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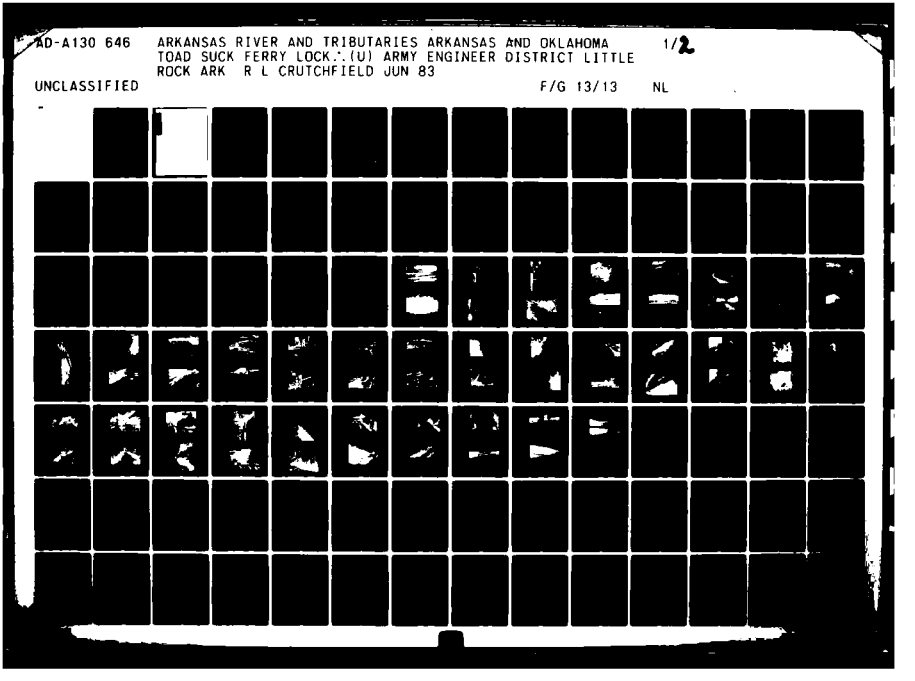

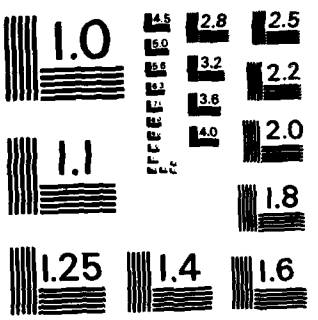

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO. AD-A130646	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) FOUNDATION REPORT (ON) CONWAY WATER SUPPLY DAM, ARKANSAS		5. TYPE OF REPORT & PERIOD COVERED Final Report, 1980 -'82
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Roy L. Crutchfield		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS U.S. Army Corps of Engineers Little Rock District P.O. Box 867 Little Rock, AR 72203		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Southwestern Division, Corps of Engineers 1114 Commerce Street Dallas, TX 75242		12. REPORT DATE June 1983
		13. NUMBER OF PAGES 142
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approval for public release; distribution unlimited

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Foundation	Shale	Curtain grouting
Excavation	Overburden	Dewatering
Blasting	Spillway	Slopes
Cutoff trench	Outlet works	
Geology		

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report describes the foundation conditions encountered during the construction of a water supply dam for the city of Conway, Arkansas; such to replace a previous water supply that was adversely affected by the construction of the McClellan-Kerr Arkansas River Navigation System.

The dam was founded on a thick shale layer of the Atoka Formation. Locally, the shale was gray to black, hard to moderately hard, sandy, and well compacted. Excavation of a 10-foot wide centerline cutoff core trench in the shale posed

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no problems with standard earth-moving equipment. Pre-split blasting was required in excavating the outlet works structures and emergency spillway.

Due to the susceptibility of shale to slake and deteriorate when exposed, a 6" to 1' protective layer above final grades in the rock were left until just prior to final foundation preparation, and placement of embankment material and/or concrete for outlet works.

The report gives the results of a well-point dewatering system installed in the valley section that did not function adequately, and methods to overcome ground-water flow at the rock/overburden contact.

Foundation preparation and treatment consisted of wash/air jetting, mortared open joints, concrete fillets, and rock anchoring. The report details the installation of a grout curtain utilizing the stop-grouting, split spacing method.

DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS
LITTLE ROCK, ARKANSAS

FOUNDATION REPORT

Conway Water Supply Project
Dam and Dike

June 1983

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PART I - INTRODUCTION

1-01. Location and Description of Project. The Conway Water Supply Dam is located in the southeast quarter of Section 21, Township 7 North, Range 15 West. It crosses Cypress Creek at mile 6.7 which is about 5 miles north of Plumerville, Arkansas, in eastern Conway County.

The dam is an earth embankment which rises 83 feet above the streambed to elevation 358.0 (m.s.l.). It has an impervious core, an impervious cut-off, and an outer shell of random fill material. The crest is 20 feet wide, and the length of embankment is 1,374 feet. The reservoir will cover about 1,165 acres and impound 23,500 acre-feet of water at the service spillway crest. The service spillway is at elevation 326 with a two-way drop inlet. There is an emergency saddle spillway on the right abutment with a crest elevation of 339.5. The outlet works has an uncontrolled inlet structure with a 4.0-foot diameter concrete outlet conduit in the right abutment. A pumping station, located on the intake structure, feeds a 36-inch diameter pipeline, which extends 11.4 miles southeast to a treatment plant near Gleason, Arkansas.

There is an earthfill dike located in the northwest quarter of Section 22, Township 7 North, Range 15 West on the east side of the reservoir. The dike is 28 feet high by 1,810 feet long, and has a crest width of 10 feet.

1-02. Construction Authority. The project was authorized under Section 10 of Public Law 93-251 dated 7 March 1974, to replace the existing raw water supply of Conway, Arkansas. The city of Conway previously obtained its water from a pool on Cadron Creek about 2.5 miles upstream from its confluence with the Arkansas River. These facilities were adversely affected by the construction of the Toad Suck Ferry Lock and Dam on the McClellan-Kerr Arkansas River Navigation System.

1-03. Purpose of Report. The objective of this report is to describe the foundation conditions encountered during the construction of the subject dam and its related features, and is a consolidated record of the foundation related construction operations, and an information source for future reference. It is intended also to provide information for evaluating any future structural problems, planning possible foundation studies, and be a part of the permanent project engineering and construction record.

1-04. Contractor and Contract Supervision. The project contract was a joint venture undertaken by McGeorge Contracting Company, Inc., and Valco, Inc. The McGeorge Company was based in Pine Bluff, Arkansas, and Valco was based in North Little Rock, Arkansas. McGeorge was the principal contractor for the earth work, and Valco was responsible for the concrete work. John Bricker of McGeorge, Inc., was the Project Manager over the joint venture. The blasting required in excavation was supervised by Arkansas Explosives, Inc. of Little Rock, Arkansas, and grouting was conducted by Judy Company of Kansas City, Missouri.

The contractor was required to establish and maintain an effective quality control system consisting of plans, procedures, and organization to insure the contract requirements in materials, equipment, workmanship, fabrication, and construction operations. A quality control system manager from within the contractor's organization was required to be at the work site, with responsibility for regulating all quality control matters. A fully qualified staff was required under the system manager with necessary experience and technical training to perform all quality control activities. Records and tests of the contractor's quality control throughout the construction operations were furnished to the Government, as directed by the Contracting Officer. The entire work was subject to inspection and testing by the Government prior to acceptance.

Don Cahoone, Project Superintendent (Civil) of McGeorge, Inc., was the designated Quality Control Officer with responsibility and authority to correct any deficiencies. David Moore, Project Superintendent (Structural) of Valco, Inc., was the designated Assistant Quality Control Officer. Quality Control testing was subcontracted to Anderson Engineering and Testing Company of Little Rock, Arkansas. The Quality Assurance for the project was provided by the Corps of Engineers and supervised by W. H. Hashbarger, Dardanelle Resident Engineer, and Jack Wilson, Project Engineer.

PART II

FOUNDATION EXPLORATIONS

2-01. Investigations Prior to Construction. The primary subsurface investigations were conducted in Fiscal Year 1978 and involved 265 exploratory drill holes. The following list shows the quantities and types of these investigations. Some drill holes are listed twice since they contained both soil and rock borings. This gives the list a total of 321 borings which represents the various boring methods rather than the actual number of drill holes. The logs of borings for the main embankment, dike, and outlet works are included in the appendix.

Location	Number of Borings	Linear Feet	Soil Samples Undisturbed	Jar	Bag
Dam Site					
Core Boring, NX Vertical	33	2244.3	---	---	---
Core Boring, 4" Vertical	1	47.3	---	---	---
Standard Penetration	20	200.5	---	119	---
Piston Sampler	22	350.5	118	179	13
Auger Borings	10	43.6	---	14	---
4" Splitspoon	4	14.8	---	5	6
Spillway Site, Right Abutment					
Core Boring, NX Vertical	2	127.5	---	---	---
Auger Borings	15	52.3	---	28	18
Left Abutment Ridge					
Core Boring, NX Vertical	1	46.4	---	---	---
Auger Boring	2	35.0	---	3	---
Dike					
Core Boring, NX Vertical	10	482.1			
Standard Penetration	9	98.5	---	46	---
Piston Sampler	5	37.3	9	20	---
Auger Borings	1	7.8	---	4	---
Borrow Area "A"					
Auger Borings	154		---	489	180
Borrow Area "B"	32		---	74	24
TOTALS	321	3787.9	127	981	241

Between October 1978 and August 1979, there were 37 additional holes drilled to determine the subsurface conditions for the spillway, outlet works, and embankment. All of the holes were combinations of soil and core borings. Samples of the rock core obtained from the outlet works foundation were tested for bearing strength and shear strength.

All of the exploratory borings were drilled by the Little Rock District, Corps of Engineers, using a Failing 1500 truck mounted rig. Overburden samples of the main embankment and dike foundations were obtained using a thin walled tube with piston, and split spoon samplers. The borrow materials were investigated by drilling a grid of auger holes spaced on 400-foot centers. All soils were classified according to the Unified Soils Classification System. The core holes were logged to give geologic descriptions and show the results of water pressure tests. Selected soil samples were tested to define the shear strength parameters. The borrow material and some of the foundation overburden were tested for natural water content in percent dry weight, plasticity index, and liquid limit.

2-02. Investigations During Construction. There was no exploratory drilling or other foundation investigations during construction. However, holes were drilled during construction for presplitting of rock faces, setting steel anchors, drain holes, and foundation grouting. This drilling is described where applicable in the following sections of this report.

PART III

GEOLOGY

3-01. Regional Geology. The Conway Water Supply Project is located in the north-central Arkansas Valley. Topographically, this is the low rolling flood plain of the Arkansas River which is bounded to the north and south by ridges and mountains reaching heights above 2,800 feet. The valley is a structural basin, or synclinorium, which is bounded to the north by the Boston Mountains of the Ozark Dome and to the south by the Ouachita Mountains, an anticlinorium. The valley extends eastward to the Mississippi Embayment and westward to the Interior Lowlands of Oklahoma. Structurally, the Arkansas Valley is a transitional province between the adjoining provinces to the north and south. Folds in the valley are more closed toward the intensely folded Ouachitas to the south, but become progressively more open toward the less intricately folded Ozark Dome to the north. Thrust faults which are typical of the Ouachita Mountains are common in the valley south of the Arkansas River. Normal faults which are downthrown to the south are typical of the Boston Mountains and are common in the valley north of the Arkansas River. Formations throughout the valley consist mostly of shale and sandstone of the Pennsylvanian Period with a few igneous intrusions thought to be of the Cretaceous Period. These formations are mostly unfossiliferous, seldom calcareous, often carbonaceous, and sometimes contain coal.

3-02. Site Geology. The local geology was similar throughout the project. The foundation consisted of the same rock formation over the entire area, however, there were a few variations in specific rock characteristics and conditions, which will be discussed in Part VI of this report.

a. Physiography. The project site is located where the northern Arkansas Valley rises to meet the southward sloping Ozark Highland Physiographic Province. Differential erosion of gently dipping sandstone and shale has formed this into an area of narrow ridges and broad valleys. The landforms trend east-west with the local and regional structure in most cases. Ridges, such as the one forming the dam abutments, are normally capped with the harder, erosion resistant sandstone or the more sandy shale. Valleys are usually eroded in the less resistant shale or in the weakened rock along fault traces. The dam valley, however, is formed by a 550-foot-wide gap incised through a typical east-west trending ridge. The dam abutments rise about 85 feet above the flood plain, but topographic relief in the area reaches about 150 feet.

b. Overburden. The dam abutments were covered with residual soils and colluvium consisting of sandy clay, clayey sand, and silt. Detrital fragments and float rock of the sandstone caprock were scattered along portions of the upper abutment slopes. Overburden thickness ranged from about 5 to 14 feet on the left abutment and from about 1.5 to 11 feet on the right abutment. The alluvial deposits of the valley average about 20 feet in depth and consisted mainly of sandy clays and clayey sands with occasional silt and silty sand. At the dike, overburden consisted of about 8 to 16 feet of residual sandy clay which graded into the weathered parent rock, sandy shale. It often contained detrital fragments and some float.

c. Bedrock Formation. The entire project area is underlain by the Atoka Formation of the Pennsylvanian Period. The Atoka is reported to be over 9,480 feet thick near Perryville, Arkansas, but about 5,000 feet thick at the dam site. It is a formation of interbedded sandstone and shale with the shale usually predominating. Other than the sandstone in the spillway foundation and capping the dam abutments, the project structures are completely underlain by shale.

The Atoka shale is typically a gray to black carbonaceous shale which weathers to a dull gray or buff and is sometimes micaceous or silty. Locally, the shale was hard to moderately hard, sandy, well compacted and cemented, and usually micaceous. It was often splintery and would readily air slake in places. Sand composition varied throughout the site, and in some cases it approached shaley sandstone. Although most of the shale in the foundation is sandy to some degree, it becomes pure shale at about 40 to 45 feet below the main embankment.

The sandstone beds throughout the Atoka Fomation range in thickness from a few inches to more than 100 feet. It is usually dark to light brown or gray, medium to fine grained, commonly micaceous, and often ripple marked or crossbedded. The sandstone in the spillway foundation and capping the dam abutments was hard, fine to medium grained, micaceous, and gray, except where it is weathered and iron stained to reddish brown. The base of the Atoka can sometimes be recognized by a strata called the "Millstone Grit," a thick bedded sandstone containing light colored, water-worn pebbles.

d. Bedrock Structure. The project is located on a broad, gently sloping homocline formed by the southward dipping limbs of the Arkansas Valley Basin and the Ozark Dome. Local structure trends east-west as does the Solgohachia Anticline and the Greenbriar Syncline, which flank the project to the north and south, respectively. The limbs of these folds dip from 2 degrees to 15 degrees but the formation dip at the project site ranges from 2 degrees to 7 degrees southward. Normal faults are common in the area and are often downthrown to the south augmenting the regional basin structure. Although no major faults were encountered in the dam foundation, there were minor displacements along bedding planes in the left abutment. The U.S.G.S. Geologic Map of the Menifee Quadrangle shows a fault trending east-west across the dike foundation, but there were no indications of this fault other than a small distorted fold in the weathered shale above firm rock. There is a major set of nearly vertical joints throughout the project with strikes which average from 12 degrees to 16 degrees northeast. The joints usually dip toward the northwest at 82 degrees to 90 degrees. Otherwise, joints occur occasionally at various attitudes, but for the most part they trend to the northeast.

e. Bedrock Weathering. Weathering throughout the project was aided by open fractures and joints which were conducive to groundwater movement, slope saturation, and freeze-thaw processes. Some of the shale was susceptible to slaking and would deteriorate into small chips when exposed to air. Therefore, care was taken during construction to protect foundation rock from unnecessary exposure at final grade.

Significant bedrock weathering was minimal in the dam valley but more pronounced in the abutments and the dike foundation. The shale in the dam valley was weathered less than a foot in depth, and firm rock was often encountered almost directly beneath the alluvium. However, it was sometimes more than 14 feet to firm shale in the dam abutments, and the shale foundation at the dike was weathered as deep as 8 to 10 feet in places. The sandstone in the spillway foundation and abutment caprock was rather resistant, with little deterioration from weathering.

f. Ground Water. Hydraulic pressure tests in project bore holes indicated that the foundation rock was generally impermeable as expected for shale, but that permeable zones existing in the formation due to open joints, fractures, and bedding planes. The water table was at an average of 5 feet below the valley surface and from there it rose about 15 feet in the lower abutments, according to water level readings in exploratory bore holes. Artesian water was encountered in some of the grout holes drilled in the valley, and occasional springs seeped water into the valley excavations. There were two springs in the stilling basin excavation, one with a flow rate of 5 gallons per minute and another which flowed at one-half gallon per minute.

g. Seismicity. The project is in a Seismic Risk Zone I which indicates that only minor damage would be expected from earthquakes. Therefore, a seismic coefficient of 0.05G was used in the structure design. Only earthquakes of minor intensity have occurred in the project area, and local activity usually amounts to only infrequent tremors. In early 1982, however, numerous tremors occurred in the project area. Most of these tremors were very minor and almost imperceptible, but a few were in the range of 3 to 5 on the Richter Scale. One of the quakes had an epicenter near Naylor, Arkansas, which is about 23 miles southeast of the dam; it occurred on 20 January 1982 and registered 4.5 on the Richter Scale. Although this earthquake was noticeable, it was considered minor and caused no apparent damage.

The most noted earthquake area in the region is about 140 miles northeast of the project near New Madrid, Missouri. In 1811 and 1812, earthquakes in this vicinity reached the top of the Modified Mercalli Scale with an intensity of XII. The New Madrid area is now classified as a Seismic Risk Zone III, in which major earthquake damage could be expected. A Seismic Risk Zone II of expected moderate damage is roughly concentric about the Zone III and includes most of northeast Arkansas.

h. Engineering Characteristics of Overburden. Overburden throughout the project foundation consisted mostly of sandy to silty clay and clayey sands. This is an impervious material with fair to good shear strength and medium to low compressibility when compacted and saturated. It has fair to good workability as a construction material and is considered suitable for foundation material when seepage control is important. There was also occasional silt and silty sand in the overburden, particularly in the dam's valley section. Silt and silty sand are semipervious to impervious with fair to good shear strength and low to medium compressibility when compacted and saturated. Overburden samples taken in the valley along the dam's centerline had a water content ranging from 6 to 30 with an average of 22, a liquid limit ranging from 20 to 44 with an average of 29, and a plasticity index ranging from 4 to 23 with an average of 11.

i. Engineering Characteristics of Bedrock. The foundation bedrock is shale of the Atoka Formation in every structure except for sandstone in portions of the spillway. The sandstone is a hard, resistant material favorable for the spillway foundation, but formed a relatively small amount of the total bedrock. The shale is hard to moderately hard, massive, well compacted, and provided good core recovery which indicated competent foundation rock. The shale is inherently impervious, but hydraulic pressure tests revealed pervious zones created by open fractures, joints, and bedding planes. For design purposes, the shale was considered to have a cohesion of 6.12 t.s.f. (tons/sq.ft.) and an angle of internal friction of 31 degrees (tan=0.6). Based on these properties, the allowable pressure on firm rock was 12 k.s.f. (kips/sq.ft.). An increase of 33-1/2 percent was allowed for earthquake and wave forces, and as stated previously, seismic forces were based on an acceleration of 0.05 G.

PART IV

SPECIAL DESIGN CONSIDERATIONS

4-01. Construction Method. Several approaches to the dam design were initially considered after the project requirements were developed. A stage construction method was studied, which would have allowed time for the alluvial foundation to gain strength. Also, a very flat sloped embankment was considered, which would have been constructed without removal of the alluvial foundation. However, it was decided that the foundation alluvium should be removed to the top of rock, and excavation would extend to the top of firm rock in the core trench. This design was favored because it eliminated several problems such as stage construction in relatively small quantities, potential liquifaction of the sands, costly seismic design analysis, possible seepage control needed along the downstream toe of the dam, and post-construction embankment settlement due to soft foundation.

4-02. Embankment Stability. The stability of the embankment was analyzed using conditions for the downstream slope at the end of construction, for partial pool, for sudden drawdown (between maximum pool and bottom of water supply pool), and for steady seepage. The computed critical safety factors for each of these conditions were respectively 1.9, 2.0, 1.4, and 1.7. The factors of safety required by EM 1110-2-1902 for these same respective conditions were 1.3, 1.5, 1.0, and 1.5.

4-03. Structure Uplift. All structures were designed for 100 percent uplift except for the stilling basin which was assumed to be relieved 50 percent by drains.

4-04. Earthfill Pressure. The earthfill was assumed to exert an at-rest pressure with K-0.8 and K=0.7 for the stilling basin backfill. The resultant was applied at 0.38H above the base. The K for active earth pressure was taken as 0.5.

4-05. Ultimate Strength Design. For ultimate strength design, a load factor of 1.8 was used. The capacity reduction factor was 0.9 for flexural members, and 0.7 for flexural members with significant axial loading. The capacity reduction factor for shear was 0.85.

4-06. Wave Forces. The significant wave height and length was based on an effective fetch of 1.097 miles, a wind velocity of 54 m.p.h., and a minimum wind duration of 18.0 seconds.

PART V

EXCAVATION PROCEDURES

5-01. General. Most of the excavation closely followed the lines and grades indicated in the plans and specifications. All permanent construction areas were stripped to an average depth of about one foot to remove unsuitable material such as topsoil, roots, stumps, and other organic matter. Excavation was classified for payment purposes as either rock or common, according to the determination of the contracting officer. Rock excavation was considered as the removal and disposal of shale and sandstone from their natural positions, including all boulders measuring more than one cubic yard. Common excavation was considered that which was not otherwise classified as rock. The contractor was responsible for maintaining the finished grade at all times; however, some deviation tolerances were allowed. The general tolerance for rock excavation was plus or minus 6 inches. The tolerance on close line drilled and presplit faces was a plus 3 inches with no minus allowances.

5-02. Excavation Equipment. The major excavation machinery was Caterpillar 631 and Terex TS18 scrapers. The scrapers were assisted by dozers and rippers where needed. Excavation of the overburden in the valley began with scrapers, but when the material became too soft and loose, Bucyrus Erie 65-D and 35-B draglines were used. Bulldozers on the job ranged from D-5 to D-9 Caterpillars and a TD-25 International. There were also Euclid end dump trucks, 950 loaders, backhoes, a wheel-type farm tractor, and a 12F motor patrol grader.

5-03. Dewatering System. A well point system was initially rented from Stang Hydronics to provide a dewatering system for the dam construction. The wellpoint pumps were Stang Model 708-1, size 8x6, and driven by 2-53 or 2-71 Detroit diesel engines. Standard non-self-jetting 1-1/2-inch wellpoints were used with 1-1/2-inch risers. The header pipe was 8-inch PVC pipe modified for wellpoint attachment on 5-foot centers. The wellpoints were installed by water jetting an 8-inch jet casing to the top of rock where the wellpoints were set within a surrounding sand filter. A 6-inch flowmeter was installed in the discharge line to record the volume of discharge. The system was installed about 5 feet outside of the crest line for excavated slopes with wellpoints spaced on 5-foot centers. However, the system did not work for this jobsite due to impermeable soils and excavations which bottomed on solid rock. Groundwater in the foundation was often at the overburden-rock contact or below and, therefore, difficult to pick up with wellpoints.

The contractor devised a plan to use shallow ditches, clay dikes, sandbag dikes, and appropriately located sump pumps for dewatering rather than wellpoints. Water was channeled to sumps by use of shallow ditches or dikes as applicable and then pumped over the cofferdams to the downstream runoff area. Pumping to the sumps from low areas in the rock surface was accomplished with small pumps such as 2- or 3-inch trash pumps. The water was then removed with a 6-inch sump pump capable of pumping 1,000 gallons per minute with a 100-foot head.

5-04. Excavation Blasting. Blasting was performed with Tovex T-1, a tubular water gel explosive manufactured by Du Pont, and with ANFO, ammonium nitrate fuel oil. Most of the blasting was done with Tovex T-1 which has a density of 0.25 lb./ft. (net explosive), a velocity of 6,800 M/Sec., and is packaged in one inch O.D. x 50 ft. coiled tubes. Originally, the specifications would not permit the use of ammonium nitrate as an explosive, but due to a value engineering change, it was allowed with Tovex in blasting the spillway excavation. However, the use of ANFO explosive was restricted to beyond 75 feet from the spillway crest and 5 feet from presplit faces.

Blasting with any explosive was not permitted within 100 feet of the intake structure or the outlet conduit while or after the concrete was placed. No blasting was allowed within 100 feet of foundation grouting, during or after grouting operations.

The blast holes were drilled according to specifications and patterned under supervision of the blasting contractor, Arkansas Explosives, Inc. For general rock excavation, blast holes were not allowed to be drilled deeper than two-thirds of the remaining depth to final grade, and in no case was the bottom of holes allowed closer than 6 inches from the final grade. The blast holes in the spillway excavation ranged from 3 to 4 inches in diameter and were usually spaced in 8'x12' or 10'x14' patterns. However, other patterns were also used, such as 4'x4', 6'x9', 7'x8', 7'x9', 7'x11', and 9'x12'. The wider patterns were used for the greater hole depths and the more narrow patterns for shallow holes. In presplitting excavations, 3- to 3-1/2-inch-diameter holes were drilled at 2-foot intervals along the desired break line and to the full depth of the cut; Tovex (0.25 lb./ft.) was loaded in every other hole.

5-05. Foundation Preparation. Horizontal surfaces of the rock foundation were protected by a 6- to 12-inch layer of unexcavated rock which was not removed to grade until the contractor was ready for placement of embankment material, reinforcement steel, or concrete. The drilling and grouting operations were performed on this protective layer to prevent damage and deterioration of the final foundation surface. The protective layer was easily and quickly removed for final cleaning just before placement of the construction material. At this time the rock surface, joints, and fractures were cleaned of dirt and loose drummy material by barring, picking, wedging, sweeping, and finally by washing or air jetting.

Open joints and fractures were cleaned of loose and weathered material and then filled and sealed with concrete or cement mortar. Areas with vertical faces and overhangs were either sloped off or a concrete fillet was placed in the recesses to allow proper compaction of the impervious fill. Rock surfaces upon which concrete was to be place was required to be kept continuously wet for 24 hours immediately prior to the concrete placement.

5-06. Left Abutment Excavation. Excavation on the left abutment followed the lines and grades of the contract drawings with no problems. The upper abutment slopes above elevation 305 were stripped to a depth of about one foot within the embankment area. Below elevation 305, the overburden was sloped at 1 vertical on 2 horizontal to the top of rock, which was at about elevation 289. The rock abutment extended from elevation 289 to elevation 264

at the top of rock in the valley floor. The surface in this area was scaled to remove loose and drummy rock prior to placement of embankment material. Care was taken that the rock slope would be no steeper than 4 vertical on 1 horizontal. The core trench in the left abutment was excavated to firm rock and extended from centerline station 16+20 to 22+43.

5-07. Valley Excavation. Excavation in the valley section removed a thickness of about 22 feet of overburden from approximate elevations 286 to 264. The top part of bedrock in the valley was weathered less than a foot in depth. This weathered zone was removed with the overburden and as a result, no further excavation was required in order to extend a core trench to firm rock, since the entire embankment foundation was excavated to firm rock. Therefore, the valley excavation was roughly on one horizon with no core trench along the axis as originally illustrated in the contract drawings. The excavation extended to the embankment toe limits which was 253 feet upstream of the dam exis at elevation 283 and downstream 232 feet from the axis at elevation 284.

Excavation slopes along the embankment toe were 1 vertical on 2 horizontal, and there were no problems in attaining the specified lines and grades. Small but persistent seeps of groundwater occurred intermittently throughout the valley excavation, and these areas were dewatered ahead of the embankment placement. Open joints and fractures were cleaned and filled with concrete or mortar as required. The rock surface was cleaned and prepared for embankment placement as described in paragraph 5-05.

5-08. Right Abutment Excavation. Excavation on the right abutment was somewhat different from that for the left abutment, due to a bench and adjoining rock face required for the outlet works foundation. The upper abutment slopes above elevation 335 were stripped to a depth of about 1 foot within the embankment area. Below elevation 335, the abutment was sloped in overburden at 1 vertical on 3 horizontal for the most part. However, it was transitioned to 1 vertical on 1 horizontal upstream of the intake structure and to 1 vertical on 2.5 horizontal along the lower outlet channel. At the top of rock, approximate elevation 325, the slope was changed to 4 vertical on 3 horizontal to form the rock face adjacent to the outlet works. The foundation bench for the outlet conduit was at the base of this rock face and extended in width from Station 11+02 to Station 11+75 on the dam axis. It was excavated to the elevation for the bottom of the outlet conduit which varied from elevation 284 upstream to elevation 281 downstream. The rock abutment sloped downward from the bench to near elevation 266 at the top of rock in the valley floor. The slope surface was no steeper than 4 vertical on 1 horizontal and was scaled to remove loose and drummy rock prior to placement of embankment materials. The core trench in the right abutment extended from Station 8+71 to 10+70 on the dam axis and was excavated to firm rock.

5-09. Core Trench Excavation. A core trench was excavated to firm rock along the dam axis from Station 8+71 to Station 22+43.44. The actual trench construction occurred only in both abutments, since the entire valley floor and the outlet conduit bench were excavated to firm rock. The trench was actually cut from Station 8+71 to 10+70 in the right abutment and from Station 16+20 to 22+43.44 in the left abutment. However, a 25-foot-wide strip along the centerline between Stations 10+70 and 16+20 was treated, inspected, and mapped as part of the core trench, although no actual trench was cut.

The trench was 10 feet wide from Station 8+71 to 9+70 where the walls tapered outward until the trench was 25 feet wide at Station 10+20. The trench foundation remained 25 feet wide to Station 19+50 where the walls tapered inward to a width of 10 feet again at Station 20+00. In the abutments, the trench walls were sloped at 1 vertical on 2 horizontal from the ground surface to the top of rock and at 1 vertical on 1 horizontal from the top of rock to the bottom of the trench in firm rock. There were no problems in the core trench excavation; lines and grades followed the contract drawings except for the absence of trench walls in the valley section. The geologic mapping of the core trends foundation is shown on sheets 13 through 17 of the plans.

5-10. Outlet Works Excavation. The outlet works excavation included the intake structure, the outlet conduit, the stilling basin, and the outlet channel. There were a few minor deviations from the specified lines and grades, but none of any major significance.

a. Intake Structure. The intake structure foundation extends along the outlet works centerline from Station 7+45.75 to Station 7+96.75. The excavation area for the wet well section was a 35-foot x 32-foot rectangle which extended from Station 7+45.75 to Station 7+80.75. The adjoining area for the drop inlet section was a 16-foot x 8-foot rectangle which extended from Station 7+80.75 to Station 7+96.75. The geologic map of the intake structure foundation is shown on sheet 19 of plans.

Contract drawings indicated that the excavation should be 4 feet in depth proceeding from elevation 284.14 (the outlet conduit elevation) to elevation 280.14. The excavation was constructed to this elevation and depth except where several joints intersected near the center of the foundation. This area was excavated to a depth of 4-1/2 to 5-1/2 feet in order to remove broken rock.

b. Outlet Conduit. The foundation excavation for the outlet conduit had a minimum width of 6 feet 4 inches and extended 420.66 feet along the outlet works centerline from Station 7+96.75 to Station 12+17.41. The elevation dropped along the invert from 284.14 at the intake structure to 281.00 at the stilling basin. The adjacent right abutment was sloped at 4 vertical on 3 horizontal to the top of the conduit excavation, and at that point it was excavated to a 6-foot-9-inch vertical cut against which the conduit concrete was poured. The conduit sidewall was presplit with a small amount of overexcavation, due mostly to overbreakage in the rock formation. The geologic maps of the outlet conduit are shown on sheets 20 through 22 of plans.

c. Stilling Basin. The stilling basin excavation extended along the outlet works centerline from Station 12+17.41 to Station 12+86.91, 69.5 feet beyond the end of the outlet conduit. At the end of the conduit, the foundation began to widen progressively and slope downward from elevation 281 at Station 12+17.41 to elevation 272.9 at about Station 12+56. Beyond this point, the foundation was about 18 feet wide and horizontal. The west side of the excavation had a 10-foot-wide berm at about elevation 286, above which the abutment was sloped at 1 vertical on 3 horizontal. The east side of the excavation had a 3-foot-wide berm at elevation 274, above which the slope was

1 vertical on 1 horizontal. The excavation was presplit with a minor amount of overexcavation, due to overbreakage in the rock formation. The geologic map of the stilling basin excavation is shown on sheet 19 of plans.

d. Outlet Channel. The excavation for the outlet channel closely followed the contract specifications. It extended along the existing creek channel from Station 12+86.91 to about Station 16+08. The channel was curved by cutting an inside radius of 300 feet on the east bank and an outside radius of 350 feet on the west bank. The channel floor was at elevation 274 with side slopes of 4 vertical on 1 horizontal in rock and 1 vertical on 2.5 to 3 horizontal in overburden. A 10-foot-wide berm on the west side of the stilling basin also extended along the outlet channel to Station 13+60.

5-11. Spillway Excavation. The spillway was excavated according to contract drawings in a saddle of the right abutment. The excavation was 235 feet wide with sides sloped at 4 vertical on 1 horizontal in presplit rock and 1 vertical on 2 horizontal in overburden. The approach channel was given an adverse slope of 0.010. The exit channel was given a supercritical slope of .025 for 200 feet and then sloped at 0.0034 to where the channel daylighted in a natural ravine about 1,600 feet below the spillway crest.

5-12. Dike Excavation. An inspection-core trench was excavated along the dike alinement. The trench was 10 feet wide with 1 vertical on 1 horizontal side slopes. The core trench was excavated to firm rock between dike Stations 19+60 and 25+00 with the remaining inspection trench in overburden. The excavation followed contract specifications with no problems. Geologic mapping of the dike core trend is shown on sheet 18 of plans.

PART VI

CHARACTER OF FOUNDATION

6-01. General. The foundation proved to be very stable throughout the project. The Atoka was the only rock formation encountered and was relatively hard, massive shale for the most part. The strata dipped only slightly, and contained no major structural complexities. Joints and fractures which formed occasional permeable zones were sealed in the grout curtain with little difficulty, although some artesian groundwater was encountered.

6-02. Left Abutment Foundation. The foundation rock in the left abutment was predominantly massive, moderately hard to hard, gray to dark gray, sandy shale. The rock surface was relatively smooth overall; however, in places it was rough and somewhat broken due to air-slaking and fractures. Occasionally, small steps were formed by excavation along intersecting joints and bedding planes, most of which were only a few tenths of a foot in height. Most of the joints were in the nearly vertical, NE trending set common to the project area. These joints varied in strike from N5°E to N29°E and in dip from 90 degrees to 82 degrees NW. There were a few joints which trended from N68°E to N86°E and from N31°W to N79°W. There were some parted bedding planes, but otherwise low angle fractures were sparse. A few small joint displacements indicated minor faulting in the left abutment. From Stations 17+26 to 17+31, three joints were displaced about 0.2 foot along the formation bedding plane which had an apparent dip of 3°SE. A more prominent displacement was visible in the north wall of the core trench at about elevation 307. Several nearly vertical joints were displaced about 1.1 feet along the formation bedding plane, which had an apparent dip of 2 degrees SE. However, there were no slickensides, gouge, or other indications of faulting along the foundation floor on this horizon. The left abutment had no groundwater problems and was mostly dry except for occasional runoff dampness along bedding planes.

6-03. Valley Foundation. The surface of the valley foundation was relatively smooth, massive, sound rock consisting of moderately hard to hard, dark gray to black, sandy shale. The formation was nearly horizontal, but dips varied from 2 degrees to 6 degrees southward. Excavation along intersecting joints and bedding planes created occasional thin steps which were only tenths of a foot in height. Most of the joints typically trended NE and were nearly vertical; their average strike was about N14°E. Usually, joints and fractures appeared relatively tight on the foundation surface, and there were no displacements or other indications of faulting. An old stream channel formed a depression in the top of rock which ran diagonally from NW to SE in the NW quadrant of the valley foundation. There was some groundwater seepage into this depression which was removed by sump pumps, buckets, and sweeping. Bedrock in the old channel was nevertheless firm, hard shale which presented no foundation problems. Small, intermittent groundwater seepage occurred throughout the valley foundation, and there were artesian flows in some of the grout holes. However, the dewatering procedures and grouting operations successfully controlled these problems.

6-04. Right Abutment Foundation. The rock foundation in the right abutment was mostly moderately hard to hard, massive, gray to black, sandy shale. The rock surface varied from relatively smooth to somewhat broken in places where air-slaking and fractures were prevalent. Excavation along intersecting joints and bedding planes formed occasional small steps which were usually a few tenths of a foot in height; none were allowed to be over 2 feet high. The nearly vertical, NE trending set of joints were also prominent in the right abutment. These joints varied in strike from N6°E to N31°E and in dip from 90° to 76°NW. There were a few high angle joints striking NW from 12° to as much as 80°, but these were somewhat random rather than characteristic. In the rock slope between axis Stations 10+70 and 11+02, there were several joints dipping at 4° to 5°SE and striking N62°E. There were no indications of faulting, and no groundwater problems above the outlet works.

6-05. Outlet Works Foundation. The geologic mapping, photography, and inspection of the outlet works included the foundations for the intake structure, the outlet conduit, and the stilling basin. Foundation characteristics were generally similar for each of these features, but specific conditions varied from place to place.

a. Intake Structure. The foundation rock was moderately hard to hard, dark gray, sandy shale. The rock surface was relatively smooth for the most part, but broken in places. A set of five nearly vertical joints trended N25°E across the foundation. These joints were intersected in the downstream half of the foundation by three curved joints which trended roughly NW-SE and dipped about 60°NE. There were also a couple of similar curved joints in the NE corner of the foundation and a few random, irregular fractures. The joints and fractures were somewhat weathered in places with occasional iron staining. There were no faults or groundwater problems.

b. Outlet Conduit. The foundation surface was smooth, massive, sound rock consisting of hard to moderately hard, dark gray to black, sandy shale. Although jointing occurred intermittently throughout the conduit foundation, it was most pronounced in the upstream 110 feet of the alinement. Most of the joints trended NE and were nearly vertical with dips of 90° to 83°NW, and strikes ranged from N73°E to N4°E and averaged N14°E. However, occasional joints trended in other directions than NE, and there were some random, irregular fractures. There were no indications of faulting along any joint or fracture plane. An irregular clay seam of 1 to 2 inches in width occurred between conduit Stations 8+54 and 8+61. It appeared that this clay seam could be projected to connect with a clay-filled, NE trending joint in the right abutment near conduit Station 8+83. A rock slide occurred along this joint plane between Stations 8+54 and 8+83 when material was removed from the base of the abutment slope during early conduit excavation. When the slide debris was removed, it left a sloping and somewhat irregular abutment surface adjacent to the conduit alinement (see paragraph 7-05). Otherwise, the foundation was markedly smooth and hard with little jointing or fracturing from conduit Station 11+15 to Station 12+30 in the stilling basin. It was also very smooth and hard with only one tight fracture in the area where the conduit alinement crossed the dam axis. (Conduit Station 10+00 = dam axis Station 11+05).

c. Stilling Basin. Similar to the outlet conduit, the foundation rock in the stilling basin consisted of moderately hard to hard, dark gray to black, sandy shale with a typically smooth, massive surface appearance. Fracturing and jointing were relatively moderate. Joints had dips of 90° to 86°NW and strikes of N5°W to N11°E. Joints and fractures appeared tight with little weathering, and there were no indications of faulting. Sump pumps were required to remove water from the excavation due to a couple of springs in the west stilling basin wall. A spring occurred at outlet works Station 12+20 which flowed at 1/2 gallon per minute, and another was at Station 12+51 which flowed at 5 gallons per minute.

6-06. Spillway Foundation. The spillway foundation surface was smooth to somewhat rough, massive, sound rock. The rock consisted mainly of moderately hard to hard, dark gray to black, sandy shale, but downstream of spillway Station 11+50, it was hard, gray, fine to medium grained sandstone. Most of the joints trended NE and were nearly vertical. There were no indications of faults and no groundwater problems.

6-07. Dike Foundation. The dike foundation was smooth, massive, sound shale which was moderately hard to hard, dark gray to black, and sandy to very sandy in places. For a few feet at each end of the core trench, the shale was weathered, moderately soft to moderately hard, and brown to buff before grading into the overburden of the inspection trench. The jointing was nearly vertical and mostly trended NE with an average strike of N12°E. The firm foundation rock had no indications of faults; however, there was a small distorted fold in the weathered shale of the west core trench wall at Station 20+52. The dike foundation was well above the water table, and there were no groundwater problems.

PART VII

FOUNDATION TREATMENT

7-01. General. Foundation treatment included a grout curtain, drainage provisions, foundation anchors, and repair of a rock slide scar. However, the major foundation treatment consisted of the grout curtain to control leakage through the foundation rock and drainage curtain to relieve uplift pressure beneath the stilling basin. The foundation rock was relatively impermeable shale except for zones of permeability along open fractures, joints, and bedding planes. These permeable zones were detected prior to construction by exploratory drilling and water pressure tests. The investigations revealed that although much of the foundation would probably take little or no grout, there were a number of areas which would require grouting to seal potential seepage zones. Although the grout curtain was intended to reduce the flow of water through the rock strata beneath the dam, the stilling basin was designed with drainage holes to relieve uplift pressures by at least 50 percent.

7-02. Curtain Grouting. The grout curtain was constructed along the axis of the dam foundation between 8+50 and 22+40. The grout holes, which were EX size having a 1.485 inch O.D., were drilled with standard percussion drilling equipment using a track-mounted Chicago pneumatic drill. The holes were grouted by zones using the split spacing-stop grouting method. The entire grout placement required 408 grouting connections, 2,080.7 bags of cement, and a grouting time of 132 hours 20 minutes. Foundations grouting is shown on sheets 23 and 24 of the plans.

a. Grout Hole Inclinations. Most of the joints at the dam site ranged from high angled to vertical, and therefore, it was determined that the maximum interception of joints would be accomplished by drilling the grout holes at 30° from vertical. The holes drilled in the valley bottom and the left abutment were inclined 30° from vertical toward the left abutment. The holes drilled in the right abutment were inclined 30° from vertical toward the right abutment.

At two areas along the axis the grout holes were drilled in a fan pattern where four holes were drilled at 2.5-foot intervals on each side of a vertical hole with respective inclinations of 7.5°, 15°, 22.5°, and 30°. This formed a fan arrangement of 9 grout holes along 20 feet of the dam axis. The hole at 90°, two holes at 15°, and two holes at 30° were primaries, and the remaining four holes were secondaries. One fan was located at the base of the right abutment to form a transition between the grout holes inclined toward the left abutment and those inclined toward the right abutment. The central vertical hole of this fan was located at Station 12+22. The other fan pattern was located with the central vertical hole at Station 10+64, and was devised to grout the 4 vertical on 3 horizontal slope above the outlet conduit. An extra secondary hole was drilled at Station 11+02 near the base of the slope to intersect the bottom of the fan holes which were drilled from above the slope; this hole was drilled 70 feet into the right abutment at an angle of 45°.

b. Split Spacing. Split spacing was the procedure of locating additional grout holes midway between two previously grouted holes. The primary holes were drilled and grouted at 20-foot intervals to a depth of 70 feet. The secondary holes were then split spaced midway between the primary holes giving a final spacing on 10-foot intervals for most of the grout curtain. However, there were areas of significant grout consumption which were supplemented with split spaced tertiary and quaternary holes. If these holes proved tight during water pressure tests, it indicated that the previous grouting was effective, and the holes were backfilled rather than grouted. The secondary holes extended to a depth of 60 feet in the left abutment but averaged 45 feet depth elsewhere. The tertiary and quaternary holes were drilled to depths varying from 20 to 45 feet depending on the zones they were intended to check.

c. Stop-Grouting. Stop-grouting was the method used whereby each hole was drilled to its final depth and grouted by zones through a packer set at successively shallower stops. The areas beneath the packer settings which were to receive grout were termed zones, and the predetermined packer setting depths were termed stops.

d. Grouting Procedure. The grouting procedure involved five basic steps for each hole. First, after being drilled to its full depth, the hole was cleaned by applying water to the bottom and letting it overflow at the surface until the return water became clear. This removed any drill cuttings, slurry, or debris left in the hole after drilling. Second, the holes were water pressure tested and washed. All holes were tested and washed with clean water under continuous pressure at the required grouting stops and pressures. This washed open the permeable fractures in the grouting zone and gave a preliminary indication of grouting conditions. Third, the packer was placed in the hole at the lowest stop or grouting position predetermined for the hole. Fourth, grout was pumped into the zone at the pressure and mixes required. Finally, after the grout pressure dropped sufficiently, the packer was moved to the next higher stop, and grout was placed at the lower pressure required for that zone. This procedure continued until the grouting was completed throughout the hole. No grouting was allowed within a 100-foot section of any drilling in progress. Before grouting could begin in any hole, at least the nearest two holes in advance of that hole had to be drilled to final depth. Also, the adjacent hole had to be pressure washed to clean out any intervening seams and fractures.

e. Grout Injections and Mixes. The grout injections and mixes were controlled to suit the conditions encountered in each grouting zone. Neat cement grout was mixed in a water-cement ratio by volume and varied according to hole characteristics from 3.0 to 0.6. The procedure usually started with a 3.0 grout, the thinnest mix allowed by the contract specifications. Most of the holes were tight, or relatively tight, and in many cases no thicker grout was needed. At 3.0 or 1.0 grout was usually the final mixture for the more permeable zones. However, in a few cases where open joints and artesian flows were encoutered, it was necessary to use an 0.75 or 0.60 mixture. Each zone was considered completely grouted when the rate of grout consumption using

the maximum required pressure was less than 1 cubic foot of mixture in 10 minutes. Grouting pressures varied according to the depth of packer stops beneath the top of the rock foundation. The pressures used were normally 1 p.s.i. for each foot of rock depth with allowances for the hydrostatic weight of the grout column. A 1.0 grout mix was used to backfill holes.

f. Grouting Conditions. Judy Company began grouting in Hole No. 14+20 on 12 September 1980. The operations proceeded well with no serious difficulties although occasional open joints were encountered and there were some artesian groundwater flows. The greatest grout consumption and the artesian flows occurred in the same general area indicating a more open joint system than in other parts of the foundation. The artesian flows were in the western valley section, and some large grout takes also occurred in that section, as well as in the lower right abutment. Artesian groundwater flows occurred in numerous holes between Stations 12+28 and 15+20, and there was often venting in adjacent holes during the grouting in this area. There were several holes between Stations 11+02 and 15+00 which had grouting zones that required bags of cement in the double digit amounts, but there were four holes which required over 100 bags of cement. The grouting conditions in these four holes were as follows:

Hole No. 11+48. Drilling was stopped when drill water was lost at the 48-foot depth. The packer was set at the 40-foot depth to grout the open zone. The grouting finally required an 0.75 mixture and took a total of 126.4 bags of cement in 1 hour and 50 minutes.

Hole No. 12+38. This was an old exploratory core hole which was found with an existing artesian flow. The hole was grouted below the 40-foot depth. This zone required a final grout mixture of 0.60 and took a total of 207.7 bags of cement in 2 hours and 19 minutes.

Hole No. 12+81. This was a grout hole which encountered an artesian flow below the 40-foot depth. When the zone below that depth was grouted, it required a 1.0 mixture and took a total of 139.7 bags of cement in 2 hours and 25 minutes.

Hole No. 13+74. This was a grout hole which was tight below the 40-foot depth but required final grout mixtures of 0.75 at both the 20-foot and 2-foot stops. The zone below the 20-foot stop took 124.3 bags of cement in 2 hours and 31 minutes, and the zone below the 2-foot stop took another 26.8 bags in 1 hour and 17 minutes.

Otherwise, the east valley section and both abutments were relatively tight. Most of the grout consumption at these locations was a 3.0 mixture requiring only tenths of a bag of cement. The largest grout consumption in the east valley section was 7.1 bags of cement below the 2-foot stop in Hole No. 15+30. This hole had some leaking through joints to the foundation surface. The largest grout take in the left abutment was 17.4 bags of cement below the 20-foot stop in Hole No. 18+40. The largest consumption in the right abutment was 17.5 bags of cement below the 2-foot stop in Hole No. 10+61.5. The final grouting operation was completed in Hole No. 12+84 on 19 March 1981.

7-03. Drainage Provisions. Drainage holes were drilled into the stilling basin foundation to relieve uplift pressures. The holes were percussion drilled with a minimum diameter of 3 inches at the final depth. They extended to a depth of 10 feet into rock and were slanted upstream 75° from the surface of the concrete slab. There were three holes drilled on the outlet works centerline at Stations 12+29.91, 12+39.91, and 12+49.91. At Stations 12+59.91, 12+69.91, and 12+80.91 a hole was drilled 2 feet 7 inches to each side of the centerline giving six additional holes. Therefore, there was a total of nine drainage holes throughout the stilling basin. These holes were drilled, as required by the contract specifications, after the dam's grouting operation was finished. All of the holes were cleaned by flushing with water and compressed air before final acceptance.

A vertical and horizontal filter drainage blanket was constructed in connection with the toe drain on the downstream side of the select impervious embankment. The filter material was a clean, free draining, well graded sand and gravel. The vertical filter blanket was 3 feet wide and extended along the downstream edge of the select impervious core from the top of this core at elevation 339.5 to the bottom of the horizontal filter blanket at elevation 286.0. The horizontal filter blanket was 2 feet thick and joined the vertical filter blanket at its base. The horizontal filter blanket extended laterally up the abutment slopes to elevation 339.5. It extended from the edge of the select impervious core, which was 35 feet downstream from the dam axis, to the toe drain, which was 216 feet downstream from the dam axis. The toe drain was a 12-inch, bituminous-coated, perforated, corrugated metal pipe wrapped in type "B" filter cloth. It was laid in a 3-foot-wide trench connected with filter material to the base of the horizontal filter blanket. The toe drain extended parallel to the dam axis and drained from east to west with respective invert elevations of 283.0 at the left abutment and 280.25 at the right abutment.

7-04. Foundation Anchors. Steel anchors were set in the foundation beneath both the spillway concrete control section and the stilling basin slab. No. 9 steel anchors were spaced along the spillway control section on 10-foot centers and were grouted into 3-inch-diameter, percussion-drilled holes which extended vertically 6 feet below the concrete. There were a series of nine anchors placed beneath each of the two stilling basin wingwalls. These were No. 11 steel anchors and were grouted into 3-inch-diameter, percussion-drilled holes that extended vertically 10 feet into the rock beneath the stilling basin slab.

The anchors were installed at least 6 days before concrete was placed over the foundation to allow proper setting time for the mortar. The mortar was a cement, sand, and water mixture proportioned into one part cement to two parts sand by dry weight with enough water for proper consistency. Each anchor hole was partially filled with mortar, and the anchor bar was vibrated to the bottom of the hole. Then, more mortar was added if needed to finish filling the hole. The bars were completely surrounded by mortar and not allowed to rest against the side of the hole.

7-05. Treatment of Slide Scar. Concrete fill was required along the scar of a rock slide which occurred on the right abutment slope above the conduit alinement. The slide left a relatively smooth scar on the upper abutment slope, but it was quite irregular and fractured adjacent to the conduit foundation. Therefore, it was decided to pour concrete fill against the slide scar where it adjoined the outlet foundation near elevation 281 (between Stations 8+54 and 8+83), in order to stabilize the fractured rock next to the relatively thin conduit wall. The concrete fill was placed to the top of the outlet conduit which was about elevation 288.

PART VIII

CONSTRUCTION MATERIALS

The earth materials used in the project construction consisted of riprap, bedding material, concrete aggregate, and sand. The riprap was syenite rock from the Granite Mountain Quarries in southeast Little Rock, Arkansas. Syenite consists mostly of feldspar minerals, and with an increase in its normally low amount of quartz, it would grade into granite. The bedding material was sandstone of the Atoka Formation from the M & M Rock Company quarry near Greenbriar, Arkansas. The concrete aggregate was a fluvial gravel obtained from an M & M Rock Company quarry located about 3 miles west of Toad Suck Ferry Lock and Dam. The sand supply was obtained from Jeffries Sand Plant near Cedar Park, about 2 miles north of Toad Suck Ferry Lock and Dam. Samples of these materials were tested by the Southwestern Division Laboratory in Dallas, Texas, and were approved for construction use.

PART IX

FOUNDATION PROBLEM AREAS

The foundation rock was sound and competent throughout the project, and no foundation problems are anticipated in the future. The rock was entirely Atoka Formation and consisted of hard to moderately hard, gray to black, usually sandy shale with some fine to medium grained, hard, gray sandstone. There were no major structural problems, and open joints and fractures were successfully sealed in the grout curtain. The small, low-angle faults in the left abutment showed no signs of intense movement such as gouge, breccia, or slickensides, but rather, appeared to be inactive, minor slippage along the shale bedding planes. There were some artesian groundwater flows in the valley foundation, but these were also sealed in the grout curtain. The grouting operations proceeded well with no significant difficulties and should provide an effective curtain beneath the embankment. The rock slide in the right abutment did no major damage and caused no construction problems other than extra concrete to smooth the scar adjacent to the outlet conduit. Therefore, the foundation appears quite good and should have no future problems.

PART X

RECORD OF FOUNDATION APPROVAL

The rock foundation was inspected, mapped, and photographed by a geologist after it was cleaned and prepared as described in paragraph 5-05. No drummy or loose material was allowed on the rock surface, and overhangs were removed or backfilled with concrete. Open joints and fractures were filled with mortar. Occasional, thin clay seams were cleaned to a depth of several inches and filled with mortar. The foundation was generally hard, massive rock which cleaned well and was usually approved with little difficulty. The following is a list of mapping and approval dates for various sections of the foundation:

Structure	Date	Stations Mapped & Approved	Geologist
DIKE	5 Sep 80	24+00 to 22+50	R. Crutchfield
(core trench)	6 Sep 80	22+50 to 19+60	R. Crutchfield
	16 Sep 80	24+00 to 25+00	B. Jabarro
INTAKE STRUCTURE	13 Nov 80	7+45.75 to 7+97	J. Irwin
OUTLET CONDUIT	20 Nov 80	7+97 to 8+37	J. Browko
	11 Dec 80	8+37 to 8+57	R. Crutchfield
	31 Dec 80	8+57 to 8+97	R. Crutchfield
	26 Jan 81	12+16.75 to 11+16.75	R. Crutchfield
	27 Feb 81	11+16.75 to 10+76.75	R. Crutchfield
	9 Mar 81	10+76.75 to 10+36.75	R. Crutchfield
	10 Mar 81	10+36.75 to 9+96.75	R. Crutchfield
	10 Mar 81	8+97 to 9+76.75	R. Crutchfield
	11 Mar 81	9+76.75 to 9+96.75	R. Crutchfield
STILLING BASIN	24 Jun 81	12+16.75 to 12+38.91	R. Crutchfield
	30 Jun 81	12+38.91 to 12+62.91	R. Crutchfield
	16 Jul 81	12+62.91 to 12+86.9	J. Browko
DAM	6 Oct 80	14+00 to 15+30	R. Crutchfield
(core trench)	7 Oct 80	15+30 to 16+70	R. Crutchfield
	24 Mar 81	11+75 to 12+40	R. Crutchfield
	27 Mar 81	12+40 to 14+00	J. Browko
	11 Jun 81	11+02 to 11+75	J. Browko
	24 Jun 81	10+70 to 11+02	R. Crutchfield
	16 Apr 82	16+70 to 17+15	S. Hartung
	22 Apr 82	10+35 to 10+70	R. Crutchfield
	23 Apr 82	17+15 to 17+40	R. Crutchfield
	3 May 82	17+57 to 18+18	R. Crutchfield
	4 May 82	9+80 to 10+35	R. Crutchfield
	10 May 82	17+40 to 17+57	R. Crutchfield
	12 May 82	18+18 to 18+75	R. Crutchfield
	8 Jun 82	19+20 to 19+75	R. Crutchfield
	9 Jun 82	18+75 to 19+20	R. Crutchfield
	16 Jun 82	19+75 to 20+63	R. Crutchfield
	22 Jun 82	9+80 to 9+10	R. Crutchfield

APPENDIX A

PHOTOGRAPHS
Pages 000 thru 031

View east showing Phase I excavation and left abutment core trench in background.

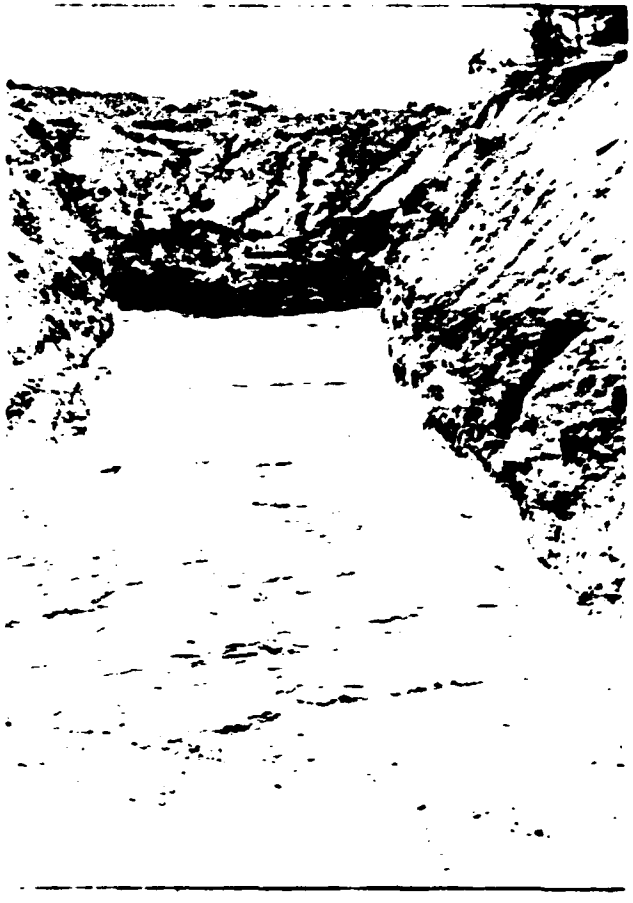
21 Aug 80 Conway Water Supply Photo No. 1

View west showing Phase I excavation and right abutment in background.

4 Sep 80 Conway Water Supply Photo No. 2

View northeast along dam axis with foundation rock exposed in core trench from Stations 9+40 to 9+75 —— Atoka Shale.

22 Jun 82 Conway Water Supply Photo No. 3



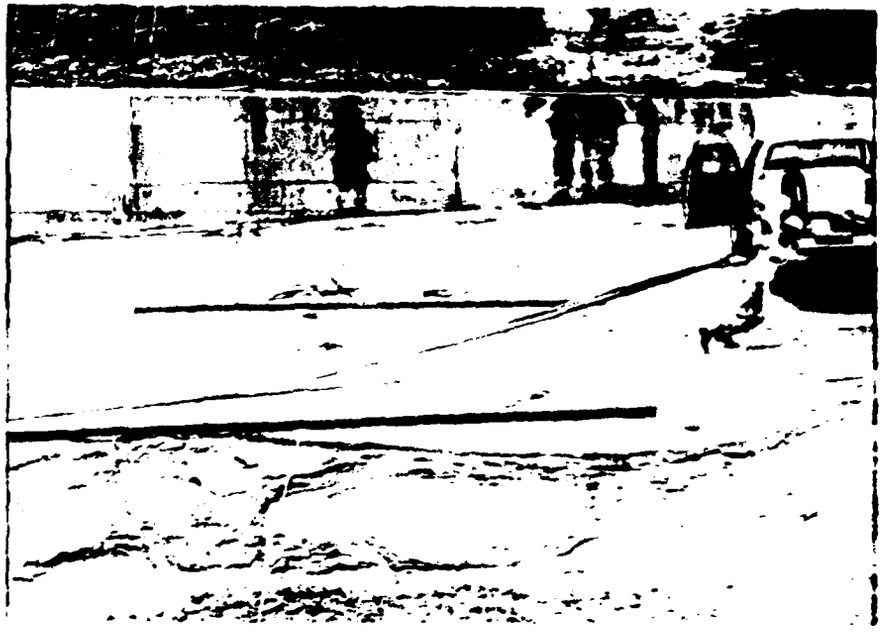
View southwest along dam axis with foundation rock exposed in core trench from Stations 9+75 to 9+10 —— Atoka Shale.

22 Jun 82 Conway Water Supply Photo No. 4

100

View northeast at foundation rock exposed in core trench from Stations 9+75 to 10+20 --- Atoka Shale.

4 May 82 Conway Water Supply Photo No. 5

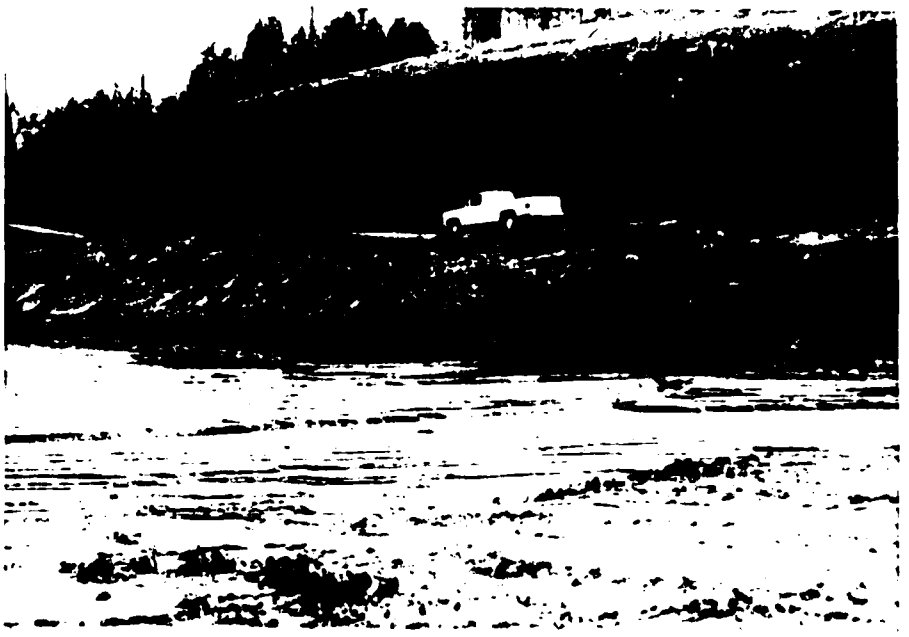


View southwest along dam axis with foundation rock exposed from Stations 11+74 to 11+10. Outlet conduit is in background with 4 vertical on 3 horizontal rock slope above it. Rock is Atoka Shale.

11 Jun 81 Conway Water Supply Photo No. 6

View south showing foundation rock exposed in slope along dam axis between Stations 11+75 and 11+95 --- Atoka Shale.

24 Mar 81 · Conway Water Supply Photo No. 7



View southwest showing foundation rock exposed along dam axis from Stations 12+40 to 11+75, left to right. Note joints in right abutment in background. Rock is Atoka Shale.

24 Mar 81 Conway Water Supply Photo No. 8

View southwest toward Station 12+00 on dam axis in upper center photo. Note exposed Atoka Formation bedding planes.

26 Apr 81 Conway Water Supply Photo No. 9

View southwest toward Station 15+20 near pump in center-right of photo. Note foundation preparation of Atoka Formation.

7 Nov 80 Conway Water Supply Photo No. 10

View northeast along dam axis from Station 14+30. Note foundation preparation crew and left abutment core trench in background.

6 Nov 80 Conway Water Supply Photo No. 11

View east toward left abutment core trench showing exposed foundation rock along dam axis between Stations 16+20 to 16+58. Note concrete fill along rock ledges of Atoka Shale.

7 Nov. 80 Conway Water Supply Photo No. 12

View north showing exposed foundation rock along dam axis between Stations 17+20 and 17+40 --- Atoka Shale.

23 Apr 82 Conway Water Supply Photo No. 13

View north on dam axis at Station 17+30. Note minor joint displacement in upper left photo.

23 Apr 82 Conway Water Supply Photo No. 14

View northeast showing exposed foundation rock along dam axis between Stations 17+40 and 17+70 --- Atoka Shale.

10 May 82 Conway Water Supply Photo No. 15

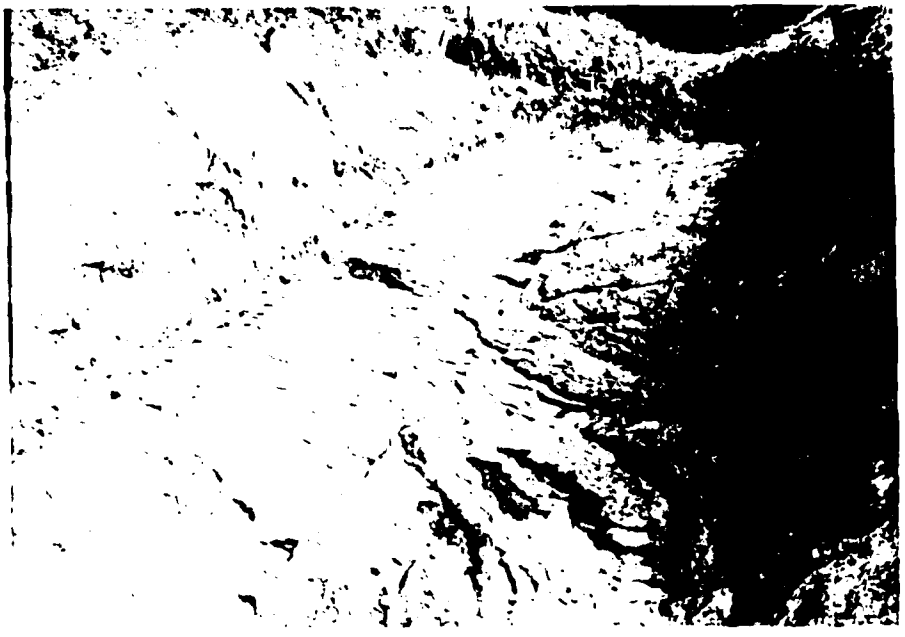
View northeast showing exposed foundation rock along dam axis between Stations 17+57 and 18+10. Note curve in core trench along dam axis. Rock is Atoka Shale.

3 May 82 Conway Water Supply Photo No. 16

View north at Station 18+18 in left abutment core trench. Note the 1.1 ft. displacement of nearly vertical joints along a bedding plane in center photo.

12 May 82 Conway Water Supply Photo No. 17

800

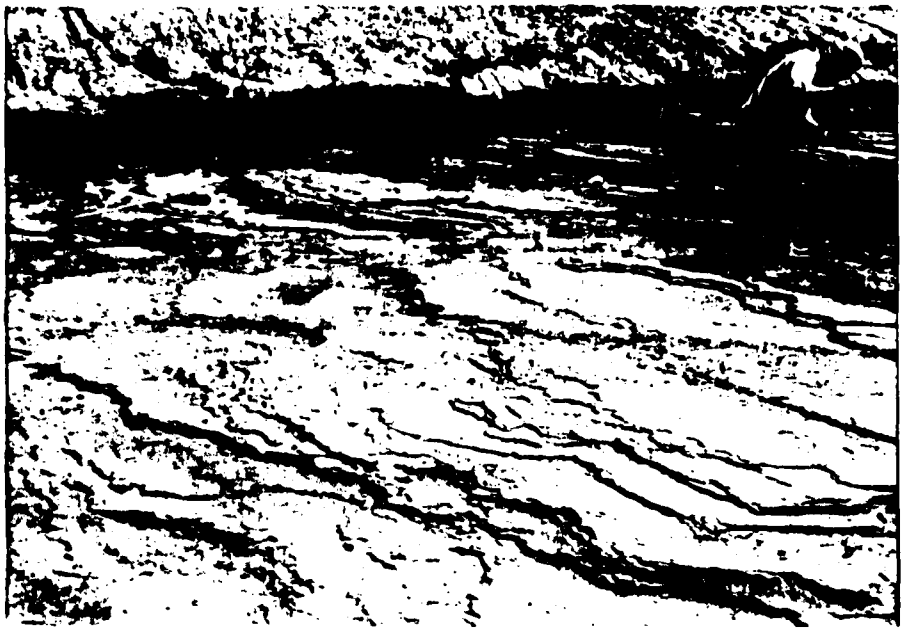


View northeast showing foundation rock exposed along dam axis from Stations 18+75 to 19+75 --- Atoka Shale.

9 Jun 82 Conway Water Supply Photo No. 18

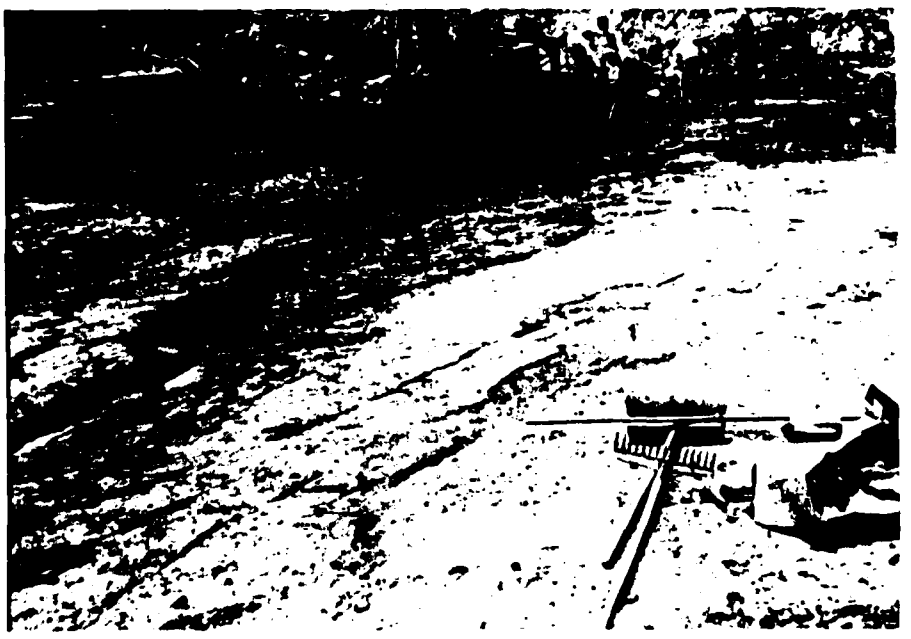
View north showing foundation rock exposed from Stations 20+45 to 20+63 in left abutment core trench. Note the blocky sandstone layer overlying the shale --- Atoka Formation

10 Jun 82 Conway Water Supply Photo No. 19



View southeast showing foundation preparation downstream of dam axis in Phase II excavation.

24 Mar 81 Conway Water Supply Photo No. 20



View southwest showing foundation preparation downstream of dam axis in Phase II excavation.

3 Apr 81 Conway Water Supply Photo No. 21

View west showing foundation preparation upstream of dam axis in Phase I excavation. Right abutment in background.

9 Oct 80 Conway Water Supply Photo No. 22

View east showing foundation preparation upstream of dam axis in Phase II excavation.

26 Mar 81 Conway Water Supply Photo No. 23

View north showing foundation preparation upstream of dam axis in Phase I excavation.

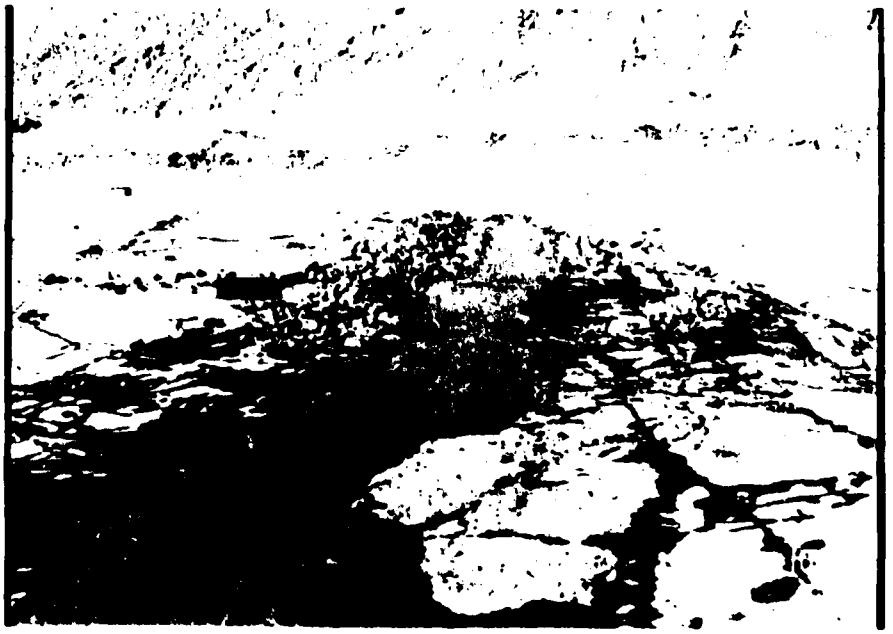
8 Nov 80 Conway Water Supply Photo No. 24

View north showing foundation preparation upstream of dam axis in Phase I excavation.

8 Nov 80 Conway Water Supply Photo No. 25

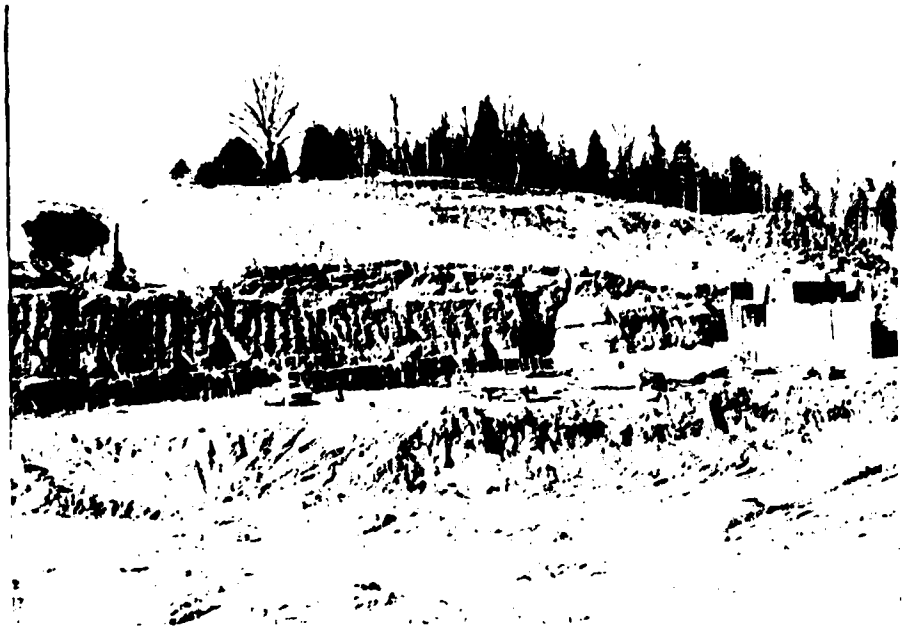
View northeast showing grout fill of open joint in Phase I excavation downstream of dam axis.

3 Nov 80 Conway Water Supply Photo No. 26



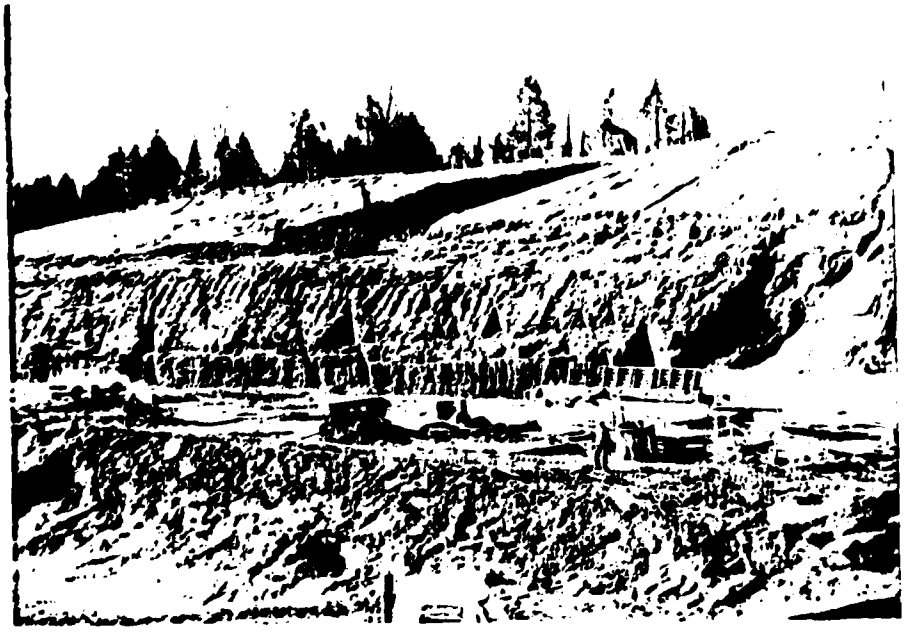
View northeast toward left abutment in upper photo. Note excavated rock and concrete fill along open joint in downstream Phase I excavation.

3 Nov 80 Conway Water Supply Photo No. 27



View west toward right dam abutment. Note intake structure and outlet conduit construction in center-right photo, grout hole drilling in core trench in center-left photo, and joints along rock face.

20 Sep 81 Conway Water Supply Photo No. 28

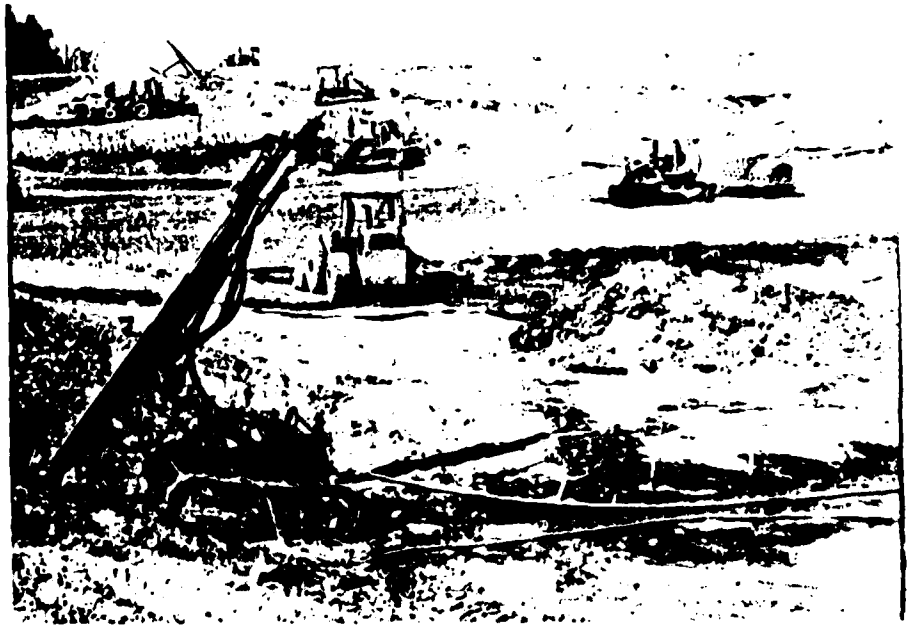


View southwest showing grout hole drilling in right abutment core trench at upper-center photo. Note joints and landslide scar in center-right photo.

20 Sep 81 Conway Water Supply Photo No. 29

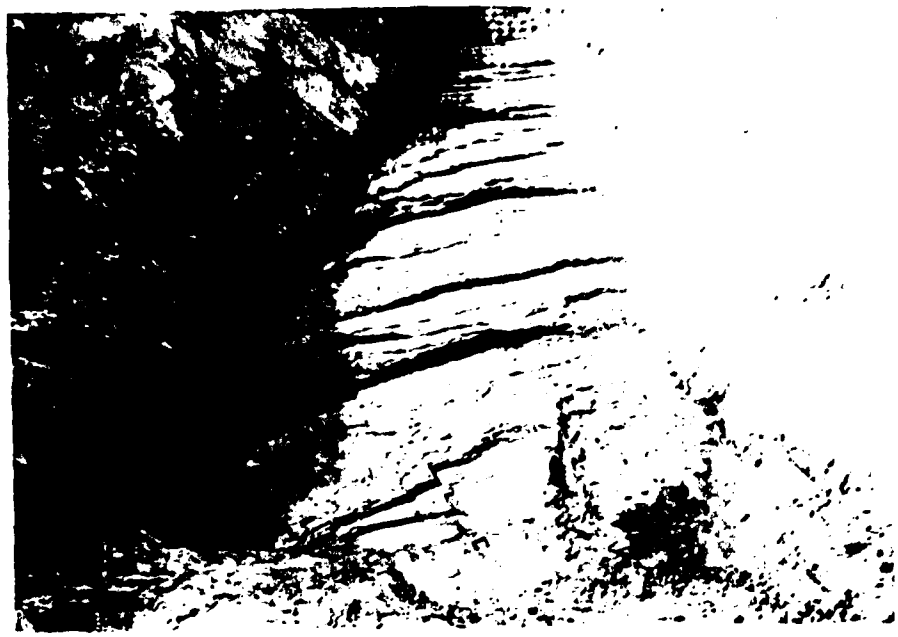
View southwest showing grouting operation in left abutment core trench. Phase I excavation in background after a heavy rain.

30 Sep 80 Conway Water Supply Photo No. 30



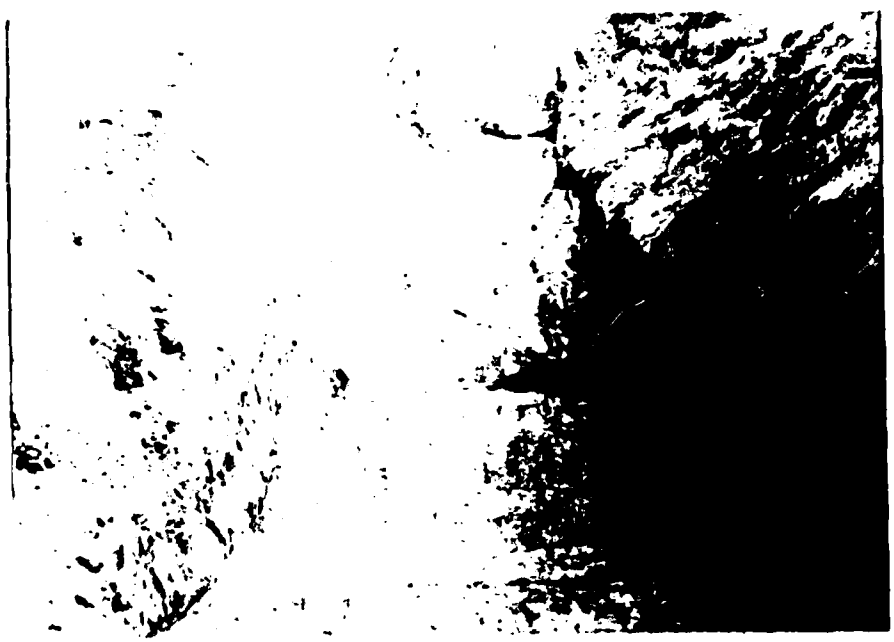
View north showing grout hole drilling rig at about Station 12+00 on the dam axis.

10 Mar 81 Conway Water Supply Photo No. 31



View southwest along dike axis showing exposed foundation rock between Stations 24+00 and 25+00 --- Atoka Shale.

16 Sep 80 Conway Water Supply Photo No. 32



View northeast along dike axis showing exposed foundation rock between Stations 24+90 and 24+00 --- Atoka Shale.

16 Sep 80 Conway Water Supply Photo No. 33

View northeast showing foundation preparation in dike core trench between Stations 24+70 and 24+00. Work crew is at about Station 24+00.

16 Sep 80 Conway Water Supply Photo No. 34

View northwest at distorted fold of weathered shale in core trench wall of dike at Station 19+85.

6 Sep 80 Conway Water Supply Photo No. 35

View northeast from Station 24+00 in dike core trench showing exposed foundation rock --- Atoka Shale.

3 Sep 80 Conway Water Supply Photo No. 36

View southwest from Station 19+70 in dike core trench showing foundation preparation of exposed Atoka Shale.

6 Sep 80 Conway Water Supply Photo No. 37

View northwest showing foundation rock exposed in intake structure excavation --- Atoka Shale.

13 Nov 80 Conway Water Supply Photo No. 38

View northwest showing foundation rock exposed in intake structure excavation --- Atoka Shale.

13 Nov Conway Water Supply Photo No. 39

View west at rock slide scar in right abutment along outlet conduit Stations 8+63 to 8+83.

11 Dec 80 Conway Water Supply Photo No. 40

020

View southwest at rock slide scar in right abutment near outlet conduit Station 8+83.

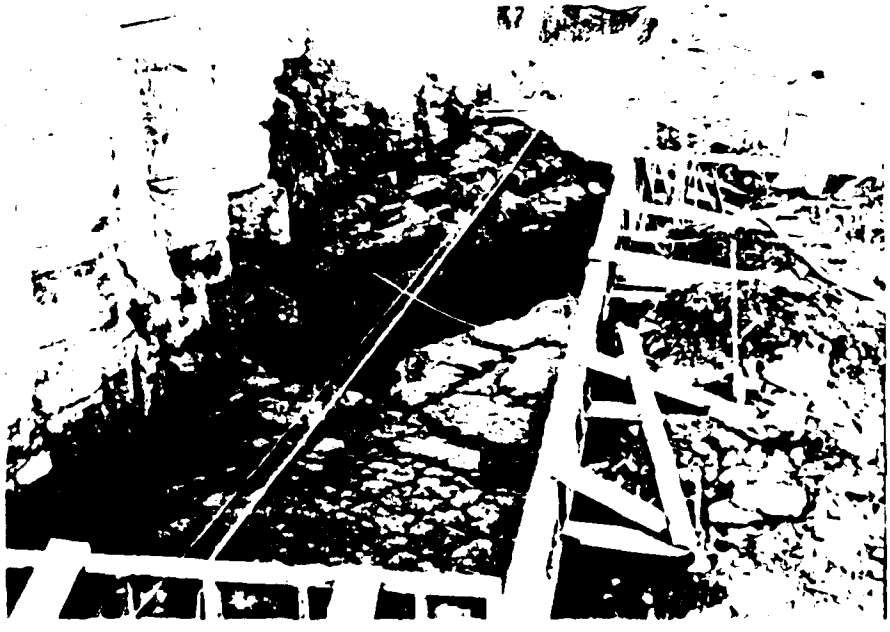
20 Nov 80 Conway Water Supply Photo No. 41

View northwest along outlet conduit alignment from Station 8+37.

20 Nov 80 Conway Water Supply Photo No. 42

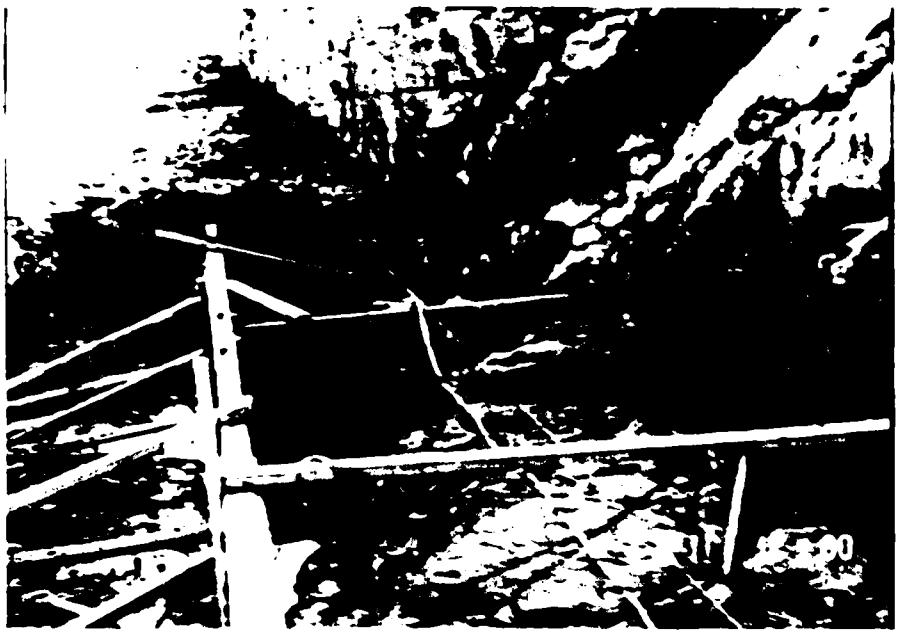
View southeast along outlet conduit alignment showing exposed foundation rock from Station 8+57 --- Atoka Shale.

31 Dec 80 Conway Water Supply Photo No. 43



View northwest slong outlet conduit alignment showing exposed foundation rock from Station 8+97 --- Atoka Shale.

31 Dec 80 Conway Water Supply Photo No. 44

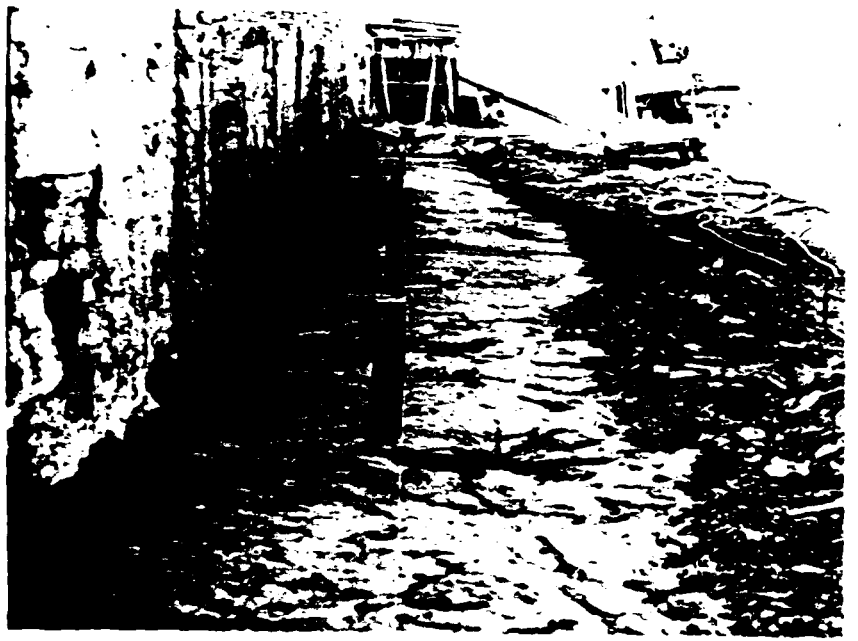


View southeast along outlet conduit alignment showing exposed foundation rock from Station 8+41 --- Atoka Shale.

11 Dec 80 Conway Water Supply Photo No. 45

View northwest along outlet conduit alignment showing exposed foundation rock from Station 9+60 --- Atoka Shale.

10 Mar 81 Conway Water Supply Photo No. 46



View northwest along outlet conduit alignment showing exposed foundation rock from Station 9+83 --- Atoka Shale.

11 Mar 81 Conway Water Supply Photo No. 47

View southeast along outlet conduit alignment showing exposed foundation rock from Station 9+97 --- Atoka Shale.

10 Mar 81 Conway Water Supply Photo No. 48

020

View southeast along outlet conduit alignment from Station 9+97, showing concrete pour.

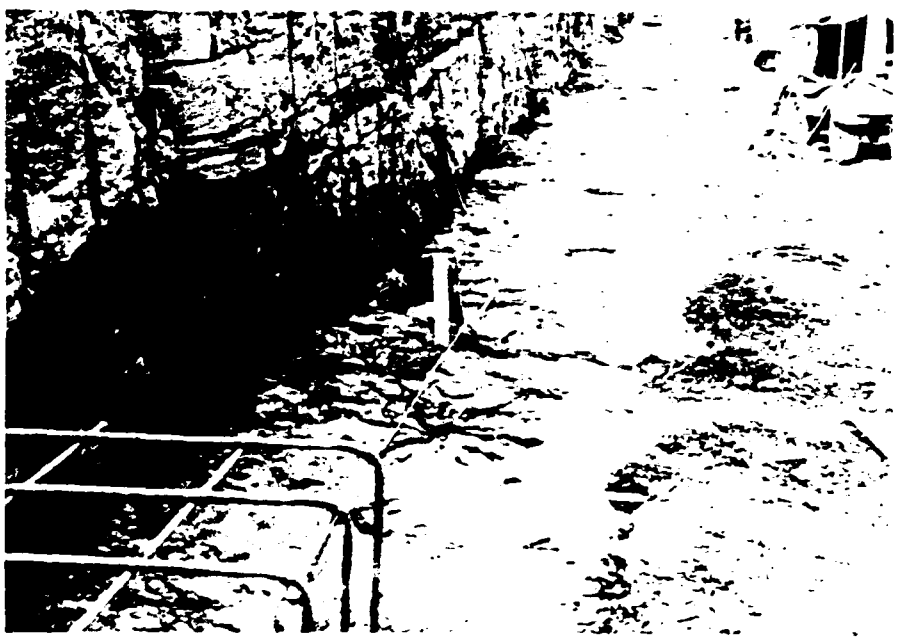
11 Mar 81 Conway Water Supply Photo No. 49

View southeast along outlet conduit alignment from Station 10+70, showing exposed foundation rock --- Atoka Shale.

27 Feb 81 Conway Water Supply Photo No. 50

View northwest along outlet conduit alignment from Station 10+72, showing exposed foundation rock --- Atoka Shale.

9 Mar 81 Conway Water Supply Photo No. 51



View northwest along outlet conduit alignment from Station 10+96, showing exposed foundation rock --- Atoka Shale.

27 Feb 81 Conway Water Supply Photo No. 52

View southeast along outlet conduit alignment showing exposed foundation rock from Station 11+17 --- Atoka Shale.

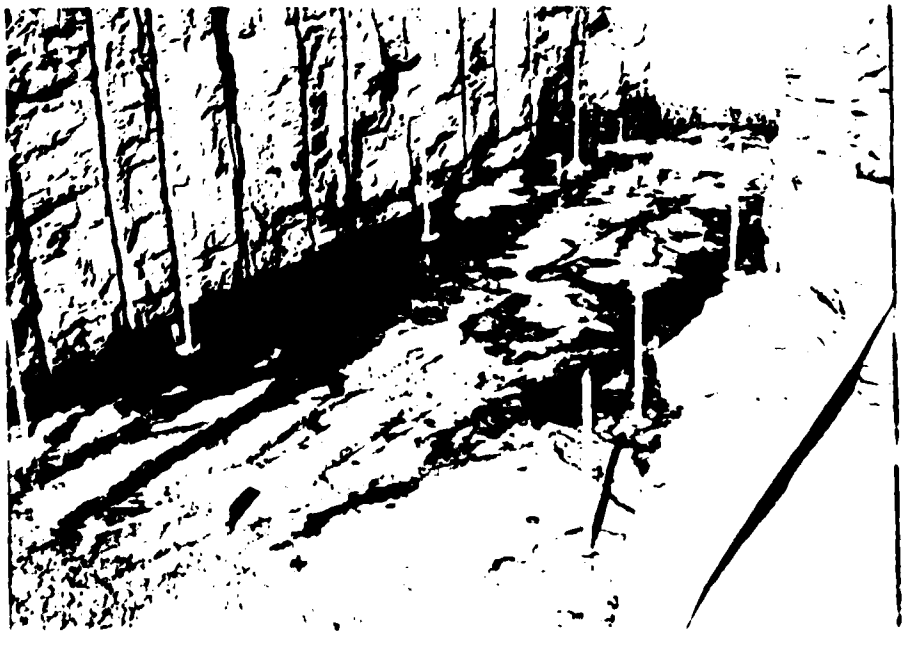
25 Jan 81 Conway Water Supply Photo No. 53

View northwest showing outlet works alignment from the stilling basin in left foreground to the intake structure in center-right of photo.

11 Feb 81 Conway Water Supply Photo No. 54

View northwest at upstream stilling basin foundation with outlet conduit construction in background.

13 Feb 81 Conway Water Supply Photo No. 55



View northwest at upstream stilling basin foundation from Stations 12+16.75 to 12+42.75 --- Atoka Shale.

13 Feb 81 Conway Water Supply Photo No. 56

View northwest at stilling basin foundation from Station 12+86.9 to 12+62.9 —— Atoka Shale.

16 Jul 81 Conway Water Supply Photo No. 57

View north at blasting in spillway excavation.

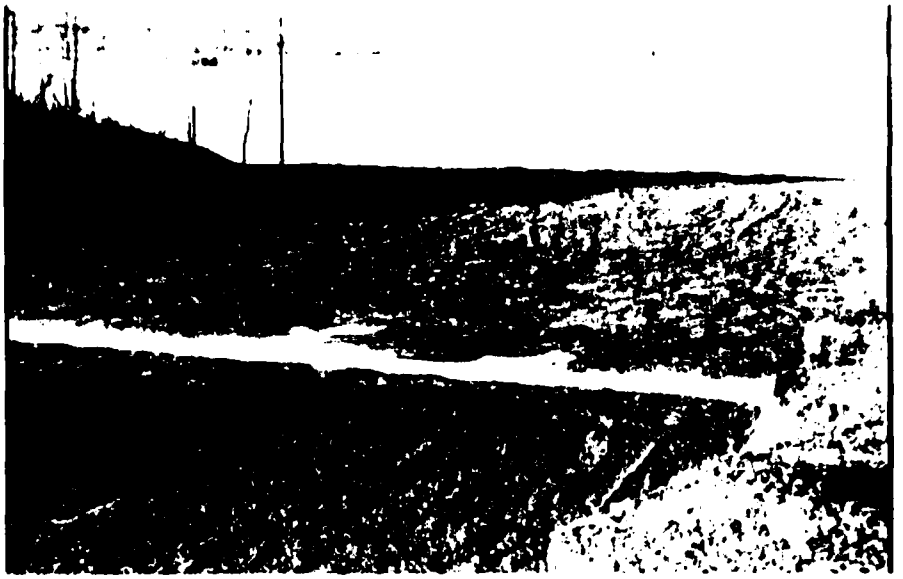
29 Apr 81 Conway Water Supply Photo No. 58

View north at blasting in spillway excavation.

29 Apr 81 Conway Water Supply Photo No. 59

SPILLWAY RIGHT CUT SLOPE LOOKING
UPSTREAM OVER CONCRETE CONTROL
STRUCTURE PHOTO #60

7 DEC 82 CONWAY WATER SUPPLY

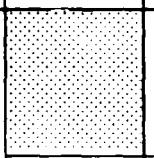
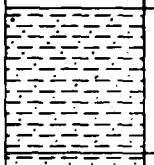
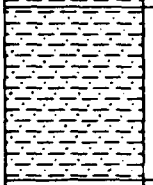
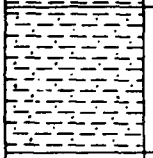
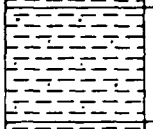
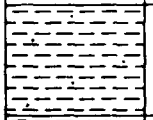
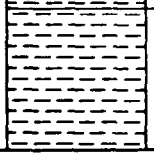


SPILLWAY CUT LOOKING UPSTREAM
OVER CONCRETE CONTROL STRUCTURE
PHOTO #61
7 DEC 82 CONWAY WATER SUPPLY

APPENDIX B

BORING LOGS
Pages 032 thru 087

GENERALIZED GEOLOGIC COLUMN

SYSTEM	FORMATION	SECTION	THICKNESS IN FEET	UNIT	DESCRIPTION
PENNSYLVANIAN	ATOKA		+ 7	10	SANDSTONE, HARD, FINE TO MEDIUM GRAINED, MEDIUM GRAY, MICACEOUS, FOUND ONLY IN THE HIGHER ELEVATIONS OF BOTH ABUTTMENTS AS A CAPPING STRATA, USUALLY SLIGHTLY WEATHERED.
			14 to 27	11	SHALE, SANDY, MODERATELY HARD TO HARD, CEMENTED, FINE GRAINED, BLACK TO MEDIUM GRAY, MICACEOUS, NUMEROUS SANDSTONE LAMINATIONS & INCLUSIONS, SOME LENSES OF SHALY SANDSTONE.
			13 to 48	12	SHALE, SANDY, HARD TO MODERATELY HARD, FINE GRAINED, CEMENTED, BLACK TO MEDIUM GRAY, MICACEOUS, NUMEROUS THICK TO THIN OFTEN IRREGULAR SANDSTONE LAMINATIONS & INCLUSIONS ZONES OF WHICH OCCASSIONALLY GRADE INTO SHALY SANDSTONE.
			11 to 27	13	SHALE, SANDY, HARD TO MODERATELY HARD, FINE GRAINED, CEMENTED, BLACK TO MEDIUM GRAY, MICACEOUS, NUMEROUS SANDSTONE LAMINATIONS & INCLUSIONS, OCCASSIONAL SHALY SANDSTONE LENSES.
			5 to 20	14	SHALE, SANDY, HARD TO MODERATELY HARD, FINE GRAINED, CEMENTED, BLACK TO MEDIUM GRAY, MICACEOUS, SCATTERED SANDSTONE LAMINATIONS & INCLUSIONS.
			7 to 24	15	SHALE, SANDY, HARD TO MODERATELY HARD, FINE GRAINED, CEMENTED, BLACK TO MEDIUM GRAY, WIDELY SCATTERED SANDSTONE LAMINATIONS & INCLUSIONS.
			+ 37	16	SHALE, MODERATELY HARD TO HARD, FINE GRAINED TO SILTY, BLACK, MICACEOUS, SCATTERED HARD SILTSTONE NODULES & LENSES ARE ENCOUNTERED IN THIS UNIT STARTING FROM ABOUT 10 TO 15' BELOW ITS TOP SURFACE.

Hole No. 6

DRILLING LOG	DIVISION	INSTALLATION	SHEET
	SOUTHWESTERN	LITTLE ROCK DISTRICT	1 OF 2 SHEETS

1. PROJECT	CONWAY WATER SUPPLY
2. LOCATION (Coordinates or Station)	N 0+06 E 11+30
3. DRILLING AGENCY	U. S. CORPS OF ENGINEERS
4. HOLE NO. (As shown on drawing title and file number)	6
5. NAME OF DRILLER	WOOD
6. DIRECTION OF HOLE	☑ VERTICAL ☐ INCLINED _____ DEG FROM VERT
7. THICKNESS OF OVERBURDEN	5.0
8. DEPTH DRILLED INTO ROCK	80.9
9. TOTAL DEPTH OF HOLE	85.9
10. SIZE AND TYPE OF BIT	NXL
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING 1500
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED – UNDISTURBED –
14. TOTAL NUMBER CORE BOXES	6
15. ELEVATION GROUND WATER	289.8
16. DATE HOLE	STARTED 1-20-78 COMPLETED 1-24-78
17. ELEVATION TOP OF HOLE	305.
18. TOTAL CORE RECOVERY FOR BORING	98.9 %
19. SIGNATURE OF INSPECTOR	R. PERRY

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
300.1			O.B.			
296.1			TOP OF ROCK			BEGIN CORING
FIRM ROCK	10		UNIT 12 C.L. SL WEA JT,Fe JTS FRAC JT,Fe SHALE, SDY HD TO MOD HD WHERE UNWEATHERED	91 100	1	1.2 CFM @ 4.5 PSI W.T. ▽ 1-24-78 0.0 CFM @ 12 PSI
	20		JTS,Fe JT	75 100	2	1.2 CFM @ 17 PSI 0.0 CFM @ 20 PSI
	30		UNIT 13 JT	100	3	0.0 CFM @ 26 PSI
	40		SHALE, SDY HD TO MOD HD	100		0.0 CFM @ 30 PSI
	50		UNIT 14	100	4	0.0 CFM @ 30 PSI
	60		SHALE, SDY HD TO MOD HD	100	5	0.0 CFM @ 30 PSI

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

PROJECT 032 HOLE NO 6

Hole No. 6

DRILLING LOG	DIVISION	INSTALLATION	SHEET
	SOUTHWESTERN	LITTLE ROCK DISTRICT	2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	70		UNIT 15 SHALE, SDY MOD HD TO HD	100		0.0 CFM @ 30 PSI
	80			100	6	0.0 CFM @ 30 PSI
200.0			UNIT 16 SHALE, MOD HD			BOTTOM OF HOLE 85.9'

NOTE:
FOR DETAILED DESCRIPTION OF UNITS - SEE GENERALIZED GEOLOGIC COLUMN

033

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE

PROJECT

HOLE NO 6

"TRANSLUCENT"

Hole No. 13

DRILLING LOG	DIVISION	INSTALLATION	SHEET
	SOUTHWESTERN	LITTLE ROCK DISTRICT	1 OF 2 SHEETS

1. PROJECT	CONWAY WATER SUPPLY
2. LOCATION (Coordinates or Station)	0+00 E 18+00
3. DRILLING AGENCY	U. S. CORPS OF ENGINEERS
4. HOLE NO. (As shown on drawing title and file number)	13
5. NAME OF DRILLER	NASH
6. DIRECTION OF HOLE	☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	7.5
8. DEPTH DRILLED INTO ROCK	80.0
9. TOTAL DEPTH OF HOLE	87.5
10. SIZE AND TYPE OF BIT	NXL
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING 1500
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 5 / UNDISTURBED -
14. TOTAL NUMBER CORE BOXES	5
15. ELEVATION GROUND WATER	-
16. DATE HOLE	STARTED 2-21-78 / COMPLETED 2-24-78
17. ELEVATION TOP OF HOLE	325.2
18. TOTAL CORE RECOVERY FOR BORING	86 %
19. SIGNATURE OF INSPECTOR	N. BOSTON

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			O.B.			
317.7			TOP OF ROCK			BEGIN CORING
	10	BADLY WEA, C.L.	UNIT 12	38	1	
		BADLY WEA		25		
	20	C.L.	SHALE, SDY MOD HD TO HD WHERE UNWEATHERED			
300.8		WEA, Fe STAINS		93		0.0 CFM @ 15 PSI
FIRM ROCK	30			100	2	0.0 CFM @ 25 PSI
	40	SOFT, JT		100		1.6 CFM @ 30 PSI
	50	JTS		97	3	1.0 CFM @ 30 PSI
	60	JTS	UNIT 13 SHALE, SDY HD TO MOD HD	100	4	0.3 CFM @ 30 PSI

034

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

PROJECT

HOLE NO 13

Hole No. 13

DRILLING LOG	DIVISION	INSTALLATION	SHEET
	SOUTHWESTERN	LITTLE ROCK DISTRICT	2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	70		UNIT 13 (cont)			
		JT	UNIT 14			0.0 CFM @ 30 PSI
		JT, NUM FRAC	SHALE, SDY HD TO MOD HD			
	80	JT				
			SHALE, SDY HD TO MOD HD UNIT 15			0.0 CFM @ 30 PSI
237.6						
	90					BOTTOM OF HOLE 87.6'

NOTE:
FOR DETAILED DESCRIPTION OF UNITS - SEE GENERALIZED GEOLOGIC COLUMN

035

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

PROJECT

HOLE NO 13

Hole No. 22

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 1 OF 2 SHEETS

1. PROJECT: CONWAY WATER SUPPLY	10. SIZE AND TYPE OF BIT: NXL
2. LOCATION (Coordinates or Station): N 1+50 E 9+70	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
3. DRILLING AGENCY: U. S. CORPS OF ENGINEERS	12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING 1500
4. HOLE NO. (As shown on drawing title and file number): 22	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 3; UNDISTURBED 5
5. NAME OF DRILLER: WOOD	14. TOTAL NUMBER CORE BOXES: 9
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: 303.9
7. THICKNESS OF OVERBURDEN: 5.3	16. DATE HOLE: STARTED 3-3-78; COMPLETED 3-10-78
8. DEPTH DRILLED INTO ROCK: 126.9	17. ELEVATION TOP OF HOLE: 347.0
9. TOTAL DEPTH OF HOLE: 132.2	18. TOTAL CORE RECOVERY FOR BORING: 99.4 %
	19. SIGNATURE OF INSPECTOR: PERRY

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			O.B.			
341.6			TOP OF ROCK			BEGIN CORING
			UNIT 11			
			BADLY WEA	100		
	10		SHALE, SDY MOD HD WHERE UNWEATHERED	100	1	
			C.L.			
328.6			SL WEA	84.9		
FIRM ROCK	20		Fe STAINS			
			UNIT 12	100	2	0.4 CFM @ 15 PSI
			JT, Fe			
	30		Fe SHALE, SDY MOD HD TO HD	100		1.1 CFM @ 25 PSI
			SOFT			0.8 CFM @ 30 PSI
			JT		3	▽ W.L. 3-10-78
	40			100		0.0 CFM @ 30 PSI
			JT BROKEN			
	50		JTS			
			JT	100		2.2 CFM @ 30 PSI
			BROKEN		4	
	60		JTS	100		
			SOFT			

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ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

PROJECT

HOLE NO. 22

Hole No. 22

DRILLING LOG	DIVISION: SOUTHWESTERN	INSTALLATION: LITTLE ROCK DISTRICT	SHEET 2 OF 2 SHEETS

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
	70		UNIT 13	100	5	0.9 CFM @ 30 PSI
			SHALE, SDY HD TO MOD HD			
	80			100		0.0 CFM @ 30 PSI
					6	
			UNIT 14	100		0.0 CFM @ 30 PSI
	90		SHALE, SDY HD TO MOD HD			
	100			100	7	0.0 CFM @ 30 PSI
			UNIT 15			0.0 CFM @ 30 PSI
	110		SHALE, SDY HD TO MOD HD	100		
					8	
	120		UNIT 16	100		0.0 CFM @ 30 PSI
			SHALE MOD HD TO HD			
214.8	130	SILTSTS		100	9	0.0 CFM @ 30 PSI
						BOTTOM OF HOLE 132.2'
	140		NOTE: FOR DETAILED DESCRIPTION OF UNITS - SEE GENERALIZED GEOLOGIC COLUMN			

037

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

PROJECT

HOLE NO 22

Hole No. 32

DRILLING LOG	DIVISION: SOUTHWESTERN	INSTALLATION: LITTLE ROCK DISTRICT	SHEET 1 OF 2 SHEETS

1. PROJECT: CONWAY WATER SUPPLY	10. SIZE AND TYPE OF BIT: NXL
2. LOCATION (Coordinates or Station): N 0+75 E 14+50	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
3. DRILLING AGENCY: US Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING 1500
4. HOLE NO. (As shown on drawing title and file number): 32	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 9; UNDISTURBED 13
5. NAME OF DRILLER: Nash	14. TOTAL NUMBER CORE BOXES: 4
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: --
7. THICKNESS OF OVERBURDEN: 20.1	16. DATE HOLE: STARTED 3/3/78; COMPLETED 3/6/78
8. DEPTH DRILLED INTO ROCK: 51.3	17. ELEVATION TOP OF HOLE: 286.0
9. TOTAL DEPTH OF HOLE: 71.4	18. TOTAL CORE RECOVERY FOR BORING: 98 %
	19. SIGNATURE OF INSPECTOR: N. Boston

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	10		OVERBURDEN			
265.9 / 264.4 Firm Rock	20		TOP OF ROCK UNIT 13 C.L.			ROCK BIT BEGIN CORING
			SHALE, SDY HD to MOD HD	85 (0)		
	30			100 (0)	1	0.7 CFM @10 PSI
			UNIT 14			
			SHALE, SDY HD to MOD HD	100 (100)		0.0 CFM @20 PSI
	40			100	2	1.44 CFM @30 PSI
	50		UNIT 15			
			SHALE, SDY HD to MOD HD	100	3	2.0 CFM @30 PSI
	60					038
			SHALE UNIT 16 HD to MOD HD			0.0 CFM @30 PSI

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PROJECT

HOLE NO 32

Hole No. 32

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			UNIT 16 (Cont)	100	4	
214.6	70					Bottom of Hole 71.4'

NOTE:
FOR DETAILED DESCRIPTION OF UNITS · SEE GENERALIZED GEOLOGIC COLUMN

039

PROJECT | HOLE NO 32

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE

(TRANSLUCENT)

Hole No. 33

DRILLING LOG	DIVISION	INSTALLATION	SHEET
	Southwestern	Little Rock District	1 OF 2 SHEETS

1. PROJECT: Conway Water Supply	10. SIZE AND TYPE OF BIT: NXL
2. LOCATION (Coordinates or Station): N 0+00 E 16+15	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
3. DRILLING AGENCY: U. S. Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL: Failing 1500
4. HOLE NO. (As shown on drawing title and file number): 33	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 12, UNDISTURBED 7
5. NAME OF DRILLER: Nash	14. TOTAL NUMBER CORE BOXES: 4
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: –
7. THICKNESS OF OVERBURDEN: 18.7	16. DATE HOLE: STARTED 3-15-78, COMPLETED 3-16-78
8. DEPTH DRILLED INTO ROCK: 52.7	17. ELEVATION TOP OF HOLE: 286.2
9. TOTAL DEPTH OF HOLE: 71.4	18. TOTAL CORE RECOVERY FOR BORING: 100 %
	19. SIGNATURE OF INSPECTOR: N. Boston

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			OVERBURDEN			
	10					
267.5			Top of Rock			Begin Coring
267.1 Firm Rock	20		WEA, BROKEN Unit 13 Shale, SDY HD to MOD HD	100		
			JT	100	1	0.0 CFM @ 9 PSI
	30					0.0 CFM @ 23 PSI
			UNIT 14 Shale, SDY HD to MOD HD	100	2	
	40			100		0.0 CFM @ 30 PSI
			UNIT 15 Shale, SDY HD to MOD HD	100	3	0.0 CFM @ 30 PSI
	50					
						040
	60					
			UNIT 16	100	4	0.0 CFM @ 30 PSI

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PROJECT | HOLE NO. 33

Hole No. 33

DRILLING LOG	DIVISION Southwestern	INSTALLATION Little Rock District	SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			Unit 16 (cont)			
214.8	70		Shale MOD HD to HD			
						Bottom of Hole 71.4'
	80					

NOTE:
FOR DETAILED DESCRIPTION OF UNITS - SEE GENERALIZED GEOLOGIC COLUMN

041

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE

(TRANSLUCENT)

PROJECT

HOLE NO 33

Hole No. 40

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRI	SHEET 1 OF 2 SHEETS

1. PROJECT: conway water supply	10. SIZE AND TYPE OF BIT: NXL
2. LOCATION (Coordinates or Station): N 3+85 E 10+80	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
3. DRILLING AGENCY: U. S. CORPS OF ENGINEERS	12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING 1500
4. HOLE NO. (As shown on drawing title and file number): 40	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 3, UNDISTURBED -
5. NAME OF DRILLER: NASH	14. TOTAL NUMBER CORE BOXES: 6
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: 284.1
7. THICKNESS OF OVERBURDEN: 5.0	16. DATE HOLE: STARTED 5/17/78, COMPLETED 5/19/78
8. DEPTH DRILLED INTO ROCK: 86.9	17. ELEVATION TOP OF HOLE: 305.8
9. TOTAL DEPTH OF HOLE: 91.9	18. TOTAL CORE RECOVERY FOR BORING: 99 %
	19. SIGNATURE OF INSPECTOR: R. PERRY

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
300.8			O.B. TOP OF ROCK			BEGIN CORING
		C.L.	UNIT 12	80		
		WEA BROKEN				
	10		SHALE, SDY HD TO MOD HD	100		
293.4 FIRM ROCK		SOFT			1	1.0 CFM @ 10 PSI
		Fe STAINS		100		
		SOFT				LOST WATER W.T. ▽ 5-19-78
	20					
			UNIT 13			
		JT, Fe		100		
			SHALE, SDY			
	30	SOFT, Fe	HD TO MOD HD		2	0.0 CFM @ 19 PSI
		JT, Fe				0.0 CFM @ 29 PSI
		JTS		100		
	40					
			UNIT 14			
			SHALE, SDY HD TO MOD HD	100	3	0.0 CFM @ 30 PSI
	50					
			UNIT 15			
			SHALE, SDY HD TO MOD HD	100		0.0 CFM @ 30 PSI
	60				4	042
				100		

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

PROJECT

HOLE NO CWS 40

Hole No. 40

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	70		UNIT 16 SHALE MOD HD TO HD			0.0 CFM @ 30 PSI
		SILTST		98	5	0.0 CFM @ 30 PSI
	80					
				100	6	0.0 CFM @ 30 PSI
213.9	90					
						BOTTOM OF HOLE 91.9'

NOTE:
FOR DETAILED DESCRIPTION OF UNITS SEE GENERALIZED GEOLOGIC COLUMN

043

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

PROJECT

HOLE NO CWS 40

Hole No. 41

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 1 OF 2 SHEETS

1. PROJECT	CONWAY WATER SUPPLY
2. LOCATION (Coordinates or Station)	S 1+40 E 11+35
3. DRILLING AGENCY	U.S. Corps of Engineers
4. HOLE NO. (As shown on drawing title and file number)	41
5. NAME OF DRILLER	NASH
6. DIRECTION OF HOLE	☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	5.0
8. DEPTH DRILLED INTO ROCK	76.2
9. TOTAL DEPTH OF HOLE	81.2
10. SIZE AND TYPE OF BIT	NXL
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING 1500
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 3 / UNDISTURBED -
14. TOTAL NUMBER CORE BOXES	5
15. ELEVATION GROUND WATER	-
16. DATE HOLE	STARTED 5/23/78 COMPLETED 5/25/78
17. ELEVATION TOP OF HOLE	296.1
18. TOTAL CORE RECOVERY FOR BORING	99 %
19. SIGNATURE OF INSPECTOR	R. PERRY

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
291.1			O.B.			
			TOP OF ROCK			BEGIN CORING
290.4 FIRM ROCK	10	C L SL WEA Fe STAINS	UNIT 12 SHALE, SDY HD TO MOD HD	89 100 89	1	0.0 CFM @ 8 PSI
	20	C L JT. Fe "		100		
	30			100	2	0.0 CFM @ 18 PSI
	40		UNIT 13 SHALE, SDY HD TO MOD HD	100	3	0.0 CFM @ 27 PSI
	50	JT		100		0.0 CFM @ 30 PSI
		VERT JTS				0.3 CFM @ 30 PSI
	60		UNIT 14 SHALE, SDY HD TO MOD HD	100 100	4	0.0 CFM @ 30 PSI

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ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

PROJECT

HOLE NO 41

Hole No. 41

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	70		UNIT 15 SHALE, SDY HD TO MOD HD			
			FRAC		5	0.0 CFM @ 30 PSI
			UNIT 16	100		
214.9	80		SHALE MOD HD TO HD			
						BOTTOM OF HOLE 81.2'

NOTE:
FOR DETAILED DESCRIPTION OF UNITS - SEE GENERALIZED GEOLOGIC COLUMN

045

ENG FORM 1836 MAR 77 PREVIOUS EDITIONS ARE OBSOLETE

PROJECT

HOLE NO 41

TRANSLUCENT

Hole No. 42

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT: CONWAY WATER SUPPLY	10. SIZE AND TYPE OF BIT: NXL
2. LOCATION (Coordinates or Station): S 1+40 E 11+15	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
3. DRILLING AGENCY: U. S. Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING 1500
4. HOLE NO. (As shown on drawing title and file number): 42	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 1 UNDISTURBED -
5. NAME OF DRILLER: NASH	14. TOTAL NUMBER CORE BOXES: 3
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: -
7. THICKNESS OF OVERBURDEN: 4.6	16. DATE HOLE STARTED: 5/30/78 COMPLETED: 5/31/78
8. DEPTH DRILLED INTO ROCK: 45.1	17. ELEVATION TOP OF HOLE: 305.3
9. TOTAL DEPTH OF HOLE: 49.7	18. TOTAL CORE RECOVERY FOR BORING: 96 %
	19. SIGNATURE OF INSPECTOR: E. MARTIN

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
302.3			O.B. TOP OF ROCK			BEGIN CORING
300.7			C.L.	UNIT 12 28		
			WEA	100		
295.5	10		C.L.		1	
FIRM ROCK			Fe STAINS	92		0.0 CFM @ 7 PSI
			SHALE, SDY HD TO MOD HD			
	20					
			Fe	100		0.0 CFM @ 17 PSI
	30				2	
						0.4 CFM @ 27 PSI
				UNIT 13 100		
	40		SHALE, SDY HD TO MOD HD		3	
				100		0.0 CFM @ 30 PSI
255.6	50					BOTTOM OF HOLE 49.7
			NOTE FOR DETAILED DESCRIPTION OF UNITS SEE GENERALIZED GEOLOGIC COLUMN			
	60					

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ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

PROJECT

HOLE NO. 42

Hole No. 43

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT	CONWAY WATER SUPPLY
2. LOCATION (Coordinates or Station)	S 2+12 E 11+52
3. DRILLING AGENCY	U. S. Corps of Engineers
4. HOLE NO. (As shown on drawing title and file number)	43
5. NAME OF DRILLER	NASH
6. DIRECTION OF HOLE	☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	10.4
8. DEPTH DRILLED INTO ROCK	27.1
9. TOTAL DEPTH OF HOLE	37.5
10. SIZE AND TYPE OF BIT	NXL
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING 1500
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 7 / UNDISTURBED -
14. TOTAL NUMBER CORE BOXES	2
15. ELEVATION GROUND WATER	-
16. DATE HOLE	STARTED 6/1/78 COMPLETED 6/1/78
17. ELEVATION TOP OF HOLE	287.6
18. TOTAL CORE RECOVERY FOR BORING	99 %
19. SIGNATURE OF INSPECTOR	E. MARTIN

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			O.B.			
277.2	10		TOP OF ROCK			BEGIN CORING
			UNIT 12	100		
			WEA			
270.6				98	1	0.0 CFM @ 6 PSI
FIRM ROCK	20		Fe STAINS	100		
			SHALE, SDY MD TO MOD HD	100		
				98		0.0 CFM @ 16 PSI
	30				2	
250.1				100		
	40					BOTTOM OF HOLE 37.5'
			NOTE FOR DETAILED DESCRIPTION SEE UNIT SET GENERALIZED GEOLOGIC COLUMN			
	50					
	60					

047

ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE

TRANSFER TO

Hole No. 45

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT	CONWAY WATER SUPPLY	10. SIZE AND TYPE OF BIT	NXL
2. LOCATION (Coordinates or Station)	S 2+12 E 11+33	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
3. DRILLING AGENCY	U. S. Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING 1500
4. HOLE NO. (As shown on drawing title and file number)	45	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 2 / UNDISTURBED -
5. NAME OF DRILLER	NASH	14. TOTAL NUMBER CORE BOXES	3
6. DIRECTION OF HOLE	☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER	--
		16. DATE HOLE	STARTED 6/5/78 / COMPLETED 6/6/78
7. THICKNESS OF OVERBURDEN	5.2	17. ELEVATION TOP OF HOLE	296.8
8. DEPTH DRILLED INTO ROCK	36.5	18. TOTAL CORE RECOVERY FOR BORING	94 %
9. TOTAL DEPTH OF HOLE	41.7	19. SIGNATURE OF INSPECTOR	E. MARTIN

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			O.B.			
291.6			TOP OF ROCK			BEGIN CORING
288.4			BADLY WEA C L.	25 (0)		
FIRM ROCK	10		UNIT 12 SL WEA	85 (0)		
			C L. SHALE, SDY Fe STAINS HD TO MOD HD JT. OPEN	100 (0)		
			VERT JT	97 (69)	1	0.0 CFM @ 8 PSI
	20					
			VERT JT	100 (81)	2	0.9 CFM @ 18 PSI
	30		BROKEN JT			LOST WATER
				100		2.4 CFM @ 24 PSI
255.1	40				3	75% WATER
						BOTTOM OF HOLE 41.7'
	50		NOTE: FOR DETAILED DESCRIPTION OF UNITS - SEE GENERALIZED GEOLOGIC COLUMN			
	60					

048

ENG FORM 1836 MAR 77 PREVIOUS EDITIONS ARE OBSOLETE

PROJECT

HOLE NO 45

TRANSLUCENT

Hole No. 46

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 1 OF 2 SHEETS

1. PROJECT	CONWAY WATER SUPPLY	10. SIZE AND TYPE OF BIT	NXL
2. LOCATION (Coordinates or Station)	N 1+35 E 10+95	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
3. DRILLING AGENCY	U. S. Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING 1500
4. HOLE NO (As shown on drawing title and file number)	46	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 2 / UNDISTURBED -
5. NAME OF DRILLER	NASH	14. TOTAL NUMBER CORE BOXES	7
6. DIRECTION OF HOLE	☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER	288.6
		16. DATE HOLE	STARTED 6/7/78 / COMPLETED 6/12/78
7. THICKNESS OF OVERBURDEN	4.0	17. ELEVATION TOP OF HOLE	317.5
8. DEPTH DRILLED INTO ROCK	104.8	18. TOTAL CORE RECOVERY FOR BORING	99 %
9. TOTAL DEPTH OF HOLE	108.8	19. SIGNATURE OF INSPECTOR	E. MARTIN

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
313.5			O.B.			
312.5			TOP OF ROCK			BEGIN CORING
			C.L.	47 (0)		
			BADLY WEA, C.L. UNIT 12	90 (0)		
307.8			WEA			
FIRM ROCK	10		SHALE, SDY HD TO MOD HD	100 (30)	1	
				100 (71)		1.2 CFM @ 7 PSI
	20		Fe STAINS			
				100		0.0 CFM @ 18 PSI
			Fe, SOFT			W.T. ▽
	30		Fe	100 (86)	2	6/9/78
			"			
			"			
			"	100		0.0 CFM @ 28 PSI
	40		"			
			JT			
			JTS		3	0.0 CFM @ 30 PSI
				100		
	50		JT, CALCITE UNIT 13			
			SHALE, SDY HD TO MOD HD	100	4	0.0 CFM @ 30 PSI
	60		JT, CALCITE			049
			SHALE, SDY UNIT 14 HD TO MOD HD	100		0.3 CFM @ 30 PSI

Hole No. 46

DRILLING LOG	DIVISION: SOUTHWESTERN	INSTALLATION: LITTLE ROCK DISTRICT	SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	70	JT	UNIT 14 (Contd) SHALE, SDY HD TO MOD HD	100	5	0.6 CFM @ 30 PSI
	80	C.L.	UNIT 15 SHALE, SDY HD TO MOD HD	100	6	25% WATER 2.1 CFM @ 30 PSI
	90	JTS	UNIT 16 SHALE MOD HD TO HD	100		75% WATER
	100	SILTSTS		100	7	0.0 CFM @ 30 PSI
208.7						BOTTOM OF HOLE 108.8'

NOTE:
FOR DETAILED DESCRIPTION OF UNITS · SEE GENERALIZED GEOLOGIC COLUMN

050

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

PROJECT

HOLE NO 46

Hole No. 47

DRILLING LOG	DIVISION	INSTALLATION	SHEET
	SOUTHWESTERN	LITTLE ROCK DISTRICT	OF 1 SHEETS

1. PROJECT	CONWAY WATER SUPPLY
2. LOCATION (Coordinates or Station)	N 1+32 E 11+15
3. DRILLING AGENCY	U. S. Corps of Engineers
4. HOLE NO. (As shown on drawing title and title number)	47
5. NAME OF DRILLER	NASH
6. DIRECTION OF HOLE	☑ VERTICAL ☐ INCLINED _____ DEG FROM VERT.
7. THICKNESS OF OVERBURDEN	4.5
8. DEPTH DRILLED INTO ROCK	42.0
9. TOTAL DEPTH OF HOLE	46.5
10. SIZE AND TYPE OF BIT	NX
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING 1500
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 2 / UNDISTURBED -
14. TOTAL NUMBER CORE BOXES	3
15. ELEVATION GROUND WATER	290.7
16. DATE HOLE	STARTED 6/13/78 COMPLETED 6/14/78
17. ELEVATION TOP OF HOLE	308.4
18. TOTAL CORE RECOVERY FOR BORING	99 %
19. SIGNATURE OF INSPECTOR	E. MARTIN

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
304.4			O.B. TOP OF ROCK			BEGIN CORING
303.7			UNIT 12	96 (0)		
299.8 FIRM ROCK	10		C.L. Fe STAINS C.L. Fe STAINS FRAC SHALE, SDY HD TO MOD HD	98 (69)	1	1.2 CFM @ 6 PSI
			FRAC "	100 (60)		W.T. ▽ 6-14-78
	20		Fe			
			Fe	100	2	0.0 CFM @ 16 PSI
	30		Fe			
			JT "			
			UNIT 13	100		0.3 CFM @ 25 PSI
	40		SHALE, SDY HD TO MOD HD	100	3	
261.9						
	50					BOTTOM OF HOLE 46.5

NOTE
FOR DETAILED DESCRIPTION OF UNITS SEE GENERALIZED GEOLOGIC COLUMN

051

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

PROJECT

HOLE NO 47

Hole No. 48

DRILLING LOG	DIVISION	INSTALLATION	SHEET
	SOUTHWESTERN	LITTLE ROCK DISTRICT	1 OF 1 SHEETS

1. PROJECT	CONWAY WATER SUPPLY
2. LOCATION (Coordinates or Station)	N 3+85 E 10+60
3. DRILLING AGENCY	U. S. Corps of Engineers
4. HOLE NO. (As shown on drawing title and file number)	48
5. NAME OF DRILLER	NASH
6. DIRECTION OF HOLE	☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT
7. THICKNESS OF OVERBURDEN	5.9
8. DEPTH DRILLED INTO ROCK	44.7
9. TOTAL DEPTH OF HOLE	50.6
10. SIZE AND TYPE OF BIT	NXL
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING 1500
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED: 2 ; UNDISTURBED: -
14. TOTAL NUMBER CORE BOXES	3
15. ELEVATION GROUND WATER	285.6
16. DATE HOLE	STARTED 6/14/78 ; COMPLETED 6/16/78
17. ELEVATION TOP OF HOLE	313.0
18. TOTAL CORE RECOVERY FOR BORING	94 %
19. SIGNATURE OF INSPECTOR	E. MARTIN

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			O.B.			
307.1						BEGIN CORING
306.7		C.L.	TOP OF ROCK	91		
305.7	10	WEA	UNIT 12	(0)		
FIRM ROCK		SL WEA	SHALE, SDY HD TO MOD HD	90 (21)	1	0.7 CFM @ 7 PSI
		C.L.				
	20	C.L. WEA		54 (0)		2.0 CFM @ 17 PSI
		SL WEA		97 (52)		LOST WATER
	30				2	W.T. ▽ 6-16-78
			UNIT 13	100		
			SHALE, SDY HD TO MOD HD	(91)		2.3 CFM @ 25 PSI
	40			100		
				(100)	3	0.0 CFM @ 30 PSI
262.4	50					
						BOTTOM OF HOLE 50.6'

NOTE.
FOR DETAILED DESCRIPTION OF UNITS · SEE GENERALIZED GEOLOGIC COLUMN

052

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

PROJECT

HOLE NO. 48

Hole No. 49

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT	CONWAY WATER SUPPLY	10. SIZE AND TYPE OF BIT	NXL
2. LOCATION (Coordinates or Station)	N 1+25 E 11+55	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
3. DRILLING AGENCY	U. S. CORPS OF ENGINEERS	12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING 1500
4. HOLE NO (As shown on drawing title and file number)	49	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 2 / UNDISTURBED -
5. NAME OF DRILLER	NASH	14. TOTAL NUMBER CORE BOXES	2
6. DIRECTION OF HOLE	☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER	280.8
		16. DATE HOLE	STARTED 6-21-78 / COMPLETED 6-22-78
7. THICKNESS OF OVERBURDEN	5.0	17. ELEVATION TOP OF HOLE	294.8
8. DEPTH DRILLED INTO ROCK	26.7	18. TOTAL CORE RECOVERY FOR BORING	90 %
9. TOTAL DEPTH OF HOLE	31.7	19. SIGNATURE OF INSPECTOR	E. MARTIN

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
289.8			O.B.			
289.3			TOP OF ROCK			BEGIN CORING
287.3			UNIT 12	100		
FIRM ROCK			WEA	100		
	10		SL WEA	91	1	5% WATER
			SHALE, SDY HD TO MOD HD	56		W.T. ▽ 6-22-75
			Fe STAINS C.L.	100		
			C.L.	67		FREE FLOW @ 0.0 PSI
	20			86		
						25% WATER
			UNIT 13	100		50% WATER
			SHALE, SDY HD TO MOD HD	100	2	
263.1	30					0.0 CFM @ 29 PSI
						BOTTOM OF HOLE 31.7'
			NOTE: FOR DETAILED DESCRIPTION OF UNITS · SEE GENERALIZED GEOLOGIC COLUMN			

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ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

PROJECT

HOLE NO 49

Hole No. 50

DRILLING LOG	DIVISION: SOUTHWESTERN	INSTALLATION: LITTLE ROCK DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT: CONWAY WATER SUPPLY	10. SIZE AND TYPE OF BIT: 4" x 5-1/2"
2. LOCATION (Coordinates or Station): N 3+65 E 10+82	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
3. DRILLING AGENCY: U. S. CORPS OF ENGINEERS	12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING 1500
4. HOLE NO. (As shown on drawing title and file number): 50	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED –; UNDISTURBED –
5. NAME OF DRILLER: NASH	14. TOTAL NUMBER CORE BOXES: 15
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: 281.1
7. THICKNESS OF OVERBURDEN: 6.0	16. DATE HOLE: STARTED 6-26-78; COMPLETED 6-29-78
8. DEPTH DRILLED INTO ROCK: 47.3	17. ELEVATION TOP OF HOLE: 306.4
9. TOTAL DEPTH OF HOLE: 53.3	18. TOTAL CORE RECOVERY FOR BORING: 93 %
	19. SIGNATURE OF INSPECTOR: E. MARTIN

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			OVERBURDEN			
300.4			TOP OF ROCK			BEGIN CORING
		C.L.	UNIT 12	53	1	50% WATER
	10	WEA	SHALE, SDY HD TO MOD HD			
		C.L.		90	2	
291.4		SL WEA				
FIRM ROCK		Fe STAINS		98	3	
	20	JT				
		JTS		100	4	25% WATER
		JT		96	5	W.T. ▽ 6-29-78
			UNIT 13	100	6	5% WATER
	30	JT	SHALE, SDY HD TO MOD HD	100	7	
		FRACS			8	NOTE: Specimens of core tested by Southwest Division Laboratory
		JT		100	9	
	40			100	10	
				100	11	
					12	
			UNIT 14			
		JT	SHALE, SDY HD TO MOD HD	100	13	
	50				14	
				100	15	
253.1						BOTTOM OF HOLE 53.3'
	60		NOTE: FOR DETAILED DESCRIPTION OF UNITS · SEE GENERALIZED GEOLOGIC COLUMN			054

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

PROJECT | HOLE NO 50

Hole No. 51

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 1 OF 2 SHEETS
1. PROJECT: CONWAY WATER SUPPLY		10. SIZE AND TYPE OF BIT: NXI	
2. LOCATION (Coordinates or Station): N 1+70 E 8+70		11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL	
3. DRILLING AGENCY: U. S. Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number): 51		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 2	UNDISTURBED
5. NAME OF DRILLER: WOOD		14. TOTAL NUMBER CORE BOXES: 7	
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER: 315.4	
7. THICKNESS OF OVERBURDEN: 5.0		16. DATE HOLE: STARTED 11/8/78	COMPLETED 11/13/78
8. DEPTH DRILLED INTO ROCK: 105.0		17. ELEVATION TOP OF HOLE: 358.5	
9. TOTAL DEPTH OF HOLE: 110.0		18. TOTAL CORE RECOVERY FOR BORING: 97 %	
		19. SIGNATURE OF INSPECTOR: R. PERRY	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			OVERBURDEN	%(RQD)		
353.5			TOP OF ROCK			BEGIN CORING
353.0			UNIT 10 SANDSTONE, HD	92 (36)		
	10	C.L. WEA BROKEN	UNIT 11	98 (0)	1	
		C.L.				
340.2 FIRM ROCK		BROKEN	SHALE, SDY MOD HD TO HD	83 (20)		
	20	JT		100		0.0 CFM @ 16 PSI
			UNIT 12	(67)		
	30	FRAC		100 (40)	2	2.24 CFM @ 16 PSI
		VERT FRACS BROKEN C.L.				LOST WATER RETURN
	40	VERT FRACS, BROKEN C.L. VERT FRACS, BROKEN		62 (0) 98	3	1.4 CFM @ 30 PSI
		FRACS, BROKEN				W.T. 43.1 11-13-78
	50		SHALE, SLY HD TO MOD HD	(62) 100		0.0 CFM @ 30 PSI
				(96)	4	055
	60	FRAC		100		0.64 CFM @ 30 PSI

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PROJECT

HOLE NO 51

Hole No. 51

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	70		(UNIT 12 (Contd)	(96)		
				100	5	0.0 CFM @ 30 PSI
			UNIT 13			
	80			(100)		
			SHALE, SDY	100		
			HD TO MOD HD		6	0.0 CFM @ 30 PSI
	90			(100)		
			FRAC. CALCITE	100		0.0 CFM @ 30 PSI
			UNIT 14	(98)		
	100			100		
			SHALE, SDY HD TO MOD HD		7	0.0 CFM @ 30 PSI
248.5	110			(100)		
						BOTTOM OF HOLE 110.0'
	120		NOTE: FOR DETAILED DESCRIPTION OF UNITS · SEE GENERALIZED GEOLOGIC COLUMN			

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ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

PROJECT

HOLE NO. 51

Hole No. 52

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET OF 2 SHEETS
1. PROJECT CONWAY WATER SUPPLY		10. SIZE AND TYPE OF BIT NXL	
2. LOCATION (Coordinates or Station) N 1+25 E 11+35		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY CORPS OF ENGINEERS		12. MANUFACTURER'S DESIGNATION OF DRILL 1500	
4. HOLE NO. (As shown on drawing title and file number) 52		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 2	UNDISTURBED –
5. NAME OF DRILLER NASH		14. TOTAL NUMBER CORE BOXES 7	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER 285.1	
		16. DATE HOLE: STARTED 11-8-78	COMPLETED 11-14-78
7. THICKNESS OF OVERBURDEN 4.0		17. ELEVATION TOP OF HOLE 305.3	
8. DEPTH DRILLED INTO ROCK 96.8		18. TOTAL CORE RECOVERY FOR BORING 99 %	
9. TOTAL DEPTH OF HOLE 100.8		19. SIGNATURE OF INSPECTOR E. MARTIN	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
301.3			O.B. = SADLY WEA. SHALE TOP OF ROCK	% (ROD)		BEGIN CORING
300.9			BROKEN	100		
298.3			UNIT 12	(0)		0.56 CFM @ 2 PSI
FIRM ROCK	10		C.L.	97		
			BROKEN		1	
			BROKEN	(23)		
			Fe STAINS	100		NO WATER RETURN
	20		SHALE, SDY HD TO MOD HD	(79)		1.12 CFM @ 17 PSI W.T. ▽ 11-14-78
			FRAC. Fe			
	30			(90)	2	
				100		
			UNIT 13			0.0 CFM @ 26 PSI
	40			(94)		
			SHALE, SDY HD TO MOD HD	100	3	0.0 CFM @ 30 PSI
	50			(100)		50% WATER RETURN
			UNIT 14	100		2.34 CFM @ 30 PSI
			FRAC			
	60		SHALE, SDY HD TO MOD HD	(90)	4	
				99		057

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PROJECT

HOLE NO 52

Hole No. 52

DRILLING LOG	DIVISION: SOUTHWESTERN	INSTALLATION: LITTLE ROCK DISTRICT	SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV-ERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
						2.42 CFM @ 30 PSI
	70	FRAC	UNIT 15	(97)		NO WATER RETURN
			SHALE, SDY HD TO MOD HD	100	5	0.0 CFM @ 30 PSI
228.3			UNIT 16	(100)		
	80	C.L. SOFT		98		1.38 CFM @ 30 PSI
			SHALE, MOD HD TO HD		6	
	90	SILTSTS		(57)		
				100		0.78 CFM @ 30 PSI
204.5	100			(59)	7	
						BOTTOM OF HOLE 100.8
	110					
	120					

NOTE:
FOR DETAILED DESCRIPTION OF UNITS - SEE GENERALIZED GEOLOGIC COLUMN

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ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

PROJECT

HOLE NO 52

Hole No. 53

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 1 OF 2 SHEETS
1. PROJECT: CONWAY WATER SUPPLY		10. SIZE AND TYPE OF BIT: NXL	
2. LOCATION (Coordinates or Station): N 1+10 E 12+30		11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL	
3. DRILLING AGENCY: U. S. Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number): 53		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 6	UNDISTURBED -
5. NAME OF DRILLER: NASH		14. TOTAL NUMBER CORE BOXES: 6	
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED ____ DEG FROM VERT		15. ELEVATION GROUND WATER: 279.5	
		16. DATE HOLE: STARTED 11/1/78 COMPLETED 11/6/78	
7. THICKNESS OF OVERBURDEN: 17.5		17. ELEVATION TOP OF HOLE: 282.5	
8. DEPTH DRILLED INTO ROCK: 73.8		18. TOTAL CORE RECOVERY FOR BORING: 99 %	
9. TOTAL DEPTH OF HOLE: 91.3		19. SIGNATURE OF INSPECTOR: E. MARTIN	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			OVERBURDEN	(RQD)		▽ W.L. 11-6-78
265.0	10					
264.7			TOP OF ROCK			BEGIN CORING
264.6 FIRM ROCK	20		C.L. FRAC. JT UNIT 13 SHALE, SDY HD to MOD HD	97 (36) 100	1	0.0 CFM @ 10 PSI
	30		JTS, CALCITE UNIT 14 SHALE, SDY HD TO MOD HD	(83) 100 (98)	2	0.74 CFM @ 19 PSI
	40			100		0.48 CFM @ 30 PSI
	50		UNIT 15 SHALE, SDY HD TO MOD HD JT	(96) 100	3	1.46 CFM @ 30 PSI
	60		JT JT JT SILTSTS UNIT 16 SHALE, MOD HD TO HD	(93) 100	4	059

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PROJECT

HOLE NO 53

Hole No. 53

DRILLING LOG	DIVISION: SOUTHWESTERN	INSTALLATION: LITTLE ROCK DISTRICT	SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	70		UNIT 16 (contd)	(79)	4	
			FRAC	100 (85)		
			SILTST	100		
			JT			
			SILTSTS			
			BROKEN	(72)	5	1.54 CFM @ 30 PSI
	80		SILTSTS			
			SILTST	100		
			"			
191.2	90		"	(94)	6	
						BOTTOM OF HOLE 91.3'
	100		NOTE: FOR DETAILED DESCRIPTION OF UNITS - SEE GENERALIZED GEOLOGIC COLUMN			
	110					
	120					

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ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE

PROJECT

HOLE NO 53

(TRANSLUCENT)

Hole No. 54

DRILLING LOG	DIVISION: SOUTHWESTERN	INSTALLATION: LITTLE ROCK DISTRICT	SHEET 1 OF 2 SHEETS

1. PROJECT: CONWAY WATER SUPPLY	10. SIZE AND TYPE OF BIT: NXL
2. LOCATION (Coordinates or Station): N 1+00 E 12+95	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
3. DRILLING AGENCY: CORPS OF ENGINEERS	12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING 1500
4. HOLE NO. (As shown on drawing title and file number): 54	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 7; UNDISTURBED –
5. NAME OF DRILLER: WOOD	14. TOTAL NUMBER CORE BOXES: 4
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: 279.3
	16. DATE HOLE: STARTED 10-26-78; COMPLETED 10-31-78
7. THICKNESS OF OVERBURDEN: 20.8	17. ELEVATION TOP OF HOLE: 285.5
8. DEPTH DRILLED INTO ROCK: 55.9	18. TOTAL CORE RECOVERY FOR BORING: 99 %
9. TOTAL DEPTH OF HOLE: 76.7	19. SIGNATURE OF INSPECTOR: E. MARTIN

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			OVERBURDEN	% (RQD)		▽W.L. 6.2' 10-30-78
	10					
264.7	20		TOP OF ROCK			BEGIN CORING
264.5 FIRM ROCK		FRAC	UNIT 13	100		
			SHALE, SDY HD TO MOD HD			0.86 CFM @ 11 PSI
	30			(67)	1	
				100		0.90 CFM @ 15 PSI
		FRAC	UNIT 14			
				(82)		
	40		SHALE, SDY HD TO MOD HD			39.9' LOST WATER RETURN
				100	2	1.5 CFM @ 25 PSI
				(86)		
	50		UNIT 15			
				100 (97)		2.14 CFM @ [illegible] PSI
			SHALE, SDY HD TO MOD HD	100		
227.5						
	60		UNIT 16	[illegible]	3	
		C.L. BROKEN		92		
			SHALE, MOD HD TO HD	30		
				100		

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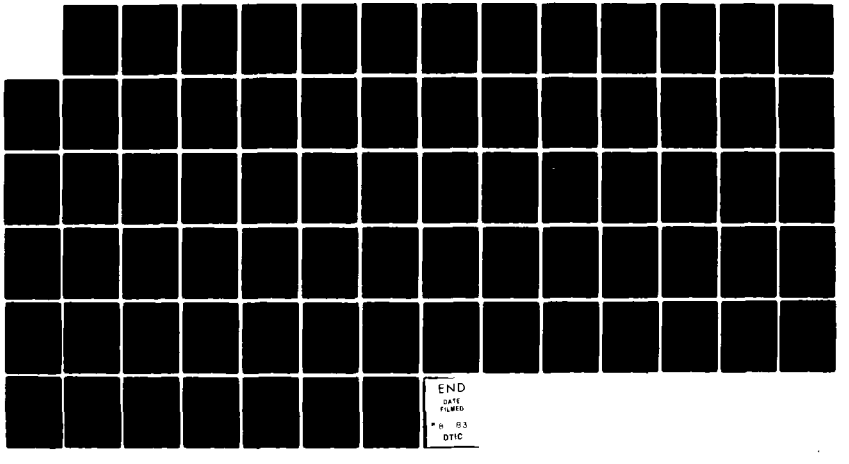
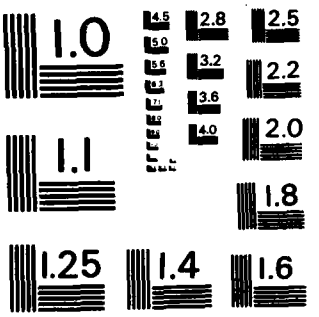
ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) PROJECT

AD-A130 646 ARKANSAS RIVER AND TRIBUTARIES ARKANSAS AND OKLAHOMA TOAD SUCK FERRY LOCK..(U) ARMY ENGINEER DISTRICT LITTLE ROCK ARK R L CRUTCHFIELD JUN 83 2/2

UNCLASSIFIED F/G 13/13 NL





Hole No. 54

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV-ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			UNIT 16 (CONT)	(73) 100		
	70		CLAY "	(95) 100	4	1.94 CFM @ 30 PSI
			"	(100)		25% WATER RETURN
208.9			SILTST "			
	80					BOTTOM OF HOLE 76.7'

NOTE:
FOR DETAILED DESCRIPTION OF UNITS - SEE GENERALIZED GEOLOGIC COLUMN

062

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT

HOLE NO. 54

Hole No. 55

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 1 OF 2 SHEETS
1. PROJECT CONWAY WATER SUPPLY		10. SIZE AND TYPE OF BIT NXL	
2. LOCATION (Coordinates or Station) N 0+60 E 15+35		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY CORPS OF ENGINEERS		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) 55		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 7	UNDISTURBED -
5. NAME OF DRILLER WOOD		14. TOTAL NUMBER CORE BOXES 4	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER 279.0	
		16. DATE HOLE: STARTED 10-31-78	COMPLETED 11-2-78
7. THICKNESS OF OVERBURDEN 21.5		17. ELEVATION TOP OF HOLE 286.3	
8. DEPTH DRILLED INTO ROCK 57.1		18. TOTAL CORE RECOVERY FOR BORING 99 %	
9. TOTAL DEPTH OF HOLE 78.6		19. SIGNATURE OF INSPECTOR R. PERRY	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			OVERBURDEN	% (RQD)		▽W.L. 7.3'
	10					
264.8	20		TOP OF ROCK			BEGIN BORING
264.3 FIRM ROCK			C.L. UNIT 13 SHALE, SDY HD TO MOD HD	99 (58)	1	.9 CFM @ 12 PSI
	30			100 (97)		0.0 CFM @ 20 PSI
	40		UNIT 14 SHALE, SDY HD TO MOD HD	100 (100)	2	0.0 CFM @ 28 PSI
	50		UNIT 15 SHALE, SDY HD TO MOD HD	100 (100)	3	0.0 CFM @ 30 PSI
	60			100 (91)		0.0 CFM @ 30 PSI
223.9			UNIT 16	100	4	

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ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT

HOLE NO. 55

Hole No. 55

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		JT	UNIT 16 (CONT)			0.84 CFM @ 30 PSI
	70		SHALE, MOD HD TO HD	100		0.0 CFM @ 30 PSI
207.7	80					BOTTOM OF HOLE 78.6'
	90		NOTE: FOR DETAILED DESCRIPTION OF UNITS - SEE GENERALIZED GEOLOGIC COLUMN			
	100					

064

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT

HOLE NO. 55

Hole No. 56

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT	Conway Water Supply
2. LOCATION (Coordinates or Station)	N 0+35 E 16+80
3. DRILLING AGENCY	Corps of Engineers
4. HOLE NO. (As shown on drawing title and file number)	56
5. NAME OF DRILLER	WOOD
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	3.0
8. DEPTH DRILLED INTO ROCK	34.2
9. TOTAL DEPTH OF HOLE	37.2
10. SIZE AND TYPE OF BIT	NXL
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	Failing 1500
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 2 / UNDISTURBED -
14. TOTAL NUMBER CORE BOXES	3
15. ELEVATION GROUND WATER	285.9
16. DATE HOLE	STARTED 3-23-79 / COMPLETED 3-26-79
17. ELEVATION TOP OF HOLE	298.6
18. TOTAL CORE RECOVERY FOR BORING	98 %
19. SIGNATURE OF INSPECTOR	R. PERRY

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV-ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
295.6			OB	%		
294.9			TOP OF ROCK	(RQD)		BEGIN CORING
			CL UNIT 12	97		
			BADLY WEA	(0)		
	10			94		
285.0			SHALE, SDY HD TO MOD HD	(26)	1	▽W.L.12.7' 3-26-79
FIRM ROCK				100		
				(0)		
	20			100		
				(30)		0.0 CFM @ 15 PSI
			UNIT 13	100	2	
				(100)		
	30			100		
			SHALE, SDY HD TO MOD HD			0.0 CFM @ 26 PSI
261.4				(100)	3	
						BOTTOM OF HOLE 37.2'
	40					
	50		NOTE: FOR DETAILED DESCRIPTION OF UNITS - SEE GENERALIZED GEOLOGIC COLUMN			
	60					

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ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT

HOLE NO. 56

Hole No. 57

DRILLING LOG	DIVISION	INSTALLATION	SHEET
	SOUTHWESTERN	LITTLE ROCK DISTRICT	1 OF 2 SHEETS

1. PROJECT	CONWAY WATER SUPPLY
2. LOCATION (Coordinates or Station)	N 0+28 E 17+45
3. DRILLING AGENCY	U. S. CORPS OF ENGINEERS
4. HOLE NO. (As shown on drawing title and file number)	57
5. NAME OF DRILLER	WOOD
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	2.9
8. DEPTH DRILLED INTO ROCK	74.1
9. TOTAL DEPTH OF HOLE	77.0
10. SIZE AND TYPE OF BIT	NXL
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING 1500
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 2 / UNDISTURBED -
14. TOTAL NUMBER CORE BOXES	5
15. ELEVATION GROUND WATER	278.3
16. DATE HOLE	STARTED 3-27-79 / COMPLETED 3-28-79
17. ELEVATION TOP OF HOLE	315.6
18. TOTAL CORE RECOVERY FOR BORING	95 %
19. SIGNATURE OF INSPECTOR	R. PERRY

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
312.7			O.B. TOP OF WEA SH	% (RQD)		BEGIN CORING
311.1			BADLY WEA UNIT 12	65 (0)		
	10		C.L.	69 (0)		
304.0 TOP OF ROCK			C.L.	88 (0)	1	
297.3 FIRM ROCK	20		SHALE, SDY HD TO MOD HD	100		0.0 CFM @ 17 PSI
			FRACS	(21)		
	30			100	2	0.0 CFM @ 27 DSI
				(37)		▽W.L. 37.3' 3-28-79
			UNIT 13	100		
	40		SHALE, SDY HD TO MOD HD		3	0.0 CFM @ 30 PSI
				(97)		
	50			100		0.0 CFM @ 30 PSI
			UNIT 14	(100)		066
	60		SHALE, SDY HD TO MOD HD	100	4	0.0 CFM @ 30 PSI

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PROJECT

HOLE NO. 57

Hole No. 57

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Descriptions) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	70		UNIT 14 (cont)		4	
				100		0.0 CFM @ 30 PSI
					5	
238.5			UNIT 15			
	80		SHALE, SDY HD TO MOD HD			BOTTOM OF HOLE 77.0

NOTE:
FOR DETAILED DESCRIPTION OF UNITS - SEE GENERALIZED GEOLOGIC COLUMN

067

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT

HOLE NO. 57

Hole No. 59

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 1 OF 2 SHEETS
1. PROJECT CONWAY WATER SUPPLY		10. SIZE AND TYPE OF BIT NXL & ROCK BIT	
2. LOCATION (Coordinates or Station) N 0+60 E 18+60		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL	
3. DRILLING AGENCY U. S. CORPS OF ENGINEERS		12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number) 59		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED –	UNDISTURBED –
5. NAME OF DRILLER WOOD		14. TOTAL NUMBER CORE BOXES 6	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER 301.6	
		16. DATE HOLE: STARTED 3-29-79	COMPLETED 4-3-79
7. THICKNESS OF OVERBURDEN 1.5		17. ELEVATION TOP OF HOLE 338.6	
8. DEPTH DRILLED INTO ROCK 83.0		18. TOTAL CORE RECOVERY FOR BORING 95 %	
9. TOTAL DEPTH OF HOLE 84.5		19. SIGNATURE OF INSPECTOR R. PERRY	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY % e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
337.1			O.B. TOP OF ROCK	(RQD)		BEGIN CORING
336.8			UNIT 10	90		
334.5			SANDSTONE, HD	(70)		ROCK BIT
		C.L.	UNIT 11	82		
		RES CLAY		(0)		
	10	C.L.		70	1	
		BADLY WEA	SHALE, SDY			
		C.L.	MOD, HD	(0)		
		SL WEA		77		
317.2	20			(0)		
			UNIT 12	100		0.0 CFM @ 19 PSI
315.2						
FIRM ROCK				(25)	2	
	30			100		0.12 CFM @ 27 PSI
			SHALE, SDY			
			HD TO MOD HD	(63)		▽ W.L. 37.0' 4-3-79
	40					
		C.L.		95		
				(51)	3	0.0 CFM @ 30 PSI
				100		
	50			(92)		
			UNIT 13			
				99		0.0 CFM @ 30 PSI
			SHALE, SDY			
	60		HD TO MOD HD	(19)	4	
		C.L.				068

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PROJECT

HOLE NO. 59

Hole No. 59

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	70		UNIT 14 (cont) VERT FRAC	100 (87)	5	0.68 CFM @ 30 PSI
			JT, PYRITE			
			UNIT 15	100		0.0 CFM @ 30 PSI
	80		SHALE, SDY HD TO MOD HD	(77)	6	
254.1						
	90					BOTTOM OF HOLE 84.5'

NOTE:
FOR DETAILED DESCRIPTION OF UNITS - SEE GENERALIZED GEOLOGIC COLUMN

069

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.
(TRANSLUCENT)

PROJECT

HOLE NO. 59

Hole No. 60

DRILLING LOG	DIVISION	INSTALLATION	SHEET
	SOUTHWESTERN	LITTLE ROCK DISTRICT	1 OF 1 SHEETS

1. PROJECT	CONWAY WATER SUPPLY
2. LOCATION (Coordinates or Station)	N 1+00 E 19+00
3. DRILLING AGENCY	U. S. CORPS OF ENGINEERS
4. HOLE NO. (As shown on drawing title and file number)	60
5. NAME OF DRILLER	WOOD
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	4.8
8. DEPTH DRILLED INTO ROCK	46.2
9. TOTAL DEPTH OF HOLE	51.0
10. SIZE AND TYPE OF BIT	NXL
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING 1500
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 1 / UNDISTURBED -
14. TOTAL NUMBER CORE BOXES	3
15. ELEVATION GROUND WATER	342.1
16. DATE HOLE	STARTED 4-4-79 / COMPLETED 4-5-79
17. ELEVATION TOP OF HOLE	347.5
18. TOTAL CORE RECOVERY FOR BORING	87 %
19. SIGNATURE OF INSPECTOR	S. HARTUNG

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			O.B.	% (RQD)		
342.7			TOP OF ROCK			BEGIN CORING
			BADLY WEA UNIT 10	50		
337.7			CL	(0)		▽ W.L. 5.4' 4-5-79
335.6	10		SANDSTONE, HD	80		
			RESID CLAY UNIT 11	(-)	1	
			CL	87		
	20		BADLY WEA	(0)		
			CL	60		
322.6			SHALE, SDY			
FIRM ROCK			MOD HD TO HD			
	30			(0)		
			CL UNIT 12	94	2	0.0 CFM @ 25 PSI
				(23)		
	40		CL SHALE, SDY	99		0.75 CFM @ 30 PSI
			HD TO MOD HD		3	
296.5	50			(24)		
						BOTTOM OF HOLE 51.0'
	60		NOTE: FOR DETAILED DESCRIPTION OF UNITS - SEE GENERALIZED GEOLOGIC COLUMN			070

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT

HOLE NO. 60

Hole No. 61

DRILLING LOG	DIVISION: SOUTHWESTERN	INSTALLATION: LITTLE ROCK DISTRICT	SHEET 1 OF 2 SHEETS

1. PROJECT	CONWAY WATER SUPPLY
2. LOCATION (Coordinates or Station)	N 1+50 E 19+50
3. DRILLING AGENCY	U. S. CORPS OF ENGINEERS
4. HOLE NO. (As shown on drawing title and file number)	61
5. NAME OF DRILLER	WOOD
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	4.4
8. DEPTH DRILLED INTO ROCK	137.5
9. TOTAL DEPTH OF HOLE	141.9
10. SIZE AND TYPE OF BIT	NXL
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING 1500
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED: 2 / UNDISTURBED: -
14. TOTAL NUMBER CORE BOXES	9
15. ELEVATION GROUND WATER	342.9
16. DATE HOLE	STARTED: 1-12-79 / COMPLETED: 1-19-79
17. ELEVATION TOP OF HOLE	351.5
18. TOTAL CORE RECOVERY FOR BORING	95 %
19. SIGNATURE OF INSPECTOR	R. PERRY

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
			O.B.	% (RQD)		
347.1			TOP OF ROCK			BEGIN CORING
		C.L.	UNIT 10	61 (0)		
		BADLY WEA				
	10	C.L.	SANDSTONE, HD	59 (30)		▽W.L. 8.6' 1-16-79
336.3						
		C.L.	UNIT 11	14 (7)	1	
331.8		BADLY WEA				
FIRM ROCK	20		SHALE, SDY HD TO MOD HD	96 (0)		0.0 CFM @ 18 PSI
		C.L.				
	30	"				
			UNIT 12	100 (14)	2	0.0 CFM @ 28 PSI
	40					
				100 (23)	3	0.0 CFM @ 30 PSI
	50		SHALE, SDY HD TO MOD HD			
				100 (80)		0.0 CFM @ 30 PSI
	60					071
				100	4	0.0 CFM @ 30 PSI

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PROJECT | HOLE NO. 61

Hole No. 61

DRILLING LOG	DIVISION: SOUTHWESTERN	INSTALLATION: LITTLE ROCK DISTRICT	SHEET 2 OF 2 SHEETS

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
	70		UNIT 13	(65)	4	
			SHALE, SDY HD TO MOD HD	97	5	0.0 CFM @ 30 PSI
	80	C.L.		(92)		
			UNIT 14	100		1.8 CFM @ 30 PSI
	90			(100)	6	
			SHALE, SDY HD TO MOD HD	100		0.0 CFM @ 30 PSI
	100			(100)		
				100		0.0 CFM @ 30 PSI
				(100)	7	
	110		UNIT 15	100		0.0 CFM @ 30 PSI
		JT		(100)		
			SHALE, SDY HD TO MOD HD	100		0.0 CFM @ 30 PSI
	120			(100)	8	
				100		
				(100)		0.0 CFM @ 30 PSI
222.5				100		
	130		UNIT 16	(100)		
			SHALE, MOD HD TO HD	100	9	0.0 CFM @ 30 PSI
		SILTST		(99)		
209.6	140					
						BOTTOM OF HOLE 141.9'
	150		NOTE: FOR DETAILED DESCRIPTION OF UNITS - SEE GENERALIZED GEOLOGIC COLUMN			

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ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT

HOLE NO. 61

Hole No. 62

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT	CONWAY WATER SUPPLY	10. SIZE AND TYPE OF BIT	NXL
2. LOCATION (Coordinates or Station)	N 2+00 E 22+00	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
3. DRILLING AGENCY	U. S. CORPS OF ENGINEERS	12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING 1500
4. HOLE NO. (As shown on drawing title and file number)	62	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 2 / UNDISTURBED -
5. NAME OF DRILLER	WOOD	14. TOTAL NUMBER CORE BOXES	2
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER	-
7. THICKNESS OF OVERBURDEN	5.5	16. DATE HOLE	STARTED 4-9-79 / COMPLETED 4-10-79
8. DEPTH DRILLED INTO ROCK	35.5	17. ELEVATION TOP OF HOLE	354.14
9. TOTAL DEPTH OF HOLE	41.0	18. TOTAL CORE RECOVERY FOR BORING	87 %
		19. SIGNATURE OF INSPECTOR	R. PERRY

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			O.B.	% (RQD)		
348.6			TOP OF ROCK			BEGIN CORING
345.9			CL BADLY WEA UNIT 10	63 (31)		
	10		CL WEA SANDSTONE, HD	90 (75)	1	
337.4			RESID CLAY UNIT 11	38 (0)		
333.8	20		CL			
FIRM ROCK			BROKEN " " " SHALE, SDY MOD HD TO HD	100 (46)		0.0 CFM @ 18 PSI
	30		JT UNIT 12 SHALE, SDY HD TO MOD HD	100 (11)	2	0.0 CFM @ 25 PSI
313.1	40		BROKEN	100 (0)		
						BOTTOM OF HOLE 41.0'
	50		NOTE: FOR DETAILED DESCRIPTION OF UNITS - SEE GENERALIZED GEOLOGIC COLUMN			
	60					

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ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT

HOLE NO. 62

Hole No. 63

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT	CONWAY WATER SUPPLY	10. SIZE AND TYPE OF BIT	NXL
2. LOCATION (Coordinates or Station)	N 2+60 E 20+57	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
3. DRILLING AGENCY	U. S. Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING
4. HOLE NO. (As shown on drawing title and file number)	63	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED / UNDISTURBED	2 / -
5. NAME OF DRILLER	WOOD	14. TOTAL NUMBER CORE BOXES	3
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER	-
		16. DATE HOLE: STARTED / COMPLETED	4/10/79 / 4/11/79
7. THICKNESS OF OVERBURDEN	5.0	17. ELEVATION TOP OF HOLE	356.4
8. DEPTH DRILLED INTO ROCK	36.6	18. TOTAL CORE RECOVERY FOR BORING	92 %
9. TOTAL DEPTH OF HOLE	41.6	19. SIGNATURE OF INSPECTOR	R. PERRY

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
351.4			OVERBURDEN	%		
			TOP OF ROCK	(RQD)		BEGIN CORING
348.4			C.L.			
			BADLY WEA			
	10		UNIT 10	84 (0)		
			JT			
			SANDSTONE, HD	100 (61)	1	
340.9			SL WEA			
			C.L.			
			UNIT 11	58 (9)		
336.8	20		"			
FIRM ROCK				97 (54)		0.0 CFM @ 17 PSI
			SHALE, SDY MOD HD TO HD			
			C.L.	98	2	0.0 CFM @ 22 PSI
	30		"			
			UNIT 12	(36)		
			SHALE, SDY HD TO MOD HD	100 (35)		0.0 CFM @ 30 PSI
314.8	40					
						BOTTOM OF HOLE 41.6'
	50					
			NOTE: FOR DETAILED DESCRIPTION OF UNITS · SEE GENERALIZED GEOLOGIC COLUMN			
	60					

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ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

PROJECT

HOLE NO 63

Hole No. 64

DRILLING LOG

DIVISION: SOUTHWESTERN

INSTALLATION: LITTLE ROCK DISTRICT

SHEET 1 OF 1 SHEETS

1. PROJECT	CONWAY WATER SUPPLY
2. LOCATION (Coordinates or Station)	N 3+20 E 21+15
3. DRILLING AGENCY	U. S. Corps of Engineers
4. HOLE NO. (As shown on drawing title and file number)	64
5. NAME OF DRILLER	WOOD
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	4.5
8. DEPTH DRILLED INTO ROCK	34.3
9. TOTAL DEPTH OF HOLE	38.8
10. SIZE AND TYPE OF BIT	NXL
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING 1500
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 3 / UNDISTURBED -
14. TOTAL NUMBER CORE BOXES	3
15. ELEVATION GROUND WATER	-
16. DATE HOLE	STARTED 4/13/79 / COMPLETED 4/13/79
17. ELEVATION TOP OF HOLE	357.41
18. TOTAL CORE RECOVERY FOR BORING	90 %
19. SIGNATURE OF INSPECTOR	R. PERRY

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
352.9			OVERBURDEN TOP OF ROCK	% (RQD)		BEGIN CORING
	10	WEA BADLY WEA SL WEA C.L. SL WEA	UNIT 10 SANDSTONE, HD	100 (41) 81 (45)	1	
343.9		C.L.	UNIT 11	51 (0)		
339.3		"				
FIRM ROCK	20		SHALE, SDY MOD HD TO HD	97 (71)		0.0 CFM @ 15 PSI
	30	C.L.		94 (69)	2	0.0 CFM @ 23 PSI
318.6		C.L.	UNIT 12 SHALE, SDY HD TO MOD HD	97 (63)	3	
						BOTTOM OF HOLE 38.8'

NOTE:
FOR DETAILED DESCRIPTION OF UNITS · SEE GENERALIZED GEOLOGIC COLUMN

075

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT

HOLE NO. 64

Hole No. 65

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT	CONWAY WATER SUPPLY
2. LOCATION (Coordinates or Station)	N 2+52N E 10+85
3. DRILLING AGENCY	U. S. CORPS OF ENGINEERS
4. HOLE NO. (As shown on drawing title and file number)	65
5. NAME OF DRILLER	WOOD
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	0.5
8. DEPTH DRILLED INTO ROCK	58.6
9. TOTAL DEPTH OF HOLE	59.1
10. SIZE AND TYPE OF BIT	NXL
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING 1500
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED – / UNDISTURBED –
14. TOTAL NUMBER CORE BOXES	4
15. ELEVATION GROUND WATER	301.2
16. DATE HOLE	STARTED 11-28-78 / COMPLETED 11-29-78
17. ELEVATION TOP OF HOLE	318.5
18. TOTAL CORE RECOVERY FOR BORING	96 %
19. SIGNATURE OF INSPECTOR	R. PERRY

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY (RQD) e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
318.0			O.B.			BEGIN CORING
314.7		C.L.	UNIT 12	68 (0)		
TOP/RK 313.3		BADLY WEA				
		C.L.		81 (14)	1	
FIRM ROCK	10	WEA		100 (29)		0.0 CFM @ 10 PSI
		JT		100		W.L. 17.3▽ 11/29/78
		SL WEA				
	20		SHALE, SDY HD TO MOD HD	(47)	2	
				100 (72)		0.0 CFM @ 21 PSI
	30	JT		100	3	0.18 CFM @ 30 PSI
		JT	UNIT 13	(64)		
	40	JTS	SHALE, SDY HD TO MOD HD	100		1.46 CFM @ 30 PSI
		JT				
	50	JT		100	4	1.8 CFM @ 30 PSI
			UNIT 14 SHALE, SDY HD TO MOD 40	(100)		
259.4	60					BOTTOM OF HOLE 59.1'

NOTE: FOR DETAILED DESCRIPTION OF UNITS - SEE GENERALIZED GEOLOGIC COLUMN

076

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT

HOLE NO. 65

Hole No. 103

DRILLING LOG	DIVISION: SOUTHWESTERN	INSTALLATION: LITTLE ROCK DISTRICT	SHEET 1 OF 2 SHEETS
1. PROJECT: CONWAY WATER SUPPLY		10. SIZE AND TYPE OF BIT: NXL	
2. LOCATION (Coordinates or Station): STA 6+25 ON DIKE CENTERLINE		11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL	
3. DRILLING AGENCY: U. S. CORPS OF ENGINEERS		12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number): 103		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 3 / UNDISTURBED -	
5. NAME OF DRILLER: WOOD		14. TOTAL NUMBER CORE BOXES: 7	
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER: 312.8	
		16. DATE HOLE: STARTED 12-27-77 / COMPLETED 12-29-77	
7. THICKNESS OF OVERBURDEN: 7.4		17. ELEVATION TOP OF HOLE: 331.7	
8. DEPTH DRILLED INTO ROCK: 93.0		18. TOTAL CORE RECOVERY FOR BORING: 99 %	
9. TOTAL DEPTH OF HOLE: 100.4		19. SIGNATURE OF INSPECTOR: R. PERRY	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			OVERBURDEN			
324.2			TOP OF ROCK			BEGIN CORING
	10	WEA	UNIT 13			
		SL WEA C.L.		95	1	0.1 CFM @ 9 PSI
316.4 FIRM ROCK			SHALE, SDY HD TO MOD HD			W.L. ▽ 12-29-77
	20			98		
	30			100	2	0.3 CFM @ 24 PSI
			UNIT 14			
	40	FRAC	SHALE, SDY HD TO MOD HD	100	3	0.7 CFM @ 30 PSI
			UNIT 15			
	50	VERT JT	SHALE, SDY HD TO MOD HD	100		0.0 CFM @ 30 PSI
	60				4	077 40% WATER
			UNIT 16	100		0.0 CFM @ 30 PSI

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT

HOLE NO 103

Hole No. 103

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			UNIT 16 (Cont)			REGAINED WATER
	70		SHALE MOD HD TO HD	100		0.0 CFM @ 30 PSI
				100	5	0.0 CFM @ 30 PSI
	80		SILTSTS			
				100		0.0 CFM @ 30 PSI
	90					
				100	6	0.0 CFM @ 30 PSI
231.3	100				7	
						BOTTOM OF HOLE 100.4'

NOTE:
FOR DETAILED DESCRIPTION OF UNITS · SEE GENERALIZED GEOLOGIC COLUMN

078

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT

HOLE NO. 103

Hole No. 132

DRILLING LOG	DIVISION	INSTALLATION	SHEET
	SOUTHWESTERN	LITTLE ROCK DISTRICT	OF 1 SHEETS

1. PROJECT	CONWAY WATER SUPPLY
2. LOCATION (Coordinates or Station)	Sta 20+00 ON DIKE CENTERLINE
3. DRILLING AGENCY	U. S. Corps of Engineers
4. HOLE NO. (As shown on drawing title and file number)	132
5. NAME OF DRILLER	NASH
6. DIRECTION OF HOLE	☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	16.0
8. DEPTH DRILLED INTO ROCK	24.3
9. TOTAL DEPTH OF HOLE	40.3
10. SIZE AND TYPE OF BIT	NXL
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING 1500
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 9 / UNDISTURBED -
14. TOTAL NUMBER CORE BOXES	1
15. ELEVATION GROUND WATER	341.8
16. DATE HOLE	STARTED 4/27/78 COMPLETED 4/28/78
17. ELEVATION TOP OF HOLE	358.5
18. TOTAL CORE RECOVERY FOR BORING	63 %
19. SIGNATURE OF INSPECTOR	R. PERRY

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			OVERBURDEN			
	10					
342.5						BEGIN CORING
			BADLY WEA			W.L.16.7' ▽ 4-28-78
	20		C.L.	37		
			TOP OF ROCK			0.0 CFM @ 8 PSI
329.9						
327.9			WEA			
FIRM ROCK	30		UNIT 13 SHALE, SDY HD TO MOD HD	70	1	
				100		
318.2	40					BOTTOM OF HOLE 40.3'
			NOTE: FOR DETAILED DESCRIPTION OF UNITS · SEE GENERALIZED GEOLOGIC COLUMN			
	50					

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ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT

HOLE NO. 132

Hole No. 134

DRILLING LOG

DIVISION: SOUTHWESTERN
INSTALLATION: LITTLE ROCK DISTRICT
SHEET 1 of 1 SHEETS

1. PROJECT	CONWAY WATER SUPPLY
2. LOCATION (Coordinates or Station)	STA 16+00 ON DIKE CENTERLINE
3. DRILLING AGENCY	U. S. Corps of Engineers
4. HOLE NO. (As shown on drawing title and file number)	134
5. NAME OF DRILLER	NASH
6. DIRECTION OF HOLE	☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	10.0
8. DEPTH DRILLED INTO ROCK	14.7
9. TOTAL DEPTH OF HOLE	24.7
10. SIZE AND TYPE OF BIT	NXL
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING 1500
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 6 / UNDISTURBED 2
14. TOTAL NUMBER CORE BOXES	1
15. ELEVATION GROUND WATER	-
16. DATE HOLE	STARTED 4/14/78 / COMPLETED 4/14/78
17. ELEVATION TOP OF HOLE	333.8
18. TOTAL CORE RECOVERY FOR BORING	93 %
19. SIGNATURE OF INSPECTOR	R. PERRY

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			OVERBURDEN			
323.8						BEGIN CORING
322.8	10		C.L. TOP OF ROCK			
320.3			WEA UNIT 13	90	1	0.0 CFM @ 8 PSI
FIRM ROCK	20		SHALE, SDY HD TO MOD HD	100		
309.1						BOTTOM OF HOLE 24.7'
	30					

NOTE:
FOR DETAILED DESCRIPTION OF UNITS - SEE GENERALIZED GEOLOGIC COLUMN

080

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT

HOLE NO. 134

Hole No. 136

DRILLING LOG	DIVISION: SOUTHWESTERN	INSTALLATION: LITTLE ROCK DISTRICT	SHEET 1 OF 1 SHEETS
1. PROJECT: CONWAY WATER SUPPLY		10. SIZE AND TYPE OF BIT: NXL	
2. LOCATION (Coordinates or Station): Sta 12+00 on DIKE CENTERLINE		11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL	
3. DRILLING AGENCY: U. S. Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING 1500	
4. HOLE NO (As shown on drawing title and file number): 136		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4	UNDISTURBED 3
5. NAME OF DRILLER: NASH		14. TOTAL NUMBER CORE BOXES: 1	
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER: -	
		16. DATE HOLE: STARTED 4/17/78	COMPLETED 4/17/78
7. THICKNESS OF OVERBURDEN: 10.0		17. ELEVATION TOP OF HOLE: 340.6	
8. DEPTH DRILLED INTO ROCK: 16.5		18. TOTAL CORE RECOVERY FOR BORING: 92 %	
9. TOTAL DEPTH OF HOLE: 26.5		19. SIGNATURE OF INSPECTOR: R. PERRY	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			OVERBURDEN			
330.6	10					BEGIN CORING
		C.L.				
326.3		BADLY WEA	TOP OF ROCK ↘	86		
325.6		SL WEA	UNIT 13			
FIRM ROCK	20	Fe STAINS	SHALE, SDY HD TO MOD HD	(9)	1	
				100		
314.1				(82)		
	30					BOTTOM OF HOLE 26.5'

NOTE:
FOR DETAILED DESCRIPTION OF UNITS · SEE GENERALIZED GEOLOGIC COLUMN

081

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT

HOLE NO. 136

Hole No. 138

DRILLING LOG	DIVISION: SOUTHWESTERN	INSTALLATION: LITTLE ROCK DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT	CONWAY WATER SUPPLY
2. LOCATION (Coordinates or Station)	STA 8+00 on DIKE CENTERLINE
3. DRILLING AGENCY	U. S. Corps of Engineers
4. HOLE NO. (As shown on drawing title and file number)	138
5. NAME OF DRILLER	NASH
6. DIRECTION OF HOLE	☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	10.0
8. DEPTH DRILLED INTO ROCK	21.7
9. TOTAL DEPTH OF HOLE	31.7
10. SIZE AND TYPE OF BIT	NXL
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING 1500
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 7 / UNDISTURBED 1
14. TOTAL NUMBER CORE BOXES	2
15. ELEVATION GROUND WATER	-
16. DATE HOLE	STARTED 4/18/78 / COMPLETED 4/18/78
17. ELEVATION TOP OF HOLE	344.9
18. TOTAL CORE RECOVERY FOR BORING	82 %
19. SIGNATURE OF INSPECTOR	R. PERRY

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
			OVERBURDEN			
334.9						
333.9	10					BEGIN CORING
			TOP OF ROCK			
		WEA	UNIT 13	63	1	
		C.L.				
325.2	20	WEA, BROKEN	SHALE, SDY MOD HD TO HD	86		0.4 CFM @ 14 PSI
FIRM ROCK		JT				
	30			100	2	
313.2						
						BOTTOM OF HOLE 31.7'
	40					

NOTE:
FOR DETAILED DESCRIPTION OF UNITS · SEE GENERALIZED GEOLOGIC COLUMN

082

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT

HOLE NO. 138

Hole No. 139

DRILLING LOG	DIVISION: SOUTHWESTERN	INSTALLATION: LITTLE ROCK DISTRICT	SHEET 1 OF 2 SHEETS
1. PROJECT: CONWAY WATER SUPPLY		10. SIZE AND TYPE OF BIT: NXL	
2. LOCATION (Coordinates or Station): STA 6+00 ON DIKE CENTERLINE		11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL	
3. DRILLING AGENCY: U. S. CORPS OF ENGINEERS		12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING 1500	
4. HOLE NO. (As shown on drawing title and file number): 139		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 6; UNDISTURBED 1	
5. NAME OF DRILLER: NASH		14. TOTAL NUMBER CORE BOXES: 7	
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER: 312.0	
		16. DATE HOLE: STARTED 4-19-78; COMPLETED 4-25-78	
7. THICKNESS OF OVERBURDEN: 10.0		17. ELEVATION TOP OF HOLE: 347.3	
8. DEPTH DRILLED INTO ROCK: 106.8		18. TOTAL CORE RECOVERY FOR BORING: 93 %	
9. TOTAL DEPTH OF HOLE: 116.8		19. SIGNATURE OF INSPECTOR: R. PERRY	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			O.B.			
337.3						
336.6	10					BEGIN CORING
			C.L.			
			WEA TOP OF ROCK	93		
335.8			SL WEA UNIT 13			
FIRM ROCK			Fe STAINS	(35)	1	0.0 CFM @ 11 PSI
	20		SHALE, SDY HD TO MOD HD	98		0.0 CFM @ 15 PSI
				(81)		
	30			90		FREE FLOW @ 0 PSI
			C.L.	(31)	2	NO WATER RETURN
			C.L.	81		W.L. 35.3 ▽ 4-24-78
	40		UNIT 14	(56)		
			FRAC SHALE, SDY HD TO MOD HD	98		2.5 CFM @ 30 PSI
			FRACS	(74)		
	50		FRAC			
			C.L. UNIT 15	87	3	2.8 CFM @ 30 PSI
			FRAC SHALE, SDY HD TO MOD HD	(8)		
	60					083
			FRAC UNIT 16		4	3.1 CFM @ 30 PSI

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT

HOLE NO. 139

Hole No. 139

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			UNIT 16 (cont)	98		
			C.L.	(8)		
	70		SILTST	94		
			SHALE MOD HD TO HD			0.4 CFM @ 30 PSI
			C.L.			
			SILTST	(24)		
	80			98	5	
			C.L.			0.0 CFM @ 30 PSI
			SILTST	(56)		
	90			100		
				(57)		0.0 CFM @ 30 PSI
				100 (0)	6	
	100			93		
				(21)		0.0 CFM @ 30 PSI
			C.L. SILTST	76		
	110		2.4' SCATT C L. SILTST	(0)	7	0.0 CFM @ 30 PSI
230.5						
	120					BOTTOM OF HOLE 116.8'

NOTE:
FOR DETAILED DESCRIPTION OF UNITS - SEE GENERALIZED GEOLOGIC COLUMN

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ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT

HOLE NO. 139

Hole No. 140

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT	CONWAY WATER SUPPLY
2. LOCATION (Coordinates or Station)	STA 4+00 on DIKE CENTERLINE
3. DRILLING AGENCY	U. S. Corps of Engineers
4. HOLE NO. (As shown on drawing title and file number)	140
5. NAME OF DRILLER	NASH
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	9.8
8. DEPTH DRILLED INTO ROCK	11.8
9. TOTAL DEPTH OF HOLE	21.6
10. SIZE AND TYPE OF BIT	NXL
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	FAILING 1500
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 6 / UNDISTURBED -
14. TOTAL NUMBER CORE BOXES	1
15. ELEVATION GROUND WATER	-
16. DATE HOLE	STARTED 4/25/78 / COMPLETED 4/25/78
17. ELEVATION TOP OF HOLE	349.9
18. TOTAL CORE RECOVERY FOR BORING	98 %
19. SIGNATURE OF INSPECTOR	R. PERRY

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			OVERBURDEN			
340.1	10		TOP OF ROCK			BEGIN CORING
339.7 FIRM ROCK			C.L. Fe STAINS FRACS JTS UNIT 13 SHALE, SDY HD TO MOD HD	98	1	0.0 CFM @ 5 PSI
328.3	20			100		
	30					BOTTOM OF HOLE 21.6'

NOTE:
FOR DETAILED DESCRIPTION OF UNITS - SEE GENERALIZED GEOLOGIC COLUMN

085

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT

HOLE NO. 140

Hole No. 142

DRILLING LOG | DIVISION: SOUTHWESTERN | INSTALLATION: LITTLE ROCK DISTRICT | SHEET 1 OF 2 SHEETS

1. PROJECT: CONWAY WATER SUPPLY	10. SIZE AND TYPE OF BIT: ROCK BIT, NXL
2. LOCATION (Coordinates or Station): STA 7+00 ON DIKE CENTERLINE	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
3. DRILLING AGENCY: U. S. CORPS OF ENGINEERS	12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING 1500
4. HOLE NO. (As shown on drawing title and file number): 142	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 5; UNDISTURBED -
5. NAME OF DRILLER: NASH	14. TOTAL NUMBER CORE BOXES: 5
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: 314.2
7. THICKNESS OF OVERBURDEN: 9.5	16. DATE HOLE: STARTED 5-8-78; COMPLETED 5-10-78
8. DEPTH DRILLED INTO ROCK: 72.1	17. ELEVATION TOP OF HOLE: 345.1
9. TOTAL DEPTH OF HOLE: 81.6	18. TOTAL CORE RECOVERY FOR BORING: 100 %
	19. SIGNATURE OF INSPECTOR: R. PERRY

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			O.B.			
335.6	10		TOP OR ROCK			
		WEA				ROCK BIT
327.6 FIRM ROCK 326.4	20	Fe STAINS	UNIT 13	100 (41)		BEGIN CORING
			SHALE, SDY HD TO MOD HD	100 (62)	1	0.0 CFM @ 12 PSI
	30			100 (62)		W.L. 30.9' ▽ 5-11-78
	40		UNIT 14		2	0.0 CFM @ 22 PSI
			SHALE, SDY HD TO MOD HD	100 (83)		0.0 CFM @ 30 PSI
	50		UNIT 15			
		JT	SHALE, SDY HD TO MOD HD	100 (81)	3	0.0 CFM @ 30 PSI
	60	FRAC	UNIT 16			086
		SOFT	SHALE MOD HD TO HD	100		1.4 CFM @ 30 PSI

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT | HOLE NO. 142

Hole No. 142

DRILLING LOG	DIVISION SOUTHWESTERN	INSTALLATION LITTLE ROCK DISTRICT	SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	70		UNIT 16 (cont)	100		
			SHALE MOD HD TO HD		4	75% WATER
			SILTSTS	100		1.1 CFM @ 30 PSI
263.5	80			(90)	5	
						BOTTOM OF HOLE 81.6'
	90		NOTE: FOR DETAILED DESCRIPTION OF UNITS - SEE GENERALIZED GEOLOGIC COLUMN			

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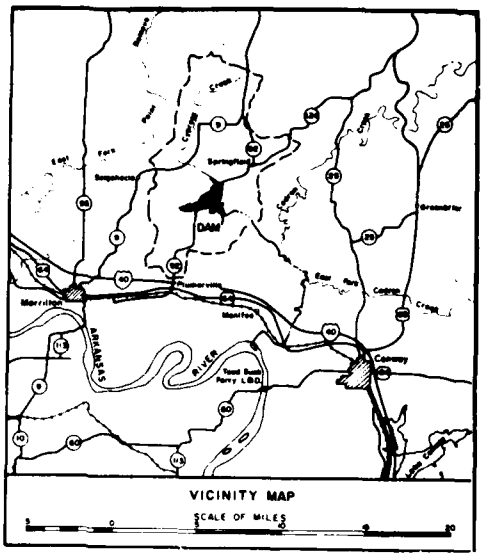
ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

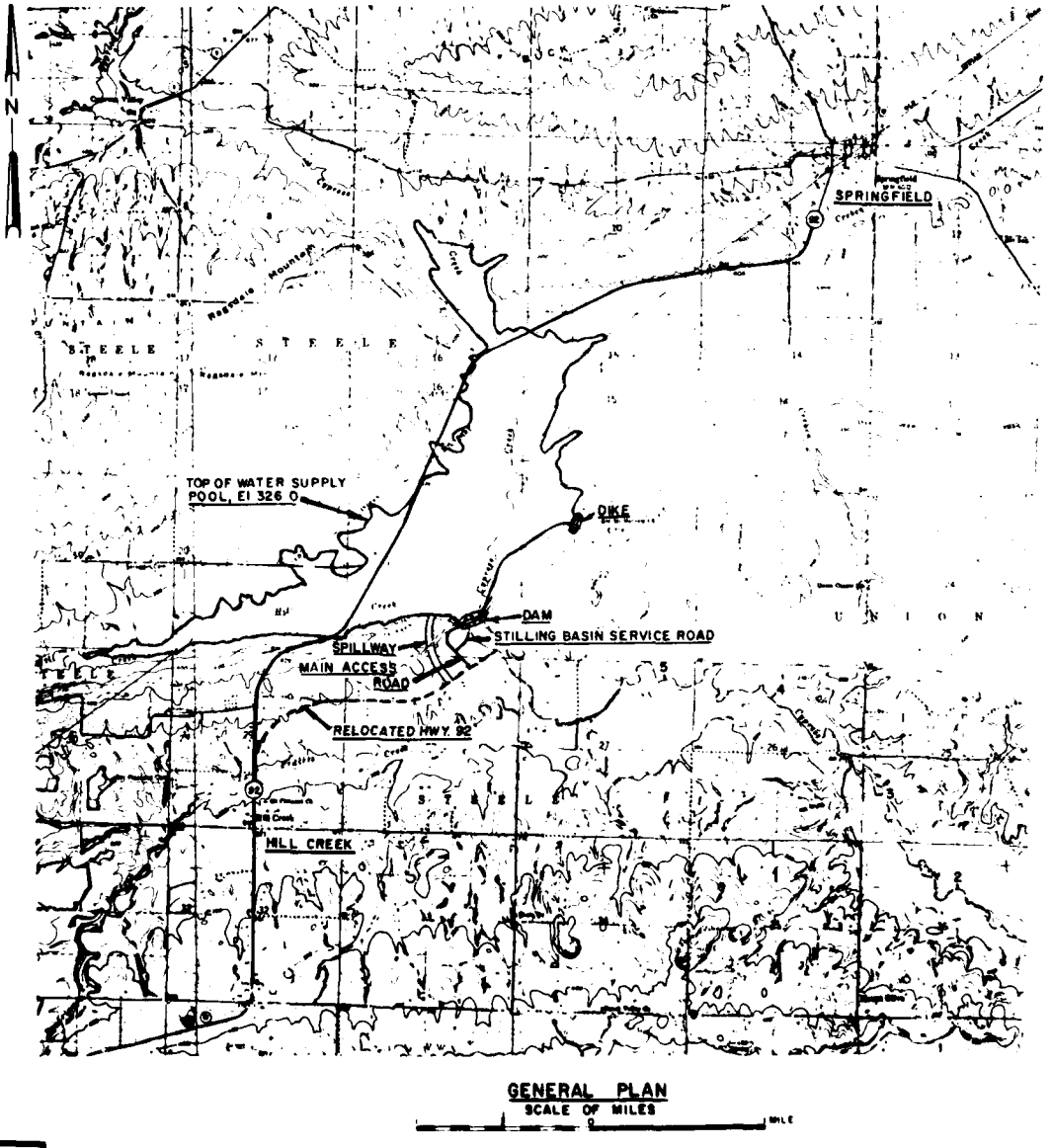
PROJECT

HOLE NO. 142

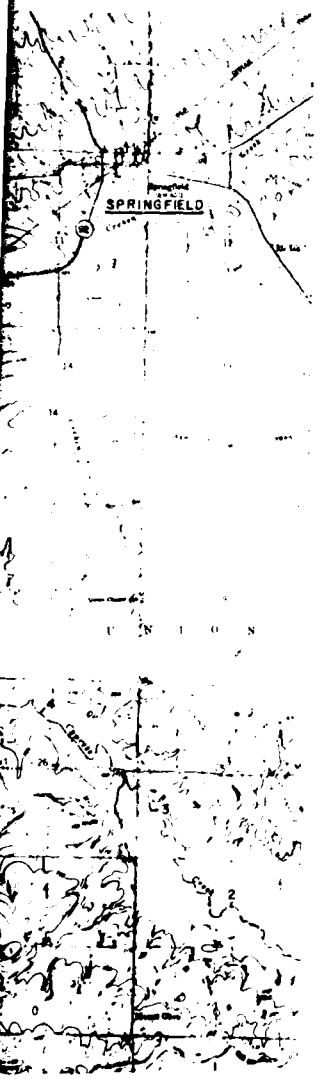
APPENDIX C

PLATES





GENERAL PLAN
SCALE OF MILES



INDEX TO DRAWINGS

FILE NO. 9689		TITLE
DRAWING NO.	SHEET NO.	
		GENERAL
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9570-62/1351	2	EMBANKMENT & SPILLWAY PLAN
9570-62/1364	3	TYPICAL EMBANKMENT SECTION
9570-62/1357	4	EMBANKMENT & OUTLET WORKS EXCAV. PLAN
9570-62/1477	5	PLAN OF EXPLORATIONS-DAM & SPILLWAY
9570-62/1479	6	GEOLOGIC SECTIONS
9570-62/1372	7	DIKE PLAN & SECTION
9570-62/1486	8	GEOLOGIC SECTION - DIKE CENTER LINE
9570-62/1359	9	OUTLET WORKS PLAN & SECTION
9670-62/1435	10	STILLING BASIN PLAN & SECTION
9570-62/1482	11	GEOLOGIC SECTIONS - STILLING BASIN
9570-62/1487	12	FOUNDATION TREATMENT
		FOUNDATION MAPS
9689-62/1659	13	DAM AXIS - STA. 9+10 TO STA. 11+02
9689-62/1660	14	DAM AXIS - STA. 11+10 TO STA. 13+60
9689-62/1661	15	DAM AXIS - STA. 13+60 TO STA. 16+70
9689-62/1662	16	DAM AXIS - STA. 16+70 TO STA. 18+95
9689-62/1663	17	DAM AXIS - STA. 18+95 TO STA. 20+65
9689-62/1664	18	DIKE - CORE TRENCH STA. 19+50 TO STA. 25+00
9689-62/1665	19	OUTLET WORKS - STILLING BASIN & INTAKE
9689-62/1666	20	OUTLET - CONDUIT STA. 7+96.75 TO STA. 9+56.75
9689-62/1667	21	OUTLET - CONDUIT STA. 9+56.75 TO STA. 11+36.75
9689-62/1668	22	OUTLET - CONDUIT STA. 11+36.75 TO STA. 12+16.75
9689-62/1669	23	GROUTING
9689-62/1670	24	GROUTING

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS
LITTLE ROCK, ARKANSAS

ARKANSAS RIVER AND TRIBUTARIES — ARKANSAS RIVER, ARKANSAS

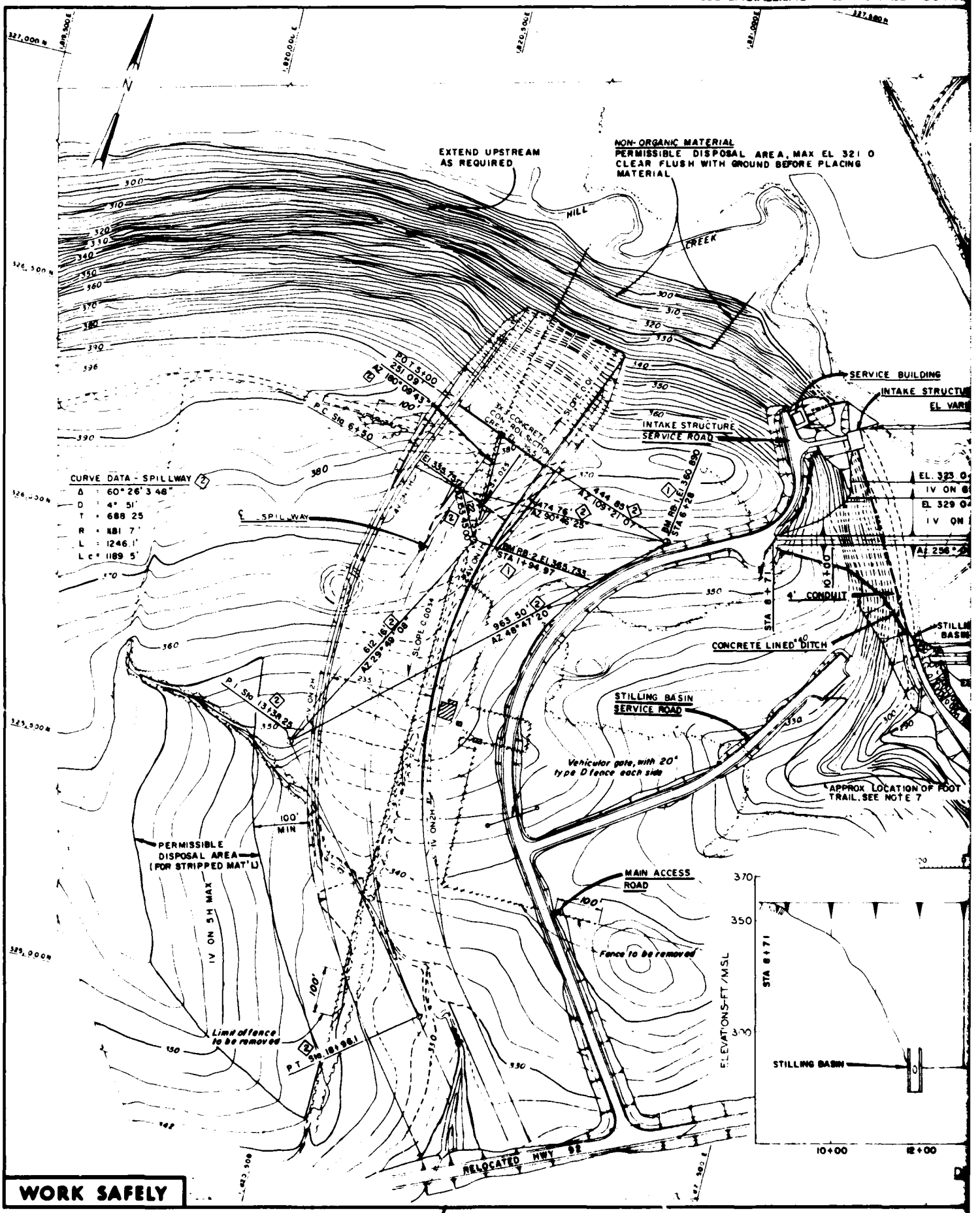
DESIGNED BY: RC
DRAWN BY: CH
CHECKED BY: CD

TOAD SUCK FERRY LOCK AND DAM
RELOCATIONS
CONWAY WATER SUPPLY
PROJECT LOCATION AND INDEX TO DRAWINGS

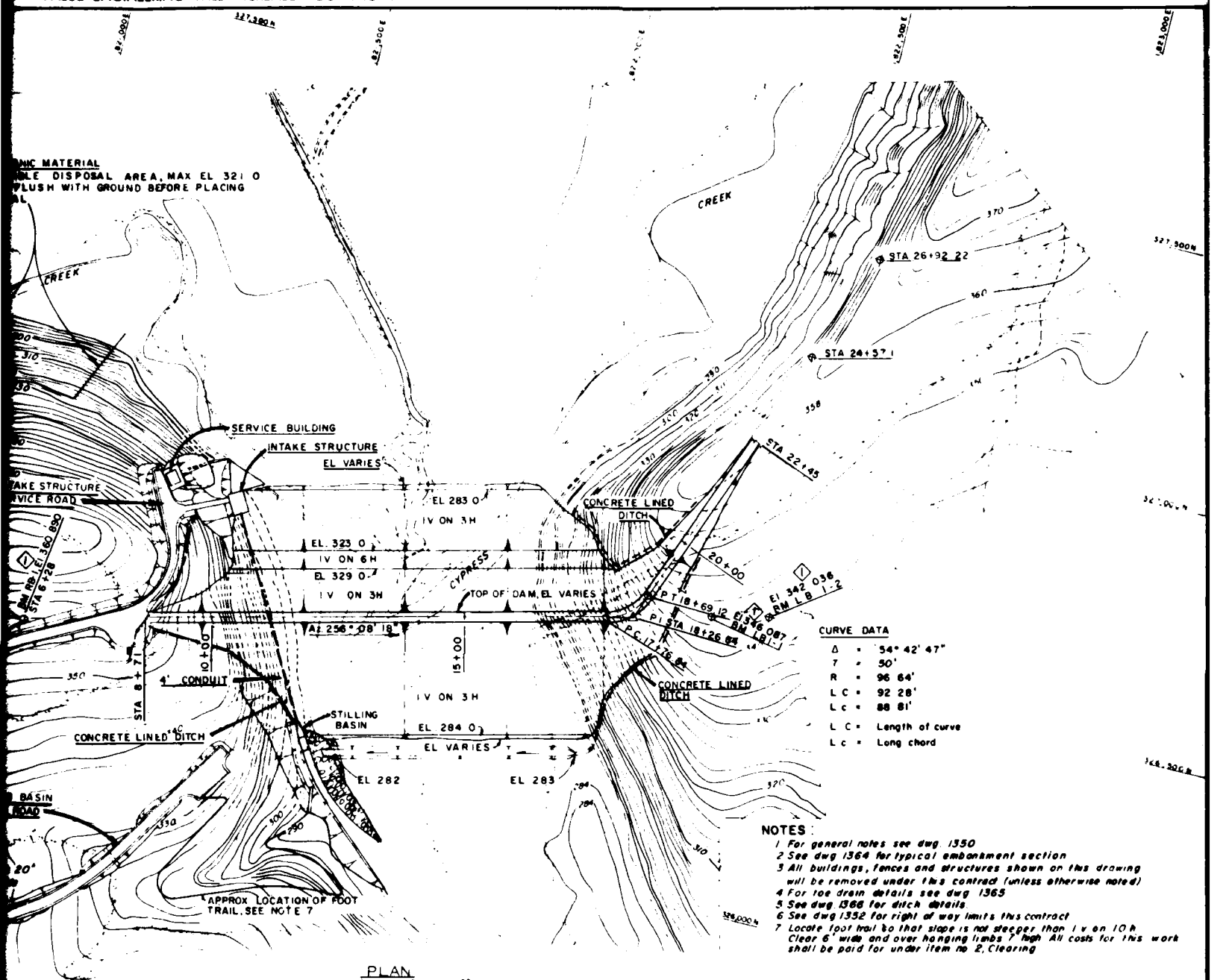
SUBMITTED BY:
ENGINEER:

APRIL 1983
DIV. SERIAL NO.

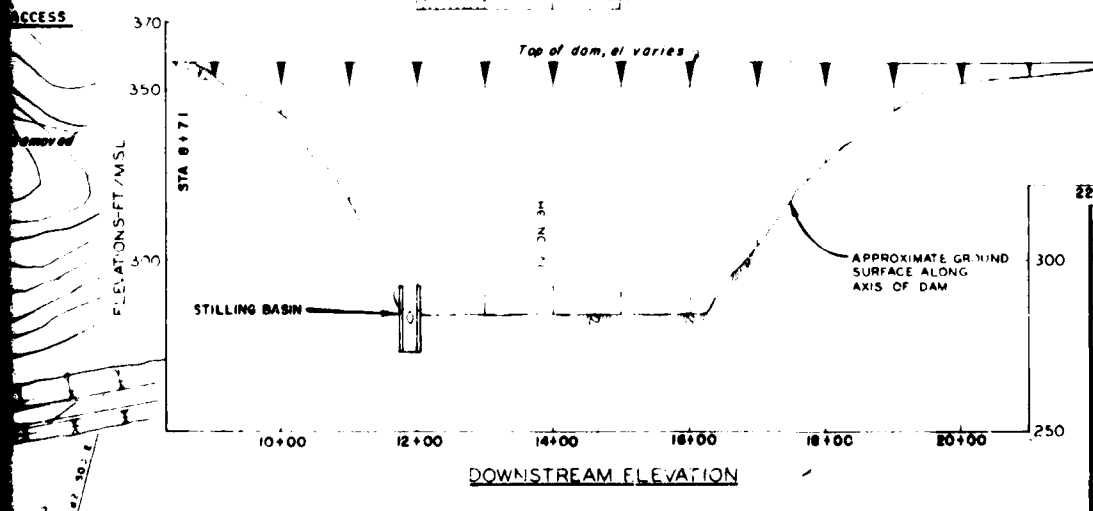
DRAWING NUMBER: 9689-62/1349
SHEET 1 OF 24


EXTEND UPSTREAM AS REQUIRED
NON-ORGANIC MATERIAL
PERMISSIBLE DISPOSAL AREA, MAX EL 321.0
CLEAR FLUSH WITH GROUND BEFORE PLACING MATERIAL
HILL
CREEK
SERVICE BUILDING
INTAKE STRUCTURE
INTAKE STRUCTURE SERVICE ROAD
CURVE DATA - SPILLWAY
Δ = 60° 26' 36"
D = 4° 51'
T = 688.25
R = 1181.7'
L = 1246.1'
Lc = 1189.5'
℄ SPILLWAY
4' CONDUIT
CONCRETE LINED DITCH
STILLING BASIN SERVICE ROAD
Vehicular gate, with 20' type D fence each side
APPROX LOCATION OF FOOT TRAIL, SEE NOTE 7
PERMISSIBLE DISPOSAL AREA (FOR STRIPPED MAT'L)
1V ON 5H MAX
100' MIN
Limit of fence to be removed
MAIN ACCESS ROAD
Fence to be removed
RELOCATED HWY 95
ELEVATIONS-FT/MSL
STA 8+71
STILLING BASIN
10+00
12+00

WORK SAFELY ...



PLAN



DOWNSTREAM ELEVATION

THIS DRAWING HAS BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

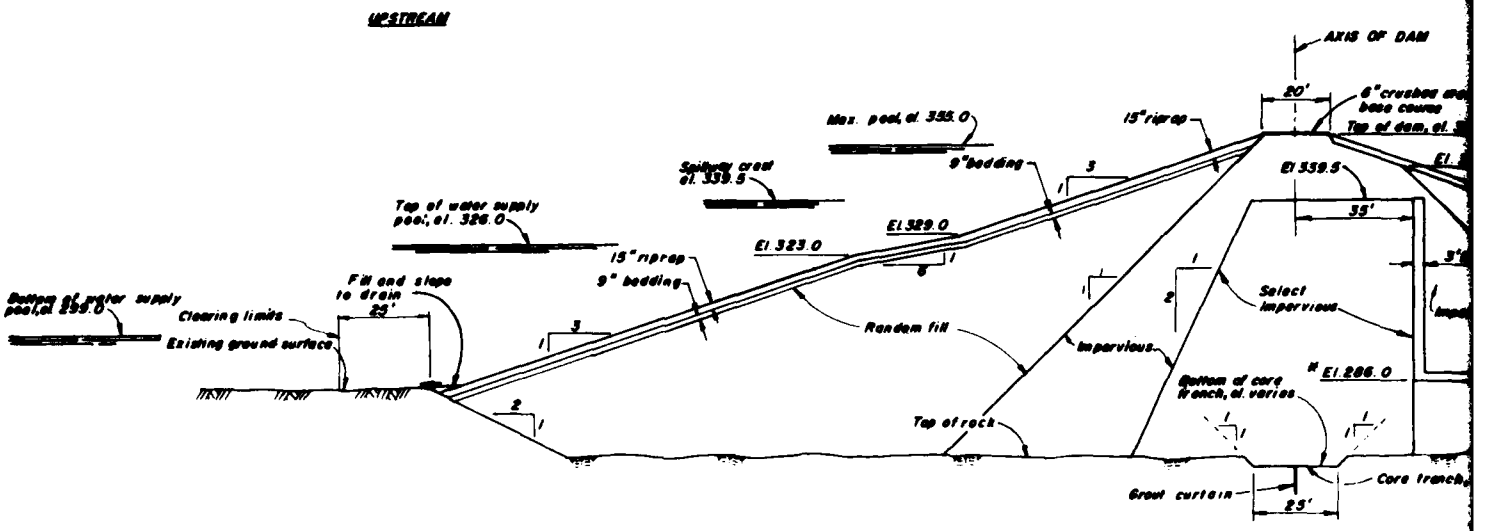
REVISION	DATE	DESCRIPTION	BY
2	8-21-80	Revise curve data, added spillway tie data,	
1	7-79	Added elev at bench marks Amend No 0001	

DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS
LITTLE ROCK ARKANSAS

ARKANSAS RIVER AND TRIBUTARIES ARKANSAS RIVER, ARKANSAS

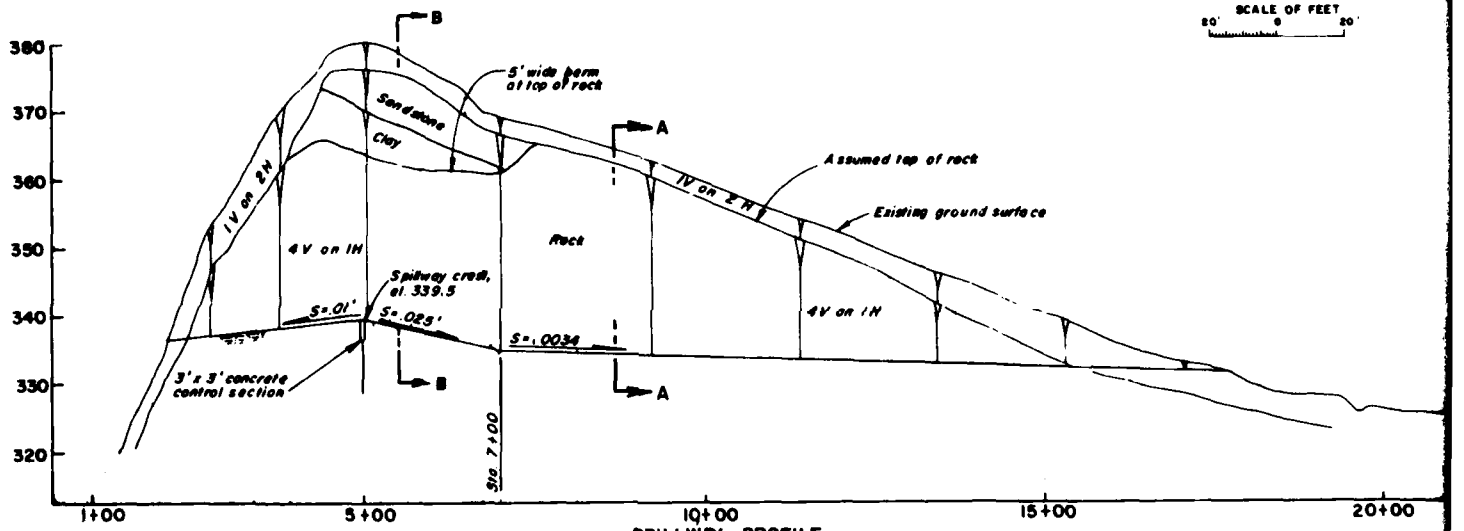
TOAD SUCK FERRY LOCK AND DAM RELOCATIONS
CONWAY WATER SUPPLY
EMBANKMENT AND SPILLWAY PLAN DOWNSTREAM ELEVATION

DESIGNED BY	JW
DRAWN BY	WFS
CHECKED BY	JW
SUBMITTED BY	
ENGINEER	
SCALE AS SHOWN	AUGUST 1979
SHEET 8 OF 24 SHEETS	DRAWING NUMBER 9870-627/1351



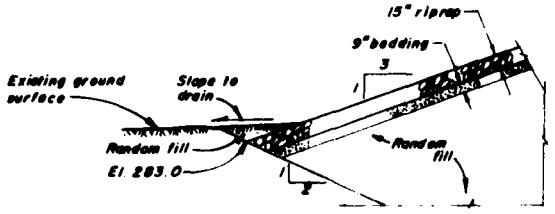
TYPICAL EMBANKMENT SECTION

SCALE OF FEET
80' 0 20'



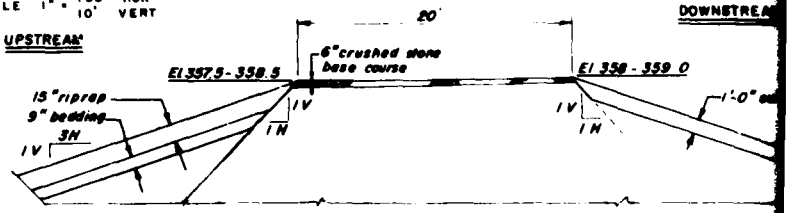
SPILLWAY PROFILE

SCALE 1" = 100' HOR
10' VERT

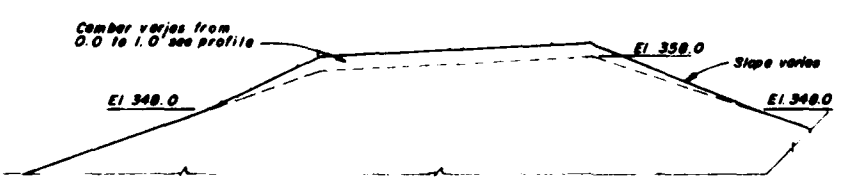


UPSTREAM TOE DETAIL

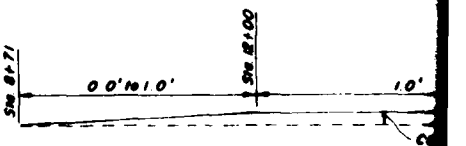
SCALE NONE



CREST DETAIL



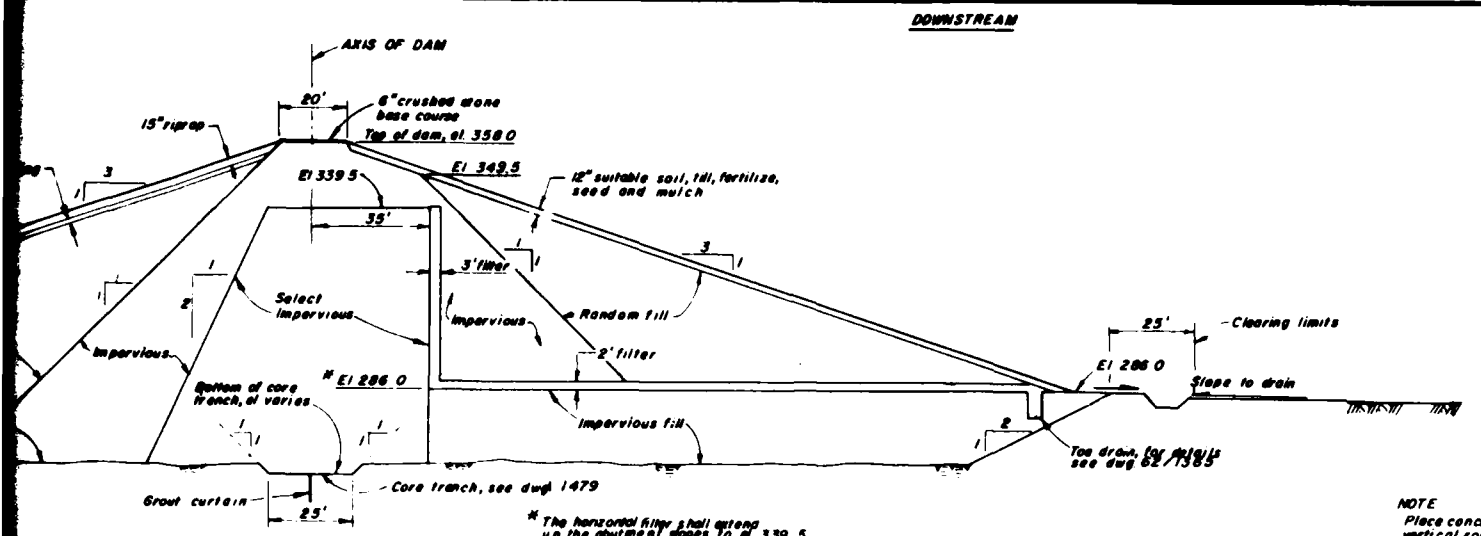
CAMBER DETAIL



CAMBER PRO

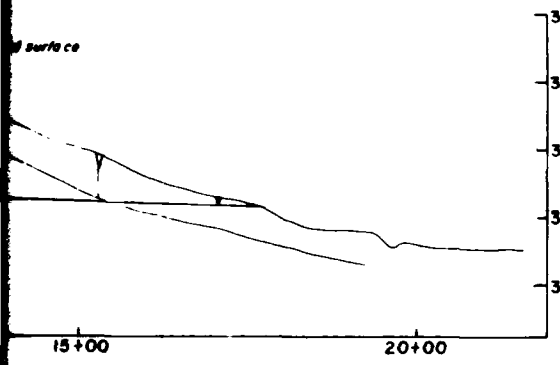
WORK SAFELY

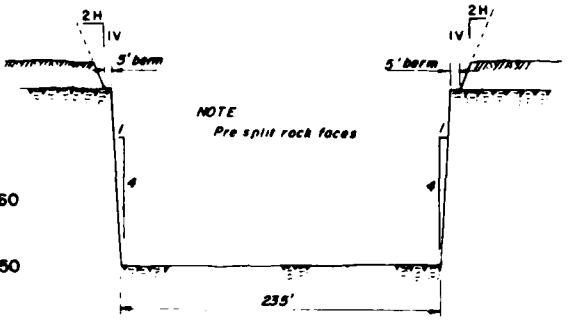
VALUE ENGINEERING WILL INCREASE YOUR PROFIT



TYPICAL EMBANKMENT SECTION

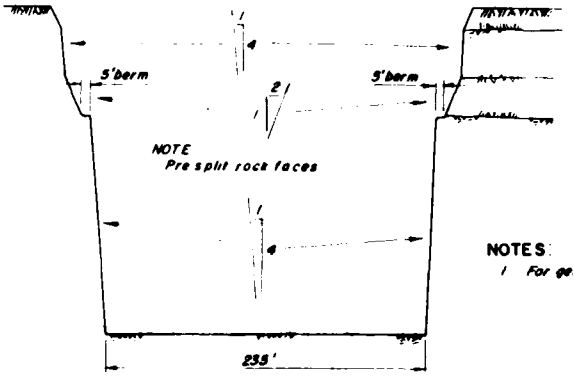
SCALE OF FEET





SECTION A - A

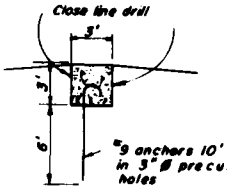
SCALE 1" = 50' HOR, 10' VERT



SECTION B - B

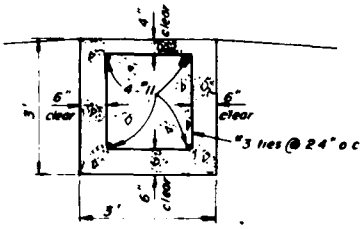
SCALE 1" = 50' HOR, 10' VERT

NOTE
Place concrete against vertical rock face regardless of the amount of rock overbreakage



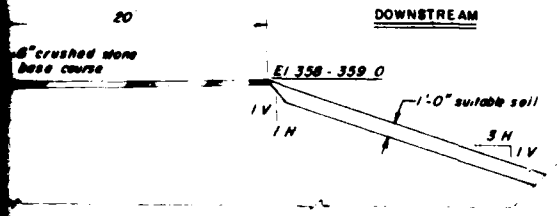
TYPICAL SECTION
CONCRETE CONTROL SECTION

SCALE NONE



REINFORCING STEEL DETAIL
CONCRETE CONTROL SECTION

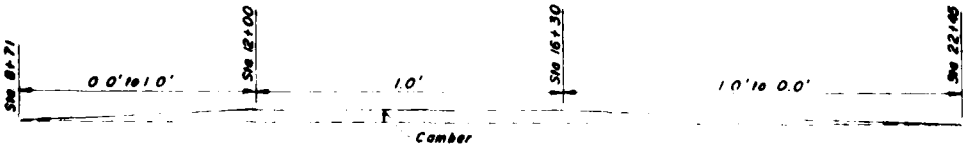
SCALE NONE



CREST DETAIL

NOTES:

1 For general notes see dwg 1350.



CAMBER PROFILE AT CREST

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS
LITTLE ROCK, ARKANSAS

DESIGNED BY J W
DRAWN BY L L B
CHECKED BY J W

ARKANSAS RIVER AND TRIBUTARIES ARKANSAS RIVER, ARKANSAS

TOAD SUCK FERRY LOCK AND DAM
RELOCATIONS
CONWAY WATER SUPPLY
TYPICAL EMBANKMENT SECTION AND SPILLWAY PROFILE

SUBMITTED BY
ENGINEER

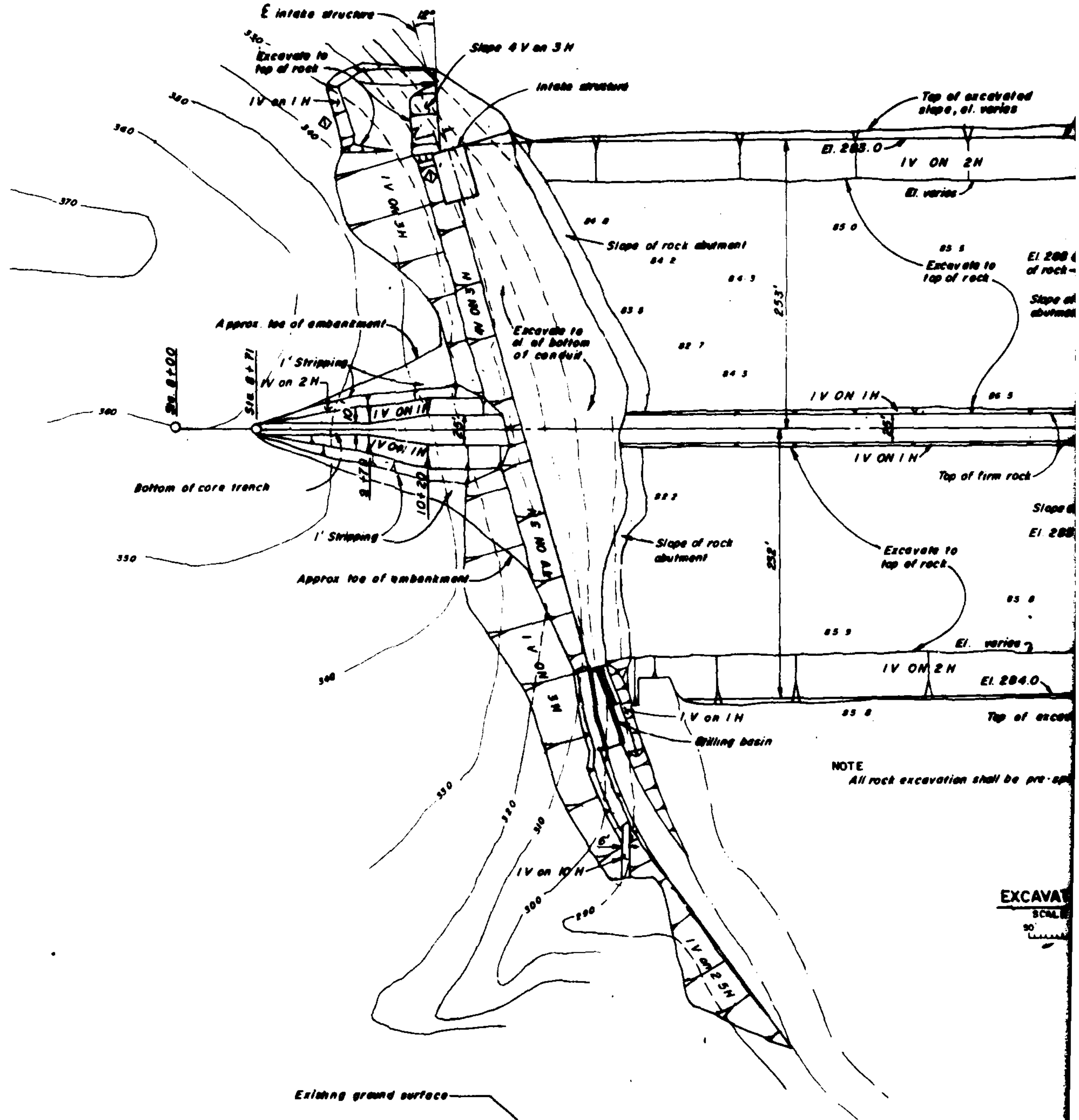
SCALE AS SHOWN

AUGUST 1979

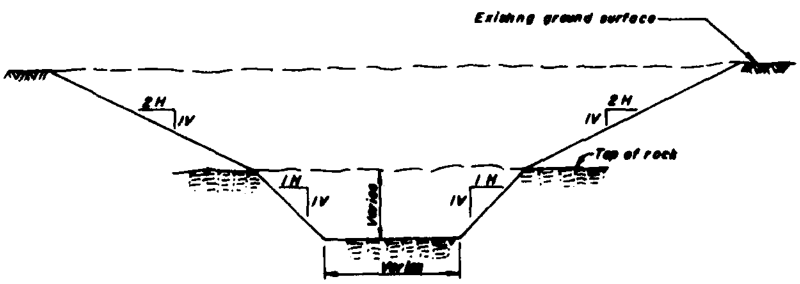
NW SERIAL NO. 80-S-0001

DRAWING NUMBER
9570-62/1364

SHEET 3 OF 81


℄ intake structure
12°
Slope 4 V on 3 H
Excavate to top of rock
1V on 1 H
Intake structure
Top of excavated slope, el. varies
El. 283.0
1V ON 2H
El. varies
Slope of rock abutment
Excavate to top of rock
Approx. toe of embankment
Excavate to el. of bottom of conduit
1' Stripping
1V on 2 H
Sta. 8+00
Sta. 8+71
1V ON 1H
Bottom of core trench
Approx. toe of embankment
253'
252'
1V ON 1H
Top of firm rock
Slope of rock abutment
Excavate to top of rock
El. varies
1V ON 2H
El. 284.0
1V on 1H
Stilling basin
1V on 10H
1V on 2.5H
1V on 3H
Top of exca
EXCAVAT

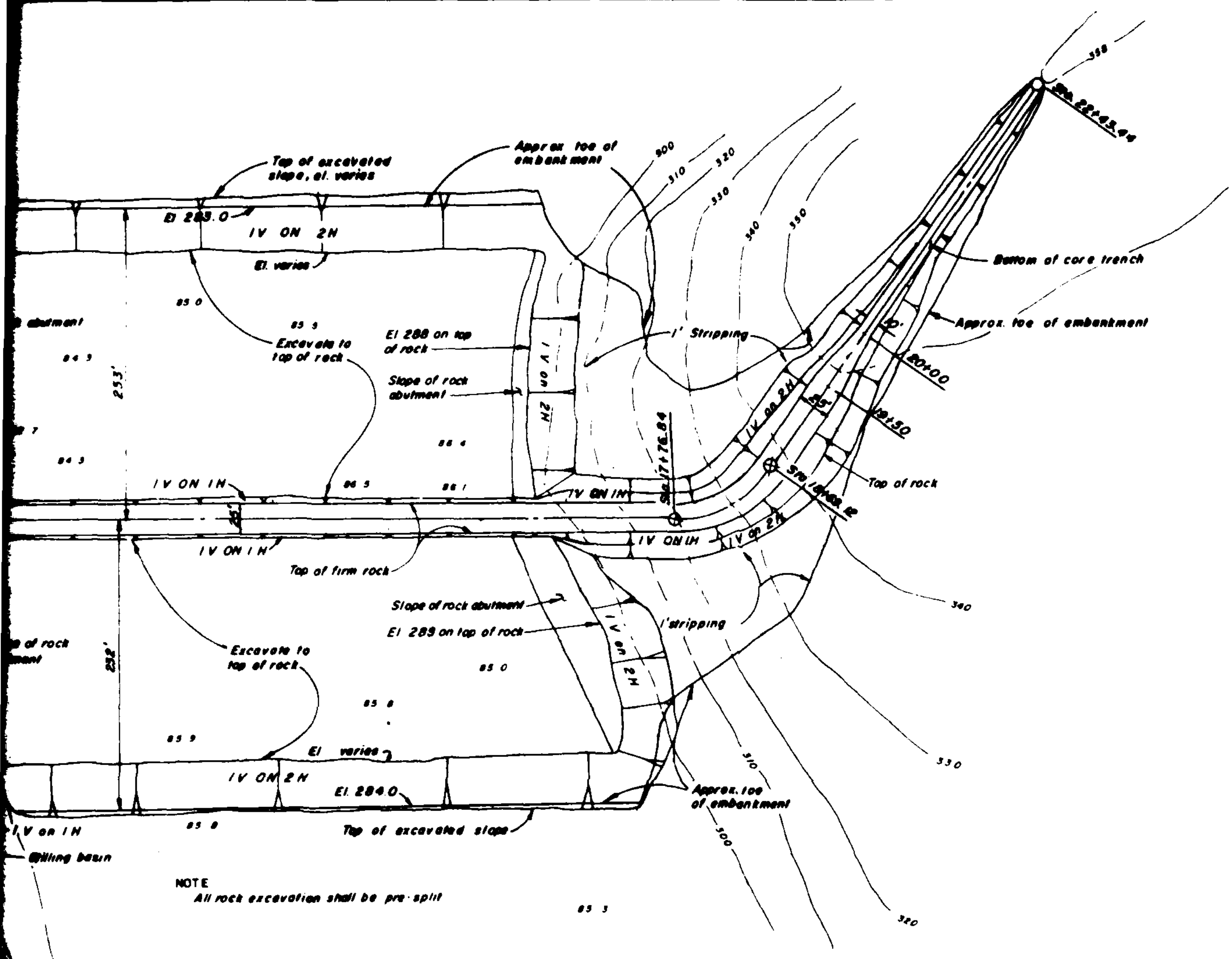
NOTE
All rock excavation shall be pre-sp



TYPICAL CORE TRENCH SECTION
SCALE NONE

WORK SAFELY

VALUE ENGINEERING WILL INCREASE YOUR PROFIT



NOTE
All rock excavation shall be pre-split

EXCAVATION PLAN

SCALE OF FEET

50 0 50

NOTES:

1. For general notes see dwg 1350.
2. Excavation plan along conduit is shown on dwg. 1358.
3. Excavation sections along conduit and outlet channel are shown on dwg. 1361
4. Existing topography is shown on dwg. 1351
5. See dwg 1479 for elevation of core trench
6. See sections 2D and 2F of the specifications for foundation preparation

THIS DRAWING HAS BEEN REDUCED TO ONE-HALF THE ORIGINAL SCALE

REVISION	DATE	DESCRIPTION	BY
1	8-1-79	Revised upstream excavation slopes Amend. No. 0001	LLB

DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS
LITTLE ROCK, ARKANSAS

ARKANSAS RIVER AND TRIBUTARIES ARKANSAS RIVER, ARKANSAS

TOAD SUCK FERRY LOCK AND DAM
RELOCATIONS
CONWAY WATER SUPPLY
EMBANKMENT AND OUTLET WORKS
EXCAVATION PLAN

DESIGNED BY: J W
DRAWN BY: L L B
CHECKED BY: J W
SUBMITTED BY: Alvin C. Austin

SCALE AS SHOWN

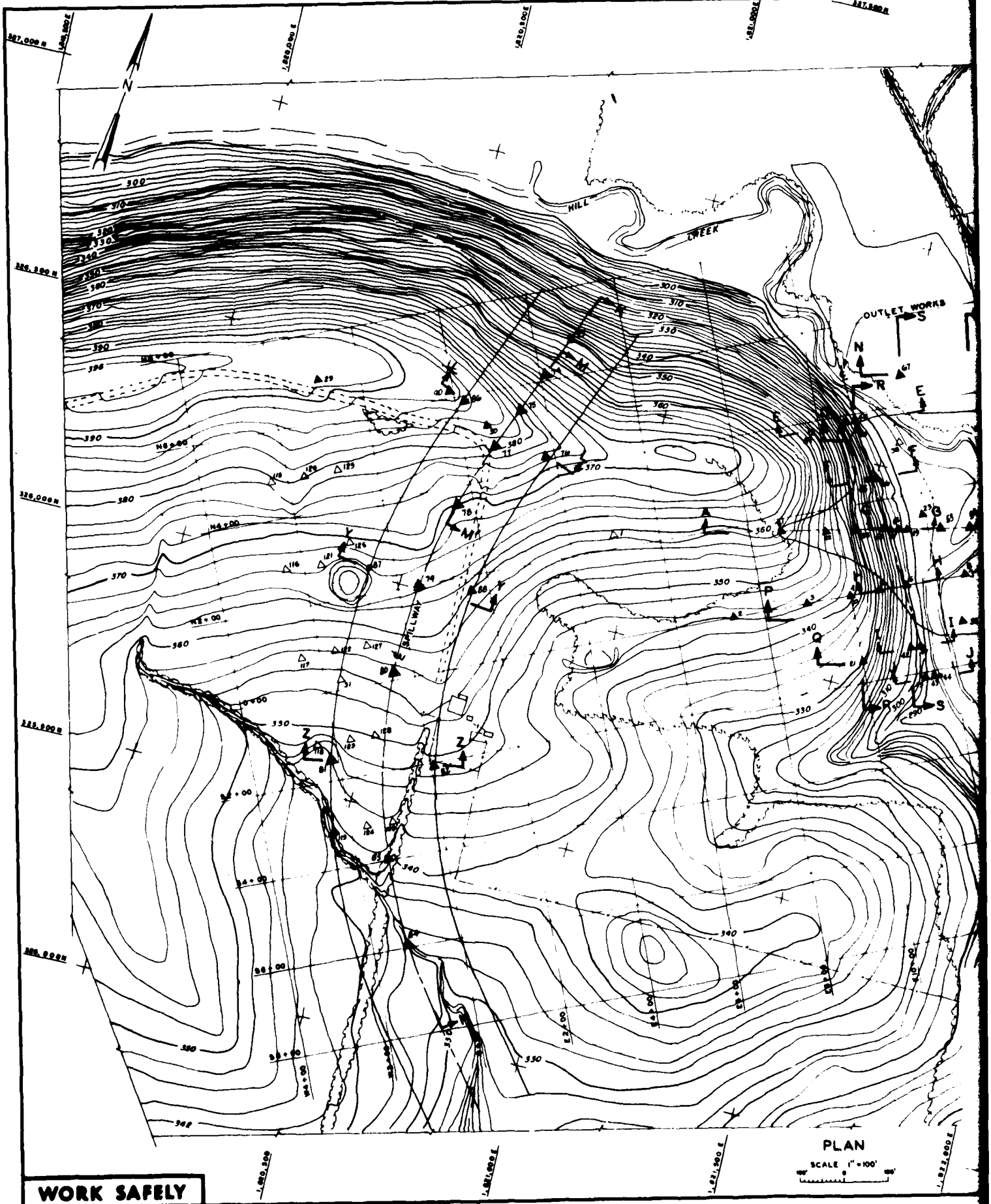
AUGUST 1979

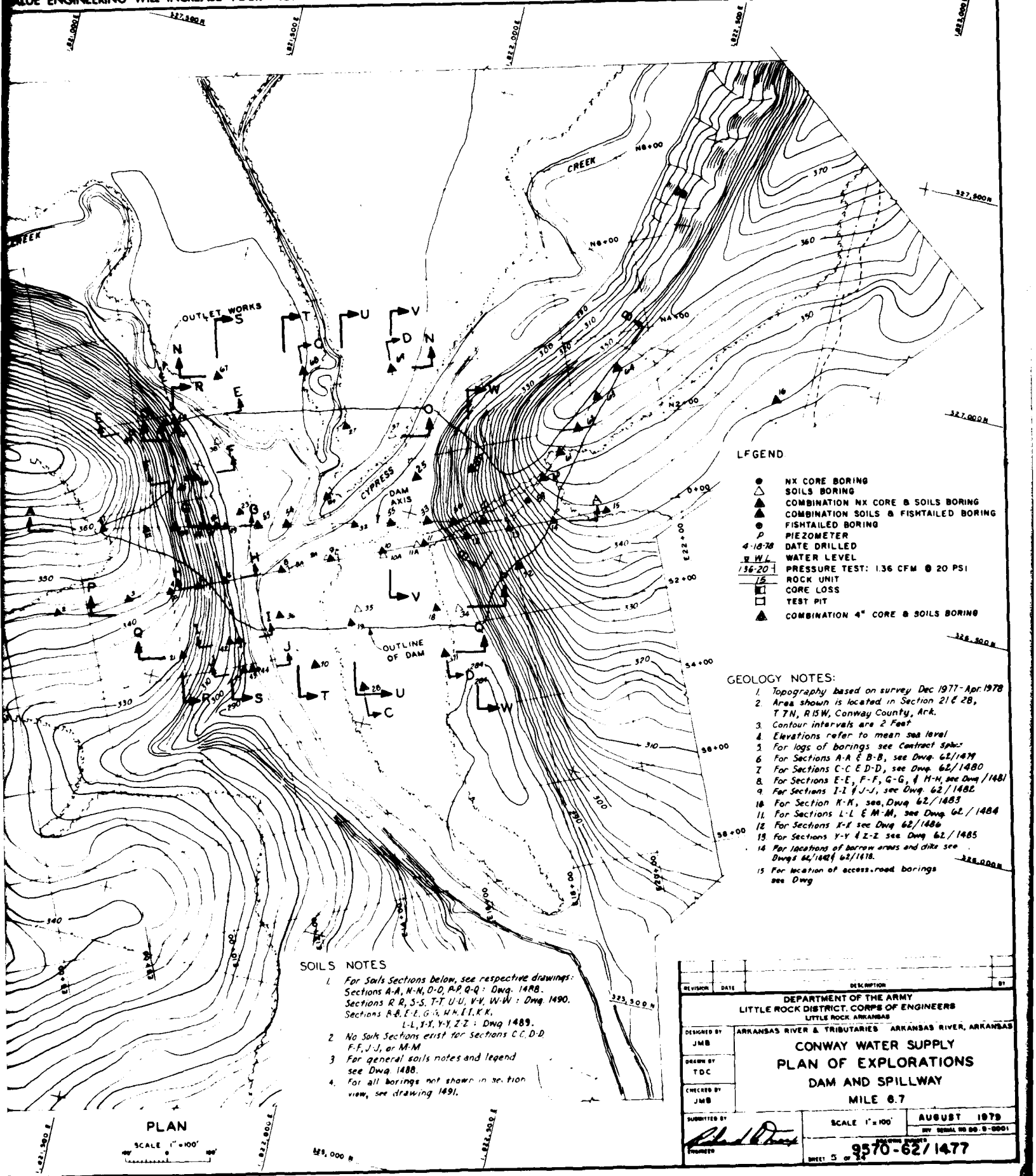
9570-62/1357

INCL. 1

AMEND. NO. 000

VALUE ENGINEERING WILL INCREASE YOUR PR





LEGEND

- NX CORE BORING
- SOILS BORING
- COMBINATION NX CORE & SOILS BORING
- COMBINATION SOILS & FISHTAILED BORING
- FISHTAILED BORING
- P PIEZOMETER
- 4-18-78 DATE DRILLED
- ▽ W.L. WATER LEVEL
- 1.36-20 PRESSURE TEST: 1.36 CFM @ 20 PSI
- 15 ROCK UNIT
- CORE LOSS
- TEST PIT
- COMBINATION 4" CORE & SOILS BORING

GEOLOGY NOTES:

1. Topography based on survey Dec 1977-Apr 1978
2. Area shown is located in Section 21 & 28, T 7N, R 15W, Conway County, Ark.
3. Contour intervals are 2 Feet
4. Elevations refer to mean sea level
5. For logs of borings see Contract Spec.
6. For Sections A-A & B-B, see Dwg. 62/1479
7. For Sections C-C & D-D, see Dwg. 62/1480
8. For Sections E-E, F-F, G-G, & H-H see Dwg /1481
9. For Sections I-I & J-J, see Dwg. 62/1482
10. For Section K-K, see Dwg 62/1483
11. For Sections L-L & M-M, see Dwg 62/1484
12. For Sections X-X see Dwg 62/1486
13. For Sections Y-Y & Z-Z see Dwg 62/1485
14. For locations of borrow areas and dike see Dwgs 62/1487 & 62/1478.
15. For location of access road borings see Dwg

SOILS NOTES

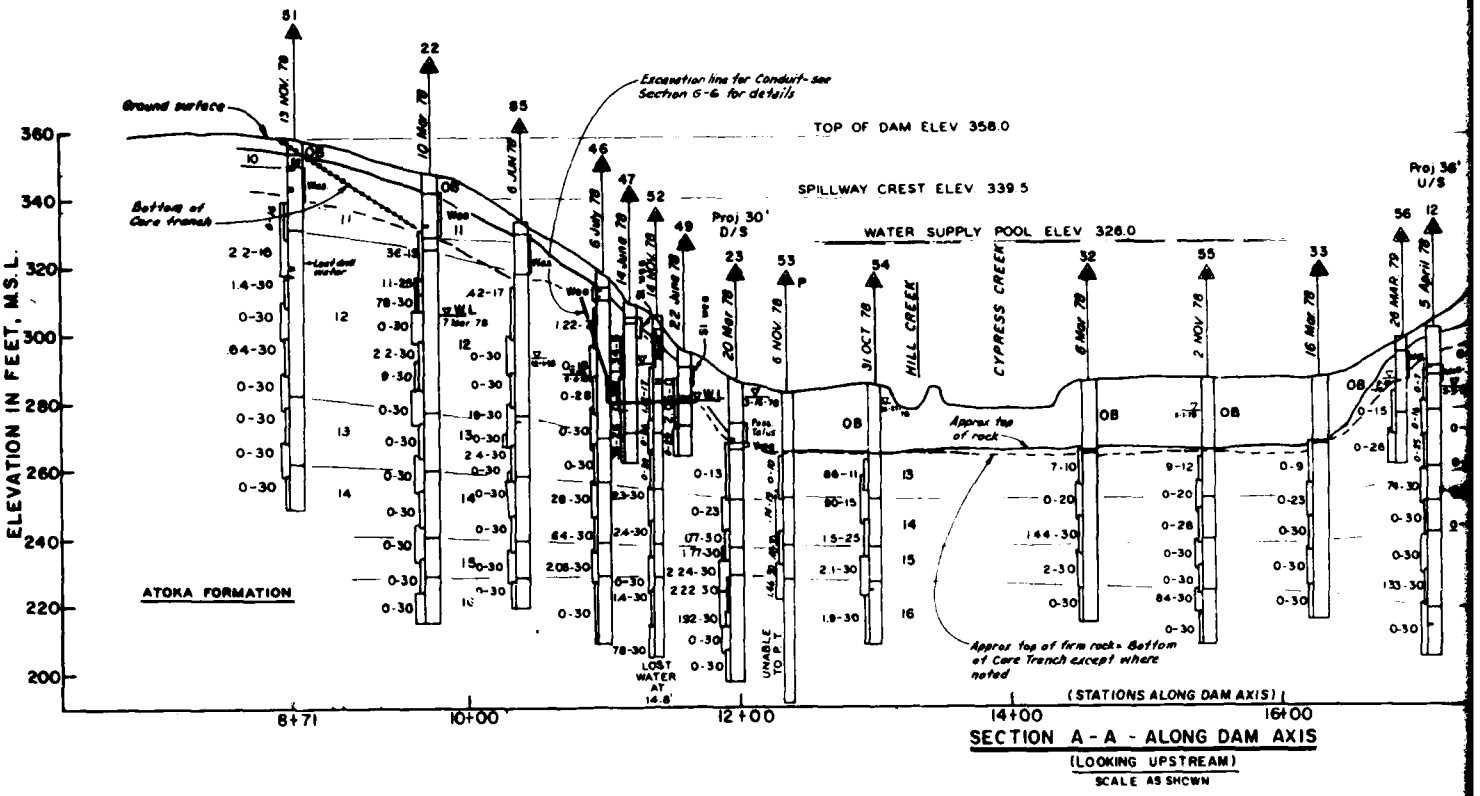
1. For Soils Sections below, see respective drawings: Sections A-A, N-N, O-O, P-P, Q-Q : Dwg. 1488. Sections R-R, S-S, T-T, U-U, V-V, W-W : Dwg. 1490. Sections B-B, E-E, G-G, H-H, I-I, K-K, L-L, X-X, Y-Y, Z-Z : Dwg 1489.
2. No Soils Sections exist for Sections C-C, D-D, F-F, J-J, or M-M
3. For general soils notes and legend see Dwg. 1488.
4. For all borings not shown in section view, see drawing 1491.

PLAN
SCALE 1" = 100'

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS
LITTLE ROCK, ARKANSAS

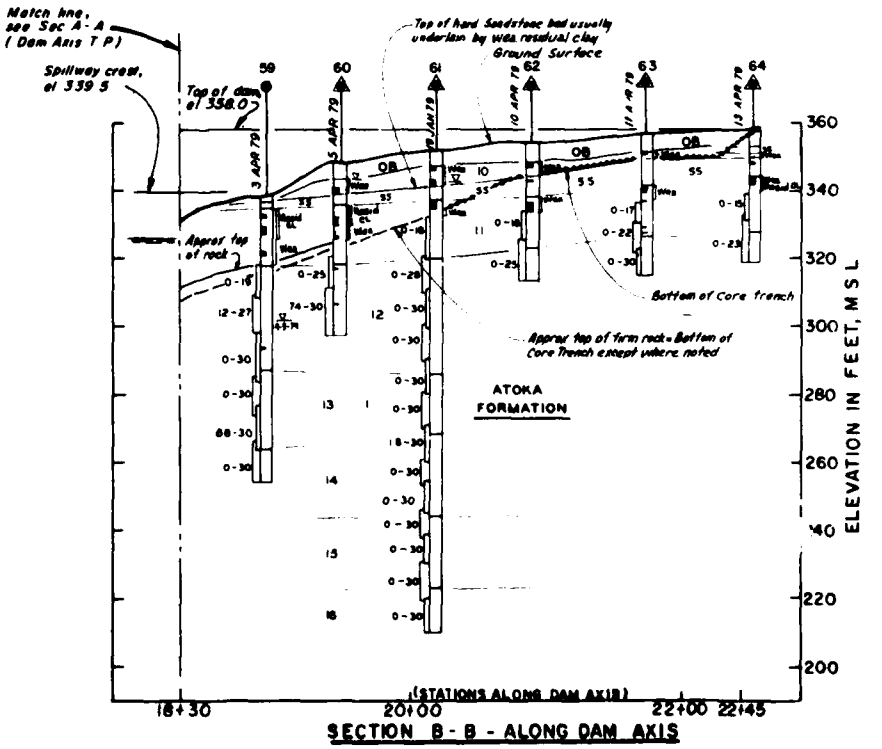
DESIGNED BY JMB	ARKANSAS RIVER & TRIBUTARIES ARKANSAS RIVER, ARKANSAS
DRAWN BY TDC	CONWAY WATER SUPPLY
CHECKED BY JMB	PLAN OF EXPLORATIONS
	DAM AND SPILLWAY
	MILE 6.7
SUBMITTED BY	SCALE 1" = 100' AUGUST 1979
ENGINEER	DRAWING NUMBER 9570-62/1477
	SHEET 5 OF 24



SECTION A - A - ALONG DAM AXIS

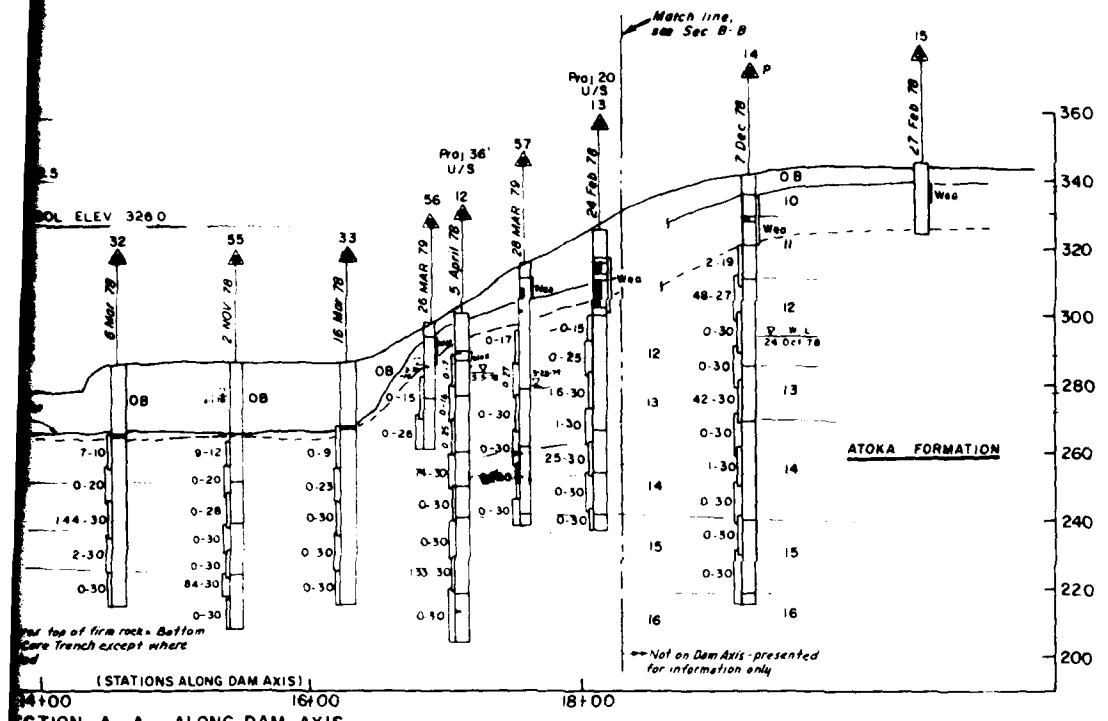
(LOOKING UPSTREAM)

SCALE AS SHOWN



SECTION B - B - ALONG DAM AXIS

WORK SAFELY



CTION A-A - ALONG DAM AXIS

(LOOKING UPSTREAM)

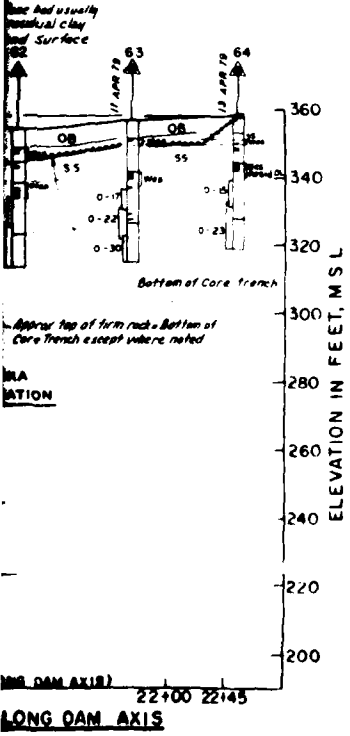
SCALE AS SHOWN

GENERALIZED GEOLOGIC COLUMN

SYSTEM	FORMATION	SECTION	THICKNESS IN FEET	UNIT	DESCRIPTION
PENNSYLVANIAN	ATOKA		7 to 30	10	SANDSTONE HARD, FINE TO MEDIUM GRAINED MEDIUM GRAY MICACEOUS, FOUND ONLY IN THE HIGHER ELEVATIONS OF BOTH ABUTTMENTS AS A CAPPING STRATA, USUALLY SLIGHTLY WEATHERED
			14 to 27	11	SHALE, SANDY MODERATELY HARD TO HARD, CEMENTED FINE GRAINED BLACK TO MEDIUM GRAY MICACEOUS, NUMEROUS SANDSTONE LAMINATIONS & INCLUSIONS, SOME LENSES OF SHALY SANDSTONE
			13 to 48	12	SHALE, SANDY HARD TO MODERATELY HARD FINE GRAINED CEMENTED BLACK TO MEDIUM GRAY MICACEOUS, NUMEROUS THICK TO THIN OFTEN IRREGULAR SANDSTONE LAMINATIONS & INCLUSIONS, ZONES OF WHICH OCCASSIONALLY GRADE INTO SHALY SANDSTONE
			11 to 27	13	SHALE, SANDY HARD TO MODERATELY HARD FINE GRAINED CEMENTED BLACK TO MEDIUM GRAY MICACEOUS, NUMEROUS SANDSTONE LAMINATIONS & INCLUSIONS, OCCASSIONAL SHALY SANDSTONE LENSES
			5 to 20	14	SHALE, SANDY HARD TO MODERATELY HARD FINE GRAINED CEMENTED BLACK TO MEDIUM GRAY MICACEOUS, SCATTERED SANDSTONE LAMINATIONS & INCLUSIONS
			7 to 24	15	SHALE, SANDY HARD TO MODERATELY HARD FINE GRAINED CEMENTED BLACK TO MEDIUM GRAY, WIDELY SCATTERED SANDSTONE LAMINATIONS & INCLUSIONS
			37	16	SHALE, MODERATELY HARD TO HARD, FINE GRAINED TO SILTY BLACK MICACEOUS, SCATTERED HARD SILTSTONE NODULES & LENSES ARE ENCOUNTERED IN THIS UNIT STARTING FROM ABOUT 10 TO 15' BELOW ITS TOP SURFACE

LEGEND

- NX CORE BORING
- SOILS BORING
- COMBINATION NX CORE & SOILS BORING
- COMBINATION SOILS & FISHTAILED BORING
- FISHTAILED BORING
- P PIEZOMETER
- 4-18-78 DATE DRILLED
- ▽ W.L. WATER LEVEL
- 136-20 PRESSURE TEST: 1.36 CFM @ 20 PSI
- 15 ROCK UNIT
- CORE LOSS
- TEST PIT



LONG DAM AXIS

NOTES

1. For general notes see Drawing 62/1477
2. For location of sections, see Drawing 62/1477
3. For detailed information of borings, pressure tests, core loss, weathering, fractures, joints, see logs of borings, contract specs
4. For overburden information see soil logs, contract specs.

DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS
LITTLE ROCK, ARKANSAS

DESIGNED BY: S C H
DRAWN BY: L L B
CHECKED BY: R K F
SUBMITTED BY: ENGINEER

ARKANSAS RIVER AND TRIBUTARIES — ARKANSAS RIVER, ARKANSAS

TOAD SUCK FERRY LOCK AND DAM
RELOCATIONS
CONWAY WATER SUPPLY
GEOLOGIC SECTIONS A-A AND B-B ALONG DAM AXIS

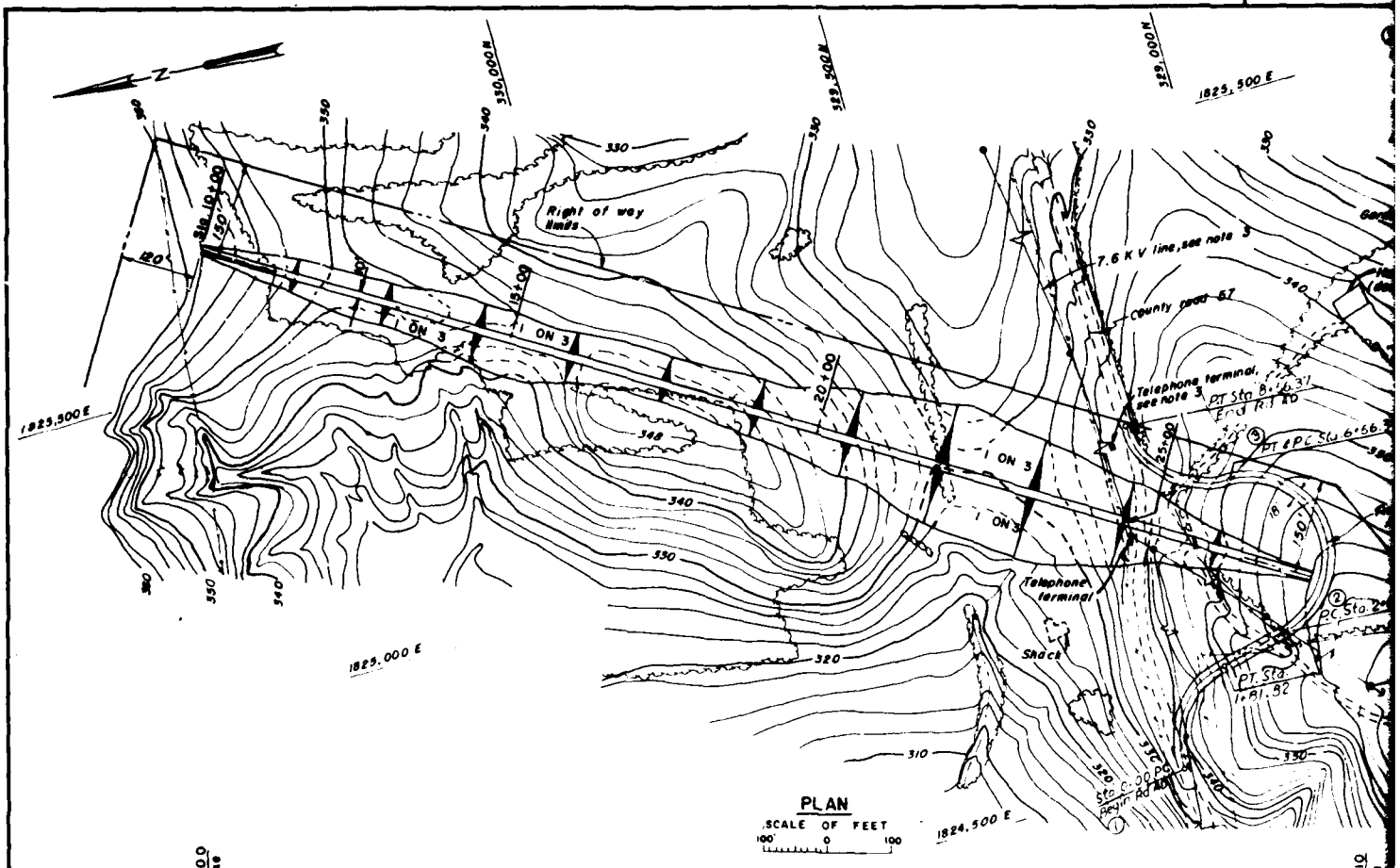
SCALE AS SHOWN

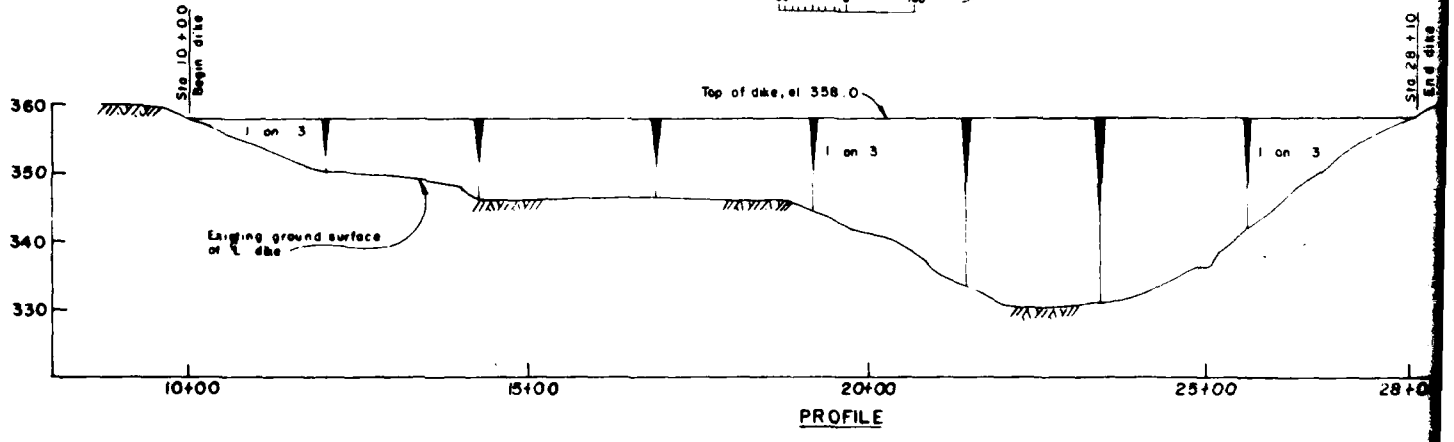
AUGUST 1979

NAV. SERIAL NO. 80-B-0084

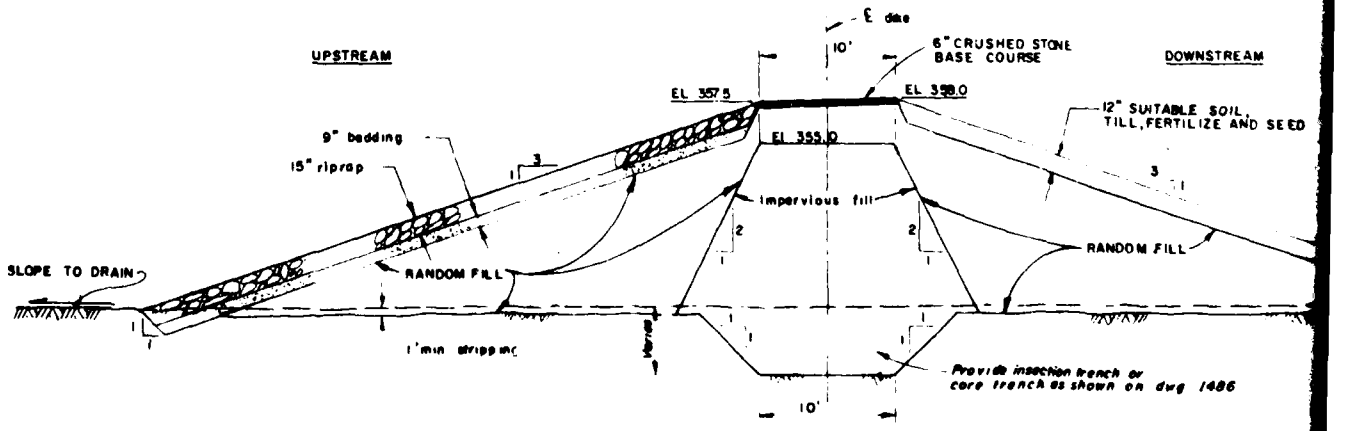
DRAWING NUMBER 9570-62/1479

SHEET 6 OF 9



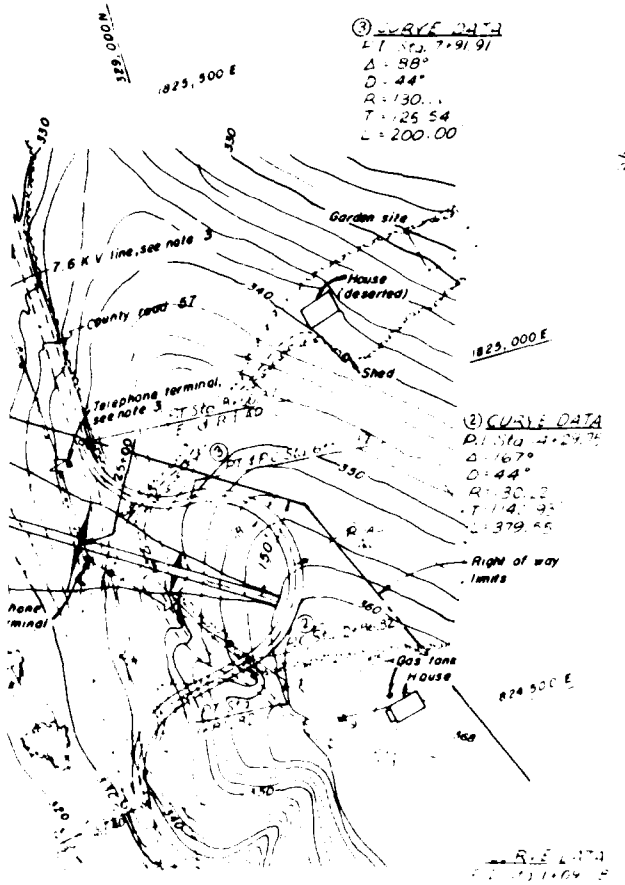


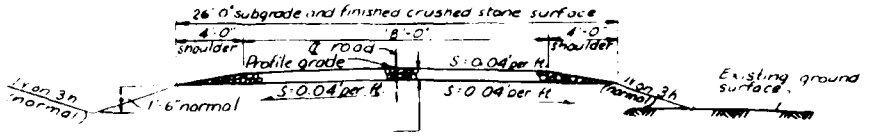
PROFILE



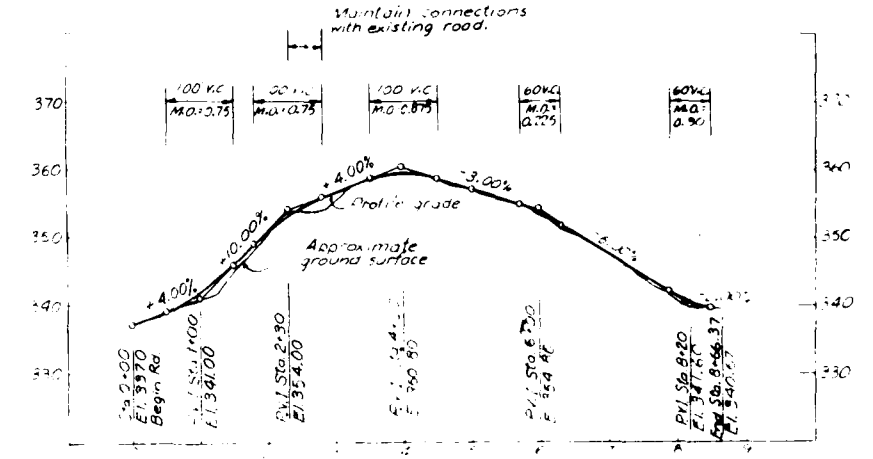
TYPICAL SECTION
SCALE OF FEET

WORK SAFELY

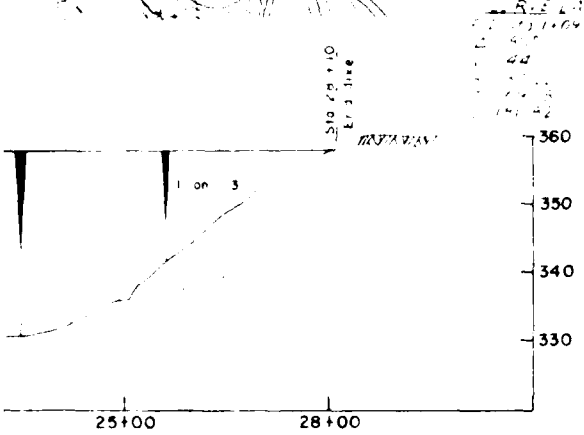




TYPICAL SECTION
(Rd. AD) Road around dike



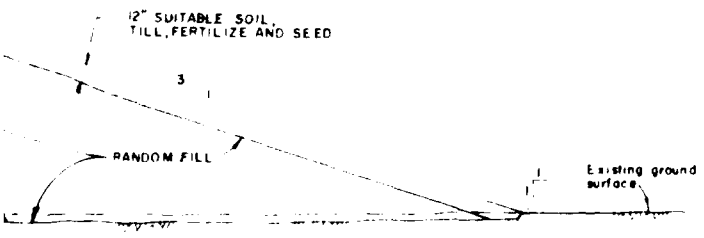
PROFILE (Rd. AD) Road dike



NOTES
1. For limits of R.O.W. see dwg. 1352
2. Clear 25' upstream and downstream of toe
3. The contractor shall be responsible for arrangements with the owners of the utility lines for the relocation of these lines, see general notes dwg. 1350

USHED STONE COURSE

DOWNSTREAM



with inspection trench or
e trench as shown on dwg. 1486

REVISION	DATE	DESCRIPTION	BY

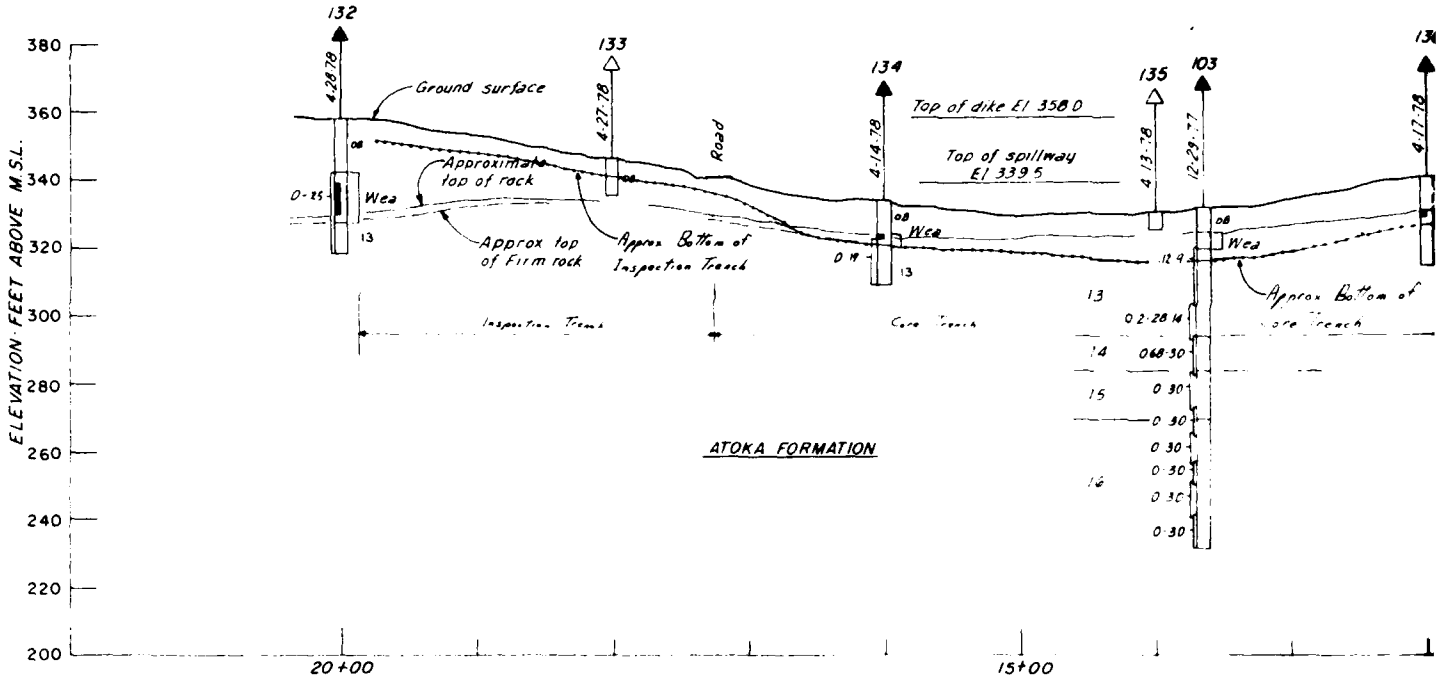
DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT CORPS OF ENGINEERS
LITTLE ROCK, ARKANSAS

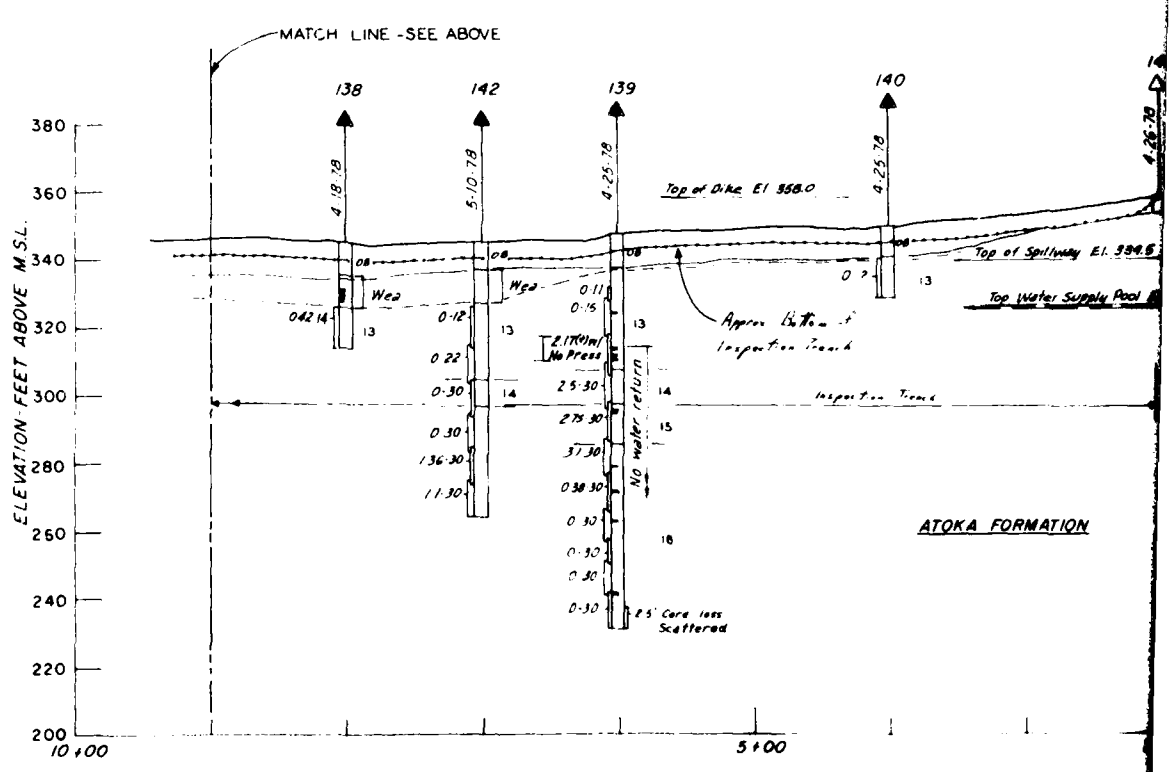
ARKANSAS RIVER AND TRIBUTARIES — ARKANSAS RIVER, ARKANSAS

TOAD SUCK FERRY LOCK AND DAM
RELOCATIONS
CONWAY WATER SUPPLY
DIKE
PLAN, PROFILE AND TYPICAL SECTION

SCALE AS SHOWN — AUGUST 1979

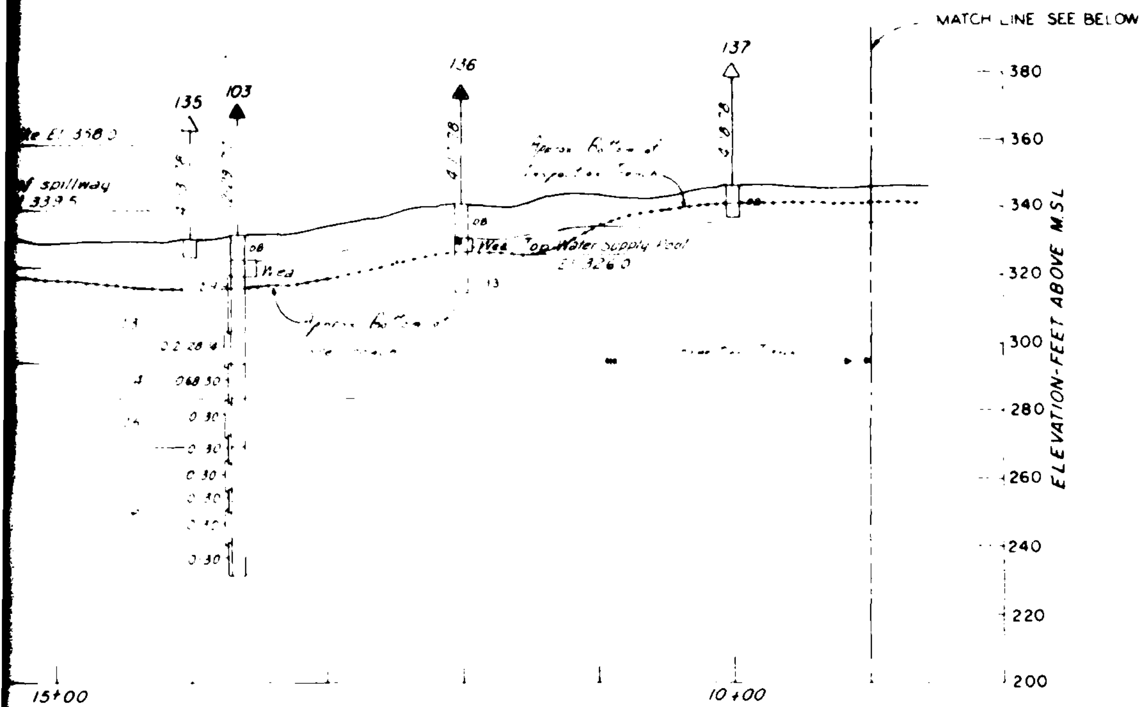
DRAWING NUMBER
9570-62/1372





SECTION X-X
ALONG ℄ OF DIKE
(LOOKING LAKEWARD)
SCALE AS SHOWN

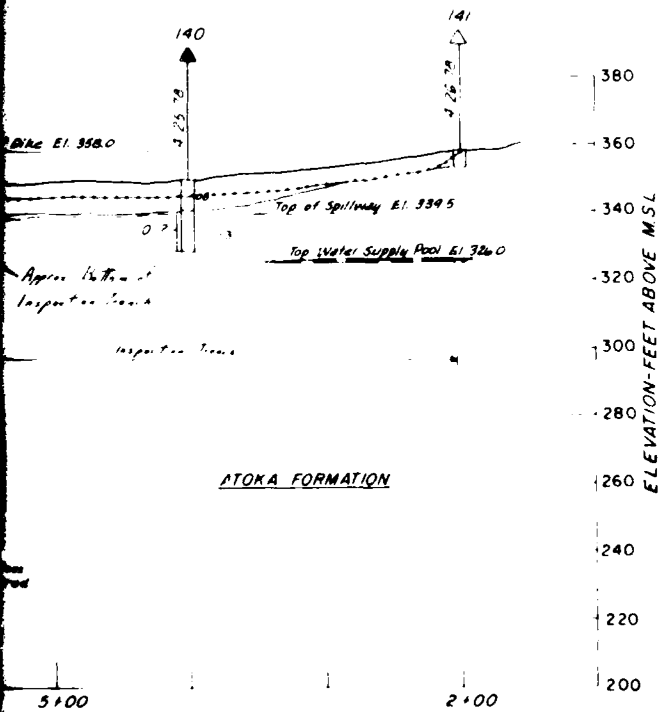
WORK SAFELY



GENERALIZED GEOLOGIC COLUMN					
SYSTEM	FORMATION	SECTION	THICKNESS IN FEET	UNIT	DESCRIPTION
PENNSYLVANIAN	ATOKA		0 to 30	10	SANDSTONE, HARD, FINE TO MEDIUM GRAINED, MEDIUM GRAY, MICACEOUS, FOUND ONLY IN THE HIGHER ELEVATIONS OF BOTH ABUTMENTS AS A CAPPING STRATA, USUALLY SLIGHTLY WEATHERED
			14 to 27	11	SHALE, SANDY, MODERATELY HARD TO HARD, CEMENTED, FINE GRAINED, BLACK TO MEDIUM GRAY, MICACEOUS, NUMEROUS SANDSTONE LAMINATIONS & INCLUSIONS, SOME LENSES OF SHALY SANDSTONE
			13 to 48	12	SHALE, SANDY, HARD TO MODERATELY HARD, FINE GRAINED, CEMENTED, BLACK TO MEDIUM GRAY, MICACEOUS, NUMEROUS THICK TO THIN OFTEN IRREGULAR SANDSTONE LAMINATIONS & INCLUSIONS, ZONES OF WHICH OCCASIONALLY GRADE INTO SHALY SANDSTONE
			11 to 27	13	SHALE, SANDY, HARD TO MODERATELY HARD, FINE GRAINED, CEMENTED, BLACK TO MEDIUM GRAY, MICACEOUS, NUMEROUS SANDSTONE LAMINATIONS & INCLUSIONS, OCCASIONAL SHALY SANDSTONE LENSES
			5 to 20	14	SHALE, SANDY, HARD TO MODERATELY HARD, FINE GRAINED, CEMENTED, BLACK TO MEDIUM GRAY, MICACEOUS, SCATTERED SANDSTONE LAMINATIONS & INCLUSIONS
			7 to 24	15	SHALE, SANDY, HARD TO MODERATELY HARD, FINE GRAINED, CEMENTED, BLACK TO MEDIUM GRAY, WIDELY SCATTERED SANDSTONE LAMINATIONS & INCLUSIONS
			37+	16	SHALE, MODERATELY HARD TO HARD, FINE GRAINED TO SILTY, BLACK, MICACEOUS, SCATTERED HARD SILTSTONE NODULES & LENSES ARE ENCOUNTERED IN THIS UNIT STARTING FROM ABOUT 10 TO 15' BELOW ITS TOP SURFACE

LEGEND

- ● NX CORE BORING
- △ SOILS BORING
- ▲ COMBINATION NX CORE & SOILS BORING
- ▲ COMBINATION SOILS & FISHTAILED BORING
- ● FISHTAILED BORING
- P PIEZOMETER
- 4-18-78 DATE DRILLED
- W.L. WATER LEVEL
- 1.36-20 PRESSURE TEST: 1.36 CFM @ 20 PSI
- 15 ROCK UNIT
- CORE LOSS



NOTES:
1. For general notes see drawing 62/1417
2. For location of Section see drawing 62/1418
3. For detailed information of Borings, Pressure Tests, Core Loss, weathering, fractures, joints, see Boring Logs, Contract Specs
4. For overburden information see Soils Logs, Contract Specs

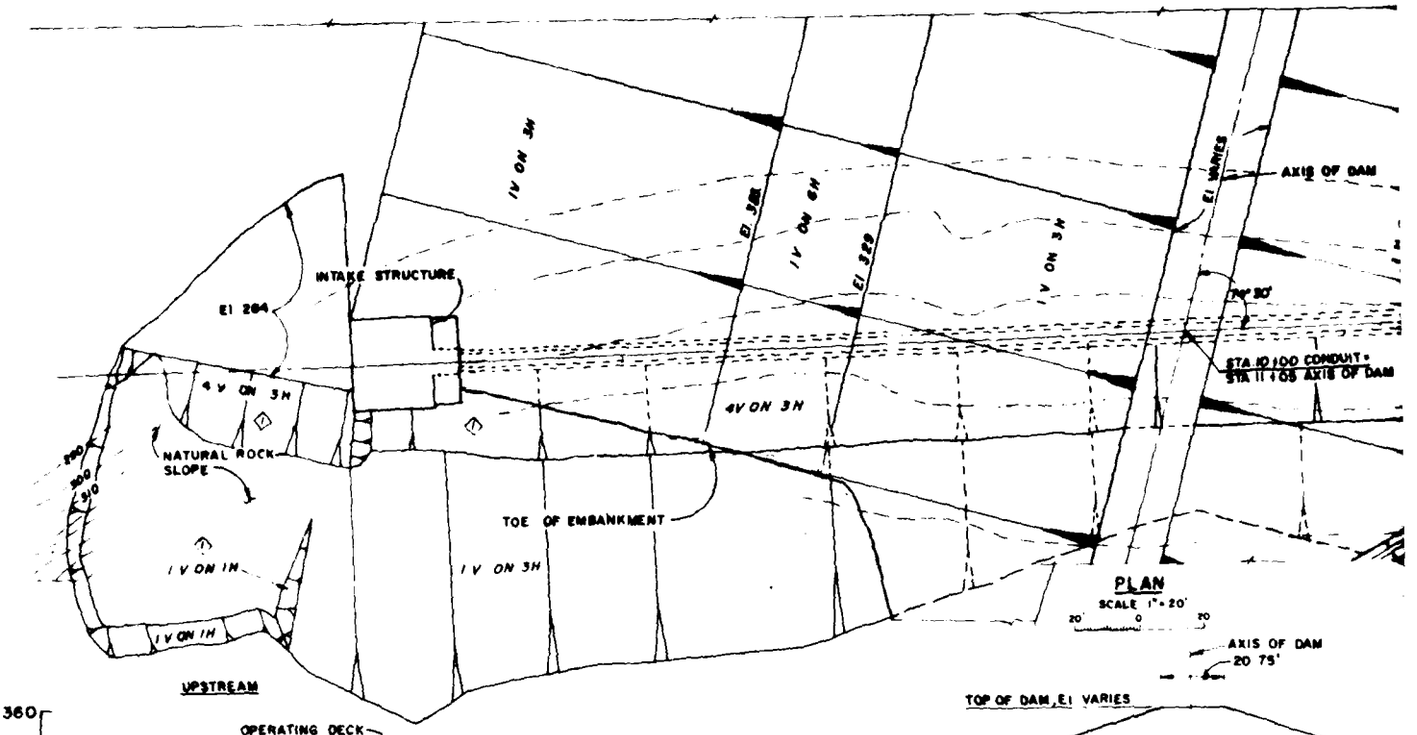
REVISION	DATE	DESCRIPTION	BY

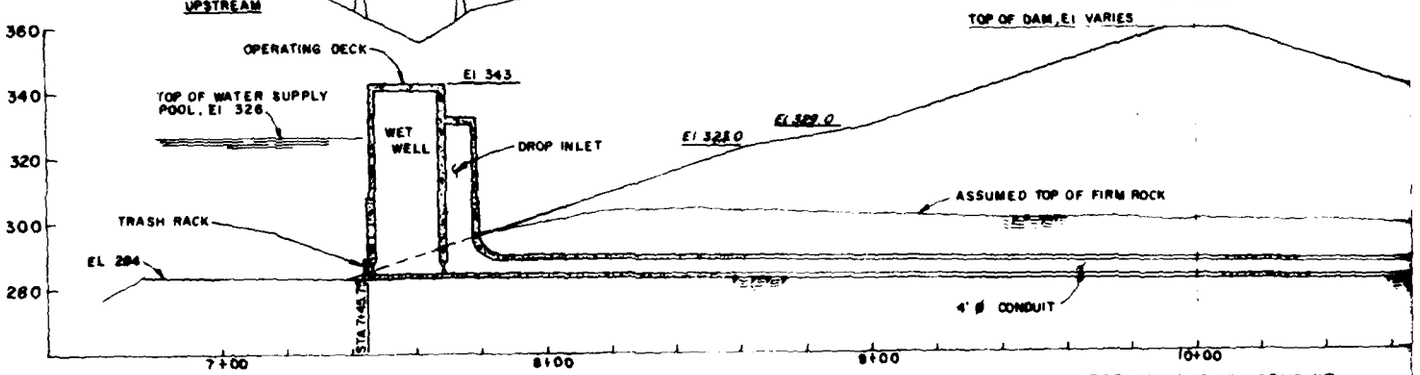
DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS
LITTLE ROCK, ARKANSAS

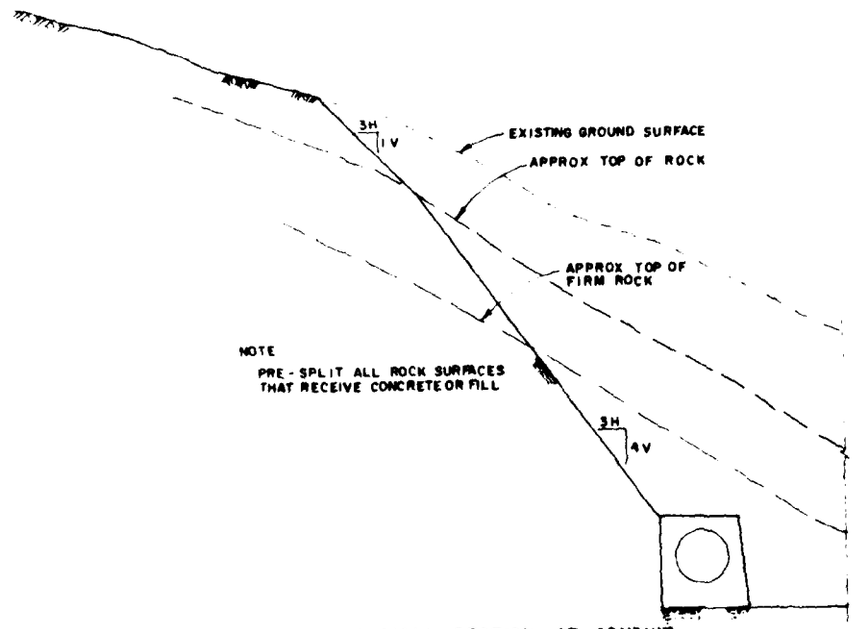
ARKANSAS RIVER AND TRIBUTARIES — ARKANSAS RIVER, ARKANSAS

TOAD SUCK FERRY LOCK AND DAM
RELOCATIONS
CONWAY WATER SUPPLY
GEOLOGIC SECTION ALONG ℄ OF DIKE
SECTION X-X

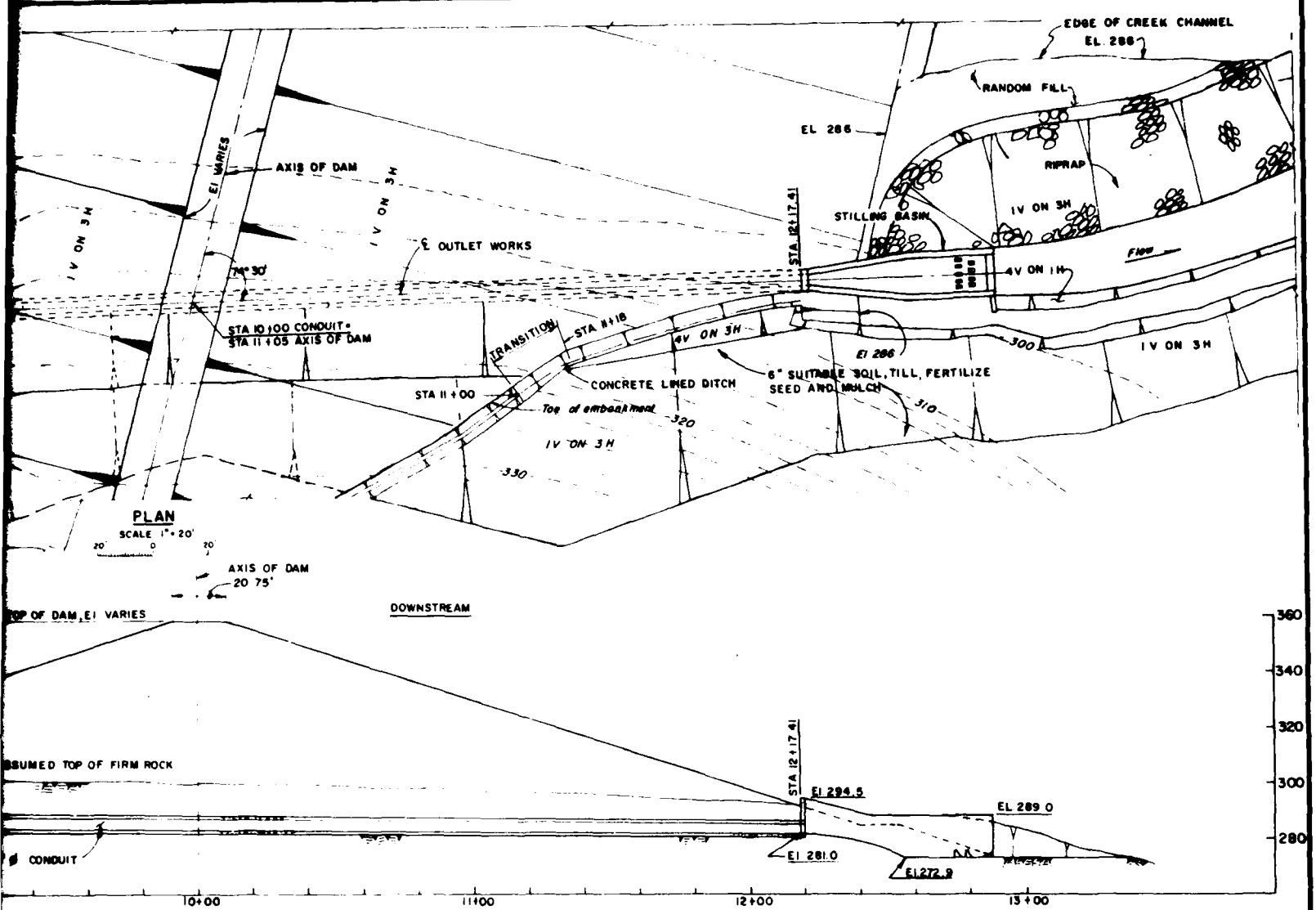
DESIGNED BY: JMB
DRAWN BY: JKP
CHECKED BY: RKF
SUBMITTED BY: [signature] ENGINEER
SCALE AS SHOWN
AUGUST 1979
DRAWING NUMBER 9570-62/1486


1V ON 3H
EL 328
1V ON 6H
EL 329
1V ON 3H
EL VARIES
AXIS OF DAM
INTAKE STRUCTURE
EL 284
4V ON 3H
NATURAL ROCK SLOPE
4V ON 3H
TOE OF EMBANKMENT
1V ON 1H
1V ON 3H
1V ON 1H
STA 10+00 CONDUIT = STA 11+05 AXIS OF DAM
PLAN
SCALE 1"=20'
AXIS OF DAM
UPSTREAM


360
340
320
300
280
OPERATING DECK
EL 343
TOP OF WATER SUPPLY POOL, EL 328
WET WELL
DROP INLET
EL 328.0
TOP OF DAM, EL VARIES
ASSUMED TOP OF FIRM ROCK
TRASH RACK
EL 284
4' ø CONDUIT
7+00
8+00
9+00
10+00
PROFILE ALONG CONDUIT
SCALE 1"=20'


3H
1V
EXISTING GROUND SURFACE
APPROX TOP OF ROCK
APPROX TOP OF FIRM ROCK
NOTE
PRE-SPLIT ALL ROCK SURFACES THAT RECEIVE CONCRETE OR FILL
3H
4V
TYPICAL SECTION AT CONDUIT
SCALE 1"=8'

WORK SAFELY



PROFILE ALONG CONDUIT
SCALE 1" = 20'

NOTES:
1. For general notes see dwg 1350
2. See dwg 1433 thru 1439 for details of conduit and stilling basin
3. Details of intake structure are shown on dwgs 1443 thru 1453

THIS DRAWING HAS BEEN REDUCED TO ONE-HALF THE ORIGINAL SCALE

DIVISION	DATE	DESCRIPTION	BY
1	11-1-79	Revised upstream slopes of intake structure Amend No. 0001	LLB

DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS
LITTLE ROCK, ARKANSAS

ARKANSAS RIVER AND TRIBUTARIES — ARKANSAS RIVER, ARKANSAS

DESIGNED BY J W
DRAWN BY L L B
CHECKED BY J W
SUBMITTED BY
RECOMMENDED

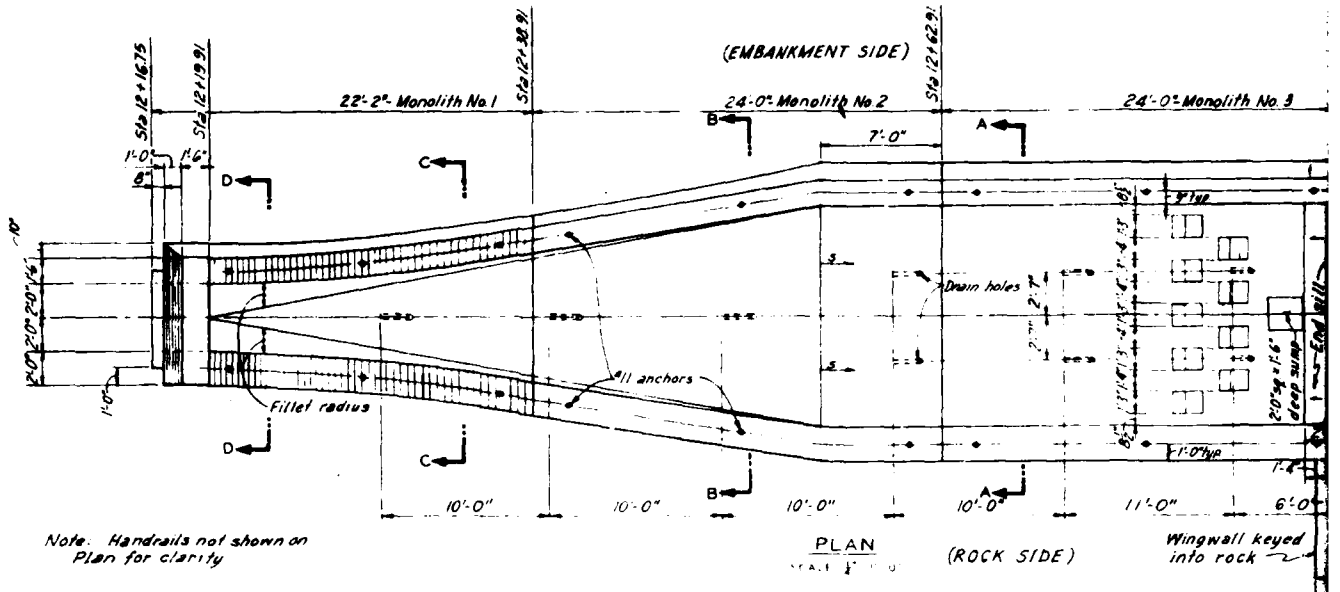
TOAD SUCK FERRY LOCK AND DAM
RELOCATIONS
CONWAY WATER SUPPLY
OUTLET WORKS
PLAN, PROFILE AND TYPICAL SECTION

SCALE AS SHOWN — AUGUST 1979

DRAWING NUMBER 9570-62/1359

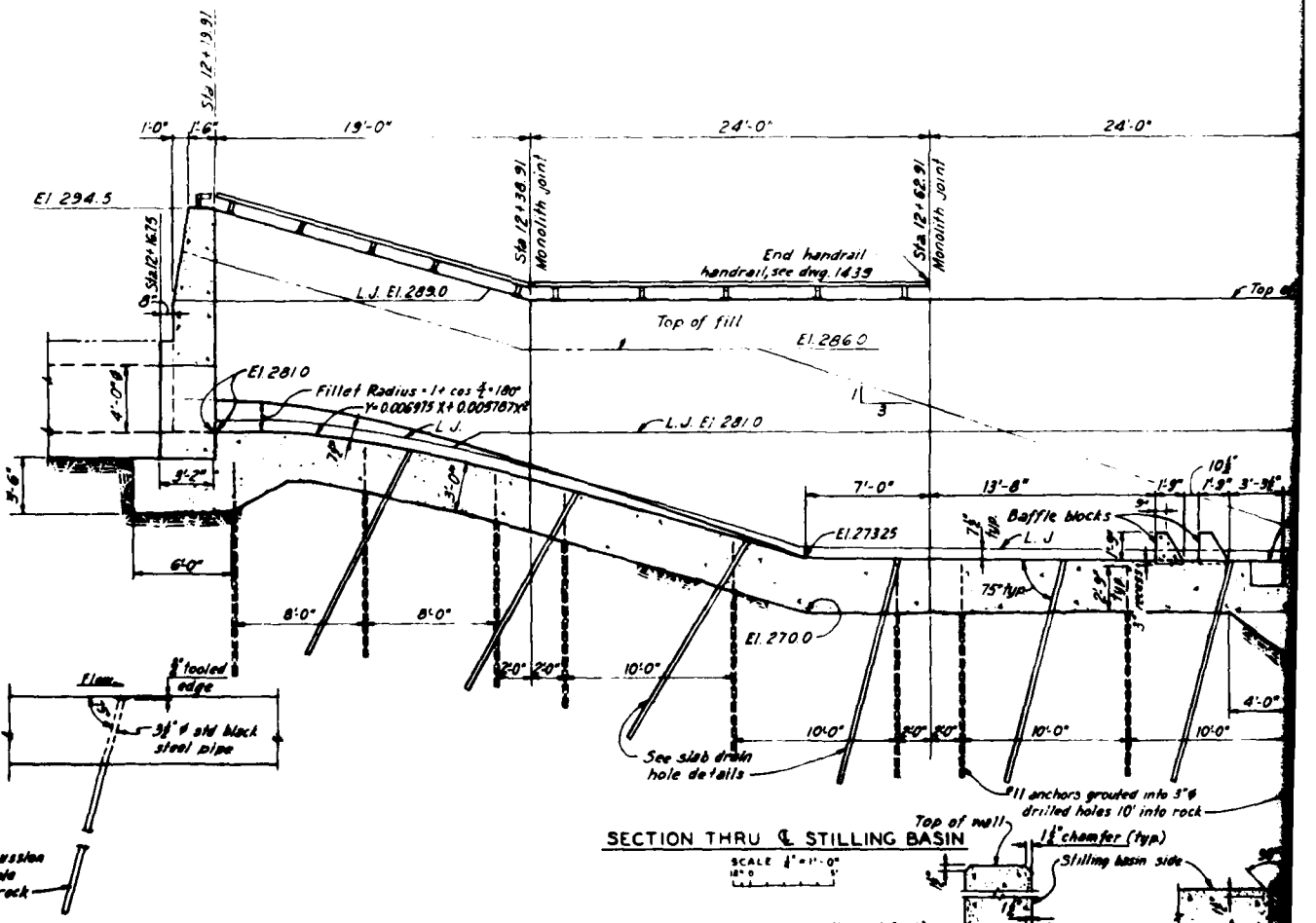
SHEET 8 OF 63

INC'L 1 — AMEND NO 000



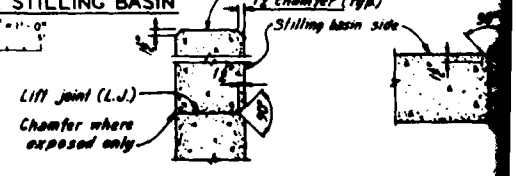
Note: Handrails not shown on Plan for clarity

PLAN



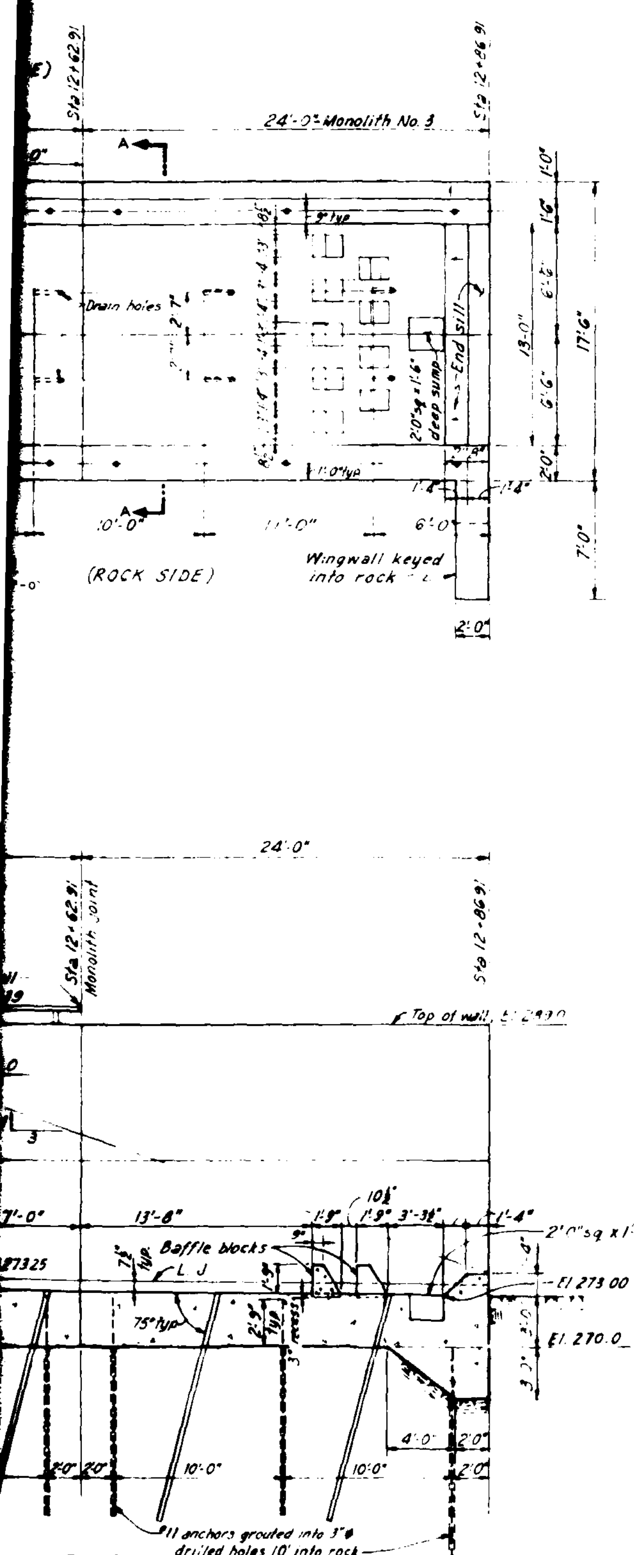
TYPICAL SLAB DRAIN HOLE DETAIL
SCALE NONE

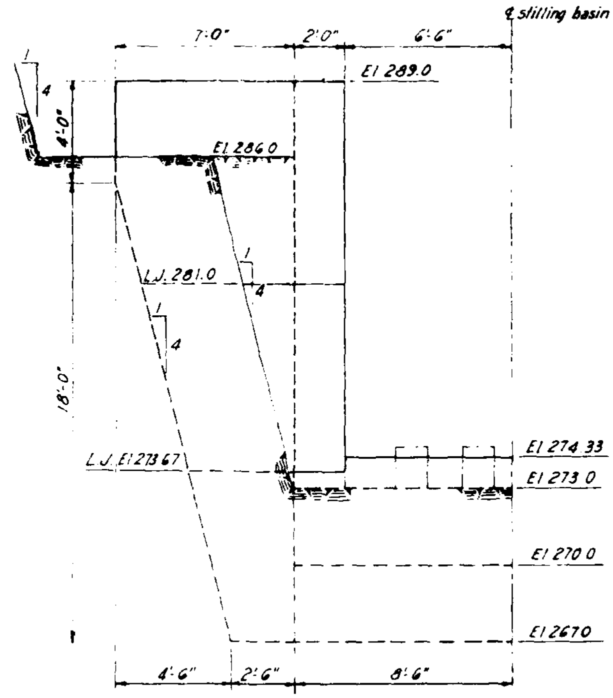
SECTION THRU ℄ STILLING BASIN
SCALE



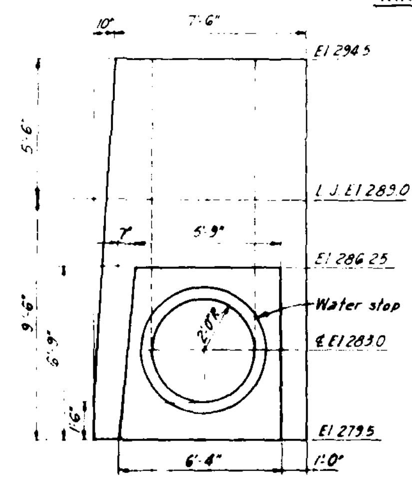
WALL MONOLITH & LIFT
SCALE NONE

WORK SAFELY





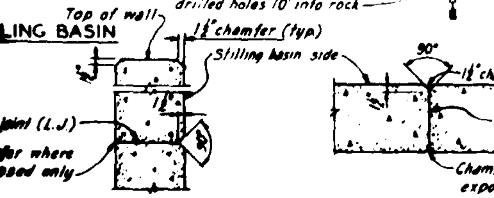
WINGWALL-DOWNSTREAM ELEVATION



HEADWALL-UPSTREAM ELEVATION

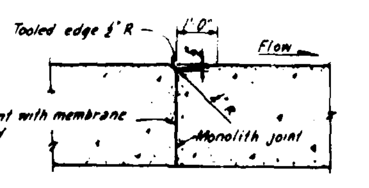
NOTES

1. Concrete for slab, end sill, and baffle blocks to have a 28 day compressive strength of 4,000 p.s.i.
2. Concrete for walls, headwall, and wingwall to have a 28 day compressive strength of 3,000 p.s.i.
3. For water stop details see dwg. 1433
4. The last few inches of rock excavation adjacent to concrete pours shall be removed during clean up operation just prior to concrete placement
5. Sections A-A, B-B, C-C and D-D appear on drawing 1436.



WALL MONOLITH & LIFT JOINT

SCALE NONE



TYPICAL SLAB MONOLITH JOINT

SCALE NONE

DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS
LITTLE ROCK, ARKANSAS

ARKANSAS RIVER AND TRIBUTARIES — ARKANSAS RIVER, ARKANSAS

TOAD SUCK FERRY LOCK AND DAM

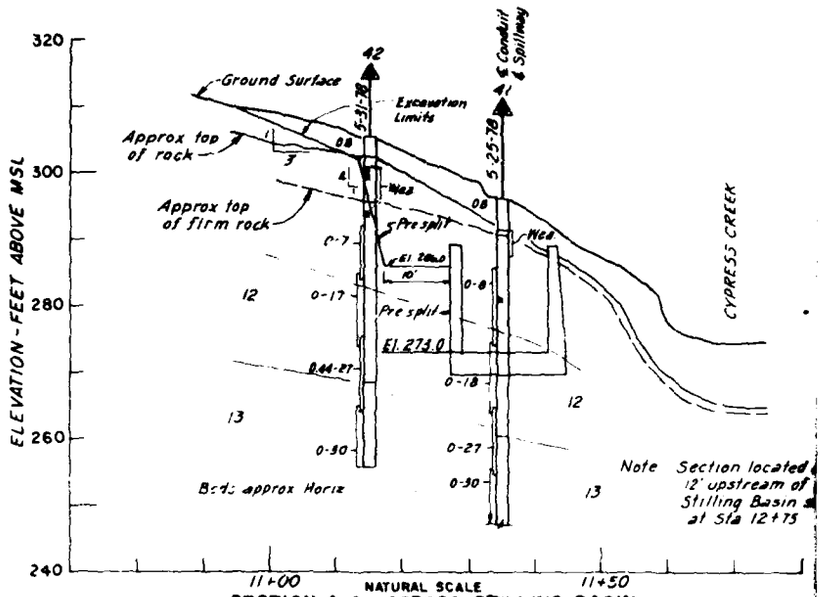
RELOCATIONS

CONWAY WATER SUPPLY
OUTLET WORKS-STILLING BASIN
PLAN, ELEVATION AND SECTIONS

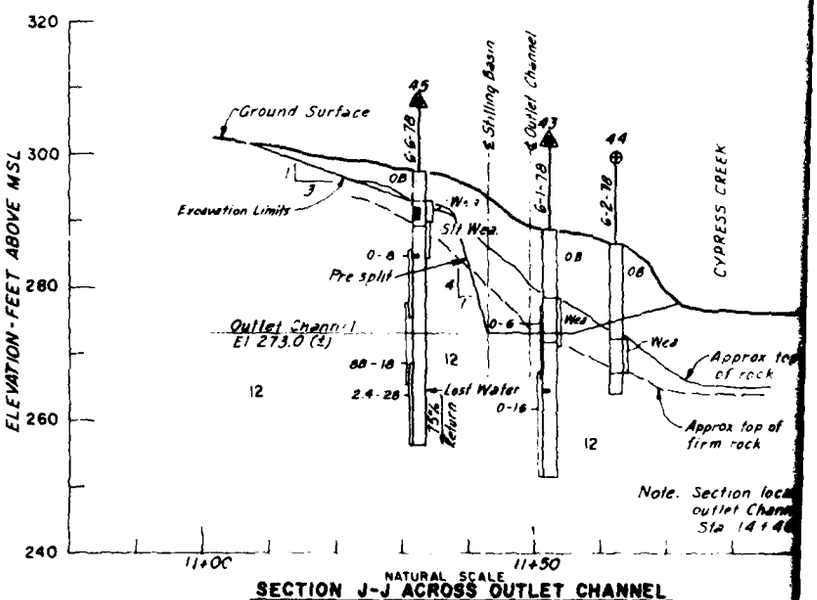
SCALE AS SHOWN

AUGUST 1979

9570-62/1435

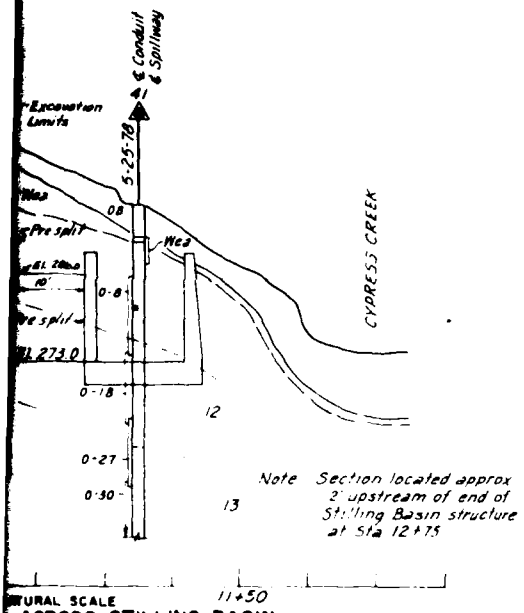


SECTION 1-1 - ACROSS STILLING BASIN
LOOKING UPSTREAM



SECTION J-J ACROSS OUTLET CHANNEL
(LOOKING UPSTREAM)

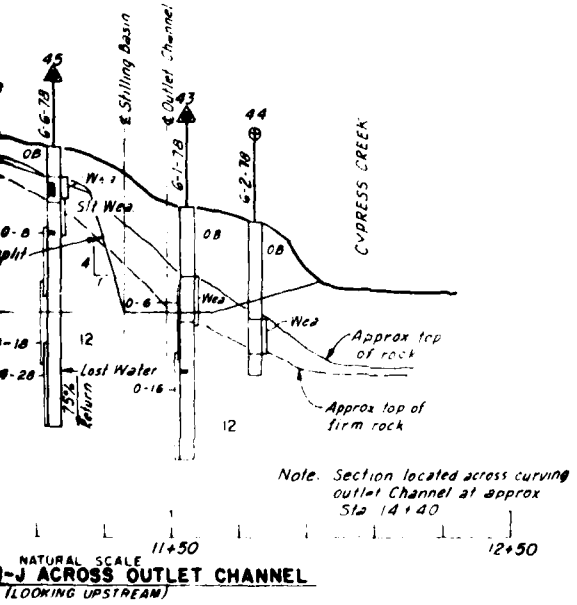
WORK SAFELY



NATURAL SCALE

A-A ACROSS STILLING BASIN

LOOKING UPSTREAM



NATURAL SCALE

I-I & J-J ACROSS OUTLET CHANNEL

(LOOKING UPSTREAM)

GENERALIZED GEOLOGIC COLUMN

SYSTEM	FORMATION	SECTION	THICKNESS IN FEET	UNIT	DESCRIPTION
PENNSYLVANIAN	ATOKA		7 to 30	10	SANDSTONE, HARD, FINE TO MEDIUM GRAINED, MEDIUM GRAY MICACEOUS, FOUND ONLY IN THE HIGHER ELEVATIONS OF BOTH ABUTMENTS AS A CAPPING STRATA, USUALLY SLIGHTLY WEATHERED
			14 to 17	11	SHALE, SANDY, MODERATELY HARD TO HARD, CEMENTED, FINE GRAINED, BLACK TO MEDIUM GRAY, MICACEOUS, NUMEROUS SANDSTONE LAMINATIONS & INCLUSIONS, SOME LENSES OF SHALY SANDSTONE
			13 to 68	12	SHALE, SANDY, HARD TO MODERATELY HARD, FINE GRAINED, CEMENTED, BLACK TO MEDIUM GRAY, MICACEOUS, NUMEROUS THICK TO THIN OFTEN LENTICULAR SANDSTONE LAMINATIONS & INCLUSIONS ZONES OF WHICH OCCASIONALLY GRADE INTO SHALY SANDSTONE
			11 to 27	13	SHALE, SANDY, HARD TO MODERATELY HARD, FINE GRAINED, CEMENTED, BLACK TO MEDIUM GRAY, MICACEOUS, NUMEROUS SANDSTONE LAMINATIONS & INCLUSIONS, OCCASIONAL SHALY SANDSTONE LENSES
			5 to 20	14	SHALE, SANDY, HARD TO MODERATELY HARD, FINE GRAINED, CEMENTED, BLACK TO MEDIUM GRAY, MICACEOUS, SCATTERED SANDSTONE LAMINATIONS & INCLUSIONS
			7 to 24	15	SHALE, SANDY, HARD TO MODERATELY HARD, FINE GRAINED, CEMENTED, BLACK TO MEDIUM GRAY, WIDELY SCATTERED SANDSTONE LAMINATIONS & INCLUSIONS
			37	16	SHALE, MODERATELY HARD TO HARD, FINE GRAINED TO SILTY BLACK, MICACEOUS, SCATTERED HARD SILTSTONE NODULES & LENSES ARE ENCOUNTERED IN THIS UNIT STARTING FROM ABOUT 10 TO 15 BELOW ITS TOP SURFACE

LEGEND

- ● NX CORE BORING
- △ SOILS BORING
- ▲ COMBINATION NX CORE & SOILS BORING
- ▲ COMBINATION SOILS & FISHTAILED BORING
- ⊕ FISHTAILED BORING
- P PIEZOMETER
- 4-18-78 DATE DRILLED
- ▽ WL WATER LEVEL
- 136-20 PRESSURE TEST: 136 CFM @ 20 PSI
- 15 ROCK UNIT
- ■ CORE LOSS
- □ TEST PIT

NOTES:

1. For general notes see Drawing 62/1477
2. For location of Section see Drawing 62/1877
3. For detailed informati. of Borings, Pressure Tests, Core Loss, weathering, fractures, joints, see Boring Logs, Contract Specs.
4. For overburden information see Soils Logs, Contract Specs.

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS
LITTLE ROCK ARKANSAS

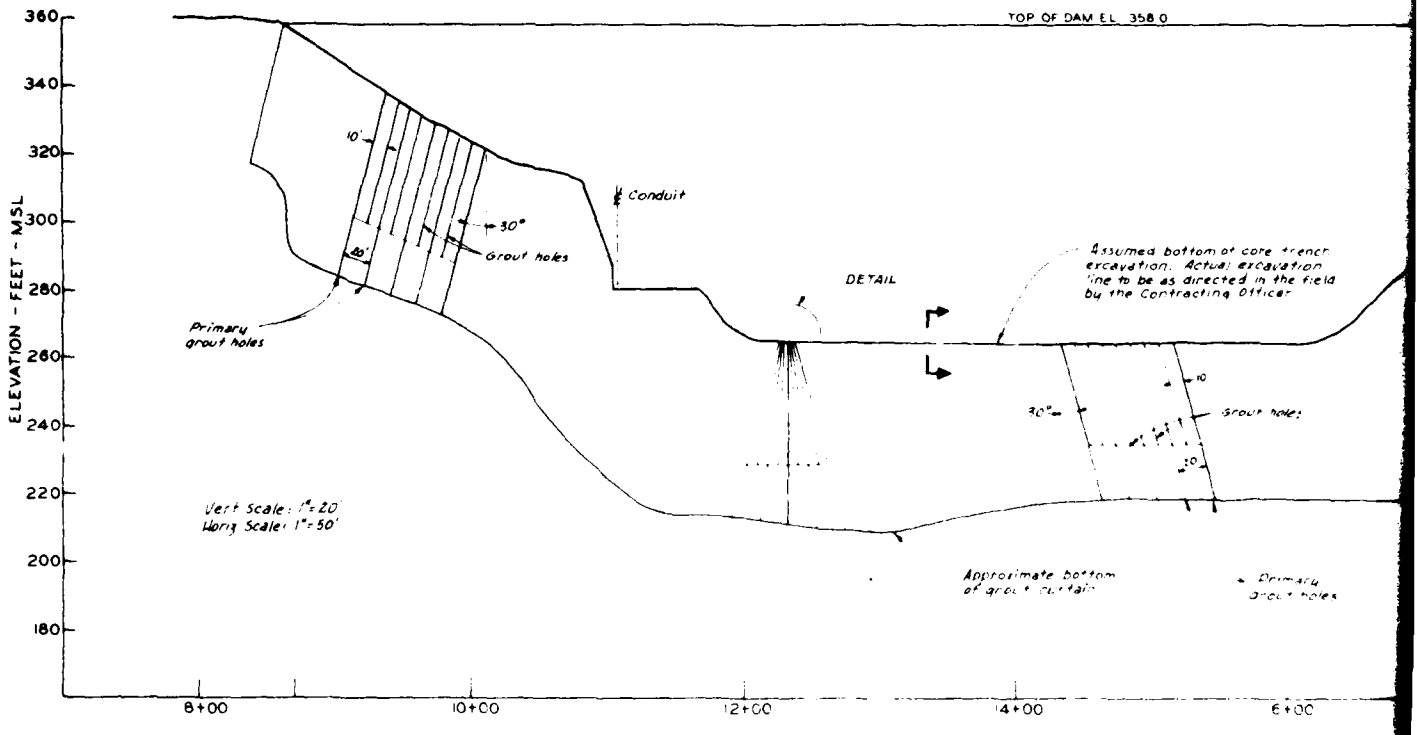
DESIGNED BY JWB
DRAWN BY JWP
CHECKED BY RKF
SUBMITTED BY ENGINEER

ARKANSAS RIVER AND TRIBUTARIES ARKANSAS RIVER, ARKANSAS

TOAD SUCK FERRY LOCK AND DAM
RELOCATIONS
CONWAY WATER SUPPLY
GEOLOGIC SECTIONS ACROSS STILLING BASIN, SECTIONS I-I & J-J

SCALE AS SHOWN
AUGUST 1979
SPV SERIAL NO 80-8-0001

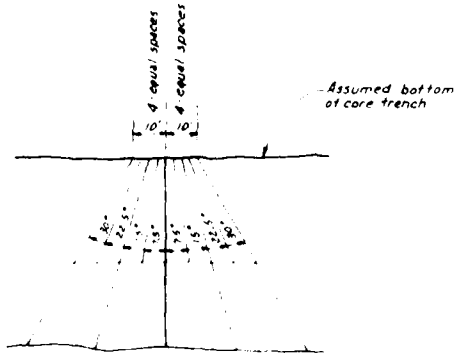
DRAWING NUMBER
SHEET 11 OF 19
9570-62/1482



SECTION ALONG LINE OF GROUT CURT

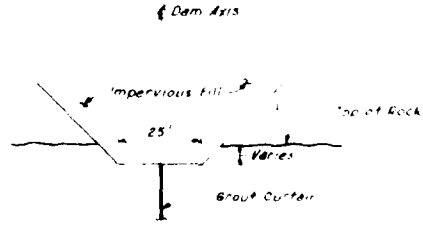
(LOOKING UPSTREAM)

SCALE AS SHOWN



DETAIL

SCALE 1" = 20'



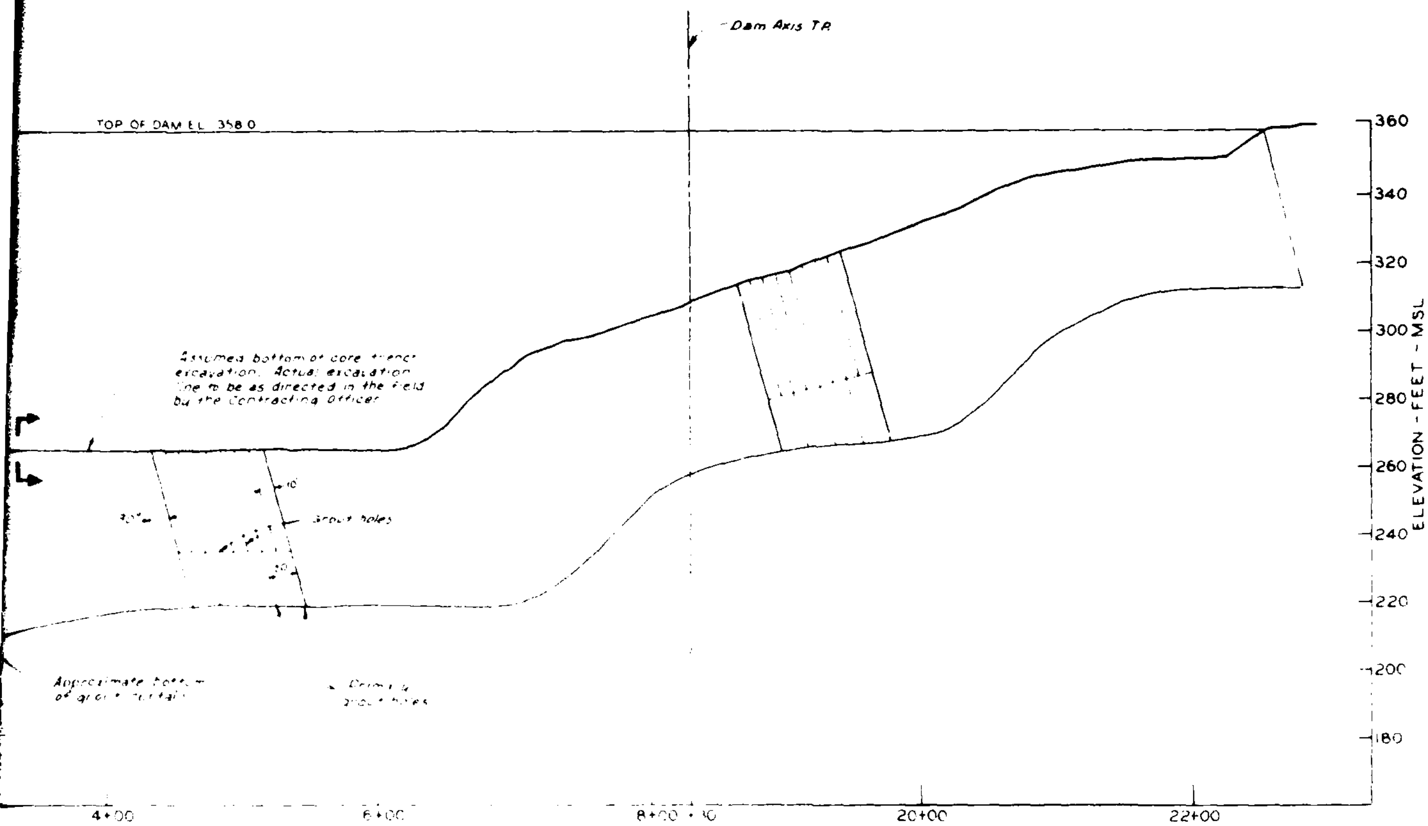
SECTION

SCALE 1" = 20'

NOT

WORK SAFELY

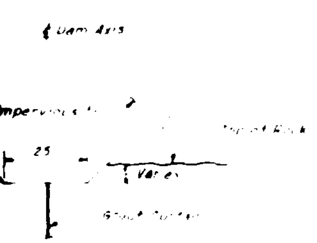
VALUE ENGINEERING WILL INCREASE YOUR PROFIT



ECTION ALONG LINE OF GROUT CURTAIN

(LOOKING UPSTREAM)

SCALE: AS SHOWN



SECTION

SCALE 1" = 20'

NOTES:

1. All grout holes to be drilled from top of rock (excavation grade) through ... grouted into top of rock or as otherwise directed by the Contracting Officer. Depths, spacing, pressure testing and grouting will be as directed by the Contracting Officer.

DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS
LITTLE ROCK, ARKANSAS

ARKANSAS RIVER & TRIBUTARIES ARKANSAS RIVER ARKANSAS

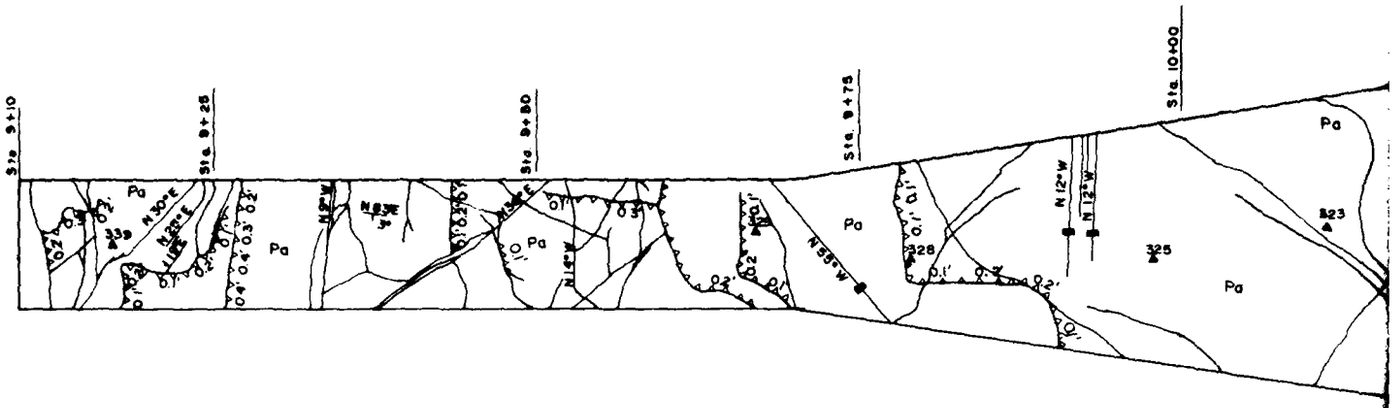
TOAD SUCK FERRY LOCK AND DAM
RELOCATIONS
CONWAY WATER SUPPLY
FOUNDATION TREATMENT

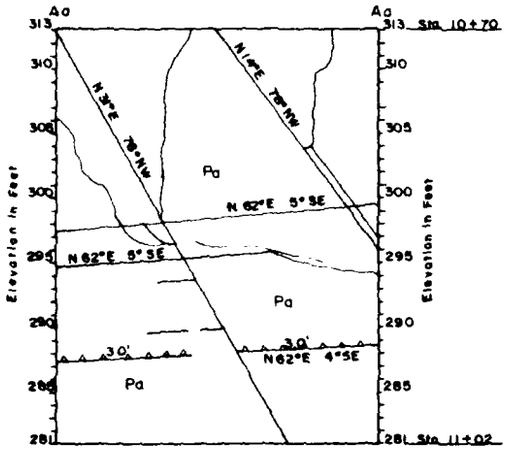
DESIGNED BY: JMB
DRAWN BY: JMB
CHECKED BY: RKF
SUBMITTED BY:
ENGINEER

AUGUST 1979

SHEET 12 OF 24

9570-62/1487





GEOLOGIC SECTION Aa-Ag

Scale: 1"= 5'

5 4 3 2 1 0 1 2 3 4 5

PLAN

Scale: 1"= 5'

5 4 3 2 1 0 1 2 3 4 5

EXPLANATIO

N 12° E / 87° — Joint, showi... where appro...

Fracture, (r... strike and d...

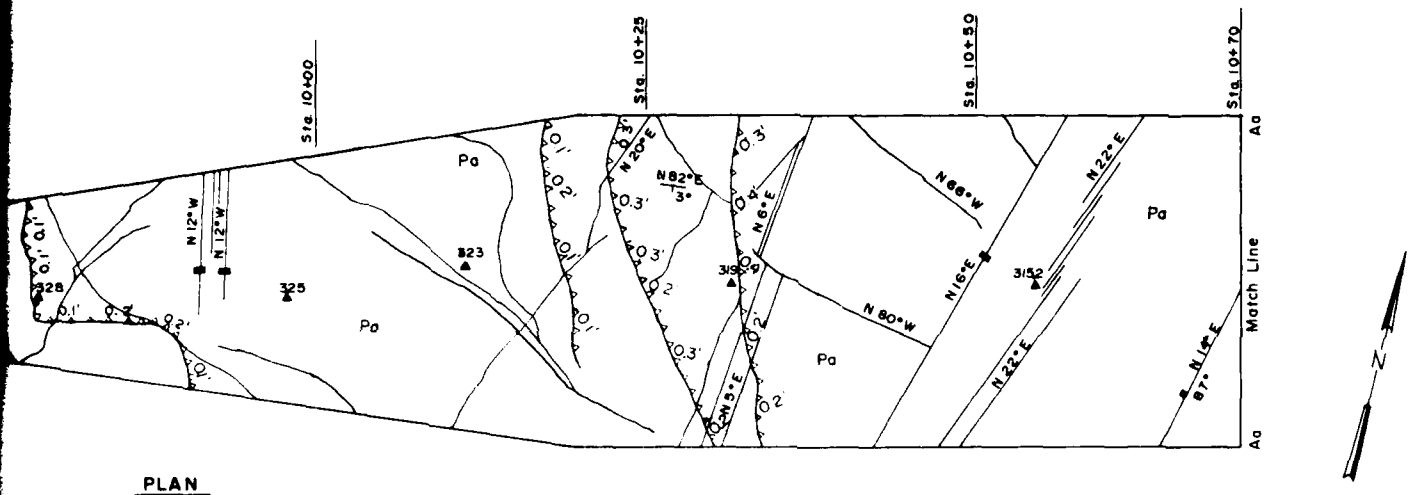
0.3' 0.4' 0.2' — Rock Ledge, ... ledge, numer...

▲ 339 — Elevation, (... by triangle.

Pa — Atoka Form... moderately ... well compac... stations 9+... the shale w... to occasion... to firm. At ... 3.5± thick, ... reddish to...

Joint, ver...

WORK SAFELY



PLAN

Scale: 1" = 5'

5 4 3 2 1 0 1 2 3 4 5

FLOW

EXPLANATION

N 12° E / 87° ------ **Joint**, showing strike and dip, dashed where approximate or unclear when mapped.

Fracture, irregular without distinct strike and dip.

0.3' 0.4' 0.2' **Rock Ledge**, with barbs on face of ledge, numerical thickness shown in feet.

▲ 339 **Elevation**, (m.s.l.) at point marked by triangle.

Pa **Atoka Formation**, shale, sandy, hard to moderately hard, gray to dark gray, black, well compacted and cemented, micaceous. From stations 9+10 to 9+70 and from 20+28 to 20+58.2 the shale was somewhat weathered, gray to buff to occasionally reddish brown, and moderately soft to firm. At station 20+58.2 there was sandstone 3.5± thick, fine grained, hard, and gray, with reddish tan staining. (Pennsylvanian Period)

Joint, vertical dip.

REFERENCE DRAWINGS

Embankment Plan	9570-62/1351
Typical Embankment Section	9570-62/1364
Geologic Sections A-A & B-B	9570-62/1479

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS
LITTLE ROCK ARKANSAS

ARKANSAS RIVER AND TRIBUTARIES — ARKANSAS RIVER, ARKANSAS

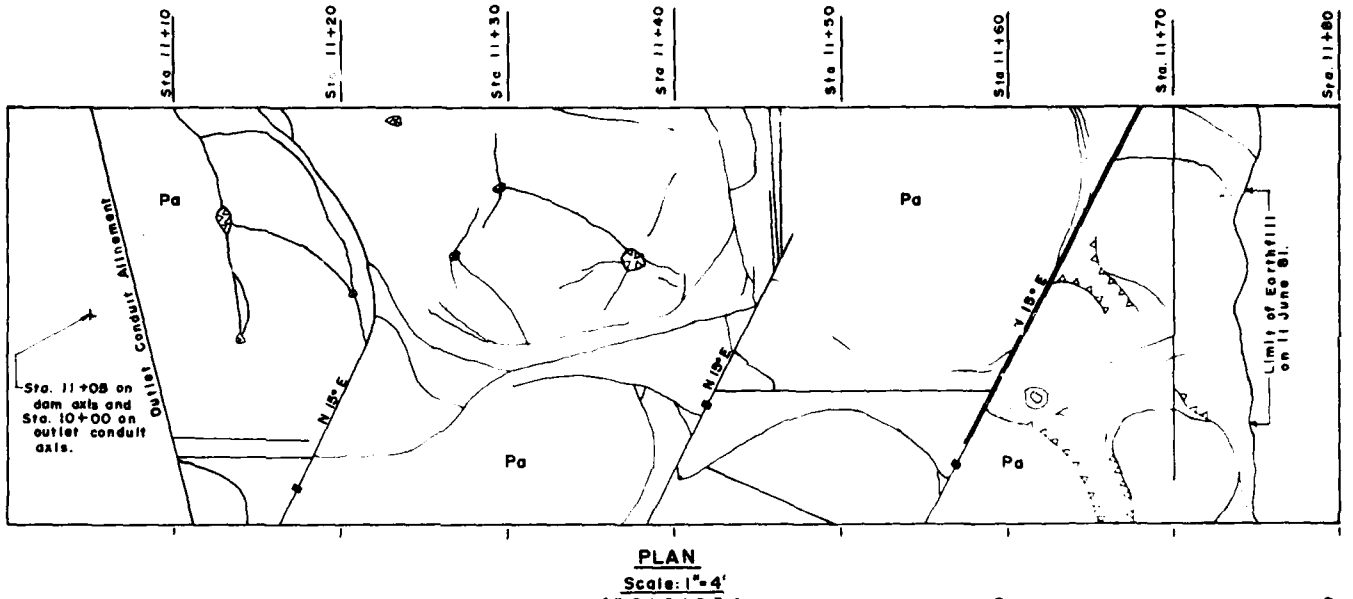
DESIGNED BY: RC
DRAWN BY: CH
TRACED BY:
CHECKED BY: CD
SUBMITTED BY:
ENGINEER:

TOAD SUCK FERRY LOCK AND DAM RELOCATIONS
CONWAY WATER SUPPLY
DAM AXIS - CORE TRENCH
STA 9+10 TO STA 11+02

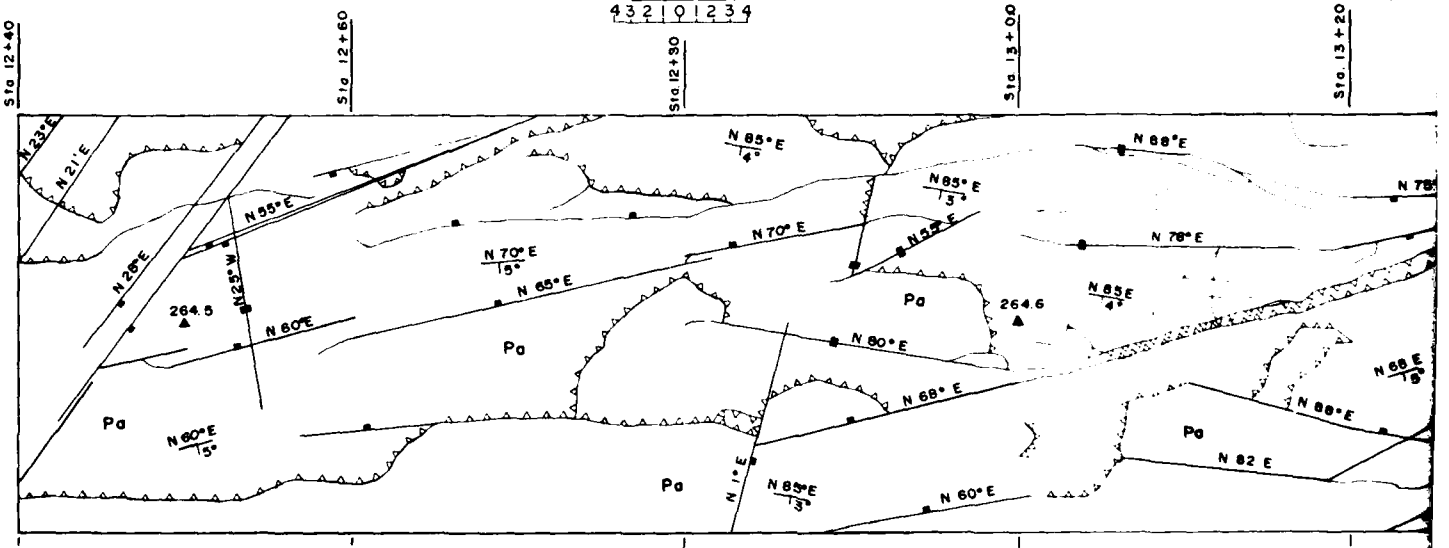
APRIL 1983

9689-62/1659

SHEET 13 OF 24

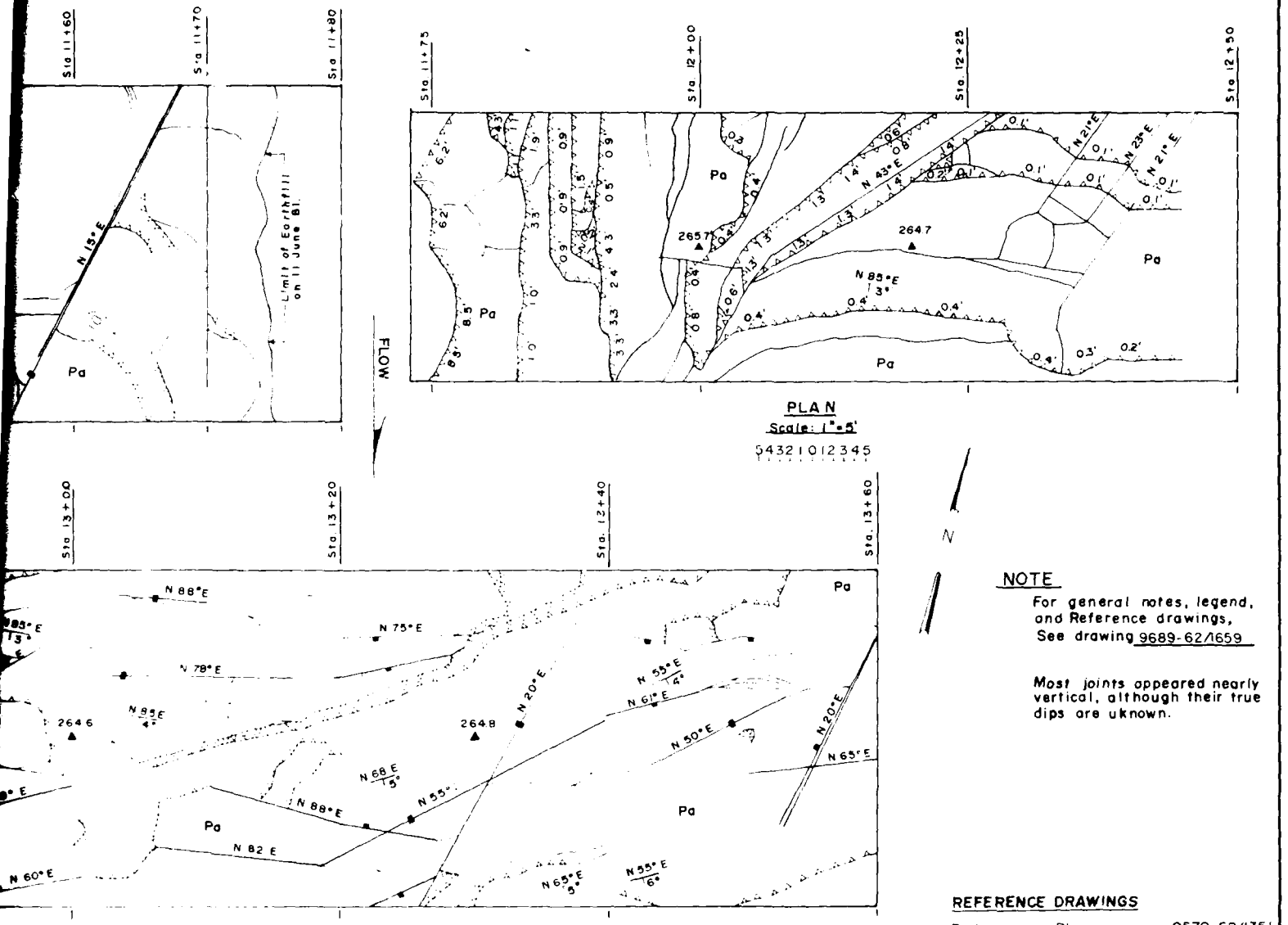


PLAN
Scale: 1"=4'
4 3 2 1 0 1 2 3 4



PLAN
Scale: 1"=4'
4 3 2 1 0 1 2 3 4

WORK SAFELY



PLAN
Scale: 1"=5'
5 4 3 2 1 0 1 2 3 4 5

PLAN
Scale: 1"=4'
4 3 2 1 0 1 2 3 4

NOTE

For general notes, legend, and Reference drawings, See drawing 9689-62/1659

Most joints appeared nearly vertical, although their true dips are uknown.

REFERENCE DRAWINGS

Embankment Plan 9570-62/1351
Typical Embankment Section 9570-62/1364
Geologic Sections A-A and B-B 9570-62/1479

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS
LITTLE ROCK, ARKANSAS

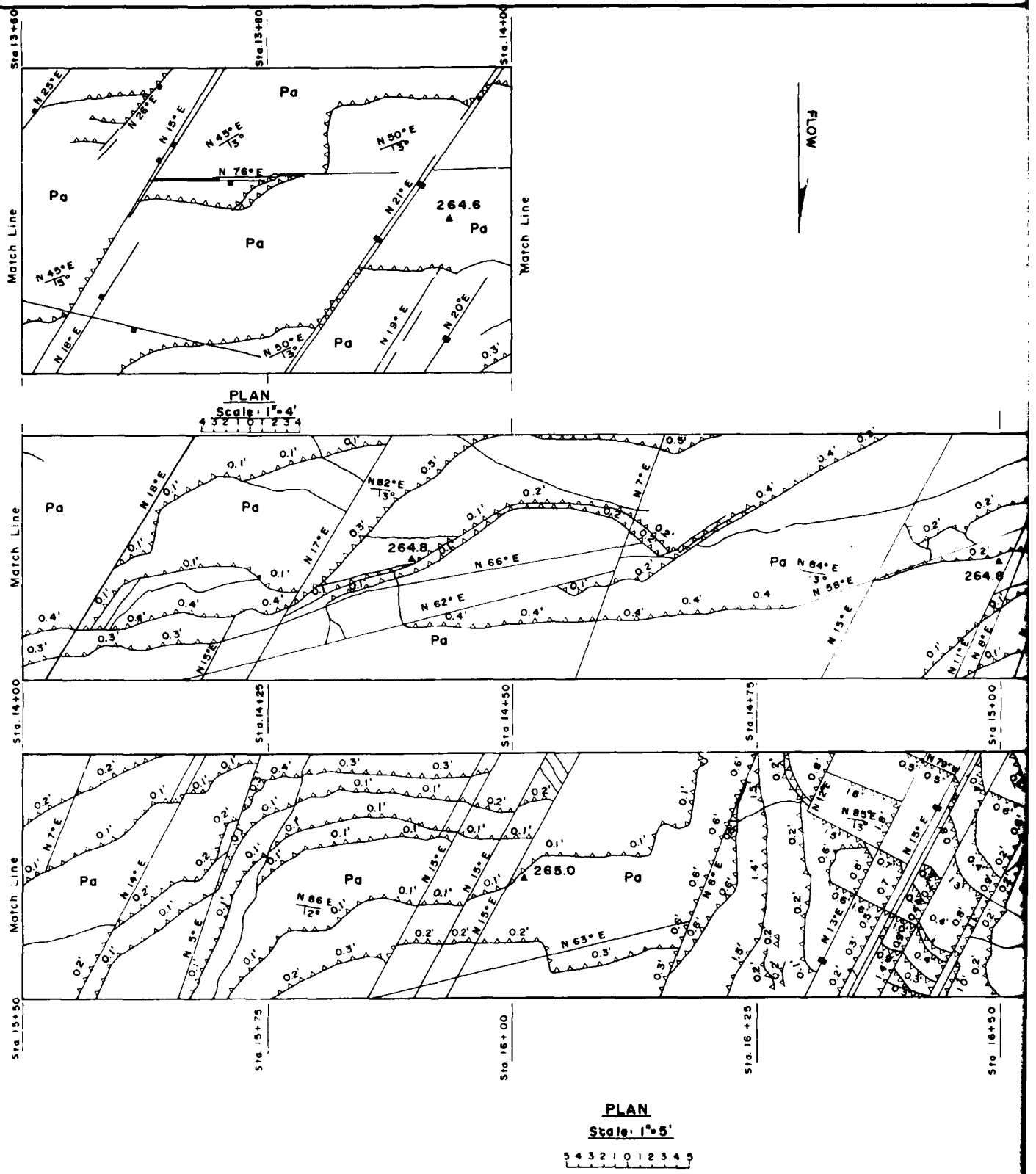
ARKANSAS RIVER AND TRIBUTARIES — ARKANSAS RIVER, ARKANSAS

DESIGNED BY: RC
DRAWN BY: CH
CHECKED BY: CD
SUBMITTED BY:
ENGINEER:

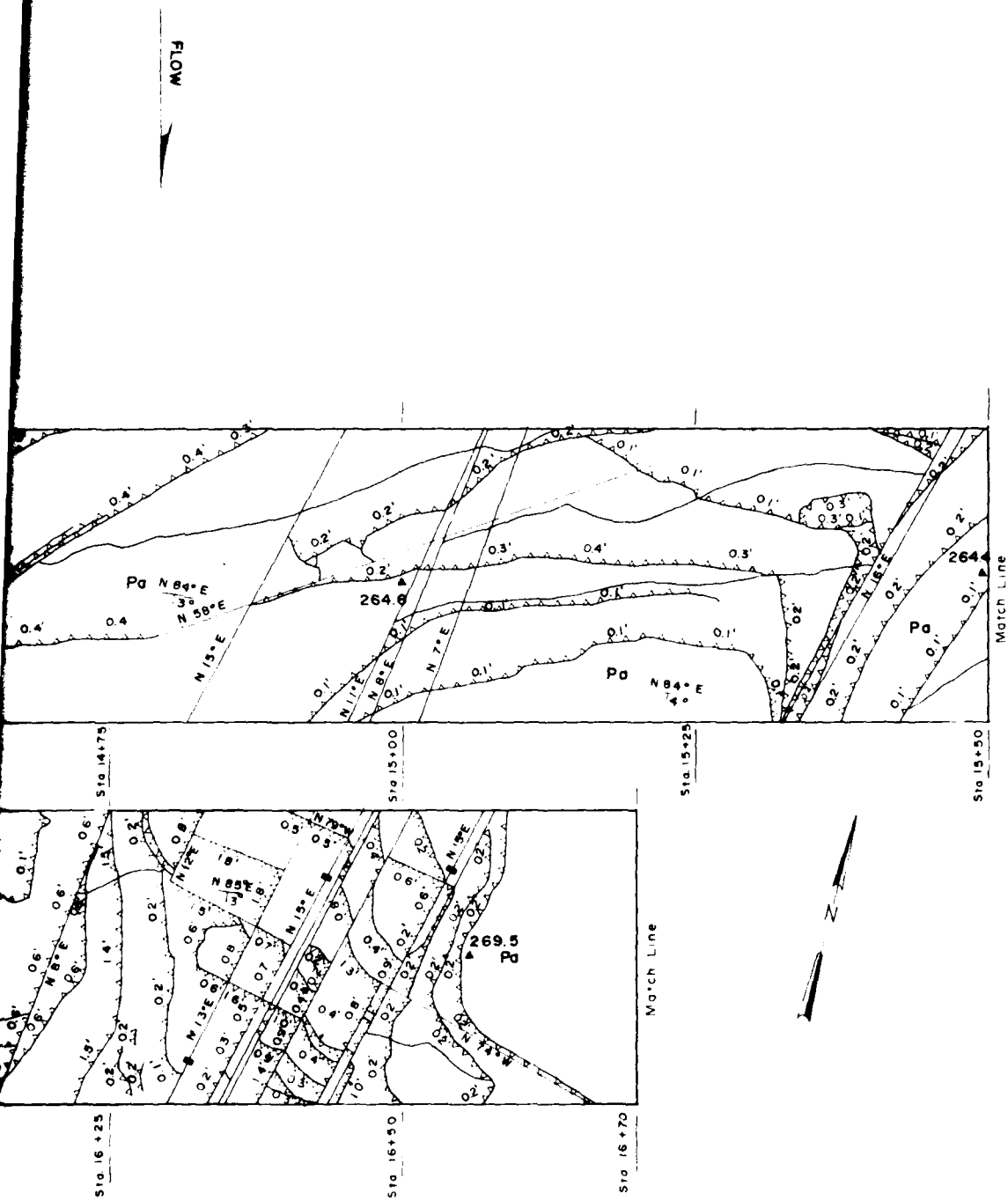
TOAD SUCK FERRY LOCK AND DAM
RELOCATIONS
CONWAY WATER SUPPLY
DAM AXIS - CORE TRENCH
STA 11+10 TO STA 13+60

APRIL 1983

DRAWING NUMBER
9689-62/1660
SHEET 14 OF 24


Sta 13+60
Sta 13+80
Sta 14+00
Match Line
Pa
N 25° E
N 26° E
N 15° E
N 45° E
3°
N 50° E
15°
N 76° E
N 21° E
264.6
N 45° E
15°
N 18° E
N 30° E
15°
N 19° E
N 20° E
0.3'
FLOW
PLAN
Scale: 1"=4'
4 3 2 1 0 1 2 3 4
Sta 14+00
Sta 14+25
Sta 14+50
Sta 14+75
Sta 15+00
N 18° E
N 82° E
3°
N 7° E
N 17° E
264.8
N 66° E
N 62° E
N 64° E
3°
N 58° E
N 15° E
N 8° E
Sta 15+50
Sta 15+75
Sta 16+00
Sta 16+25
Sta 16+50
N 14° E
N 5° E
N 86° E
12°
265.0
N 15° E
N 63° E
N 13° E
N 85° E
3°
PLAN
Scale: 1"=5'
5 4 3 2 1 0 1 2 3 4 5

WORK SAFELY



NOTE

For general notes, legend, and reference drawings, see drawing 9689-62/1659

REFERENCE DRAWINGS

Embankment Plan	9570 62/135
Typical Embankment Section	9570 62/1364
Geologic Sections A A B B-B	9570-62/1479

DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT CORPS OF ENGINEERS
LITTLE ROCK ARKANSAS

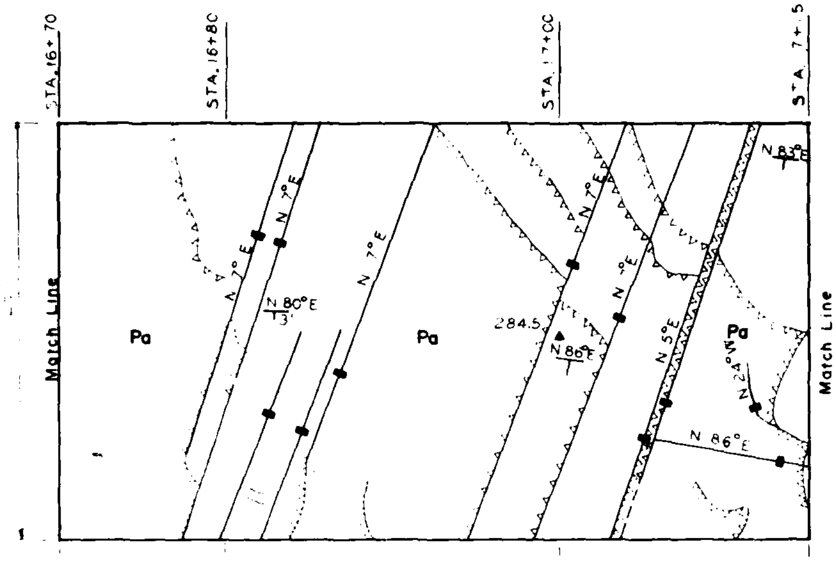
ARKANSAS RIVER AND TRIBUTARIES ARKANSAS RIVER ARKANSAS

DESIGNED BY RC
DRAWN BY CH
CHECKED BY CD
SUBMITTED BY
ENGINEER

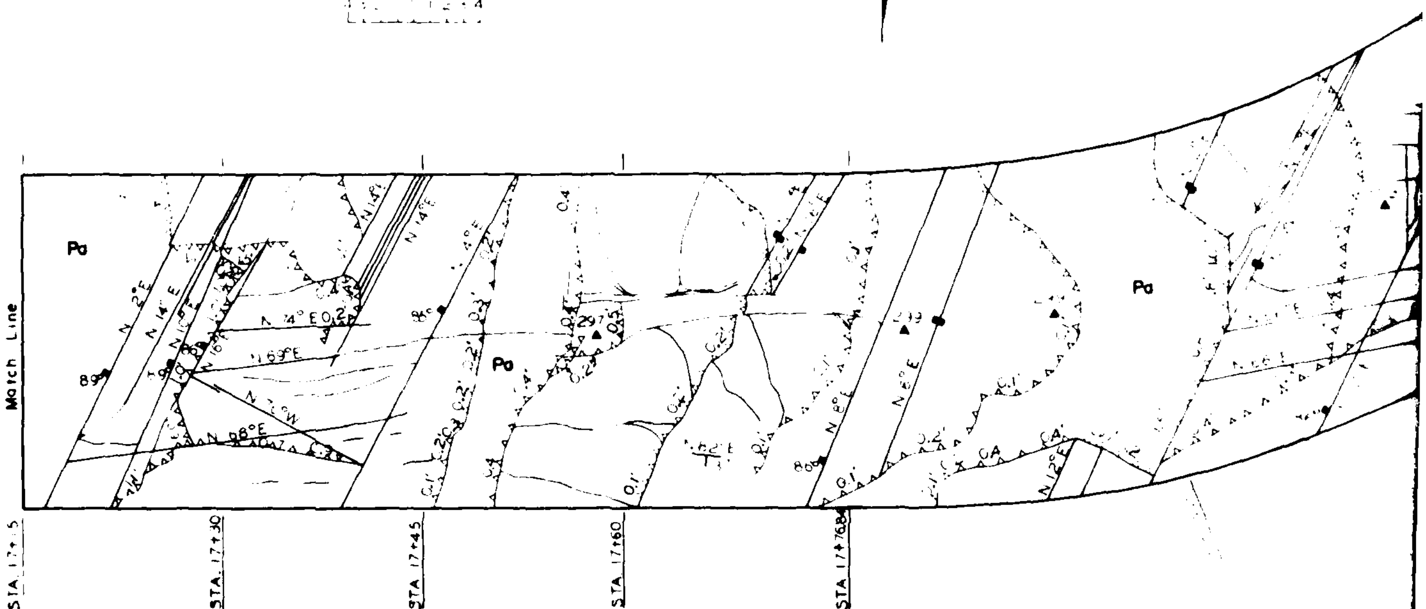
TOAD SUCK FERRY LOCK AND DAM
RELOCATIONS
CONWAY WATER SUPPLY
DAM AXIS-CORE TRENCH
STA 13+60 TO STA 16+70

APRIL 1983

DRAWING NUMBER
SHEET 15 OF 24
9689-62/1661

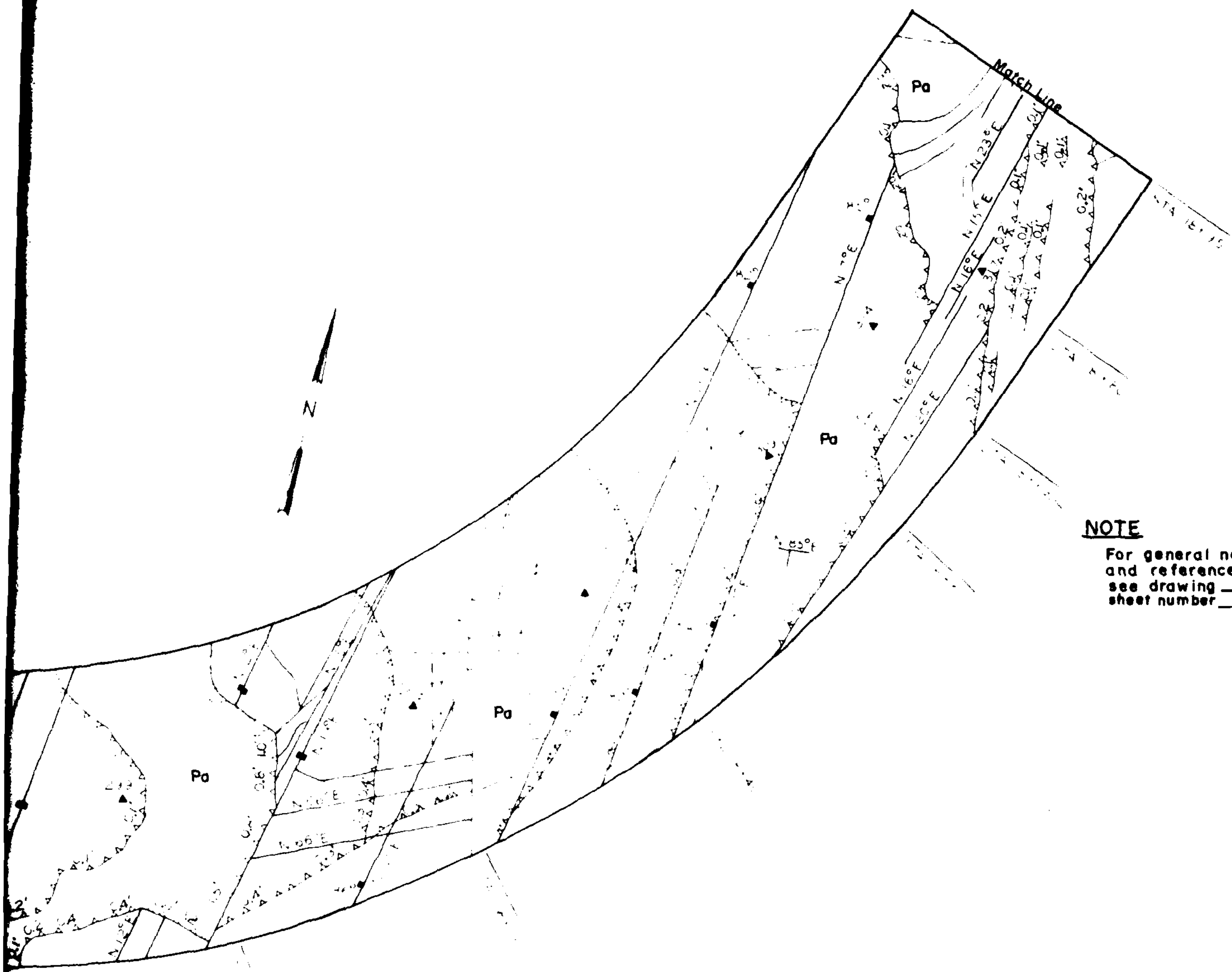


PLAN



PLAN

VALUE ENGINEERING WILL INCREASE YOUR PROFIT



NOTE

For general notes, explanation, and reference drawings, see drawing 9689-62/1659, sheet number 13.

REFERENCE DRAWINGS

Embankment Plan	9570-62/1351
Typical Embankment Section	9570-62/1364
Geological Sections A-A & B-B	9570-62/1479

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS
LITTLE ROCK, ARKANSAS

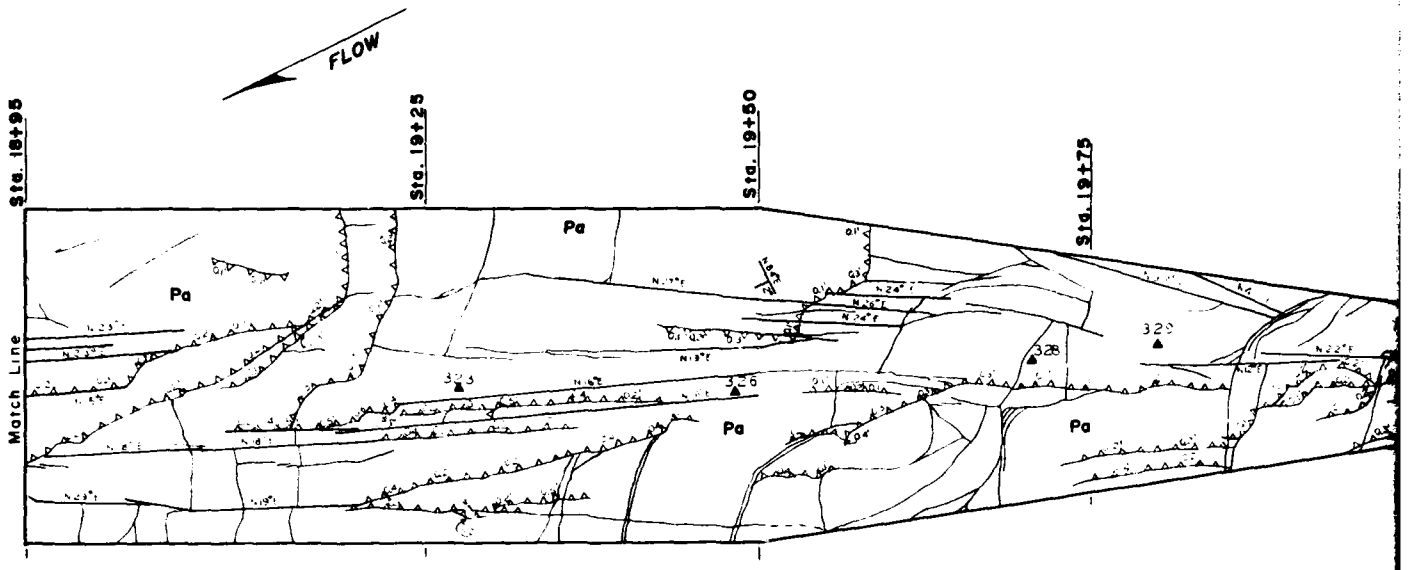
ARKANSAS RIVER AND TRIBUTARIES — ARKANSAS RIVER, ARKANSAS

TOAD SUCK FERRY LOCK AND DAM
RELOCATIONS
CONWAY WATER SUPPLY
DAM AXIS-CORE TRENCH
STA 16+70 TO STA 18+95

DESIGNED BY: RC
DRAWN BY: CH
CHECKED BY: CD
SUBMITTED BY:
ENGINEER:

APRIL 1983

DRAWING NUMBER 9689-62/1662
SHEET 16 OF 26

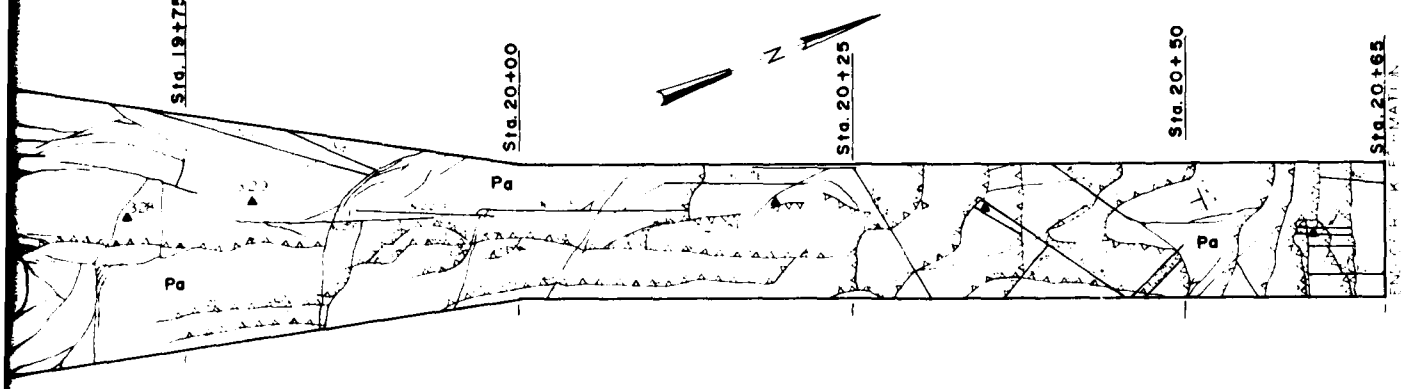


PLAN

Scale: 1"=5'

5 4 3 2 1 0 1 2 3 4 5

WORK SAFELY



PLAN

Scale: 1"=5'

5 4 3 2 1 0 2 3 4 5

NOTE

For general notes, explanation, and reference drawings, see drawing 9689-62/1659 sheet number 13

REFERENCE DRAWINGS

Embankment Plan	9570-62/1351
Typical Embankment Section	9570-62/1364
Geologic Sections A-A & B-B	9570-62/1479

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS
LITTLE ROCK, ARKANSAS

ARKANSAS RIVER AND TRIBUTARIES ARKANSAS RIVER, ARKANSAS

TOAD SUCK FERRY LOCK AND DAM

RELOCATIONS

CONWAY WATER SUPPLY

DAM AXIS-CORE TRENCH

STA 18+95 TO STA 20+65

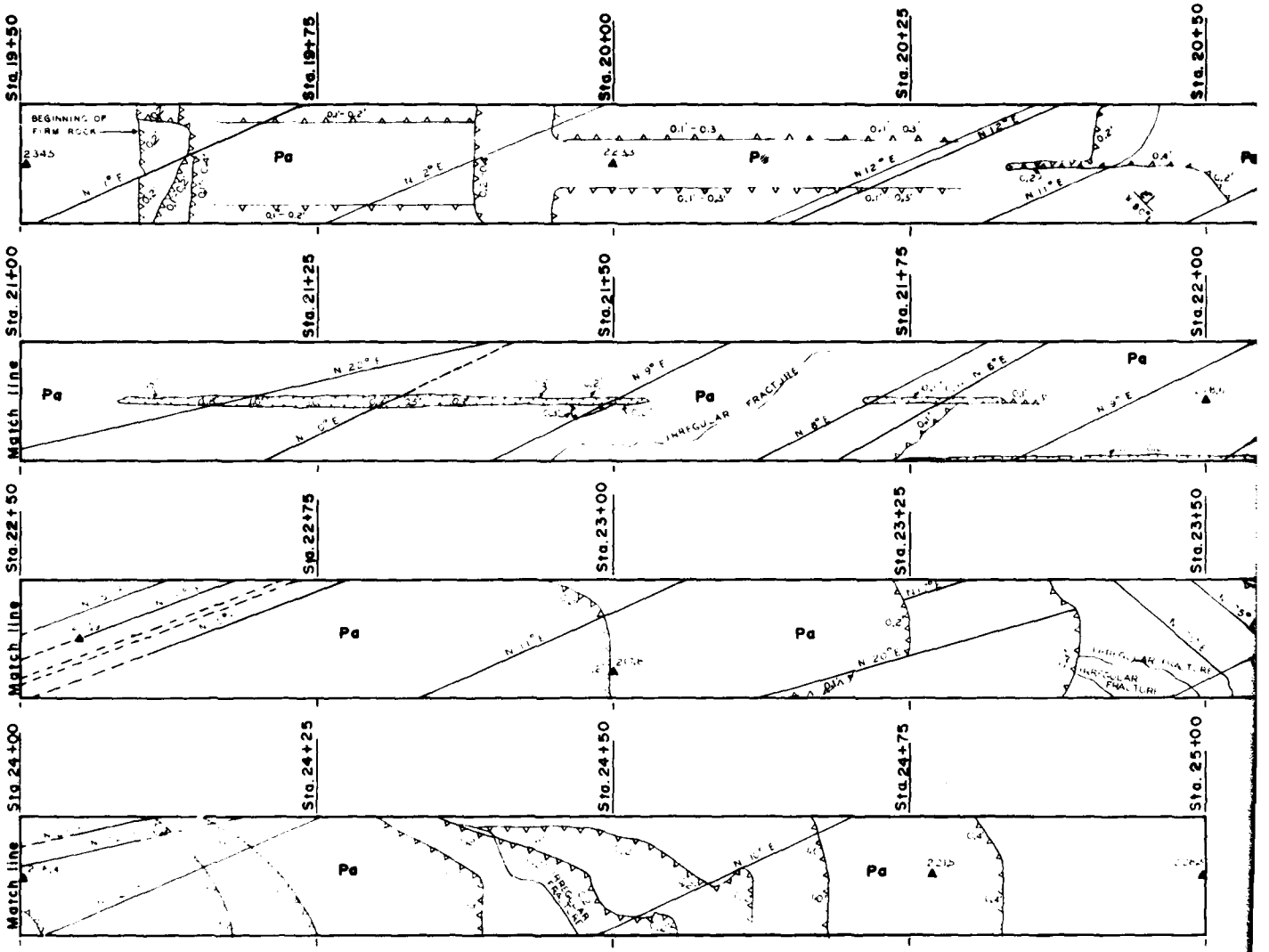
DESIGNED BY	RC
DRAWN BY	CH
CHECKED BY	CD
SUBMITTED BY	
ENGINEER	

APRIL 1983

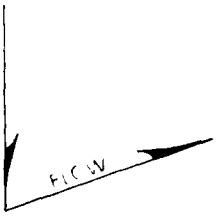
NWV SERIAL NO. 80-B-0001

9689-62/1663

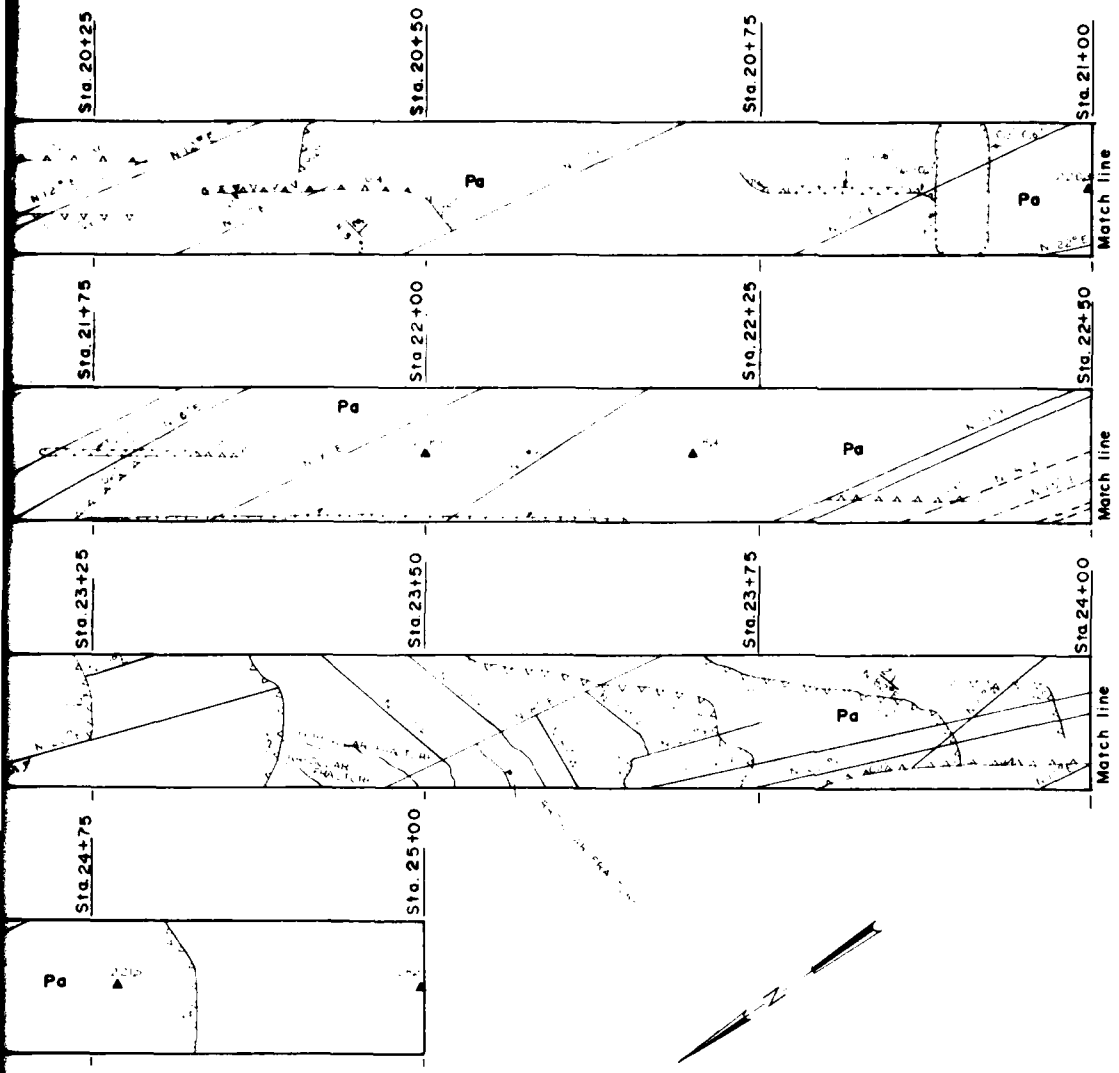
SHEET 17 OF 24



PLAN
Scale: 1"=5'
5 4 3 2 1 0 1 2 3 4 5



VALUE ENGINEERING WILL INCREASE YOUR PROFIT



EXPLANATION

- Joint, showing direction of strike, dashed, where approximate or unclear when mapped.
- Fracture, mostly tight and irregular.
- Rock Ledge, with barbs on face of ledge; numercial thickness shown in feet
- Enclosed Depression or Trench, with barbs toward center of depression, numerical depth shown in feet.
- Pa — Atoka Formation, shale, sandy, hard to moderately hard, gray to dark gray compacted and cemented, with occasional shaly sandstone lenses.
- Elevation, in feet, msl

REFERENCE DRAWINGS

Dike, plan, profile and typical section.	9570-62/1372
Geologic section along ℄ of dike.	9570-62/1486

PLAN

Scale: 1"=5'

5 4 3 2 1 0 1 2 3 4 5

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS
LITTLE ROCK, ARKANSAS

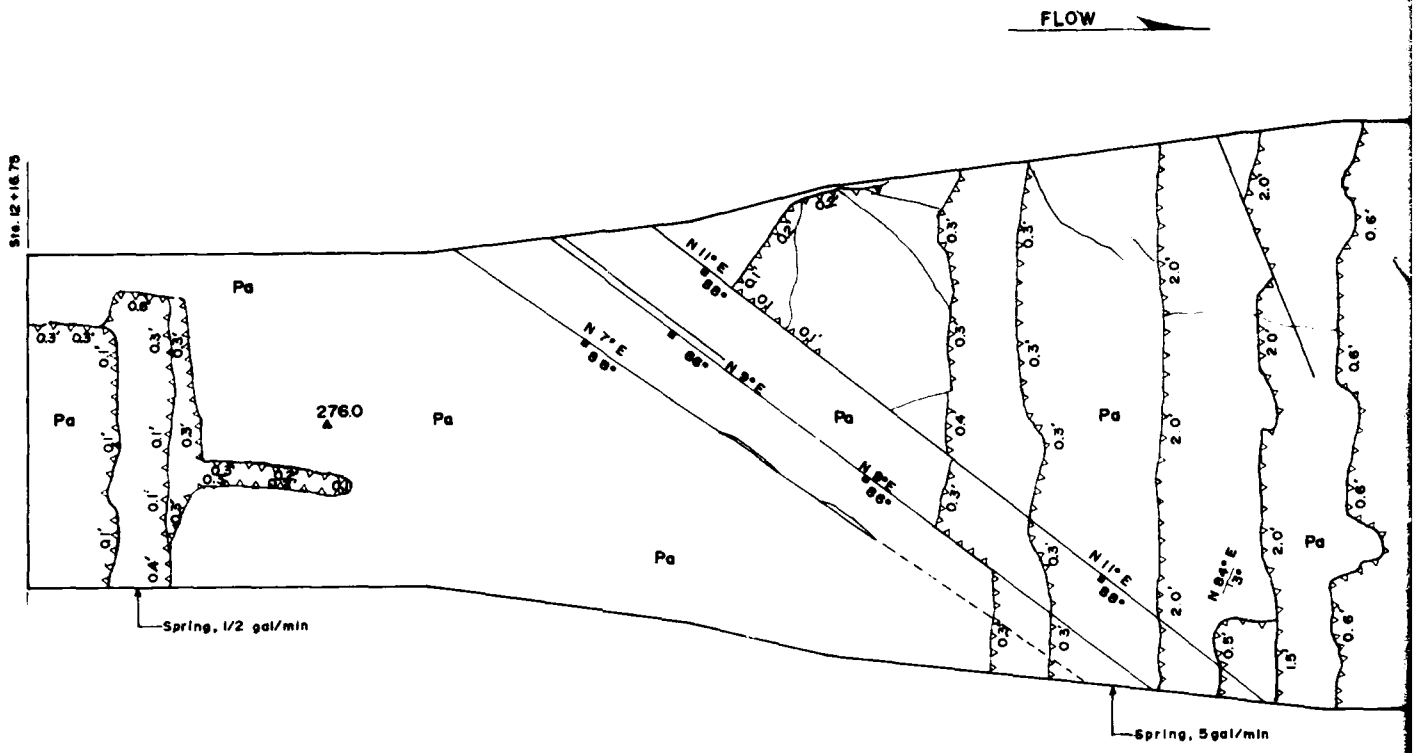
ARKANSAS RIVER AND TRIBUTARIES — ARKANSAS RIVER, ARKANSAS

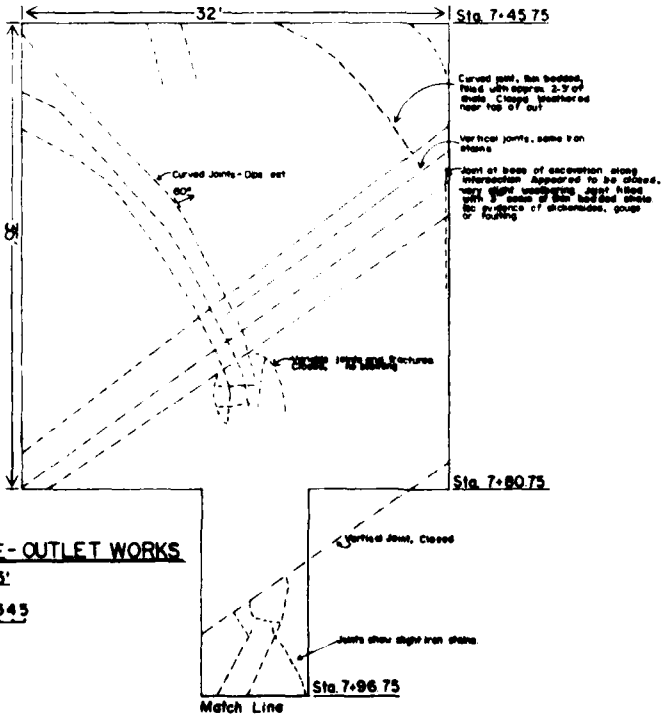
TOAD SUCK FERRY LOCK AND DAM
RELOCATIONS
CONWAY WATER SUPPLY
DIKE-CORE TRENCH
STA. 19+50 TO STA. 25+00

DESIGNED BY	RC
DRAWN BY	CH
CHECKED BY	CD
SUBMITTED BY	
ENGINEER	

APRIL 1983
INV SERIAL NO 80-B-0001

DRAWING NUMBER
9689-62/1664
SHEET 18 OF 23





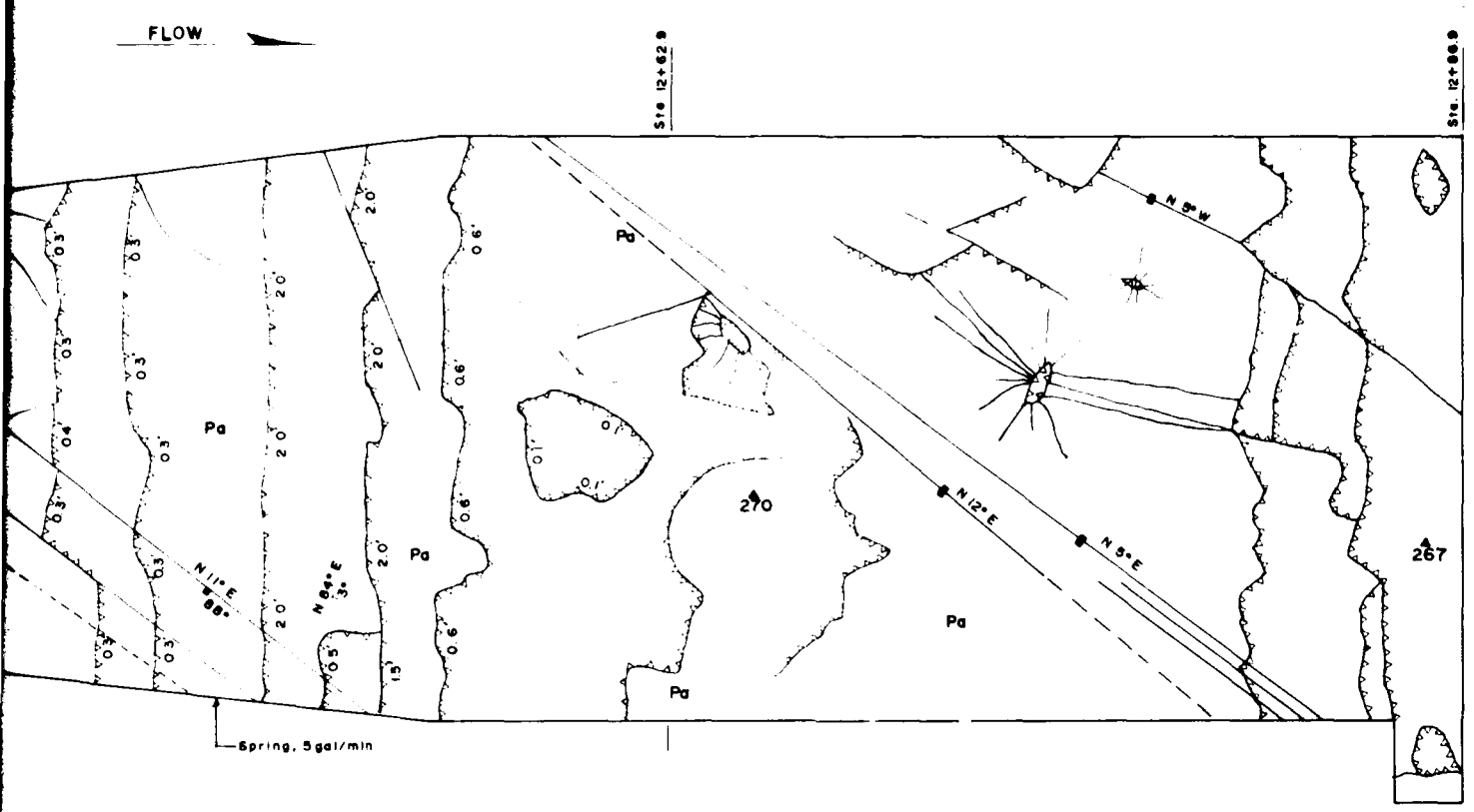
STILLING BASIN

INTAKE STRUCTURE - OUTLET WORKS

Scale, 1"=5'

5 4 3 2 1 0 1 2 3 4 5

WORK SAFELY



STILLING BASIN

EXPLANATION

N 9° E / 86° — Joint, showing strike and dip, dashed where approximate or unclear when mapped.

Fracture, irregular without distinct strike and dip.

2.0' 2.0' — Rock Ledge, with barbs on face of ledge, numerical thickness shown in ft.

Pa — Atoka Formation, shale, sandy, hard to moderately hard, gray to dark gray, well compacted and cemented micaceous.

270 — Elevation, (m.s.l.)

Joint, vertical dip.

PLAN
Scale 1" = 2'
2 1 0 1 2

REFERENCE DRAWINGS

Outlet works
Plan, Profile, and Typical Section . 9570-62/1358
Outlet Works-Stilling Basin
Plan, Elevation, and Sections 9570-62/1435
Geologic Sections Across
Stilling Basin, I-I, J-J 9570-62/1482

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS
LITTLE ROCK ARKANSAS

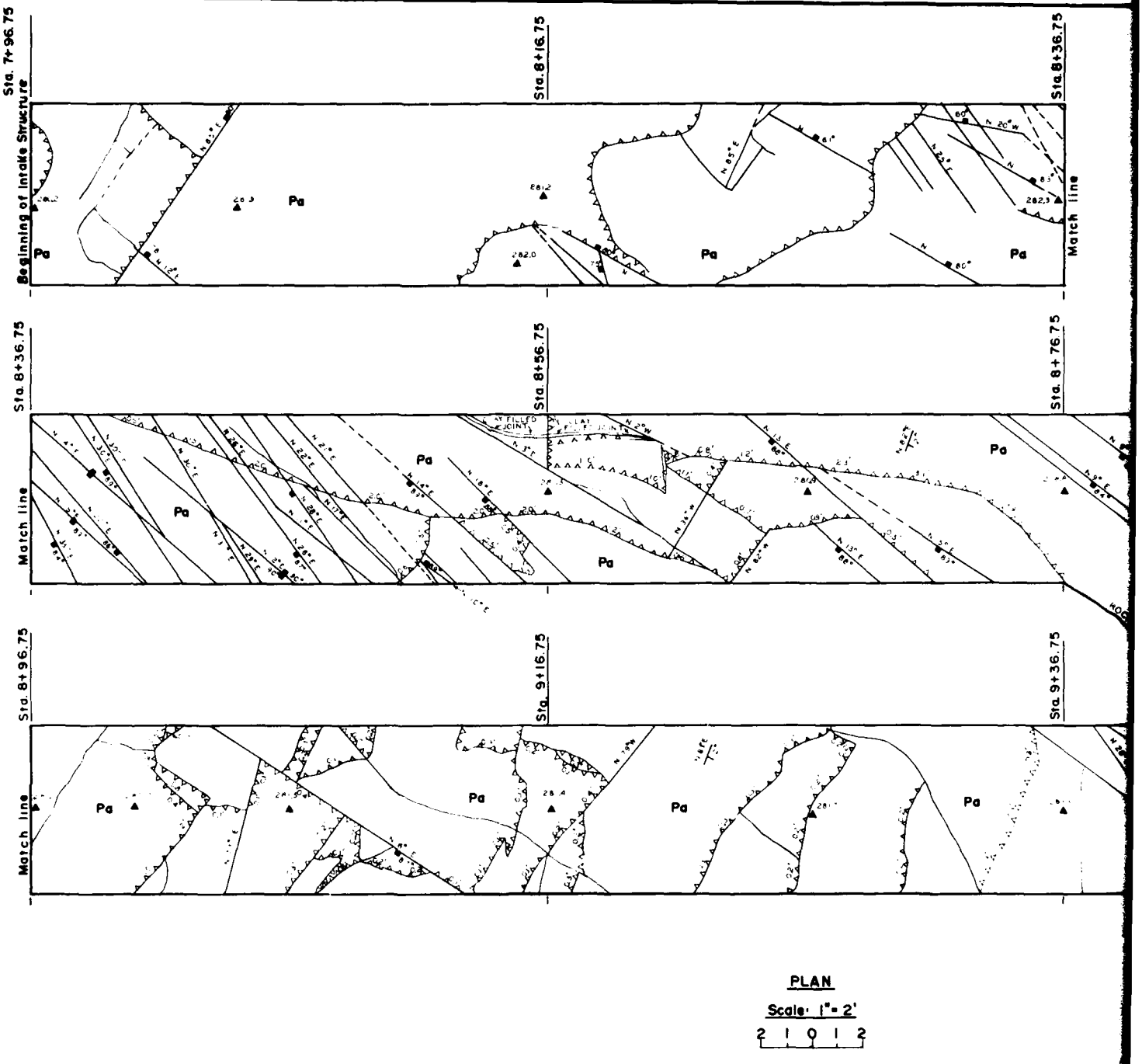
ARKANSAS RIVER AND TRIBUTARIES — ARKANSAS RIVER, ARKANSAS

DESIGNED BY: RC
DRAWN BY: CH
CHECKED BY: CD

TOAD SUCK FERRY LOCK AND DAM
RELOCATIONS
CONWAY WATER SUPPLY
OUTLET WORKS-STILLING BASIN
AND INTAKE STRUCTURE

SUBMITTED BY
ENGINEER

APRIL 1983
DRAWING NUMBER
SHEET 15 OF 24
9689-62/1665

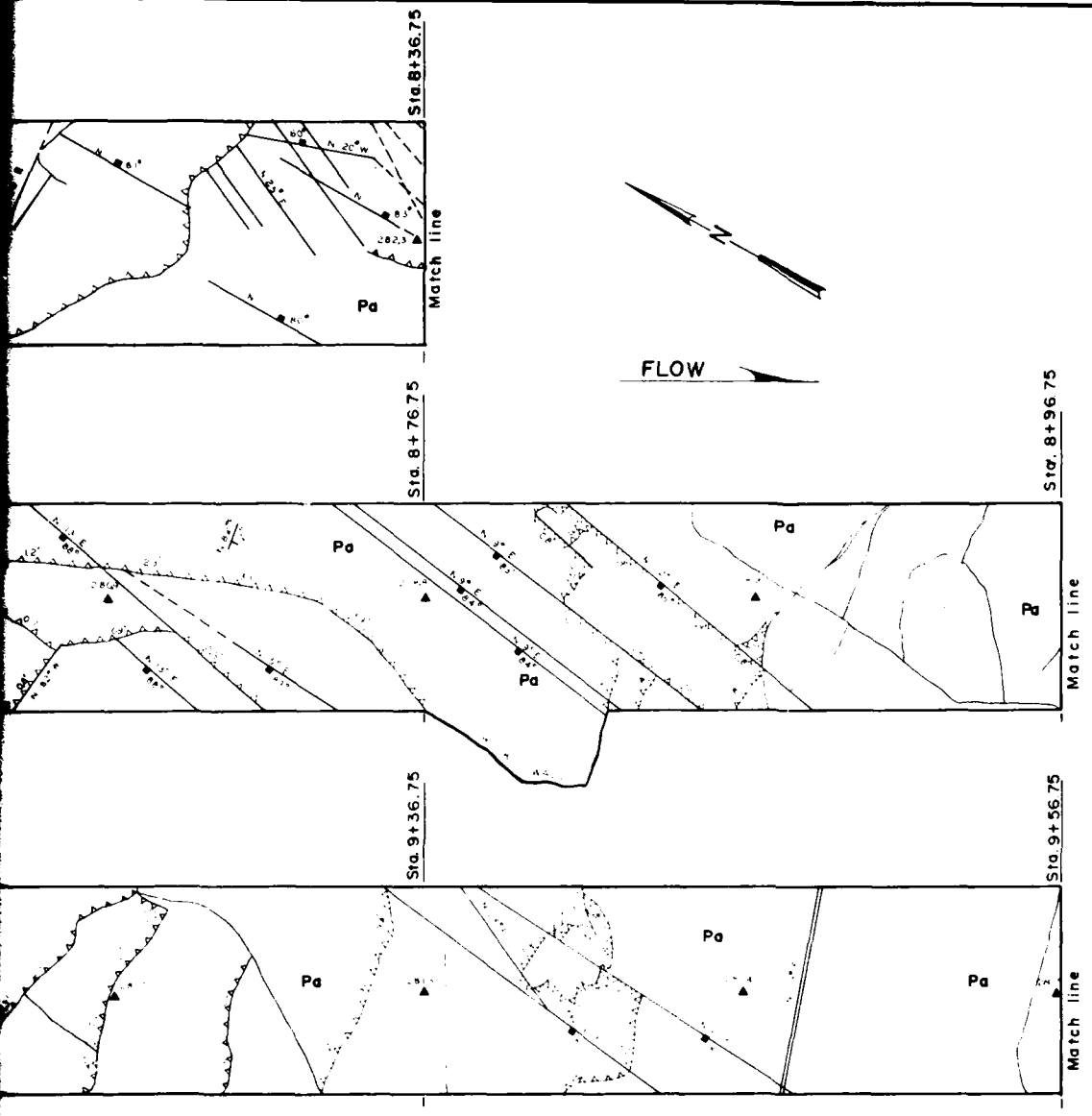


PLAN

Scale: 1" = 2'

2 1 0 1 2

WORK SAFELY



EXPLANATION

- Joint, showing strike and dip dashed where approximate or unclear when mapped.
- Fracture, irregular, without distinct strike and dip.
- Rock Ledge, with barbs on face of ledge; numerical thickness shown in feet.
- Pa — Atoka Formation, shale, sandy, hard to moderately hard gray to dark gray, well compacted and cemented, calcareous
- Elevation, in m.s.l.
- Blast Hole, remnant presplitting shows radiating fractures.

REFERENCE DRAWINGS

Concrete and Reinforcing	9570-62/1433
Geologic Sections	9570-62/1481

PLAN

Scale: 1" = 2'

2 1 0 1 2

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS
LITTLE ROCK ARKANSAS

ARKANSAS RIVER AND TRIBUTARIES — ARKANSAS RIVER, ARKANSAS

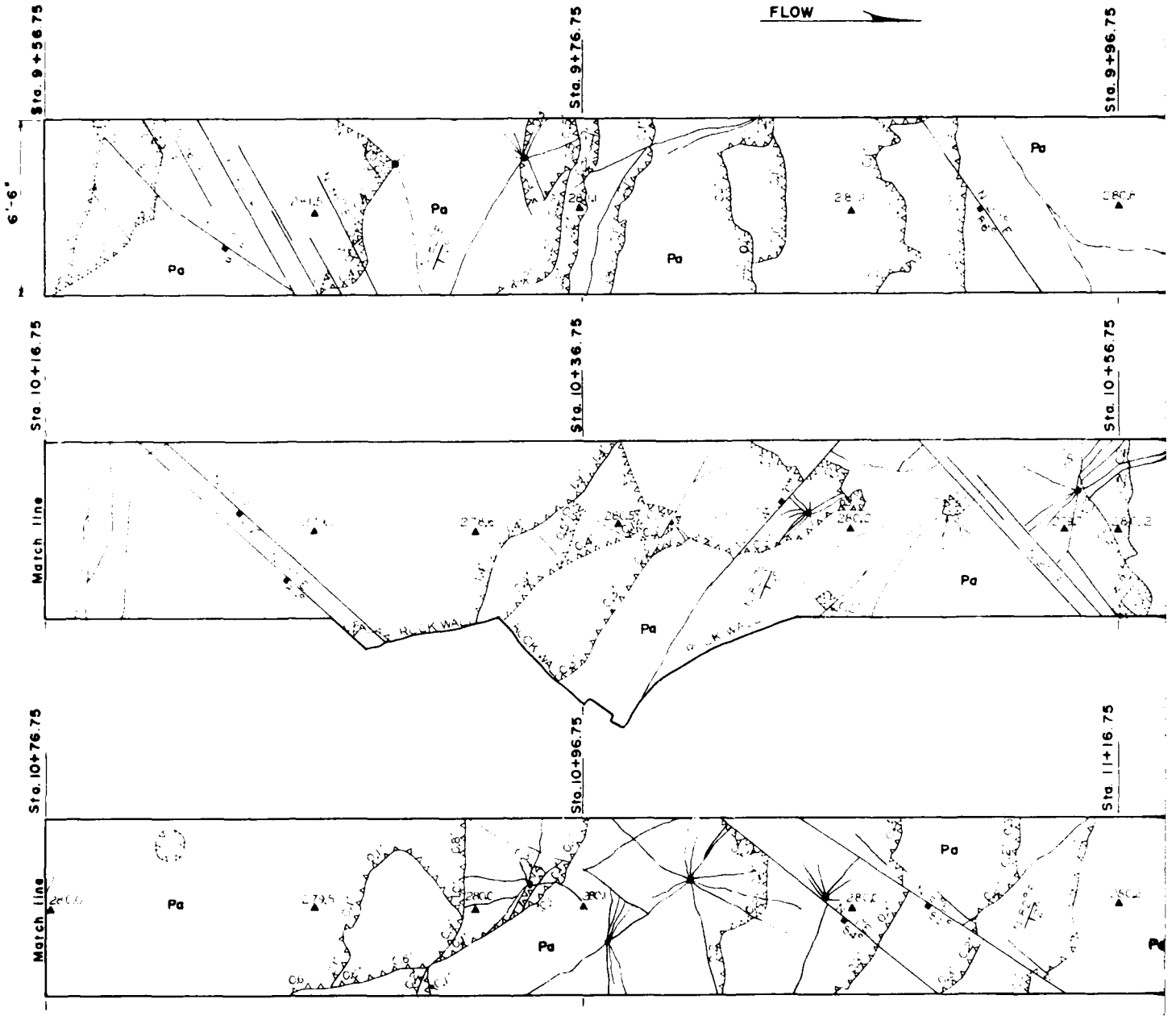
DESIGNED BY: RC
DRAWN BY: CH
CHECKED BY: CD
SUBMITTED BY:
ENGINEER:

TOAD SUCK FERRY LOCK AND DAM
RELOCATIONS
CONWAY WATER SUPPLY
OUTLET WORKS - CONDUIT
STA. 7+96.75 TO STA. 9+56.75

APRIL 1983

REV. SERIAL NO. 80-B-0001

DRAWING NUMBER
SHEET 20 OF 43
9689-62/1666

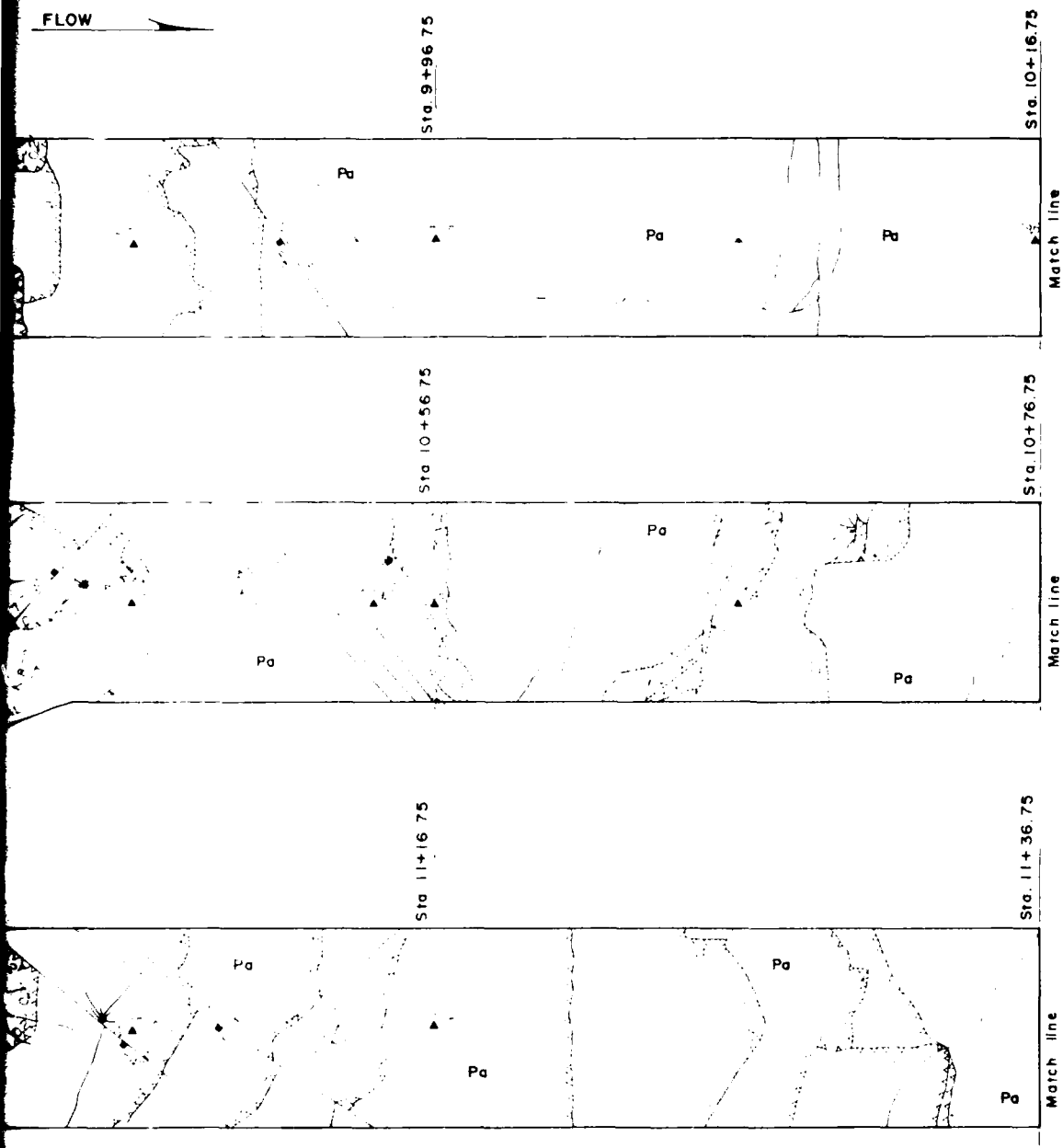


PLAN

Scale 1"= 2'

2 1 0 1 2

WORK SAFELY



NOTE

For general notes, explanation, and reference drawings, see drawing 9689-62/1666 sheet 20

Reference Drawings

Concrete and Reinforcing	9570-62/1433
Geologic Sections	9570-62/1481

PLAN

Scale 1"= 2'

2 1 0 1 2

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS
LITTLE ROCK, ARKANSAS

ARKANSAS RIVER AND TRIBUTARIES — ARKANSAS RIVER, ARKANSAS

DESIGNED BY: RC
DRAWN BY: CH
CHECKED BY: CD
SUBMITTED BY:
ENGINEER:

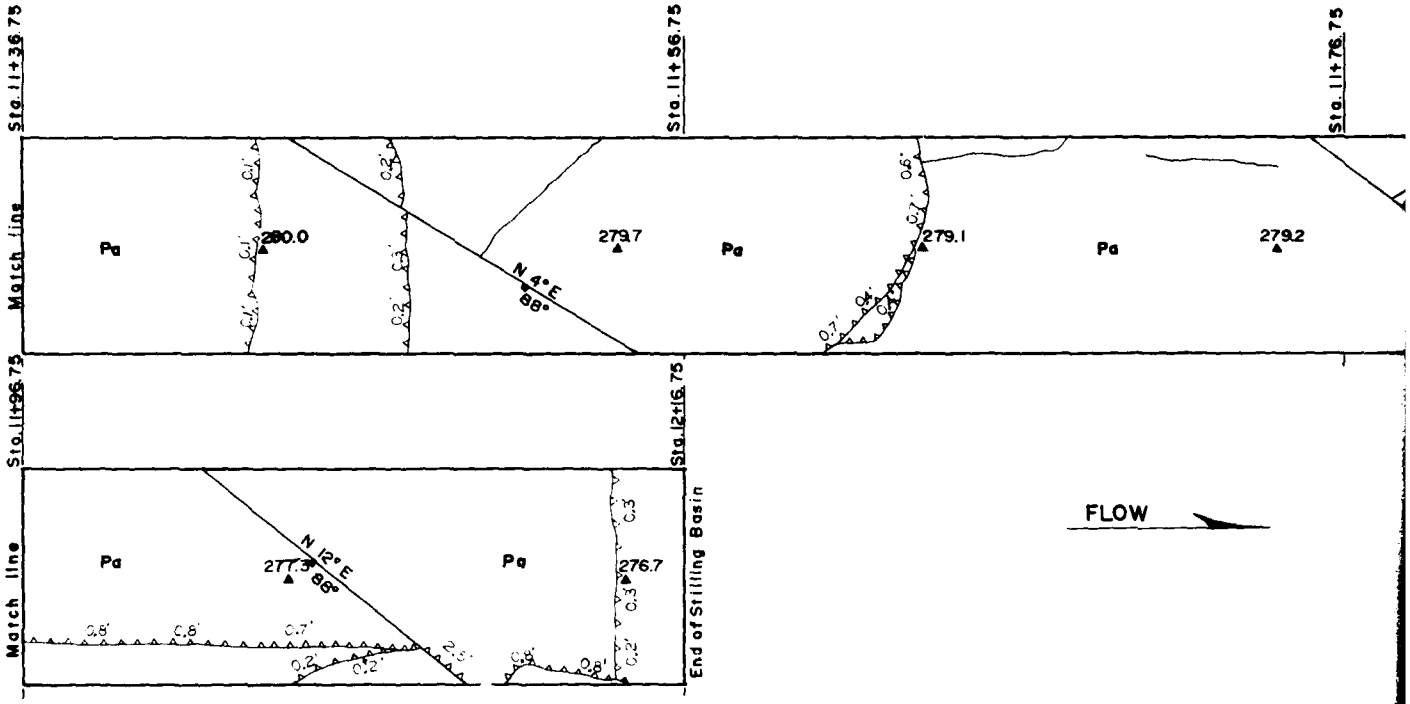
TOAD SUCK FERRY LOCK AND DAM
RELOCATIONS
CONWAY WATER SUPPLY
OUTLET WORKS - CONDUIT
STA 9+5675 TO STA 11+3675

APRIL 1983

MV SERIAL NO 80-8 0001

DRAWING NUMBER
9689-62/1667

SHEET 21 OF 24



PLAN

Scale: 1" = 2'

2 1 0 1 2

WORK SAFELY

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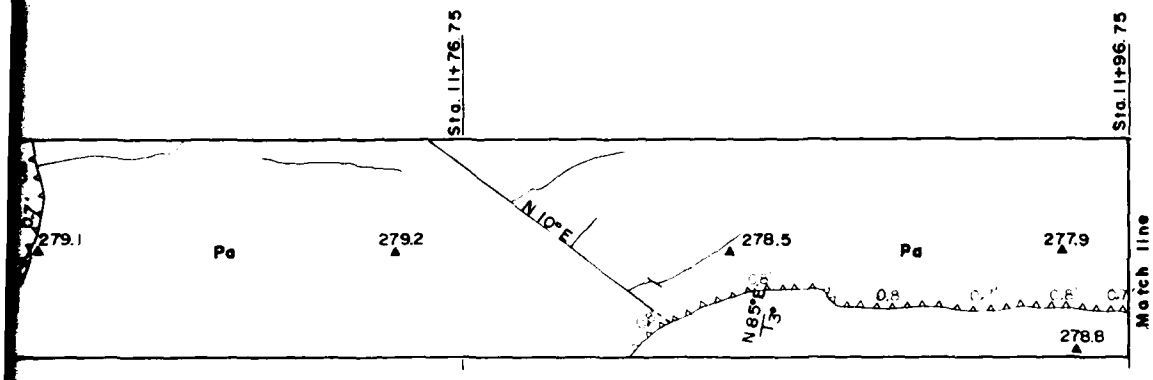


NOTE

For general notes, explanation, and reference drawings, see drawing 9689-62/1666, sheet 20.

FLOW

PLAN

Scale: 1" = 2'

2 1 0 1 2

REFERENCE DRAWINGS

Concrete and Reinforcing	9570-62/1433
Geologic Sections	9570-62/1481

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS
LITTLE ROCK ARKANSAS

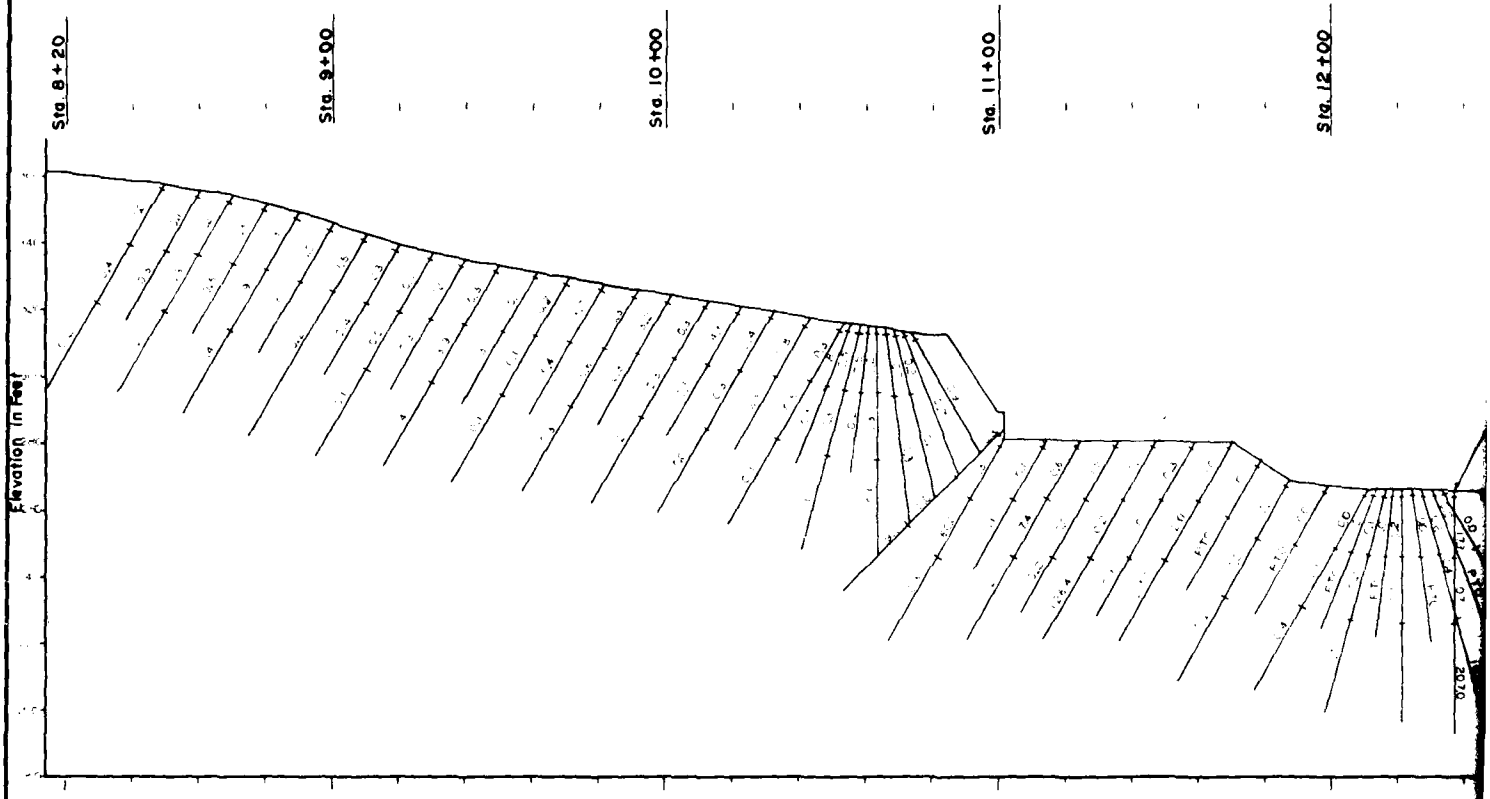
ARKANSAS RIVER AND TRIBUTARIES — ARKANSAS R VER, ARKANSAS

TOAD SUCK FERRY LOCK AND DAM

RELOCATIONS

CONWAY WATER SUPPLY
OUTLET WORKS - CONDUIT
STA 11+3675 TO STA 12+1675

DESIGNED BY: RC	APRIL 1983
DRAWN BY: CH	AW SERIAL NO 80-B-0004
CHECKED BY: CD	
SUBMITTED BY:	DRAWING NUMBER: 9689-62/1668
ENGINEER	SHEET 22 OF 84

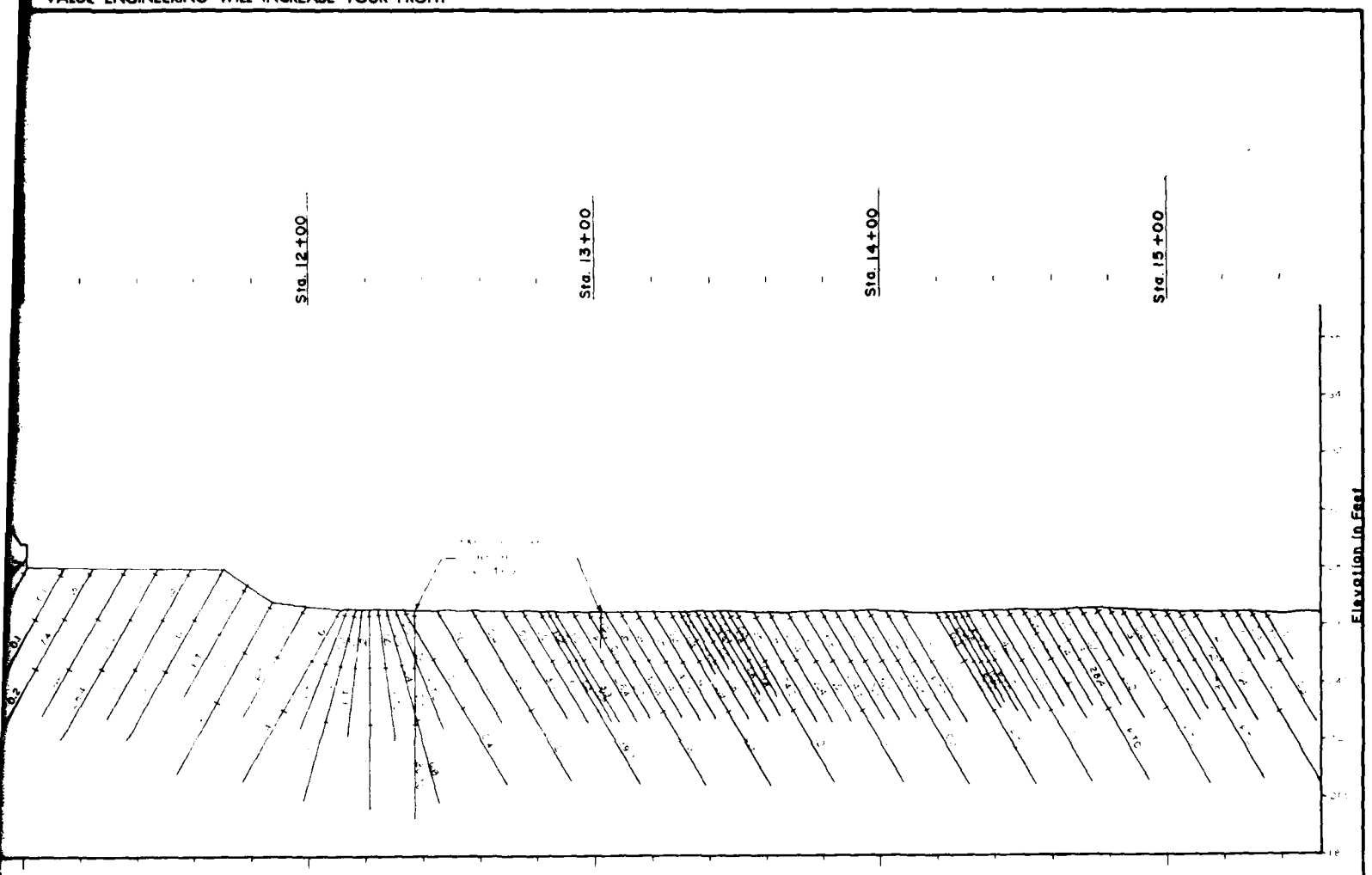


SECTION ALONG GROUT CURTAIN ON DAM A

(LOOKING UPSTREAM)

Scale: 1" = 20'

20 10 0 10 20



SECTION ALONG GROUT CURTAIN ON DAM AXIS

(LOOKING UPSTREAM)

Scale: 1" = 20'

20 10 0 10 20

NOTE

Grout holes are shown with numberof bags of cement used in each grout zone. Grout zones are between stops which are indicated by tick marks usually at depths of 2ft., 20ft., and 40ft.

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS
LITTLE ROCK, ARKANSAS

ARKANSAS RIVER AND TRIBUTARIES — ARKANSAS RIVER, ARKANSAS

DESIGNED BY: RC
DRAWN BY: CH
CHECKED BY: CD
SUBMITTED BY:
ENGINEER:

TOAD SUCK FERRY LOCK AND DAM
RELOCATIONS
CONWAY WATER SUPPLY
FOUNDATION TREATMENT
GROUTING

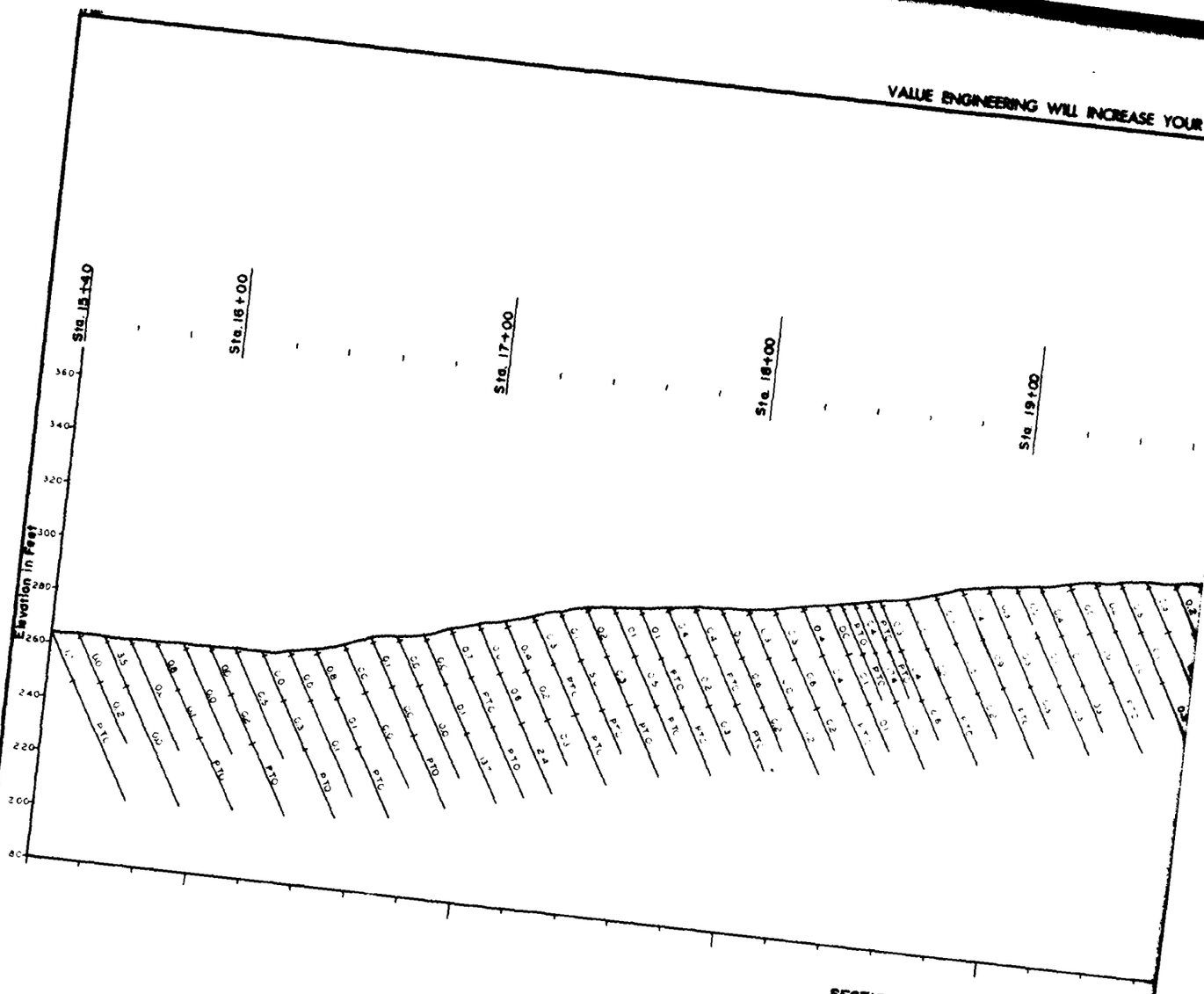
APRIL 1983

MRD SERIAL NO 80-8-0001

DRAWING NUMBER
9687-621669

SHEET 23 OF 24

VALUE ENGINEERING WILL INCREASE YOUR PROFI



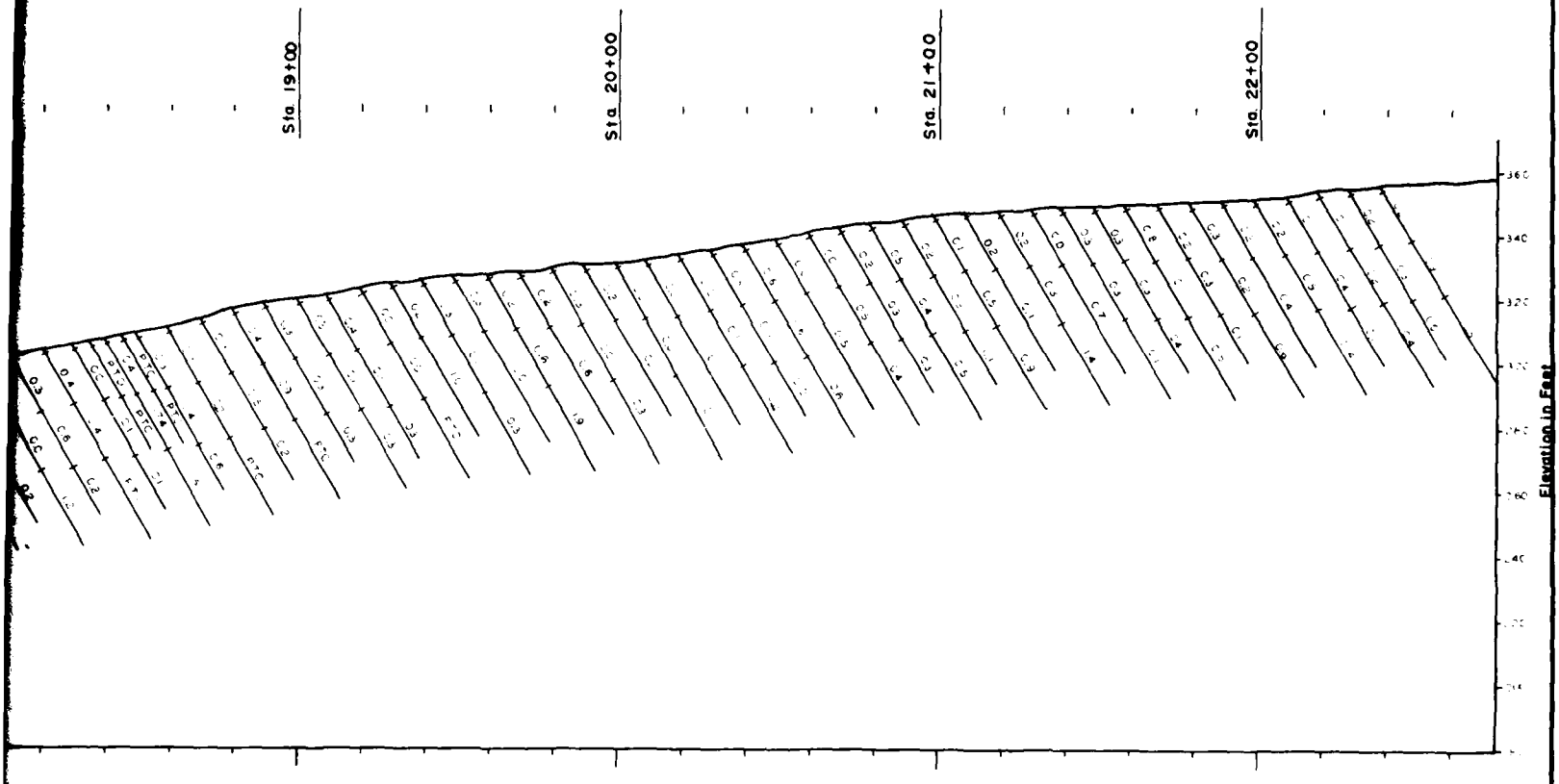
SECTION ALONG GROUT CURTAIN ON DAM

(LOOKING UPSTREAM)

Scale 1"=20'

20 10 0 10 20

WORK SAFELY



SECTION ALONG GROUT CURTAIN ON DAM AXIS

(LOOKING UPSTREAM)

Scale: 1"=20'

20 10 0 10 20

NOTE

Grout holes are shown with number of bags of cement used in each grout zone. Grout zones are between stops which are indicated by tick marks, usually at depths of 2 ft, 20ft., and 40 ft.

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS
LITTLE ROCK ARKANSAS

ARKANSAS RIVER AND TRIBUTARIES — ARKANSAS RIVER, ARKANSAS

TOAD SUCK FERRY LOCK AND DAM

RELOCATIONS

CONWAY WATER SUPPLY
FOUNDATION TREATMENT
GROUTING

DESIGNED BY	RC
DRAWN BY	CH
CHECKED BY	CD
SUBMITTED BY	
ENGINEER	

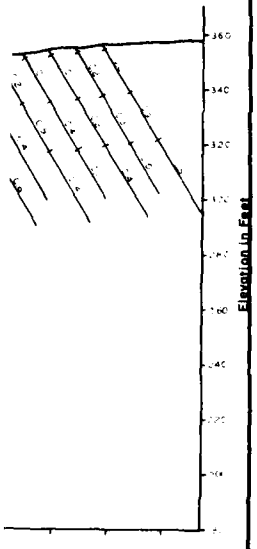
APRIL 1983

DRAWING NUMBER
9689-627/670

SHEET 24 OF 24

9689-627663

WORK SAFELY



th number of bags
grout zone. Grout
ps which are indicated
at depths of 2 ft, 20ft.

DESCRIPTION BY

MENT OF THE ARMY
TRICT, CORPS OF ENGINEERS
E ROCK, ARKANSAS
RIBUTARIES ARKANSAS RIVER, ARKANSAS
K FERRY LOCK AND DAM
RELOCATIONS
AY WATER SUPPLY
DATION TREATMENT
GROUTING

APRIL 1983
DIV SERIAL NO 80 9-00

9689-627670
24 of 24

END

DATE
FILMED

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