

History of Construction Brame Fly Ash Pond



CLECO Corporation

Rodemacher Unit 2
Project No. 90965

Revision 0
10/14/2016

History of Construction Brame Fly Ash Pond

prepared for

**CLECO Corporation
Rodemacher Unit 2
Rapides Parish, Louisiana**

Project No. 90965

**Revision 0
10/14/2016**

prepared by

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

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INDEX AND CERTIFICATION

CLECO Corporation
History of Construction
Brame Fly Ash Pond
Project No. 90965

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Certification

I hereby certify, as a Professional Engineer in the state of Louisiana, 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 the CLECO Corporation or others without specific verification or adaptation by the Engineer.

Randell L Sedlacek
Randell L Sedlacek, P.E.
Louisiana License #38408

Date: *10/14/16*

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LIST OF ABBREVIATIONS

<u>Abbreviation</u>	<u>Term/Phrase/Name</u>
BMcD	Burns & McDonnell
Brame	Brame Energy Center
CCR	Coal Combustion Residual
CFR	Code of Federal Regulations
CLECO	CLECO Corporation
CY	Cubic Yards
EPA	Environmental Protection Agency
GPM	Gallons per Minute
HUC	Hydrologic Unit Code
LSU	Louisiana State University
U.S.C	United States Code
USGS	United States Geological Survey

1.0 INTRODUCTION

On April 17, 2015, the Environmental Protection Agency (EPA) issued the final version of the federal Coal Combustion Residual (CCR) Rule to regulate the disposal of 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.

The existing CCR impoundments at CLECO Corporation's (CLECO's) Brame Energy Center (Brame) are subject to the CCR Rule and as such CLECO must compile a History of Construction for each CCR surface impoundment per 40 CFR §257.73(c). This report serves as the History of Construction for the Fly Ash Pond at Brame.

This history of construction is in addition to, not in place of, any other applicable site permits, environmental standards, or work safety practices.

2.0 PLAN OBJECTIVES

Per 40 CFR §257.73(c), the History of Construction must contain, to the extent feasible, the following items:

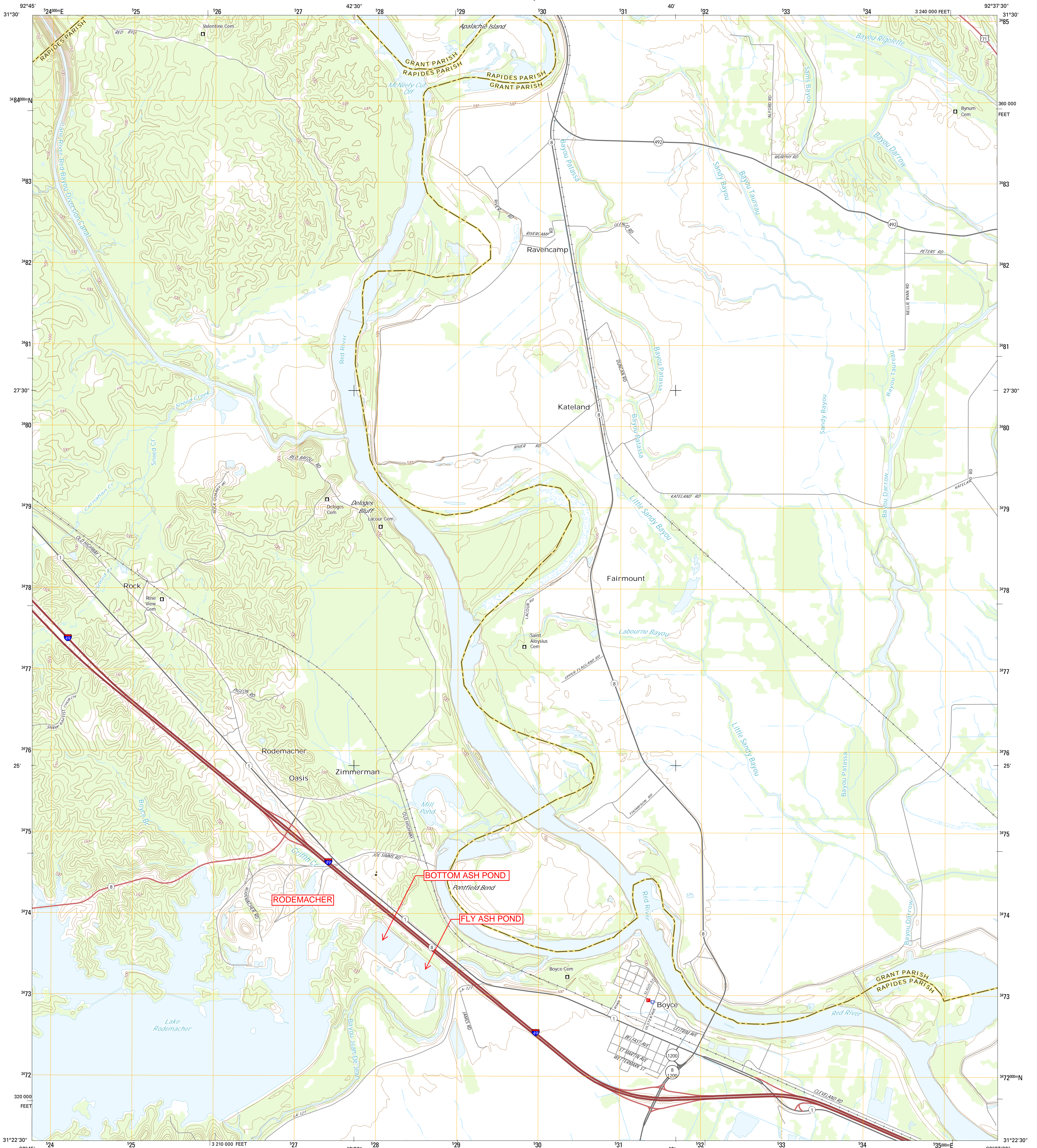
- The name and address of the owner/operator of the CCR unit, the name of the CCR unit, and the identification number of the CCR unit
- The location of the CCR unit on most recent United States Geological Survey (USGS) 7½ minute or 15 minute topographical map
- A statement of the purpose for which the CCR unit is being used
- The name and size of watershed within which the CCR unit is located
- A description of the physical and engineering properties of the foundation and abutment materials on which the CCR unit is constructed
- 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 or stage of the CCR unit; and the approximate dates of construction of each successive stage of construction of the CCR unit.
- Detailed dimensional drawings of the CCR Unit, including the following:
 - Plan view and cross sections of the length and width of the CCR unit
 - Foundation improvements
 - Drainage provisions, spillways, diversion ditches, outlets
 - Instrumentation locations
 - Slope protection
 - Normal operating pool surface elevation
 - Maximum pool surface elevation following peak discharge from the inflow design flood
 - Expected maximum depth of CCR within the unit
 - Any identifiable natural or manmade features that could adversely affect operation of the CCR unit due to malfunction or mis-operation
- A description of the type, purpose, and location of existing instrumentation
- Area-capacity curves for the CCR unit
- A description of each spillway and diversion design features and capacities and calculations used in their determination
- The construction specifications and provisions for surveillance, maintenance, and repair of the CCR unit
- Any record or knowledge of structural instability of the CCR unit

3.0 HISTORY OF CONSTRUCTION

Section	CCR Rule Description	Included	Information	Source
40 CFR §257.73 (c)(1) (i)	Name and address of the owner/operator of the CCR unit	Y	Cleco Corporation 2030 Donahue Ferry Road P.O. Box 5000 Pineville, LA 71361-5000	Owner
	Name of the CCR units	Y	Fly Ash Pond	Owner
	Identification number of the CCR unit	Y	P-0005 (permit number)	Owner
40 CFR §257.73 (c)(1) (ii)	Location of the CCR unit on most recent United States Geological Survey (USGS) 7½ minute or 15 minute topographical map	Y	See Appendix A	USGS Map
40 CFR §257.73 (c)(1) (iii)	Statement of the purpose for which the CCR unit is being used	Y	The pond receives fly ash from the dry fly ash silos that is loaded onto trucks, hauled, and placed in the pond for disposal.	Owner
40 CFR §257.73 (c)(1) (iv)	Name and size of watershed within which the CCR unit is located	Y	HUC12 = 111402070703 Jacks Creek Watershed Area = 9,407 acres Only approximately 39 acres of this overall watershed actually contributes runoff to the Fly Ash Pond.	HUC 12 Mapping - LSU AGCenter.com
40 CFR §257.73 (c)(1) (v)	Description of the physical and engineering properties of the foundation and abutment materials on which the CCR unit is constructed	Y	Foundation Soils include soft to medium stiff clay and silty clay. See Appendix C for Geologic Data	Permit
40 CFR §257.73 (c)(1) (vi)	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	Y	Embankment constructed of on-site material. Embankment contains 3-ft compacted clay liner with average Plasticity Index of 29 and average Liquid Limit of 49. See Appendix C permit data	Permit / Correspondence between CLECO and Louisiana DNR
	The method of site preparation and construction of each zone or stage of the CCR unit	Y	Original embankment constructed with 3:1 side slopes with 3-ft compacted clay liner. Liner was constructed in 8-10 in. horizontal lifts compacted with sheepsfoot compaction. Post-construction inspection in 1982 indicated in-situ liner insufficient in large areas of pond (allegedly due to excessive borrow during construction of Bottom Ash Pond). Footprint / dikes reconfigured to 30 acre area (from original 104 acre area) with compacted liner placed in insufficient areas. See Appendix C for original permit data	Correspondence between CLECO and Louisiana DNR
	The approximate dates of construction of each successive stage of construction of the CCR unit	Y	Began construction in 1978. Post-construction inspection in 1982, footprint / dikes reconfigured to 30 acre area (from 104 acre area) with compacted liner placed in insufficient areas. Construction completed in 1984.	Correspondence between CLECO and Louisiana DNR

40 CFR §257.73 (c)(1)	(vii)	Detailed dimensional drawings including the following: Plan view and cross sections of the length and width of the CCR unit Foundation improvements Drainage provisions, spillways, diversion ditches, outlets Instrumentation locations Slope protection Normal operating pool surface elevation Maximum pool surface elevation following peak discharge from the inflow design flood Expected maximum depth of CCR within the unit Any identifiable natural or manmade features that could adversely affect operation of the CCR unit due to malfunction or mis-operation	Y	See Appendix D	Permit
			N	N/A	
			Y	6" HDPE pipe (discharges to adjacent Bottom Ash Pond via manually started pump only)	Owner
				Pump info not found in records review	
			Y	See Appendix E for groundwater monitoring well locations. No other instruments are installed at this time.	Permit
			Y	Exterior: 3:1, vegetated Interior: 3:1, vegetated	Owner
			Y	Normal operating level at EL 86	Owner
			Y	Maximum pool surface level at EL 90.6 following peak discharge from the inflow design flood, assuming pond is 50% full of ash to the top of the dike and initial water level of EL 86.	Inflow Design Flood Control System Plan, Oct. 2016
			Y	At EL 105, depth of CCR is approximately 21 feet.	Measured in CAD based on Construction Drawings / aerial imagery
	250 GPM pump - manually operated to control pond overflow	Owner			
40 CFR §257.73 (c)(1)	(viii)	Description of the type, purpose, and location of existing instrumentation	Y	Monitoring wells - monitor uppermost aquifer (compliance and background monitoring). See Appendix E for locations. Surface water level gauge (measured manually)	Permit
40 CFR §257.73 (c)(1)	(ix)	Area-capacity curves for the CCR unit	Y	See Appendix B	Measured in CAD based on Construction Drawings / aerial imagery
40 CFR §257.73 (c)(1)	(x)	Description of each spillway and diversion design features and capacities and calculations used in their determination	Y	Pump - controls pond overflow 0.086 MGD to Bottom Ash Pond (when pumping)	Owner
40 CFR §257.73 (c)(1)	(xi)	Construction specifications	N	Not found in records review	
		Provisions for surveillance, maintenance, and repair of the CCR unit	Y	Weekly and Annual Inspections per 40 CFR §257.83.	
40 CFR §257.73 (c)(1)	(xii)	Any record or knowledge of structural instability of the CCR unit	N	N/A	

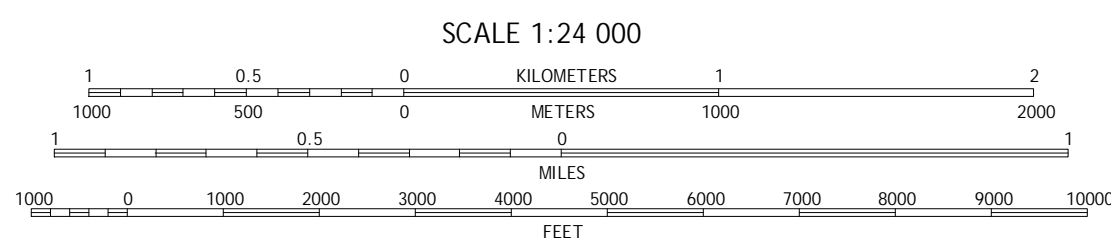
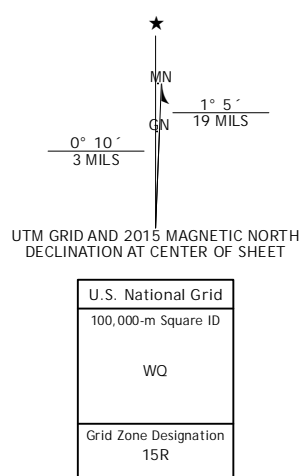
APPENDIX A - USGS TOPOGRAPHICAL MAP



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 15R
10 000-foot ticks: Louisiana Coordinate System of 1983 (north
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, June 2013
Roads.....HERE, ©2013 - 2014
Names.....GNIS, 2015
Hydrography.....National Hydrography Dataset, 2013
Contours.....National Elevation Dataset, 2008
Boundaries.....Multiple sources: see metadata file 1972 - 2015
Public Land Survey System.....BLM, 2015



CONTOUR INTERVAL 10 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 0.6.18



QUADRANGLE LOCATION

1	2	3	1 Aloha
4	5	6	2 Coifak
7	8	8 Gardner	3 Dry Prong
			4 Lena
			5 Rock Hill
			6 Jericho
			7 Gardner
			8 Rapides

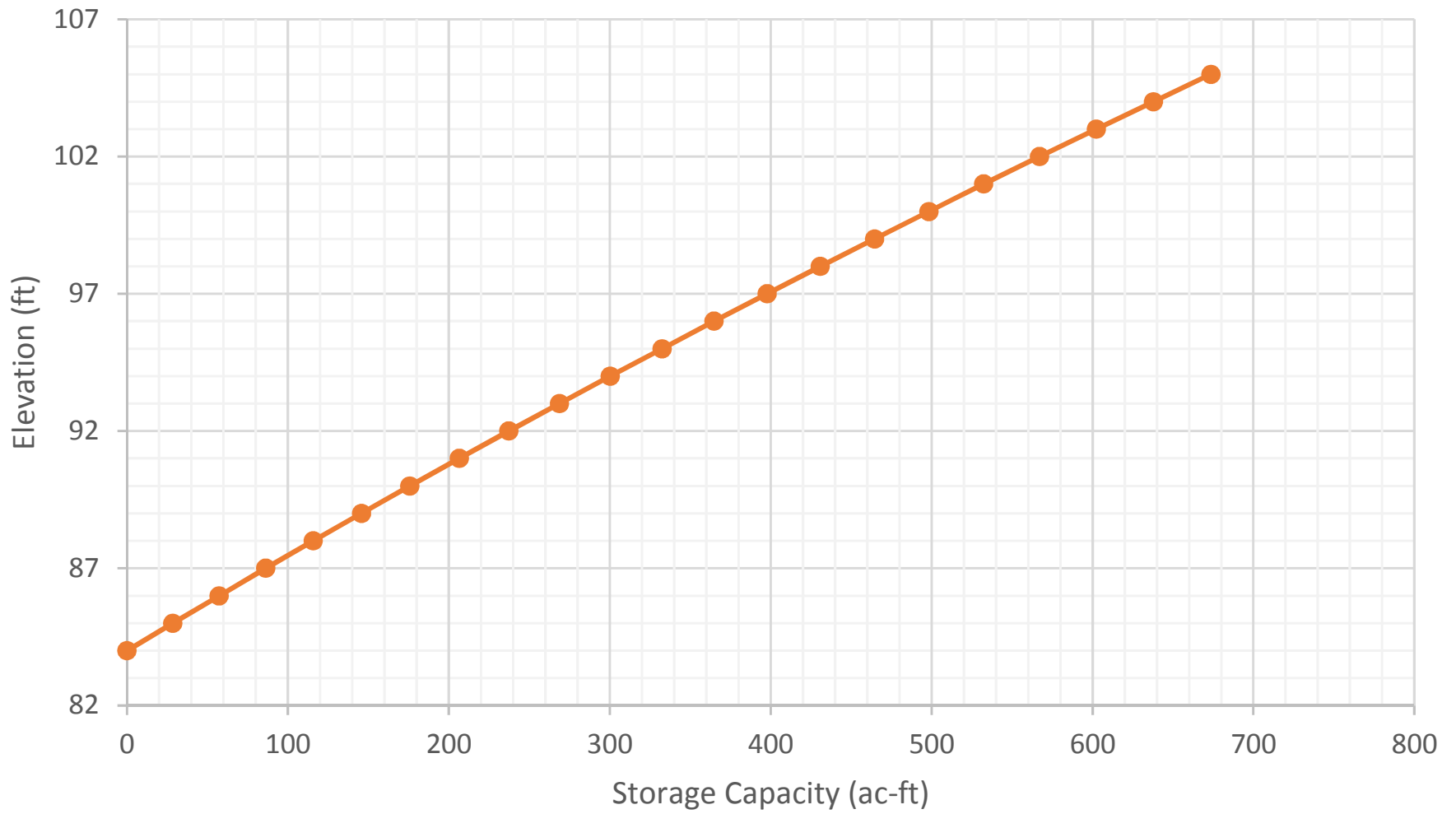
ROAD CLASSIFICATION

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



APPENDIX B - AREA-CAPACITY CURVE

Brame - Fly Ash Pond



APPENDIX C - GEOLOGIC DATA

521.D. FACILITY GEOLOGY

1. INFORMATION REQUIRED FOR TYPE I AND II FACILITIES

Exhibits 20 through 24 present representative soil conditions for the Fly Ash Pond. These borings were done before excavation of clay materials used to form a three-foot thick compacted liner for the dikes. After excavation, the Fly Ash Pond will be underlain by a 3-foot to 13-foot top layer of reddish-brown clay to gray clay which grades in some areas to a silt/sandy silt. Beneath most of the Fly Ash Pond and underlying the top clay stratum is approximately 25 to 40 feet of clay below which are sands and clayey sands 10 feet or more in thickness. Laboratory permeability of the clay tested at 1.1×10^{-8} cm/sec. The Atterburg Limit values for Plasticity Index averaged 29 with an average liquid limit of 49 which classifies the clay as a CH according to the Unified Soil Classification System.

Compaction and Atterburg Limits tests were being performed on the clay liner of the Fly Ash Pond dike. The minimum specified Plasticity Index is 15 with 60 percent passing the #200 sieve and compaction is 95 percent of modified proctor test. The clay liner is being placed in 8- to 10-inch layers and compacted with "sheep's foot" equipment. Given these criteria and knowing the in situ characteristics of the clay which is being excavated (Average Plasticity Index 29), an effective protective layer should be present for the ground water.

After clay liner material is borrowed from the Fly Ash Pond area, hand auger borings will be performed to confirm that a 3-foot thickness of clay remains over the bottom of the Fly Ash Pond.

1.a. Isometric Profiles and Cross-sections

The locations of the 20 borings used to develop the soil profiles of the Fly Ash Pond are shown on Exhibit 25. Borings along the profile of the area of the dike were spaced 200 to 700 feet apart and extended to an average depth of 50 feet below grade. Borings inside the Fly Ash Pond were spaced from 100 to 400 feet apart and varied from a minimum depth of 15 feet to a maximum depth of 50 feet. Five cross sections of the subsurface conditions are illustrated on Exhibits 20 through 24.

Section A-A covers the most northwestern portion of the Fly Ash Pond from a southwest to northeast direction. Section B-B is near the central portion of the pond in a southwest to northeast direction and section C-C is in the lower southeast corner of the pond with the profile covering a southwest to northeast section.

Two profiles, Sections D-D and E-E, cover the center area of the pond and both sections are drawn to cover a northwest to southeast direction.

1.b. Soil Boring Logs

Representations of the boring logs are included on Exhibits 20 through 24.

521.D (cont'd)

1.c. Soil Test Results

Appendix F is a summary of representative laboratory tests on soils from the Fly Ash Pond area.

1.d. Geologic Cross-sections

Exhibit 5 contains geologic cross-sections which extend to a depth greater than 200 feet below ground surface.

1.e. Faults

The review of available published information did not reveal information on faulting near the facility and faults have not been noted within the facility itself.

1.f. Seismic Impact Zone

The facility is not located in a seismic impact zone.

1.g. Unstable Areas

The facility is not located in an unstable area.

2. INFORMATION REQUIRED FOR TYPE III WOODWASTE AND
CONSTRUCTION/DEMOLITION-DEBRIS FACILITIES.

These sections are not applicable because the facility is not a Type III woodwaste or construction/demolition-debris facility.

Pond, the Coal Sedimentation Pond, and the Unit 2 Metal Cleaning Waste Pond are situated on the Terrace aquifer, while the Fly Ash Pond, Bottom Ash Pond, and Ash Management Area are situated on the aquifer recharge area for the Alluvial aquifer.

- e. **if the facility is located in a flood plain, a plan to ensure that the facility does not restrict the flow of the 100-year base flood or significantly reduce the temporary water-storage capacity of the flood plain, and documentation indicating that the design of the facility is such that the flooding does not affect the integrity of the facility or result in the washout of solid waste.**

The Fly Ash Pond is the only facility that is constructed within an area previously permitted through the Army Corps of Engineers (COE) under permit number LMNOD-SP dated March 29, 1977. Cleco currently holds a solid waste permit from the LDEQ for this area to manage ash for future plant expansions.

- D. **Facility Geology. Standards governing facility geology are contained in LAC 33:VII.709.C (Type I and II facilities), LAC 33:VII.717.D (Type I-A and II-A facilities), and LAC 33:VII.719.D (Type III facilities).**

- l. **The following information regarding geology is required for Type I and Type II facilities:**

- a. **isometric profile and cross-sections of soils, by type, thickness, and permeability;**

Isometric soil profiles and geologic cross sections have been constructed for the facilities from available data. The locations of the profiles for the cross sections are shown in Appendix G. Five (5) isometric soil profiles and sixteen (16) geologic cross sections, A-A' through P-P', were constructed from available data and are included in this appendix. Historical geologic cross sections constructed for the facilities are included in Appendix H.

- b. **logs of all known soil borings taken on the facility and a description of the methods used to seal abandoned soil borings;**

A copy of the logs of soil borings is included in Appendix I. Please note that the soil boring logs performed by Aquaterra (2004) and Eagle (2005) are included in this appendix. Soil boring logs were not available for the drilling activities performed by Sargent & Lundy (1981); however, geologic cross sections illustrating these logs are available and are included. Design and construction of the units began before the Louisiana Solid Waste Rules and Regulations were established and the units were initially under interim status prior to the standard permits being issued.

Abandoned soil borings were sealed in accordance with applicable methods at the time of drilling according to available records reviewed. Since May 1993, soil

borings have been sealed in accordance with applicable portions of "Construction of Geotechnical Boreholes and Groundwater Monitoring Systems Handbook" dated December 2000 (LDEQ and LDOTD, 2000).

- c. **results of tests for classifying soils (moisture contents, Atterberg limits, gradation, etc.), measuring soil strength, and determining the coefficients of permeability, and other applicable geotechnical tests;**

A copy of available geotechnical testing used for soil classification is included in Appendix I.

- d. **geologic cross-section from available published information depicting the stratigraphy to a depth of at least 200 feet below the ground surface;**

A fence diagram illustrating Rapides Parish geology to approximately 3,000 feet below ground surface is included as Appendix F. (Plate 4, Water Resources of Rapides Parish, Louisiana, Water Resources Bulletin No. 8, Department of Conservation, Louisiana Geological Survey, and Louisiana Department of Public Works, April 1966).

- e. **for faults mapped as existing through the facility, verification of their presence by geophysical mapping or stratigraphic correlation of boring logs. If the plane of the fault is verified within the facility's boundaries, a discussion of measures that will be taken to mitigate adverse effects on the facility and the environment;**

There are no known faults within the facility or within one mile of the perimeter of the facility. The review of available published information did not reveal information on faulting near the facility.

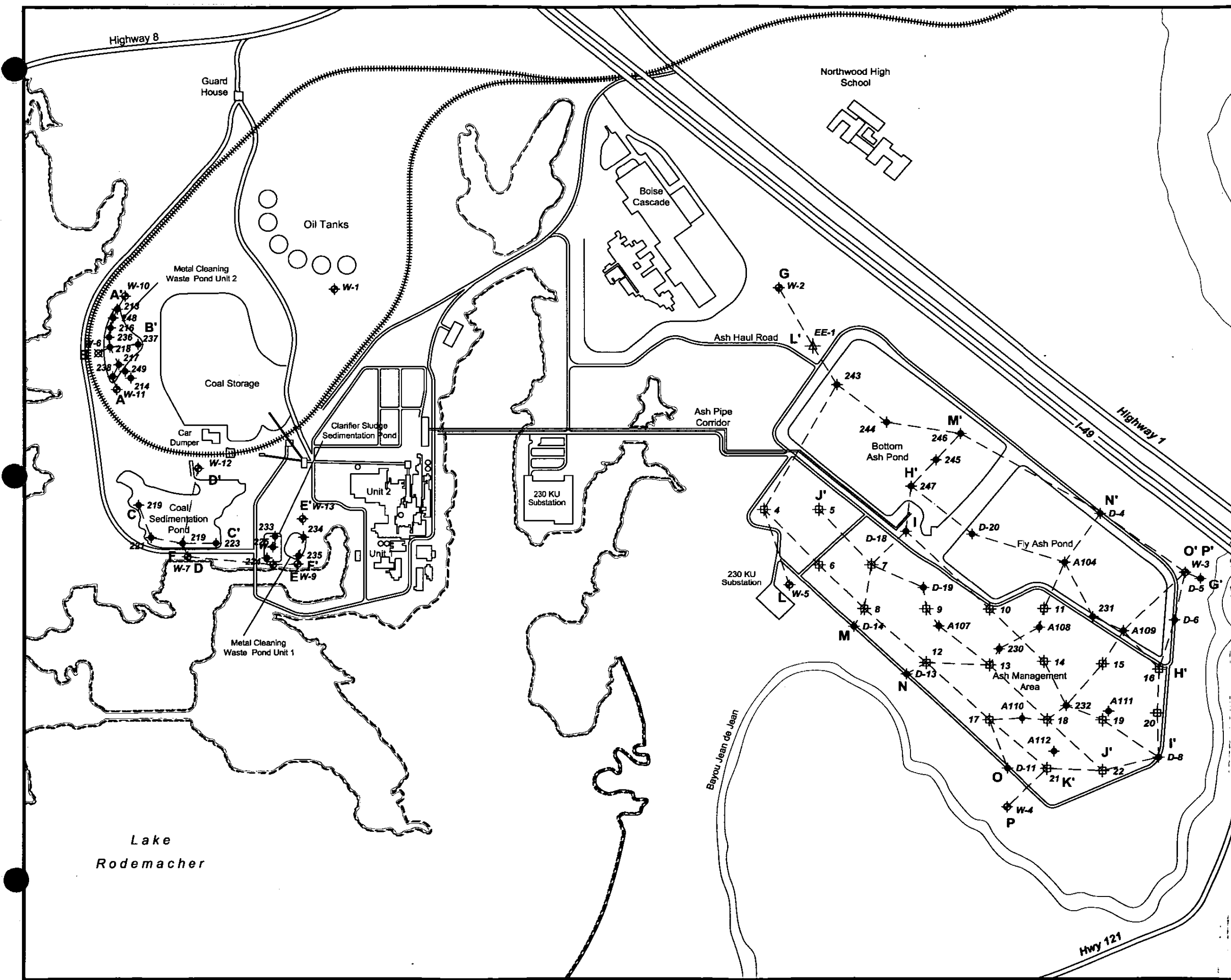
- f. **for a facility located in a seismic impact zone, a report with calculations demonstrating that the facility will be designed and operated so that it can withstand the stresses caused by the maximum ground motion, as provided in LAC 33:VII.709.C.2; and**

Not applicable. Review of the "Seismicity Map of the State of Louisiana" (Map MF-1081, Stover and others, United States Geological Survey, 1987) does not indicate seismic activity in the area of the Rodemacher Power Station.

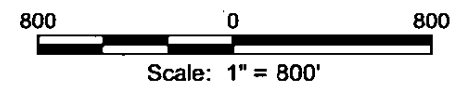
- g. **for a facility located in an unstable area, a demonstration of facility design as provided in LAC 33:VII.709.C.3.**


Not applicable. The RPS is not located in an unstable area.

- 2. **The following information regarding geology is required by Type III wood waste, and construction/demolition-debris facilities:**



- ### Legend
- Railroad Tracks
 - ◆ Monitor Well Location
 - ⊠ W-6 Plugged and Abandoned Monitor Well Location
 - ◆ Boring Location (Sargent & Lunoy 1981)
 - ⊠ Boring Location (Eagle, 2005)
 - ⊠ Boring Location (Aquaterra, 2004)
 - A — A' Cross Section Profile





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**Geologic Cross Sections
Location Map**

Rapides Parish, Louisiana


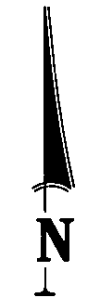
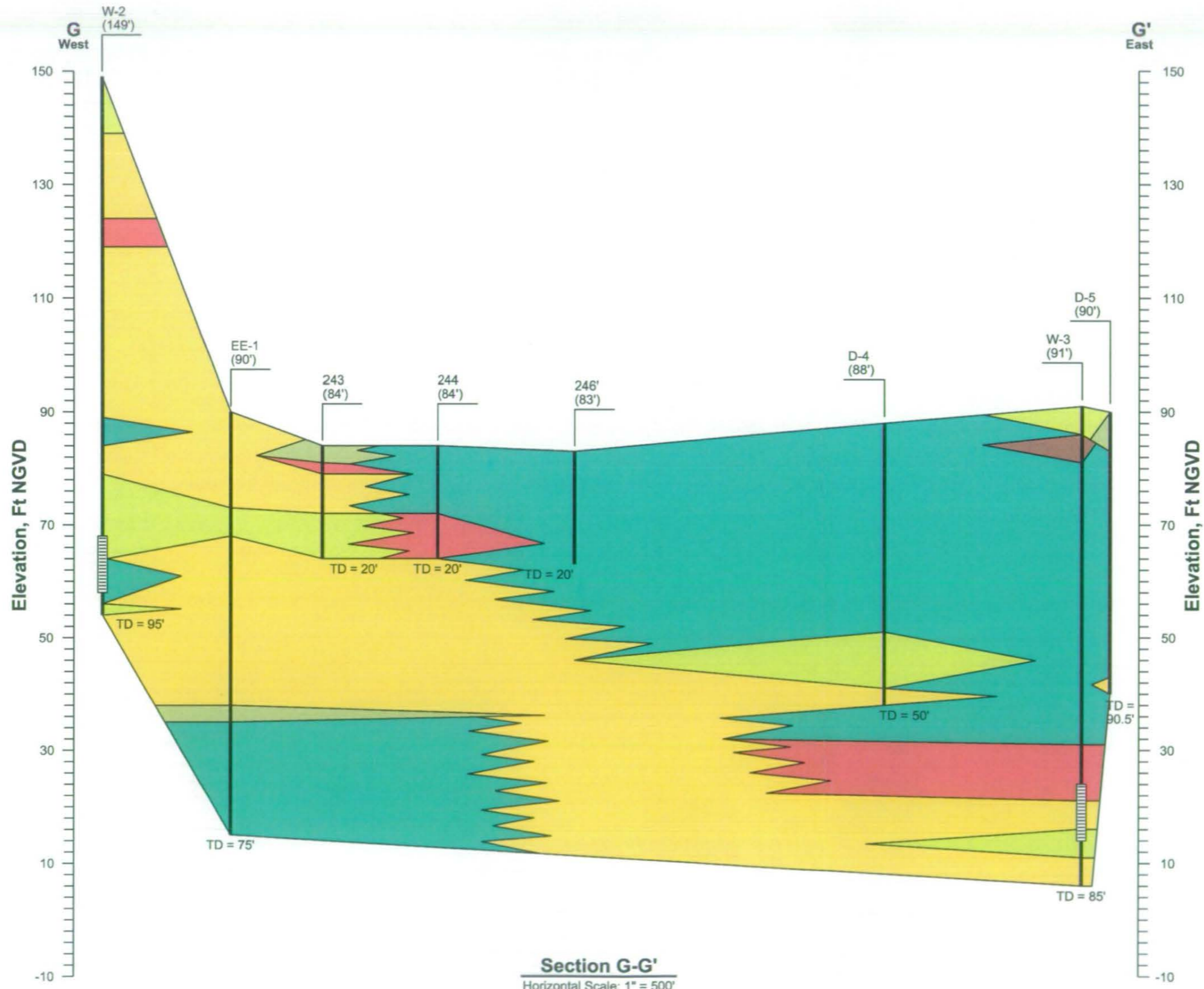
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	Checked: JHM
	Approved: RS
	Date: 09/18/06
	Dwg. No.: 01-0009-B017

Figure G-1






Legend

- Sand
- Silty Sand / Sandy Silt / Silt
- Sandy Clay
- Silty Clay
- Clay
- Clayey Silt
- Clayey Sand
- Screen Interval
- (114') Elevation, Ft NGVD
- TD Total Depth

Note:

Stratigraphy between boring are inferred. Actual conditions may vary.

Section G-G'
 Horizontal Scale: 1" = 500'
 Vertical Scale: 1" = 20'



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 Rodemacher Power Station

Geologic Cross Sections G-G'

Rapides Parish, Louisiana


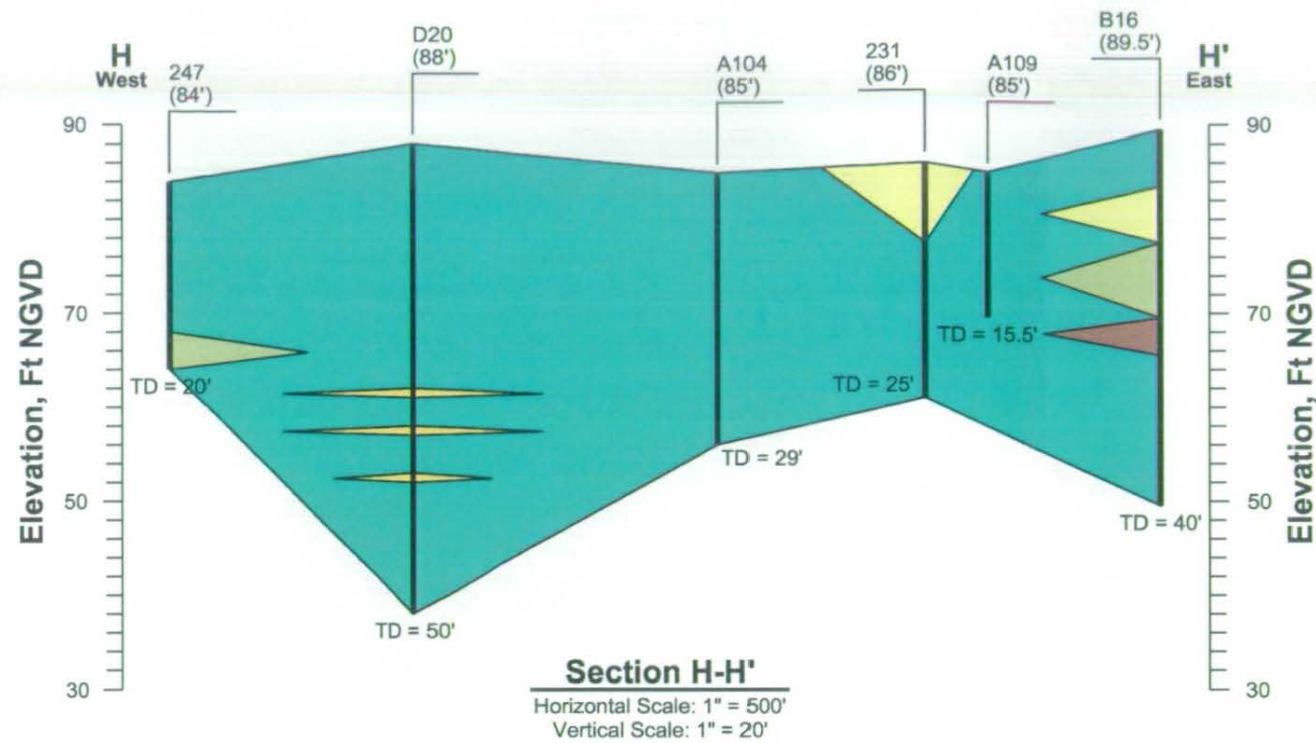
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Figure G-5

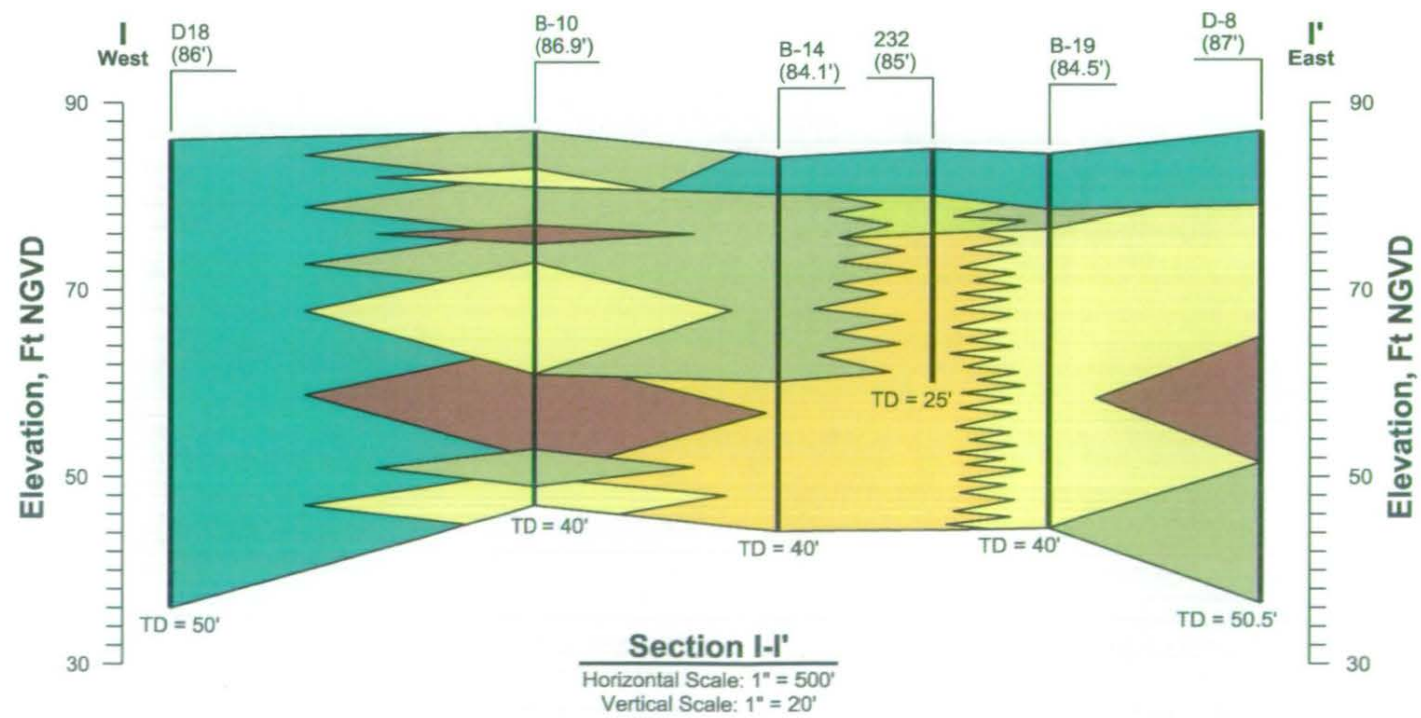



Legend

- Sand
- Silty Sand / Sandy Silt / Silt
- Sandy Clay
- Silty Clay
- Clay
- Clayey Silt
- Clayey Sand
- Screen Interval
- (114') Elevation, Ft NGVD
- TD Total Depth

Note:

Stratigraphy between boring are inferred. Actual conditions may vary.





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 Rodemacher Power Station

**Geologic Cross Sections
 H-H' and I-I'**

Rapides Parish, Louisiana


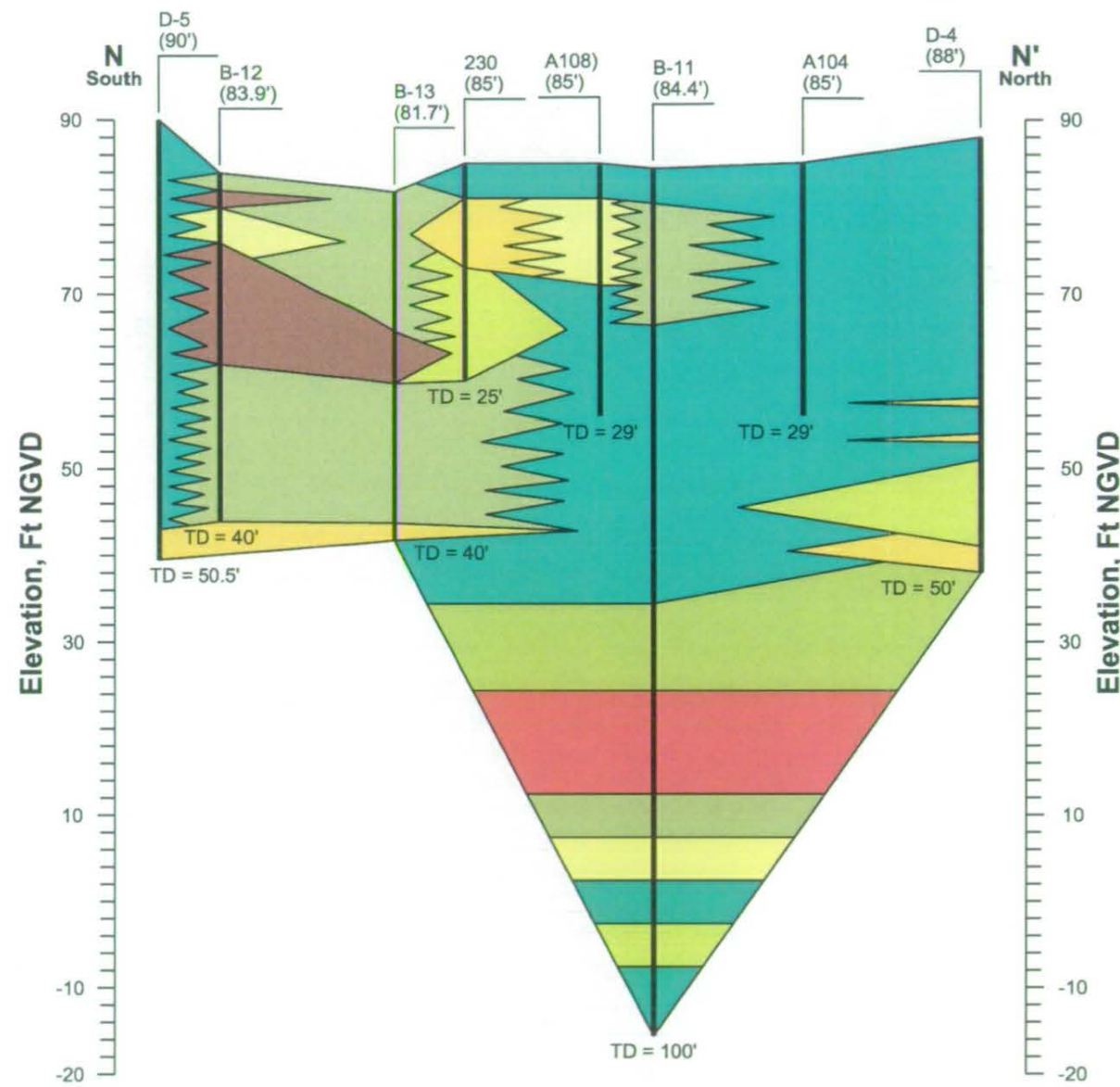
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	Dwg. No.: 01-0009-B009

Figure G-6




Section N-N'
 Horizontal Scale: 1" = 500'
 Vertical Scale: 1" = 20'

Legend

- Sand
- Silty Sand / Sandy Silt / Silt
- Sandy Clay
- Silty Clay
- Clay
- Clayey Silt
- Clayey Sand
- Wood / Clay
- Screen Interval
- (114') Elevation, Ft NGVD
- TD Total Depth

Note:

Stratigraphy between boring are inferred. Actual conditions may vary.



CLECO Power LLC
 Rodemacher Power Station

Geologic Cross Section N-N'

Rapides Parish, Louisiana


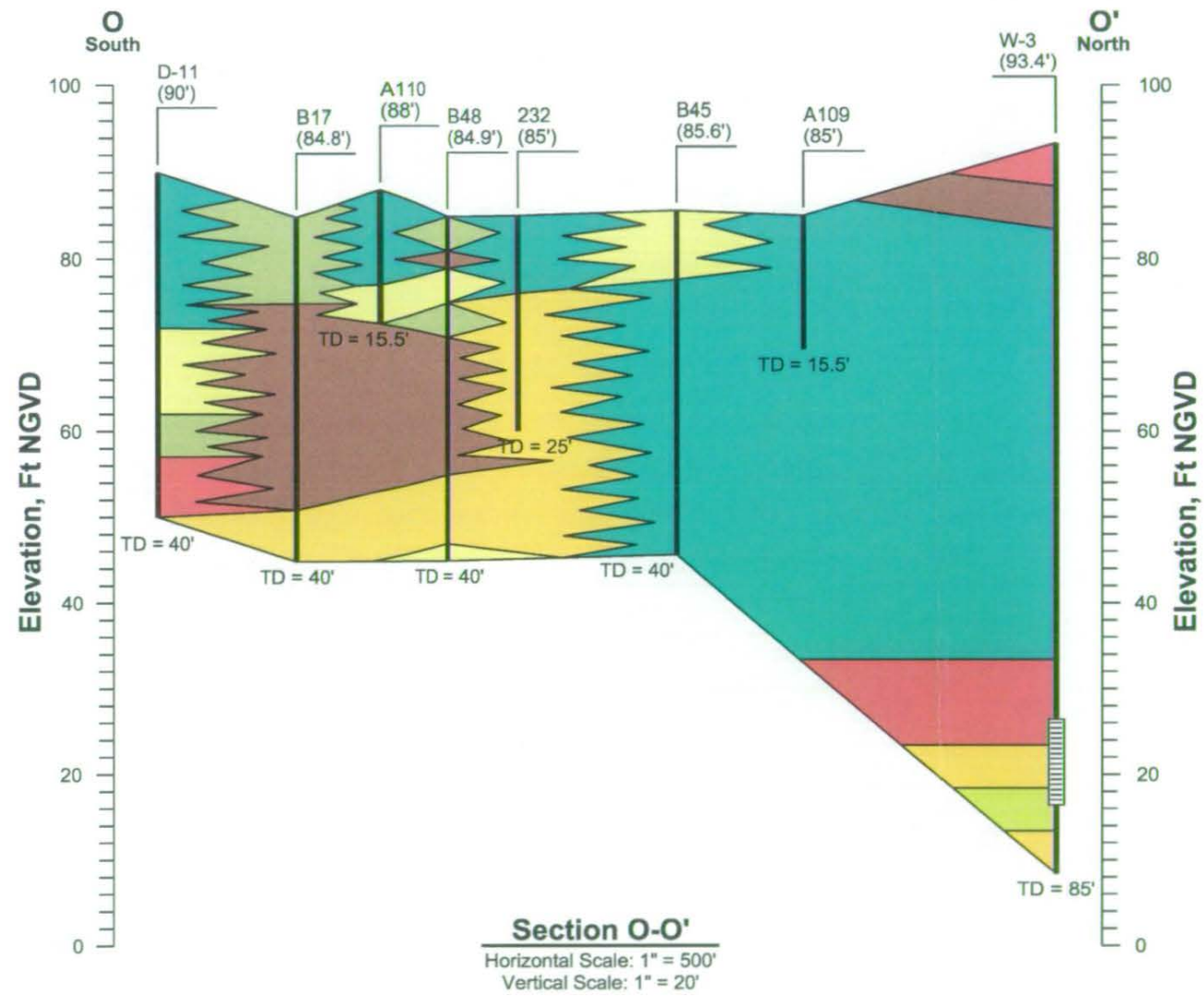
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	Checked: JHM
	Approved: RS
	Date: 06/15/05
	Dwg. No.: 01-0009-B014

Figure G-11




Legend

- Sand
- Silty Sand / Sandy Silt / Silt
- Sandy Clay
- Silty Clay
- Clay
- Clayey Silt
- Clayey Sand
- Screen Interval
- (114') Elevation, Ft NGVD
- TD Total Depth

Note:

Stratigraphy between boring are inferred. Actual conditions may vary.



CLECO Power LLC
 Rodemacher Power Station

Geologic Cross Section O-O'

Rapides Parish, Louisiana


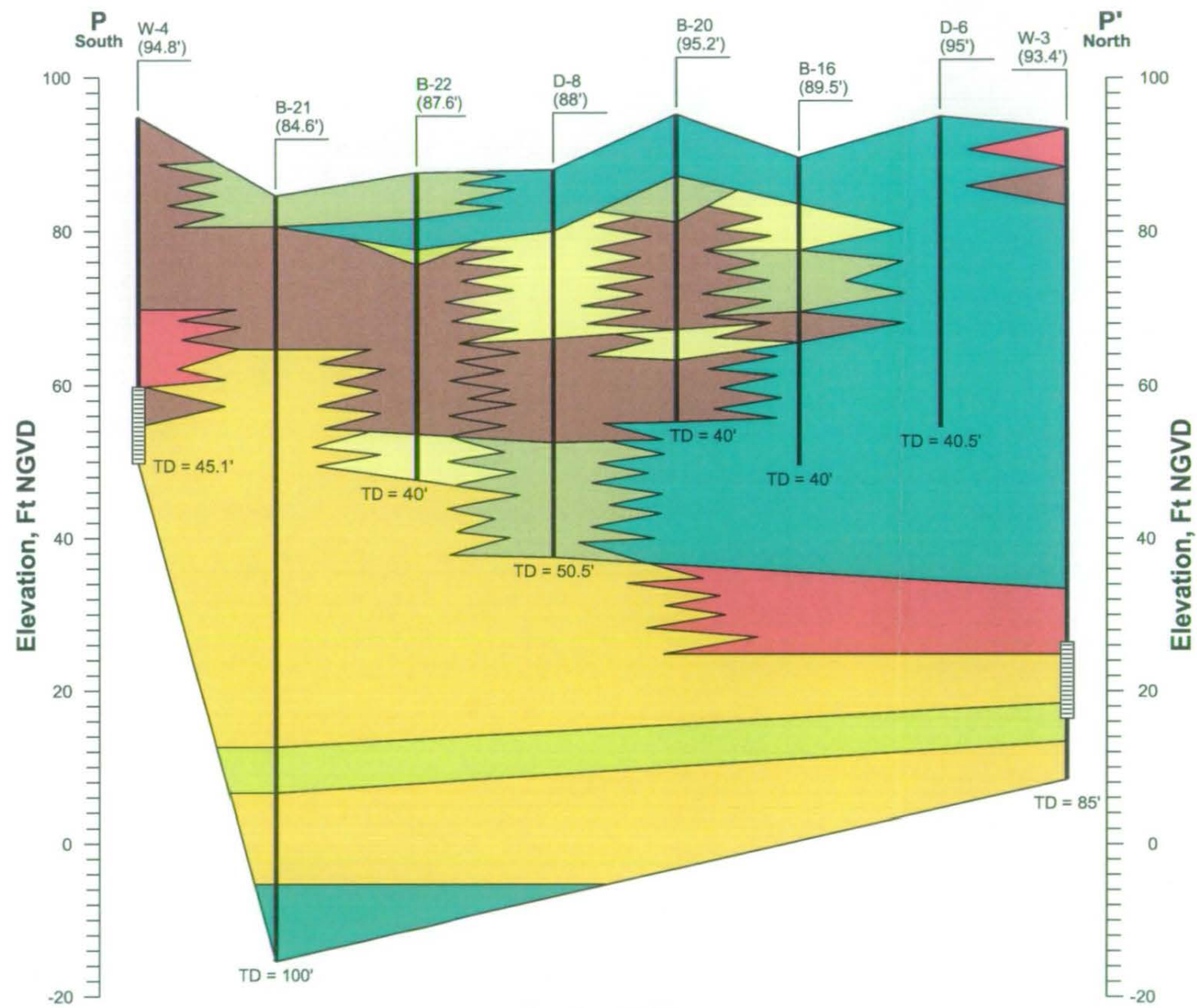
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	Approved: RS
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Figure G-12





Section P-P'
 Horizontal Scale: 1" = 500'
 Vertical Scale: 1" = 20'

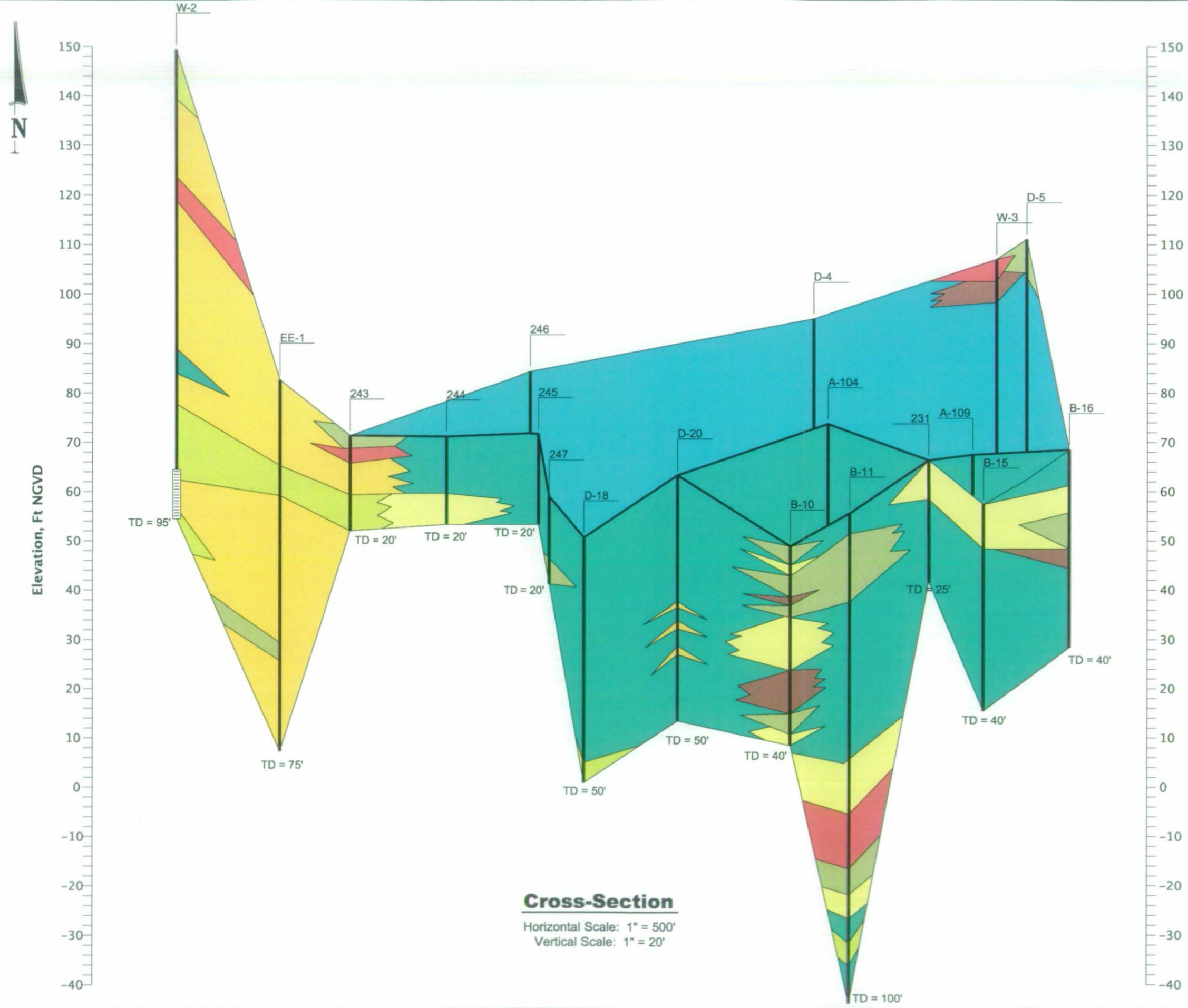
Legend

- Sand
- Silty Sand / Sandy Silt / Silt
- Sandy Clay
- Silty Clay
- Clay
- Clayey Silt
- Clayey Sand
- Screen Interval
- (114') Elevation, Ft NGVD
- TD Total Depth

Note:

Stratigraphy between boring are inferred. Actual conditions may vary.

	
Rodemacher Power Station	
Geologic Cross Section P-P'	
Rapides Parish, Louisiana	
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	Checked: JHM
	Approved: RS
	Date: 06/10/05
	Dwg. No.: 01-0009-B016
Figure G-13	



Legend


- Sand
- Silty Sand / Sandy Silt / Silt
- Sandy Clay
- Silty Clay
- Clay
- Clayey Silt
- Clayey Sand
- Screen Interval
- TD Total Depth

Note:

Stratigraphy between boring are inferred. Actual conditions may vary.

Cross-Section

Horizontal Scale: 1" = 500'
Vertical Scale: 1" = 20'



CLECO Power LLC
Rodemacher Power Station

Isometric Soil Profile
Bottom Ash and Fly Ash Pond

Rapides Parish, Louisiana


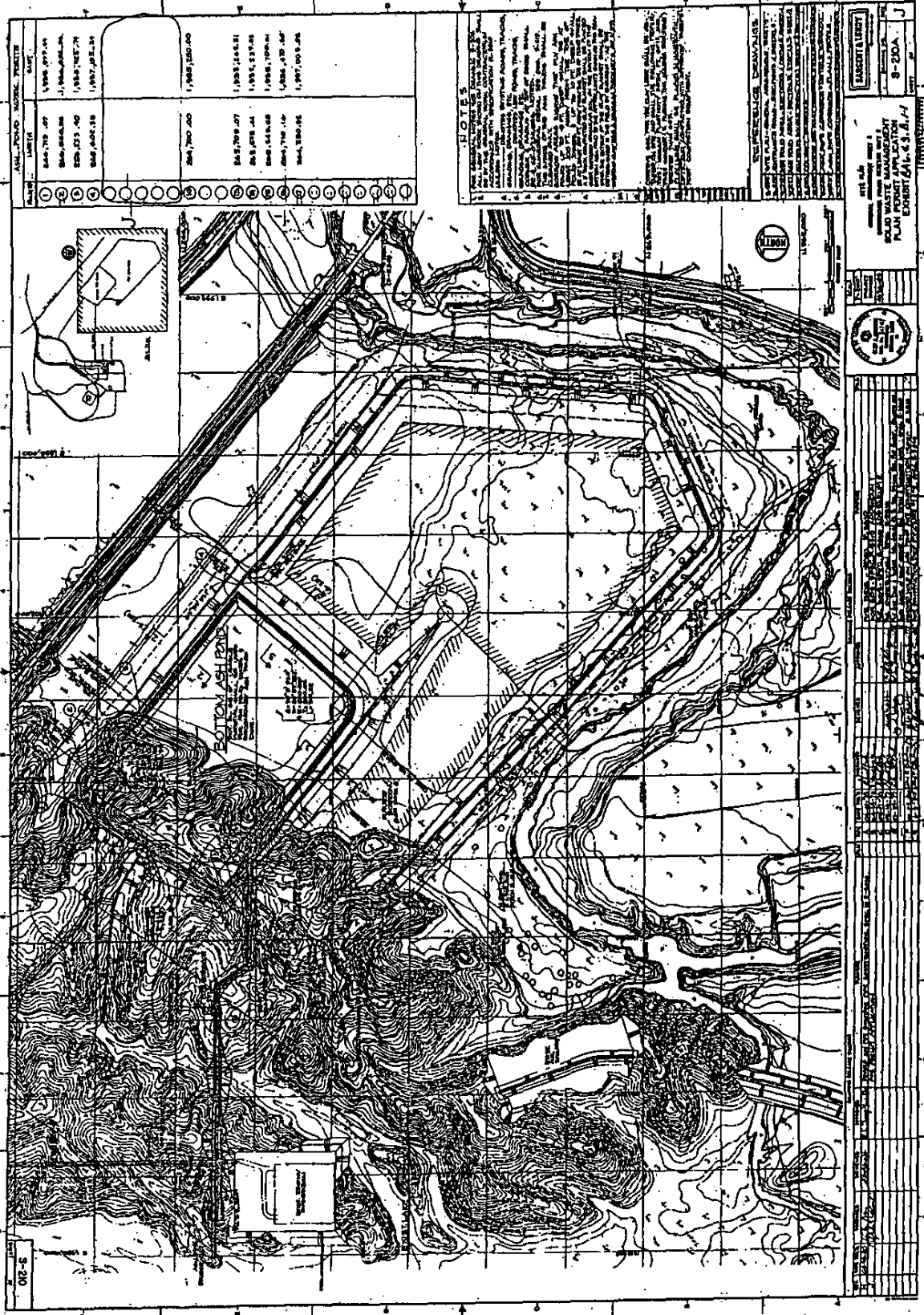
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Approved:	RS										
Date:	05/17/05										
Dwg. No.:	01-0009-C004										

Figure G-15



NO.	DATE	DESCRIPTION	BY	CHECKED
1	1/25/68	PRELIMINARY DESIGN	J. J. [unclear]	[unclear]
2	1/25/68	FINAL DESIGN	J. J. [unclear]	[unclear]
3	1/25/68	CONSTRUCTION	[unclear]	[unclear]
4	1/25/68	AS-BUILT	[unclear]	[unclear]

NOTES

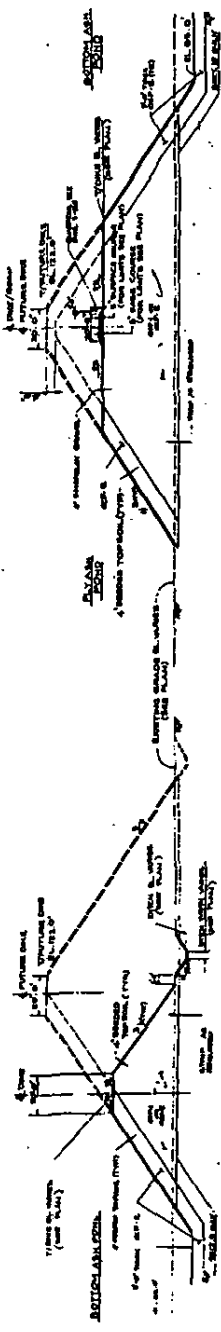
1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITIONS OF THE A.S.T.M. SPECIFICATIONS FOR STEEL AND CONCRETE.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AUTHORITIES.
3. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL ADJACENT PROPERTIES AT ALL TIMES.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES AND STRUCTURES.
5. THE CONTRACTOR SHALL MAINTAIN A RECORD OF ALL CHANGES AND VARIATIONS FROM THE ORIGINAL DESIGN.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND RESTORATION OF ALL NATURAL RESOURCES AND ENVIRONMENTAL FEATURES.
7. THE CONTRACTOR SHALL MAINTAIN A RECORD OF ALL MATERIALS AND LABOR USED IN THE CONSTRUCTION.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND RESTORATION OF ALL EXISTING INFRASTRUCTURE.
9. THE CONTRACTOR SHALL MAINTAIN A RECORD OF ALL INSPECTIONS AND TESTS PERFORMED DURING CONSTRUCTION.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND RESTORATION OF ALL EXISTING HISTORIC STRUCTURES AND MONUMENTS.

PROJECT & CLIENT

PROJECT NO. 1
 CLIENT: [unclear]
 TITLE: [unclear]
 SCALE: 1" = 100'

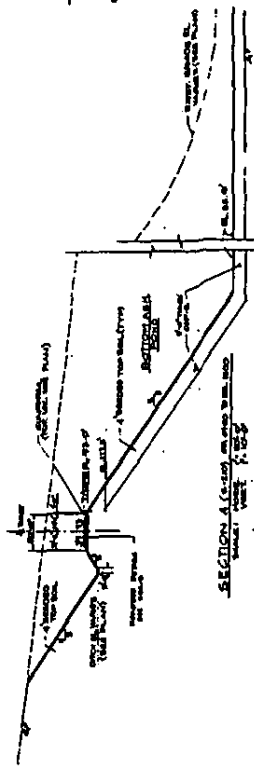
02-8

3-231

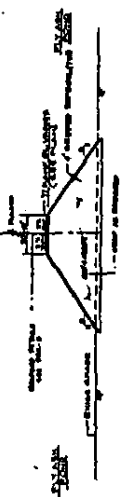


SECTION 3 (S-110) and SECTION 10 (S-100) diagrams showing waste management structures and flow paths.

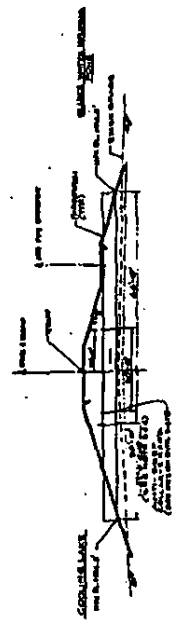
SECTION 7 (S-110) and SECTION 9 (S-100) diagrams showing waste management structures and flow paths.



SECTION 5 (S-100) diagram showing waste management structures and flow paths.



SECTION 6 (S-110) diagram showing waste management structures and flow paths.



SECTION 7 (S-110) diagram showing waste management structures and flow paths.

NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.
3. ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL BE APPROVED BY THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
4. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL ADJACENT PROPERTIES AND PUBLIC UTILITIES AT ALL TIMES.
5. ALL EXCAVATIONS SHALL BE PROTECTED BY SHIELDING OR SHIELDING.
6. ALL UTILITIES SHALL BE MARKED AND DEPTH VERIFIED BEFORE ANY EXCAVATION.
7. ALL WORK SHALL BE COMPLETED WITHIN THE SPECIFIED TIME FRAME.
8. THE CONTRACTOR SHALL MAINTAIN A DETAILED RECORD OF ALL WORK PERFORMED AND MATERIALS USED.
9. ALL WORK SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE ENGINEER AT ALL STAGES.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND RESTORATION OF ALL ADJACENT PROPERTIES AND PUBLIC UTILITIES.

REFERENCE DRAWINGS

1. SITE PLAN
2. GENERAL NOTES
3. SPECIFICATIONS
4. PERMITS AND APPROVALS
5. ADJACENT PROPERTY RECORDS
6. PUBLIC UTILITIES RECORDS
7. ENVIRONMENTAL ASSESSMENT REPORTS
8. GEOTECHNICAL INVESTIGATION REPORTS
9. HYDROLOGICAL STUDY REPORTS
10. SOIL TEST RESULTS
11. AIR QUALITY MONITORING DATA
12. WATER QUALITY MONITORING DATA
13. WASTE MANAGEMENT PLAN
14. LANDFILL CLOSURE PLAN
15. WASTE TREATMENT PLANT DESIGN
16. SEWERAGE SYSTEM DESIGN
17. DRAINAGE CANAL DESIGN
18. PIT DESIGN
19. LANDFILL CLOSURE PLAN
20. WASTE TREATMENT PLANT DESIGN
21. SEWERAGE SYSTEM DESIGN
22. DRAINAGE CANAL DESIGN
23. PIT DESIGN

PROJECT INFORMATION

PROJECT NAME: WASTE MANAGEMENT PLAN FOR THE [REDACTED] LANDFILL

CLIENT: [REDACTED]

DATE: [REDACTED]

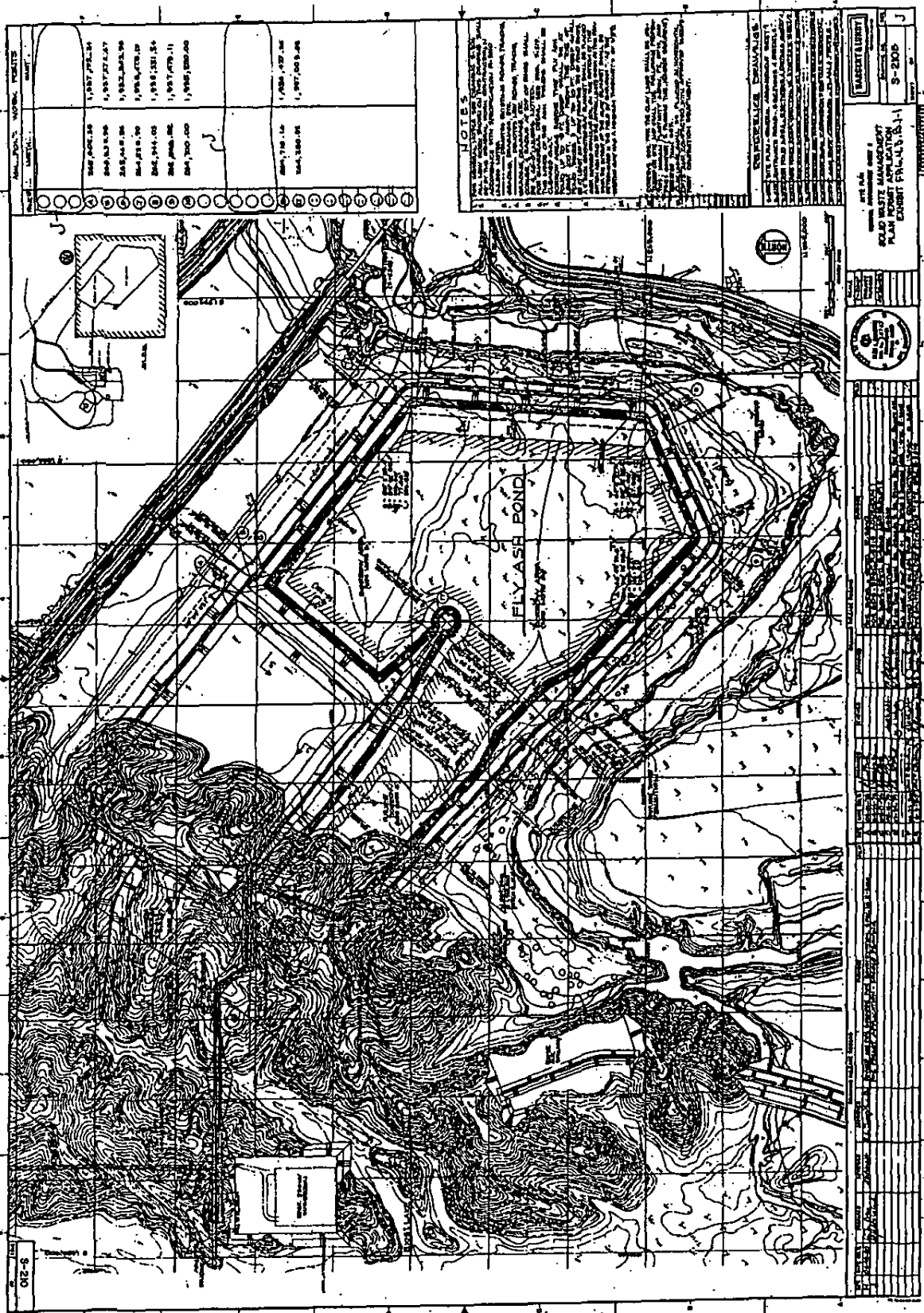
SCALE: [REDACTED]

PROJECT NUMBER: [REDACTED]

PROJECT LOCATION: [REDACTED]

PROJECT STATUS: [REDACTED]

NO.	DESCRIPTION	DATE	BY	APP'D BY
1	ISSUED FOR PERMITTING			
2	ISSUED FOR CONSTRUCTION			
3	ISSUED FOR CLOSURE			
4	ISSUED FOR FINAL REPORT			
5	ISSUED FOR [REDACTED]			
6	ISSUED FOR [REDACTED]			
7	ISSUED FOR [REDACTED]			
8	ISSUED FOR [REDACTED]			
9	ISSUED FOR [REDACTED]			
10	ISSUED FOR [REDACTED]			
11	ISSUED FOR [REDACTED]			
12	ISSUED FOR [REDACTED]			
13	ISSUED FOR [REDACTED]			
14	ISSUED FOR [REDACTED]			
15	ISSUED FOR [REDACTED]			
16	ISSUED FOR [REDACTED]			
17	ISSUED FOR [REDACTED]			
18	ISSUED FOR [REDACTED]			
19	ISSUED FOR [REDACTED]			
20	ISSUED FOR [REDACTED]			
21	ISSUED FOR [REDACTED]			
22	ISSUED FOR [REDACTED]			
23	ISSUED FOR [REDACTED]			
24	ISSUED FOR [REDACTED]			
25	ISSUED FOR [REDACTED]			
26	ISSUED FOR [REDACTED]			
27	ISSUED FOR [REDACTED]			
28	ISSUED FOR [REDACTED]			
29	ISSUED FOR [REDACTED]			
30	ISSUED FOR [REDACTED]			
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33	ISSUED FOR [REDACTED]			
34	ISSUED FOR [REDACTED]			
35	ISSUED FOR [REDACTED]			
36	ISSUED FOR [REDACTED]			
37	ISSUED FOR [REDACTED]			
38	ISSUED FOR [REDACTED]			
39	ISSUED FOR [REDACTED]			
40	ISSUED FOR [REDACTED]			
41	ISSUED FOR [REDACTED]			
42	ISSUED FOR [REDACTED]			
43	ISSUED FOR [REDACTED]			
44	ISSUED FOR [REDACTED]			
45	ISSUED FOR [REDACTED]			
46	ISSUED FOR [REDACTED]			
47	ISSUED FOR [REDACTED]			
48	ISSUED FOR [REDACTED]			
49	ISSUED FOR [REDACTED]			
50	ISSUED FOR [REDACTED]			



NO.	DESCRIPTION	AMOUNT	TOTAL
1	1,000,000.00		1,000,000.00
2	1,000,000.00		2,000,000.00
3	1,000,000.00		3,000,000.00
4	1,000,000.00		4,000,000.00
5	1,000,000.00		5,000,000.00
6	1,000,000.00		6,000,000.00
7	1,000,000.00		7,000,000.00
8	1,000,000.00		8,000,000.00
9	1,000,000.00		9,000,000.00
10	1,000,000.00		10,000,000.00
11	1,000,000.00		11,000,000.00
12	1,000,000.00		12,000,000.00
13	1,000,000.00		13,000,000.00
14	1,000,000.00		14,000,000.00
15	1,000,000.00		15,000,000.00
16	1,000,000.00		16,000,000.00
17	1,000,000.00		17,000,000.00
18	1,000,000.00		18,000,000.00
19	1,000,000.00		19,000,000.00
20	1,000,000.00		20,000,000.00

NOTES

1. This map was prepared from aerial photographs taken on 10/15/54 and 10/16/54. The contour interval is 10 feet. The map is based on a datum of 1929.

2. The map shows the location of the Fly Ash Pond and the proposed dam. The dam is shown as a solid line with a height of 10 feet. The pond is shown as a shaded area.

3. The map also shows the location of the proposed road and the existing road. The proposed road is shown as a dashed line and the existing road as a solid line.

4. The map is based on a datum of 1929. The elevation of the datum is 100 feet above sea level.

CONSTRUCTION SPECIFICATIONS

1. The dam shall be constructed of concrete. The dam shall be 10 feet high and 10 feet wide at the top. The dam shall have a slope of 1:1 on both sides.

2. The pond shall be constructed of earth. The pond shall be 100 feet long and 10 feet deep. The pond shall have a slope of 1:1 on both sides.

3. The road shall be constructed of gravel. The road shall be 10 feet wide and 10 feet deep. The road shall have a slope of 1:1 on both sides.

PROJECT DATA

DATE: 10/15/54

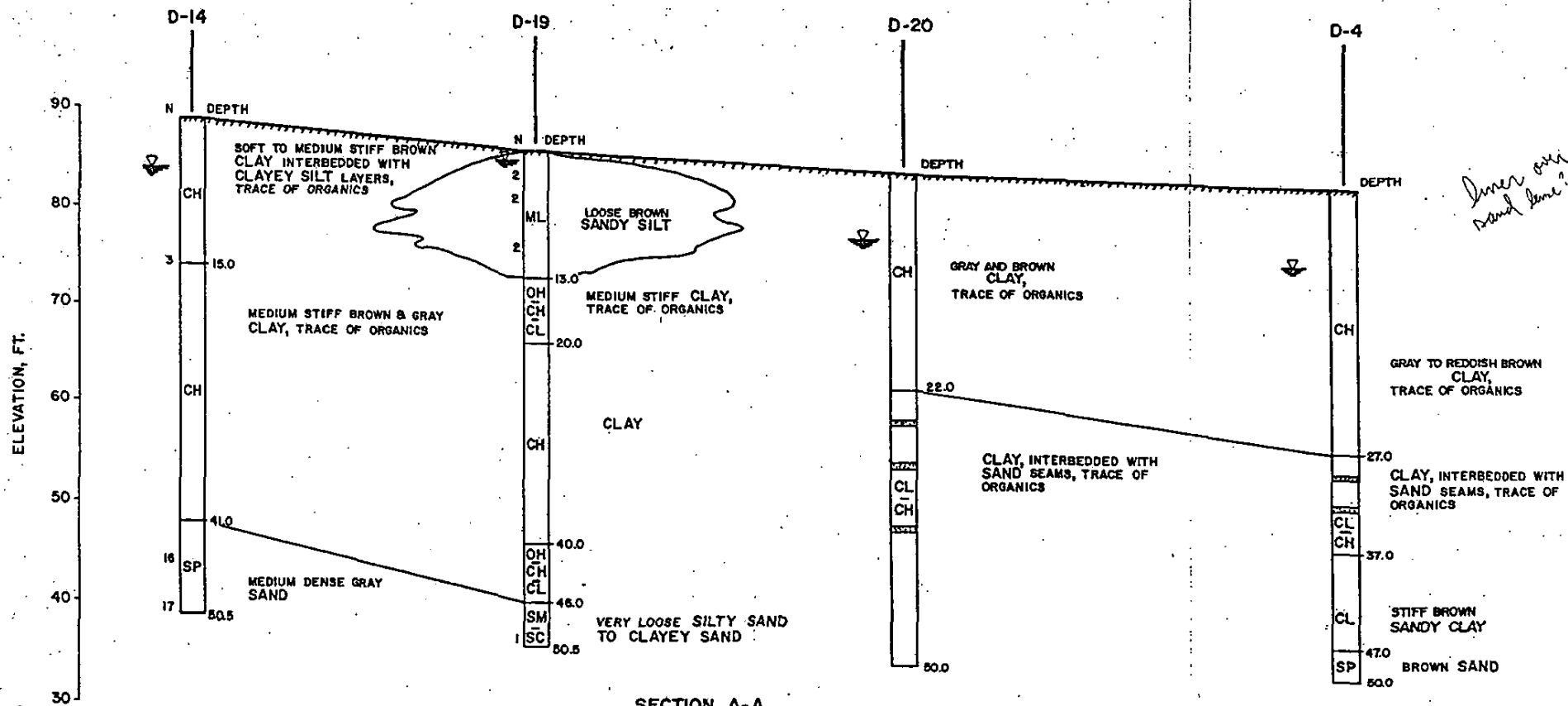
SCALE: 1" = 100'

PROJECT NO.: 5-2005

DESIGNED BY: [Name]

CHECKED BY: [Name]

NO.	DESCRIPTION	AMOUNT	TOTAL
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3	1,000,000.00		3,000,000.00
4	1,000,000.00		4,000,000.00
5	1,000,000.00		5,000,000.00
6	1,000,000.00		6,000,000.00
7	1,000,000.00		7,000,000.00
8	1,000,000.00		8,000,000.00
9	1,000,000.00		9,000,000.00
10	1,000,000.00		10,000,000.00
11	1,000,000.00		11,000,000.00
12	1,000,000.00		12,000,000.00
13	1,000,000.00		13,000,000.00
14	1,000,000.00		14,000,000.00
15	1,000,000.00		15,000,000.00
16	1,000,000.00		16,000,000.00
17	1,000,000.00		17,000,000.00
18	1,000,000.00		18,000,000.00
19	1,000,000.00		19,000,000.00
20	1,000,000.00		20,000,000.00



0 200'
HORIZONTAL
SCALE IN FEET

LEGEND

N = STANDARD PENETRATION TEST,
BLOWS PER FOOT

▽ = GROUND WATER LEVEL AFTER
24 HOURS OF DRILLING

----- = BOTTOM OF POND (TOP OF BORINGS)

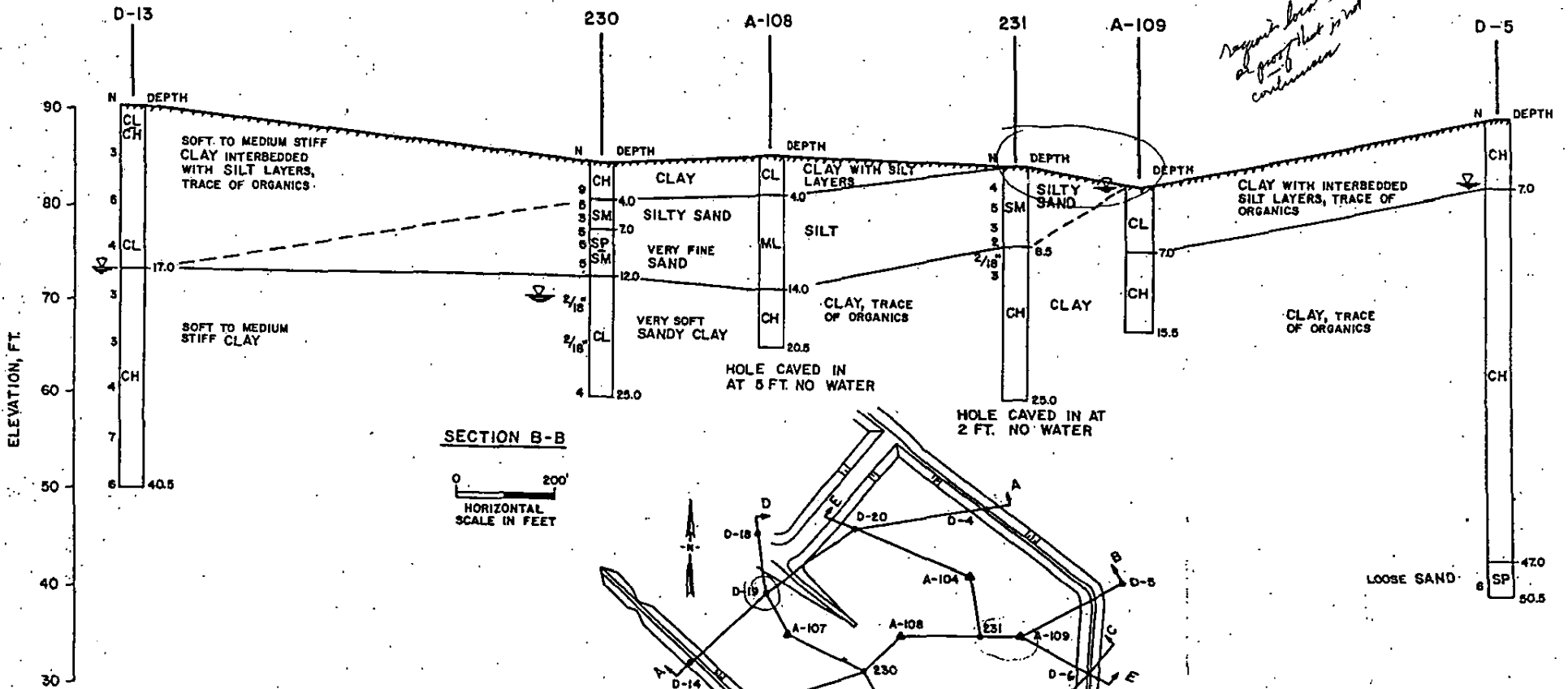
NOTE:
FOR BORING LOCATION
PLAN SEE SECTION B-B

GENERALIZED SUBSURFACE DIAGRAM - SECTION A-A FLY ASH POND

RODEMACHER POWER STATION UNIT 2 SOLID WASTE MANAGEMENT PLAN PERMIT APPLICATION

EXHIBIT PA 6.4.3.B.2-2

Dimer over sand line?

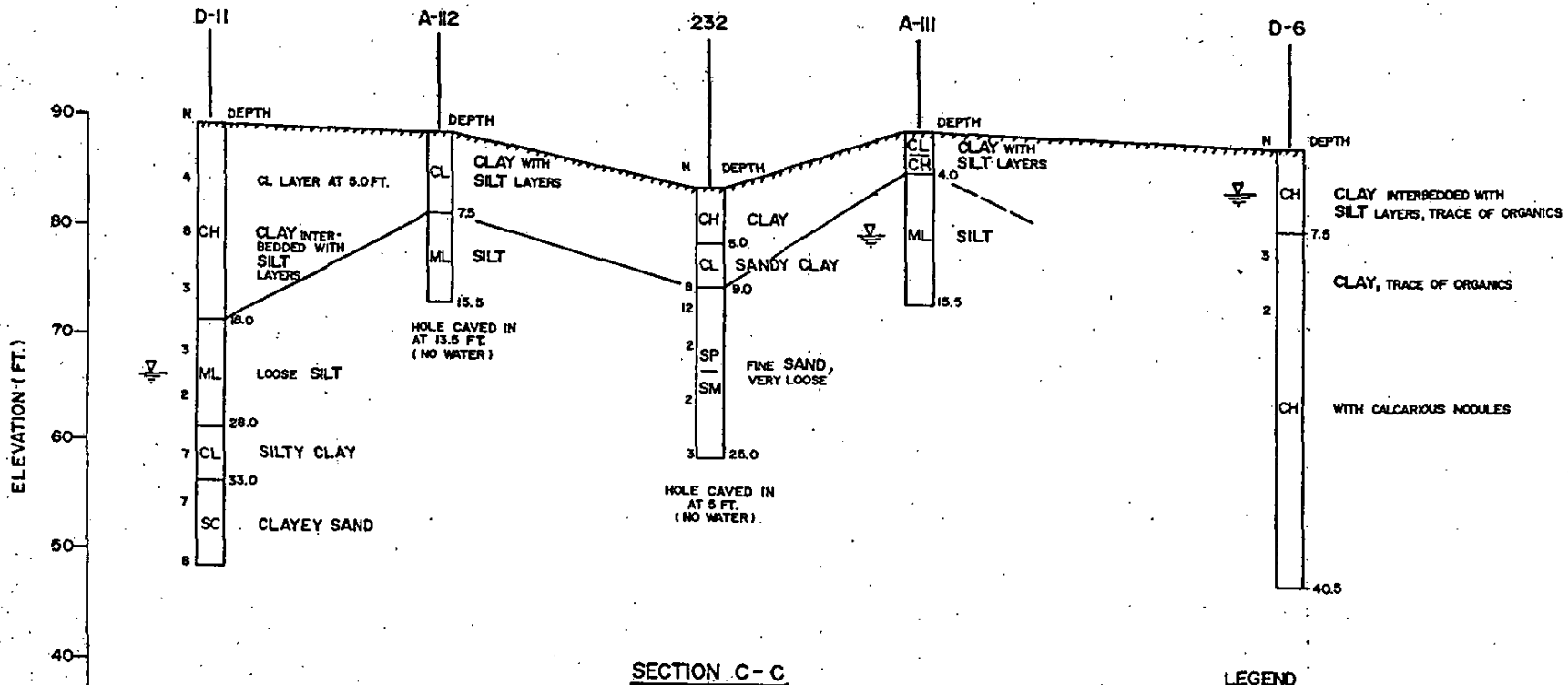


requires local lines of proof that is not continuous

HOLE CAVED IN AT 5 FT. NO WATER

HOLE CAVED IN AT 2 FT. NO WATER

LOOSE SAND



LEGEND

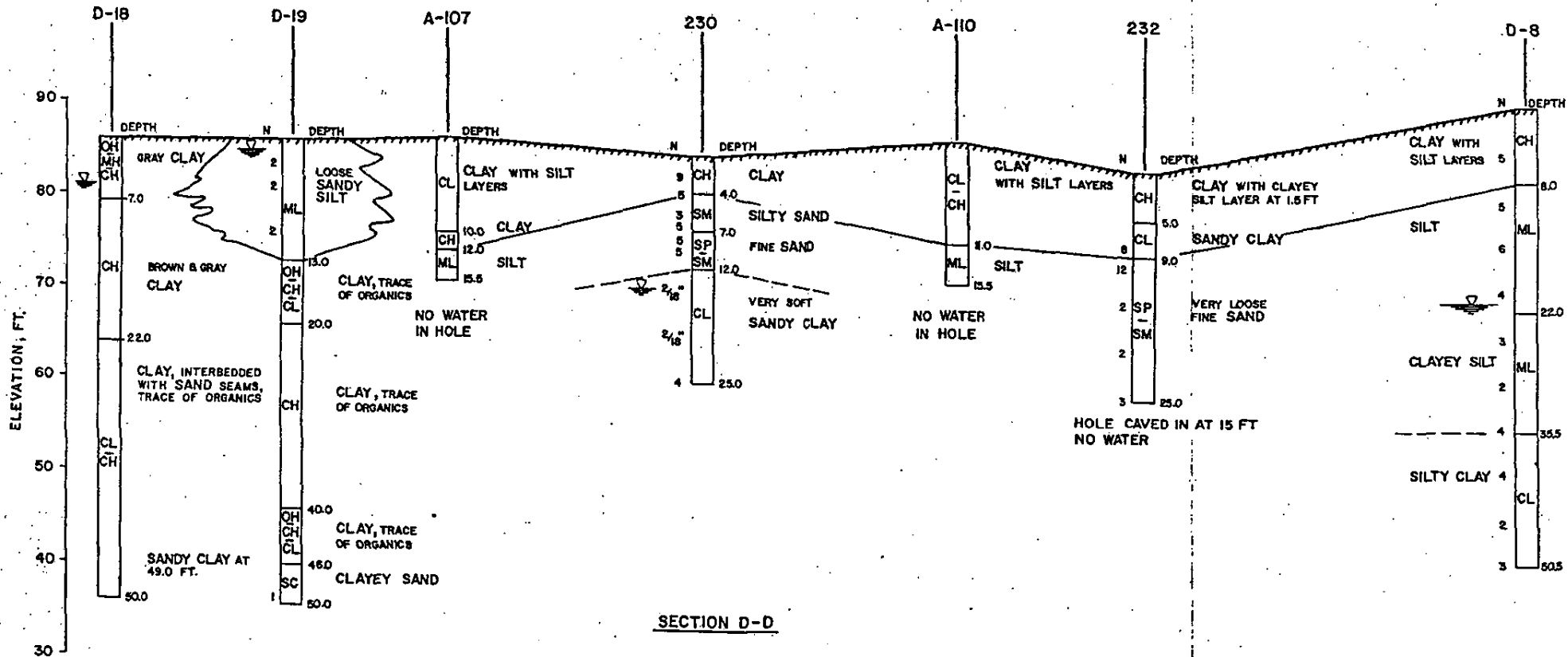
- N = STANDARD PENETRATION TEST, BLOWS PER FOOT
- = GROUND WATER LEVEL AFTER 24 HRS OF DRILLING
- = BOTTOM OF POND (TOP OF BORINGS)

NOTE:
FOR BORING LOCATION
PLAN, SEE SECTION B-B

GENERALIZED SUBSURFACE DIAGRAM -
SECTION C-C
FLY ASH POND

RODEMACHER POWER STATION UNIT 2
SOLID WASTE MANAGEMENT PLAN
PERMIT APPLICATION

EXHIBIT FA 6.4.3.B.2-4



LEGEND

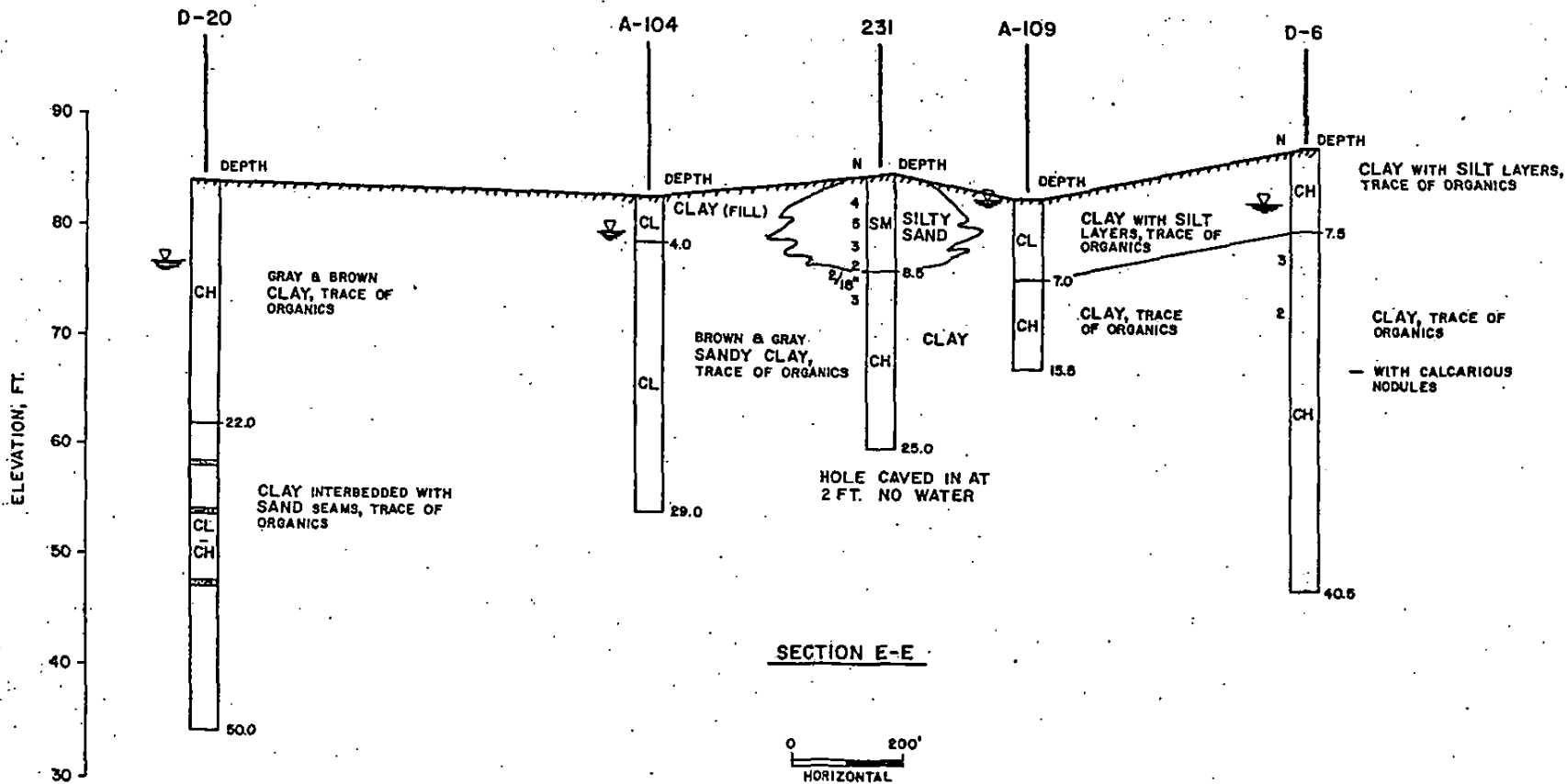
N = STANDARD PENETRATION TEST, BLOWS PER FOOT

GROUND WATER LEVEL AFTER 24 HOURS OF DRILLING

BOTTOM OF POND (TOP OF BORINGS)

NOTE: FOR BORING LOCATION PLAN, SEE SECTION B-B

GENERALIZED SUBSURFACE DIAGRAM - SECTION D-D
 FLY ASH POND
 RODEMACHER POWER STATION UNIT 2
 SOLID WASTE MANAGEMENT PLAN
 PERMIT APPLICATION
 EXHIBIT PA 6.4.3.B.2-5



LEGEND

N = STANDARD PENETRATION TEST, BLOWS PER FOOT

▽ GROUND WATER LEVEL AFTER 24 HOURS OF DRILLING

~~~~~ BOTTOM OF POND (TOP OF BORINGS)

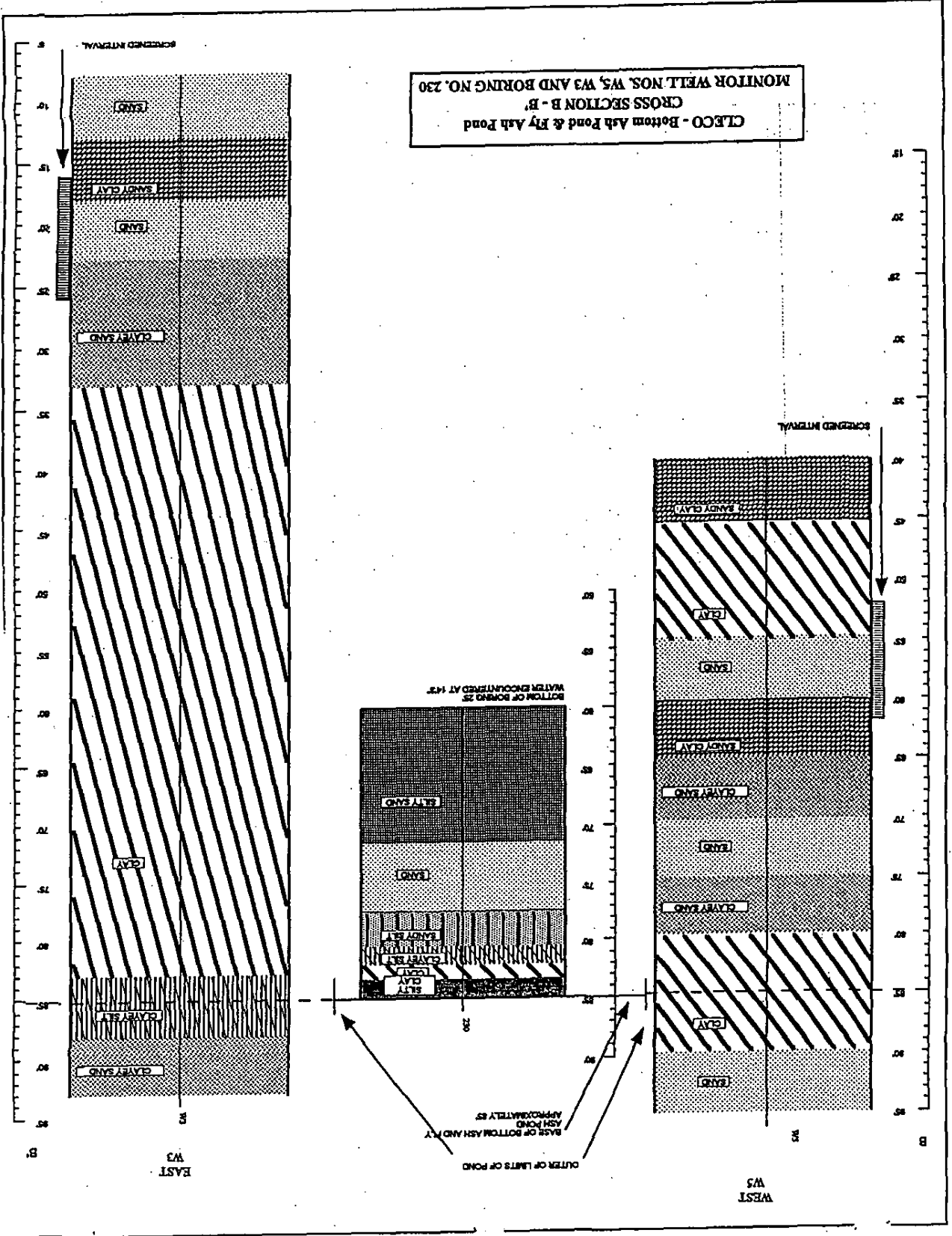
NOTE:  
FOR BORING LOCATION PLAN, SEE SECTION B-B

GENERALIZED SUBSURFACE DIAGRAM - SECTION E-E  
FLY ASH POND

RODEMACHER POWER STATION UNIT 2  
SOLID WASTE MANAGEMENT PLAN  
PERMIT APPLICATION

EXHIBIT PA 6.4.3.B.2-6

CLECO - Bottom Ash Pond & Fly Ash Pond  
 CROSS SECTION B - B'  
 MONITOR WELL NOS. W5, W3 AND BORING NO. 230



## **APPENDIX D - DESIGN DOCUMENTS**

## **521.F. FACILITY PLANS AND SPECIFICATIONS**

### **1. CERTIFICATION**

Appendix D contains a certification by the person who prepared the permit application in accordance with 33.VII.521.F.1

### **2. INFORMATION REQUIRED FOR TYPE I AND II FACILITIES**

Exhibit 19 illustrates the Fly Ash Pond with original and final topographic contours. The Fly Ash Pond is located predominately in alluvial deposits of the Red River Valley. The pond was constructed by building a 20-foot wide dike around the area to be used. At elevation 103, the surface area of the pond will be 109 acres. The slope of the dikes are 3 horizontal to 1 vertical. The interior side of the dikes have a minimum 3-foot thick layer of compacted clay. There is an effective horizontal clay layer of about 10 feet.

#### **2.a. Topography**

Typical cross sections of the Fly Ash Pond are similar to those of the adjacent Bottom Ash Pond as shown in Exhibit 16. The dry fly ash trucked to the pond will be spread and sprayed for dust control as well as for compaction by dozers spreading the material. Rain water which will pond on the lowest sections of the Fly Ash Pond will be used for spraying the ash. The bottom of the Fly Ash Pond and completed dikes will have a minimum 3-foot thickness of relatively impermeable clay. This should protect the underlying ground water. furthermore, the waste characteristics of the ash are such that no harmful effects should occur to the quality of ground water.

#### **2.b. Levee Construction**

The levees were constructed using on-site materials. Since additional construction is not anticipated, calculations are not applicable.

#### **2.c. Construction Materials**

Very plastic clay soils underlay the Fly Ash Pond and excavation of these soils is underway to form a 3-foot thick layer for the diked Fly Ash Pond. The soil liner is a CH material. Cross sections showing soil profiles are illustrated in Exhibits 20 through 24.

### **3. INFORMATION REQUIRED FOR TYPE I, II, AND III LANDFILLS**

#### **3.a. Daily Fill and Cover**

This section is not applicable to surface impoundments.

#### **3.b. Cover Material**

This section is not applicable to surface impoundments (see above).

521.F (cont'd)

4. PREVENTION OF GROUNDWATER CONTAMINATION

4.a. Representative Cross-Sections

Cross sections of the subsurface conditions are shown in Exhibits 20 through 24.

4.b. Liner System

An engineered liner system was not included as part of the original design of the facility, however, as shown in the geotechnical information, the soils in the area of the pond are primarily clays and silty clays.

4.c. Leachate Collection and Removal System

A leachate collection and removal system was not included as part of the original design of the facility.

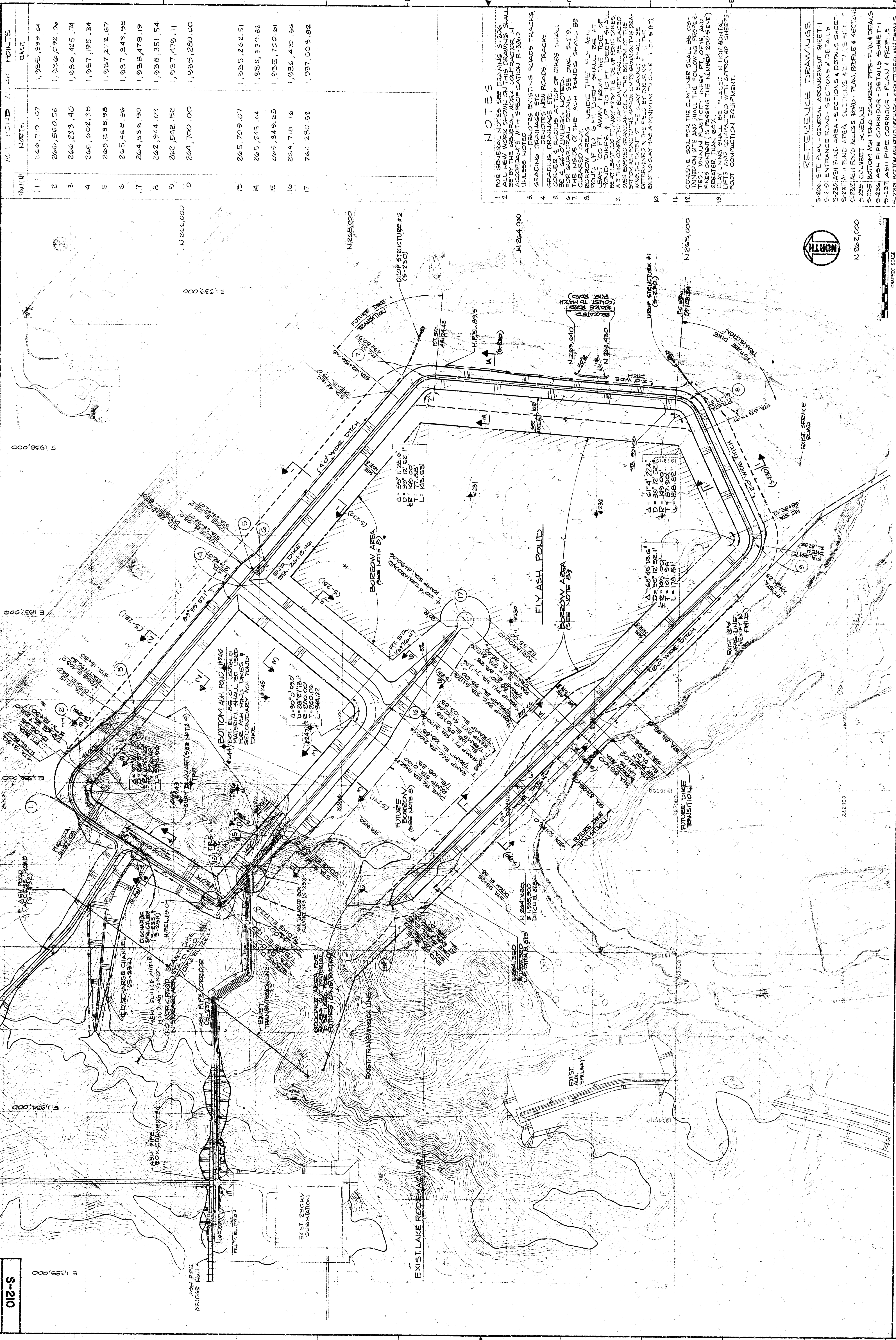
No leachate collection and/or treatment system is planned for the Fly Ash Pond since it is designed to contain liquids.

5. GROUNDWATER MONITORING

Appendix E contains a comprehensive groundwater monitoring program.

6. GAS COLLECTION AND TREATMENT SYSTEM

A gas collection and treatment system is not provided because surface impoundments do not have a potential to produce any gases.

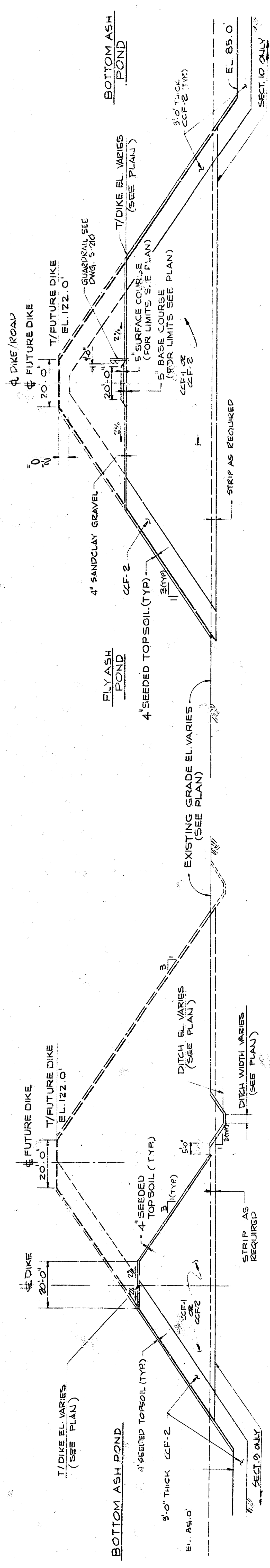


| POINT | NORTH      | EAST         |
|-------|------------|--------------|
| 1     | 266,719.07 | 1,955,899.64 |
| 2     | 266,560.56 | 1,956,092.96 |
| 3     | 266,233.40 | 1,956,425.74 |
| 4     | 265,602.38 | 1,957,195.34 |
| 5     | 265,338.98 | 1,957,272.67 |
| 6     | 265,468.86 | 1,957,343.95 |
| 7     | 264,538.90 | 1,958,478.19 |
| 8     | 262,944.03 | 1,958,351.54 |
| 9     | 262,548.52 | 1,957,479.11 |
| 10    | 264,700.00 | 1,955,280.00 |
| 11    |            |              |
| 12    |            |              |
| 13    |            |              |
| 14    |            |              |
| 15    |            |              |
| 16    |            |              |
| 17    |            |              |

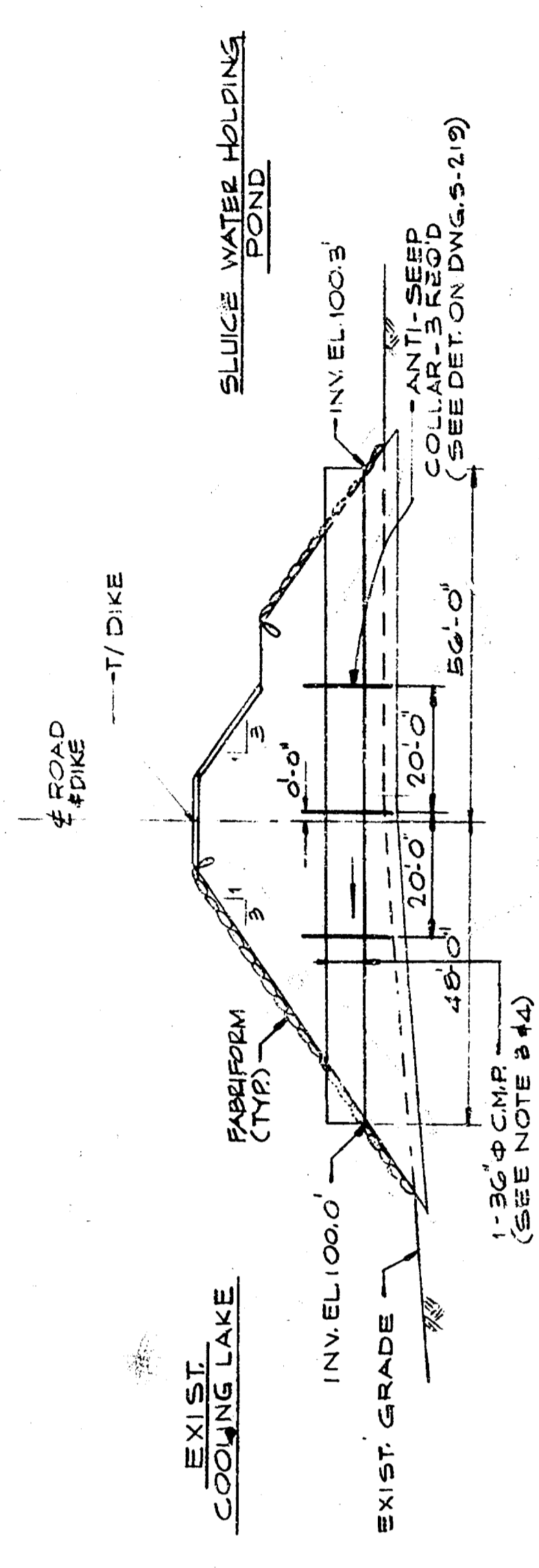
- NOTES**
- FOR GENERAL NOTES SEE DRAWING S-210.
  - ALL NEW WORK SHALL BE IN ACCORDANCE WITH THE GENERAL WORK CONTRACTORS MANUAL AND SPECIFICATION R-3810 UNLESS NOTED OTHERWISE.
  - UNLESS NOTED OTHERWISE, ALL EXISTING ROADS SHALL BE REPAIRED TO MEET THE REQUIREMENTS OF THE GENERAL WORK CONTRACTORS MANUAL AND SPECIFICATION R-3810.
  - GRADING SHALL BE DONE IN ACCORDANCE WITH THE GENERAL WORK CONTRACTORS MANUAL AND SPECIFICATION R-3810.
  - FOR SPECIAL DETAIL SEE DWG S-219.
  - FOR SPECIAL DETAIL SEE DWG S-219.
  - FOR SPECIAL DETAIL SEE DWG S-219.
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- REFERENCE DRAWINGS**
- S-206 SITE PLAN - GENERAL ARRANGEMENT SHEET 1
  - S-209 ENTRANCE ROAD - SECTIONS & DETAILS
  - S-230 ASH POND AREA - SECTIONS & DETAILS SHEET 1
  - S-231 ASH POND AREA - SECTIONS & DETAILS SHEET 2
  - S-232 ASH POND AREA - SECTIONS & DETAILS SHEET 3
  - S-233 ASH POND AREA - SECTIONS & DETAILS SHEET 4
  - S-234 ASH POND AREA - SECTIONS & DETAILS SHEET 5
  - S-235 ASH POND AREA - SECTIONS & DETAILS SHEET 6
  - S-236 ASH POND AREA - SECTIONS & DETAILS SHEET 7
  - S-237 ASH POND AREA - SECTIONS & DETAILS SHEET 8
  - S-238 ASH POND AREA - SECTIONS & DETAILS SHEET 9
  - S-239 ASH POND AREA - SECTIONS & DETAILS SHEET 10

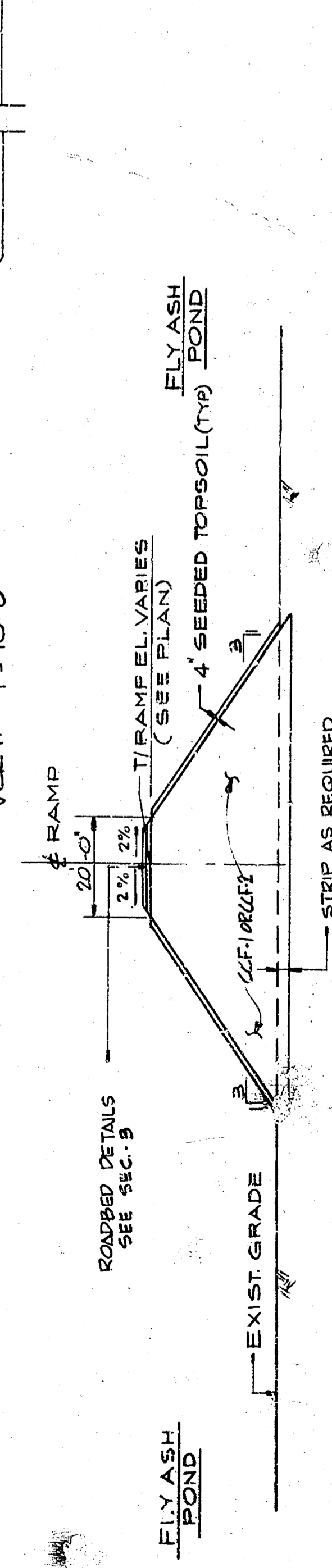
|                                     |  |                                                                                                                                          |  |
|-------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------|--|
|                                     |  | SITE PLAN<br>GENERAL ARRANGEMENT SHEET 2<br>RODENBACHER POWER STATION UNIT 2<br>CENTRAL LOUISIANA ELECTRIC CO., INC.<br>ROYCE, LOUISIANA |  |
| SCALE<br>1" = 200'<br>GRAPHIC SCALE |  | PROJECT NUMBER<br>4276-03                                                                                                                |  |
|                                     |  | DRAWING NO.<br>S-210                                                                                                                     |  |
| SHEET OF                            |  | SHEET OF                                                                                                                                 |  |
| REV. DATE RECD. APPROVED REVIEWED   |  | PURPOSE                                                                                                                                  |  |
| A 02-01-78                          |  | FOR BIDS - SPEC. R-3810 ADDENDUM 1                                                                                                       |  |
| B 02-17-78                          |  | FOR BIDS - SPEC. R-3810 ADDENDUM 2                                                                                                       |  |
| C 02-16-78                          |  | FOR BIDS - SPEC. R-3810 ADDENDUM 3                                                                                                       |  |
| D 02-16-78                          |  | FOR BIDS - SPEC. R-3810 ADDENDUM 4                                                                                                       |  |
| E 07-24-79                          |  | FOR BIDS - SPEC. R-3810 ADDENDUM 5                                                                                                       |  |
| F 01-27-80                          |  | FOR BIDS - SPEC. R-3810 ADDENDUM 6                                                                                                       |  |
| G 02-09-80                          |  | FOR BIDS - SPEC. R-3810 ADDENDUM 7                                                                                                       |  |
| H 06-10-80                          |  | FOR BIDS - SPEC. R-3810 ADDENDUM 8                                                                                                       |  |
| I 07-03-80                          |  | FOR BIDS - SPEC. R-3810 ADDENDUM 9                                                                                                       |  |
| J 07-03-80                          |  | FOR BIDS - SPEC. R-3810 ADDENDUM 10                                                                                                      |  |



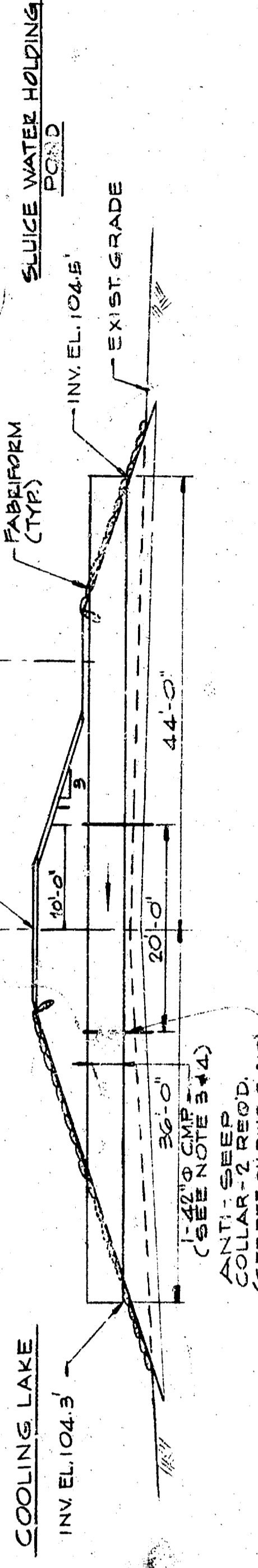
SECTION 2 AS NOTED (S-210) STA 10150 TO STA 27492.07  
 SECTION 3 AS NOTED (S-210) CENTER DIKE STA 9150 TO STA 2419.40  
 SECTION 10 AS NOTED (S-210) CENTER DIKE STA. 0100 TO STA. 9150  
 SCALE: HORIZ. 1"=20'-0" VERT. 1"=10'-0"



SECTION 5 (S-210)  
 SCALE: HORIZ. 1"=20'-0" VERT. 1"=10'-0"



SECTION 4 (S-210) STA 0100 TO STA. 1100  
 SECTION 6 (S-210) RMP STA 0100 TO STA 8117  
 SECTION 7 (S-210) SCALE: 1"=10'-0"



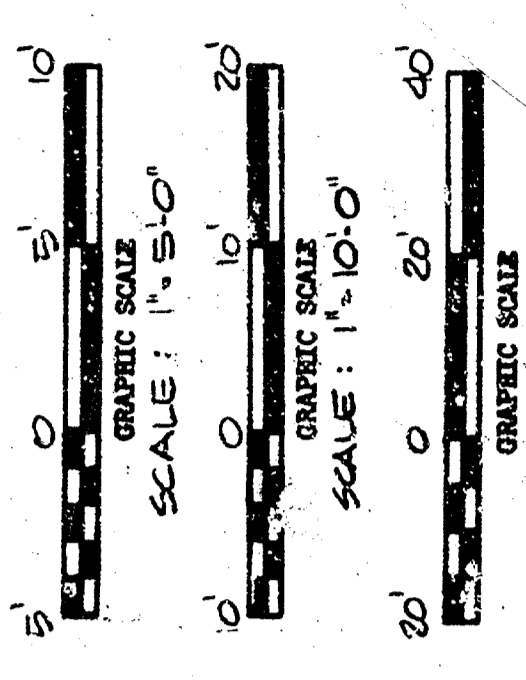
SECTION 7 (S-210)  
 SCALE: 1"=10'-0"

**NOTES**

- FOR GENERAL NOTES SEE DRAWING S-206
- ALL NEW WORK SHOWN ON THIS DRAWING SHALL BE BY THE GENERAL WORK CONTRACTOR IN ACCORDANCE WITH SPECIFICATION R-3810 UNLESS NOTED
- THE 24" x 42" CORRUGATED METAL PIPE SHALL BE PROVIDED WITH TYPICAL MANHOLES AND DOUBLE BUTT JOINTS COATING WITH MINIMUM 100% ZINC RICH METAL FLUOROPOLYMER COATING. ALL PIPE JOINTS SHALL BE GASKETED. ALL PIPE JOINTS SHALL BE GASKETED. ALL PIPE JOINTS SHALL BE GASKETED. ALL PIPE JOINTS SHALL BE GASKETED.
- ARMCO HUGGER BAND COUPLER TYPE ARKCO NO. 1005165-A OR APPROVED EQUIVALENT.

**REFERENCE DRAWINGS**

- S-204 SITE PLAN - GENERAL ARRANGEMENT SHEET 2
- S-210 SITE PLAN - GENERAL ARRANGEMENT SHEET 2
- S-219 EN TRANCE ROAD - SECTIONS 4 DETAILS
- S-229 ASH PIPE CORRIDOR - SECTIONS



| REV. | DATE     | RELD. | PREPARED | REVIEWED | APPROVED | PURPOSE                                                     |
|------|----------|-------|----------|----------|----------|-------------------------------------------------------------|
| A    | 04-01-18 |       |          |          |          | FOR SIDE - SPEC. R-3810 ADDENDUM 1                          |
| B    | 04-14-18 |       |          |          |          | GENERAL PERMITS FOR ASH POND DIKE CONSTRUCTION SPEC. R-3810 |
| C    | 04-16-18 |       |          |          |          | GENERAL PERMITS FOR ASH POND DIKE CONSTRUCTION SPEC. R-3810 |
| D    | 04-16-18 |       |          |          |          | GENERAL PERMITS FOR ASH POND DIKE CONSTRUCTION SPEC. R-3810 |
| E    | 04-27-18 |       |          |          |          | GENERAL PERMITS FOR ASH POND DIKE CONSTRUCTION SPEC. R-3810 |
| F    | 02-03-22 |       |          |          |          | GENERAL PERMITS FOR ASH POND DIKE CONSTRUCTION SPEC. R-3810 |

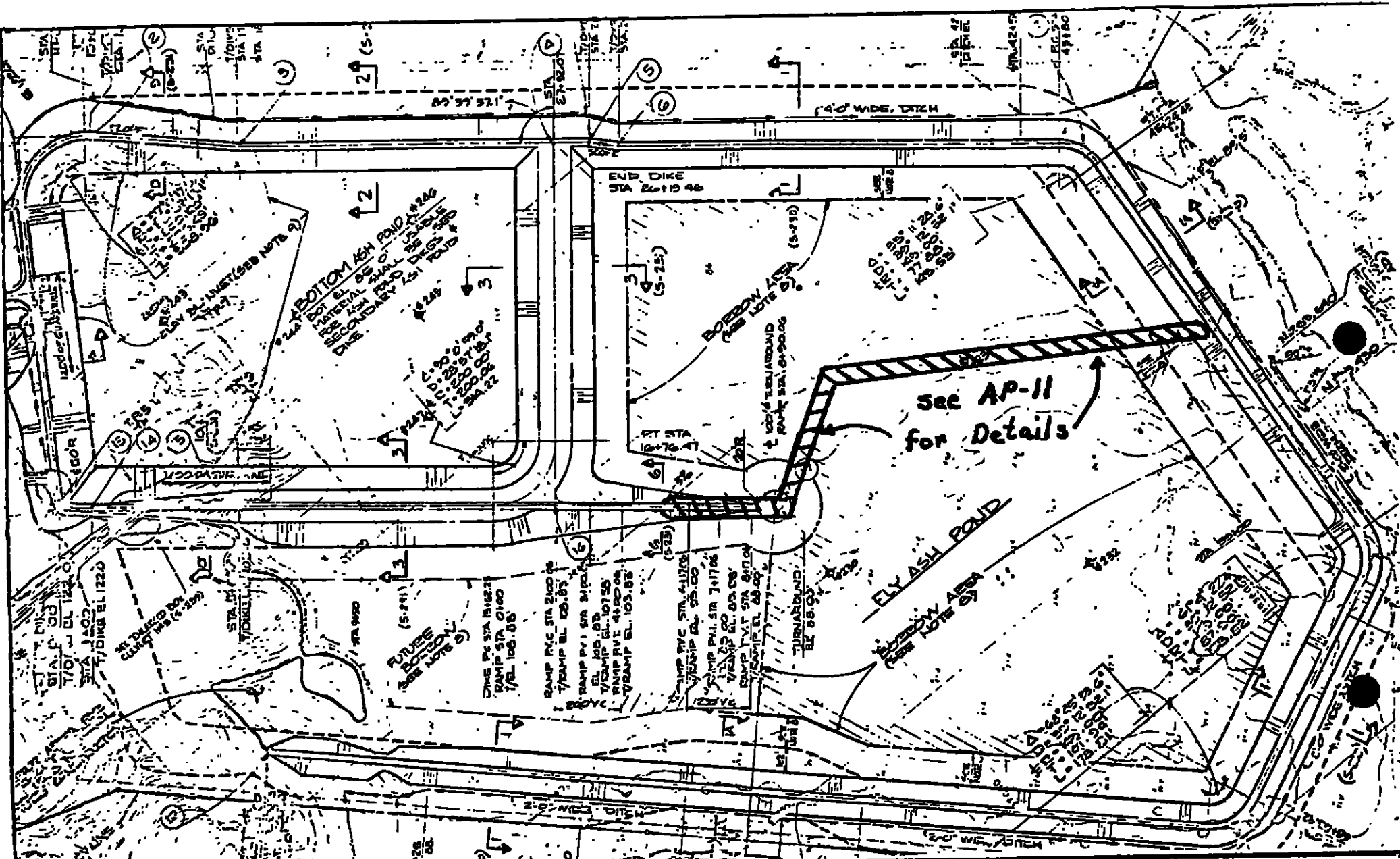
**SARGENT & LUNDY**  
 ENGINEERS  
 ARCHITECTS

ASH POND AREA  
 SECTIONS & DETAILS SHEET 2  
 RODENBACHER POWER STATION UNIT 2  
 CENTRAL LOUISIANA ELECTRIC CO., INC.  
 BOUCE, LOUISIANA

DRAWING NO. **S-231**

SHEET **2** OF **2**

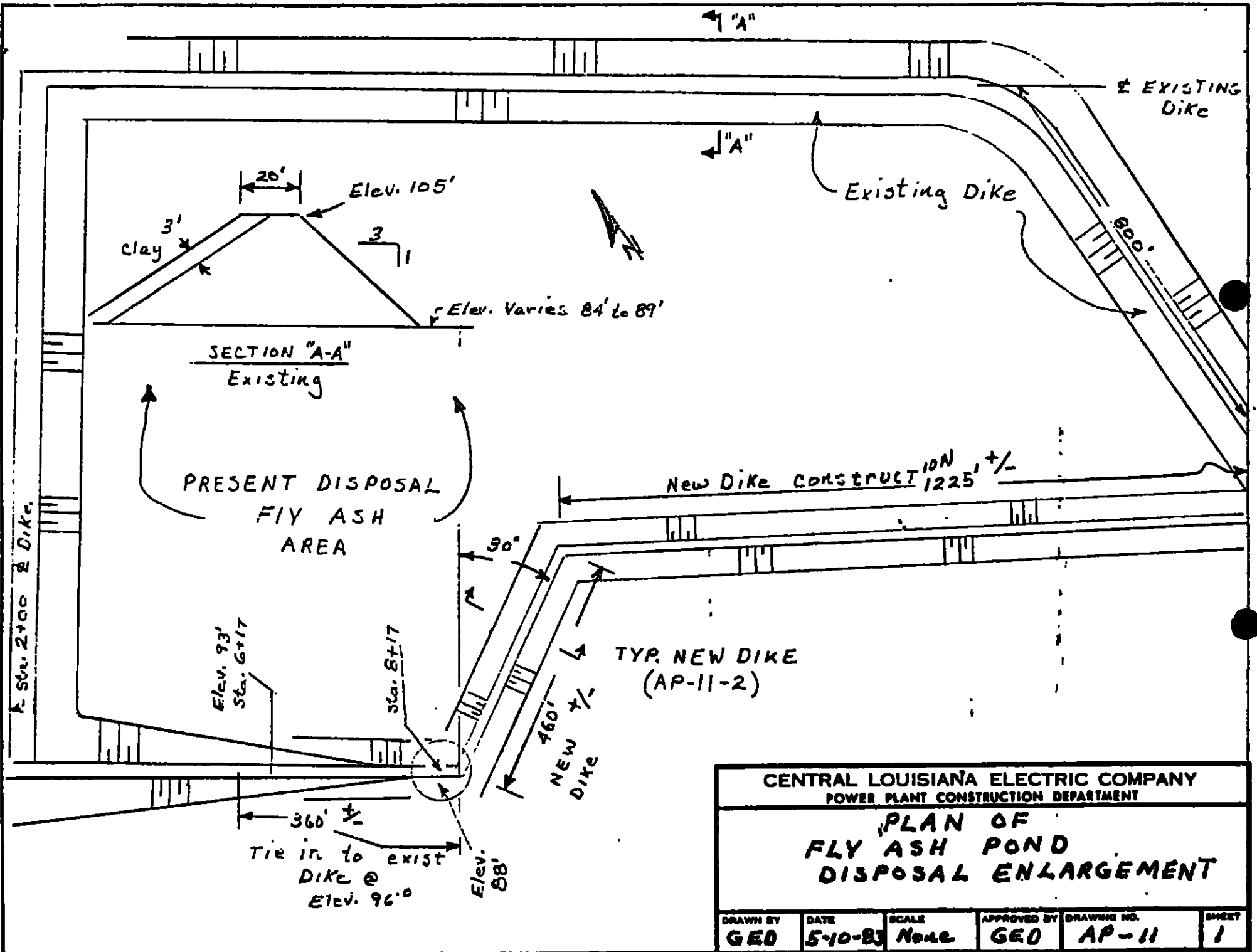




CENTRAL LOUISIANA ELECTRIC COMPANY  
POWER PLANT CONSTRUCTION DEPARTMENT

**RODEMACHER STATION  
FLY ASH POND  
GENERAL ARRANGEMENT**

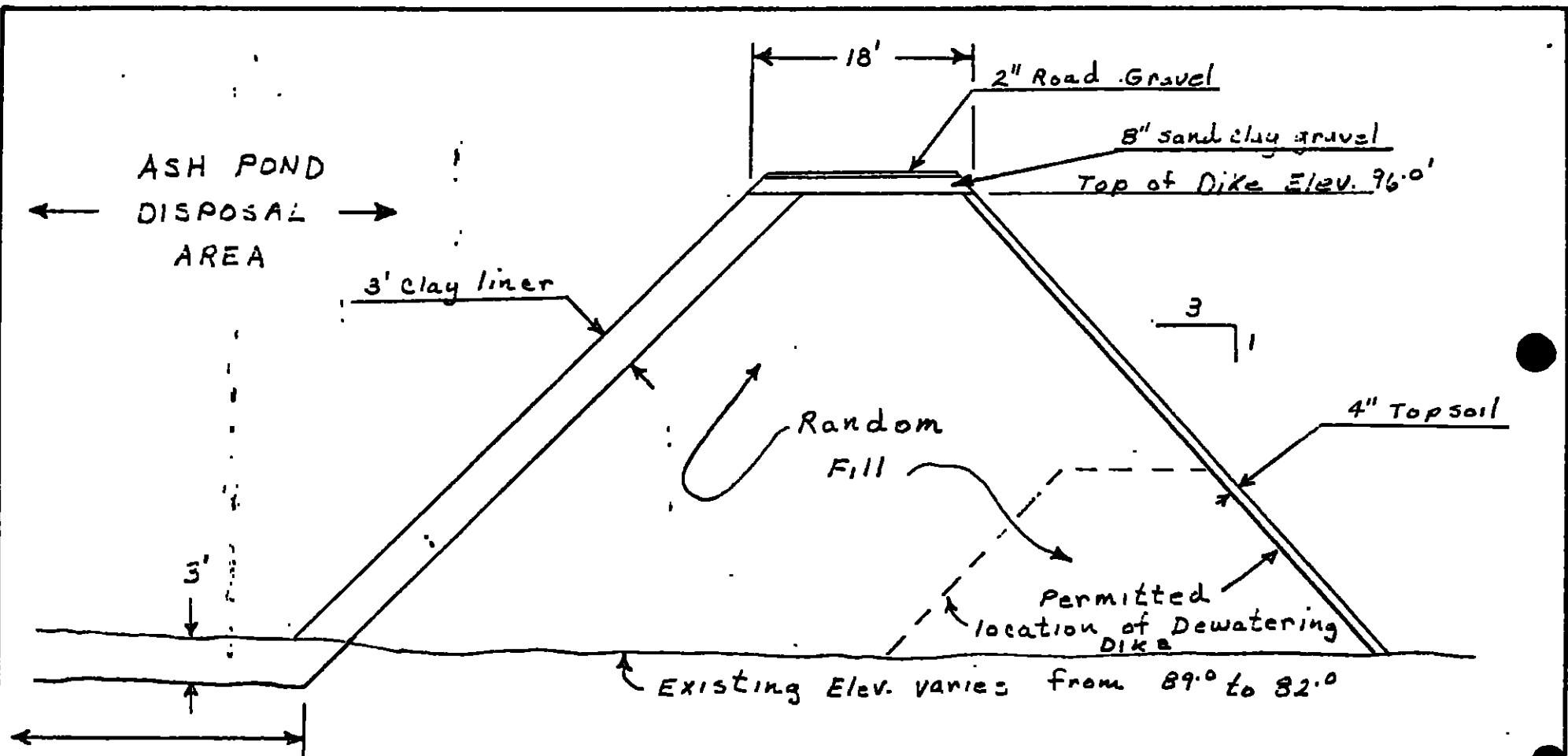
|                        |                        |                      |                           |                             |                   |
|------------------------|------------------------|----------------------|---------------------------|-----------------------------|-------------------|
| DRAWN BY<br><b>GED</b> | DATE<br><b>5-10-83</b> | SCALE<br><b>None</b> | APPROVED BY<br><b>GED</b> | DRAWING NO.<br><b>AP-10</b> | SHEET<br><b>1</b> |
|------------------------|------------------------|----------------------|---------------------------|-----------------------------|-------------------|



CENTRAL LOUISIANA ELECTRIC COMPANY  
POWER PLANT CONSTRUCTION DEPARTMENT

PLAN OF  
FLY ASH POND  
DISPOSAL ENLARGEMENT

| DRAWN BY | DATE    | SCALE | APPROVED BY | DRAWING NO. | SHEET |
|----------|---------|-------|-------------|-------------|-------|
| GEO      | 5-10-83 | None  | GEO         | AP-11       | 1     |

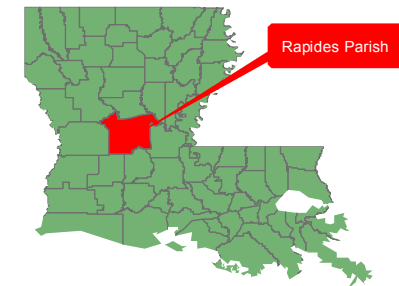
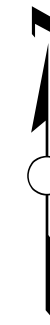
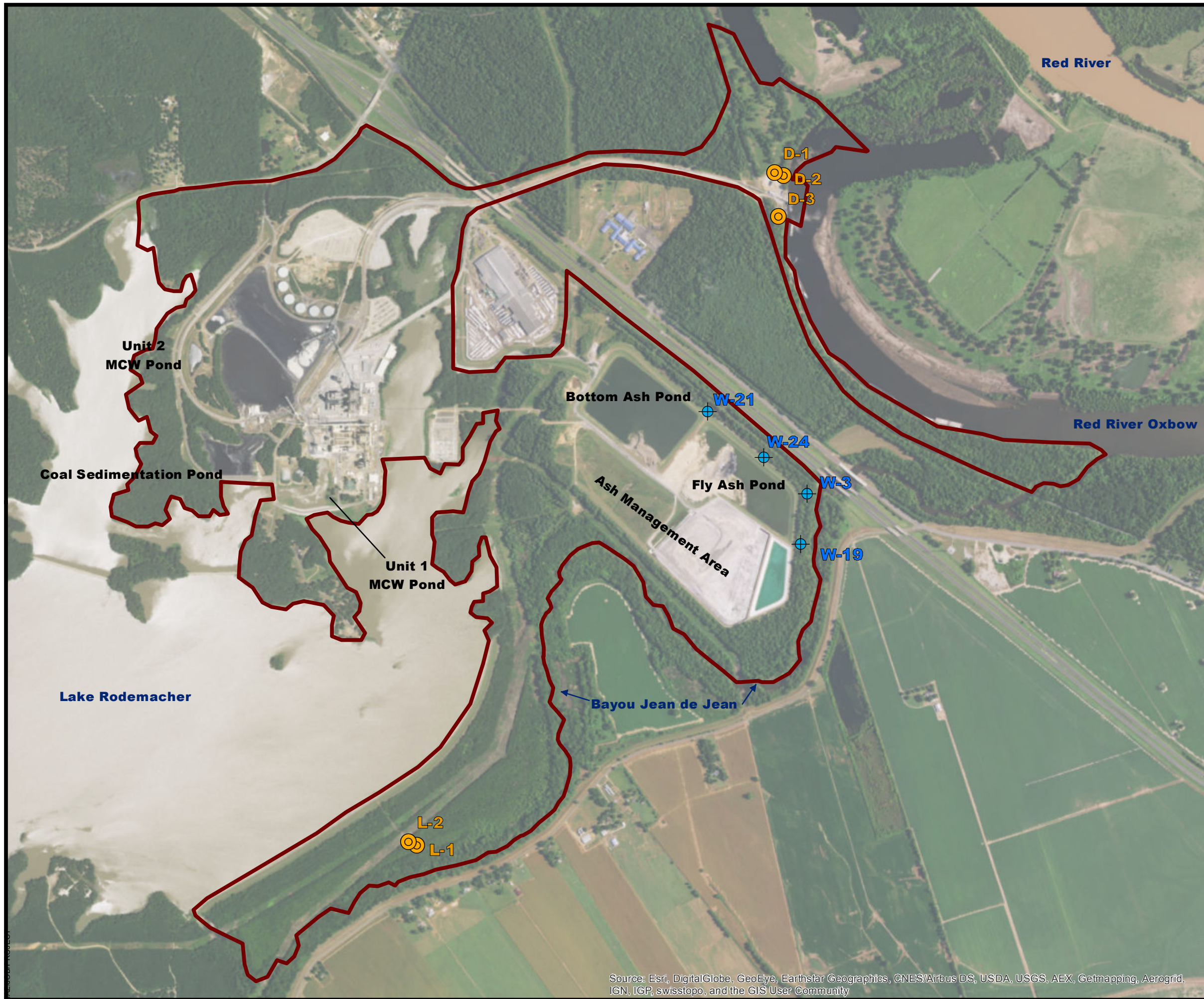


TYPICAL SECTION  
NEW DIKE  
 (AP-11 sheet 1)




|                                                                           |         |       |             |             |
|---------------------------------------------------------------------------|---------|-------|-------------|-------------|
| CENTRAL LOUISIANA ELECTRIC COMPANY<br>POWER PLANT CONSTRUCTION DEPARTMENT |         |       |             |             |
| Dike<br>section                                                           |         |       |             |             |
| DRAWN BY                                                                  | DATE    | SCALE | APPROVED BY | DRAWING NO. |
| GEO                                                                       | 5-10-83 | None  | GEO         | AP-11       |
|                                                                           |         |       |             | SHEET       |
|                                                                           |         |       |             | 2           |

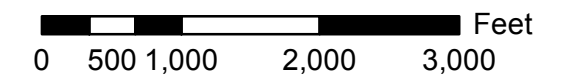


## APPENDIX E - INSTRUMENTATION



**Legend**

-  CCR Rule Compliance Wells
-  CCR Rule Background Wells
-  Secured Property Boundary



**CLECO Power LLC**  
Brame Energy Center

**CCR Rule  
Monitoring Well Location Map**

Rapides Parish, Louisiana



|           |                 |
|-----------|-----------------|
| Drawn:    | JP              |
| Checked:  | RS              |
| Approved: | JM              |
| Date:     | 10/4/16         |
| Dwg. No.: | 01-16-0160-A003 |

**Figure 2**

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



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