL CONTAINERS SHALL BE TIGHTLY SEALED AND PROPERLY STORED WHEN NOT IN USE. EXCESS PAINT IS NOT BE DISCHARGED TO THE STORM SEWER SYSTEM, BUT PROPERLY DISPOSED OF ACCORDING TO MANUFACTURERS' INSTRUCTIONS OR STATE, LOCAL, OR FEDERAL REGULATIONS.

FINAL STABILIZATION

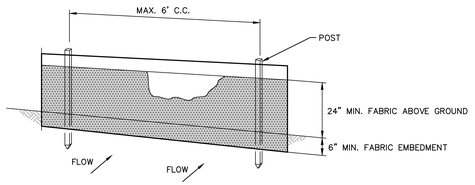
A SITE IS CONSIDERED STABILIZED WHEN ALL OF THE FOLLOWING CRITERIA ARE MET:

- A PERENNIAL, VEGETATED COVER (OR OTHER PERMANENT STABILIZATION PRACTICE) HAS GROWN TO A 70% DENSITY THROUGHOUT THE ENTIRE DISTURBED AREA.
- ALL TEMPORARY EROSION AND SEDIMENT CONTROLS HAVE BEEN REMOVED AND DISPOSED OF PROPERLY.
- ALL TRAPPED SEDIMENT HAS BEEN PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION OR RE-SUSPENSION.
- ALL CONSTRUCTION ACTIVITIES HAVE CEASED.

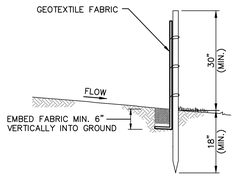
SEDIMENT BARRIER

DESCRIPTION

A SEDIMENT BARRIER IS A SEDIMENT-TRAPPING PRACTICE UTILIZING A GEOTEXTILE FABRIC WHICH IS TRENCHED INTO THE GROUND AND ATTACHED TO SUPPORTING POST TO CAUSE SEDIMENT DEPOSITION. SEDIMENT BARRIER REDUCES RUNOFF'S ABILITY TO TRANSPORT SEDIMENT BY PONDING RUNOFF AND DISSIPATING SMALL RILLS OF CONCENTRATED FLOW INTO UNIFORM SHEET FLOW.



PERSPECTIVE



SIDE

SPECIFICATIONS FOR SILT FENCE (SEDIMENT BARRIER)

1. SILT FENCE SHALL BE CONSTRUCTED BEFORE UPSLOPE LAND DISTURBANCE BEGINS.
2. ALL SILT FENCE SHALL BE PLACED AS CLOSE TO THE CONTOUR AS POSSIBLE SO THAT WATER WILL NOT CONCENTRATE AT LOW POINTS IN THE FENCE AND SO THAT SMALL SWALES OR DEPRESSIONS WHICH MAY CARRY SMALL CONCENTRATED FLOWS TO THE SILT FENCE ARE DISSIPATED ALONG ITS LENGTH.
3. TO PREVENT WATER PONDED BY THE SILT FENCE FROM FLOWING AROUND THE ENDS, EACH END SHALL BE CONSTRUCTED UPSLOPE SO THAT THE ENDS ARE AT A HIGHER ELEVATION.
4. WHERE POSSIBLE, SILT FENCE SHALL BE PLACED ON THE FLATTEST AREA AVAILABLE.
5. WHERE POSSIBLE, VEGETATION SHALL BE PRESERVED FOR 5 FEET (OR AS MUCH AS POSSIBLE) UPSLOPE FROM THE SILT FENCE. IF VEGETATION IS REMOVED, IT SHALL BE REESTABLISHED WITHIN 7 DAYS FROM THE INSTALLATION OF THE SILT FENCE.
6. FENCE POSTS SHALL BE DRIVEN A MINIMUM OF 18 INCHES BELOW GROUND.
7. THE HEIGHT OF THE SILT FENCE SHALL BE A MINIMUM OF 24 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
8. THE SILT FENCE SHALL BE PLACED IN A TRENCH CUT A MINIMUM OF 6 INCHES DEEP. THE TRENCH SHALL BE CUT WITH A TRENCHER, CABLE LAYING MACHINE, OR OTHER SUITABLE DEVICE WHICH WILL ENSURE AN ADEQUATELY UNIFORM TRENCH DEPTH.
9. THE SILT FENCE SHALL BE PLACED WITH THE STAKES ON THE DOWNSLOPE SIDE OF THE GEOTEXTILE AND SO THAT 6 INCHES OF CLOTH ARE BELOW THE GROUND SURFACE. EXCESS MATERIAL SHALL LAY ON THE BOTTOM OF THE 6 INCH DEEP TRENCH. THE TRENCH SHALL BE BACKFILLED AND COMPACTED.
10. SEAMS BETWEEN SECTION OF SILT FENCE SHALL BE OVERLAPPED WITH THE END STAKES OF EACH SECTION WRAPPED TOGETHER BEFORE DRIVING INTO THE GROUND.
11. MAINTENANCE SHALL BE PERFORMED AS NEEDED--SILT FENCE SHALL ALLOW RUNOFF TO PASS ONLY AS DIFFUSE FLOW THROUGH THE GEOTEXTILE. IF RUNOFF OVERTOPS THE SILT FENCE, FLOWS UNDER OR AROUND THE ENDS, OR IN ANY OTHER WAY BECOMES A CONCENTRATED FLOW, ONE OF THE FOLLOWING SHALL BE PERFORMED, AS APPROPRIATE:
    - THE LAYOUT OF THE SILT FENCE SHALL BE CHANGED,
    - ACCUMULATED SEDIMENT SHALL BE REMOVED, OR
    - OTHER PRACTICES SHALL BE INSTALLED.

CRITERIA FOR SILT FENCE MATERIALS:

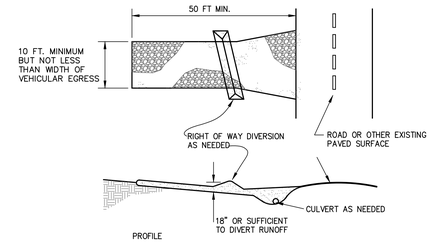
1. FENCE POSTS--THE LENGTH SHALL BE A MINIMUM OF 48 INCHES LONG. WOOD POSTS WILL BE 2-BY-2 INCH HARDWOOD OF SOUND QUALITY. THE MAXIMUM SPACING BETWEEN POSTS SHALL BE 6 FEET.
2. SILT FENCE FABRIC (SEE CHART BELOW):

Fabric Properties	Values	Test Method
Tensile Strength	Warp-120 Fill-100	ASTM D-4632
Elongation (% Max.)	40	ASTM D-4632
AOS (Apparent Opening Size)	No.30	ASTM D-4751
Flow Rate (Gal/Min/Sq. ft.)	25	
Ultraviolet Stability[2]	80	ASTM D-4632
Bursting Strength (PSI Min.)	175	ASTM D-3786
Minimum Fabric Width (Inches)	36	

CONSTRUCTION EXIT PAD

DESCRIPTION

A CONSTRUCTION EXIT IS A STABILIZED PAD OF AGGREGATE OVER A GEOTEXTILE BASE AND IS USED TO REDUCE THE AMOUNT OF MUD TRACKED OFF-SITE WITH CONSTRUCTION TRAFFIC. THIS PRACTICE APPLIES ANYWHERE TRAFFIC WILL BE LEAVING THE CONSTRUCTION SITE AND MOVING DIRECTLY ONTO A PUBLIC ROAD OR STREET.



SPECIFICATIONS FOR CONSTRUCTION ENTRANCE

1. STONE SIZE--ALDOT NO.1 AGGREGATE
2. LENGTH--THE CONSTRUCTION ENTRANCE SHALL BE AS LONG AS REQUIRED TO STABILIZE HIGH TRAFFIC AREAS BUT NOT LESS THAN 50 FEET.
3. THICKNESS--THE STONE LAYER SHALL BE AT LEAST 6 INCHES THICK.
4. BEDDING--A NON-WOVEN 10 OZ. GEOTEXTILE SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING STONE. IT SHALL HAVE A GRAB TENSILE STRENGTH OF AT LEAST 200 LB. AND A MULLEN BURST STRENGTH OF AT LEAST 190 LB.
5. A WASHING FACILITY SHALL BE PROVIDED IF NECESSARY TO PREVENT MUD AND CAKED SOIL FROM BEING TRANSPORTED TO PUBLIC STREETS AND HIGHWAYS. IT SHALL BE CONSTRUCTED OF CONCRETE, STONE, AND/OR OTHER DURABLE MATERIALS. PROVISIONS SHALL BE PROVIDED FOR THE MUD AND OTHER MATERIAL TO BE CARRIED AWAY FROM THE WASHING FACILITY TO A SEDIMENT TRAP OR BASIN TO ALLOW FOR SETTLEMENT OF THE SEDIMENT FROM RUNOFF BEFORE IT IS RELEASE FROM THE SITE.
6. CULVERT--A PIPE OR CULVERT SHALL BE CONSTRUCTED UNDER THE ENTRANCE IF NEEDED TO PREVENT SURFACE WATER FLOWING ACROSS THE ENTRANCE FROM BEING DIRECTED OUT ONTO PAVED SURFACES.
7. WATER BAR--A WATER BAR SHALL BE CONSTRUCTED AS PART OF THE CONSTRUCTION ENTRANCE IF NEEDED TO PREVENT SURFACE RUNOFF FROM FLOWING THE LENGTH OF THE CONSTRUCTION ENTRANCE AND OUT ONTO PAVED SURFACES.
8. MAINTENANCE--TOP DRESSING OF ADDITIONAL STONE SHALL BE APPLIED AS CONDITIONS DEMAND. MUD SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADS, OR ANY SURFACE WHERE RUNOFF IS NOT CHECKED BY SEDIMENT CONTROLS, SHALL BE REMOVED IMMEDIATELY. REMOVAL SHALL BE ACCOMPLISHED BY SCRAPING OR SWEEPING.
9. CONSTRUCTION ENTRANCES SHALL NOT BE RELIED UPON TO REMOVE MUD FROM VEHICLES AND PREVENT OFF-SITE TRACKING. VEHICLES THAT ENTER AND LEAVE THE CONSTRUCTION SITE SHALL BE RESTRICTED FROM MUDDY AREAS.

GENERAL NOTE:

1. TEMPORARY CONSTRUCTION ENTRANCES MUST BE INSTALLED AT EACH CONSTRUCTION TRAFFIC ENTRANCE / EXIT. THESE LOCATIONS WILL BE COORDINATED BY THE CONSTRUCTION MANAGER.
2. CONTRACTOR TO WASH OFF WHEELS IN GRAVEL CONSTRUCTION ENTRANCE PRIOR TO ENTERING CITY STREETS. IF MUD ACCUMULATES IN STREETS, THEN THE CONTRACTOR SHALL BE RESPONSIBLE TO CLEAN STREETS AS REQUESTED BY THE CITY OR CONSTRUCTION MANAGER.

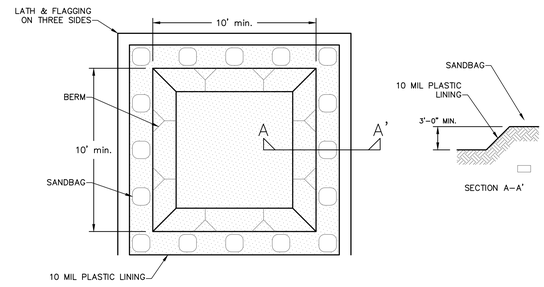
CONCRETE WASHOUT AREA (AS NEEDED)

DESCRIPTION

A CONCRETE WASH OUT AREA IS A STABILIZED LINED COLLECTION AREA WHERE TRUCKS, PANS AND TOOLS CAN BE WASHED OFF AFTER WORKING WITH CONCRETE.

SPECIFICATIONS FOR CONCRETE WASHOUT AREA

1. FINAL LOCATION AND SIZE TO BE DETERMINED IN THE FIELD.
2. A CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30 FEET OF THE TEMPORARY CONCRETE WASHOUT FACILITY. THE SIGN SHALL BE A MIN. OF 24"X24" WITH 4" MIN. LETTER HEIGHT MOUNTED 72" MIN. ABOVE GRADE.



PLAN

THIS DRAWING WAS REVISED BASED ON INFORMATION FURNISHED BY THE CONTRACTOR AND THE OWNER TO INCORPORATE CONSTRUCTION CHANGES. CARE SHALL BE TAKEN IN ANY FURTHER USE OF THIS DRAWING FOR THE EXTENSIONS OF THIS PROJECT OR FOR ANY OTHER PROJECT WITHOUT FIELD VERIFICATION

RECORD DRAWING

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. ID
R 1	04/09/15	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694		J
RECORD DRAWING											
R 0	07/09/14	SEB	CMA	MJS	MJS	RSH	MST	JCK	606694		D
ISSUE FOR CONSTRUCTION											

DISCIPLINE INTERFACE

SCALE: AS SHOWN EXCEPT AS NOTED

CBMPP-NOTES AND DETAILS

ASH POND 4

SLOPE IMPROVEMENT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
SEB	CMA	MJS	MJS	RSH	MST	JCK

URS

COLBERT STEAM PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD 2013	DATE 04/09/15	47	C	10W504-14	R 1

URS Corporation	1
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

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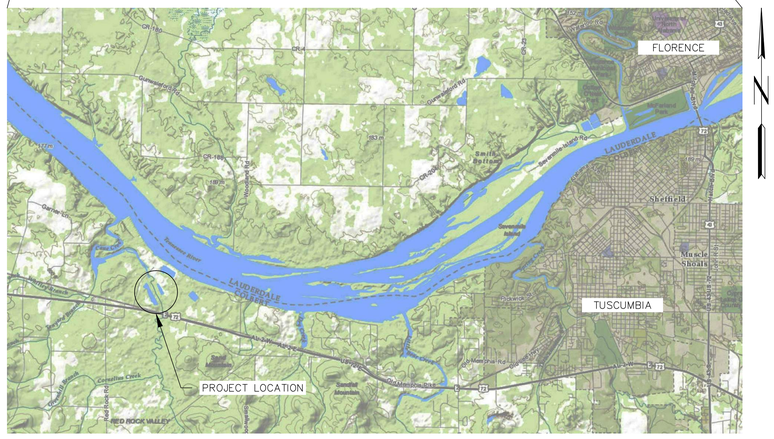
TENNESSEE VALLEY AUTHORITY
COLBERT FOSSIL PLANT – ASH POND 4
EAST DIKE SEISMIC IMPROVEMENT PROJECT

TUSCUMBIA, COLBERT COUNTY, ALABAMA
ISSUED FOR CONSTRUCTION
JULY 31, 2015



VICINITY MAP

SOURCE: ESRI WORLD TOPOGRAPHIC MAP, ACCESSED VIA ARCGIS ONLINE SERVICES

SOURCE: AERIAL IMAGE PROVIDED COURTESY OF TVA

APPROXIMATE PROJECT LIMITS

DRAWING INDEX	
DWG. NO.	DRAWING TITLE
10W395–1	COVER SHEET
10W395–2	GENERAL NOTES AND LEGEND
10W395–3	EXISTING SITE PLAN
10W395–4	OVERALL SITE PREPARATION AND SOIL EROSION CONTROL PLAN
10W395–5	PROJECT CONTROL AND BASELINE ALIGNMENT LAYOUT
10W395–6	SUBSURFACE EXPLORATION LOCATION PLAN
10W395–7 – 10W395–9	GEOLOGIC PROFILE
10W395–10	NORTH ACCESS ROAD PLAN AND PROFILE
10W395–11	SOUTH ACCESS ROAD PLAN AND PROFILE
10W395–12	SCHEMATIC CONSTRUCTION SEQUENCE
10W395–13	PAYLINE AND QUANTITY INFORMATION
10W395–14	INSTRUMENTATION INSTALLATION AND MODIFICATION PLAN
10W395–15	INSTRUMENTATION DETAILS
10W395–16	CANE CREEK BANK RESTORATION PLAN
10W395–17 – 10W395–18	WORKING PLATFORM GRADING PLAN
10W395–19 – 10W395–22	WORKING PLATFORM CROSS SECTIONS
10W395–23	TEMPORARY SLOPE STABILZATION DETAILS
10W395–24	DMM WALL LAYOUT PLAN
10W395–25	DMM WALL TYPICAL SECTION AND DETAILS
10W395–26 – 10W395–29	DMM WALL PLAN AND PROFILE
10W395–30	DMM WALL TEST SECTION LAYOUT AND DETAILS
10W395–31	SEEPAGE COLLECTION SYSTEM TYPICAL SECTION AND DETAILS
10W395–32 – 10W395–33	FINAL GRADING PLAN
10W395–34 – 10W395–37	FINAL GRADING CROSS SECTIONS
*10W395–38	PROPOSED FINAL GRADING FOR BASIS OF DMM WALL DESIGN

NOTE:

*FUTURE CONCEPTUAL CLOSURE GRADING PLAN PROVIDED FOR INFORMATIONAL PURPOSES ONLY. FUTURE WORK TO BE PERFORMED BY OTHERS.

PREPARED FOR: TVA

PREPARED BY: GEI Consultants

PROJECT OWNER:
TENNESSEE VALLEY AUTHORITY
1101 MARKET STREET
CHATTANOOGA, TN 37402

ENGINEER OF RECORD:
GEI CONSULTANTS, INC.
400 N. LAKEVIEW PARKWAY, SUITE 140
VERNON HILLS, IL 60061

GEI Consultants
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Wo□ur□□MA □1□□1
7□1-7□1-4□□□

ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM HERBERT WALTON

R	–	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–	–
ISSUED FOR CONSTRUCTION											

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT QA	AS CONST	REV. NO.

DISCIPLINE INTERFACE

SCALE: NONE EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT
COVER SHEET

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395–1	R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

GENERAL NOTES:

1. DESCRIPTION OF WORK: WORK CONSISTS OF CONSTRUCTING TEMPORARY WORKING PLATFORM AND PERMANENT SOIL-CEMENT DMM WALLS, MODIFYING A SEEPAGE COLLECTION SYSTEM, RE-CONSTRUCTING THE DOWNSTREAM DIKE SLOPE, CONSTRUCTING A MID-SLOPE ACCESS ROAD, AND ASSOCIATED APPURTENANCES AS SHOWN IN THIS DRAWING SET.

2. DEFINITIONS: WHENEVER THE FOLLOWING TERMS ARE USED IN THESE PLANS FOR CONSTRUCTION, IT IS UNDERSTOOD THAT THEY REPRESENT THE FOLLOWING:

   - CONTRACTOR: ENTITY RESPONSIBLE FOR CONSTRUCTION.
   - ENGINEER / ENGINEER OF RECORD: GEI CONSULTANTS, INC. (GEI).
   - OWNER: TENNESSEE VALLEY AUTHORITY (TVA)
   - CONSTRUCTION MANAGER: REFERS TO AN INDIVIDUAL EMPLOYED BY TVA FOR COORDINATION OF CONSTRUCTION ACTIVITIES AT COLBERT FOSSIL PLANT (COF).
   - ALDOT: ALABAMA DEPARTMENT OF TRANSPORTATION AND SPECIFICALLY REFERENCES TO THE "STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION," CURRENT EDITION. ANY MATERIAL DESIGNATED AS ALDOT· IS TO CONFORM TO THE MATERIAL STANDARDS NOTED AND PLACEMENT/INSTALLATION METHODOLOGY SPECIFIED IN THE CURRENT EDITION OF THE "STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION" UNLESS NOTED OTHERWISE IN THE CONTRACT DOCUMENTS.
   - CONSTRUCTION QUALITY CONTROL (CQC) PLAN: REFERS TO A DOCUMENT THAT ESTABLISHES MINIMUM QUALITY CONTROL REQUIREMENTS, TESTING FREQUENCY AND QUALITY OVERSIGHT RESPONSIBILITY.
   - QUALITY CONTROL (QC) MANAGER: A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF ALABAMA THAT IS RESPONSIBLE FOR THE QUALITY OF THE CONSTRUCTED PROJECT AS DEFINED IN THE CQC PLAN. THE QC TEAM CONSISTS OF QUALIFIED PERSONNEL THAT WORK UNDER THE DIRECT SUPERVISION OF THE QC MANAGER. QC TEAM PERSONNEL ARE INDIVIDUALS THAT ARE FAMILIAR WITH THE MATERIALS UTILIZED AND THE PROPOSED CONSTRUCTION COMPONENTS.

3. WHENEVER REFERENCE IS MADE TO THE ALABAMA DEPARTMENT OF TRANSPORTATION (ALDOT STANDARD SPECIFICATIONS), AMERICAN CONCRETE INSTITUTE (ACI), AMERICAN SOCIETY OF TESTING AND MATERIALS (ASTM) AND OTHER PUBLISHED STANDARDS OR SPECIFICATIONS, IT SHALL MEAN THE LATEST VERSION IN ITS ENTIRETY.

4. HORIZONTAL AND VERTICAL SURVEY CONTROL EXISTS AT THE SITE. TVA WILL PROVIDE CONTROL POINT INFORMATION TO THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR ALL SURVEYING AND STAKING NECESSARY FOR LAYOUT AND CONSTRUCTION OF THE PROJECT.

5. PLAN DIMENSIONS ARE MEASURED IN TRUE HORIZONTAL PLANE, UNLESS OTHERWISE NOTED. VERTICAL DIMENSIONS ARE MEASURED IN TRUE VERTICAL PLANE, UNLESS OTHERWISE NOTED.

6. ACCEPTABLE CONSTRUCTION TOLERANCES FROM PLAN DIMENSIONS, ELEVATIONS, AND GRADES ARE:
   a. EXCAVATIONS AND FINAL GRADES FOR EARTH SURFACES AND SLOPES: ±0.25 FT
   b. DMM WALLS VERTICALLY: ±0.5% OF DEPTH
   c. DMM WALLS: ±3-INCH IN PLAN
   d. PIPES AND APPURTENANCES: ± 1-INCH OF PLAN ELEVATION

7. OBTAIN THE LATEST EDITION OF ALABAMA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS WHEN PERFORMING WORK WHICH IS PRESCRIBED HEREIN. COPIES MAY BE OBTAINED FROM:

   PROPOSALS ENGINEER
   ALABAMA DEPARTMENT OF TRANSPORTATION
   1409 COLISEUM BOULEVARD
   MONTGOMERY, ALABAMA 36130-3050
   HTTP: //WWW.DOT.STATE.AL.US/CONWEB/SPECIFICATIONS.HTM

8. DO NOT DEVIATE FROM THE PLANS OR APPROVED SHOP DRAWINGS WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE CONTRACTOR WILL BE RESPONSIBLE FOR KEEPING A RECORD OF ALL DEVIATIONS OF ANY INSTALLATION FROM THAT SHOWN ON THE PLANS, AND ANY DEVIATIONS IN INSTALLATIONS FROM APPROVED SHOP DRAWINGS AND PROVIDE COPIES OF THESE RECORDS TO ENGINEER. AT COMPLETION OF THE PROJECT, A SET OF FINAL RECORD DRAWINGS WILL BE PREPARED BY THE ENGINEER TO PROVIDE THE OWNER WITH A PERMANENT RECORD OF THE PROJECT AS IT WAS CONSTRUCTED. THE CONTRACTOR WILL BE REQUIRED TO ASSIST THE ENGINEER WITH ANY MEASUREMENTS OR INTERPRETATIONS NECESSARY FOR PREPARATION OF THE FINAL RECORD DRAWINGS.

9. CONSTRUCT THE WORK IN ACCORDANCE WITH THE INFORMATION PROVIDED IN THE CONTRACT DOCUMENTS.

10. USE OF THE DESIGN AS PRESENTED IN THESE PLANS DOES NOT RELIEVE THE CONTRACTOR FROM ITS RESPONSIBILITY TO VERIFY THE CONSTRUCTABILITY OF THE DESIGN.

11. THESE DOCUMENTS REPRESENT THE FINAL DESIGN INTENT, BASED ON AVAILABLE CURRENT DATA. IF ADDITIONAL INFORMATION IS OBTAINED OR ENCOUNTERED PRIOR TO OR DURING CONSTRUCTION, NOTIFY TVA AND GEI CONSULTANTS, INC. IMMEDIATELY.

12. VERIFY ALL DIMENSIONS AND CONDITIONS NOTED ON THE DRAWINGS AND INFORM TVA AND GEI OF ANY DISCREPANCIES BETWEEN THE DRAWINGS AND THE FIELD CONDITIONS PRIOR TO THE START OF CONSTRUCTION.

13. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING INSTRUMENTATION AND MONITORING EQUIPMENT ADJACENT TO THE PROPOSED DMM WALL ALIGNMENT.

14. DO NOT VARY THE DIMENSIONS OR SPACING OF THE DMM WALLS WITHOUT WRITTEN APPROVAL FROM TVA AND GEI.

15. WHERE MODIFICATION TO DMM WALL GEOMETRY IS NECESSARY, SUBMIT PROPOSED CHANGES TO TVA AND GEI A MINIMUM OF THREE (3) WEEKS PRIOR TO STARTING WORK.

16. THE USER OF THESE DRAWINGS ACKNOWLEDGES AND AGREES THAT THE ORIGINAL STAMPED RECORD SET OF CONSTRUCTION DOCUMENTS, AND NOT ANY ELECTRONIC VERSION THEREOF, IS THE CONTROLLING DESIGN DOCUMENT.

17. DO NOT USE ELECTRONIC VERSIONS OF THESE DRAWINGS TO SCALE OR LOCATE INDIVIDUAL DMM WALLS OR TO LAYOUT DMM WALLS OR OTHER ELEMENTS OF THE DESIGN.

18. THESE DRAWINGS ARE PROVIDED EXCLUSIVELY FOR USE ON THE PROJECT INDICATED IN THE TITLE BLOCK. ANY OTHER USE, REPRODUCTION, OR REDISTRIBUTION OF THESE DRAWINGS WITHOUT THE WRITTEN CONSENT OF TVA IS PROHIBITED.

19. ADHERE TO THIS DRAWING PACKAGE FOR CONSTRUCTION, ALONG WITH THE TECHNICAL SPECIFICATIONS, CQC PLAN, OTHER REFERENCED SPECIFICATIONS OR STANDARDS, INCLUDING ALDOT STANDARDS, AND APPLICABLE ENVIRONMENTAL AND SAFETY REGULATIONS DURING THE CONSTRUCTION OF THIS PROJECT.

GENERAL NOTES CONTINUED:

20. THE CONTRACTOR IS RESPONSIBLE FOR HEALTH AND SAFETY OF ITS PERSONNEL AND FOR MEETING INDUSTRY STANDARD REQUIREMENTS. ADHERE TO THE OWNER'S REQUIREMENTS FOR SAFETY DURING CONSTRUCTION, UNLESS SUCH STANDARDS ARE SUPERSEDED BY REGULATORY REQUIREMENTS. PERFORM WORK IN ACCORDANCE WITH OSHA SAFETY STANDARDS AND IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL LAWS AND TVA REQUIREMENTS.

21. COMMUNICATE CONSTRUCTABILITY ISSUES OR DISCREPANCIES IN THE CONSTRUCTION DOCUMENTS TO THE QC MANAGER AND CONSTRUCTION MANAGER IMMEDIATELY UPON BECOMING AWARE. USE THE OWNER'S REQUEST FOR INFORMATION (RFI) FORM THAT IS CONTAINED IN THE CQC PLAN TO COMMUNICATE AND ESTABLISH WRITTEN DOCUMENTATION OF THE ISSUE AND ITS RESOLUTION.

22. THE CONTRACTOR SHALL COORDINATE WITH THE CONSTRUCTION MANAGER AND ALABAMA 811 TO LOCATE AND VERIFY ALL UTILITIES, INSTRUMENTATION AND UNDER GROUND FACILITIES PRIOR TO CONSTRUCTION TO ENSURE THERE IS NO CONFLICT WITH THE IMPROVEMENTS PRESENTED HEREIN.

23. VERIFY ONSITE UTILITIES AND UNDERGROUND FACILITIES, (WHETHER SHOWN ON THE PLANS OR NOT) AND PROTECT THEM FROM DAMAGE BY THE CONTRACTOR'S OPERATIONS. IF DAMAGE OCCURS. COORDINATE THE NECESSARY REPAIRS WITH THE CONSTRUCTION MANAGER, AND THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGE THAT IS ATTRIBUTED TO THE CONTRACTOR'S OPERATIONS.

24. LOCATE ALL INSTRUMENTATION PRIOR TO CONSTRUCTION. PRESERVE AND PROTECT ALL EXISTING INSTRUMENTATION.

25. THE CONTRACTOR IS RESPONSIBLE FOR THE IMMEDIATE REPLACEMENT OF ANY INSTRUMENTATION DAMAGED DURING CONSTRUCTION. ABANDON INSTRUMENTATION THAT CANNOT BE PROTECTED USING TVA DOCUMENT TVA-KIF-SOP-46, GROUNDWATER MONITORING WELL ABANDONMENT. SUCH INSTRUMENTATION SHALL BE REPLACED ACCORDING TO TVA-KIF-SOP-39.

26. THE CONTRACTOR IS RESPONSIBLE FOR SITE SECURITY AND PROTECTION OF THE WORK AREA.

27. ANY PROPOSED MODIFICATIONS TO DESIGN FEATURES AS SHOWN (OR DESCRIBED) IN THE APPROVED ISSUED FOR CONSTRUCTION DESIGN DOCUMENTS MUST BE APPROVED BY THE ENGINEER OF RECORD PRIOR TO INSTALLATION.

28. DESCRIBE MEANS AND METHODS FOR TEMPORARY FEATURES IMPLEMENTED TO FACILITATE THE CONSTRUCTION OF THE APPROVED DESIGN FEATURES IN THE APPLICABLE MEANS AND METHODS SUBMITTAL OR PROJECT MANAGEMENT DOCUMENTS.

29. VEHICULAR ACCESS TO THE SITE TO BE DETERMINED BY TVA.

30. PROVIDE APPROVED SIGNAGE BARRIERS AND TRAFFIC SAFETY PERSONNEL RESPONSIBLE FOR DIRECTING CONSTRUCTION AND PLANT TRAFFIC AT ALL POINTS OF INGRESS AND EGRESS. SUBMIT A MAINTENANCE OF TRAFFIC PLAN PRIOR TO BEGINNING CONSTRUCTION.

31. TVA WILL MAINTAIN THE PONDS AT ELEVATION 452 FT DURING CONSTRUCTION.

EARTHWORK NOTES:

1. CLEAR AREAS SCHEDULED FOR EXCAVATION OF TREES, STUMPS, BRUSH, PROJECTING ROOTS, WEEDS, LOGS AND OTHER PROTRUDING OBSTRUCTIONS. ALL TREES, STUMPS, BRUSH, PROJECTING ROOTS, WEEDS, AND PROTRUDING OBSTRUCTIONS SHALL BE CUT TO WITHIN 3 INCHES OF EXISTING GROUND. GRUBBED THE AREA TO A DEPTH OF 6 INCHES TO REMOVE GRASS, ROOTS AND OTHER ORGANIC MATERIAL. REMOVE MATERIAL FROM THE CLEARING AND GRUBBING OPERATION FROM THE SITE AND DISPOSE IT AT AN APPROVED DISPOSAL SITE AND IN ACCORDANCE WITH APPLICABLE LAWS. IF ENCOUNTERED, TOPSOIL SHALL BE STRIPPED TO A DEPTH OF 4 INCHES, AND STORED AT THE DESIGNATED STOCKPILE AREA AS NOTED IN THE CONSTRUCTION BEST MANAGEMENT PRACTICES PLAN (CBMPP) AND AS ALLOWED BY THE OWNER.

2. SLOPE, BENCH, OR SHORE EXCAVATIONS TO PROVIDE SAFE WORKING CONDITIONS PER OSHA REQUIREMENTS.

3. SLOPE EXCAVATIONS ALONG THE SLOPES OF THE EXISTING DIKE AND ANY MISCELLANEOUS EXCAVATIONS GREATER THAN 4 FT IN DEPTH THAT WILL REMAIN OPEN FOR A PERIOD OF GREATER THAN 1 WEEK NO STEEPER THAN 2H:1V, UNLESS OTHERWISE ALLOWED BY THE OWNER OR THE ENGINEER.

4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING DRAINAGE WAYS, SUMP PITS AND PUMPS, OR OTHER METHODS ANO PRACTICES TO KEEP EXCAVATIONS IN A DE-WATERED CONDITION. GRADE SURFACES ABOVE EXCAVATIONS OR PROVIDE OTHER MEANS OF PROTECTION SO THAT SURFACE RUNOFF IS DIRECTED AWAY FROM OPEN EXCAVATIONS.

5. PRIOR TO PLACING FILLS AGAINST THE OUTER SLOPE OF THE DIKE, INSTALL A LEVEL BENCH AT THE BOTTOM OF THE SLOPE TO PROVIDE A LEVEL SURFACE TO BEGIN THE FILLING ACTIVITIES. TO IMPROVE THE BONDING OF THE FILL TO THE EXCAVATION FACE, DISC, BENCH OR SCARIFY SLOPING SURFACES PRIOR TO PLACING FILL MATERIAL.

6. PRIOR TO PLACING FILL MATERIAL, THE SUBGRADE SURFACE SHOULD BE PROOF-ROLLED. PUMPING OR RUTTING EVIDENCE SHALL RESULT IN REMOVAL AND REPLACEMENT OF UNSUITABLE MATERIAL WITH GRANULAR COMPACTED STRUCTURAL BACKFILL.

7. PLACE FILL MATERIALS IN 12-INCH MAXIMUM LOOSE LIFTS AND COMPACT IT TO A MINIMUM OF 95% OF THE MAXIMUM DRY DENSITY PER ASTM D-698 (STANDARD PROCTOR COMPACTION). THE MOISTURE CONTENT DURING COMPACTION SHALL BE WITHIN A RANGE OF +2 TO -2 PERCENT OF THE OPTIMUM MOISTURE CONTENT. COMPACTION TESTING TO CONFIRM COMPLIANCE SHALL BE AT A FREQUENCY OF ONE (1) TEST PER 2,000 SQUARE FEET PER LIFT MINIMUM OR PER THE SPECIFICATIONS, WHATEVER COMES FIRST.

PERMITTING AND ENVIRONMENTAL NOTES:

1. COMPLY WITH ALL REQUIREMENTS OF PERMITS OBTAINED BY TVA. CONTRACTOR IS RESPONSIBLE TO OBTAIN OTHER PERMITS NECESSARY FOR CONSTRUCTION OF THE WORK OR FOR PROVIDING INFORMATION REQUIRED TO REVISE PERMITS OBTAINED BY TVA.

2. MAINTAIN ACCESS ROADS FREE OF DEBRIS AND PASSABLE BY PASSENGER VEHICLES. COORDINATE WITH TVA PLANT PERSONNEL.

3. TVA WILL COORDINATE WITH CONTRACTOR TO IDENTIFY AND APPROVE AREA(S) FOR GROUT PLANT, WORK STAGING, AND STOCKPILING OF EXCAVATED SOILS AND WASTE MATERIALS.

4. RUNOFF FROM WORK SITE AND WASTE WASH WATER FROM ALL CONTRACTOR OPERATIONS SHALL BE COLLECTED, TREATED AND DISCHARGED TO APPROVED LOCATIONS.

CONTRACTOR QUALITY CONTROL (CQC) NOTES:

1. CONSTRUCTION ACTIVITIES WILL BE OBSERVED BY THE QC MANAGER OR A DESIGNATED REPRESENTATIVE ON THE QC TEAM. COORDINATE WITH THE ON-SITE QC REPRESENTATIVE AND INFORM THE REPRESENTATIVE OF THE CONTRACTOR'S SCHEDULED WORK SHIFTS TO ENSURE THAT QC REPRESENTATION OCCURS AS REQUIRED. ADDITIONAL QA ACTIVITIES MAY BE PERFORMED BY THE OWNER.

2. THE CONTRACTOR IS RESPONSIBLE FOR ALL QUALITY CONTROL, FIELD INSPECTION, AND TESTING OF MATERIALS INCLUDING, BUT NOT LIMITED TO EARTHWORK COMPACTION, EARTH WORK MATERIALS AND GROUT FOR DMM WALL CONSTRUCTION AS REQUIRED IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS ASSOCIATED WITH EACH ITEM.

3. PERFORM WORK AND SUPPLY MATERIALS IN CLOSE CONFORMITY WITH THE LINES, GRADES, CROSS SECTIONS, DIMENSIONS AND MATERIAL REQUIREMENTS SHOWN IN THE ISSUED FOR CONSTRUCTION DRAWINGS AND SPECIFICATIONS AND/OR THE APPROVED CQC PLAN.

4. SUBMIT CERTIFICATIONS OF MATERIAL QUALITY AND CONFORMANCE TO THE PROJECT REQUIREMENTS TO THE QC MANAGER A MINIMUM OF 10 WORKING DAYS PRIOR TO INSTALLATION.

5. THE CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTION SURVEYING AND FIELD MEASUREMENTS TO VERIFY CONFORMANCE WITH LINES, GRADES, CROSS SECTIONS, AND DIMENSIONS AND TOLERANCES SHOWN IN THE ISSUED FOR CONSTRUCTION DRAWINGS AND SPECIFICATIONS.

6. PERFORM SURVEYING AND FIELD MEASUREMENTS AT APPROPRIATE TIMES THROUGHOUT CONSTRUCTION TO DOCUMENT CONFORMANCE AND TO PROVIDE THE NECESSARY DATA FOR PREPARATION OF RECORD DRAWINGS BY THE ENGINEER. PROVIDE DETAILED AS-BUILT RECORDS OF THE CONSTRUCTED PROJECT TO THE ENGINEER UPON COMPLETION OF CONSTRUCTION. ITEMS TO BE VERIFIED AND/OR MEASURED BY SURVEYING INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:

   - DIMENSIONS AND ELEVATIONS AT CHANGES (BREAKS) IN CONSTRUCTION MATERIALS.
   - ALL ELEVATION, DIMENSION, AND STATION/OFFSET "CALLOUTS"
   - TOP OF DMM WALL ELEVATIONS FOR EACH WALL.
   - EMBANKMENT CROSS SECTIONS ON 50-FOOT INTERVALS TO VERIFY GRADES AND ELEVATIONS.
   - DIMENSIONS AND ELEVATIONS OF STRUCTURES.
   - OTHER ITEMS DEEMED NECESSARY BY QC TEAM AND/OR CONTRACTOR TO VERIFY PLAN CONFORMANCE AND CONSTRUCTION TOLERANCES.

SITEWORK NOTES:

1. PERFORM DAILY REVIEWS OF ACCESS INTO THE WORK AREA FOR DELIVERY OF EQUIPMENT, MATERIALS, AND CONTROL OR MODIFY ACCESS AS NEEDED TO PREVENT DAMAGE TO THE CREST OR SLOPES OF THE DIKES. IF IN THE OPINION OF THE OWNER OR THE ENGINEER, EQUIPMENT OR MATERIAL HAULING CAUSES UNACCEPTABLE DAMAGE, IMMEDIATELY REPAIR THE DAMAGE, AND MODIFY THE MEANS AND METHODS OF THE HAULING OPERATION TO PREVENT FURTHER DAMAGE.

2. DO NOT MAKE UNPLANNED EXCAVATIONS INTO THE DIKE WITHOUT THE APPROVAL OF THE OWNER OR THE ENGINEER. DURING CONSTRUCTION, THE CONTRACTOR IS RESPONSIBLE FOR PRECAUTIONS REQUIRED TO PROTECT THE INTEGRITY OF THE DIKES AND APPURTENANCES NEEDED FOR THE SAFE OPERATION OF THE ASH POND.

3. DO NOT ALLOW OIL OR GROUT EXCURSIONS INTO THE ASH POND OR INTO CANE CREEK DURING CONSTRUCTION. MAINTAIN CONTROL EQUIPMENT (ABSORBENT BOOMS, ETC) ON SITE AT ALL TIMES. IF RELEASES ARE OBSERVED DURING CONSTRUCTION, IMMEDIATELY NOTIFY THE OWNER AND ENGINEER AND DEPLOY CONTROL EQUIPMENT. COORDINATE WITH THE OWNER AND ENGINEER ON CLEANUP ACTIVITIES, AS NECESSARY.

4. INSTALL, MAINTAIN AND INSPECT SILT FENCE AND OTHER EROSION CONTROL FEATURES AS REQUIRED IN THE CONSTRUCTION BEST MANAGEMENT PRACTICES PLAN (CBMPP) INSTALL EROSION CONTROL FEATURES PRIOR TO DISTURBING EARTH OR BEGINNING ANY EARTHMOVING ACTIVITIES.

5. WEEKLY DELIVERIES OF CARBON DIOXIDE ARE MADE BY TANKER TRUCK TO THE CO2 SYSTEM LOCATED ON THE EAST DIKE. FULL ACCESS TO DELIVERY VEHICLES MUST BE MAINTAINED THROUGHOUT THE DURATION OF CONSTRUCTION.

6. OWNER WILL MONITOR PH AND WATER QUALITY AT DISCHARGE TO CANE CREEK THROUGHOUT CONSTRUCTION. CONTRACTOR MAY NEED TO ADJUST CONSTRUCTION PRACTICES IF WATER QUALITY ISSUES ARISE. CONTRACTOR TO COORDINATE WITH TVA AND ENGINEER.

7. APPROXIMATE LOCATIONS FOR STAGING AND STOCKPILE AREAS ARE SHOWN IN THE DRAWINGS. COORDINATE WITH THE OWNER TO SELECT THE FINAL LOCATION OF STAGING AREAS FOR EQUIPMENT OR MATERIAL STORAGE AND FOR OTHER CONSTRUCTION LAY DOWN ACTIVITY. COORDINATE LAY DOWN ACTIVITY FOR THE EAST DIKE SEISMIC IMPROVEMENT PROJECT WITH ACTIVITIES FOR OTHER PROJECTS OCCURRING SIMULTANEOUSLY.

8. GRADE SOIL STOCKPILES TO MAINTAIN POSITIVE DRAINAGE AT ALL TIMES. THE SIDE SLOPES MAY HAVE A MAXIMUM 3H:1V SLOPE, AND GRADE THE TOP OF THE STOCKPILE TO HAVE A MINIMUM TWO PERCENT SLOPE. SEGREGATE MATERIALS AS DIRECTED BY THE QC MANAGER.

9. MAINTAIN SITE GRADING AND TEMPORARY DRAINAGE DITCHES AS NEEDED TO PROVIDE POSITIVE DRAINAGE DURING CONSTRUCTION. INSTALL AND MAINTAIN EROSION AND SEDIMENT CONTROL MEASURES THROUGHOUT CONSTRUCTION AS SHOWN ON THE DRAWINGS.

10. THE EROSION AND SEDIMENT CONTROL MEASURES SHOWN ARE TO BE CONSIDERED THE MINIMUM REQUIRED. PROVIDE SUPPLEMENTAL MEASURES AS FIELD AND WEATHER CONDITIONS DICTATE.

11. DO NOT REMOVE SEDIMENT AND EROSION CONTROL DEVICES UNTIL DIRECTED TO DO SO BY THE QC MANAGER.

12. CONTROL FUGITIVE DUST EMISSIONS DURING CONSTRUCTION IN SUCH A MANNER AS TO COMPLY WITH APPLICABLE REGULATIONS. DUST CONTROL MEASURES ARE SUBJECT TO APPROVAL BY THE QC MANAGER AND THE CONSTRUCTION MANAGER.

13. MATERIALS DELIVERED FOR INCORPORATION INTO THE WORK MAY BE TEMPORARILY STORED IN AREAS SELECTED BY THE CONTRACTOR AND APPROVED BY THE CONSTRUCTION MANAGER. STORE MATERIALS IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

14. THE CONTRACTOR IS RESPONSIBLE FOR THE MAINTENANCE OF ALL ACCESS ROADS, STAGING AREAS, AND STORAGE AREAS USED DURING CONSTRUCTION AND FOR RESTORING SAID AREAS TO THEIR ORIGINAL CONDITION OR BETTER ONCE CONSTRUCTION IS COMPLETE UNLESS THE CONSTRUCTION MANAGER GIVES WRITTEN PERMISSION TO THE CONTRACTOR TO LEAVE THE AREA "AS IS". UPON COMPLETION OF THE PROJECT, REMOVE ALL PERSONNEL AND EQUIPMENT FROM THE SITE, INCLUDING ANY TEMPORARY ITEMS INSTALLED BY THE CONTRACTOR DURING THE COURSE OF THEIR WORK. LEAVE THE SITE IN A SIGHTLY CONDITION WITH ALL TRASH AND RUBBISH REMOVED. ALL ESTABLISHED TVA BENCHMARKS OR OTHER MONUMENTS SHALL BE PRESERVED AND PROTECTED. ANY ESTABLISHED MARKER OR BENCHMARK THAT IS DAMAGED BY CONSTRUCTION ACTIVITIES WILL BE REPLACED BY TVA SURVEYING SERVICES AT THE CONTRACTOR'S EXPENSE.

SUGGESTED SITE WORK AND CONSTRUCTION SEQUENCE:

1. MOBILIZE EQUIPMENT, TEMPORARY FACILITIES, PLANT EQUIPMENT AND PERSONNEL TO THE SITE.
2. ESTABLISH EROSION CONTROL MEASURES.
3. LOCATE IDENTIFIED UNKNOWN UNDERGROUND UTILITIES USING VACUUM EXCAVATION TECHNIQUES. TVA PLANT STAFF TO MAKE A DETERMINATION WHETHER ABANDONMENT OR RELOCATION IS NECESSARY.
4. CONSTRUCT NEW ACCESS ROADS.
5. SETUP GROUT PLANT AND STAGING/LAYDOWN AREAS.
6. PERFORM BANK RESTORATION OPERATIONS.
7. BEGIN WORKING PLATFORM CUT AND FILL OPERATIONS.
8. INSTALL DMM WALL ELEMENTS.
9. PERFORM REGULAR MAINTENANCE OF AFFECTED EROSION CONTROL MEASURES.
10. PERFORM FINAL GRADING OPERATIONS.
11. PERFORM SITE RESTORATION, PERMANENT SOIL EROSION MEASURES AND PROJECT CLEANUP.

GENERAL LEGEND:

- EXISTING POWER POLE
- EXISTING NATURAL GAS (NGAS)
- EXISTING STORM SEWER (STM)
- EXISTING OVERHEAD ELECTRIC (OHD)
- EXISTING WATERWAY LIMITS
- EXISTING ROAD LIMITS
- EXISTING FENCE
- UNKNOWN UTILITY/APPROXIMATE SOUND ROCK EL (?)
- EXISTING RAILROAD TRACKS
- GRADING: CUT SYMBOL
- GRADING: FILL SYMBOL

PLAN — MAIN TITLE

10 0 10 20 SCALE, FEET — DRAWING SCALE IN UNITS SPECIFIED

SECTION A/3 — SECTION TILE. THE LETTER "A" REFERS TO THE SECTION DESIGNATION. THE NUMBER "3" REFERS TO THE DRAWING NUMBER WHERE THE SECTION IS CALLED OUT.

DETAIL 1/3 — DETAIL TILE. THE NUMBER "1" REFERS TO THE DETAIL DESIGNATION. THE NUMBER "3" REFERS TO THE DRAWING NUMBER WHERE THE DETAIL IS CALLED OUT.

A/3 — SECTION LOCATION. THE LETTER "A" REFERS TO THE SECTION DESIGNATION. THE NUMBER "3" REFERS TO THE DRAWING NUMBER WHERE THE SECTION IS SHOWN.

3/7 — DETAIL LOCATION. THE NUMBER "3" REFERS TO THE DETAIL DESIGNATION. THE NUMBER "7" REFERS TO THE DRAWING NUMBER WHERE THE DETAIL IS SHOWN.

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–

ISSUED FOR CONSTRUCTION

SCALE: NONE — EXCEPT AS NOTED

DISCIPLINE INTERFACE: REV. NO. / DATE

GEI Consultants
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Wo□ur□MA □1□□1
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ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER JOHN NESBITT WALTON

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT
GENERAL NOTES AND LEGEND

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-2	R 0

GEI Consultants	0
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W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

EXISTING CONCRETE LINED CHANNEL

EXISTING SEEPAGE COLLECTION PIPES

FLOW CANE CREEK

CANE CREEK

CANE CREEK

EXISTING SILT FENCE

CONCRETE ENCASED DRAIN LINE FROM COAL YARD RUNOFF POND. LOCATION IS APPROXIMATE, CONTRACTOR TO FIELD VERIFY LOCATION IN WORK ZONE.

CANE CREEK

105+00

110+00

115+00

120+00

125+00

130+00

135+00

140+00

STILLING POND

EXISTING SPILLWAY AND SIPHONS

CO2 INJECTION AREA

DIKE CREST BASELINE

OVERHEAD ELECTRIC LINE ALONG DIKE CREST ROADWAY

CREST ACCESS ROAD

MAIN POND NO. 4

NORMAL WATER LEVEL ELEVATION ~453.0'

WATER LEVEL ELEVATION DURING CONTRUCTION ~452.0'

SLUICING AREA

DIVIDER DIKE

BOTTOM ASH STACK

NORFOLK SOUTHERN RAILROAD

LEE HWY (US-72)

NORTH ALABAMA GAS DISTRICT LINE (SEE NOTE 2)

EXISTING POWER TOWERS (TYP)

COLBERT STEAM PLANT ROAD

OLD LEE HWY

CONTOUR INTERVAL 1 FOOT

NOTES:

1. CONTRACTOR MUST VERIFY LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION ACTIVITIES.
2. LOCATION OF NORTH ALABAMA BURIED GAS LINE SHOWN ON PLANS IS APPROXIMATE. LOCATION MARKERS EXIST ON SITE. CALL NORTH ALABAMA GAS DISTRICT AT 256-383-3306 OR 256-772-0227 PRIOR TO BEGINNING CONSTRUCTION ACTIVITIES TO HAVE LOCATION OF LINE MARKED.
3. CONTRACTOR SHALL COORDINATE ALL HAUL ROUTES, STAGING AREAS, STOCKPILE LOCATIONS, ETC. WITH TVA PERSONNEL.
4. EXISTING SEEPAGE COLLECTION SYSTEM INFORMATION HAS BEEN PROVIDED BY TVA. PLEASE REFER TO RECORD DRAWINGS FOR THE SEEPAGE REMEDIATION PROJECT DATED JANUARY 4, 2013, TVA DELIVERABLE ID: COLBERT FACILITY-P4SR-0003.

MAPPING NOTE:

TOPOGRAPHIC SURVEY INFORMATION HAS BEEN PROVIDED BY TVA AND SHOULD BE USED FOR INFORMATION ONLY. BATHYMETRIC CONTOURS HAVE ALSO BEEN PROVIDED BY TVA ON 11-07-14. THE INFORMATION IS BELIEVED TO BE CORRECT, BUT IS NOT TO BE USED BY THE CONTRACTOR FOR CONSTRUCTION OF THE PROJECT.

GEI Consultants
4□□U□cor□Par□Dr□e
Wo□ur□□MA □1□□1
7□1-7□1-4□□□

ALABAMA LICENSED PROFESSIONAL ENGINEER NO. 34318-E WILLIAM HERBERT WALTON

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–

ISSUED FOR CONSTRUCTION

DISCIPLINE INTERFACE

SCALE: NONE EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT EXISTING SITE PLAN

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

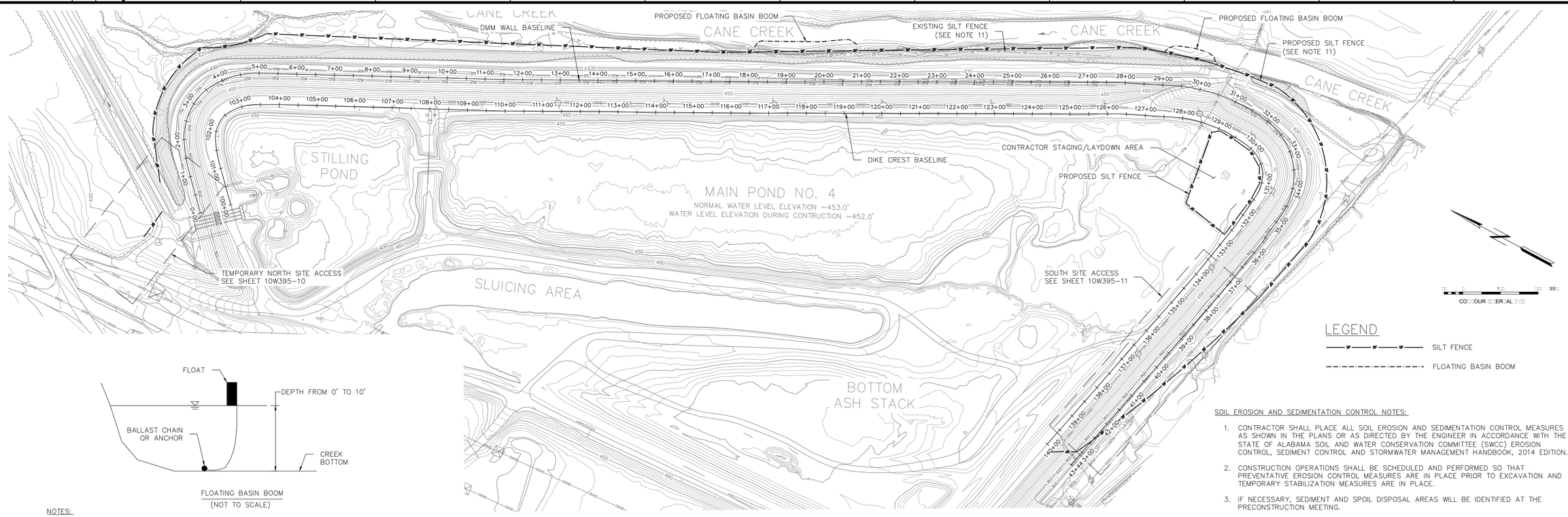
COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-3	R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

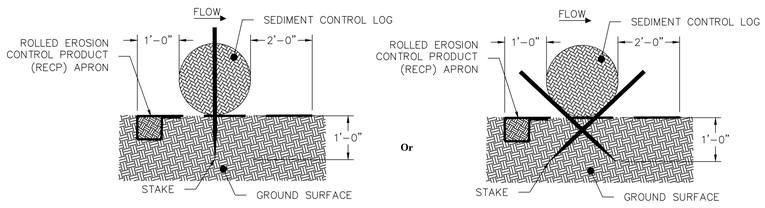
C.A.D. DRAWING
DO NOT ALTER MANUALLY



FLOATING BASIN BOOM
(NOT TO SCALE)

NOTES:

1. INSTALL FLOATING BASIN BOOM (PER SWCC HANDBOOK) AROUND BANK RESTORATION LOCATION PRIOR TO EXCAVATION.
2. BALLAST CHAIN OR ANCHOR POINTS SHALL BE USED TO SECURE THE BASIN BOOM TO THE CREEK BOTTOM. SHORELINE ANCHOR POINTS SHALL EXTEND BEYOND THE BANK RESTORATION EXTENTS.
3. BASIN BOOM SHALL BE MAINTAINED FOR DURATION OF THE BANK RESTORATION WORK.
4. BASIN BOOM SHALL BE INSPECTED CONTINUALLY WHILE IN PLACE.

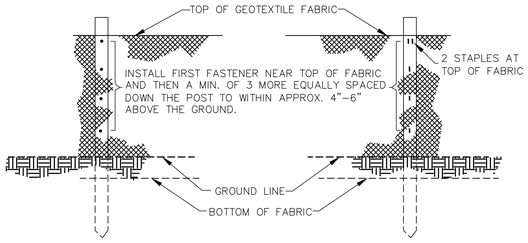


SECTION

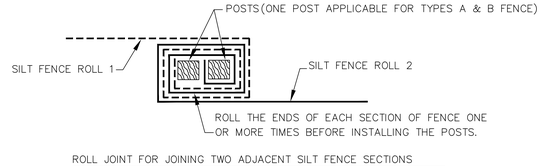
STRAW WATTLE SLOPE/CHANNEL INSTALLATION
(NOT TO SCALE)

NOTES:

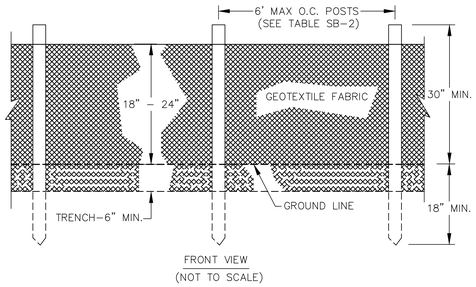
1. THE DETAIL ABOVE SHALL BE USED IN LOCATIONS OF CONCENTRATED FLOW AND ON TEMPORARY SLOPES THAT EXCEED A 3H:1V.
2. SLOPE PROTECTION WATTLES SHALL BE PLACED ALONG CONTOURS TO AVOID A CONCENTRATION OF FLOW.
3. MULTIPLE ROWS OF WATTLES MAY BE REQUIRED ON THE TEMPORARY CUT SLOPES ABOVE THE WORKING PLATFORM. CONTRACTOR SHALL COORDINATE WITH TVA ENVIRONMENTAL PERSONNEL PRIOR TO INSTALLATION OF SEDIMENT CONTROL MEASURES.
4. WATTLES SHALL BE A MINIMUM OF 12 INCHES IN DIAMETER AND COMPOSED OF 100% CLEAN, CERTIFIED WEED FREE STRAW.

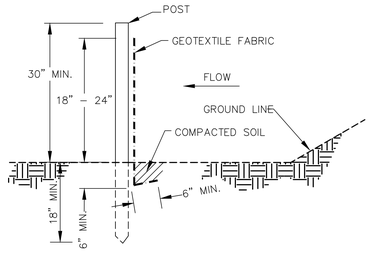


FASTENERS FOR SILT FENCES
(NOT TO SCALE)



ROLL JOINT FOR JOINING TWO ADJACENT SILT FENCE SECTIONS
(NOT TO SCALE)





SOIL EROSION AND SEDIMENTATION CONTROL NOTES:

1. CONTRACTOR SHALL PLACE ALL SOIL EROSION AND SEDIMENTATION CONTROL MEASURES AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER IN ACCORDANCE WITH THE STATE OF ALABAMA SOIL AND WATER CONSERVATION COMMITTEE (SWCC) EROSION CONTROL, SEDIMENT CONTROL AND STORMWATER MANAGEMENT HANDBOOK, 2014 EDITION.
2. CONSTRUCTION OPERATIONS SHALL BE SCHEDULED AND PERFORMED SO THAT PREVENTATIVE EROSION CONTROL MEASURES ARE IN PLACE PRIOR TO EXCAVATION AND TEMPORARY STABILIZATION MEASURES ARE IN PLACE.
3. IF NECESSARY, SEDIMENT AND SPOIL DISPOSAL AREAS WILL BE IDENTIFIED AT THE PRECONSTRUCTION MEETING.
4. SPECIAL PRECAUTIONS SHALL BE TAKEN IN THE USE OF CONSTRUCTION EQUIPMENT TO PREVENT SITUATIONS THAT PROMOTE EROSION.
5. CLEANUP WILL BE DONE IN A MANNER TO INSURE THAT EROSION CONTROL MEASURES ARE NOT DISTURBED.
6. THE PROJECT WILL CONTINUALLY BE INSPECTED FOR SOIL EROSION AND SEDIMENTATION CONTROL COMPLIANCE. DEFICIENCIES WILL BE CORRECTED BY THE CONTRACTOR WITHIN 24 HOURS OF NOTICE.
7. TEMPORARY EROSION CONTROL MEASURES SHALL BE COMPLETELY REMOVED BY THE CONTRACTOR UPON ESTABLISHMENT OF PERMANENT CONTROL MEASURES.
8. ALL ROADS WITHIN THE INFLUENCE OF THE PROJECT MUST REMAIN CLEAN AT ALL TIMES. CONTRACTOR SHALL SWEEP ROADS AS DIRECTED BY THE ENGINEER.
9. BEST MANAGEMENT PRACTICES FOR SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE USED ON THIS PROJECT AS SHOWN ON THE PLANS AND AS DEFINED BY THE ENGINEER.
10. PROJECT IS WITHIN A FLOOD PLAIN AS DEFINED BY FEMA.
11. PROPOSED SILT FENCE SHOWN ALONG ENTIRE PROJECT DISTURBANCE LIMITS. EXISTING SILT FENCE MAY BE REUSED IF FOUND TO BE ACCEPTABLE BY TVA ENVIRONMENTAL PERSONNEL. NOTE THAT THE EXISTING SILT FENCE DOES NOT HAVE WIRE MESH BACKING.
12. CONTRACTOR SHALL INSTALL SOIL EROSION AND SEDIMENTATION CONTROL MEASURES DOWNSTREAM OF ALL STAGING AND LAYDOWN AREAS.
13. COORDINATE LOCATION OF FLOATING BASIN BOOM WITH CANE CREEK BANK RESTORATION SHOWN ON SHEET 10W395-16.

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. NO.
R	–	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–	–
ISSUED FOR CONSTRUCTION											

DISCIPLINE INTERFACE

SCALE: NONE EXCEPT AS NOTED

GEI Consultants
4□□ U□cor□Par□Dr□e
Wo□r□MA □1□□1
7□1-7□1-4□□□

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT OVERALL SITE PREPARATION AND SOIL EROSION CONTROL PLAN

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-4	R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

COORDINATE INFORMATION

HORIZONTAL PROJECTION: COF-PLANT LOCAL GROUND

HORIZONTAL DATUM: LOCAL

VERTICAL DATUM: NGVD 29

H&V ACCURACY: GPS RTK (RAPID MODE)

UNITS: US SURVEY FEET

DMM WALL BASELINE INFORMATION

ELEMENT	POINT TYPE	STATION	NORTHING	EASTING	BEARING	RADIUS	LENGTH	DELTA/THETA	ROTATION DIRECTION
TANGENT	PT	0+00.00	1723622.33	394262.90					
					N 46° 48' 21.3581" E				
ARC	PC	1+00.16	1723690.89	394335.92					
						392.14	109.38	14° 36' 40.1089"	RIGHT
ARC	PC	2+09.54	1723756.68	394422.86					
						178.71	125.98	32° 03' 38.3099"	RIGHT
ARC	PC	3+35.52	1723767.44	394545.77					
						224.59	158.93	25° 30' 39.5445"	RIGHT
TANGENT	PT	4+94.45	1723663.66	394661.76					
					S 26° 30' 03.0517" E				
TANGENT	PT	11+56.73	1723070.97	394957.27					
					S 27° 32' 41.0663" E				
TANGENT	PT	18+52.84	1722453.76	395279.18					
					S 27° 53' 06.9152" E				
TANGENT	PT	27+81.77	1721632.70	395713.64					
					S 24° 30' 57.6242" E				
ARC	PC	29+06.22	1721519.46	395765.28					
						455.61	305.24	12° 34' 32.6764"	RIGHT
ARC	PC	32+11.46	1721222.62	395805.60					
						180.05	262.37	31° 49' 17.6407"	RIGHT
TANGENT	PT	34+73.83	1721085.31	395609.05					
					N 83° 06' 51.8275" W				
TANGENT	PT	35+70.19	1721096.86	395513.39					
					N 79° 00' 53.0668" W				
TANGENT	PT	37+45.14	1721130.20	395341.65					
					N 76° 46' 47.8301" W				
TANGENT	PT	43+44.45	1721267.25	394758.21					

DIKE CREST BASELINE ALIGNMENT INFORMATION

ELEMENT	POINT TYPE	STATION	NORTHING	EASTING	BEARING	RADIUS	LENGTH	DELTA/THETA	ROTATION DIRECTION
TANGENT	PT	100+00.00	1723561.41	394320.00					
					N 46° 50' 44.2905" E				
ARC	PC	100+99.99	1723629.80	394392.95					
ARC						308.64	85.98	15° 57' 37.4733"	RIGHT
ARC	PC	101+85.97	1723682.19	394460.76					
ARC						95.21	60.08	36° 09' 10.1750"	RIGHT
ARC	PC	102+46.04	1723687.92	394519.57					
ARC						141.09	103.93	42° 12' 19.9272"	RIGHT
TANGENT	PT	103+49.97	1723616.56	394591.89					
					S 28° 12' 19.8324" E				
TANGENT	PT	103+99.97	1723572.50	394615.52					
					S 26° 21' 31.4703" E				
TANGENT	PT	109+99.91	1723034.94	394881.89					
					S 27° 32' 41.0663" E				
TANGENT	PT	116+99.78	1722414.40	395205.53					
					S 27° 53' 07.6884" E				
TANGENT	PT	126+32.05	1721590.38	395641.56					
					S 24° 20' 13.0263" E				
ARC	PC	127+49.63	1721483.25	395690.02					
ARC						372.11	249.61	38° 26' 03.5961"	RIGHT
ARC	PC	129+99.24	1721240.67	395724.06					
ARC						96.55	136.20	80° 49' 15.8392"	RIGHT
TANGENT	PT	131+35.43	1721167.88	395622.21					
					N 83° 13' 38.5286" W				
TANGENT	PT	132+32.08	1721179.28	395526.25					
					N 79° 01' 14.7705" W				
TANGENT	PT	133+98.35	1721210.95	395363.02					
					N 76° 46' 47.8301" W				
TANGENT	PT	140+00.00	1721348.54	394777.31					

MAPPING NOTE:

TOPOGRAPHIC AND SURVEY INFORMATION WAS DERIVED FROM AERIAL MAPPING PERFORMED AND PROVIDED BY TUCK MAPPING SOLUTIONS, INC., DATED AUGUST 30, 2013. THE INFORMATION IS BELIEVED TO BE CORRECT, BUT IS NOT TO BE USED BY THE CONTRACTOR FOR CONSTRUCTION OF THE PROJECT.

SURVEY CONTROL NOTE:

A GLOBAL POSITIONING SYSTEM (GPS) BASE STATION HAS BEEN ESTABLISHED AND TRANSFORMATION PARAMETERS DETERMINED BY TVA USING SELECTED SURVEY CONTROL MONUMENTS. CONTACT WITH TVA SURVEYING DEPARTMENT (423)751-8416 OR (423)751-2571 SHALL BE MADE BEFORE ANY SURVEY OR CONSTRUCTION WORK IS COMMENCED. BASE STATION FREQUENCIES AND TRANSFORMATION PARAMETERS WILL BE PROVIDED TO THE CONTRACTOR FOR USE IN CONSTRUCTION ACTIVITIES AT THE SITE. PREVIOUSLY USED OR ESTABLISHED CONTROL POINTS AND MONUMENTS SHALL NOT BE USED BY THE CONTRACTOR WITHOUT PRIOR APPROVAL BY TVA SURVEYING DEPARTMENT.

GEI Consultants

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ALABAMA LICENSED PROFESSIONAL NO. 34318-E ENGINEER WILLIAM HERBERT WALTON

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. NO.
R	–	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–	–

ISSUED FOR CONSTRUCTION

DISCIPLINE INTERFACE

SCALE: NONE EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT PROJECT CONTROL AND BASELINE ALIGNMENT LAYOUT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

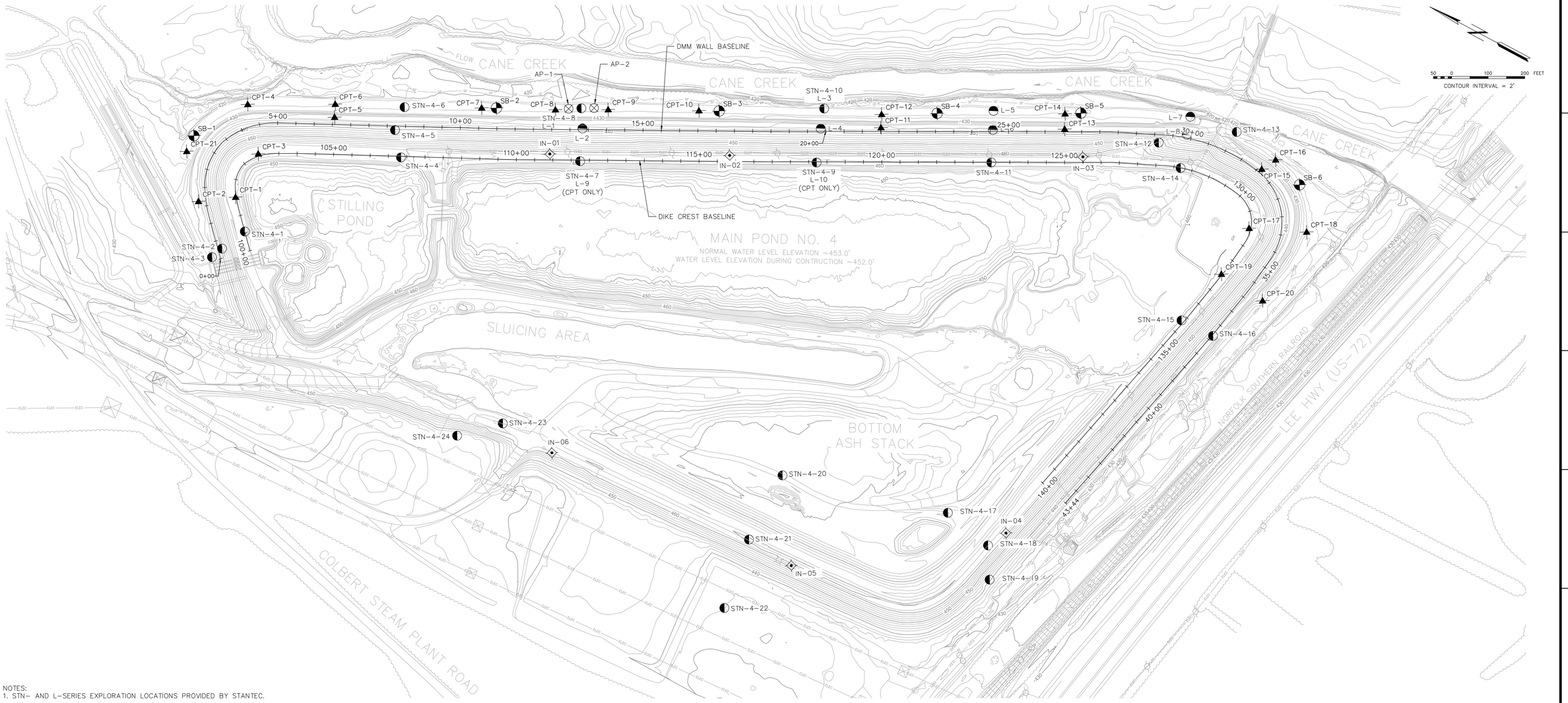
COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-5	R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



NOTES:
1. STN- AND L-SERIES EXPLORATION LOCATIONS PROVIDED BY STANTEC.
2. CPT- AND SB- SERIES EXPLORATION LOCATIONS PROVIDED BY TVA.
3. TOPOGRAPHIC SURVEY INFORMATION HAS BEEN PROVIDED BY TVA AND SHOULD BE USED FOR INFORMATION ONLY.

LEGEND

- CPT- 2015 CONE PENETRATION TESTING
- SB- 2015 SOIL BORING WITH STANDARD PENETRATION TESTING AND VIBRATING WIRE PIEZOMETERS
- AP- 2015 AUGER PROBE TESTING
- IN- 2015 INCLINOMETER
- L- 2014 SOIL BORING WITH STANDARD PENETRATION TESTS, TUBE SAMPLING, AND/OR CONE PENETRATION TESTING (2014 EXPLORATION)
- STN- 2009 SOIL BORING WITH CONTINUOUS STANDARD PENETRATION TESTS AND/OR SHELBY TUBE SAMPLING (2010 EXPLORATION, BY OTHERS)

GEI Consultants
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ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM HERBERT WALTON

R	–	–	–	–	–	–	–	–	–	–	–	
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–	–	DISCIPLINE INTERFACE
ISSUED FOR CONSTRUCTION												
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV NO.	

SCALE: NONE EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT SUBSURFACE EXPLORATION LOCATION PLAN

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

TENNESSEE VALLEY AUTHORITY
COLBERT FOSSIL PLANT
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-6	R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
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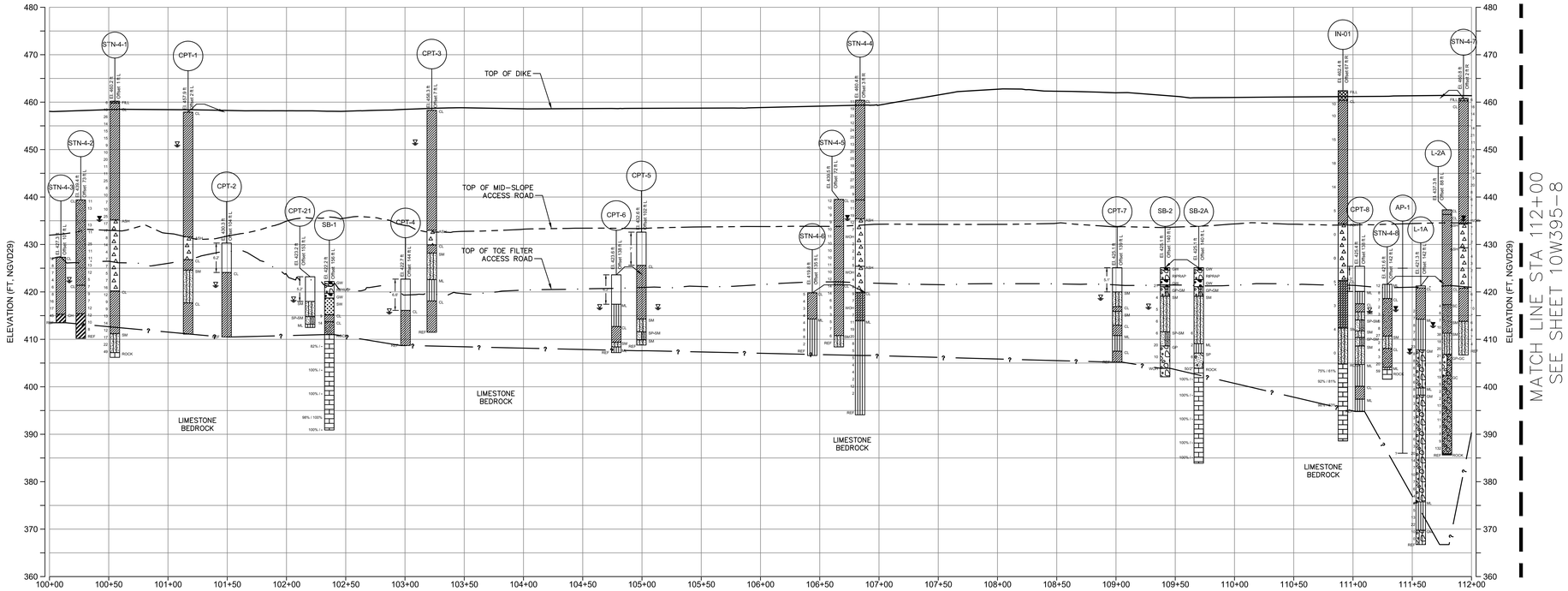
C.A.D. DRAWING
DO NOT ALTER MANUALLY



GEOLOGIC PROFILE ALONG EAST DIKE CREST BASELINE

□OR□O□□AL SCALE□1" □ 4□□
□ER□□CAL SCALE□1" □ 1□□
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LEGEND:

- TOP OF DIKE
- TOP OF MID-SLOPE ACCESS ROAD
- TOP OF TOE FILTER ACCESS ROAD
- INTERPRETED TOP OF BEDROCK AT TOE OF EAST DIKE

NOTES:

1. THE PROFILE FOLLOWS THE CENTERLINE OF THE EAST DIKE CREST.
2. OFFSET DISTANCES SHOWN FOR EACH BORING REPRESENT THE PERPENDICULAR DISTANCE OF THE BORING TO THE CENTERLINE. THE DIRECTION SHOWN (L or R) IS DEFINED AS LOOKING UP-STATION.
3. LOGS SHOWN REPRESENT GENERALIZED SUBSURFACE CONDITIONS. REFER TO BORING LOGS FOR SPECIFIC SUBSURFACE CONDITIONS ENCOUNTERED IN THE TEST BORINGS.
4. SUBSURFACE CONDITIONS SHOWN REPRESENT OBSERVATIONS AT THE SPECIFIC BORING LOCATIONS AT THE TIME THE EXPLORATIONS WERE COMPLETED. SUBSURFACE CONDITIONS BETWEEN BORING LOCATIONS AND SAMPLES ARE UNKNOWN.
5. MANY CPT LOCATIONS WERE PRE-DRILLED TO CLEAR GRAVEL AND RIPRAP FILL MATERIALS PRIOR TO TESTING. A CASING WAS SET IN THE PREDRILLED DEPTH AND LOOSELY BACKFILLED. DIMENSIONS ADJACENT TO CPT LOGS INDICATE THE LENGTH OF PRE-DRILLING AND BACKFILL MATERIAL.

GEI Consultants
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Wo□ur□□MA □1□□1
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ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM HERBERT WALTON

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST.
R	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–

ISSUED FOR CONSTRUCTION

DISCIPLINE INTERFACE

SCALE: NONE — EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT GEOLOGIC PROFILE (1 OF 3)

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

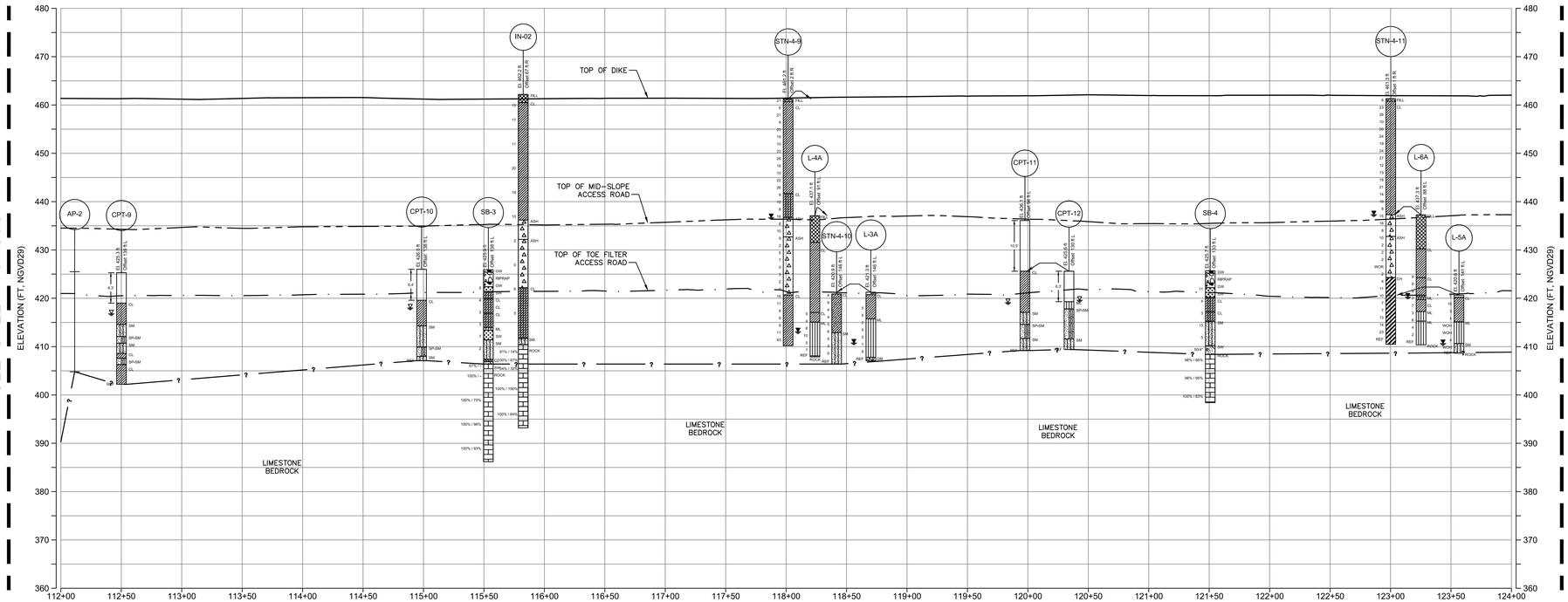
AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-7	R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

MATCH LINE STA 112+00
SEE SHEET 10W395-7



MATCH LINE STA 124+00
SEE SHEET 10W395-9

GEOLOGIC PROFILE ALONG EAST DIKE CREST BASELINE

□OR□O□□AL SCALE:1" □ 4□□
□ □ 4□ □□□
□ □□
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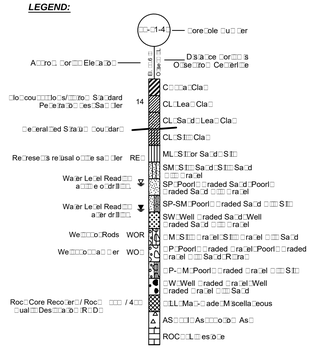
□ER□CAL SCALE:1" □ 1□□□
□O□E:4□□ER□CAL EXA□□ERA□O□

NOTES:

1. THE PROFILE FOLLOWS THE CENTERLINE OF THE EAST DIKE CREST.
2. OFFSET DISTANCES SHOWN FOR EACH BORING REPRESENT THE PERPENDICULAR DISTANCE OF THE BORING TO THE CENTERLINE. THE DIRECTION SHOWN (L or R) IS DEFINED AS LOOKING UP-STATION.
3. LOGS SHOWN REPRESENT GENERALIZED SUBSURFACE CONDITIONS. REFER TO BORING LOGS FOR SPECIFIC SUBSURFACE CONDITIONS ENCOUNTERED IN THE TEST BORINGS.
4. SUBSURFACE CONDITIONS SHOWN REPRESENT OBSERVATIONS AT THE SPECIFIC BORING LOCATIONS AT THE TIME THE EXPLORATIONS WERE COMPLETED. SUBSURFACE CONDITIONS BETWEEN BORING LOCATIONS AND SAMPLES ARE UNKNOWN.
5. MANY CPT LOCATIONS WERE PRE-DRILLED TO CLEAR GRAVEL AND RIPRAP FILL MATERIALS PRIOR TO TESTING. A CASING WAS SET IN THE PREDRILLED DEPTH AND LOOSELY BACKFILLED. DIMENSIONS ADJACENT TO CPT LOGS INDICATE THE LENGTH OF PRE-DRILLING AND BACKFILL MATERIAL.

LEGEND:



TOP OF DIKE

TOP OF MID-SLOPE ACCESS ROAD

TOP OF TOE FILTER ACCESS ROAD

INTERPRETED TOP OF BEDROCK AT TOE OF EAST DIKE

GEI Consultants
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Wo□ur□□MA □1□□1
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ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM HERBERT WALTON

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	DISCIPLINE INTERFACE
R	–	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–	–
ISSUED FOR CONSTRUCTION											

SCALE: NONE EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT GEOLOGIC PROFILE (2 OF 3)

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

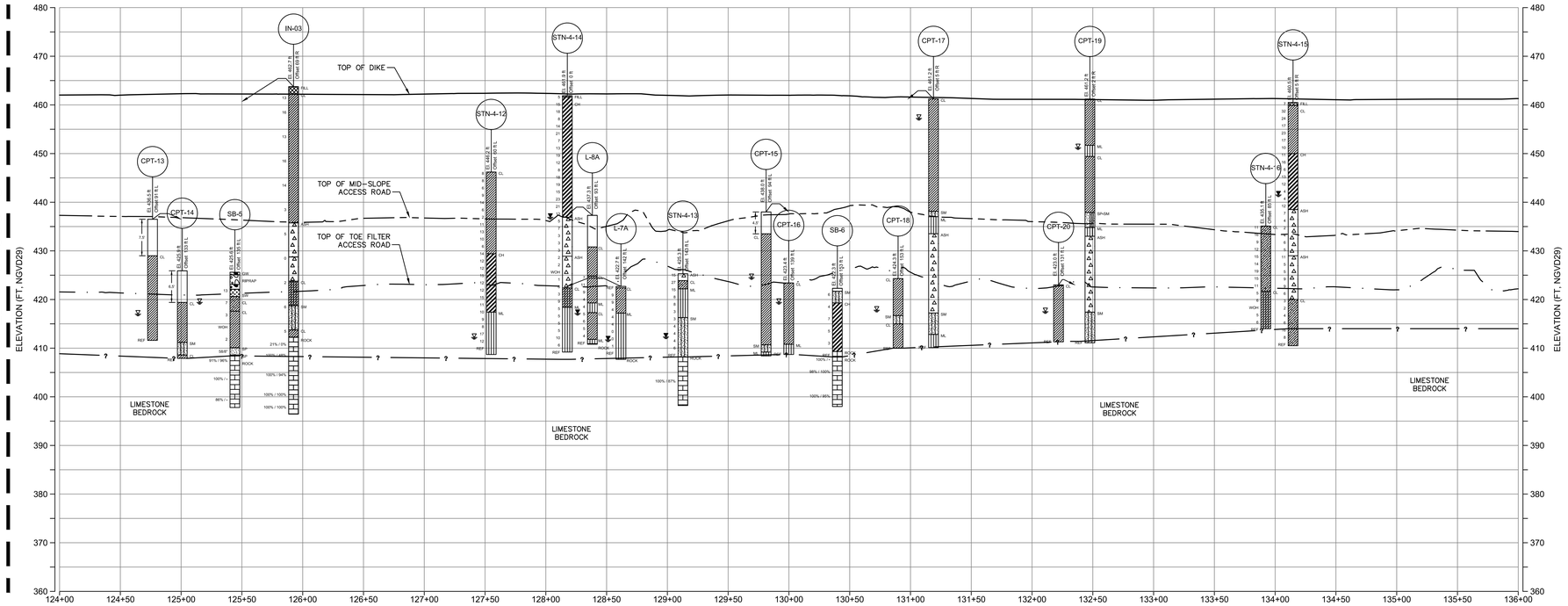
COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-8	R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



GEOLOGIC PROFILE ALONG EAST DIKE CREST BASELINE

□OR□O□□AL SCALE□1" □ 4□□

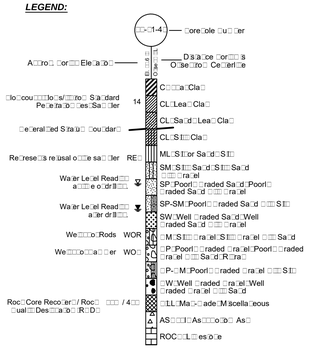
□ER□CAL SCALE□1" □ 1□□

□O□E□4□□ER□CAL EXA□□ERA□□O□

NOTES:

1. THE PROFILE FOLLOWS THE CENTERLINE OF THE EAST DIKE CREST.
2. OFFSET DISTANCES SHOWN FOR EACH BORING REPRESENT THE PERPENDICULAR DISTANCE OF THE BORING TO THE CENTERLINE. THE DIRECTION SHOWN (L or R) IS DEFINED AS LOOKING UP-STATION.
3. LOGS SHOWN REPRESENT GENERALIZED SUBSURFACE CONDITIONS. REFER TO BORING LOGS FOR SPECIFIC SUBSURFACE CONDITIONS ENCOUNTERED IN THE TEST BORINGS.
4. SUBSURFACE CONDITIONS SHOWN REPRESENT OBSERVATIONS AT THE SPECIFIC BORING LOCATIONS AT THE TIME THE EXPLORATIONS WERE COMPLETED. SUBSURFACE CONDITIONS BETWEEN BORING LOCATIONS AND SAMPLES ARE UNKNOWN.
5. MANY CPT LOCATIONS WERE PRE-DRILLED TO CLEAR GRAVEL AND RIPRAP FILL MATERIALS PRIOR TO TESTING. A CASING WAS SET IN THE PREDRILLED DEPTH AND LOOSELY BACKFILLED. DIMENSIONS ADJACENT TO CPT LOGS INDICATE THE LENGTH OF PRE-DRILLING AND BACKFILL MATERIAL.

LEGEND:



R	–	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–	–
ISSUED FOR CONSTRUCTION											

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST

DISCIPLINE INTERFACE

REV. CODE: 1. 2. 3. 4.

SCALE: NONE EXCEPT AS NOTED

GEI Consultants
4□□U□cor□Par□Dr□e
Wo□ur□□MA □1□□1
7□1-7□1-4□□□

ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM HERBERT WALTON

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT
GEOLOGIC PROFILE (3 OF 3)

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

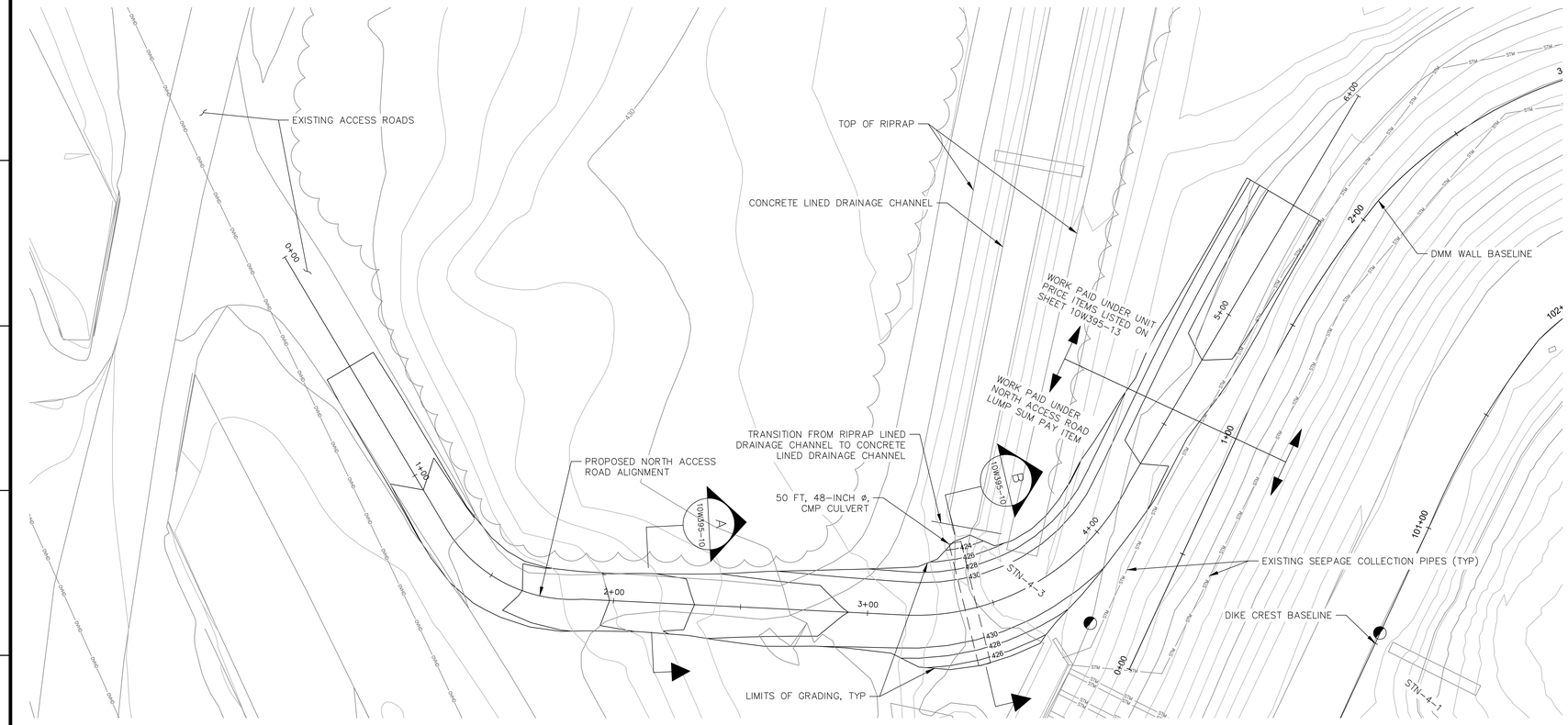
COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

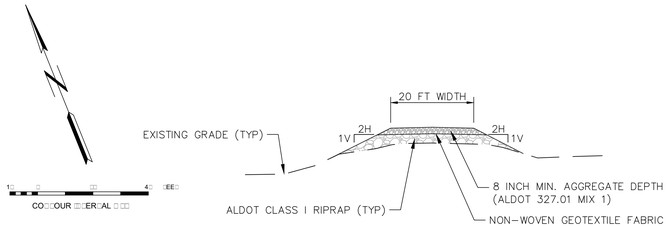
AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-9	R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

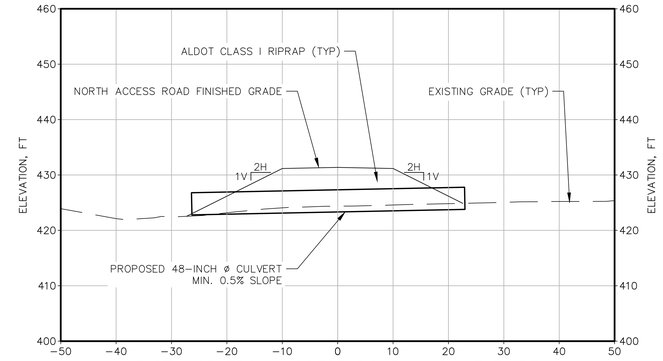
C.A.D. DRAWING
DO NOT ALTER MANUALLY





TYPICAL NORTH ACCESS ROAD

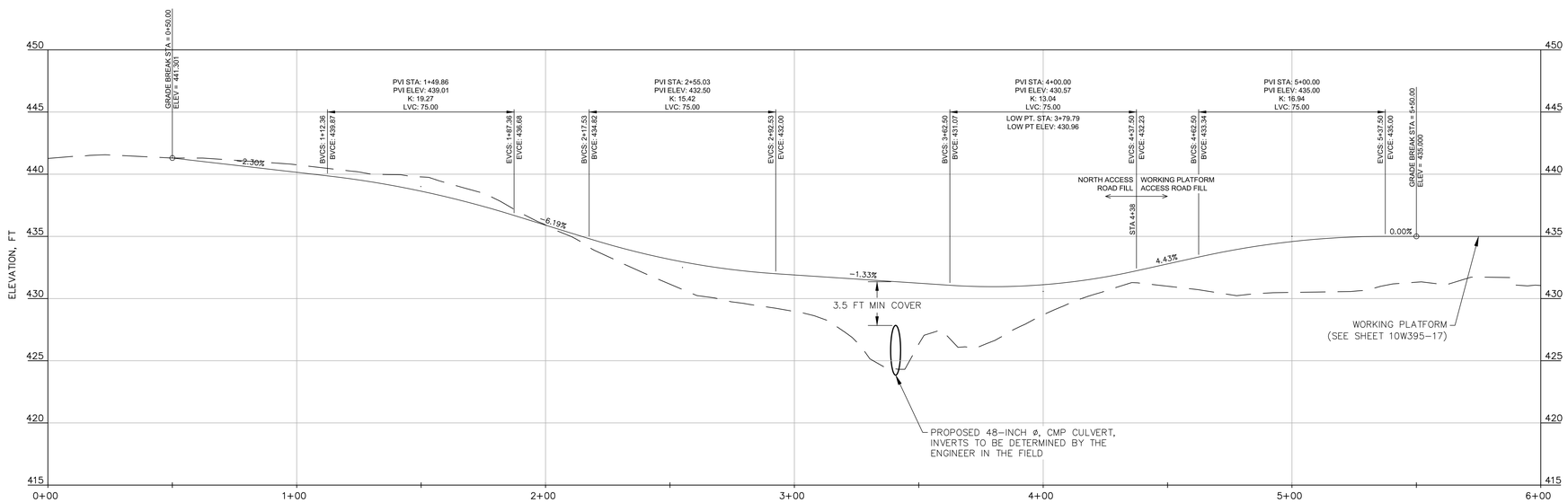
SECTION A (10W395-10)



SECTION B (10W395-10)

NOTES:

1. PROVIDE TEMPORARY NORTH ACCESS ROAD TO FACILITATE CONSTRUCTION.
2. REMOVE TEMPORARY ACCESS ROAD AND WORK AREA UPON COMPLETION OF PROJECT.
3. CULVERT HAS A DESGIN CAPACITY OF 60 CFS ASSUMING INLET CONTROLLED CONDITIONS AT A 0.5% SLOPE. TVA TO CONFIRM CULVERT CAPACITY IS ADEQUETE FOR ANTICIPATED FLOWS FROM ASH POND NO.4.



PROFILE – NORTH ACCESS ROAD BASELINE

SCALE: 1"=4' (VERTICAL)
1"=20' (HORIZONTAL)

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Wo□ur□□MA □1□□1
7□1-7□1-4□□□

ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM HERBERT WALTON

REV	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–

ISSUED FOR CONSTRUCTION

DISCIPLINE INTERFACE

SCALE: NONE EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT NORTH ACCESS ROAD PLAN AND PROFILE

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

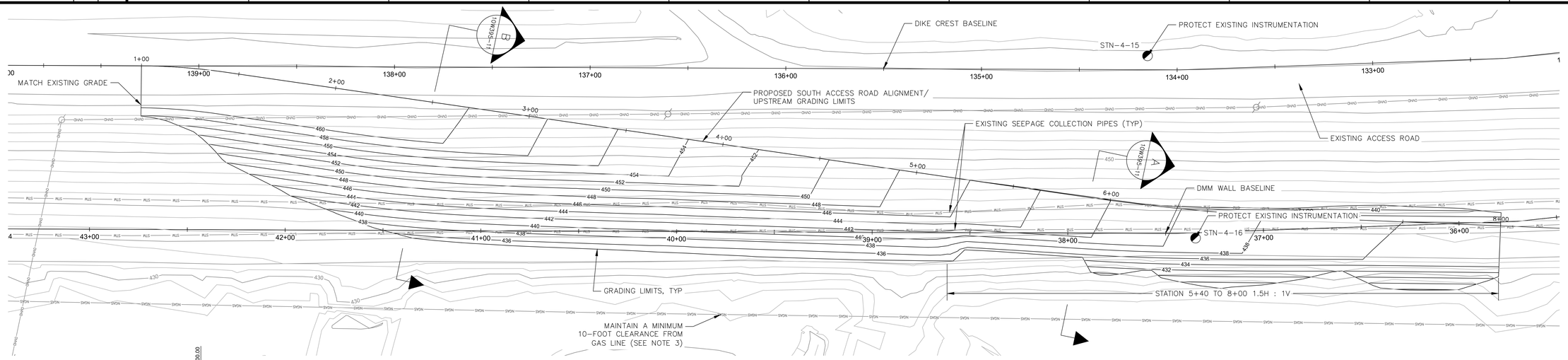
COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

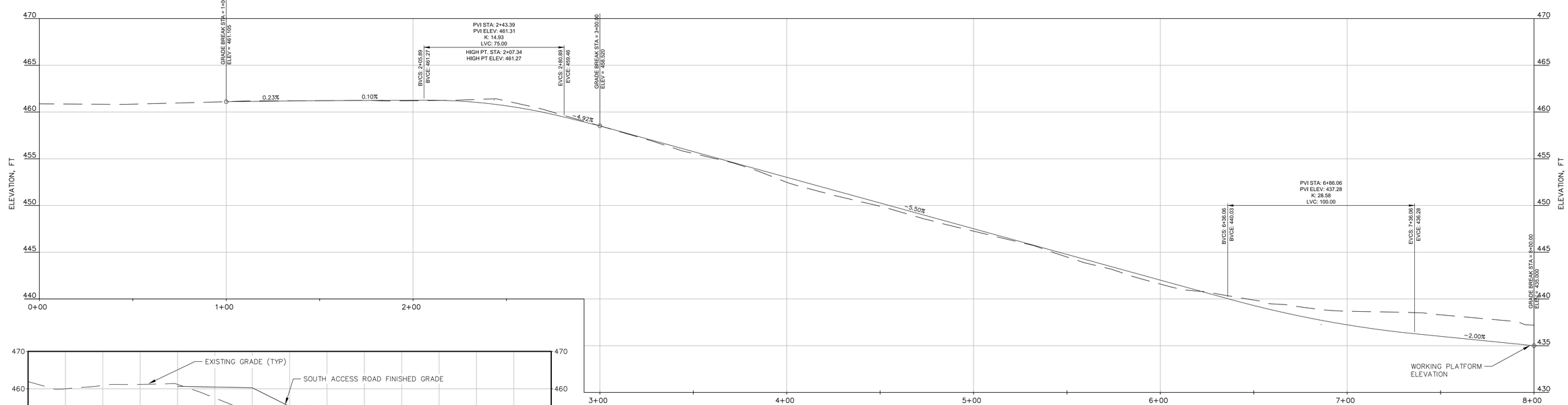
AUTOCAD R 2014	DATE: 7/31/15	XX	C	10W395-10	R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

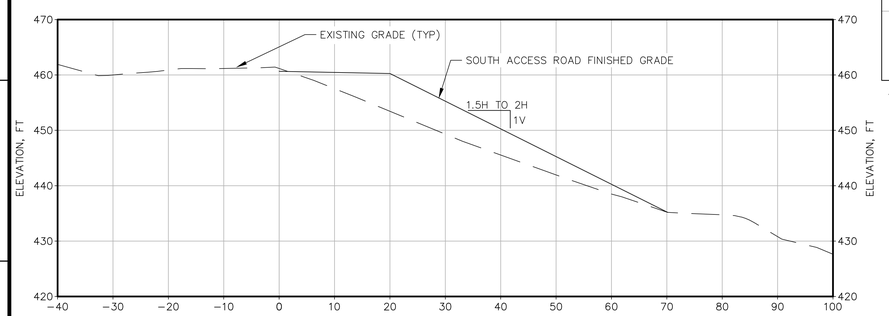
C.A.D. DRAWING
DO NOT ALTER MANUALLY





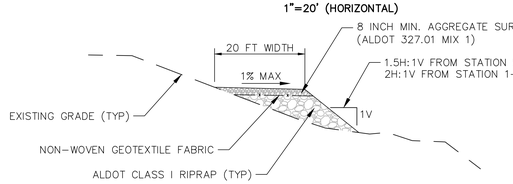
PROFILE – SOUTH ACCESS ROAD BASELINE

SCALE: 1"=4' (VERTICAL)
1"=20' (HORIZONTAL)



STA 2+50

SECTION B (10W395-11)



TYPICAL SOUTH ACCESS ROAD
DMM BASELINE STA 38+50 TO 42+75

SECTION A (10W395-11)

NOTES:

1. SOUTH ACCESS ROAD TO REMAIN IN PLACE AFTER CONSTRUCTION.
2. NO CUT OF EXISTING EMBANKMENT SHALL BE ALLOWED FOR CONSTRUCTION OF SOUTH ACCESS ROAD.
3. FILL PLACEMENT FOR THE SOUTH ACCESS ROAD AND WORKING PLATFORM SHALL NOT ENCROACH ON THE 10-FOOT BUFFER ZONE NORTH OF THE EXISTING GAS LINE.

GEI Consultants
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Wo□ur□□MA □1□□1
7□1-7□1-4□□□

ALABAMA LICENSED PROFESSIONAL ENGINEER NO. 34318-E HERBERT WALTON

R	–	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–	–

ISSUED FOR CONSTRUCTION

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. NO.

SCALE: NONE — EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT SOUTH ACCESS ROAD PLAN AND PROFILE

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

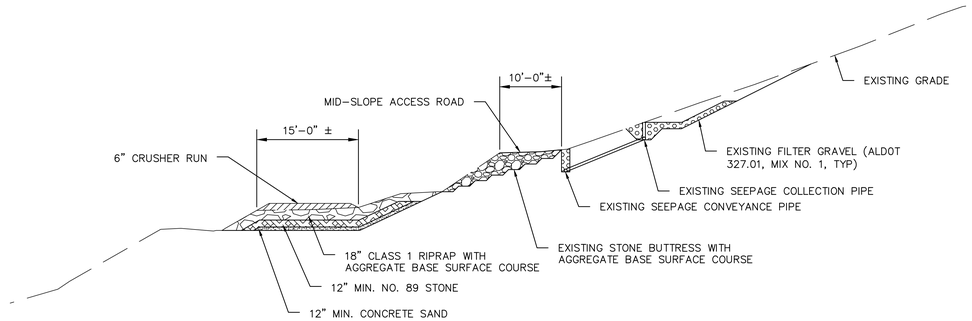
AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-11	R 0

DISCIPLINE INTERFACE

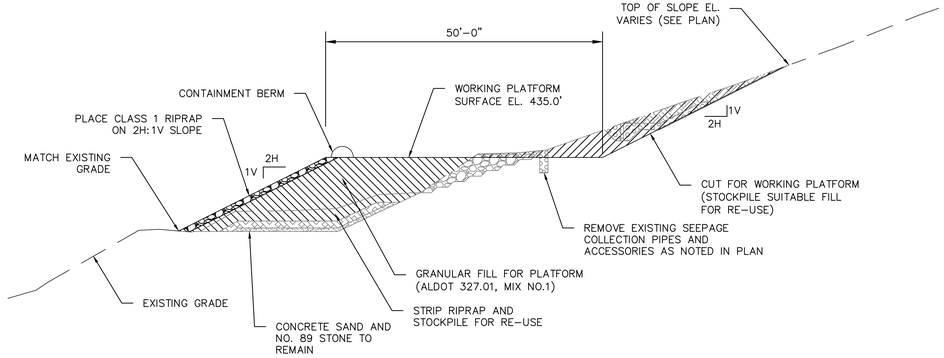
GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

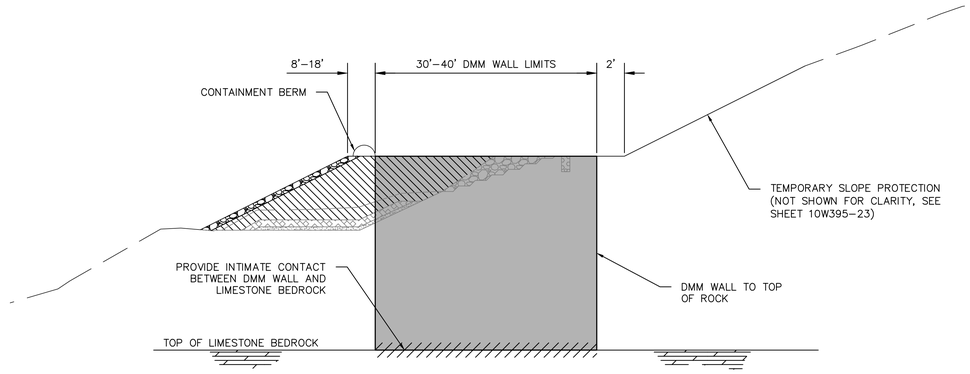
C.A.D. DRAWING
DO NOT ALTER MANUALLY



TYPICAL EMBANKMENT SECTION (NTS)
EXISTING CONDITIONS



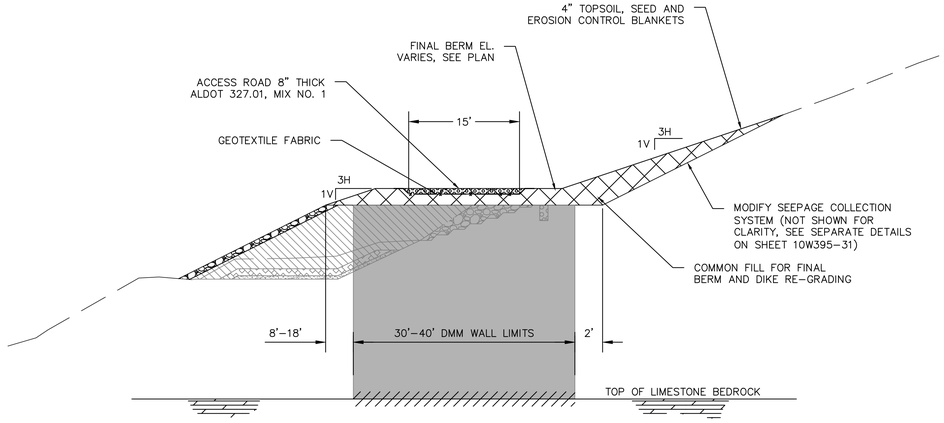
TYPICAL EMBANKMENT SECTION (NTS)
STEP 1 – CONSTRUCT WORKING PLATFORM



TYPICAL EMBANKMENT SECTION (NTS)
STEP 2 – CONSTRUCT DMM WALLS

NOTES:

1. INSTALL TEMPORARY SLOPE PROTECTION IN ALL AREAS.



TYPICAL EMBANKMENT SECTION (NTS)
STEP 3 – CONSTRUCT BERM AND PERMANENT DIKE SLOPE

NOTES:

1. RECONSTRUCT PORTIONS OF THE DRAIN BLANKET THAT HAVE BEEN CONTAMINATED DURING DMM WALL INSTALLATION.
2. CONSTRUCT THE FILTER BLANKET DETAILS AS SHOWN ON SHEET 10W395-31.

SHEET NOTES:

1. THESE SECTIONS SHOW A SUGGESTED SCHEMATIC CONSTRUCTION SEQUENCE. SEE SHEETS 10W395-16 THROUGH 10W395-37 FOR ADDITIONAL DETAIL.
2. AS-BUILT DRAWINGS FOR EXISTING SEEPAGE COLLECTION SYSTEM ALONG SLOPE AND FILTERED SEEPAGE BERM AT TOE ARE AVAILABLE FROM TVA UPON REQUEST.

GEI Consultants
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Wo□ur□□MA □1□□1
7□1-7□1-4□□□

ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM HERBERT WALTON

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–
ISSUED FOR CONSTRUCTION										

DISCIPLINE INTERFACE
REV. CD

SCALE: NONE EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT SCHEMATIC CONSTRUCTION SEQUENCE

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

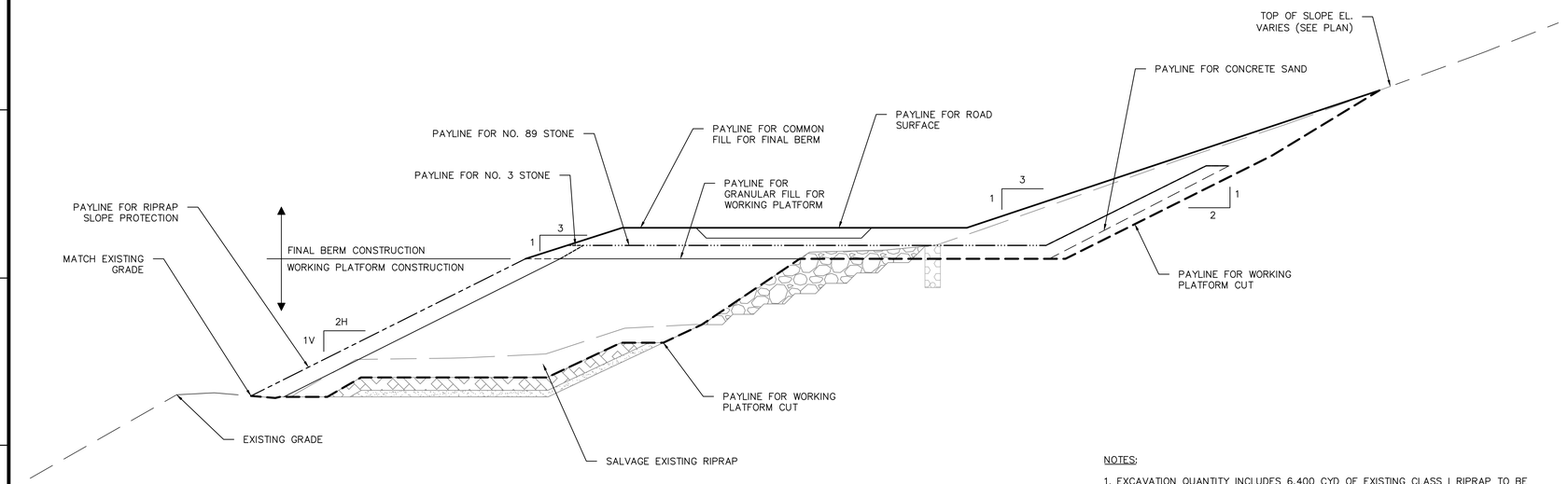
COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-12	R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

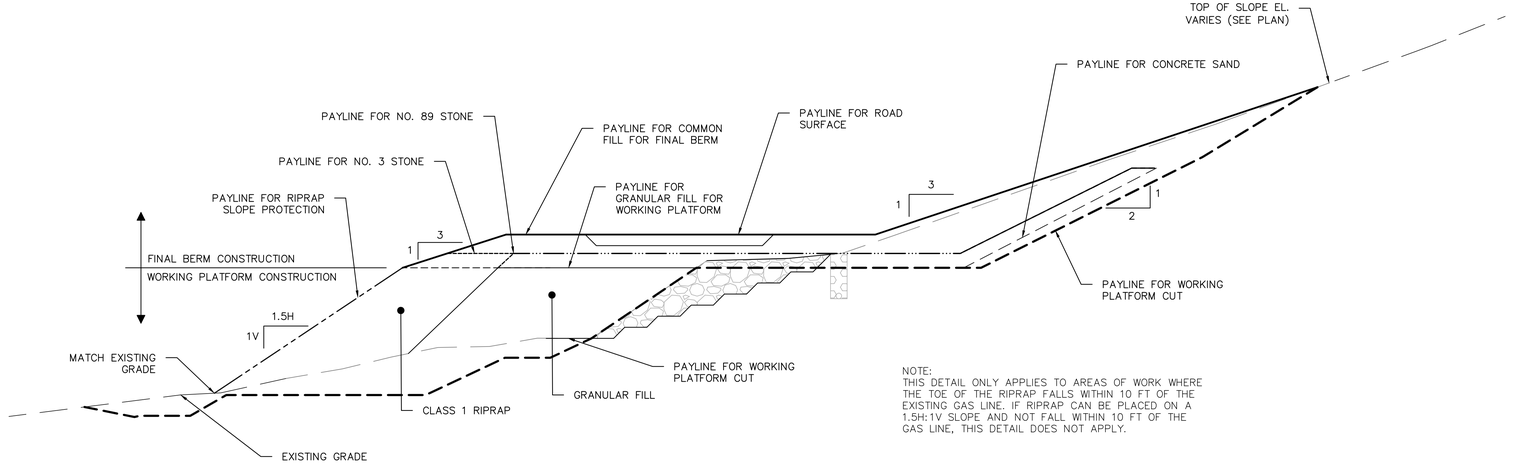


TYPICAL EMBANKMENT SECTION (NTS)
EARTHWORK PAYLINES

NOTES:

1. EXCAVATION QUANTITY INCLUDES 6,400 CYD OF EXISTING CLASS I RIPRAP TO BE SALVAGED AND REUSED.
2. CLASS I RIPRAP QUANTITY INCLUDES SALVAGED RIPRAP (6,400 CYD) FROM THE EXISTING TOE FILTER ACCESS ROAD AND IMPORTED RIPRAP (3,300 CYD).
3. LIMITS OF SOUTH ACCESS ROAD ARE APPROXIMATELY STATION 35+80 TO STATION 42+75 ALONG THE DMM WALL BASELINE.
4. CLASS I RIPRAP FROM STATION 35+80 TO STATION 42+75 IS FOR CONSTRUCTION OF SOUTH ACCESS ROAD.
5. ITEM 9 IS FOR IMPORTED CLASS I RIPRAP AND ITEM 10 IS FOR SALVAGED CLASS I RIPRAP. SEE THE INDIVIDUAL PAY ITEMS IN THE BID SHEET FOR INDIVIDUAL QUANTITIES. CONTRACTOR SHALL PLACE SALVAGED RIPRAP PRIOR TO IMPORTING RIPRAP.

	PAY ITEMS AND PAYLINE QUANTITIES (PER 100 LF ALONG DMM WALL BASELINE)						
PAY ITEM NO.	8	9 & 10	13	14	15	16	17
PAY ITEM	EXCAVATION	CLASS 1 RIPRAP	NO. 3 STONE	NO. 89 STONE	CONCRETE SAND	GRANULAR FILL	COMMON FILL
DMM BASELINE STATION RANGE (FT)	ESTIMATED VOLUME (CY)	ESTIMATED VOLUME (CY)	ESTIMATED VOLUME (CY)	ESTIMATED VOLUME (CY)	ESTIMATED VOLUME (CY)	ESTIMATED VOLUME (CY)	ESTIMATED VOLUME (CY)
0+00 TO 1+00	INCLUDED IN NORTH ACCESS ROAD LUMP SUM ITEM						
1+00 TO 2+00	444	64	11	84	46	400	548
2+00 TO 3+00	1120	141	11	168	91	832	1113
3+00 TO 4+00	1286	154	11	168	91	882	1211
4+00 TO 5+00	897	154	11	168	91	1171	1024
5+00 TO 6+00	665	149	11	168	91	1388	868
6+00 TO 7+00	705	143	11	168	91	1242	867
7+00 TO 8+00	613	132	11	168	91	1127	828
8+00 TO 9+00	621	125	11	168	91	1063	817
9+00 TO 10+00	698	124	11	168	91	997	832
10+00 TO 11+00	732	125	11	168	91	972	839
11+00 TO 12+00	764	124	11	168	91	957	847
12+00 TO 13+00	803	121	11	168	91	922	866
13+00 TO 14+00	818	119	11	168	91	885	864
14+00 TO 15+00	908	116	11	168	91	851	935
15+00 TO 16+00	1001	115	11	168	91	843	1003
16+00 TO 17+00	1013	116	11	168	91	868	991
17+00 TO 18+00	1041	119	11	168	91	912	1014
18+00 TO 19+00	1052	137	11	168	91	917	998
19+00 TO 20+00	1031	162	11	168	91	966	953
20+00 TO 21+00	970	167	11	168	91	1056	906
21+00 TO 22+00	891	165	11	168	91	1088	864
22+00 TO 23+00	871	165	11	168	91	1051	857
23+00 TO 24+00	890	140	11	168	91	1017	871
24+00 TO 25+00	892	144	11	168	91	1030	876
25+00 TO 26+00	897	173	11	168	91	1018	872
26+00 TO 27+00	849	175	11	168	91	1023	862
27+00 TO 28+00	1187	140	11	168	91	1013	1029
28+00 TO 29+00	1801	101	11	168	91	890	1256
29+00 TO 30+00	1403	129	11	168	91	554	1140
30+00 TO 31+00	708	139	11	168	91	515	954
31+00 TO 32+00	904	134	11	168	91	800	1096
32+00 TO 33+00	1653	134	11	168	91	1360	1533
33+00 TO 34+00	2039	134	11	168	91	1220	1723
34+00 TO 35+00	1574	320	11	168	91	525	1484
35+00 TO 36+00	942	320	11	168	91	820	1145
36+00 TO 37+00	534	325	0	153	68	0	500
37+00 TO 38+00	193	325	0	69	23	0	0
38+00 TO 39+00	0	450	0	0	0	0	0
39+00 TO 40+00	0	650	0	0	0	0	0
40+00 TO 41+00	0	825	0	0	0	0	0
41+00 TO 42+00	0	875	0	0	0	0	0
42+00 TO 43+00	0	600	0	0	0	0	0
UNSPECIFIED ITEMS	590	529	65	366	166	1825	1615
ESTIMATED TOTALS	**36000**	**9700**	**450**	**6400**	**3400**	**35000**	**37000**



NOTE:
THIS DETAIL ONLY APPLIES TO AREAS OF WORK WHERE THE TOE OF THE RIPRAP FALLS WITHIN 10 FT OF THE EXISTING GAS LINE. IF RIPRAP CAN BE PLACED ON A 1.5H:1V SLOPE AND NOT FALL WITHIN 10 FT OF THE GAS LINE, THIS DETAIL DOES NOT APPLY.

TYPICAL EMBANKMENT SECTION STA 34+20 TO 35+80 (NTS)
EARTHWORK PAYLINES

GEI Consultants
4□□U□cor□Par□Dr□e
Wo□ur□□MA □1□□1
7□1-7□1-4□□□

ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM HERBERT WALTON

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–

ISSUED FOR CONSTRUCTION

SCALE: NONE — EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT
PAYLINE AND QUANTITY INFORMATION

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

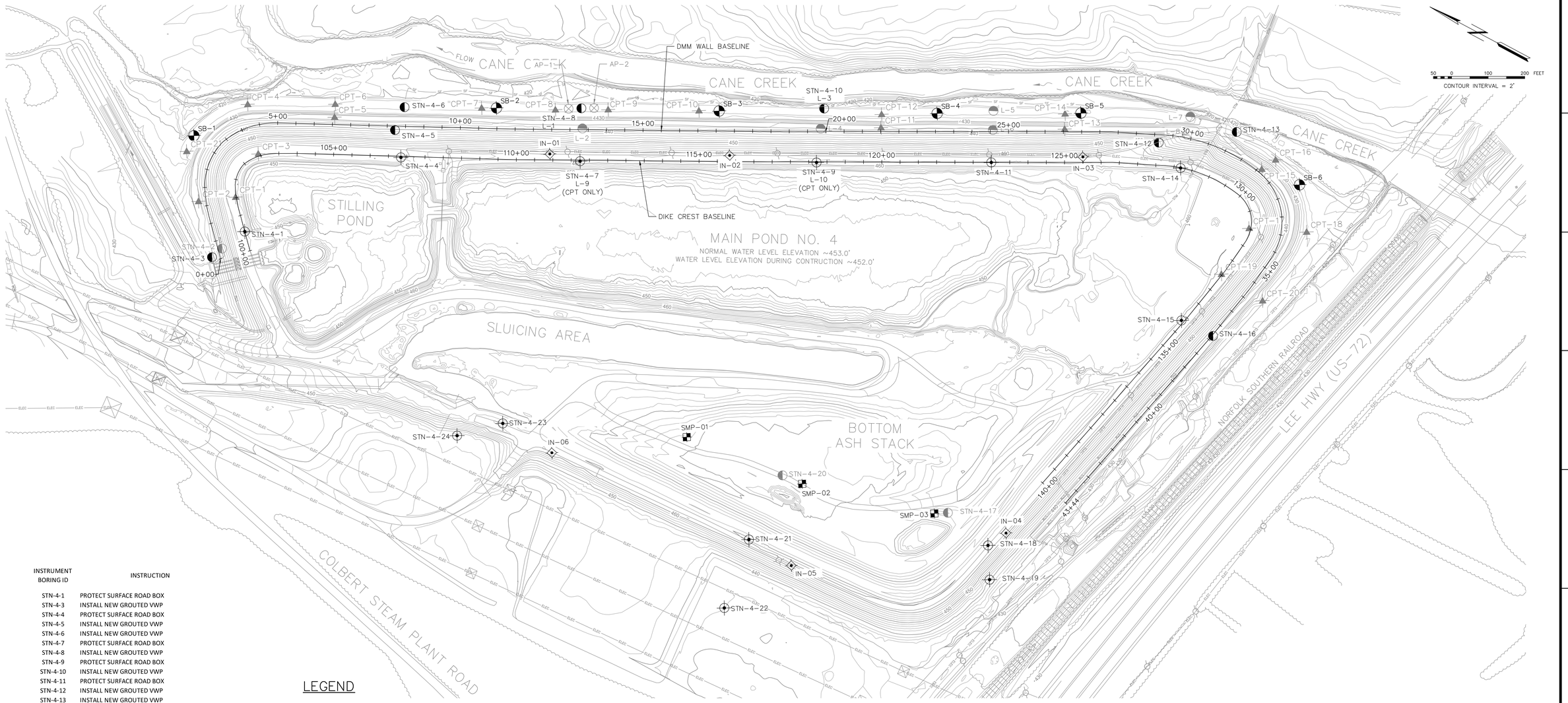
AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395–13	R 0

DISCIPLINE INTERFACE

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



INSTRUMENT BORING ID	INSTRUCTION
STN-4-1	PROTECT SURFACE ROAD BOX
STN-4-3	INSTALL NEW GROUTED VWP
STN-4-4	PROTECT SURFACE ROAD BOX
STN-4-5	INSTALL NEW GROUTED VWP
STN-4-6	INSTALL NEW GROUTED VWP
STN-4-7	PROTECT SURFACE ROAD BOX
STN-4-8	INSTALL NEW GROUTED VWP
STN-4-9	PROTECT SURFACE ROAD BOX
STN-4-10	INSTALL NEW GROUTED VWP
STN-4-11	PROTECT SURFACE ROAD BOX
STN-4-12	INSTALL NEW GROUTED VWP
STN-4-13	INSTALL NEW GROUTED VWP
STN-4-14	PROTECT SURFACE ROAD BOX
STN-4-15	PROTECT SURFACE ROAD BOX
STN-4-16	INSTALL NEW GROUTED VWP
STN-4-18	PROTECT SURFACE ROAD BOX
STN-4-19	PROTECT SURFACE ROAD BOX
STN-4-21	PROTECT SURFACE ROAD BOX
STN-4-22	PROTECT SURFACE ROAD BOX
STN-4-23	PROTECT SURFACE ROAD BOX
STN-4-24	PROTECT SURFACE ROAD BOX
SB-1	EXTEND VWP
SB-2	EXTEND VWP
SB-3	EXTEND VWP
SB-4	EXTEND VWP
SB-5	EXTEND VWP
SB-6	EXTEND VWP
SMP-1	INSTALL SETTLEMENT MONITORING POINT
SMP-2	INSTALL SETTLEMENT MONITORING POINT
SMP-3	INSTALL SETTLEMENT MONITORING POINT
IN-01	PROTECT INCLINOMETER WITH GROUTED VWP.
IN-02	PROTECT INCLINOMETER WITH GROUTED VWP.
IN-03	PROTECT INCLINOMETER WITH GROUTED VWP.
IN-04	PROTECT INCLINOMETER WITH GROUTED VWP.
IN-05	PROTECT INCLINOMETER WITH GROUTED VWP.
IN-06	PROTECT INCLINOMETER WITH GROUTED VWP.

NOT IN CONTRACT

LEGEND

- IN- EXISTING INCLINOMETER
- SMP- PROPOSED SETTLEMENT MONITORING POINT
- SB- EXISTING VIBRATING WIRE PIEZOMETER TO BE EXTENDED
- STN- EXISTING OPEN STANDPIPE PIEZOMETER TO BE MODIFIED
- STN- EXISTING OPEN STANDPIPE (PROTECT – NO MODIFICATION PLANNED)
- CPT- 2015 CONE PENETRATION TESTING
- SB- 2015 SOIL BORING WITH STANDARD PENETRATION TESTING AND VIBRATING WIRE PIEZOMETERS
- AP- 2015 AUGER PROBE TESTING
- L- 2014 SOIL BORING WITH STANDARD PENETRATION TESTS, TUBE SAMPLING, AND/OR CONE PENETRATION TESTING (2014 EXPLORATION)
- STN- 2009 SOIL BORING WITH CONTINUOUS STANDARD PENETRATION TESTS AND/OR SHELBY TUBE SAMPLING (2010 EXPLORATION, BY OTHERS)

GEI Consultants
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ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM HERBERT WALTON

R	–	–	–	–	–	–	–	–	–	–	–	
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–	–	DISCIPLINE INTERFACE
ISSUED FOR CONSTRUCTION												
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST		

SCALE: NONE EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT INSTRUMENTATION INSTALLATION AND MODIFICATION PLAN

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

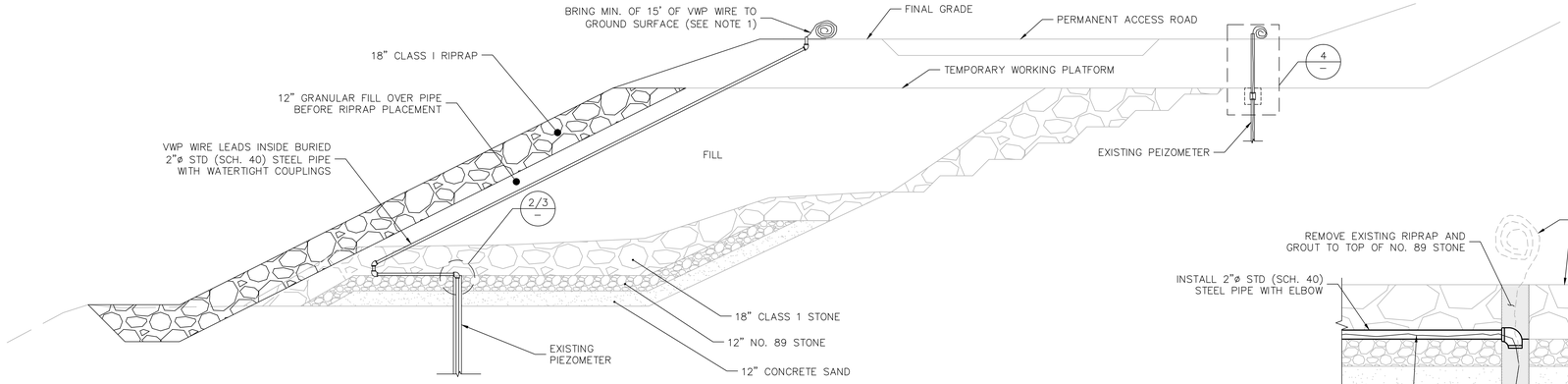
COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-14	R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

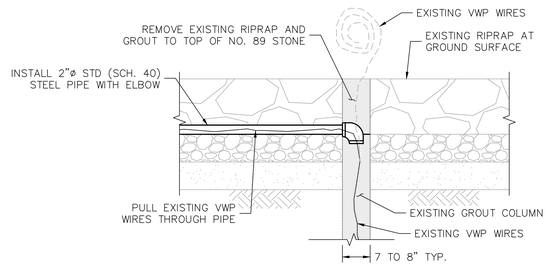
C.A.D. DRAWING
DO NOT ALTER MANUALLY



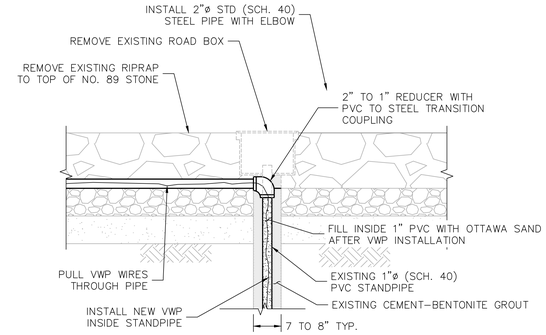
DETAIL 1: VIBRATING WIRE PIEZOMETER PROTECTION
SCALE: N.T.S.

NOTES:

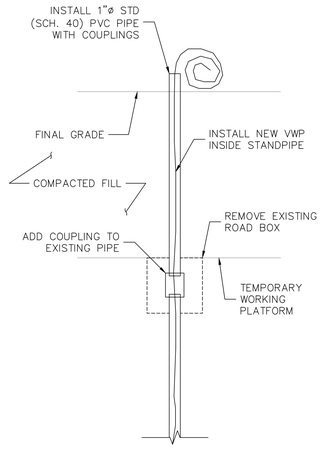
1. TVA WILL PROVIDE DATA LOGGERS, CONCRETE PADS, ROAD BOXES AND BOLLARDS IN FUTURE.
2. LOCATE WIRES AND PROTECTIVE PIPE TO AVOID CONFLICT DURING CONSTRUCTION OF DMM WALLS.



DETAIL 2: EXISTING VWP EXTENSION
SCALE: N.T.S.

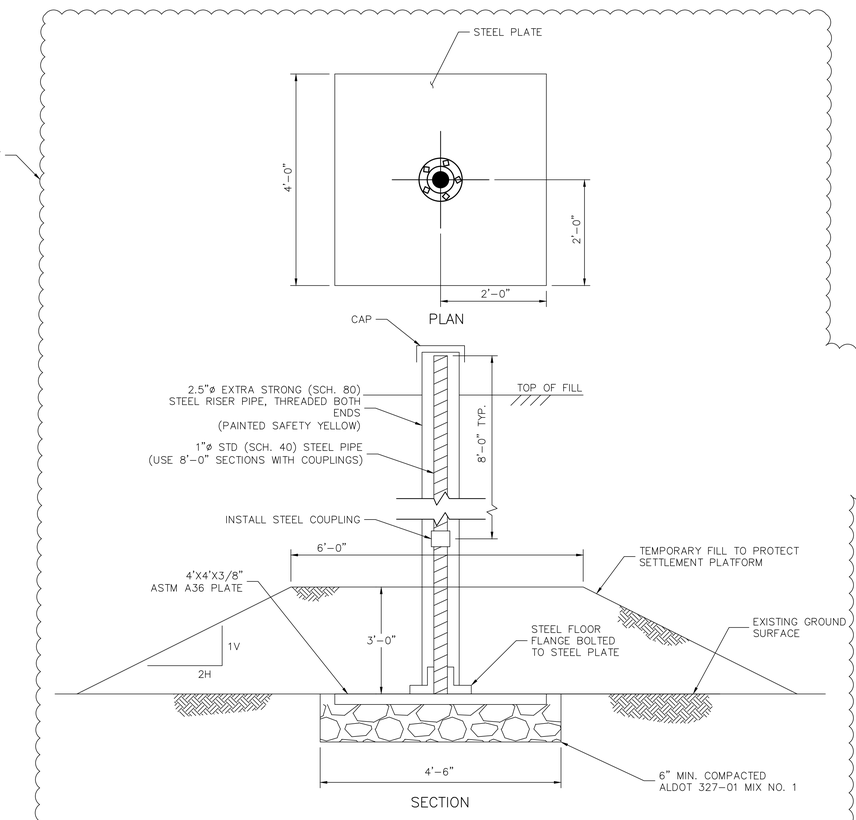


DETAIL 3: EXISTING OPEN STANDPIPE PIEZOMETER EXTENSION – TYPE 1
SCALE: N.T.S.



DETAIL 4: EXISTING OPEN STANDPIPE PIEZOMETER EXTENSION – TYPE 2
SCALE: N.T.S.

NOT IN CONTRACT



DETAIL 5: SETTLEMENT PLAFORM
SCALE: N.T.S.

INSTRUMENTATION SCHEDULE

VIBRATING WIRE PIEZOMETERS

INSTRUMENT BORING ID	NORTHING	EASTING	EXISTING GROUND SURFACE ELEVATION	ELEVATION OF NEW VWP
STN-4-3	1723645.0	394255.5	430.0	411.5
STN-4-5	1723366.2	394797.6	440.7	420.5
STN-4-6	1723372.5	394865.2	425.0	407.0
STN-4-8	1722943.9	395089.6	425.4	406.5
STN-4-10	1722357.0	395400.9	423.9	411.0
STN-4-12	1721505.1	395748.3	452.7	431.0
STN-4-13	1721330.4	395874.2	425.8	414.0
STN-4-16	1721125.5	395351.2	435.8	419.0

SETTLEMENT MONITORING POINTS

INSTRUMENT BORING ID	NORTHING	EASTING	EXISTING GROUND SURFACE ELEVATION
SMP-1	1722266.9	394430.8	478.2
SMP-2	1721928.1	394466.4	480.9
SMP-3	1721570.7	394564.7	476.7

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Wo□ur□MA □1□□1
7□1-7□1-4□□□

ALABAMA LICENSED PROFESSIONAL ENGINEER NO. 34318-E WILLIAM HERBERT WALTON

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT SF	AS CONST	REV. NO.
R	–	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–	–

ISSUED FOR CONSTRUCTION

SCALE: NONE — EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT INSTRUMENTATION DETAILS

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

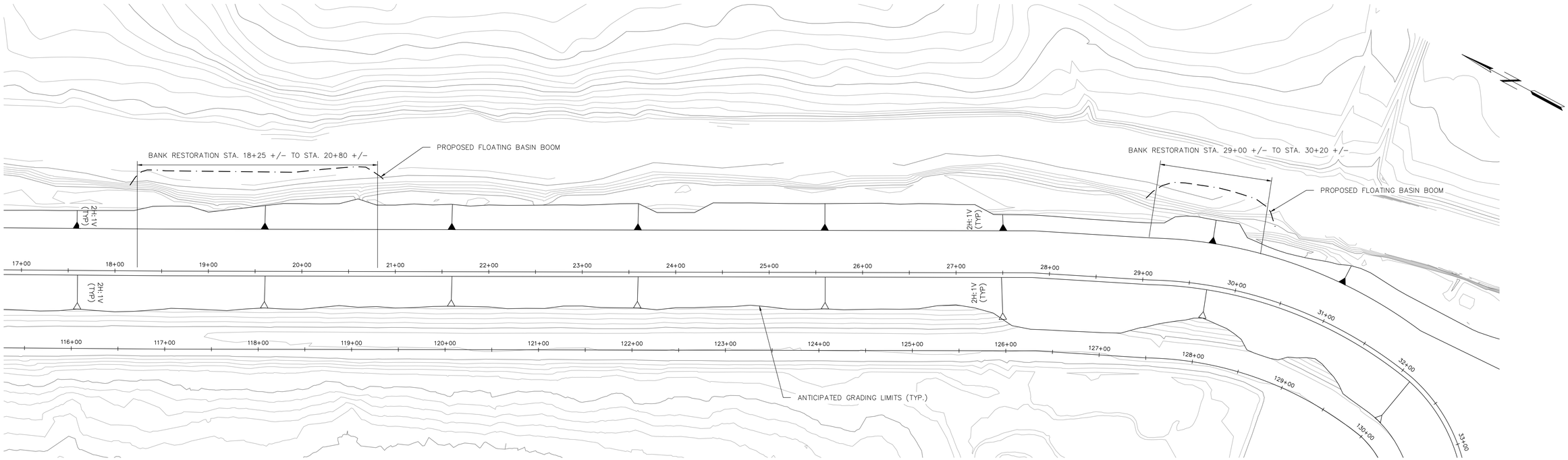
COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014 | DATE 7/31/15 | XX | C | 10W395-15 | R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

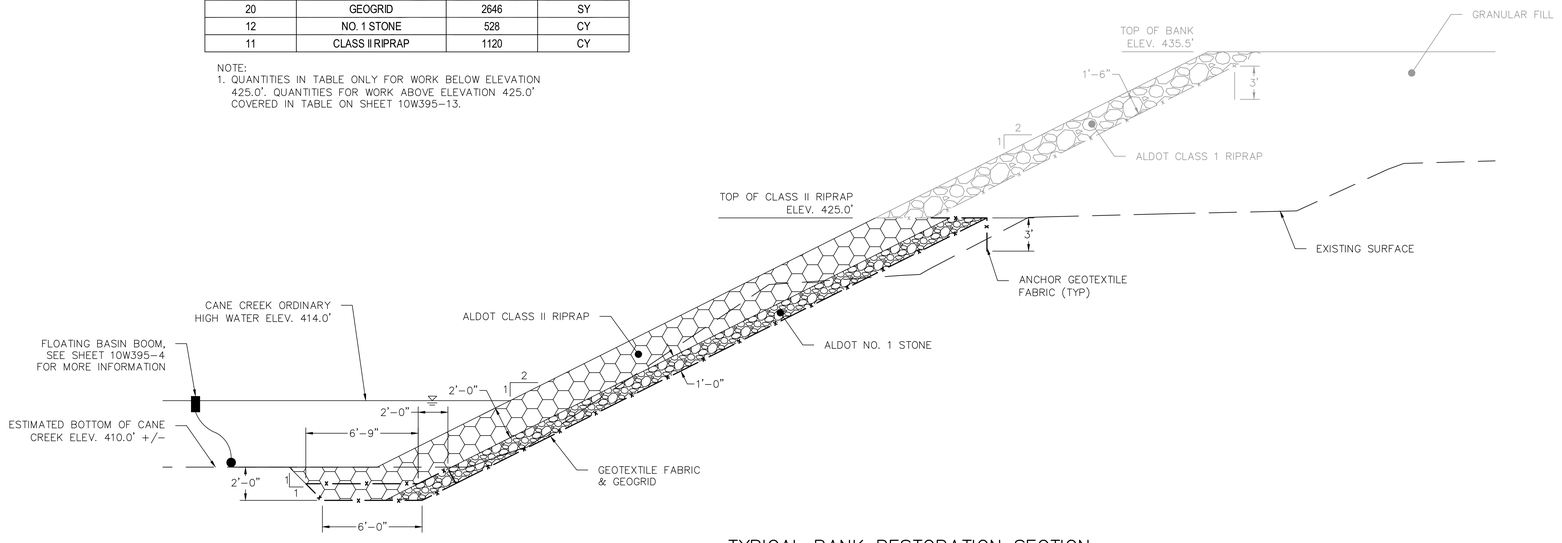
PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



PAY ITEM NO.	PAY ITEM	QUANTITY	UNITS
8	EXCAVATION	601	CY
19	GEOTEXTILE	2646	SY
20	GEOGRID	2646	SY
12	NO. 1 STONE	528	CY
11	CLASS II RIPRAP	1120	CY

NOTE:
1. QUANTITIES IN TABLE ONLY FOR WORK BELOW ELEVATION 425.0'. QUANTITIES FOR WORK ABOVE ELEVATION 425.0' COVERED IN TABLE ON SHEET 10W395-13.



TYPICAL BANK RESTORATION SECTION
CANE CREEK BANK, APPROXIMATE LOCATIONS SHOWN ABOVE

NOTES:

1. GEOTEXTILE FABRIC SHALL BE MIRAFI 180N OR APPROVED EQUIVALENT.
2. GEOGRID SHALL BE TENSAR TX160 OR APPROVED EQUIVALENT.
3. CONTRACTOR SHALL COORDINATE WITH ENGINEER AND TVA ENVIRONMENTAL PERSONNEL TO CONFIRM THE LOCATIONS OF THE CANE CREEK RESTORATION AREAS.

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ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM HERBERT WALTON

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST.
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–
ISSUED FOR CONSTRUCTION										

SCALE: NONE — EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT
CANE CREEK BANK RESTORATION

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

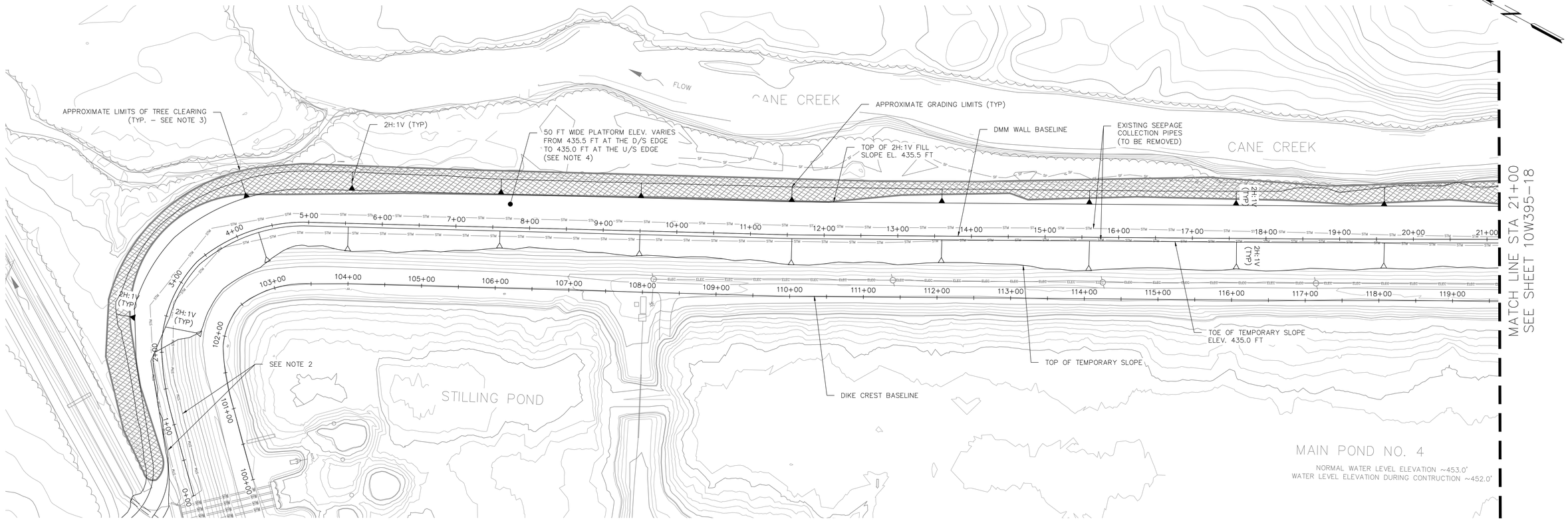
AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-16	R 0

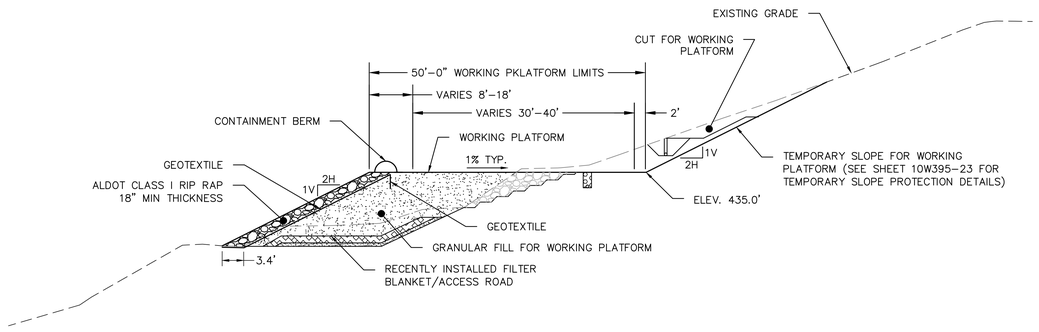
DISCIPLINE INTERFACE

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

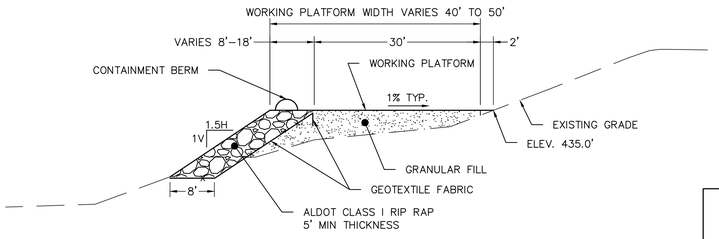
PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY





WORKING PLATFORM TYPICAL SECTION
DMM BASELINE STA 1+00 TO STA 35+80



WORKING PLATFORM TYPICAL SECTION
DMM BASELINE STA 35+80 TO STA 38+50

LEGEND:

APPROXIMATE LIMITS OF CLEARING AND GRUBBING

NOTE:

1. SEE NOTES ON SHEET 10W395-18.
2. CUT AND INSTALL MECHANICAL PLUG WITHIN PIPES EXPOSED IN THE EXCAVATION FOR THE WORKING PLATFORM.
3. CLEARING LIMITS SHOWN ARE APPROXIMATELY 10 FEET PAST LIMITS OF PROPOSED GRADING AND CANE CREEK BANK RESTORATION.
4. COORDINATE WORK WITH INSTRUMENT PROTECTION PLAN SHOWN ON SHEET 10W395-14 AND 10W395-15.

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GEI Consultants
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ALABAMA LICENSED PROFESSIONAL ENGINEER NO. 34318-E WILLIAM HERBERT WALTON

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–
ISSUED FOR CONSTRUCTION										

DISCIPLINE INTERFACE

SCALE: NONE EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT WORKING PLATFORM GRADING PLAN (1 OF 2)

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

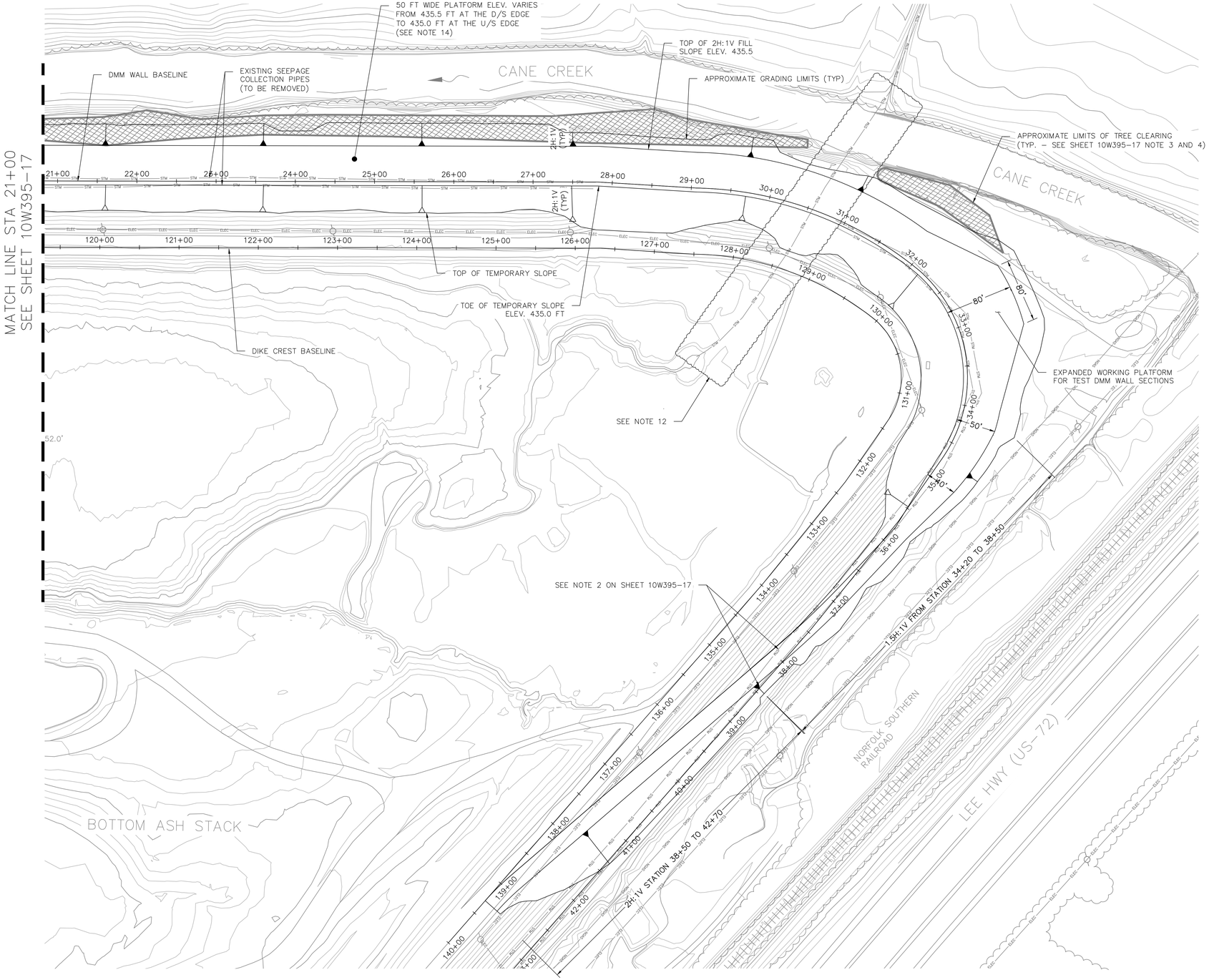
COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-17	R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



NOTES:

1. CONTRACTOR SHALL CONFINE OPERATIONS TO WITHIN INDICATED CONSTRUCTION LIMITS.
2. VISUALLY INSPECT THE CREST ROADWAY, POND AREA UPSTREAM OF THE CREST ROADWAY, AND SLOPE DOWNSTREAM OF THE CREST ROADWAY ON A DAILY BASIS DURING DOWNSTREAM SLOPE EXCAVATION FOR CONSTRUCTION OF THE WORKING PLATFORM AND AT LEAST ONCE PER WEEK THEREAFTER. REPORT ANY ISSUES THE TVA AND GEI IMMEDIATELY.
3. THE WORKING PLATFORM, AND HAUL AND ACCESS ROADS WITHIN THE WORK AREA SHALL HAVE AN AGGREGATE SURFACE. THE CONTRACTOR SHALL MAINTAIN THE WORKING PLATFORM, AND HAUL AND ACCESS ROADS IN A SERVICEABLE CONDITION AND PROVIDE DUST CONTROL BY WETTING THE SURFACES AS NECESSARY.
4. KEEP THE HAUL AND ACCESS ROADS CLEAR OF SPOIL OR SPILLAGE FROM HAULING EQUIPMENT.
5. WITHIN AREAS SCHEDULED TO BE EXCAVATED OR TO BE USED FOR STOCKPILING, STORAGE OR WORK AREAS, TOPSOIL SHALL BE STRIPPED TO ITS FULL DEPTH AND STOCKPILED FOR RE-USE IN THE FINAL RESTORATION OF THE SITE. THE SURFACE OF ALL DISTURBED AREAS SHALL GRADED TO DRAIN AND BE COVERED WITH A MINIMUM OF 6 INCHES OF TOPSOIL AND SEEDED.
6. STABILIZED SPOIL (I.E. SPOIL THAT HAS SET) MAY BE SPREAD ALONG THE WORKING PLATFORM OR INCORPORATED INTO THE BACKFILL REQUIRED TO MEET THE FINAL GRADING REQUIREMENTS. SPOIL OR WASTE MATERIAL MUST BE SET BEFORE PLACEMENT. NO WET MATERIALS SHALL BE PLACED.
7. DO NOT DISTURB EXISTING VEGETATION ON THE DIKE SLOPE ABOVE THE TOP OF THE TEMPORARY SLOPE. WHILE THE TEMPORARY CUT EXISTS, THE EXPOSED SLOPES OF THE DIKE SHOULD BE ROUTINELY MONITORED AND EROSION CHANNELS, DEPRESSIONS OR OTHER DAMAGE SHOULD BE FILLED OR REPAIRED TO MAINTAIN THE CURRENT SLOPE PROFILE.
8. IN AREAS WHERE THE EXISTING GRADE IS BELOW THE GRADE OF THE TOP OF THE WORKING PLATFORM, THE AREA SHOULD BE BACKFILLED WITH COMPACTED FILL.
9. THE WORKING PLATFORM SHALL EXTEND AT LEAST 5 FEET HORIZONTALLY BEYOND THE LIMITS OF THE DMM WALLS.
10. GEOMETRY OF THE EXISTING DIKES IS APPROXIMATE AND WAS ESTIMATED FROM HISTORICAL CONSTRUCTION RECORDS.
11. MAXIMUM EQUIPMENT LOADING NEAR THE EDGE OF WORKING PLATFORM: UNIFORM CONSTRUCTION SURCHARGE OF 1,400 PSF APPLIED AT THE DOWNSTREAM EDGE OF THE WORKING PLATFORM AND EXTENDING 15 FEET IN THE UPSTREAM DIRECTION. OTHER PRESSURES AND CONFIGURATIONS MAY BE PERMISSIBLE. SUBMIT EQUIPMENT WEIGHTS, APPLICATION AREAS, MAXIMUM CONTACT PRESSURES, AND OTHER SURCHARGE LOADS TO THE ENGINEER FOR EVALUATION PRIOR TO MOBILIZING TO THE SITE.
12. CONTRACTOR SHALL EXPOSE COAL YARD RUNOFF PIPE AND COORDINATE WORK WITH TVA PERSONNEL AND THE ENGINEER.
13. CLEARING LIMITS SHOWN ARE APPROXIMATELY 10 FEET PAST LIMITS OF PROPOSED GRADING AND CANE CREEK BANK RESTORATION.
14. COORDINATE WORK WITH INSTRUMENT PROTECTION PLAN SHOWN ON SHEETS 10W395-14 AND 10W395-15.

LEGEND:

APPROXIMATE LIMITS OF CLEARING AND GRUBBING

CONTOUR INTERVAL

GEI Consultants
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ALABAMA LICENSED PROFESSIONAL ENGINEER NO. 34318-E WILLIAM HERBERT WALTON

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–
ISSUED FOR CONSTRUCTION										

DISCIPLINE INTERFACE

SCALE: NONE EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT WORKING PLATFORM GRADING PLAN (2 OF 2)

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

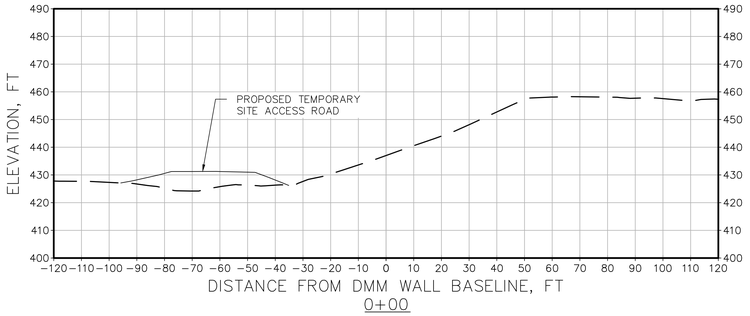
COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-18	R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



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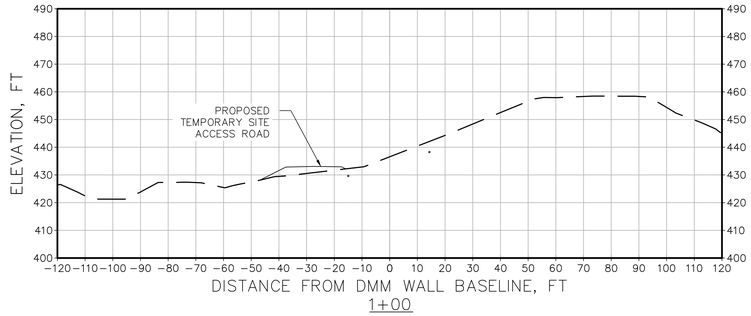

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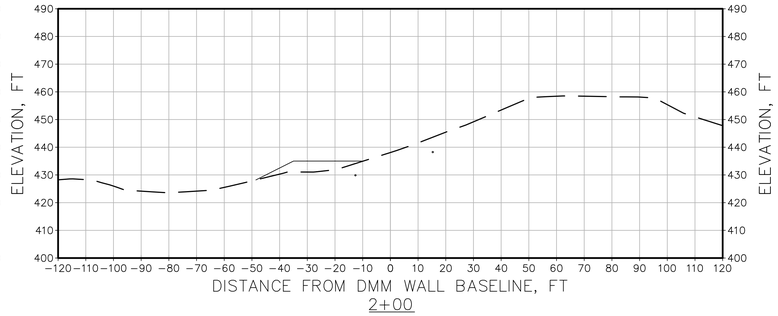

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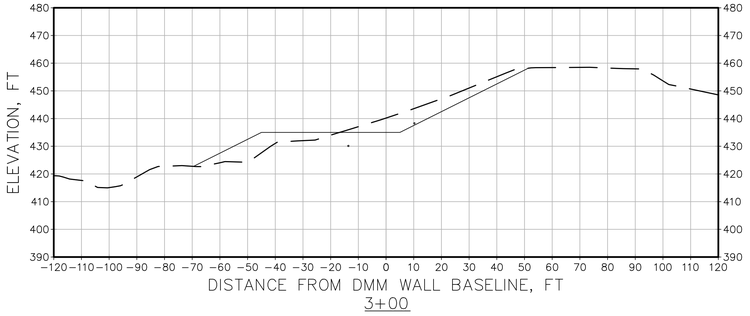

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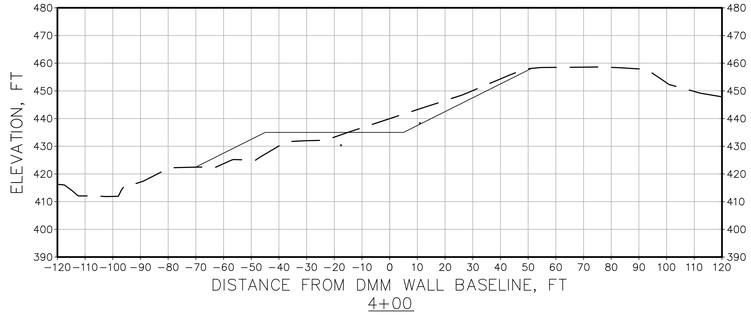

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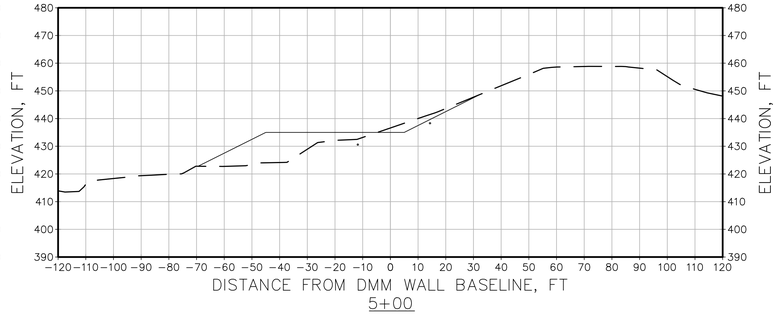

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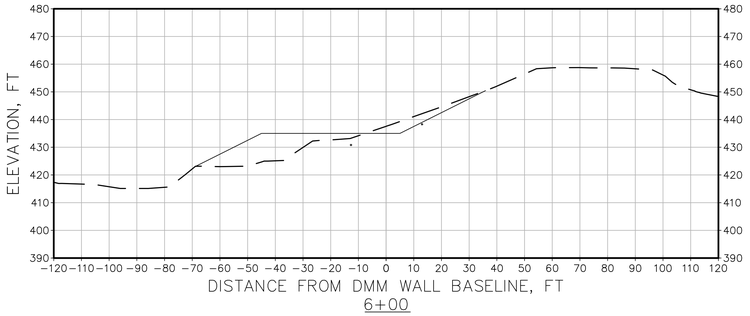

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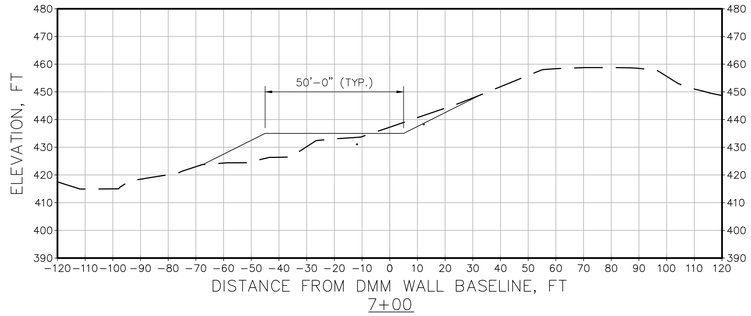

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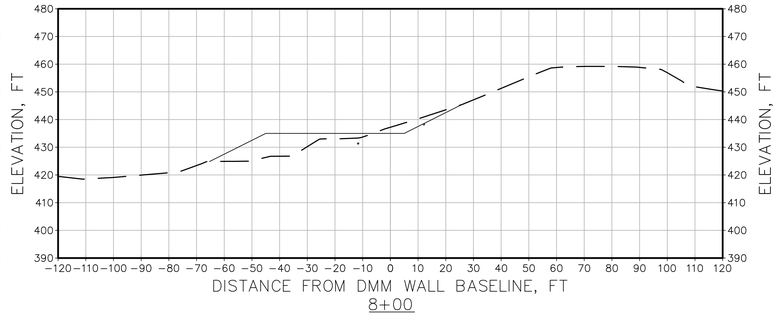

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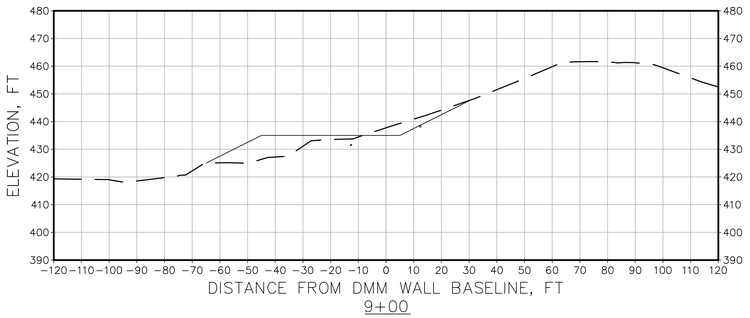

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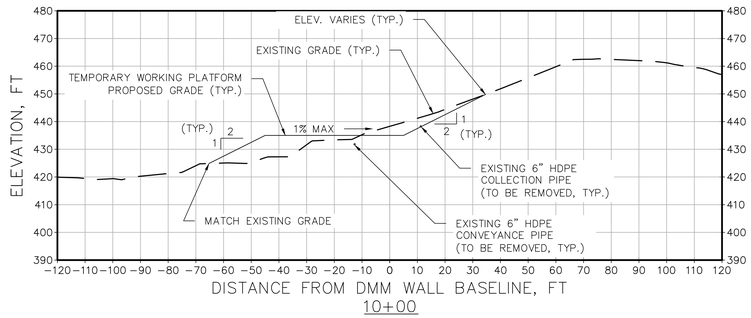

10+00

LEGEND

EXISTING GRADE FROM TVA (11/07/14)

TEMPORARY WORKING PLATFORM PROPOSED GRADE

NOTES:
1. EXISTING SEEPAGE COLLECTION SYSTEM INFORMATION HAS BEEN PROVIDED BY TVA. PLEASE REFER TO RECORD DRAWINGS FOR THE SEEPAGE REMEDIATION PROJECT DATED JANUARY 4, 2013, TVA DELIVERABLE ID: COLBERT FACILITY–P4SR–0003.

GEI Consultants
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Wo□r□MA □1□□1
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ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM HERBERT WALTON

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST.
R	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–
ISSUED FOR CONSTRUCTION										

DISCIPLINE INTERFACE: REV. NO. | DATE

SCALE: NONE — EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT WORKING PLATFORM CROSS SECTIONS (1 OF 4)

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

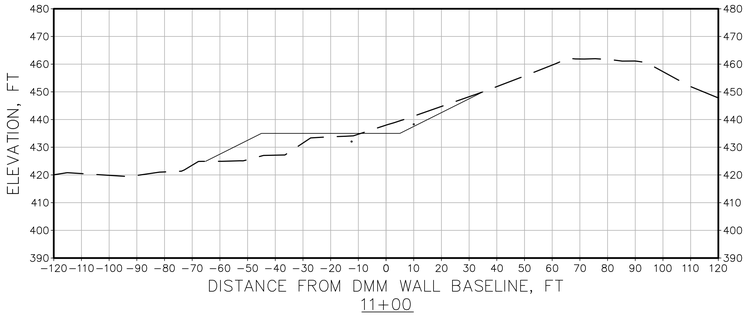
COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395–19	R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



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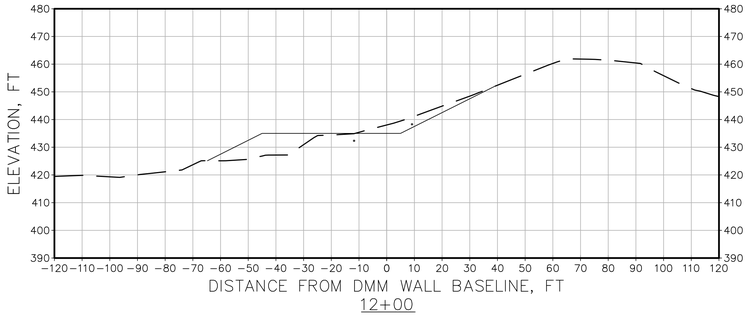

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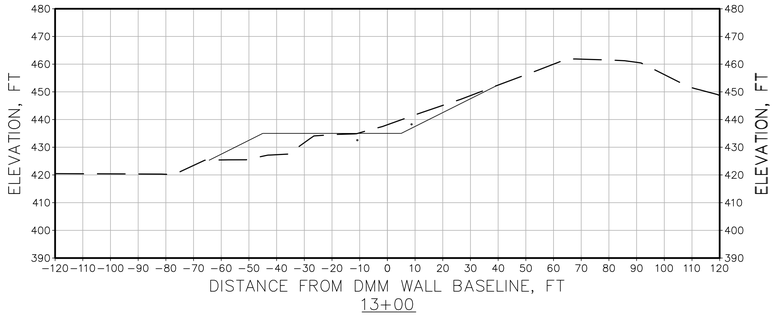

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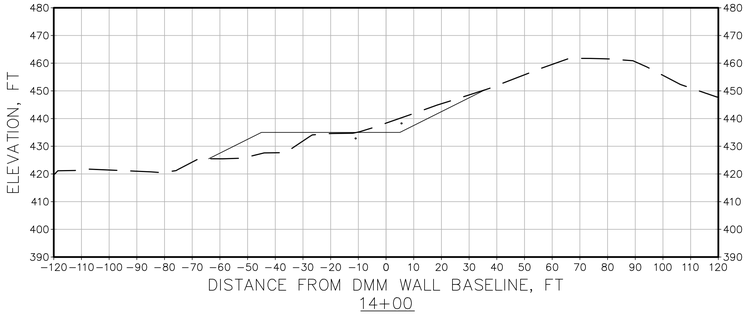

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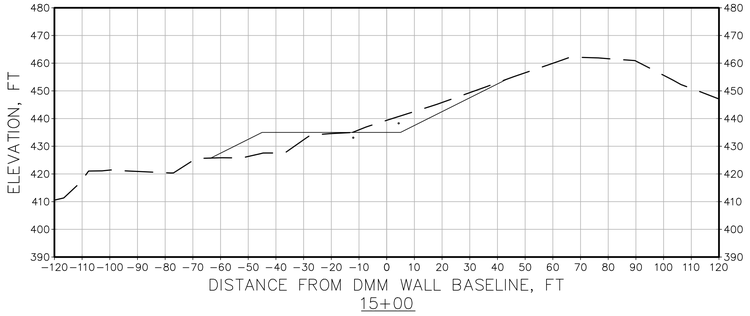

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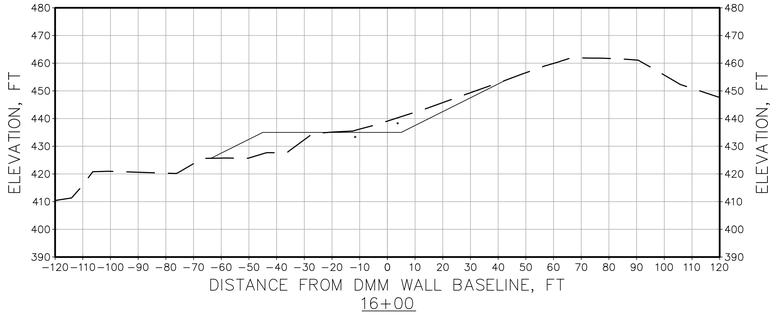

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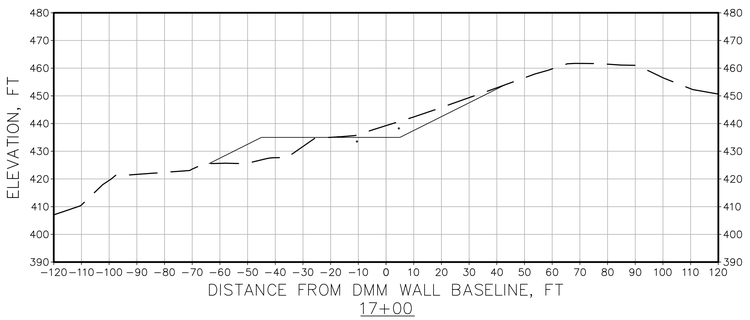

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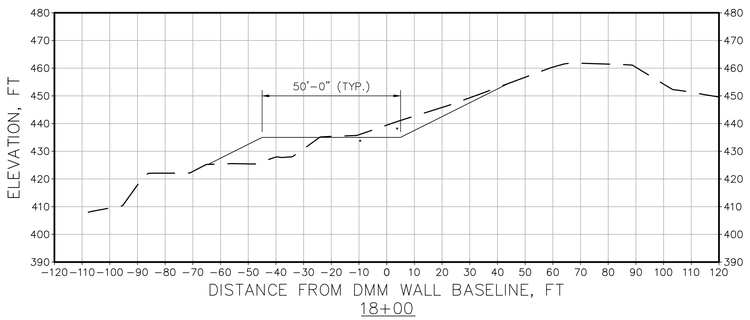

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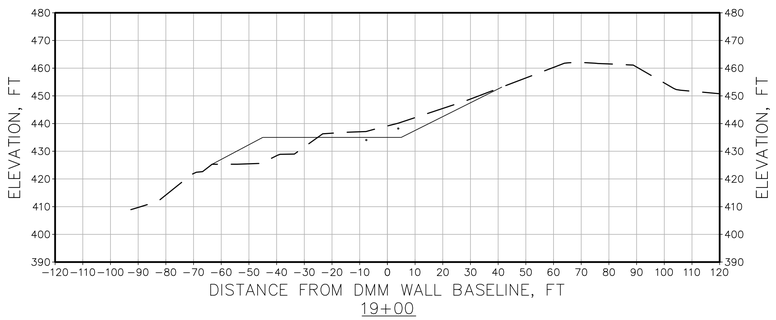

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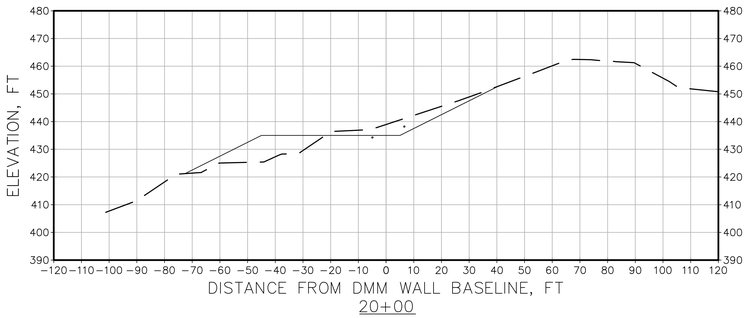

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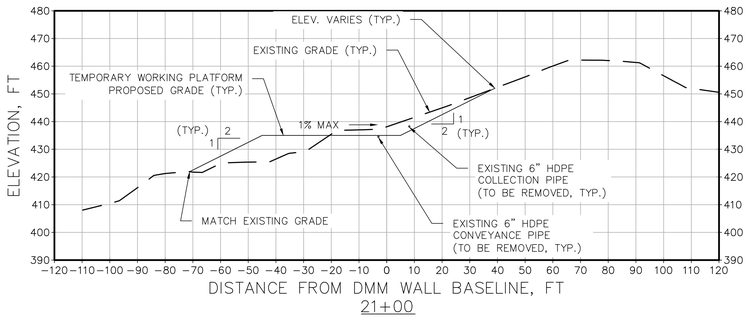


21+00

LEGEND

EXISTING GRADE FROM TVA (11/07/14)

TEMPORARY WORKING PLATFORM PROPOSED GRADE

NOTES:

1. EXISTING SEEPAGE COLLECTION SYSTEM INFORMATION HAS BEEN PROVIDED BY TVA. PLEASE REFER TO RECORD DRAWINGS FOR THE SEEPAGE REMEDIATION PROJECT DATED JANUARY 4, 2013, TVA DELIVERABLE ID: COLBERT FACILITY-P4SR-0003.

GEI Consultants
4□□U□cor□Par□Dr□e
Wo□ur□□MA □1□□1
7□1-7□1-4□□□

ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM HERBERT WALTON

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST.	DISCIPLINE INTERFACE
R	–	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–	–
ISSUED FOR CONSTRUCTION											

SCALE: NONE — EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT WORKING PLATFORM CROSS SECTIONS (2 OF 4)

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

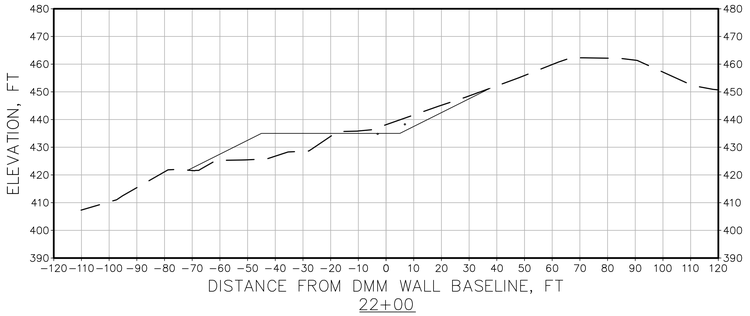
COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-20	R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



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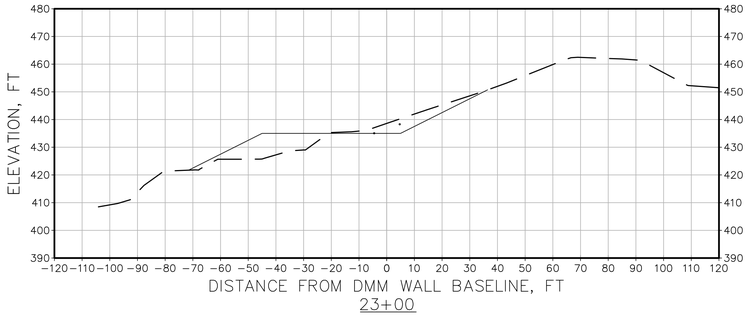

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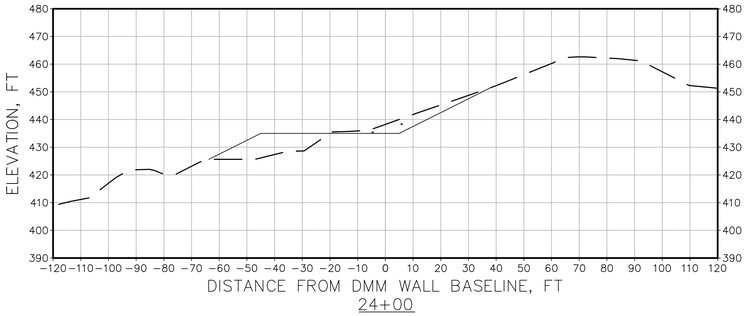

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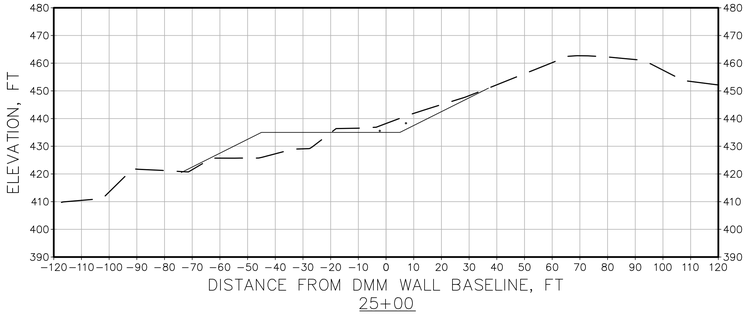

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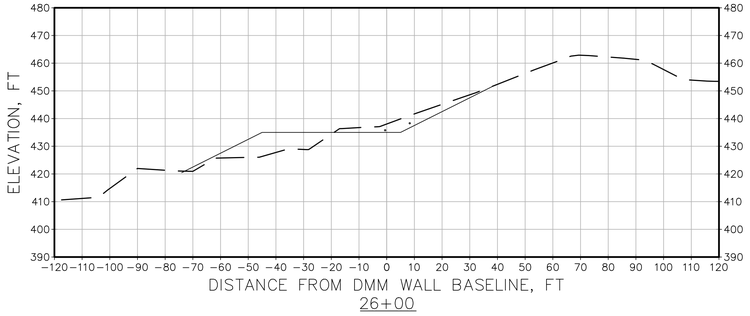

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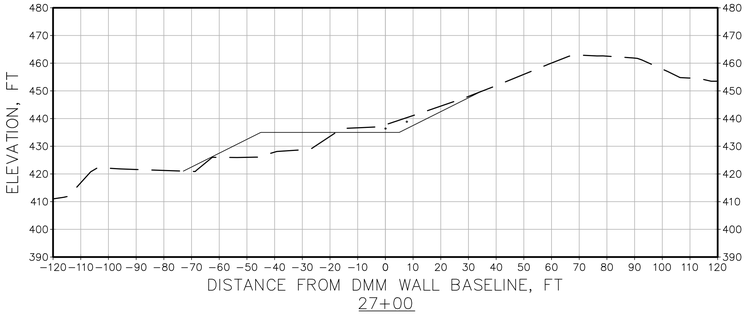

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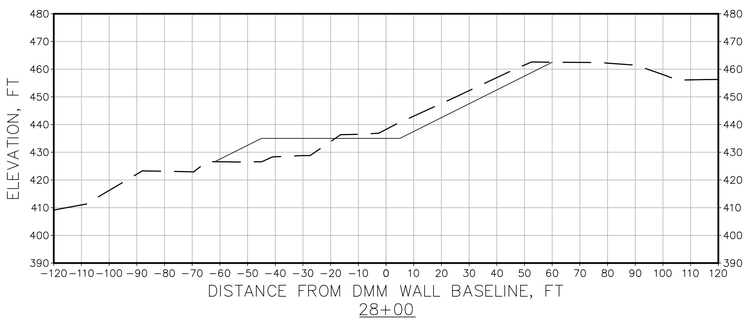

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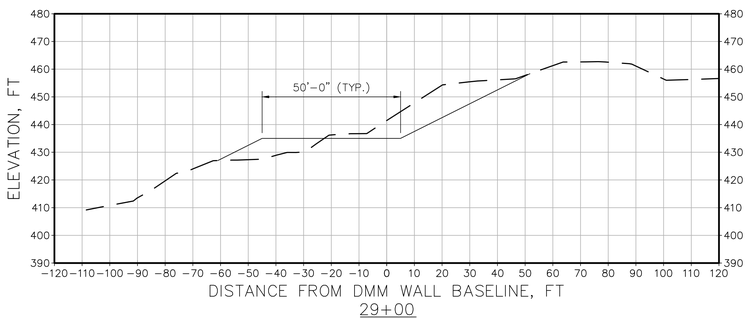

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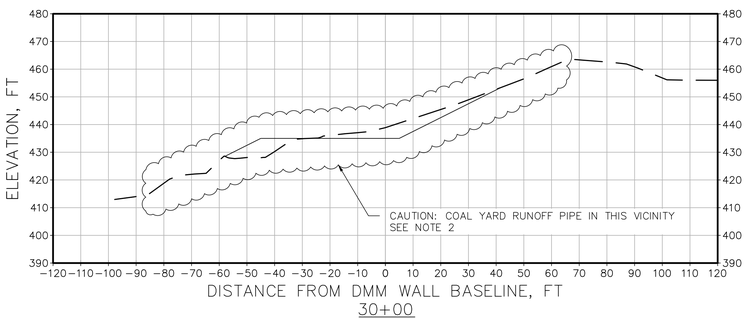

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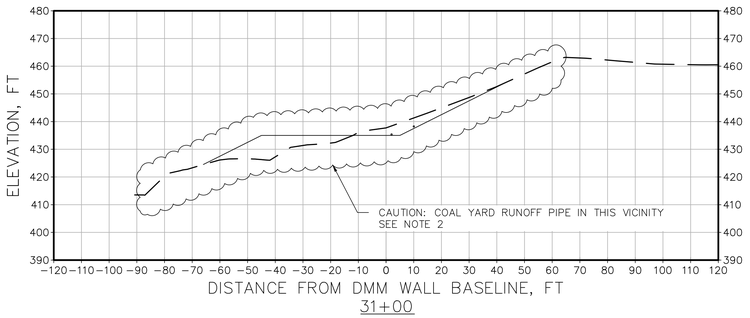

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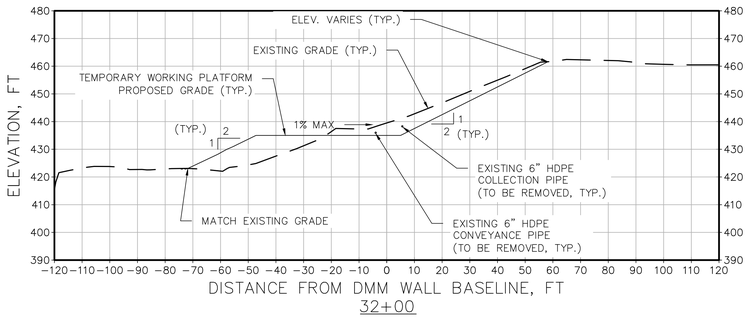


32+00

NOTES:
1. EXISTING SEEPAGE COLLECTION SYSTEM INFORMATION HAS BEEN PROVIDED BY TVA. PLEASE REFER TO RECORD DRAWINGS FOR THE SEEPAGE REMEDIATION PROJECT DATED JANUARY 4, 2013, TVA DELIVERABLE ID: COLBERT FACILITY-P4SR-0003.
2. COAL YARD RUNOFF PIPE LOCATION SHOWN IN PLAN IS APPROXIMATE. RUNOFF PIPE SHALL BE LOCATED IN FIELD PRIOR TO WORKING IN THESE AREAS. CONTRACTOR TO PROTECT PIPE IN PLACE DURING ALL CONSTRUCTION ACTIVITIES. WORK ENCROACHING ON RUNOFF PIPE SHALL BE COORDINATED WITH THE ENGINEER AND TVA.

LEGEND

EXISTING GRADE FROM TVA (11/07/14)

TEMPORARY WORKING PLATFORM PROPOSED GRADE

GEI Consultants
4□□U□cor□Par□Dr□e
Wo□r□□MA □1□□1
7□1-7□1-4□□□

ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM HERBERT WALTON

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–

ISSUED FOR CONSTRUCTION

SCALE: NONE EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT WORKING PLATFORM CROSS SECTIONS (3 OF 4)

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

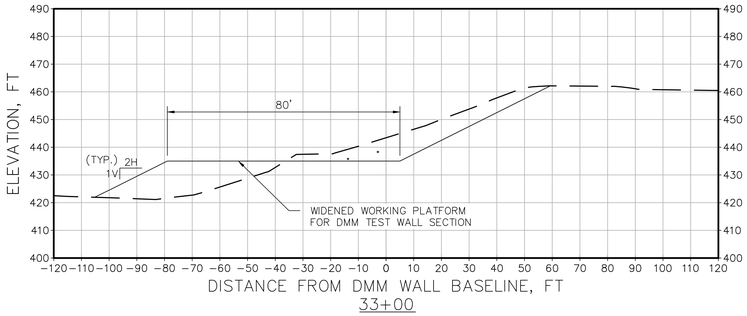
COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-21	R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



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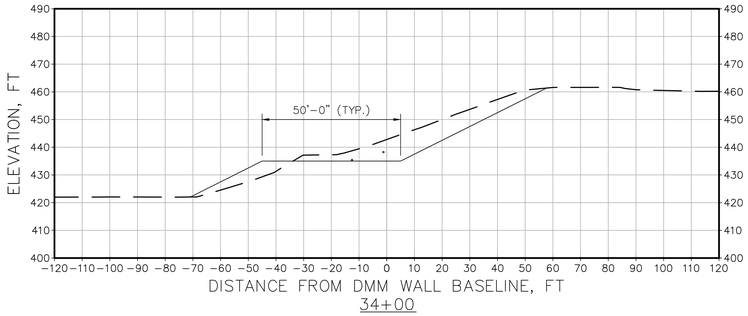

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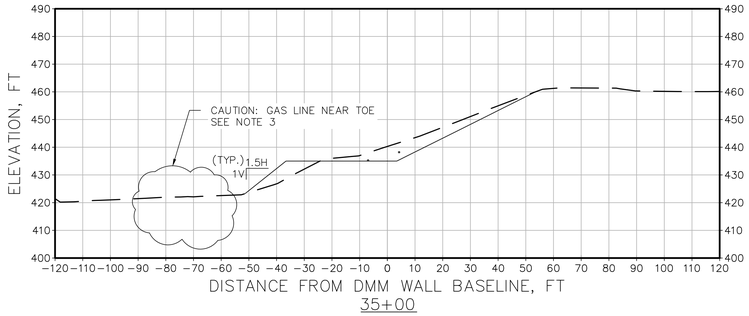

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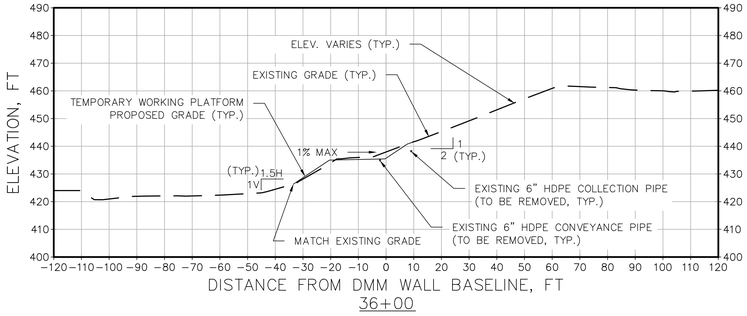

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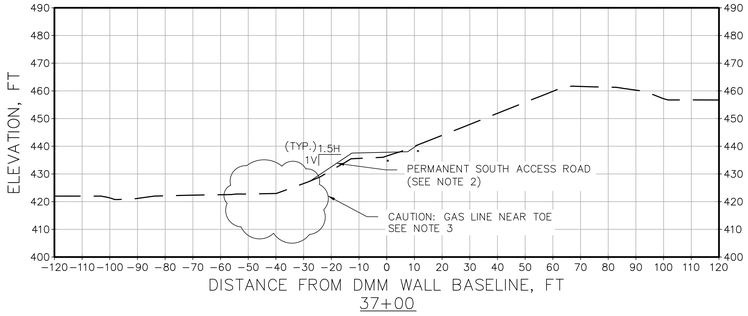

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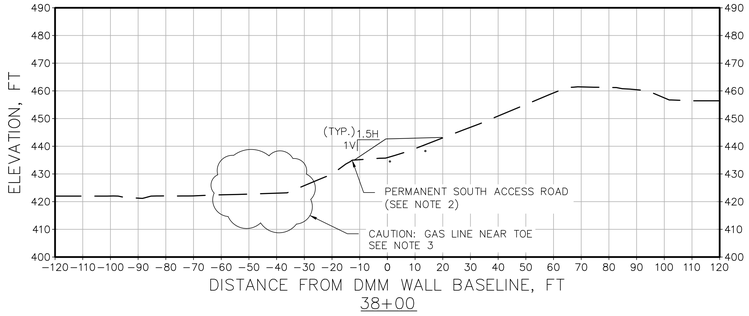

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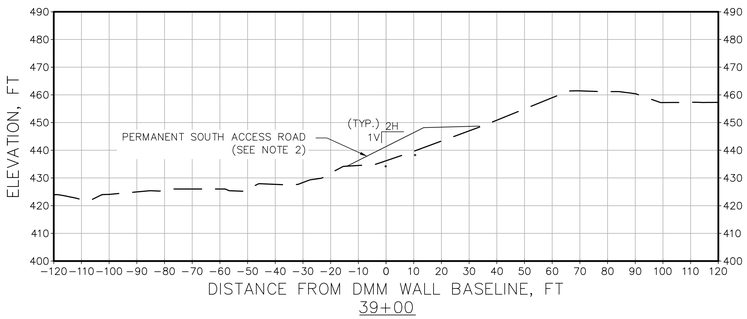

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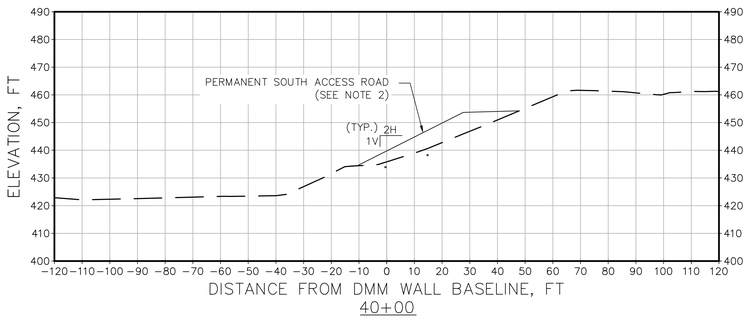

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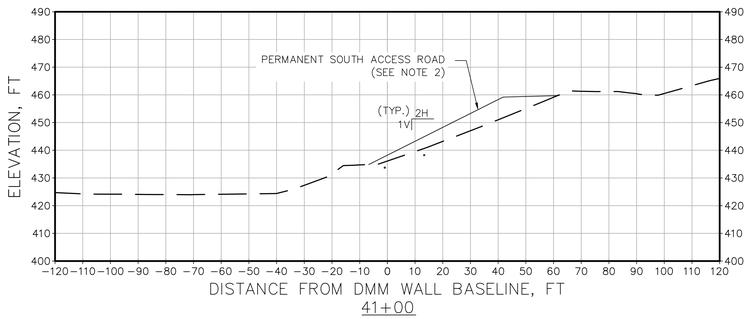

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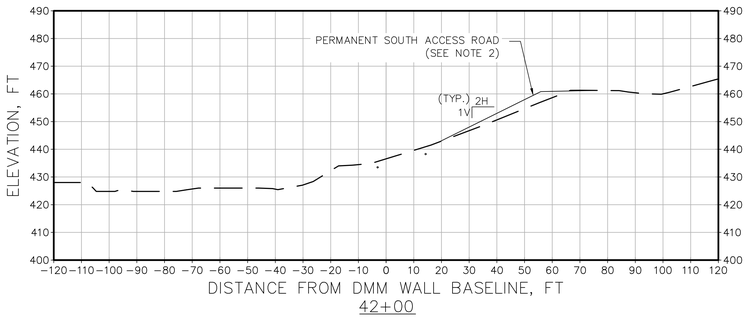


42+00

NOTES:

1. EXISTING SEEPAGE COLLECTION SYSTEM INFORMATION HAS BEEN PROVIDED BY TVA. PLEASE REFER TO RECORD DRAWINGS FOR THE SEEPAGE REMEDIATION PROJECT DATED JANUARY 4, 2013, TVA DELIVERABLE ID: COLBERT FACILITY-P4SR-0003.
2. SECTIONS AT STATIONS 36+00 TO 42+00 SHOW THE PERMANENT SOUTH ACCESS ROAD.
3. GAS LINE LOCATION SHOWN IN PLAN IS APPROXIMATE. GAS LINE SHALL BE LOCATED IN FIELD PRIOR TO WORKING IN THESE AREAS. CONTRACTOR TO MAINTAIN 10' OFFSET FROM GAS LINE DURING ALL CONSTRUCTION ACTIVITIES. WORK ENCROACHING ON GAS LINE SHALL BE COORDINATED WITH UTILITY COMPANY, ENGINEER, AND TVA.

LEGEND

EXISTING GRADE FROM TVA (11/07/14)

TEMPORARY WORKING PLATFORM PROPOSED GRADE

GEI Consultants
4□□U□cor□Par□Dr□e
Wo□ur□□MA □1□□1
7□1-7□1-4□□□

ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM HERBERT WALTON

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST.
R	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–
ISSUED FOR CONSTRUCTION										

SCALE: NONE EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT WORKING PLATFORM CROSS SECTIONS (4 OF 4)

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

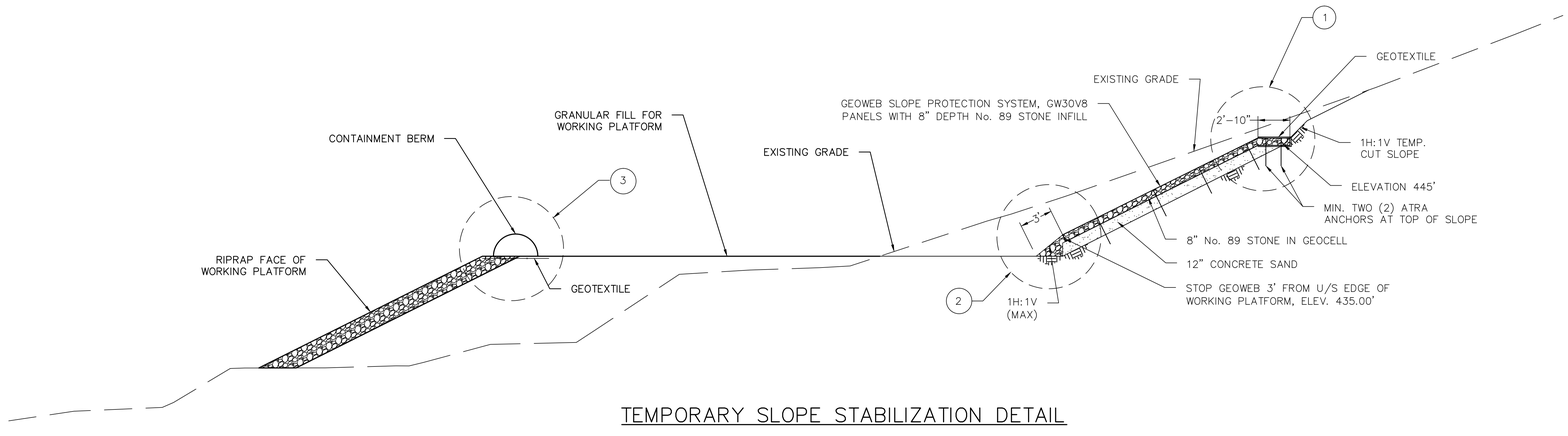
COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-22	R 0

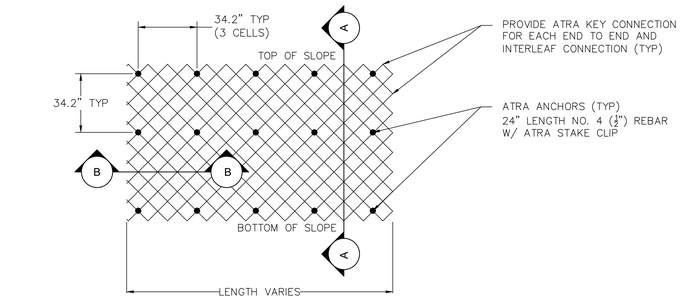
GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

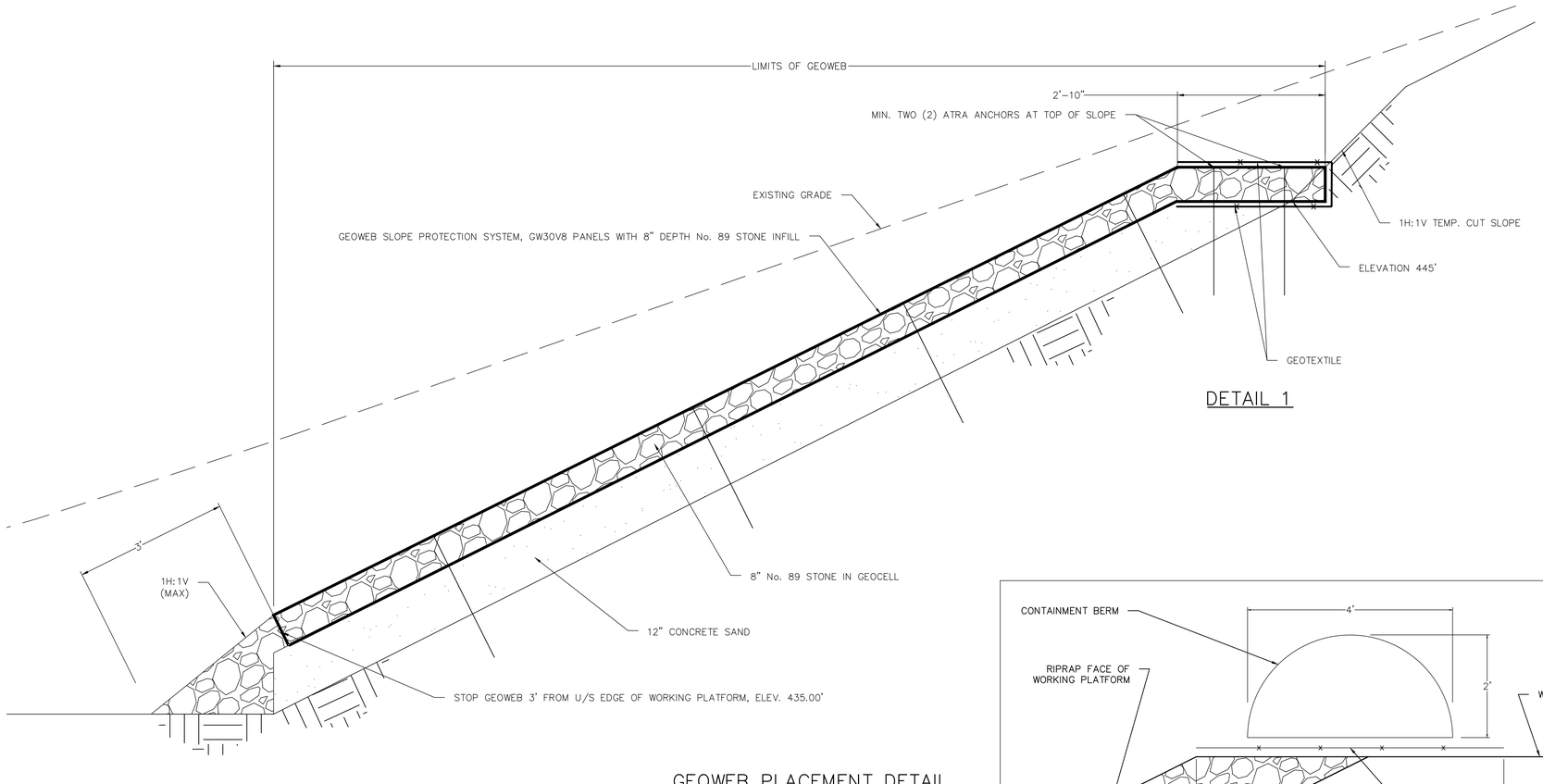
C.A.D. DRAWING
DO NOT ALTER MANUALLY



TEMPORARY SLOPE STABILIZATION DETAIL



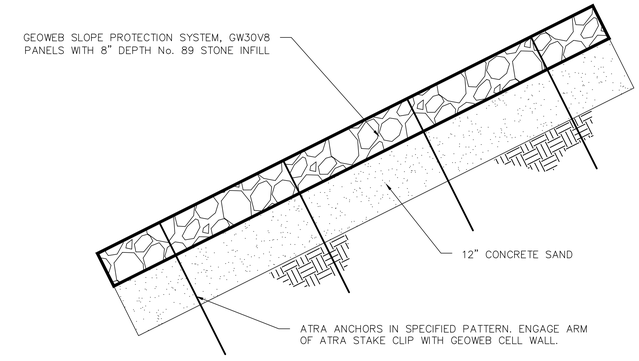
PLAN VIEW



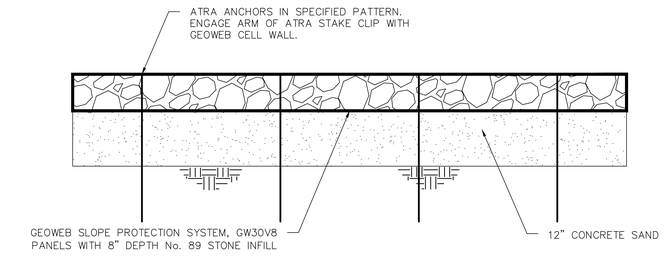
DETAIL 1

DETAIL 2

GEOWEB PLACEMENT DETAIL



SECTION A–A



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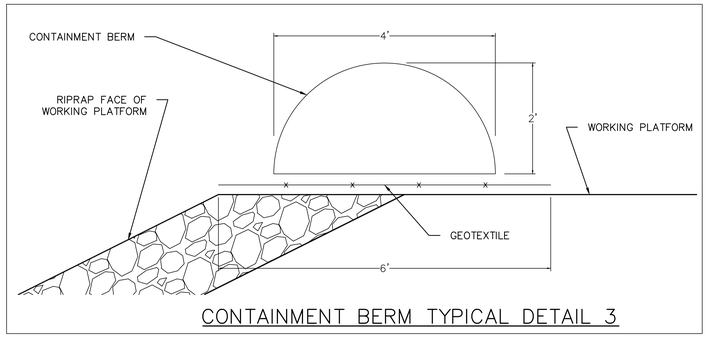


CONTAINMENT BERM TYPICAL DETAIL 3

GEI Consultants
4□□U□cor□Par□Dr□e
Wo□ur□□MA □1□□1
7□1-7□1-4□□□

ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM HERBERT WALTON

R	–	–	–	–	–	–	–	–	–	–	–	
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–	–	DISCIPLINE INTERFACE
ISSUED FOR CONSTRUCTION												
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. CLD	

SCALE: NONE — EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT TEMPORARY SLOPE STABILIZATION DETAILS

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

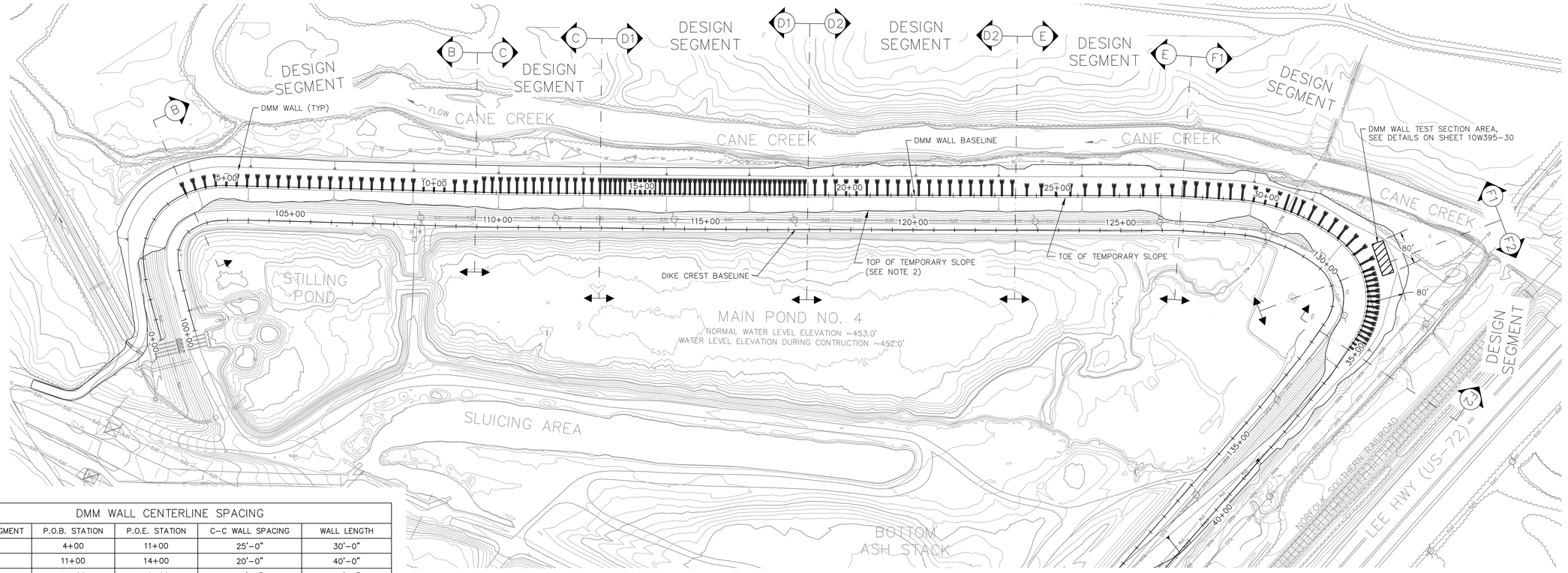
COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-23	R 0

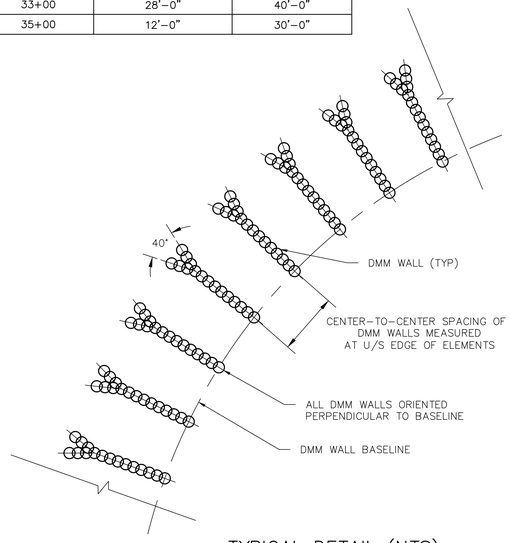
GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

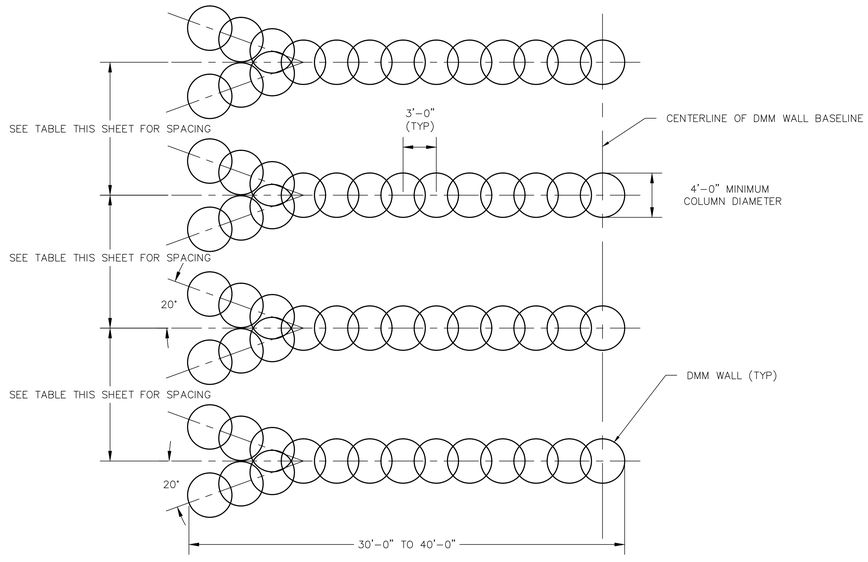
C.A.D. DRAWING
DO NOT ALTER MANUALLY



DMM WALL CENTERLINE SPACING				
DESIGN SEGMENT	P.O.B. STATION	P.O.E. STATION	C-C WALL SPACING	WALL LENGTH
B	4+00	11+00	25'-0"	30'-0"
C	11+00	14+00	20'-0"	40'-0"
D1	14+00	19+00	12'-0"	40'-0"
D2	19+00	24+00	25'-0"	40'-0"
E	24+00	28+00	35'-0"	30'-0"
F1	28+00	33+00	28'-0"	40'-0"
F2	33+00	35+00	12'-0"	30'-0"



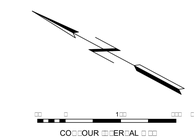
TYPICAL DETAIL (NTS)
CURVED ALIGNMENT DMM WALL DETAIL



TYPICAL DETAIL (NTS)
DMM DETAIL

NOTES:

1. PERFORM SOIL MIX TEST SECTION IN DMM WALL TEST SECTION AREA NEAR WALL STATION 33+00. CONTINUE TO PROVIDE ACCESS TO WATER SAMPLING AREA TO TVA.
2. THE UNPROTECTED TEMPORARY CUT SLOPE INTO THE DIKE ABOVE THE WORKING PLATFORM SHALL BE LIMITED TO 200 FEET IN LENGTH AT ONE TIME. THE CUT AREAS SHALL BE STABILIZED BY COVERING THE CUT SLOPE TEMPORARY GRANULAR FILTER. THE 200 FOOT LIMIT DOES NOT APPLY TO STABILIZED SLOPES.
3. RIPRAP, COBBLE SIZE ROCK FRAGMENTS, STUMPS AND PIPING MAY BE ENCOUNTERED IN THE UPPER SOILS DURING WORKING PLATFORM CONSTRUCTION AND DMM WALL INSTALLATION.



GEI Consultants
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ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM HERBERT WALTON

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–

ISSUED FOR CONSTRUCTION

SCALE: NONE — EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT DMM WALL LAYOUT PLAN

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE: 7/31/15	XX	C	10W395-24	R 0

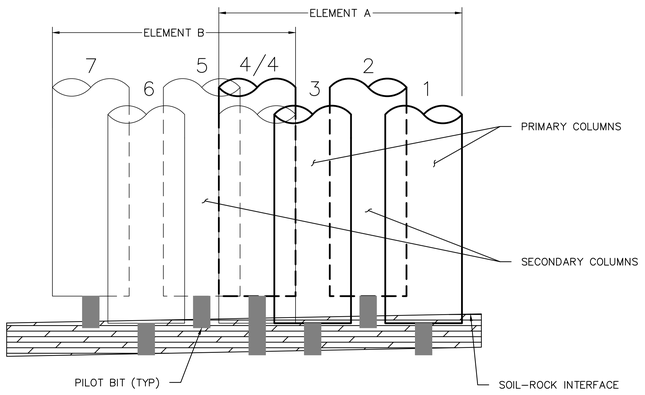
DISCIPLINE INTERFACE

REV. NO.	DATE
1	
2	
3	
4	

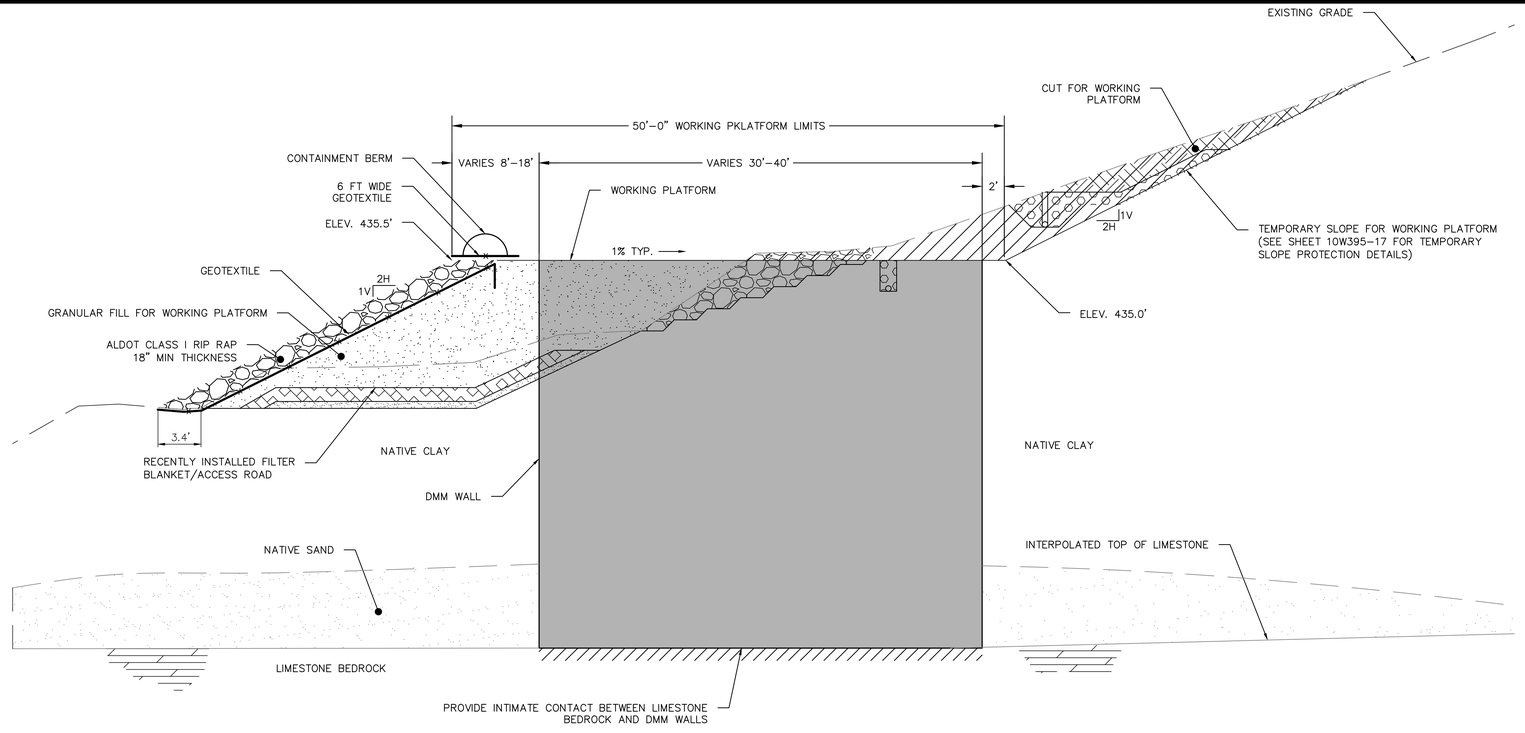
GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

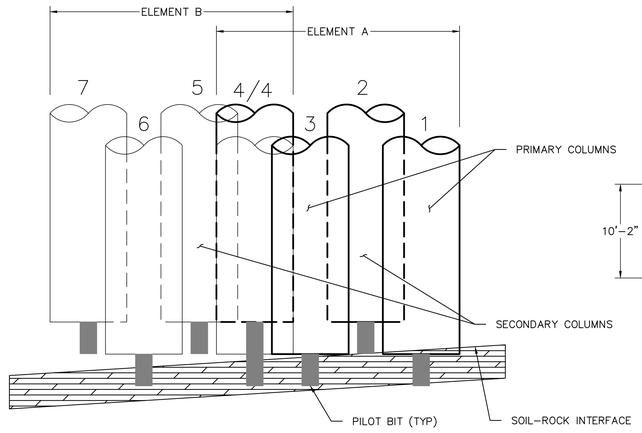
C.A.D. DRAWING
DO NOT ALTER MANUALLY



CONCEPTUAL SECTION–A 4 AUGER ELEMENTS
LEVEL ROCK CONDITION

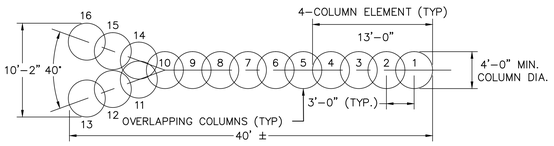


TYPICAL SECTION (NTS)
DMM WALL DETAIL

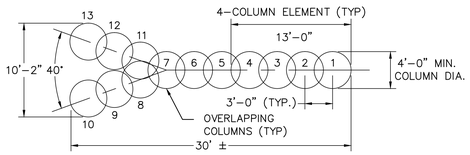


CONCEPTUAL SECTION–B 4 AUGER ELEMENTS
SLOPED ROCK CONDITION

NOTES:
1) ELEMENTS INSTALLED WITH 4–GANG AUGER SYSTEMS WITH OFFSETTING TIP ELEVATIONS WILL BE CONSIDERED TO HAVE PRIMARY (FULL DEPTH) AND SECONDARY (SHORTER DEPTH) COLUMNS.
2) SECONDARY COLUMNS WILL NEED TO BE REMIXED TO PROVIDE INTIMATE ROCK/DMM WALL CONTACT. REMIXING SHALL BE PERFORMED BY A SINGLE–AUGER MIXING RIG DOWN TO ROCK.
3) SECONDARY COLUMNS MAY BE REMIXED AS A PRIMARY COLUMNS ON THE SUBSEQUENT 4–GANG ELEMENT WITH A FULL DEPTH AUGER (E.G. COLUMN 4 AS SHOWN ABOVE).



TYPE 1 WALL DETAIL (NTS)
DEEP MIX METHOD (DMM) WALL



TYPE 2 WALL DETAIL (NTS)
DEEP MIX METHOD (DMM) WALL

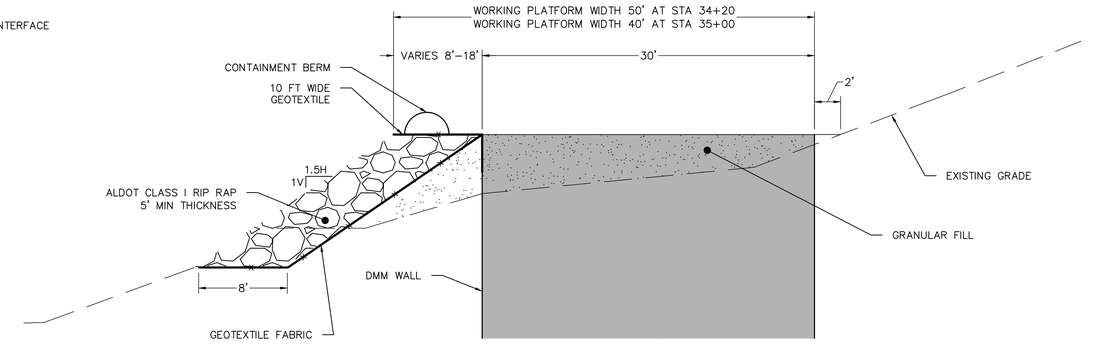
NOTE THE FOLLOWING SECONDARY COLUMNS WILL BE REMIXED USING A SINGLE AUGER RIG AS DESCRIBED ON THIS SHEET TO PROVIDE INTIMATE ROCK/DMM WALL CONTACT:

TYPE 1 WALLS: 2, 5, 8, 11, 13, 14 AND 16

TYPE 2 WALLS: 2, 5, 8, 10, 11 AND 13

NOTES:

1. THE DMM STABILIZATION WIDTH AND ALIGNMENT SHOWN ARE TYPICAL. THE ACTUAL STABILIZED WIDTH AND ALIGNMENT FOR INDIVIDUAL SEGMENTS OF THE DMM WALL SYSTEMS ARE SHOWN IN THE DMM WALL PLAN AND PROFILE DRAWINGS.
2. THE DMM WALL LAYOUT IS SHOWN AS A SCHEMATIC. ACTUAL LAYOUT MAY VARY BASED ON AVAILABLE EQUIPMENT AND THE APPROVED CONSTRUCTION METHODS.
3. PROVIDE INTIMATE CONTACT BETWEEN BOTTOM OF DMM WALL AND FRACTURED LIMESTONE BEDROCK. CONTRACTOR MUST USE TOOLING WITH ROCK TOOTH STINGER BIT AND ENOUGH DOWNLOAD AND TORQUE CAPACITY TO ESTABLISH A SOLID CONTACT FREE OF SOIL AND CUTTINGS.
4. UNCONFINED COMPRESSIVE STRENGTH OF DMM COLUMNS SHALL BE 275 PSI AT 28 DAYS.



TYPICAL SECTION (NTS)
STATION 34+20 – 35+00

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–
ISSUED FOR CONSTRUCTION										

SCALE: NONE — EXCEPT AS NOTED

GEI Consultants
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COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT
DMM WALL TYPICAL SECTION AND DETAILS

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014 | DATE 7/31/15 | XX | C | 10W395–25 | R 0

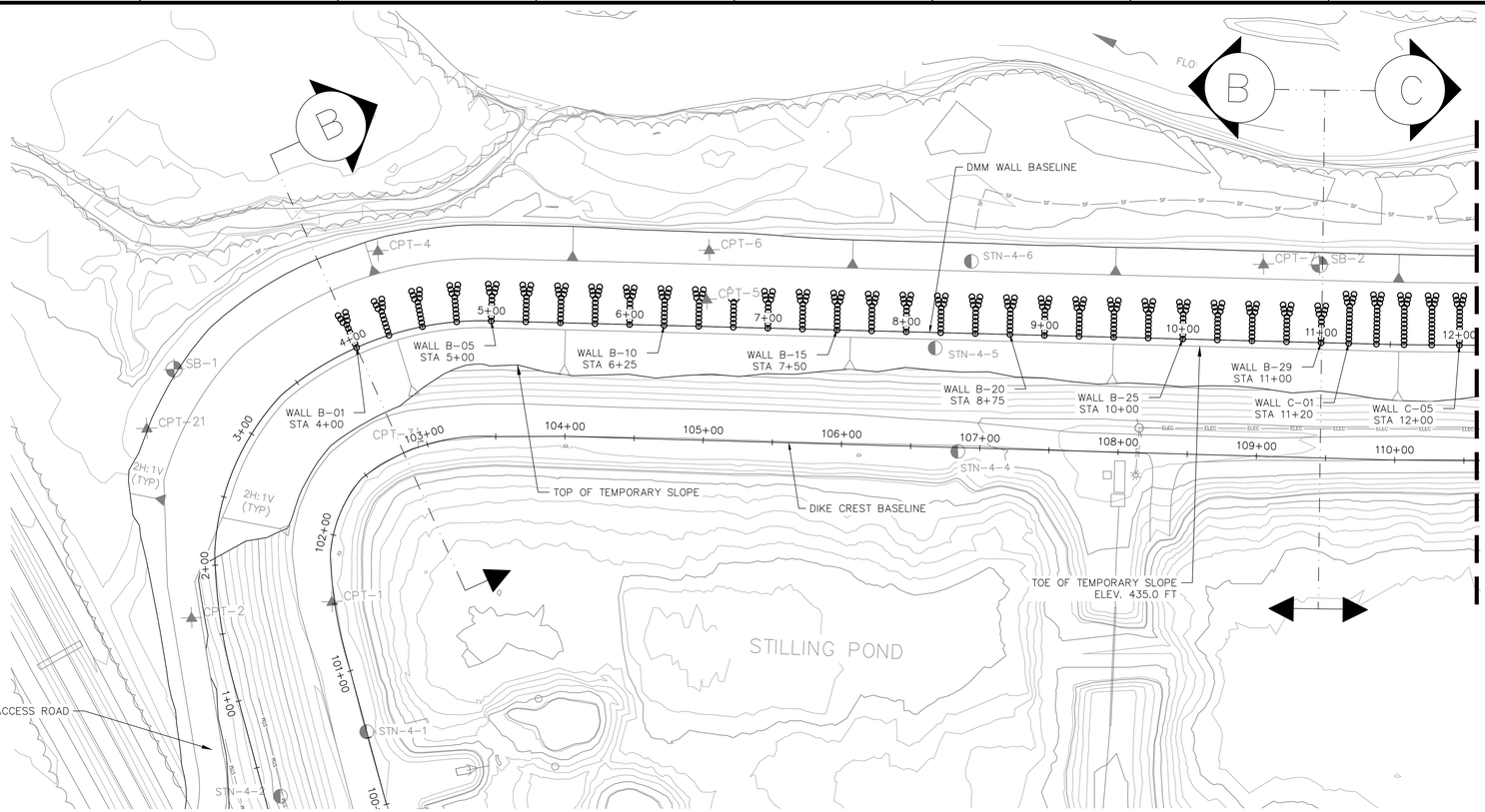
ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM NESBITT WALTON

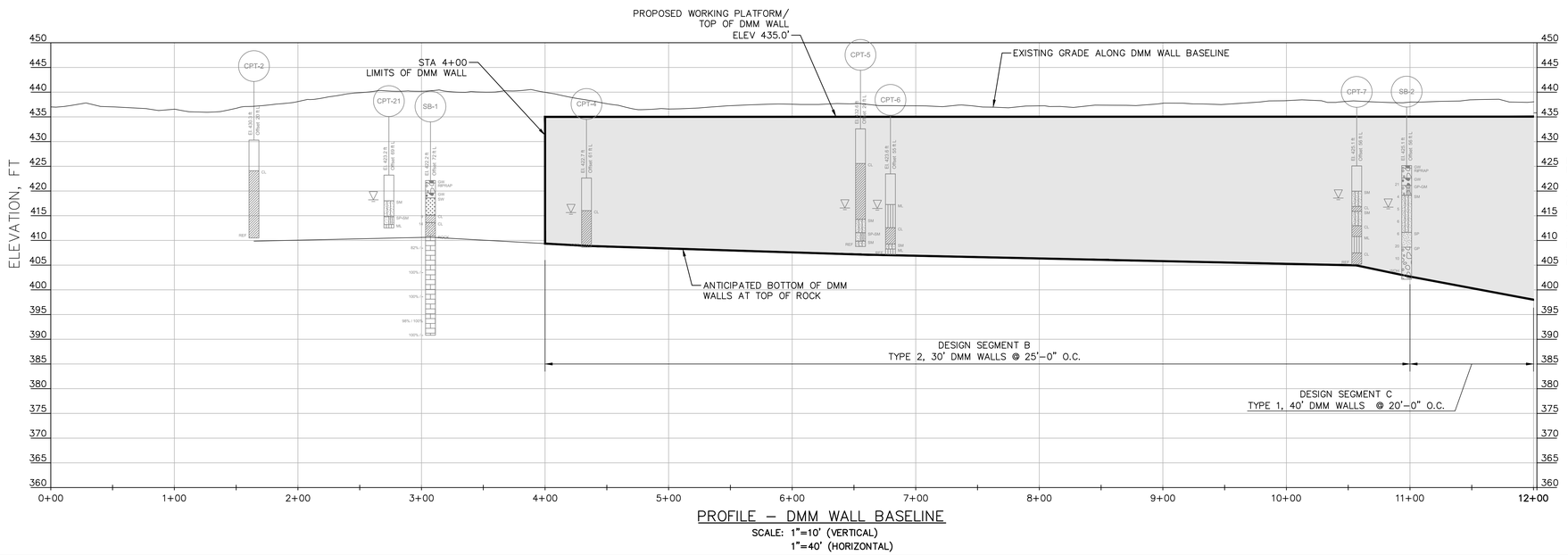
DISCIPLINE INTERFACE

GEI Consultants | 0
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY





PROFILE – DMM WALL BASELINE

SCALE: 1"=10' (VERTICAL)
1"=40' (HORIZONTAL)

NOTES:

1. SEE NOTES ON SHEET 10W395-24.
2. SUBSURFACE CONDITIONS ARE KNOWN AT BORING LOCATIONS ONLY. CONDITIONS BETWEEN BORINGS AND SAMPLES MAY VARY FROM THE CONDITIONS AT THE BORINGS AND MAY VARY SIGNIFICANTLY FROM THE INTERPRETATIONS SHOWN ON THE DRAWINGS. REFER TO INDIVIDUAL BORING LOGS FOR ADDITIONAL INFORMATION.
3. THE TOP OF THE BEDROCK STRATA WAS MODELED FROM AVAILABLE TEST BORING DATA WITHIN APPROXIMATELY 200 FEET FROM THE SHEAR WALL BASELINE. THE SUBSURFACE PROFILE ONLY SHOWS BORINGS ALONG THE DIKE TOE.
4. THE ELEVATIONS OF THE STRATA BREAKS AND THE TOP OF ROCK SHOWN ON THE DRAWINGS DEPICT THE APPROXIMATELY SUBSURFACE CONSTRUCTION AT THE INDIVIDUAL BORING LOCATIONS ONLY AT THE TIME OF DRILLING. CONDITIONS AT OTHER LOCATIONS MAY DIFFER FROM THOSE OCCURRING AT THE BORING LOCATIONS. ANY CORRELATIONS SHOWN BETWEEN BORINGS ARE BASED ON INTERPRETATION OR INTERPOLATION OF THE AVAILABLE SUBSURFACE DATA. ACTUAL CONDITIONS BETWEEN BORINGS ARE UNKNOWN AND MAY DIFFER FROM WHAT IS SHOWN ON THE DRAWINGS.
5. BURIED PIPES, WHERE KNOWN TO EXIST WITHIN THE FOOTPRINT OF THE PERMANENT DMM WALL STABILIZATION ARE TO BE REMOVED BY THE CONTRACTOR DURING CONSTRUCTION.
6. UNKNOWN BURIED OBSTRUCTION MAY EXIST WITHIN THE AREA OF DMM WALL CONSTRUCTION. IF OBSTRUCTIONS ARE ENCOUNTERED DURING WORKING PLATFORM OR DMM WALL CONSTRUCTION, THEY SHOULD BE BACKFILLED IN ACCORDANCE WITH THE REQUIREMENTS IN THE SPECIFICATIONS. POTHOLING WILL BE PERMITTED TO REMOVED RIPRAP AND STUMPS.
7. COORDINATE THIS WORK WITH INSTRUMENTATION PROTECTION WORK SHOWN ON SHEETS 10W395-14 AND 10W395-15.

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GEI Consultants
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REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–

ISSUED FOR CONSTRUCTION

SCALE: NONE EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT DMM WALL PLAN AND PROFILE (1 OF 4)

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM NESBITT WALTON

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

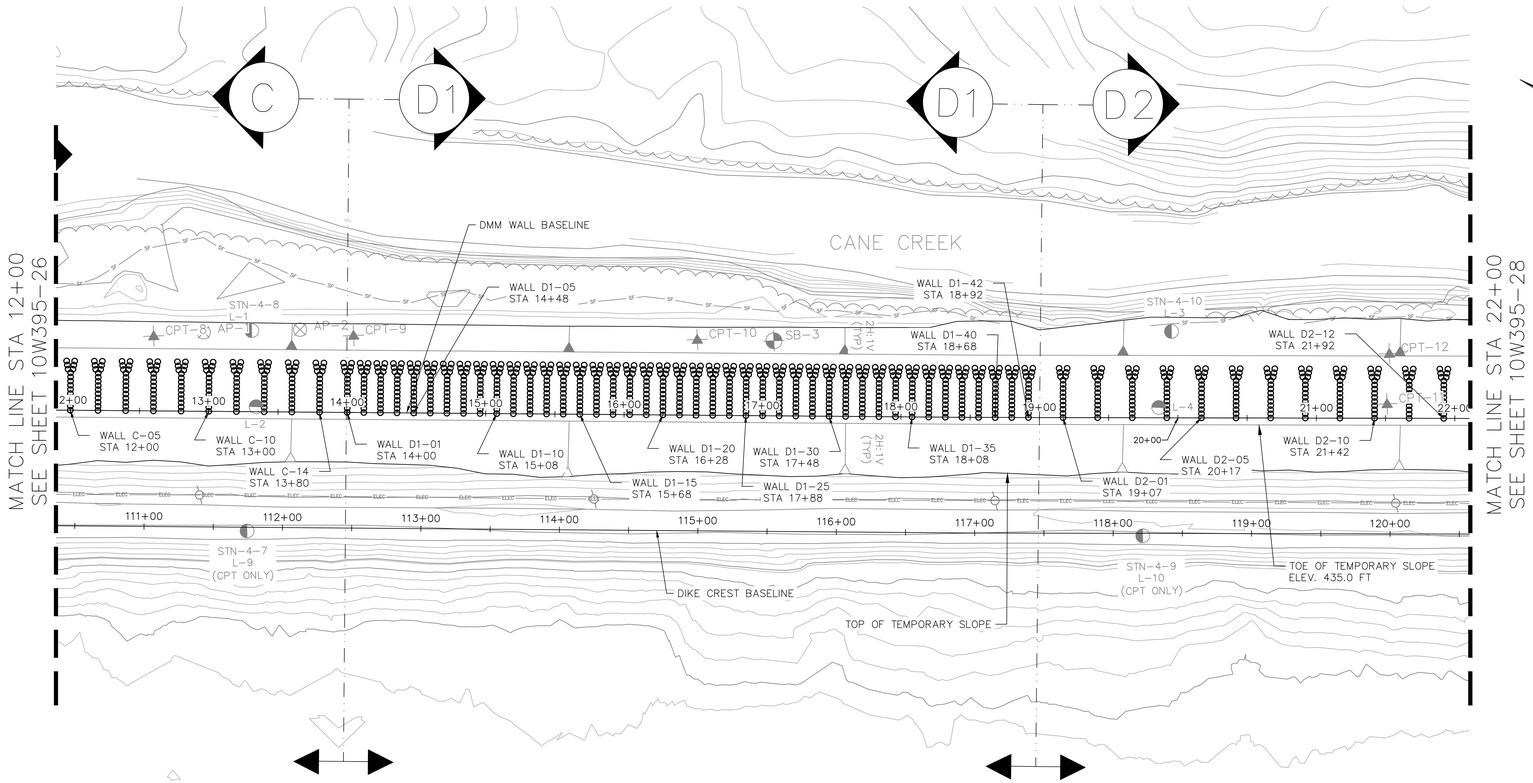
AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-26	R 0

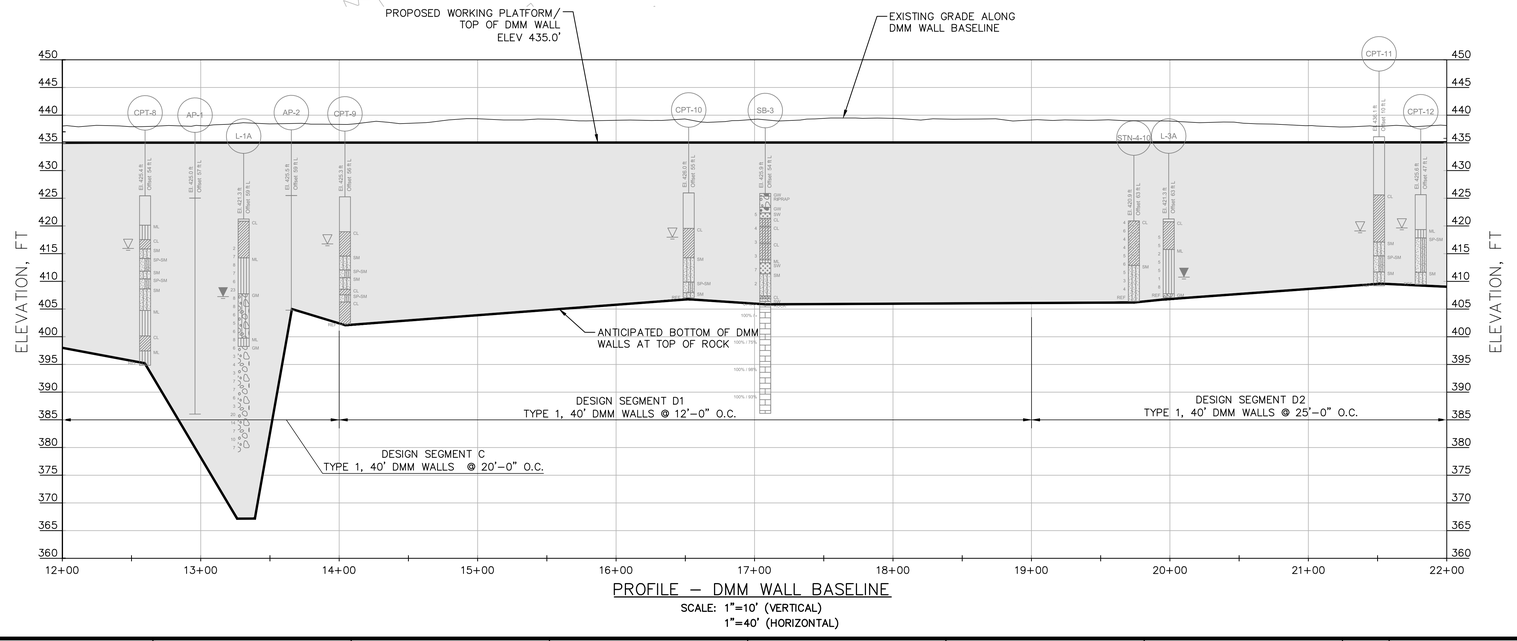
DISCIPLINE INTERFACE

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY





PROFILE – DMM WALL BASELINE

SCALE: 1"=10' (VERTICAL)
1"=40' (HORIZONTAL)

NOTES:

1. SEE NOTES ON SHEETS 10W395-24 AND 10W395-26.

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GEI Consultants
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ALABAMA LICENSED PROFESSIONAL ENGINEER NO. 34318-E WILLIAM HERBERT WALTON

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–

ISSUED FOR CONSTRUCTION

DISCIPLINE INTERFACE

SCALE: NONE EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT DMM WALL PLAN AND PROFILE (2 OF 4)

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

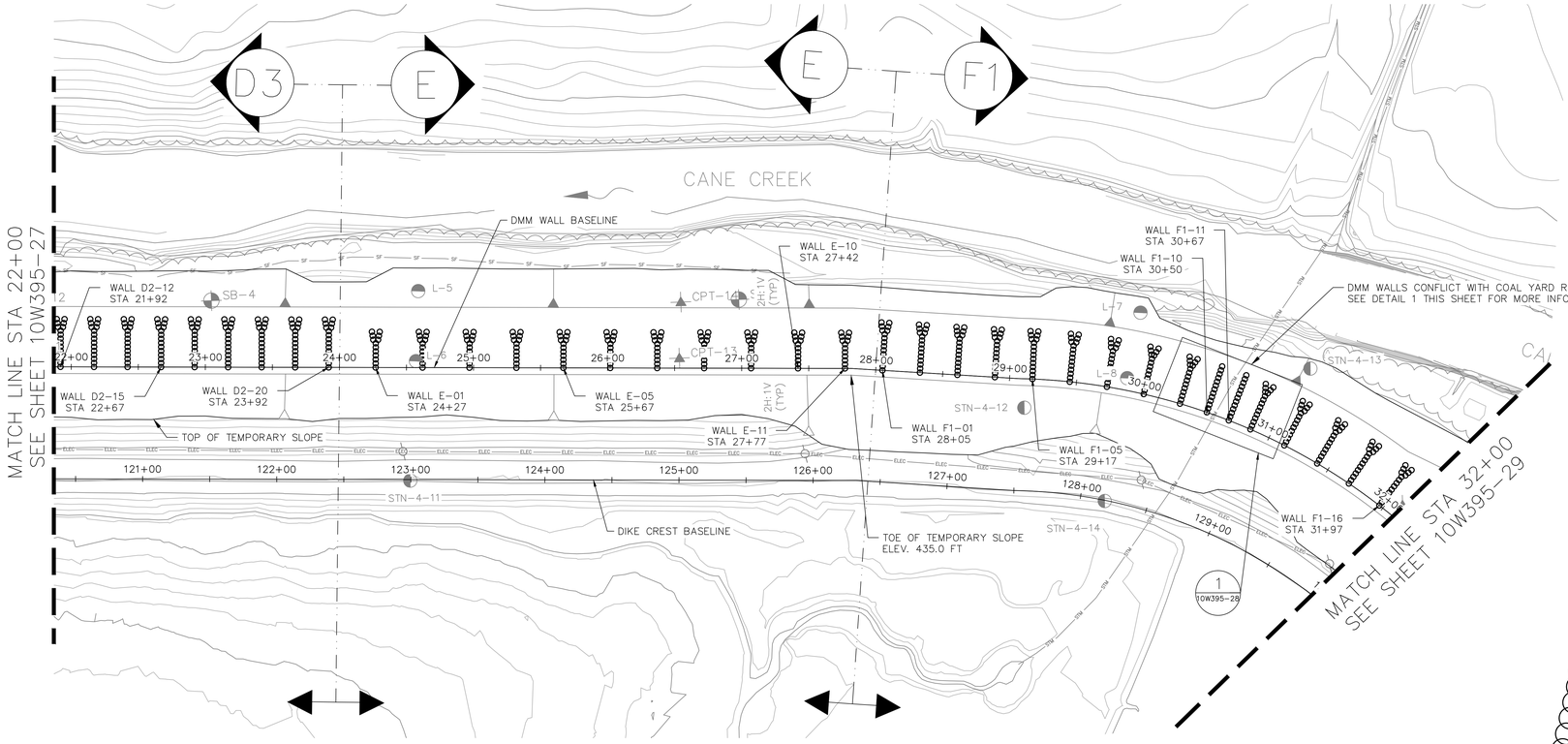
COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-27	R 0

PLOT FACTOR:XX
W_TVA

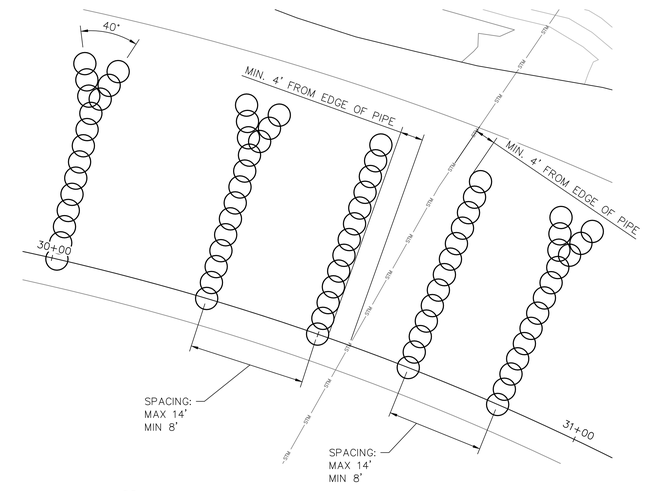
C.A.D. DRAWING
DO NOT ALTER MANUALLY

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

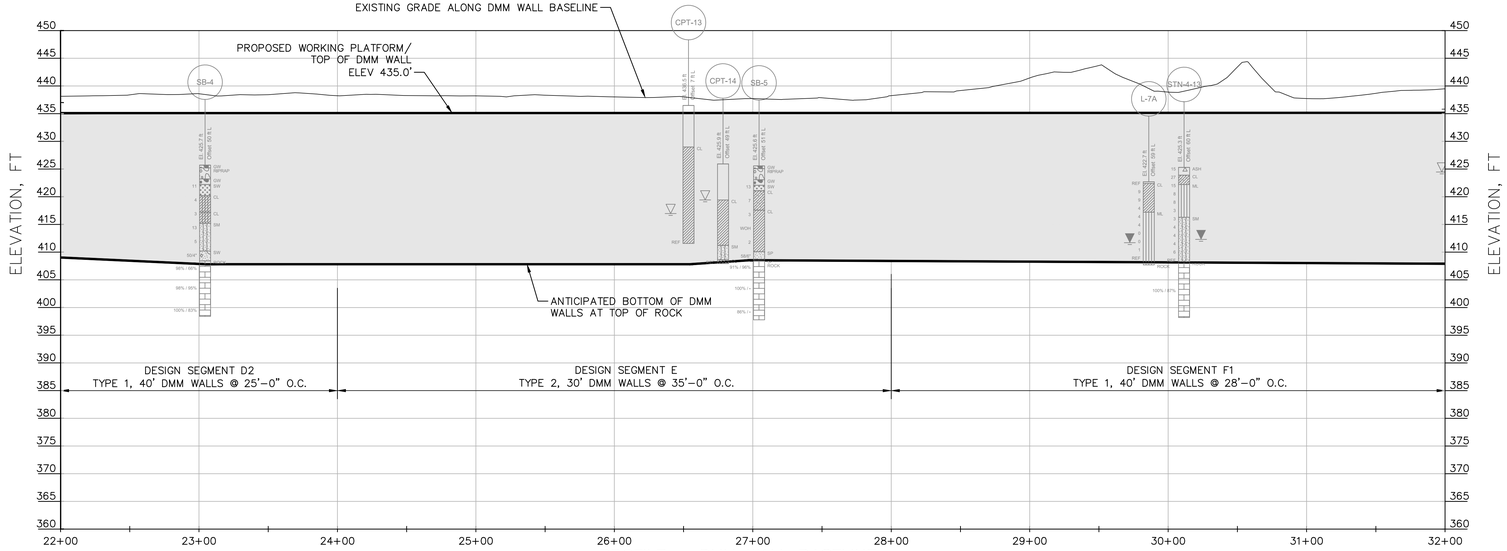


NOTES:

1. SEE NOTES ON SHEETS 10W395-24 AND 10W395-26.



1 (10W395-28) COAL YARD RUNOFF PIPE CROSSING DETAIL



PROFILE – DMM WALL BASELINE

SCALE: 1"=10' (VERTICAL)
1"=40' (HORIZONTAL)

GEI Consultants
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ALABAMA LICENSED PROFESSIONAL NO. 34318-E ENGINEER WILLIAM BERBERT WALTON

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–

ISSUED FOR CONSTRUCTION

SCALE: NONE EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT DMM WALL PLAN AND PROFILE (3 OF 4)

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

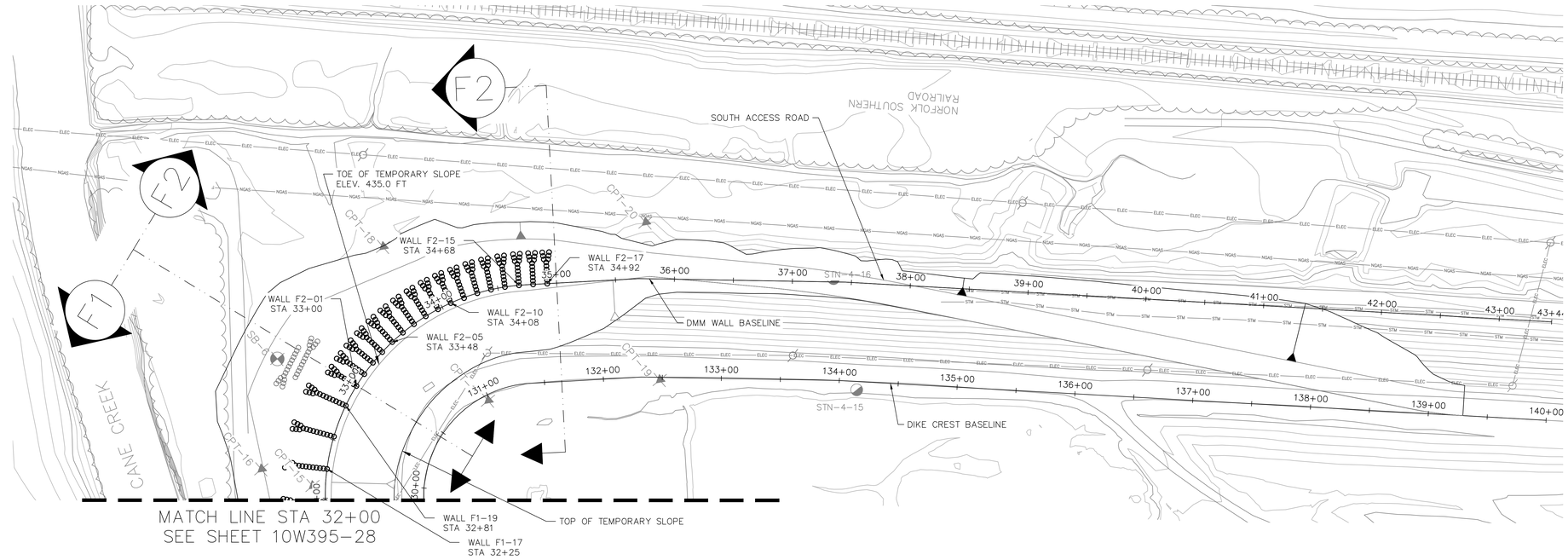
COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

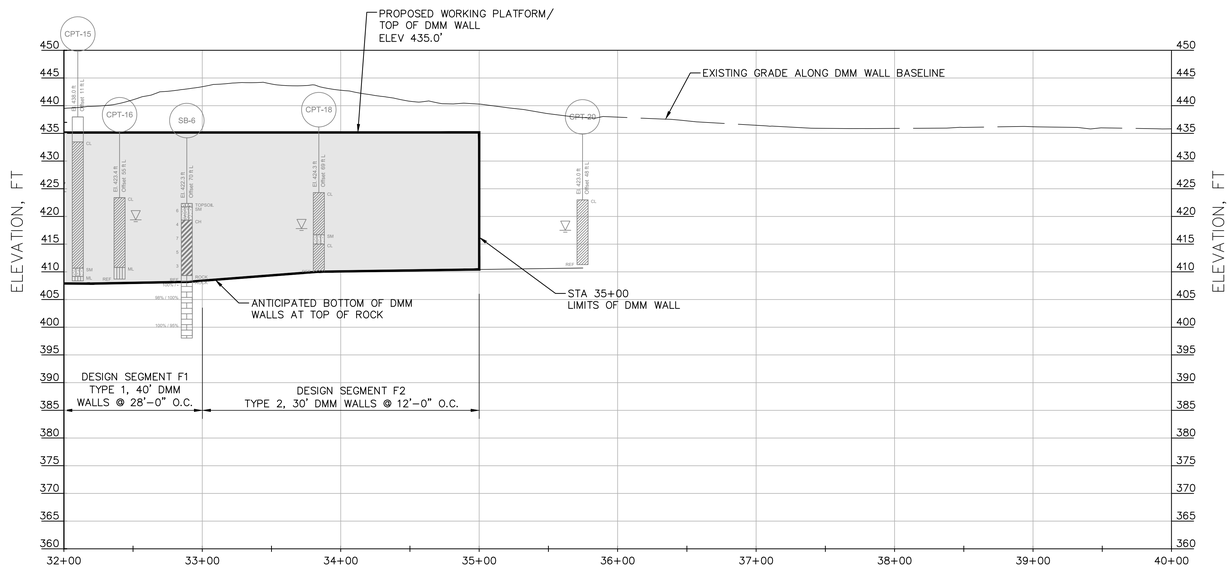
AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-28	R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY





PROFILE – DMM WALL BASELINE

SCALE: 1"=10' (VERTICAL)
1"=40' (HORIZONTAL)

NOTES:

1. SEE NOTES ON SHEETS 10W395-24 AND 10W395-26.
2. PLAN AND PROFILE NOT ALIGNED VERTICALLY DUE TO CURVED ALIGNMENT.

CO□□OUR □□ER□AL □ □□

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–
ISSUED FOR CONSTRUCTION										

DISCIPLINE INTERFACE

GEI Consultants
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Wo□ur□□MA □1□□1
7□1-7□1-4□□□

SCALE: NONE EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT
DMM WALL PLAN AND PROFILE
(4 OF 4)

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

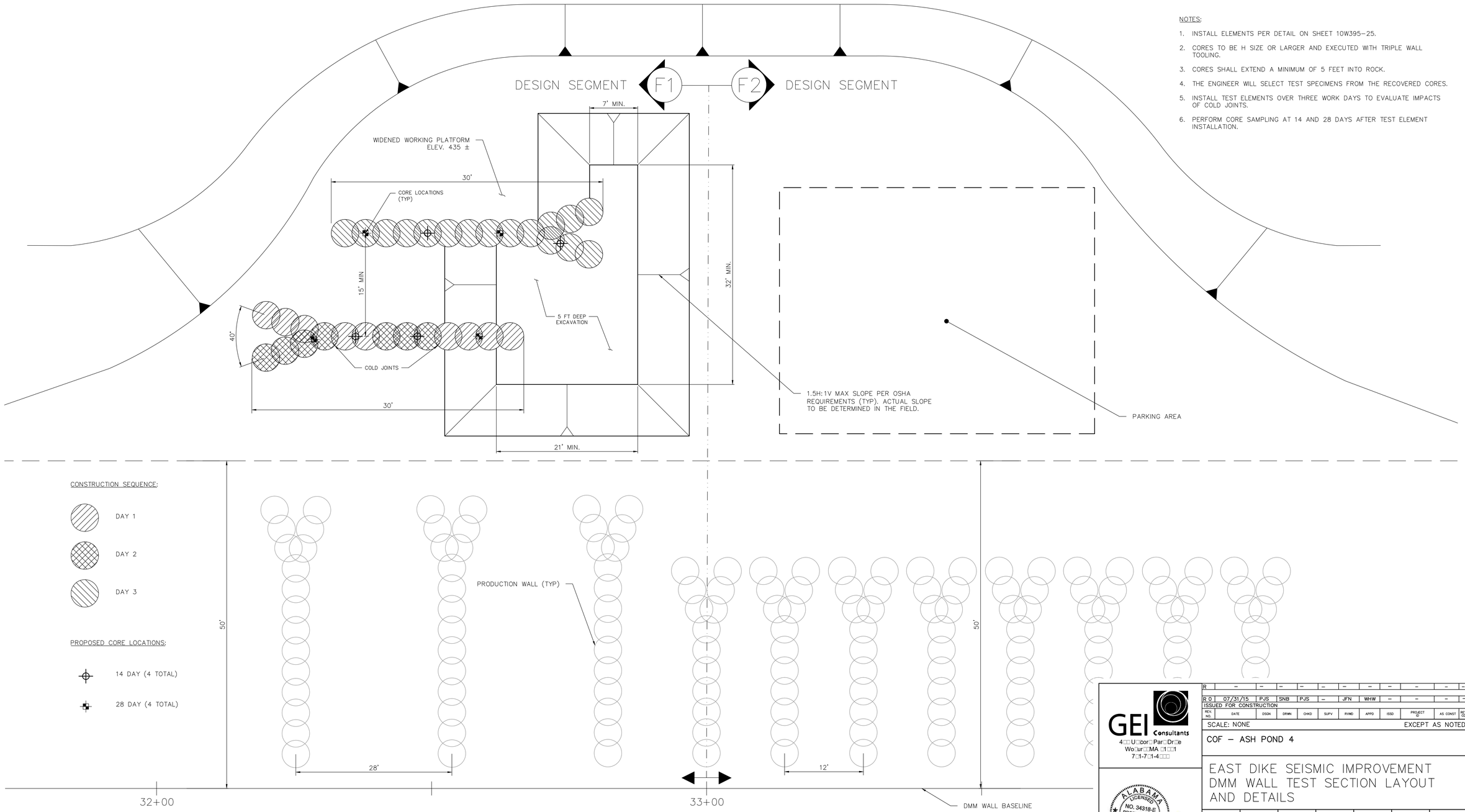
COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-29	R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



NOTES:

1. INSTALL ELEMENTS PER DETAIL ON SHEET 10W395-25.
2. CORES TO BE H SIZE OR LARGER AND EXECUTED WITH TRIPLE WALL TOOLING.
3. CORES SHALL EXTEND A MINIMUM OF 5 FEET INTO ROCK.
4. THE ENGINEER WILL SELECT TEST SPECIMENS FROM THE RECOVERED CORES.
5. INSTALL TEST ELEMENTS OVER THREE WORK DAYS TO EVALUATE IMPACTS OF COLD JOINTS.
6. PERFORM CORE SAMPLING AT 14 AND 28 DAYS AFTER TEST ELEMENT INSTALLATION.

TEST SECTION LAYOUT AND DETAILS (NTS)

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–

ISSUED FOR CONSTRUCTION

DISCIPLINE INTERFACE

SCALE: NONE EXCEPT AS NOTED

GEI Consultants
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Wo□ur□MA □1□□1
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ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER JOHN HERBERT WALTON

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT DMM WALL TEST SECTION LAYOUT AND DETAILS

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

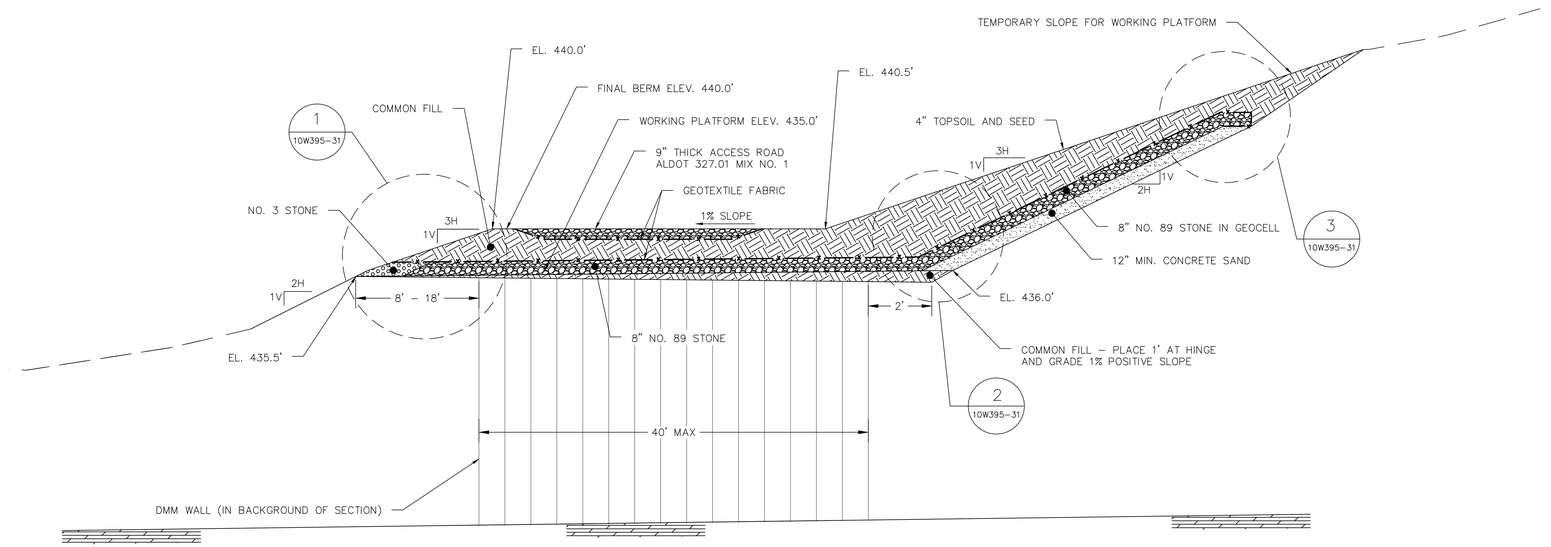
COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-30	R 0

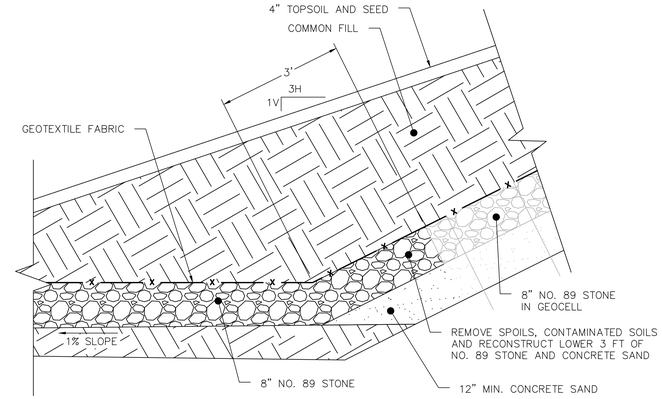
GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

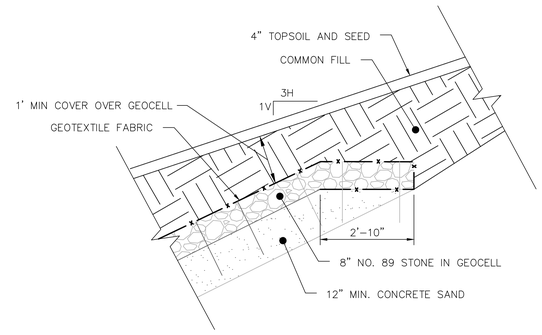
C.A.D. DRAWING
DO NOT ALTER MANUALLY



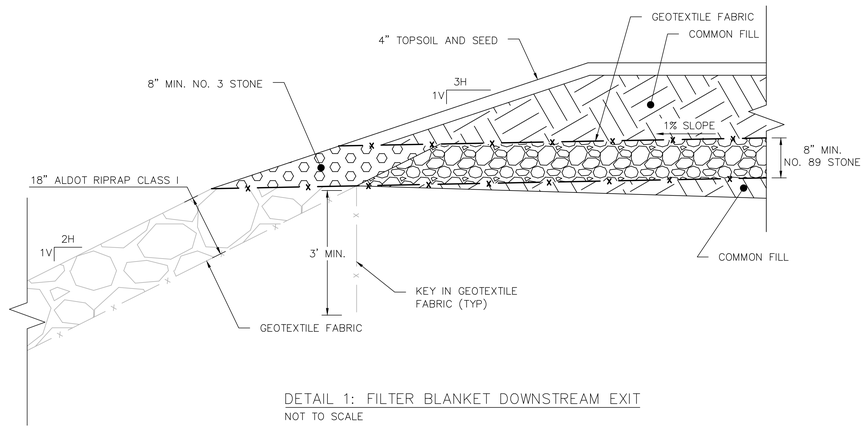
TYPICAL FILTER BLANKET SECTION
NOT TO SCALE



DETAIL 2: FILTER BLANKET TRANSITION
NOT TO SCALE



DETAIL 3: GEOCELL BLANKET TRANSITION
NOT TO SCALE



DETAIL 1: FILTER BLANKET DOWNSTREAM EXIT
NOT TO SCALE

GEI Consultants
4□□U□cor□Par□Dr□e
Wo□ur□MA □1□□1
7□1-7□1-4□□□

ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER HERBERT WALTON

R	–	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–	–
ISSUED FOR CONSTRUCTION											
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. ID

DISCIPLINE INTERFACE

SCALE: NONE EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT SEEPAGE COLLECTION SYSTEM TYPICAL SECTION AND DETAILS

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

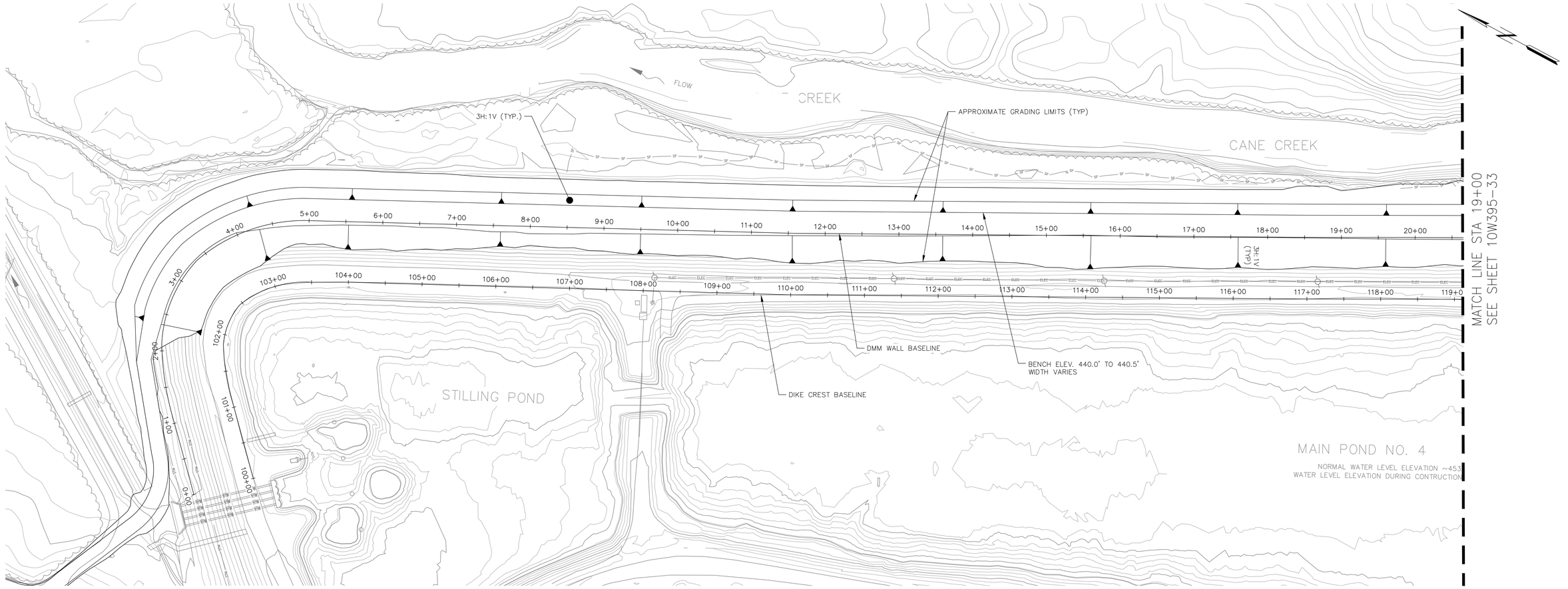
COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-31	R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

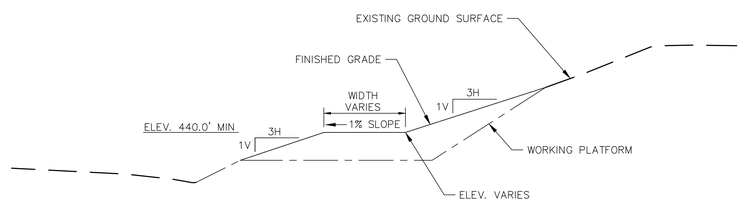
PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

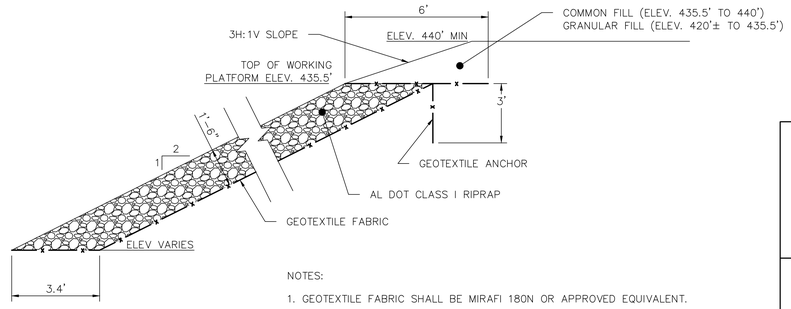


NOTE:

1. FINAL GRADING SLOPE IS 3H:1V UPSTREAM OF BENCH ELEV. 440.0'.
2. FINAL GRADING SLOPE IS 3H:1V DOWNSTREAM OF BENCH ELEV. 440.0' TO ELEV. 435.0'
3. ALL 2H:1V FINAL SLOPES SHALL RECEIVE RIPRAP PROTECTION PER THE DETAIL BELOW ON THIS SHEET.



TYPICAL FINAL GRADING DETAIL (NTS)



NOTES:

1. GEOTEXTILE FABRIC SHALL BE MIRAFI 180N OR APPROVED EQUIVALENT.

TYPICAL FINAL GRADING SECTION
APPLIES TO ALL 2H:1V FINAL SLOPES

CO□□OUR □□ER□AL □ □□

GEI Consultants
4□□U□cor□Par□Dr□e
Wo□ur□MA □1□□1
7□1-7□1-4□□□

ALABAMA LICENSED PROFESSIONAL ENGINEER NO. 34318-E WILLIAM HERBERT WALTON

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	DISCIPLINE INTERFACE
R	–	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–	–
ISSUED FOR CONSTRUCTION											

SCALE: NONE — EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT
FINAL GRADING PLAN
(1 OF 2)

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

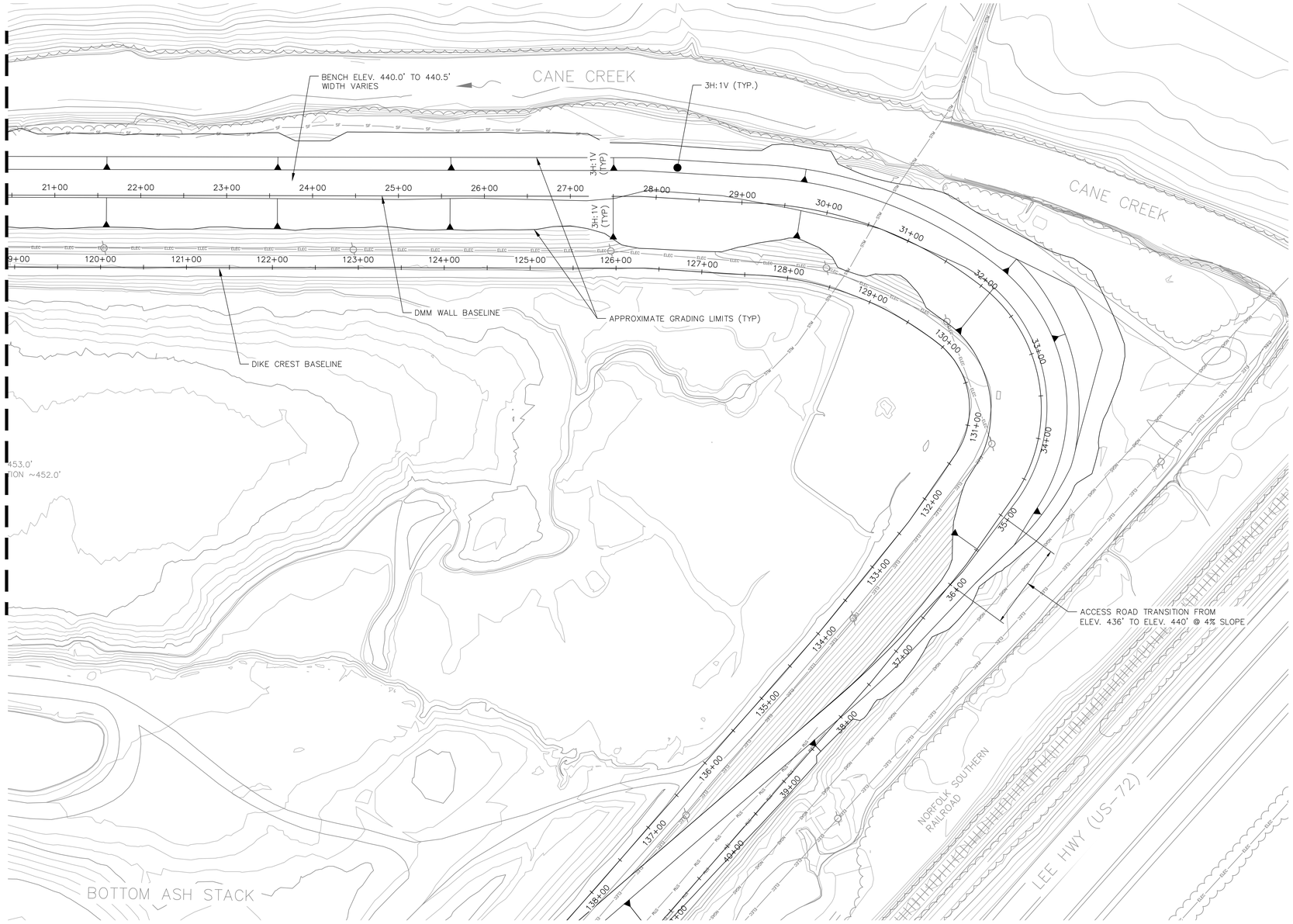
COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-32	R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



NOTE:
1. SEE NOTES ON SHEET 10W395-32.

GEI Consultants
4□□U□cor□Par□Dr□e
Wo□ur□□MA □1□□1
7□1-7□1-4□□□

R	–	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–	–
ISSUED FOR CONSTRUCTION											

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST.

DISCIPLINE INTERFACE

SCALE: NONE — EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT FINAL GRADING PLAN (2 OF 2)

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM HERBERT WALTON

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-33	R 0

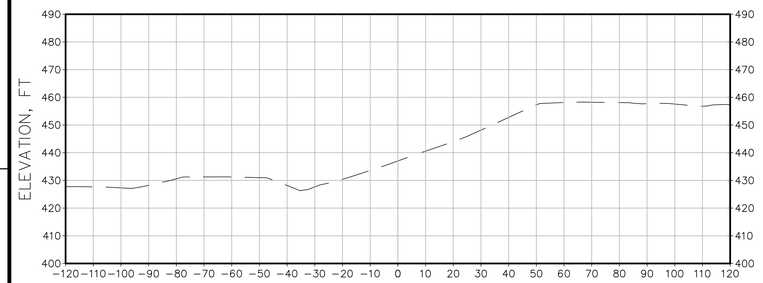
CO□□OUR □□ER□AL □ □□

□□ 0 □□ 1□□ □EE□

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



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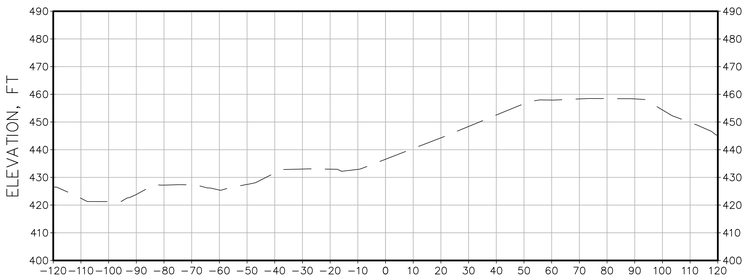

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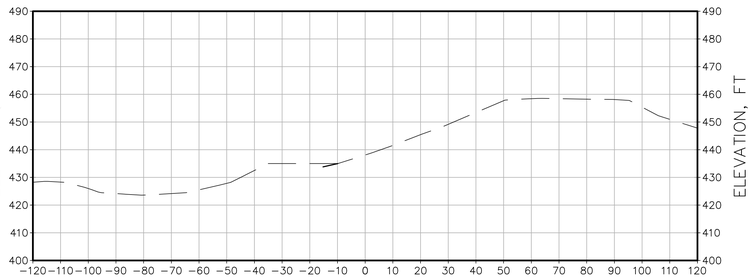

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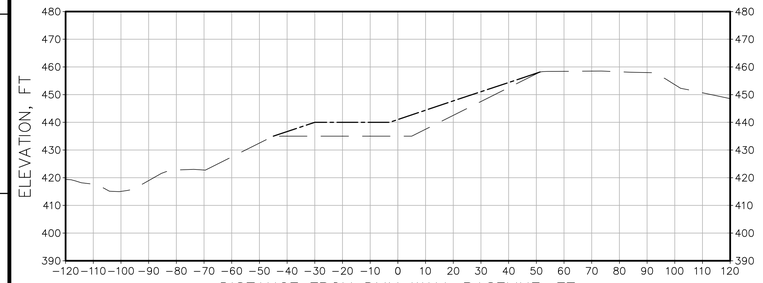

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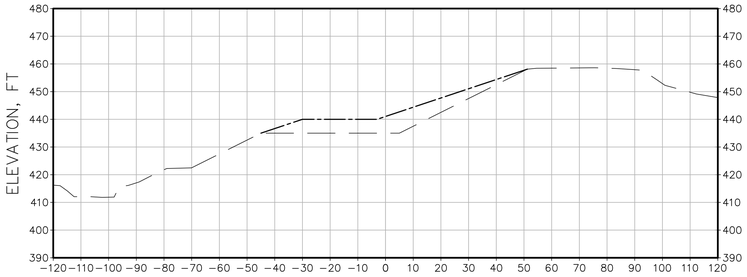

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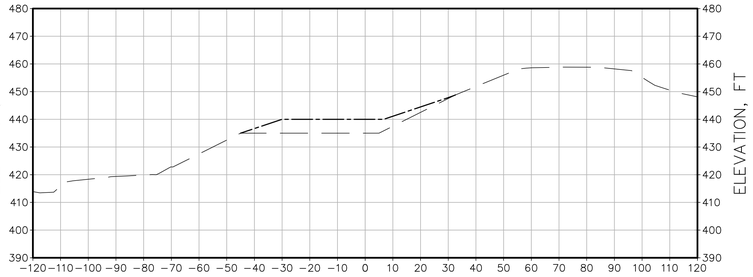

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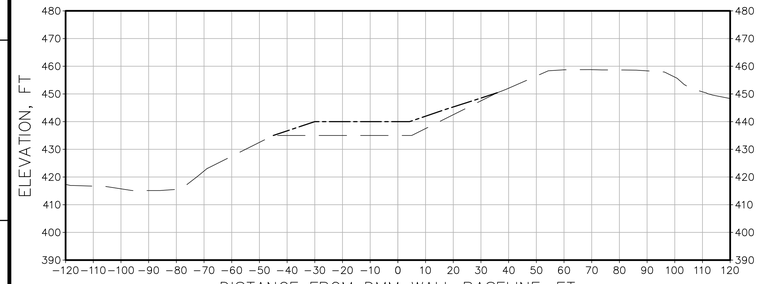

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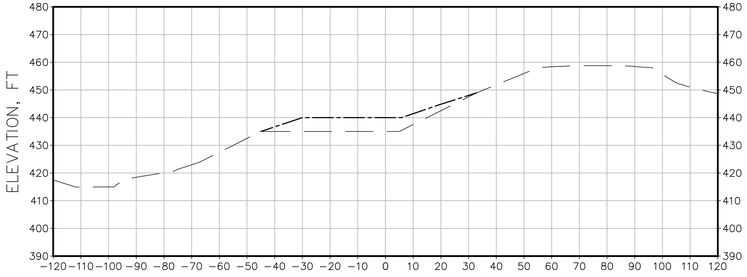

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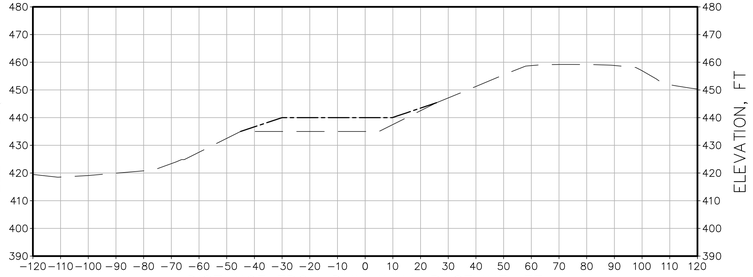

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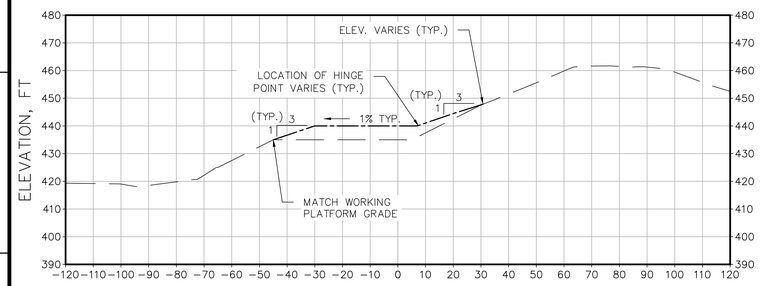

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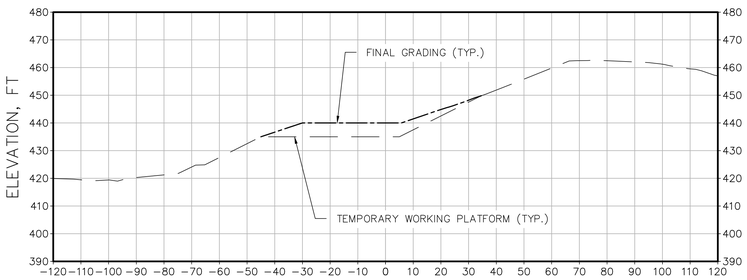


10+00

LEGEND

TEMPORARY WORKING PLATFORM EXISTING GRADE

FINAL GRADING SURFACE

GEI Consultants
4□□U□□or□Par□Dr□e
Wo□ur□□MA □1□□1
7□1-7□1-4□□□

ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM NESBERT WALTON

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–
ISSUED FOR CONSTRUCTION										

SCALE: NONE — EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT FINAL GRADING CROSS SECTIONS (1 OF 4)

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-34	R 0

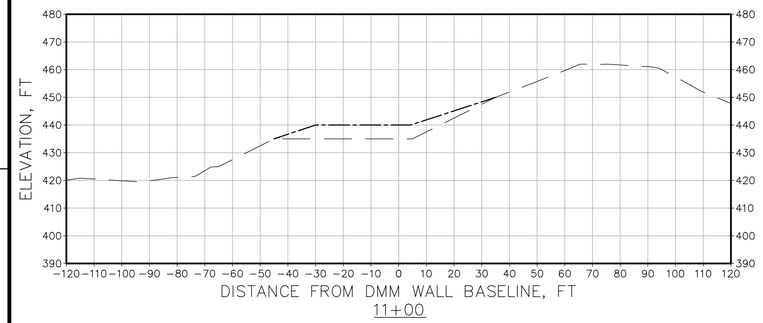
DISCIPLINE INTERFACE

REV. NO.	DATE
0	

GEI Consultants | 0
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



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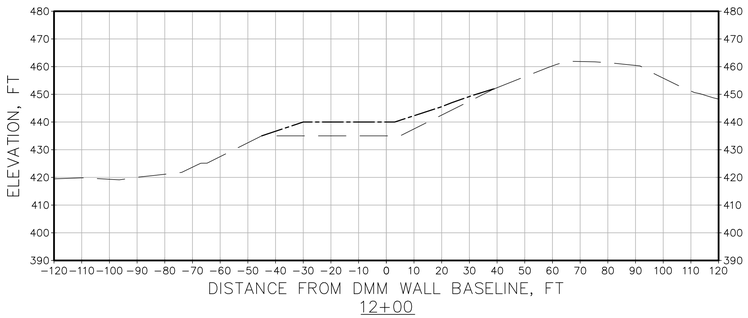

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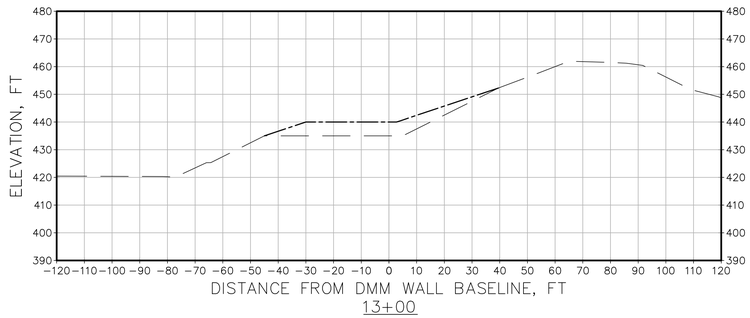

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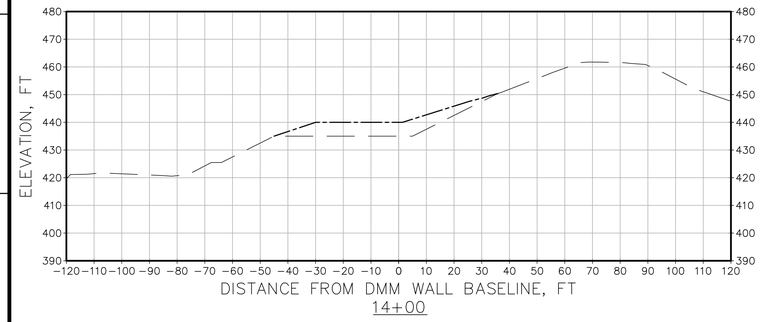

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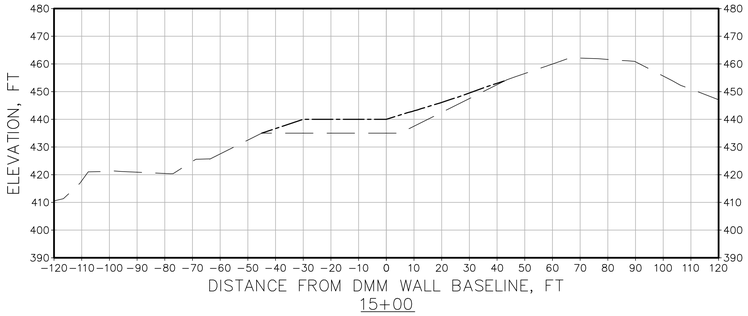

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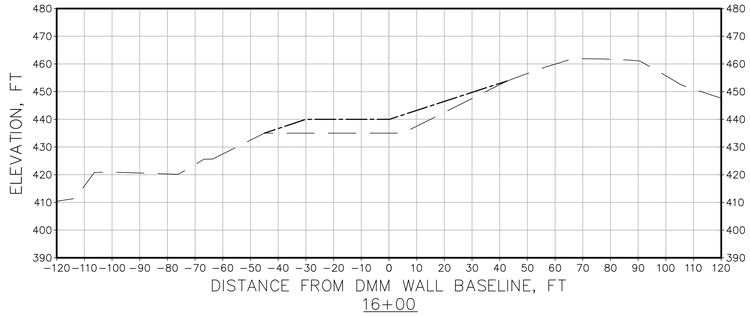

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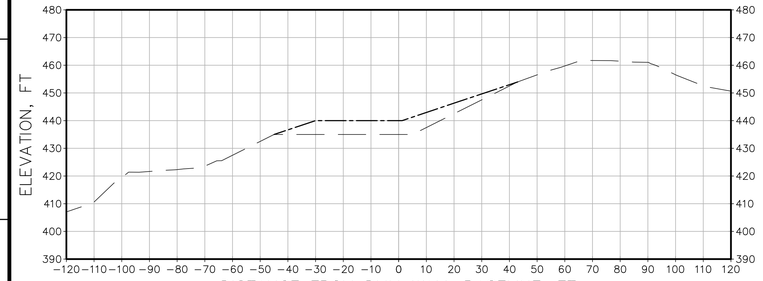

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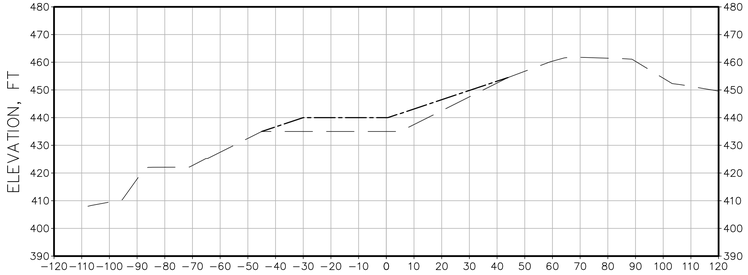

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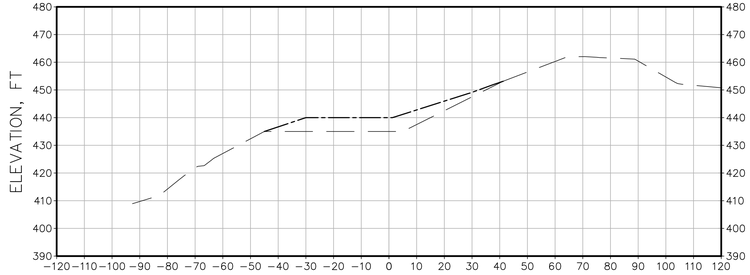

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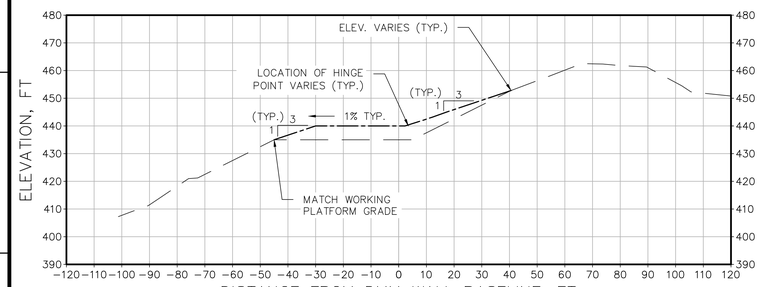

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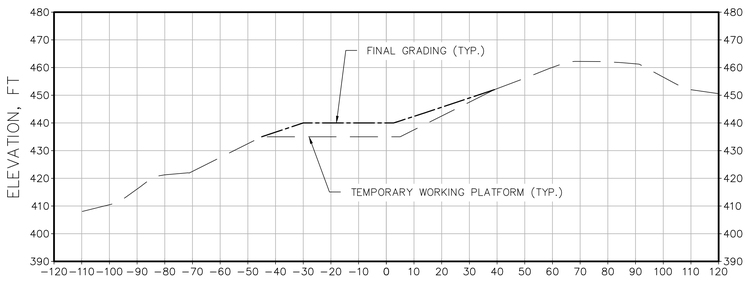


21+00

LEGEND

TEMPORARY WORKING PLATFORM EXISTING GRADE

FINAL GRADING SURFACE

GEI Consultants
4□□ U□cor□ Par□Dr□e
Wo□ur□□MA □1□□1
7□1-7□1-4□□□

ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM NESBITT WALTON

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT IS	AS CONST	DISCIPLINE INTERFACE
R	–	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–	–
ISSUED FOR CONSTRUCTION											

SCALE: NONE — EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT FINAL GRADING CROSS SECTIONS (2 OF 4)

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

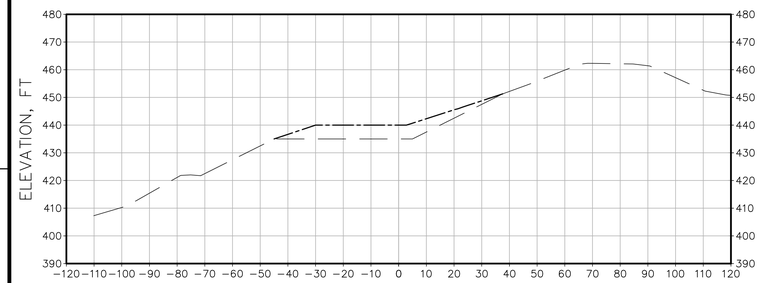
COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-35	R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



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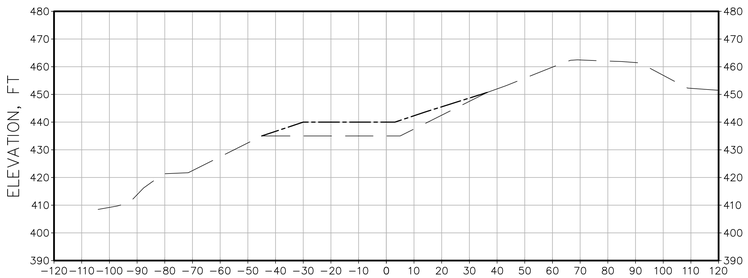

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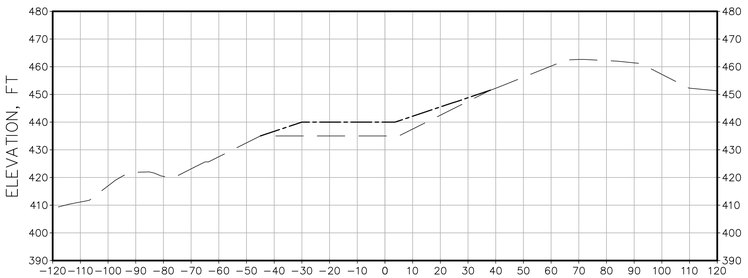

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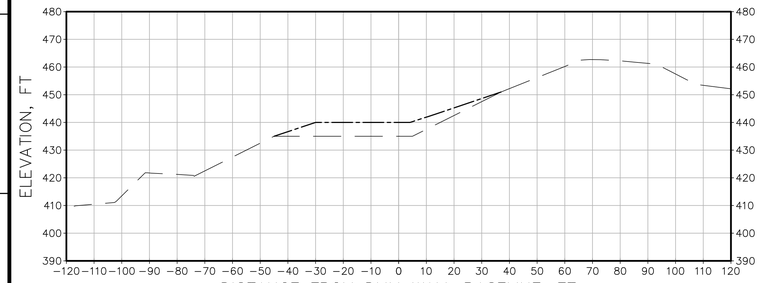

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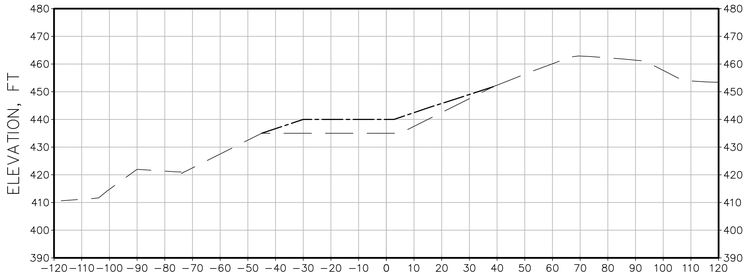

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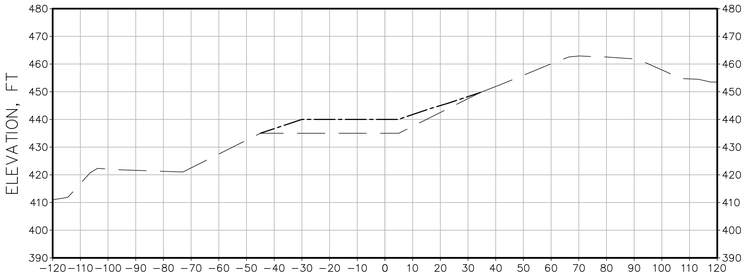

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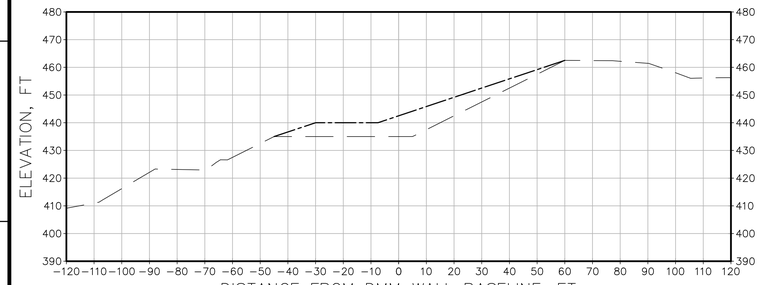

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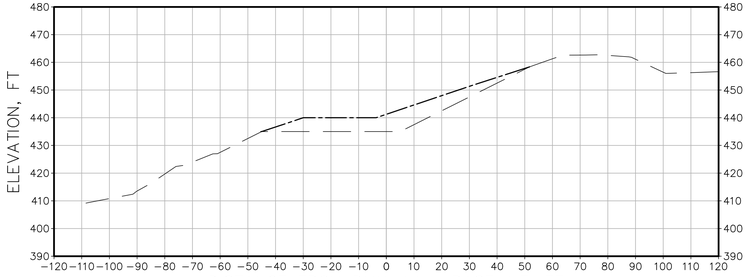

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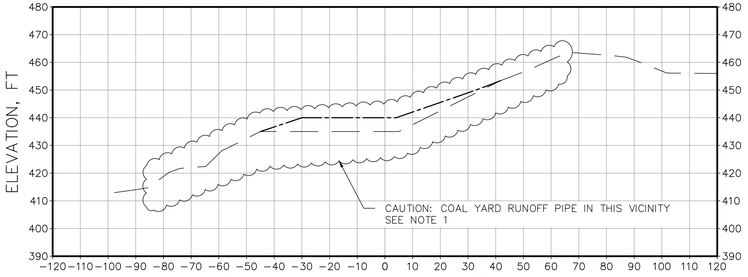

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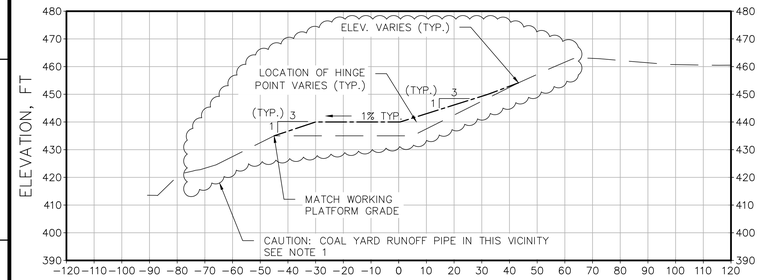
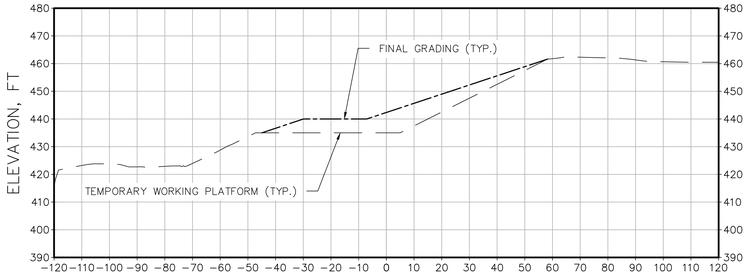


31+00



32+00

NOTES:

1. COAL YARD RUNOFF PIPE LOCATION SHOWN IN PLAN IS APPROXIMATE. RUNOFF PIPE SHALL BE LOCATED IN FIELD PRIOR TO WORKING IN THESE AREAS. CONTRACTOR TO PROTECT PIPE IN PLACE DURING ALL CONSTRUCTION ACTIVITIES. WORK ENCROACHING ON RUNOFF PIPE SHALL BE COORDINATED WITH THE ENGINEER AND TVA.

LEGEND

- TEMPORARY WORKING PLATFORM EXISTING GRADE
- FINAL GRADING SURFACE

GEI Consultants
4□□U□□or□Par□Dr□e
Wo□ur□□MA □1□□1
7□1-7□1-4□□□

ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM NESBITT WALTON

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT IR	AS CONST
R	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–
ISSUED FOR CONSTRUCTION										

DISCIPLINE INTERFACE

SCALE: NONE — EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT FINAL GRADING CROSS SECTIONS (3 OF 4)

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

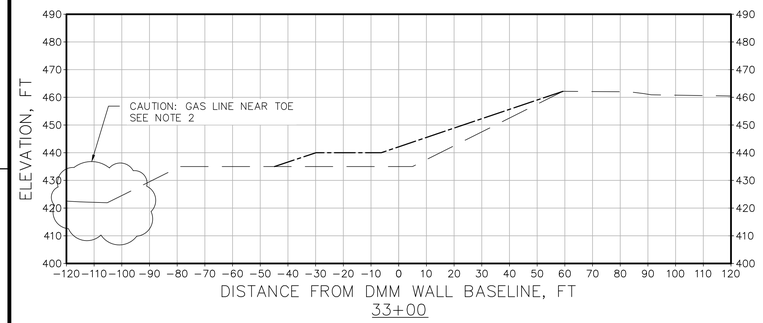
COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-36	R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



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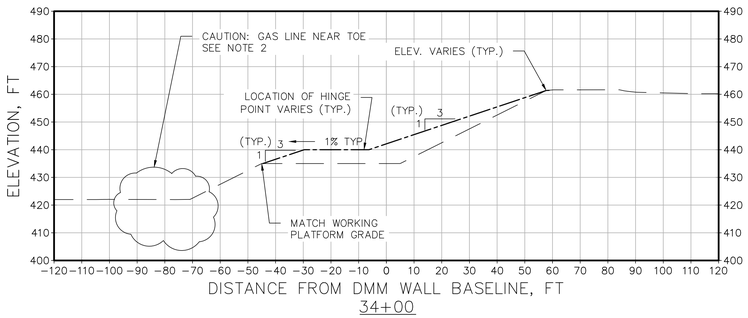

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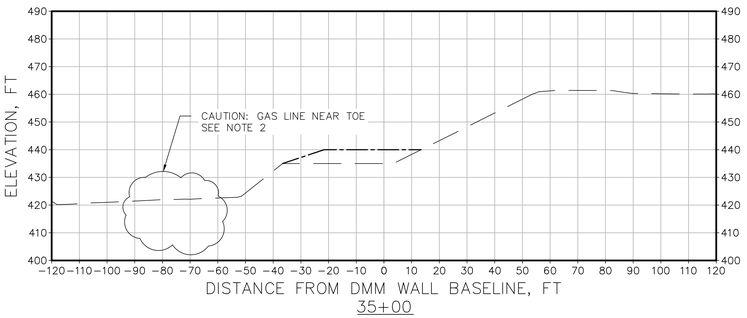

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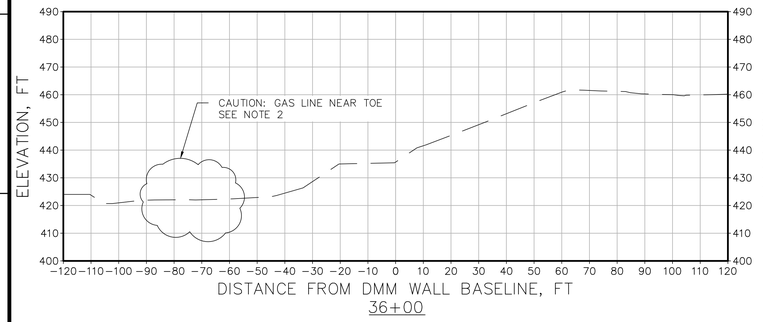

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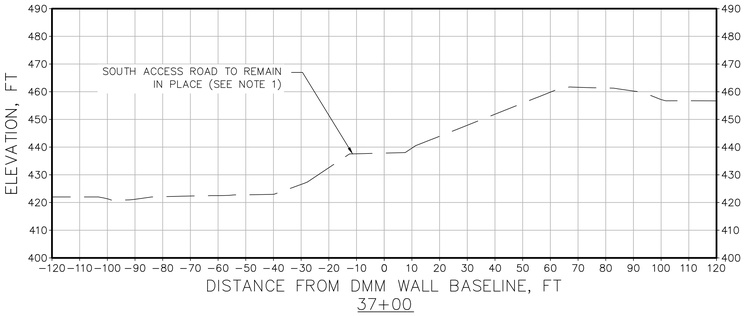

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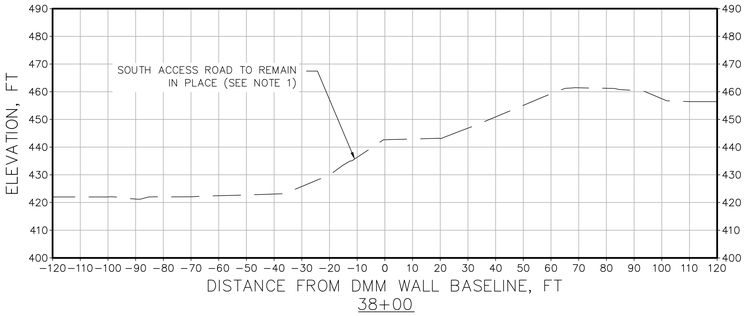

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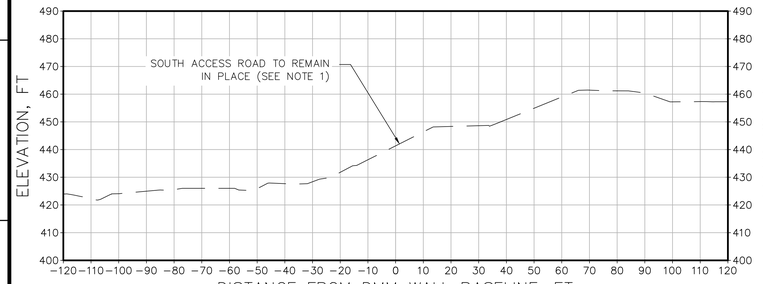

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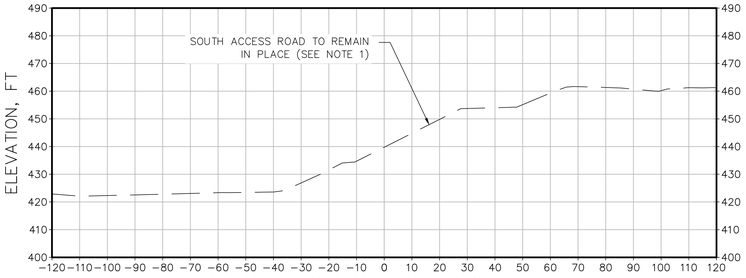

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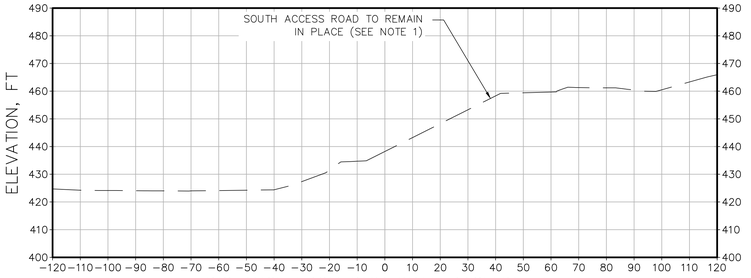

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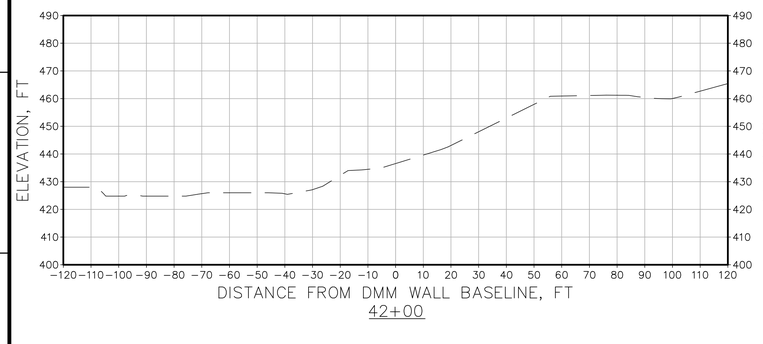

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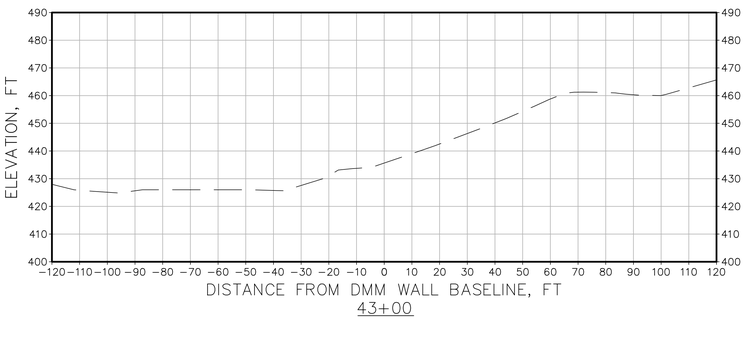


43+00

NOTES:

1. THE SOUTH ACCESS ROAD SHOWN IN SECTIONS 38+00 TO 43+00 SHALL REMAIN IN PLACE ONCE CONSTRUCTION OF THE DMM WALLS HAS BEEN COMPLETED.
2. GAS LINE LOCATION SHOWN IN PLAN IS APPROXIMATE. GAS LINE SHALL BE LOCATED IN FIELD PRIOR TO WORKING IN THESE AREAS.

LEGEND

- TEMPORARY WORKING PLATFORM EXISTING GRADE
- FINAL GRADING SURFACE

GEI Consultants
4□□U□cor□Par□Dr□e
Wo□ur□MA □1□□1
7□1-7□1-4□□□

ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM NEBBETT WALTON

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–
ISSUED FOR CONSTRUCTION										

DISCIPLINE INTERFACE

SCALE: NONE EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT FINAL GRADING CROSS SECTIONS (4 OF 4)

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

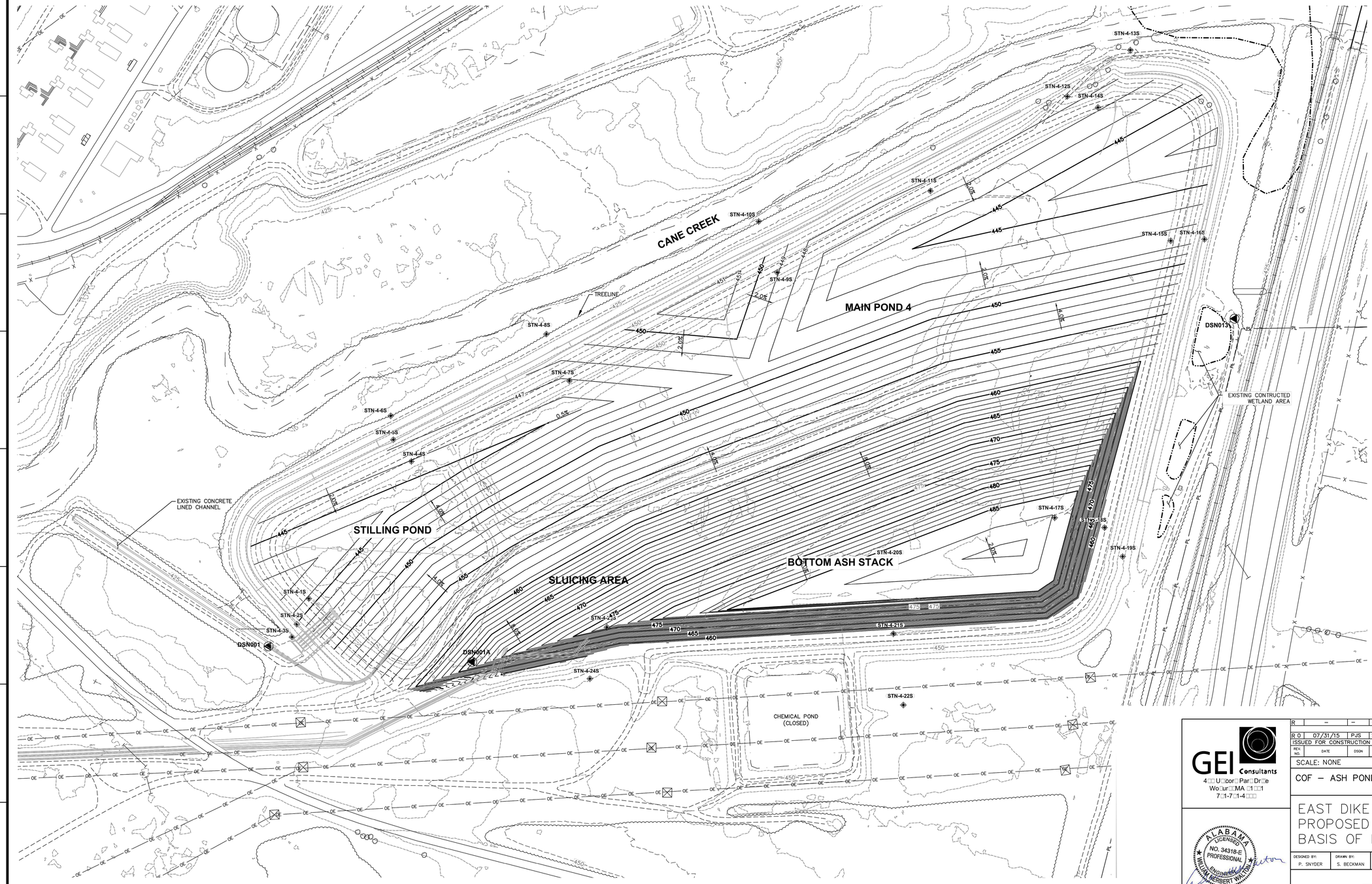
COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-37	R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



LEGEND

- EXISTING VEGETATION
- PL — EXISTING PROPERTY LINE
- X — EXISTING FENCE
- OE — EXISTING OVERHEAD ELECTRIC LINE
- EXISTING HAUL ROAD
- EXISTING CREEK
- EXISTING WETLANDS
- EXISTING TURBIDITY CURTAIN
- EXISTING BENCH MARKS
- EXISTING PIEZOMETERS

NOTES:
1. DRAWING PROVIDED BY URS CORP. IN MARCH 2015.

URS

GEI Consultants
4□□U□cor□Par□Dr□e
Wo□ur□□MA □1□□1
7□1-7□1-4□□□

ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM HERBERT WALTON

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	DISCIPLINE INTERFACE
R	–	–	–	–	–	–	–	–	–	–	–
R 0	07/31/15	PJS	SNB	PJS	–	JFN	WHW	–	–	–	–
ISSUED FOR CONSTRUCTION											

SCALE: NONE — EXCEPT AS NOTED

COF – ASH POND 4

EAST DIKE SEISMIC IMPROVEMENT PROPOSED FINAL GRADING FOR BASIS OF DMM WALL DESIGN

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. SNYDER	S. BECKMAN	P. SNYDER		J. NICKERSON	W. WALTON	

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE 7/31/15	XX	C	10W395-38	R 0

GEI Consultants	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

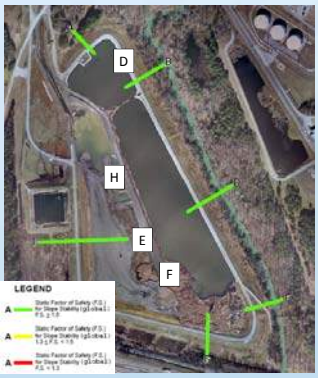
C.A.D. DRAWING
DO NOT ALTER MANUALLY

APPENDIX D
UNIT HISTORY EXHIBIT

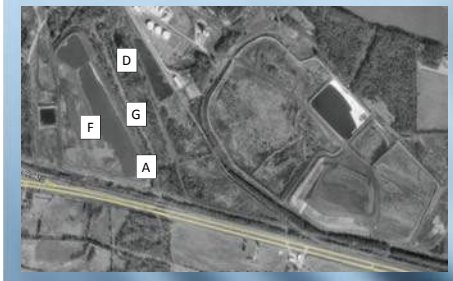
Colbert Fossil Plant Disposal Area 4
History of Construction

2010 Existing Conditions

Collector Drain Installed for Seepage Remediation



2010 Factor of Safety



1999 Aerial Photograph

1952 Colbert Site Development Plan

2015 — **A** In 2015, GEI began construction of seismic remediation at Ash Disposal Area 4 and installed deep mixing method walls around portions of the north, east and south toe of the embankment.

2013

2011

2010 — **B** In 2015, URS completed a project to improve the slopes along toe of the eastern perimeter dike. Slopes were regraded and rock buttresses and filter blankets were installed.

2009 — **C** During 2013, seepage remediation was performed by URS. A seepage collection and conveyance system was installed along the northern, eastern and southern perimeter dike of the Unit.

D During 2010 and 2011 Ash Disposal Area 4 the existing spillway was abandoned and a new spillway was installed to lower the normal pool elevation in the pond from +456 to +453. Portions of the crest of the perimeter dike were lowered from +460 to +458 to eliminate the "high hazard" dam categorization.

1991 — **E** Stantec's 2010 Ash Pond 4 geotechnical report recommended pond modifications to increase seepage and slope stability safety factors.

F In 2009 TVA classified Ash Pond 4 as a "high hazard" impoundment.

1984 — **G** In 1984 the Ash Pond 4 perimeter dikes were raised 20 feet to +460 over sluiced ash, using upstream construction. Seepage at the interface between the two clay dikes has persisted, especially along the east side of Pond 4.

1978

1972 — **H** In 1972, the 52-acre Ash Pond 4 was initially constructed with 20' high clay perimeter dikes to elevation +440. Both bottom and fly ash were wet sluiced to Ash Pond 4 until 1990.

I From April 1952 to January 1953 the initial 45-acre ash disposal pond was formed using rock from the intake, downstream of the powerhouse, near the confluence of Cane Creek and the river.

1955

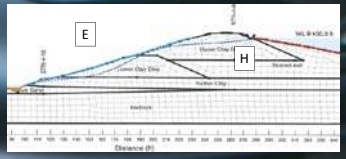
1953 — **J** Construction on Colbert's first two units began October 15, 1951, and units 3 and 4 were added in July 1952. First 4 units were in operation by November 1955.

1951

Slope Improvements to Perimeter Dike

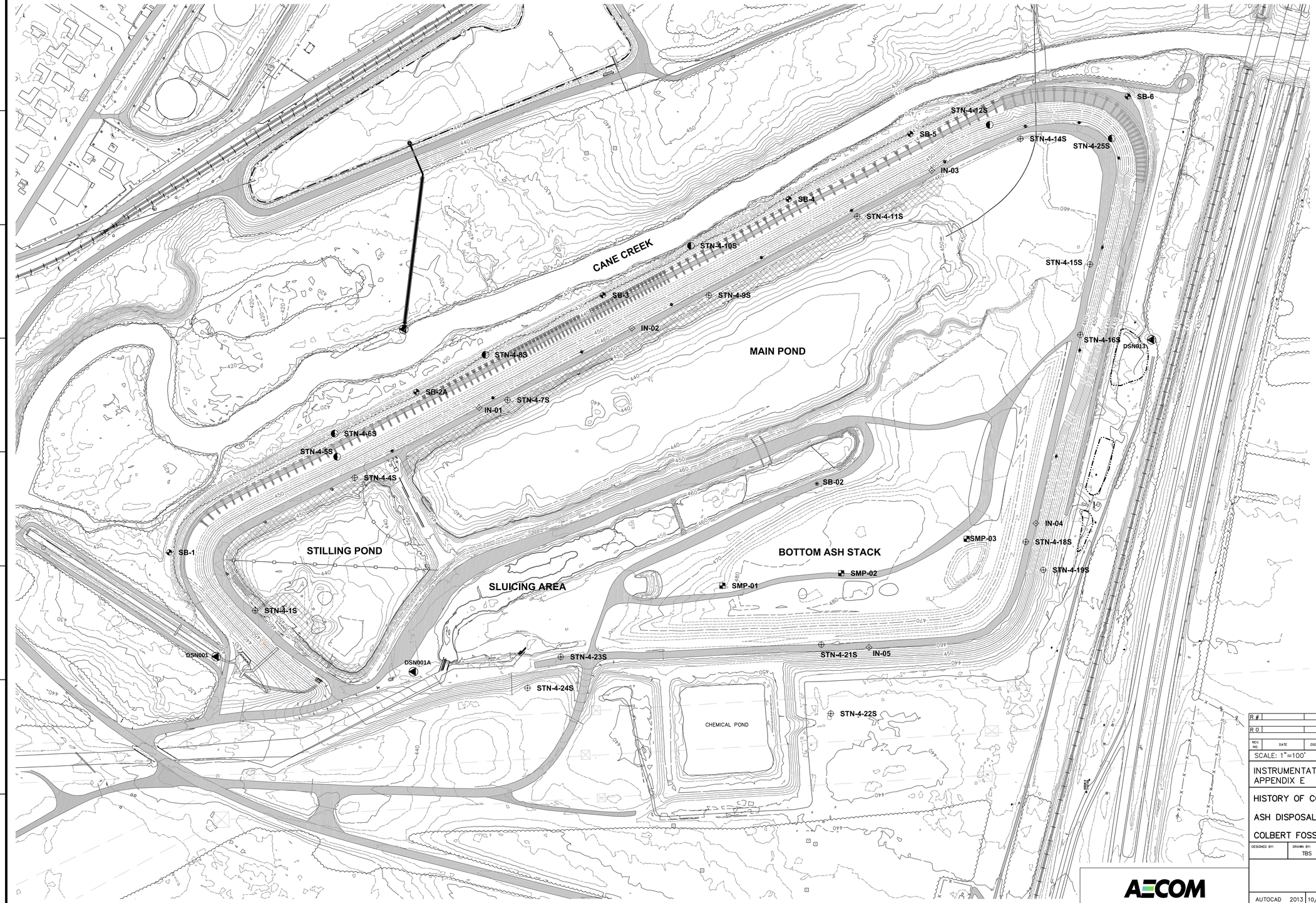
Siphons installed to lower normal pool in Ash Pond 4 Stilling Basin during spillway reconstruction.

2009 Inundation Map for Ash Disposal Area 4.



Ash Disposal Area 4 perimeter embankments were raised in 1984 over sluiced ash. Seepage between two clay dikes was noted.

APPENDIX E
INSTRUMENTATION MAP



R #

R 0 — D — DISCIPLINE INTERFACE

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT MGR	AS CONST
0	10/12/16		TBS	SEB			MJS			

SCALE: 1"=100' EXCEPT AS NOTED

INSTRUMENTATION LOCATION PLAN
APPENDIX E

HISTORY OF CONSTRUCTION

ASH DISPOSAL AREA 4

COLBERT FOSSIL PLANT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
	TBS	SEB			MJS	

AECOM

COLBERT FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD	2013	DATE 10/12/16	47	C	10WXXX-XX	R 0

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

AECOM	0
TASK COMPLETED BY:	REV NO.

Attachment D

Hazard Potential and Emergency Action Plans

Periodic Hazard Potential Classification Assessment by Stantec dated October 12, 2021

Emergency Action Plan (EAP) Ash Disposal Area 4, Revision 2 by TVA dated February 21, 2019

Stantec Consulting Services Inc.
3052 Beaumont Centre Circle, Lexington, Kentucky 40513-1703

October 12, 2021
File: rpt_012_let_175568465
Revision 0

Tennessee Valley Authority
1101 Market Street
Chattanooga, Tennessee 37402

RE: Periodic Hazard Potential Classification Assessment
Ash Disposal Area 4
EPA CCR Rule
TVA Colbert Fossil Plant
Tuscumbia, Alabama

1.0 PURPOSE

This letter documents certification that the Ash Disposal Area 4 at the Tennessee Valley Authority (TVA) Colbert Fossil Plant is in compliance with the hazard potential classification requirements set forth in 40 CFR 257.73(a)(2) of the EPA CCR Rule. The EPA CCR Rule requires periodic hazard potential classification assessments, certified by a professional engineer, every five years. The initial certification of hazard potential classification was placed in the operating record October 12, 2016.

2.0 INITIAL HAZARD CLASSIFICATION ASSESSMENT

The initial hazard potential classification assessment is attached. The results of the initial assessment assigned a hazard potential classification rating of "significant" for the Ash Disposal Area 4 because a failure or mis-operation could result in off-site release of CCRs and is unlikely to result in loss of human life.

3.0 CURRENT HAZARD CLASSIFICATION ASSESSMENT

Stantec reviewed the result of the initial assessment and the changes in the site conditions that have occurred in the past five years. Since the previous assessment, Ash Disposal Area 4 has been closed and capped and the area is no longer designed to impound surface water. Based on our review, there are no conditions that have changed in the past five years that would cause the result of the initial hazard classification assessment to have changed.

4.0 SUMMARY OF ASSESSMENT

Based on a review of the initial hazard potential classification assessment and the current site conditions, the result of this hazard potential classification assessment is that the Ash Disposal Area 4 at Colbert meets the requirements for classification as a "significant" hazard impoundment (as defined in 40 CFR § 257.53).

Re: **Periodic Hazard Potential Classification Assessment**
Ash Disposal Area 4
EPA CCR Rule
TVA Colbert Fossil Plant
Tuscumbia, Alabama

5.0 QUALIFIED PROFESSIONAL ENGINEER CERTIFICATION

I, Robert D. Fuller, being a Professional Engineer in good standing in the State of Alabama, do hereby certify, to the best of my knowledge, information, and belief:

1. that the information contained in this certification is prepared in accordance with the accepted practice of engineering;

2. that the information contained herein is accurate as of the date of my signature below; and

3. that the hazard potential classification assessment for the TVA Colbert Fossil Plant's Ash Disposal Area 4 meets the requirements specified in 40 CFR 257.73(a)(2).

SIGNATURE Robert D. Fuller DATE 10/12/2021

ADDRESS: Stantec Consulting Services Inc.
3052 Beaumont Centre Circle
Lexington, Kentucky 40513-1703

TELEPHONE: (859) 422-3000

ATTACHMENTS: Initial Hazard Potential Classification Assessment

INITIAL HAZARD POTENTIAL CLASSIFICATION ASSESSMENT

Stantec Consulting Services Inc.
3052 Beaumont Centre Lane, Lexington KY 40513-1074

December 8, 2016
File: rpt_016_let_175565009
Revision 0

Tennessee Valley Authority
1101 Market Street
Chattanooga, Tennessee 37402

Re: Initial Hazard Potential Classification Assessment
Ash Disposal Area 4
EPA Final Coal Combustion Residuals (CCR) Rule
TVA Colbert Fossil Plant
Tuscumbia, Alabama

1.0 PURPOSE

This letter documents Stantec's certification of the initial hazard potential classification assessment for the TVA Colbert Fossil Plant's Ash Disposal Area 4. The EPA Final CCR Rule requires owners or operators of CCR surface impoundments to conduct initial and periodic hazard potential classification assessments of the unit, assign one of three potential hazard classification ratings to it, and provide the basis for the rating, as per 40 CFR 257.73(a)(2). Hazard potential classification ratings define the consequences in the event of a failure – *the ratings have nothing to do with the likelihood of failure or the structural stability of the impoundment*. Based on this assessment, the Ash Disposal Area 4 has been assigned a significant hazard potential classification rating.

2.0 BASIS FOR CLASSIFICATION RATING

As described in the attached assessment report, the hazard potential classification rating of "significant" was assigned to the Ash Disposal Area 4 because a failure or mis-operation would result in no probable loss of human life, but could cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns. In 2013, Stantec reviewed the hazard potential classification of Ash Pond No. 4. It was determined that a breach of the impoundment would not likely result in loss of life. To the north and east, a breach would likely result in the release of CCR materials to Cane Creek. Review of the analysis and current conditions at the Ash Disposal Area 4 concluded that the existing hazard classification was applicable.

3.0 SUMMARY OF FINDINGS

The attached report presents the analysis for the initial hazard potential classification assessment. The results demonstrate that the impoundment meets the hazard potential classification of "significant."

Re: Initial Hazard Potential Classification Assessment
Ash Disposal Area 4
EPA Final Coal Combustion Residuals (CCR) Rule
TVA Colbert Fossil Plant
Tuscumbia, Alabama

4.0 QUALIFIED PROFESSIONAL ENGINEER CERTIFICATION

I, John S. Montgomery, being a Professional Engineer in good standing in the State of Alabama, do hereby certify, to the best of my knowledge, information, and belief:

1. that the information contained in this certification is prepared in accordance with the accepted practice of engineering;

2. that the information contained herein is accurate as of the date of my signature below; and

3. that the initial hazard potential classification assessment for the TVA Colbert Fossil Plant's Ash Disposal Area 4 meets the requirements specified in 40 CFR 257.73(a)(2).

SIGNATURE John S. Montgomery DATE December 8, 2016

ADDRESS: Stantec Consulting Services Inc.
3052 Beaumont Centre Circle
Lexington, Kentucky 40513-1703

TELEPHONE: (859) 422-3000

ATTACHMENTS: Initial Hazard Potential Classification Assessment

Initial Hazard Potential Classification Assessment

Colbert Fossil Plant – Ash Disposal
Area 4
Tuscumbia, Alabama

Prepared for:
Tennessee Valley Authority
Chattanooga, Tennessee

Prepared by:
Stantec Consulting Services Inc.
Lexington, Kentucky

December 8, 2016
Revision 0

Table of Contents

1.0 RATING 1

2.0 BASIS OF RATING 2
2.1 INTRODUCTION 2
2.2 SOURCE DATA 2
2.3 POTENTIAL FAILURE SCENARIOS 2
2.4 HAZARD CLASSIFICATION 2

3.0 REFERENCES 3

APPENDIX SITE OVERVIEW FIGURE

1.0 RATING

This report documents the hazard potential classification assessment for the Ash Disposal Area 4 at Colbert Fossil Plant (COF) as required per the Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities [RIN-2050-AE81; FRL-9149-4] (EPA Final CCR Rule) § 257.73 (a)(2). Hazard potential classifications are based on the consequences of failure or mis-operation and are not a measure of the condition of the unit. The applicable hazard potential classifications are defined in the EPA Final CCR Rule § 257.53 as follows:

> (1) High hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation will probably cause loss of human life.
>
> (2) Significant hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation results in no probable loss of human life, but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns.
>
> (3) Low hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the surface impoundment owner's property.

Based on these definitions the Ash Disposal Area 4 is classified as a significant hazard potential CCR surface impoundment.

This report contains supporting documentation for the hazard potential classification assessment. The hazard potential classification for this structure was determined by review of a previous assessment conducted by Stantec in September, 2013.

2.0 BASIS OF RATING

2.1 INTRODUCTION

The Tennessee Valley Authority (TVA) has contracted Stantec Consulting Services Inc. (Stantec) to review and update previous hazard potential classification assessments as needed and to prepare the accompanying certification for selected impoundments at various TVA Plants.

COF is located in Colbert County Alabama, adjacent to the Tennessee River. Ash Disposal Area 4 is located south of the power plant and adjacent to Cane Creek, a tributary of the Tennessee River. A site overview figure is included in the appendix.

2.2 SOURCE DATA

For the COF Ash Disposal Area 4, an assessment was previously conducted in 2013. Based on the findings, it was recommended that the hazard classification be listed as a significant hazard.

2.3 POTENTIAL FAILURE SCENARIOS

The 2013 study consisted of a review of previous breach analyses and an assessment of consequence on surrounding property and infrastructure. It concluded a breach of Ash Disposal Area 4 represents a minor risk to external infrastructure and does not represent a probable loss of human life threat. However, because Ash Disposal Area 4 is bordered by Cane Creek to the north and east, a breach would likely result in the off-site release of CCRs into the waters of the United States.

As part of this initial hazard classification assessment, site conditions were reviewed to determine if changes have occurred to the impoundment or to downstream areas that would affect the conclusions of the 2013 study. No significant changes were identified and it is concluded that the hazard classification determination is appropriate.

2.4 HAZARD CLASSIFICATION

Findings of this review and assessment demonstrate that a breach of the Ash Disposal Area 4 would result in no probable loss of human life, but could cause economic loss or environmental damage. It is Stantec's opinion the impoundment fits the definition for a significant hazard potential CCR surface impoundment (as defined in the EPA Final CCR Rule §257.53).

3.0 REFERENCES

1. Stantec, September 30, 2013. Dam Safety Hazard Classification Review Ash Pond No. 4.

2. Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities [RIN-2050-AE81; FRL-9149-4]. April, 2015.

APPENDIX
SITE OVERVIEW FIGURE

Stantec

1863513

1722437

1722437

1863513

Figure No.
1

Title
Site Overview
COF - Ash Disposal Area 4

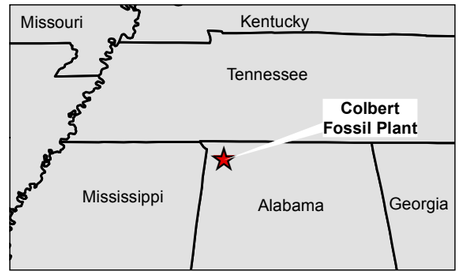
Client/Project
Tennessee Valley Authority
Colbert Fossil Plant (COF)
Hazard Potential Classification Assessment

Project Location:
Colbert County, Alabama

Prepared by mmm on 2016-12-08
Technical Review by awg on 2016-12-08
Independent Review by wrm on 2016-12-08

0 200 400 Feet

1:4,800 (At Original document size of 11x17)



Notes
1. Coordinate System: NAD 1983 StatePlane Alabama West FIPS 0102 Feet
2. TVA Aerial Imagery dated 2016.
3. State boundaries produced by ESRI, U.S. Department of Commerce, U.S. Census Bureau.

Stantec

V:\1753\active\175565009\gis\mxds\Colbert101.mxd Revised: 2016-11-30 By: mmeehan

February 21, 2019
Revision 2

Emergency Action Plan (EAP)
Ash Disposal Area 4
EPA Final Coal Combustion Residuals (CCR) Rule
TVA Colbert Fossil Plant
Tuscumbia, Alabama

1.0 Purpose

This letter documents TVA's certification of the Emergency Action Plan (EAP) for the TVA Colbert Fossil Plant's Ash Disposal Area 4. The EPA Final CCR Rule requires owners or operators of significant or high hazard potential CCR surface impoundments to prepare and maintain a written EAP. Additionally, the written EAP, and any subsequent amendment to the EAP, must be certified by a qualified professional engineer that the EAP meets the requirements specified in 40 CFR 257.73(a)(3) of the CCR Rule.

2.0 Qualified Professional Engineer Certification

I, Jason Curtsinger, being a Professional Engineer in good standing in the State of Alabama, do hereby certify, to the best of my knowledge, information, and belief:

1. That the information contained in this certification is prepared in accordance with the accepted practice of engineering;

2. That the information contained herein is accurate as of the date of my signature below; and

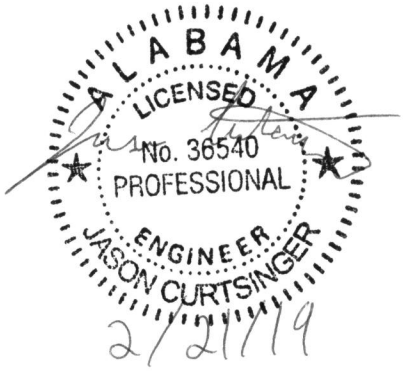
3. That the EAP for Ash Disposal Area 4 meets the requirements specified in 40 CFR 257.73(a)(3).

Signature _____ Date 2/21/19

Address: Tennessee Valley Authority
1101 Market Street
Chattanooga, TN 37402-2801

Telephone: (423) 751-3469

Attachments: Emergency Action Plan



CCR UNIT EMERGENCY ACTION PLAN

COLBERT FOSSIL PLANT
TUSCUMBIA, ALABAMA

Prepared by:

TENNESSEE VALLEY AUTHORITY
1101 Market Street
Chattanooga, TN 37402-2801

February 21, 2019 (Amended)

Revision or Change Number	Effective Date	Affected Page Numbers	Description of Revision/Change
0	04/17/2017	All	Initial Issue
1	10/17/18	Multiple	Updated description for closure of unit, roles and responsibilities, and contact information.
2	02/21/19	4, 5	Updated Colbert County EMA information and exercises

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APPENDICES

Appendix 1 Potential Breach Maps
Appendix 2 Notification Flow Chart

1.0 Purpose

This Emergency Action Plan (EAP) provides guidance for identifying and responding to safety emergencies at Ash Disposal Area 4 Coal Combustion Residuals (CCR) unit at the Colbert Fossil Plant (COF) which has been categorized as a significant hazard potential CCR surface impoundment as required by 40 CFR 257.73(a)(2) of the Final CCR Rule. The EAP has been prepared, and will be maintained, in accordance with 40 CFR 257.73(a)(3) of the Final CCR Rule and with TVA Standard Programs and Processes.

2.0 Map and Description of CCR Unit

In accordance with § 257.73(a)(3)(i)(D), the EAP must include a map which delineates the downstream area which would be affected in the event of a CCR unit failure and a physical description of the CCR unit.

The requisite map is attached as Appendix 1.

Ash Disposal Area 4 is enclosed within a clay perimeter dike system consisting of original and raised dikes. The unit has been closed with a geomembrane cap system and does not impound water. The final configuration has been graded to gravity drain surface water to Cane Creek.

3.0 Safety Emergency Identification and Detection Procedures

In accordance with 40 CFR 257.73(a)(3)(i)(A), the EAP must define the events or circumstances involving the CCR unit that represent a safety emergency and describe the procedures that will be followed to detect a safety emergency in a timely manner.

The Construction Manager conducts weekly observations of the unit and is trained to detect a real or potential safety emergency. In addition to the weekly observations, TVA

performs regularly-scheduled inspections of the unit per TVA's Generation, Construction, Projects & Services (GCP&S) Standard Programs and Processes (SPP) 27.4. If the incident is discovered by plant personnel after hours of normal operations, the Combustion Turbine (CT) Manager will coordinate directly with the Construction Manager. Upon detection of a condition that could result in a real or potential safety emergency, the Construction Manager is responsible for the immediate evaluation and classification of the condition into one of the following three classifications.

1. *Potential Threat (Condition Yellow)* – The potential for failure exists due to significant slope movement or stack subsidence without CCR material exposure or release. CCR material is contained within the unit but the conditions are currently unstable. The Construction Manager will work with the CCP Engineer to further evaluate and determine the appropriate repairs and whether deployment of contingent containment measures or additional notifications is necessary. This condition **IS NOT** considered a safety emergency and will not require activation of this EAP.

2. *On-Site Uncontained Condition (Condition Orange)* - CCR material has been released from the CCR unit but can be contained on-site. Immediate remedial action is required to prevent further migration of CCR material. The Construction Manager and the CT Manager will make the required TVA and appropriate external notifications identified in Section 4.2. The local responders will be notified of the condition, but no action will be required from the external agencies. This condition **IS NOT** considered a safety emergency and will not require activation of this EAP.

3. *Off-Site Uncontained Condition (Condition Red)* – A significant impoundment or slope failure occurs which has the potential to result, or has resulted, in the off-site migration of CCR material. The Construction Manager and the CT Manager will make the required TVA and appropriate external notifications identified in

Section 4.2. This condition **IS** considered a safety emergency and requires activation of this EAP.

4.0 Roles and Responsibilities and Notification Procedures

According to § 257.73(a)(3)(i)(B), the EAP must define responsible persons, their respective responsibilities, and the notification procedures in the event of a safety emergency involving the CCR unit.

4.1 Responsible Persons and Their Responsibilities

The following section describes the responsible persons and their respective roles and responsibilities under the EAP.

- CT Manager – Responsible for notifying the TVA corporate emergency response operations staff and external agencies as required by the Site Emergency Response Procedures (SERP) and as identified in Section 4.2 and Appendix 2. Coordinates with Construction Manager.
- Construction Manager – Responsible for on-site response including initial assessment, notifications as identified in Appendix 2, and Contractor oversight. Serves as the primary interface with the CT Manager.
- TVA Strategic Asset Program Manager – Responsible for coordinating the engineering response to an incident and assisting the Construction Manager in notifications and emergency response resources.
- CCP Engineer – Responsible for conducting field evaluations to verify containment, assess stability, and the potential for continued or future CCR discharges.

4.2 Notification Procedures

In the event of a real or potential safety emergency condition being identified, the notification flow chart provided in Appendix 2 will be followed. Communication and

coordination with outside agencies will be through the CT Manager. The CT Manager has plant specific site emergency response procedures for each of these notifications. Access to the unit, staging areas, and communications will be arranged and coordinated through this interface. Specific tasks that the CT Manager will perform with coordination from the Construction Manager in the event of a safety emergency include:

- Activate internal alarms and hazard communication system to notify plant personnel.
- Notify required response personnel.
- Identify the character, source, amount and extent of the release, as well as any other items needed for notification.
- Notify and provide necessary information to the appropriate Federal, State and local authorities in accordance with TVA site specific emergency procedure CCT-EP-35.001.
- Assess the possible hazards to human health and the environment due to the release.
- Assess and implement prompt removal actions to contain the CCR material.
- Coordinate rescue and response actions previously arranged with all response personnel.
- Coordinate activities for setting up the incident command, if needed.

5.0 Contact Information of Emergency Responders

In accordance with § 257.73(a)(3)(i)(C), the EAP must provide the contact information of emergency responders.

The contact information for emergency responders is provided below:

- TVA Colbert CT Manager – (256) 627-0893
- Colbert County Emergency Management Agency (EMA) – (256) 381-0911
- Colbert County Warning Point – (256) 381-0911

6.0 Meetings/Exercises

Per Rule § 257.73(a)(3)(i)(E), the EAP must include provisions for an annual face-to-face meeting or exercise between representatives of the owner or operator of the CCR unit and the local emergency responders.

Annual face-to-face meetings shall be conducted between representatives of TVA responsible for safety emergency response for the unit and the local emergency responders.

Records of such meetings or exercises will be incorporated into the operating record as described in Section 7.0.

7.0 Records

TVA will comply with all recordkeeping and notification requirements specified in 40 CFR 257.105, 257.106, and 257.107. The following records are maintained in an electronic auditable database for the unit's operating record and made publicly available through the "CCR Rule Compliance Data and Information" website.

- EAP and any revisions to the EAP.
- Documentation recording the annual face-to-face meeting or exercise between representatives of the owner/operator of the CCR unit and local emergency responders.
- Any activations of the EAP.

Notification of additions to the operating record must be sent to the Alabama Solid Waste Program within 30 days of being placed in the operating record.

8.0 Amendments/Modification

Per Rule § 257.73(a)(3)(ii), the owner or operator of a CCR unit may amend the written EAP at any time and must amend the written EAP whenever there is a change in conditions that would substantially affect the EAP in effect. The revised EAP must be placed in the facility's operating record as required by § 257.105(f)(6). The written EAP must be evaluated at a minimum every five years to ensure the information required in § 257.73(a)(3)(i) is accurate. Additionally, pursuant to § 257.73(a)(3)(iii), if the owner or operator determines that the CCR until is no longer classified as either a high hazard or significant hazard potential CCR surface impoundment, then the owner or operator is no longer required to maintain a written EAP beginning on the date when the periodic hazard potential assessment documentation is placed in the facility's operating records as required by § 257.105(f)(5).

If it is concluded in a periodic hazard potential assessment that this unit is no longer classified as a significant or a high hazard potential CCR surface impoundment, then the unit is no longer subject to the EAP requirements.

This EAP must be evaluated every five years at a minimum, but will be reviewed and evaluated annually as a matter of TVA policy. Additionally, the EAP will be amended in the event of a change of conditions that would substantially affect the EAP. As necessary, the EAP will be updated and the revised EAP will be placed in the facility's operating record as required by 40 CFR 257.105(f)(6). Amendments and modifications to the EAP will be recorded as described in Section 7.0.

APPENDIX 1

POTENTIAL BREACH MAP

Tennessee River
(Normal Pool El. 414 Ft)

TVA Facilities
Approximate Elevation = 440 ft

Cane Creek

Dike Minimum Crest
Elevation = 460 ft

Ash Pond Number 4

Railroad

72

Colbert Steam Plant Road

Railroad

72

Legend

- Potential Breach Direction of Flow
- Direction In Which Breach Cannot Occur
- Elevation Structure
- Dike Crest
- Impoundment Boundary
- Elevation Contours (10-Foot Intervals Outside of Impoundment, 2-Foot Intervals Inside Impoundment)

Stantec Consulting Services Inc.
11687 Lebanon Rd.
Cincinnati, Ohio
45241-2012
513-842-8200
www.stantec.com

Stantec

Ash Pond Number 4 Breach Scenarios

TVA Hazard Classification
Colbert Fossil Plant
Tennessee Valley Authority
Colbert County, Alabama

PROJECT NO.	175630008
DATE	May 29, 2012
DRAWN BY	DEH
CHECKED BY	
CHECKED BY	
SCALE	1" = 500'
REVISED	
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	

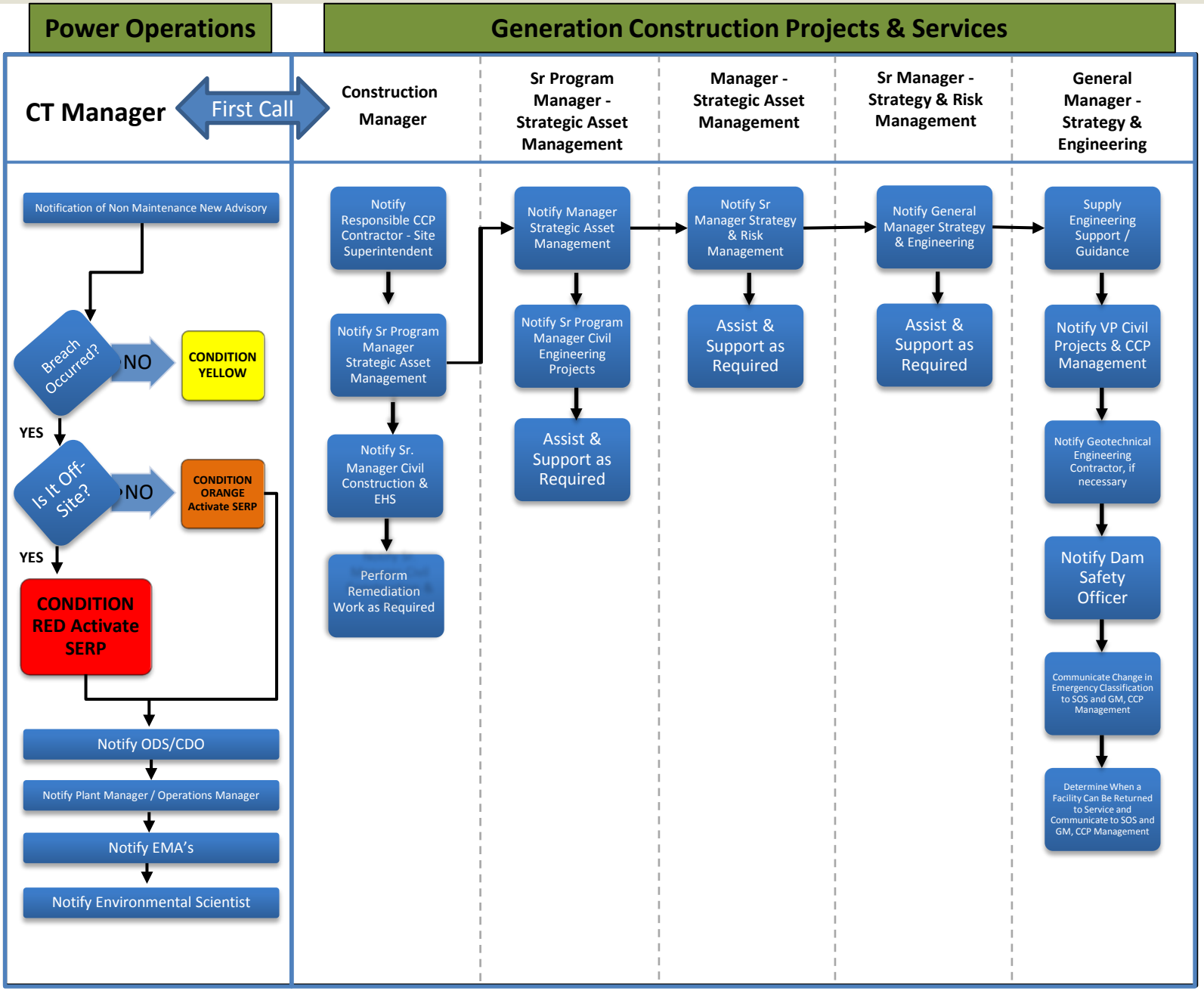
SHEET

Figure 1

APPENDIX 2

NOTIFICATION FLOW CHART

CCP Emergency Action Plan Notification Flow Chart



Attachment E

Stability and Safety Factor Assessments

Periodic Structural Stability Assessment by Stantec dated October 12, 2021

Post Closure Safety Factor Assessment Report Colbert Fossil Plan Ash Disposal Area 4 by GEI dated December 7, 2021

Stantec Consulting Services Inc.
3052 Beaumont Centre Circle, Lexington, KY 40513

October 12, 2021
File: rpt_013_let_175568465
Revision 0

Tennessee Valley Authority
1101 Market Street
Chattanooga, Tennessee 37402

RE: Periodic Structural Stability Assessment
Ash Disposal Area 4
EPA CCR Rule
TVA Colbert Fossil Plant
Colbert County, Alabama

1.0 PURPOSE

This letter documents certification that the Ash Disposal Area 4 at the Tennessee Valley Authority (TVA) Colbert Fossil Plant is in compliance with the structural stability requirements set forth in 40 CFR 257.73(d) of the EPA CCR Rule. The EPA CCR Rule requires periodic structural stability assessments, certified by a professional engineer, every five years. The initial certification of structural stability was placed in the operating record October 14, 2016.

2.0 INITIAL STRUCTURAL STABILITY ASSESSMENT

The initial structural stability assessment is attached. The result of the initial assessment was that Ash Disposal Area 4 complied with 40 CFR 257.73(d).

3.0 CURRENT STRUCTURAL STABILITY ASSESSMENT

Stantec reviewed the result of the initial structural stability assessment and the changes in the site conditions that have occurred in the past five years. Stantec also visually observed current site conditions during a site reconnaissance held on June 21, 2021. The following items summarize changes that have occurred:

1. Ash Disposal Area 4 has been capped and closed and the area is no longer designed to impound surface water. The site is graded to convey stormwater to the north and south of the impoundment. Stormwater discharges through a 30-inch diameter HDPE culvert (north) and a 36-inch diameter HDPE culvert (south).

2. Cross-sectional geometry of the perimeter dike system has not changed.

3. Flood levels of adjacent Cane Creek have not changed.

Re: **Periodic Structural Stability Assessment**
Ash Disposal Area 4
EPA CCR Rule
TVA Colbert Fossil Plant
Colbert County, Alabama

4. Annual and weekly inspections conducted since 2015 were reviewed as part of this assessment. No areas of interest were identified that would warrant remediation of deficient stability conditions.

5. Monthly instrumentation (i.e., piezometer) monitoring conducted since 2015 has been reviewed and the phreatic condition at the critical cross section has reduced or remained consistent.

6. The perimeter dike and spillway structure were visually inspected during the site reconnaissance and no deficiencies were found that would negatively affect the structural stability assessment.

Based on our review, there are no conditions that have changed in the past five years that would cause the results of the initial structural stability assessment to have changed.

4.0 SUMMARY OF ASSESSMENT

Based on review of the initial structural stability assessment and the items listed in Section 3.0, the result of this periodic structural stability assessment is that the Ash Disposal Area 4 at Colbert meets the requirements of §257.73(d) of the EPA CCR Rule.

Re: **Periodic Structural Stability Assessment**
Ash Disposal Area 4
EPA CCR Rule
TVA Colbert Fossil Plant
Colbert County, Alabama

5.0 QUALIFIED PROFESSIONAL ENGINEER CERTIFICATION

I, Robert D. Fuller, being a Professional Engineer in good standing in the State of Kentucky, do hereby certify, to the best of my knowledge, information, and belief:

1. that the information contained in this certification is prepared in accordance with the accepted practice of engineering;

2. that the information contained herein is accurate as of the date of my signature below; and

3. that this periodic structural stability assessment for the TVA Colbert Fossil Plant's Ash Disposal Area 4 meets the requirements specified in 40 CFR 257.73(d)(1)&(2).

SIGNATURE Robert D. Fuller DATE 10/12/2021

ADDRESS: Stantec Consulting Services Inc.
3052 Beaumont Centre Circle
Lexington, Kentucky 40513

TELEPHONE: (859) 422-3000

ATTACHMENTS: Initial Structural Stability Assessment Report

INITIAL STRUCTURAL STABILITY ASSESSMENT

AECOM
564 White Pond Drive
Akron, OH 44320-1100
www.aecom.com

330-836-9111 tel
330-836-9115 fax

December 9, 2016

Tennessee Valley Authority
1101 Market Street
Chattanooga, Tennessee 37402

Initial Structural Stability Assessment
Ash Disposal Area 4
EPA Final CCR Rule
TVA Colbert Fossil Plant
Drakesboro, Kentucky

1.0 PURPOSE

This letter documents AECOM's certification of the initial structural stability assessment for the TVA Colbert Fossil Plant's Ash Disposal Area 4. Based on this assessment, Ash Disposal Area 4 complies with the structural stability requirements in the Final CCR Rule at 40 CFR 257.73(d).

2.0 INITIAL STRUCTURAL STABILITY ASSESSMENT

As described in 40 CFR 257.73(d), documentation is required on whether Ash Disposal Area 4 has been designed, constructed, operated, and maintained according to the structural stability requirements listed in the section. The combined capacity of all spillways must also be designed, constructed, operated, and maintained to adequately manage flow from the 1000-year storm event based upon a hazard potential classification of "significant."

3.0 SUMMARY OF FINDINGS

The attached report presents the initial structural stability assessment of Ash Disposal Area 4 . The results show that the impoundment meets the structural stability requirements set forth in 40 CFR 257.73(d)(1)-(2).

Remainder of page intentionally left blank.

AECOM

4.0 QUALIFIED PROFESSIONAL ENGINEER CERTIFICATION

I, Michael Stepic PE, being a Professional Engineer in good standing in the State of Alabama, do hereby certify, to the best of my knowledge, information, and belief:

1. that the information contained in this certification is prepared in accordance with the accepted practice of engineering;

2. that the information contained herein is accurate as of the date of my signature below; and

3. that the initial structural stability assessment for the TVA Colbert Fossil Plant's Ash Disposal Area 4 meets the requirements specified in 40 CFR 257.73(d)(1)-(2).

SIGNATURE _____ DATE 12/9/16

ADDRESS: AECOM
564 White Pond Drive
Akron, OH 44320
TELEPHONE: (330) 936-9111

ATTACHMENTS: Initial Structural Stability Assessment (40 CFR §257.73(d)(1)) for Coal Combustion Residuals (CCR)

COAL COMBUSTION PRODUCT DISPOSAL PROGRAM

TENNESSEE VALLEY AUTHORITY – ASH DISPOSAL AREA 4
TVA COLBERT FOSSIL PLANT
TUSCUMBIA, ALABAMA

INITIAL STRUCTURAL STABILITY ASSESSMENT (40 CFR §257.73(d)(1)) FOR COAL COMBUSTION RESIDUALS (CCR)

EXISTING SURFACE IMPOUNDMENT

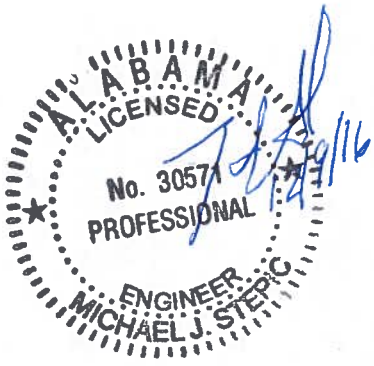
Prepared for

Tennessee Valley Authority
1101 Market Street
Chattanooga, TN 37402-2801

December 9, 2016

Prepared by

AECOM



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APPENDICES

Appendix A: Hydraulic Structures Assessment Calculation Package

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1.0 PROJECT BACKGROUND

On April 17, 2015, the "Disposal of Coal Combustion Residuals (CCR) from Electric Utilities" (EPA Final CCR Rule) was published in the Federal Register. AECOM has been contracted by the Tennessee Valley Authority (TVA) to analyze the Structural Stability of the Colbert Fossil Plant's CCR surface impoundments (SI) and evaluate compliance with §257.73 of the EPA Final CCR Rule.

As required by §257.73 of the EPA Final CCR Rule, an initial structural integrity evaluation must include an initial structural stability assessment for each existing CCR surface impoundment that meets the conditions of paragraph (b) as follows:

1. Has a height of five feet or more and a storage volume of 20 acre-feet or more or
2. Has a height of 20 feet or more.

Ash Disposal Area 4 meets the first criterion. The location of Ash Disposal Area 4 is shown in **Figure 1**.

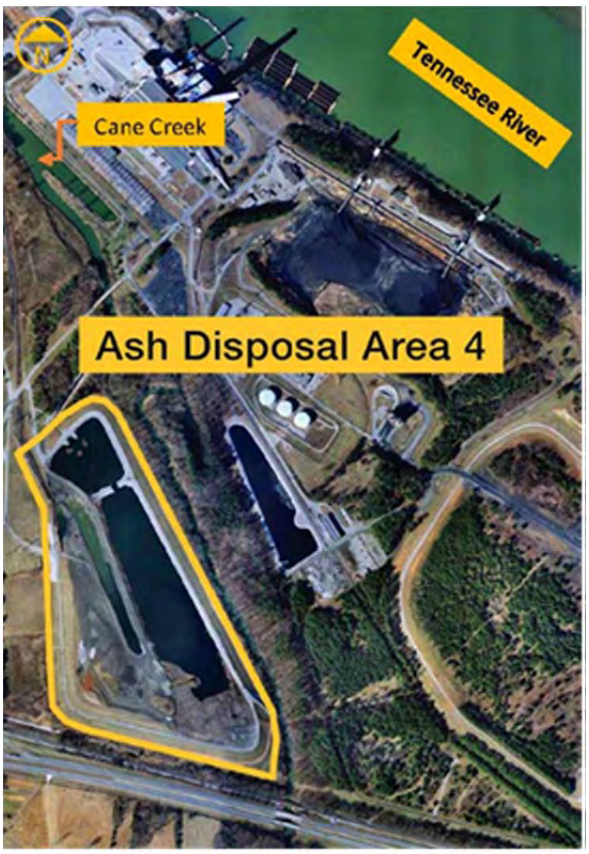


Figure 1: Site Location Plan

2.0 STRUCTURAL STABILITY ASSESSMENT - §257.73(d)(1)

40 CFR 257.73(d)(1). *Periodic structural stability assessments. (1) The owner or operator of the CCR unit must conduct initial and periodic structural stability assessments and document whether the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded therein. The assessment must, at a minimum, document whether the CCR unit has been designed, constructed, operated, and maintained with:*

(i) Stable foundations and abutments;

(ii) Adequate slope protection to protect against surface erosion, wave action, and adverse effects of sudden drawdown;

(iii) Dikes mechanically compacted to a density sufficient to withstand the range of loading conditions in the CCR unit;

(iv) Vegetated slopes of dikes and surrounding areas, except for slopes which have an alternate form or forms of slope protection;

(v) A single spillway or a combination of spillways configured as specified in paragraph (d)(1)(v)(A) of this section. The combined capacity of all spillways must be designed, constructed, operated, and maintained to adequately manage flow during and following the peak discharge from the event specified in paragraph (d)(1)(v)(B) of this section.

(vi) Hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit that maintain structural integrity and are free of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris which may negatively affect the operation of the hydraulic structure; and

(vii) For CCR units with downstream slopes which can be inundated by the pool of an adjacent water body, such as a river, stream or lake, downstream slopes that maintain structural stability during low pool of the adjacent water body or sudden drawdown of the adjacent water body.

2.1 FOUNDATIONS AND ABUTMENTS - §257.73(d)(1)(i)

The geology of Colbert Fossil Plant is underlain by the Tuscumbia Limestone formation. The Tuscumbia Limestone is of Mississippian age and consists of light to medium gray, fine- to medium-grained fossiliferous (primarily crinoid stems), cherty limestone. Chert occurs as light gray to dark bluish gray, sub-rounded nodules in layers throughout the unit. Cherty layers are laterally discontinuous, and no marker beds exist in the formation. Fractures occur commonly within the Tuscumbia Limestone. Horizontal fractures along bedding planes are the most common orientation. No faults were detected on or in the vicinity of the site.

The soils primarily consist of residual clays including silty clays and moderate to high plasticity clays. Chert fragments generally increase near the bedrock interface. Additionally, alluvial deposits can be encountered near Cane Creek.

An inspection of Ash Disposal Area 4 was completed in 2016. Based on the report, no evidence of structural weakness of the unit was observed. No significant signs of tension cracking, settlement, depressions, erosion, and/or deformations at the crest, slope and toe of dikes were observed. The stability of the slopes has been confirmed through TVA's Instrumentation Program and the Initial Safety Factor Assessment. No boils or major uncontrollable seepage areas was observed along slopes or toes of the dikes.

Also, an assessment of seepage conditions for Ash Disposal Area 4 including an evaluation of piping potential of the foundation material was performed. Seepage analyses were performed at a critical cross section (Cross-Section D-D') on the eastern embankment using Geoslope, Inc.'s SEEP/W software. The modeled cross section is shown in **Appendix B**. Vertical gradients were determined near the toe of the outboard slope. A determination of critical, vertical exit gradients was performed following established sources (including Terzaghi and Peck, USACE EM 1110-2-1901, and USBR Design Standard No. 13 Embankment Dams). Seepage exit gradients determined from the analysis were compared with the critical gradient to calculate a safety factor against piping. For the analyzed cross section, the minimum computed safety factor against piping was calculated to be 3.9 which exceed the recommendations of between 1.5 and 3.0 stated in USACE EM 1110-2-1901. Based on existing analytical data and results, the existing embankments and foundation materials are performing acceptably in regard to piping potential in comparison to current criteria.

2.2 SLOPE PROTECTION - §257.73(d)(1)(ii)

The inboard slope along of the dike is armored with riprap, serving as erosion protection along the water line. The crest and the toe of the dike serve as access roads, both having a stone surface. The downstream slopes are primarily covered with well-maintained grassy vegetation, except where covered by stone.

An Intermediate Inspection of CCR Facilities at Colbert Fossil Plant which included the Ash Disposal Area 4 was performed in May 2016. Based on this inspection, the slopes were reported as being generally covered with either maintained grass or riprap; no trees or large, bushy vegetation were present on the slopes. No evidence of burrowing animals was observed. No evidence of actual or potential structural weakness of the inspected units was observed.

Storm water travel along the dike slopes will not cause erosive effects based on the current slope protection and condition. Pond water will not overtop the dike crest during a 1,000-year storm event. No additional slope protection is required based on anticipated erosive flows.

More information on the assessment of slope protection can be found in the 2016 Intermediate Inspection of CCR Facilities and the attached **Photos**.

2.3 EMBANKMENT DIKE COMPACTION - §257.73(d)(1)(iii)

The dike which forms Ash Disposal Area 4 is approximately 6700 feet in length and consists of an original and raised dike. The Dike ranges in height from approximately 20 to 40 feet in height, with the original perimeter dike being constructed to 440 feet MSL and the raised dike to

460 feet MSL. The raised portion was completed to the upstream of the original crest and is partially founded on ash.

Construction documents from the initial Ash Disposal Area 4 construction in 1972 include sections and notes for both the original and raised dikes. Such construction documents note that the fill was to be compacted to at least 95% of standard compaction maximum density, and have moisture content with no more than 2% above optimum, as determined by laboratory testing.

Construction documents noting the methods of embankment dike compaction can be found in the History of Construction Report prepared for CCR Certification by AECOM**.**

2.4 VEGETATED SLOPES - §257.73(d)(1)(iv)

The downstream slopes of Ash Disposal Area 4 are vegetated with well-established and maintained grass except were riprap or stone is present. The impoundment is free from brushy and tree like vegetation, with trees in several locations having been removed in 2009.

An Intermediate Inspection of CCR Facilities at Colbert Fossil Plant which included the Ash Disposal Area 4 was performed in May 2016. This report states that a good stand of grass is generally maintained on the slopes of the perimeter dikes. No evidence of burrowing animals was observed. No evidence of actual or potential structural weakness of the inspected units was observed.

More information on the assessment of vegetated slopes can be found in the 2016 Intermediate Inspection of CCR Facilities and the attached **Photos**.

2.5 SPILLWAY CONDITION AND CAPACITY - §257.73(d)(1)(v)

Under existing conditions, the drainage area for Ash Disposal Area 4 is approximately 52 acres. The drainage area consists of only the impoundment area as there are no run-on flows from outside of the pond's perimeter dikes. The COF ceased coal burning operations on March 23, 2016. As a result, bottom ash is no longer sluiced to Ash Disposal Area 4. Ash Disposal Area 4 is considered to be an inactive surface impoundment and closure activities are scheduled to begin during December 2016.

During operations, water flowed through an open channel along the bottom ash stack and into the main impoundment area. From the main impoundment area, water flowed through a section of the internal divider dike and into the stilling area. Water then discharged through the spillway and into a concrete channel that leads to Cane Creek, located north of the impoundment. In May 2016, all stop logs were removed from the spillway structure to lower the pond operating level. Currently a water elevation (ELE 449) lower than the spillway inverts is maintained through the usage of siphons and pumps.

More information on the existing Ash Disposal Area 4 operations can be found in the History of Construction Report prepared for CCR Certification by AECOM and the attached **Photos**.

An H&H computer model was developed using HEC-HMS to examine the hydraulic behavior of the Ash Disposal Area 4 complex during the Inflow Design Flood (IDF). The required IDF used in the model calculation is based on the pond's hazard classification. Since the Ash Disposal Area 4 was classified as a significant hazard, the required IDF is a 1,000-year flood.

All structure dimensions and invert elevations are modeled using the best available information under current operating conditions of the COF Plant. Existing topographic and survey information for the Ash Disposal Area 4 was provided by TVA. Drainage areas, volumes, and other site geometry were determined using the AutoCAD Civil 3D software package in conjunction with survey data provided by TVA

The modeling results indicate the Ash Disposal Area 4 would not overtop the dike crest during a 1,000-year design storm. The freeboard for the Ash Disposal Area 4 during this storm event is adequate.

More information on the assessment of spillway capacity can be found in the Initial Inflow Design Flood Control Plan prepared for CCR Certification by AECOM.

2.6 SPILLWAY STRUCTURAL INTEGRITY - §257.73(d)(1)(vi)

The Ash Disposal Area 4 spillway device consists of four chambers with stop log weirs in the pond and the associated outlet headwall located near the toe of the pond embankment. The spillway structure was constructed by cast-in-place concrete with each of the four chambers being approximately 9'-4" wide, 5'-4" deep, and 7'-0" in height. The front wall incorporates a stop log weir of adjustable height. A davit arm hoist is mounted on the top of the structure to add/remove stop logs as necessary to adjust the weir elevation.

Also affixed to the front of each chamber is a skimmer structure consisting of a half circle corrugated metal pipe at 96" in diameter. 27" HDPE pipes run from the rear wall of the spillway chambers, through an underground filter diaphragm, and out the headwall structure at the toe of the embankment. The headwall is 4'-0" tall and 31'-0" in length with 13'-0¾" long wingwalls on both ends, turned in at 60°. The headwall sits on a large concrete slab, which has 12" high sills for energy dissipation. The pond water flowing from the headwall flows into a culvert beneath an access road into a concrete lined discharge channel to Cane Creek.

Refer to the Construction Documents in the History of Construction Report prepared for CCR Certification by AECOM for additional information on the existing spillway structures.

2.6.1 SITE INSPECTION AND FINDINGS

On February 18, 2016, AECOM conducted a site inspection to evaluate the condition of the Ash Disposal Area 4 spillway structure. The inspection was performed from the shore of pond 4 and from the pedestrian grates mounted on top of the spillway chambers. The water elevation of Pond 4 was not lowered for additional inspection access. Likewise, the headwall was inspected from the soil behind the headwall, as well as from a nearby timber access platform. The inspection was visual and non-destructive. Conditions for all four chambers were in similar condition.

2.6.1.1 Spillway Chamber Concrete

No evidence of concrete delamination or spalling was present on the exposed spillway chamber concrete. Minor hairline cracking, likely associated with initial shrinkage, is present, but poses no structural concern. There is staining inside the chambers, likely occurring from storm events, but does not appear to be deteriorating the concrete (**Photo 7**). The chamber appears to be functioning adequately.

2.6.1.2 Skimmers, Bracing, and Connections

The skimmer devices exhibit surface rust on the corrugated metal pipes, associated steel bracings, and skimmer mount connection angles (**Photos 8 and 10**). Surface rust has not caused any weakness or loss of material at this time. There was a noticeable kink in one of the skimmer bracing rods in the southernmost chamber, most likely from construction when two rod pieces may have been spliced together (**Photo 9**). Neoprene dampening shims were installed to mount the skimmer devices between the bolted angle plate and the headwall. The neoprene shims caused the angle not to be seated squarely on the concrete face (**Photo 12**). This connection still appears to be functioning adequately.

2.6.1.3 Stop Logs, Guides, and Connections

The stop logs are used to establish the weir elevation for the pond water have mineral deposits and algae on their surface, but does not appear to be causing any issues at this time (**Photo 14**).

The stop log guides consist of a light gauge angle and channel welded together. Sliding surfaces with neoprene gaskets are bonded to the inside of the channels. The bonding agent has begun to break down, and the sliding surfaces have pulled away from channel flanges (**Photo 15**). This may cause some difficulty in sliding additional stop logs down from the top. Neoprene dampening shims were installed between the angle legs and the concrete faces with holes for the anchors to pass through. These shims were placed correctly and are remaining in place and in good condition.

2.6.1.4 Pedestrian Grating, Railings and Crane

The pedestrian railing and grating is in excellent condition with only a few minor spots of surface rust (**Photo 16**). The two davit arm hoist baseplates used to raise and lower stop log sections into the spillway chambers were not tested for operation, but all components appear to be in good condition.

2.6.1.5 Outlet headwall

The outlet structure is generally in very good condition. There are no signs of forward rotation or sliding. There is no significant soil erosion occurring behind the headwall or wing walls (**Photos 3 and 4**). There is a small amount of concrete deterioration at the end of the northern wing wall, but does not appear to be the type of spalling that is associated with rebar corrosion (**Photo 17**).

There is minor vertical cracking with efflorescence above the 27" dia. HDPE pipe openings (**Photo 18**) and mineral buildup below the two 4" HDPE pipes exiting the headwall (**Photo 19**),

but neither affect function, nor pose any structural concern. The energy dissipation sills are in good condition with no signs of erosion.

See the attached **Photos** for typical conditions of the spillway device.

2.6.2 STRUCTURAL ASSESSMENT

The riser structures were evaluated for two different limit states. The first is associated with regularly occurring reservoir levels. The critical condition for floatation of the riser structures occurs when the reservoir level is near the top of the riser structures, but water is not flowing over. It was assumed that the riser structures were not filled with water. The buoyant force is acting on the outside, but the riser structures are not filled with water. The critical condition for bearing capacity at the base of the riser structures is when the risers are filled with water. Sliding and overturning moment were not checked for this limit state because the structure is subjected to equalized hydrostatic pressure.

The second limit state is associated with loading under the 1,000-year storm event. Evaluation for this flood event is required for a significant hazard potential unit per rule §257.73(d). It has been determined that the 1,000-year storm event will not likely overtop the pond, so there will not be a flow velocity on the side of the riser structures. At this state, the structural stability was once again checked with regard to floatation, sliding, moment equilibrium, and bearing capacity. Various parts of the structure were again checked to ensure adequate structural capacity.

The headwall was evaluated for only one limit state. The phreatic surface is below the footing slab under normal conditions, and will not rise appreciably for the 1000 year flood. Therefore, groundwater will not affect the design, and the same analysis will apply for the normal operating conditions and the flood event. The concrete lined discharge channel tail water could rise and submerge the headwall, but any buoyant force generated would be counteracted by water above the footing slab. The headwall structure stability was checked with regard to sliding, moment equilibrium, and bearing capacity, and various parts of the structure where checked for capacity.

It should be noted that no live load surcharge was applied to the rear wall of the spillway structure for the analyses. Haul trucks travel the perimeter road behind the spillway, but the road is far enough from the spillway to effectively reduce any live load surcharge.

The existing structures satisfy the factor of safety requirements for both limit states under each condition evaluated.

See **Appendix A** for the results for each limit state including the associated calculations, structure geometry and material properties.

2.7 SUDDEN DRAWDOWN - §257.73(d)(1)(vii)

The Sudden Drawdown Assessment does not apply to the Ash Disposal Area 4. Currently water level is maintained at an elevation lower than the inverts of the spillway outlet via a siphon structure. The stop log weirs of the outlet structure have also been removed.

3.0 CONCLUSION

Based on the initial structural stability assessment, the requirements of **Rule §257.73(d)(1)** for the Ash Disposal Area 4 have been met.

4.0 REFERENCES

1. Environmental Protection Agency, "Final Rule: Disposal of Coal Combustion Residuals from Electric Utilities", Federal Register, April 17, 2015.
2. AECOM, Ash Disposal Area 4, Initial Inflow Design Flood Control System Plan (40 CFR 257.82) prepared for Coal Combustion Residuals (CCR) Existing Surface Impoundments, 2016.
3. AECOM, Ash Disposal Area 4, History of Construction (40 CFR 257.73(c)) prepared for Coal Combustion Residuals (CCR) Existing Surface Impoundments, 2016.
4. TVA, Colbert Fossil Plant, 2016 Intermediate Inspection of CCR Facilities, May 13, 2016.
5. USACE, "USACE EM 1110-2-1902 Slope Stability," October 31, 2003.
6. USBR Design Standard No. 13 Embankment Dams, Chapter 8, January, 2014.
7. K. Terzaghi and R. B. Peck, Soil mechanics in engineering practice, New York: John Wiley & Sons, Inc., 1996.
8. Stantec and AECOM, "Annual Instrumentation and Monitoring Program Final Report (Rev. 2); Fiscal Year 2015; Tennessee Valley Authority Instrumentation Monitoring Program; Coal Combustion Product (CCP) Storage Facilities; Various Plants Alabama, Kentucky, and Tennessee." February 2016.

PHOTOS

Photo 1 – Aerial View of Spillway and Headwall

Photo 2 – Spillway Structure

Photo 3 – Headwall

Photo 4 – Culvert Beneath Access Road

Photo 5 – Culvert Discharging into Concrete Lined Channel

Photo 6 – Concrete Lined Channel

Photo 7 – Typical Concrete Wall Staining

Photo 8 – Typical Skimmer Rust

Photo 9 – Kink at Splice in Bracing Rod

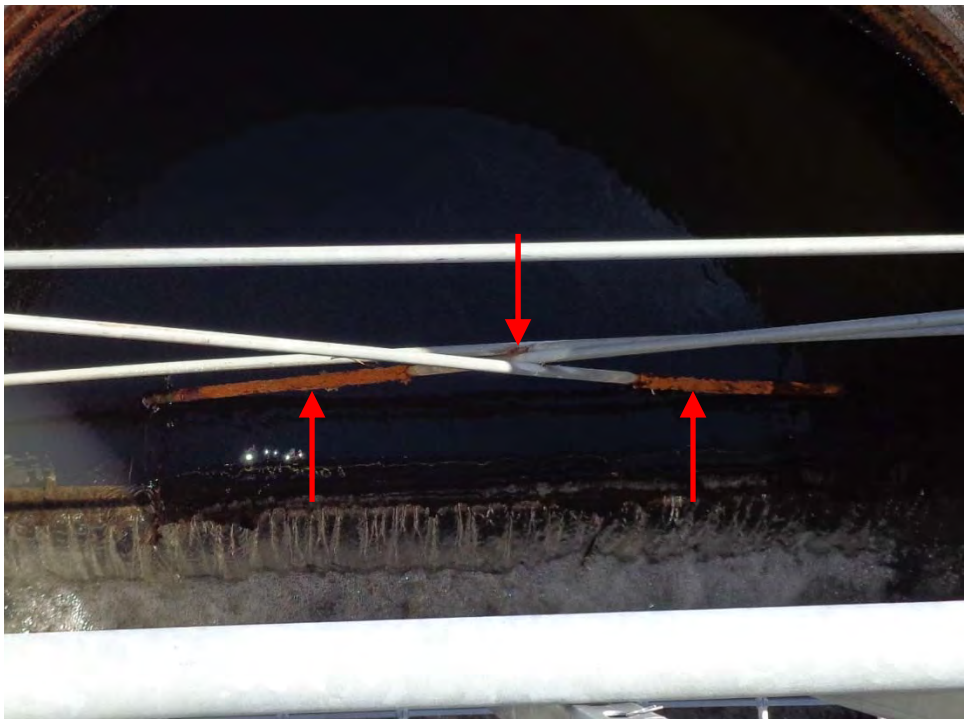


Photo 10 – Typical Rust on Bracing Rods

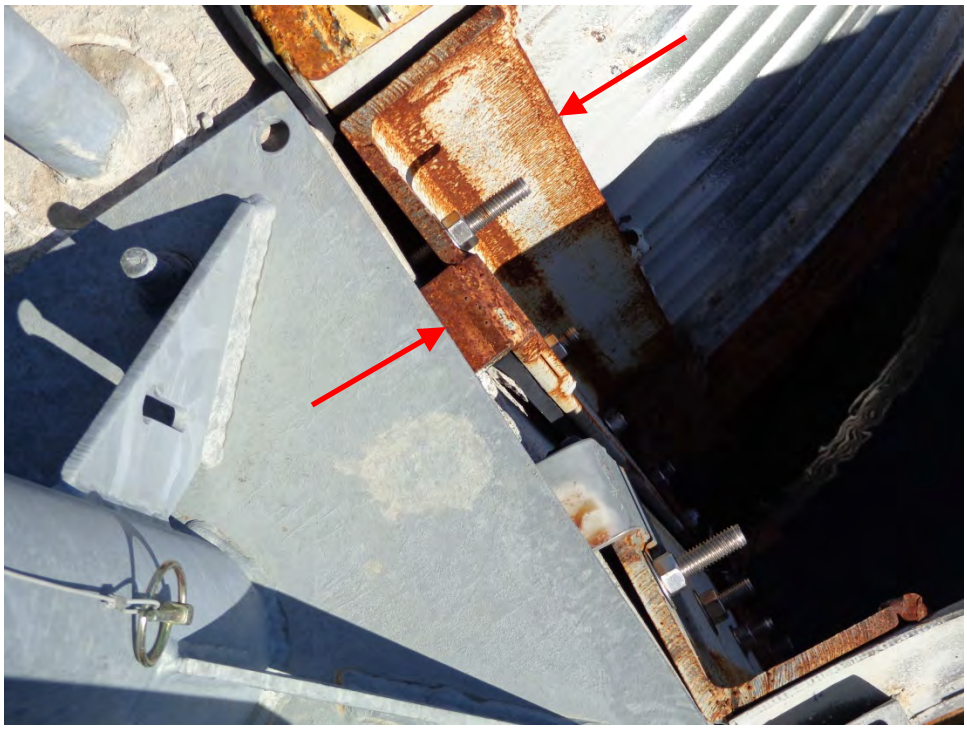


Photo 11 – Typical Surface Rust on Connection Angles

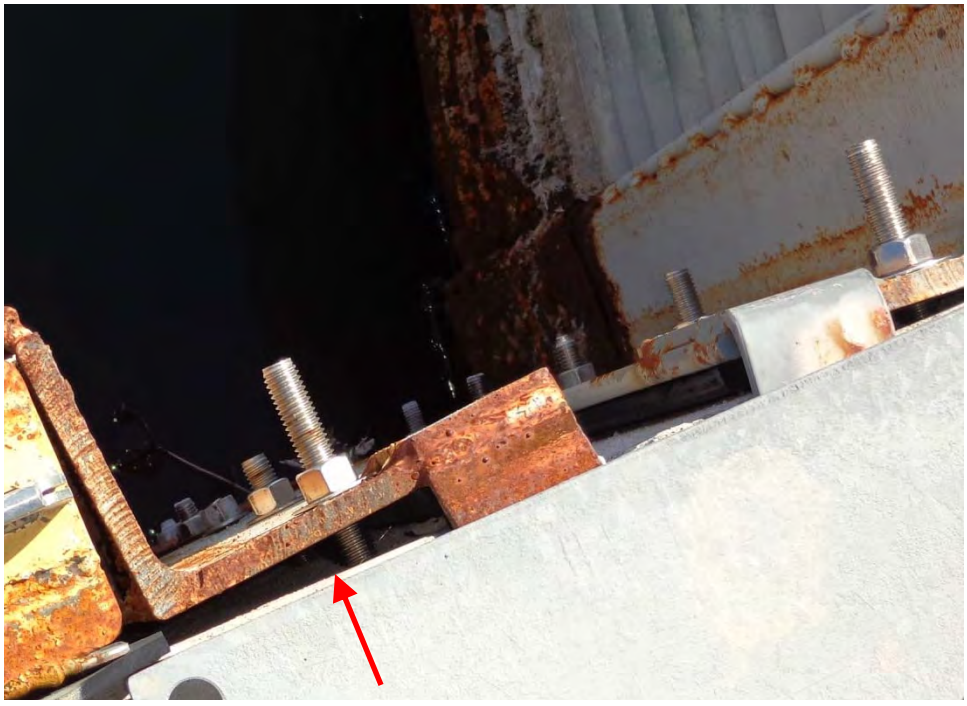


Photo 12 – Typical Improper Angle Seating

Photo 13 – Neoprene Shim Fallen Out of Connection

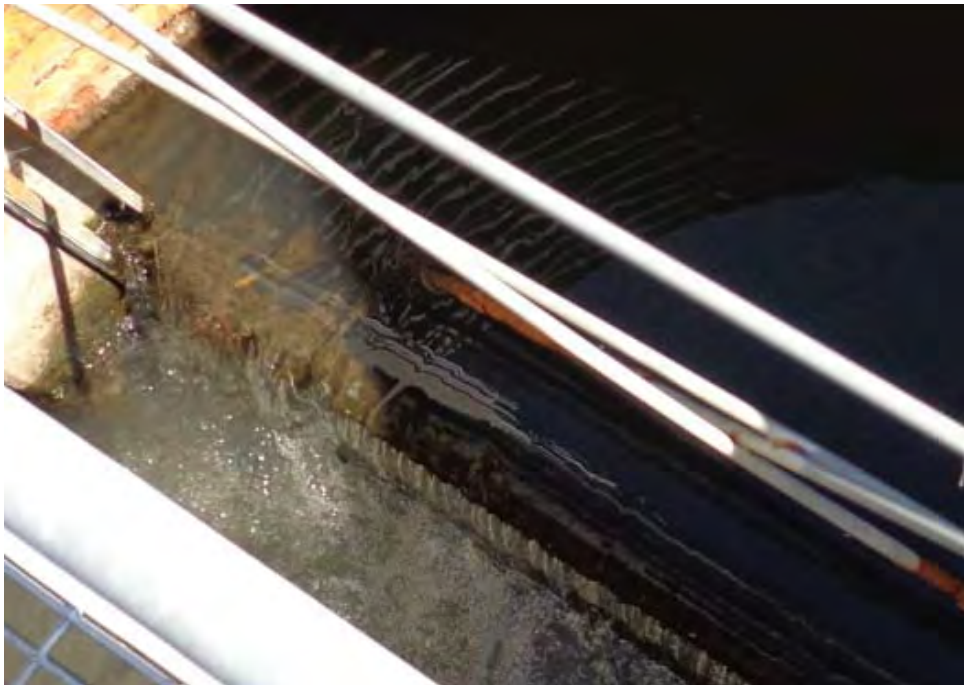


Photo 14 – Typical Algae and Mineral Deposits on Stop Logs

Photo 15 – Typical Bonding Agent Failure

Photo 16 – Pedestrian Grating and Railing

Photo 17 – Minor Concrete Deterioration at End of Northern Wingwall

Photo 18 – Typical Cracking with Efflorescence above 27” HDPE Openings

Photo 19 – Typical Mineral Buildup beneath 4” HDPE Openings

APPENDIX A

HYDRAULIC STRUCTURES ASSESSMENT CALCULATION PACKAGE

AECOM

Job TVA COF | Project No. 60432289 | Sheet ____ of ____

Description Colbert Pond 4 Spillway Evaluation | Computed by MRW | Date 3/11/16

Checked by PJW | Date 3/25/16

Reference

Structure Geometry

See URS Ash Pond 4 - High Hazard Removal & Spillway Replacement Record Drawings dated 8/10/11

Material Properties (Per Record Drawings)

Concrete Strength → 4 ksi

Rebar Yield Stress → 60 ksi

Rolled Steel Plates, Shapes, Bars & Rod → A36

Corrugated Metal Pipe → ASTM A760 Type I

Bolts → $\frac{3}{4}$" ASTM A307

Stop Logs → FRP designed for differential head of 6'

Soil properties per original design calculations performed by URS dated 3/19/10 and Stantec report dated 12/7/09

At Spillway

Soil bearing capacity = 6000 psf

Soil-to-slab friction coefficient = 0.35

Soil-to-wall friction angle $\delta = 11°$

Soil-to-soil friction angle $\varnothing = 28°$

Retained soil → equivalent fluid weighing 40 pcf

(This includes the effect of the sloping backfill and accounts for a portion of the soil being buoyant under the water table.)

$\gamma = 130$ pcf

At Headwall

Soil bearing capacity = 6000 psf

Soil-to-slab friction coefficient = 0.50

Soil-to-wall friction angle $\delta = 11°$

Retained soil → equivalent fluid weighing 65 pcf

(This includes the effect of the sloping backfill.)

$\gamma = 130$ pcf

Water table is below headwall floor slab

AECOM

Job TVA COF | Project No. 60432289 | Sheet ____ of ____

Description Colbert Pond 4 Spillway Evaluation | Computed by MRW | Date 3/11/16

Checked by PJW | Date 3/25/16

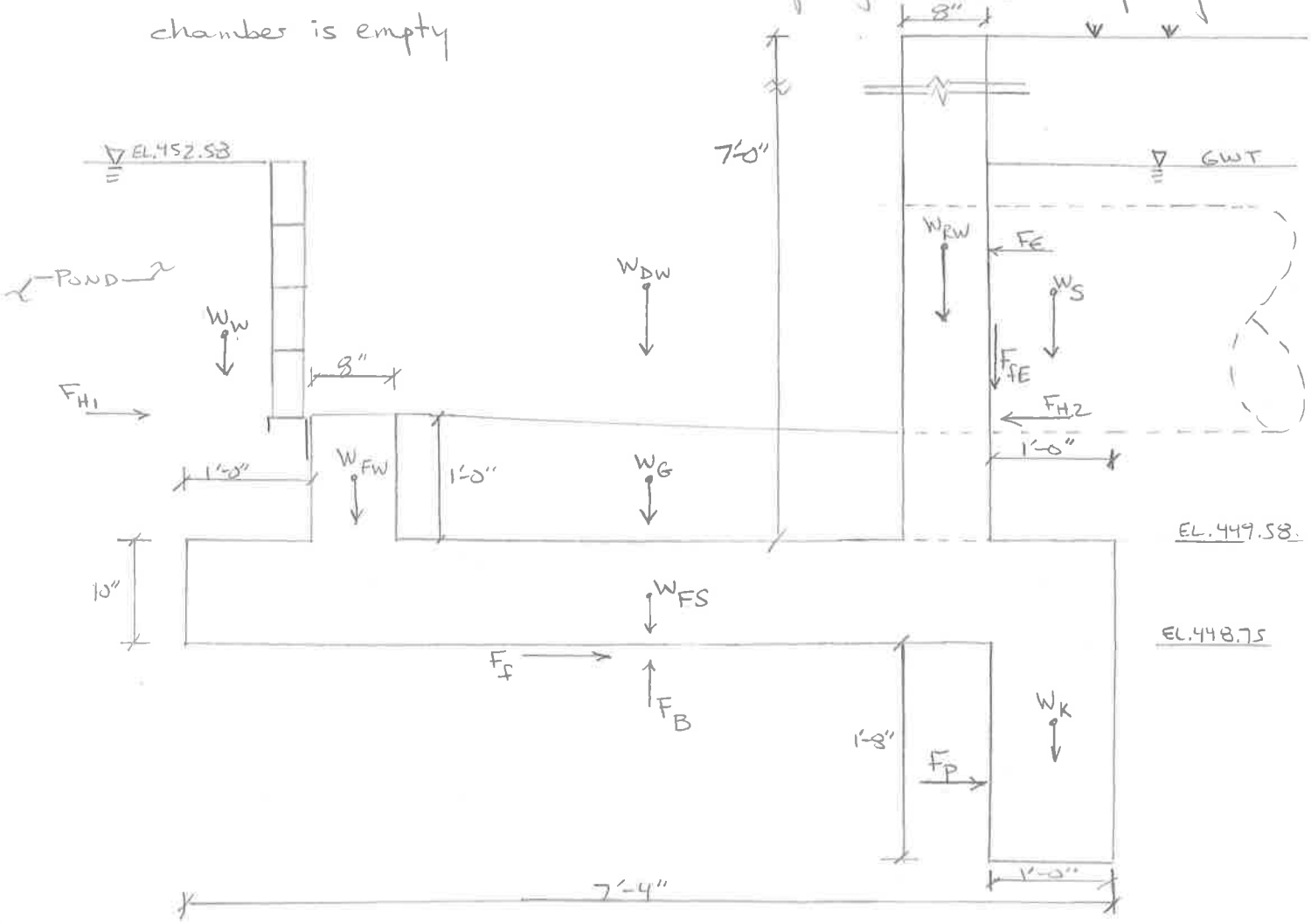
Reference

Evaluate spillway & headwall under regularly occurring water elevation and 1000 year flood elevation.

Structure is considered a significant hazard potential unit (1000 yr flood per TVA-CCR Rule Template 257.73 (d))

Spillway - Regularly Occurring Water Elevation

Per record drawings, normal operation stop log elevation 452.58
Critical scenario → water surface drops just below stop logs and chamber is empty



Evaluate 1 chamber of width
Consider floatation, sliding, moment equilibrium, and bearing capacity

$W_W = 3'(0.667')(9.333')(0.0624 \frac{kip}{ft^3}) = 1.165$ kip

$W_{FW} = 1'(0.667')(9.333')(0.150 \frac{kip}{ft^3}) = 0.934$ kip increase 50% for stop logs 1.401 kip

$W_{FS} = 7.333'(0.833')(9.333')(0.150 \frac{kip}{ft^3}) = 8.551$ kip

$W_{DW} = 7'(4')(1.333')(0.150 \frac{kip}{ft^3}) = 5.599$ kip

$W_{RW} = 7'(0.667')(9.333')(0.150 \frac{kip}{ft^3}) = 6.536$ kip

subtract opening $\frac{\pi(27'')^2}{4} \frac{1}{144}(0.667')(0.150 \frac{kip}{ft^3}) = 0.398$ kip

$\hookrightarrow 6.138$ kip

$W_S = 7'(1')(9.333')(0.130 \frac{kip}{ft^3}) = 8.493$ kip

$W_K = 1.667'(1')(9.333')(0.150 \frac{kip}{ft^3}) = 2.334$ kip

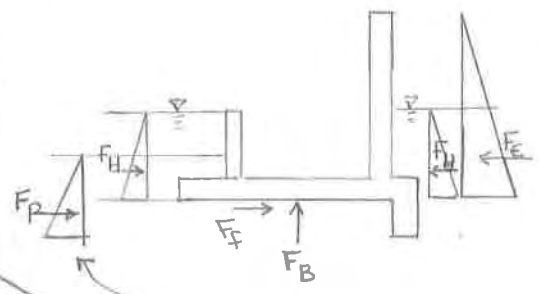
$W_G = 1'(4')(8')(0.120 \frac{kip}{ft^3}) = 3.840$ kip

$F_{H1} = F_{H2} = 0.5(3.833')(.239 ksf)(9.333') = 4.275$ kip

$F_E = 0.5(7.833')(0.313 ksf)(9.333') = 11.441$ kip

$F_{FE} = 11.441$ kip $\tan 11° = 2.224$ kip

$F_B = 3.833'(7.333')(9.333')(0.0624 \frac{kip}{ft^3}) = 16.369$ kip



Conservatively applying hydrostatic forces & buoyant force because structure is buried as shown here. Top is class 1 rip rap so will not scour.

Net downward to create friction on bottom of floor slab

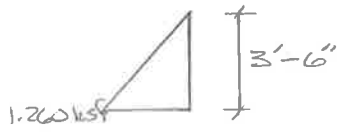
$W_W + W_{FW} + W_{DW} + W_G + W_{FS} + W_{RW} + W_S + F_{FE} - F_B$

1.165 kip $+ 1.401$ kip $+ 5.599$ kip $+ 3.840$ kip $+ 8.551$ kip $+ 6.138$ kip $+ 8.493$ kip $+ 2.224$ kip $- 16.369$ kip $= 21.042$ kip

$F_F = 21.042$ kip $(0.35) = 7.365$ kip

Passive Coefficient

$\frac{1+\sin\phi}{1-\sin\phi} = \frac{1+\sin 28}{1-\sin 28} = 2.77$



$F_p = 0.5(3.500')(1.260ksf)(9.333') = 20.579$ kip

Regularly occurring water elevation is a "Usual Load Combination" (USLC)
Per TVA-CCR Rule Template 257.73(d) 2.1.5
min allowable floatation stability factor of safety for USLC = 1.3

$FS_f = \frac{W_S + W_C + \cancel{S}^{0} + \cancel{D}^{0}}{U - \cancel{W_G}_{0}} = \frac{37.411\text{ kip}}{16.369\text{ kip}} = 2.285 > 1.3$ ✓

Per TVA-CCR Rule Template 257.73(d) 2.1.5
min allowable sliding stability factor of safety for USLC = 2.0

$FS = \frac{F_f + F_p}{F_E} = \frac{7.365\text{ kip} + 20.579\text{ kip}}{11.441\text{ kip}} = 2.442 > 2.0$ ✓

Per TVA-CCR Rule Template 257.73(d) 2.1.5
moment equilibrium stability requirement for USLC is 100% of base in compression

sum moments about right corner, ignoring shear key

$1.165^k(7') + 1.401^k(6') + 5.599\text{ kip}(3.667') + 3.840^k(3.667') + 8.551^k(3.667')$
$+ 6.138^k(1.333') + 2.224^k(1') + 8.493^k(0.5') + 11.441^k(2.611') - 16.369^k(3.667')$
$= 67.030$ kip-ft

Total Vertical $= 1.165^k + 1.401^k + 5.599^k + 3.840^k + 8.551^k + 6.138^k + 2.224^k + 8.493^k$
$- 16.369^k = 21.042^k$

Resultant located $67.030\text{ kip-ft}/21.042^k = 3.19'$ from right corner

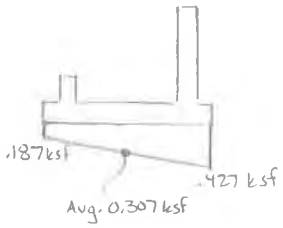
$e = 0.477'$ right of center

$e < \frac{L}{6} = 1.222'$ ∴ Base is 100% in compression ✓

Per TVA-CCR Rule Template 257.73(d) 2.1.5
min allowable bearing capacity factor of safety for USLC = 3.0

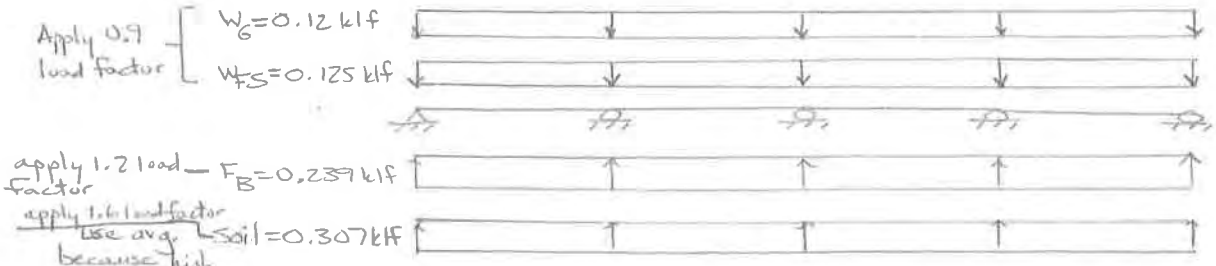
for $e \leq \frac{L}{6}$

$$q = \frac{P\left(1 \pm \frac{6e}{L}\right)}{BL} = \frac{21.042^k\left(1 \pm \frac{6(0.477')}{7.333'}\right)}{9.333'(7.333')} = 0.427\ ksf / 0.187\ ksf$$



$$FS = \frac{6\ ksf}{0.427\ ksf} = 14.1 > 3.0$$ ✓

Check longitudinal floor slab rebar
1' width at center



Net = 0.301 klf
Factored 0.558 klf
0.9D + 1.2F + 1.6H

use avg. because high pressure is near wall (deep beam)

if simply supported $\frac{wl^2}{8}$ top → use $\frac{wl^2}{10} = 0.100\,wl^2$

use $0.107\,wl^2$ bottom

$M_U = 0.107(0.558\ klf)(9.333')^2 = 5.201\ kip\cdot ft = 62.408\ kip\cdot in$

#5 bars @ 12"

$$\phi M_n = \phi A_s f_y\left(d - \frac{A_s f_y}{2(0.85)f'_c b}\right) = 0.9(0.31\ in^2)(60\ ksi)\left(6.063'' - \frac{0.31\ in^2(60\ ksi)}{2(0.85)4\ ksi(12'')}\right) = 97.679\ kip\cdot in$$ ✓

$$1.2M_{cr} = 1.2\frac{(0.474\ ksi)(1000\ in^4)}{5''} = 113.760\ kip\cdot in$$

$1.33M_U = 1.33(62.408\ kip\cdot in) = 83.003\ kip\cdot in < 97.679\ kip\cdot in$ ✓

AECOM

Job TVA COF | Project No. 60437284 | Sheet ____ of ____

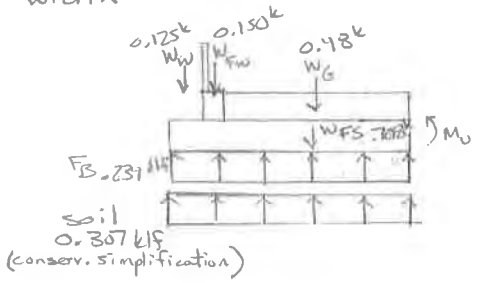
Description Colbert Pond 4 Spillway Evaluation | Computed by MRW | Date 3/14/16

Checked by PJW | Date 3/25/16

Reference

check transverse floor slab rebar

1' width



$M_u = -0.9(.125^k)(5.333') - 0.9(0.150^k)(4.333') - 0.9(0.48^k)(2') - 0.9(0.708^k)(2.833') +$
$1.2(0.239\,klf)(5.666')(2.833') + 1.6(0.307\,klf)(5.666')(2.833') = 8.634\ kip\cdot ft = 103.610\ kip\cdot in$

#5 bars @ 8"

$\phi M_n = 0.9(0.465\,in^2)(60\,ksi)\left(6.688" - \frac{0.465\,in^2(60\,ksi)}{2(0.85)(4\,ksi)(12")}\right) = 159.350\ kip\cdot in$

$1.2M_{cr} = 113.760\ kip\cdot in$ ✓

Check rear wall

spans horizontally between chamber walls

1' width 1/3 up from base

hydrostatic 0.042 ksf soil 0.187 ksf

$1.2(0.042\,klf) + 1.6(0.187\,klf) = 0.350\,klf$

$M_u = 0.107wl^2 = 0.107(0.350\,klf)(7.333')^2 = 3.262\ kip\cdot ft = 39.145\ kip\cdot in$

#5 bars @ 12" horiz.

$\phi M_n = 0.9(0.31\,in^2)(60\,ksi)\left(4" - \frac{0.31\,in^2(60\,ksi)}{2(0.85)(4\,ksi)(12")}\right) = 63.144\ kip\cdot in$

$1.2M_{cr} = 1.2\left(\frac{0.474\,ksi}{4"}\right)(512\,in^4) = 72.806\ kip\cdot in$

$1.33M_u = 1.33(39.145\ kip\cdot in) = 52.063\ kip\cdot in < \phi M_n$ ✓

Job TVA COF | Project No. 60432289 | Sheet ___ of ___

Description Colbert Pond 4 Spillway Evaluation | Computed by MRW | Date 3/14/16

Checked by PJN | Date 3/25/16

Reference

Check side wall

side wall cantilevers vertically because no support at front face of chamber

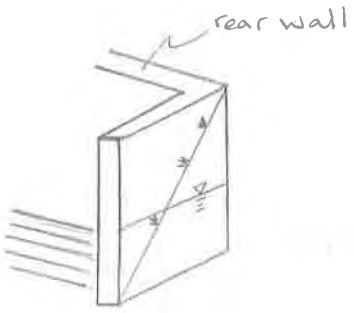
$M_u = 1.2(0.281\,k)(1') + 1.6(0.980\,k)(2.333') = 3.995\ kip\cdot ft = 47.944\ kip\cdot in$

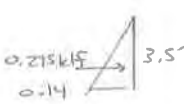
#4 bars @ 12" vertically

$\phi M_n = 0.9(0.20\,in^2)(60\,ksi)\left(4" - \frac{0.20\,in^2(60\,ksi)}{2(0.85)4\,ksi(12")}\right) = 41.612\ kip\cdot in$

$\frac{41.612\ kip\cdot in}{47.944\ kip\cdot in} = 0.868$

Side wall loaded like shown. Assume when soil reaches full height, it is transfered directly into rear wall. Check soil up 3.5'





$M_u = 1.2(0.281\,k)(1') + 1.6(0.245\,k)(1.167') = 0.795\ kip\cdot ft = 9.536\ kip\cdot in$

$1.33M_u = 12.683\ kip\cdot in < \phi M_n = 41.612\ kip\cdot in$ ✓

Interior walls will always receive equal hydrostatic pressure on both sides, so okay by inspection.

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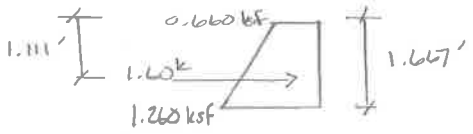
Description Colbert Pond 4 Spillway Evaluation | Computed by MRW | Date 3/14/16

Checked by PJW | Date 3/25/16

Reference

Check shear key

1' wide



$M_u = 1.6(1.60^k)(1.111') = 2.844 \text{ kip}\cdot\text{ft} = 34.130 \text{ kip}\cdot\text{in}$

$\phi M_n = 0.9\left(0.465 \text{ in}^2 (60 \text{ ksi})\left(8.688'' - \frac{0.465(60)}{2(6.35)(4)(12)}\right)\right) = 209.570 \text{ kip}\cdot\text{in}$

$1.2 M_{cr} = 1.2\left(0.474 \text{ ksi}\left(\frac{1728 \text{ in}^4}{6''}\right)\right) = 163.814 \text{ kip}\cdot\text{in}$ ✓

Spillway – 1000 yr Flood

1000 yr flood el. = 454.85

For 1000 yr flood, water will overtop stop logs & chambers will be full.

Evaluate 1 chamber of width

Consider floatation, sliding, moment equilibrium, and bearing capacity

$W_W = 5.27'(5.667')(8.000')\left(0.0624 \frac{kip}{ft^3}\right) = 14.709\ kip$ (chamber is full)

F_H = Equal & opposite hydrostatic pressure on front & rear wall

$F_B = 6.100'(7.333')(9.333')\left(0.0624 \frac{kip}{ft^3}\right) = 26.051\ kip$

Net downward to create friction on bottom of floor slab

$W_W + W_{FW} + W_{DW} + W_G + W_{FS} + W_{RW} + W_S + F_{fE} - F_B$

$14.909\,kip + 1.401\,kip + 5.599\,kip + 3.840\,kip + 8.551\,kip + 6.138\,kip + 8.493\,kip + 2.224\,kip - 26.051\,kip = 25.104\,kip$

$F_f = 25.104\,kip(0.35) = 8.786\,kip$

1000 yr flood is an "Unusual Load Combination" (UNLC)

min allowable floatation stability factor of safety for UNLC = 1.2

$FS_f = \frac{51.155\,kip}{26.051\,kip} = 1.964 > 1.2$ ✓

min allowable sliding stability factor of safety for UNLC = 1.5

$FS = \frac{F_f + F_p}{F_E} = \frac{8.786\,kip + 20.579\,kip}{11.441\,kip} = 2.567 > 1.5$ ✓

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Description Colbert Pond 4 Spillway Evaluation | Computed by MRW | Date 3/15/16

Checked by PJW | Date 3/25/16

Reference

moment equilibrium stability requirement for UNLC is 75% of base in compression

sum moments about right corner, ignoring shear key

$14.909\,kip(4.500') + 1.401^k(6') + 5.599^k(3.667') + 3.840^k(3.667') + 8.551^k(3.667') + 6.139^k(1.333') + 2.224^k(1') + 8.493^k(0.5') + 11.441^k(2.611') - 26.051^k(3.667') = 90.462\,kip\cdot ft$

Resultant located $90.462\,kip\cdot ft / 25.104\,kip = 3.603'$ from right corner

$e = 0.064'$ right of center

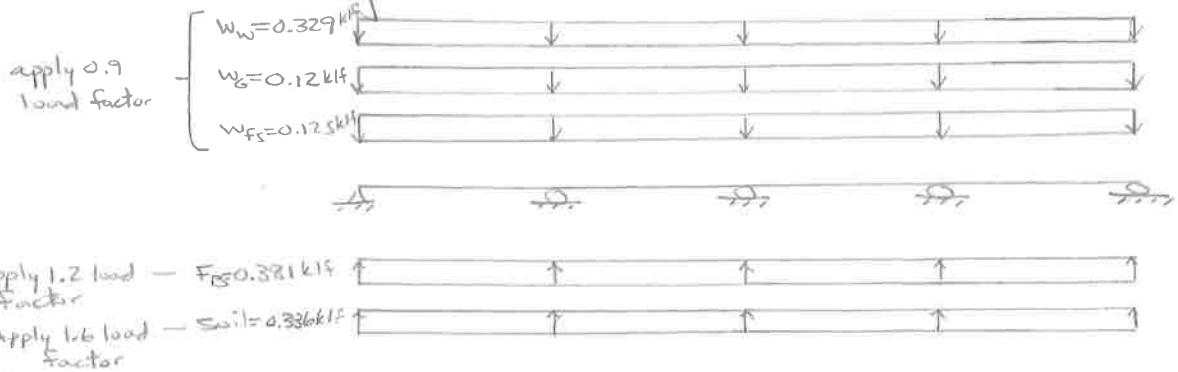
∴ Base is 100% in compression ✓

min allowable bearing capacity factor of safety for UNLC = 2.6

$$q = \frac{25.104^k\left(1 \pm \frac{6(0.064')}{7.333'}\right)}{9.333'(7.333')} = 0.386\,ksf / 0.348\,ksf$$

$$FS = \frac{6\,ksf}{0.386\,ksf} = 15.5 > 2.6 \checkmark$$

Check longitudinal floor slab rebar



Factored upward load = 0.558 klf

same as previous check ∴ okay ✓

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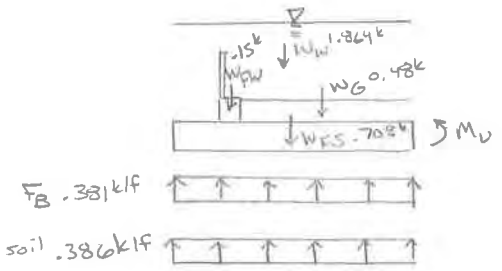
Reference

check transverse floor slab rebar
1' width



$M_U = -1.2(1.864^k)(2.833') - 0.9(0.15^k)(4.333') - 0.9(0.48^k)(2') - 0.9(0.708^k)(2.833')$
$+ 1.2(0.381\,k/f)(5.667')(2.833') + 1.6(0.386k/f)(5.667')(2.833') = 7.664$ kip·ft = 91.974 kip·in

less than previous check ∴ okay ✓

Check rear wall
hydrostatic is equal & opposite on rear wall, therefore only soil load
less than previous check ∴ okay ✓

Check side wall
hydrostatic is equal & opposite on side wall, therefore only soil load
less than previous check ∴ okay

Interior walls will always receive equal hydrostatic pressure on both sides, so okay by inspection.

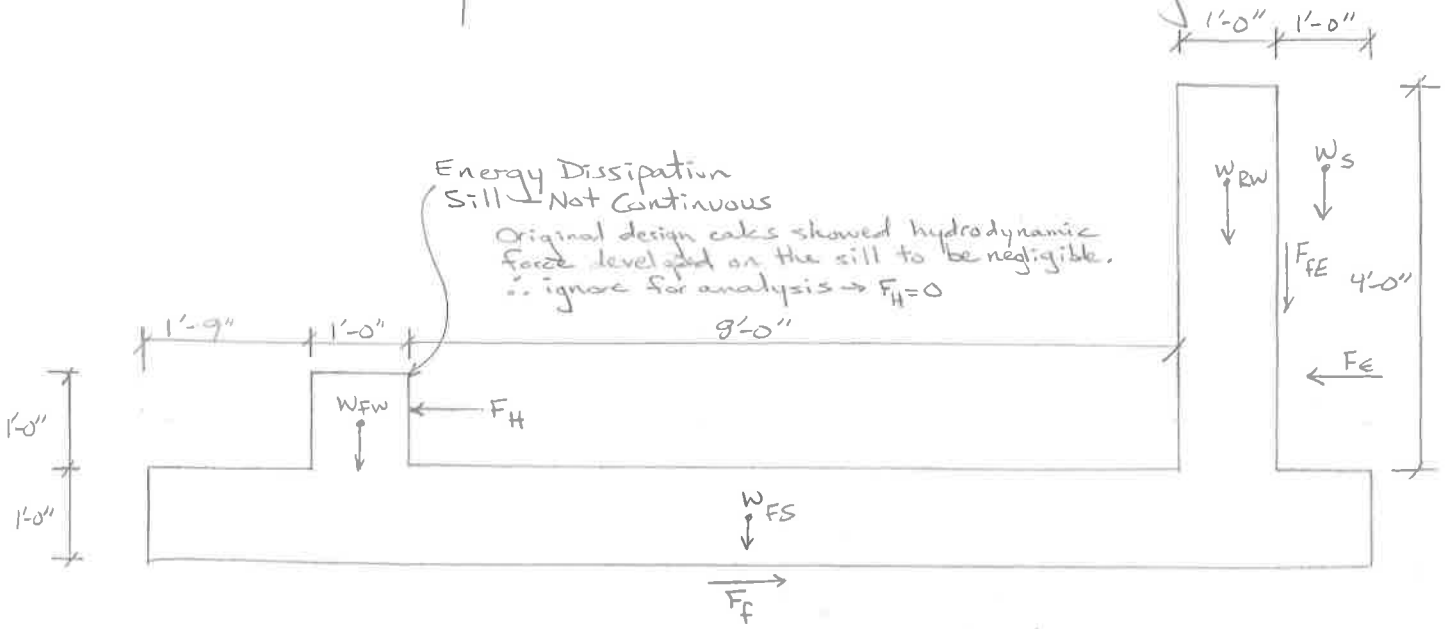
Shear key check same as before

Headwall – Regularly Occurring Water Elevation and 1000 yr Flood

Per STANTEC report & VKG, phreatic surface is below footing for headwall & will not rise appreciably for 1000 yr flood. Therefore, groundwater will not affect design and same checks apply to regularly occurring Pond 4 water elevation & 1000 yr flood.

Channel tailwater could rise & submerge headwall, but any buoyant force will be counteracted by water above the footing.

Also, new headwall is doweled into existing structure below, but conservatively not accounted for in design.



$W_{FW} = 1'(1')0.150 \frac{kip}{ft^3} = 0.150$ klf

$W_{FS} = 1'(12.75')0.150 \frac{kip}{ft^3} = 1.913$ klf

$W_{RW} = 4'(1')0.150 \frac{kip}{ft^3} = 0.600$ klf

$W_S = 4'(1')(0.130 \frac{kip}{ft^3}) = 0.520$ klf

$F_E = \frac{1}{2}(5')(0.325 ksf) = 0.813$ klf @ 1.667' up from base

$F_{FE} = 0.813 klf \tan 11° = 0.158$ klf

Net downward to create friction on bottom of floor slab

$W_{FW} + W_{FS} + W_{RW} + W_S + F_{FE}$

$0.150 klf + 1.913 klf + 0.600 klf + 0.520 klf + 0.158 klf = 3.341$ klf

$F_f = 3.341 klf (0.5) = 1.671$ klf

min allowable sliding stability factor of safety for USLC = 2.0

$FS = \frac{1.671 klf}{0.813 klf} = 2.055 > 2.0$ ✓

moment equilibrium stability requirement for USLC is 100% of base in compression

Sum moments about right corner

$.150 klf(10.5') + 1.913 klf(6.375') + 0.600 klf(1.5') + 0.520 klf(0.5') + 0.158 klf(1') + 0.813 klf(1.667') = 16.444 \frac{kip\cdot ft}{ft}$

Total Vert = 3.341 klf

Resultant located $\frac{16.444 kip\cdot ft/ft}{3.341 klf} = 4.922'$ from right corner

e = 1.453' right of center

L/6 = 2.125'

$e < \frac{L}{6}$ ∴ base is 100% in compression ✓

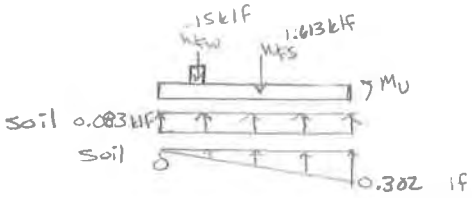
min allowable bearing capacity factor of safety for USLC = 3.0

$$q = \frac{P\left(1 \pm \frac{6e}{L}\right)}{BL} = \frac{3.341\ kf\left(1 \pm \frac{6(1.453')}{12.75'}\right)}{12.75'} = 0.441\ ksf / 0.083\ kf$$

$$FS = \frac{6\ ksf}{0.441\ ksf} = 13.6 > 3.0\ ✓$$

---

check transvesse floor slab rebar



$$M_U = -0.9(0.15)(8.5') - 0.9(1.613)(5.375) + 1.6(0.083)(10.75')(5.375') + 1.6(0.5)(10.75')(0.302)(5.375') = 8.029\ kip\cdot ft = 96.345\ kip\cdot in$$

#5@10"

$$\phi M_n = 0.9(0.372\ in^2)(60\ ksi)\left(8.688" - \frac{(0.372\ in^2)(60\ ksi)}{2(0.85)(4\ ksi)(12")}\right) = 169.030\ kip\cdot in$$

$$1.2M_{cr} = 1.2\frac{(0.474\ ksi)(1728\ in^4)}{6"} = 163.814\ kip\cdot in\ ✓$$

Check headwall rebar

$$M_U = 1.6\left(\tfrac{1}{2}\right)(4')(0.26\ ksf)(1.333') = 1.109\ \frac{kip\cdot ft}{ft} = 13.309\ \frac{kip\cdot in}{ft}$$

#5@10" ✓

AECOM

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Reference

Stop logs spec'd for differential head of 6'. This is the max height of the stop logs per chamber geometry. ✓

Stop log guide frames and 96" CMP bolted to spillway w/ 6" long ½" dia. wedge anchors. Minimal load on connection (self-weight). Water flow does not apply additional load to anchors. Okay by inspection.

APPENDIX B

GEOTECHNICAL CROSS SECTION

Tennessee Valley Authority
Colbert Fossil Plant
Ash Pond 4

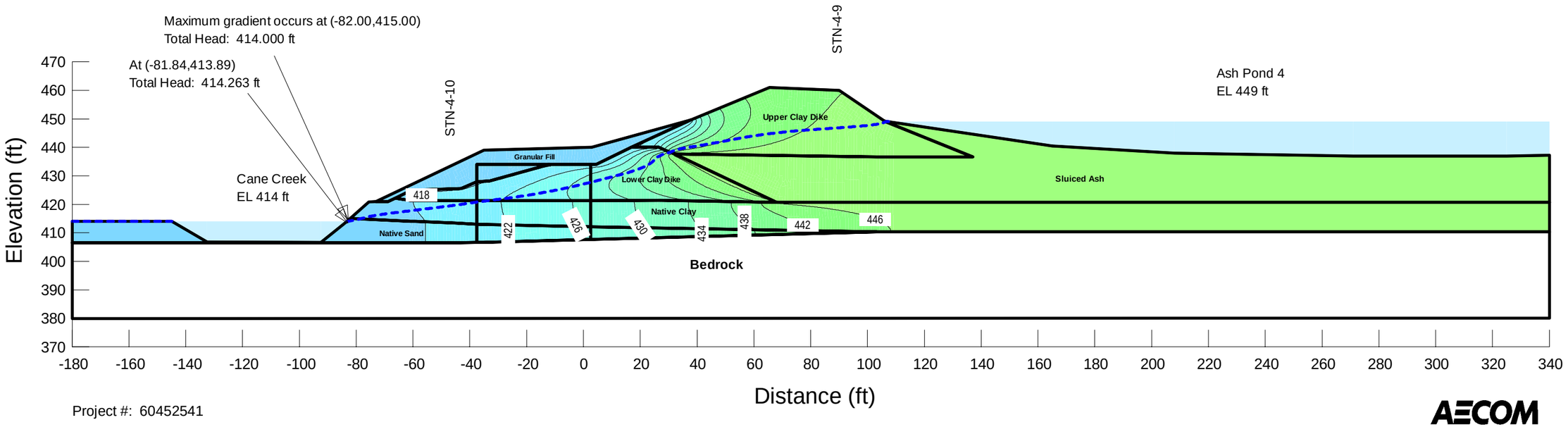
Steady-State Seepage Analysis
Long-Term Existing Conditions
Cross-Section D-D'

Date: 11/30/2016
Contour parameter: Total Head ft
Method: Steady-State

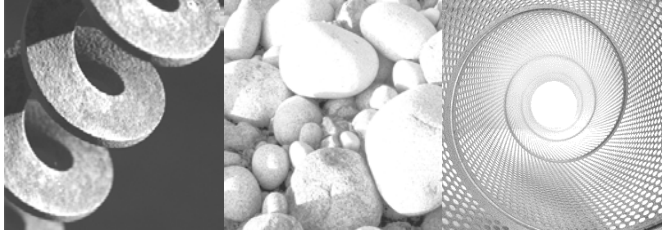
Critical gradient: i(crit) = 0.93
Exit gradient: i(exit) = ΔH/ΔL = 0.24

FS against piping = 3.9

Color	Name	Model	Sat Kx (ft/sec)	Ky'/Kx' Ratio	Volumetric Water Content (ft^3/ft^3)
	Native Clay (Saturated)	Saturated Only	3e-006	0.1	0.37
	Upper Clay Dike (Saturated)	Saturated Only	3e-009	0.4	0.4
	Lower Clay Dike (Saturated)	Saturated Only	1.5e-009	0.02	0.37
	Sluiced Ash (Saturated)	Saturated Only	4e-005	0.1	0.46
	Bedrock	(none)			
	Native Sand (Saturated)	Saturated Only	1e-005	0.5	0.46
	Granular Fill	Saturated Only	1e-005	0.5	0.15



Project #: 60452541



GEI Consultants

Consulting
Engineers and
Scientists

Post-Closure Safety Factor Assessment Report

Colbert Fossil Plant Ash Disposal Area 4
Tuscumbia, Alabama

Submitted to:
Tennessee Valley Authority
1101 Market Street
Chattanooga, TN 37402

Submitted by:
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801
781-721-4000

December 7, 2021
Project 2100946

12/7/21
ALABAMA LICENSED NO. 34318-E PROFESSIONAL ENGINEER WILLIAM HERBERT WALTON

James Nickerson
Project Manager

William H. Walton, P.E. (AL), S.E.
Senior Vice President

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Executive Summary

This report documents the stability safety factors for Ash Disposal Area 4 (also called Ash Pond 4) at the Colbert Fossil Plant in its final configuration and demonstrates the perimeter dikes meets the Alabama Department of Environmental Management (ADEM) required safety factors for static conditions and earthquake conditions using the peak ground acceleration for a seismic event with a 2% probability of exceedance in 50 years, equivalent to a return period of approximately 2,500 years.

In summary, perimeter dikes for Ash Disposal Area 4 are stable for static and seismic loading conditions. They satisfy federal, state and TVA required factor of safety for slope and foundations storing Coal Combustion Residuals (CCR).

Load Case	Analysis Section		
	E (East)	**J (East)**	**14+50 (West)**
Static Factor of Safety under long-term, maximum storage pool loading conditions (**≥ 1.50 Reqd.)**	2.09	2.18	2.87
Static Factor of Safety under maximum surcharge pool loading condition (**≥ 1.40 Reqd.)**[1]	N/A	N/A	N/A
Seismic Factor of Safety (**≥ 1.00 Reqd.)**	1.21	1.05	1.19
Post-EQ (liquefaction stability) Factor of Safety (**≥ 1.20 Reqd.)**	1.21	2.00	1.29

Note:

1. The ash pond is capped and closed and no longer impounds surface water. The pond has been graded and capped to provide positive surface water runoff. Therefore, the static factor of safety under maximum surcharge pool loading condition is not applicable.

1. Introduction

1.1 Purpose

The purpose of this report is to document that the final configuration of the closed and capped Colbert Fossil Plant (COF) Ash Disposal Area 4 (also called Ash Pond 4) unit meets the ADEM required static and seismic stability factors of safety after an approximate 2,500-year design earthquake event.

1.2 Site Description

The COF is in northwestern Alabama, approximately eight (8) miles east of Tuscumbia in Colbert County. The COF site is adjacent to the southern bank of the Tennessee River as shown in Fig. 1.

Ash Disposal Area 4 covers an area of approximately 52 acres and is enclosed by perimeter clay fill dike approximately 6,700 feet in total length along the crest, as shown in Fig. 2. The East Dike is about 2,700 linear feet long and the toe of the East Dike is adjacent to Cane Creek, which flows to the north into the Tennessee River. The normal water level in the Cane Creek is at about elevation (El.) 414 (feet) adjacent to the site. The top of stream bank of the creek or flood plain near the toe of the East Dike ranges from about El. 415 to El. 425.

Ash Disposal Area 4 was constructed in two phases. The first phase consisted of compacted clay perimeter dikes up to 20 feet high, termed the lower starter dikes, with crest at El. 440. The lower dikes were constructed of compacted clay and silty sand and gravel. The pond was designed to store sluiced fly ash from the power plant and was put into service in 1972.

In 1984, the Phase 2 perimeter dike was raised an additional 20 feet, up to crest El. 460. The upper dikes were constructed of compacted clay using upstream methods, i.e., the upper dikes were constructed partially over the crest of the lower starter dike and partially over the sluiced fly ash retained by the lower dike. The overall constructed height of the perimeter dike system varied from approximately 20 to 30 feet on the west side, to about 40 feet on the east side, adjacent to Cane Creek. Dike downstream and upstream slopes were approximately 2.5H:1V to 3H:1V.

During the 2000s, bottom ash was delivered hydraulically to the pond through an inflow pipeline and structure on the north portion of the west dike. Coarse bottom ash material settled out in the sluicing area, which was separated from the main pond by a divider dike. The water then flowed into the main pond where it was retained before being discharged to Cane Creek using a NPDES permitted discharge channel as described below. Water from the surface of the main pond flowed into the settling pond at the north end of the main pond over

a section of the divider dike between the main pond and settling pond that had been lowered to form a spillway. Overflow discharge from the settling pond was through three (3) pipes that discharged to a riprap-lined channel that then discharged to a trapezoidal channel that leads to Cane Creek north (downstream) of the settling pond. The southwest corner of the former ash pond is filled with stacked dry bottom ash.

The Colbert Fossil Plant was shut down in March 2016 and TVA stopped placing ash in the pond in May 2016. The pond was drained, re-graded, and capped with a geomembrane in early 2018.

The Ash Disposal Area 4 facility has undergone multiple slope stability evaluations since 2009 and remediation efforts to improve safety factors in accordance with federal and state safety factor criteria. These stability improvements are described in Section 3 and are incorporated into the evaluations included in this Safety Factor Assessment report.

1.3 Elevation Datum, Horizontal Coordinates and Stationing Systems

Elevations cited in this report and shown on the figures and plans prepared for this project are referenced to the National Geodetic Vertical Datum of 1929 (NGVD29). The horizontal coordinate system used for this project is the Alabama West region of the North American Datum of 1927 (NAD27). Site benchmarks are controlled by TVA.

The primary (long) axis of Ash Disposal Area 4 is oriented approximately north northwest (NNW) to south southeast (SSE) in terms of compass direction. For this report, the primary axis is called North-South (N-S), and the main sections of the impoundment are called the east, north, south, and west dikes. For reference, the East Dike for Ash Disposal Area 4 parallels Cane Creek that flows from south to north.

There was one baseline established for this project. The baseline is located along the upstream end of the working platform constructed for the DMM stabilization walls, as shown in Fig. 3. Sta. 0+00 for the DMM alignment is located near the former settling pond outlet pipe works at the north end of the pond. Stationing proceeds in a clockwise direction around the former pond embankment, including the West Dike.

2. Subsurface Conditions

2.1 Site Geology

The site is underlain by Tuscumbia Limestone, a light grey hard limestone of Mississippian age, a sub-period of the Carboniferous. Chert nodules commonly occur in the limestone. The bedded limestone plateau dips slightly to the south. There are limestone outcrops along the east bank of Cane Creek and the south bank of the Tennessee River. Limited karst and infilled epikarst features have been observed in test borings and exposed limestone outcrops on the Colbert Fossil Plant site.

Overburden soils under Ash Disposal Area 4 typically consist of alluvial terrace deposits comprised of over-consolidated clay (by desiccation) underlain by relatively loose silty sands, sands, and gravels over sound limestone, except for one infilled epikarst anomaly area located in a limited area under approximately 325 ft of the East Dike.

2.2 Subsurface Explorations

Several recent subsurface exploration programs have been conducted around the perimeter of Ash Disposal Area 4 and in the Cane Creek floodplain to collect data for analysis of potential seismic behavior of the West and East Dikes and underlying native foundation soils and for design of seismic improvements. A summary of the exploration programs is presented in Table 1 and the subsurface exploration locations are shown in plan on Fig. 3.

2.3 Subsoil Strata Descriptions

The soil layers encountered in the explorations by GEI and Stantec are described below, in general order of increasing depth. Subsurface conditions were observed only at the standard penetration test borings and the piezocone penetrometer probes (CPT) locations. Conditions between borings may differ significantly from those described below.

In general, the subsurface soils encountered at Ash Disposal Area 4 include compacted upper and lower dike engineered fill soils and sluiced ash above native soils consisting of strata of native stiff clay and loose silt and sand limestone bedrock. Along the West Dike and most of the East Dike, a thin layer of weathered bedrock (a few feet or less) was present over the limestone bedrock. However, in a limited area of the East Dike a heterogenous epikarst layer up to 70 feet thick was encountered over limestone bedrock between about Sta. 11+50 to 14+75.

2.3.1 Loose Sluiced Ash

Sluiced fly ash and bottom ash were encountered beneath the upper dike in borings drilled through the crest. The borings typically encountered bottom ash overlying a lesser thickness of sluiced loose fly ash. Historical documents indicate that the pond was initially used for disposal of fly ash in the past, in addition to the current bottom ash disposal. Bottom ash samples generally had a gradation equivalent to well-graded sand with silt and gravel. Sluiced fly ash samples generally have a gradation equivalent to sandy silt and silt with sand. The ash materials are black due to coal residuals.

For our analyses and design, we combined the sluiced fly ash and bottom ash into one layer called loose sluiced ash.

2.3.2 Upper and Lower Dike

The upper Phase 2 dike up to a crest El. 462 represents the most recent dike raising which occurred in 1984. The top of Phase 1 dike was reportedly El. 440. The upper dike fill materials are compacted clay soils with Unified Soil Classification System (USCS) classifications of CL and CH, and with textural descriptions of lean clay with sand and fat clay with sand. The medium stiff to stiff clays are described as moist and predominately reddish brown in color, with occasional brown and tan mottling.

The lower Phase 1 dike extends upward from the original native ground to approximate El. 440 (crest of the initial dike construction). The lower dike soils generally consist of compacted sandy lean clay and lean clay with sand. The compacted clays are predominantly reddish brown to brown.

2.3.3 Native Alluvial Clay

Under the dike fill was a layer of native clay was sometimes encountered below the fill materials. The clay stratum consisted of a brown to gray lean clay with silt, though pockets of silt were observed. Varying amounts of sand and traces of gravel were encountered in most of the samples. Visual classifications of the soil indicated a silty clay, sandy silty clay, and silt, with Unified Soil Classification System (USCS) classifications of CL, CL-ML, and ML. SPT blowcount N-values and pocket penetrometer readings of unconfined compressive strength of the clayey soils indicated consistencies ranging from very soft to stiff. Little to no native clay was encountered in borings east of Cane Creek. The thickness of the native clay layer west of Cane Creek along the East Dike increased in a north-to-south direction.

2.3.4 Native Alluvial Sand and Silt

Below the native clay, approximately 2 to 17 ft of native sand and silt was encountered. This layer consisted of reddish brown to gray fine to medium sand with varying amounts of silt

and gravel. Visual classifications of the soil indicated fine to medium sand, silty sand, and sandy silt, with the USCS classifications of SP, SP-SM, and SM. SPT blowcount N-values of the soils indicated relative densities ranging from very loose to medium dense. Most the fine to medium sand was loose and susceptible to liquefaction. No native sands and silts were encountered in borings under the West Dike.

2.3.5 Epikarst Anomaly Area

Along the West Dike and most of the East Dike (approx. 6,700 linear feet), sound hard limestone bedrock was encountered immediately below the native sand and silt layer. A thin layer of gravel or weathered rock was encountered in some of the borings above sound limestone bedrock. However, in a limited portion under the East Dike, an infilled epikarst feature was encountered (between about Sta. 11+50 to 14+75). In this area, designated the Epikarst Anomaly Area, borings encountered an approximately 400 ft diameter conical or funnel shaped feature that included up to about 70 feet of epikarst infill soil and rock blocks beneath the native sand and silt layer and above the top of sound limestone bedrock next to Cane Creek. The epikarst infill consisted of a clay-like mixture of heterogeneous clay, gravelly clay, clayey gravel, and up to 7 ft of limestone rock, either layers or boulders of unweathered bedrock or boulders that have shifted into the anomaly area.

2.3.6 Tuscumbia Limestone

Bedrock generally consisted of gray limestone of the Tuscumbia formation. The bedrock was nearly horizontally bedded. The limestone under most of Ash Disposal Area 4was generally sound, with good recovery, and medium to very hard with slight to moderate weathering along existing fractures.

The bedrock was cored in one (1) boring at the West Dike. In addition, top of rock was likely indicated by refusal in the other nine (9) borings where rock was not cored. Also, the limestone bedrock was cored in three (3) holes drilled at the west dike for installation of inclinometers. Top of sound bedrock elevations ranged from approximately El. 420.8 to El. 410.5.

Borings along the East Dike indicated top of limestone bedrock elevation outside of the anomaly area ranged from approximately El. 414 to 402, lower than top of rock along the West Dike. Rock core recovery was high and the rock quality designation (RQD) values outside of the anomaly area ranged from 46 to 100 percent; with increasing RQD with depth.

In the epikarst anomaly area, the top of sound hard limestone bedrock dropped to at least El. 330 in boring B19-7, which was abandoned prior to confirming the top of sound bedrock due to issues with the drilling casing and tooling. RQD values within the anomaly area ranged from 7 to 100 percent with the values increasing with depth.

Borings performed by Barge (2020) encountered auger or Standard Penetration Test (SPT) blowcount refusal on bedrock east of Cane Creek at depths of 8 to 18 feet. Three GEI borings performed east of Cane Creek in 2021 encountered bedrock at depths of 14.8 to 15.9 ft. Bedrock cores collected in the GEI borings had good recovery ratios and Rock Quality Designation (RQD) values of 54 to 100 percent with little weathering, implying competent horizontally bedded bedrock.

2.4 Piezometric and Phreatic Conditions

Prior to the pond closure, the static water level in the active Ash Disposal Area 4 was at about El. 453. As part of the closure, surface water was dewatered, the pond areas were filled in and graded to provide positive drainage and a geomembrane cap was installed over the ash. This geomembrane cap prevents surface water from infiltrating into the ash.

Readings from instruments in the now-closed Ash Disposal Area 4show that the pore water pressures in the sluiced ash are lowering from the pre-closure El. 453 to El. 425 and continues to drop. Fig. 5 shows the phreatic surface levels along the East Dike on a cross section at Sta. 12+50. Shown in the figure are phreatic surfaces prior to closure and from January 2020. Over time the pore water pressure in the loose ash should continue to reduce.

3. Stability Improvements

Several improvements have been, or are being made at Ash Disposal Area 4 to improve stability of perimeter dikes. These improvements have been incorporated into this computational Safety Factor Assessment:

1. Installed deep soil-cement mix method (DMM) shear walls in 2016 bearing on sound bedrock along downstream slope of the East Dike,
2. Installed a 1,400 ft long stability berm in 2017 along a perimeter portion of the West Dike, and
3. Installing of an earthen buttress fill along a 500 ft portion of the East Dike over the anomaly area.

3.1 East Dike DMM Wall

Deep mix method (DMM) shear walls were installed through the native clay and loose sands and silts down to top of bedrock to improve the seismic stability of the East Dike. DMM walls were installed from Sta. 4+00 to Sta. 35+00, along the DMM baseline as shown in Fig. 4. DMM walls were omitted from about Sta. 11+50 to 14+75 due to challenges with the epikarst anomaly area encountered during installation.

3.2 Cane Creek Realignment and East Dike Buttress

In the area of the epikarst anomaly along the East Dike, the East Dike will be buttressed from about Sta. 10+00 to 15+00. This buttress fill also requires the realignment of Cane Creek to the east with the former creek channel filled to create a foundation for the stabilization buttress along the downstream slope of the East Dike. The buttress ends at a point where the anomaly was not encountered in subsurface explorations.

3.3 West Dike Stability Berm

An approximately 1,400-foot-long stability berm was added to the to buttress the perimeter of a portion of the West Dike. This berm improves both static and post-seismic stability of the dike in areas where the ash height is tallest.

4. Static and Seismic Evaluation Criteria

4.1 General

The factor of safety criteria for evaluation of the closed ash pond include:

Stability Evaluation Condition	Minimum Factor of Safety
Static Factor of Safety under long-term, maximum storage pool loading conditions	1.50
Static Factor of Safety under maximum surcharge pool loading condition[1]	1.40
Seismic Factor of Safety	1.00
Post-EQ (liquefaction stability) Factor of Safety	1.20

Note:

1. The ash pond is capped and closed and no longer impounds surface water. The pond has been graded and capped to provide positive surface water runoff. Therefore, the static factor of safety under maximum surcharge pool loading condition is not applicable.

4.2 Evaluation Guidance Documents

The evaluation of stability safety factors was performed in general accordance with the following current analysis and design guidance documents:

- ADEM Land Division – Solid Waste Program Division 13, Admin. Code r. 335-13, (ADEM, 2021).
- FHWA Design Manual: Deep Mixing for Embankment and Foundation Support, Publication No. FHWA-HRT-13-046 (FHWA, 2013).
- FERC *Engineering Guidelines for the Evaluation of Hydropower Projects*, Chapter IV, Embankment Dams, (FERC, 1991).
- US Army Corps of Engineers, Engineer Manual 1110-2-1902, *Slope Stability*, (USACE, 2003).
- TVA CCR Structural Stability Program, Design Assessment of CCR Storage Facilities, March 31, 2021.

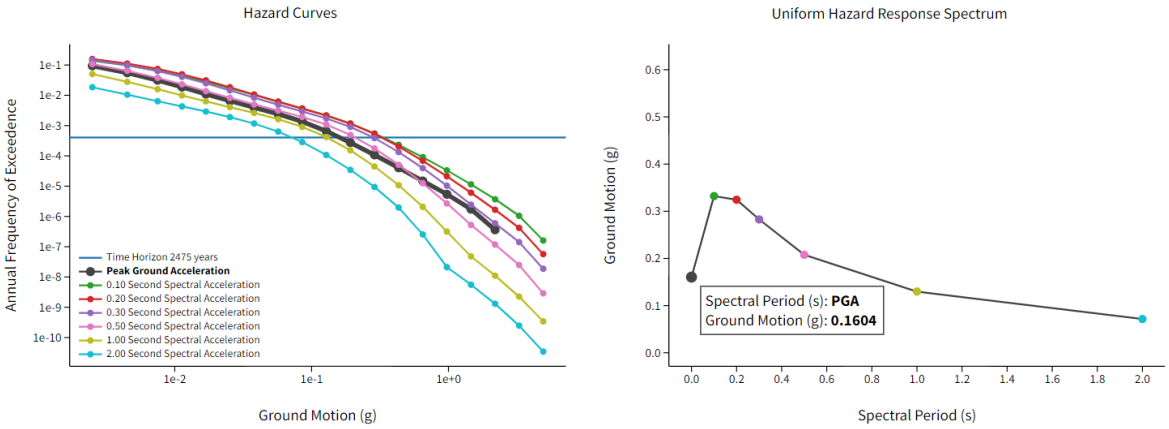
4.3 Technical Approach

For each stability evaluation, we performed the following general steps:

- Selected soil properties for analyses (unit weight, static and post-EQ shear strength, and shear wave velocity). This includes selecting post-earthquake (triggered) strengths for the soils that undergo strength loss during the design earthquake.
- Performed two-dimensional force and moment limit equilibrium slope stability analyses on the design sections to determine the post-closure safety factors.

4.4 Design Basis Earthquake

The design basis earthquake for our analyses, was the 2% chance of exceedance in 50 years (equivalent to a return period of approximately 2,500 years) based on the 2014 U.S. Geological Survey (USGS) seismic hazard map. The design earthquake corresponded to a magnitude 7.6 earthquake located 131 miles from the New Madrid, Missouri seismic zone. The reported peak ground acceleration (PGA) was 0.16g, as shown in the figure below was used for the Seismic Factor of Safety computation.



4.5 Liquefaction Screening and Triggering Evaluation

GEI performed a liquefaction triggering analyses on data collected in borings along the East Dike to determine whether sluiced ash, dike fills or foundation soils were likely to undergo significant loss of shear strength because of earthquake induced shaking associated with the design earthquake event. Post-earthquake material strength conclusions for each fill and native soil material are presented below.

Material	**Triggering of Strength Loss**
Saturated sluiced ash	The design earthquake triggers liquefaction and strength loss to the steady state strength, S_{US} or S_r.
Native sand and silt	The design earthquake triggers liquefaction and strength loss to the steady state strength, S_{US} or S_r.
Epikarst under East Dike from Sta. 11+50 to 14+75	The design earthquake triggers liquefaction and strength loss to the steady state strength, S_{us} or S_r, in clay-like epikarst susceptible to liquefaction and weight-of-tools material. The untriggered portion may experience a 20% strength reduction.
DMM improved soil	The DMM improved soil is not considered susceptible to either liquefaction of strength loss.
Unsaturated sluiced ash	Strength loss is not triggered because the material is too dense (dilative), is too clayey, and/or is above the groundwater table. Soft to medium stiff clays are clay-like and may experience a 20% strength reduction, but for other soils the peak undrained strength is the appropriate post-EQ strength.
Upper and lower clay fill in East and West dikes	
Native clay	
Granular fill in the Working Platform and Old Canal Backfill Material	
Riprap fill	

5. Design Methodology and Supporting Analyses

5.1 Evaluation Cross Section Locations

Stability evaluations were performed at three (3) critical cross sections of the perimeter dikes around the closed ash pond.

1. Section E (Sta. 24+20) - East Dike with DMM wall improvement and working platform
2. Section J (Sta. 48+90) - West Dike with buttress fill
3. Station 14+50 - East Dike Buttress Fill over the epikarst anomaly area

The critical cross sections were selected to represent areas that are expected to have lower safety factors due to loading conditions, geometry, and foundation soil conditions. The closure stability cross section locations are shown in plan on Figure 4.

5.2 Soil Properties for Stability Analyses

Unit weights and shear strengths for materials used in the stability analyses are summarized in Table 2 and presented in more detail in Appendix A. Strengths for the different loading conditions were used in the analyses:

- Drained strength, for long-term loading of both saturated and unsaturated soils,
- Undrained strength for saturated soils, for short-term rapid (earthquake) loading and unloading, and
- Post-earthquake strength, for the native sand and silt, saturated native clay, epikarst, saturated upper and lower clay dike, and ash, for static loading after the end of the design earthquake.

The properties used in each stability analysis are shown on a table on the plot of the results of each analysis in Appendix B.

5.3 Stability Analyses

The two-dimensional embankment stability analyses were performed with the computer program SLOPE/W using the Spencer method (GEOSLOPE) for force and moment equilibrium analysis methods. The phreatic surface was defined from the 2020 piezometer and observation well data at the time of analysis. For each analysis, the circular and wedge-type failure surfaces were identified. Then, the SLOPE/W optimization routine was used to determine whether a non-circular surface, generally following the overall shape of the

circular or wedge-type surface, would have a lower factor of safety. The optimization process involves automatically breaking the failure surface into a series of straight-line segments, and then sequentially moving the endpoints and subdividing the length of each segment to find the lowest factor of safety. The resulting optimized failure surface, with the minimum factor of safety, is defined by a series of relatively short line segments which can more closely follow the weaker layers.

5.4 Stability Results

The slope stability results for the final configuration of Ash Disposal Area 4 are presented below. The individual stability analyses are presented in Appendix B. In summary, in the final configuration, perimeter dikes for Ash Disposal Area 4 meet the minimum requirements for federal, ADEM and TVA required factors of safety for slope and foundations storing CCR at this closed facility.

Load Case	Analysis Section		
	E (East)	**J (East)**	**14+50 (West)**
Static Factor of Safety under long-term, maximum storage pool loading conditions (**≥ 1.50 Reqd.)**	2.09	2.18	2.87
Static Factor of Safety under maximum surcharge pool loading condition (**≥ 1.40 Reqd.)**[1]	N/A	N/A	N/A
Seismic Factor of Safety (**≥ 1.00 Reqd.)**	1.21	1.05	1.19
Post-EQ (liquefaction stability) Factor of Safety (**≥ 1.20 Reqd.)**	1.21	2.00	1.29

Note:

1. The ash pond is capped and closed and no longer impounds surface water. The pond has been graded and capped to provide positive surface water runoff. Therefore, the static factor of safety under maximum surcharge pool loading condition is not applicable.

Tables

Table 1 – Subsurface Exploration Programs
Post-Closure Stability Report
COF Ash Disposal Area 4
Tuscumbia, Alabama

Date	By	Series	Comments
July – August 2009	Stantec	STN-4-xx	SPT borings
July – August 2014	Stantec	L-x	SPT (A) and Tube (B) borings
August 2014	GEI (GEI CPT equip. pushed by Stantec rig)	L-x-CPT	Seismic Cone Penetration Tests
January 2015	GEI (driller was S&ME)	SB-x	SPT borings with rock coring
January 2015	GEI (driller was S&ME)	CPT-x	Cone Penetration Tests
July 2015	GEI (driller was Stantec)	IN-xx	SPT borings with rock coring
August 2015	Geo-Solutions (driller was Armstrong)	GSI-xx	Roto-sonic borings
April – June 2016	GEI (driller was S&ME)	COF-AP4-xx	SPT borings with rock coring
May – June 2017	GEI (driller was Stantec)	S-x	SPT borings with rock coring
June 2017	GEI (driller was Stantec)	T-2	Tube boring
June 2017	GEI (GEI CPT equip. pushed by Stantec rig)	C-x	Seismic Cone Penetration Tests
February 2019	Stantec	COF-XXX	Roto-sonic borings
September – October 2019	GEI (driller was Stantec)	B19-X	SPT borings with rock coring
June 2020	Barge (driller was Stantec)	B-XX	SPT borings
March 2021	GEI (driller was S&ME)	B-10X	SPT borings with rock coring

Table 2 – Summary of Material Properties
Post-Closure Stability Report
COF Ash Disposal Area 4
Tuscumbia, Alabama

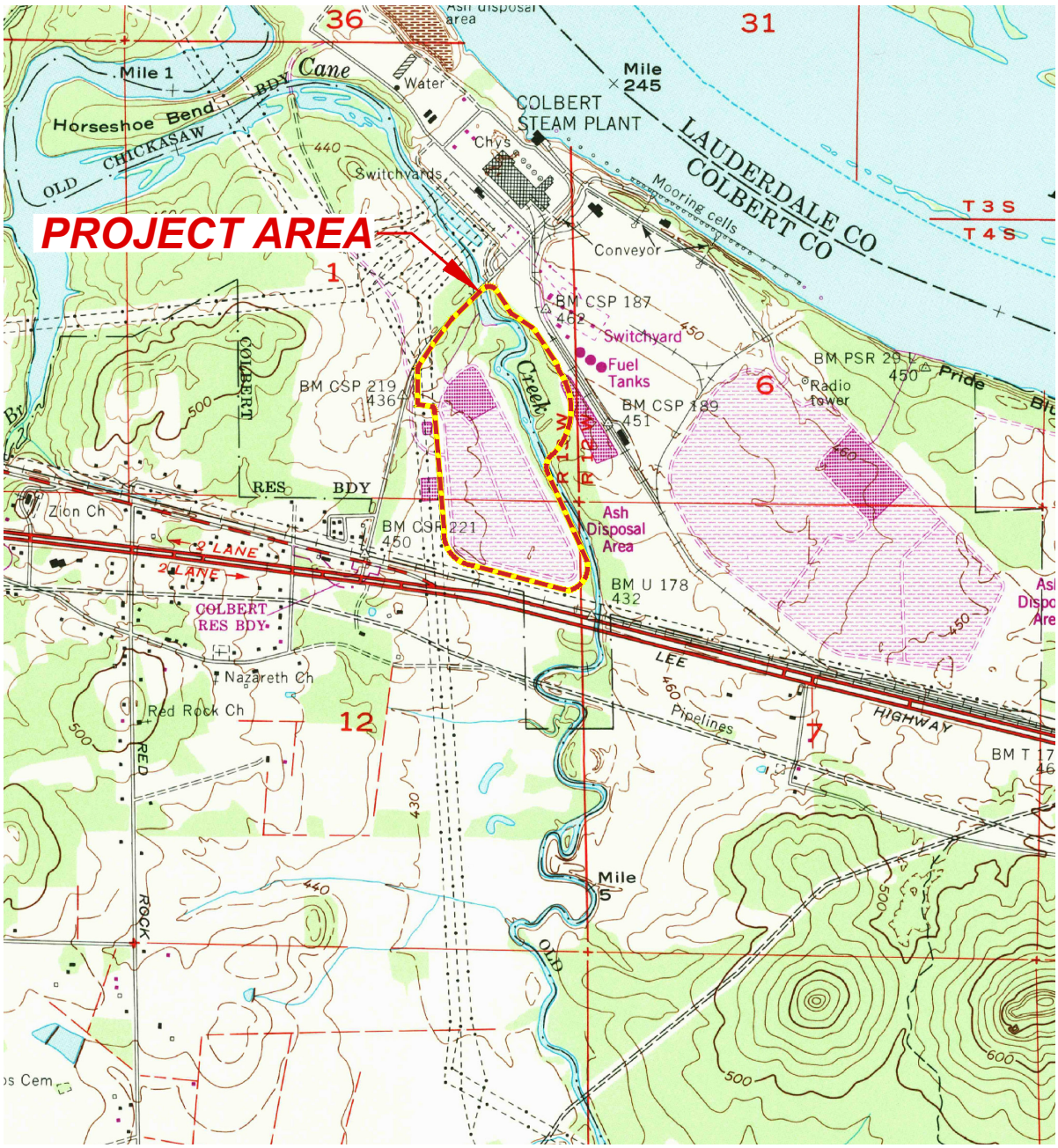
Material Properties							
Material Name	Unit Weight (pcf)	Drained Strengths		Undrained Strengths		Post-EQ Strengths	
		c' (psf)	φ' (deg)	c (psf)	φ (deg)	c (psf)	φ (deg)
Upper Clay Dike (Unsaturated)	127	200	28	1500	0	1500	0
Upper Clay Dike (Saturated)	127	200	28	1500	0	1200	0
Stacked Ash (Unsaturated)	107	0	30	0	30	0	30
Sluiced Ash (Saturated and Unsaturated)	107	0	26	400	10	c/σ'_v= .06 c_{min}= 100	0
Lower Clay Dike (Unsaturated)	127	200	29	1500	0	1500	0
Lower Clay Dike (Saturated)	127	200	29	1500	0	1200	0
Native Clay (Unsaturated)	129	200	28	1250	0	1250	0
Native Clay (Saturated)	129	200	28	750	0	600	0
Native Clay Under Dike (Saturated)	129	200	28	1250	0	1000	0
Native Sand and Low Plasticity Silts (Saturated)	120	0	30	0	30	235	0
Non-liquefiable Epikarst	125	100	30	1,000	0	800	0
Liquefiable Epikarst	125	0	36	1,000	0	220	0
Rip Rap	120	0	38	0	38	0	38
West Dike Stability Berm Fill	140	0	45	0	45	0	45
Granular Fill/Dense Graded Aggregate	125	0	35	0	35	0	35
Filter Sand (C-33)	120	0	36	0	36	0	36
Common Fill	115	0	31	0	31	0	31
Limestone Bedrock	135	20000	45	20000	45	20000	45

Table 3 - Post-Closure Stability Factors of Safety
Post-Closure Stability Report
COF Ash Disposal Area 4
Tennessee Valley Authority

Load Case	Minimum Required Safety Factor	Analysis Section		
		E	J	14+50
Static Factor of Safety under long-term, maximum storage pool loading conditions	1.50	2.09	2.18	2.87
Static Factor of Safety under maximum surcharge pool loading condition[1]	1.40	N/A	N/A	N/A
Seismic Factor of Safety	1.00	1.21	1.05	1.19
Post-EQ (liquefaction stability) Factor of Safety	1.20	1.21	2.00	1.29

Notes:
1) The ash pond is closed and is no longer impounding water. The pond has been graded and capped to provide positive surface water runoff. Therefore the static factor of safety under maximum surcharge pool loading condition is not applicable.

Figures



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SCALE, FEET

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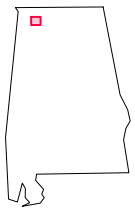

ALABAMA
QUADRANGLE LOCATION

Post-Closure Stability Report Closed COF Ash Pond No. 4 Tuscumbia, Alabama	GEI Consultants	SITE LOCATION MAP
Tennessee Valley Authority Chattanooga, Tennessee	Project 2100946	December 2021 Fig. 1

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APPROXIMATE SCALE, FEET

Post-Closure Stability Report
Closed COF Ash Pond No. 4
Tuscumbia, Alabama

Tennessee Valley Authority
Chattanooga, Tennessee

GEI Consultants

AERIAL SITE LOCATION PLAN

Project 2100946

December 2021

Fig. 2

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CA-17B
COF-103
COF-104
COF-105
COF-106
COF-111BR
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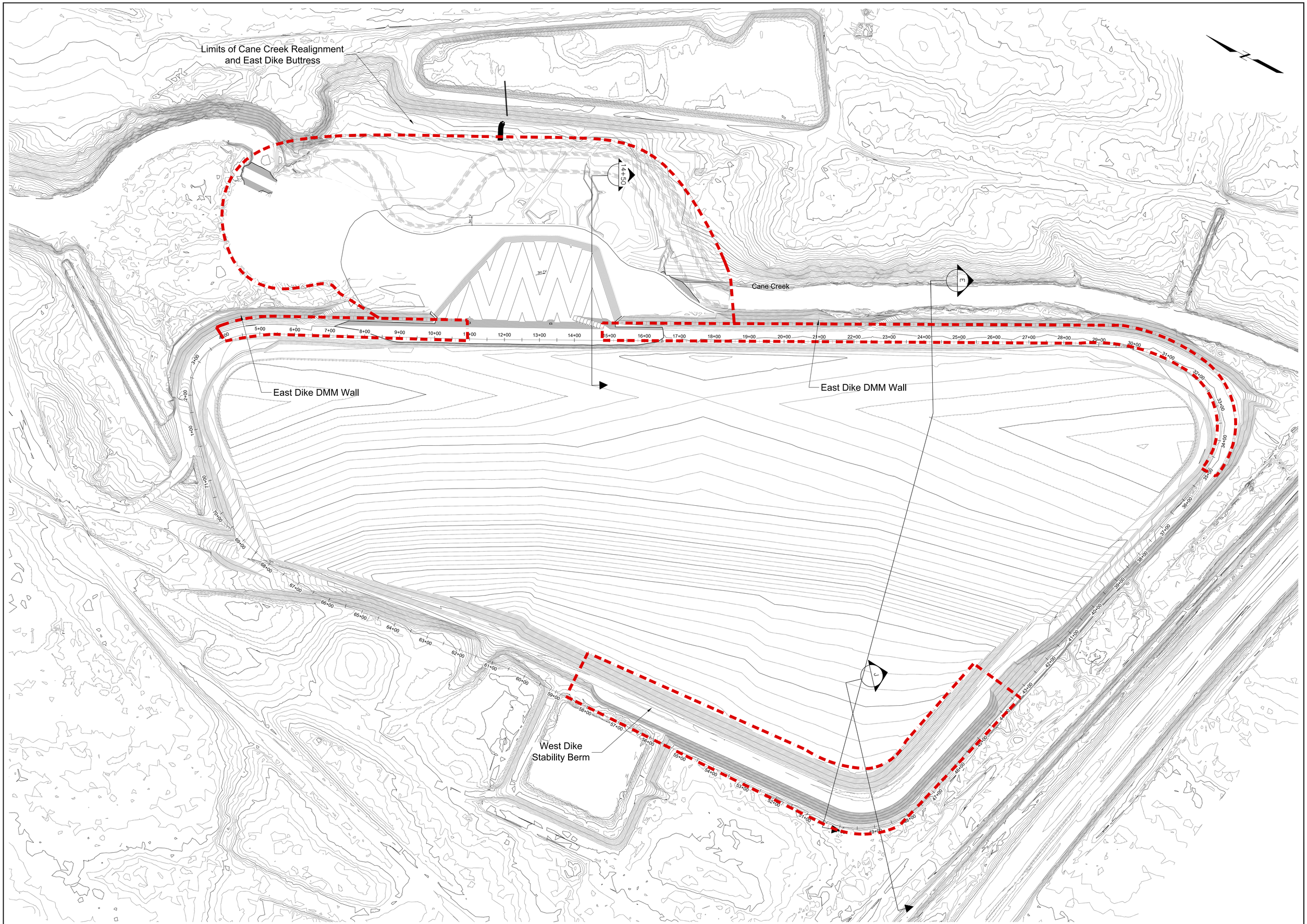

Post-Closure Stability Report Closed COF Ash Pond No.4 Tuscumbia, Alabama	GEI Consultants	SITE PLAN AND SECTION LOCATIONS
Tennessee Valley Authority Chattanooga, Tennessee	Project 2100946	December 2021 Fig. 4

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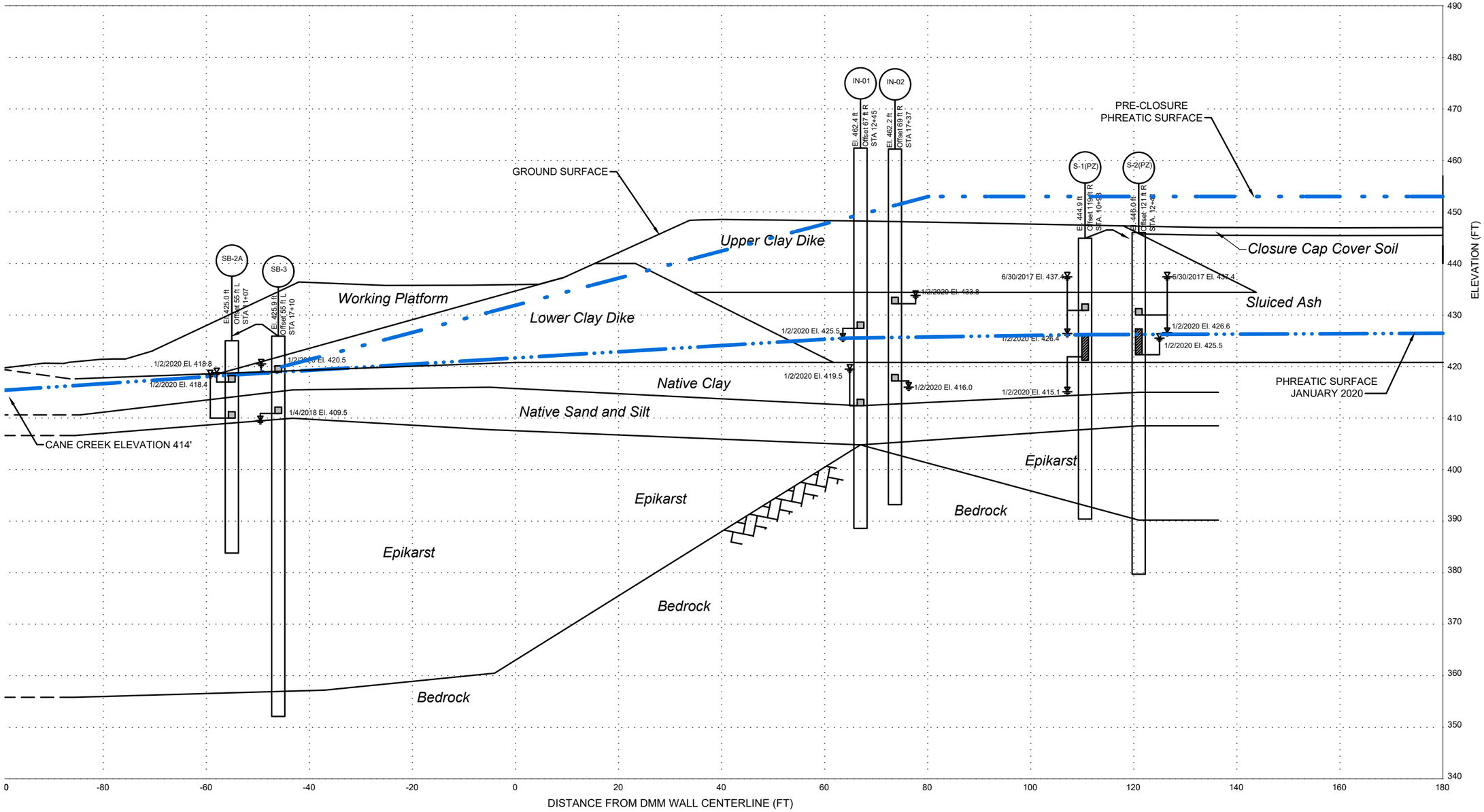

NOTES:

1. PRE-CONSTRUCTION GROUND SURFACE FROM ELEVATION CONTOUR DATA PROVIDED BY TVA.
2. AS-BUILT WORKING PLATFORM GROUND SURFACE FROM GEI DMM AS BUILT GRADES AND AECOM FINAL COVER GRADES.
3. ELEVATIONS ARE IN NGVD29.

0 20 40

SCALE: 1" = 20'

Post-Closure Stability Report
Closed COF Ash Pond No.4
Tuscumbia, Alabama

Tennessee Valley Authority
Chattanooga, Tennessee

GEI Consultants

PHREATIC SURFACES
AT THE EAST DIKE

Project 2100946 | December 2021 | Fig. 5

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Appendix A

Soil Strength Parameters

Soil Strength Parameters for Analysis

Purpose:

Select representative shear strength parameters for typical soil types at the site, using the available sources below. Selected values will be applied in our stability analyses.

References:

AECOM (2009) Kingston Fossil Plant, Root Cause Failure Analysis, Dredge Cell 2 Failure of December 22, 2008, June 25, 2009.

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Stantec (2010), Report of Geotechnical Explorations and Slope Stability Evaluation, Disposal Area 5 Dry Stack and Drainage Basin, Colbert Fossil Plant, Tuscumbia, Alabama.

GEI Consultants

Client: Tennessee Valley Authority
Project: Post-Closure Stability Ash Pond 4
Project No.: 2100946
Compiled By: W. Lukas
Date: August 2021

Soil Strength Parameters for Analysis

Summary:

Our selected shear strength parameters are summarized in the following table:

Material Properties							
Material Name	Unit Weight (pcf)	Drained Strengths		Undrained Strengths		Post-EQ Strengths	
		c' (psf)	φ' (deg)	c (psf)	φ (deg)	c (psf)	φ (deg)
Upper Clay Dike (Unsaturated)	127	200	28	1500	0	1500	0
Upper Clay Dike (Saturated)	127	200	28	1500	0	1200	0
Stacked Ash (Unsaturated)	107	0	30	0	30	0	30
Sluiced Ash (Saturated and Unsaturated)	107	0	26	400	10	c/σ'_v= .06 c_{min}= 100	0
Lower Clay Dike (Unsaturated)	127	200	29	1500	0	1500	0
Lower Clay Dike (Saturated)	127	200	29	1500	0	1200	0
Native Clay (Unsaturated)	129	200	28	1250	0	1250	0
Native Clay (Saturated)	129	200	28	750	0	600	0
Native Clay Under Dike (Saturated)	129	200	28	1250	0	1000	0
Native Sand and Low Plasticity Silts (Saturated)	120	0	30	0	30	235	0
Non-liquefiable Epikarst	125	100	30	1,000	0	800	0
Liquefiable Epikarst	125	0	36	1,000	0	220	0
Rip Rap	120	0	38	0	38	0	38
West Dike Stability Berm Fill	140	0	45	0	45	0	45
Granular Fill/Dense Graded Aggregate	125	0	35	0	35	0	35
Filter Sand (C-33)	120	0	36	0	36	0	36
Common Fill	115	0	31	0	31	0	31
Limestone Bedrock	135	20000	45	20000	45	20000	45

Approach:

The parameters were used to evaluate slope stability for four failure modes: static drained, static undrained, post-earthquake static stability and pseudostatic stability.

We developed three sets of shear strength parameters for each layer, depending on loading conditions: (1) drained effective strengths, using effective stress c' and ϕ' parameters, (2) undrained total strengths, using total stress c and ϕ parameters, and (3) undrained post-earthquake strengths, using post liquefaction s_{us} and $\phi = 0°$ parameters for soils susceptible to liquefaction (liquifiable epikarst, sluiced ash and native sand) and reduced shear strength for the saturated fine-grained soils (compacted clay dikes, non-liquefiable epikarst, and native clay).

Static Drained Case

The static drained strengths are used in our analyses for the current conditions and the post-closure conditions and assume that steady-state seepage conditions are achieved in the embankment. Drained strengths were assigned to all materials.

Static Undrained Case

The static undrained case assumes that proposed construction is performed rapidly enough to induce undrained loading of the soil. Therefore, shear strengths fine grained materials and sluiced ash are defined using undrained shear strengths.

The coarse grained materials and stacked ash are relatively freely draining soils. Therefore, we assigned drained strengths to the freely draining layers in static undrained case.

Post-Earthquake Static Case

For the post-earthquake static case we assigned post-liquefaction shears strengths to the materials that were identified as being potentially liquefiable. Non-liquefiable coarse grained soils were assigned drained strengths. Saturated undrained soils were assigned 80% of the peak undrained strength to limit the available strength from these layers (Makdisi and Seed, 1978).

Unit Weights:

We based the selection of unit weights for the embankment, fill, and foundation soils based on:

- The measured unit weights from the 2010 and 2014 laboratory testing.
- Values reported in previous evaluations.
- Typical values from the literature and experience.

Drained (Effective Stress) Strength Parameter Selection:

We selected drained effective stress strength parameters based on laboratory data from Stantec (2010). The following paragraphs discuss how we selected these parameters for each layer.

Fine Grained Soils and Sluiced Ash
Drained strength parameters for fine grained soils and the sluiced ash were selected from the Stantec (2010) report. Stantec used data from isotropically consolidated undrained triaxial compression tests. The values of ϕ' and c' were selected by fitting a K_f line to the p'-q failure points such that approximately two thirds of the data points were above the failure envelope. This K_f line has a slope of tan α' and a y-intercept a'. The drained strength parameters were then calculated using the following equations.

$$\sin \phi' = \tan \alpha$$
$$c' = a'/\cos\phi'$$

1. **Upper Clay Dike**

Drained strength parameters for the upper clay dike were selected from the Stantec (2010) report. The resulting failure envelope from Stantec for the upper clay dike is shown in Fig. 1. The drained friction angle was rounded to the nearest degree and the cohesion intercept was limited to a maximum of 200 pcf. The selected parameters were ϕ′=28° and c'=200 psf.

2. **Lower Clay Dike**

Drained strength parameters for the lower clay dike were selected from the Stantec (2010) report. The resulting failure envelope from Stantec for the lower clay dike is shown in Fig. 2. The drained friction angle was rounded to the nearest degree and the cohesion intercept was limited to a maximum of 200 pcf. The selected parameters were ϕ′=29° and c'=200 psf.

3. **Native Clay**

Drained strength parameters for the native clay were selected from the Stantec (2010) report. The resulting failure envelope from Stantec for the native clay is shown in Fig. 3. The drained friction angle was rounded to the nearest degree and the cohesion intercept was limited to a maximum of 200 pcf. The selected parameters were ϕ′=28° and c'=200 psf.

4. **Sluiced Ash**

Drained strength parameters for the sluiced ash were selected from the Stantec (2010) report. The y-intercept was set to zero for the sluiced ash. The resulting failure envelope from Stantec is shown in Fig. 4. The drained friction angle was rounded to the nearest degree. The selected parameters were ϕ′=26° and c'=0 psf.

5. **Common Fill**

Above El. 420 the berm will be constructed of common fill composed of reused on-site and borrowed materials. For the seismic upgrade at Pickwick Dam (2019), GEI used a total unit weight of 115 pcf, ϕ = 31°, and c = 0 psf with c_{max} = 800 psf. After reviewing the QA/QC data from Phase 3, ϕ was increased to 37° and c_{max} was replaced with a second strength envelope with c = 1,360 psf and ϕ = 15.7°

(GEI,2020). We believe it is reasonable and conservative to adopt the original common fill properties from Pickwick Dam for the Colbert analyses.

The selected parameters for drained, undrained, and post-EQ strengths are pcf, $\phi = 31°$ and c = 0 psf with c_{max} = 800 psf.

Coarse Grained Soils and Stacked Ash

Drained strength parameters for in situ coarse grained soils and stacked ash were based on empirical correlations to SPT N-values. Drained strength parameters for proposed fill materials were based on available literature.

1. Stacked Ash

Drained strength parameters for the stacked ash for the DMM East Dike and West Dike analyses were estimated using empirical correlations to SPT N-values. We used the correlation from FHWA (2002), adapted from Hatanaka and Uchida (1996). This correlation uses SPT $N_{1(60)}$ (SPT-N field values with energy correction and overburden correction) to estimate drained friction angle for coarse grained soils. The correlation is presented in Fig. 5. The $N_{1(60)}$ values in the stacked ash ranged from 0 blows per foot (bpf) to 51 bpf. The median $N_{1(60)}$ was 18 bpf. The drained friction angle estimated from the correlation is 37°. We conservatively used drained strength parameters of ϕ'=30° and c'=0 psf.

Drained strengths parameters for unsaturated fly ash for the anomaly area and Cane Creek realignment and East Dike buttress were selected from the GEI (2015) report. Thirteen isotropically consolidated-undrained triaxial compression tests were performed on the fly ash, nine by GEI and four by URS. The y-intercept was set to zero for the sluiced ash. The resulting failure envelope in p′-q space is shown in Fig. 6. The values of ϕ' and c′ were selected by fitting a K_f line to the p′-q failure points. This K_f line has a slope of tan α′ and a y-intercept a′. The y-intercept was set to zero for the sluiced ash. The drained strength parameters were then calculated using the following equations.

$$\sin \phi' = \tan \alpha'$$
$$c' = a'/\cos\phi'$$

The drained friction angle was rounded to the nearest degree. The selected parameters were ϕ'=34° and c′=0 psf. We did not update the DMM East Dike and West Dike analyses with the updated strength parameters, meaning that they are conservative.

2. Native Sand and Low Plasticity Silts

Drained strength parameters for the native sand and low plasticity silt layers were estimated using empirical correlations to SPT N-values. We used the correlation from FHWA (2002), adapted from Hatanaka and Uchida (1996). This correlation uses SPT $N_{1(60)}$ (SPT-N field values with energy correction and overburden correction) to estimate drained friction angle for coarse grained soils. The correlation is presented in Fig. 5. The $N_{1(60)}$ values in the native sand and low plasticity silts ranged from 0 blows per foot (bpf) to 51 bpf. The median $N_{1(60)}$ was 8 bpf. The drained friction angle estimated from the correlation is 31°. We selected a slightly lower drained friction angle because some borings had consistently lower SPT-N values. We used drained strength parameters of ϕ'=30° and c'=0 psf.

3. Rip Rap

We selected drained strength parameters for the rip rap based on data for rock fills from Leps (1970) presented here in Fig. 7. We used conservative drained strength parameters of ϕ'=38° and c'=0 psf.

4. West Dike Stability Berm Fill

We selected drained strength parameters for the proposed west dike stability berm fill based on data for rock fills from Leps (1970) presented here in Fig. 7. We used drained strength parameters of ϕ′=45° and c'=0 psf.

5. Granular Fill

The proposed granular fill will be a dense graded aggregate. We selected drained strength parameters based on common values for that type of fill. We used drained strength parameters of ϕ′=35° and c'=0 psf.

6. Filter Sand

A layer of filter sand will be compacted at the bottom of the existing Cane Creek channel after the stream bed is cleaned out. Sand in accordance with ASTM C33 has the USCS classification of SP (Poorly-Graded Sand). At Pickwick Dam the average placed dry unit weight of the filter sand was about 110 pcf. According to the NAVFAC Design Manual (1986), at 75% relative density and a dry unit weight of 110 pcf an SP soil has a friction angle of about 36° (Fig. 8). This is in general agreement with the properties measured by the US Army Corps of Engineers (2008), which reported a peak, minimum, and average friction angles of 40, 33, and 37°, respectively, for ASTM C33 Sand. We have assumed that the sand will be sufficiently compacted to not be susceptible to liquefaction.

We have assumed a total unit weight of 120 pcf.

The selected parameters for drained, undrained, and post-EQ strengths are ϕ = 36° and c = 0 psf.

7. Epikarst

Drained strength parameters for the liquefiable epikarst (i.e. the gravel) were estimated using empirical correlations to CPT tip resistance. We used the following correlation from Kulhawy and Mayne (1990):

$$D_r^2 = \frac{1}{305 Q_c OCR^{0.18}} \frac{\frac{q_c}{p_a}}{\left(\frac{\sigma'_{v0}}{p_a}\right)^{0.5}}$$

We assumed the compressibility factor of Q_c was equal to 1.0 (for medium compressibility). We assumed the OCR was equal to 1. The median relative density value was 18% and the mean relative density value was 21% (Fig. 9). We used the MacGregor and Duncan (1998) correlation between relative density and peak angle of internal friction (Fig. 10). We assumed no cohesion and chose a relative density of 15% and a conservative soil type of uniform coarse sand. The selected parameters were ϕ′ = 36° and c′ = 0 psf.

Drained strength parameters for the non-liquefiable epikarst were estimated using empirical correlations to plasticity index. The median plasticity index of non-liquefiable epikarst was 33%. We used the Lambe and Whitman (1969) correlation between plasticity index and drained friction angle to find a drained friction angle of 27° (Fig. 11). Due to the presence of gravel in the non-liquefiable epikarst we assumed that 27° was overly conservative and increased the drained friction angle accordingly. The selected parameters were ϕ′=30° and c′ = 100 psf.

8. Limestone Bedrock

Strength parameters for the limestone bedrock were estimated based on laboratory tests on rock core samples collected by GEI. The Rock Quality Designation (RQD) of the rock cores ranged from 46% to

100% with a median of 100% indicating excellent rock quality. Uniaxial compressive strength tests were performed on intact rock samples by Stantec. The results are presented in our 2015 Geotechnical Data Report. The unconfined compressive strength of the rock ranged from 116 ksi to 186 ksi. We used drained strength parameters of ϕ'=45° and c'=20,000 psf.

Undrained (Total Stress) Strength Parameter Selection:

Fine grained Soils

Undrained total stress shear strengths for the clay soils (upper dike, lower dike and native clay) were selected based on the results of laboratory triaxial tests reported in Stantec (2010) and recent tests performed in 2014 by GEI. The triaxial tests are mostly isotropically consolidated undrained triaxial compression tests with pore pressure measurement (CIU' tests) and a few unconsolidated undrained triaxial compression tests (UU tests). The following table provides a summary of the type and number of tests performed on each soil.

Soil	CIU' Tests (2010)	CIU' Tests (2014)	UU Tests (2014)
Upper Dike	14	--	--
Lower Dike	11	2	2
Native Clay	10	15	5

We used the test data to develop a plot of undrained shear strength (s_u) versus currently consolidated vertical effective stress (σ_{vc}') for each soil. For the CIU' tests we used an equivalent value of field σ_{vc}' computed from the isotropic consolidation stress applied in the test (σ_c') by assuming:

$$\sigma_{vc}' (1 + 2 K_o)/3 = \sigma_c' \quad \text{with an at-rest pressure coefficient } K_o = 0.5$$

Most of the CIU' tests were consolidated to an equivalent field σ_{vc}' that is equal to or greater than the estimated field σ_{vc}' of the sample. For the UU triaxial tests we used the estimated field σ_{vc}'. The s_u versus σ_v' plots are presented in Figs. 12 through 14. Tabular summary of the data used to generate the plots is provided in our GEI (2015) Draft Triggering Report. As shown in these plots, the measured values of s_u increase with increasing σ_v', although there is considerable scatter.

For each soil we estimated an approximate range of field σ_{vc}' in the general zone where the expected critical failure surfaces pass through that soil. The estimated σ_{vc}' ranges are shown on the s_u versus σ_v' plots (Figs. 14 through 16). As shown in the plots, a significant portion of the available test data corresponds to values of σ_v' that are greater than the field σ_{vc}' values. For each soil we selected a value of s_u that corresponds to the range of σ_{vc}' in the field.

1. **Upper Clay Dike**

We selected undrained strengths for the upper clay dike based on available CIU tests. The s_u versus σ_v' plot is presented in Fig. 12. We used undrained strength parameters of ϕ=0° and c=1,500 psf.

2. **Lower Clay Dike**

We selected undrained strengths for the lower clay dike based on available CIU and UU tests. The s_u versus σ_v' plot is presented in Fig. 13. We used undrained strength parameters of ϕ=0° and c=1,500 psf.

3. Native Clay

We selected undrained strengths for the lower clay dike based on available CIU and UU tests. We divided the native clay layer in two sections to benefit from the higher strength of the clay that has been consolidated beneath the upper and lower clay dikes. One material was called Native Clay and the other Native Clay Under Dike. The s_u versus σ_v' plot is presented in Fig. 14.

We used undrained strength parameters for the Native Clay of ϕ=0° and c=750 psf.
We used undrained strength parameters for the Native Clay Under Dike of ϕ=0° and c=1,250 psf.

4. Epikarst

We used SLOPE/W limit equilibrium slope stability analyses to determine the minimum strength of the epikarst. We ran SLOPE/W static stability analyses using drained strengths for all coarse-grained materials and undrained strength for all clayey materials. The strength of the epikarst was varied until we found a factor of safety of 1.0. The minimum undrained shear strength of the epikarst was 550 psf.

Station	Epikarst Strength (psf)	Factor of Safety	
		Deep Circular	Deep Wedge
11+00	200	0.920	0.839
	250	*1.025*	*1.009*
	300	1.134	1.263
12+50	400	0.942	0.972
	450	*1.020*	*1.043*
	500	1.103	1.157
13+50	500	0.989	0.983
	550	*1.071*	*1.069*
	600	1.143	1.148
14+50	100	1.090	0.966
	150	*1.056*	*1.056*
	200	1.135	1.159

We estimated undrained shear strengths in the Upper Silty Sand layer from the cone penetrometer data based on the following formula as defined in Lunne et. al. (1997):

$$s_u = \frac{q_t - \sigma_{v0}}{N_{kt}}$$

Where N_{kt} is a constant ranging from 10 to 20. We used an N_{kt} value of 15. The median undrained shear strength was 2,010 psf and the mean undrained shear strength was 3,330 psf (Fig. 15). The selected parameters were ϕ=0° and c = 1,000 psf.

5. Sluiced Ash

Undrained strength parameters for the sluiced ash were selected from the Stantec (2010) report. Stantec used data from isotropically consolidated undrained triaxial compression tests. The values of ϕ and c were selected by fitting a K_f line to the p-q failure points such that approximately two thirds of the data points were above the failure envelope. This K_f line has a slope of tan α and a y-intercept a. The drained strength parameters were then calculated using the following equations.

$$\sin \phi = \tan \alpha$$
$$c' = a'/\cos\phi$$

The resulting failure envelope from Stantec is shown in Fig. 16. The undrained friction angle and cohesion intercept were rounded to the nearest degree and psf. The selected parameters were ϕ′=10° and c'=400 psf.

Coarse Grained Soils and Stacked Ash

Coarse grained soils and the stacked ash are considered freely draining materials. Therefore drained strengths were used for the static undrained analyses.

Undrained Post-Earthquake Strength Parameter Selection:

Fine Grained Soils

For post-earthquake stability analyses, the fine grained soils were divided into saturated and unsaturated materials. For unsaturated material strengths we used the undrained total strengths. For saturated material strengths we used 80% of the undrained total strengths. This strength reduction is suggested by Makdisi and Seed (1978) and is widely used in post-earthquake analyses to account for potential softening during the earthquake loading.

1. Upper Clay Dike

We used post-earthquake strength parameters for the Upper Clay Dike (Unsaturated) of ϕ=0° and c=1500 psf.
We used post-earthquake strength parameters for the Upper Clay Dike (Saturated) of ϕ=0° and c=1,200 psf.

2. Lower Clay Dike

We used post-earthquake strength parameters for the Lower Clay Dike (Unsaturated) of ϕ=0° and c=1500 psf.
We used post-earthquake strength parameters for the Lower Clay Dike (Saturated) of ϕ=0° and c=1,200 psf.

3. Native Clay

We used post-earthquake strength parameters for the Native Clay (Unsaturated) of ϕ=0° and c=750 psf.
We used post-earthquake strength parameters for the Native Clay (Saturated) of ϕ=0° and c=600 psf.
We used post-earthquake strength parameters for the Native Clay Under Dike (Unsaturated) of ϕ=0° and c=1,250 psf.
We used post-earthquake strength parameters for the Native Clay Under Dike (Saturated) of ϕ=0° and c=1,000 psf.

Liquefiable Soils

The triggering analyses indicate that strength loss could be triggered in the native sand and the sluiced ash during the design earthquake. Therefore, values of undrained steady state (residual) shear strength s_{us} are used for the post-earthquake stability analyses. The selection of s_{us} for each fill and soil type is described below.

1. Native Sand and Low Plasticity Silts

For the native sand we used correlations from Idriss & Boulanger (2008) and Castro (1995) to estimate s_{us} based on the values of corrected SPT resistance $N_{1,60}$ measured in the sand. Fig. 17 shows a histogram of $N_{1,60}$ values measured in the sand. We selected a representative value of $N_{1,60}$ = 7 for the sand. Based on the sample descriptions and available grain size test data we selected representative fines content (i.e., material passing the #200 sieve by weight) of 30% for the sand. Using these values in the Idriss and Boulanger (2008) correlation we obtained a value of s_{us} = 235 psf. We obtained a value of s_{us} = 380 psf using the GEI lower bound curve in the Castro (1995) correlation.

The selected value of s_{us} for the native sand is input in the stability analyses as a value of cohesion with a friction angle of zero. We used post-earthquake strength parameters for the native sand and low plasticity silts of ϕ=0° and c=235 psf.

2. Sluiced Ash

For the sluiced ash we used a residual strength ratio of $s_{us}/\sigma_{vc}' = 0.06$ which is the design value that was used for a similar sluiced ash material in the remedial design for the Kingston Fossil Plant (Stantec 2012). This ratio gives s_{us} as a function of the current consolidated geometry effective vertical overburden stress σ_{vc}'. The Kingston design value was derived from an extensive post-failure investigation using correlations with SPT and piezocone CPT testing and laboratory testing by AECOM to determine post failure steady state shear strengths. The Kingston results are considered applicable to the Colbert sluiced ash because the materials are similar and have similar values of $N_{1,60}$. Based on the histogram of $N_{1,60}$ values in Fig. 18, an $N_{1,60}$ of 3 to 4 is considered representative of the Colbert sluiced fly ash. This is similar to the Kingston sluiced fly ash, which had a reported average of $N_{1,60}$ = 3.1 for the values equal to 10 or less.

For situations where the existing σ_v' is reduced by removal of material as part of the remedial design, we used a s_{us} based on the higher value σ_{vc}' to compute s_{us} existing prior to the fill soil removal. This is consistent with the concept underlying the use of a strength ratio, i.e., increasing σ_v' reduces the void ratio by compressing the soil and the lower void ratio results in higher s_{us} (Olson and Stark, 2002). Assuming that subsequent unloading does not result in a significant change in void ratio, it is appropriate to use the value of original σ_{vc}' that existed prior to the unloading as the material has been subject to pre-consolidation prior to upcoming removal.

In zones of sluiced ash not affected by fill soil removal, the selected value of $s_{us}/\sigma_{vc}' = 0.06$, with a minimum value of 100 psf, is input directly into a SLOPEW soil strength model for undrained steady state shear strength versus vertical effective stress. We used the figures in Idriss and Boulanger (2008) to compute the minimum s_{us}, as case history data shows there is residual shear strength even with SPT blowcounts are less than unity. In zones affected by soil removal, values of s_{us} versus depth are calculated based on the original σ_{vc}' prior to soil removal. These values are input in the stability analysis as a value of cohesion varying with depth and a friction angle of zero.

3. Epikarst

The triggering analyses indicate that strength loss could be triggered in epikarst during the design earthquake. Therefore, values of undrained steady state (residual) shear strength s_{us} are used for the post-earthquake stability analyses. For the liquefiable epikarst we used correlations from Idriss & Boulanger (2008) to estimate s_{us} based on the values of equivalent clean-sand corrected SPT resistance $N_{1,60cs\text{-}Sr}$. We selected the median value of $N_{1,60cs\text{-}Sr}$ = 9 for the epikarst. Using this value in the Idriss and Boulanger (2008) correlation we obtained a value of s_{us} = 220 psf.

The selected value of s_{us} for the native sand is input in the stability analyses as a value of cohesion with a friction angle of zero. We used post-earthquake strength parameters for the liquefiable epikarst of ϕ=0° and c=220 psf.

For the non-liquefiable epikarst a reduced undrained strength was selected. The selected parameters were ϕ=0° and c = 800 psf.

Non-liquefiable Coarse Grained Soils

For very coarse materials excess pore pressures will not accumulate, and the drained strength was used.

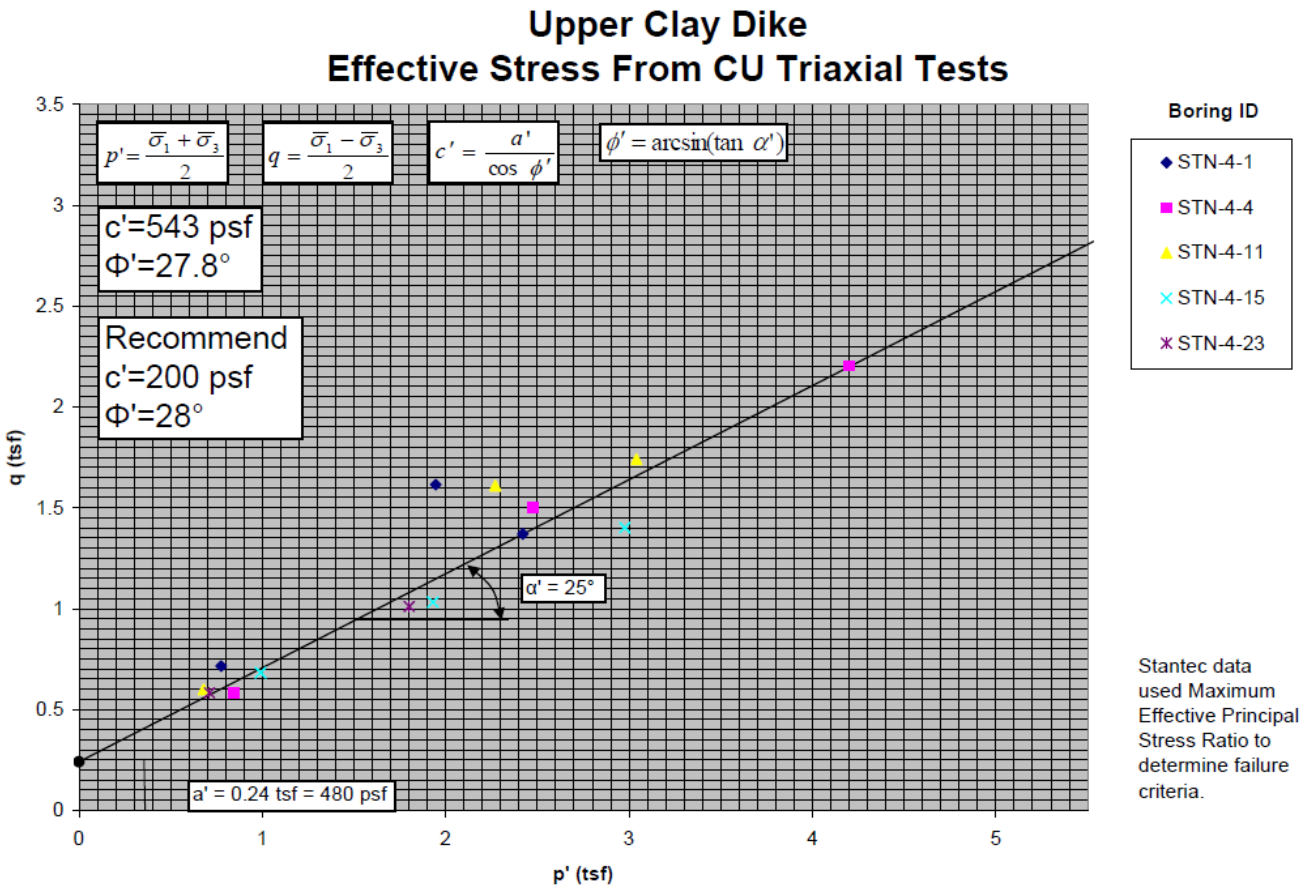


Figure 1. Drained Failure Envelope for Upper Clay Dike (Stantec, 2010).

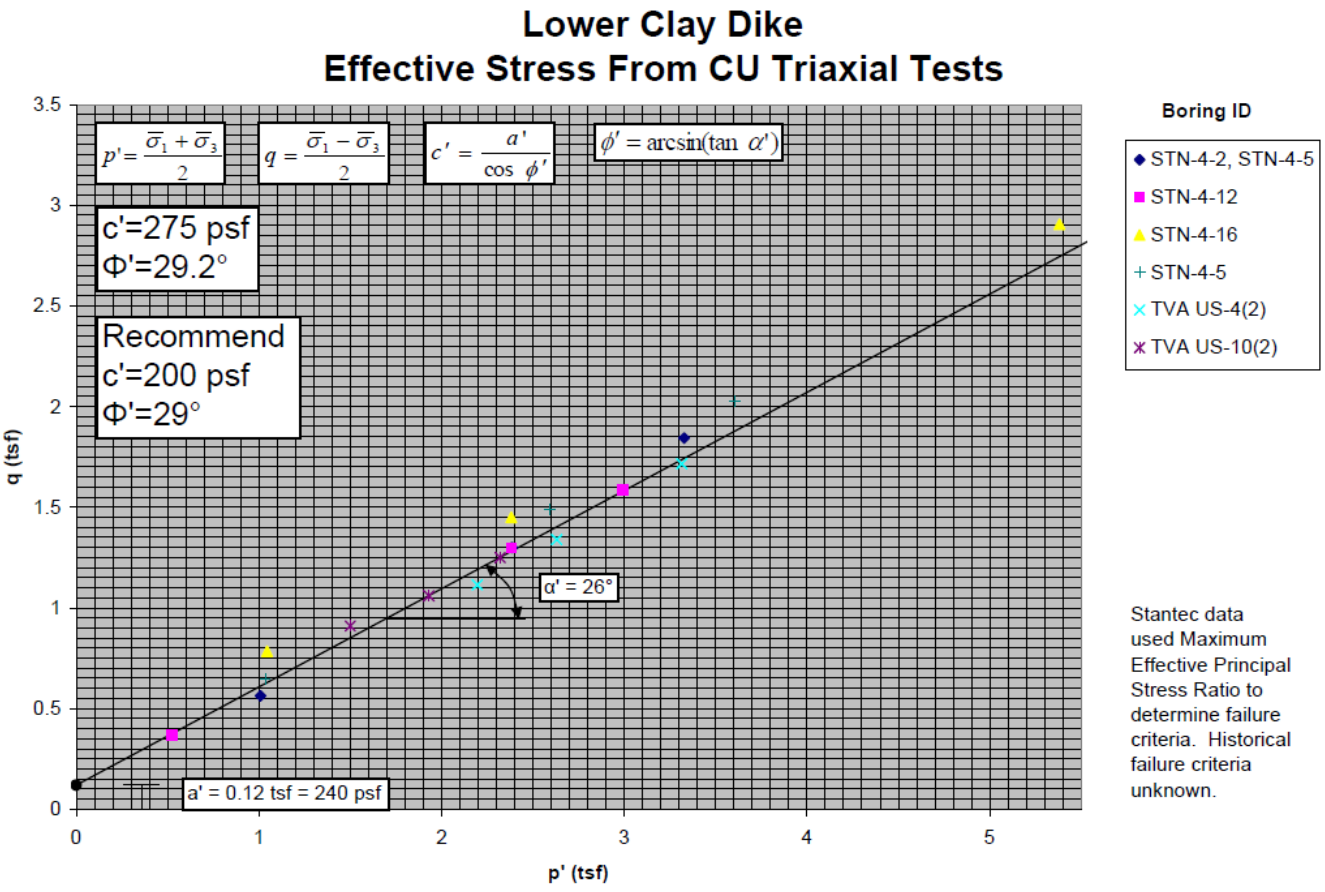


Figure 2. Drained Failure Envelope for Lower Clay Dike (Stantec, 2010).

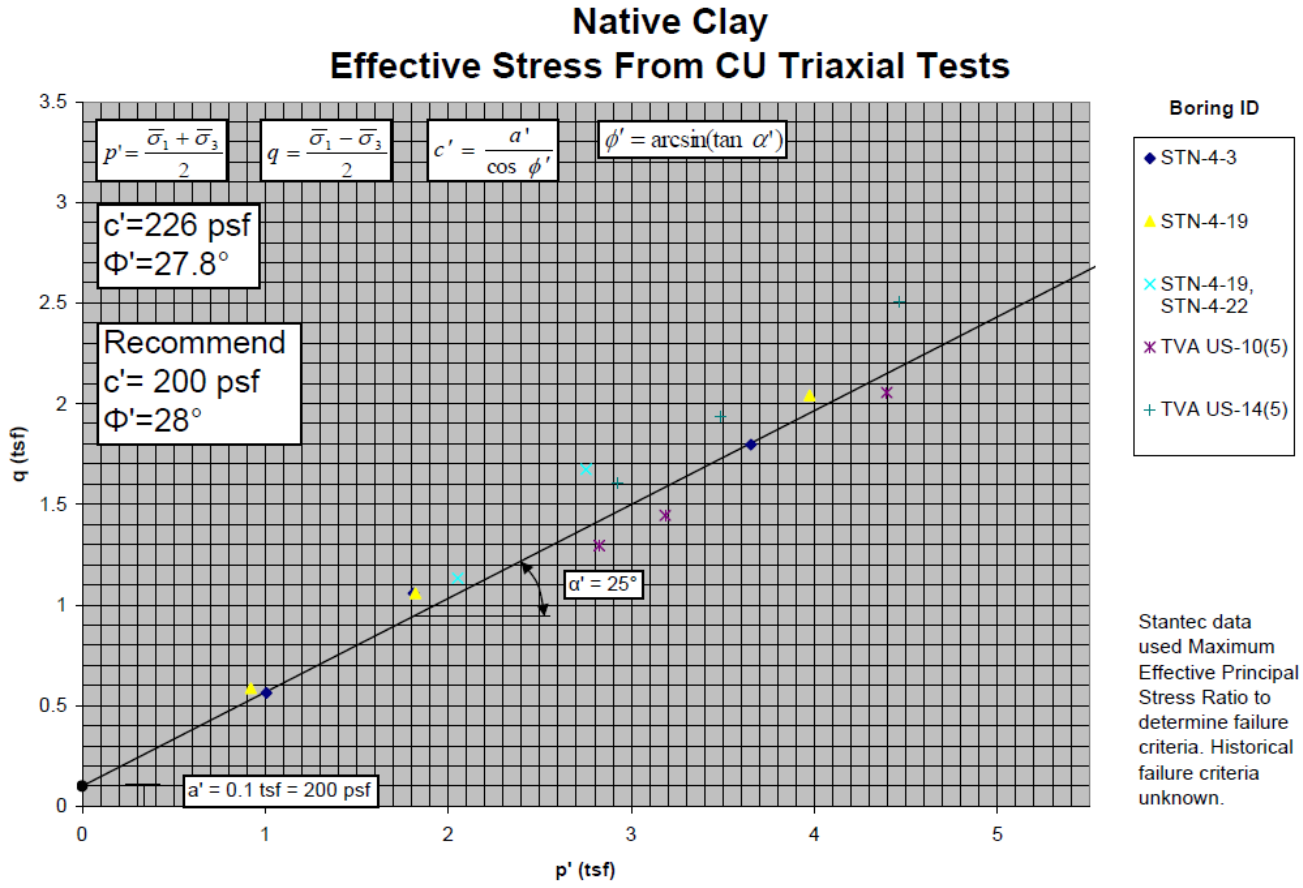


Figure 3. Drained Failure Envelope for Native Clay (Stantec, 2010).

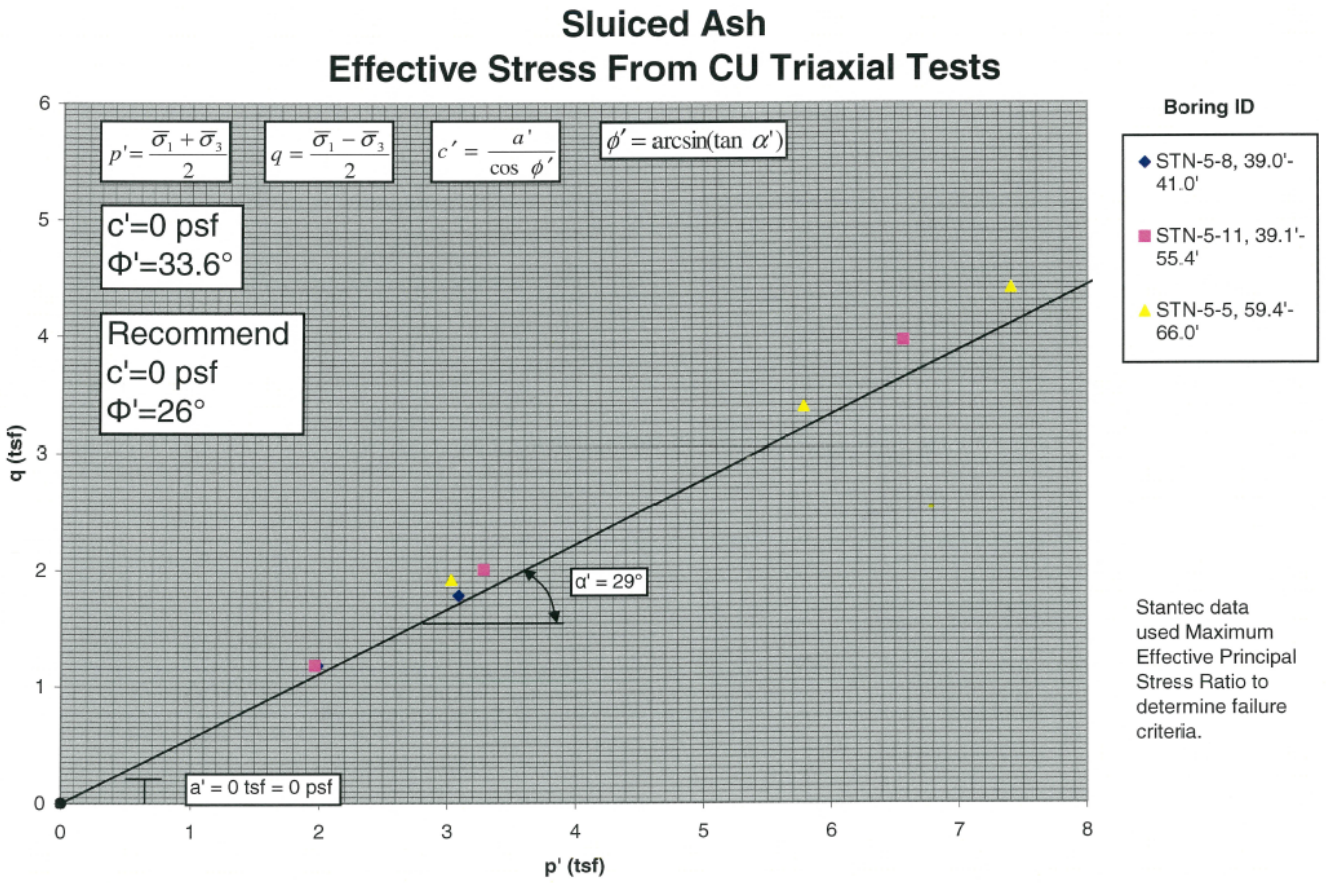


Figure 4. Drained Failure Envelope for Sluiced Ash (Stantec, 2010).

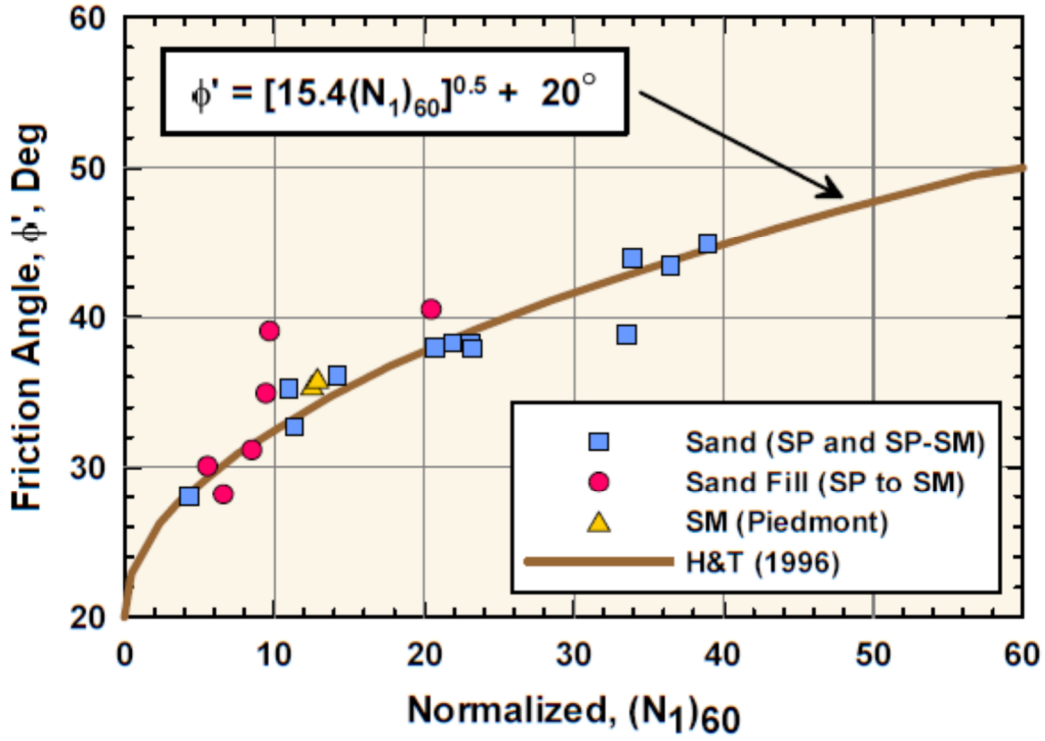


Figure 5. Peak Friction Angle of Sands from SPT Resistance (Adapted from Hatanaka & Uchida, 1996; Figure from FHWA NHI, 2002).

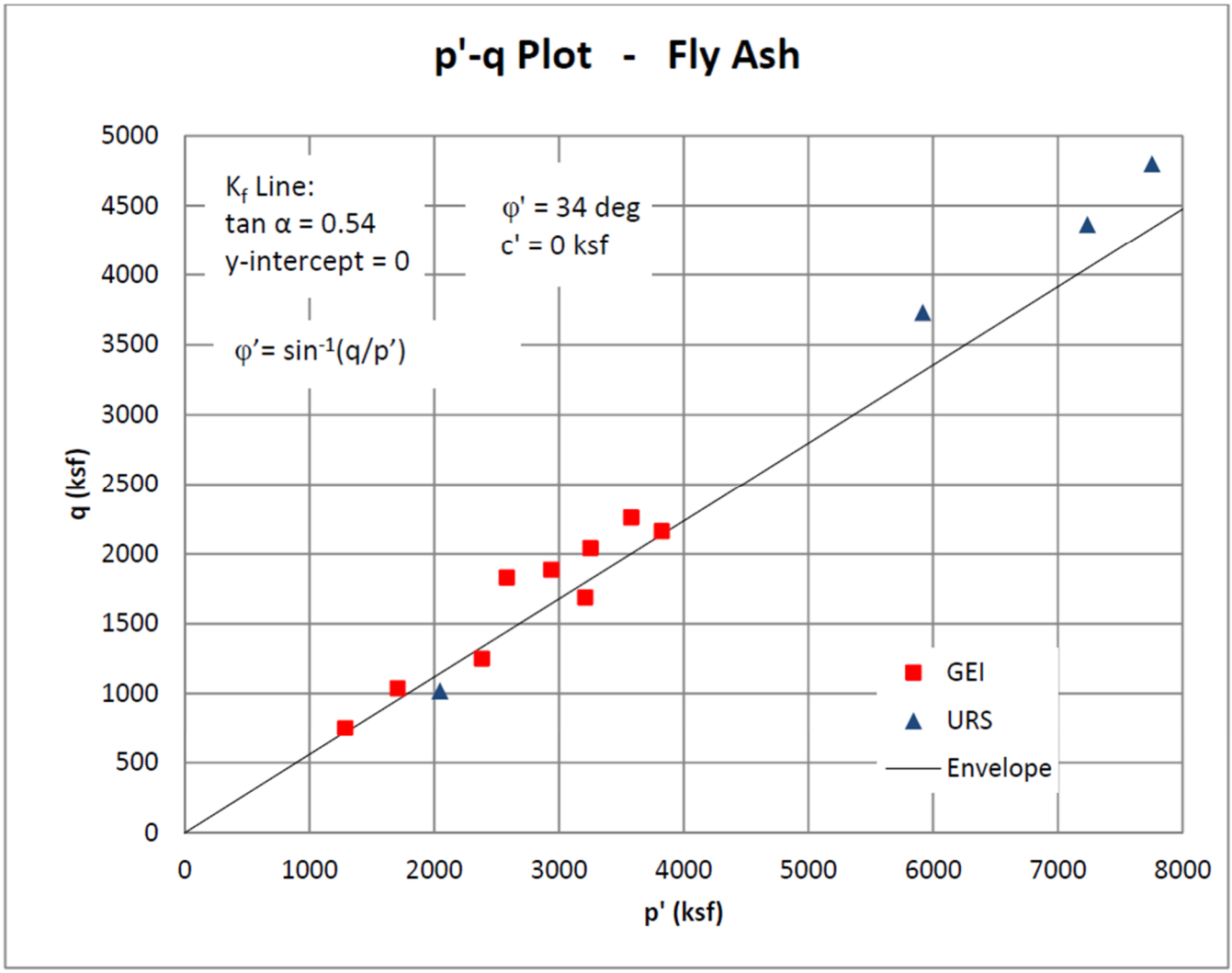


Figure 6. Failure envelope for Fly Ash (GEI, 2015)

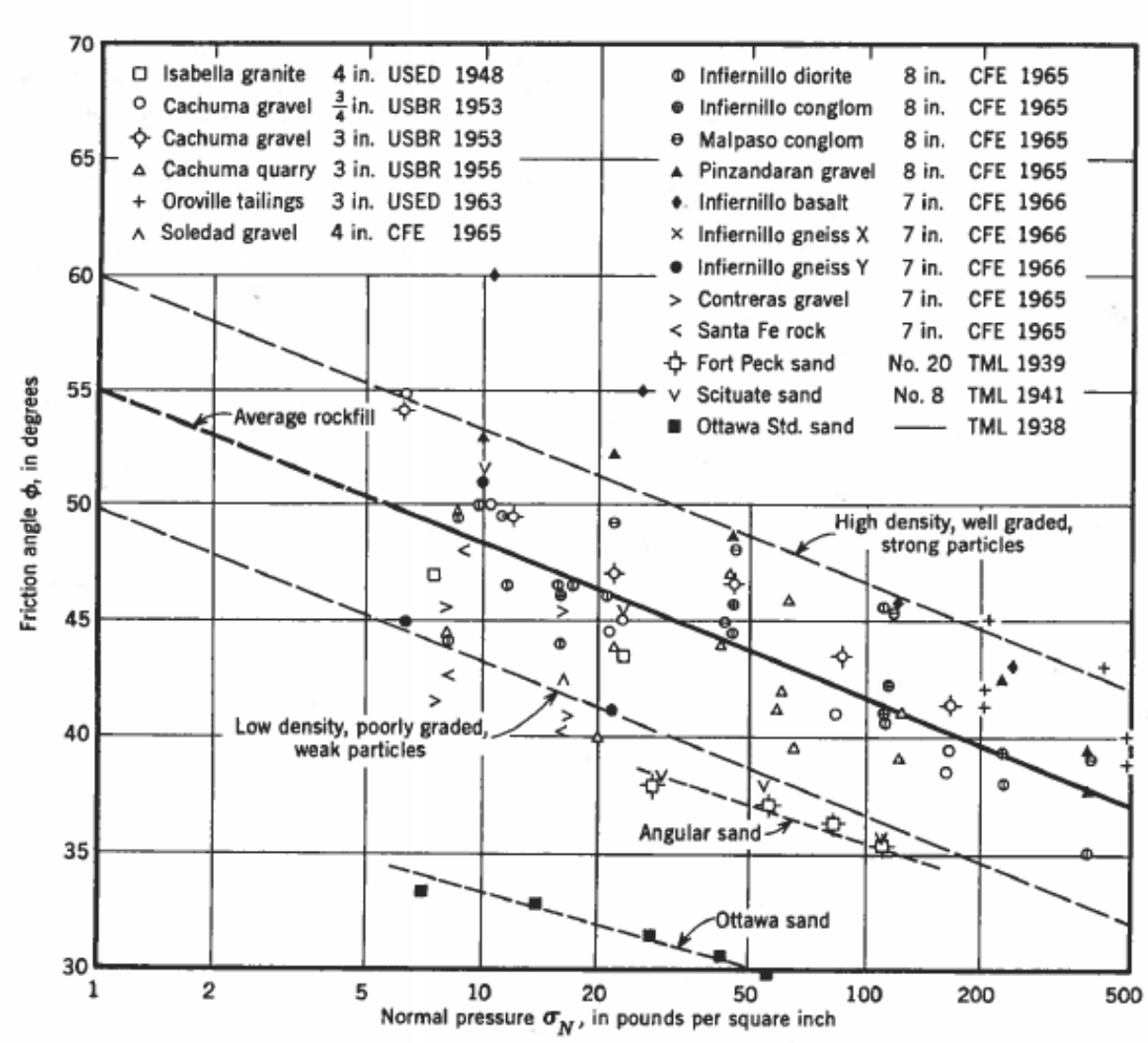


Figure 7. Shearing Strengths of Rockfill from Large Triaxial Tests (Leps, 1970).

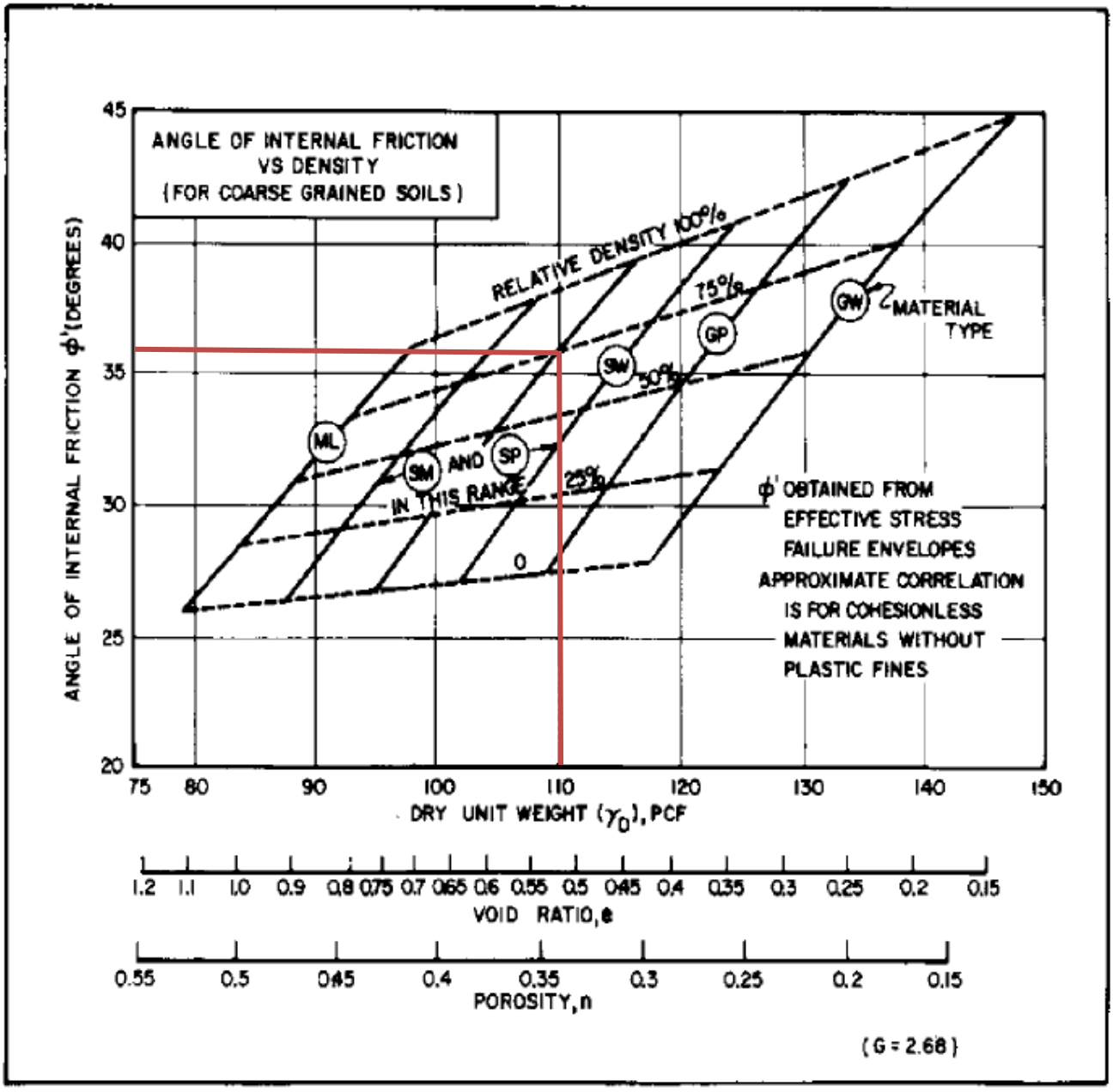


Figure 8: Correlations of Strength Characteristics for Granular Soils (NAVFAC, 1986).

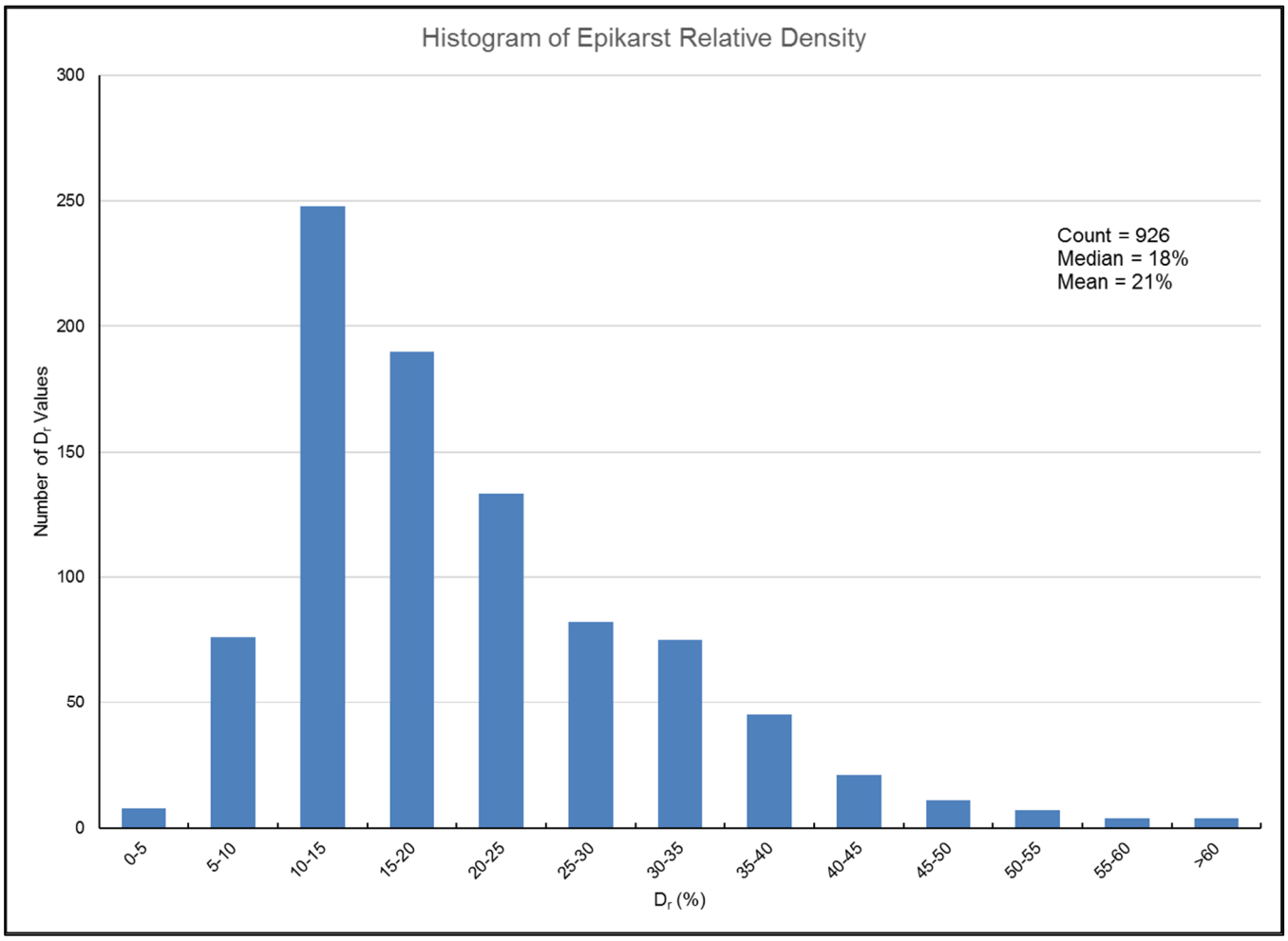


Figure 9: Histogram of Epikarst Relative Density.

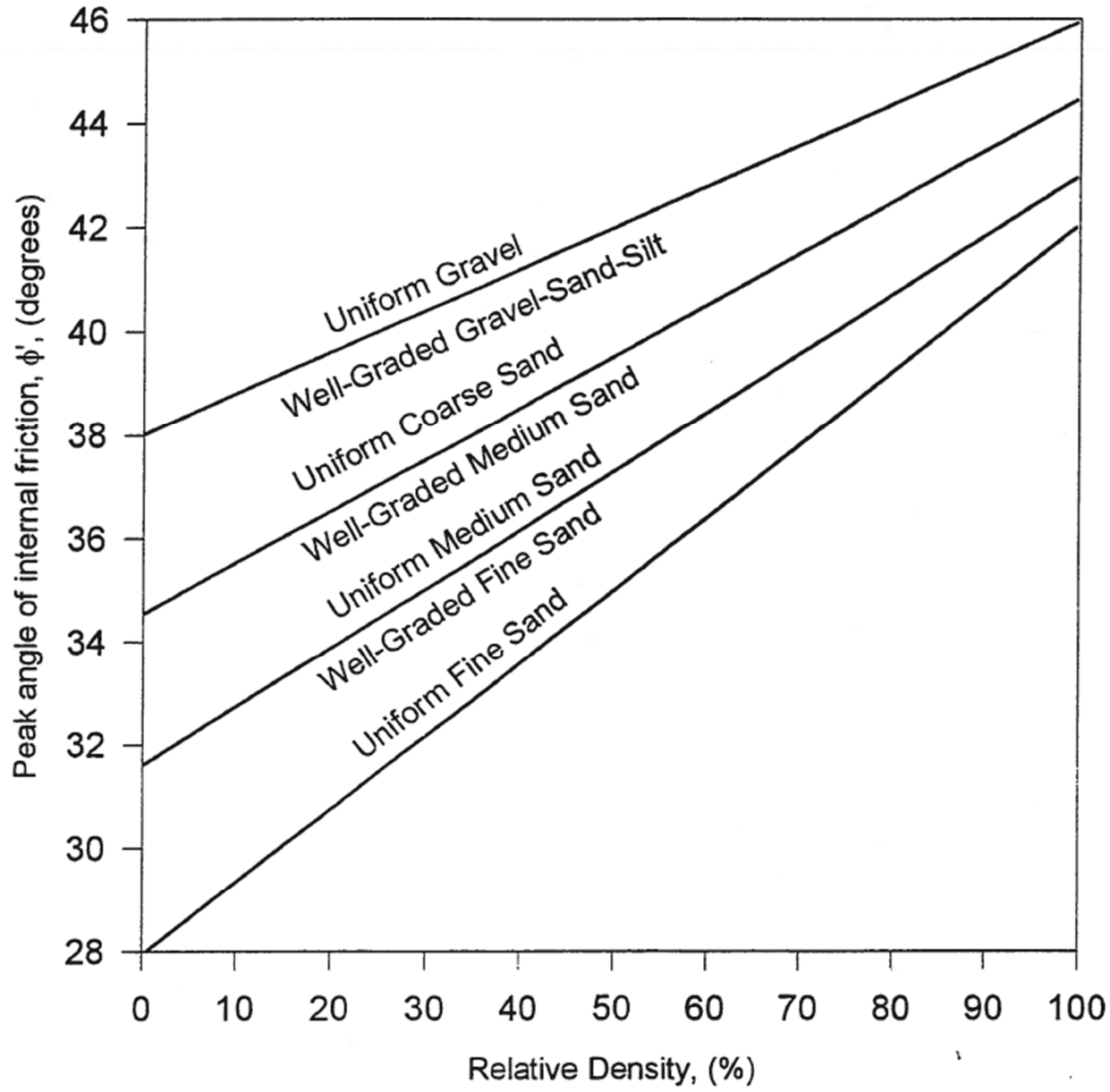
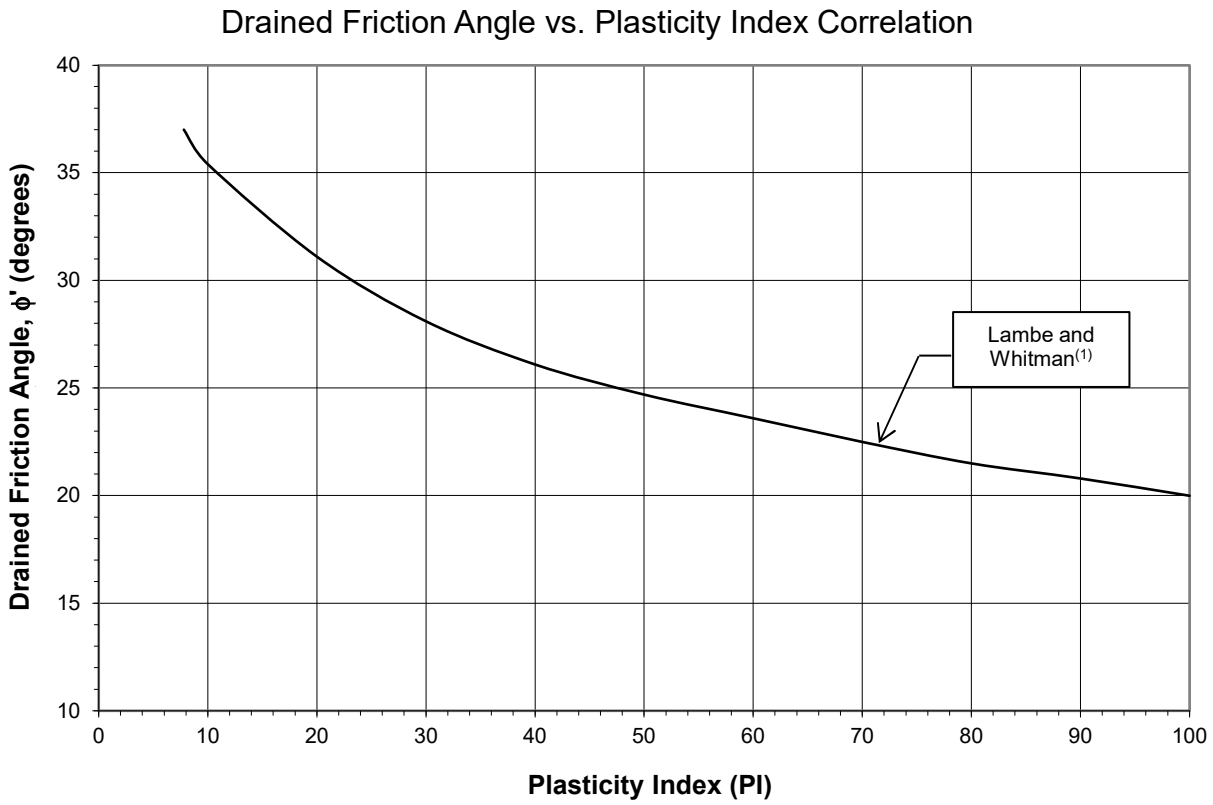


Figure 10: Correlation between relative density and peak angle of internal friction (MacGregor and Duncan, 1998).



(1) Lambe, T.W., and Whitman, R.V. (1969), Figure 21.4, page 307, Soil Mechanics, John Wiley & Sons Inc., New York.

Figure 11: Correlation between Plasticity Index and Drained Friction Angle (Lambe and Whiteman, 1969).

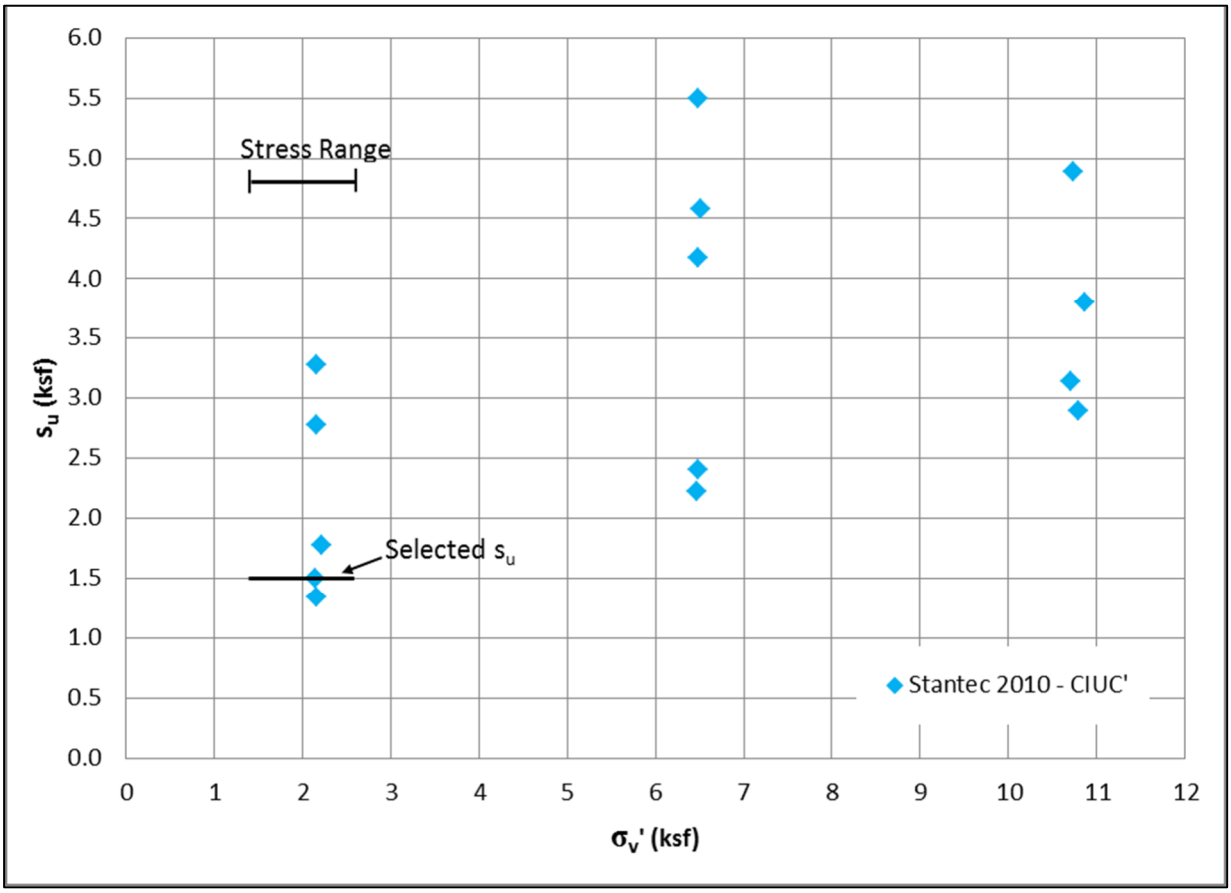


Figure 12. s_u Versus σ_v' Plots for Upper Clay Dike.

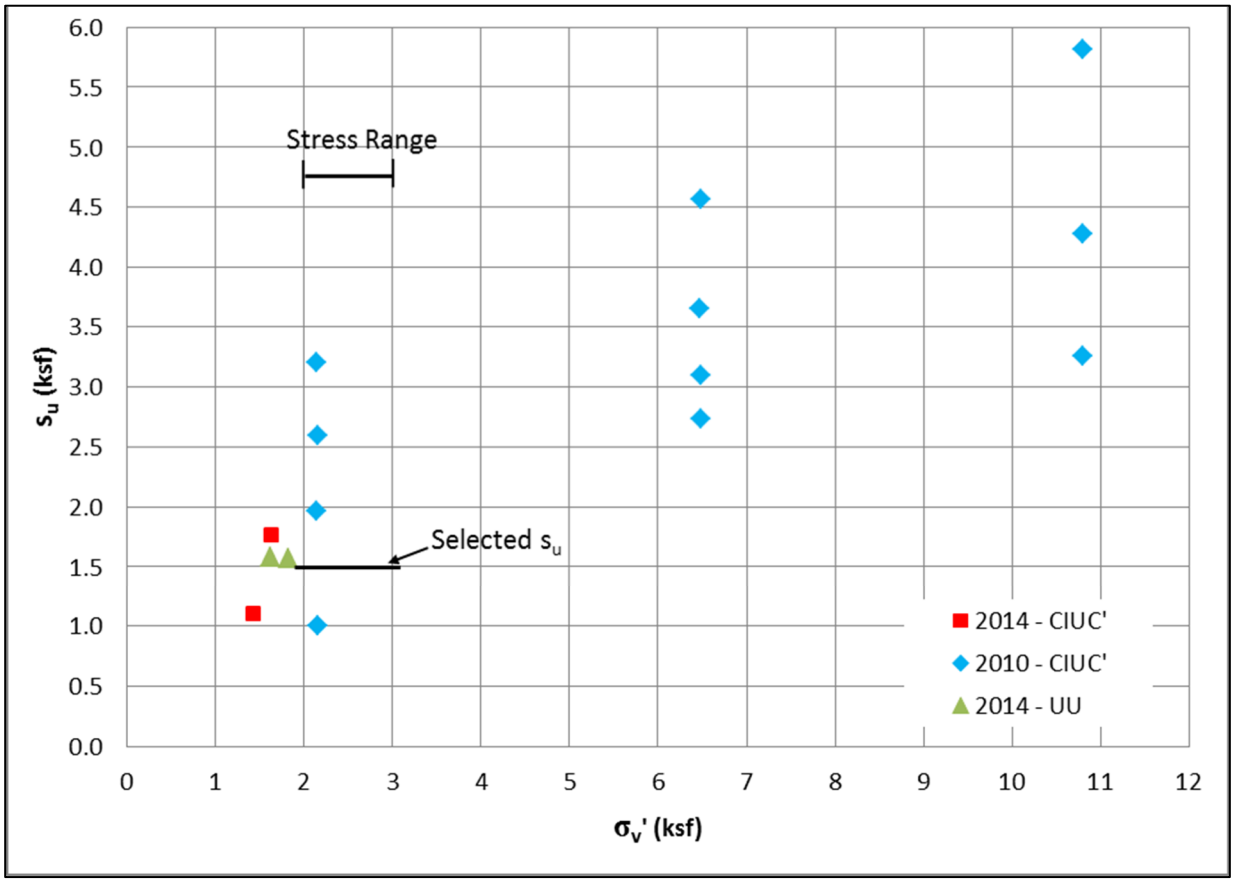


Figure 13. s_u Versus σ_v' Plots for Lower Clay Dike.

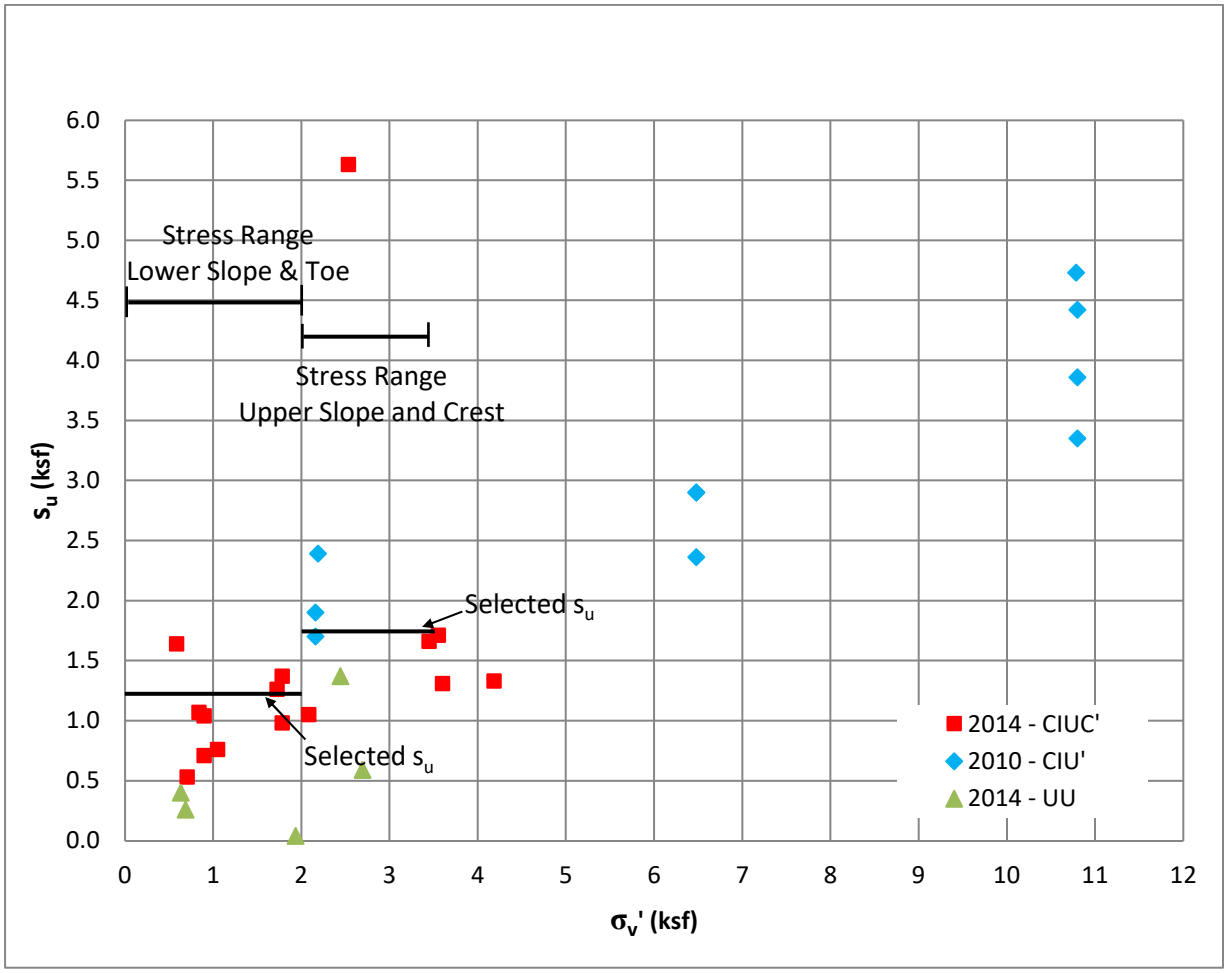


Figure 14. s_u Versus σ_v' Plots for Native Clay.

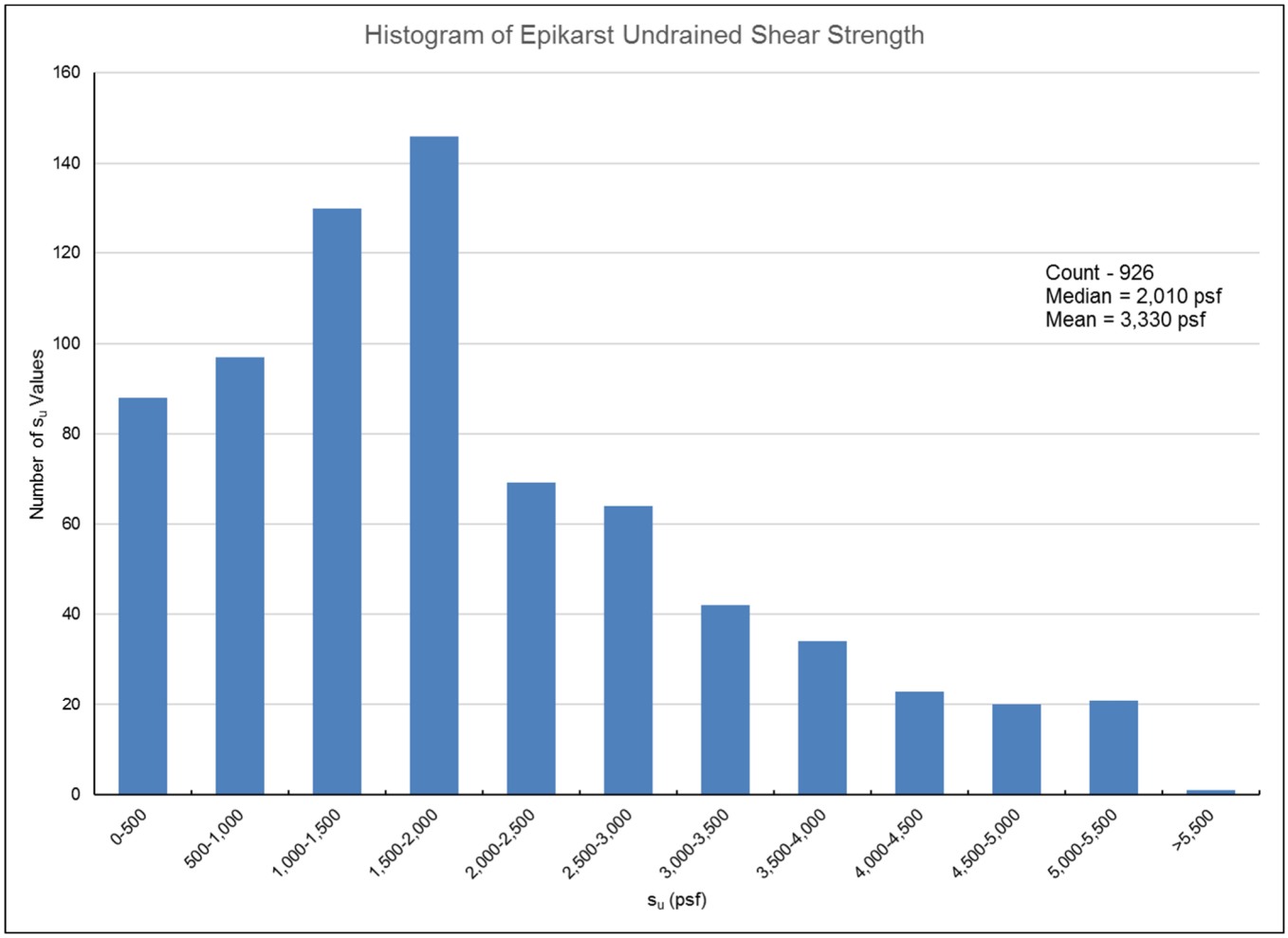


Figure 15: Histogram of Epikarst Undrained Shear Strength

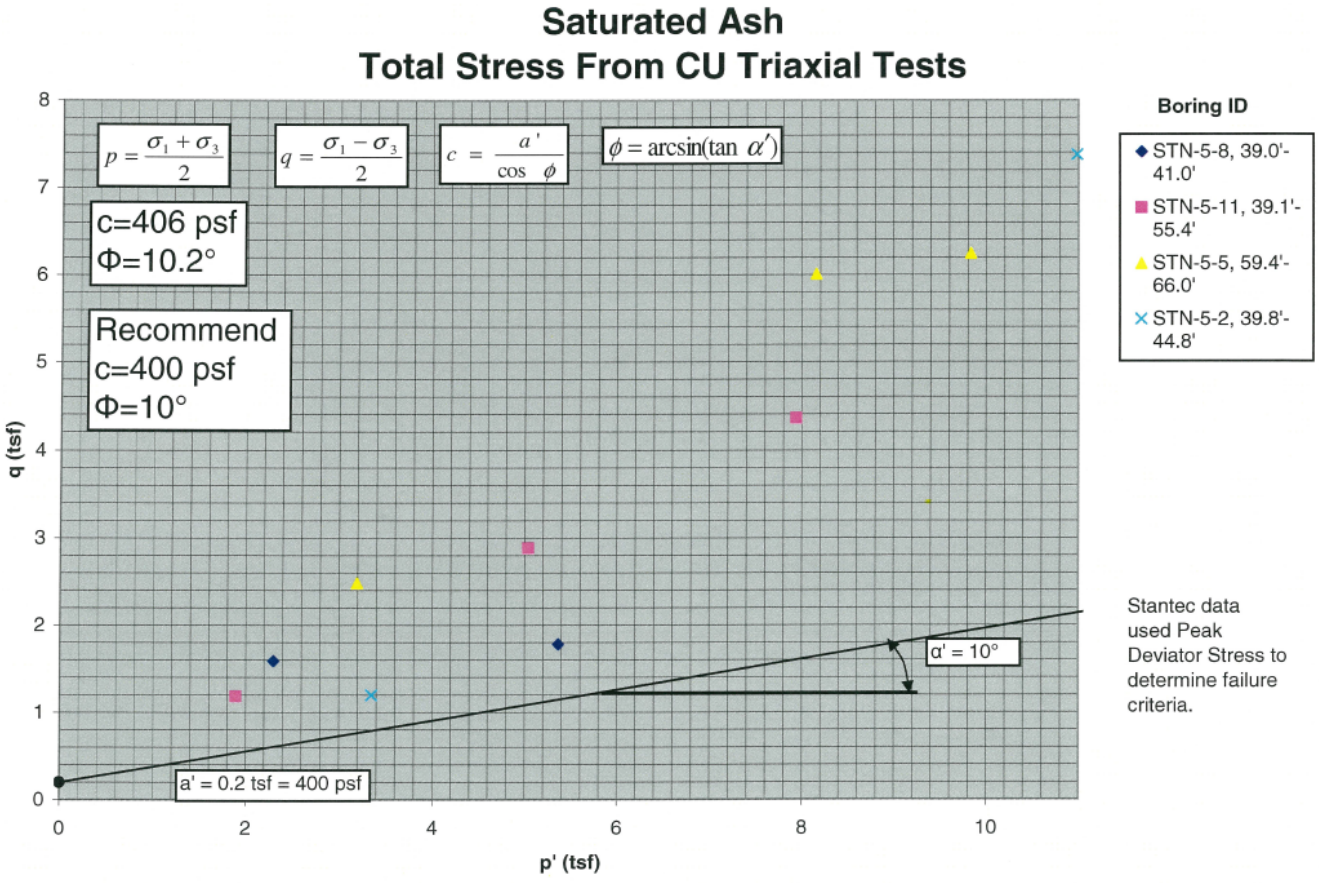


Figure 16. Undrained Failure Envelope for Sluiced Ash (Stantec, 2010).

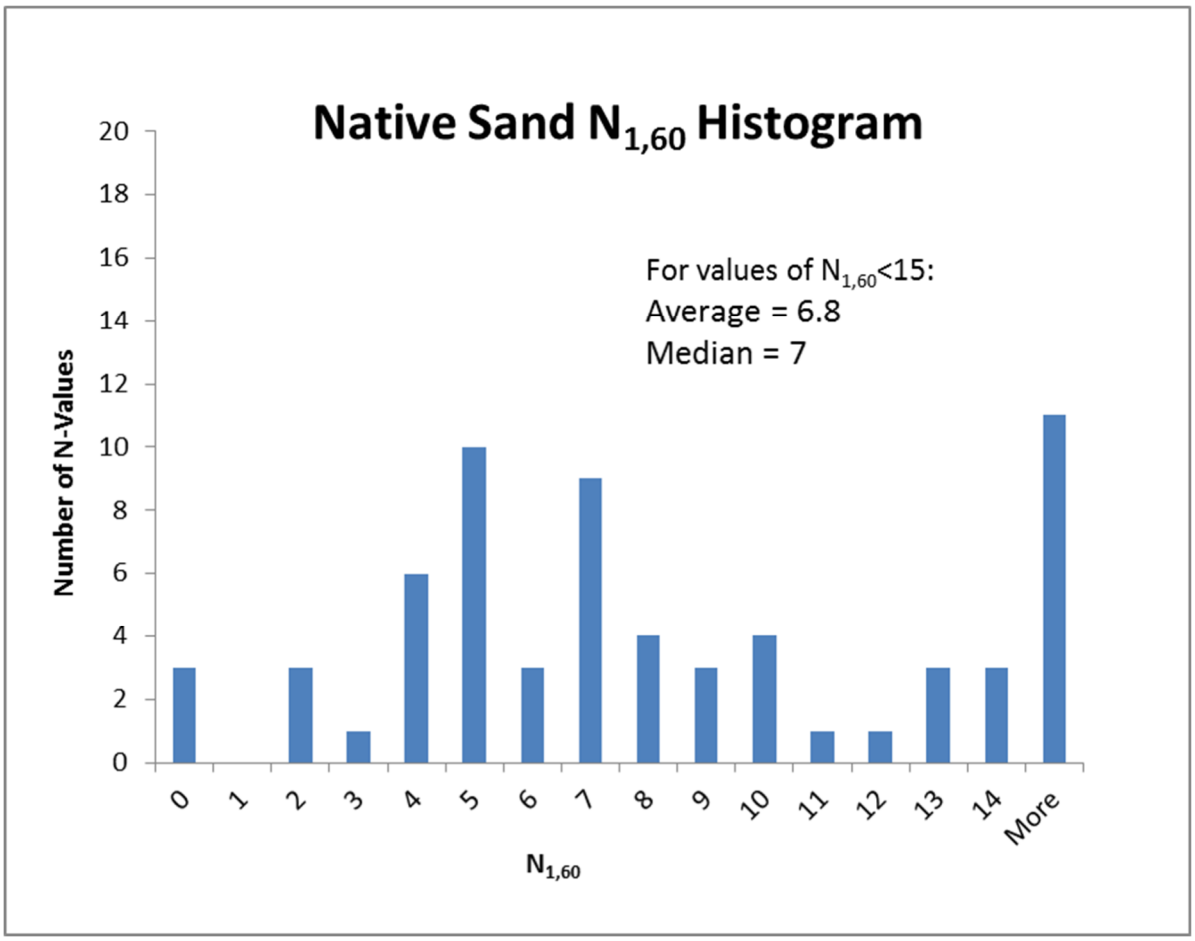


Figure 17. Histogram of $N_{1,60}$ Values Measured in the Native Sand and Low Plasticity Silt.

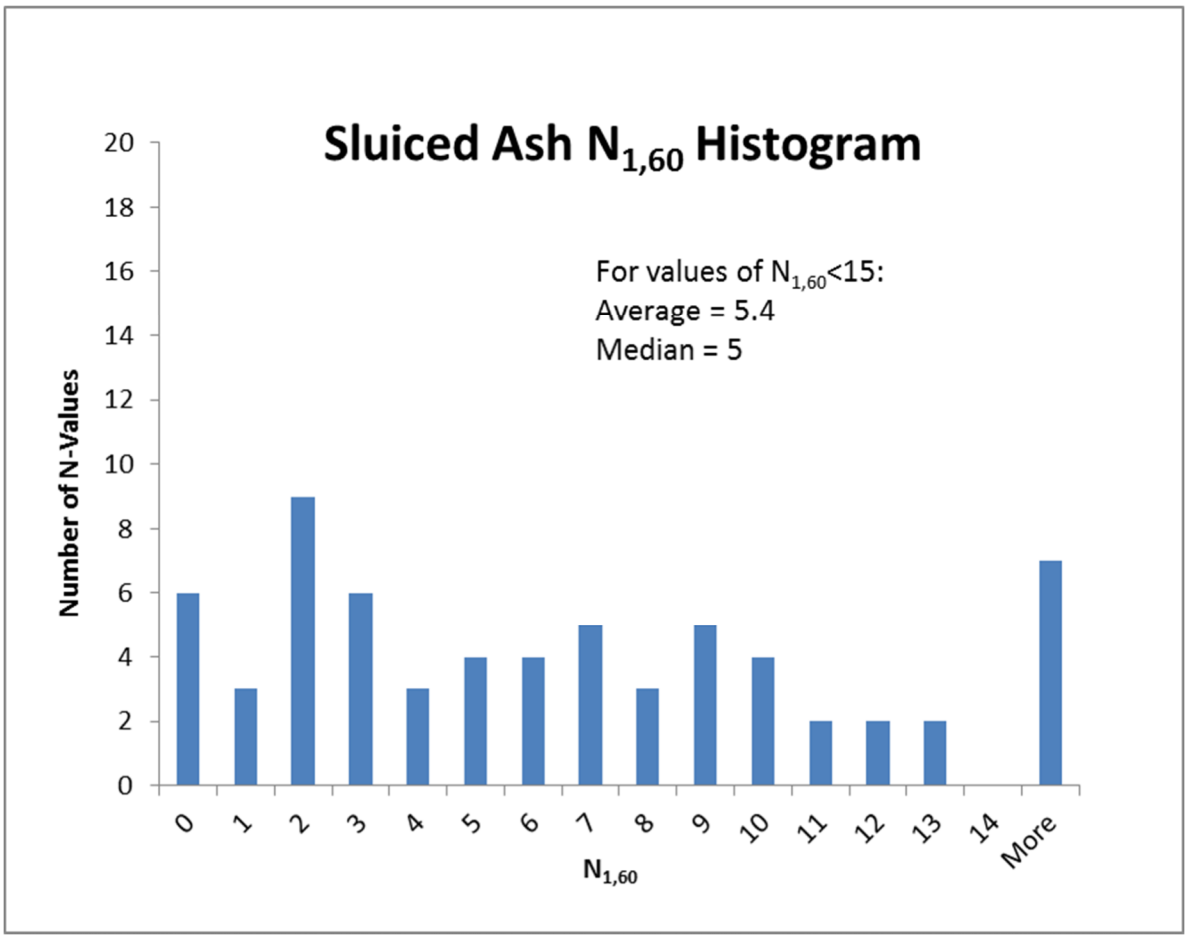


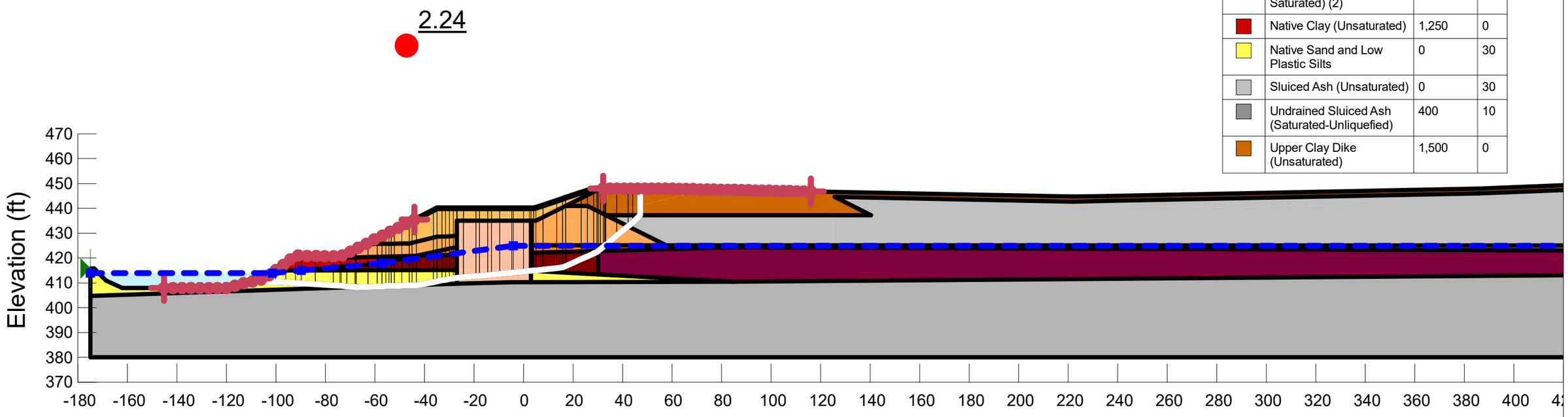
Figure 18. Histogram of $N_{1,60}$ Values Measured in the Sluiced Ash.

Appendix B

Post-Closure Stability Analyses

Post-Closure Stability
Section: E
Analysis: Static Undrained
Failure Type: Circular

Color	Name	Cohesion' (psf)	Phi' (°)
	Bedrock	20,000	45
	Granular Fill	0	35
	Improved Soil	1,000	0
	Lower Clay Dike (Saturated)	1,500	0
	Lower Clay Dike (Unsaturated)	1,500	0
	Native Clay (Saturated)	750	0
	Native Clay (Under Dike Saturated) (2)	1,250	0
	Native Clay (Unsaturated)	1,250	0
	Native Sand and Low Plastic Silts	0	30
	Sluiced Ash (Unsaturated)	0	30
	Undrained Sluiced Ash (Saturated-Unliquefied)	400	10
	Upper Clay Dike (Unsaturated)	1,500	0

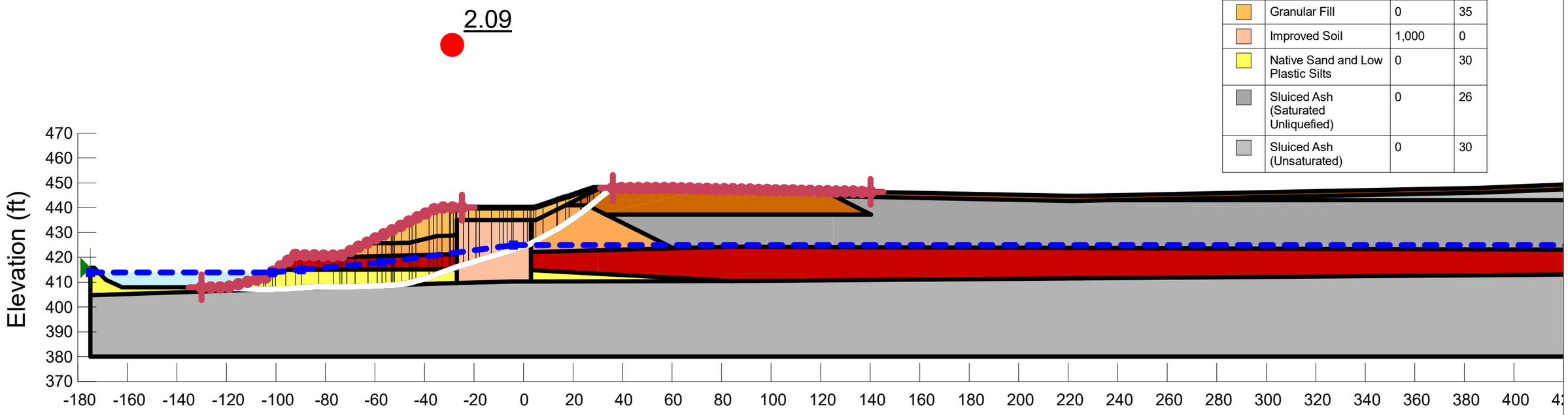


Scale: 1" = 40'

Post-Closure Stability Report Closed COF Ash Pond No.4 Tuscumbia, Alabama	GEI Consultants	POST-CLOSURE STABILITY REPORT
Tennessee Valley Authority Chattanooga, Tennessee	Project 2100946	December 2021

Post-Closure Stability
Section: E
Analysis: Static Drained
Failure Type: Circular

Color	Name	Cohesion' (psf)	Phi' (°)
	Bedrock	20,000	45
	Drained Lower Clay Dike	200	29
	Drained Native Clay	200	28
	Drained Upper Clay Dike	200	28
	Granular Fill	0	35
	Improved Soil	1,000	0
	Native Sand and Low Plastic Silts	0	30
	Sluiced Ash (Saturated Unliquefied)	0	26
	Sluiced Ash (Unsaturated)	0	30

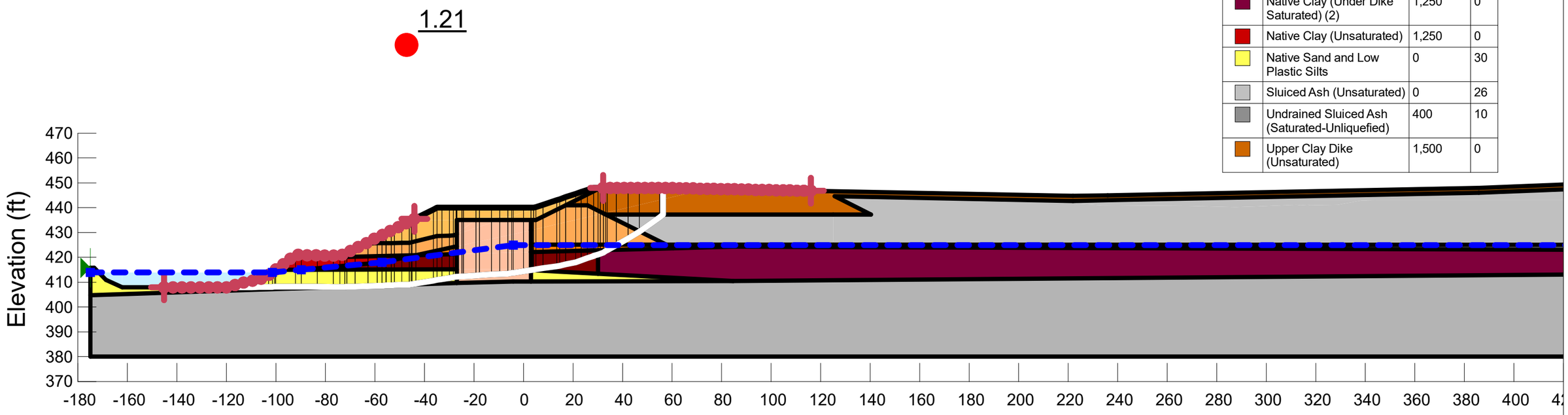


Scale: 1" = 40'

Post-Closure Stability Report Closed COF Ash Pond No.4 Tuscumbia, Alabama	GEI Consultants	POST-CLOSURE STABILITY REPORT
Tennessee Valley Authority Chattanooga, Tennessee	Project 2100946	December 2021

Post-Closure Stability
Section: E
Analysis: Pseudo-Static (kh = 0.16)
Failure Type: Circular

Color	Name	Cohesion' (psf)	Phi' (°)
	Bedrock	20,000	45
	Granular Fill	0	35
	Improved Soil	1,000	0
	Lower Clay Dike (Saturated)	1,500	0
	Lower Clay Dike (Unsaturated)	1,500	0
	Native Clay (Saturated)	750	0
	Native Clay (Under Dike Saturated) (2)	1,250	0
	Native Clay (Unsaturated)	1,250	0
	Native Sand and Low Plastic Silts	0	30
	Sluiced Ash (Unsaturated)	0	26
	Undrained Sluiced Ash (Saturated-Unliquefied)	400	10
	Upper Clay Dike (Unsaturated)	1,500	0

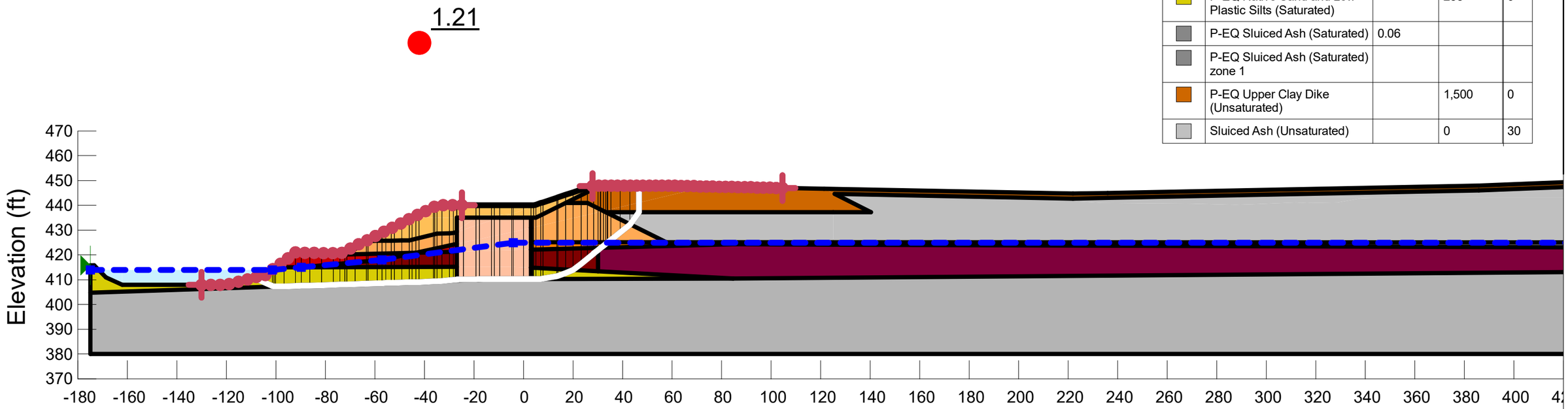


Scale: 1" = 40'

Post-Closure Stability Report Closed COF Ash Pond No.4 Tuscumbia, Alabama	GEI Consultants	POST-CLOSURE STABILITY REPORT
Tennessee Valley Authority Chattanooga, Tennessee	Project 2100946	December 2021

Post-Closure Stability
Section: E
Analysis: Post-EQ Undrained
Failure Type: Circular

Color	Name	Tau/Sigma Ratio	Cohesion' (psf)	Phi' (°)
	Bedrock		20,000	45
	Granular Fill		0	35
	Improved Soil		1,000	0
	P-EQ Lower Clay Dike (Saturated)		1,200	0
	P-EQ Lower Clay Dike (Unsaturated)		1,500	0
	P-EQ Native Clay (Saturated)		600	0
	P-EQ Native Clay (Under Dike Saturated)		1,000	0
	P-EQ Native Clay (Unsaturated)		1,250	0
	P-EQ Native Sand and Low Plastic Silts (Saturated)		235	0
	P-EQ Sluiced Ash (Saturated)	0.06		
	P-EQ Sluiced Ash (Saturated) zone 1			
	P-EQ Upper Clay Dike (Unsaturated)		1,500	0
	Sluiced Ash (Unsaturated)		0	30



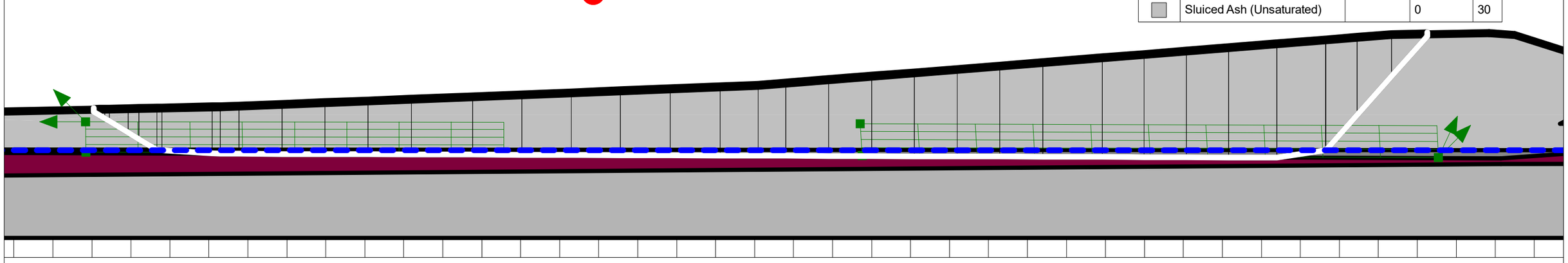
Scale: 1" = 40'

Post-Closure Stability Report Closed COF Ash Pond No.4 Tuscumbia, Alabama	GEI Consultants	POST-CLOSURE STABILITY REPORT
Tennessee Valley Authority Chattanooga, Tennessee	Project 2100946	December 2021

East Dike DMM Wall Stabilty Analysis
Section: E
Analysis: Failure in Ash Stack
Failure Type: Deep Wedge

Color	Name	Tau/Sigma Ratio	Cohesion' (psf)	Phi' (°)
	Bedrock		20,000	45
	Granular Fill		0	35
	Improved Soil		1,000	0
	P-EQ Lower Clay Dike (Saturated)		1,200	0
	P-EQ Lower Clay Dike (Unsaturated)		1,500	0
	P-EQ Native Clay (Saturated)		600	0
	P-EQ Native Clay (Under Dike Saturated)		1,000	0
	P-EQ Native Clay (Unsaturated)		1,250	0
	P-EQ Native Sand and Low Plastic Silts (Saturated)		235	0
	P-EQ Sluiced Ash (Saturated)	0.06		
	P-EQ Sluiced Ash (Saturated) zone 1			
	P-EQ Upper Clay Dike (Unsaturated)		1,500	0
	Sluiced Ash (Unsaturated)		0	30

2.16

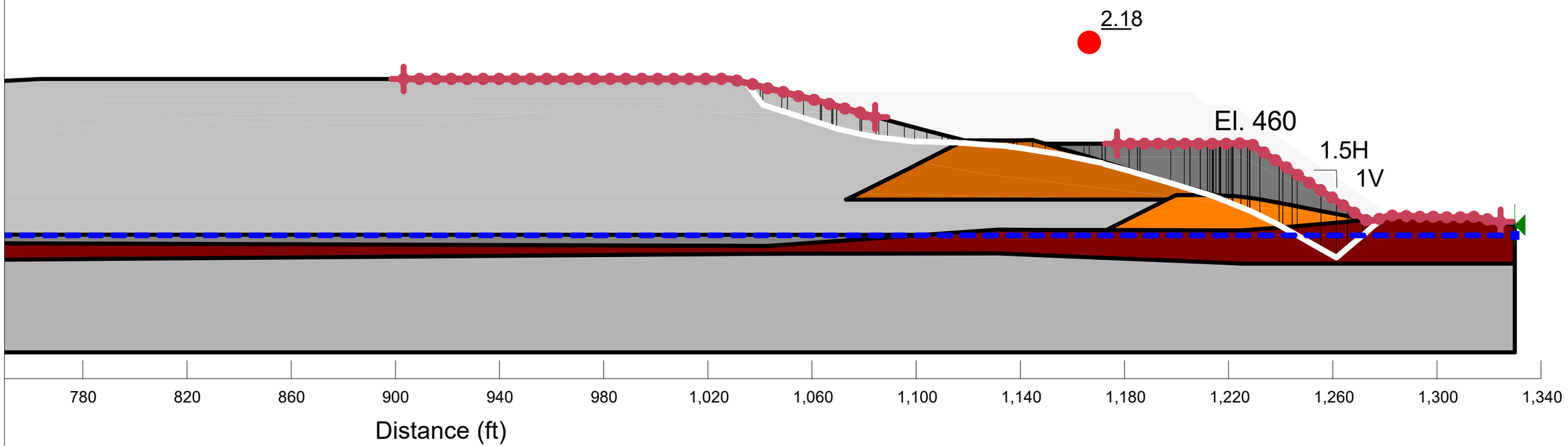


Scale: 1" = 50'

Post-Closure Stability Report Closed COF Ash Pond No.4 Tuscumbia, Alabama	GEI Consultants	POST-CLOSURE STABILITY REPORT
Tennessee Valley Authority Chattanooga, Tennessee	Project 2100946	December 2021

Post-Closure Stability
Section: J
Analysis: Static Drained
Failure Type: Deep Circular

Color	Name	Cohesion' (psf)	Phi' (°)
	Bedrock	20,000	45
	Drained Lower Clay Dike	200	29
	Drained Native Clay	200	28
	Drained Sluiced Ash	0	26
	Drained Upper Clay Dike	200	28
	Sluiced Ash (Unsaturated)	0	30
	Stability Berm	0	40

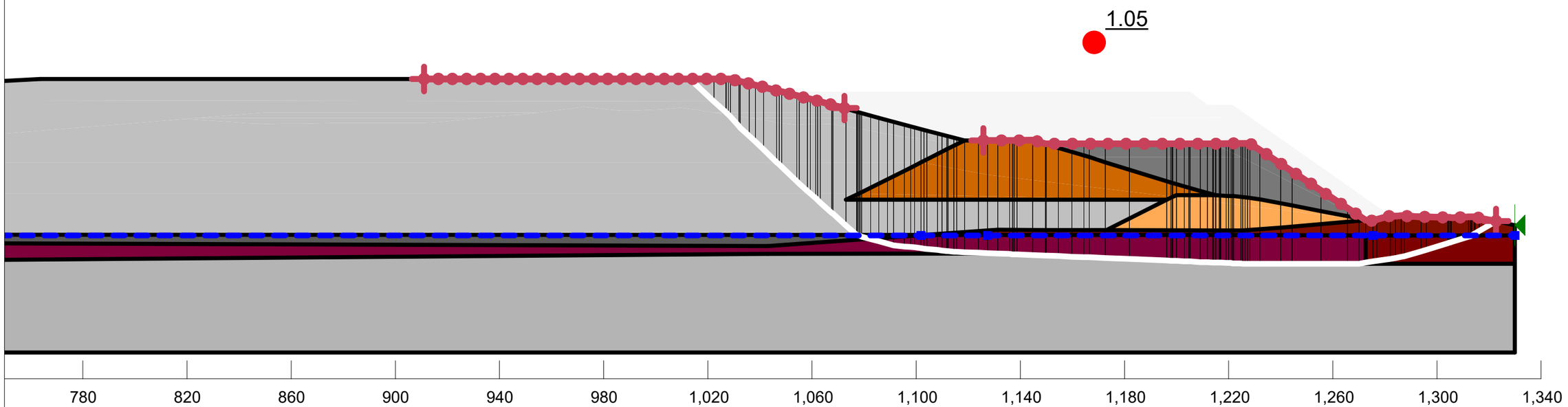


Scale: 1" = 40'

Post-Closure Stability Report Closed COF Ash Pond No.4 Tuscumbia, Alabama	GEI Consultants	POST-CLOSURE STABILITY REPORT
Tennessee Valley Authority Chattanooga, Tennessee	Project 2100946	December 2021

Post-Closure Stability
Section: J
Analysis: Pseudo-Static (kh = 0.16)
Failure Type: Deep Circular

Color	Name	Cohesion' (psf)	Phi' (°)
	Bedrock	20,000	45
	Lower Clay Dike (Unsaturated)	1,500	0
	Native Clay (Saturated)	750	0
	Native Clay (Under Dike Saturated)	1,250	0
	Native Clay (Unsaturated)	1,250	0
	Sluiced Ash (Saturated)	400	10
	Sluiced Ash (Unsaturated)	0	26
	Stability Berm	0	45
	Upper Clay Dike (Unsaturated)	1,500	0

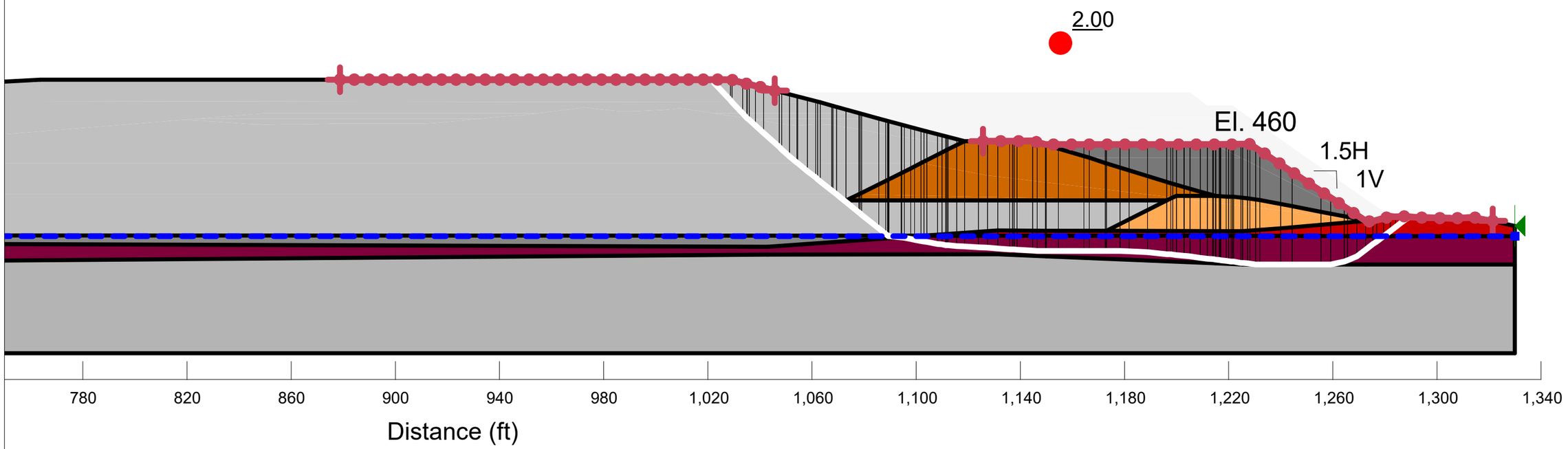


Scale: 1" = 40'

Post-Closure Stability Report Closed COF Ash Pond No.4 Tuscumbia, Alabama	GEI Consultants	POST-CLOSURE STABILITY REPORT
Tennessee Valley Authority Chattanooga, Tennessee	Project 2100946	December 2021

Post-Closure Stability
Section: J
Analysis: Post-EQ Undrained
Failure Type: Deep Circular

Color	Name	Tau/Sigma Ratio	Cohesion' (psf)	Phi' (°)
	Bedrock		20,000	45
	P-EQ Lower Clay Dike (Unsaturated)		1,500	0
	P-EQ Native Clay (Under Dike Saturated)		1,000	0
	P-EQ Native Clay (Unsaturated)		1,250	0
	P-EQ Sluiced Ash (Saturated)	0.06		
	P-EQ Upper Clay Dike (Unsaturated)		1,500	0
	Sluiced Ash (Unsaturated)		0	30
	Stability Berm		0	40

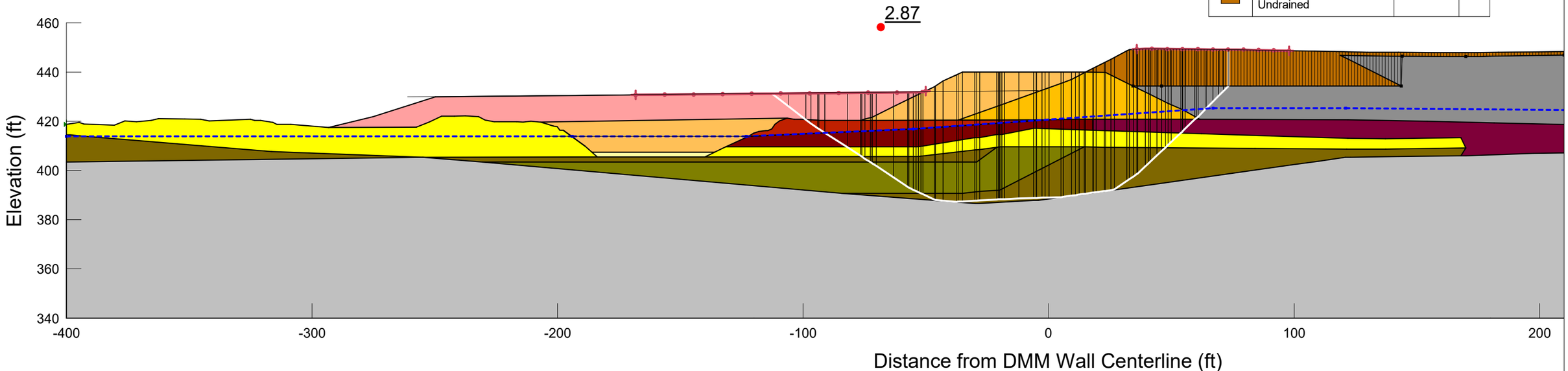


Scale: 1" = 40'

Post-Closure Stability Report Closed COF Ash Pond No.4 Tuscumbia, Alabama	GEI Consultants	POST-CLOSURE STABILITY REPORT
Tennessee Valley Authority Chattanooga, Tennessee	Project 2100946	December 2021

Post-Closure Stability
Section: Sta. 14+50
Analysis: Undrained Static
Failure Type: Deep Circular Dike

Color	Name	Cohesion' (psf)	Phi' (°)
	Bedrock	10,000	0
	Common Fill - Undrained	0	31
	Epikarst - Undrained	1,000	0
	Epikarst (Liquifiable) - Undrained	1,000	0
	Filter Sand - Undrained	0	36
	Granular Fill - Undrained	0	35
	Lower Clay Dike - Undrained	1,500	0
	Native Clay - Unsaturated	1,250	0
	Native Clay - Saturated	750	0
	Native Clay Under Dike - Saturated	1,250	0
	Native Sand and Low Plastic Silts - Undrained	0	30
	Sluiced Ash - Undrained	400	10
	Upper Clay Dike - Undrained	1,500	0

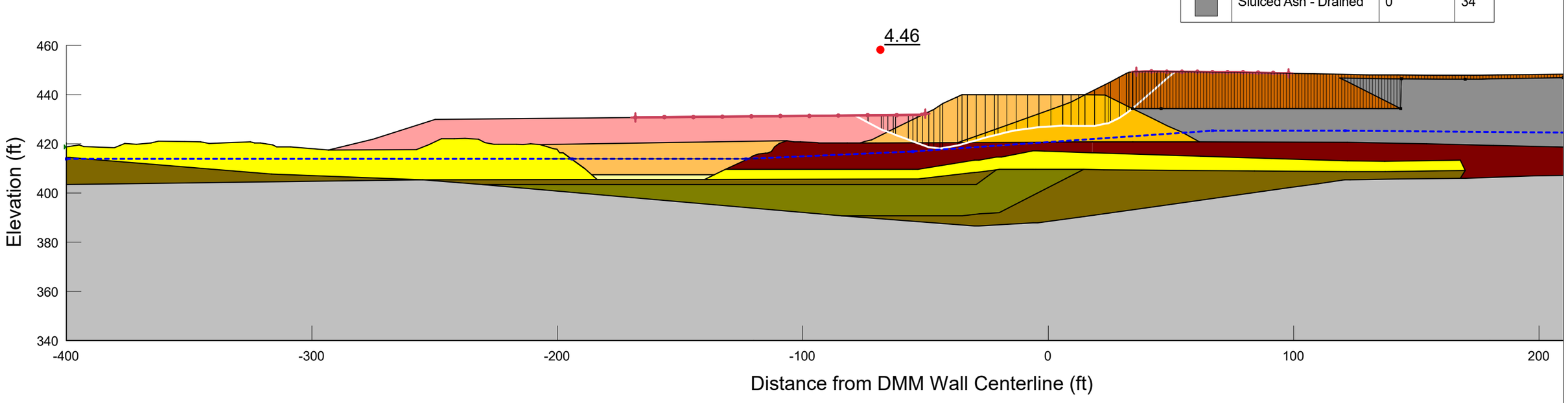


Scale: 1" = 40'

Post-Closure Stability Report Closed COF Ash Pond No.4 Tuscumbia, Alabama	GEI Consultants	POST-CLOSURE STABILITY REPORT
Tennessee Valley Authority Chattanooga, Tennessee	Project 2100946	December 2021

Post-Closure Stability
Section: Sta. 14+50
Analysis: Drained Static
Failure Type: Deep Circular Dike

Color	Name	Cohesion' (psf)	Phi' (°)
	Bedrock	10,000	0
	Common Fill - Drained	0	31
	Epikarst - Drained	100	30
	Epikarst (Liquifiable) - Drained	0	35
	Filter Sand - Drained	0	36
	Granular Fill - Drained	0	35
	Lower Clay Dike - Drained	200	29
	Native Clay - Drained	200	28
	Native Sand and Low Plastic Silts - Drained	0	30
	P-EQ Upper Clay Dike (Unsaturated)	200	28
	Sluiced Ash - Drained	0	34

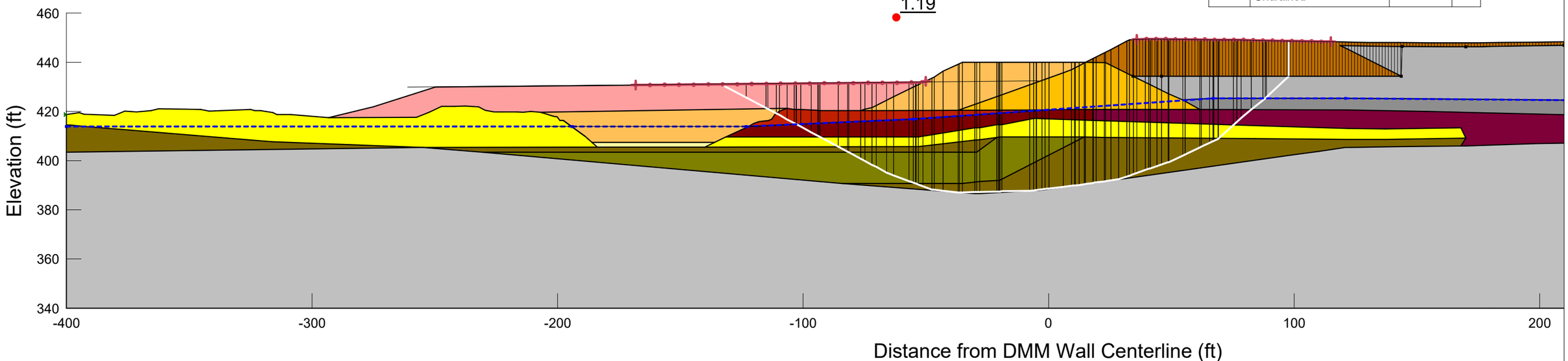


Scale: 1" = 40'

Post-Closure Stability Report Closed COF Ash Pond No.4 Tuscumbia, Alabama	GEI Consultants	POST-CLOSURE STABILITY REPORT
Tennessee Valley Authority Chattanooga, Tennessee	Project 2100946	December 2021

Post-Closure Stability
Section: Sta. 14+50
Analysis: Pseudo-Static (kh = 0.16)
Failure Type: Deep Circular

Color	Name	Cohesion' (psf)	Phi' (°)
	Bedrock	20,000	45
	Common Fill - Undrained	0	31
	Epikarst - Undrained	1,000	0
	Epikarst (Liquifiable) - Undrained	1,000	0
	Filter Sand - Undrained	0	36
	Granular Fill - Undrained	0	35
	Lower Clay Dike - Undrained	1,500	0
	Native Clay - Unsaturated	1,250	0
	Native Clay - Saturated	750	0
	Native Clay Under Dike - Saturated	1,250	0
	Native Sand and Low Plastic Silts - Undrained	0	30
	Sluiced Ash - Undrained	400	10
	Sluiced Ash - Unsaturated	0	26
	Upper Clay Dike - Undrained	1,500	0

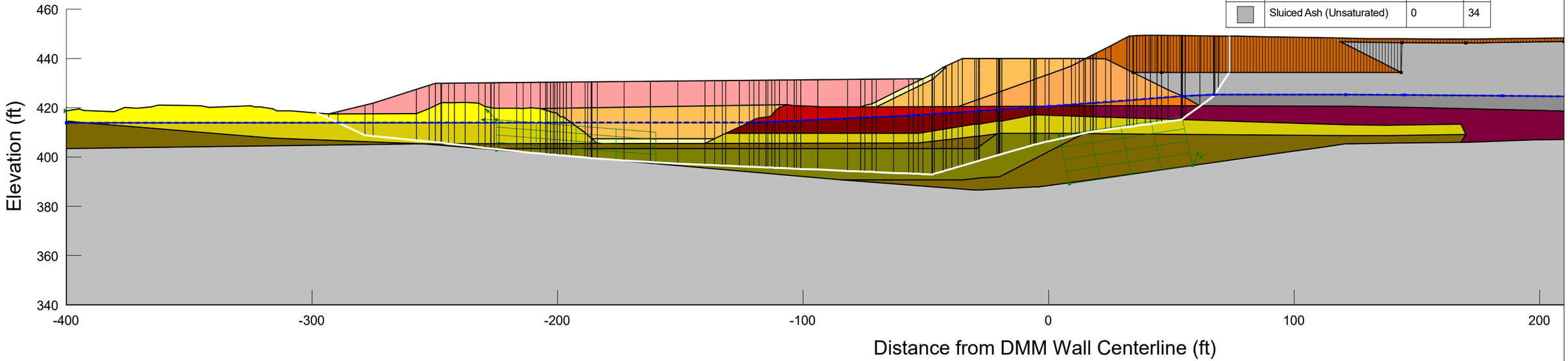


Scale: 1" = 40'

Post-Closure Stability Report Closed COF Ash Pond No.4 Tuscumbia, Alabama	GEI Consultants	POST-CLOSURE STABILITY REPORT
Tennessee Valley Authority Chattanooga, Tennessee	Project 2100946	December 2021

Post-Closure Stability
Section: Sta. 14+50
Analysis: Undrained Post-EQ
Failure Type: Deep Wedge

Color	Name	Cohesion' (psf)	Phi' (°)
	Bedrock	10,000	0
	Clayey Gravel	800	0
	Common Fill	800	
	Filter Sand	0	36
	Granular Fill	0	35
	Native Sand and Low Plastic Silts (Unsaturated)	0	30
	P-EQ Native Sand and Low Plastic Silts (Saturated-Liquefied)	235	0
	P-EQ Epikarst (Liquifiable)	220	0
	P-EQ Lower Clay Dike (Saturated)	1,200	0
	P-EQ Lower Clay Dike (Unsaturated)	1,500	0
	P-EQ Native Clay (Saturated)	600	0
	P-EQ Native Clay (Under Dike Saturated)	1,000	0
	P-EQ Native Clay (Unsaturated)	1,250	0
	P-EQ Sluiced Ash (Saturated)		
	P-EQ Upper Clay Dike (Unsaturated)	1,500	0
	Sluiced Ash (Unsaturated)	0	34



Scale: 1" = 40'

Post-Closure Stability Report Closed COF Ash Pond No.4 Tuscumbia, Alabama	GEI Consultants	POST-CLOSURE STABILITY REPORT
Tennessee Valley Authority Chattanooga, Tennessee	Project 2100946	December 2021

Attachment F

Topographic Plans and Control Points

Colbert Fossil Plant Ash Pond 4 Site Plan, October 2021

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
781-721-4000

R											
R 0	XXXXXXX	–	–	–	–	–	–	–	–	–	–
PERMIT APPLICATION FOR CCR SURFACE IMPOUNDMENT											

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV CO

SCALE: 1" : 100' EXCEPT AS NOTED

COF ASH POND NO. 4 CANE CREEK REALIGNMENT AND EAST DIKE BUTTRESS PROJECT

SITE PLAN AND SURVEY CONTROL POINTS

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
XXXXXXX	XXXXXXX	XXXXXX	–	XXXXX	XXXXXXXXX	–

COLBERT FOSSIL PLANT – ASH POND NO.4
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2014	DATE OCT. 2021	–	c	FIG. F1	R 0

GEI Consultants	1
TASK COMPLETED BY:	REV NO.

PLOT FACTOR: W_TVA

C.A.D. DRAWING DO NOT ALTER MANUALLY

DISCIPLINE INTERFACE

\\gei\consults\e B:\Working\TVA\3100646 TVA COF AP4 Anomaly Area Phase 2 Design\00_CAD\Figures\Final Closure Stability\Fig F1 Site Plan and Survey Control Points.dwg - 10/28/2021