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Cleveland, OH 44131
216.739.0555

MEMORANDUM

16 October 2016
File No. 40616-108

SUBJECT: History of Construction
Associated Electric Cooperative, Inc.
New Madrid Power Plant – Pond 003
New Madrid, MO

Haley & Aldrich, Inc. (Haley & Aldrich) has assisted Associated Electric Cooperative, Inc. (AECI) with compiling the history of construction in accordance with §257.73(c)(1) for the existing coal combustion residuals (CCR) surface impoundment known as Pond 003 at the New Madrid Power Plant (NMPP). This document addresses the requirements of the US Environmental Protection Agency's (EPA's) Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities, 40 CFR Part 257 (CCR Rule) effective 19 October 2015. To the extent feasible, AECI has provided documentation supporting the history of construction. Information on the history of construction of Pond 003 is presented in the following sections.

§257.73(c)(1)(i): *The name and address of the person(s) owning or operating 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.*

Owner: Associated Electric Cooperative, Inc.
2814 South Golden Avenue
P.O. Box 754
Springfield, Missouri 65807

Name of CCR Unit: Pond 003 (Comprised of ponds formerly referred to as "Ash Pond 1" and "Slag Pond 1")

§257.73(c)(1)(ii): *The location of the CCR unit identified on the most recent U.S. Geological Survey (USGS) 7 ½ minute or 15 minute topographic quadrangle map, or a topographic map of equivalent scale if a USGS map is not available.*

Latitude: 36°30'28"
Longitude: 89°33'27"

The general location of the facility is provided in Appendix A.

§257.73(c)(1)(iii): *A statement of the purpose for which the CCR unit is being used.*

Pond 003 receives sluiced boiler slag, small amounts of fly ash, coal pile runoff and process water. Pond 003 was originally constructed with a splitter dike constructed in the north-south direction to separate individual flows. That dike was altered to maintain settling of fly ash primarily in the western portion (date unknown), with the combined impoundment system still discharging out a single outfall location.

§257.73(c)(1)(iv): *The name and size in acres of the watershed within which the CCR unit is located.*

USGS Watershed Name: Little River Ditches Watershed 08020204
Unit-specific Watershed Area: 111 acres

The watershed area, which includes only the impoundment area itself, is based on the most recent site topography, provided by AECl and conducted by Pictometry International Corporation between October 4-8, 2014. It should be noted that the drainage area was determined as part of the Inflow Flood Control System Plan required by §257.83 of the CCR Rule which will be provided under separate cover.

§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.*

The description of the physical and engineering properties of the foundation and abutment materials on which Pond 003 was constructed was discussed on page 3 of “Final Report, Round 7 Dam Assessment” by GZA GeonEnvironmental, Inc., dated 3 June 2011, from which an excerpt is provided as Appendix B, and also on pages 1-4 of “Stability Evaluation, Slag Pond 1 and Ash Pond 2” by Geotechnology, Inc., dated 22 June 2009¹, from which an excerpt is provided as Appendix C.

§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; the method 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.*

The type, size, range, and physical engineering properties of the materials of each zone of the Pond 003 were discussed on page 2-4 of “Final Report, Round 7 Dam Assessment” by GZA GeonEnvironmental, Inc., dated 3 June 2011, from which an excerpt is provided as Appendix B,

¹ Note that AECl was only able to locate the draft version of this document.

and also on pages 1-5 of draft “Stability Evaluation, Slag Pond 1 and Ash Pond 2” by Geotechnology, Inc., dated 22 June 2009, from which an excerpt is provided as Appendix C.

Information on the method of site preparation and construction of Pond 003 is not readily available.

Pond 003 was constructed circa 1972.

§257.73(c)(1)(vii): 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, diversion 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.

As readily available, drawings including partial, but not all, information listed from above have been provided on the “Ash Retaining Dike Grading and Drainage Plan” by Burns and McDonnell, “Slag Pond Improvements”, Sheets 2-4, by Barttelbort, Rhutasel & Associates, Inc., and “Proposed Ash Disposal Facilities”, Sheets 1-9, dated 4 December, 1970 and included as the approved USACE permit for construction of the unit. These drawings are included in Appendix D, E, and F, respectively.

§257.73(c)(1)(viii): a description of the type, purpose, and location of existing instrumentation.

Pond 003 does not have instrumentation for the purpose of monitoring structural stability. Piezometers have been installed for groundwater monitoring purposes in 2009. The location of those piezometers are provided in Appendix G.

§257.73(c)(1)(ix): area-capacity curves for the CCR unit.

Original design area-capacity curves for Pond 003 are not readily available. It should be noted that updated area-capacity curves for the impoundment are being developed as part of the Inflow Flood Control System Plan required by §257.83 of the CCR Rule which will be provided under separate cover.

§257.73(c)(1)(x): *a description of each spillway and diversion design features and capacities and calculations used in their determination.*

Discharges from the impoundment flow to a concrete drop inlet structure with concrete stoplogs. A discharge pipe directs water through the dike and into a discharge channel which flows to the Mississippi River. Drawings detailing the outlet structures are included in Appendix E. Original design calculations for the spillway are not readily available. It should be noted that updated calculations for the outlet structure are being developed as part of the Inflow Flood Control System Plan required by §257.83 of the CCR Rule which will be provided under separate cover.

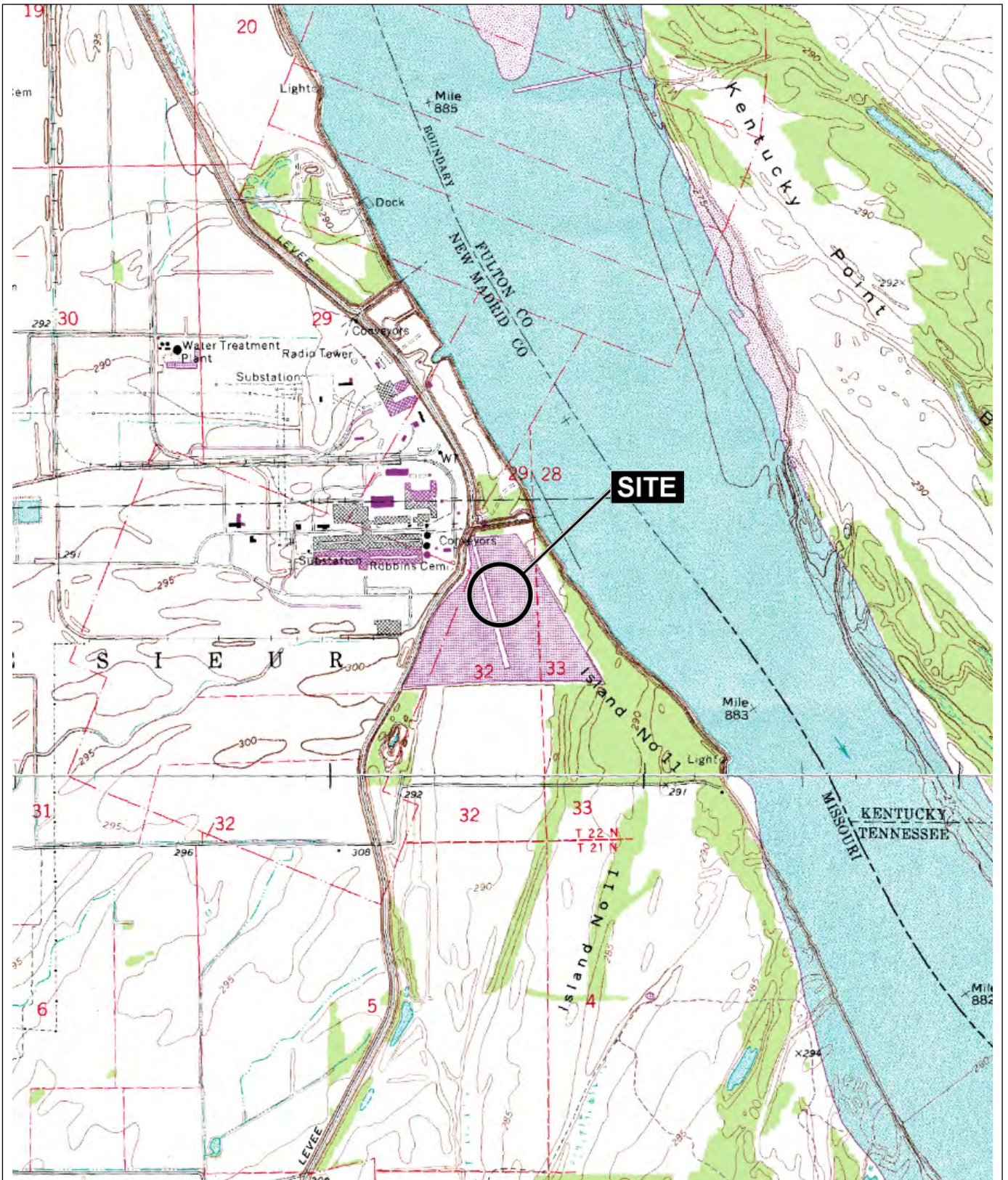
§257.73(c)(1)(xi): *The construction specifications and provisions for surveillance, maintenance, and repair of the CCR unit.*

Information on the construction specifications and provisions for surveillance, maintenance, and repair of the CCR unit are not readily available.

§257.73(c)(1)(xii): *any record or knowledge of structural instability of the CCR unit.*

There are no records or knowledge of structural instability associated with Pond 003.

APPENDIX A
Site Locus

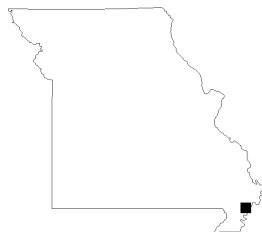


MAP SOURCE: USGS

SITE COORDINATES: 36°30'28"N, 89°33'27"W

**HALEY
ALDRICH**

ASSOCIATED ELECTRIC COOPERATIVE, INC.
POND 003 - NEW MADRID POWER PLANT
MARSTON, MISSOURI



PROJECT LOCUS

APPROXIMATE SCALE: 1 IN = 2000 FT
OCTOBER 2016

FIGURE 1

APPENDIX B

Excerpts from:

**Final Report, Round 7 Dam Assessment, Associated Electric Cooperative, Inc.
New Madrid Power Plant, Ash Pond 1 & 2 and Slag Pond 1 & 2 Impoundments
By GZA GeoEnvironmental, Dated June 2011**



**FINAL REPORT
ROUND 7 DAM ASSESSMENT
ASSOCIATED ELECTRIC COOPERATIVE, INC.
NEW MADRID POWER PLANT
ASH POND 1 & 2 AND SLAG POND 1 & 2 IMPOUNDMENTS
NEW MADRID COUNTY, MISSOURI**

June 3, 2011

PREPARED FOR:



**U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460**

PREPARED BY:



**GZA GeoEnvironmental, Inc.
19500 Victor Parkway, Suite 300
Livonia, MI 48152
GZA File No. 01.0170142.20**

1.2 Description of Project

1.2.1 Location



The NMPP is located about three miles east of the city of Marston in New Madrid County, Missouri. The Site is accessible from the west via State Highway EE and from the north and south from Levee Road. The NMPP CCW impoundments are located near the power plant, which is located at latitude 36° 30' 56" North and longitude 89° 33' 47" West. A Site locus of the impoundments and surrounding area is shown in **Figure 1**. An aerial photograph of the impoundments and surrounding area is provided as **Figure 2**. The impoundments can be accessed by vehicles from earthen access roads from the NMPP.

1.2.2 Owner/Caretaker

The CCW impoundments are owned and operated by AECL.

	Dam Owner/Caretaker
Name	Associated Electric Cooperative, Inc. New Madrid Power Plant
Mailing Address	2814 S. Golden, P.O. Box 754
City, State, Zip	Springfield, Missouri 65801-0754
Contact	Duane Highley, P.E.
Title	Director, Power Production
E-Mail	duanehighley@aeci.org
Daytime Phone	(573) 643-2211
Emergency Phone	911 / (573) 379-0451 (Yard Superintendent Cell)

1.2.3 Purpose of the Impoundments

The NMPP is a two-unit coal-fired power plant, with a maximum generating capacity of approximately 1200 Megawatts. Unit 1 was constructed in 1972 while Unit 2 was constructed in 1977. Four earthen embankment CCW impoundments known as Ash Pond 1 (AP1) Impoundment, Slag Pond 1 (SP1) Impoundment, Ash Pond 2 (AP2) Impoundment, and Slag Pond 2 (SP2) Impoundment were constructed for the purpose of storing CCW waste and discharging plant wastewater.

The AP1 Impoundment and SP1 Impoundment were constructed in 1972 and function as sedimentation and storage basins for fly ash and boiler slag, respectively.² The SP2 Impoundment was constructed in 1984 and functions as a sedimentation and storage basin for boiler slag. The AP2 Impoundment was constructed in 1994 and functions as a sedimentation and storage basin for fly ash. The impoundments are located outside (on the river side) of the Mississippi River levee system. The top of embankment elevation of the AP1 Impoundment,

² Information regarding the materials received by each impoundment is based on the March 24, 2009 "Response to Request for Information Under Section 104(e) of the Comprehensive Environmental Response, Compensation, and Liability Act," from AECL to EPA.

AP2 Impoundment and SP1 Impoundment embankments generally matches the elevation of the Mississippi River levees.



1.2.4 Description of the Ash Pond 1 Impoundment and Appurtenances

Based on information provided by the NMPP personnel, the AP1 Impoundment was designed by Burns and McDonnell of Kansas City, Missouri. No construction documentation was available but a design drawing was provided by AECI³. The following description of the AP1 Impoundment is based on: (a) the available design drawings; (b) the March 24, 2009 “Response to Request for Information Under Section 104(e) of the Comprehensive Environmental Response, Compensation, and Liability Act” from AECI to the EPA (Response); (c) a slope stability analysis that was conducted for the impoundment embankments; (d) and information provided by NMPP personnel.

The AP1 Impoundment is located east of the NMPP and is roughly triangular in shape as shown in **Figure 3**. The eastern embankment of the AP1 Impoundment is shared with the SP1 Impoundment and the southern embankment is shared with the AP2 Impoundment. Most of the area of the AP1 Impoundment is filled with fly ash that has settled in-place or is stockpiled in the impoundment. Water and fly ash are discharged into the AP1 Impoundment via four pipelines located on the northern portion of the impoundment. The discharged water and ash flow through an approximately 7 foot deep channel in the stockpiled ash that is maintained through the removal of settled fly ash. The channel transports water through a channel between the embankment between the AP1 Impoundment and SP1 Impoundment and water then travels through the SP1 Impoundment. The ash that is removed from the channel is dewatered and stockpiled in the AP2 Impoundment as shown on **Figure 3**. The stockpiled ash is several feet above the embankment elevations in several areas.

The AP1 Impoundment consists of an earthfill embankment with a crest length of approximately 6,400 feet⁴ and a general height (from the lowest toe elevation to the crest of embankments) of approximately 12 feet. The impoundment is unlined and the embankments were constructed from native silty clay. The impoundment has a surface area of approximately 31 acres at a water level elevation of 303 feet Mean Sea Level (MSL) and the stockpiled ash occupies approximately 80 percent of the available storage capacity⁵. A gravel access road is present on the southern embankment crest and an asphalt access road is present on the western embankment crest. The crest elevation of the impoundment is approximately 310 feet MSL.⁶

Based on the design drawings provided and discussions with NMPP personnel, it does not appear the embankment was constructed over wet ash, slag or other unsuitable materials.

³ Drawing provided by AECI titled: “Fly Ash Pond Improvement Plan View W/Contours”. Drawing generated by AECI and dated 1989.

⁴ The length of the embankments for the impoundments was estimated by GZA using Google Earth Software.

⁵ The volume of ash provided for the impoundments was taken from the March 24, 2009 “Response to Request for Information Under Section 104(e) of the Comprehensive Environmental Response, Compensation, and Liability Act” from AECI to EPA.

⁶ Elevations of the AP1 and SP1 impoundments were estimated by GZA from topographic contours provided in AECI drawing titled: “Fly Ash Pond Improvement Plan View W/Contours” dated 1989.



The AP1 impoundment embankments were designed with 3 horizontal on 1 vertical (3H:1V) upstream and downstream slopes⁷. The western downstream slope was generally designed to be vegetated with grass. There is one groundwater monitoring well (P-5) located near the western embankment of the AP1 Impoundment.

1.2.5 Description of the Slag Pond 1 Impoundment and Appurtenances

Based on information provided by the NMPP personnel, the SP1 Impoundment was designed by Burns and McDonnell of Kansas City, Missouri. No construction documentation was available but a design drawing was provided by AECI⁸. The following description of the SP1 Impoundment is based on the available design drawing, the March 24, 2009 Response, a stability analysis that was conducted for the impoundment embankments, and information provided by NMPP personnel.

The SP1 Impoundment is located east of the NMPP and the AP1 Impoundment. The western, southern, and southeastern embankments of the SP1 Impoundment are shared with the AP1 Impoundment, the AP2 Impoundment and the Raw Water Pond, respectively as shown in **Figure 3**. Most of the area of the SP1 Impoundment is filled with fly ash that has settled and or has been stockpiled in the impoundment. Water and presumably ash enter the impoundment through a channel in the embankment between the AP1 Impoundment and SP1 Impoundment. The water flows through an approximately 7 foot deep channel in the ash delta and discharges to the Raw Water Pond through a channel in the southeastern embankment of the SP1 Impoundment. The stockpiled ash extends several feet above the embankment elevations in some areas.

The impoundment consists of an earthfill embankment with a crest length of approximately 6,700 feet and a general height (from the lowest toe elevation to the crest of impoundment) of approximately 20 feet. The impoundment is unlined and the embankments were constructed from native silty clays. The impoundment has a surface area of approximately 62 acres at a water level elevation of 303 feet MSL and the stockpiled ash occupies approximately 80 percent of the storage capacity. A gravel access road is present on the top of the southern and eastern portions of the impoundment. The crest elevation of the impoundment is approximately 307 feet to 310 feet MSL.

The SP1 Impoundment embankments were designed with 3H:1V upstream and downstream slopes without rip-rap or other protection against wave action erosion⁹. The downstream slope of the eastern embankment was generally designed to be vegetated with grass. There are three groundwater monitoring wells (P-1 through P-3) located along the eastern embankment of SP1 Impoundment.

⁷ Slopes based on Geotechnology, Inc. report "Global Stability Evaluation, Slag Pond 1 and Ash Pond 2, AECI New Madrid Power Generating Facility, New Madrid County, Missouri", dated July 31, 2009.

⁸ Drawing provided by AECI titled: "Fly Ash Pond Improvement Plan View W/Contours". Drawing generated by AECI and dated 1989.

⁹ Slopes based on Geotechnology, Inc. report "Global Stability Evaluation, Slag Pond 1 And Ash Pond 2, Aeci New Madrid Power Generating Facility, New Madrid County, Missouri", dated July 31, 2009.

APPENDIX C

Excerpt from:

Stability Evaluation, Slag Pond 1 and Ash Pond 2

AECI New Madrid Power Generating Facility

By Geotechnology, Inc., dated June 2009

**STABILITY EVALUATION
SLAG POND 1 AND ASH POND 2
AECI NEW MADRID POWER GENERATING FACILITY
NEW MADRID COUNTY, MISSOURI**

Prepared for:

ASSOCIATE ELECTRIC COOPERATIVE, INC.
Springfield, Missouri

Prepared by:

GEOTECHNOLOGY, INC.
St. Louis, Missouri

Geotechnology Project No. 1011304.91IG

June 22, 2009

STABILITY EVALUATION
SLAG POND 1 AND ASH POND 2
AECI NEW MADRID POWER GENERATING FACILITY
NEW MADRID COUNTY, MISSOURI

SECTION I - PROJECT DATA

AUTHORIZATION

The services documented in this report were provided in accordance with the terms, conditions and scope of services described in Geotechnology's February 19, 2009 proposal numbered P15245.00.91IG. The project was authorized by your signed acceptance of the proposal.

PURPOSE AND SCOPE OF SERVICES

The purpose of our services was to provide AECI with the information necessary to make decisions regarding repairs/improvements to the ash/slag pond embankments. Also, our scope included a study of potential flow of the slag/flyash during an embankment breach. Briefly, services consisted of site reconnaissance, drilling five borings, observing the excavation of ten test pits, installing eight piezometers, laboratory testing, engineering analyses and preparation of this report. Important information prepared by The Association of Engineering Firms Practicing in the Geosciences (ASFE) for studies of the type is included in Appendix A for your review.

Our scope of service originally included performing a geotechnical boring, installing a piezometer (i.e. P-5), and performing a slope stability evaluation of the embankment between the two raw water ponds. At the request of a representative of AECI, a stability evaluation of this area was not performed because a structural failure at this location would not result in the movement of ash material outside of the impoundment area. AECI also determined that placing Piezometer P-5 adjacent to the mainline levee road would provide a better understanding of groundwater movement beneath the site.

PROJECT AND SITE DESCRIPTION

We understand that the waste materials from the power generating process at the AECI New Madrid Power Plant are stored in the slag/ash ponds located southeast of the plant. The site location and general topography of the area as per U.S.G.S. map of the vicinity are shown on Plate 1. The slag/ash ponds are in the floodplain of the Mississippi River and east (outside) of the river levee. The storage ponds are contained by approximately 15-foot high embankments as shown on Plate 2. Based on the plans provided, each embankment consists of 1V:3H (Vertical:Horizontal) slopes, and a 10- to 15-foot wide crest at approximately El 308¹. Raw water ponds are present to the

¹ All elevations herein refer to the mean sea level (msl) datum in feet.

southeast of Slag Pond 1 and east of Ash Pond 2. The Slag Pond and Ash Pond 1 were constructed in the 1970's, and Ash Pond 2 in the early 1990's. The slopes are generally grass covered. An exception is the area east of Slag Pond 1, which is moderately wooded.

SECTION II - FIELD EXPLORATION AND LABORATORY TESTING

FIELD EXPLORATION

The field exploration consisted of drilling five borings and excavating ten test pits, designated as Borings P-2, 3, 4, 6, 7 and Test Pits TP-1 through -10, respectively, at approximately the locations shown on Plate 2. The borings were located in the field by Geotechnology by measuring distances from existing site features. The boring and test pit locations were surveyed by S.H. Smith & Company, and the location coordinates and elevations were provided to Geotechnology.

The borings were drilled to predetermined depths of 55 to 85 feet using an all-terrain CME 550 rotary drill rig equipped with hollow stem augers. All borings were extended using rotary wash techniques below the depths indicated on the boring logs. Standard Penetration Tests (SPT's) were performed using an automatic hammer. Split-spoon samples and relatively undisturbed Shelby tube samples were obtained at the depths indicated on the boring logs presented in Appendix B. A bulk soil sample was obtained from the auger cuttings generated at Boring P-4 and at a nearby slab stockpile. An explanation of the terms and symbols used on the boring logs is provided in Appendix B.

The test pits were excavated with a Caterpillar 324L trackhoe to depths of 5.5 to 16 feet. Grab samples of excavated materials were collected from the trackhoe bucket.

An engineer from Geotechnology provided technical direction during field exploration, observed drilling and sampling, observed excavation of the test pits, assisted in obtaining samples and prepared descriptive logs of the material encountered. The boring logs represent conditions observed at the time of exploration, and have been edited to incorporate results of the laboratory tests as appropriate.

Unless noted on the logs, the lines designating the changes between various strata represent approximate boundaries. The transition between materials may be gradual or may occur between recovered samples. The stratification given on the logs, or described herein, is for use by Geotechnology in its analyses and should not be used as the basis of design or construction cost estimates without realizing that there can be variation from that shown or described.

The logs and related information depict subsurface conditions only at the specific locations and times where sampling was conducted. The passage of time may result in changes in conditions, interpreted to exist, at or between the locations where sampling was conducted.

PIEZOMETERS

Open-standpipe piezometers were installed in all borings to permit subsequent measurement of the groundwater levels. The piezometers consist of 2-inch diameter PVC pipe with a 10-foot long screen placed at the bottom of the borehole. The piezometers were backfilled with sand to a depth of 43 feet and sealed with bentonite pellets to a depth of 39 feet; the remainder of the piezometer was grouted with bentonite slurry and capped with concrete. Above-ground protective casings were installed for the piezometers. Exceptions are Piezometers P-7 and -8 where flush mount protective casings were installed. Details of typical piezometer installations at the borings are presented in Appendix D.

LABORATORY TESTING

Laboratory testing was performed to estimate pertinent engineering and index properties of the soil. Moisture contents were determined for cohesive soil samples, and Atterberg limits tests were accomplished on selected samples. Unconfined compression tests were performed on selected Shelby tube samples. A consolidated-undrained triaxial compression test was performed on a representative embankment fill sample. Grain size analyses and passing #200 sieve tests were performed on representative cohesionless samples. Modified Proctor (ASTM D 1557) tests were performed on a representative embankment fill sample and a representative sample of a nearby stockpile of slag. Laboratory test results are presented in Appendices B and C.

SECTION III - SUBSURFACE CONDITIONS

STRATIGRAPHY

Embankment. The overburden in borings drilled along the embankments consists of man-placed fill underlain by alluvial material transported and deposited by the Mississippi River. The fill is approximately 15 to 23 feet thick and is generally comprised of silty clay, occasionally mixed with sand and clay. Representative samples in the fill had unit dry unit weights of 88 to 107 pounds per cubic foot (pcf). Moisture content percentages ranged from the mid-teens to the upper twenties. SPT N-values in the embankment fill varied from 4 to 18 blows per foot (bpf).

The soil encountered beneath the fill consists of alluvial deposits of silty clay, silt and sand. An exception is Boring P-4 where the cohesive stratum is not present. The thickness of the cohesive soil varies between 9 and 24 feet. Sand occurs below the cohesive soil and beneath the fill in Boring P-4, and extends to the 55- to 85-foot depths of exploration. The consistency of the cohesive soil generally varies from soft to very stiff. The density of the granular soil varies from loose to dense, but is mostly medium dense. Auger refusal material was not encountered in the borings.

Slag Pond 1 (Test Pits TP-1 through -4). The surface stratum in test pits excavated in the slag pond area consists of 3 to 10 feet of black slag. An exception is Test Pit TP-1 where 4 feet of coal dust, debris and fly ash is present above the black slag. Below the slag, an alluvial deposit of silt is present to the 6- to 15-foot depths of exploration (refer to photographs in Appendix E). Moisture contents of the slab material varied from approximately 18 to 30 percent. The moisture content of the silt was greater than 40 percent, and indicates partially saturated to saturated conditions.

Ash Pond 1 (Test Pits TP-5 through -7). Approximately 7 to 13 feet of fly ash is present in the test pits excavated in Ash Pond 1. Silt was observed below the fly ash in Test Pits TP-5 and TP-7 at depths of 7 feet and 12 feet, respectively. Test Pit TP-6 was terminated in the fly ash. The moisture contents of two fly ash samples were 47 and 132 percent, which is indicative of the moisture retention characteristics of the material.

Ash Pond 2 (Test Pits TP-8 through -10). The test pits in Ash Pond 2 were excavated to depths of approximately 13 to 16 feet, terminated in fly ash, and not extended further in order to not penetrate the HPDE liner below the fly ash. The moisture contents of three fly ash samples were 75, 76 and 111 percent, which is indicative of the moisture retention characteristics of the material

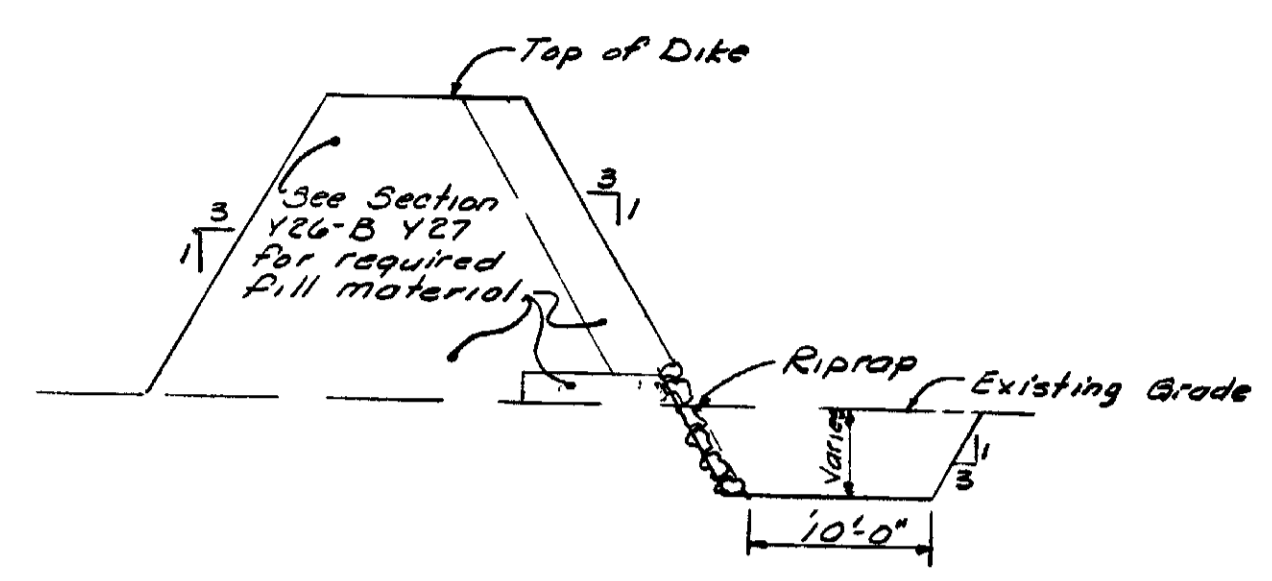
Water perched within the fly ash was observed at a depth of eleven feet in Test Pit TP-10. Perched water was not observed in Test Pits TP-8 and TP-9.

GROUNDWATER

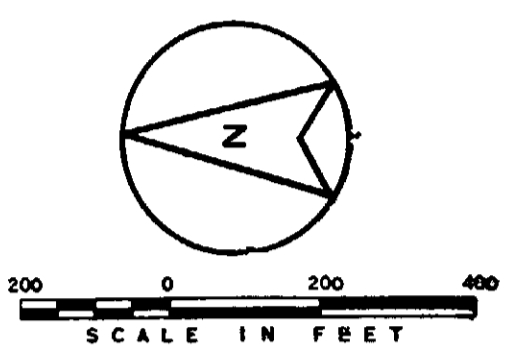
Borings and Piezometers. Groundwater levels in the borings could not be recorded at the time of the subsurface exploration due to the rotary wash technique used in drilling the borings. Rotary wash drilling techniques include the introduction of water into the borehole which masks the presence of groundwater. Groundwater levels shown on the boring logs may not have stabilized before backfilling, which is typical in less permeable cohesive soil. Consequently, the indicated/lack of observed groundwater levels may not represent present or future levels. Groundwater levels may vary significantly over time due to the effects of seasonal variation in

APPENDIX D
Drawings Y26-5:
Ash Retaining Dike Grading and Drainage Plan
By Burns and McDonnell, Dated December 7, 1970

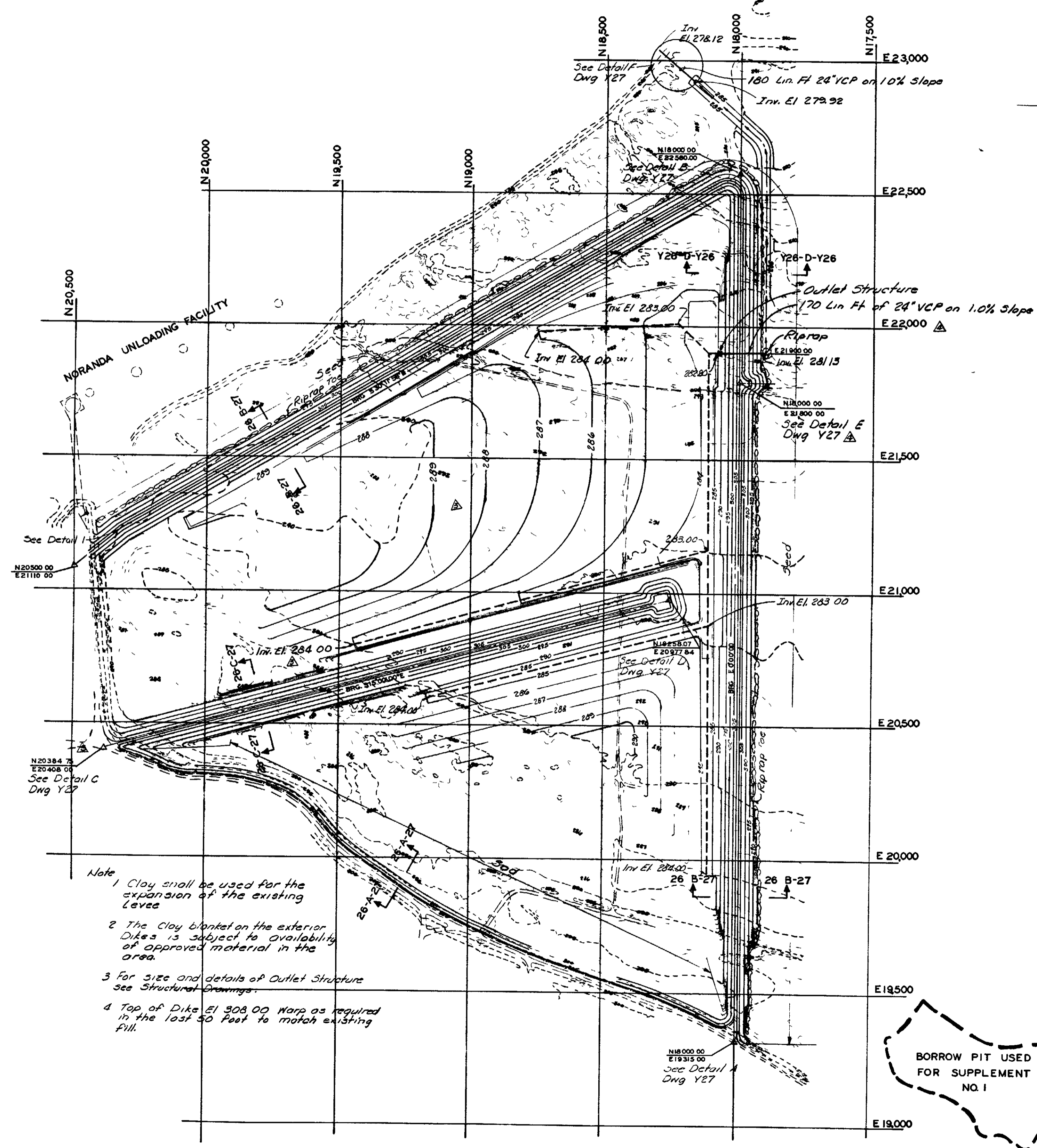
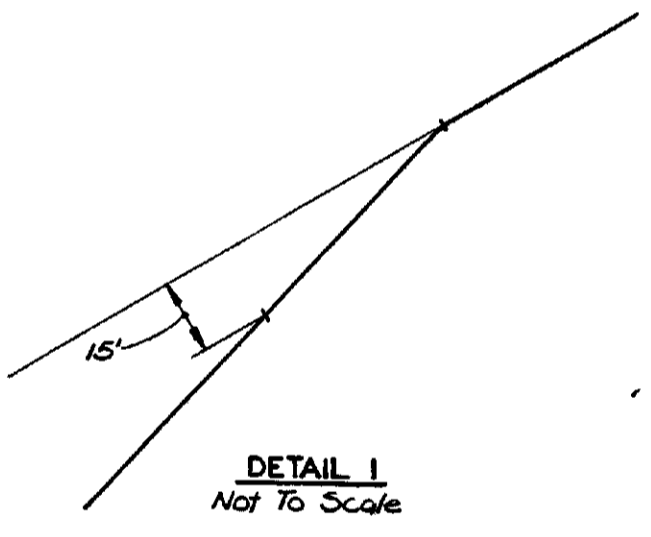
NO	DATE	BY	REVISION
23	11	RZ	Increased 18" VCP to 24" VCP @ Outlet Structure Revised Sub-drain @ Outlet Structure Added Riprap @ the Outlet Structure
4	27	RZ	Revised existing topography per new survey Regraded as required
6	27	RZ	Lowered Inv. Elev. on Subdrain, Regraded area within N.E. Dike
7	17	RZ	Relocated Outlet Structure & Turn around Added Section Y26-D-Y26
10	26	TDW	CONFORMING TO CONSTRUCTION RECORDS



SECTION Y26-D-Y26
Not to Scale



LEGEND
 --- Existing Contour
 --- Finish Contour
 --- Guardrail
 --- Culvert or Pipe
 --- Subdrain



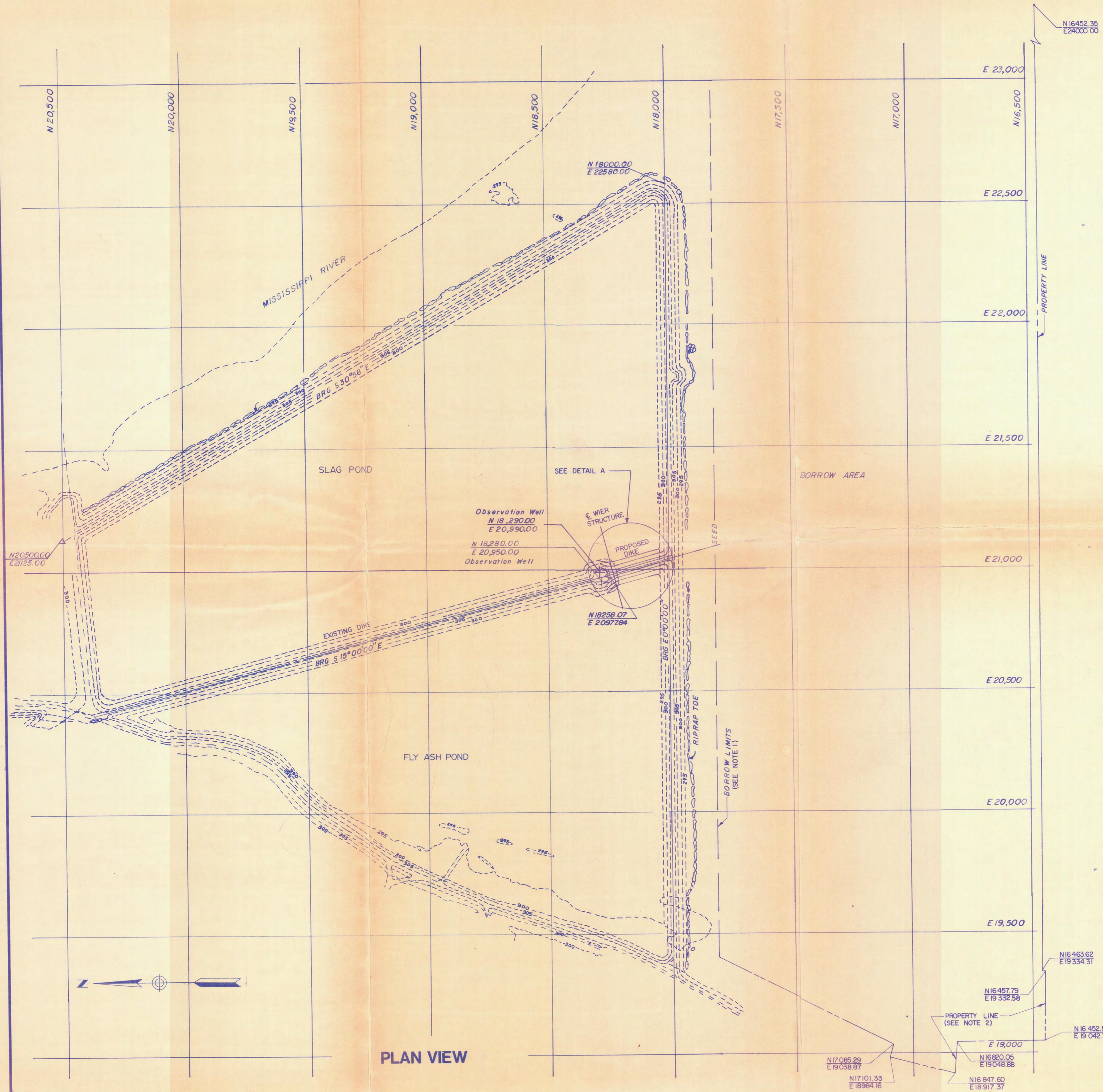
- Note
1. Clay shall be used for the expansion of the existing levee.
 2. The clay blanket on the exterior Dikes is subject to availability of approved material in the area.
 3. For size and details of Outlet Structure see Structural Drawings.
 4. Top of Dike El 308.00 Work as required in the last 50 Feet to match existing fill.



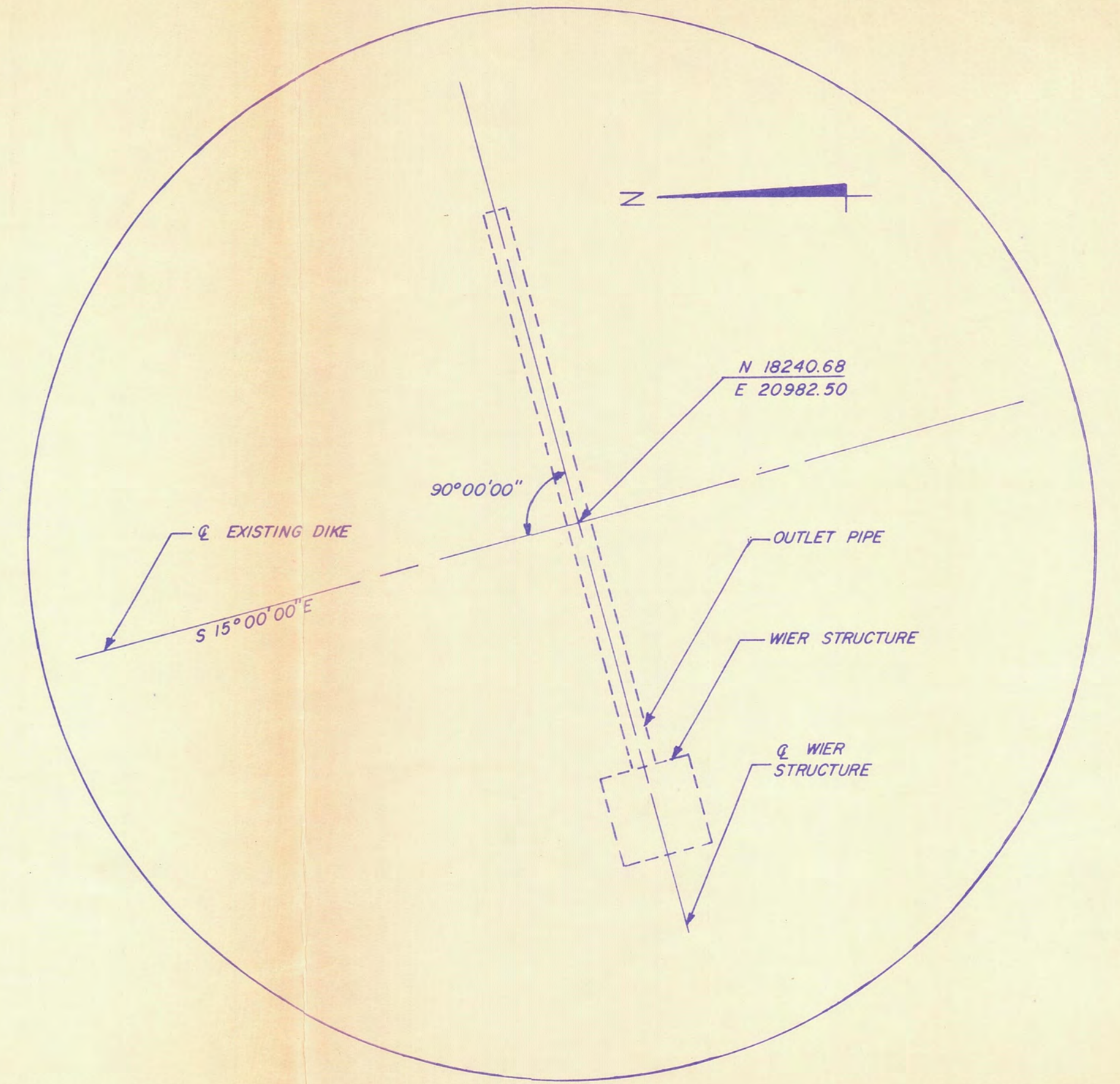
CONTRACT NO 150
 SUPPLEMENT 14
STEAM GENERATING STATION-UNIT 1
CITY OF NEW MADRID
 NEW MADRID, MISSOURI
 ASH RETAINING DIKE
 GRADING AND DRAINAGE PLAN
 BURNS & MCDONNELL ENGINEERING CO
 KANSAS CITY MISSOURI

DATE DEC 7 1970	DRAWING NO Y26 - 5	REV
DESIGNED RZ	PROJECT 67 51D	
Detailed RZ	SHEET 26 OF 68 SHEETS	
CHECKED		

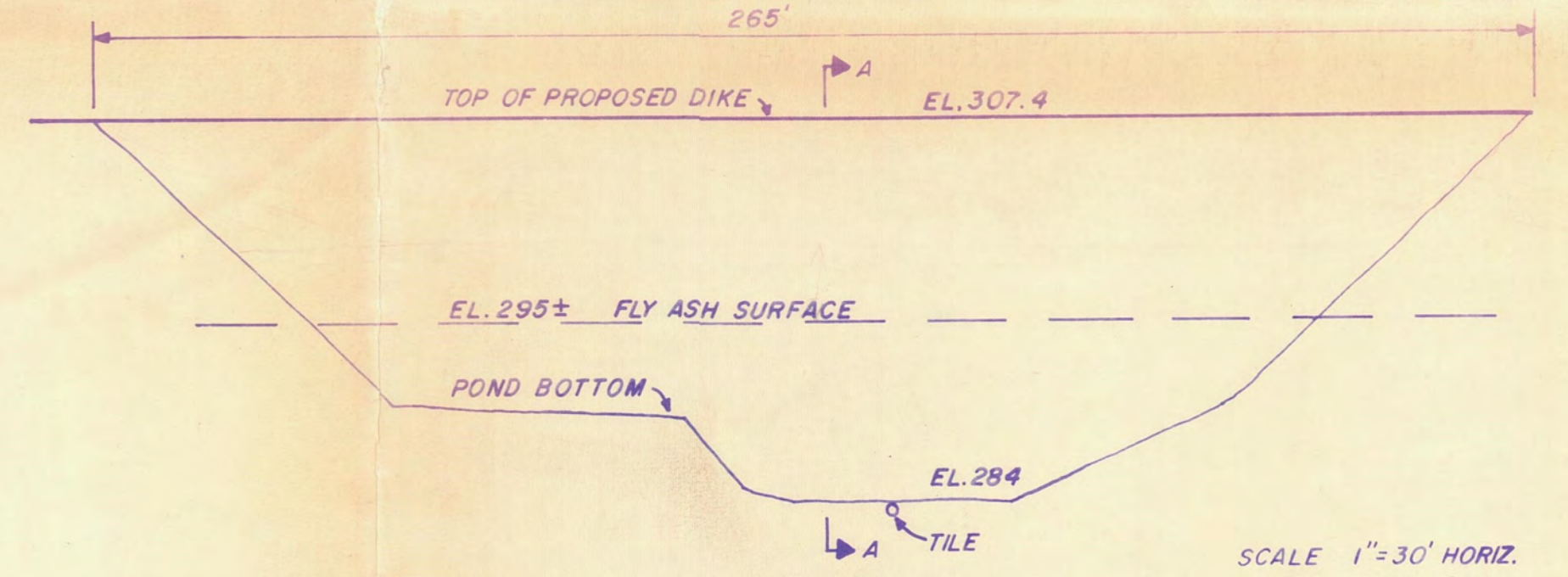
APPENDIX E
Sheets 2-4, Slag Pond Improvements
By Barttelbort, Rhutasel & Associates, Inc.



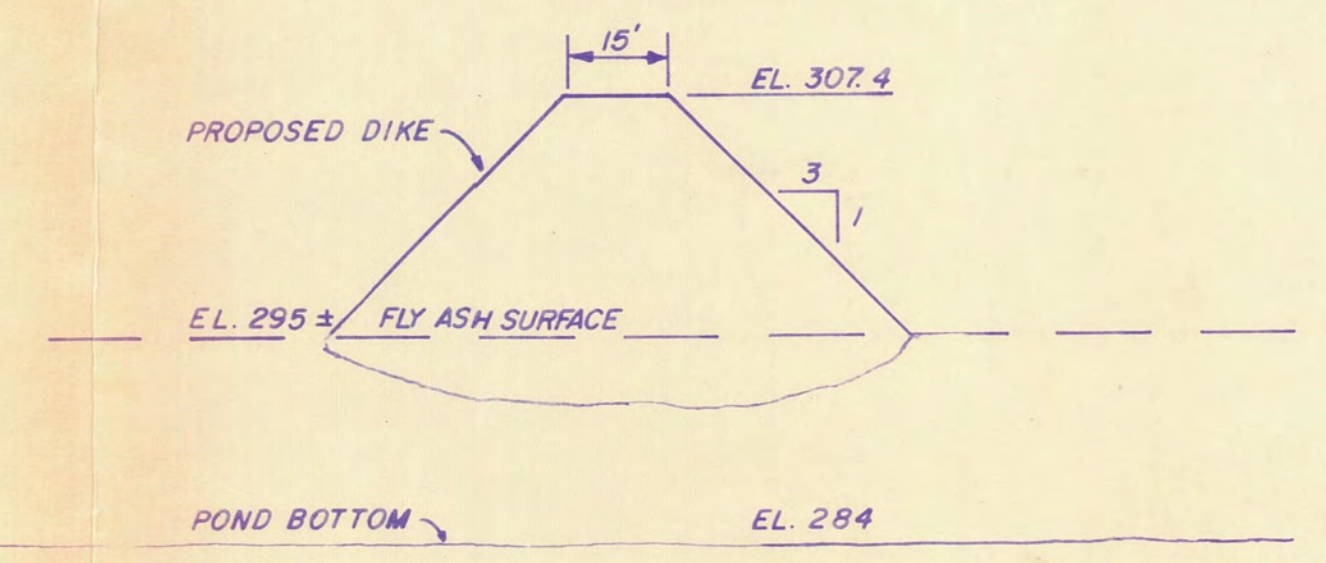
PLAN VIEW



DETAIL A



PROFILE PROPOSED DIKE



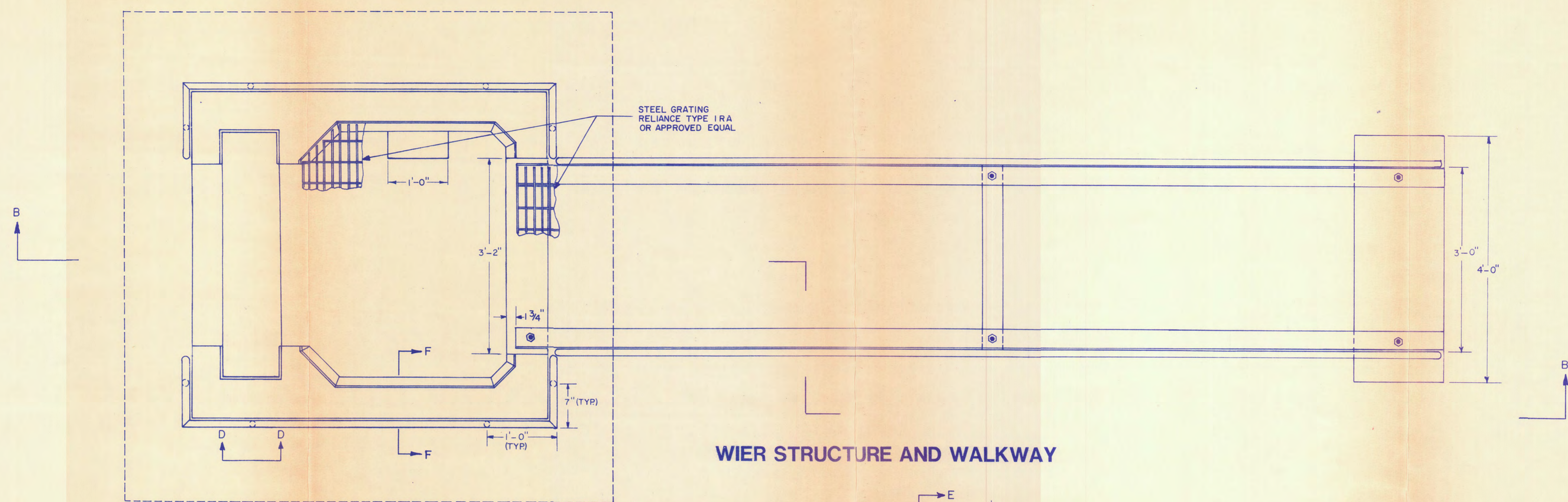
SECTION A-A

- NOTES:
- EXCAVATION FOR BORROW IS TO BE NO CLOSER THAN 100 FEET FROM TOE OF EXISTING DIKE
 - PROPERTY LINE IS LIMIT OF BORROW AREA.

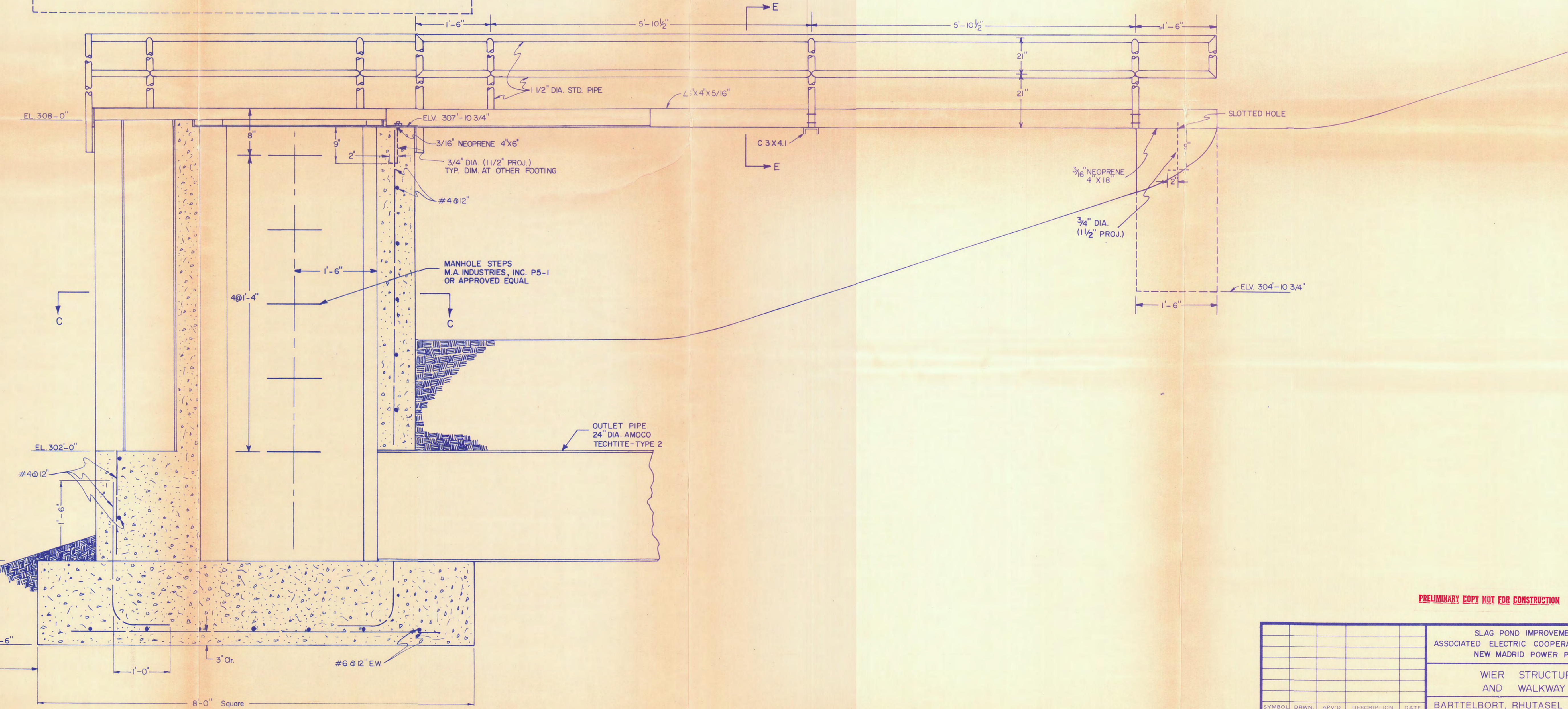
PRELIMINARY COPY NOT FOR CONSTRUCTION

SYMBOL				DRWN	APV'D	DESCRIPTION	DATE
REVISIONS							
DR. BY:	APV'D BY:		SCALE:		SHEET NO. 2		
CK'D BY:	DATE:		OF 4				
SLAG POND IMPROVEMENTS ASSOCIATED ELECTRIC COOPERATIVE, INC. NEW MADRID POWER PLANT				GENERAL LAYOUT			
BARTTELBORT, RHUTASEL & ASSOC., INC. CONSULTING ENGINEERS FREEBURG, ILLINOIS							

EP No. 6003



WIER STRUCTURE AND WALKWAY



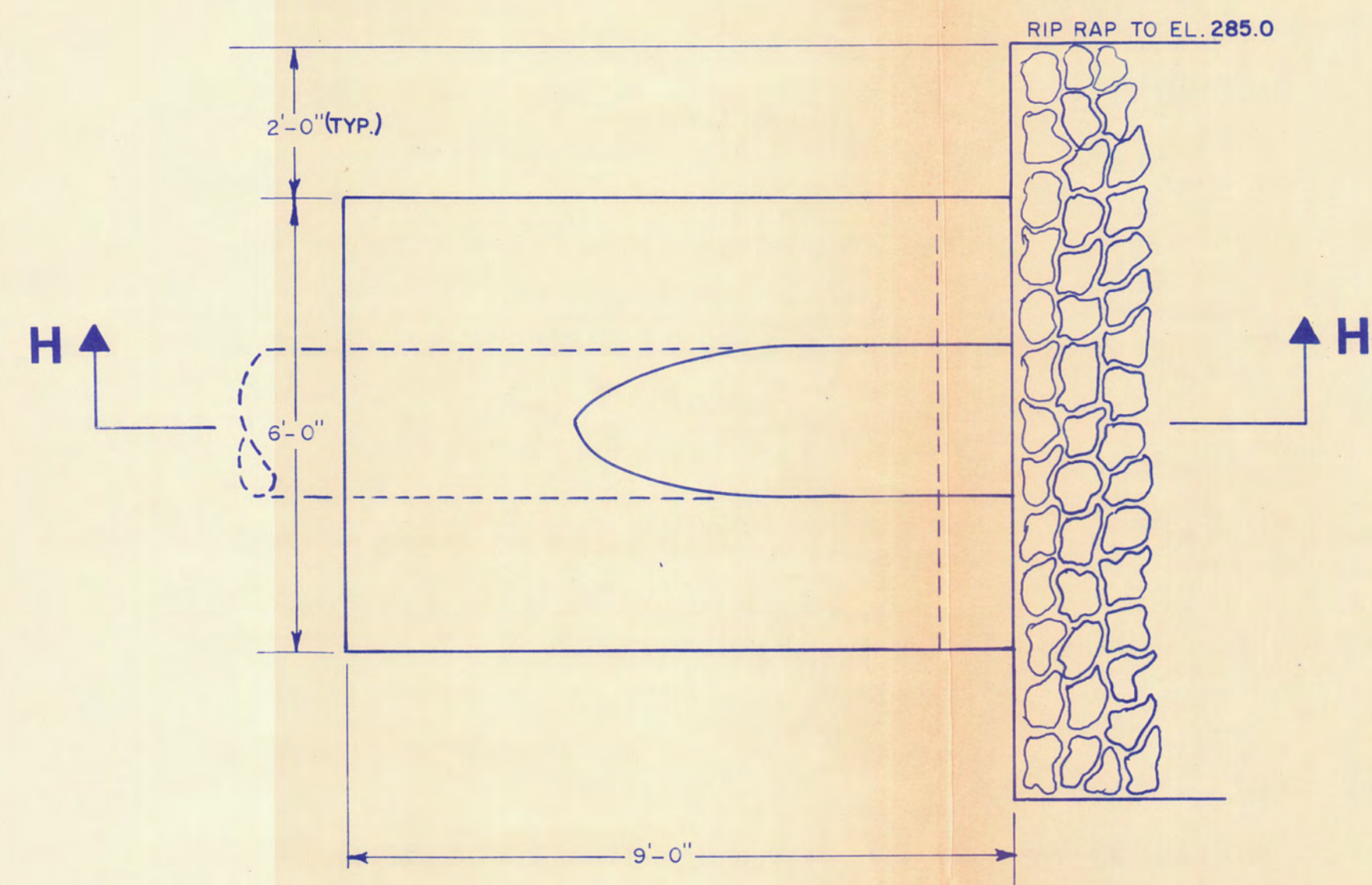
SECTION B-B

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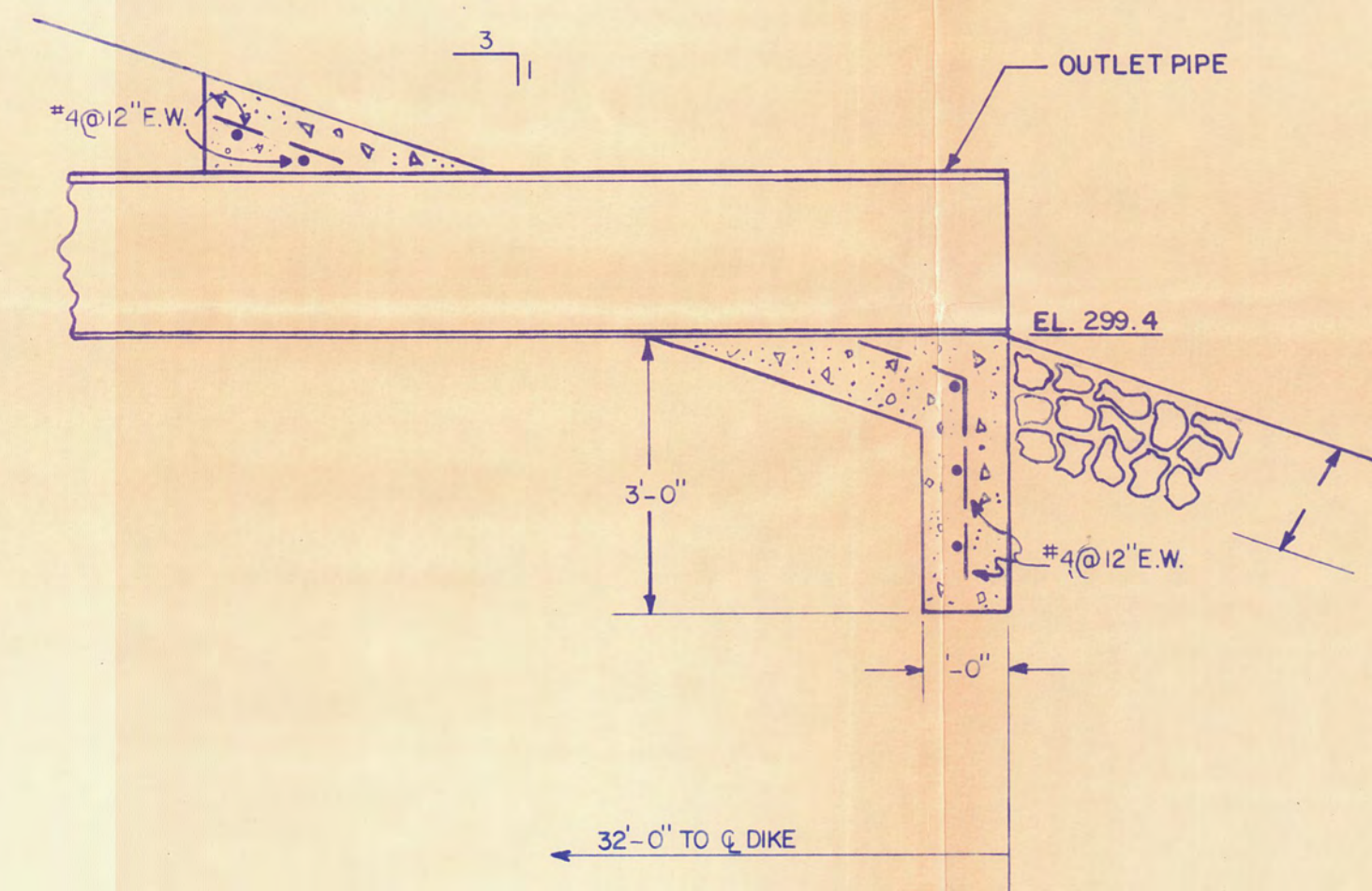
SLAG POND IMPROVEMENTS ASSOCIATED ELECTRIC COOPERATIVE, INC. NEW MADRID POWER PLANT			
WIER STRUCTURE AND WALKWAY			
BARTTELBERT, RHUTASEL & ASSOC., INC. CONSULTING ENGINEERS FREEBURG, ILLINOIS			
REVISIONS			
SYMBOL	DRWN.	APV'D	DESCRIPTION
DR. BY:	APV'D BY:	SCALE:	SHEET NO. 3
CK'D BY:	DATE:		OF 4

EP NO. 8003

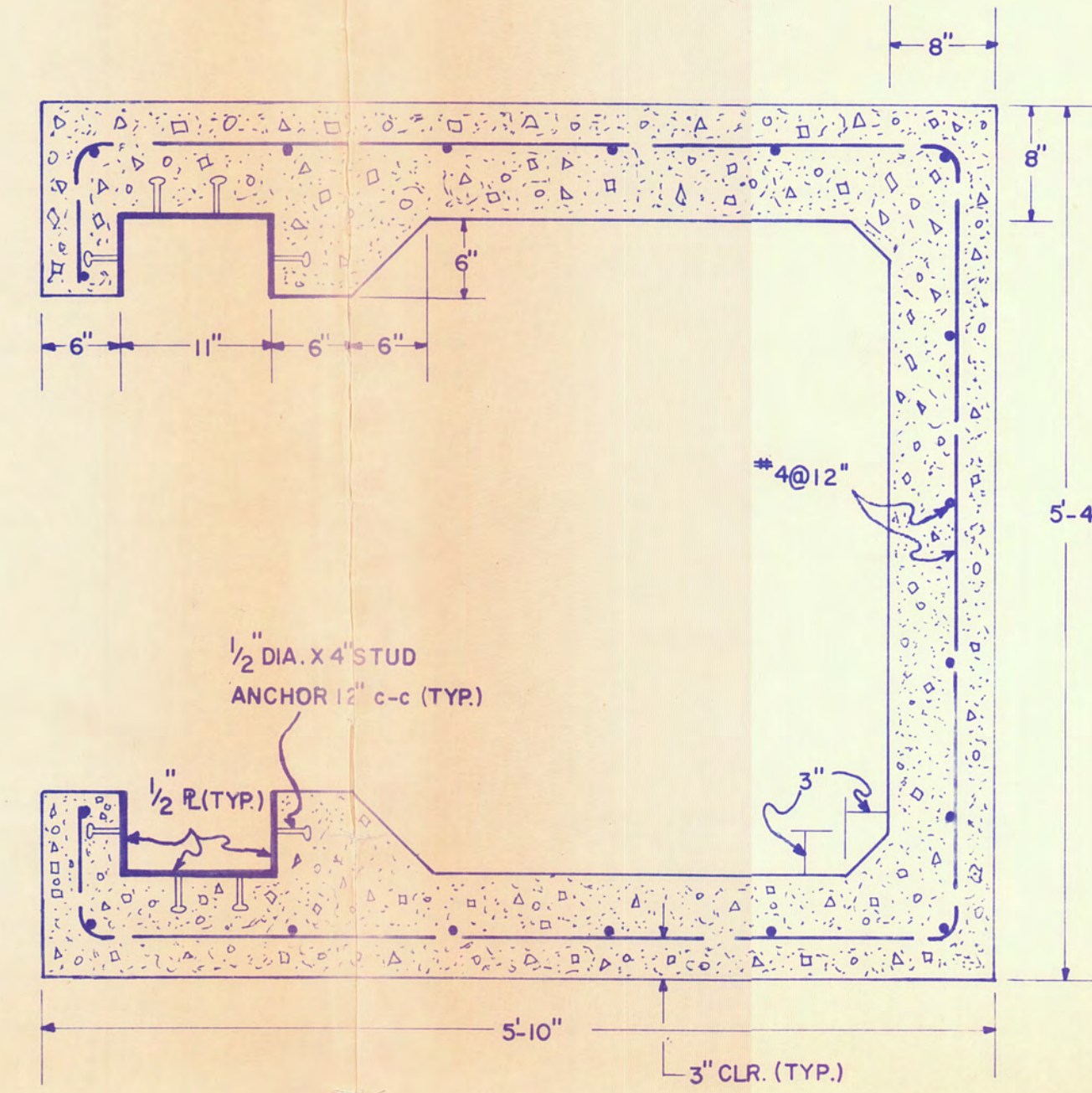
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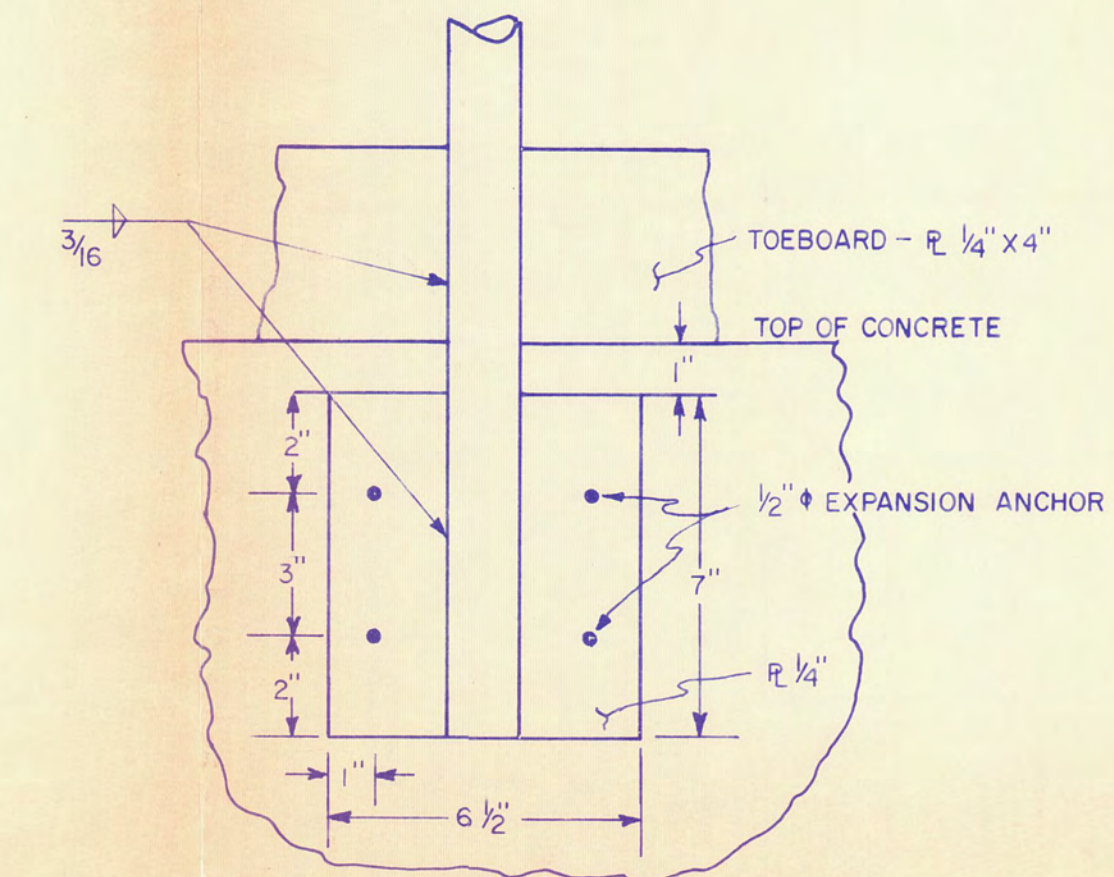
OUT FALL



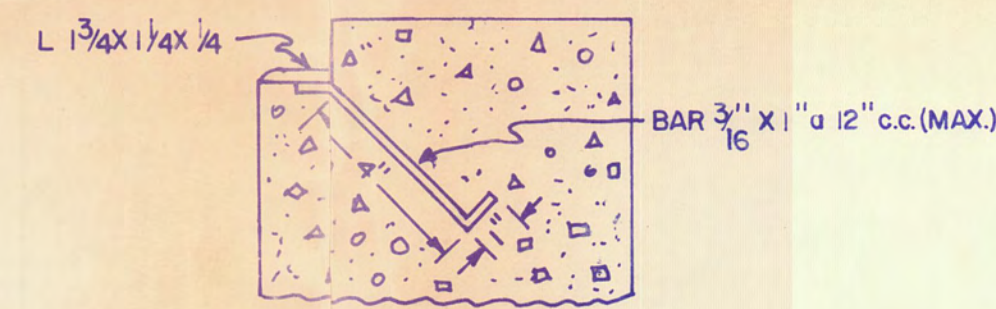
SECTION H-H



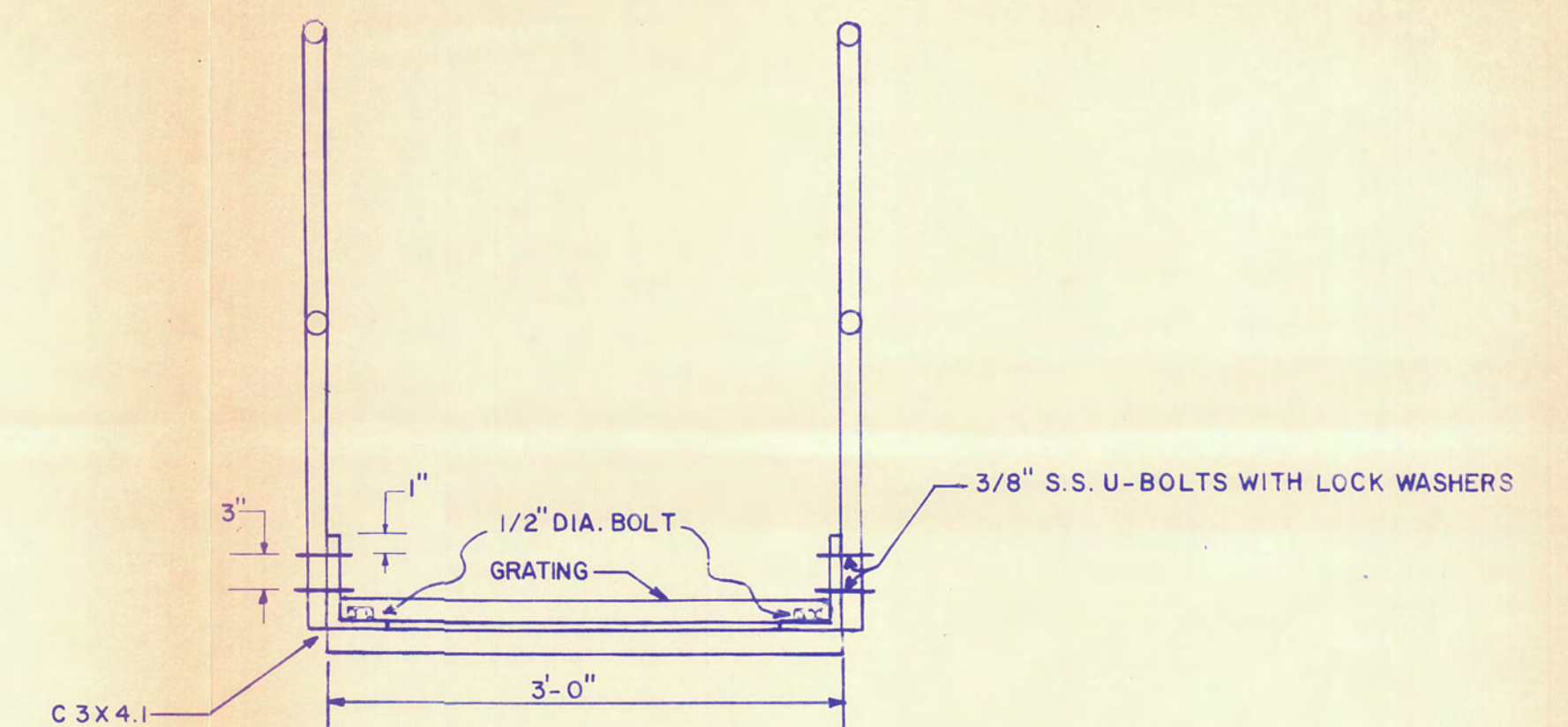
SECTION C-C



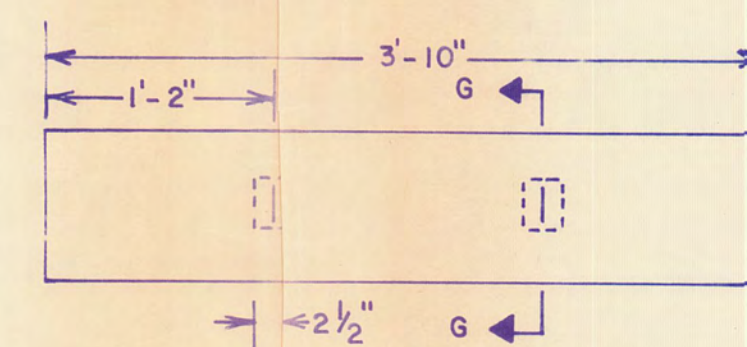
SECTION D-D



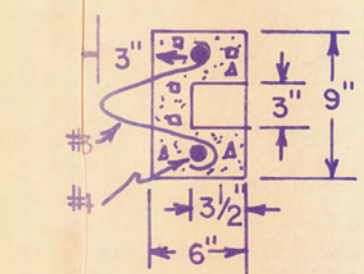
SECTION F-F



SECTION E-E



STOPLOG



SECTION G-G

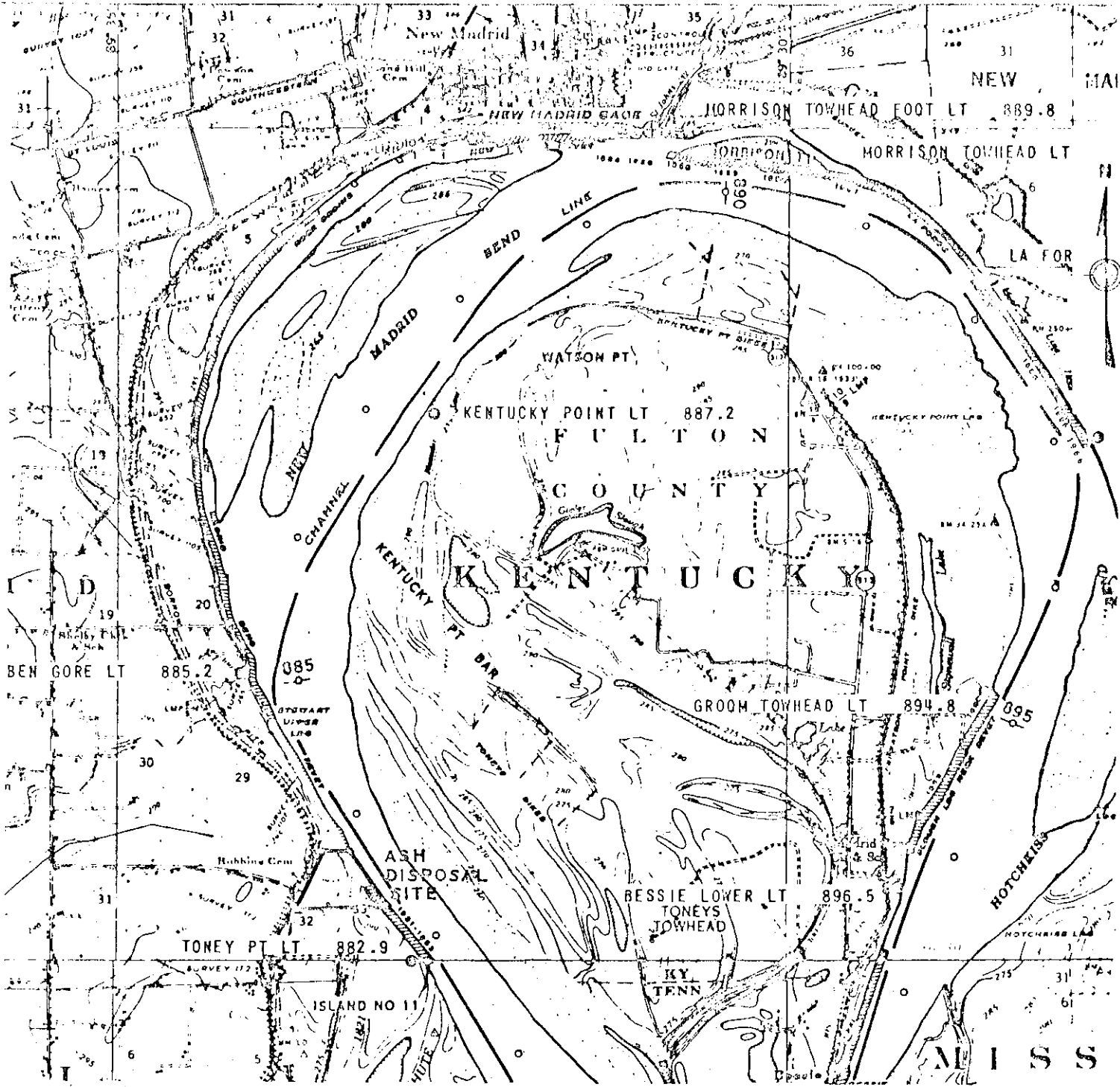
PRELIMINARY COPY NOT FOR CONSTRUCTION

SLAG POND IMPROVEMENTS ASSOCIATED ELECTRIC COOPERATIVE, INC. NEW MADRID POWER PLANT			
OUTFALL STOPLOGS AND SECTIONAL DETAILS			
BARTELBORT, RHUTASEL & ASSOC., INC. CONSULTING ENGINEERS FREEBURG, ILLINOIS			
SYMBOL		DATE	
DRWN.		APV'D	
DESCRIPTION		REVISIONS	
DR. BY:	APP'D BY:	SCALE:	SHEET NO. 4
CK'D BY:	DATE:		OF 4

62 No. 8003

4

APPENDIX F
Sheets 1-9, Proposed Ash Disposal Facilities
Dated December 4, 1970



From Mississippi River Commission Navigation Charts - Map No. 5

PROPOSED ASH DISPOSAL FACILITIES

In the Mississippi River

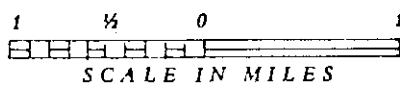
At Approx. Mile 883.5

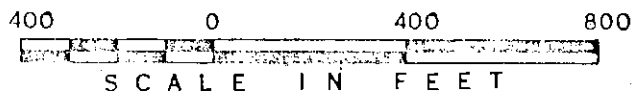
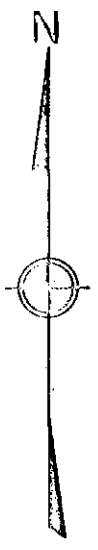
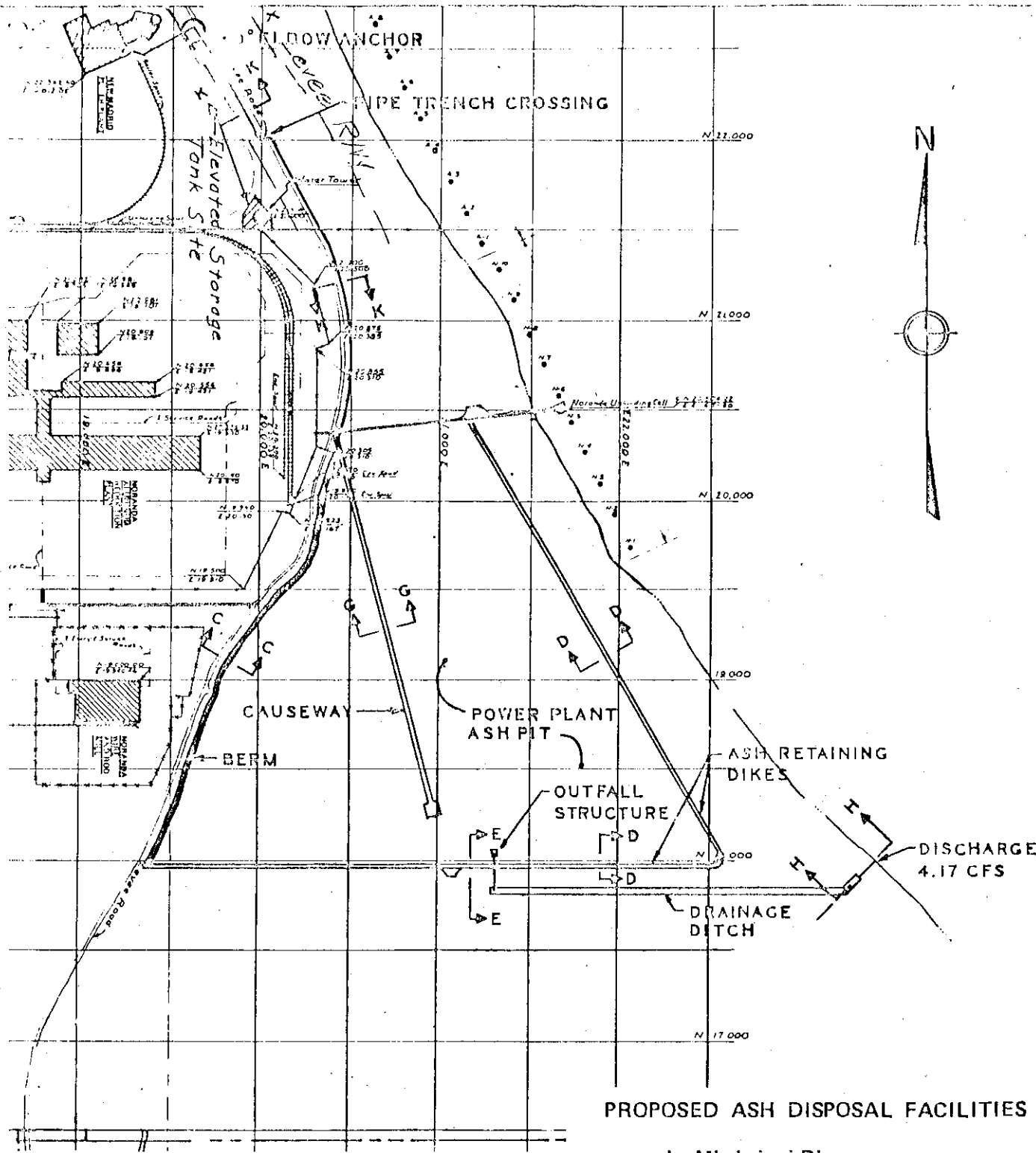
County of New Madrid State of Missouri

Application by City of New Madrid, Missouri

Sheet 1 of 9 Date December 4, 1970

LOCATION MAP

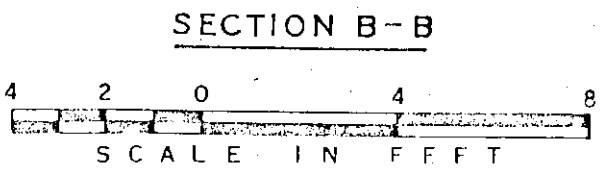
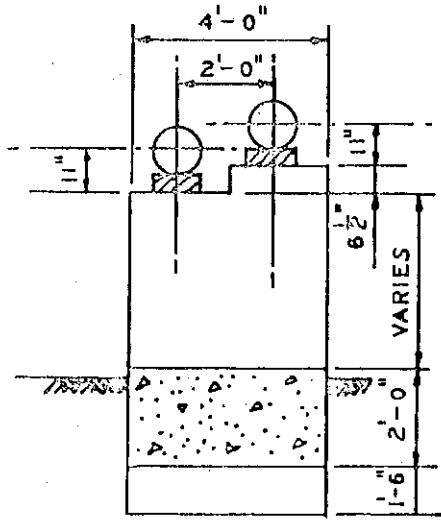
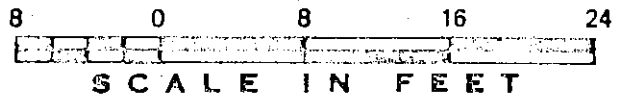
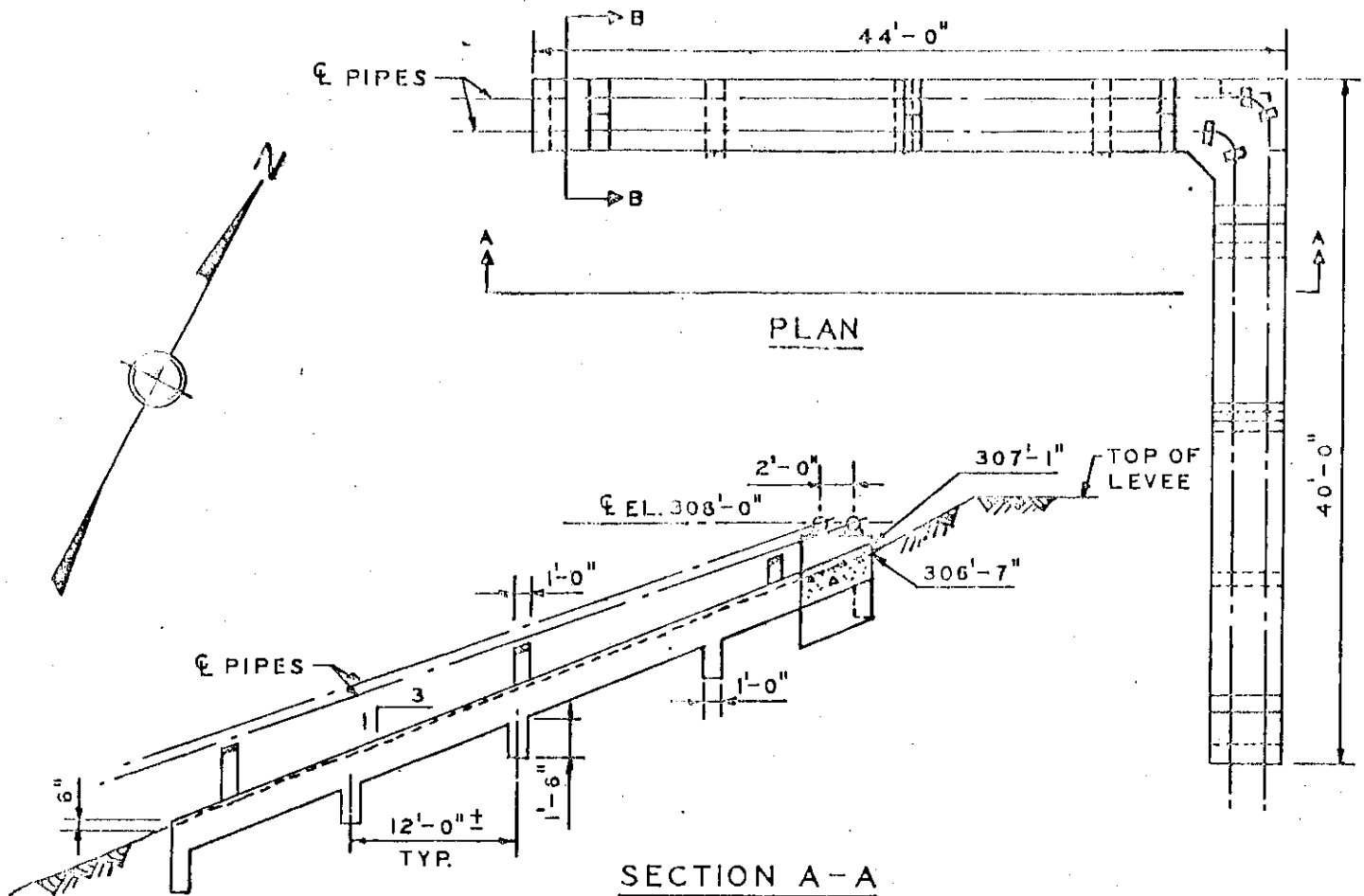




SITE PLAN

PROPOSED ASH DISPOSAL FACILITIES

In the Mississippi River
 At Approx. Mile 883.5
 County of New Madrid State of Missouri
 Application by City of New Madrid, Missouri
 Sheet 2 of 9 Date December 4, 1970



PIPELINE ANCHORAGE FOR 90° ELBOW

PROPOSED ASH DISPOSAL FACILITIES

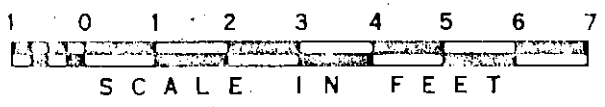
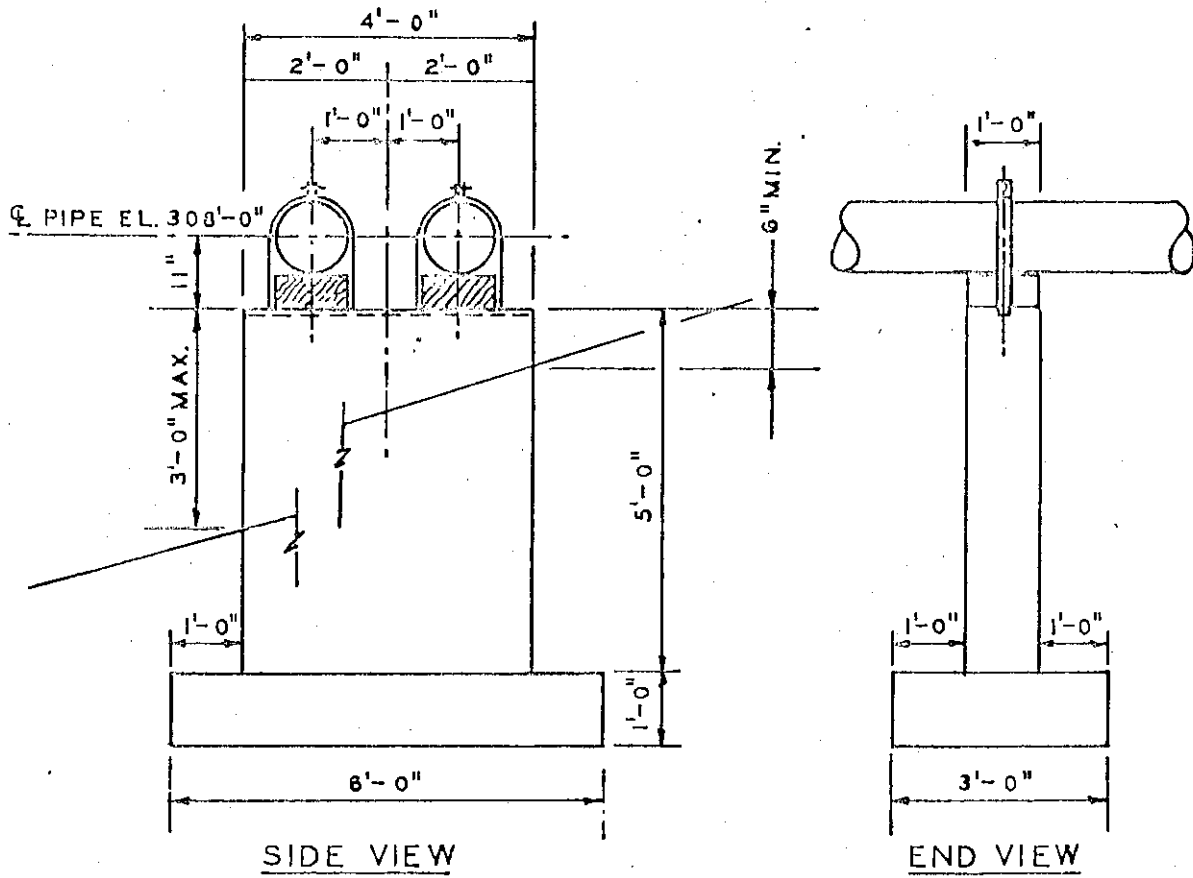
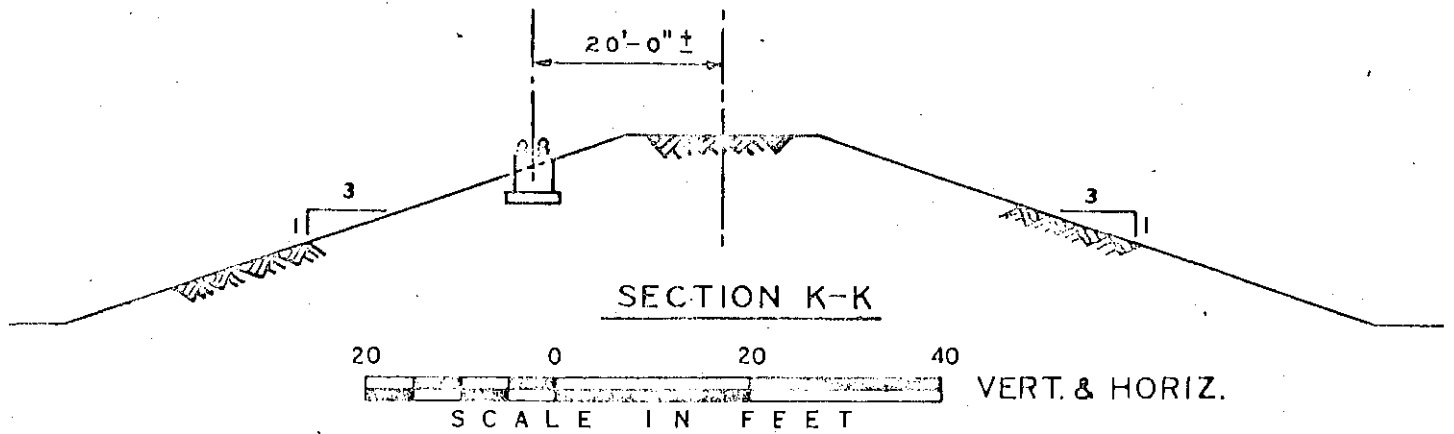
In the Mississippi River

At Approx. Mile 883.5

County of New Madrid State of Missouri

Application by City of New Madrid, Missouri

Sheet 3 of 9 Date December 4, 1970



TYPICAL PIPELINE SUPPORTS

PROPOSED ASH DISPOSAL FACILITIES

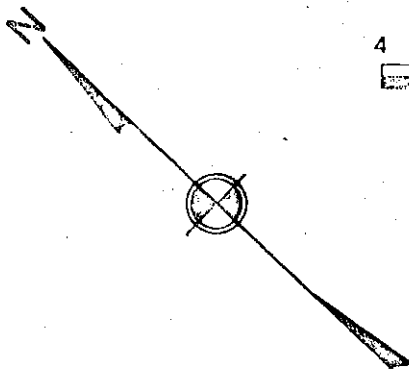
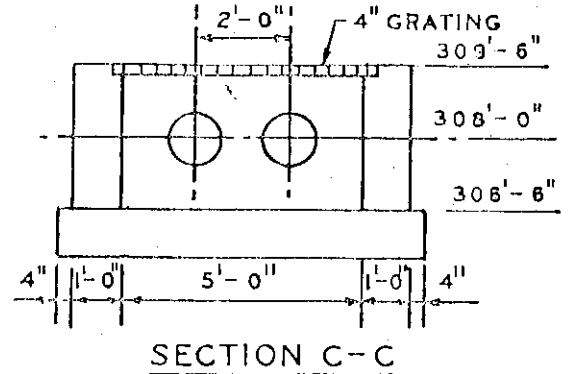
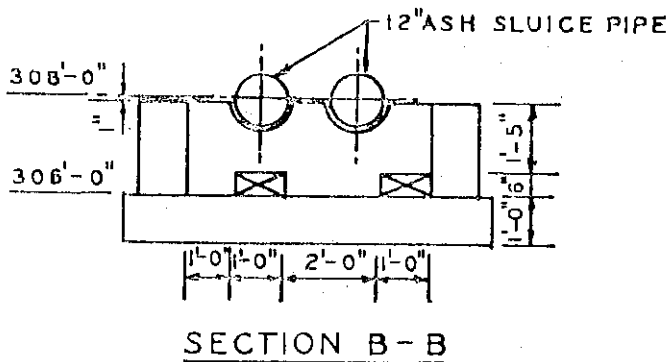
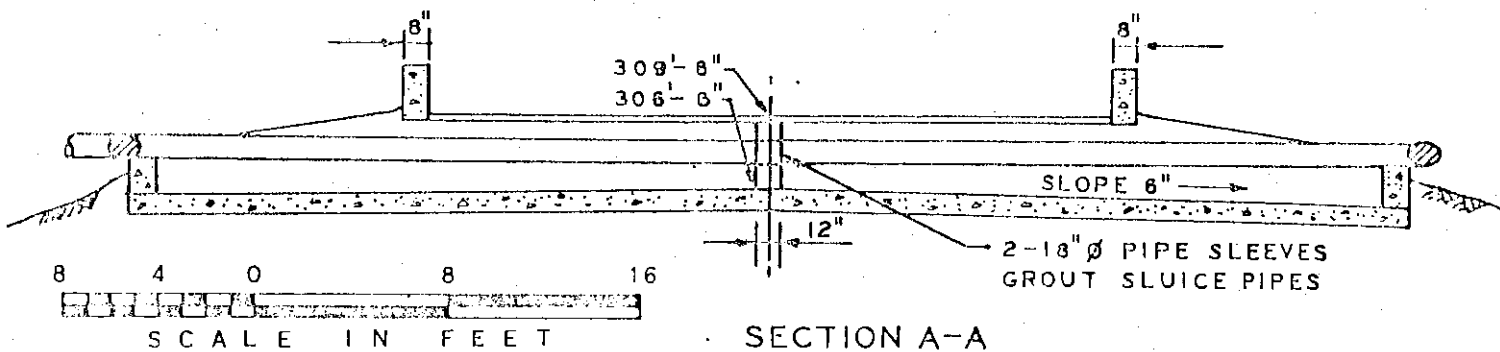
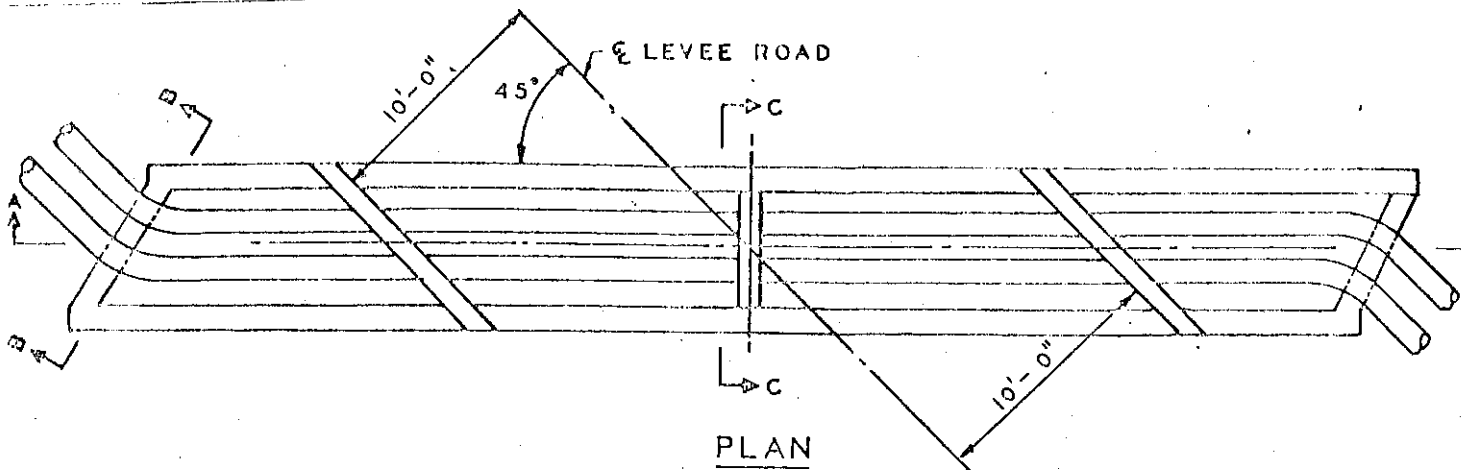
In the Mississippi River

At Approx. Mile 893.5

County of New Madrid State of Missouri

Application by City of New Madrid, Missouri

Sheet 4 of 9 Date December 4, 1970



PIPE TRENCH CROSSING LEVEE ROAD

PROPOSED ASH DISPOSAL FACILITIES

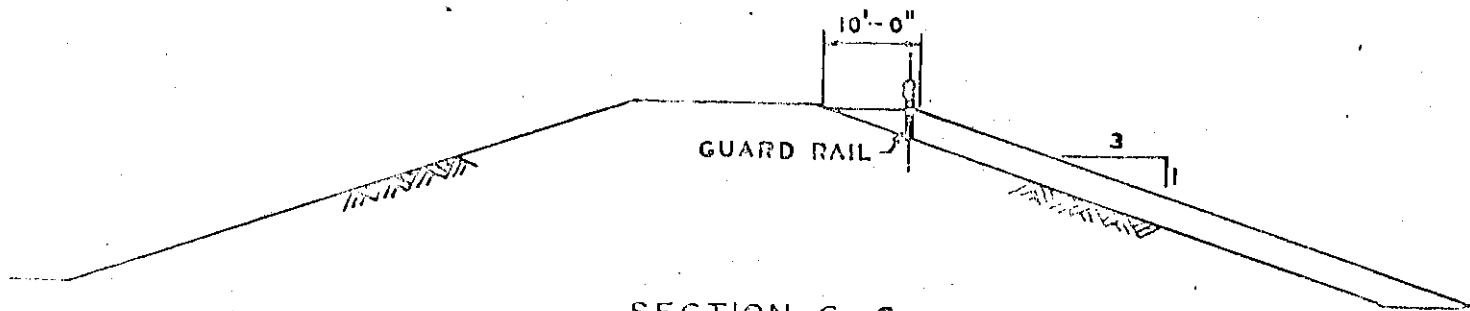
In the Mississippi River

At Approx. Mile 883.5

County of New Madrid State of Missouri

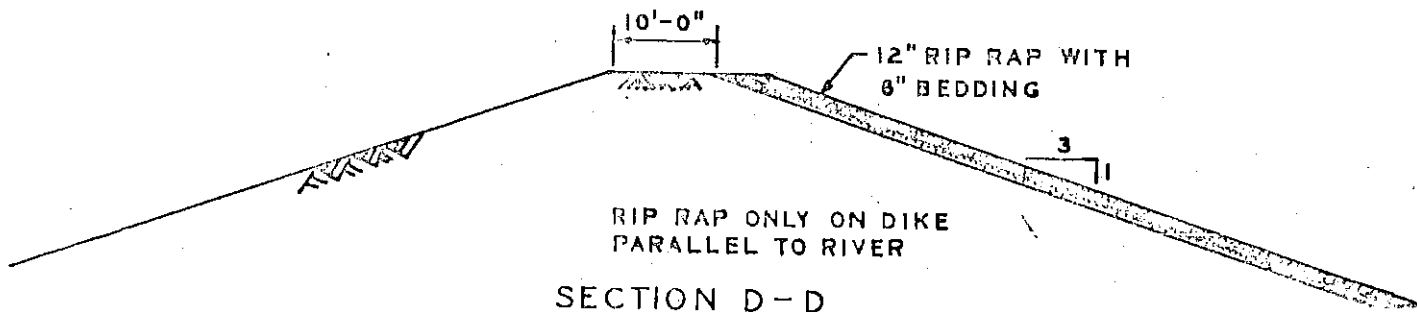
Application by City of New Madrid, Missouri

Sheet 5 of 9 Date December 4, 1970



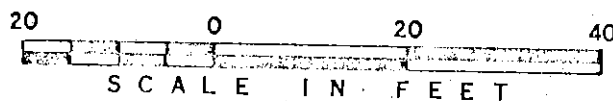
SECTION C-C

BERM REINFORCING OF EXISTING LEVEE



SECTION D-D

ASH RETAINING DIKE



VERT. & HORIZ.

ASH PIT DIKE SECTIONS

PROPOSED ASH DISPOSAL FACILITIES

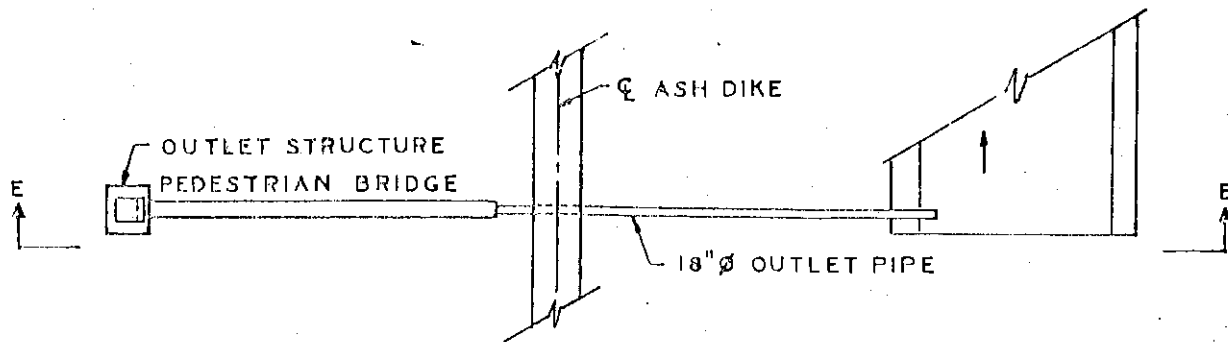
In the Mississippi River

At Approx. Mile 883.5

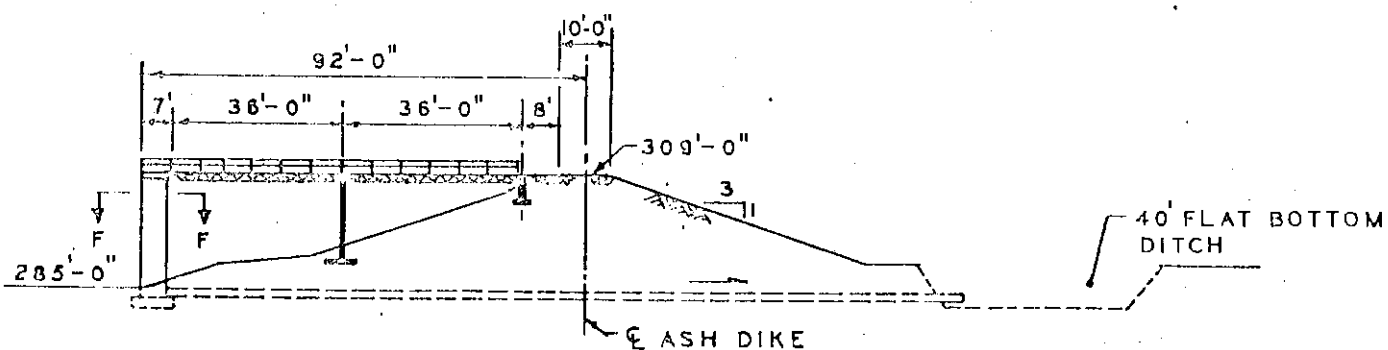
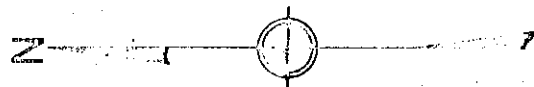
County of New Madrid State of Missouri

Application by City of New Madrid, Missouri

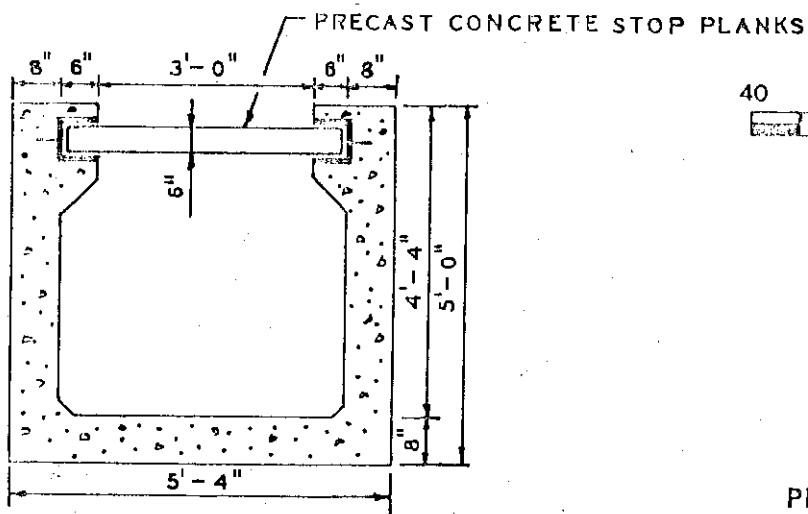
Sheet 6 of 9 Date December 4, 1970



PLAN



SECTION E-E



SECTION F-F



OUTFALL STRUCTURE

PROPOSED ASH DISPOSAL FACILITIES

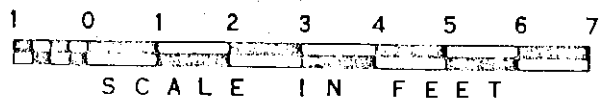
In the Mississippi River

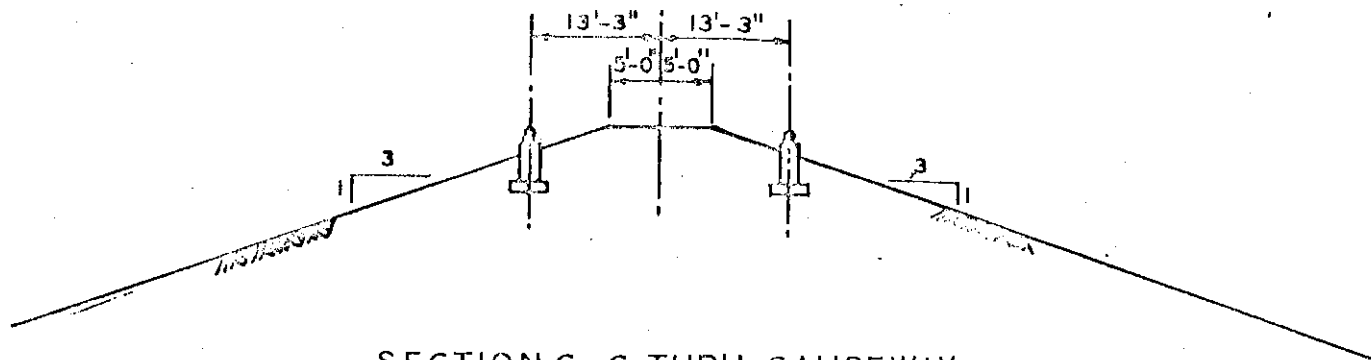
At Approx. Mile 883.5

County of New Madrid State of Missouri

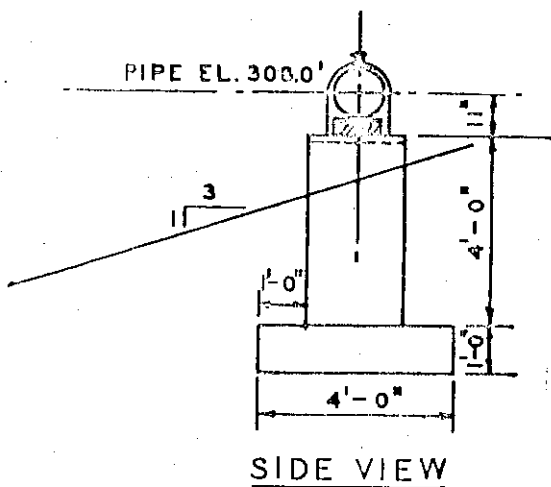
Application by City of New Madrid, Missouri

Sheet 7 of 9 Date December 4, 1970

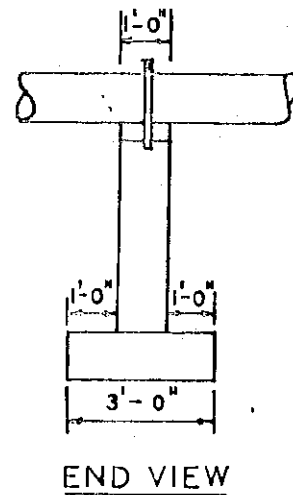




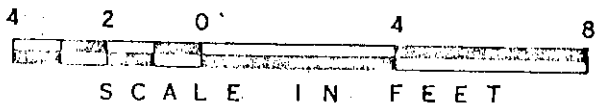
SECTION G-G THRU CAUSEWAY



SIDE VIEW



END VIEW



CAUSEWAY

PROPOSED ASH DISPOSAL FACILITIES

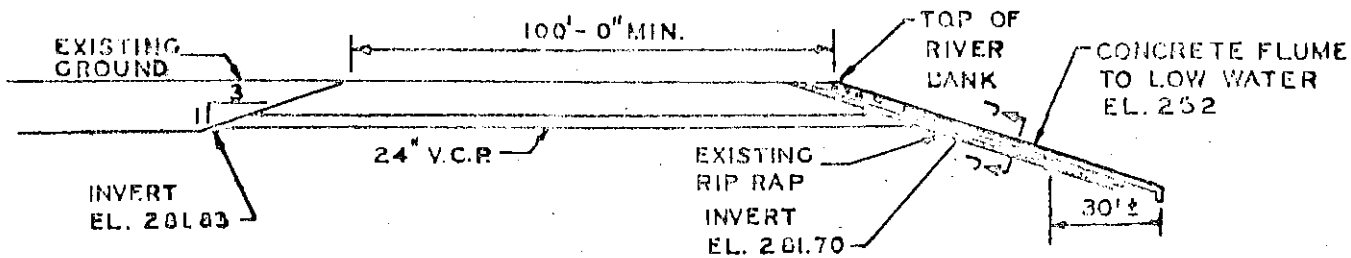
In the Mississippi River

At Approx. Mile 883.5

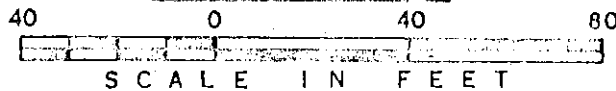
County of New Madrid State of Missouri

Application by City of New Madrid, Missouri

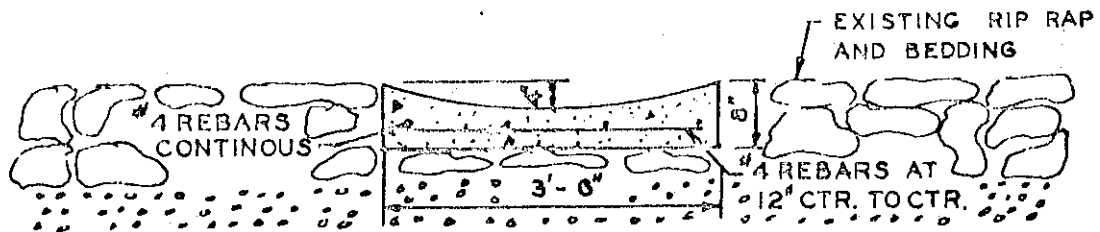
Sheet 8 of 9 Date December 4, 1970



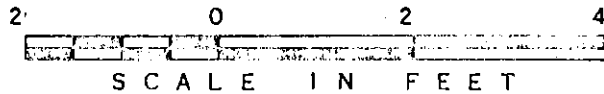
SECTION H-H



VERT. & HORIZ



SECTION J-J



VERT. & HORIZ.

ASH STORAGE AREA OUTFALL

PROPOSED ASH DISPOSAL FACILITIES

In the Mississippi River

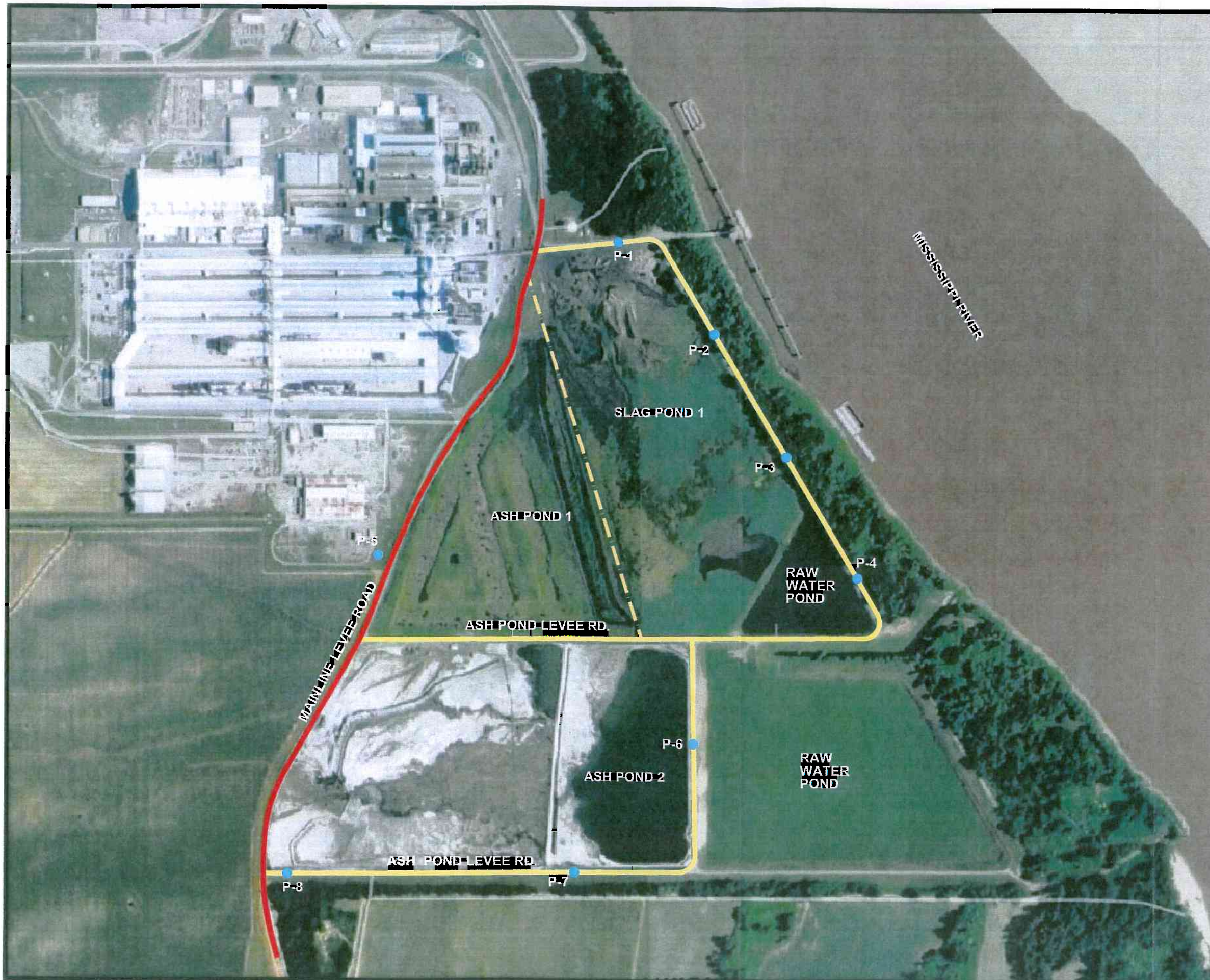
At Approx. Mile 883.5

County of New Madrid State of Missouri

Application by City of New Madrid, Missouri

Sheet 9 of 9 Date December 4, 1970

APPENDIX G
Excerpt from:
Slag Pond 1 and Ash Pond 2 Piezometers
AECI New Madrid Power Generating Facility
Dated July 31, 2009



NOTES:

1. Plan adapted from an aerial photograph courtesy of Google Earth.
2. Piezometers were located in the field by Geotechnology and subsequently surveyed by the project surveyor.

LEGEND:

● Piezometer Location



Drawn By: SLC	Ck'd By: <i>See</i>	App'vd By: <i>MHM</i>
Date: 04-23-09	Date: <i>7/30/09</i>	Date: <i>7/30/09</i>



AECI New Madrid
Slag Pond and Ash Pond Piezometers
New Madrid County, Missouri

AERIAL PHOTOGRAPH OF SITE AND PIEZOMETER LOCATIONS

Project Number
1011304.911G

PLATE 2