

# Summary of Liner Construction Monticello Impoundments

Luminant Generating Company, LLC

Monticello Steam Electric Station CCR Documentation  
Project No. 90601

09/16/2016

# **Summary of Liner Construction Monticello Impoundments**

prepared for

**Luminant Generating Company, LLC  
Monticello Steam Electric Station CCR Documentation  
Titus County, Texas**

**Project No. 90601**

**09/16/2016**

prepared by

**Burns & McDonnell Engineering Company, Inc.  
Kansas City, Missouri**

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## INDEX AND CERTIFICATION

### Luminant Generating Company, LLC Summary of Liner Construction Monticello Impoundments Project No. 90601

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#### Certification

I hereby certify, as a Professional Engineer in the state of Texas, that the information in this document was assembled under my direct personal charge. This report is not intended or represented to be suitable for reuse by Luminant Generating Company, LLC or others without specific verification or adaptation by the Engineer.



*Randell Lee Sedlacek*  
9/16/16

*Randell Lee Sedlacek*

Randell Lee Sedlacek, P.E. (Texas License No. 99056)

Date: 9/16/16

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**LIST OF ABBREVIATIONS**

<b><u>Abbreviation</u></b>	<b><u>Term/Phrase/Name</u></b>
BMcD	Burns & McDonnell
CCR	Coal Combustion Residual
CFR	Code of Federal Regulation
EPA	Environmental Protection Agency
GM	Geomembrane
MOSES	Monticello Steam Electric Station
RCRA	Resource Conservation and Recovery Act

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## 1.0 INTRODUCTION

On April 17, 2015, the Environmental Protection Agency (EPA) issued the final version of the federal Coal Combustion Residual Rule (CCR Rule) to regulate the disposal of coal combustion residual (CCR) materials generated at coal-fired units. The rule will be administered as part of the Resource Conservation and Recovery Act [RCRA, 42 United States Code (U.S.C.) §6901 et seq.], using the Subtitle D approach.

Luminant is subject to the CCR Rule and as such must document the liner construction for existing surface impoundments per 40 Code of Federal Regulations (CFR) §257.71. This document provides the liner construction documentation for the following existing CCR surface impoundment at Monticello Steam Electric Station (MOSES):

- Bottom Ash Ponds
  - Southwest Ash Settling Pond
  - West Ash Settling Pond
  - Northeast Ash Water Retention Pond

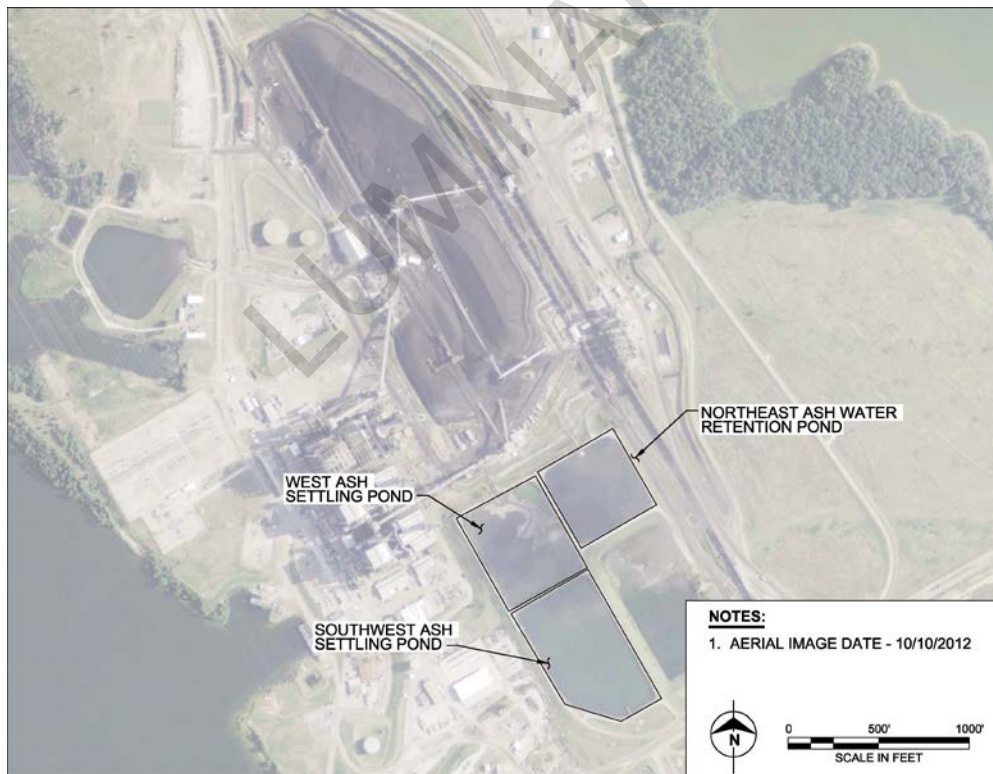


Figure 1 MOSES Site Plan

An existing surface impoundment is classified as lined if the liner was constructed with any of the following:

- A liner consisting of a minimum of two feet of compacted soil with a hydraulic conductivity of no more than  $1 \times 10^{-7}$  centimeters per second.
- A composite liner that meets the requirements of §257.70(b).
- An alternative composite liner that meets the requirements of §257.70(c).

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## 2.0 LINER CONSTRUCTION

The following section describes the liners at the CCR Impoundments at MOSES.

### 2.1 Bottom Ash Ponds

Based on drawings provided by Luminant, these ponds have compacted clay liners installed in them. Drawing No. 129-1423-302 Sheet 2, Rev 3 (See Appendix A) indicates the Ash Ponds have three feet of clay soil. The clay soil is covered by four inches of revetment.

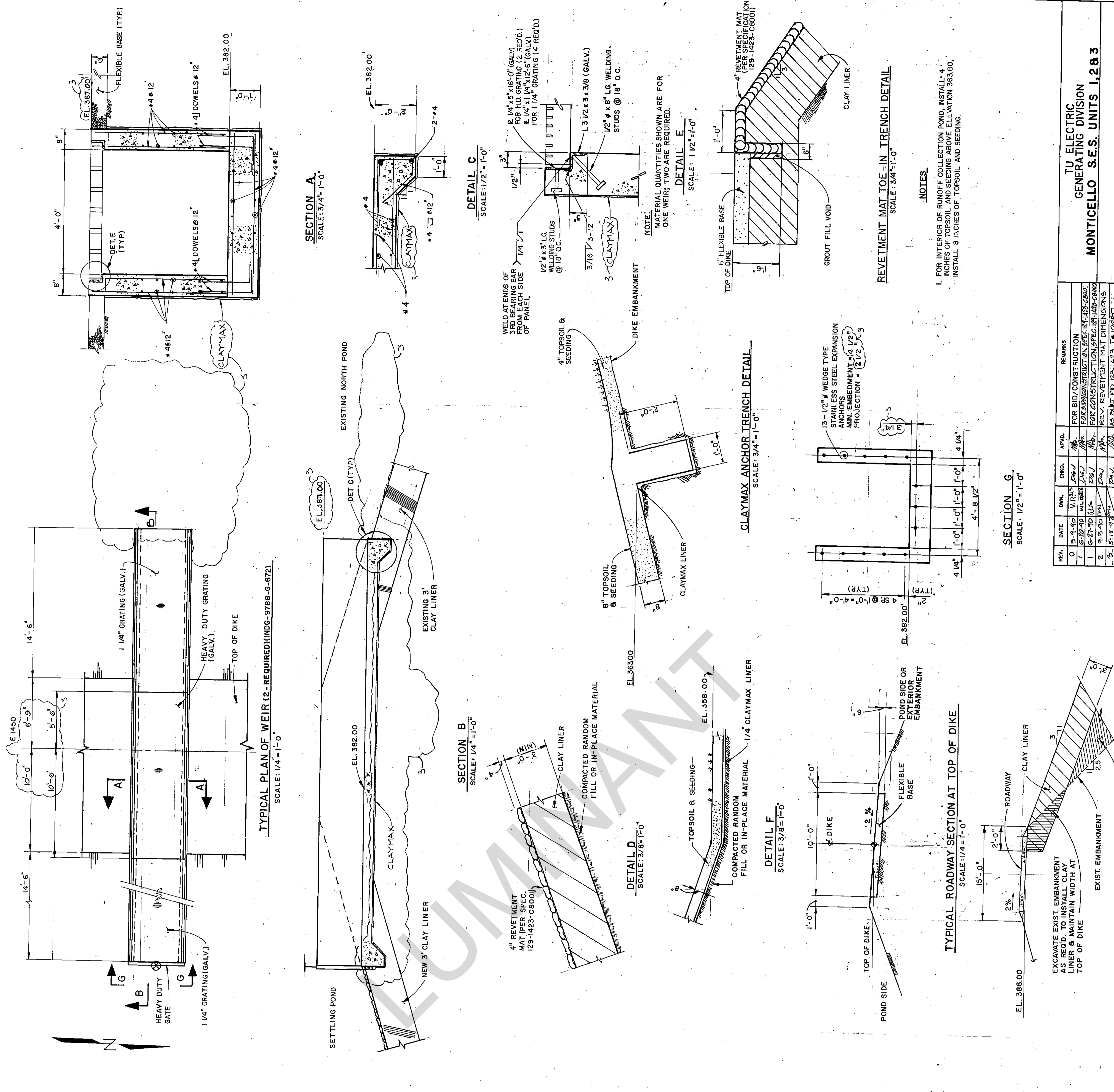
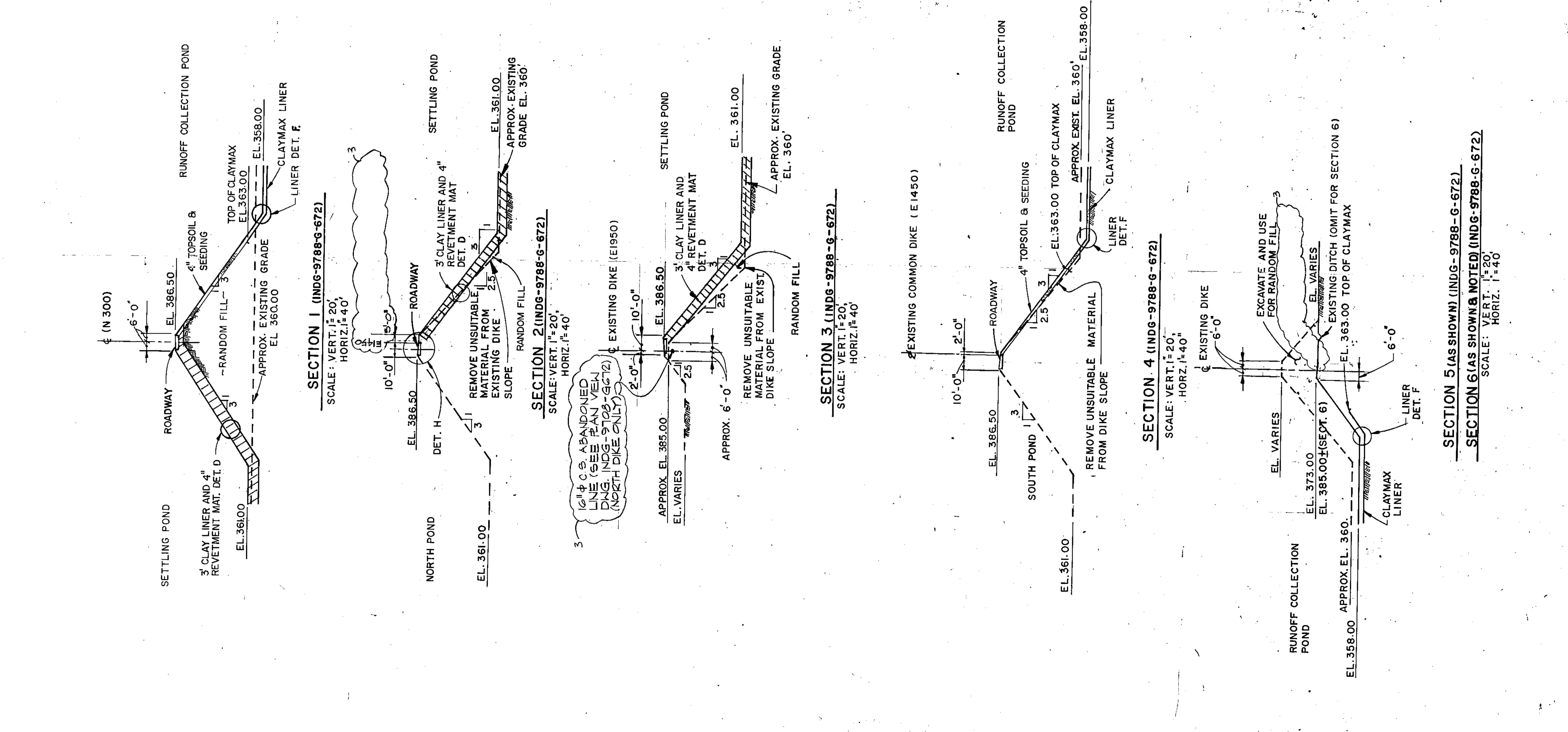
Based on the drawings provided, and the GM/soil system described on those drawings, BMcD's opinion is the Ash Ponds, which include the NE Ash Water Retention Pond, the West Ash Settling Pond, and the SW Ash Settling Pond, would be considered lined per the Rule. BMcD's opinion is based on the following:

1. The drawings show that there is three feet of compacted soil with a hydraulic conductivity of no more than  $1 \times 10^{-7}$  cm/sec, which meets the requirements of the Rule.



**APPENDIX A - NORTHEAST ASH WATER RETENTION POND**

**DRAWING NO. 129-1423-302 SHEET 02 REV. 3  
MONTICELLO ASH POND DESIGN MEMO 1990  
DRAWING NO. INDG-9788-G-672 REV. 8**



**NOTES**

1. FOR INTERIOR OF RUNOFF COLLECTION POND, INSTALL 4 INCHES OF TOPSOIL AND SEEDING ABOVE ELEVATION 363.00. INSTALL 8 INCHES OF TOPSOIL AND SEEDING.

REV.	DATE	BY	CHKD.	APPROV.	REMARKS
0	8-2-20	V. B. J.	T. S. J.		FOR BID/CONSTRUCTION
1	8-2-20	V. B. J.	T. S. J.		FOR BID/CONSTRUCTION SPEC. 141-1423-302
2	8-2-20	V. B. J.	T. S. J.		FOR CONSTRUCTION SPEC. 141-1423-302
3	8-11-20	V. B. J.	T. S. J.		REV. REVEMENT MAT DIMENSIONS AS BUILT PER 129-1423-T-10257

MONTICELLO STEAM ELECTRIC STATION

Replace Ash Water Retention Pond - Phases II & III  
Conceptual Design Meeting  
February 27, 1990

DESIGN SUMMARY

A. Construct two new ponds by adding a dike splitting the existing East Bottom Ash Pond.

1. The north part, the Settling Pond, will measure approximately 500' x 500'.
2. The south part, the Runoff Collection Pond, will measure approximately 940' x 500'. Storage capacity of runoff equivalent to a 10-year, 24-hour rainfall event.

B. Settling Pond

1. Bottom elevation 361' to match West Bottom Ash Ponds.
2. Two weirs join the Settling Pond to the West Bottom Ash North Pond.
3. Line pond with 3' of clay and a 4" concrete revetment mat. *sides & Bottom?*
4. Raise top of dike elevation to 386.5' to match WBAP.

C. Runoff Collection Pond

1. Bottom elevation 358' to avoid water table at 357'.
2. Line with Claymax and 8" of fill.
3. Provide grass cover over entire surface of pond.
4. Lower dikes to elevation 371'. Use existing dike and pond floor material to construct new dike. *East & South*
5. Invert elevation of drainage into the pond at 362'.
6. Provide roadway at top of dikes to allow passage of motor vehicles completely around both ponds.
7. Reuse two existing 2000 gpm pumps at the Ash Water Retention Pond for pumping water to the Operating Pond. Pump shafts to be shortened as required (by plant). *cut down 9'*

*4' of storage capacity in pond*  
*Pumps drop level 9" per day.*

Mount pumps on a permanent concrete intake structure in lieu of a barge.

Pond has to be kept as dry as possible to be prepared for 10-year, 24-hour rainfall event.

#### Drainage Modification

- Use existing culverts as much as possible by reversing flow where needed.
- Need two new culverts below tracks near entrance to the runoff collection pond.
- Details of runoff collection at ash car maintenance facilities pending review of surveying drawings.

#### Power Requirements

Utilize one of the two options, based on plant preference and future expansion, listed below:

- Extend the existing 13.2 kV distribution line located at the south end of the existing East Bottom Ash Pond to the new intake structure. Install a transformer and appropriate starters, controls, etc. for the pump motors. Install a distribution panel for lighting, convenience receptacles, welding receptacle, etc.
- Extend the existing duct bank that runs to the Ash Water Retention Pond to the new intake structure. Install the appropriate power and control wiring for the motor feeders, controls, lighting, and receptacles.

#### NO LINER OPTIONS

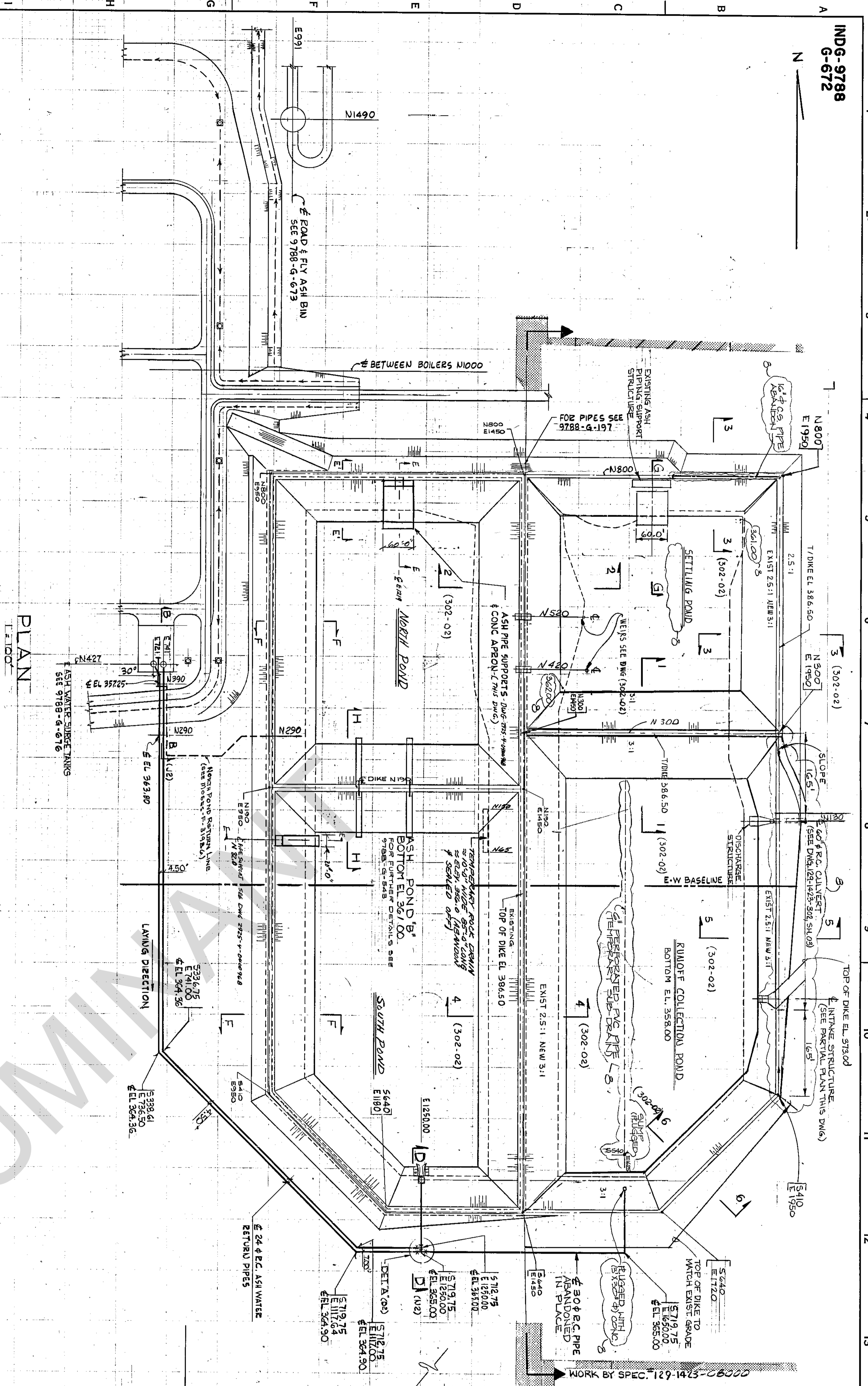
##### Settling Pond

Clay liner with revetment mat is most feasible and economical.

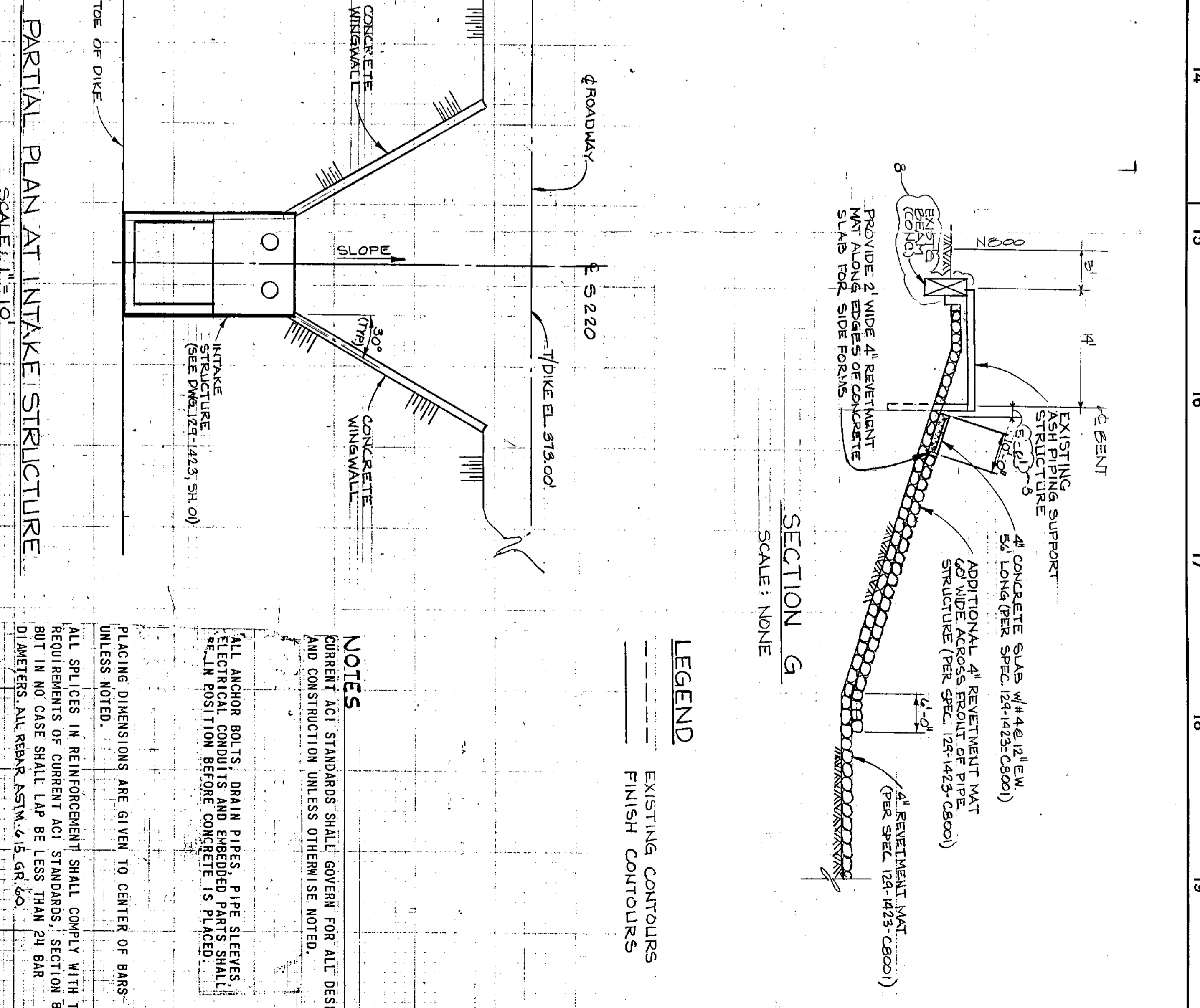
##### Runoff Collection Pond

- Clay liner: Due to high water table (357' elevation) and low invert elevation (362'), in order to maintain sufficient clearance to groundwater during excavation, 3' of clay leaves only 1' to invert elevation. Disregard clay liner.

Spec  
WALK  
105 F



PLAN  
L1000



PARTIAL PLAN AT INTAKE STRUCTURE  
SCALE: 1"=10'

SECTION G  
SCALE: NONE

LEGEND

- EXISTING CONTOURS
- FINISH CONTOURS

NOTES

EXISTING ACI STANDARDS SHALL GOVERN FOR ALL DESIGN AND CONSTRUCTION UNLESS OTHERWISE NOTED.

ALL ANCHOR BOLTS, DRAIN PIPES, PIPE SERVICES, ELECTRICAL CONDUITS AND EMBEDDED PARTS SHALL BE IN POSITION BEFORE CONCRETE IS PLACED.

PLACING DIMENSIONS ARE GIVEN TO CENTER OF BARS UNLESS NOTED.

ALL SPICES IN REINFORCEMENT SHALL COMPLY WITH THE REQUIREMENTS OF CURRENT ACI STANDARDS. SECTION 508, BUT IN NO CASE SHALL LAP BE LESS THAN 24 BAR DIAMETERS. ALL REBAR ASTM A-63 GR. 60.

ALL BARS SHALL HAVE 2" MINIMUM CONCRETE COVER UNLESS OTHERWISE NOTED.

SHIRT OR BEND BARS TO CLEAR ANCHOR BOLTS, DRAINS, PIPE STEEVES AND EMBEDDED PARTS.

REFERENCE DRAWINGS:

ELONG SECTION AND INTAKE DETAILS 189-1423-302 SH. 01  
ASH POND SECTIONS & DETAILS 189-1423-302 SH. 02  
BUILDING STRUCTURE 189-1423-302 SH. 03  
ROAD PILING STRUCTURE 189-1423-302 SH. 04  
PILE CAPS FROM AREA 'B' 189-1096-40-00  
REVISIONS TO ASH POND 'B' 189-1096-40-00

NO.	DATE	REVISION	BY	CHK.	APPROVED
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2	6-20-72	FOR CONSTRUCTION 189-1423-302 SH. 01	...	...	...
3	6-20-72	FOR CONSTRUCTION 189-1423-302 SH. 02	...	...	...
4	6-20-72	FOR CONSTRUCTION 189-1423-302 SH. 03	...	...	...
5	6-20-72	FOR CONSTRUCTION 189-1423-302 SH. 04	...	...	...

DALLAS POWER & LIGHT COMPANY  
TEXAS ELECTRIC SERVICE COMPANY  
TEXAS POWER & LIGHT COMPANY  
MONTICELLO STEAM ELECTRIC STATION  
189-1423-302 MW INSTALLATION  
ASH DISPOSAL SYSTEM  
GEN PLAN & MISC DETS

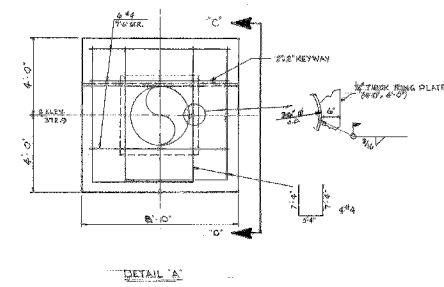
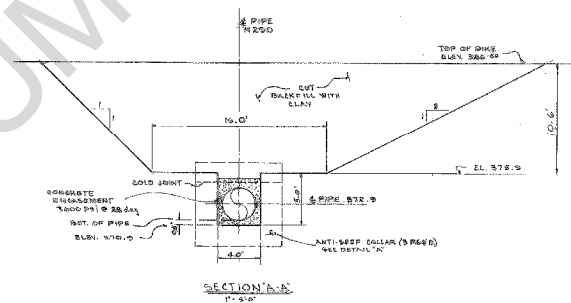
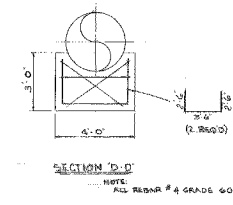
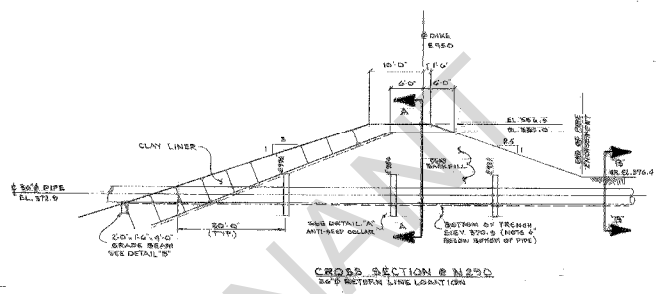
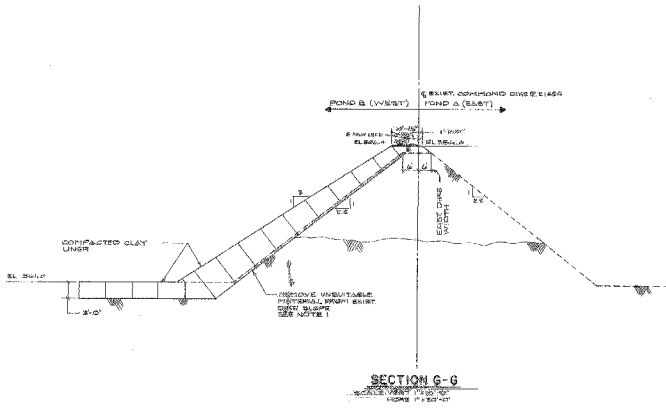
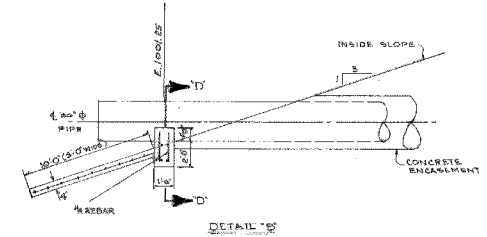
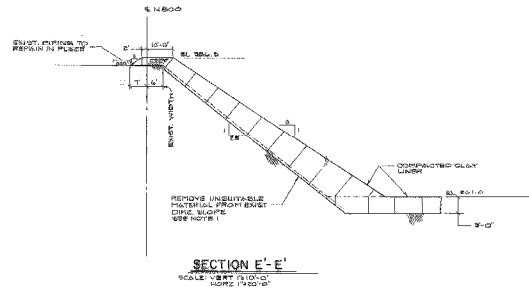
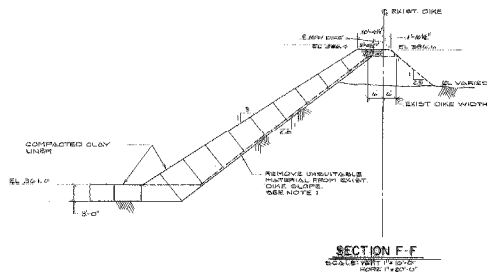
EBASCO SERVICES INCORPORATED, NEW YORK

SCALE: VARIOUS  
DATE: 1/18/72  
INDG-9788  
G-672

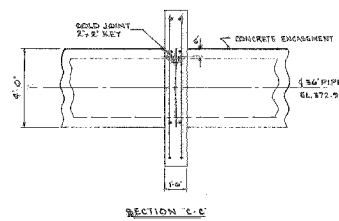
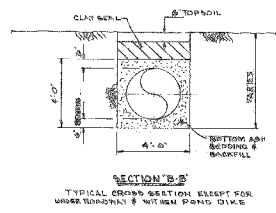
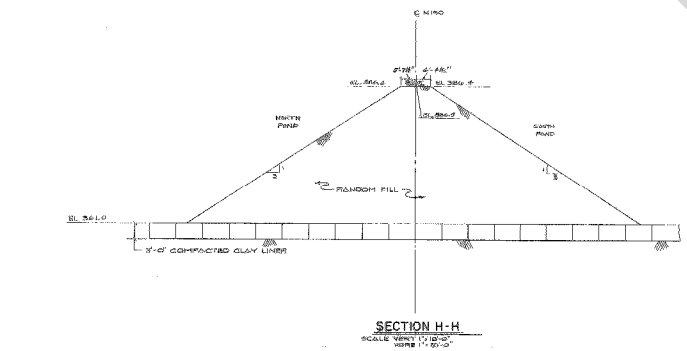
LUMIVANT

**APPENDIX B - WEST ASH WATER SETTLING POND**

**DRAWING NO. 129-1009-301-01 REV. 1**  
**DRAWING NO. INDG-9788-G-672 REV. 8**



- NOTES:**
- UNSATURABLE MATERIALS SHALL CONSIST OF SOIL CONTAINING NOT MORE THAN 5% OF MATERIAL WITH BOTTOM ASH WATER MATERIAL REMOVED SHALL BE REPLACED WITH SOIL MEETING CLAY LINER REQUIREMENTS.
  - CLAY LINER MATERIAL SHALL MEET THE FOLLOWING REQUIREMENTS:  
 PLASTICITY INDEX SHALL BE 15% TO 25%  
 PERMEABILITY SHALL BE 1.0E-10 CM/SEC  
 --- EXIST DIKE SLOPES



**REFERENCE DRAWINGS:**

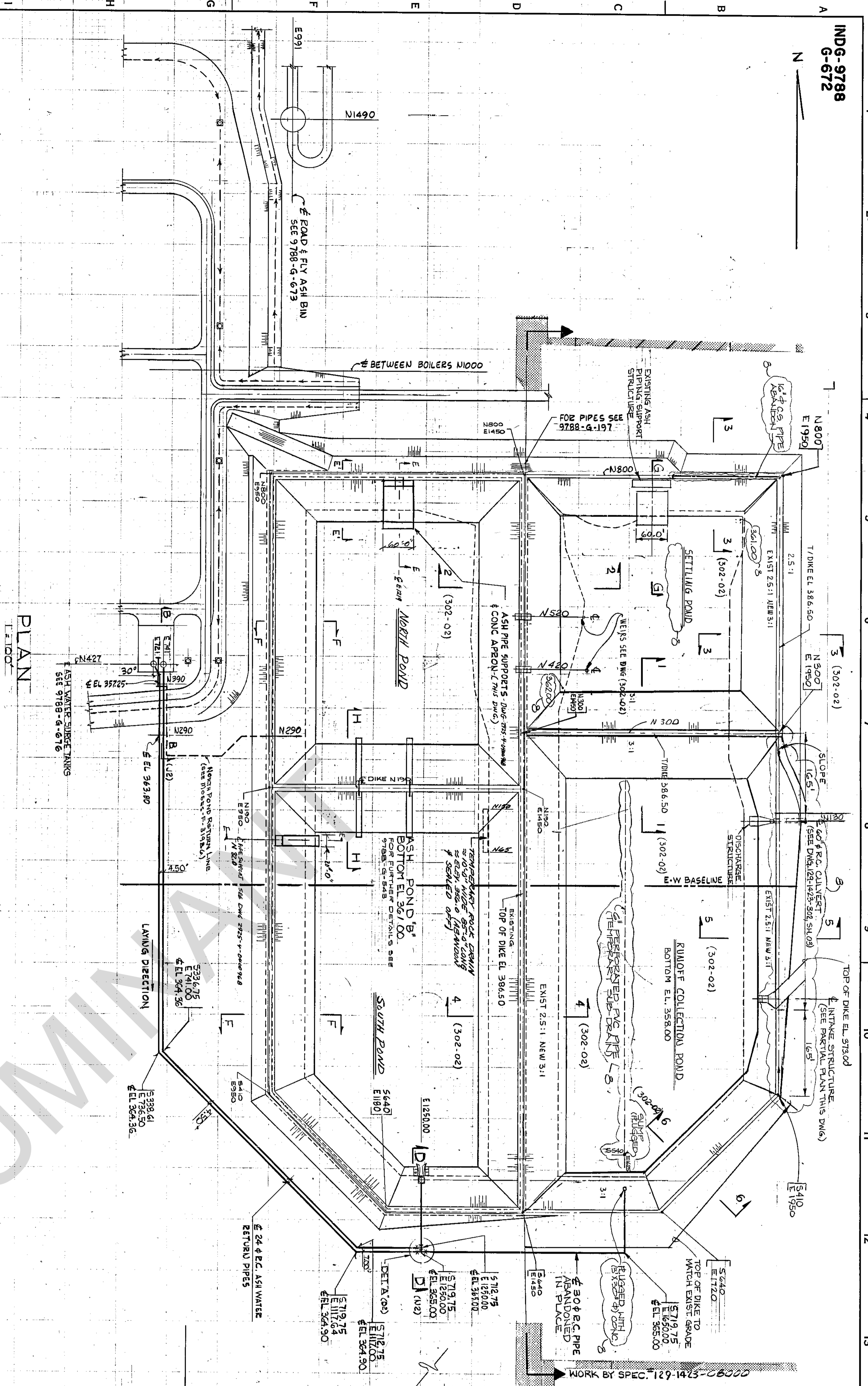
CON. DISPOSAL SYSTEM CON. PLAN & TIE-IN DETAILS:  
 - S-17A  
 - S-17B  
 - C-15B1

MONTEICELLO S.E.S.  
 BOTTOM ASH POND MODIFICATION  
 ENBANKMENT CROSS SECTIONS  
 TEXAS UTILITIES GENERATING CO.

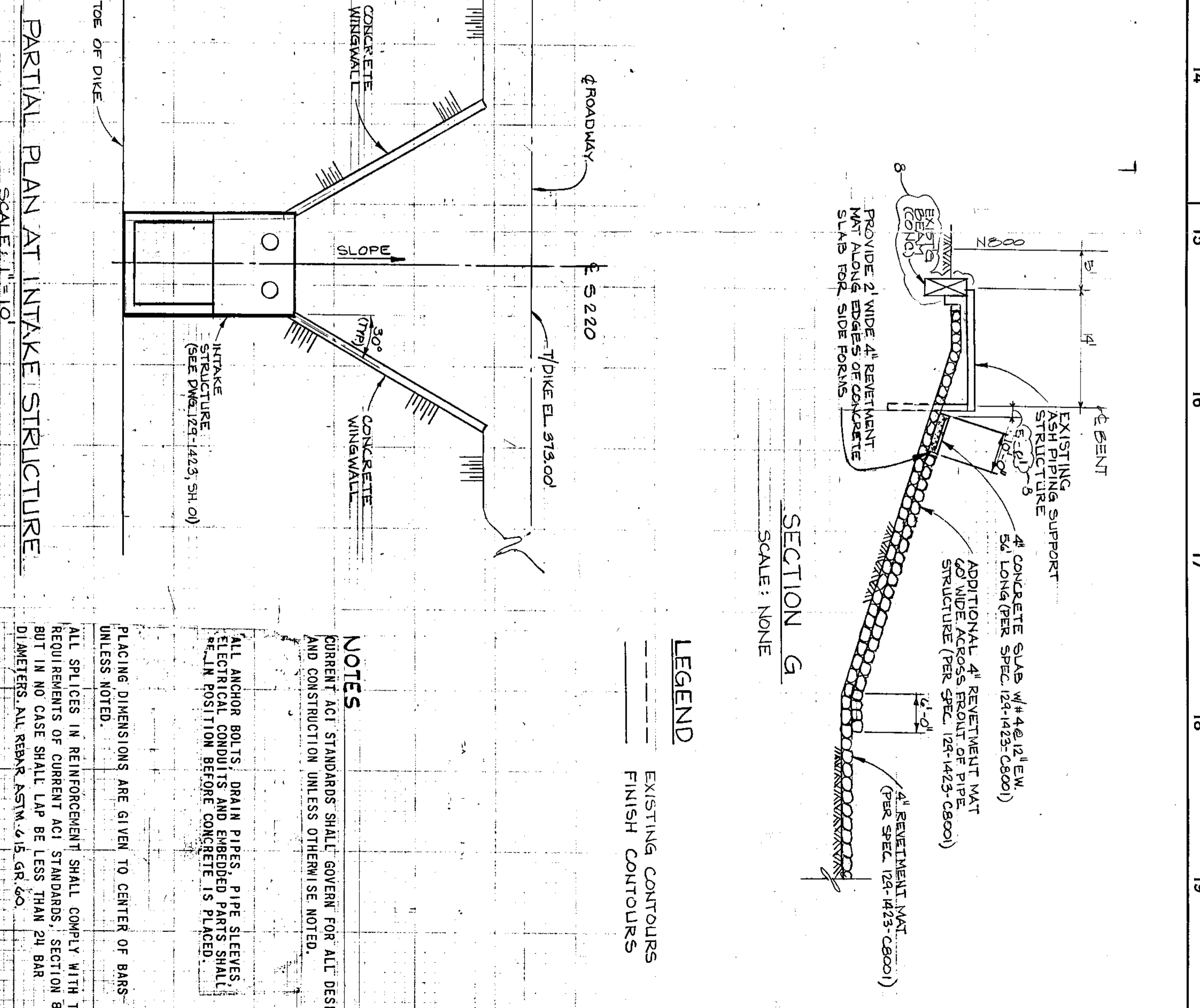
NOTE:  
 AT ROADWAY PIPE IS CONSIDERED SUCCESSOR FROM SECTION OF EXCAVATION TO FLOOR 'T' TOP OF GRAVING

NO.	DATE	BY	DESCRIPTION	CHK'D	APP'D	SCALE	DATE
1	10/10/00	NEW DRAWING					
2	10/10/00	REVISION					

123-1009-301-01



PLAN  
L.I.O.C.



PARTIAL PLAN AT INTAKE STRUCTURE  
SCALE: 1\"/>

SECTION G  
SCALE: NONE

LEGEND  
--- EXISTING CONTOURS  
--- FINISH CONTOURS

NOTES  
CURRENT ACI STANDARDS SHALL GOVERN FOR ALL DESIGN AND CONSTRUCTION UNLESS OTHERWISE NOTED.

PLACING DIMENSIONS ARE GIVEN TO CENTER OF BARS UNLESS NOTED.  
ALL SPLICES IN REINFORCEMENT SHALL COMPLY WITH THE REQUIREMENTS OF CURRENT ACI STANDARDS. SECTION B08, BUT IN NO CASE SHALL LAP BE LESS THAN 24 BAR DIAMETERS. ALL REBAR ASTM A63 GR. 60.  
ALL BARS SHALL HAVE 2\"/>

REFERENCE DRAWINGS:  
ELECTRICAL SECTION AND INTAKE DETAILS 189-1423-302 SH. 01  
ASH POND SECTIONS & DETAILS 189-1423-302 SH. 02  
BUILDING AND STRUCTURE 189-1423-302 SH. 03  
ROAD PILING STRUCTURE 189-1423-302 SH. 04  
PILE CAPS FROM AREA 'B' 189-1096-40-00  
REVISIONS TO ASH POND 'B' 189-1096-40-00

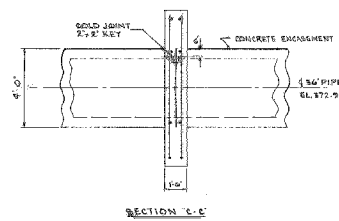
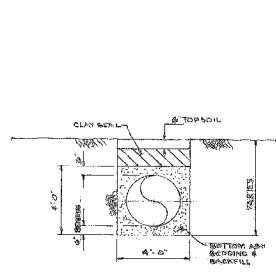
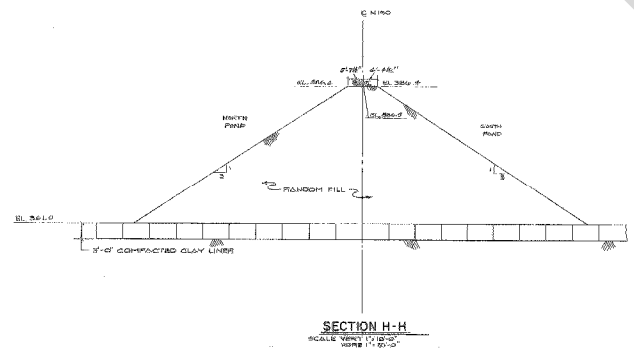
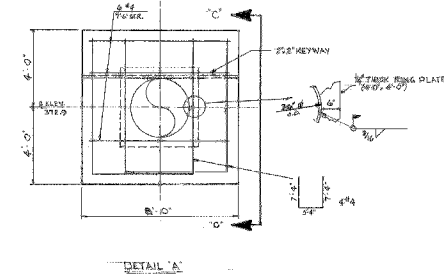
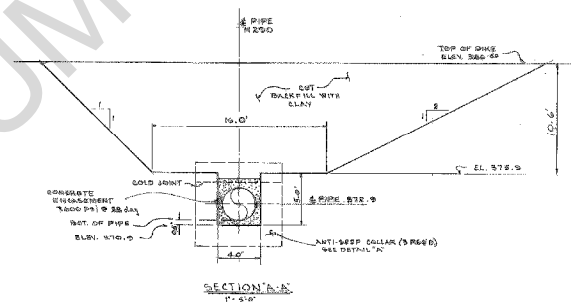
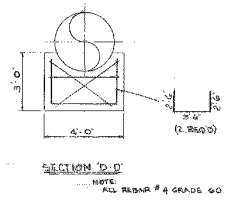
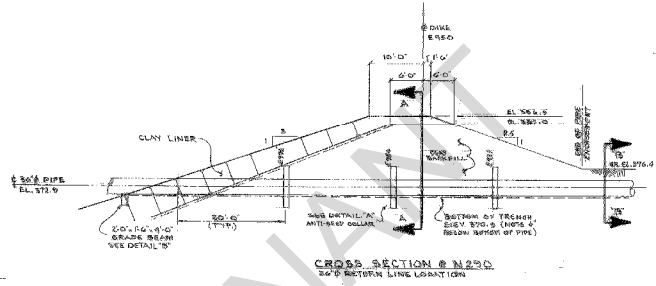
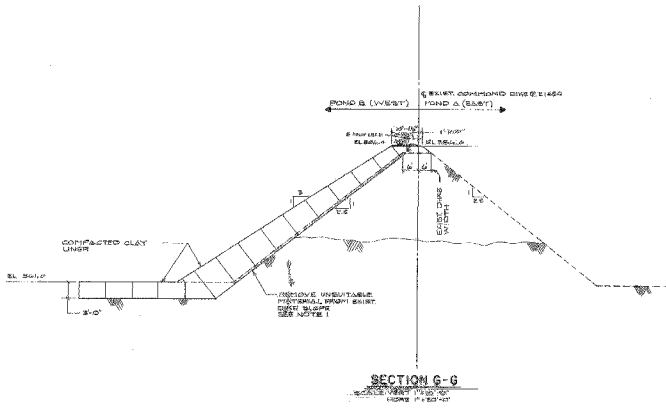
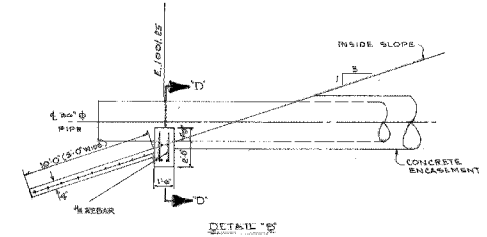
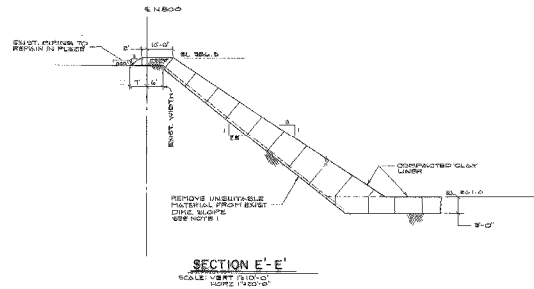
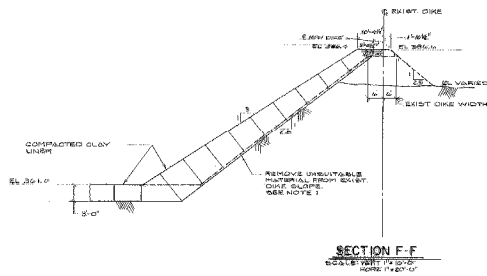
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2	6-20-72	FOR CONSTRUCTION	...	...	...
3	6-20-72	FOR CONSTRUCTION	...	...	...
4	6-20-72	FOR CONSTRUCTION	...	...	...
5	6-20-72	FOR CONSTRUCTION	...	...	...

DALLAS POWER & LIGHT COMPANY  
TEXAS ELECTRIC SERVICE COMPANY  
TEXAS POWER & LIGHT COMPANY  
MONTICELLO STEAM ELECTRIC STATION  
189-1423-100 MW INSTALLATION  
ASH DISPOSAL SYSTEM  
GEN PLAN & MISC DETS  
EASCO SERVICES INCORPORATED, NEW YORK



**APPENDIX C - SOUTHWEST ASH WATER SETTLING POND**

**DRAWING NO. 129-1009-301-01 REV. 1**  
**DRAWING NO. INDG-9788-G-672 REV. 8**



- NOTES:**
- UNDESIRABLE MATERIALS SHALL CONSIST OF SOIL CONTAINING MATERIALS SUCH AS REBAR WITH BOTTOM ASH WATER MATERIAL REMOVED SHALL BE REPLACED WITH SOIL MEETING CLAY LINER REQUIREMENTS.
  - CLAY LINER MATERIAL SHALL MEET THE FOLLOWING REQUIREMENTS:  
 PLASTICITY INDEX <math>PI < 10</math>  
 PERMEABILITY <math>K < 1.0 \times 10^{-10}</math> CM/SEC  
 --- EXIST. DIKE SLOPES

**REFERENCE DRAWINGS:**

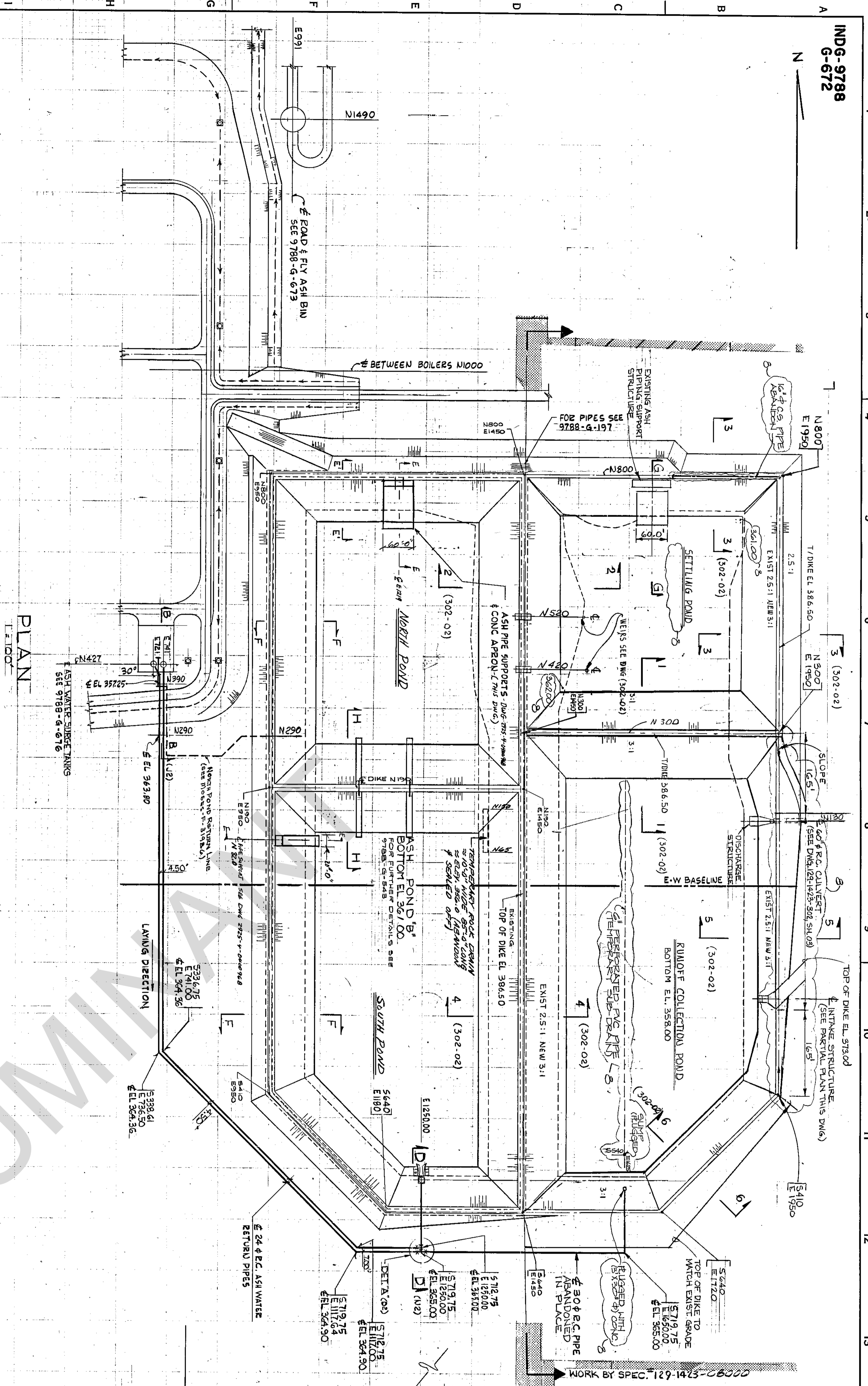
CON. DISPOSAL SYSTEM CON. PLAN & HORIZ. DETAILS:  
 - S-17A  
 - S-17B  
 - C-15B1

MONTEICELLO S.E.S.  
 BOTTOM ASH POND MODIFICATION  
 ENBANKMENT CROSS SECTIONS  
 TEXAS UTILITIES GENERATING CO.

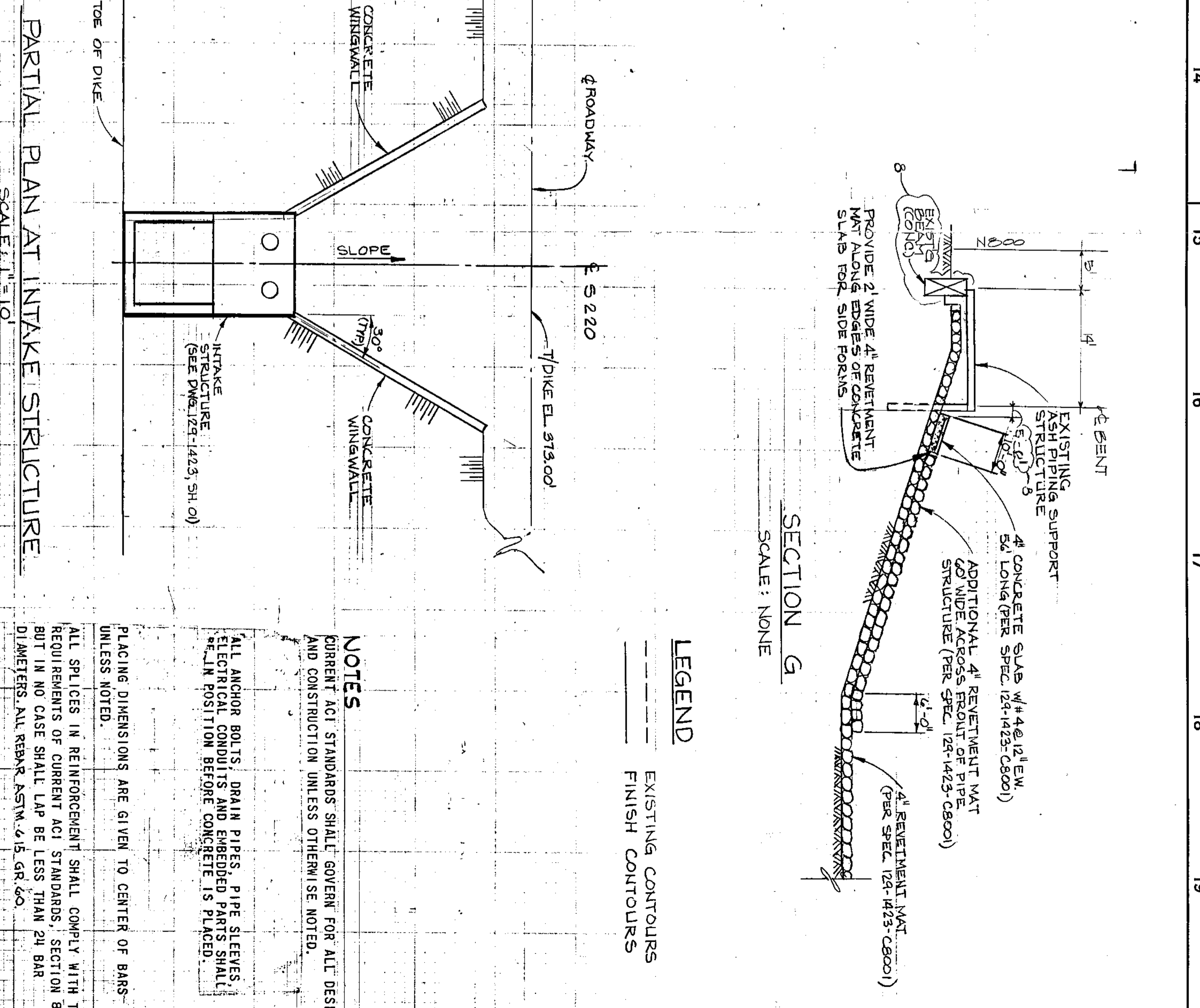
NOTE:  
 AT ROADWAY PIPE IS CONSIDERED SUCCESSOR FROM SECTION OF EXCAVATION TO FLOOR 'T' TOP OF GRAVING.

NO.	DATE	BY	DESCRIPTION	SCALE	DATE	BY	DESCRIPTION
1	10/10/00	NEW DRAWING					
2	10/10/00	REVISION					

123-1009-301-01



PLAN  
L.I.O.C.



PARTIAL PLAN AT INTAKE STRUCTURE  
SCALE: 1\"/>

SECTION G  
SCALE: NONE

**LEGEND**  
--- EXISTING CONTOURS  
--- FINISH CONTOURS

**NOTES**  
CURRENT A.C.I. STANDARDS SHALL GOVERN FOR ALL DESIGN AND CONSTRUCTION UNLESS OTHERWISE NOTED.  
ALL ANCHOR BOLTS, DRAIN PIPES, PIPE SERVICES, ELECTRICAL CONDUITS AND EMBEDDED PARTS SHALL BE IN POSITION BEFORE CONCRETE IS PLACED.  
PLACING DIMENSIONS ARE GIVEN TO CENTER OF BARS UNLESS NOTED.  
ALL SPLICES IN REINFORCEMENT SHALL COMPLY WITH THE REQUIREMENTS OF CURRENT A.C.I. STANDARDS. SECTION 508, BUT IN NO CASE SHALL LAP BE LESS THAN 24 BAR DIAMETERS. ALL REBAR ASTM A-63 GR. 60.  
ALL BARS SHALL HAVE 2\"/>

**REFERENCE DRAWINGS:**  
ELECTRICAL SECTION AND INTAKE DETAILS 189-1423-302 SH. 01  
ASH POND SECTIONS & DETAILS 189-1423-302 SH. 02  
BUILDING AND STRUCTURE 189-1423-302 SH. 03  
ROAD PILING STRUCTURE 189-1423-302 SH. 04  
PILE CAPS FROM AREA 'B' 189-1096-40-00  
189-1423-1501

DALLAS POWER & LIGHT COMPANY TEXAS ELECTRIC SERVICE COMPANY TEXAS POWER & LIGHT COMPANY MONTICELLO STEAM ELECTRIC STATION 189-1423 180 MW INSTALLATION ASH DISPOSAL SYSTEM GEN PLAN & MISC DETS	
EBARSCO SERVICES INCORPORATED, NEW YORK SCALE: VARIOUS DATE: 1/18/72 INDG-9788 G-672	APPROVED: DATE: 1/18/72 INDG-9788 G-672
NO. DATE 1 6-20-70 2 6-20-70 3 6-20-70 4 6-20-70 5 6-20-70 6 6-20-70 7 6-20-70 8 6-20-70	BY: [Signature] CH: [Signature] APPROVED: [Signature]



CREATE AMAZING.

LUMINANCE

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F 816-333-3690  
[www.burnsmcd.com](http://www.burnsmcd.com)