



# HISTORY OF CONSTRUCTION

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## HISTORY OF CONSTRUCTION

**Bremo Power Station CCR Surface Impoundment:  
North Ash Pond**



**Submitted To:** Bremo Power Station  
1038 Bremo Bluff Road  
Bremo Bluff, VA 23022

**Submitted By:** Golder Associates Inc.  
2108 W. Laburnum Avenue, Suite 200  
Richmond, VA 23227

October 2016

Project No. 15-20347





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## 1.0 CERTIFICATION


This History of Construction for the Bremo Power Station's North Ash Pond was prepared by Golder Associates Inc. (Golder). The document and Certification/Statement of Professional Opinion are based on and limited to information that Golder has relied on from Dominion and others, but not independently verified, as well as work products produced by Golder.

On the basis of and subject to the foregoing, it is my professional opinion as a Professional Engineer licensed in the Commonwealth of Virginia that this document has been prepared in accordance with good and accepted engineering practices as exercised by other engineers practicing in the same discipline(s), under similar circumstances, at the same time, and in the same locale. It is my professional opinion that the document was prepared consistent with the requirements in §257.73(c) of the United States Environmental Protection Agency's "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments," published in the Federal Register on April 17, 2015, with an effective date of October 19, 2015 [40 CFR §257.73(c)].

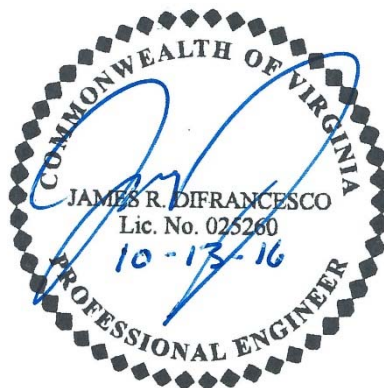
The use of the word "certification" and/or "certify" in this document shall be interpreted and construed as a Statement of Professional Opinion, and is not and shall not be interpreted or construed as a guarantee, warranty, or legal opinion.

James R. DiFrancesco, P.E.  
Print Name

Principal and Practice Leader  
Title

  
Signature

10/13/2016  
Date



## 2.0 INTRODUCTION

This History of Construction was prepared for the Bremo Power Station's (Station) existing Coal Combustion Residuals (CCR) surface impoundment known as the North Ash Pond (NAP). This History of Construction was prepared in accordance with 40 CFR Part §257, Subpart D and is consistent with the requirements of 40 CFR §257.73(c).

The Station, owned and operated by Virginia Electric and Power Company d/b/a Dominion Virginia Power (Dominion), is located in Fluvanna County at 1038 Bremo Road, east of Route 15 (James Madison Highway) and north of the James River. The Station includes an existing CCR surface impoundment, the NAP, as defined by the Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule (40 CFR §257; the CCR rule).

## 3.0 HISTORY OF CONSTRUCTION

### 3.1 CCR Unit

The NAP, previously referred to as the "Ash Disposal Pond" (1982) and the "Master Ash Pond" (1984), is located at the Station, as shown in the attached 2013 United States Geological Survey (USGS) 7½-minute topographic quadrangle map (Appendix A). The NAP is owned and operated by Virginia Electric and Power Company d/b/a Dominion Virginia Power (Dominion). Dominion's address, as well as contact information for the Station, are provided below.

Virginia Electric and Power Company  
5000 Dominion Boulevard  
Glen Allen, VA 23060

Mr. David A. Craymer  
Vice President, Power Generation System Operations  
Virginia Electric and Power Company  
5000 Dominion Boulevard  
Glen Allen, VA 23060

In 2014, the Station converted from a coal-fired power plant to a natural gas-fired power plant. The NAP is used as a water treatment pond to settle and manage low-volume wastewaters including CCR.

The NAP surface impoundment is regulated under the following permits:

- Virginia Department of Environmental Quality (DEQ) Virginia Pollutant Discharge Elimination System (VPDES) Permit No. VA0004138
- DEQ VPDES Construction General Permit No. VAR10H875
- Virginia Department of Conservation and Recreation (DCR) Dam Permit, Inventory No. 06520



The long-term management of the NAP, which includes closure, post-closure care, and groundwater monitoring, will be governed by the Virginia DEQ Solid Waste Management Regulations (VSWMR) Permit No. 618, once issued. The embankments will continue to be regulated by DCR under the Impounding Structure Regulations (4VAC50-20 *et seq.*).

### 3.2 Watershed

The NAP is located within the Middle James – Buffalo Watershed (USGS Hydrologic Unit Code 02080203), which is approximately 1,273,600 acres. The NAP has a contributing drainage area of approximately 103 acres.

### 3.3 Foundation and Abutments

The NAP was constructed by damming a steep drainage feature in the rising natural hillside. The natural soils in the hillside area consist of a typical Piedmont residual, saprolitic soil profile, formed from in-place weathering of rock. Piedmont soils consist of fine sandy silts (ML) and silty sands (SM), with occasional coarser materials that include coarser sands and angular gravel pieces derived from seams of resistant materials (mainly quartz), as well as the lower saprolites and upper disintegrated rock. Material properties for the various strata were interpreted based on subsurface data and site reconnaissance taken from previous Golder investigations, analyses, and reports included in Golder’s March 2016 Virginia Department of Conservation and Recreation (DCR) Impounding Structure Geotechnical Design Report Supporting Documents (Golder 2016), and are presented in Table 1 below.

**Table 1: Summary of Geotechnical Strength Properties**

<i>Material</i>	<i>Total Unit Weight (pound per cubic foot, pcf)</i>	<i>Strength Properties</i>		
		<i>Peak <math>\phi'</math> (°)</i>	<i>Cohesion (pound per square foot, psf)</i>	<i>Su (ton per square foot, tsf)</i>
<i>Dike Fill Soils- NAP</i>	125	0 - 40 ft: 31 > 40 ft: 28	50	2.0
<i>Residuum</i>	125	28	50	1.5
<i>Disintegrated Rock</i>	140	31	1000	50

### 3.4 Construction Details

The NAP was constructed in 1982 and 1983, in two phases. Phase I involved the construction of the embankment and spillway foundation, and Phase II involved the remainder of the embankment and spillway construction. Borrow soil was obtained from within the planned NAP ponded footprint, excavating into the natural ground. The natural soils in the hillside area are described above.

The dike extends primarily across the mouth of the steep drainage feature (about 1,000 feet long). The main segment of the dike is over 100 feet high with slopes of 2.5H:1V, benches on the upstream and downstream side, and 6-inch toe drains at the toe of the embankment. The main dike segment abuts steep natural slopes on either side of the valley outlet to the floodplain. Additional dike segments wrap around the west side and fill in some minor declivities in the ridgeline, but are generally 20 feet or less in height. The dike was designed as a zoned embankment with a core of theoretically less permeable material, and upstream and downstream shells consisting of theoretically more permeable materials. However, as borrow materials from the residual Piedmont soils were used for both the core and shell, and in spite of an attempt to segregate soils based on fines content, the difference in permeability achieved was relatively small based on the water surface in the dam, which is nearly consistent with that expected for a homogeneous embankment.

During Phase II, the remainder of the primary spillway was constructed, as well as the emergency spillway. The primary and emergency spillway systems are further discussed in Section 2.8. Historical record drawings for the phased construction of the NAP were completed in December of 1983 and are provided in Appendix B.

The NAP is currently in the process of being closed in accordance with §257.102(d) by leaving CCR in place, removing and treating free liquids, and installing an engineered final cover system. Closure details are included in the Closure Plan.

### **3.5 Engineering Drawings**

Current detailed dimensional drawings of the NAP's existing conditions, extracted from Golder's March 2016 DCR Impounding Structure Geotechnical Design Report Supporting Documents (Golder 2016), are provided in Appendix C.

### **3.6 Instrumentation**

A network of pumps and dewatering wells has been installed within the NAP. The surface water and pore water collected in the NAP are conveyed to the on-site Centralized Source Water Treatment System (CSWTS) for treatment and compliance with permitted effluent limits prior to discharge through a permitted outfall.

Additionally, groundwater monitoring wells are being installed. The downgradient monitoring network is comprised of five downgradient CCR rule compliance groundwater wells, four perimeter VSWMR sentinel monitoring wells, and two upgradient wells. These wells will be supplemented during the site characterization activities by two deep observation wells that will also be installed.

In addition, there are three existing piezometers in the NAP embankment that were historically used to observe static water levels within the embankment.

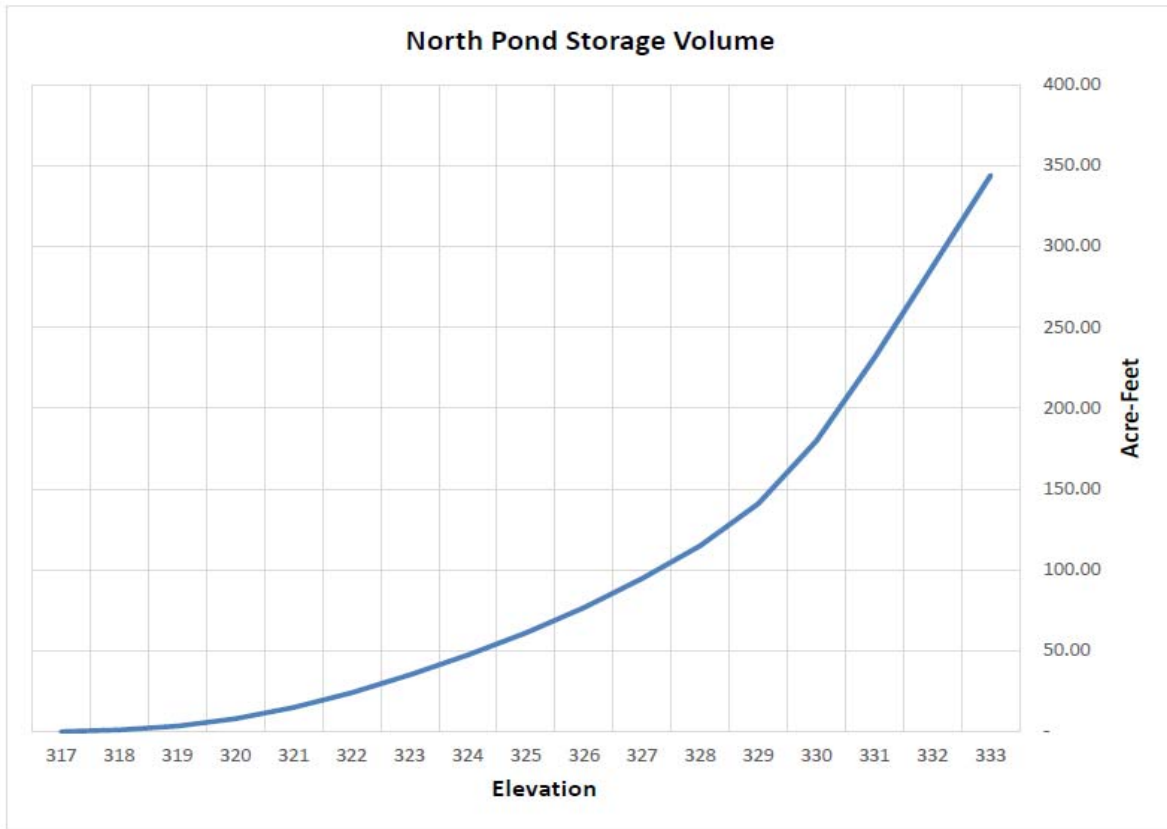
### 3.7 Area-Capacity Curves

Using the August 2016 aerial topographic survey, the available stage-storage capacities were computed from the top of the previously impounded CCR [elevation 317 feet above mean sea level (ft amsl)] to the top of the embankment (elevation 333 ft amsl). The NAP stage-storage capacity data are provided in Table 2 and Figure 1, below.

**Table 2: Stage-Storage Capacity**

Elevation	Area (square feet, sf)	Area (acres, ac)	Volume (cubic feet, cf)	Volume (cubic yard, cy)	Cumulative Volume (cy)	Cumulative Volume (acre-foot, ac-ft)
333	2,477,161	56.868	2,464,954.5	91,294.6	555,052.2	344.04
332	2,452,773	56.308	2,440,590.9	90,392.3	463,757.6	287.45
331	2,428,434	55.749	2,253,534.1	83,464.2	373,365.4	231.42
330	2,083,052	47.820	1,689,610.6	62,578.2	289,901.1	179.69
329	1,324,660	30.410	1,127,466.9	41,758.0	227,323.0	140.90
328	941,172	21.606	889,598.6	32,948.1	185,564.9	115.02
327	839,005	19.261	783,802.3	29,029.7	152,616.8	94.60
326	729,868	16.755	679,314.6	25,159.8	123,587.1	76.60
325	629,987	14.463	594,776.6	22,028.8	98,427.3	61.01
324	560,249	12.862	534,588.4	19,799.6	76,398.6	47.35
323	509,333	11.693	478,290.2	17,714.5	56,599.0	35.08
322	447,906	10.283	399,939.8	14,812.6	38,884.5	24.10
321	353,821	8.123	301,354.4	11,161.3	24,072.0	14.92
320	251,775	5.780	198,392.3	7,347.9	12,910.7	8.00
319	149,434	3.431	108,058.0	4,002.1	5,562.8	3.45
318	71,427	1.640	42,138.2	1,560.7	1,560.7	0.97
317	18,569	0.426	-	-	-	-

**Figure 1: Stage-Storage Capacity Curve**



### 3.8 Diversion and Spillway Details

The NAP was constructed by damming a steep drainage feature in the rising natural hillside. The main dike segment abuts steep natural slopes on either side of the valley outlet to the floodplain. Additional dike segments wrap around the west side and fill in some minor declivities in the ridgeline, but are generally 20 feet or less in height. Outside of the dike segments, no additional diversions are in place.

Prior to May 2016, the primary spillway, an intake tower and 24-inch diameter pipe, regulated the NAP pool elevation. The intake tower, standing within the impoundment area at approximately 110 feet in height, is constructed of steel-reinforced concrete and has three openings that are regulated by a floating skimmer and concrete stop planks. Water formerly exited the NAP through a 24-inch diameter pipe that is connected to the outlet tower structure near the highest section of the main dike segment. This pipe extends to a concrete-armored basin within the East Ash Pond (EAP), and the water was ultimately released through a permitted outfall. As of May 2016, the 24-inch diameter pipe of the primary spillway has been plugged to satisfy discharge permit requirements. Surface water and pore water within the NAP are pumped to the on-site CSWTS for treatment and discharge.

The emergency spillway is located on the west side of the NAP and would allow flow into the valley to the west, through a small stormwater pond, and then into the ditch along the north side of the EAP, and either to the west into the main plant stormwater pond or east toward the open water portion of the EAP. The existing emergency spillway is an approximately trapezoidal-shaped, broad-crested spillway that is built into the road surface along the top of the impoundment natural ridgeline. Its original design crest width of 200 feet has been reduced to a width of approximately 153 feet due to operations and road maintenance over the years. The spillway has an effective depth of 2.6 feet, and is surfaced with well-compacted gravel. Considering the NAP's current configuration, the size and capacity of the emergency spillway are adequate to convey the runoff from the probable maximum flood (PMF) event without overtopping the embankment or eroding the spillway. The analysis of the spillway capacity is included in Appendix B of the Inflow Design Flood Control System Plan.

### **3.9 Surveillance, Maintenance, and Repair**

Inspections and maintenance are currently conducted in accordance with 40 CFR §257.83. General construction specifications and provisions for future surveillance, maintenance, and repair of the NAP are included in the Closure and Post-Closure Plans. Annual inspections by a Professional Engineer are conducted to satisfy the requirements of the DCR Dam Safety Regulations.

### **3.10 Structural Instability**

There is no record or knowledge of structural instability of the NAP. The NAP dikes are in good condition, without evidence of significant issues.

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[www.golder.com](http://www.golder.com)

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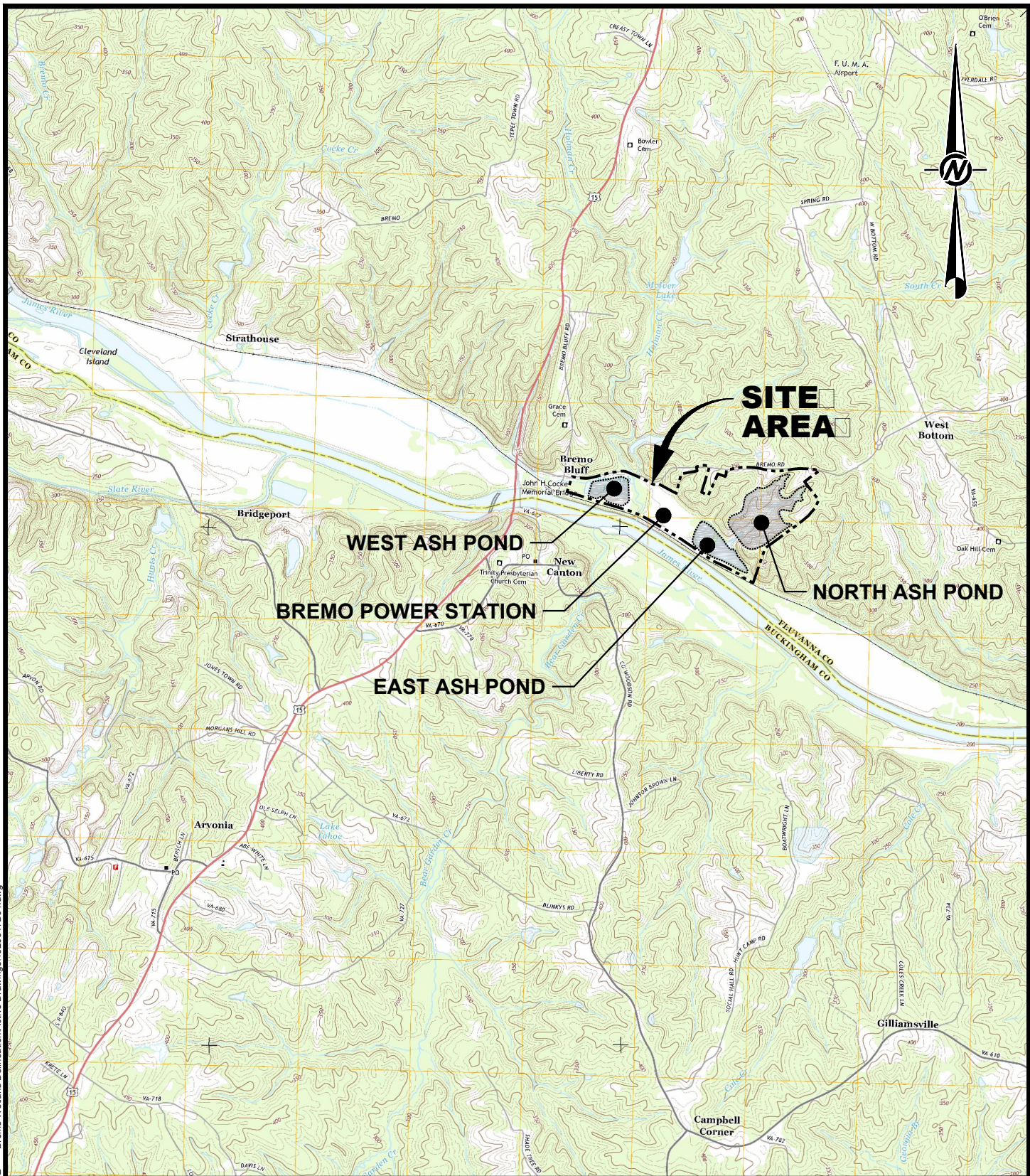
**Engineering Earth's Development, Preserving Earth's Integrity**

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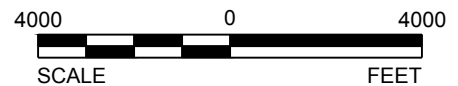
**Appendix A**  
**Site Location Map**





**REFERENCE**

BASE MAP CONSISTS OF 7.5-MINUTE USGS TOPOGRAPHIC QUADRANGLE NAMED ARVONIA, VIRGINIA, DATED 2013.



G:\Plan Production Data Files\Drawing Data Files\15-20347B - Bremo Weiland Delineation\Active Drawings\1520347B01.dwg



DATE	09/28/16
DESIGN	ATN
CADD	ATN
CHECK	SDRM
REVIEW	JRD

TITLE

**SITE LOCATION MAP**

PROJECT No.	15-20347
SCALE	AS SHOWN
REV.	0

**DOMINION, BREMO POWER STATION**

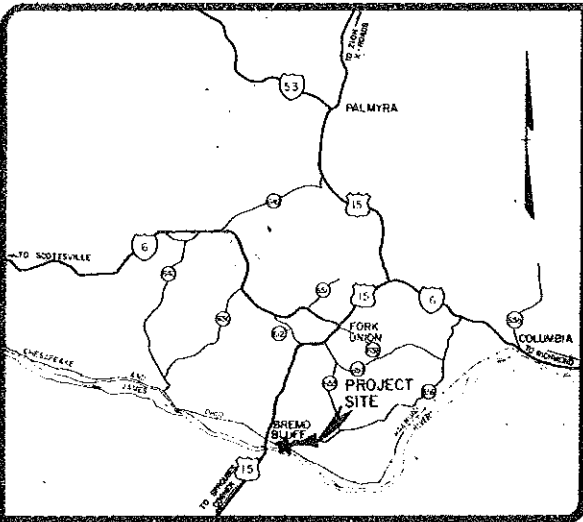
**FIGURE 1**





## **Appendix B**

### **North Ash Pond Phase I & II Historical Record Drawings**



LOCATION MAP

SCALE 1"=10,000'

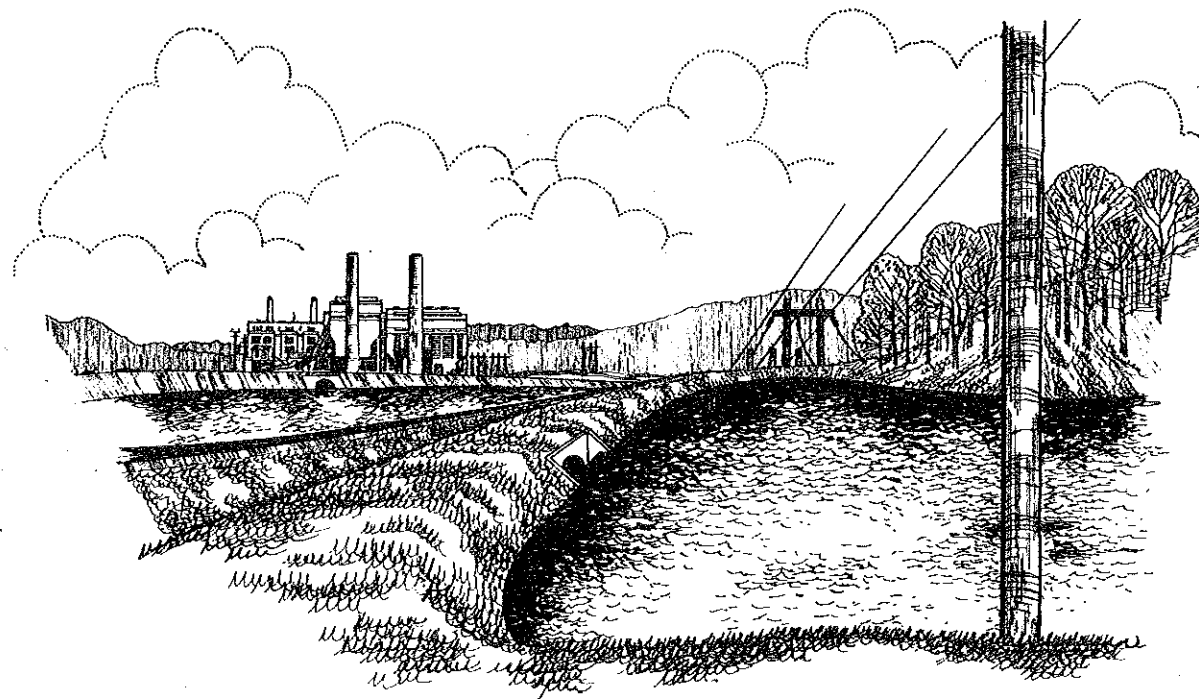
# VEPCO

## BREMO BLUFF POWER STATION FLUVANNA COUNTY, VIRGINIA ASH DISPOSAL POND DAM CONSTRUCTION

### PHASE 1

SHEET INDEX

DESCRIPTION	SHEET NO.
TITLE SHEET	1
VICINITY MAP	2
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SITE PLAN	4
DAM TYPICAL SECTIONS AND DETAILS	5
PIPE AND TOWER DETAILS	6
CROSS SECTIONS (BASE LINE 'A')	7
BORROW AREA	8
BORROW AREA AND SIDEHILL ASH AREA	9
BORROW AREA AND SIDEHILL ASH AREA	10
BORROW AREA CROSS SECTIONS	11
BORROW AREA CROSS SECTIONS	12



JOB NO. 13239

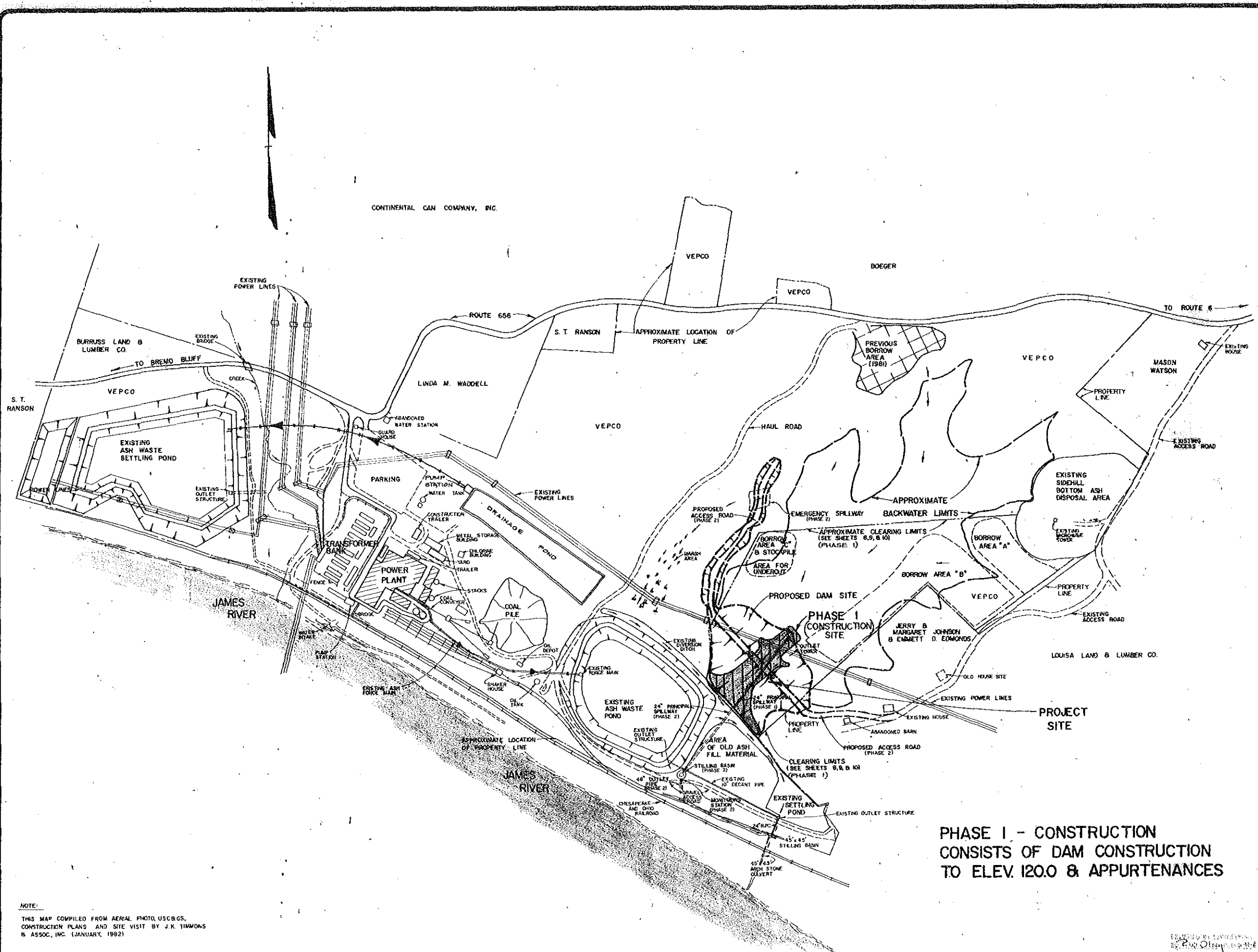
DATE: MAY 21, 1982

VEPCO PROJECT NUMBER 73864104

**J. K. TIMMONS & ASSOCIATES, INC.**  
**ENGINEERS, SURVEYORS, PLANNERS**  
 711 NORTH COURTHOUSE RD. (804) 794-3500 RICHMOND, VIRGINIA 23224  
 8903 STAPLES MILL RD. (804) 262-7396 RICHMOND, VIRGINIA 23225

**ACHABEL ENGINEERING  
 ASSOCIATES, P.C.**  
**GEOTECHNICAL ENGINEERS**  
 ONE WEST GARY STREET (804) 648-7055 RICHMOND, VIRGINIA 23220

REVISIONS



NOTE:  
THIS MAP COMPILED FROM AERIAL PHOTO, USCGS,  
CONSTRUCTION PLANS AND SITE VISIT BY J.K. TIMMONS  
& ASSOC., INC. (JANUARY, 1982)

SCALE: 1" = 200'

PHASE I - CONSTRUCTION  
CONSISTS OF DAM CONSTRUCTION  
TO ELEV. 120.0 & APPURTENANCES

DESIGNED BY: J. HENSON  
CHECKED BY: B. FARIES

DATE DRAWN:  
MAY 21, 1982

DESIGNED BY:  
J. HENSON

CHECKED BY:  
B. FARIES

2 OF 12  
SHEET NUMBER  
13239  
JOB NUMBER

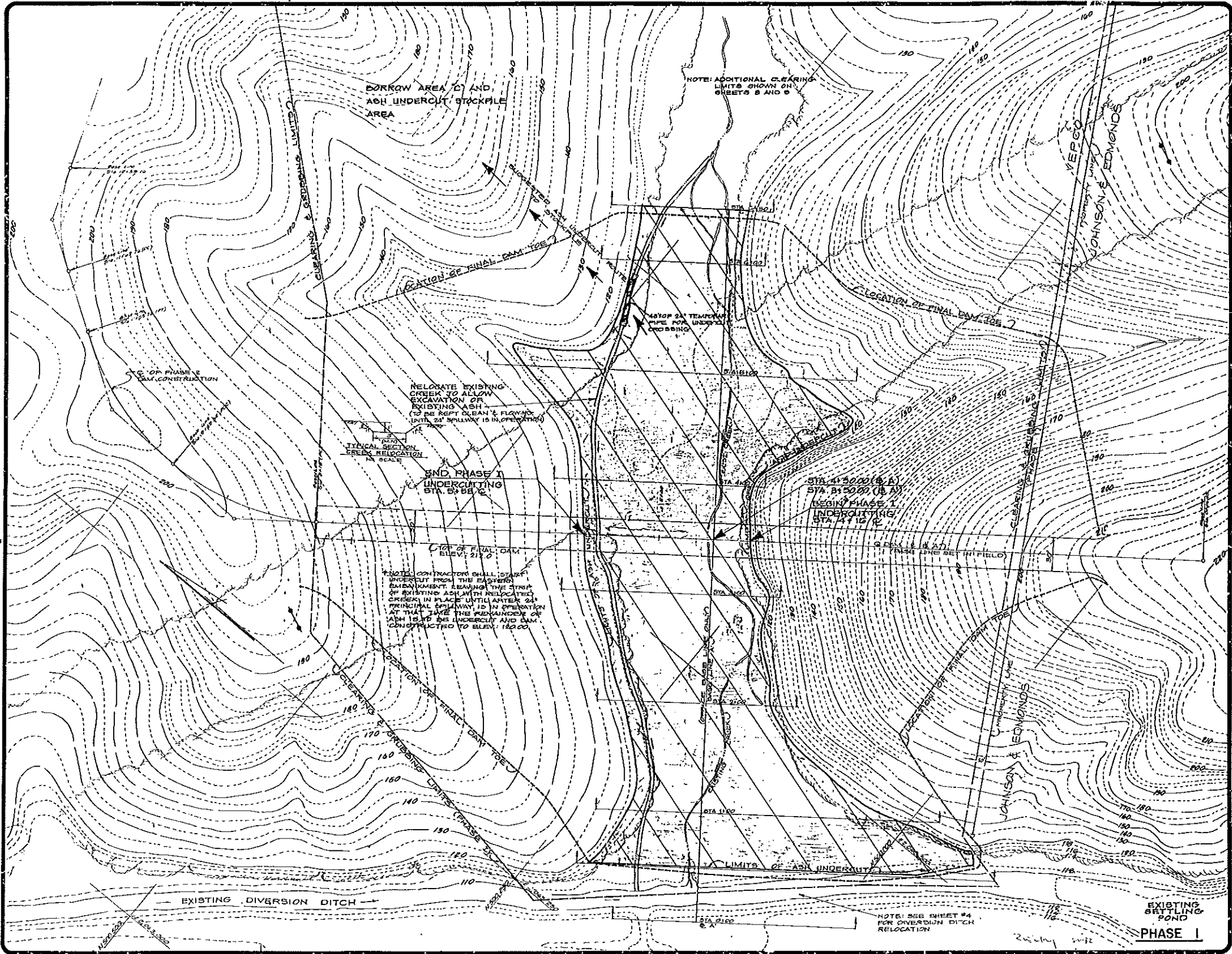
VEPCO P.N. 73864104

**J. K. TIMMONS & ASSOCIATES, INC.**  
ENGINEERS, SURVEYORS, PLANNERS  
7111 NORTH COURTHOUSE RD. (804) 194-1500 RICHMOND, VIRGINIA 23235  
8803 STAPLES MILL RD. (804) 262-7396 RICHMOND, VIRGINIA 23226

**ASH DISPOSAL POND**  
BREMO BLUFF POWER STATION  
FLUVANNA COUNTY, VIRGINIA  
VICINITY MAP

REVISIONS

STAMP  
1" = 200'  
SCALE  
B. FARIES  
DRAWN BY  
MAY 21, 1982  
DATE DRAWN  
B. FARIES  
DESIGNED BY  
J. HENSON  
CHECKED BY  
2 OF 12  
SHEET NUMBER  
13239  
JOB NUMBER



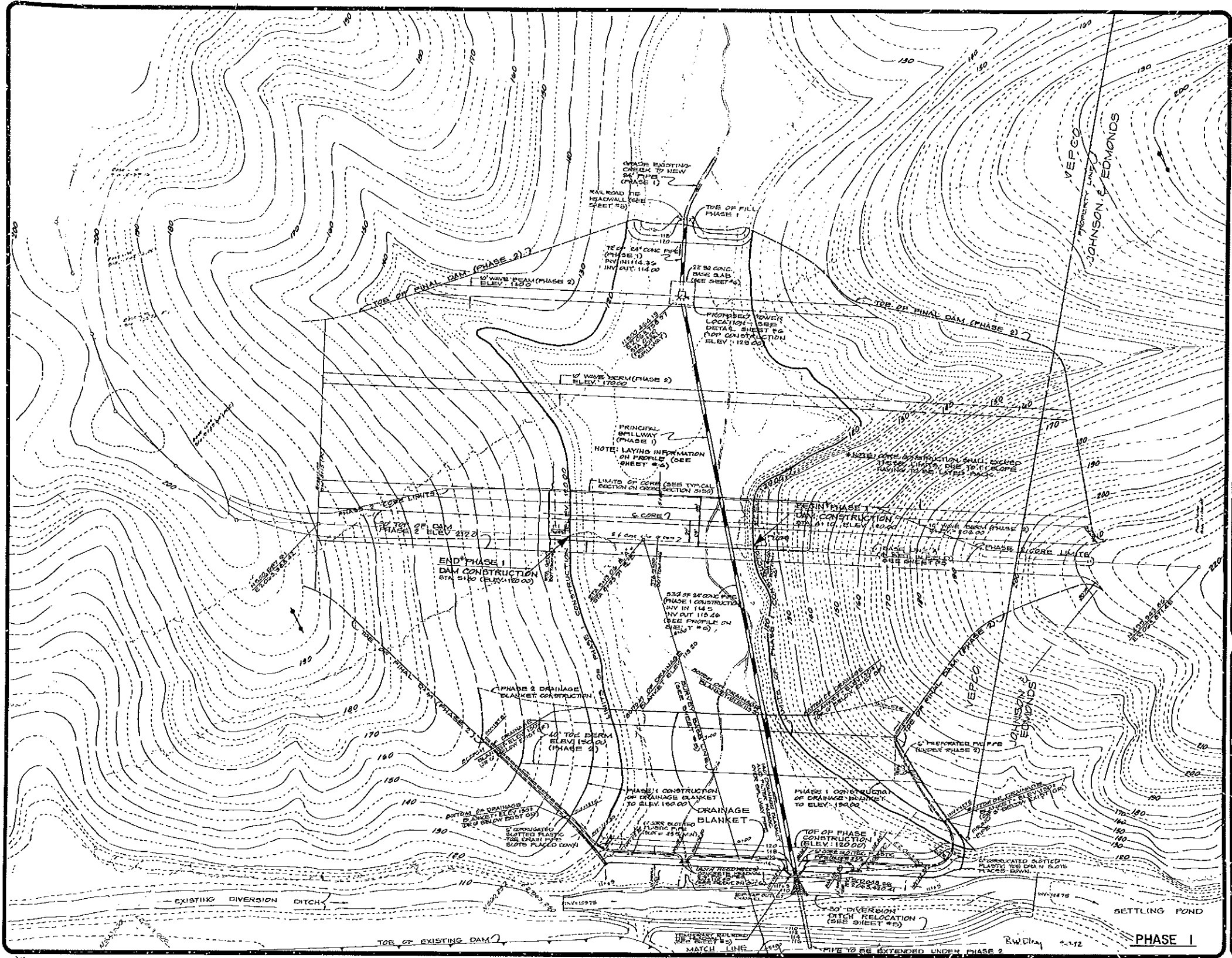
**J. HENSON & ASSOCIATES**  
**ENGINEERS SURVEYORS PLANNERS**  
 711 WEST COURTHOUSE BLDG. (100) 784-3500 RICHMOND, VIRGINIA 23220  
 2303 STABLES HILL ST. (804) 382-2318 RICHMOND, VIRGINIA 23220



**ASH DISPOSAL POND - BREMO BLUFF POWER STATION**  
 FLUVANIA COUNTY, VIRGINIA  
**CLEARING AND UNDERCUT PLAN**



DATE: MAY 21, 1982  
 SCALE: 1" = 30'  
 DRAWN BY: R. POPE  
 CHECKED BY: S. JOHNS  
 DESIGNED BY: J. HENSON  
 J. HENSON  
 3 OF 12  
 13239



**J. K. JAMISON & ASSOCIATES, INC.**  
**ENGINEERS SURVEYORS & PLANNERS**  
 711 NORTH COURTHOUSE RD. (RD 41) 734-3300 RICHMOND, VIRGINIA 23215  
 8803 STAPLES MILL RD. (RD 41) 257-7395 RICHMOND, VIRGINIA 23228

**ASH DISPOSAL POND**  
**BRECO BLUFF POWER STATION**  
 FLUVANNA COUNTY, VIRGINIA  
**SITE PLAN**

DATE OF REVISION: 4/26/82

NO.	REVISIONS
1	11 EDM 11-12-81

STAMP: 11 EDM 11-12-81 104

SCALE: 1" = 30'

SCALE: 1" = 30'

DESIGNED BY: R. POPE

DRAWN BY: J. HENSON

CHECKED BY: B. JOHNS

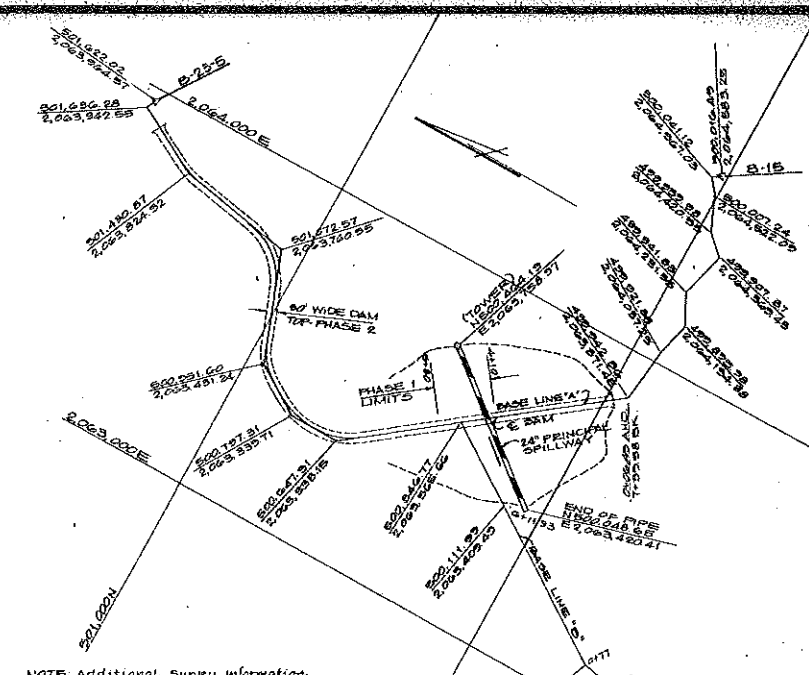
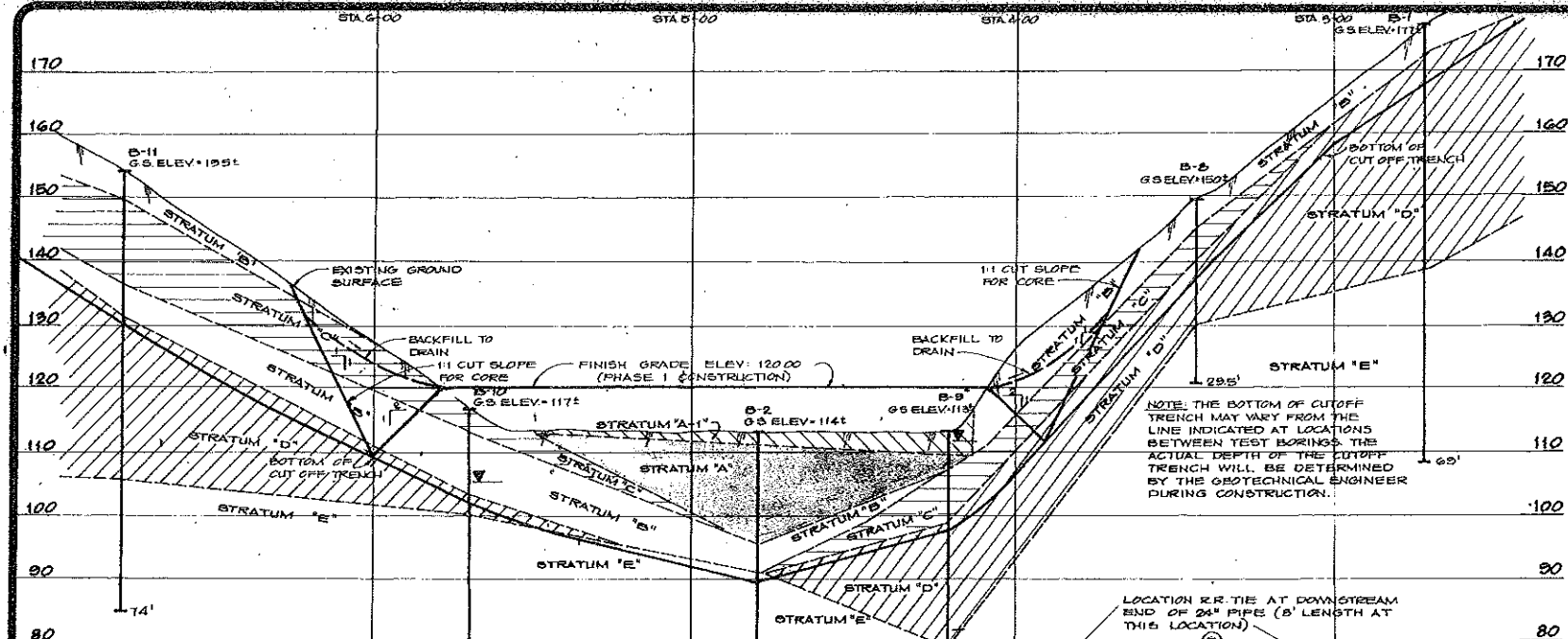
DATE DRAWN: MAY 21, 1982

DATE CHECKED: 4 OF 12

SHEET NUMBER: 13239

JOB NUMBER: 13239





**GENERAL NOTES**

1. TEST BORINGS DRILLED BY AYERS AND AYERS, INC. IN JANUARY, 1982 (SEE SHEET B-9 & 10).
2. TEST BORINGS INSPECTED BY SCHNADEL ENGINEERING ASSOCIATES.
3. THIS DRAWING CONTAINS INTERPOLATION BETWEEN WIDELY SPACED BORINGS. ONLY AT THE BORING LOCATIONS SHOULD THEY BE CONSIDERED AS AN APPROXIMATELY ACCURATE REPRESENTATION AND THEN ONLY TO THE DEGREE IMPLIED BY THE NOTES ON THE BORING LOGS.

**SOIL STRATUM ACROSS DAM SITE**

SCALE  
Horiz: 1"=20'  
Vert: 1"=10'

**PLAN - R.R. TIE HEADWALL**

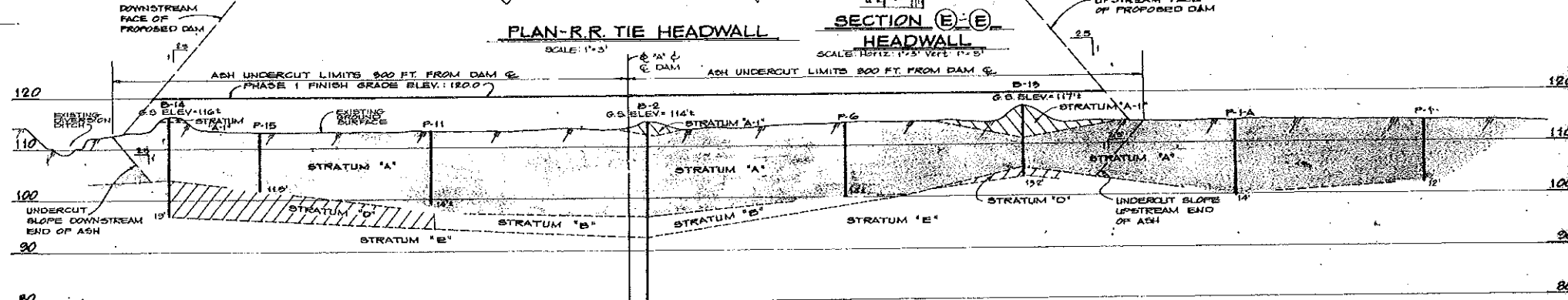
SCALE: 1"=3'

**SECTION E-E HEADWALL**

SCALE: Horiz: 1"=3' Vert: 1"=5'

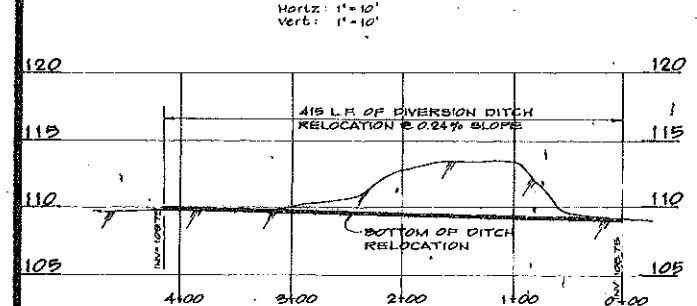
**STRATUM DESCRIPTIONS**

- STRATUM A: BROWN, SILTY CLAY, FILL, SOME FINE TO MEDIUM SAND (CL)
- STRATUM B: GRAY FLY ASH FILL, VERY LOOSE TO FIRM (N=WOR TO 12)
- STRATUM C: VARICOLORED FINE SANDY SILT AND CLAYEY SILT, SOME FINE TO MEDIUM SAND WITH MICA (ML TO MH); FIRM TO VERY COMPACT (N=9 TO 19) AND SILTY CLAY, SOME FINE TO MEDIUM SAND WITH MICA (CL); MEDIUM TO VERY STIFF CONSISTENCY (N=1 TO 12)
- STRATUM D: VARICOLORED FINE TO MEDIUM SILTY TO CLAYEY SILTY SAND (SM) AND SILTY CLAYEY SAND (SC) WITH MICA; VERY LOOSE TO COMPACT (N=3 TO 12)
- STRATUM E: VARICOLORED DISINTEGRATED ROCK WITH MICA (ML TO SM); VERY COMPACT (N=65 TO 100)
- STRATUM F: VARICOLORED FRESH TO HIGHLY WEATHERED GRANODIORITE GNEISS; VERY HARD TO SOFT, SLIGHTLY TO HIGHLY FRACTURED (REC=0 TO 99%, ROD=0 TO 99%)



**TYPICAL SECTION - DIVERSION DITCH**

RELOCATION - TOE PROP DAM  
SCALE  
Horiz: 1"=10'  
Vert: 1"=10'

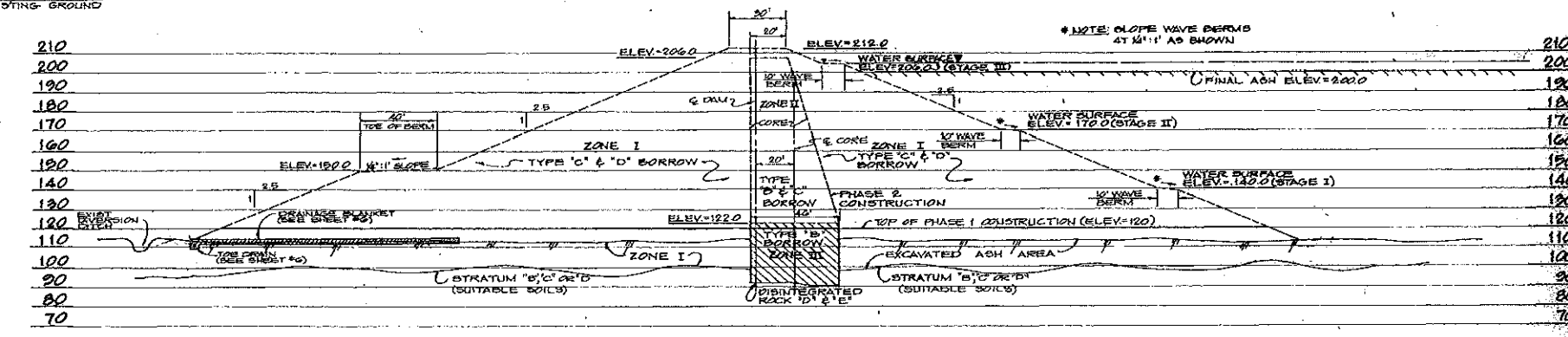


**PROFILE - RELOCATION EXIST DIVERSION DITCH**

SCALE  
Horiz: 1"=60'  
Vert: 1"=5'

**SOIL STRATUM - VALLEY CROSS-SECTION**

BASE LINE STATION 4+80  
SCALE  
Horiz: 1"=30'  
Vert: 1"=10'



**TYPICAL SECTION - DAM COMPOSITION**

SCALE  
Horiz: 1"=30'  
Vert: 1"=30'

**PHASE I**

**J. K. TIMMONS & ASSOCIATES, INC.**  
ENGINEERS, SURVEYORS, PLANNERS

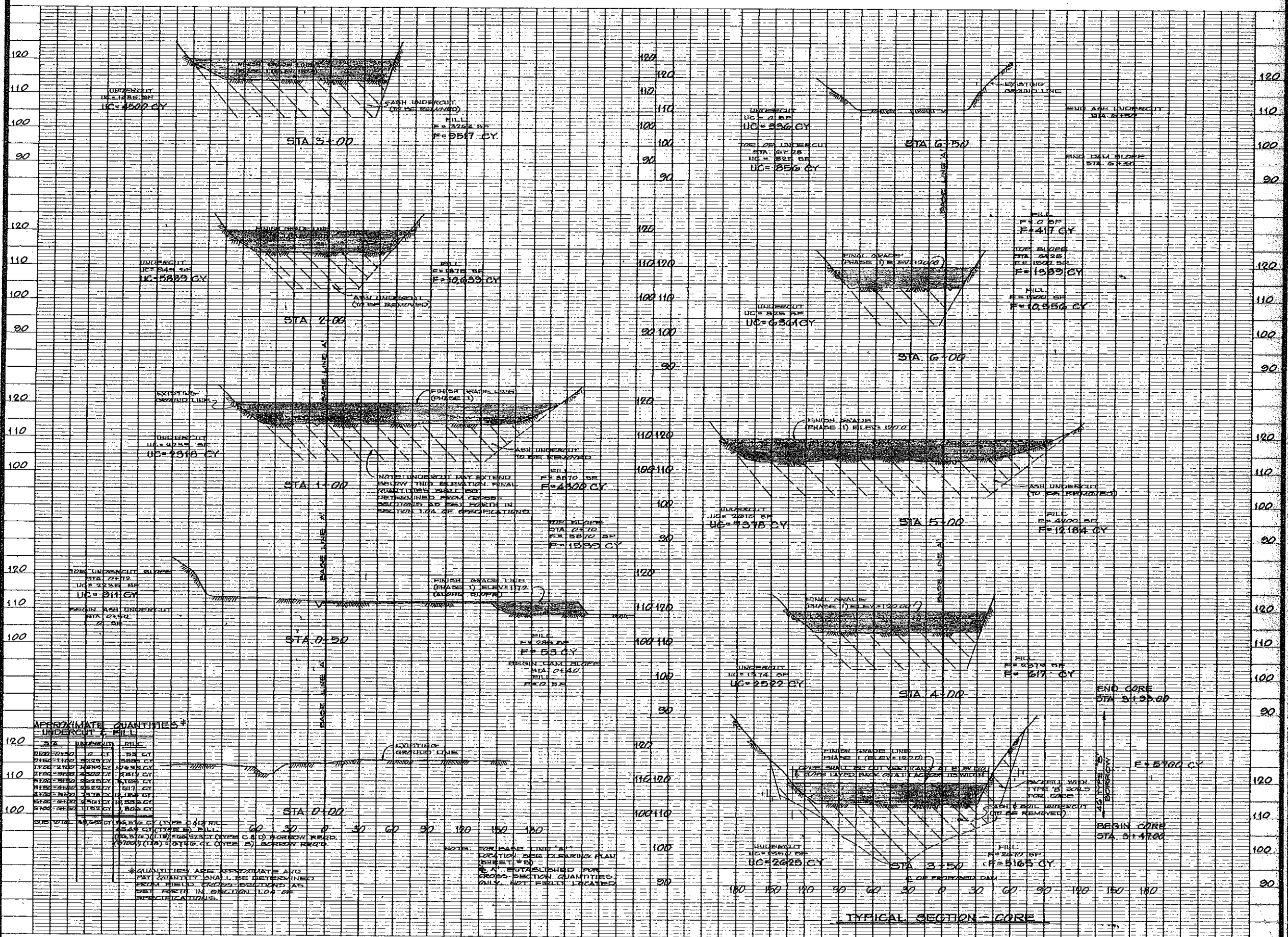
711 NORTH COURTHOUSE RD. (204) 794-4300 RICHMOND, VIRGINIA 23215  
800 STAPLES WILL BL. (800) 252-7395 RICHMOND, VIRGINIA 23215

**ASH DISPOSAL POND**  
BREMO BLUFF POWER STATION  
FLUVANNA COUNTY, VIRGINIA

**TYPICAL SECTIONS AND DETAILS**

AS SHOWN  
R. POPE  
MAY 21, 1982  
G. JOHNS  
J. HENSON  
5 OF 12  
13239





**J. K. JAMMONS & ASSOCIATES, INC.**  
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 717 NORTH COURTHOUSE BL. (804) 384-1500 RICHMOND, VIRGINIA 23225  
 8008 STAPLES MILL RD. (804) 282-7398



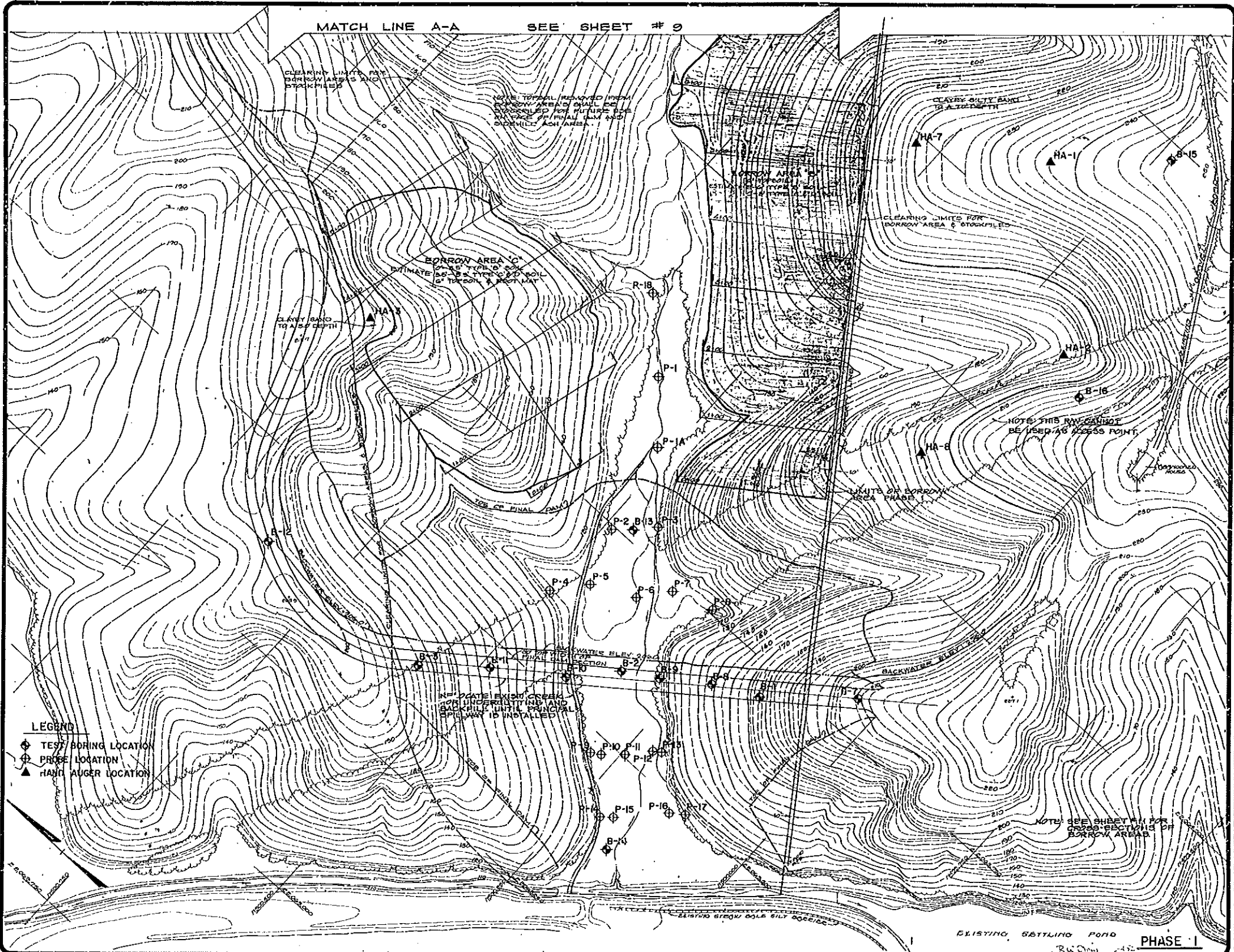
**ASH DISPOSAL POND**  
 BREWSTER BLUFF POWER STATION  
 FLORENCE COUNTY, VIRGINIA  
 PHASE I - DAM FOUNDATION  
 CROSS-SECTIONS (BASE LINE 'A')



AS SHOWN  
 R. POPE  
 MAY 21, 1982  
 B. JOHNS  
 J. HENSON  
 7 OF 12  
 13239

PHASE I





**J. L. HENSON ASSOCIATES, INC.**  
 ENGINEERS SURVEYORS PLANNERS  
 711 NORTH GREENHOUSE RD. RICHMOND, VIRGINIA 23223  
 (804) 794-3300  
 (804) 282-7336  
 2100 STAPLES W. RD. RICHMOND, VIRGINIA 23233

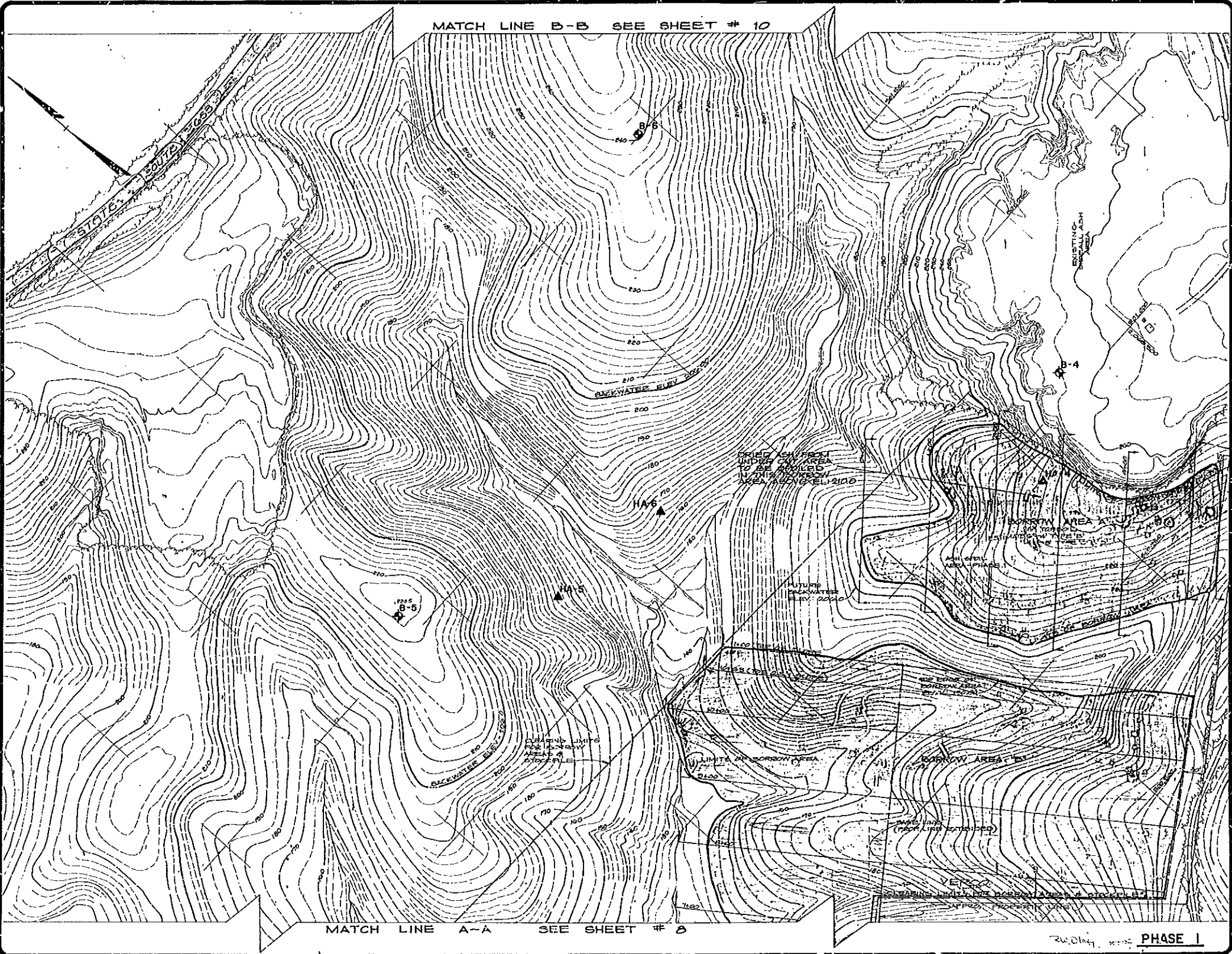


**ASH DISPOSAL POND**  
 BRENO BLUFF POWER STATION  
 FLUVANIA COUNTY, VIRGINIA  
**BORROW AREA**

REVISIONS  
 J. L. HENSON  
 REGISTERED P.E.  
 1974

SCALE  
 1" = 50'  
 R. POPE  
 DRAWN BY  
 MAY 21, 1982  
 DATE DRAWN  
 B. JOHNS  
 DESIGNED BY  
 J. HENSON  
 CHECKED BY  
 8 OF 12  
 SHEET NUMBER  
 13239  
 JOB NUMBER

MATCH LINE B-B SEE SHEET # 10



MATCH LINE A-A SEE SHEET # 8

PHASE I

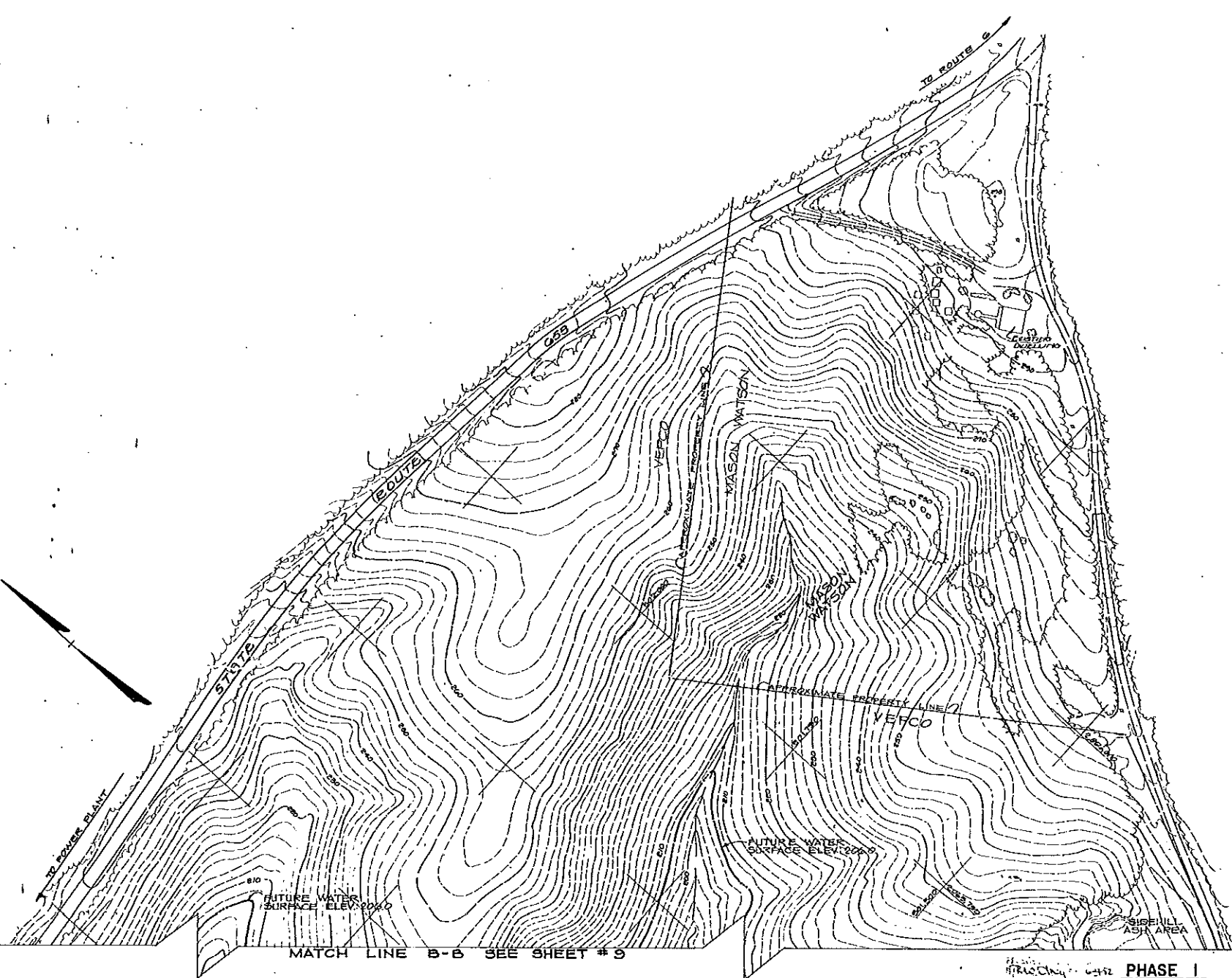
**J. J. THOMPSON & ASSOCIATES, INC.**  
**ENGINEERS, SURVEYORS, PLANNERS**  
 1103 STAPLES - 1111 E.  
 RICHMOND, VIRGINIA 23228  
 (804) 252-3336

**ASH DISPOSAL POND**  
**BRENO BLUFF POWER STATION**  
 FLUVANNA COUNTY, VIRGINIA

**BORROW AREA AND SIDEHILL ASH AREA**

REVISIONS

STAMP  
 1" = 50'  
 SCALE  
 R. POPE  
 DRAWN BY  
 MAY 21 1982  
 DATE DRAWN  
 B. JOHNS  
 DESIGNED  
 J. HENSON  
 CHECKED  
 9 OF 12  
 SHEET NUMBER  
 13239  
 JOB NUMBER




MATCH LINE B-B SEE SHEET # 3

PHASE 1


VEPCO P.N. 73864104

**J. E. THAMONS & ASSOCIATES, INC.**  
**ENGINEERS - SURVEYORS - PLANNERS**  
 1113 STRALES HILL RD  
 RICHMOND, VIRGINIA 23235  
 (804) 284-5511  
 (804) 284-1311

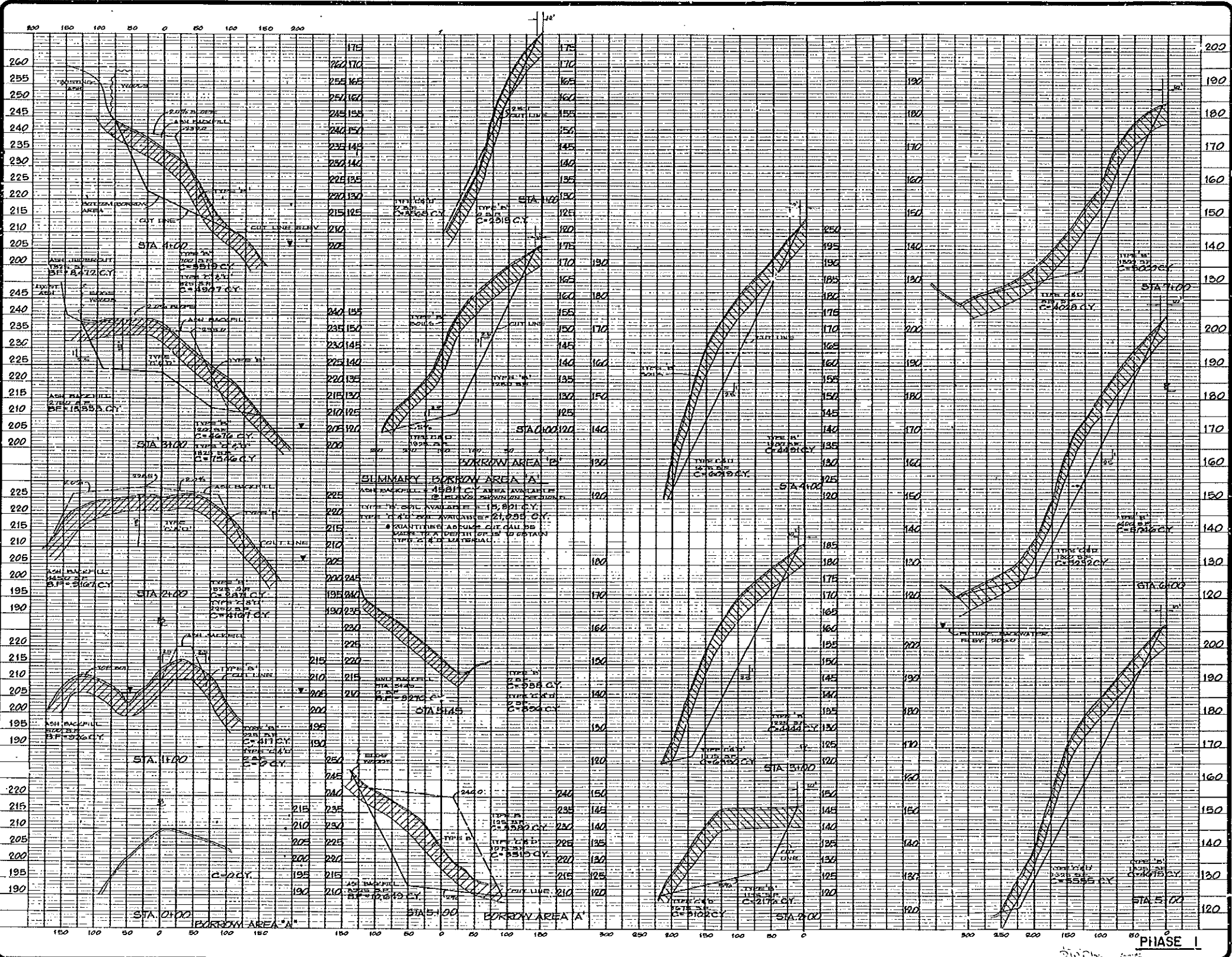


**ASH DISPOSAL POND**  
**SREMO BLUFF POWER STATION**  
**FLUVANNA COUNTY, VIRGINIA**  
**BORROW AREA AND SIDERHILL ASH AREA**

REVISIONS



STAMP  
 1" = 50'  
 SCALE  
 R. POPE  
 DRAWN BY  
 MAY 21, 1982  
 DATE DRAWN  
 B. JOHNS  
 DESIGNED  
 J. HEINSON  
 CHECKED  
 10 OF 12  
 SHEET NUMBER  
 13239  
 JOB NUMBER



**J. K. TIMMONS & ASSOCIATES, INC.**  
 ENGINEERS - SURVEYORS - PLANNERS  
 271 W. MAIN COMPANY RD. (1843) 744-3110  
 1803 STARRS MILL RD. (847) 282-1918  
 RICHMOND, VIRGINIA 23234

**ASH DISPOSAL POND**  
 BREMO BLUFF POWER STATION  
 FLUVANNA COUNTY, VIRGINIA

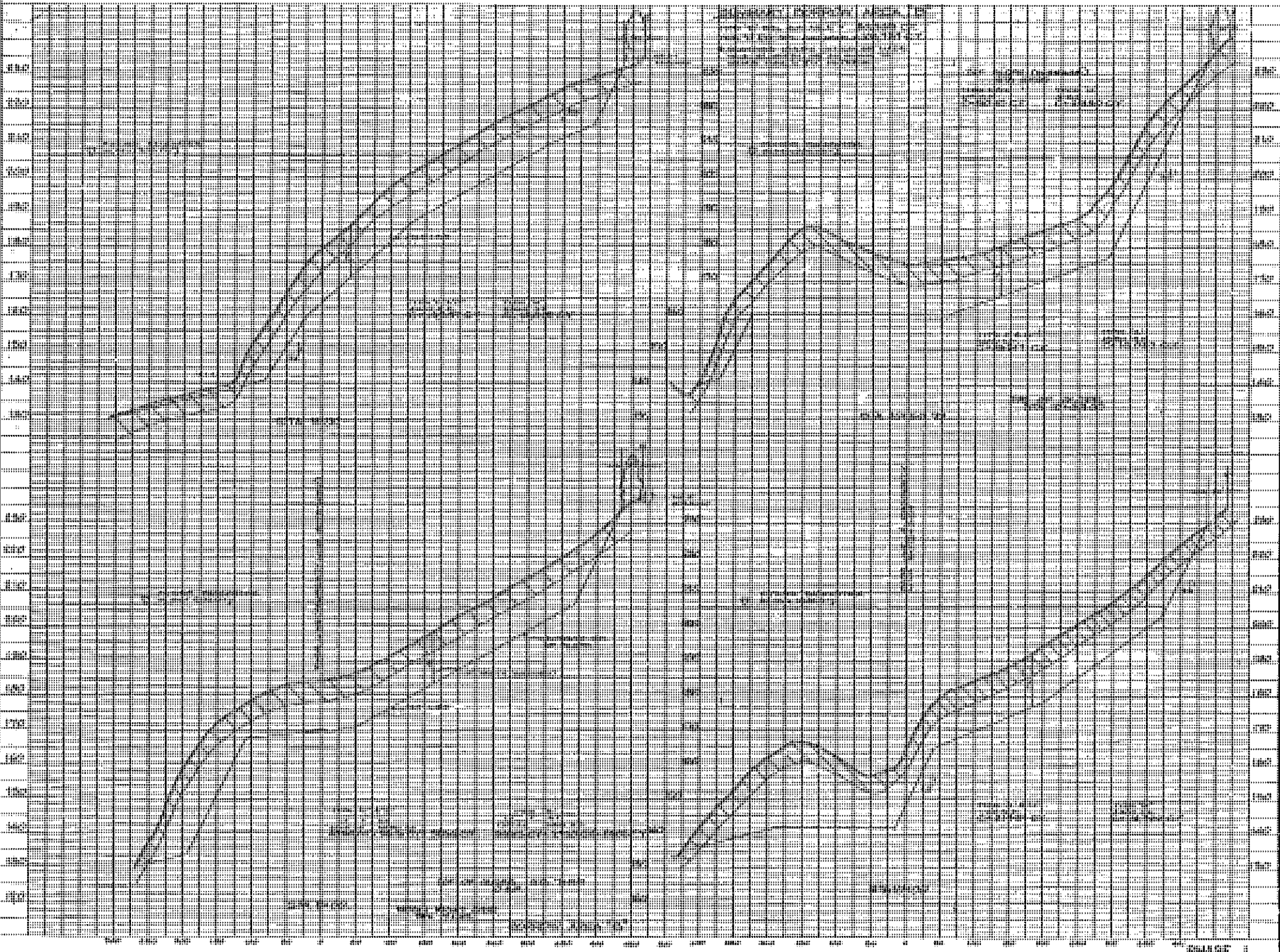
**BORROW AREA CROSS SECTIONS**

REVISIONS

11/88  
 07/03 M  
 284

STAMP  
 AS SHOWN  
 SCALE  
 R. POPE  
 DRAWN BY  
 MAY 21/1982  
 DATE DRAWN  
 B. JOHNS  
 DESIGNED  
 J. HENSON  
 CHECKED  
 11 OF 12  
 SHEET NUMBER  
 13239  
 JOB NUMBER





**1. F. THOMAS & COMPANY, INC.**  
 1100 BROADWAY, NEW YORK, N. Y.  
 TELEPHONE BR. 5-1111

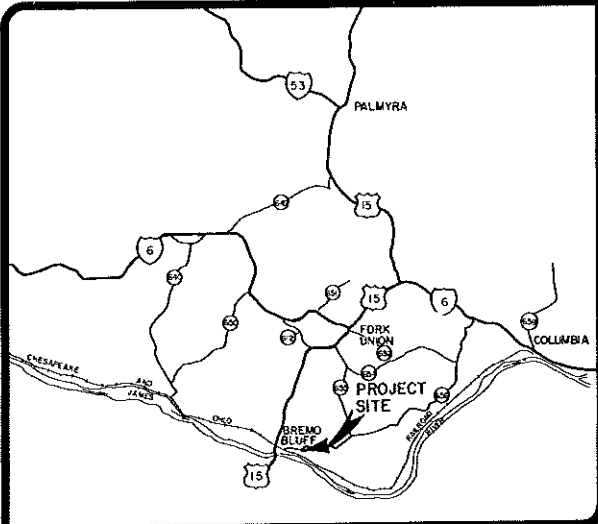
**FOR SPECIAL FORD**  
 MOTOR VEHICLES FROM 1950  
 FORDHOLLYWOOD, MICHIGAN

**EXPAND AREA CROSS SECTIONS**

**1000**  
 1000  
 1000

PLATE 1

1000



LOCATION MAP

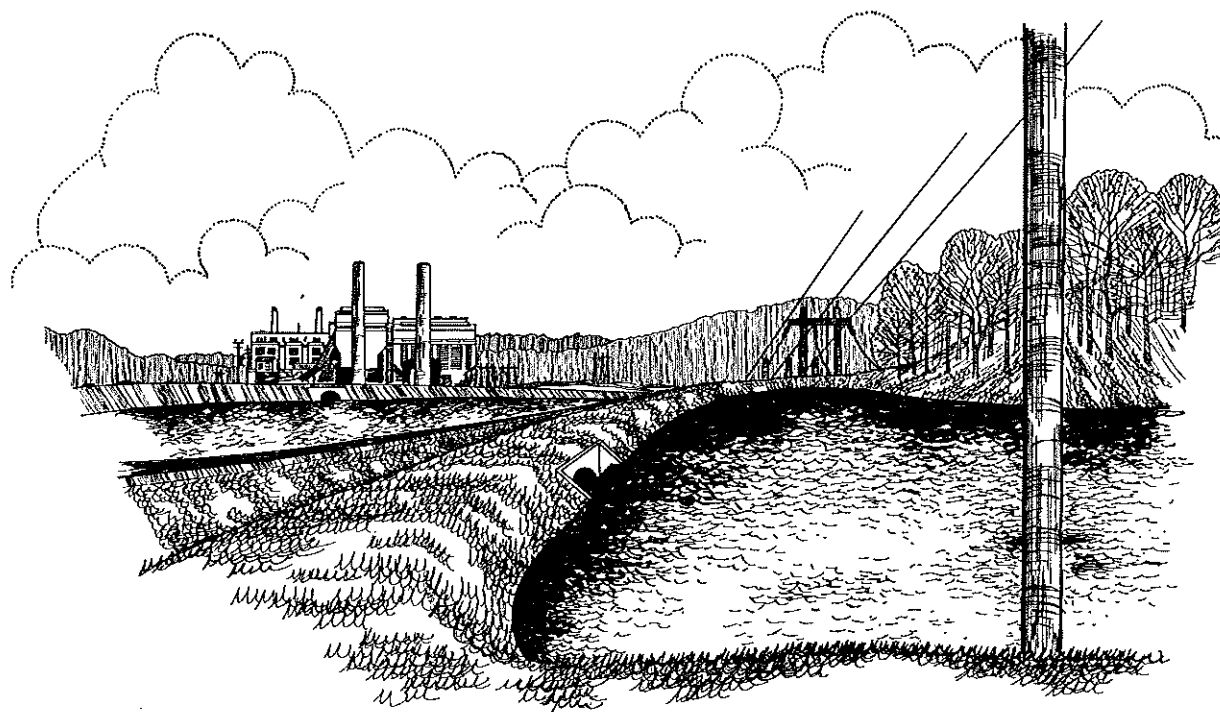
SCALE 1" = 10,000'

# VEPCO

## BREMO BLUFF POWER STATION FLUVANNA COUNTY, VIRGINIA ASH DISPOSAL POND PHASE II

SHEET INDEX

DESCRIPTION	SHEET NO.
TITLE SHEET	1
VICINITY MAP	2
SITE PLAN	3
SITE PLAN & ELECTRICAL SCHEMATIC FOR TOWER	4
SITE PLAN AND DETAILS	5
TYPICAL SECTIONS AND DETAILS	6
DAM PROFILE AND ACCESS ROAD PLAN	7
SECTIONS & DETAILS - OUTLET TOWER & BRIDGE	8
" " " " " "	9
" " " " " "	10
SOIL PROFILE AT DAM CENTERLINE	11
BORROW AREAS	12
BORROW AREAS	13
BORROW AREAS	14
CROSS SECTIONS (0+00 - 19+13.68)	15
CROSS SECTIONS (0+00 - 10+00)	16
CROSS SECTIONS (11+00 - 24+00)	17
AS BUILT DAM & ACCESS ROAD PROFILE	17A
REVISED PILE CAP DETAILS	17B
EXIST. TOPO DATED 12/8/83	17C
EXIST. TOPO DATED 10/6/83	17D
EXIST. TOPO DATED 10/6/83	17E
EXIST. TOPO DATED 10/6/83	17F



AS BUILT  
12-21-83

XXX - DENOTES ITEMS THAT WERE FIELD  
CHANGED. ALSO ITEMS SHOWN BOLD  
ARE THE "AS BUILT" ITEMS.

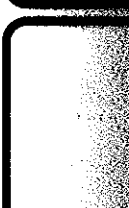
JOB NO. 13239  
DATE : NOVEMBER 1, 1982  
REVISIONS:

J.K. TIMMONS & ASSOCIATES, INC.  
CONSULTING ENGINEERS  
PLANNERS SURVEYORS  
RICHMOND, VIRGINIA  
PHONE : 794-3500  
VEPCO PROJECT NUMBER 73864104

J. K. TIMMONS & ASSOCIATES, INC.  
ENGINEERS SURVEYORS PLANNERS

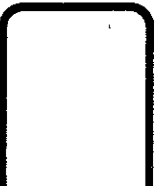


SCHWABER ENGINEERING  
ASSOCIATES, P.C.  
GEOTECHNICAL ENGINEERS





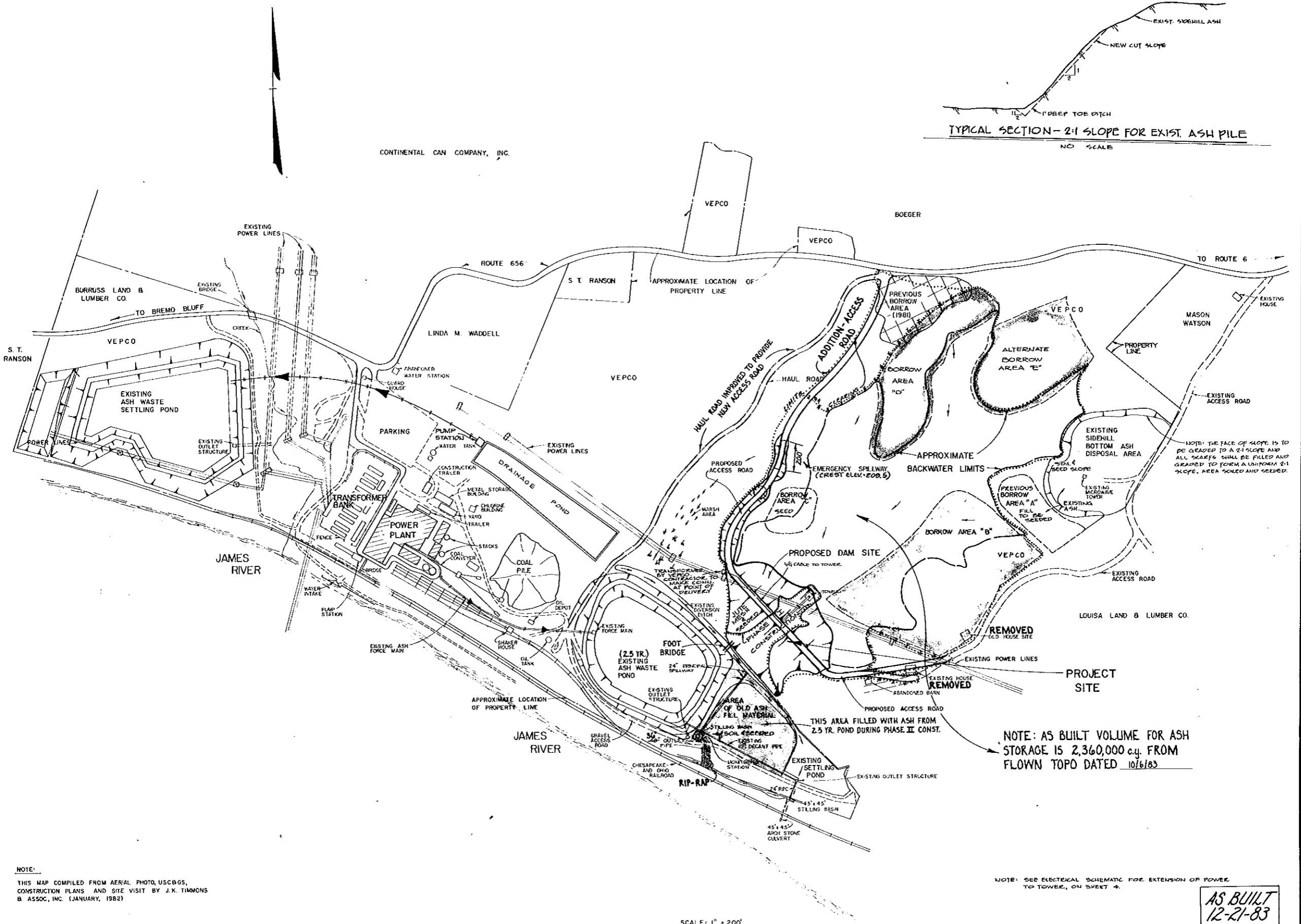
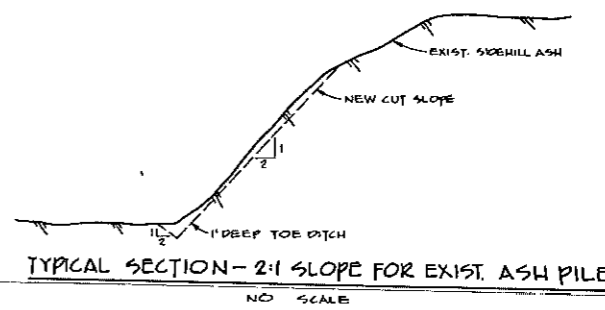
**ASH DISPOSAL POND**  
**BREMO BLUFF POWER STATION**  
**FLUVANNA COUNTY, VIRGINIA**



REVISIONS

1	AS BUILT
2	AS BUILT

STAMP  
 1" = 200'  
 SCALE  
 B. FARIES  
 DRAWN BY  
 NOV. 1, 1982  
 DATE DRAWN  
 B. JOHNS  
 DESIGNED  
 J. HENSON  
 CHECKED  
 2 OF 17  
 SHEET NUMBER  
 13239  
 JOB NUMBER



NOTE:  
 THIS MAP COMPILED FROM AERIAL PHOTO, USCBGS,  
 CONSTRUCTION PLANS AND SITE VISIT BY J.K. TIMMONS  
 & ASSOC, INC. (JANUARY, 1982)

NOTE: AS BUILT VOLUME FOR ASH  
 STORAGE IS 2,360,000 c.y. FROM  
 FLOWN TOPO DATED 10/6/83

NOTE: SEE ELECTRICAL SCHEMATIC FOR EXTENSION OF POWER  
 TO TOWER, ON SHEET 4.

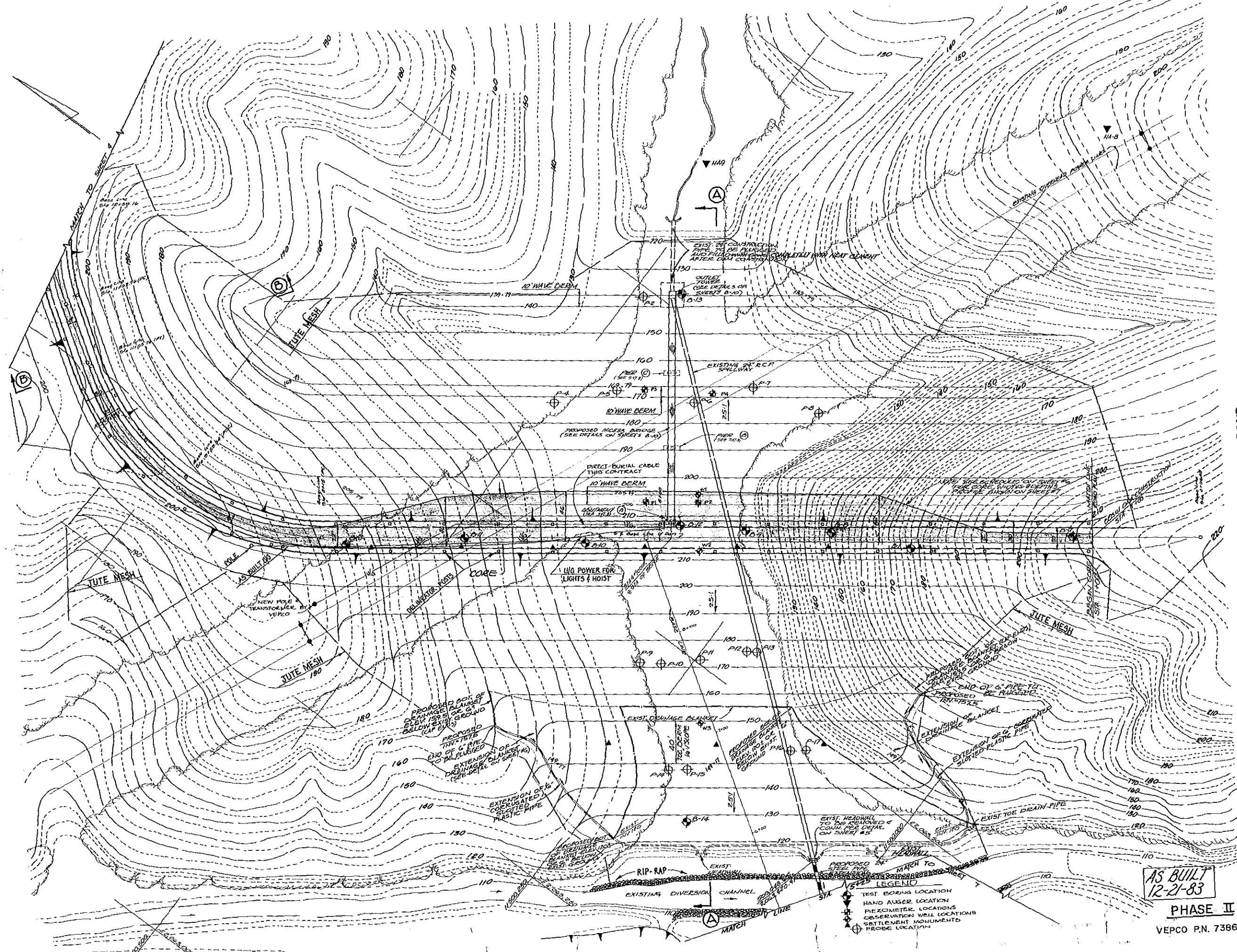
**AS BUILT**  
**12-21-83**

SCALE: 1" = 200'

**PHASE II**

VEPCO P.N. 73864104





ASH DISPOSAL POND  
 BREMO BLUFF POWER STATION  
 FLUVANNA COUNTY, VIRGINIA

SITE PLAN

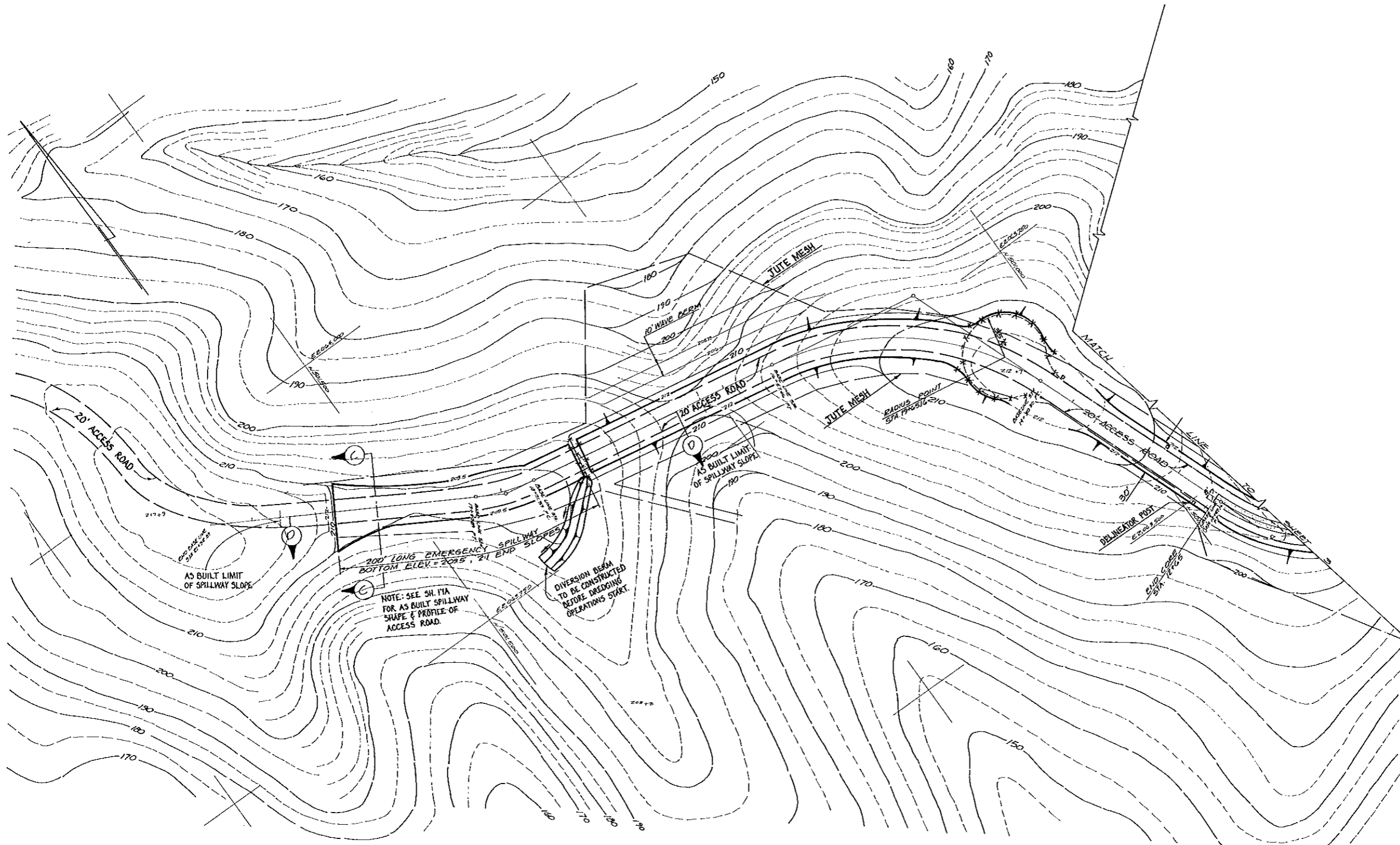
1" = 30'  
 B. JOHNS  
 NOV. 1, 1982  
 B. JOHNS  
 J. HENSON  
 3 OF 17  
 13239

AS BUILT  
 12-21-83

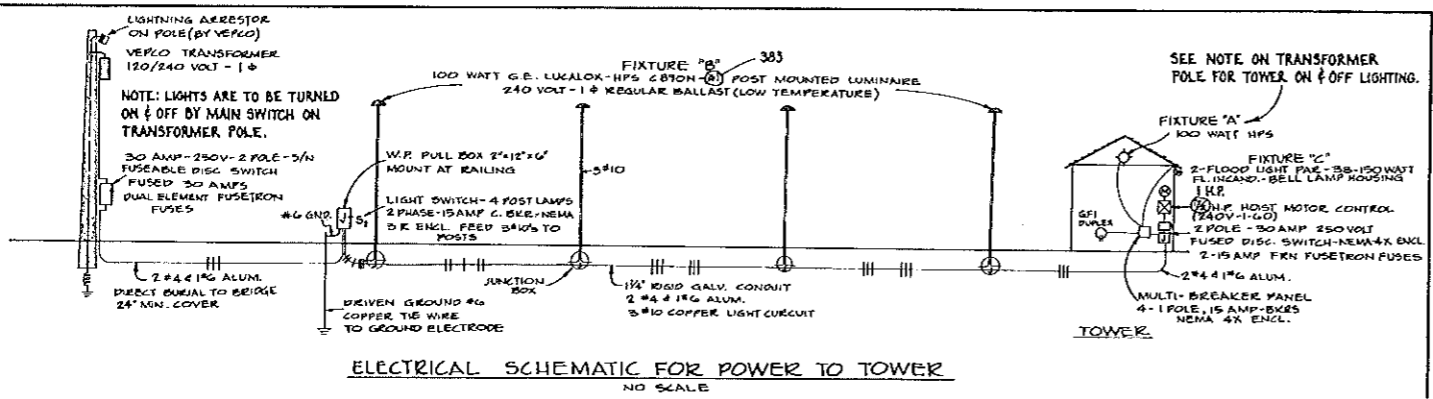
PHASE II

VEPCO P.N. 73864104





ASH DISPOSAL POND  
 BREMO BLUFF POWER STATION  
 FLUVANNA COUNTY, VIRGINIA  
 SITE PLAN & ELEC. SCHEMATIC FOR TOWER

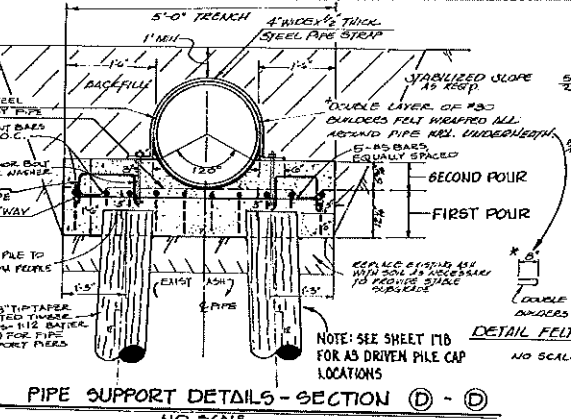
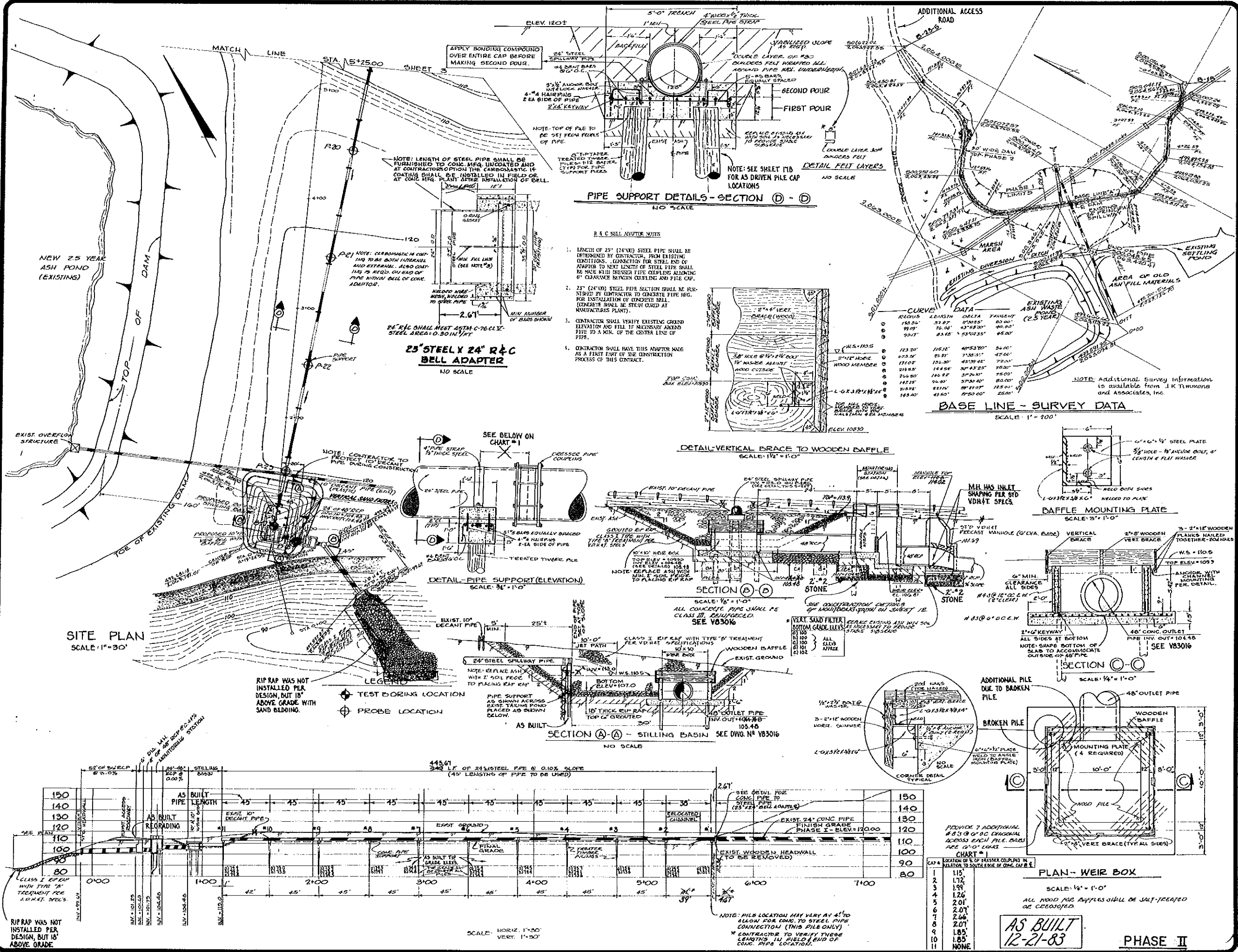


ELECTRICAL SCHEMATIC FOR POWER TO TOWER  
 NO SCALE

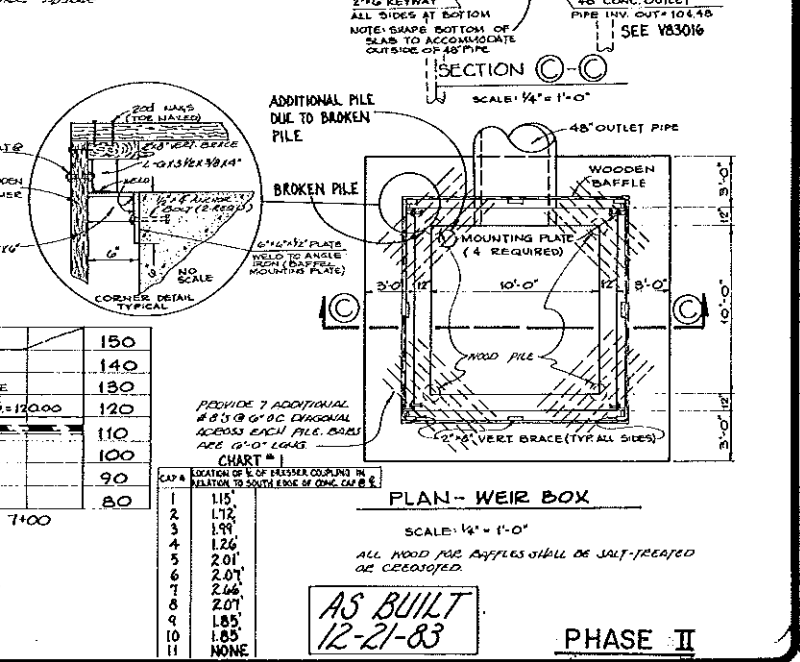
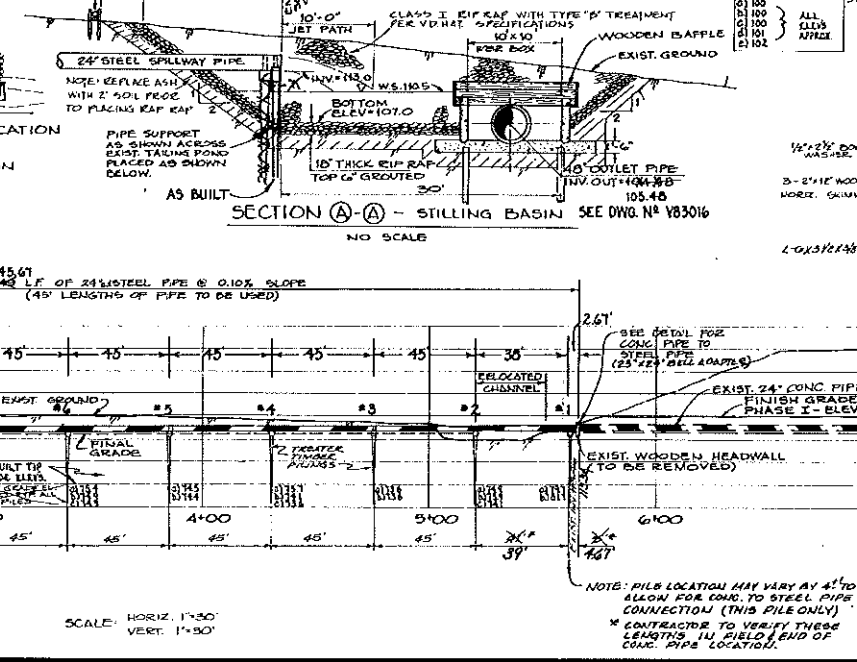
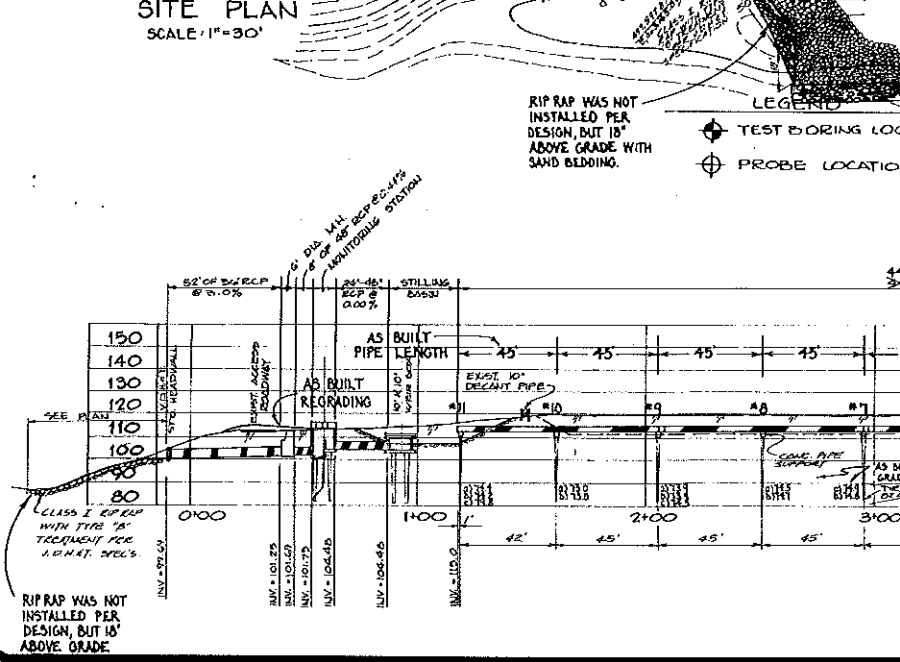
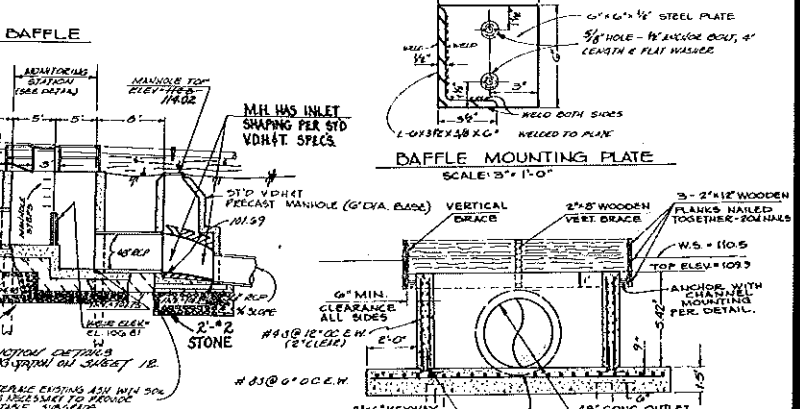
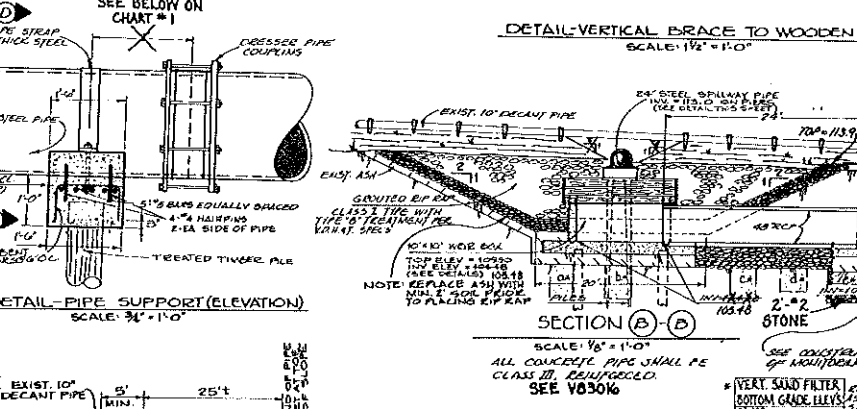
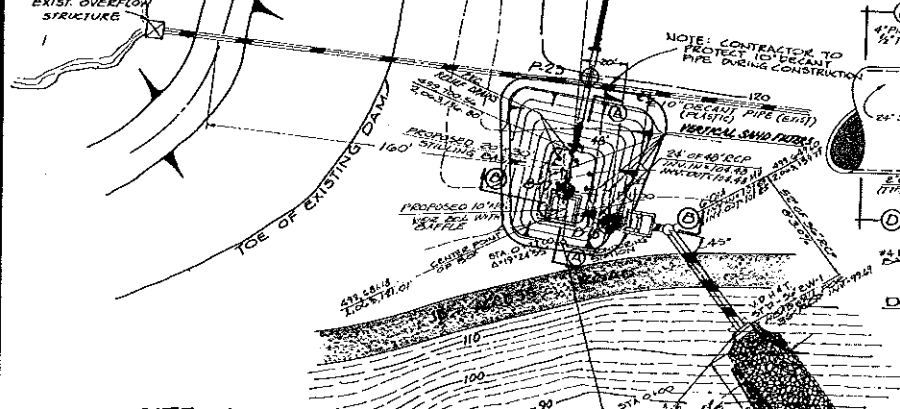
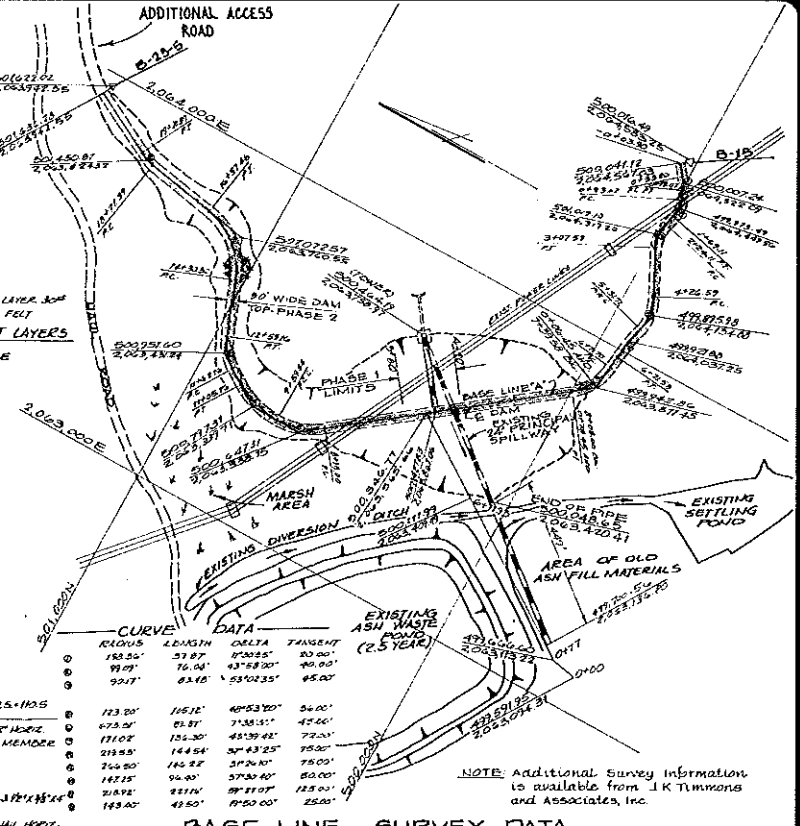
AS BUILT  
 12-21-83

1" = 30'  
 B. JOHNS  
 NOV. 1, 1982  
 B. JOHNS  
 J. HENSON  
 4 OF 17  
 13239

PHASE II



- R & C BELL ADAPTER NOTES**
- LENGTH OF 23" (24" O.D.) STEEL PIPE SHALL BE DETERMINED BY CONTRACTOR FROM EXISTING CONDITIONS. CONNECTION FOR STEEL END OF ADAPTER TO NEW LENGTH OF STEEL PIPE SHALL BE MADE WITH DRESSER PIPE CLIPPING ALLOWING 6" CLEARANCE BETWEEN CLIPPING AND PIPE CAP.
  - 23" (24" O.D.) STEEL PIPE SECTION SHALL BE FURNISHED BY CONTRACTOR TO CONCRETE PIPE H.G. FOR INSTALLATION OF CONCRETE BELL. (CONCRETE SHALL BE STEAM CURED AT MANUFACTURER'S PLANT.)
  - CONTRACTOR SHALL VERIFY EXISTING GROUND ELEVATION AND FILL IF NECESSARY ADJOINING PIPE TO A MIN. OF THE CENTER LINE OF PIPE.
  - CONTRACTOR SHALL HAVE THIS ADAPTER MADE AS A FIRST PART OF THE CONSTRUCTION PROCESS OF THIS CONTRACT.



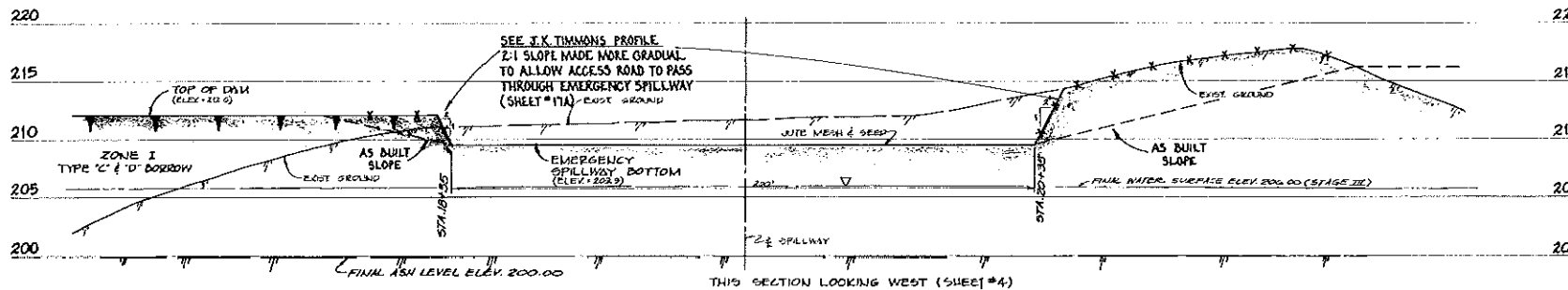
**J. K. TIMMONS & ASSOCIATES, INC.**  
**ENGINEERS SURVEYORS PLANNERS**  
 711 NORTH COURTHOUSE RD. (804) 794-3500 RICHMOND, VIRGINIA 23225  
 809 STAPLES MILL RD. (804) 282-7338 RICHMOND, VIRGINIA 23228

**ASH DISPOSAL POND**  
 BREMO BLUFF POWER STATION  
 FLUVANNA COUNTY, VIRGINIA

**SITE PLAN AND DETAILS**

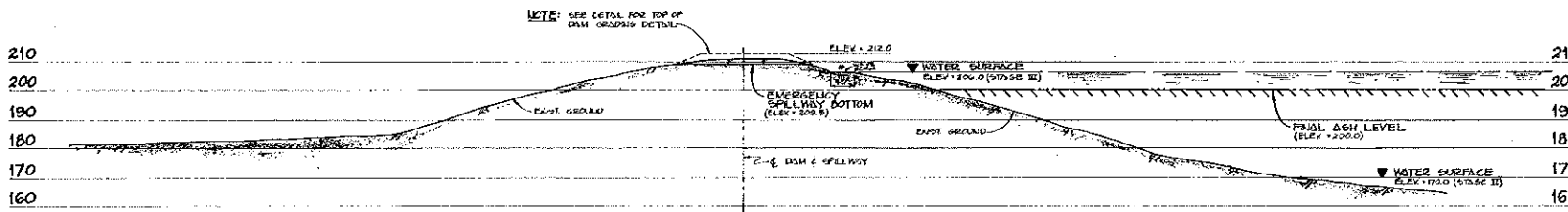
**AS SHOWN**  
 R. THOMAS  
 NOV 1, 1982  
 B. JOHNS  
 J. HENSON  
 5 OF 17  
 13239

**VEPCO RN. 73864104**



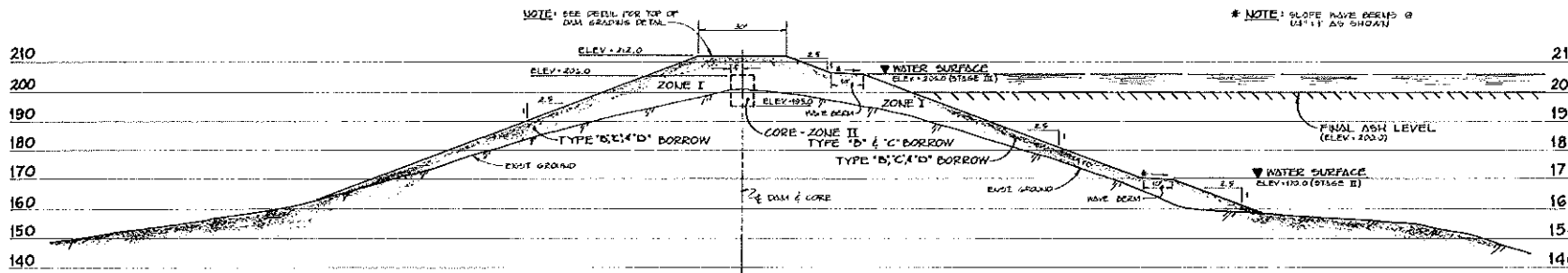
TYPICAL SPILLWAY ELEVATIONAL-SECTION D-D

SCALE  
HORIZONTAL: 1"=20'  
VERTICAL: 1"=5'



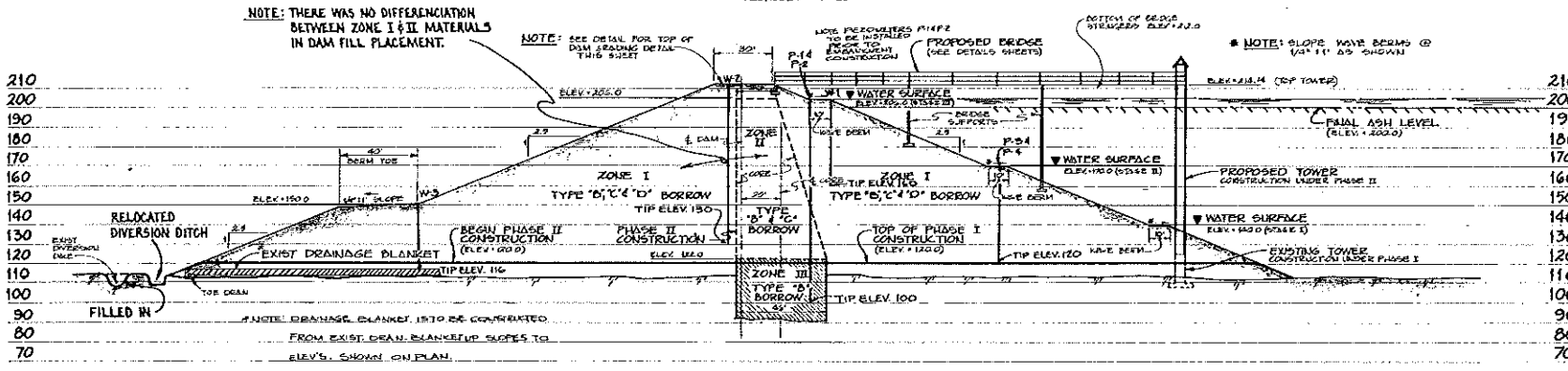
TYPICAL SPILLWAY SECTION C-C

SCALE  
HORIZONTAL: 1"=20'  
VERTICAL: 1"=20'



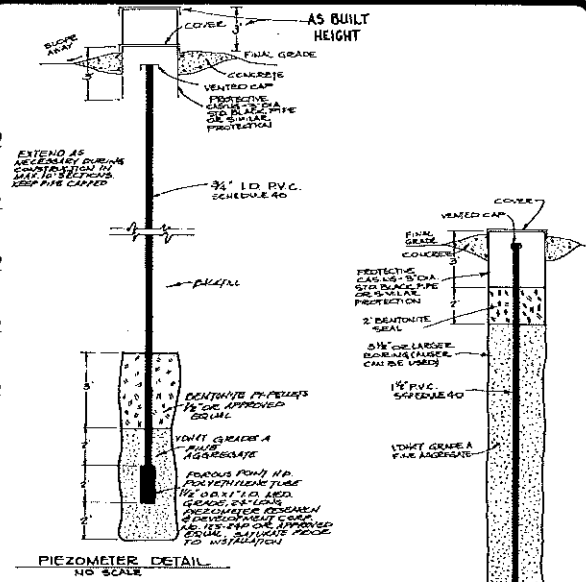
TYPICAL SECTION - DAM COMPOSITION B-B

SCALE  
HORIZONTAL: 1"=30'  
VERTICAL: 1"=5'



TYPICAL SECTION - DAM COMPOSITION A-A

SCALE  
HORIZONTAL: 1"=30'  
VERTICAL: 1"=5'

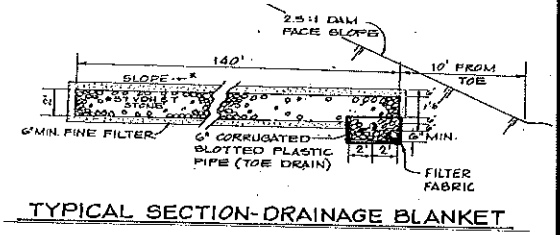


NOTE: ALL PIEZOMETER COVERS SET W/ 3\"/>

POST CONSTRUCTION OBSERVATION WELL DETAIL

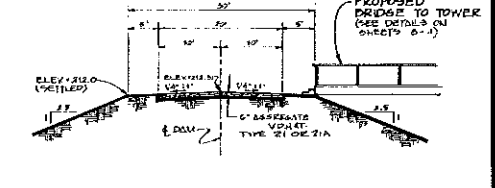
STATION      WIDTH (FT)      DISTANCE TO FACE OF DAM (FT)

STATION	WIDTH (FT)	DISTANCE TO FACE OF DAM (FT)
0+00	206	0
1+00	185	12
2+00	158	44
3+00	136	46
4+00	92	46
5+00	92	46
6+00	100	29
7+00	137	46
8+00	167	46
9+00	155	22
10+00	125	8
11+00	125	8
12+00	...	0



TYPICAL SECTION - DRAINAGE BLANKET

SCALE: Horiz. 1"=5', Vert. 1"=5'



TOP OF DAM GRADING DETAIL

SCALE  
HORIZONTAL: 1"=10'  
VERTICAL: 1"=10'

AS BUILT  
12-21-83

PHASE II

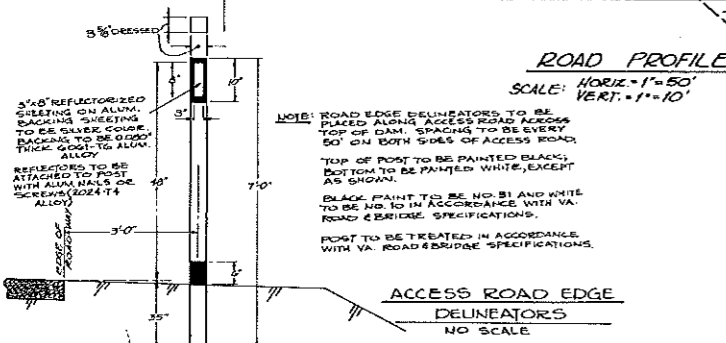
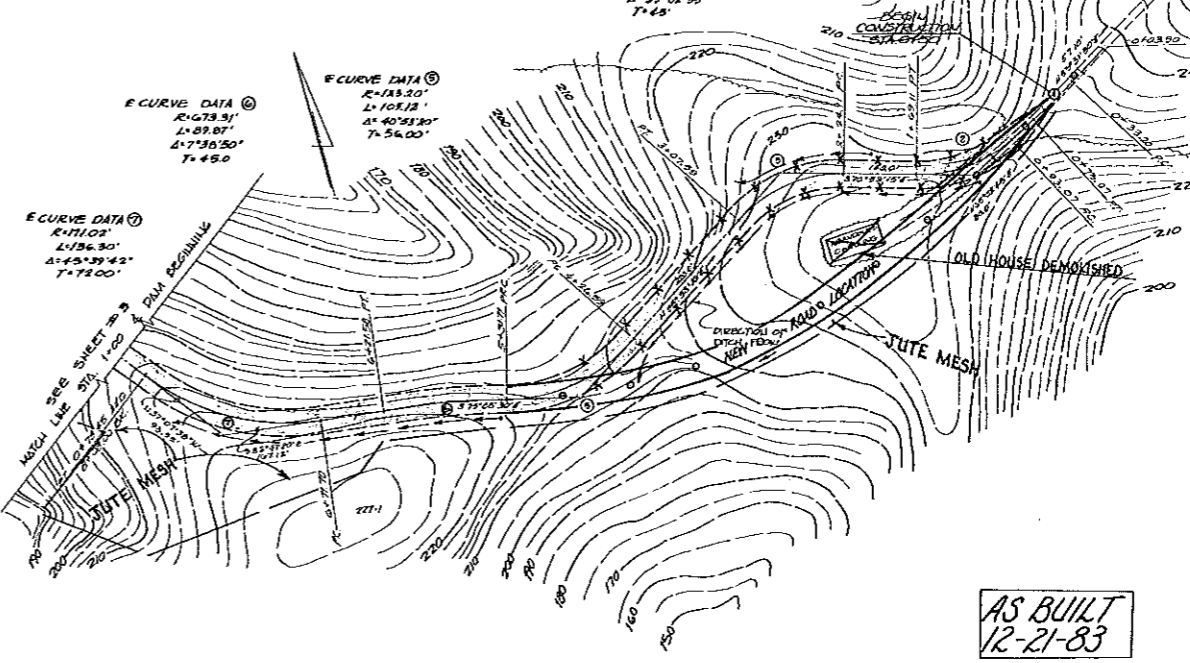
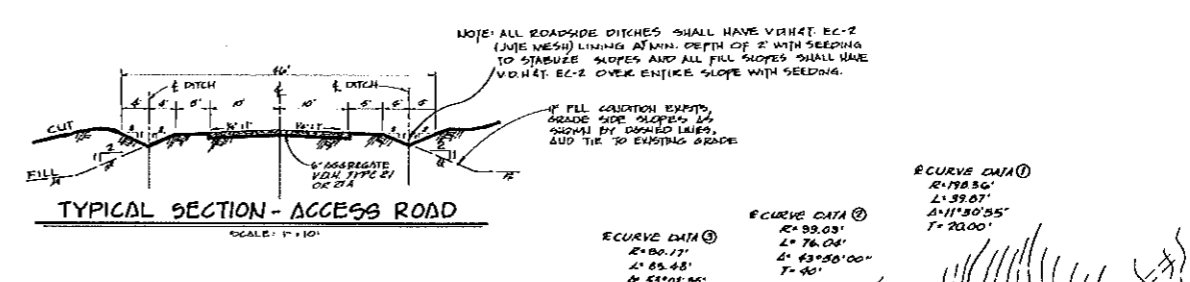
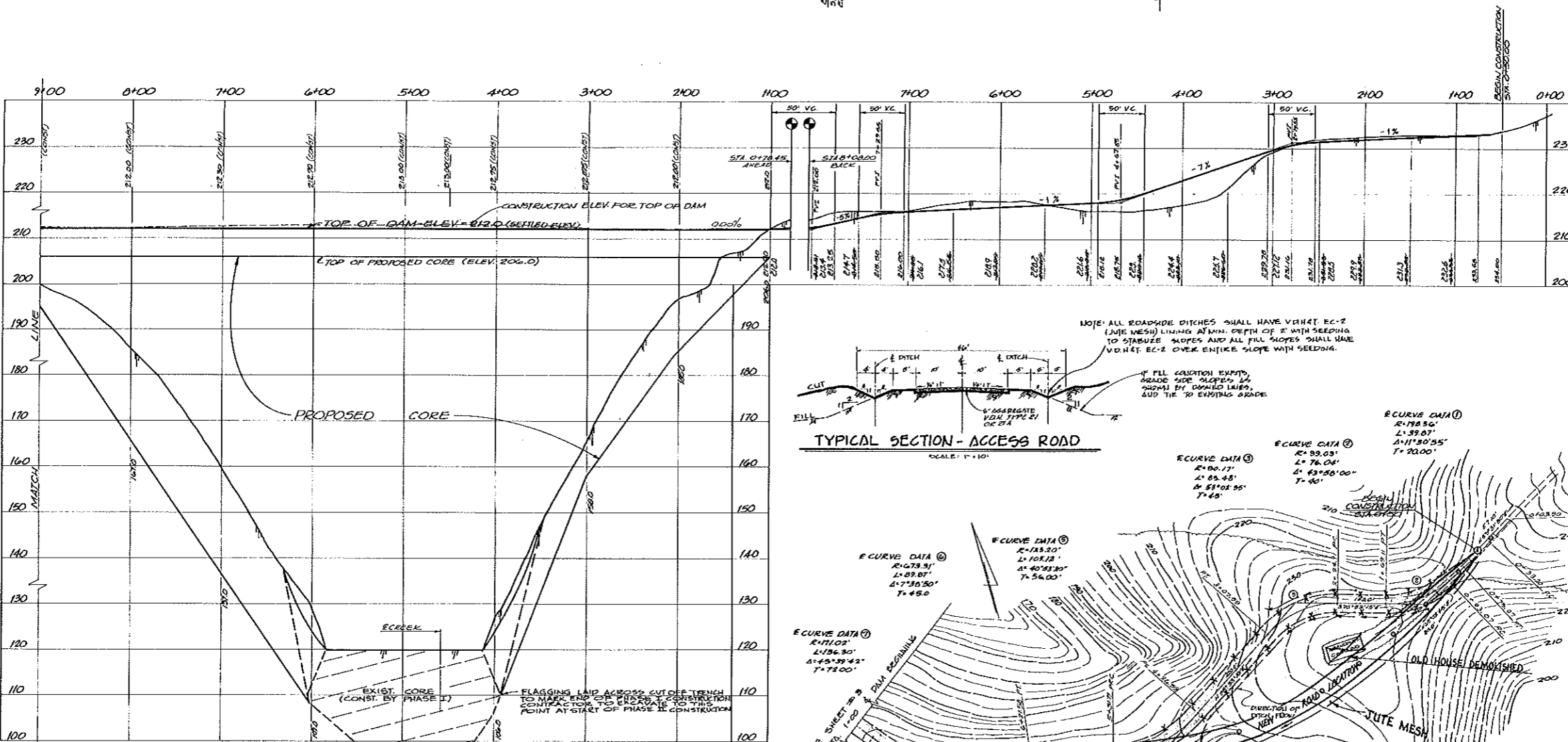
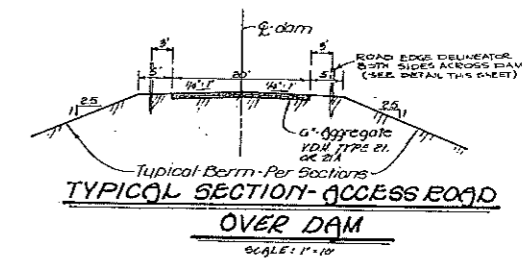
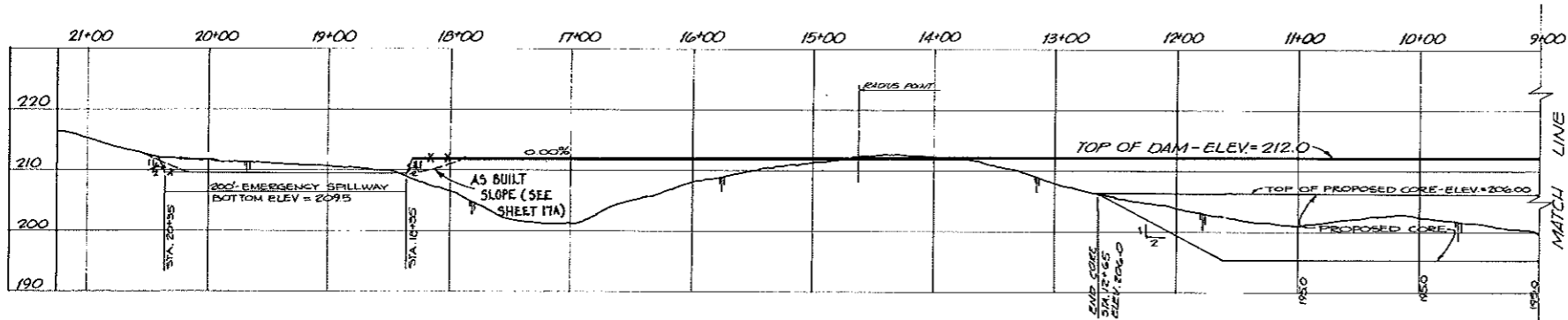
**J. K. TIMMONS & ASSOCIATES, INC.**  
**ENGINEERS - SURVEYORS - PLANNERS**  
 711 NORTH COURTHOUSE RD. RICHMOND, VIRGINIA 23205  
 8803 STAPLES MILL RD. RICHMOND, VIRGINIA 23228  
 (804) 784-3500  
 (804) 262-7396



**ASH DISPOSAL POND**  
**BREMO BLUFF POWER STATION**  
 FLUVANNA COUNTY, VIRGINIA  
**TYPICAL SECTIONS & DETAILS**



**AS SHOWN**  
**GORRELL**  
**NOV. 1, 1982**  
**JOHNS**  
**HENSON**  
**6 OF 17**  
 SCALE: HORIZ. 1"=10'  
 VERT. 1"=10'



ASH DISPOSAL POND  
 BREMO BLUFF POWER STATION  
 FLUVANNA COUNTY, VIRGINIA

DAM PROFILE AND ACCESS ROAD PLAN

★ (CONST. ELEV. OF TOP (12-13-88))



'AS SHOWN'  
 R. THOMAS  
 NOV. 1, 1982  
 B. JOHNS  
 J. HENSON  
 7 OF 17  
 13239

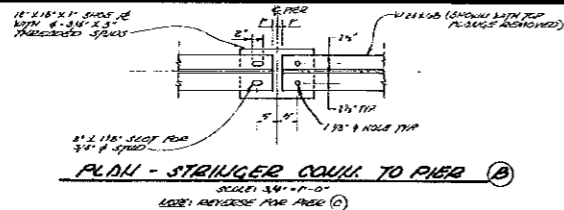
AS BUILT  
 12-21-83

ACCESS ROAD PLAN  
 SCALE: 1" = 50'

PHASE II

VEPCO P.N. 73864104

HUMAN FIGURES ARE SHOWN FOR PURPOSE OF PERSPECTIVE. ALL ARE 6'-0" TALL.



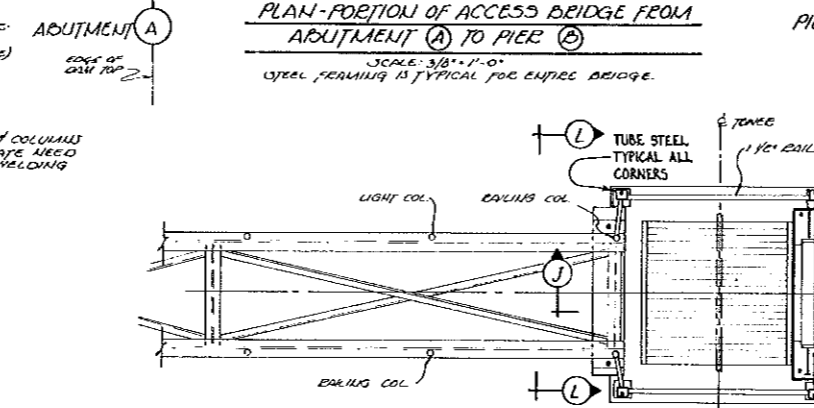
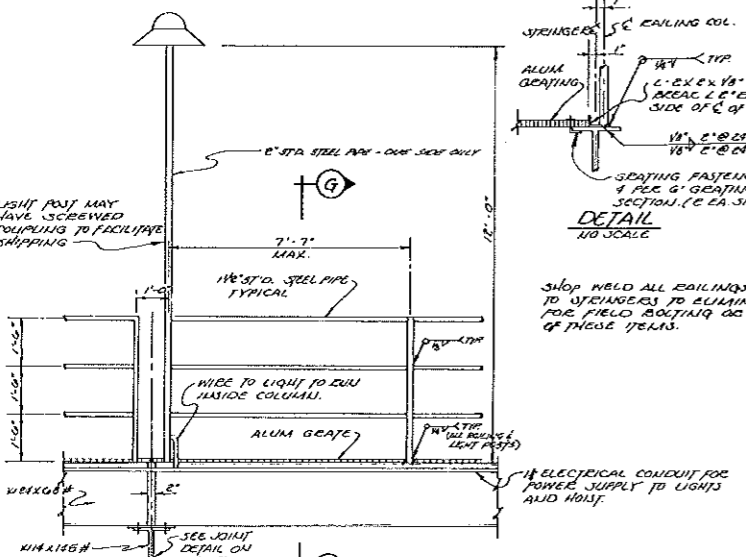
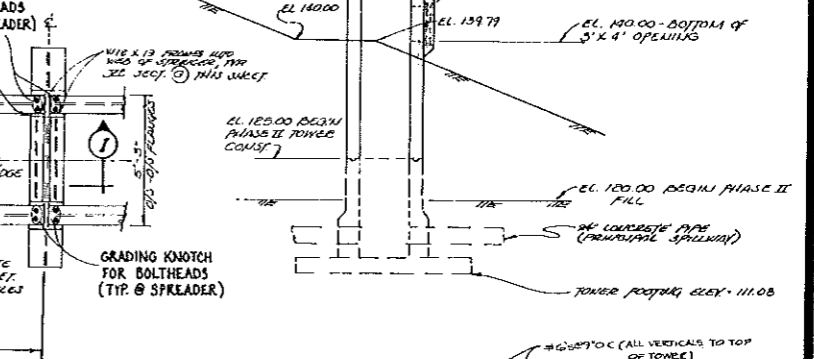
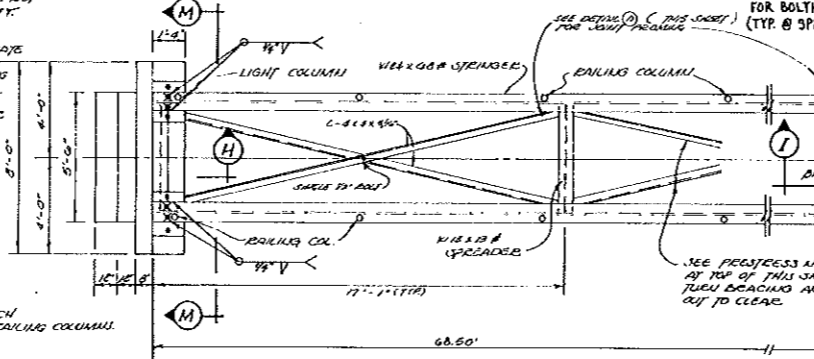
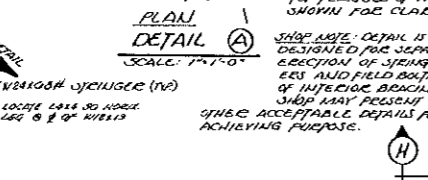
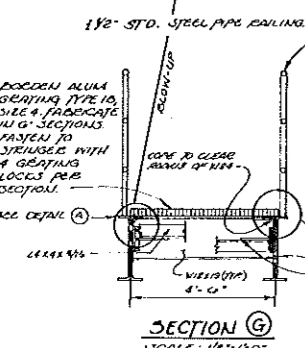
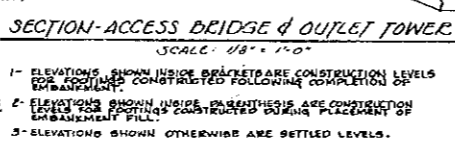
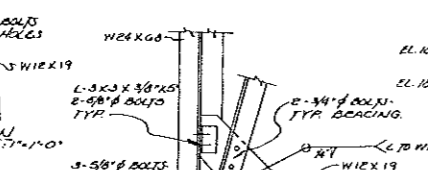
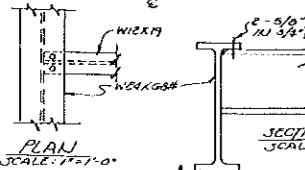
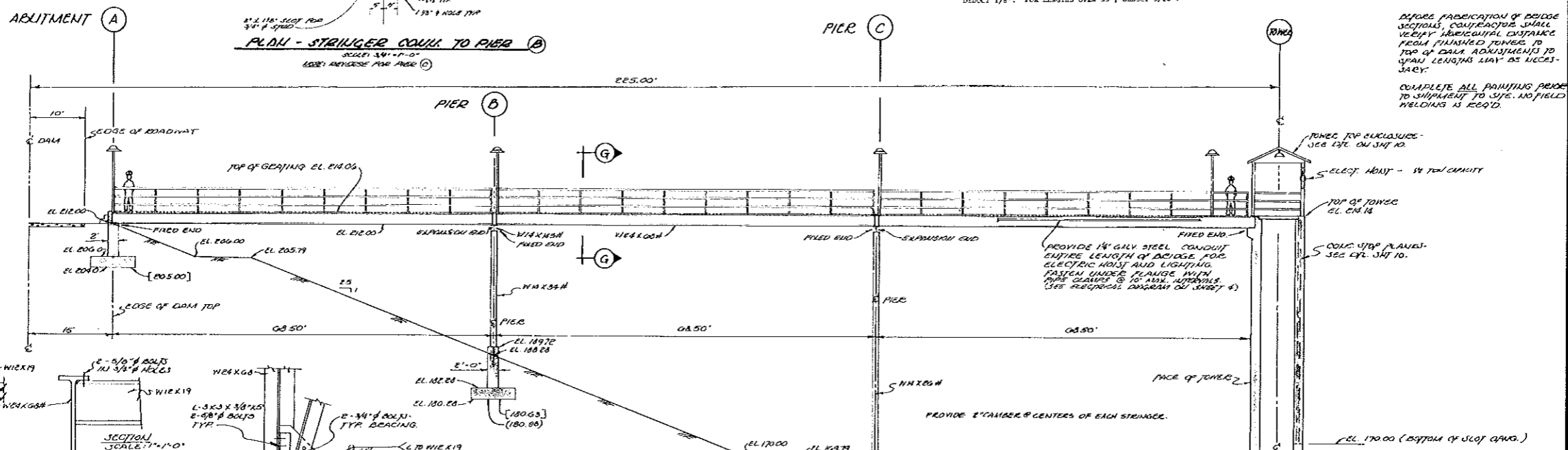
MAX. EXPANSION (@ 100' DIFFERENTIAL) IN 0.000' SPANS + 8/16" MOMENTS @ BASE OF PIER B AND C ARE CALCULATED ON BASIS OF 5/16" REALIGNMENT AT TOP OF PIER

RELATIVE TO CROSS BRACING MEMBERS, A CALCULATED OR THEORETICAL DISTANCE C-C OF THE END MOUNTING JOINTS SHALL BE REDUCED FOR FABRICATING TOLERANCES ACCORDING TO THE FOLLOWING SCHEDULES: FOR LENGTHS UP TO 10', NO DEDUCTION; FOR LENGTHS OVER 10' TO 20', DEDUCT 1/16"; FOR LENGTHS OVER 20' TO 35', DEDUCT 1/8"; FOR LENGTHS OVER 35', DEDUCT 3/16".

NOTE: EACH BRIDGE SECTION (68.50') MUST BE FROM C-1 - G-3 TOWNS BEFORE PAINTING.

BEFORE FABRICATION OF BRIDGE SECTIONS, CONTRACTOR SHALL VERIFY HORIZONTAL DISTANCE FROM FINISHED TOWNS TO TOP OF DAM ADJUSTMENTS TO SPAN LENGTHS MAY BE NECESSARY.

COMPLETE ALL PAINTING BEFORE TO SHIPMENT TO SITE. NO FIELD WELDING IS ALLOWED.



HORIZONTAL STEEL SCHEDULE		
ELEV. TO	ELEV. FROM	REIN. STEEL
125.00	145.00	15 #5 @ 11" / 0.5 #7 @ 11"
145.00	165.00	15 #4 @ 9" / 0.5 #6 @ 10"
185.00	185.00	13 #4 @ 9" / 0.5 #5 @ 8"
185.00	214.14	13 #4 @ 12" / 0.5 #5 @ 10"

AS BUILT  
12-21-83

PHASE II

VEPCO P.N. 73864104

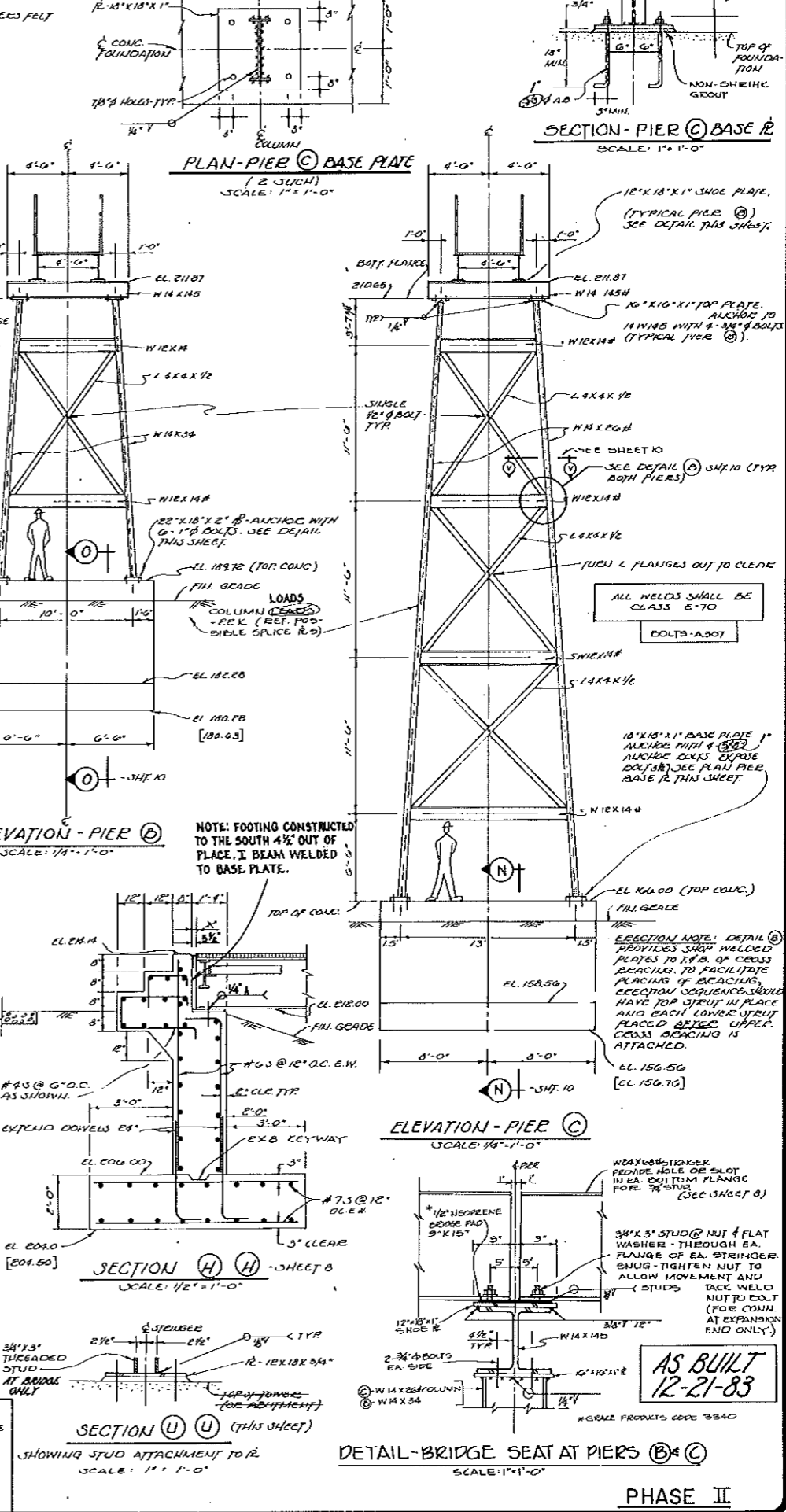
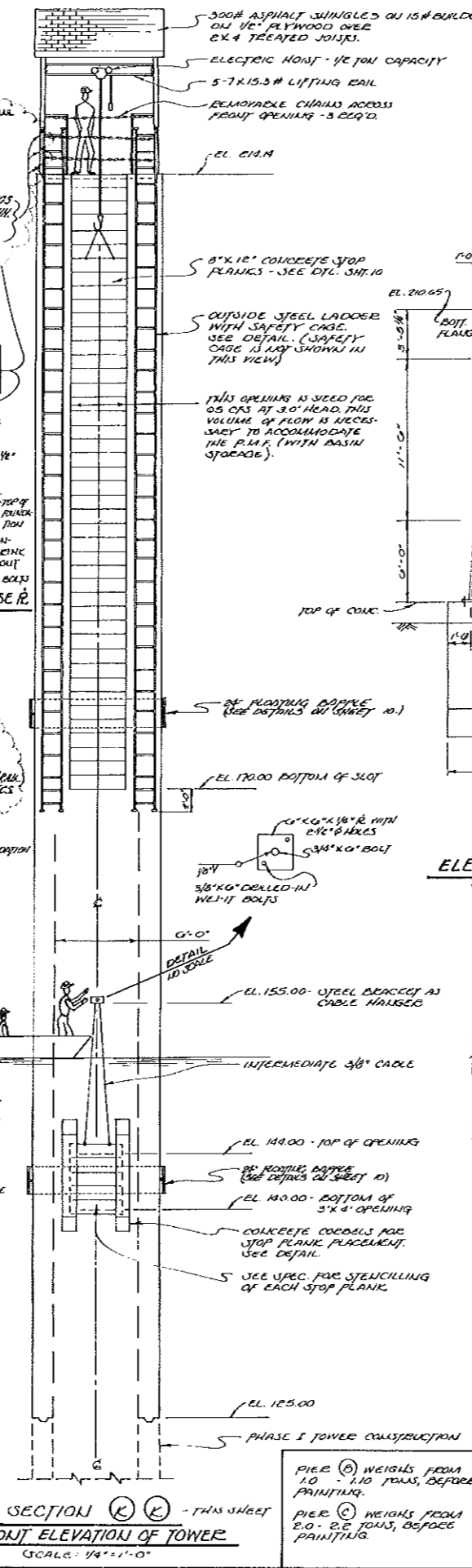
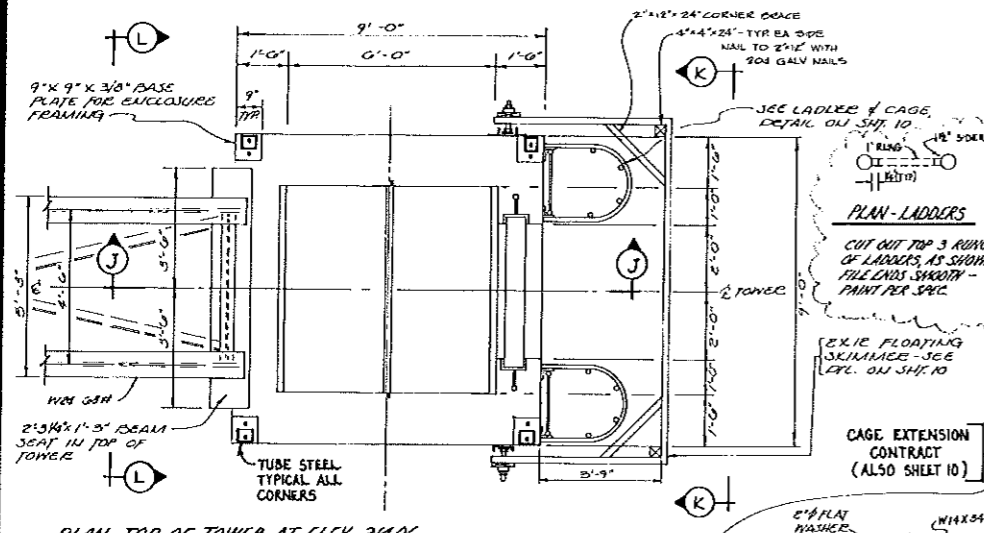
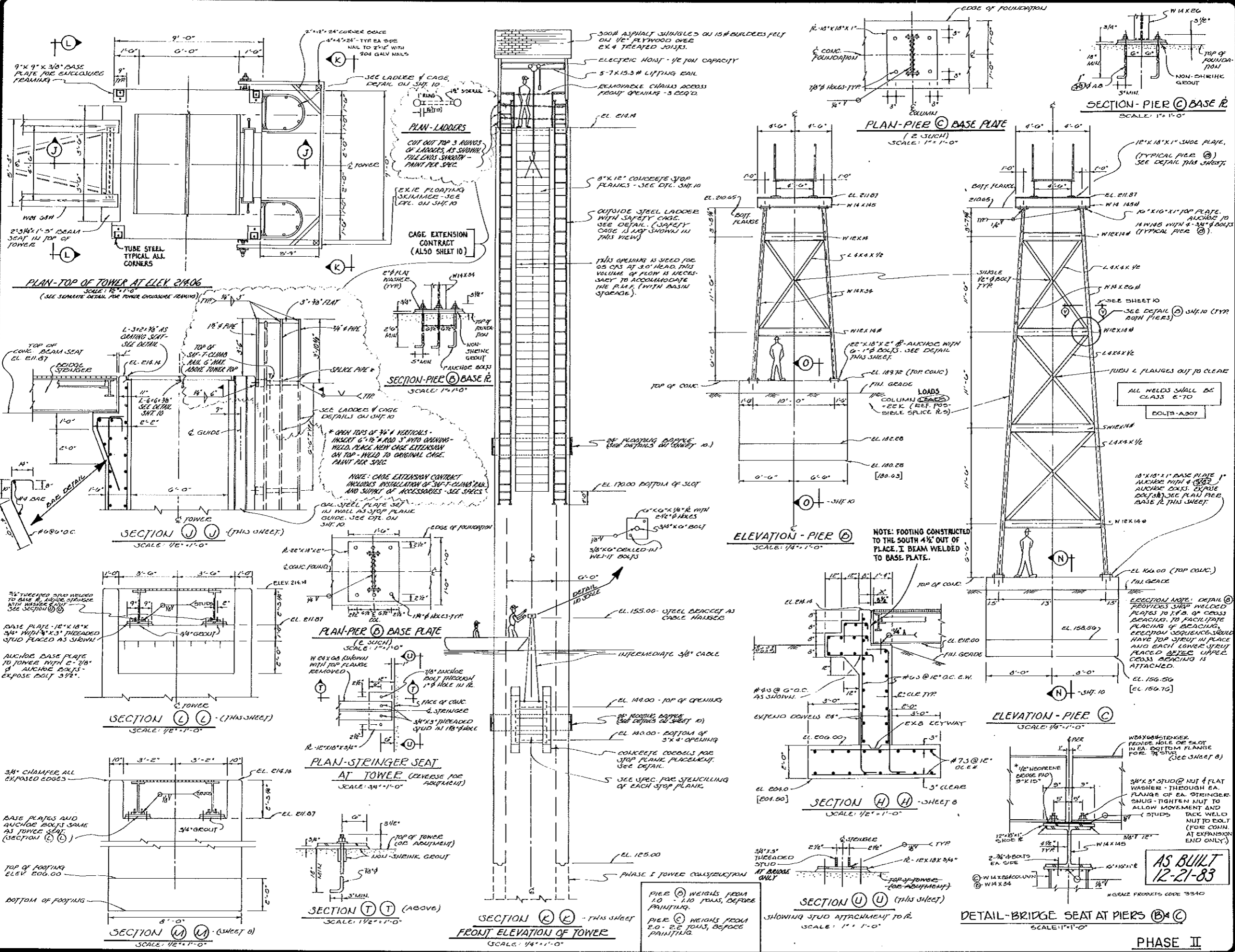
**J. E. LAWSON & ASSOCIATES, INC.**  
ENGINEERS SURVEYORS PLANNERS  
711 NORTH COURTHOUSE DR. RICHMOND, VIRGINIA 23268  
(804) 784-3500 (804) 262-7386

**ASH DISPOSAL POND**  
BREM O BLUFF POWER STATION  
FLUVANNA COUNTY, VIRGINIA

**SECTIONS & DTLS-OUTLET TOWER & BR.**

AS SHOWN  
CLARK  
NOV 1, 1982  
HENSON  
HENSON  
6 OF 17  
13239





**ENGINEERS ASSOCIATES, INC.**  
RICHMOND, VIRGINIA 23226  
711 NORTH COURTHOUSE RD. (804) 784-3500  
8803 STAPLES MILL RD. (804) 262-7336

**ASH DISPOSAL POND**  
BREMEO BLUFF POWER STATION  
FLUVANNA COUNTY, VIRGINIA

**SECTIONS & DTLS-OUTLET TOWER & BR.**

**J. L. HENSON**  
CERT. DATE 1/28/83  
2854

**AS SHOWN**

**CLARK**

**NOV. 1, 1982**

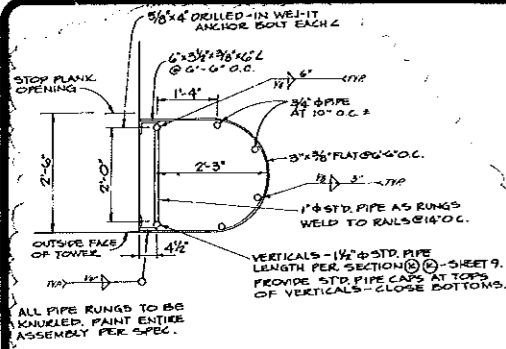
**HENSON**

**HENSON**

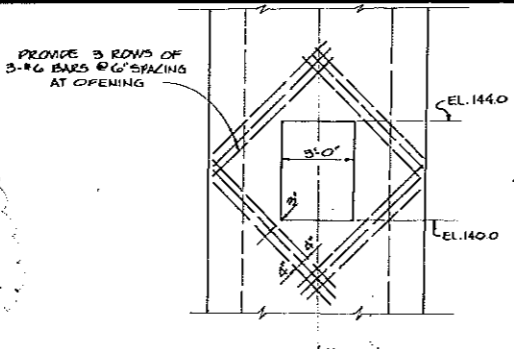
**9 OF 17**

**13239**

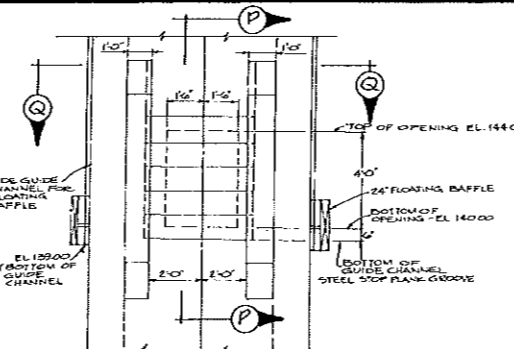
**AS BUILT**  
12-21-83



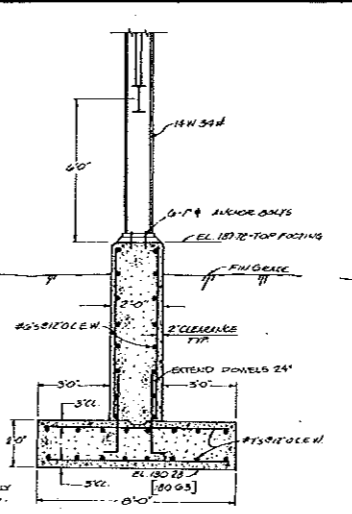
**PLAN-LADDER & CAGE ASSEMBLY**  
SCALE: 3/8"=1'-0"  
ALSO SEE SECTION (D) - SHEET 9



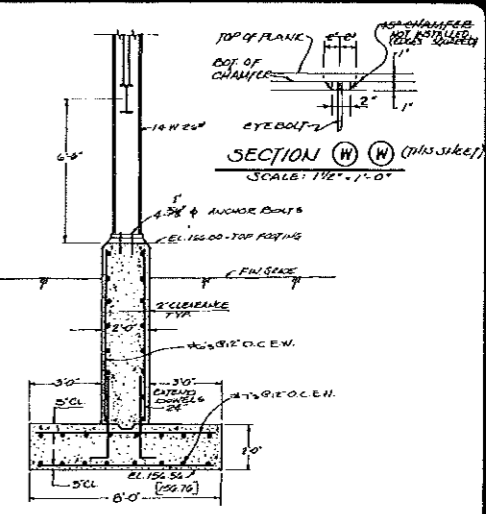
**ELEVATION-LOWER TOWER OPNG.**  
SCALE: 3/8"=1'-0"  
SHOWING ADDITIONAL DIAGONAL WALL REIN. STEEL



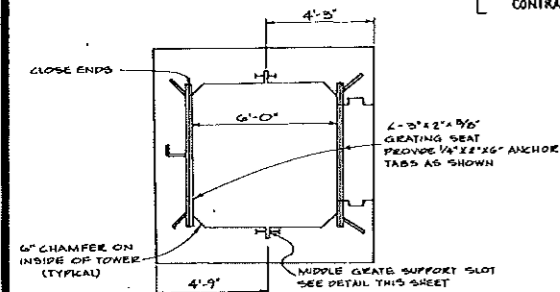
**FRONT ELEVATION-LOWER TOWER OPENING**  
SCALE: 3/8"=1'-0"



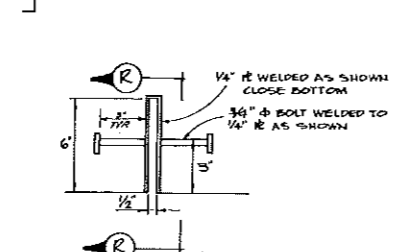
**SECTION (O) (O) (SEE SHEET 9)**  
SCALE: 3/8"=1'-0"



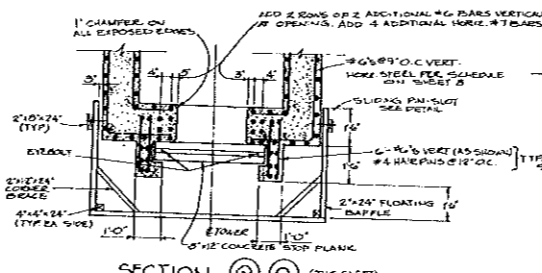
**SECTION (N) (N) (THIS SHEET)**  
SCALE: 3/8"=1'-0"



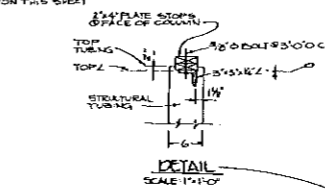
**PLAN-TOP OF TOWER SHOWING GRATING SEATS**  
SCALE: 3/8"=1'-0"



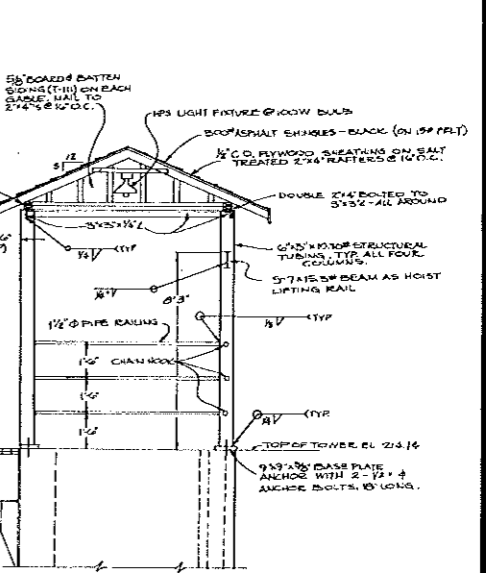
**PLAN-MIDDLE GRATE SUPPORT SLOT**  
SCALE: 3/8"=1'-0"  
GALVANIZE AFTER FABRICATION



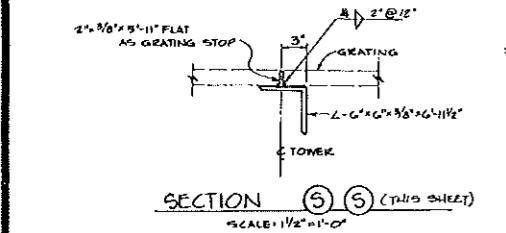
**SECTION (Q) (Q) (THIS SHEET)**  
SCALE: 3/8"=1'-0"



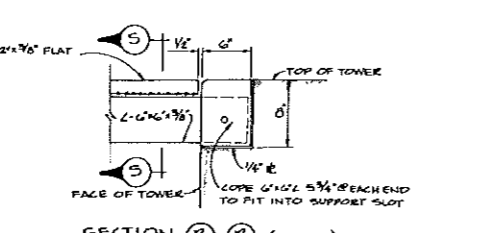
**DETAIL SCALE 1/2"=1'-0"**



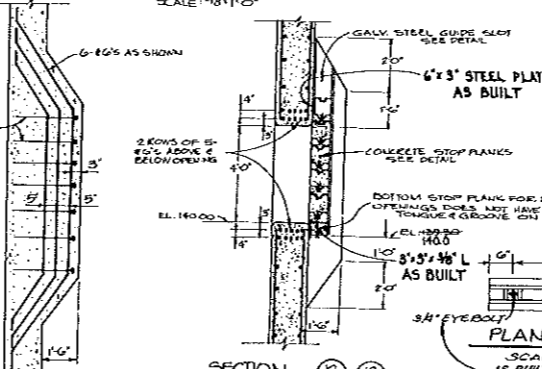
**NORTHWEST ELEVATION-TOWER TOP ENCLOSURE**  
SCALE: 3/8"=1'-0"  
ALL STEEL FOR THIS ITEM SHALL BE SHOP WELDED AND PAINTED PRIOR TO SHIPPING TO SITE.



**SECTION (S) (S) (THIS SHEET)**  
SCALE: 1/2"=1'-0"



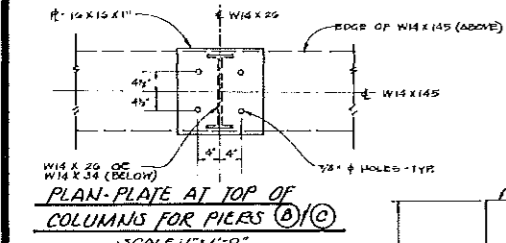
**SECTION (R) (R) (ABOVE)**  
SCALE: 1/2"=1'-0"



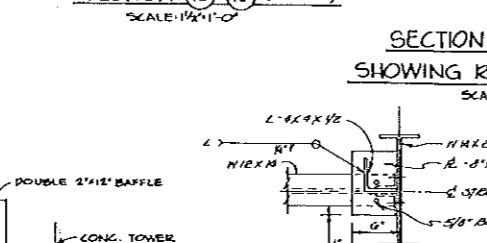
**SECTION THROUGH CORBEL SHOWING REINFORCING STEEL**  
SCALE: 3/8"=1'-0"



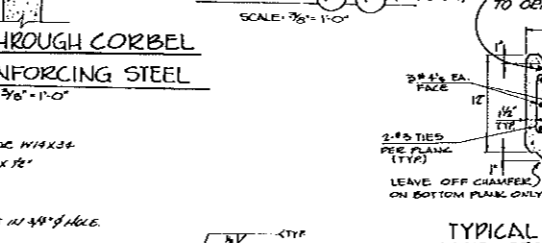
**PLAN-STOP PLANK**  
SCALE: 3/8"=1'-0"  
AS-BUILT EYEBOLTS ROTATED 90° TO ORIGINAL DESIGN.



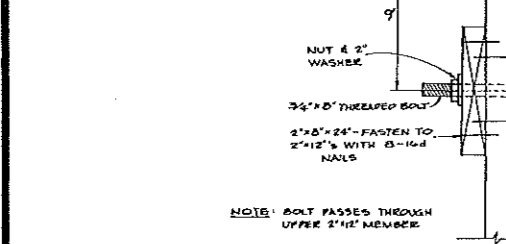
**PLAN-PLATE AT TOP OF COLUMNS FOR PILES (D) (D)**  
SCALE: 1/2"=1'-0"



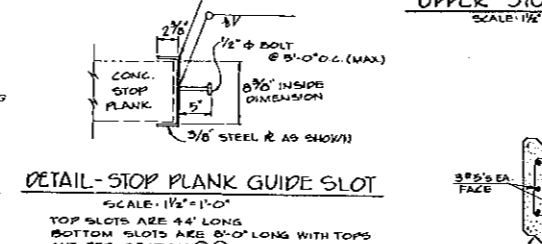
**SECTION (V) (V) (SHEET 9)**  
SCALE: 1/2"=1'-0"



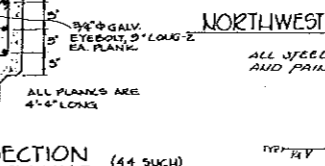
**TYPICAL SECTION UPPER STOP PLANKS (44 SUCH)**  
SCALE: 1/2"=1'-0"



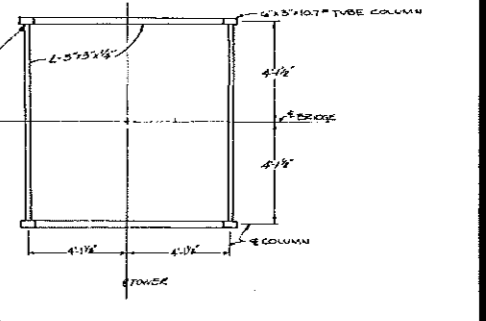
**DETAIL (PLAN)-FLOATING BAFFLE ANCHOR SLOT**  
SCALE: 3/8"=1'-0"



**DETAIL-STOP PLANK GUIDE SLOT**  
SCALE: 1/2"=1'-0"  
TOP SLOTS ARE 44" LONG  
BOTTOM SLOTS ARE 8'-0" LONG WITH TOPS CUT PER SECTION (O) (O)



**TYPICAL SECTION LOWER STOP PLANKS (5 SUCH)**  
SCALE: 1/2"=1'-0"



**PLAN AT ELEVATION 2.23.14 (TOP OF HORIZONTAL ANGLE)**  
SCALE: 3/8"=1'-0"

**AS BUILT**  
12-21-83

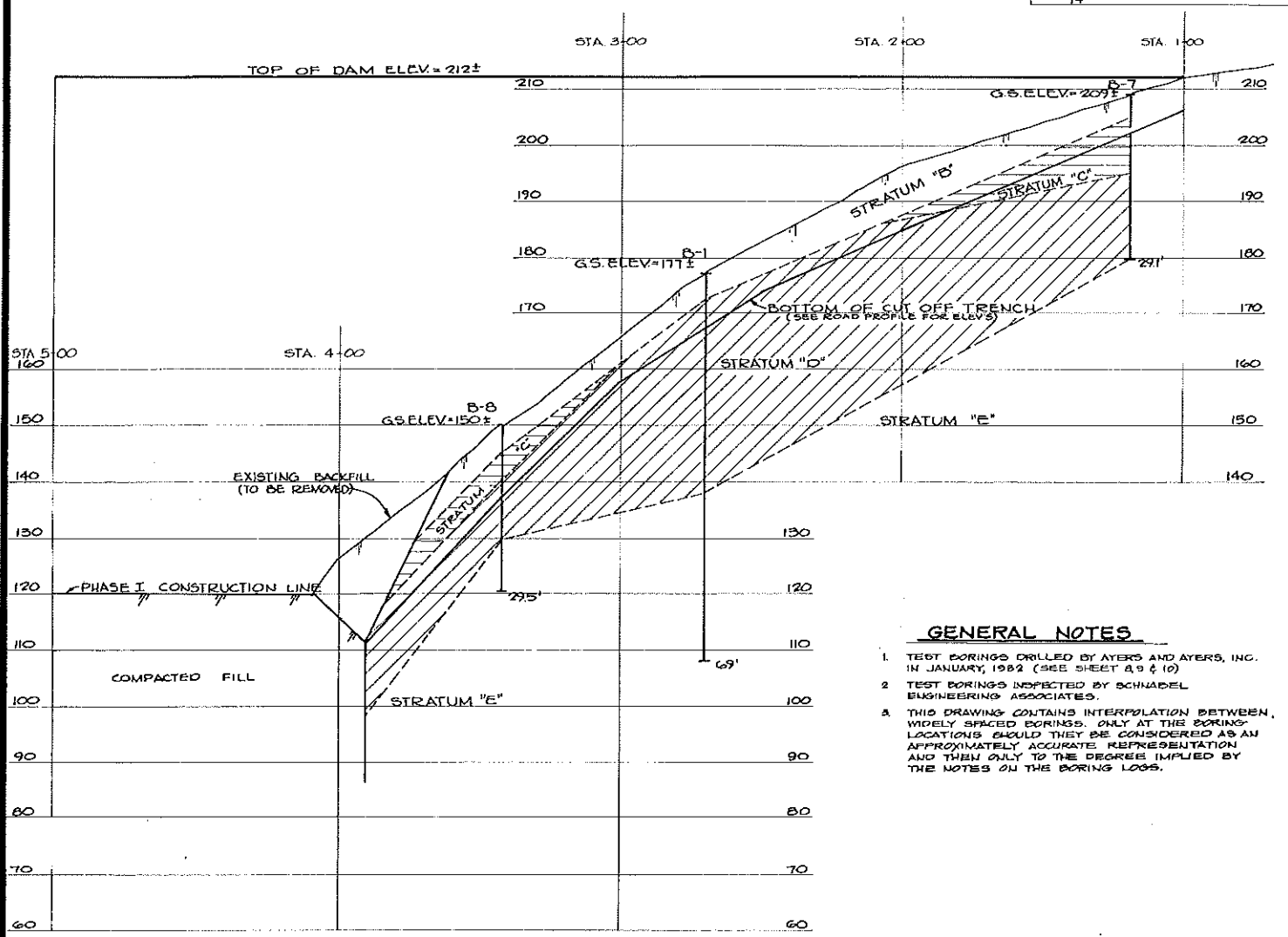
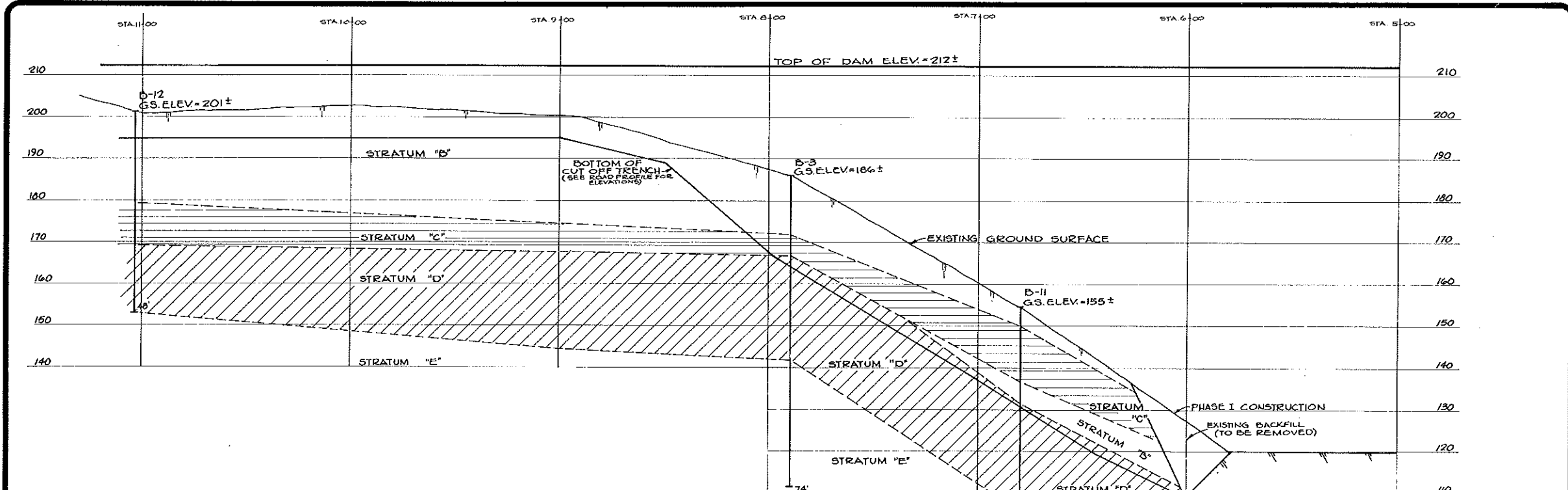
**WILSON ASSOCIATES, INC.**  
ENGINEERS SURVEYORS PLANNERS  
RICHMOND, VIRGINIA 23220  
711 NORTH COURTHOUSE RD. (804) 784-3380  
8802 STAPLES MILL RD. (804) 262-7336

**ASH DISPOSAL POND**  
BREM O BLUFF POWER STATION  
FLUVANNA COUNTY, VIRGINIA

**SECTIONS 8-DTLS-OUTLET TOWER & BR.**

**J. I. HENSON**  
ESTD. DATE NO. 2854

**R. THOMAS**  
**NOV. 1, 1982**  
**J. HENSON**  
**10 OF 17**  
**13239**



SOIL PROFILE AT DAM CENTERLINE  
 SCALE: HORIZ. 1"=20'  
 VERT. 1"=10'

**GENERAL NOTES**

1. TEST BORINGS DRILLED BY AYERS AND AYERS, INC. IN JANUARY, 1982 (SEE SHEET 8, 9 & 10)
2. TEST BORINGS INSPECTED BY SCHWADEL ENGINEERING ASSOCIATES.
3. THIS DRAWING CONTAINS INTERPOLATION BETWEEN WIDELY SPACED BORINGS. ONLY AT THE BORING LOCATIONS SHOULD THEY BE CONSIDERED AS AN APPROXIMATELY ACCURATE REPRESENTATION AND THEN ONLY TO THE DEGREE IMPLIED BY THE NOTES ON THE BORING LOGS.

**STRATUM DESCRIPTIONS**

- STRATUM A-1: BROWN, SILTY CLAY, FILL, SOME FINE TO MEDIUM SAND (CL)
- STRATUM A: GRAY FLY ASH FILL; VERY LOOSE TO FIRM (N = W-2 TO 12)
- STRATUM B: VARICOLORED FINE SANDY SILT AND CLAYEY SILT; SOME FINE TO MEDIUM SAND WITH MICA (ML TO MH); FIRM TO VERY COMPACT (N=3 TO 28) AND SILTY CLAY, SOME FINE TO MEDIUM SAND WITH MICA (CL); MEDIUM TO VERY STIFF CONSISTENCY (N=1 TO 19)
- STRATUM C: VARICOLORED FINE TO MEDIUM SILTY TO CLAYEY SILTY SAND (SM) AND SILTY CLAYEY SAND (SC) WITH MICA; VERY LOOSE TO COMPACT (N=3 TO 20)
- STRATUM D: VARICOLORED BIINTEGRATED ROCK WITH MICA (ML TO SM); VERY COMPACT (N= 60 TO 100)
- STRATUM E: VARICOLORED FRESH TO HIGHLY WEATHERED GRANODIORITE GNEISS; VERY HARD TO SOFT, SLIGHTLY TO HIGHLY FRACTURED (REC= 0 TO 22%, ROD= 0 TO 22%)

AS BUILT  
 12-21-83

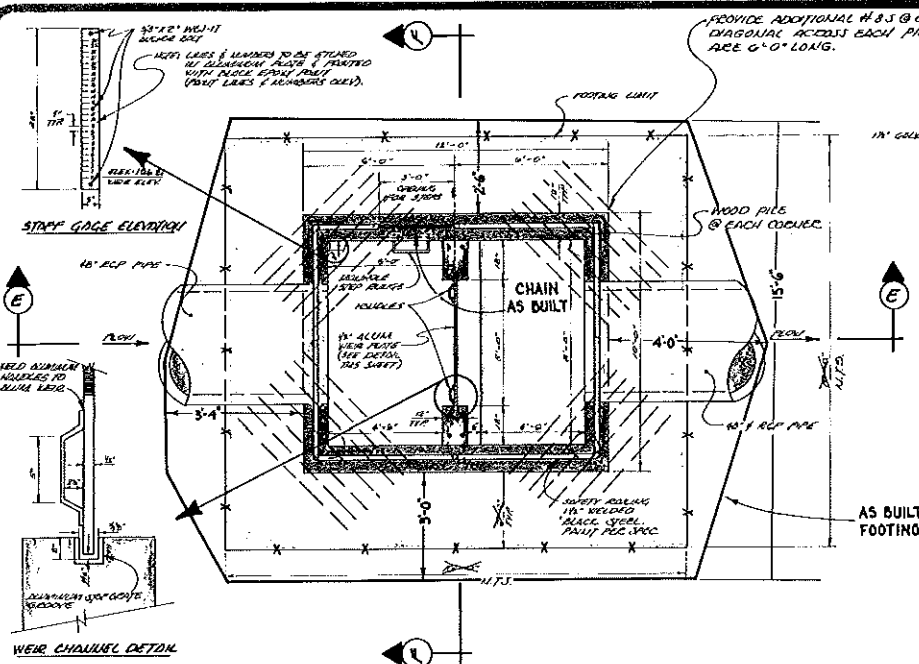
PHASE II

**J. K. JAMMONS & ASSOCIATES, INC.**  
 ENGINEERS SURVEYORS PLANNERS  
 771 NORTH COURTHOUSE RD. (804) 794-5500 RICHMOND, VIRGINIA 23225  
 8803 STAPLES MILL RD. (804) 262-7396 RICHMOND, VIRGINIA 23228

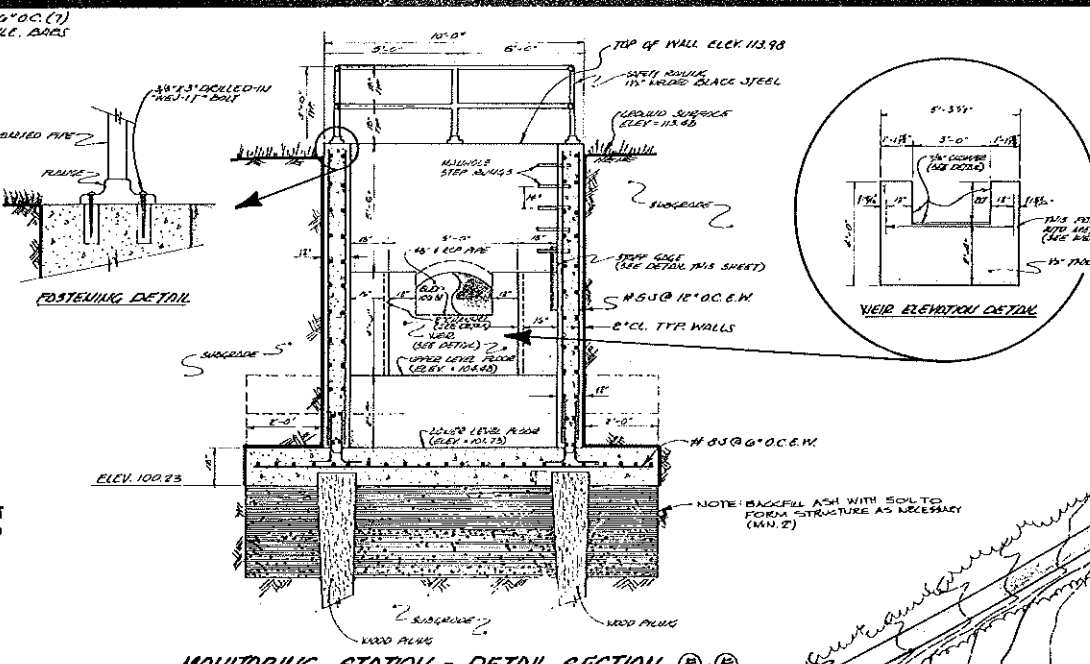
**ASH DISPOSAL POND**  
 BREMO BLUFF POWER STATION  
 FLUVANNA COUNTY, VIRGINIA  
 PROFILE AT DAM CENTERLINE

AS SHOWN  
 R. THOMAS  
 NOV. 1, 1982  
 B. JOHNS  
 J. HENSON  
 11 OF 17  
 13239

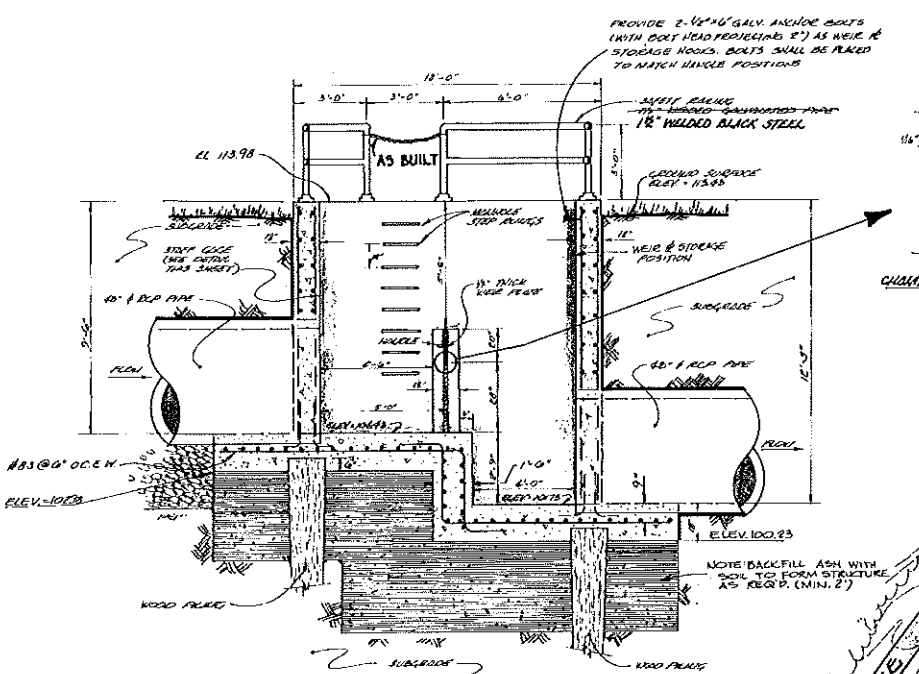




**MONITORING STATION - PLAN VIEW DETAIL**  
SCALE: 3/8" = 1'-0"



**MONITORING STATION - DETAIL SECTION (A-A)**  
SCALE: 3/8" = 1'-0"



**MONITORING STATION - DETAIL SECTION (B-B)**  
SCALE: 3/8" = 1'-0"

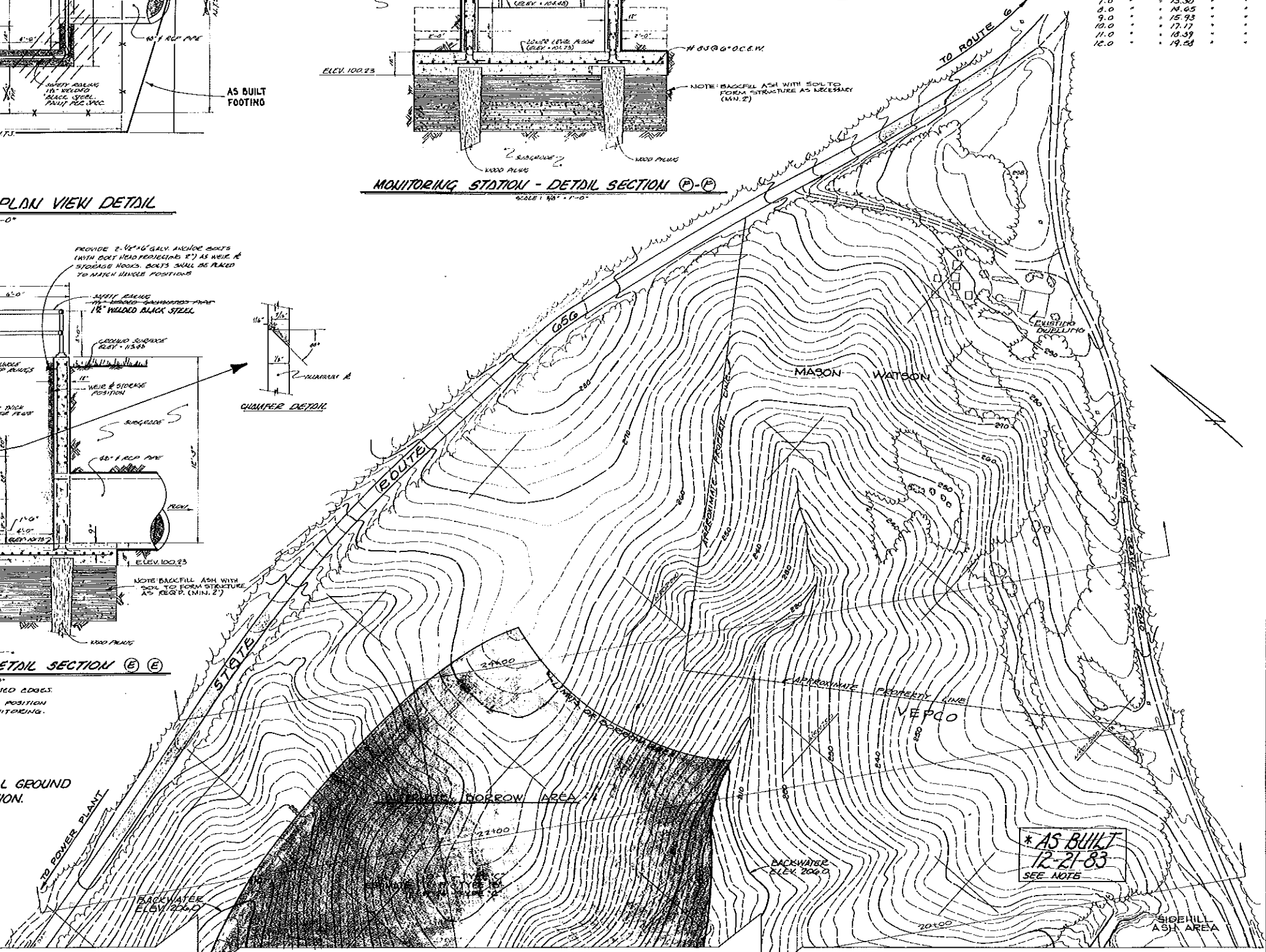
PROVIDE 3/4" CHAMFER ON ALL EXPOSED EDGES.  
WEIR PLATE IS TO BE PLACED IN STORAGE POSITION  
WHEN NOT USED FOR ACTUAL FLOW MONITORING.

\* **NOTE:** TOPO ON THIS SHEET IS ORIGINAL GROUND  
PRIOR TO START OF CONSTRUCTION.  
FOR AS-BUILT TOPO REFER TO  
SHEETS 17C, 17D, 17E & 17F.

**WEIR DESIGN CONDITIONS**

PLATE IS USED TO MEASURE THE  
FLOW BETWEEN AVERAGE SURFACE  
WATER INFLOW AND THE MAXIMUM  
PUMP DISCHARGE RATE THAT IS  
ANTICIPATED. IT IS NOT USED TO  
MEASURE PEAK SURFACE WATER  
INFLOW.  
WEIR HAS BEEN DESIGNED TO  
ACCOMMODATE THE PUMPED FLOW  
OF 11.52 MGD. THE FOLLOWING TABLE  
SHOWS THE DEPTH OF WATER OVER  
WEIR TO THE FLOW RATE IN MGD.

0.5 MGD	1.19 INCH DEPTH
1.0	2.20
2.0	3.51
3.0	5.61
4.0	7.40
5.0	10.52
6.0	11.98
7.0	13.30
8.0	14.65
9.0	15.93
10.0	17.17
11.0	18.39
12.0	19.58



**\* AS BUILT**  
12-21-83  
SEE NOTE

**PHASE II**

VEPCO P.N. 73864104

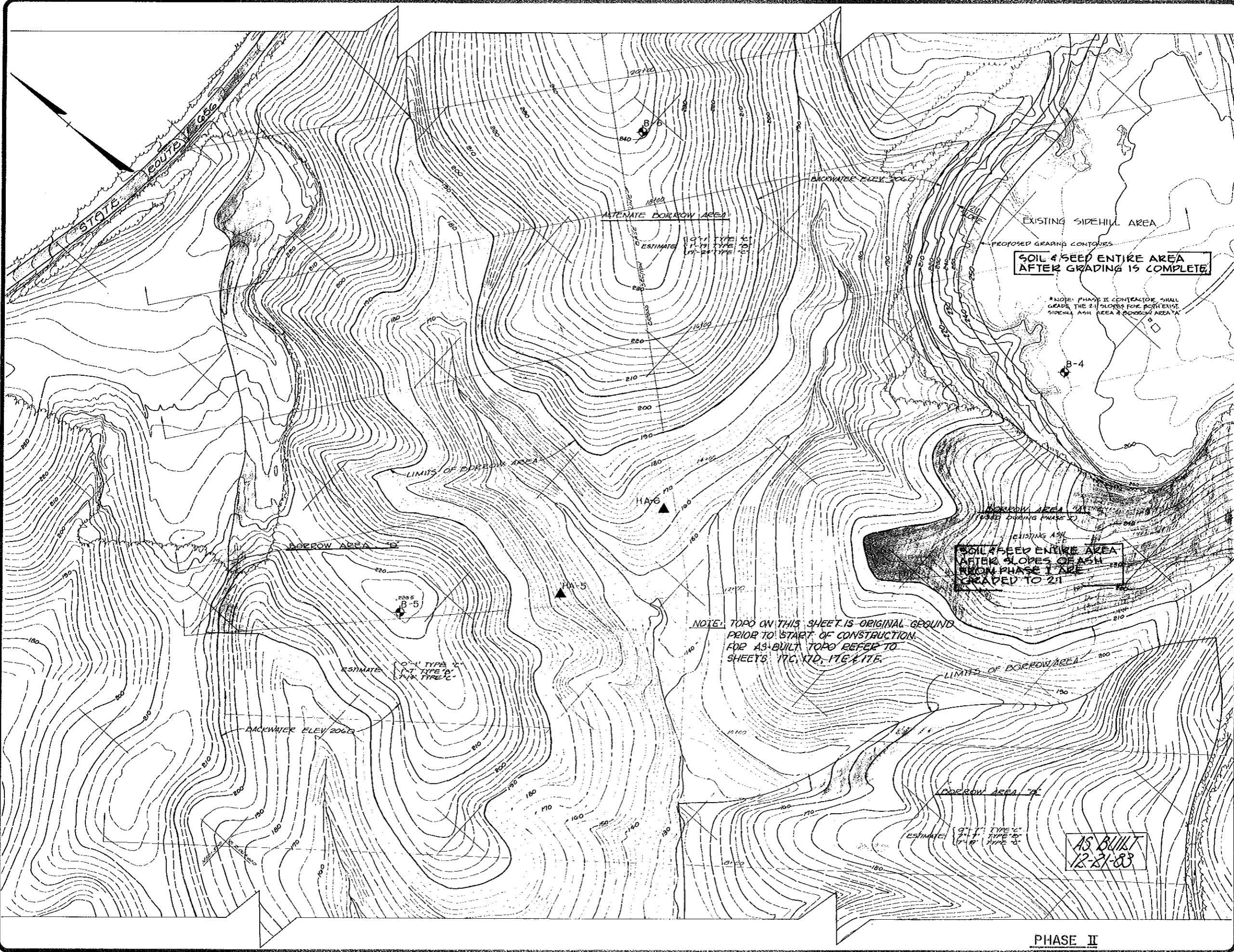
**J. K. THOMAS & ASSOCIATES, INC.**  
ENGINEERS - SURVEYORS - PLANNERS  
711 NORTH COURTHOUSE RD. (804) 794-3500 RICHMOND, VIRGINIA 23228  
8803 STAPLES MILL RD. (804) 282-7395 RICHMOND, VIRGINIA 23228

**ASH DISPOSAL POND**  
BREM O BLUFF POWER STATION  
FLUVANIA COUNTY, VIRGINIA

**BORROW AREAS**

**REVISIONS**

**STAMP**  
1" = 50'  
SCALE  
R. THOMAS  
DRAWN BY  
NOV. 1982  
DATE DRAWN  
B. JOHNS  
DESIGNED  
J. HENSON  
CHECKED  
12 OF 17  
SHEET NUMBER  
13239  
JOB NUMBER



\*NOTE: PHASE II CONTRACTOR SHALL GRADE THE 2:1 SLOPES FOR BOTH EXIST. SIDEHILL ASH AREA & BORROW AREA 'A'

SOIL & SEED ENTIRE AREA AFTER SLOPES OF ASH FROM PHASE I ARE GRADED TO 2:1

NOTE: TOPO ON THIS SHEET IS ORIGINAL GROUND PRIOR TO START OF CONSTRUCTION. FOR AS-BUILT TOPO REFER TO SHEETS 17C, 17D, 17E, 17F.

AS BUILT  
12-21-83

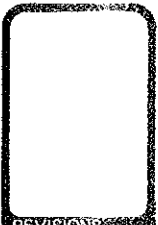
PHASE II

VEPCO P.N. 73864104

J. K. TIMMONS & ASSOCIATES, INC.  
ENGINEERS, SURVEYORS, PLANNERS

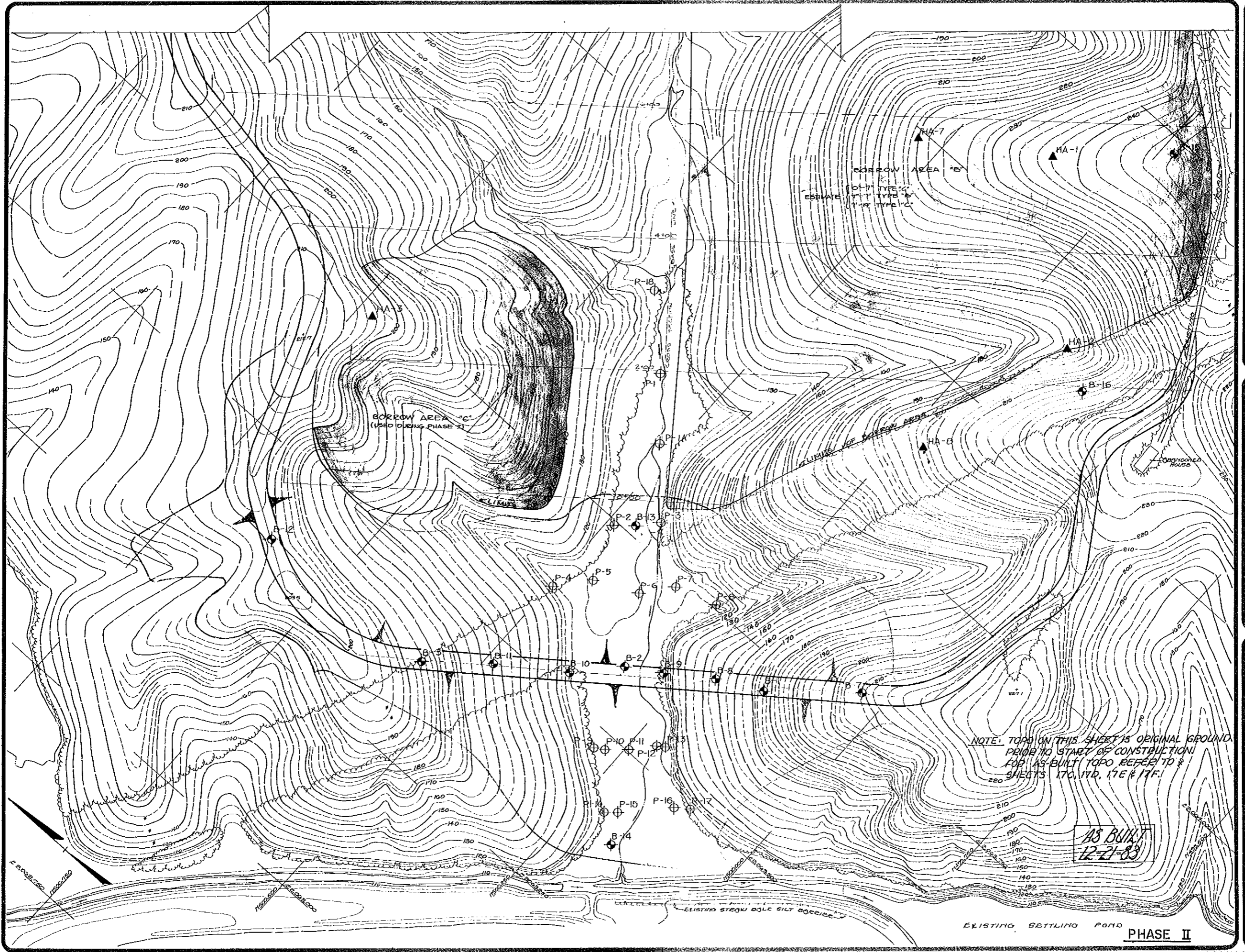


ASH DISPOSAL POND  
BREMONT BLUFF POWER STATION  
FLUVANNA COUNTY, VIRGINIA



REVISIONS  
STAMP  
SCALE 1" = 50'  
DRAWN BY R. THOMAS  
NOV 1, 1982  
DATE DRAWN  
DESIGNED BY B. JOHNS  
CHECKED BY J. HENSON  
13 OF 17 SHEETS  
SHEET NUMBER 13239

BORROW AREAS



**J. K. THOMAS & ASSOCIATES, INC.**  
**ENGINEERS - SURVEYORS - PLANNERS**  
 18047 79A-3500 RICHMOND, VIRGINIA 23235  
 711 NORTH COURTHOUSE RD. (804) 262-7396 RICHMOND, VIRGINIA 23226  
 8803 STAPLES MILL RD. (804) 262-7396 RICHMOND, VIRGINIA 23226



**ASH DISPOSAL POND**  
**BREMO BLUFF POWER STATION**  
**FLUVANNA COUNTY, VIRGINIA**  
**BORROW AREAS**

REVISIONS

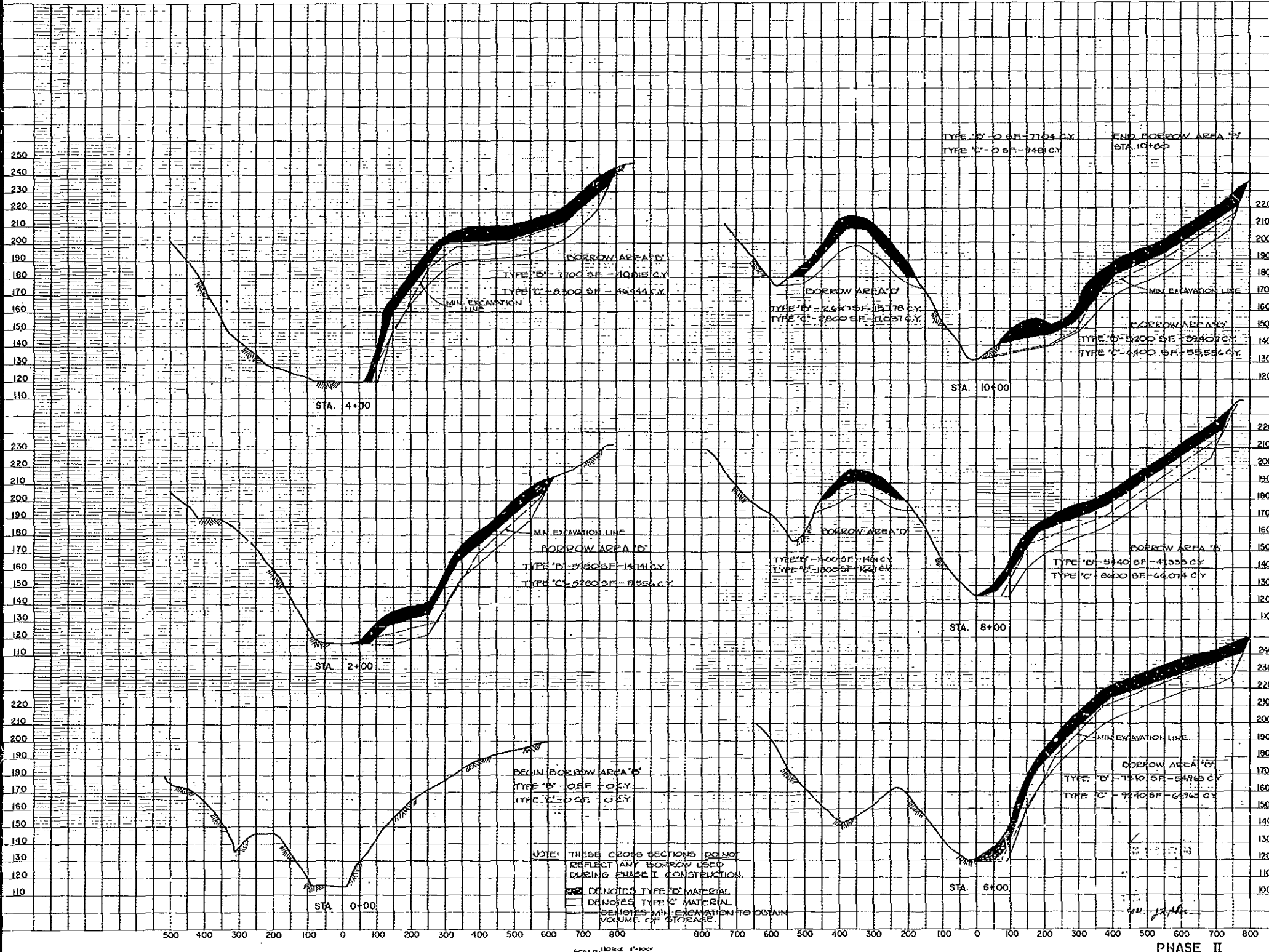



STAMP  
 1" = 50'  
 SCALE  
 R. THOMAS  
 DRAWN BY  
 NOV. 1, 1982  
 DATE DRAWN  
 B. JOHNS  
 DESIGNED  
 J. HENSON  
 CHECKED  
 14 OF 17  
 SHEET NUMBER  
 13239  
 JOB NUMBER

**PHASE II**







SCALE: HORIZ. 1"=100'  
 VERT. 1"=10'

PHASE II

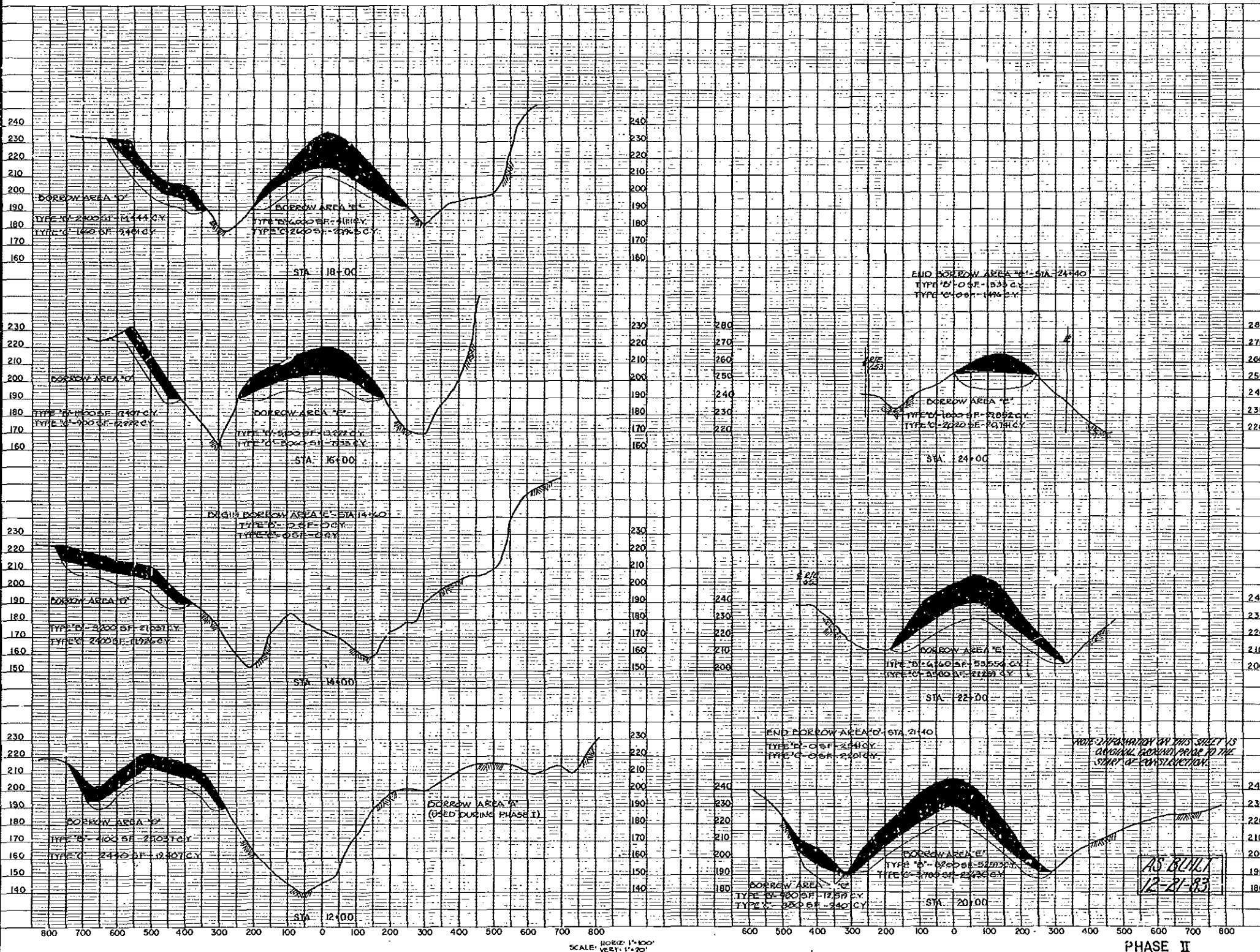
**J. E. THAMMONS & ASSOCIATES, INC.**  
 ENGINEERS, SURVEYORS, PLANNERS  
 8225 STAYLES HILL RD. (804) 784-3550 RICHMOND, VIRGINIA 23133  
 5111 WORTH COURTHOUSE RD. (804) 282-7316 RICHMOND, VIRGINIA 23228

**ASH DISPOSAL POND**  
 BREMO BLUFF POWER STATION  
 FLUVANNA COUNTY, VIRGINIA  
 CROSS - SECTIONS

REVISIONS

AS SHOWN  
 R. THOMAS  
 NOV. 1, 1982  
 DATE DRAWN  
 B. JOHNS  
 DESIGNED  
 J. HENSON  
 CHECKED  
 13 239  
 SHEET NUMBER  
 JOB NUMBER





**J. K. TIMMONS & ASSOCIATES, INC.**  
 ENGINEERS - SURVEYORS - PLANNERS  
 711 NORTH COMMONWEALTH RD. RICHMOND, VIRGINIA 23221  
 (804) 784-3350  
 1822 STAPLES HILL RD. RICHMOND, VIRGINIA 23221  
 (804) 787-7191



**ASH DISPOSAL POND**  
 BREMO BLUFF POWER STATION  
 FLUVANNA COUNTY, VIRGINIA  
 CROSS - SECTIONS

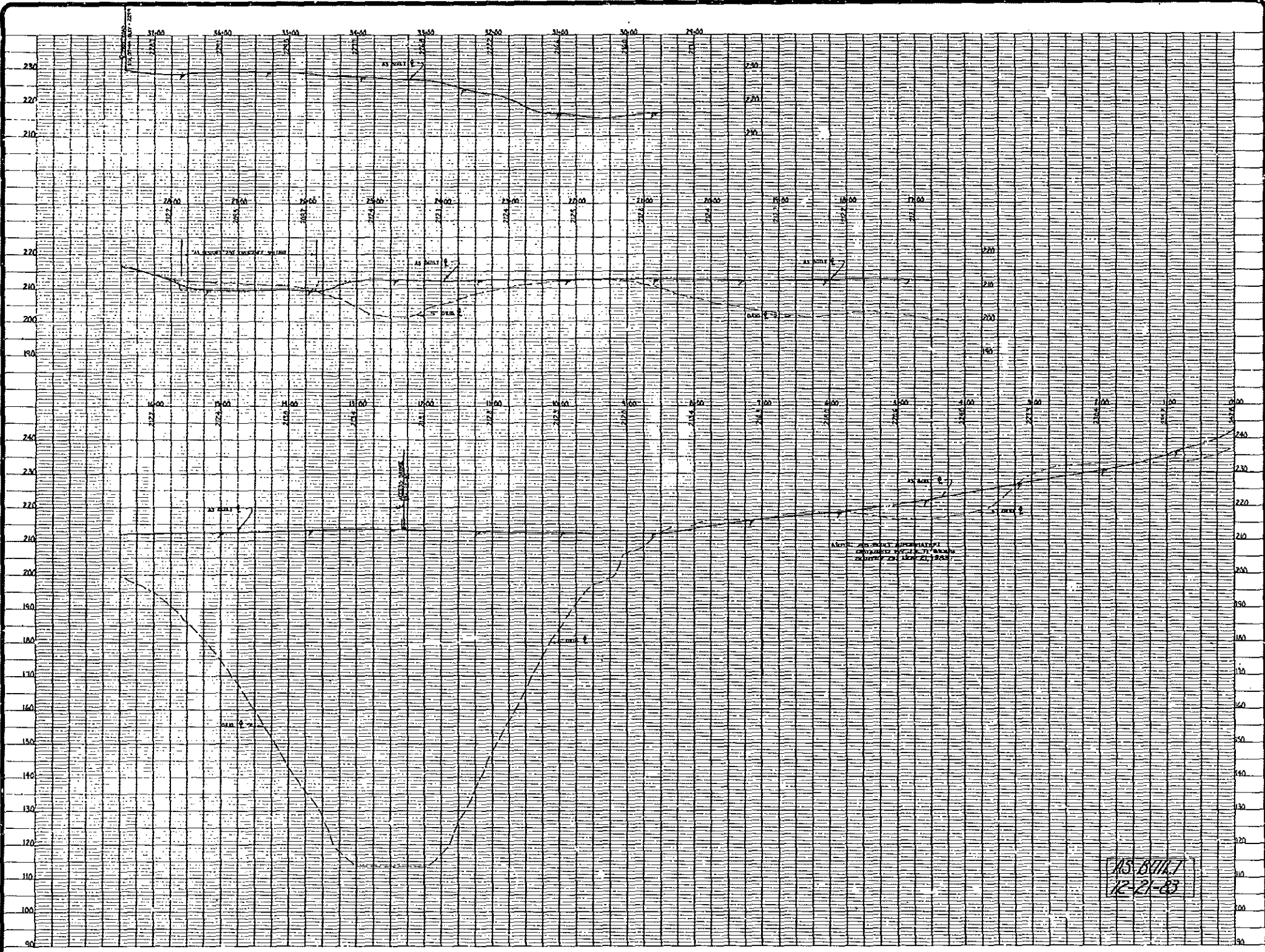
REVISIONS

1. E. HENSON  
 1984

STAMP: AS SHOWN

SCALE: R. THOMAS  
 DRAWN BY: NOV. 1, 1982  
 DATE DRAWN: B. JOHNS  
 DESIGNED BY: J. HENSON  
 CHECKED BY: 17 OF 17  
 SHEET NUMBER: 13239  
 JOB NUMBER:

AS BUILT  
 12-21-83



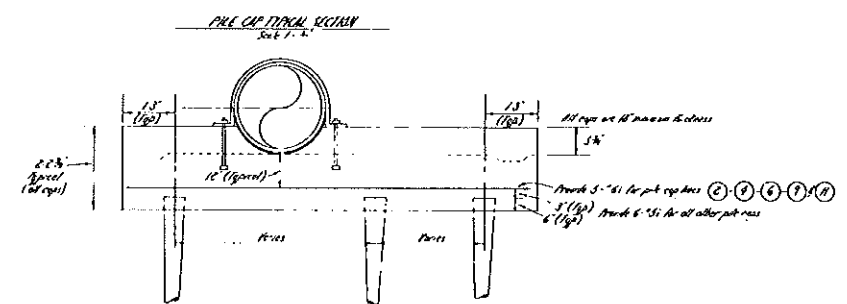
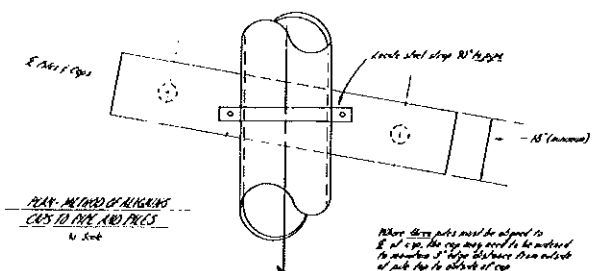
MS-8011.7  
12-21-83

**J. J. TAMMONS & ASSOCIATES, INC.**  
**ENGINEERS, SURVEYORS, PLANNERS**  
 111 WEST COURTHOUSE BL. (RD 43) 2144-8300  
 2114 STAVELANDS MILL RD. (RD 43) 2832-7741  
 RICHMOND, VIRGINIA 23261

**ASH DISPOSAL POND**  
 BREMO BLUFF POWER STATION  
 FLUVANNA COUNTY, VIRGINIA  
 AS BUILT DAM & ACCESS ROAD PROFILE

REVISIONS

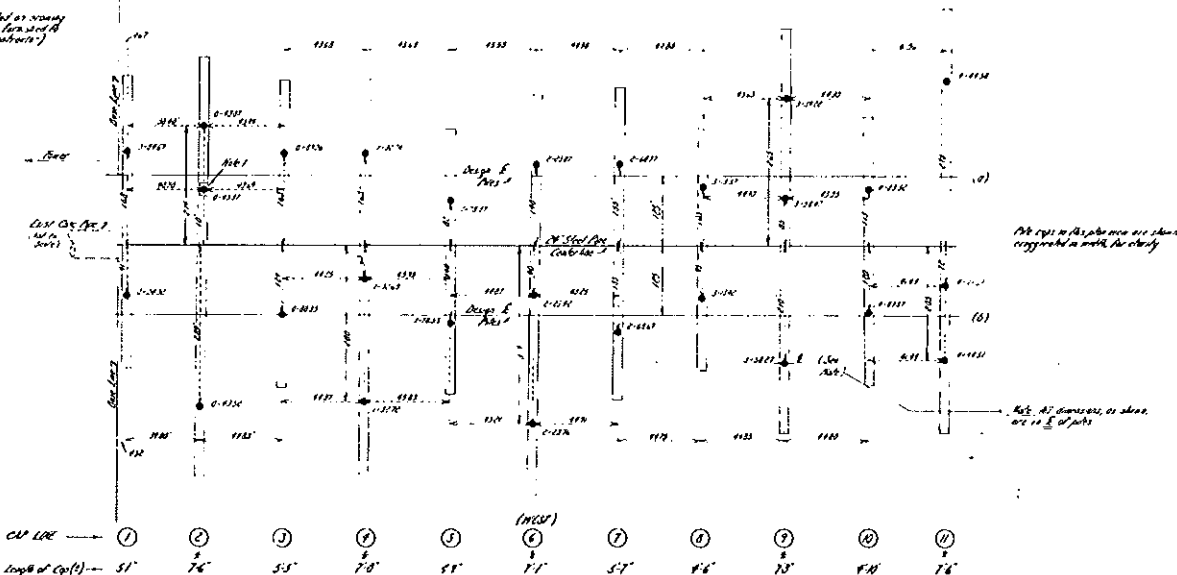
AS SHOWN  
 SCALE  
 V. CARTER  
 DRAWN BY  
 11-23-83  
 DATE DRAWN  
 B. JOHNS  
 DESIGNED  
 J. HENSON  
 CHECKED  
 17A OF 17  
 SHEET NUMBER  
 13239  
 JOB NUMBER



**DESIRED E SITUATIONS OF PILE CAPS** (as determined as varying 18' MIN. at foundation top by contractor)

CAP LINE	DEPTH
1	0-0.67
2	0-0.67
3	0-0.67
4	1-3.67
5	1-7.67
6	2-1.67
7	2-6.67
8	3-5.67
9	3-11.67
10	4-11.67
11	4-11.67

Other elevations are shown by 1' on E.



1 Indicates cap for either a gravity or driven pile or heavy and no additional pile detail

Note 1 - No pile heads outside of cap diameter. Show as per.

SCALE: 1/4" = 1'-0"

LEGEND: • - Continuation of existing pile

Secondary for location of existing piles not located in 18' along cap

① Revised pile locations per construction drawing 12-21-83. Add pile 11.67'.

AS BUILT  
12-21-83

**J. K. TAYLOR & ASSOCIATES, INC.**  
**ENGINEERS - SURVEYORS - PLANNERS**  
 2111 NORTH COOPERHOUSE RD. (684) 244-1300  
 2103 STAPLES HILLS RD. (684) 242-2316  
 RICHMOND, VIRGINIA 23234

**ASH DISPOSAL POND**  
 BREMO BLUFF POWER STATION  
 FLUVANNA COUNTY, VIRGINIA  
 REVISED PILE CAP DETAILS

REVISIONS

STAMP: J. K. TAYLOR & ASSOCIATES, INC. 2054

AS SHOWN  
 SCALE: 1/4" = 1'-0"  
 DRAWN BY: V. CARTER  
 DATE: APR 13, 1983  
 DATE DRAWN: J. HENSON  
 DESIGNER: J. HENSON  
 CHECKED: J. HENSON  
 17B OF 17  
 SHEET NUMBER: 13239  
 JOB NUMBER

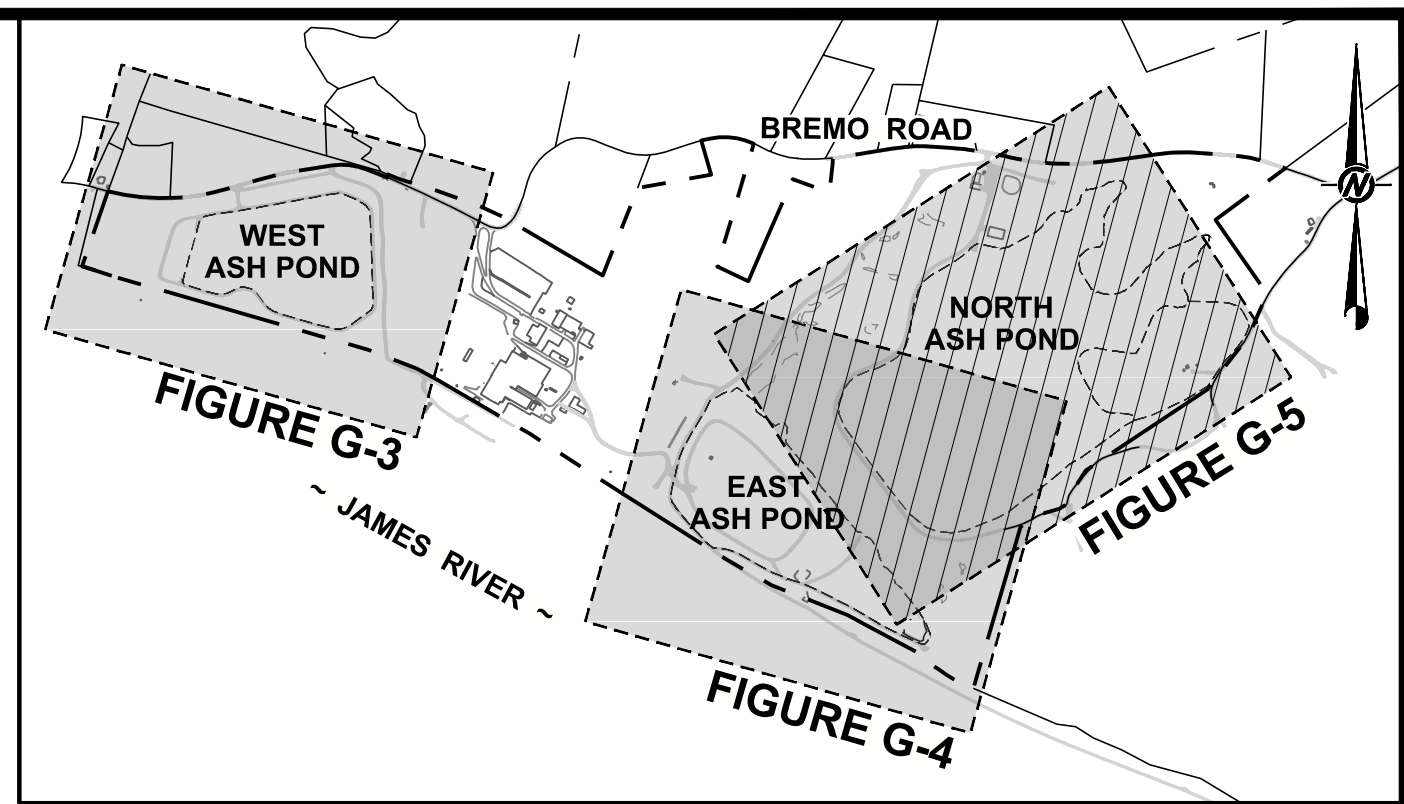
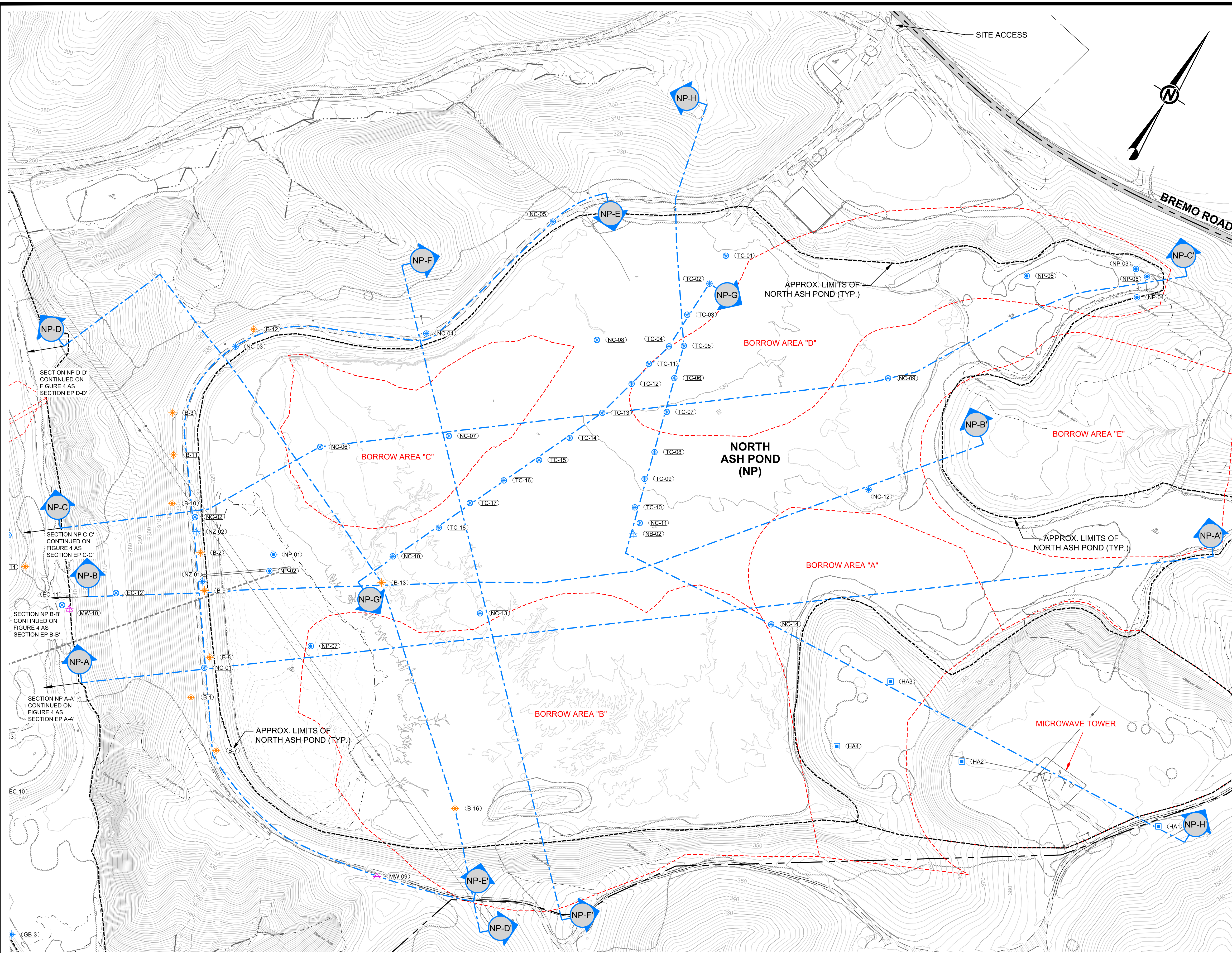


## **Appendix C**

### **North Ash Pond Existing Conditions Drawings**



G:\Plan Production Data Files\Drawing Data Files\15-20347.A - Breomo Pond Closure (Conceptual Plan)\Active Drawings\Geotech\Exploration\Revised 2015\_10071520347AG02-05.dwg | Modified: Peterson 04/15/2016 9:49 AM | Plotted: Peterson 04/15/2016



**SITE KEY** NOT TO SCALE

**LEGEND**

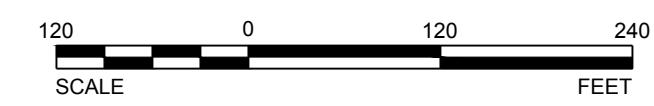
	DOMINION PROPERTY BOUNDARY
	ADJACENT PROPERTY BOUNDARY
	APPROXIMATE LIMITS OF EXISTING ASH PONDS
	LIMITS OF BATHYMETRIC SURVEYS
	EXISTING TOPOGRAPHIC CONTOURS (2' INTERVALS)
	EXISTING BATHYMETRIC SURFACE CONTOURS (2' INTERVALS)
	EXISTING PAVED ROAD
	EXISTING UNPAVED ROAD
	EXISTING RAILROAD
	CREEK CENTERLINE
	APPROXIMATE EDGE OF SURFACE WATER
	EXISTING TREE LINE
	EXISTING FENCE
	EXISTING OVERHEAD ELECTRIC LINE
	EXISTING MANHOLE
	DENOTES AREAS OF TOPOGRAPHY THAT DO NOT MEET MINIMUM ACCURACY STANDARDS FOR AERIAL SURVEYING
	SCHNABEL BORING (1982)
	SCHNABEL BORING (2010)
	GES MONITORING WELL (2013)
	HALEY AND ALDRICH BORING (2015)
	GOLDER BORING (2014 / 2015)
	GOLDER PIEZOMETER (2015)
	GOLDER CONE PENETRATION TEST (CPT)(2015)
	GOLDER PROBE HOLE (2015)
	GOLDER HAND AUGER (2015)

REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RWW
04/13/16		UPDATE NOTATION	-	JJP	JGM	GLH
10/15/15		UPDATED SECTION LOCATIONS	-	SEP	JGM	GLH

PROJECT: DOMINION BREMO POWER STATION CCR IMPOUNDMENT CLOSURE FLUVANNA COUNTY, VIRGINIA

TITLE: **EXISTING CONDITIONS GEOTECHNICAL EXPLORATION PLAN (NORTH POND)**

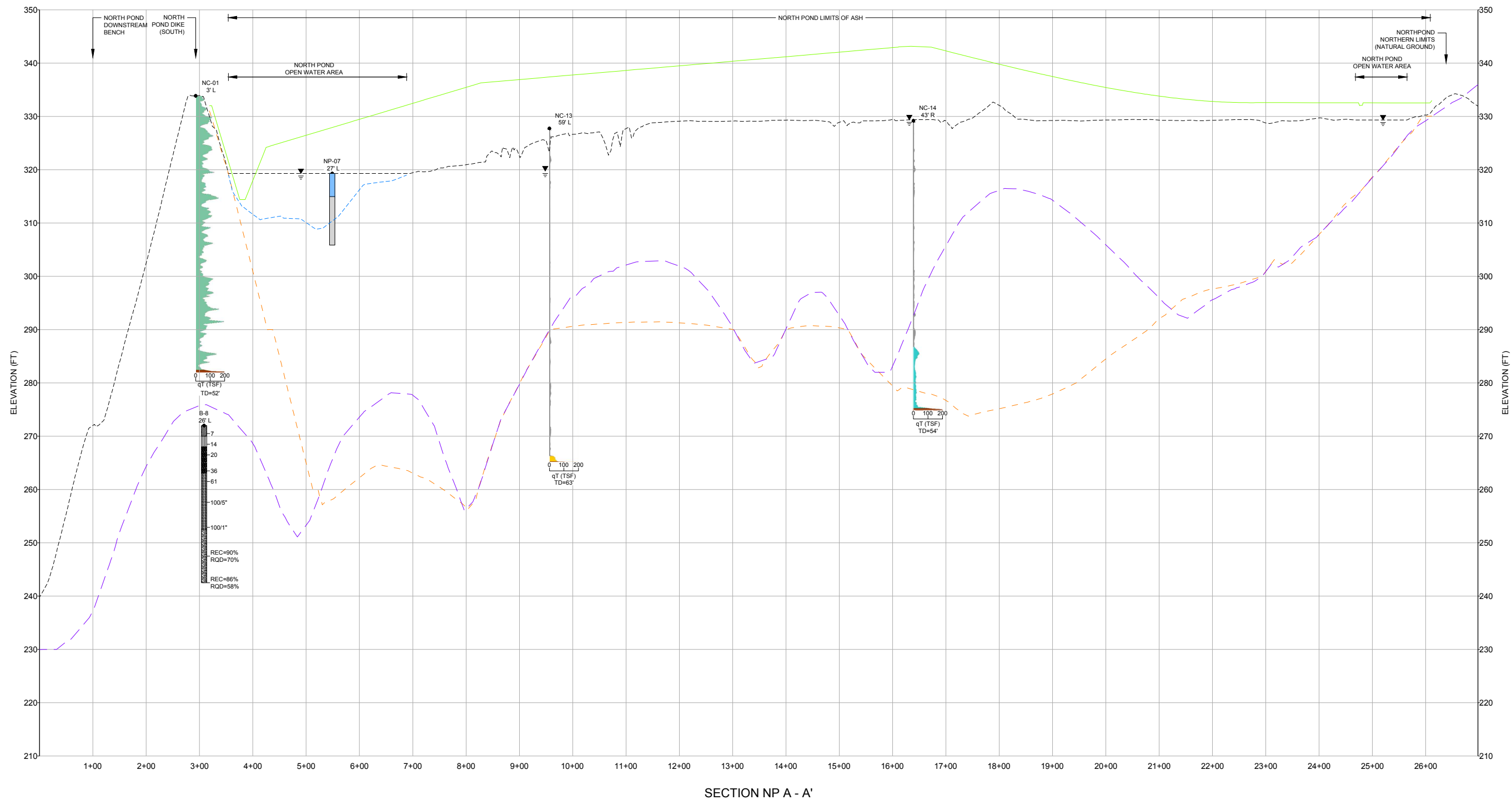
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CADD	CCP	11/30/15	
CHECK	JGM	11/30/15	
REVIEW	GLH	11/30/15	



**FIGURE G-5**



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SECTION NP A - A'

**LINE WORK LEGEND**

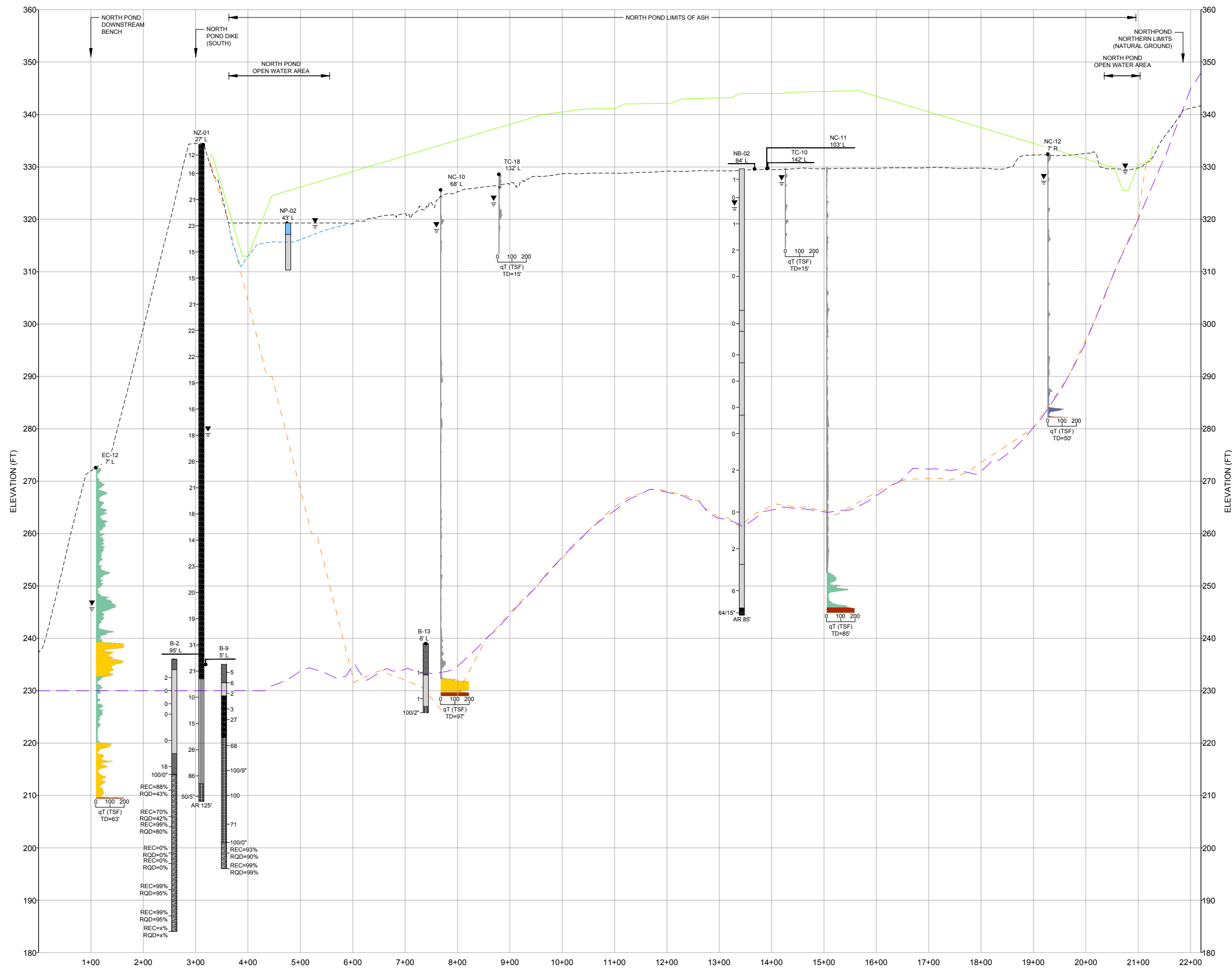
-----	EXISTING GRADES
—————	PROPOSED GRADES
- - - - -	BATHYMETRY CONTOURS
- - - - -	HISTORICAL BOTTOM GRADES
- - - - -	1967 USGS TOPOGRAPHY (PRE-POND CONSTRUCTION)

- NOTES**
- REFER TO FIGURE G-1 FOR GENERAL NOTES AND REFERENCES.
  - REFER TO FIGURE G-6 FOR LEGEND INFORMATION.



REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVV
PROJECT: DOMINION BREMO POWER STATION CCR IMPOUNDMENT CLOSURE FLUVANNA COUNTY, VIRGINIA						
TITLE: <b>GEOTECHNICAL EXPLORATION SECTIONS (NORTH POND 1 OF 7)</b>						
PROJECT No. 15-20347		FILE No. 1520347AG06-18		SCALE AS SHOWN		
DESIGN	-	-	SCALE AS SHOWN			
CADD	CCP	11/30/15	SCALE AS SHOWN			
CHECK	JGM	11/30/15	SCALE AS SHOWN			
REVIEW	GLH	11/30/15	SCALE AS SHOWN			
			<b>FIGURE G-12</b>			

C:\Plan Production Data Files\15-20347A - BreMO Pond Closure (Conceptual Plan)\Active Drawings\Geotech Exploration\Revised 2015\_10071520347AG06-18.dwg | Layout: NP SECTION B | Modified: SPRebecca 11/03/2015 12:04 PM | Plotted: SPRebecca 12/02/2015



**LINE WORK LEGEND**

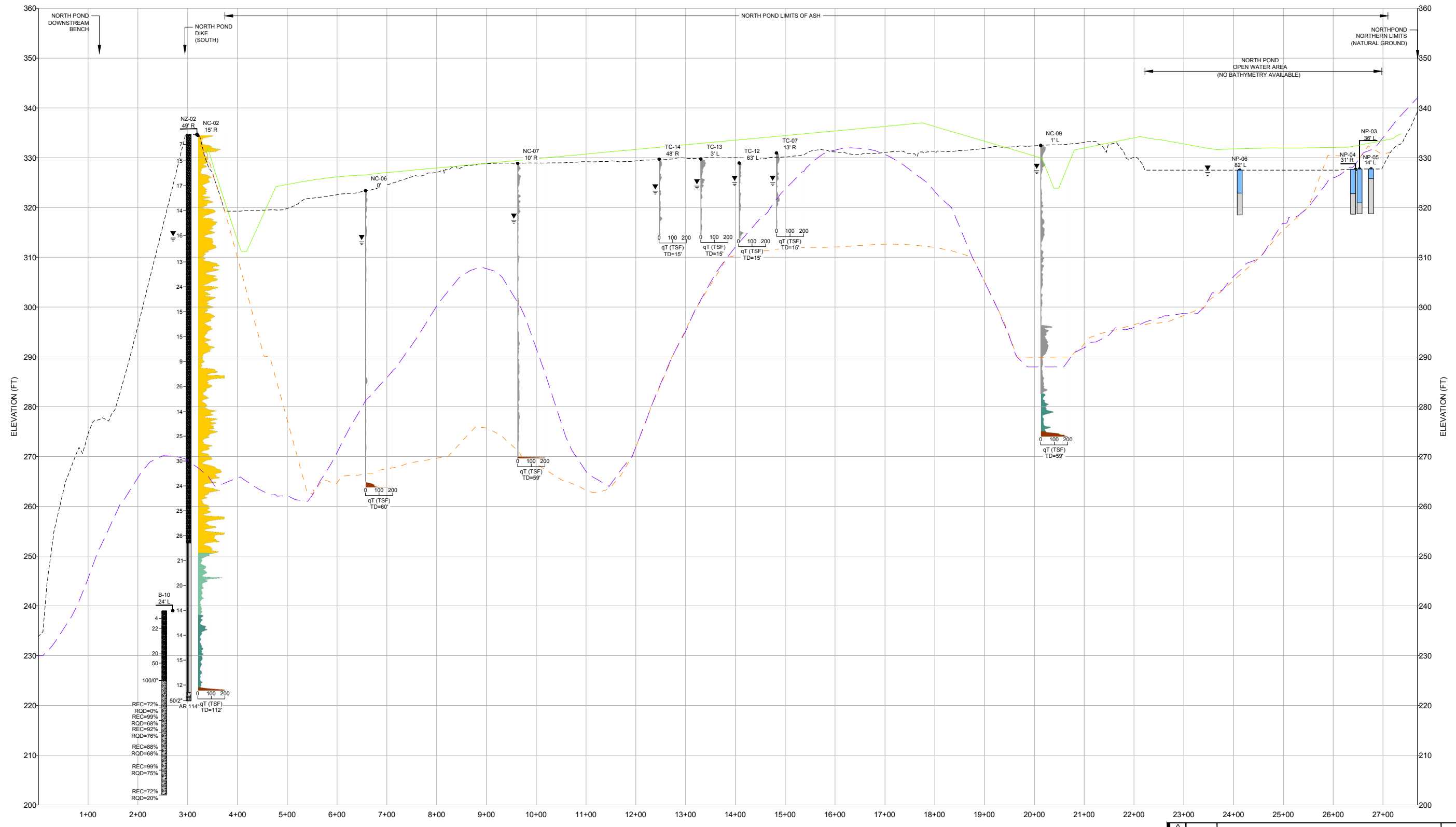
- EXISTING GRADES
- PROPOSED GRADES
- - - BATHYMETRY CONTOURS
- - - HISTORICAL BOTTOM GRADES
- - - 1967 USGS TOPOGRAPHY (PRE-POND CONSTRUCTION)

**NOTES**

1. REFER TO FIGURE G-1 FOR GENERAL NOTES AND REFERENCES.
2. REFER TO FIGURE G-6 FOR LEGEND INFORMATION.

REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVV
PROJECT <b>DOMINION BREMO POWER STATION CCR IMPOUNDMENT CLOSURE FLUVANNA COUNTY, VIRGINIA</b>						
TITLE <b>GEOTECHNICAL EXPLORATION SECTIONS (NORTH POND 2 OF 7)</b>						
PROJECT No. 15-20347		FILE No. 1520347AG06-18				
DESIGN	-	SCALE	AS SHOWN			
CADD	CCP	11/30/15				
CHECK	JGM	11/30/15				
REVIEW	GLH	11/30/15				
			<b>FIGURE G-13</b>			

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SECTION NP C - C'

**LINE WORK LEGEND**

-----	EXISTING GRADES
—————	PROPOSED GRADES
-----	BATHYMETRY CONTOURS
-----	HISTORICAL BOTTOM GRADES
-----	1967 USGS TOPOGRAPHY (PRE-POND CONSTRUCTION)

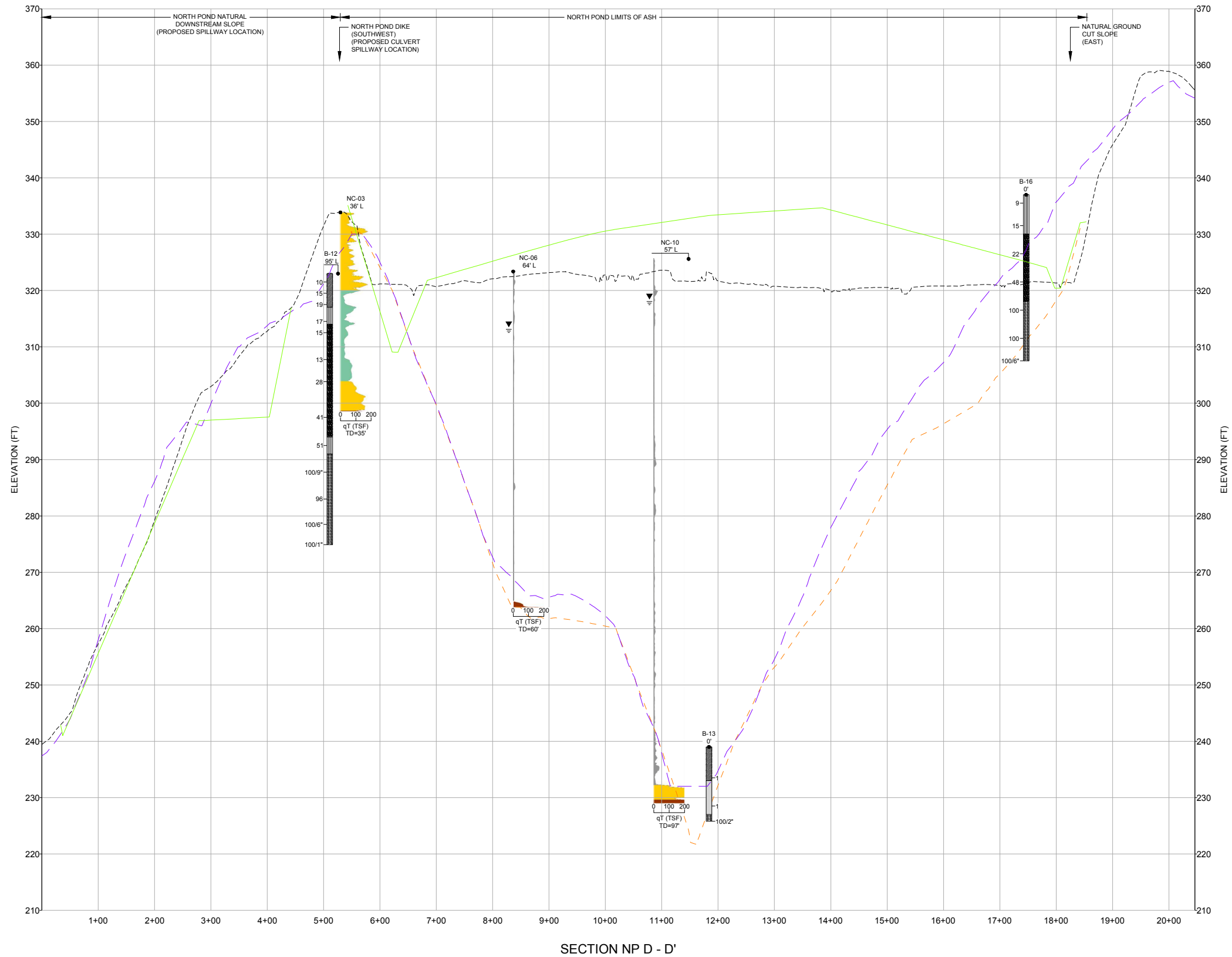
- NOTES**
- REFER TO FIGURE G-1 FOR GENERAL NOTES AND REFERENCES.
  - REFER TO FIGURE G-6 FOR LEGEND INFORMATION.

REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RWW
<p>PROJECT: DOMINION BREMO POWER STATION CCR IMPOUNDMENT CLOSURE FLUVANNA COUNTY, VIRGINIA</p> <p>TITLE: <b>GEOTECHNICAL EXPLORATION SECTIONS (NORTH POND 3 OF 7)</b></p>						
PROJECT No. 15-20347		FILE No. 1520347AG06-18	SCALE AS SHOWN			
DESIGN	-	-	AS SHOWN			
CADD	CCP	11/30/15	AS SHOWN			
CHECK	JGM	11/30/15	AS SHOWN			
REVIEW	GLH	11/30/15	AS SHOWN			



**FIGURE G-14**

C:\Plan Production Data Files\Drawing Data Files\15-20347A - Brems Pond Closure (Conceptual Plan)\Active Drawings\Geotech Exploration\Revised 2015\_10071520347AG06-18.dwg | Layout: NP SECTION D | Modified: SPecheba 11/03/2015 12:04 PM | Plotted: SPecheba 12/02/2015

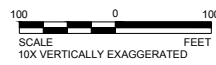


**LINE WORK LEGEND**

- EXISTING GRADES
- PROPOSED GRADES
- BATHYMETRY CONTOURS
- HISTORICAL BOTTOM GRADES
- 1967 USGS TOPOGRAPHY (PRE-POND CONSTRUCTION)

**NOTES**

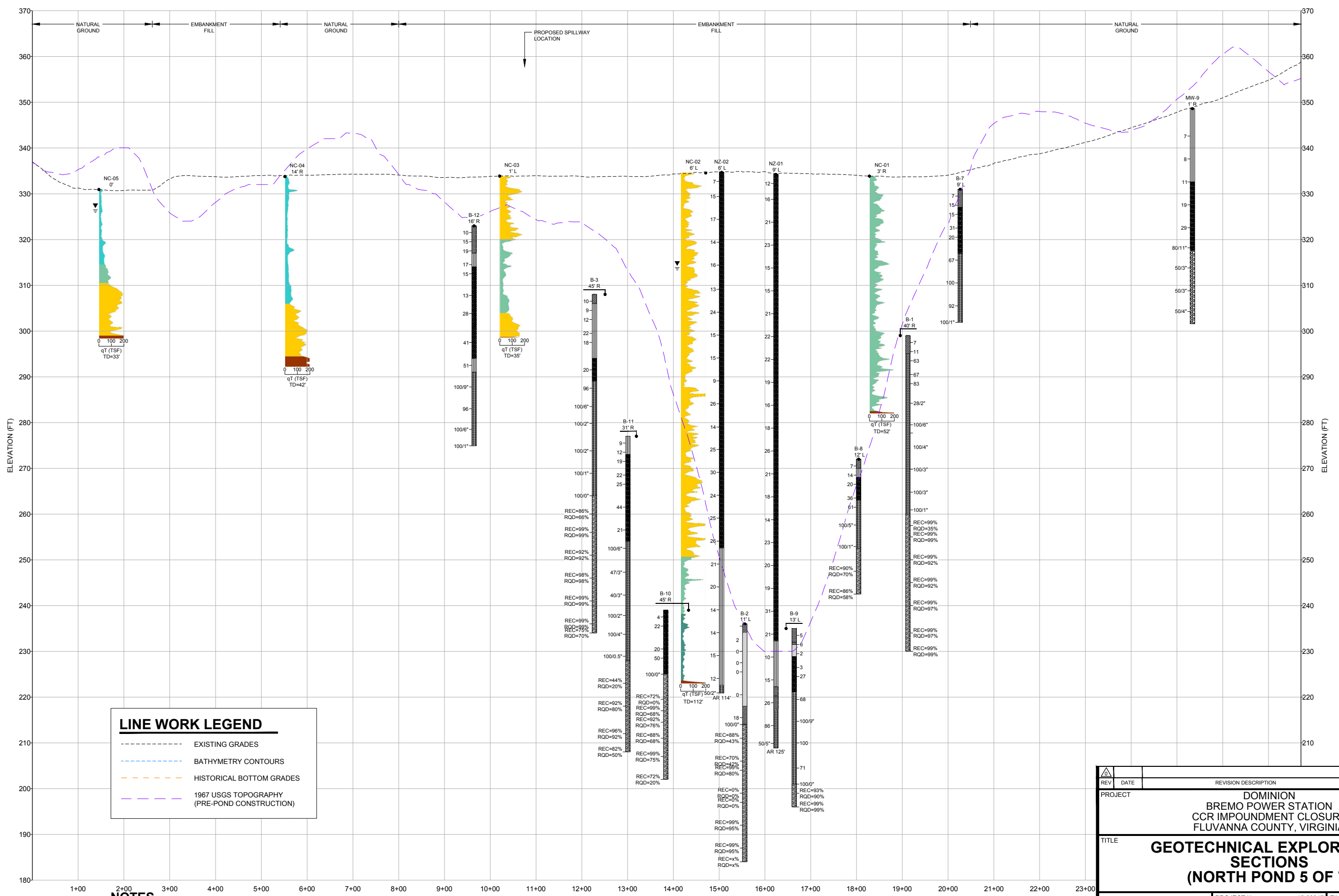
1. REFER TO FIGURE G-1 FOR GENERAL NOTES AND REFERENCES.
2. REFER TO FIGURE G-6 FOR LEGEND INFORMATION.



REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVV
PROJECT DOMINION BREMO POWER STATION CCR IMPOUNDMENT CLOSURE FLUVANNA COUNTY, VIRGINIA						
TITLE <b>GEOTECHNICAL EXPLORATION SECTIONS (NORTH POND 4 OF 7)</b>						
PROJECT No.		15-20347	FILE No.		1520347AG06-18	
DESIGN	-	-	SCALE		AS SHOWN	
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CHECK	JGM	11/30/15				
REVIEW	GLH	11/30/15				
			<b>FIGURE G-15</b>			



C:\Plan Production Data Files\Drawing Date Files\15-20347A - Brems Pond Closure (Conceptual Plan)\Active Drawings\Geotech Exploration\Revised 2015\_10071520347AG06-18.dwg | Layout: NP SECTION E | Modified: SPrichard 12/02/2015

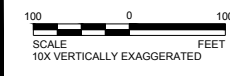


LINE WORK LEGEND	
-----	EXISTING GRADES
.....	BATHYMETRY CONTOURS
-----	HISTORICAL BOTTOM GRADES
-----	1967 USGS TOPOGRAPHY (PRE-POND CONSTRUCTION)

- NOTES**
- REFER TO FIGURE G-1 FOR GENERAL NOTES AND REFERENCES.
  - REFER TO FIGURE G-6 FOR LEGEND INFORMATION.
  - PROPOSED CONTOURS ARE THE SAME AS EXISTING GRADES.

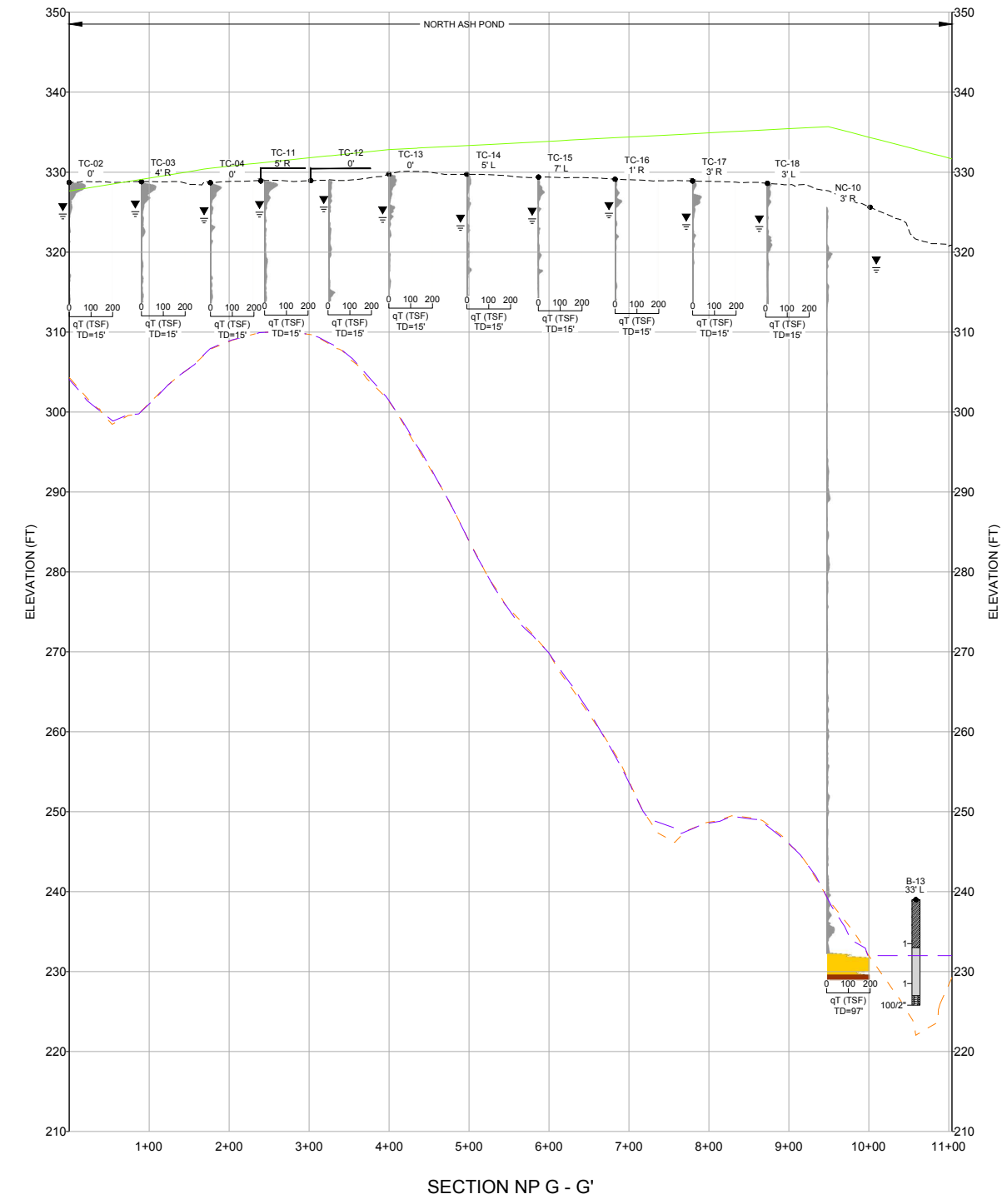
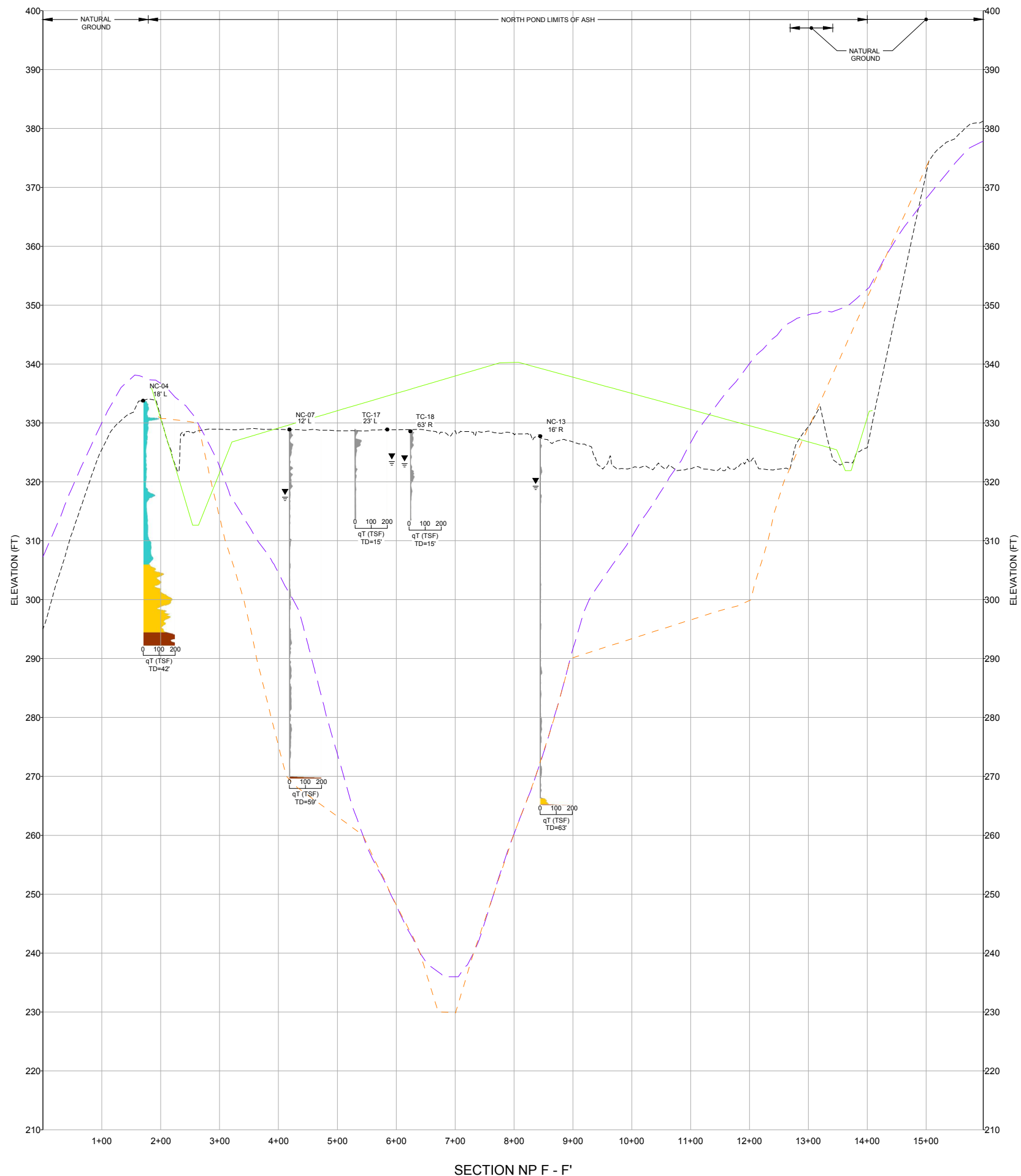
SECTION NP E - E'

REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVV
PROJECT: DOMINION BREMO POWER STATION CCR IMPOUNDMENT CLOSURE FLUVANNA COUNTY, VIRGINIA						
TITLE: <b>GEOTECHNICAL EXPLORATION SECTIONS (NORTH POND 5 OF 7)</b>						
PROJECT No. 15-20347		FILE No. 1520347AG06-18		SCALE AS SHOWN		
DESIGN	-	-	SCALE AS SHOWN			
CADD	CCP	11/30/15	FIGURE G-16			
CHECK	JGM	11/30/15				
REVIEW	GLH	11/30/15				





C:\Plan Production Data Files\Drawing Data Files\15-20347A - Brems Pond Closure (Conceptual Plan)\Active Drawings\Geotech Exploration\Revised 2015\_10071520347AG06-18.dwg | Layout: NP SECTION F-G | Modified: SPlachba 11/03/2015 12:04 PM | Plotter: SPlachba 12/02/2015



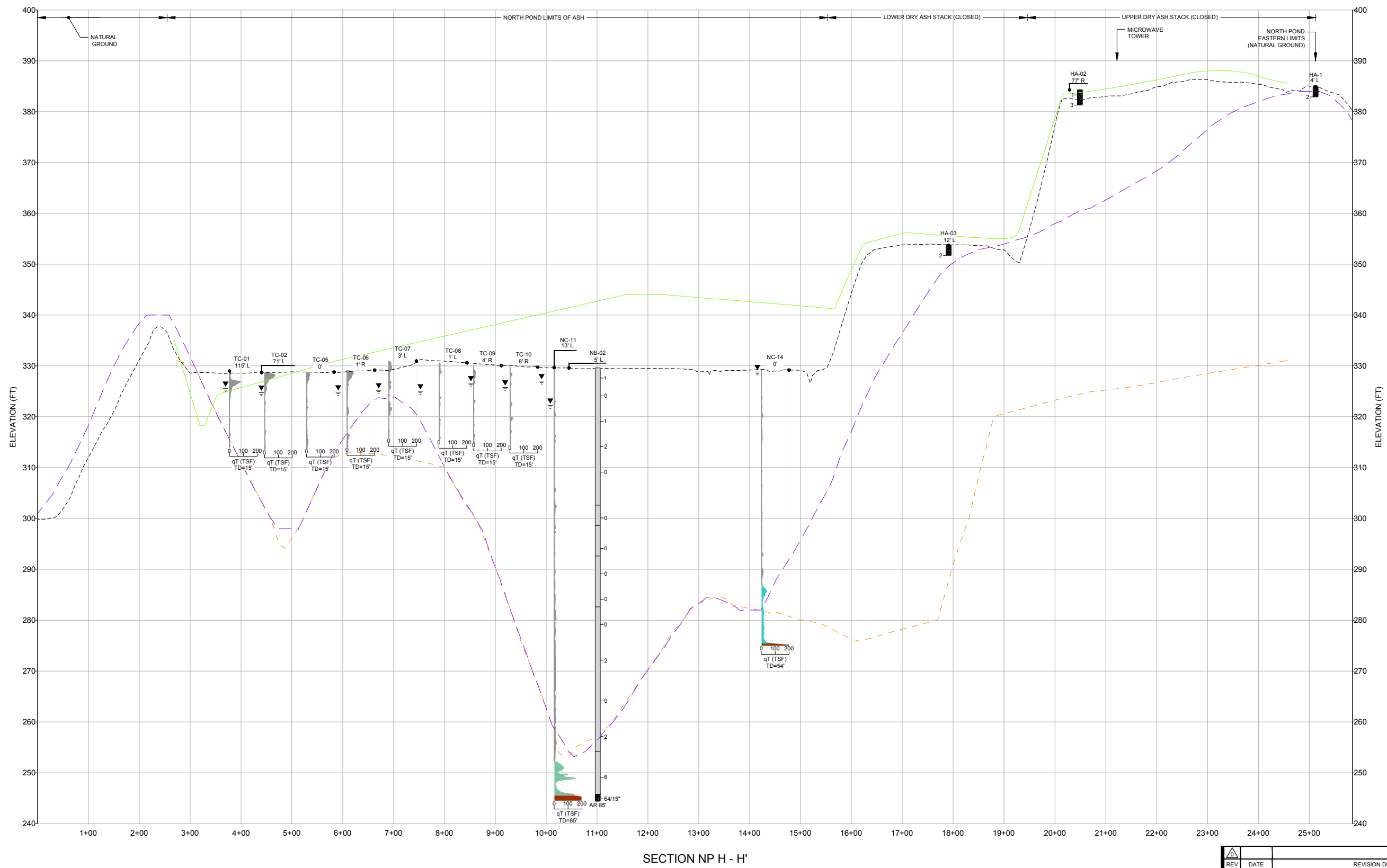
- LINE WORK LEGEND**
- EXISTING GRADES
  - PROPOSED GRADES
  - BATHYMETRY CONTOURS
  - HISTORICAL BOTTOM GRADES
  - 1967 USGS TOPOGRAPHY (PRE-POND CONSTRUCTION)

- NOTES**
1. REFER TO FIGURE G-1 FOR GENERAL NOTES AND REFERENCES.
  2. REFER TO FIGURE G-6 FOR LEGEND INFORMATION.

REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RWW
PROJECT						
DOMINION BREMO POWER STATION CCR IMPOUNDMENT CLOSURE FLUVANNA COUNTY, VIRGINIA						
TITLE						
<b>GEOTECHNICAL EXPLORATION                  SECTIONS                  (NORTH POND 6 OF 7)</b>						
PROJECT No.		15-20347	FILE No.		1520347AG06-18	
DESIGN	-	-	SCALE		AS SHOWN	
CADD	CCP	11/30/15				
CHECK	JGM	11/30/15				
REVIEW	GLH	11/30/15				
<b>FIGURE G-17</b>						



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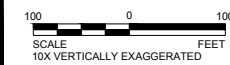


SECTION NP H - H'

**LINE WORK LEGEND**

-----	EXISTING GRADES
—————	PROPOSED GRADES
- - - - -	BATHYMETRY CONTOURS
- - - - -	HISTORICAL BOTTOM GRADES
- - - - -	1967 USGS TOPOGRAPHY (PRE-POND CONSTRUCTION)

- NOTES**
- REFER TO FIGURE G-1 FOR GENERAL NOTES AND REFERENCES.
  - REFER TO FIGURE G-6 FOR LEGEND INFORMATION.



REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW
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PROJECT No. 15-20347		FILE No. 1520347AG06-18		SCALE AS SHOWN		
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CHECK	JGM	11/30/15	SCALE AS SHOWN			
REVIEW	GLH	11/30/15	SCALE AS SHOWN			
			<b>FIGURE G-18</b>			