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DIERKS LAKE

SALINE RIVER, ARKANSAS

EMBANKMENT CRITERIA AND PERFORMANCE REPORT

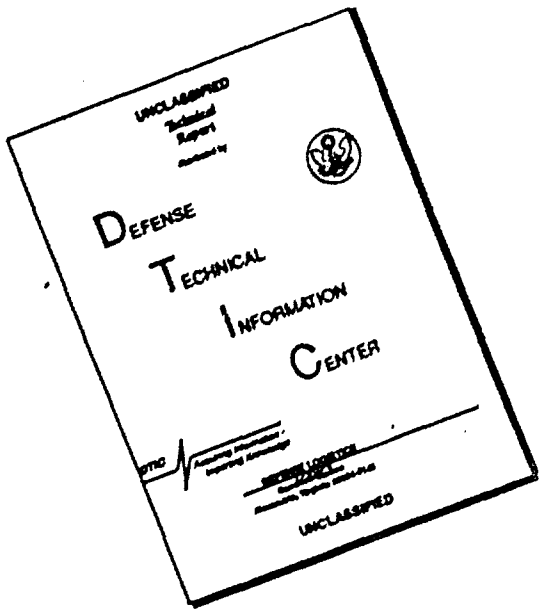
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SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION Unclassified	1b. RESTRICTIVE MARKINGS None
2a. SECURITY CLASSIFICATION AUTHORITY N/A	3. DISTRIBUTION/AVAILABILITY OF REPORT Unlimited
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE N/A	
4 PERFORMING ORGANIZATION REPORT NUMBER(S) N/A	5. MONITORING ORGANIZATION REPORT NUMBER(S) N/A
6a NAME OF PERFORMING ORGANIZATION Grimes & Johnson, Inc. & Grubbs, Garner & Hoskyn, Inc. 6b. OFFICE SYMBOL (If applicable)	7a. NAME OF MONITORING ORGANIZATION US Army Corps of Engineers Little Rock District, Geotechnical Branch
6c. ADDRESS (City, State, and ZIP Code) 400 West Capitol, Suite 2321 Little Rock, AR 72201	7b. ADDRESS (City, State, and ZIP Code) P.O. Box 867 Little Rock, AR 72203
8a NAME OF FUNDING/SPONSORING ORGANIZATION 8b. OFFICE SYMBOL (If applicable) CESWL-ED_GS	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER DACW03-86-D-0070, Delivery Order # 07
8c. ADDRESS (City, State, and ZIP Code) P.O. Box 867 Little Rock, AR 72203	10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO. / PROJECT NO. / TASK NO. / WORK UNIT ACCESSION NO.

11. TITLE (Include Security Classification)
DIERKS LAKE, EMBANKMENT CRITERIA AND PERFORMANCE REPORT (UNCLASSIFIED)

12. PERSONAL AUTHOR(S)
Johnson, Terry L. and Grimes, Roy; Grimes and Johnson, Inc.

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Final	FROM 6-70 TO 7-75	87 October	355

16. SUPPLEMENTARY NOTATION
Singularities ... structures

17. COSATI CODES		
FIELD	GROUP	SUB-GROUP

18 SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
Geology, Foundations and Abutment Treatment; Construction Procedures; Construction Control Data; Instrumentation.

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

This report provides a summary record of significant design, construction and operational data on the Dierks Dam and Reservoir. It was prepared in accordance with ER 1110-2-1901, "Embankment Criteria and Performance Report," and is for use by engineers to familiarize themselves with the project, reevaluate the embankment when needed, and for guidance in design of comparable future projects. The report presents a general description of the foundation conditions, type of material and placement methods of the various sections of the embankment, the design considerations on stability and seepage control, significant operational events, and an evaluation of the condition of the embankment. Pertinent drawings, design and construction data, and photos are also included. Dierks Dam is located on the Saline River in Sevier and Howard Counties in southwest Arkansas. The dam consists of a 1,830 feet long main earth embankment rising a maximum of 153 feet above the riverbed and a 670 feet long right embankment. Other major features include an uncontrolled spillway and an outlet works consisting of a 6 feet by 9 feet oblong concrete conduit. The purpose of the project is flood control, water supply, recreation, and fish and wildlife conservation.

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT	21. ABSTRACT SECURITY CLASSIFICATION
☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS	Unclassified
22a. NAME OF RESPONSIBLE INDIVIDUAL Robert L. Arnold	22b. TELEPHONE (Include Area Code) (501) 378-5055 / 22c. OFFICE SYMBOL CESWL-ED-GS

DD Form 1473, JUN 86 — Previous editions are obsolete.

SECURITY CLASSIFICATION OF THIS PAGE
Unclassified

and wildlife conservation. Keywords: Earth dams, Engineering geology,

DIERKS DAM AND RESERVOIR
SALINE RIVER, ARKANSAS

EMBANKMENT CRITERIA
AND
PERFORMANCE REPORT

October 1987

U. S. Army Engineer District, Little Rock
Corps of Engineers

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Prepared by
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Little Rock, Arkansas

DIERKS DAM AND RESERVOIR
SALINE RIVER, ARKANSAS

EMBANKMENT CRITERIA AND PERFORMANCE REPORT

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DIERKS DAM AND RESERVOIR
SALINE RIVER, ARKANSAS

EMBANKMENT CRITERIA AND PERFORMANCE REPORT

PERTINENT DATA

LOCATION

Saline River mile 56.5, a tributary of the Little River, in Sevier and Howard Counties, Arkansas.

AUTHORITY

Authorized by the Flood Control Act of 3 July 1958

TYPE OF PROJECT

Rockfill dam with compacted-impervious earth core, uncontrolled spillway, outlet works, and supporting facilities.

DRAINAGE AREA

114 square miles

ELEVATIONS, AREAS AND STORAGES

Feature	Elevation (feet,m.s.l.)	Area (Acres)	Storage (Acre-feet)	Storage (inches)
Top of Dam	593.0	-	-	-
Maximum pool	587.9	5,400	221,600	36.45
Spillway crest	575.0	4,260	159,500	26.23
Top flood control pool	557.5	2,970	96,800	15.92
Top conservation pool	526.0	1,360	29,700	4.88
Top inactive pool	512.0	810	14,600	2.40
Flood control storage	526.0-557.5	-	67,100	11.04
Water supply storage	512.0-526.0	-	15,100	2.48
50-year pool	564.5	3,440	119,100	19.59

SPILLWAY DESIGN FLOOD

Peak flow into full pool	210,000 c.f.s
Volume in full pool	206,900 acre-feet
Total runoff	34.03 inches
Peak flow, natural	202,000 c.f.s.
Reservoir operational channel capacity	1,000 c.f.s.

PERTINENT DATA (Cont.)

HYDRAULIC DESIGN DATA

Spillway	
Discharge at maximum pool	102,000 c.f.s.
Design head	12.9 feet
Outlet works	
Discharge at maximum pool	2,640 c.f.s.
Discharge at top of flood control pool	2,370 c.f.s.
Discharge at top of conservation pool	1,980 c.f.s.
Low flow discharge at bottom of conservation pool	140 c.f.s.

STRUCTURES

Main dam	
Type	Rockfill with impervious earth core
Height	
Maximum above streambed	153 feet
Average above valley floor	119 feet
Crest width	32 feet
Roadway width	24 feet
Length (main dam)	1,830 feet
Length (right embankment)	670 feet
Height (right embankment)	113 feet
Crest elevation	593 feet, m.s.l.
Spillway	
Type	Uncontrolled
Location	Right Abutment
Width	780 feet
Crest elevation	575 feet, m.s.l.
Outlet works	
Type	Oblong conduit
Size	6 feet by 9 feet
Control	2-service, 2-emergency 3'-3" x 8'-0" hydraulic slide gates

1. INTRODUCTION

1.1 Purpose and Scope of Report. This report provides a summary record of significant design, construction and operational data on the Dierks Dam and Reservoir. It was prepared in accordance with ER 1110-2-1901, "Embankment Criteria and Performance Report," dated 31 December 1981 and is for use by engineers to familiarize themselves with the project, reevaluate the embankment when needed, and for guidance in design of comparable future projects. This report was prepared jointly by Grimes & Johnson, Inc. and Grubbs, Garner & Hoskyn, Inc., for the Soils and Materials Section, Little Rock District, under the provisions of Contract No. DACW38-86-D-0070, Delivery Order No. 0007.

The report presents a general description of the foundation conditions, type of material and placement methods of the various sections of the embankment, the design considerations on stability and seepage control, significant operational events, and an evaluation of the condition of the embankment. Pertinent drawings. design and construction data, and photos are also included. More detailed descriptions of the foundation conditions are contained in the Dierks Dam foundation reports: Part I - "Embankment Foundation Grouting," dated April 1974, and Part III - "Embankment Foundation and Spillway," dated September 1978.

1.2 Brief Description and Purpose of Project. Dierks Dam is located at river mile 56.5 of the Saline River in Sevier and Howard Counties in west-central Arkansas, a tributary of Little River. The dam and reservoir are located about 5 miles northwest of the town of Dierks and about 66 miles north of Texarkana, Arkansas.

The major structures include a 780-foot-wide uncontrolled spillway with weir crest at elevation 575.0, a 670-foot-long right embankment located in a saddle between the spillway and the hill forming the right abutment of the main embankment, a 1,830-foot-long main embankment rising to a maximum of 153 feet above the riverbed, and an outlet works consisting of a 6-foot by 9-foot oblong reinforced concrete conduit controlled by two service and two emergency hydraulically operated slide gates. Other structures consist of an administration and maintenance building, paint and oil storage building,

gasoline pump and storage facilities, vehicle parking area, and public overlook facilities.

The purpose of the project is flood control and other beneficial public uses, which include water supply, recreation and fish and wildlife. The recreation area, operated and maintained by the Corps of Engineers, provides facilities year-round.

1.3 Project Authorization. The Dierks Dam and Reservoir project was authorized by the Flood Control Act approved 3 July 1958 (Public Law 85-500, 85th Congress, 2d Session). Related legislation included (a) House Document No. 170, the report "Millwood Reservoir and Alternate Reservoirs, Little River, Oklahoma and Arkansas," and (b) Public Law 87-88, which concerns requirements of local cooperation by State or local interests with regard to the water supply features of the project.

1.4 Project Construction History. Construction was initiated on the right and left abutment access roads in June 1968 and completed in March 1972. Construction of the main embankment, outlet works, spillway and project buildings was initiated in June 1970 and completed in July 1975. The maximum pool of record occurred on December 5, 1982, and reached elevation 558.0 NGVD.

A summary of construction contracts for the entire project is contained on the following page.

LIST OF PROJECT CONTRACTS

CONTRACT NO.	CONSTRUCTION FEATURE	CONTRACT AMOUNT	START DATE	COMPLETION DATE
DACW56-68-C-0235	Left Abutment Access Road	$ 582,985	29 May 68	1 Mar 72
Contractor: E. W. Blair, Inc., P.O. Box 450, Broken Bow, OK				
DACW56-70-C-0159	Embankment, Outlet Works, Spillway & Project Buildings	$ 7,915,460	19 June 70	11 July 75
Contractor: Amis Construction Co., P. O. Box 1871, Oklahoma City, OK 73104				
DACW56-74-0066	Landscaping of Project Bldg. Area	$ 19,636	19 Oct 73	18 Dec 74
Contractor: Green Country Landscaping, P. O. Box 605, Muskogee, OK				
DACW56-75-C-0080	Public Use Areas Stage I, Roads and Parking	$ 255,323	28 Feb 75	1 Mar 76
Contractor: AAA Excavating Company, 800 Arch Street, Little Rock, AR 72201				
DACW56-75-C-0196	Public Use Areas Stage I, Jefferson Ridge & Blue Ridge	$ 572,527	May 75	Feb 76
Contractor: W. R. Austin Const. Co., P. O. Box 998, Shawnee, OK 74801				
DACW56-76-C-0092	Public Use Areas Downstream Horseshoe Bend	$ 300,000	10 Jan 76	27 Oct 76
Contractor: LaForge & Budd Const. Co., P. O. Box 883, Parsons, KS 67357				

1.5 Periodic Inspections. In accordance with the requirements for periodic inspection and continuing evaluation of completed civil works structures, the following reports have been published for periodic inspections performed on the embankment, spillway and outlet works at Dierks Dam and Reservoir. They contain the problems developed after construction and instrumentation data.

Periodic Inspection Report No. 1	November 1974
Periodic Inspection Report No. 2	February 1976
Periodic Inspection Report No. 3	June 1977
Periodic Inspection Report No. 4	November 1979
Periodic Inspection Report No. 5	April 1983
Periodic Inspection Report No. 6	March 1985

2. GEOLOGY

2.1 Physiography. Dierks dam is situated on the Athens Plateau, a dissected piedmont belt about 15 miles wide located between the Ouachita Mountain region to the north and the Gulf Coastal Plain to the south. The Saline River, which heads in the Cossatot Mountains to the north, flows southerly across the Ouachita Mountain region to its confluence with Little River about 30 miles downstream from the dam. Drainage in the area features a trellis pattern and is expressed topographically by rugged east-west ridges and valleys. These alternate ridges and valleys are a reflection of the differential erosion of the soft and hard beds that comprise the foundation. Only an occasional gap breaks the continuity of the ridges. The trunk streams or consequent streams, such as the Saline River, presently flow in rather crooked channels nearly coincident with their ancestral courses. The ancestral courses were eroded into relatively soft Cretaceous formations but subsequent erosion removed the Cretaceous, and the streams presently flow on the underlying, upturned Paleozoic strata.

2.2 Overburden. Except for the alluvial material deposited in the flood plain of the Saline River, there is very little overburden. The right (west) abutment supports only the residual clay, sand, and sandstone boulders that can be held in place by vegetation, and the left (east) abutment supports only the residual materials that have accumulated between sandstone outcrops. These deposits range from 2 to 10 feet in thickness and consist of weathered sandstone fragments in a clayey sand matrix. The flood plain alluvium averages about 20 feet in thickness and consists of sandy clay or clayey sand overlying a heterogeneous mixture of weathered sandstone gravels, cobbles, and boulders.

2.3 Geological Formations. Three formations are exposed in the vicinity of the dam. The Stanley shale (Mississippian age), which is about 6,000 feet thick, consists of shale and interbedded sandstone, and outcrops a short distance upstream of the dam. The Jackfork formation (Mississippian age) also about 6,000 feet thick, consists of quartzitic sandstone and shale interbeds, conformably overlies the Stanley, and forms the bedrock for the dam and spillway. The Pike gravel member of the Trinity formation (Cretaceous age) is comprised of gravel, sand, and clay and unconformably overlies the Jackfork

formation. Remnants of this member cap the hills and ridges a short distance south and west of the dam. The Stanley and Jackfork formations, along with the other pre-Cretaceous deposits in the Ouachita Mountain region, have undergone intense lateral compression resulting in a series of anticlinal and synclinal folds. Evidence of this activity can be seen in the area to the north of the dam. At the damsite, the rocks strike northeast-southwest and dip steeply to the south. There is no evidence of any significant faulting within the damsite although jointing is quite prominent in the hard sandstone beds.

2.4 Stratigraphy. The Jackfork formation, which comprises the foundation rock for the dam and the appurtenant structures, is interbedded sandstone, shaly or argillaceous sandstone, and shale. The sandstone is hard to very hard, light gray, highly quartizitic, and forms ridges up to 15 feet wide that strike almost parallel to the dam axis. These ridges run the entire length of the dam. In some places they form the upstream and/or downstream faces of the cutoff trench. The shaly sandstone is hard, gray to dark gray, and includes zones of shaly inclusions and partings. The shale is moderately hard, slightly fissile, dark gray to black, with occasional thin sandstone seams. Joints, frequently lined with crystals of quartz, calcite, or pyrite, were found throughout the formation.

2.5 Foundation Structure. There was no evidence of faulting at the damsite. This absence of faulting can be attributed to the presence of interbeds of shale which can absorb the compressive stresses (crustal shortening) by crumpling and shearing rather than rupturing. The strikes observed in the general area were found to be quite variable, ranging from about North 60° East to North 75° East. The dip of the rock varies from about 50° to 60° to the south. Because of the steep dip, any slight change in the strike of the strata gives an abrupt change in the apparent dip in the geologic sections. Investigation of the Jackfork sandstone outcrops at the damsite revealed three joint sets. The principal set strikes about North 80° East, which is slightly oblique to the strike of the rock, and dips 50° to 60° to the north. A secondary set strikes roughly North 10° West and dips steeply to the west. The third set, less apparent than the other two, strikes about parallel to the bedding but dips no nerly. Jointing in the sandstone beds adjacent to the river valley appears to have been affected by elastic

rebound in that the joints are more open and partially rearranged. Jointing was not prominent in the shale, but numerous slickensided planes found throughout the shales give evidence of some differential adjustments, possibly resulting from past regional tectonic activity.

2.6 Weathering. The foundation rock has been subjected to both chemical and mechanical weathering. The chemical weathering has occurred by both hydration and oxidation. Mechanical weathering, aided slightly by hydration which produces a swelling that widens existing joints and fractures, is evident only at 2- to 3-foot depths. The weathered sandstones are generally moderately hard, tan to rust-brown, with clay-lined, highly stained joints throughout. The weathered shale beds are soft, tan to gray, highly stained, and where highly weathered are sometimes completely altered to clay. The bedrock comprising the abutments at the damsite is chemically weathered to a depth of about 30 feet. Below 30 feet the rock is usually fresh except for staining and minor rock softening adjacent to and on the joint surfaces. Staining, primarily iron oxide, extends considerably deeper in the rock but appears to be negligible below a depth of about 50 to 60 feet. As determined from core borings, the joint staining appears to be the most prominent on the steep right abutment. The rock in the flood plain is fresh except for the top 2 or 3 feet which is very slightly weathered.

2.7 Ground Water. Water occurs in the Jackfork formation in a free state and is replenished by surface runoff and streamflow filtering into the formation through open joints and fractures. The depth of the regional water table was not established. The water table is tributary to the river at both abutments of the main embankment. In the right embankment, artesian flow occurred in several grout holes between stations 2+50 and 3+80 at depths of 28 to 76 feet. In the main embankment, artesian flow was encountered between stations 18+90 and 20+25 at depths of 44 to 82 feet.

2.8 Characteristics of Bedrock. In addition to the bedrock characteristics discussed in the preceding paragraphs, tests were made on a 6-inch rock core taken in the spillway. On the basis of investigations before and during construction, the foundation rock is considered adequate to support the structure.

2.9 Investigations. Tulsa District drilled six site selection borings during January 1964. Later in 1964, and in 1965, and 1966, Fort Worth District completed an additional 67 dam site borings and excavated 14 floodplain test pits for design of the dam, spillway, and outlet works. Nineteen of these borings were drilled along the originally proposed dam axis, and eight were drilled on or adjacent to the design dam axis, including 4 offset borings for exploration of an unexpectedly deep bedrock interval in the floodplain near Boring 169. The initially proposed controlled spillway, located in the deep ravine right of the river, was explored with 12 borings. These borings were drilled and a trench was excavated to bedrock in the design spillway. Two of these borings were drilled inclined 35 degrees from horizontal and normal to bedding dip. Overburden was sampled with an auger and/or Denison core barrel. Where the overburden could not be sampled due to gravelly and cobbly material, the interval was penetrated with a rock bit. Test pits were dug to provide soil samples and to determine top of rock, where practicable. Hydraulic pressure tests were conducted in all NX-size borings, except boring 2C-20 and a few shallow holes along the axis of the outlet works. Electric logs were made in selected borings to aid in correlation of bedrock strata. Surface mapping was done to determine dip and strike of strata, joint patterns, rock type, and rock conditions in outcrops and along the shallow trench excavated in the design spillway. After 1966, 61 additional holes were drilled, making a total of 141 borings. The majority of the additional holes were drilled in the spillway-quarry area. The plans of borings for structures, spillway and borrow areas are given on Plates 10 and 12. Geologic sections with borings and water levels are shown on Plates 12 through 17. Logs of overburden borings and test pits are shown on Plates 5 through 11.

3. FOUNDATION AND ABUTMENT TREATMENT

3.1 Design Considerations.

3.1.1 Embankment. All overburden and loose, weathered material were removed from the embankment areas, and a cutoff trench excavated to firm rock in the abutments. In a few instances, where deeper weathering was encountered, the excavation was planned to stop at 10 feet below the rock line, in order to remove all severely weathered material to a satisfactory foundation. The upstream slope of the cutoff trench coincided with the downstream dip of the rock. The downstream slope was planned as a 4 on 1 slope, but final slopes adjusted during construction to conform to other geologic structures such as jointing. The proposed alignment of the trench crossed various beds of sandstones and shales due to the divergence between the dam axis and strike of the rock. The cutoff trench alignment was adjusted during construction, as limits of the impervious zone permitted, to take advantage of the strike and dip of the rocks. A grout curtain was constructed along the entire bottom length of the cutoff trench by means of grout holes inclined upstream and drilled on a minimum of ten-foot centers. The degree of angle was controlled so as to intersect the downstream dipping bedding plane, normally. It was believed this plane would control the greatest amount of grout movement and/or communication.

3.1.2 Spillway. The spillway contains generally the same bedrock distribution and conditions as the embankment foundation, as it is essentially on the strike of the formations. The excavation, though curved, is essentially across the strike, with the rocks dipping in a downstream, southerly, direction. The side slopes in the spillway were presplit 10V on 1H with two 10-foot berms. Since the spillway excavation cuts across the strike, the resulting side slope and dip of rock relation are favorable for stability. Due to the orientation of the rock, controlled blasting and machine trimming methods near final grade were required to produce a generally uniform surface. The curved alignments on the approach channel could not be excavated upstream from Hole 23 since the cut paralleled the strike. Downstream from Hole 23, the indicated alignment was followed and the 10-foot berm provided. Spillway details are shown on Plate 22.

3.1.3 Outlet Works.

(a) Foundation Conditions. The interbedded sandstone and shale provides an adequate foundation for the outlet works structure, whereas hard and competent sandstone underlie the gate tower. Unconfined compressive strengths for this sandstone were considered similar to those values for the same rock type at Gillham Dam which ranged from 2,500 psi for alternating shale and sandstone beds to 8,666 psi for a hard, fine-grained sandstone. The foundation grade for the intake structure, upper portion of the cut-and-cover conduit, and stilling basin were in unweathered rock (see Plates 1 and 2). The foundation grade at the axis of the dam and for about the last 200 feet of the downstream end of the conduit approximated the top of rock. Therefore, additional excavation of weathered zones was required to secure a suitable foundation in these zones.

(b) Water Table. The water table along the centerline of the outlet works varied from about elevation 445 at the upstream and downstream ends to about elevation 470 at Station 18+60 (see Plates 5 through 9). Although pump tests were not made, ground water inflow was expected to be moderate, and conventional sump and pump methods were used.

(c) Excavation. The excavation grade along the centerline of the outlet works is shown on Plate 1. The total depth of cut in the overburden and rock along the conduit will vary from about 20 to 32 feet. The maximum cut occurred in the stilling basin area where the foundation grade is 39 feet below the original ground surface. Overburden excavation depths varied from about 7 feet at the intake structure to about 34 feet near the center of the conduit section. Rock excavation depths varied from about 2 feet at the downstream end of the conduit to about 22 feet at the stilling basin end sill. Excavation below grade to firm rock and concrete backfill was performed where top of rock was encountered at a lower elevation. The excavation grade for the intake structure was about 17 feet below the top of rock. Overburden cut slopes of 1V on 3.5H, and rock cut slopes of 4V on 1H were selected.

Control blasting techniques, such as presplitting, smooth blasting, or cushion blasting were used to minimize overbreakage and shattering in the sandstone

and shale. The floor of the excavation broke out unevenly because of the steep dip and interbedded nature of the rock. Hand grading was utilized for the final cleanup and foundation preparation. From inspection of local outcrops it was determined that the shales slake slowly when exposed to air. Consequently, due to the low slaking potential of this compaction type clay shale, and the predominance of sandstone, foundation protection was not required. Permanent excavated slopes for the discharge channel were selected to be 1V on 3.5H through overburden and 2V on 1H through rock with a 5-foot bench at the top of rock.

3.2 Embankment Design.

3.2.1 Main Embankment. A typical section of the main embankment is shown on Plates 1 and 28. The maximum height of the main embankment is 153 feet. The embankment was designed with a 1-foot overbuild to compensate for settlements during reservoir filling. The section is essentially symmetrical, with a central impervious core and with random fill zones flanked by transition material and outer shell zones of rock fill. A 4-foot-thick inclined filter is connected to a horizontal 6-foot thick select-rock drain at the base of the downstream shell. The embankment was designed to make maximum use of the materials from the required excavation of the spillway, supplemented where necessary by borrow materials.

3.2.2 Right Embankment. The typical section for the right embankment is shown on Plate 28. The maximum height of the embankment is 120 feet. The section consists of random fill zones, which were mainly a heterogeneous mixture of all soils from the main embankment foundation excavation, with a centrally-located impervious core. A select rock-fill zone was placed on the upstream random fill to increase stability and to provide slope protection for the embankment. Internal drainage was provided by a 3-foot-thick inclined filter located on the downstream face of the impervious core which connects to a 4-1/2-foot horizontal filter blanket under the downstream random fill shell. The right embankment was designed with a 1-foot overbuild to compensate for settlements during reservoir filling.

4. CONSTRUCTION PROCEDURES

4.1 Embankment Foundation.

4.1.1 Main Embankment.

(a) Soils Description. Profiles of the foundation soils are presented in the sections shown on Plates 5 through 11. These sections indicate that the main embankment overburden consisted of a surface layer of low plasticity silts, sands, and sandy clays; interspersed with small quantities of gravels, cobbles, and boulders. A heterogeneous mixture of gravels, cobbles, and boulders with a silty to clayey matrix underlies the upper sand and clays. The thickness of these deposits ranged from near zero on the abutments to a maximum of about 35 feet at boring 169 in the flood plain. The average depth of materials in the flood plain was about 20 feet.

(b) Treatment. Amis Construction Company of Oklahoma City, Oklahoma, the prime contractor, began clearing the embankment area on 20 August 1970. Beginning 20 September 1970, all overburden materials were removed from the foundation of the main embankment to provide a firm rock-to-rock contact for the rock-fill shell zones. Unsuitable material was hauled to the designated waste area or used to build haul roads. Suitable materials were stockpiled for later use as random fill or filter material or were incorporated into the first stage cofferdam. This excavation was accomplished with the use of 621 and 660 Caterpillar scrapers, 769 Caterpillar tail dumps, D-8 and D-9 Caterpillar dozers, and 988 and 980 Caterpillar loaders. Treatment of the foundation rock was limited to removal of all loose and highly weathered materials by blade cleaning outside the limits of the random fill and impervious core zones. Treatment of the foundation rock within the limits of the random fill and impervious core zones consisted of removing all dirt and other loose and highly weathered material by washing, air jet, or both. All open joints and fractures were cleaned and covered or filled with cement mortar or thick grout. The final excavated surface was protected by layers of unexcavated rock until just prior to final excavation, cleanup, treatment, and fill placement.

4.1.2 Right Embankment. The depths of the foundation overburden

material under the right embankment were generally shallow, ranging from 1 to 4 feet, and were composed of forest litter underlaid by a heterogeneous residual soil (clay, sand, boulders, etc.). These overburden materials were excavated and wasted. Treatment of the foundation rock under the impervious core and random fill was the same as that for the main embankment impervious core and random fill zones. The foundation rock under the downstream random fill zone was blade cleaned.

4.2 Embankment Foundation Rock.

4.2.1 General. The discussion of rock excavation in this report will be limited to the excavation within the the cutoff trench. Rock excavation by drilling and blasting began on 2 December 1970 in the right embankment. Rock excavation was required from station 0+00 to 2+60 to a depth of 10 feet at centerline. The right abutment of the right embankment (station 0+00 to 2+60) sloped steeply upstream. Thus, to achieve a 10-foot cut along centerline of the cutoff trench, it was necessary to excavate as much as 25 feet of rock along the downstream face. See Photograph No. 1 for a general view of the trench excavation. The rock from station 2+60 to 3+80 was considered fresh and firm. Rock was excavated from station 3+80 to 6+60 to a depth of 6 to 10 feet at centerline. The left abutment of the right embankment (station 3+80 to 6+60) sloped very steeply downstream. This required a 15- to 20-foot cut in the upstream face to achieve the desired 6- to 10-foot cut at centerline. This also produced a very shallow cut on the downstream face. Except for several narrow sandstone ridges, the small mass of rock downstream of the presplit line was insufficient to contain the energy of the presplit shot. Consequently, there was almost no downstream face in the cutoff trench from station 3+80 to 6+60 (see Photograph No. 2). There was no cutoff trench from station 6+60 to 9+00. Rock was excavated from station 9+00 to 12+00 to a depth of 10 feet measured at centerline (see Photographs Nos. 4 and 5). No cutoff trench was constructed from station 12+00 to 20+30. Rock was excavated from station 20+30 to 27+00 to a depth of 6 to 10 feet at centerline (see Photographs Nos. 12 through 18). All explosives used by Amis Construction Company at this project were manufactured by the Atlas Powder Company.

4.2.2 Presplitting. To determine the best method of presplitting the downstream face of the cutoff trench, a test section was designated from

station 21+00 to 24+00. Within this area, from station 21+75 to 22+00, the contractor elected to use Kleen-Kut and E-Cord to compare the results with those obtained by the loading procedure outlined in the contract specifications. Holes 2-1/2 inches in diameter were drilled on 24-inch centers to a depth of 6 feet. The holes from station 21+75 to 22+00 were each loaded with one stick of Kleen-Kut 17 percent (1-1/8-inch by 36-inch) with a cap and E-Cord downline. The holes in the control sections were each loaded with one stick of Giant Gelatin 40 percent (1-1/4-inch by 8-inch) in the bottom and two one-half sticks of Giant Gelatin hung on E-Cord on 12-inch centers above it. All holes were stemmed in the top 3 feet. Results of the test showed no discernable difference in the face produced; therefore, the Contractor continued to use Kleen-Kut because of the ease of loading. Typically, the holes were drilled on 24-inch centers and loaded with a continuous column of Kleen-Kut to within 3 feet of the collar. The remaining 3 feet was stemmed.

Primary or excavation shot holes were 3-1/2 inches in diameter. The hole spacing and loads varied with the lift thickness and competence of the rock. Holes adjacent to the presplit line were loaded with one stick of Power Primer 75 percent (2 inches by 8 inches) in the bottom followed by one or more sticks of Ammodyte 57 percent (2-1/2 inches by 16 inches). The amount of stemming in holes less than 8 feet deep ranged from 2 feet to 4 feet. In the deeper holes the depth of stemming approximately equaled the shorter dimension of the hole spacing. Generally, the shallower holes were spaced 4 feet by 6 feet with the spacing increasing with hole depth to a maximum of 7 feet by 11 feet. The holes toward the center of a shot were usually loaded with one stick of Power Primer in the bottom followed by ammonium nitrate blasting agent in the form of prills. These holes were stemmed in the same manner as the holes loaded with Ammodyte. Total quantities of explosives used for excavation of the cutoff trench are shown in Table 4.2.2.

TABLE 4.2.2

EXPLOSIVES SUMMARY

Trade Name	Quantity
Kleen-Kut (1-1/8 inches by 36 inches) 17 percent	1,028 pounds
Giant Gelatin (1-1/4 inches by 8 inches) 40 percent	223 pounds
Power Primer (2 inches by 8 inches) 75 percent	1,789 pounds
Ammodyte (2-1/2 inches by 16 inches) 57 percent	3,731 pounds
ANFO (ammonium nitrate prills)	9,475 pounds
Primacord	2,112 feet
E-Cord	7,701 feet

4.3 Foundation Preparation.

4.3.1 General. All foundation areas to receive concrete, impervious fill, or random fill required foundation preparation. Subsequent change orders widened the foundation preparation under random fill zones, and in August 1972 the foundation preparation under random zones was limited to the 20 feet immediately upstream and 15 feet immediately downstream of the impervious zone. In those areas where the top of rock was considered to be top of firm rock, foundation preparation directly followed overburden excavation. Where rock excavation was necessary, it was carried to within 1 foot of final grade. The final foundation was achieved by removing the large, loose, weathered rock with a Poclain backhoe and a Caterpillar 966 rubber- tired loader. Then a labor crew removed smaller rock with picks, shovels, and pry bars. Final cleanup was achieved by using compressed air and water jets to blow off the remaining loose material. This final cleanup was timed to immediately precede the placement of concrete or earth fill. Generally, placement followed cleanup by less than 1 hour. The foundation was kept wet after the completion of cleanup until the start of backfilling operations.

4.3.2 Foundation Protection Concrete. Several areas in the foundation required the application of foundation protection concrete. Where open joints or badly weathered thin shale seams occurred, they were cleaned to a depth twice as great as their width. They were then filled with 3/4-inch aggregate concrete and allowed to set before covering with fill. In several areas, large overhangs existed in the downstream

portion of the natural cutoff trench created by the weathering of a shale bed between two more resistant sandstone beds. In one area the overhang was backfilled with foundation protection concrete by forming the open side and filling with high slump 3/4-inch concrete. In another area the overhang was eliminated by ripping and dozing. The overhanging rock was sufficiently jointed to allow its removal in this manner without disturbing the underlying rock.

4.4 Grout Curtain.

4.4.1 Drilling and Grouting. The drilling and grouting was performed by the Judy Company, a subcontractor. The Judy Company began moving equipment to the jobsite on 16 December 1970. Drilling and grouting began on 1 March 1971 and continued to 15 August 1971. Following diversion of the river through the outlet works, drilling and grouting began again on 1 June 1972 and was completed on 29 August 1972. Equipment used is listed in Table 4.4.1. Photograph No. 3 shows grouting operations.

The grout curtain was formed by drilling and grouting a single line of holes, varying in depth from 50 to 100 feet, along the dam axis from station 0+00 to 27+00 (see Plates 39 through 42). Generally, the holes were angled 30° upstream to intersect the maximum number of bedding planes, which were dipping downstream. The primary holes (20-foot centers) were drilled to full depth, washed, pressure tested, and grouted in accordance with the "Stop Grouting, Split Spacing" method. Briefly, this method requires the holes to be drilled to final depth and grouted by stops through a packer set at successively shallower depths. The secondary holes were then located midway between the previously drilled and grouted holes. This split spacing continued until the holes were determined to be tight. Generally, a hole was considered tight if it took less than 0.1 sacks of cement per foot.

TABLE 4.4.1

GROUTING EQUIPMENT

Item	Quantity
Chicago-Pneumatic 600 Air Compressor	1
Gardner-Denver 900 Air Compressor	1
Chicago-Pneumatic Airtrac Drill	1
Gardner-Denver Airtrac Drill	1
Atlas-Copco Airtrac Drill	1
Gardner-Denver Pump, 5'x 3' - 1/2' x 4'	1
Wilden Air Pump, 2-inch	1
Deming Air Pump, 3-inch	1
Trucks, 2-ton	2
Pickups, 1/2-ton	2
Parts Trailer	1
Assorted Valves, Gages, and Hoses	

4.4.2 Difficulties Encountered. There were three areas of the grout curtain which required special treatment.

(a) Area No. 1. The first area occurred between stations 16+75 and 19+00 (see Photograph No. 21 for excavation difficulties). From about station 20+10 to 18+70 the dam axis falls between two of the resistant sandstone ridges which strike almost parallel to the axis. At station 18+70 the axis intersects the toe of the steeply dipping sandstone bed which forms the upstream face of this natural cutoff trench. The dam axis falls on this dip slope face from station 18+70 to 17+25, at which point the top of the dip slope is reached (see Photographs Nos. 23 through 26). It was not practical to drill grout holes in this face; therefore, an overlap section was created. This was done by moving the grout curtain gradually upstream from a point on the centerline at station 16+80 to a point 12 feet upstream at station 17+80. Likewise, the grout curtain was moved gradually downstream from a point on the centerline at station 19+00 to a point 20 feet downstream at station 16+75. This, in effect, created two lines of grouted holes approximately 20 feet apart from station 16+75 to station 17+80 (see Plate 41).

(b) Area No. 2. The second problem occurred between stations 12+30 and 12+80. The slope of the right abutment presented a safety hazard to the drilling operation. The subcontractor proposed to drill and grout this

area with two series of angle holes drilled from stations 12+30 and 12+80. The subcontractor agreed to drill two holes at angles greater than the maximum required by the specifications to assure complete grouting of this area. The proposal was accepted, and seven angle holes, ranging from 10° to 45° and 75 feet to 100 feet, were drilled and grouted (see Plate 40).

(c) Area No. 3. The third area requiring special treatment occurred between stations 6+60 and 9+00. The plans did not require a grout curtain across the hill between the right embankment and the main embankment. However, on the recommendation of the Foundations and Materials Section, Southwestern Division, five holes were drilled on 40-foot centers from stations 6+60 and 9+00. All these holes were tight and no further grouting was deemed necessary in this area.

4.4.3 Conclusions on Grouting Effectiveness. The entire length of the grout curtain for its full depth was pressure grouted to refusal, with a very small quantity of grout lost through surface leaks. In areas where seeps occurred in the foundation downstream of the centerline or artesian flow was encountered during drilling, there was a noticeable relocation of seeps to areas upstream of the grout curtain. This indicates the grout curtain has intercepted ground-water flow. Subsequent high water retained by the cofferdam produced no unusual increase in seepage downstream. These facts indicate that the grout curtain is performing its design function.

4.5 Material Sources

4.5.1 Borrow Materials. Borrow soils for the embankment were obtained from borrow area E located upstream of the axis and from areas located within the limits of the conservation pool and outside of borrow area E, which was a value-engineered proposal to the contract. Borrow area D was used as a source of granular materials for the filter. Borrow area C, which was to be a source of impervious borrow, but was not used. The investigation program and plan of the borrow areas are shown on Plates 10 and 11. Characteristics of soils in borrow area E are contained in the following tabulation:

Soil Type	No. Samples Tested	Average Value Liquid Limit	Percent Fines
CL	8	31	60
ML-CL	3	19	60
ML	4	NP	61
SC	24	27	36
SM, SP	44	NP	33
CH	1	65	88
GC	18	32	17
GM, GP	3	NP	22

4.5.2 Filter Materials. Materials for the filter A were obtained from selective excavation of the main embankment foundation and borrow area D. The materials were then processed to the extent necessary to meet the specifications.

4.5.3 Rockfill and Transition Materials. The rockfill material was obtained from the required spillway and approach channel excavations. Plate 17 defines the geologic quality of the in situ material. The select rock fill was obtained from the better quality, least weathered material and was processed over a 3-inch grizzly to insure drainage of the mass and to remove poor quality materials. The minus-3-inch byproduct of the select rock was used for transition. The random rock fill material came from any of the zones except the most weathered. The original contract documents did not require processing of the random rock fill materials; however, the quality of the excavated material was so poor that the processing over a 3-inch grizzly was required. The minus-3-inch byproduct was then used in the random fill zone of the embankment.

5. CONSTRUCTION CONTROL DATA

5.1 Construction Sequence. The general construction sequence was as outlined below:

(a) Excavated Stage 1 diversion channel and constructed first stage cofferdams. (See Plate 27 for details of first and second stage diversions.)

(b) Constructed outlet works and embankment within first stage cofferdams to the minimum elevations and sections shown on Plate 26.

(c) Completed right embankment except upstream transition and select rock sections prior to beginning second stage construction.

(d) Removed first stage cofferdam and constructed second stage diversion cofferdam.

(e) Constructed second stage cofferdam.

(f) Constructed remainder of main and right embankments.

5.2 Impervious Fill. The specifications required that the impervious material consist of clays having a liquid limit of 25 or greater and a percent fines of not less than 35. In addition, the materials were to be placed at 95 percent or greater of standard density as determined by the Rapid Method of Compaction Control (Water Resources Technical Publication EM No. 26). The moisture content was to be within minus-one and plus-three percentage points of optimum. A summary of control tests performed on the impervious fill materials placed in the embankment and reported in Monthly Summaries in Appendix F is given below.

Parameter	No. Tests	Average	High	Low
% Comp.	203	99.5	106	94
Wf-Wo (%)	203	+ 0.3	+ 3.3	- 1.4
-200 Sieve (%)	46	49	77	21
LL (%)	43	34	64	25

Results of impervious fill density tests are plotted on Plates 18 through 21.

5.3 Random Fill. The specifications required a moisture content of plus or minus three percentage points of optimum and 95 percent of standard density.

Parameter	No. Tests	Average	High	Low
% Comp.	271	96.6	110	94
Wf-Wo (%)	271	- 0.5	+ 3.1	- 3.4

Results of the above tests indicate the design requirements were achieved. The random fill density test results are shown plotted on Plates 17 through 21.

5.4 Design Modifications.

5.4.1 Typical Section. The typical section as shown on Plate 28 is the final section resulting after several modifications were made. The sequence of modifications to the main embankment section is shown on Plate 29.

The original section had an upstream random fill zone 20-feet wide and a downstream random fill zone only 15-feet wide; however, the quality of the rock from the required excavation was so poor that the rockfill zones had to be reduced and the screenings from the random rockfill were absorbed in the enlarged random fill zones.

5.4.2 Filter. The specifications did not require a washing sequence in the production of the filter materials. After some material was produced, it became evident that the material would not function as a high capacity drain. A change order was initiated in which the contractor blended 60 percent of the material from the foundation with 40 percent from borrow area D to reduce the minus-200 material. The horizontal filter thickness below elevation 490.0 in the right embankment was increased from 3 feet to 4.5 feet, and above 490.0 the thickness was reduced to 2 feet. This change was made to increase the capacity of the drain placed prior to the change order.

5.4.3 Select Rockfill. The spillway was excavated by systematic drilling and blasting commencing in February 1971 and completed in May 1974. The required excavation in the spillway was the primary source of rockfill material for the embankment. The fresh, hard, unweathered sandstone was processed to produce select rockfill by removing all minus 3-inch material. The minus 3-inch material was placed in the transition zone. Softer, slightly weathered sandstone meeting specifications for random rockfill was used as quarry run. The portion of the remaining spillway excavation meeting

specifications for random rockfill was used as quarry run. The portion of the remaining spillway excavation meeting specifications was used as random fill. Materials unsuitable for zone placement were wasted or used to construct haul roads.

5.4.4 Placement Quantities. The original design contained 1,890,000 cubic yards of compacted random rockfill, select rockfill, and transition material. As a result of the embankment zoning revisions, the actual quantities placed were as follows:

Select rockfill	328,059 cubic yards
Random rockfill	900,564 cubic yards
Transition material	223,757 cubic yards
Total	1,452,380 cubic yards

5.4.5 Seepage During Construction. As shown on Plates 1 and 27, a random rock fill cofferdam was incorporated into the upstream toe of the main embankment. During construction, the pool rose against the cofferdam and seepage occurred through the cofferdam and emerged downstream across a haul ramp. This cofferdam was part of the second stage diversion as shown on plate 27. As a result of the observed seepage, a modification was made to the main embankment section which consisted of placing a five ft. thick blanket of impervious material on the cofferdam upstream slope.

5.5 Embankment Stability.

5.5.1 Tests and Design Values. Tests were conducted on representative soils in the remolded state. The summary of soil shear strength data and graphical presentations are contained in Appendices B through G. Test results from test fills at Gillham Dam and Dierks Dam were used in determining the unit weights and design shear strengths for the rock fills. The adopted design strengths are shown in the following tabulation:

Adopted Design Data

Materials	Saturated Unit Weight (pcf)	Submerged Unit Weight (pcf)	Design Strengths Q ø (degrees)	Q C (tsf)	R ø (degrees)	R C (tsf)	S ø (degrees)	S C (tsf)
Select rock (1)	135	72.6	39	0	39	0	39	0
Random rock (1)	135	72.6	25	0.4	33	0	33	0
Impervious	125	62.5	10	0.6	14	0.1	27	0
Random fill (1)	125	62.5	12	0.8	15	0.3	30	0
Transition	125	62.5	12	0.8	15	0.3	30	0
Filter	125	62.5	33	0	33	0	33	0

ø = Angle of internal friction. C = cohesion.
(1) Material assumed to have 40 percent voids and a saturated surface dry unit weight of 105 pcf.

(2) Design shear strengths for the random rock fill zones were based on test results for the minus No. 4 fraction of rock.

(3) Design shear strengths for the random fill zones were based on the assumption that these zones would be entirely shale material. These zones actually contain large percentages of sandstone fines and plus 3/4-inch material. Therefore, the design values are conservative.

5.5.2 Construction Control Record Shear Tests. The following summary contains the results of tests performed as construction control samples from the impervious and random fill zones, with six samples obtained from each zone.

Shear tests on the record samples reflected strengths higher than design values with the exception of the unconsolidated-undrained, Q, strengths which were lower. The consolidated-undrained, R, tests on the random fill record samples have not been completed since testing apparatus of sufficient size to test material containing gravel was not available.

Construction Control Shear Tests

Random Material

No. Tests	Type Test	Test Strength ø Degrees	Test Strength C t.s.f.	Design Strength ø Degrees	Design Strength C t.s.f.
6	Q	6*	0.4	12	0.8
6	S	30	0	30	0

Impervious Material

No. Tests	Type Test	Test Strength ø Degrees	Test Strength C t.s.f.	Design Strength ø Degrees	Design Strength C t.s.f.
6	Q	6	0.6	10	0.6
5	R	17	0.5	14	0.1
5	S	31	0	27	0

*The random materials included minus-3-inch byproduct of the random rock and were less plastic than originally designed. (Ref: Periodic Inspection Report No. 1. November, 1974).

5.5.3 Procedures. The embankments were analyzed for stability using the circle arc and wedge methods under conditions of end of construction, partial pool, sudden drawdown, and steady seepage. The design analyses are presented on Plates 30 through 33 for the right embankment and Plates 34 through 37 for the main embankment. The "Adopted" factors of safety for the

main embankment, per Plates 34 through 37, were computed using the adopted design shear strengths and the revised embankment configuration. This reanalysis refined the original slope stability calculations in view of shear strength values developed from the Gillham and Dierks Dam test fills. The stability of the right embankment was not reanalyzed because the design factors of safety were generally higher than those for the main embankment. In addition to the above circle arc and wedge analyses, the main embankment was analyzed for the end of construction and steady seepage conditions by a procedure outlined in an ASCE paper titled, "Rockfill Design - Carters Dam," by Robeson and Crisp, September 1966. This procedure, which basically utilizes earth pressure theories, was believed to be more applicable to a narrow core rockfill structure than those contained in EM 1110-2-1902. Results of these analyses indicate the embankment will be stable for all design conditions.

5.5.4 Results. The following tabulations indicate the safety factors obtained for the most critical arcs.

Factors of Safety for Right Embankment Stability Analysis

Condition Analyzed	Shear Strength Used	Type of Analysis	Safety Factor Design	Safety Factor Adopted
End of const., downstream (1)	Q	Arc	1.36	N/A
Partial pool	R	Arc	1.51	N/A
Sudden drawdown (2)	R	Arc	1.40	N/A
Steady seepage (3)	R	Arc	1.41	N/A
	S	Arc	1.89	N/A

(1) Results are for downstream slope which is more critical than the upstream slope.

(2) Analysis for drawdown from maximum pool elevation, 587.9, to conservation pool elevation 526.0. The select rock zone was considered to be free draining.

(3) Analysis based on differential head between maximum water surface elevation 587.9, and maximum tailwater elevation 451.0.

Factors of Safety for Main Embankment Stability Analysis

Condition Analyzed	Type of Shear Strength	Type of Analysis	Safety Factor Design	Safety Factor Adopted
End of Construction U.S.	Q	Arc	1.71	1.51
Partial Pool	S,(R+S)/2	Arc	1.40	1.77
Sudden Drawdown	R	Arc	1.03	1.12
Steady Seepage	S,(R+S)/2	Arc	1.37	1.63
End of Construction D.S.	Q	Arc	1.58	1.32

(1) Results are for the downstream slope which is more critical than the upstream slope.

(2) Analysis for drawdown from maximum pool elevation 587.9, to conservation pool elevation 526.0. The select rock zone was considered to be free-draining.

(3) Analysis based on differential head between maximum pool elevation 587.9, and maximum tailwater elevation 457.9.

5.5.5 Conclusion. Based on a comparison of test results of the in-place materials with those used in design, the stability of the structure is considered adequate.

6. INSTRUMENTATION

6.1 Surface Control Monuments. A total of thirty-two (32) embankment surface monuments and seventeen (17) abutment control monuments were established to monitor the embankment movements along eight lines of monuments. The locations of the monuments are shown on Plate 4. Results of alignment and settlement surveys are first reported in the second periodic inspection report. Movements observed were less than .05 feet and were well within the accuracy of the survey techniques used. Subsequent readings through the sixth periodic inspection report (March 1985) indicated decreasing amounts of annual settlement, and insignificant amourts of horizontal movement.

6.2 Conduit Alignment Plugs. A total of sixty-four (64) plugs were installed in the conduit invert, as shown on Plate 24. Damage to several of the plugs occurred during construction and necessitated repair and reestablishment of the initial survey in May 1975. A crack was noted at the crown of the conduit during the second periodic inspection. Monolith joint 13-14 had opened 1/2 inch, but the waterstop was still totally effective. Later periodic inspections indicated minor settlements only and generally satisfactory condition of the conduit. Conduit alignment has not been run since the initial alignment of May 1975 because the gates at the upstream end of the conduit do not seal tight enough to decrease flow of water through the conduit enough to take measurements on the plugs located on both sides of each monolith in the conduit invert.

6.3 Bridge Alignment Plugs. Thirteen (13) alignment plugs were installed on the gate tower and service bridge in June 1976, as shown on Plate 24. The maximum settlement recorded by the sixth periodic inspection was approximately .08 feet at the end of the bridge farthest from the gate tower. The maximum deviation horizontally from a line of sight between centers of abutments is approximately 0.15 inch. Movements of the service bridge are not considered significant.

6.4 Pneumatic Pore Pressure Cells. Fourteen (14) nitrogen-gas-operated pore-pressure transducers were installed in the embankment; however, the instrumentation malfunctioned and is not operating. Since these were installed for the purpose of determining pore pressure buildup in the impervious core

during construction, the loss of the cells does not affect the monitoring or the safety of the structure.

6.5 Carlson Stress Cells. A total of twenty-six (26) Carlson stress cells were installed on or along the conduit as shown on Plate 43. Cell No. 23 did not function at the second periodic inspection. In addition, the readings and resulting analysis of stress conditions strongly suggested that some of the cell data was misunderstood or unreliable. By 1977 all Carlson stress cells had ceased to function.

6.6 Seepage. The quantity of controlled seepage in the main embankment increased from the first periodic inspection to the second. Seepage along the stilling basin walls reported in the first report was stopped by plugging selected drain holes in the upper part of the drop section. An appreciable flow of clear water was noted coming from the right side toe drain. Observaations for seepage through the sixth periodic inspection reported no apparent problems from the seepage, though the clear water discharge from the right toe drain continues. Some intermittent wet areas have been noted on the downstream face coincident with a construction phase haul ramp. Significant seepage has not been reported.

Observations of the right embankment continue to note flow in the paved ditches along both abutments and at isolated locations near the base of the downstream slope. The areas are for the most part seasonal and are considered to be due primarily to rainfall infiltration. However, a small area of perennial flow does exist in the right abutment paved ditch.

In summary, periodic inspections have indicated that seepage flow rates are negligible and reflect a non-changing condition. Continued monitoring is recommended.

6.7 Inspection Schedule. The schedule for monitoring this instrumentation is contained in the "Operation and Maintenance Manual" dated January 1987.

APPENDIX A

PHOTOGRAPHS

DIERKS DAM AND RESERVOIR
SALINE RIVER, ARKANSAS

EMBANKMENT CRITERIA AND PERFORMANCE REPORT

APPENDIX A - PHOTOGRAPHS

Page No.	Photo. No. and Description
A-1	Photo. No. 1. Cut-off trench in the rt. embankment from sta. 0+00 to 5+00. Skid-mounted grout pump is located in the ravine between the truck and the compressor. Note excavation of the u/s face on the dip slope. 28 Apr 71
A-1	Photo. No. 2. Cut-off trench in rt. embankment from sta. 4+00 to 6+00. Note absence of a d/s face. 14 Jun 71
A-2	Photo. No. 3. Grout pump used on this contract. Mixing tank is being charged. The mixed grout is emptied into the holding tank to be pumped into the grout holes.
A-2	Photo. No. 4. Cut-off trench in the main embankment from sta. 9+00 to 11+50. Grout lines are being layed in the foreground. 10 Sep 71
A-3	Photo. No. 5. C. O. T. from sta. 12+40 to 11+00 u/s face is excavated on the dip slope. 26 Jan 73
A-3	Photo. No. 6. Cut-off trench from sta. 19+50 to 23+00. The deep hole in foreground occurred as a result of stream erosion. 27 Sep 71
A-4	Photo. No. 7. D/s face of cut-off trench from sta. 19+50 to 19+70. Face is very irregular as a result of differential erosion. 4 Oct 71
A-4	Photo. No. 8. Overall view of d/s face of C. O. T. from sta. 19+50 to 19+70. 4 Oct 71
A-5	Photo. No. 9. U/s (dip slope) face of C. O. T. from sta. 19+00 to 19+25. 4 Oct 71
A-5	Photo. No. 10. View along center line of C. O. T. from sta. 19+00 to 19+25. Note alluvial fill behind skip box. 14 Oct 71
A-6	Photo. No. 11. Overhang in d/s face of C. O. T. at sta. 19+00 being cleaned prior to backfilling with concrete. 21 Oct 71
A-6	Photo. No. 12. Typical view of the cut-off trench from sta. 20+30 to 21+50. Note dip slope face u/s and absence of d/s face. 7 Oct 71
A-7	Photo. No. 13. D/s portion of the C. O. T. from sta. 21+25 to 22+00. Note presplit holes in the remaining portion of the d/s face. 13 Nov 71
A-7	Photo. No. 14. C. O. T. from sta. 21+00 to 23+00. Note grout hole casings along center line. 13 Nov 71

APPENDIX A - PHOTOGRAPHS
(continued)

Page No.	Photo. No. and Description
A-8	Photo. No. 15. C. O. T. from sta. 22+50 to 23+50. A deeper cut at center line results in a better defined d/s face. Note grout hole casings along centerline. 26 Jan 72
A-8	Photo. No. 16. Typical view of C. O. T. from sta. 23+00 to 24+50. 3 Feb 72
A-9	Photo. No. 17. Typical view of C. O. T. from sta. 24+50 to 27+00. 10 May 72
A-9	Photo. No. 18. Dozer excavating shot rock from cut-off trench in vicinity of sta. 26+00. 12 May 71
A-10	Photo. No. 19. Clean-up of foundation along center line, sta. 18+00 to 14+50. Note dozer working in weathered shale seam on the left. 13 Apr 72
A-10	Photo. No. 20. Excavation of overburden and foundation clean-up for impervious and downstream random zones. Note depth of weathered shale seam. 13 Apr 72
A-11	Photo. No. 21. Clean-up of foundation for upstream random fill zone near sta. 17+50 to 18+50. Note overhand in downstream face. 17 Apr 72
A-11	Photo. No. 22. D-9 Ripper removing rock overhang under upstream random fill zone near sta. 17+50. 19 Apr 72
A-12	Photo. No. 23. Overall view of main embankment C. O. T. Foreground showns C. O. T. from sta. 9+50 to 11+00 right center of photo shows the natural C. O. T. 26 May 72
A-12	Photo. No. 24. Foundation along center line from sta. 16+00 to 18+00. The upper line of grout holes in the overlap section occurs where the men are standing. 4 Aug 72
A-13	Photo. No. 25. Natural C. O. T. from sta. 18+00 to 19+00. Note overhang to be removed in d/s face also the lower line of grout holes in the overlap section occurs in this area. 27 Jul 72
A-13	Photo. No. 26. Overall view of the center line form sta. 15+00 to 18+50. Center line in the foreground falls in the water in the lower left corner. Centerline in the background fall under the dozer. 4 Aug 72
A-14	Photo. No. 27. Damsite, looking toward left abutment. Dec 70
A-15	Photo. No. 28. Construction of outlet works, looking downstream. Jul 71
A-16	Photo. No. 29. Construction of outlet works and embankment, looking downstream. Mar 72
A-17	Photo. No. 30. Main embankment construction, looking toward left abutment. Jul 72

APPENDIX A - PHOTOGRAPHS
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Page No.	Photo. No. and Description
A-18	Photo. No. 31. Conduit being used for diversion while work progresses on main embankment. Spillway excavation and right embankment in background.
A-19	Photo. No. 32. Heavy rains caused flooding of construction site. Lake elevation 512+/-. Apr 73
A-20	Photo. No. 33. Downstream view of gate tower construction. Oct 73
A-21	Photo. No. 34 Main embankment and outlet works essentially complete. Work progressing on service bridge. Apr 74



Photo. No. 1

4-28-71
Cut-off trench in the rt. embankment from sta 0+00 to 5+00. Skid-mounted grout pump is located in the ravine between the truck and the compressor. Note excavation of the u/s face on the dip slope.



Photo. No. 2

6-14-71
Cut-off trench in rt. embankment from sta. 4+00 to 6+00. Note absence of a d/s face.

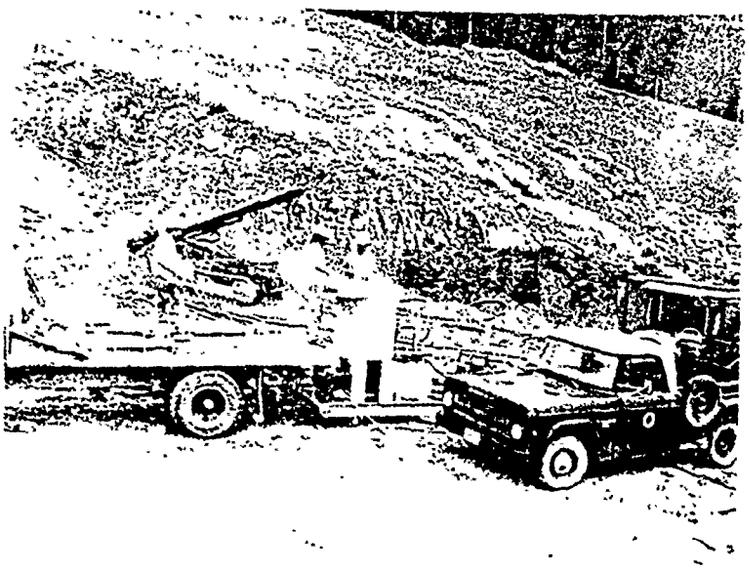
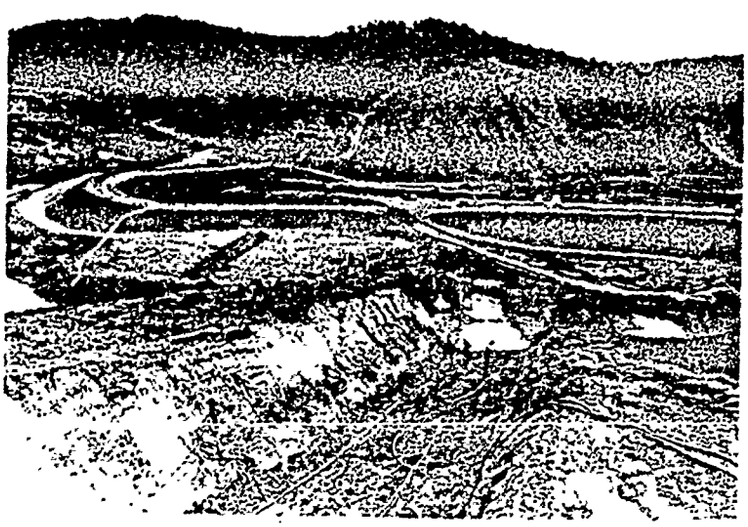


Photo. No. 3

Grout pump used on this contract. Mixing tank is being charged. The mixed grout is emptied into the holding tank to be pumped into the grout holes.



9-10-71

Photo. No. 4

Cut-off trench in the main embankment from sta 9+00 to 11+50.. Grout lines are being layed in the foreground.

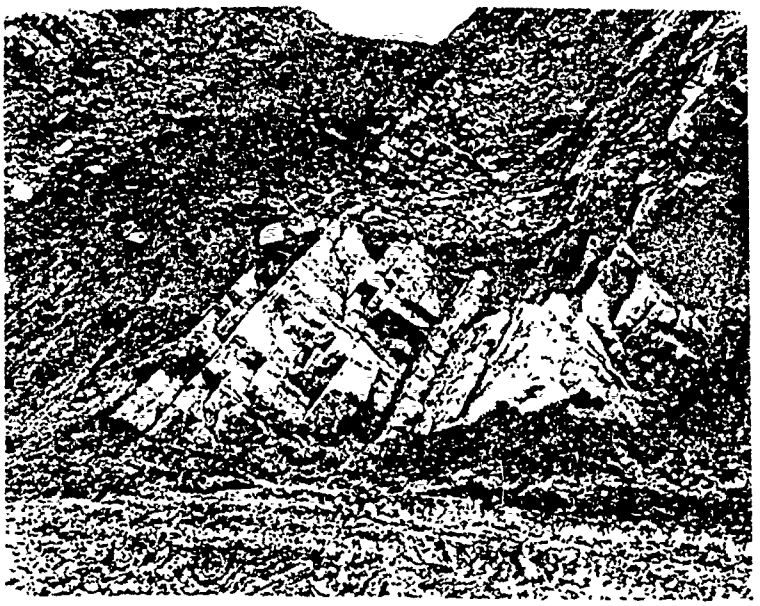


Photo. No. 5

1-26-73

C. O. T. from sta 12+40 to 11+00 u/s face is excavated on the dip slope.

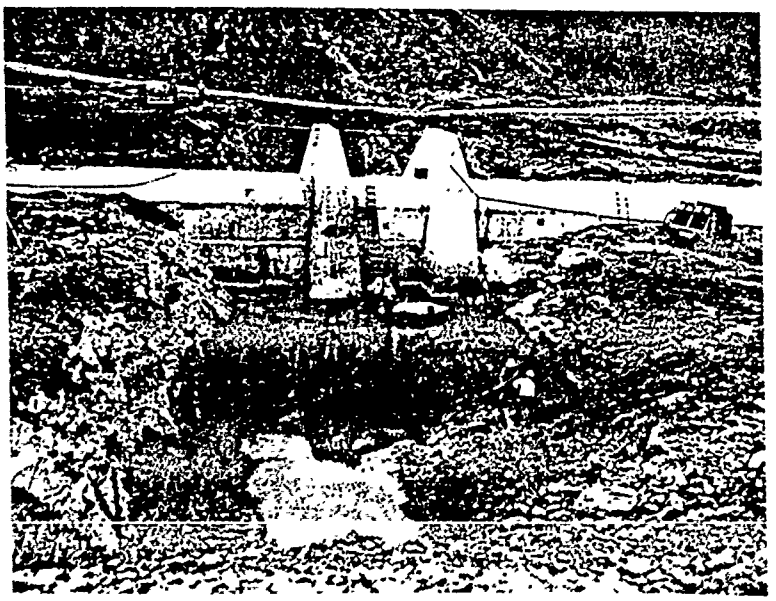


Photo. No. 6

9-27-71

Cut-off trench from sta 19+50 to 23+00. The deep hole in foreground occurred as a result of stream erosion.

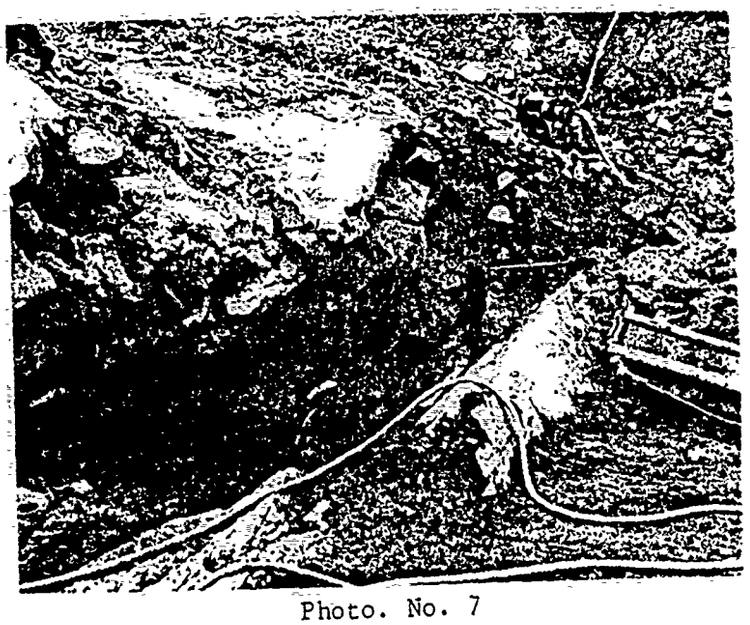


Photo. No. 7

10-4-71
D/s face of cut-off trench from sta 19+50 to 19+70. Face is very irregular as a result of differential erosion.

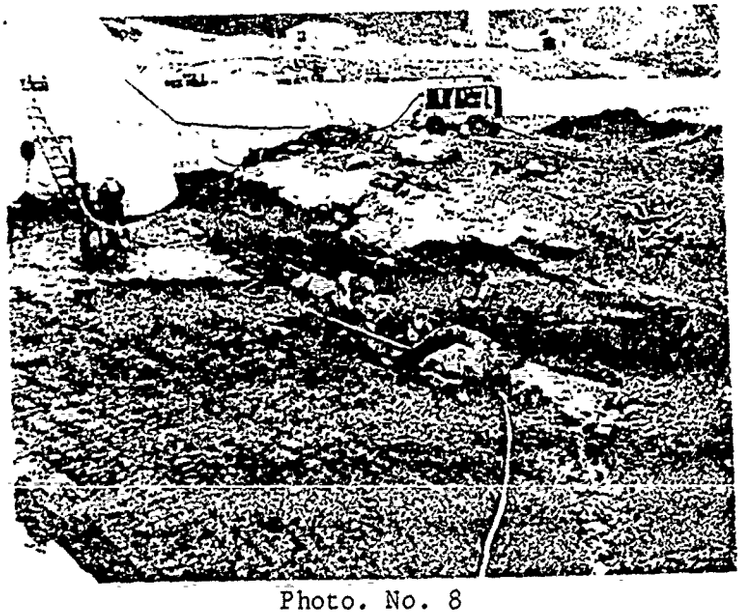


Photo. No. 8

10-4-71
Overall view of d/s face of C.O.T. from sta 19+50 to 19+70.

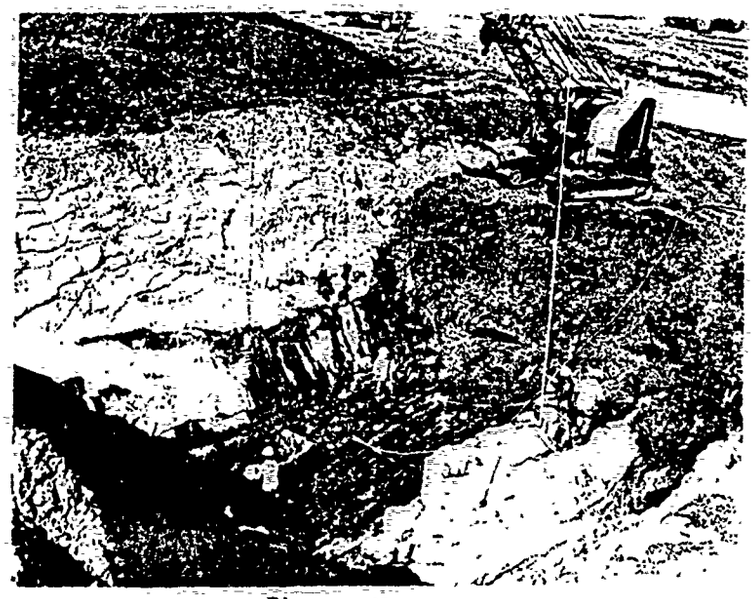


Photo No. 9

10-4-71
U/s (dip slope) face of C.O.T. from sta 19+00 to 19+25.

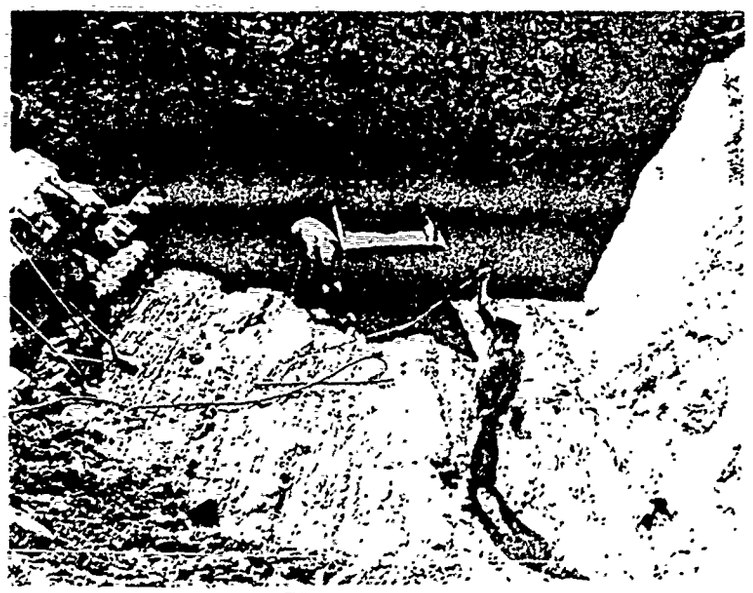


Photo. No. 10

10-14-71
View along center line of C.O.T. from sta 19+00 to 19+25.
Note alluvial fill behind skip box.



Photo. No. 11

10-21-71
Overhang in d/s face of C.O.T. at sta 19+00 being cleaned prior to backfilling with concrete.

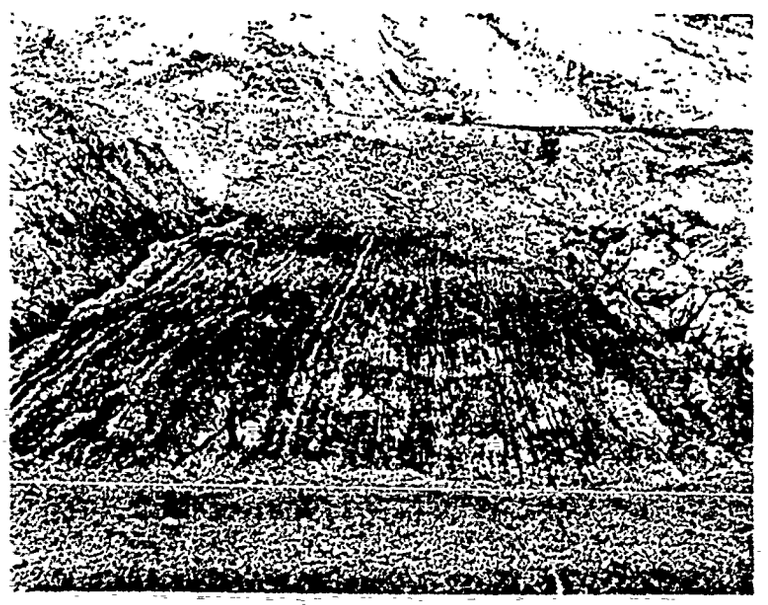


Photo. No. 12

10-7-71
Typical view of the cut-off trench from sta 20+30 to 21+50. Note dip slope face u/s and absence of d/s face.



Photo. No. 13

11-13-71

D/s portion of the C.O.T. from sta 21+25 to 22+00. Note presplit holes in the remaining portion of the d/s face.



Photo. No. 14

11-13-71

C.O.T. from sta 21+00 to 23+00. Note grout hole casings along center line.



Photo. No. 15

1-26-72
C.O.T. from sta 22+50 to 23+50. A deeper cut at center line results in a better defined d/s face. Note grout hole casings along centerline.



Photo. No. 16

2-3-72
Typical view of C.O.T. from sta 23+00 to 24+50.



Photo. No. 17

5-10-72

Typical view of C.O.T. from sta 24+50 to 27+00.

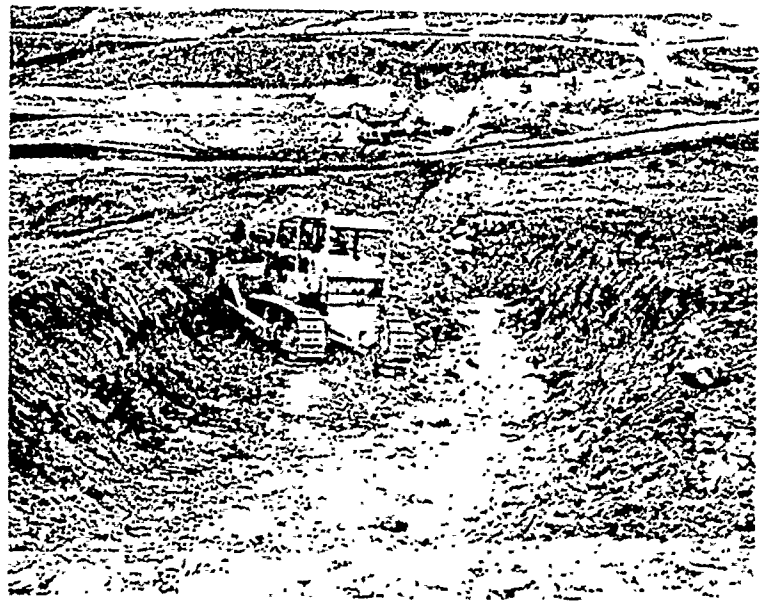


Photo No. 18

5-12-71

Dozer excavating shot rock from cut-off trench in vicinity of sta 26+30.

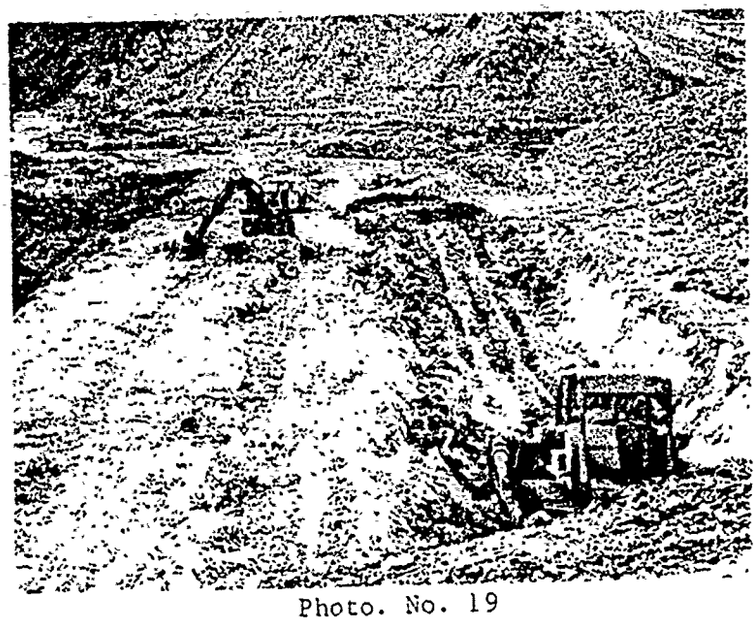


Photo. No. 19

4-13-72
Clean-up of foundation along center line, sta 18+00 to 14+50.
Note dozer working in weathered shale seam on the left.

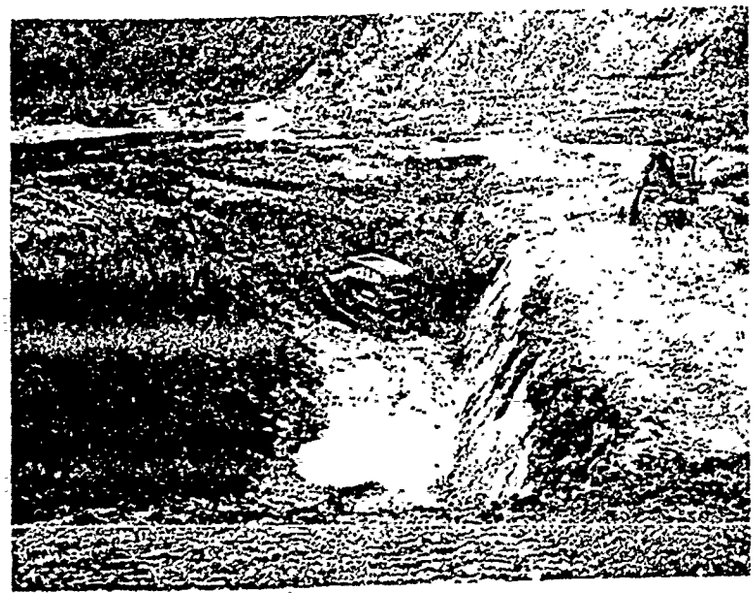


Photo. No. 20

4-13-72
Excavation of overburden and foundation clean-up for impervious and downstream random zones. Note depth of weathered shale seam.

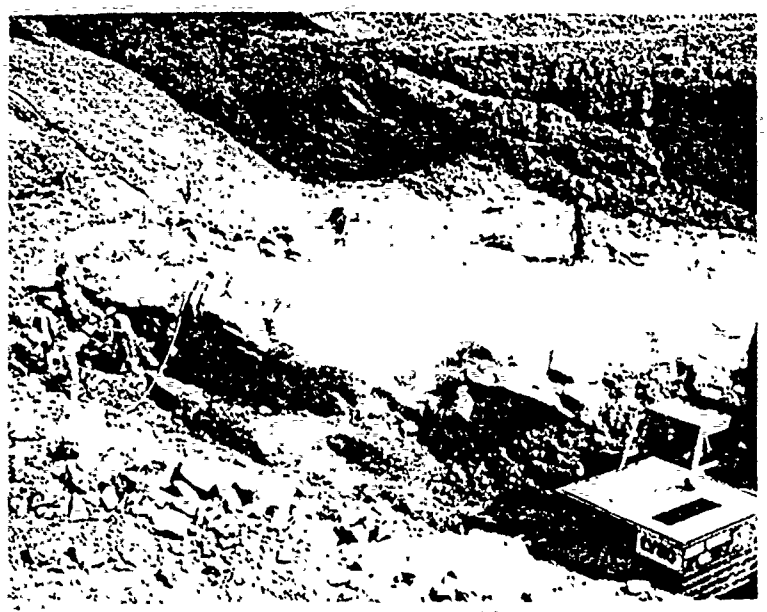


Photo. No 21

4-17-72

Clean-up of foundation for upstream random fill zone, near sta 17+50 to 18+50. Note overhang in downstream face.

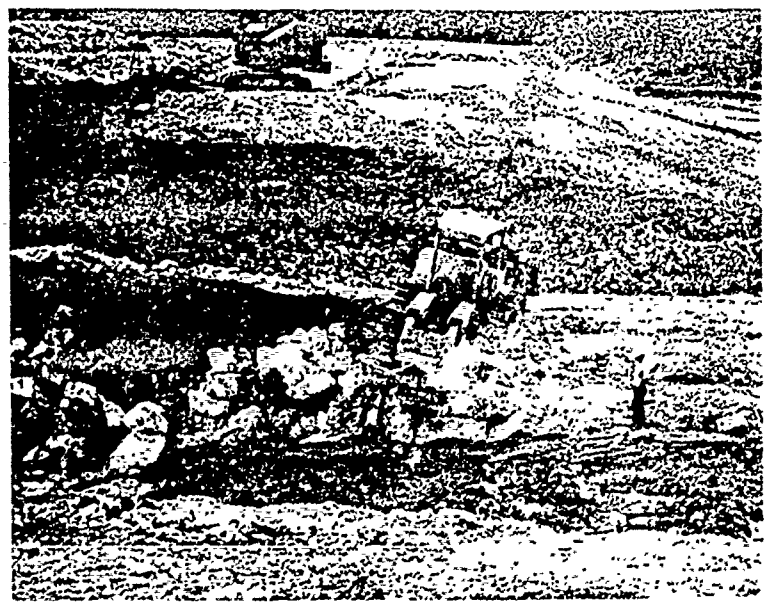


Photo. No. 22

4-19-72

D-9 Ripper removing rock overhang under upstream random fill zone near sta 17+50.

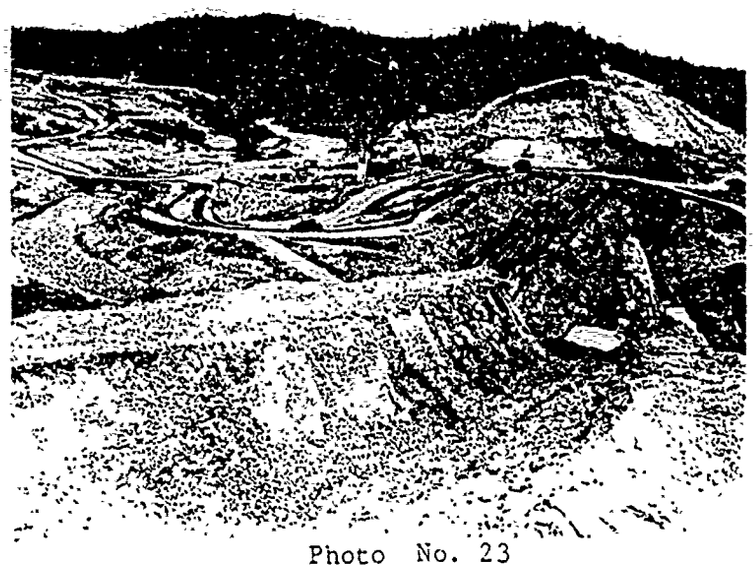


Photo No. 23

5-26-72

Overall view of main embankment C.O.T. Foreground shows C.O.T. from sta 9+50 to 11+00 right center of photo shows the natural C.O.T.

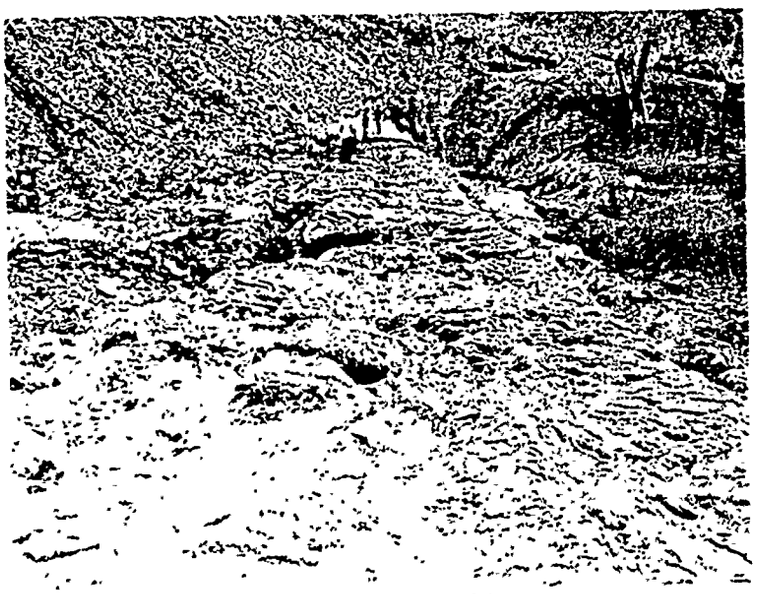


Photo. No. 24

8-4-72

Foundation along center line from sta 16+00 to 18+00. The upper line of grout holes in the overlap section occurs where the men are standing.



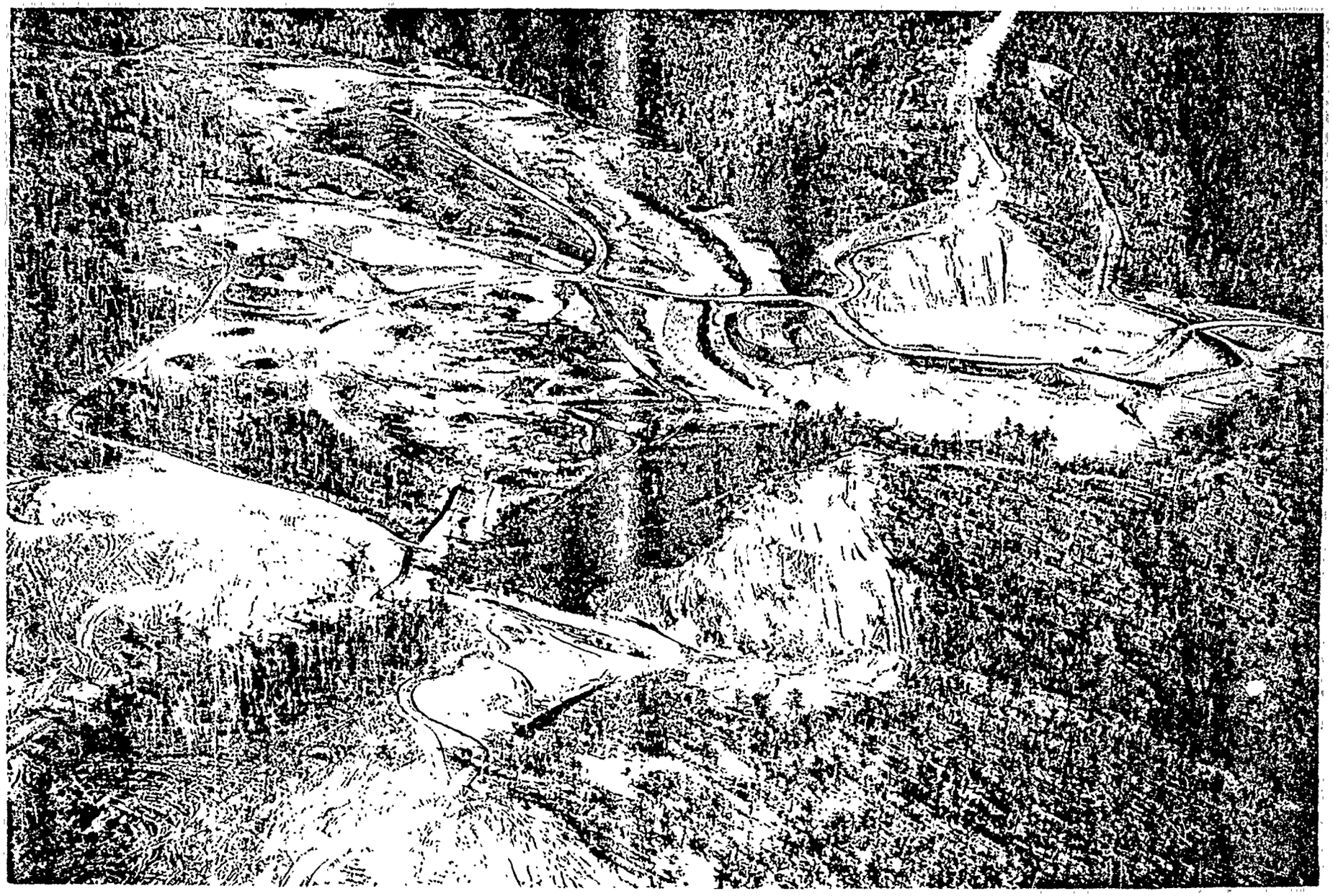
Photo. No. 25

7-27-72
Natural C.O.T. from sta 18+00 to 19+00. Note overhang to be removed in d/s face also the lower line of grout holes in the overlap section occurs in this area.



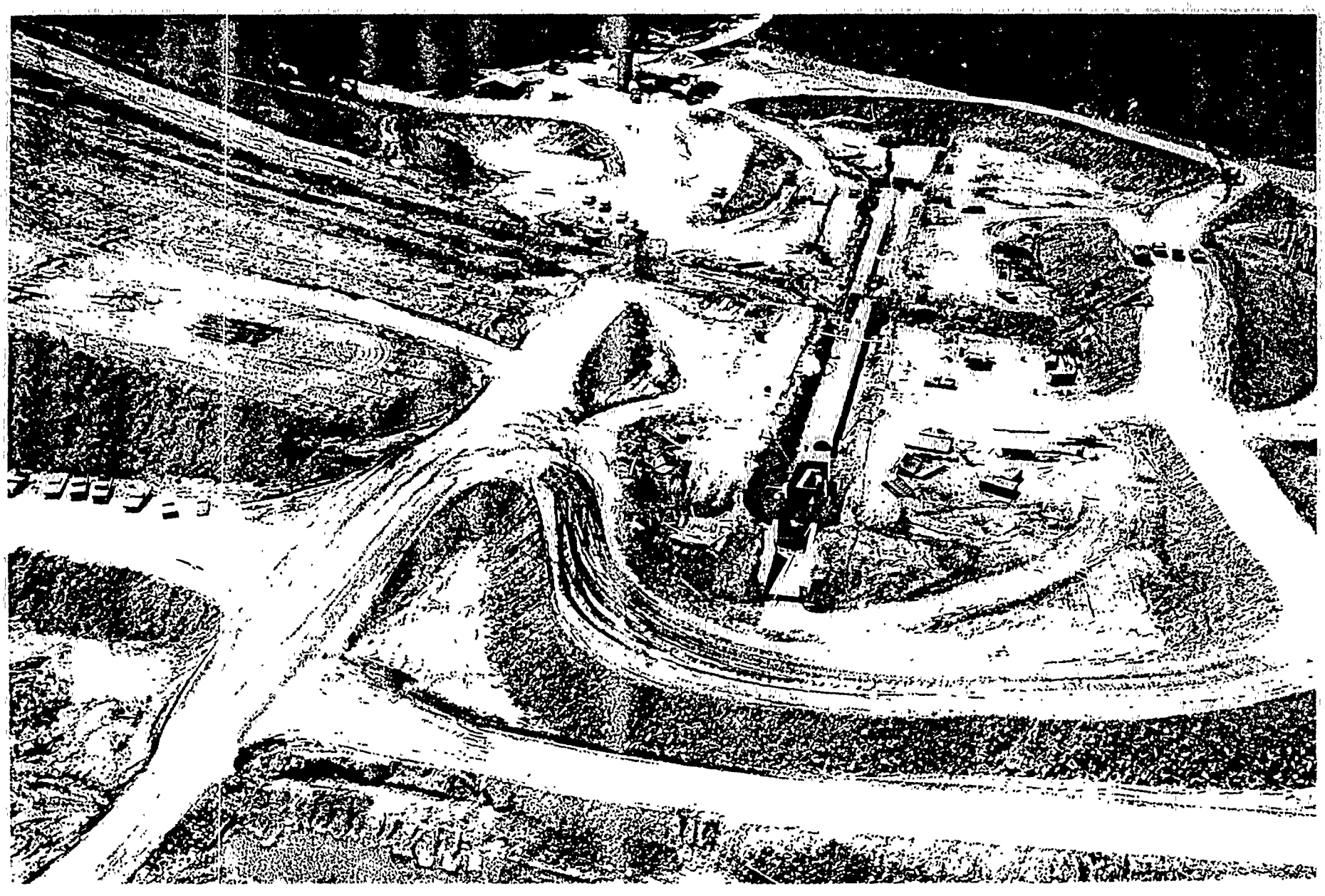
Photo. No. 26

8-4-72
Overall view of the center line from sta 15+00 to 18+50. Center line in the foreground falls in the water in the lower left corner. Centerline in the background fall under the dozer.

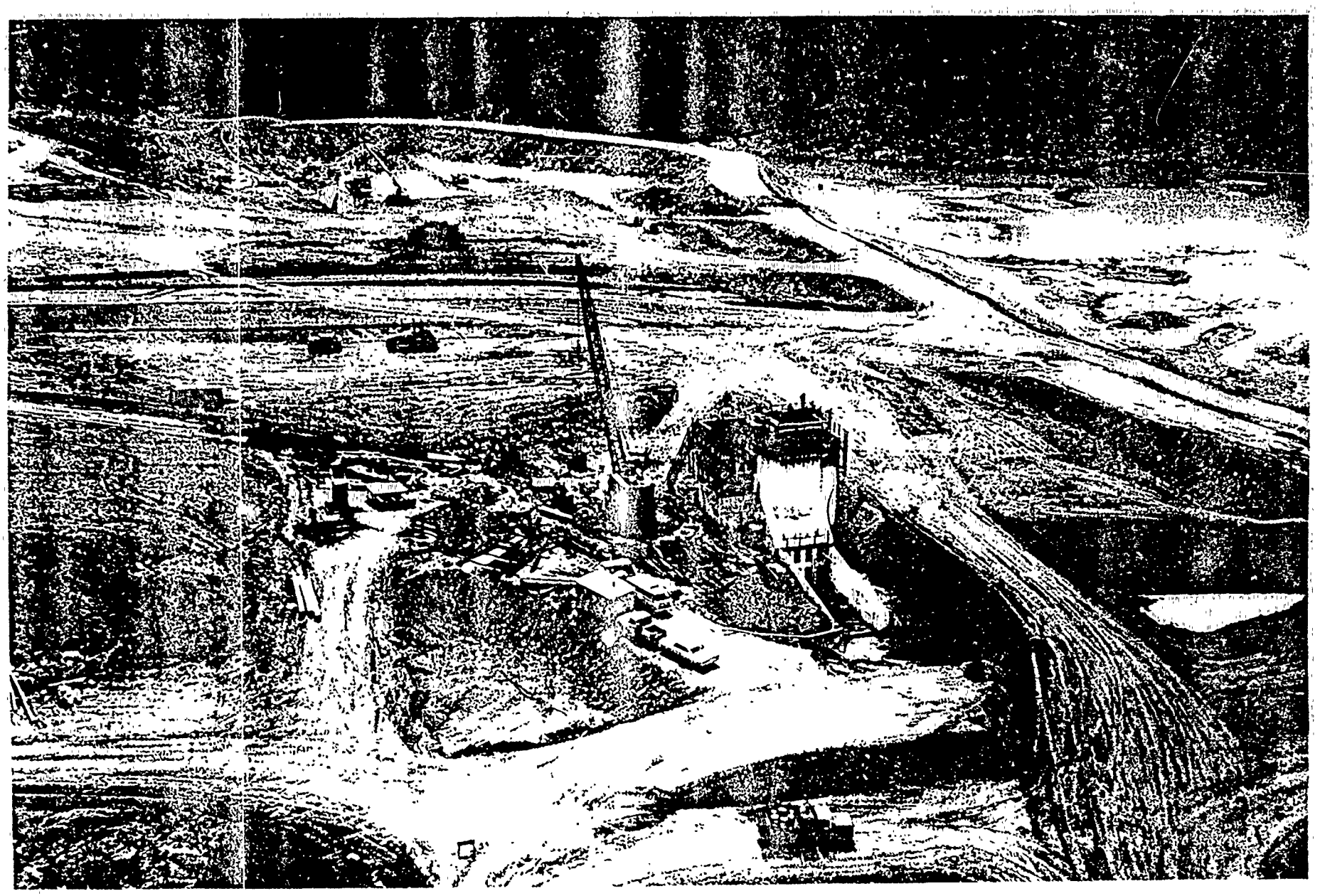


DIERKS DAM - December 1970 - Damsite, looking toward left abutment.

Photograph no. 27

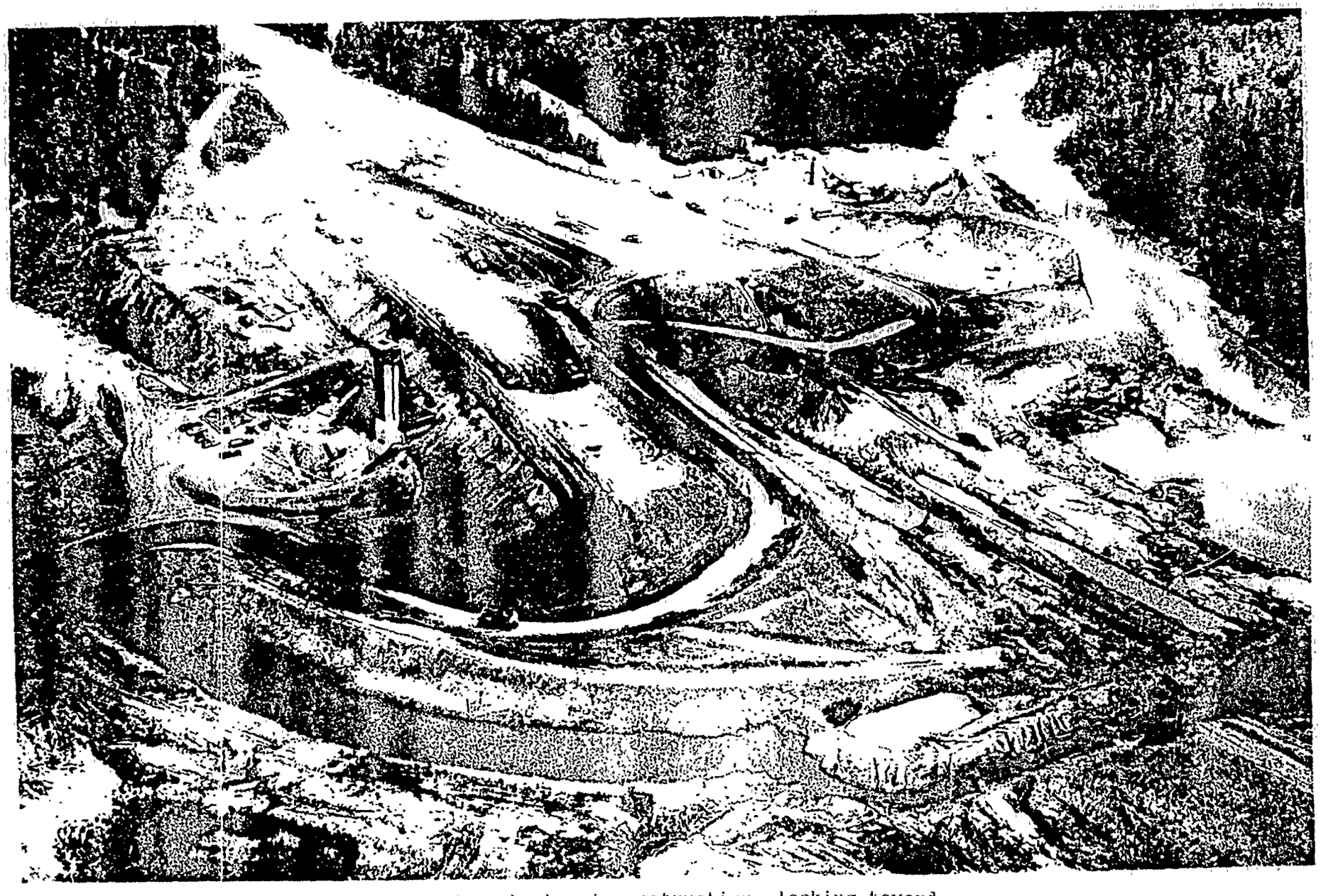


DIERKS DAM - July 1971 - Construction of outlet works, looking downstream.



DIERKS DAM - March 1972 - Construction of outlet works and embankment, looking downstream.

Photograph No. 29

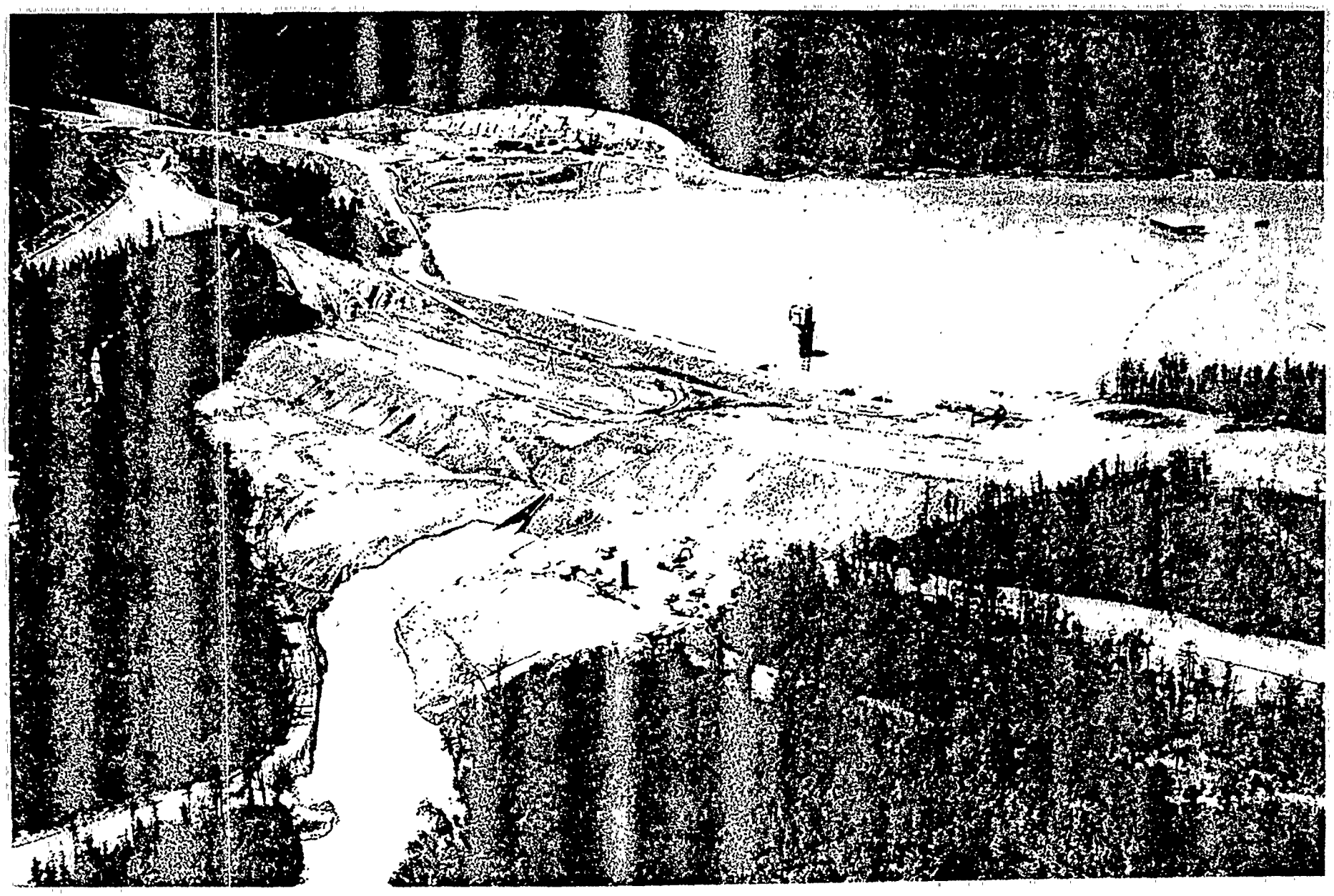


DIERKS DAM - July 1972 - Main embankment construction, looking toward left abutment.

Photograph No. 30

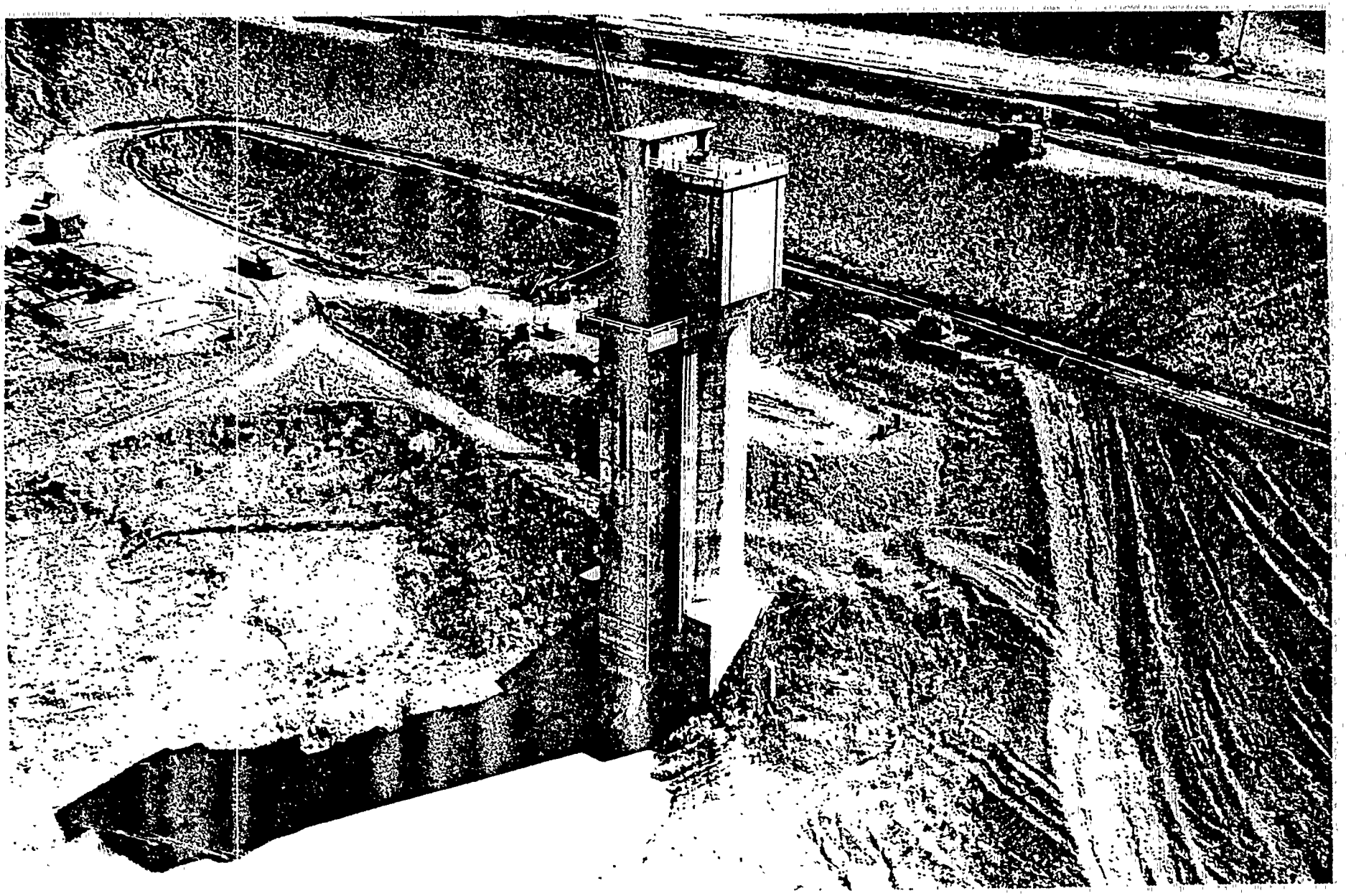


DIERKS DAM - October 1972 - Conduit being used for diversion while work progresses on main embankment. Spillway excavation and right embankment in background.



DIERKS DAM - April 1973 - Heavy rains caused flooding of construction site. Lake elevation 512±.

Photograph No. 32



DIERKS DAM - October 1973 - Downstream view of gate tower construction.



DIERKS DAM - April 1974 - Main embankment and outlet works essentially complete. Work progressing on service bridge.

Photograph No. 34

APPENDIX B

SWDED - GL REPORT NO. 11227

DATED 27 SEPTEMBER 1971

REQUEST FOR AND RESULTS OF TESTS

PAGE NO. 1 | NO. OF PAGES 41

SECTION A - REQUEST FOR TEST TU-FM-72-5 dated 18 & 27 Aug 71

1 TO: *(Include ZIP Code)*
Southwestern Division Laboratory
U. S. Army Engineer Division, Southwestern
Corps of Engineers
4815 Cass Street
Dallas, Texas 75235

2. FROM: *(Include ZIP Code)*
Chief, Foundations & Materials Branch
U. S. Army Engineer District, Tulsa
Corps of Engineers
P. O. Box 61
Tulsa, Oklahoma 74102

3. PRIME CONTRACTOR AND ADDRESS *(Include ZIP Code)*

CONTRACT NUMBER

4. MANUFACTURING PLANT NAME AND ADDRESS *(Include ZIP Code)*

P. O. NUMBER

5. END ITEM AND/OR PROJECT	6. SAMPLE NUMBER	7. LOT NO.	8. REASON FOR SUBMITTAL	9. DATE SUBMITTED
Dierks Dam				

10. MATERIAL TO BE TESTED	10a. QUANTITY SUBMITTED	11. QUANTITY REPRESENTED	12. SPEC. & AMEND AND/OR DRAWING NO & REV. FOR SAMPLE & DATE
Borrow	8 Bag Samples		

13. PURCHASED FROM OR SOURCE	14. SHIPMENT METHOD	15. DATE SAMPLED AND SUBMITTED BY
Test Fill and Quarry	Gov't Vehicle	

16. REMARKS AND/OR SPECIAL INSTRUCTIONS AND/OR WAIVERS.

Field No.	SWD Lab No.	Source	Material
1	X-15010	Quarry	Minus 3/4"
2	X-15011	Quarry	Minus No. 4
3	X-15012	Test Fill, Panel 1 South End	Minus 3/4"
4	X-15013	Test Fill, Panel 1 South End	Minus No. 4
5	X-15014	Test Fill, Panel 1 Center	Minus 3/4"
6	X-15015	Test Fill, Panel 1 Center	Minus No. 4
7	X-15016	Test Fill, Panel 1 North End	Minus 3/4"
8	X-15017	Test Fill, Panel 1 North End	Minus No. 4

17 SEND REPORT OF TEST TO

Tulsa Dist. O.

SECTION B - RESULTS OF TEST *(Continue on plain white paper if more space is required)*

1. DATE SAMPLE RECEIVED	2. DATE RESULTS REPORTED	3. LAB REPORT NUMBER
20 August 1971	29 September 1971	SWDED-GL Report No. 11227

4 TEST PERFORMED	RESULTS OF TEST	SAMPLE RESULT	REQUIREMENTS

See Test Data Summary (5 sheets) and Plates 1 - 35.

This completes requested testing.

DATE	TYPED NAME AND TITLE OF PERSON CONDUCTING TEST	SIGNATURE
29 Sep 71	HUGH E. GARRISON Director Southwestern Division Laboratory	Hugh E. Garrison

DD FORM 1 FEB 62 1222 REPLACES DD FORM 1222, 1 JUL 58, WHICH IS OBSOLETE.

Sheet 1 of 5

TEST DATA SUMMARY

SWDED-GL Report 11227

FEATURE Dierks Dam

BORING NO.	SAMP. NO.	DEPTH OR ELEV. OF SAMPLE	LABORATORY CLASSIFICATION	MECHANICAL ANALYSIS: GRAVEL %	SAND %	FINES %	D10	ATTERBERG LIMITS: LL	PL	SPECIFIC GRAVITY	NAT. WATER CONT. %	NATURAL DRY DENSITY LBS/CU FT	COMPACTION DATA: OPT. WATER %	MAXIMUM DRY DENSITY LBS/CU FT	SHEAR DATA: INITIAL %	DRY DENSITY LBS/CU FT	σ_3 %	σ_d %	σ_1 %	TYPE TEST	SPECIMEN DIA. INCHES	TEST	σ_3 T/SQ FT	σ_1 T/SQ FT	C T/SQ FT	ϕ DEGREES	PERMEABILITY: k	k OPTIMUM	CONSOLIDATION DATA: σ_3 T/SQ FT	σ_c T/SQ FT	ϵ_c	t_{50}	REMARKS
Quarry																																
X-15210	1		SC	22	37	41		38	19				15.2	113.8																		
				- 3" material				SAND, clayey gravelly																									
X-15211	2		SC	0	53	47		35	18				16.0	113.2																		
				- #4 material				SAND, clayey							637	102	130	54	TC-Q	1.9 x 2.9	1	0.5	7.14	0.7	20							
															641	101	130	53		1.9 x 2.9	2	1.5	5.48								Remolded to 90% maximum density at optimum -3% water content
															648	101	130	54		1.9 x 2.9	3	3.0	8.83								
															635	102	130	56		1.9 x 2.9	4	6.0	14.66								
															635	102	156	66	TC-Q	1.9 x 3.0	1	0.5	2.76	0.8	12						
															637	102	158	66		1.9 x 2.9	2	1.5	4.60								Remolded to 96% maximum density at optimum water content
															645	102	150	62		1.9 x 3.0	3	3.0	6.70								
															637	102	157	66		1.9 x 2.9	4	6.0	11.29								
															636	102	190	80	TC-Q	1.9 x 2.9	1	0.5	1.80	0.5	3						
															650	101	189	78		1.9 x 2.9	2	1.5	3.04								Remolded to 90% maximum density at optimum +3% water content
															635	102	190	80		1.9 x 2.9	3	3.0	4.86								
															635	102	189	80		1.9 x 3.0	4	6.0	7.89								
															575	106	120	60	TC-Q	1.9 x 2.9	1	0.5	3.66	0.9	21						
															554	108	129	65		1.9 x 2.9	2	1.5	6.99								Remolded to 95% maximum density at optimum -2% water content
															558	107	120	62		1.9 x 2.9	3	3.0	9.60								
															564	108	129	62		1.9 x 2.9	4	6.0	11.58								
															562	107	155	73	TC-Q	1.9 x 2.9	1	0.5	7.14	0.9	16						
															548	108	156	76		1.9 x 3.0	2	1.5	5.52								Remolded to 95% maximum density at optimum water content
															570	104	166	73		1.9 x 2.9	3	3.0	7.58								
															560	107	165	74		1.9 x 3.0	4	6.0	12.18								
															558	107	189	91	TC-Q	1.9 x 2.9	1	0.5	2.86	0.7	2						
															563	108	189	92		1.9 x 3.0	2	1.5	3.82								Remolded to 99% maximum density at optimum +3% water content
															576	104	182	89		1.9 x 2.9	3	3.0	4.85								
															567	107	182	91		1.9 x 2.9	4	6.0	7.95								

ENG FORM 2086 1 MAR 56 (PREVIOUS EDITIONS MAY BE USED) (EM 1110-2-1906) (TRANSLUCENT)

TC – Triaxial Compression
UC – Unconfined Compression
DS – Direct Shear
Q – Unconsolidate Undrained
CB – Consolidated Drained
CU – Consolidated Undrained
* Values at Pressure
T/SQ FT

TEST DATA SUMMARY

SWDED-GL Report 11227

FEATURE Dierks Dam

BORING NO	SAM NO	DEPTH OR ELEV OF SAMPLE	LABORATORY CLASSIFICATION	MECHANICAL ANALYSIS: GRAVEL %	SAND %	FINES %	D_{10}	ATTERBERG LIMITS: LL	PL	SPECIFIC GRAVITY	NAT WATER CONT %	NATURAL DRY DENSITY LBS/CU FT	COMPACTION DATA: OPT WATER %	MAXIMUM DRY DENSITY LBS/CU FT	INITIAL %	DRY DENSITY LBS/CU FT	σ_3	σ_d	σ_1	TYPE TEST	SPECIMEN SIZE INCHES	TEST	SHEAR DATA: ϕ_u T/SQ FT	ϕ_1 T/SQ FT	c T/SQ FT	ϕ DEGREES	PERMEABILITY: k	FT/MIN	CONSOLIDATION DATA: P_0 T/SQ FT	P_c T/SQ FT	C_c	t_{50}	REMARKS
Test Fill																																	
Panel 1 So. End																																	
	3		SC-SM	26	52	22		22	15				10.8	123.8																			
X-15012				-3/4" material				SAND, clayey gravelly																									
	4		SM-SC	0	72	28		21	16				12.0	121.2																			
X-15013				-#4 material				SAND, silty																									
Panel 1 Center																																	
	5		SC	26	46	28		27	16				11.4	122.4																			
X-15014				-3/4" material				SAND, clayey gravelly																									
	6		SC	0	63	37		27	15				12.3	120.3																			
X-15015				-#4 material				SAND, clayey																									
Panel 1 No. End																																	
	7		SC	22	49	29		25	15				10.5	123.9																			
X-15016				-3/4" material				SAND, clayey gravelly																									
	8		SC	0	54	36		25	15				12.3	119.8																			
X-15017				-#4 material				SAND, clayey																									

ENG FORM 2086 1 MAR 69 (PREVIOUS EDITIONS MAY BE USED) (TRANSLUCENT)

TC – Triaxial Compression
UC – Unconfined Compression
DS – Direct Shear
UU – Unconsolidated Undrained
CB – Consolidated Drained
CU – Consolidated Undrained
*Values at Pressure
T/SQ FT

TEST DATA SUMMARY

SWDED-GL Report 11227

FEATURE Dierks Dam

SAMPLING NO.	SAM. NO.	DEPTH OR ELEV OF SAMPLE	LABORATORY CLASSIFICATION	MECHANICAL ANALYSIS: GRAVEL %	SAND %	FINES %	D_{10}	ATTERBERG LIMITS: LL	PL	SPECIFIC GRAVITY	NAT WATER CONT %	NATURAL DRY DENSITY LBS/CU FT	COMPACTION DATA: OPT WATER %	MAXIMUM DRY DENSITY LBS/CU FT	SHEAR DATA: INITIAL %	DRY DENSITY LBS/CU FT	σ_3 %	σ_c %	ϵ_f %	TYPE TEST	SPECIMEN DIM INCHES	TEST	σ_m T/SQ FT	σ_1 T/SQ FT	C T/SQ FT	ϕ DEGREES	PERMEABILITY: K	K FT/MIN.	CONSOLIDATION DATA: σ_o T/SQ FT	σ_c T/SQ FT	C_c	t_{50}	REMARKS
Quarry		(Retrieved)																															
	2		SC	0	53	47		25	18				16.0	113.2																			Remolded to 90% maximum density at optimum - 3% water content
X-5011				- N	4	material		SAND,	clayey																								
															101	13.6	17.6			DS-S	30x30x0.5	1			0.0	30.						
															101	13.5	17.9				30x30x0.5	2										
															101	16.1	18.6			DS-S	30x30x0.5	1			0.0	30.						Remolded to 90% maximum density at optimum water content
															101	15.9	16.5				30x30x0.5	2										
															102	18.8	19.1			DS-S	30x30x0.5	1			0.0	28.						Remolded to 90% maximum density at optimum ± 3% water content
															102	18.7	17.6				30x30x0.5	2										
															107	13.6	17.2			DS-S	30x30x0.5	1			0.0	29.						Remolded to 95% maximum density at optimum - 2% water content
															107	13.7	17.7				30x30x0.5	2										
															107	15.8	19.3			DS-S	30x30x0.5	1			0.0	28.						Remolded to 95% maximum density at optimum water content
															107	16.1	17.8				30x30x0.5	2										

TC – Triaxial Compression
UC – Unconfined Compression
DS – Direct Shear
UU – Unconsolidated Undrained
CU – Consolidated Undrained
•Values at Pressure
T/SQ FT

ENG FORM 2086 1 MAR 66 (PREVIOUS EDITIONS MAY BE USED) (TRANSLUCENT)

TEST DATA SUMMARY

Sheet 4 of 5

SWDED-GL Report 11227

FEATURE Dierks Dam

BORING NO.	SAMPLE NO.	DEPTH OR ELEV OF SAMPLE	LABORATORY CLASSIFICATION	MECHANICAL ANALYSIS: GRAVEL %	SAND %	FINES %	D10	ATTERBERG LIMITS: LL	PL	SPECIFIC GRAVITY	NAT WATER CONT %	NATURAL DRY DENSITY LBS/CU FT	COMPACTION DATA: OPT WATER %	MAXIMUM DRY DENSITY LBS/CU FT
Test Fill - Composite of Samples 4, 4 and 5														
X-15017C			SC			-#4 material		24	15				12.2	120.4 (Average from tests of Samples 4, 4 and 5)

SHEAR DATA: INITIAL %	DRY DENSITY LBS/CU FT	%	%	%	TYPE TEST	SPECIMEN SIZE INCHES	TEST	ϕ_o T/SQ FT	ϕ_1 T/SQ FT	c T/SQ FT	ϕ DEGREES	PERMEABILITY: K	K SYMBOL	CONSOLIDATION DATA: σ_o T/SQ FT	σ_c T/SQ FT	C_c	t_{50}	REMARKS
538	108	9.2		45	TC-Q	1.3 x 2.9	1	0.5	3.84	0.5	27							Remolded to 90% maximum density at optimum -3% water content.
540	108	9.2		45		1.3 x 3.0	2	1.5	6.19									
536	107	9.2		44		1.3 x 2.9	3	3.0	10.03									
553	107	9.1		44		1.3 x 2.9	4	6.0	17.81									
587	105	12.0		54	TC-Q	1.3 x 2.9	1	0.5	2.16	0.3	23							Remolded to 90% maximum density at optimum water content.
550	107	11.3		57		1.3 x 2.9	2	1.5	4.55									
527	109	11.7		59		1.3 x 2.9	3	3.0	8.02									
535	108	11.8		59		1.3 x 3.0	4	6.0	14.88									
539	108	15.1		75	TC-Q	1.4 x 3.0	1	0.5	1.55	0.4	6							Remolded to 90% maximum density at optimum + 3% water content.
518	108	14.9		74		1.4 x 3.0	2	1.5	2.97									
545	108	15.0		73		1.5 x 3.0	3	3.0	5.02									
540	108	15.1		74		1.4 x 2.9	4	6.0	8.48									
462	114	9.4		54	TC-Q	1.4 x 2.9	1	0.5	4.44	1.0	38							Remolded to 90% maximum density at optimum -3% water content.
469	113	9.1		52		1.4 x 3.3	2	1.5	7.52									
463	114	9.0		52		1.4 x 2.9	3	3.0	11.70									
467	114	9.1		52		1.6 x 2.9	4	6.0	19.73									
487	115	11.9		71	TC-Q	1.3 x 3.0	1	0.5	3.06	0.6	25							Remolded to 90% maximum density at optimum water content.
488	115	12.1		72		1.3 x 3.0	2	1.5	5.82									
445	115	11.7		70		1.3 x 3.0	3	3.0	9.14									
457	114	11.8		69		1.3 x 3.0	4	6.0	16.69									
455	114	15.3		90	TC-Q	1.4 x 3.0	1	0.5	2.04	0.6	5							Remolded to 90% maximum density at optimum + 3% water content.
452	115	15.2		90		1.4 x 3.0	2	1.5	3.42									
448	116	15.1		90		1.4 x 2.9	3	3.0	5.44									
460	114	15.3		89		1.4 x 2.9	4	6.0	8.66									

ENG FORM 2086 1 MAR 58 (PREVIOUS EDITIONS MAY BE USED) (TRANSLUCENT)

TC = Triaxial Compression; UC = Unconfined Compression; DS = Direct Shear; Q UU = Unconsolidate Undrained; CD = Consolidated Drained; CU = Consolidated Undrained; *Values at Pressure; T/SQ FT

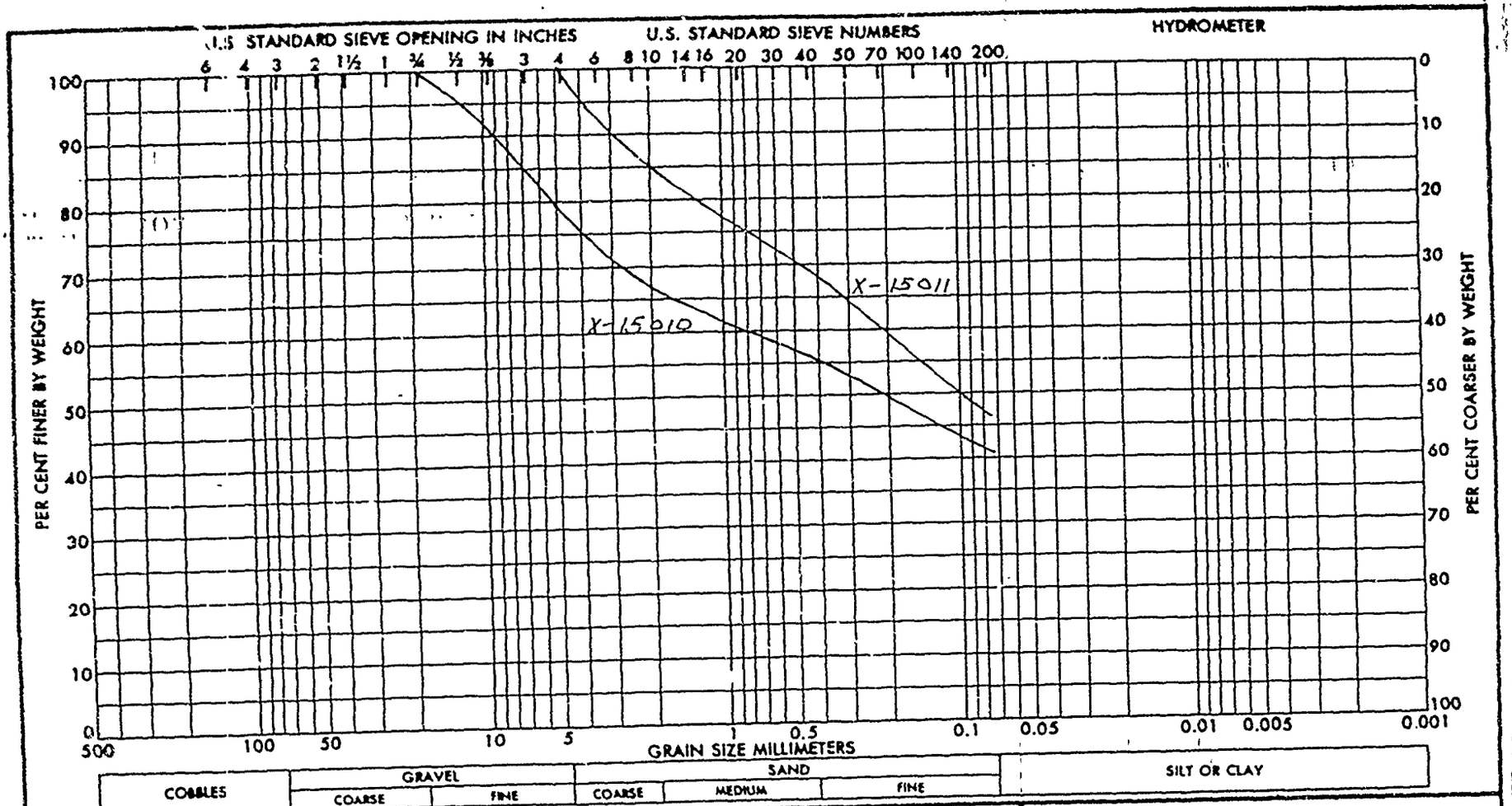
TEST DATA SUMMARY

SWDED GL Report 11227 FEATURE Diarks Dam

BORING NO	SAMPLE NO	DEPTH OR ELEV OF SAMPLE	LABORATORY CLASSIFICATION	MECHANICAL ANALYSIS: GRAVEL %	SAND %	FINES %	D_{10}	ATTERBERG LIMITS: LL	PL	SPECIFIC GRAVITY	NAT WATER CONT %	NATURAL DRY DENSITY LBS/CU FT	COMPACTION DATA: DRY DENSITY LBS/CU FT	MAXIMUM DRY DENSITY LBS/CU FT	INITIAL %	SHEAR DATA: DRY DENSITY LBS/CU FT	σ_n	σ_1	σ_3	TYPE TEST	SPECIMEN DIA INCHES	TEST	σ_d T/SQ FT	σ_3 T/SQ FT	c T/SQ FT	ϕ DEGREES	PERMEABILITY: k	n	CONSOLIDATION DATA: σ_0 T/SQ FT	σ_c T/SQ FT	C_c	t_{50}	REMARKS
Test Fill																																	
Composite of Samples 4, 6, and 8. (Continued)																																	
X-15012-C		SC					24	15					12.2	120.4	(Average from tests of Samples 4, C and 8)																			
				-#4 material				SAND, clayey								108	9.3	14.2		DS-S	3.0x3.0x0.5	1				0.0	34							Remolded to 90% maximum density at optimum + 3% water content.
																108	9.2	13.0			3.0x3.0x0.5	2											
																107	12.6	13.7		DS-S	3.0x3.0x0.5	1				0.0	34							Remolded to 90% maximum density at optimum water content
																108	12.1	13.9			3.0x3.0x0.5	2											
																108	15.3	14.9		DS-S	3.0x3.0x0.5	1				0.0	35							Remolded to 90% maximum density at optimum + 3% water content.
																108	15.2	13.0			3.0x3.0x0.5	2											
																114	9.3	14.1		DS-S	3.0x3.0x0.5	1				0.0	33							Remolded to 95% maximum density at optimum + 3% water content.
																114	9.4	14.1			3.0x3.0x0.5	2											
																114	12.2	13.8		DS-S	3.0x3.0x0.5	1				0.0	33							Remolded to 95% maximum density at optimum water content.
																114	12.1	13.4			3.0x3.0x0.5	2											
																114	15.3	13.8		DS-S	3.0x3.0x0.5	1				0.0	34							Remolded to 95% maximum density at optimum + 3% water content.
																114	15.3	14.2			3.0x3.0x0.5	2											

ENG FORM 1 MAR 54 2086 (PREVIOUS EDITIONS MAY BE USED) (EM 1110-1-1906) (TRANSLUCENT)

TC – Triaxial Compression; UC – Unconfined Compression; DS – Direct Shear; UU – Unconsolidated Undrained; CD – Consolidated Drained; CU – Consolidated Undrained; *Values at Pressure; T/SQ FT



SAMPLE NO.	ELEV OR DEPTH	CLASSIFICATION	NAT W%	LL	PL	PI
X-15010		Clayey gravelly SAND (SC)		38	19	19
-15011		Clayey SAND (SC)		35	18	17

GRADATION CURVES

PROJECT DIERKS DAM

AREA

BORING NO. Quarry

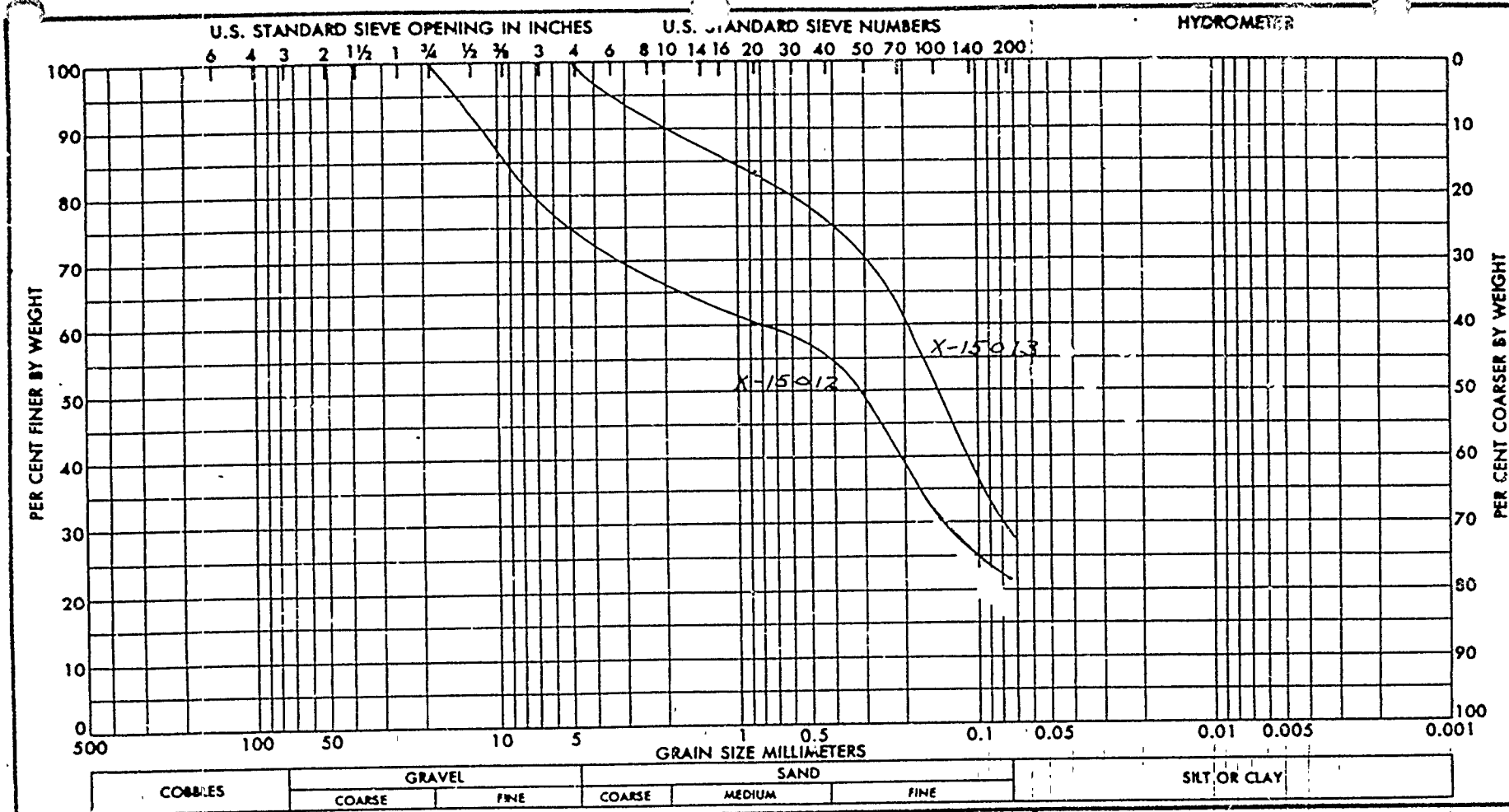
DATE SEP 71

U.S. GOVERNMENT PRINTING OFFICE : 1963 O—709-126

ENG FORM 2087 REPLACES WES FORM NO. 1241, SEP 1962, WHICH IS OBSOLETE.

Plate No. 1

SWDEN-GL Report 11227



SAMPLE NO.	ELEV OR DEPTH	CLASSIFICATION	NAT W%	LL	PL	PI
X-15012		Clayey gravelly SAND (SC-SM)		22	15	7
-15013		Silty SAND (SM-SC)		21	16	5

GRADATION CURVES

PROJECT DIERK'S DAM

AREA Test fill

BORING NO. Panel 1, So. end

DATE SEP 71

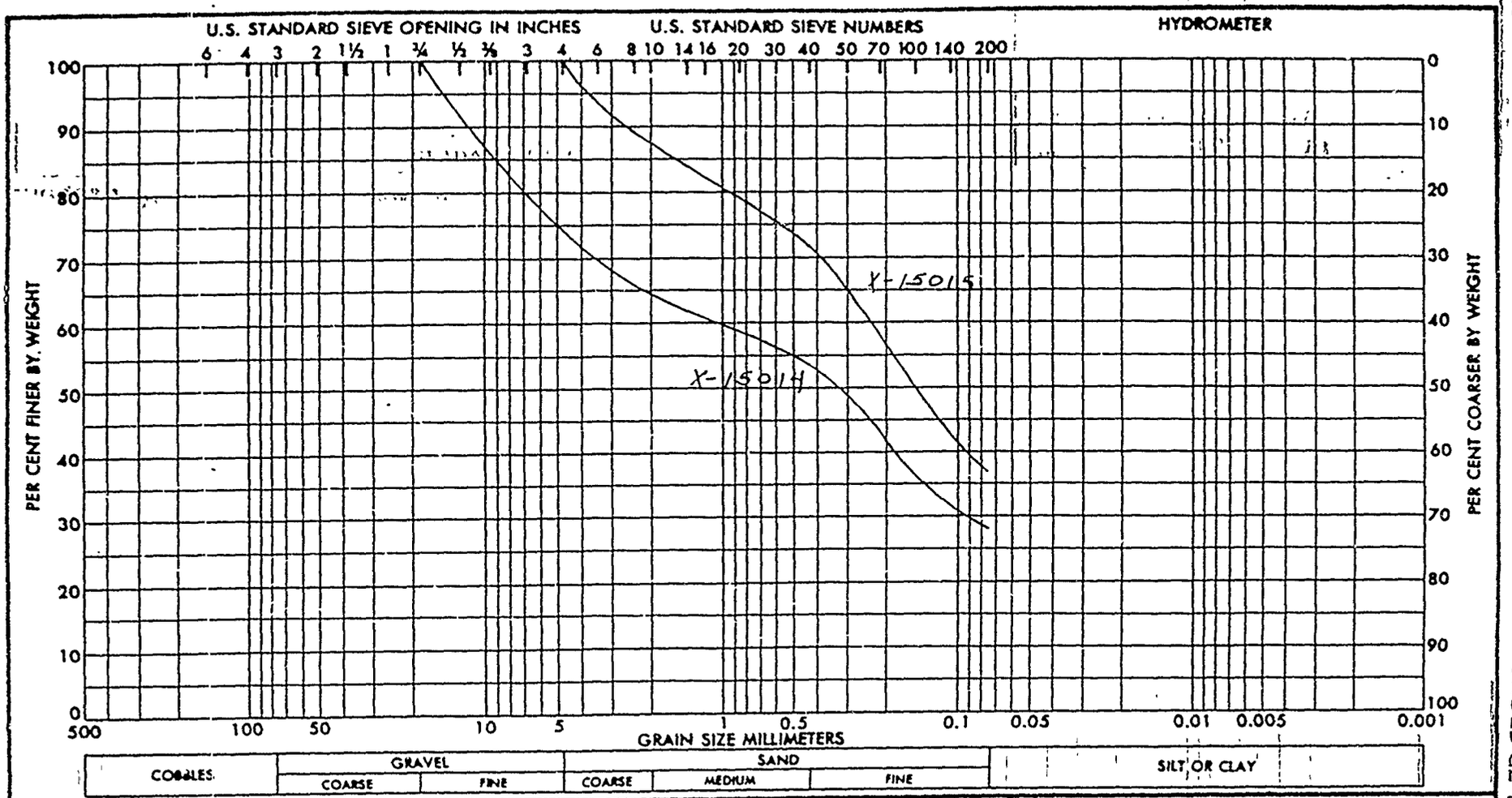
U.S. GOVERNMENT PRINTING OFFICE : 1963 O—709-128

Plate No. 2

ENG FORM 2087
1 MAY 63

REPLACES WES FORM NO. 1241, SEP 1962, WHICH IS OBSOLETE.

SWDED-GL Report 11227



SAMPLE NO.	ELEV OR DEPTH	CLASSIFICATION	NAT W%	LL	PL	PI
X-15014		Clayey gravelly SAND (SC)		27	16	11
-15015		Clayey SAND (SC)		27	15	12

GRADATION CURVES

PROJECT DIERKS DAM

AREA Test Fill

BORING NO. Panel 1, center

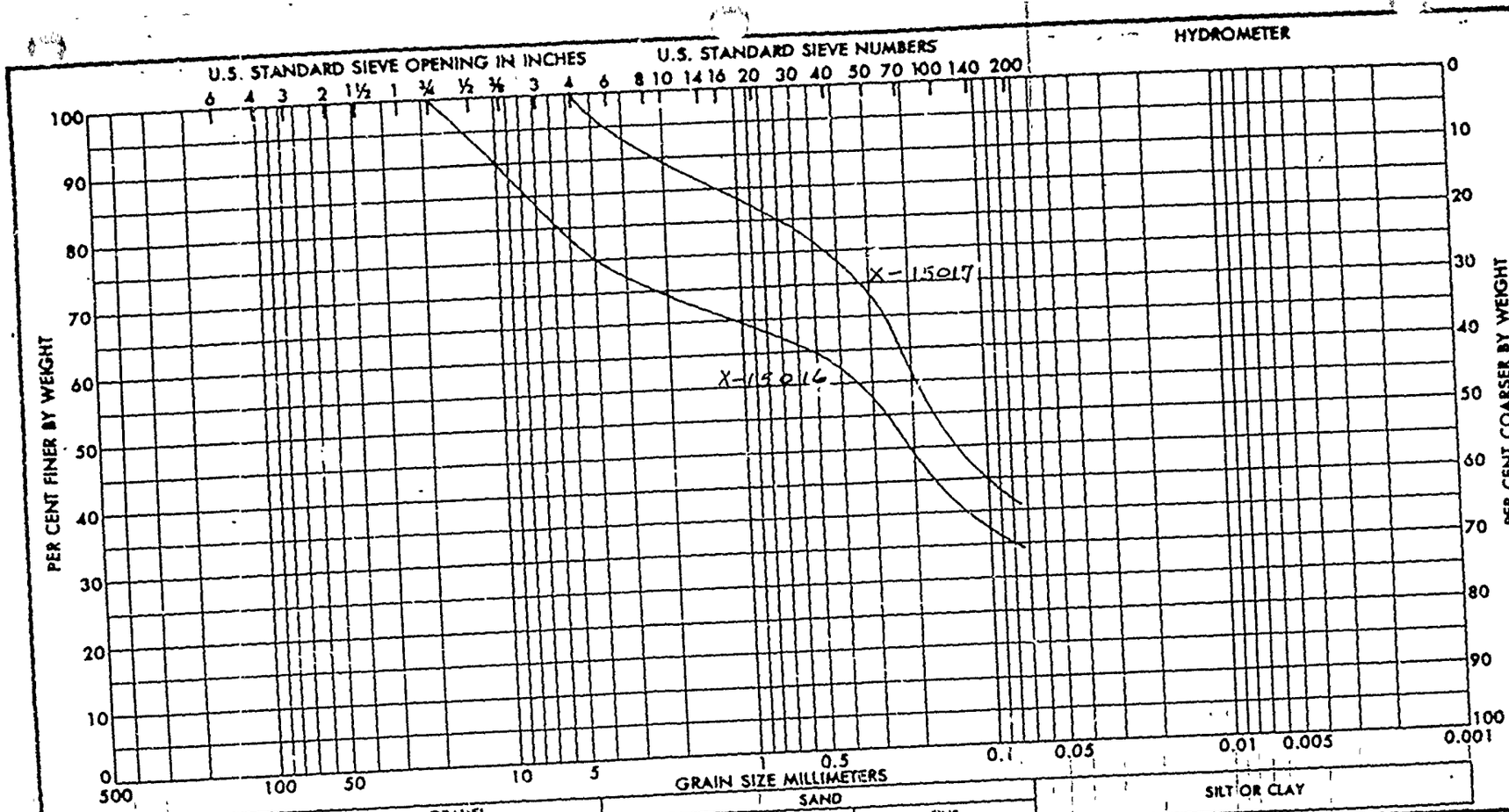
DATE SEP 71

Plate No. 3

SWDED-GL Report 11227

ENG FORM 2087 REPLACES WES FORM NO. 1241, SEP 1962, WHICH IS OBSOLETE.

U.S. GOVERNMENT PRINTING OFFICE : 1963 O—706-126



SAMPLE NO.	ELEV OR DEPTH	CLASSIFICATION	NAT W%	LL	PL	PI
X-15016		Clayey gravelly SAND (SC)		25	15	10
X-15017		Clayey SAND (SC)		25	15	10

PROJECT DIERKS DAM

AREA Test fill

BORING NO. Panel 1, No. end

DATE SEP 71

GRADATION CURVES

Plate No. 4

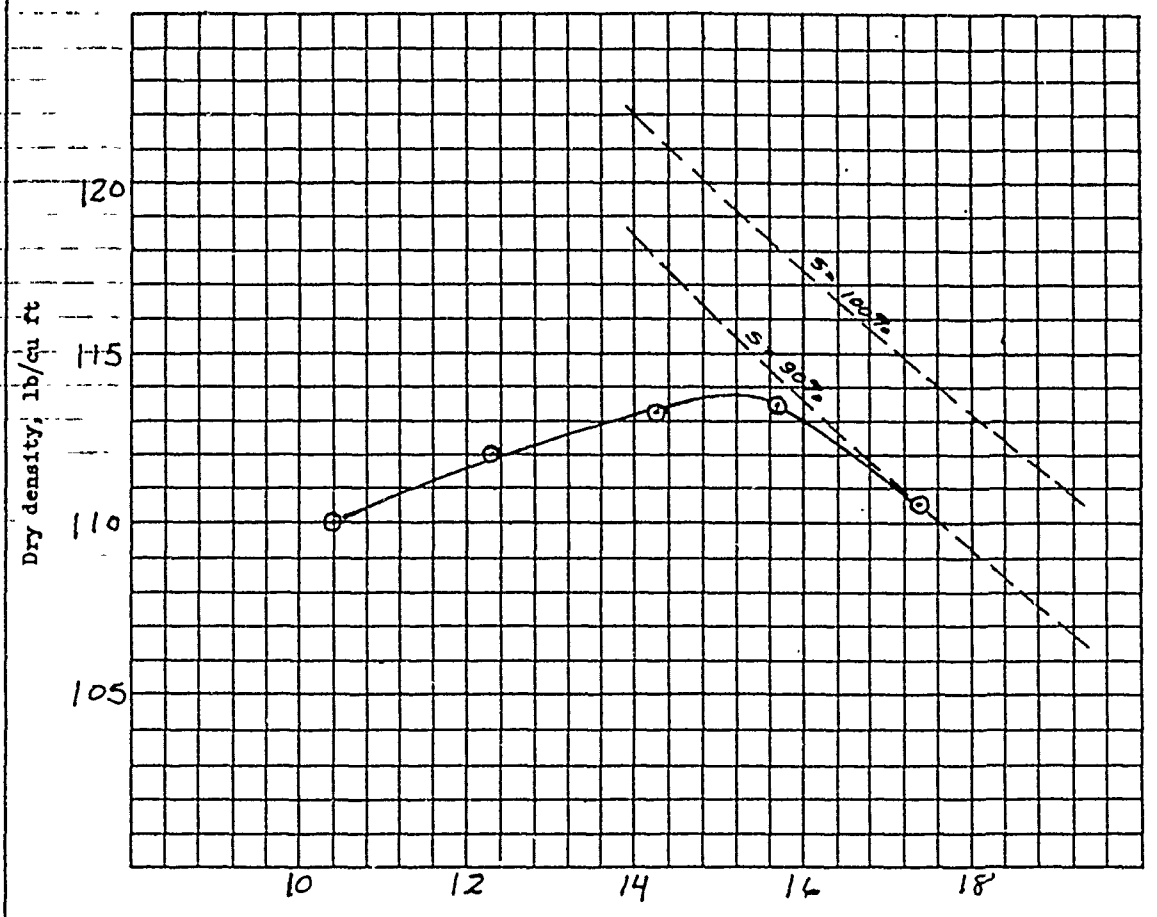
SWDED-GL Report 11227

ENG FORM 2087
1 MAY 63

REPLACES WES FORM NO. 1241, SEP 1962, WHICH IS OBSOLETE.

U.S. GOVERNMENT PRINTING OFFICE 1963 OF—700-126

SWDED-GL Report 11227



Standard compaction test

56 blows per each of 3 layers, with 5.5 lb rammer and

12 inch drop. 6 inch diameter mold

Sample No.	Elev or Depth	Classification	G	LL	PL	% > No. 4	% > 3/4 in.
		Clayey gravelly SAND (SC)	2.69 est.	38	19	22	0

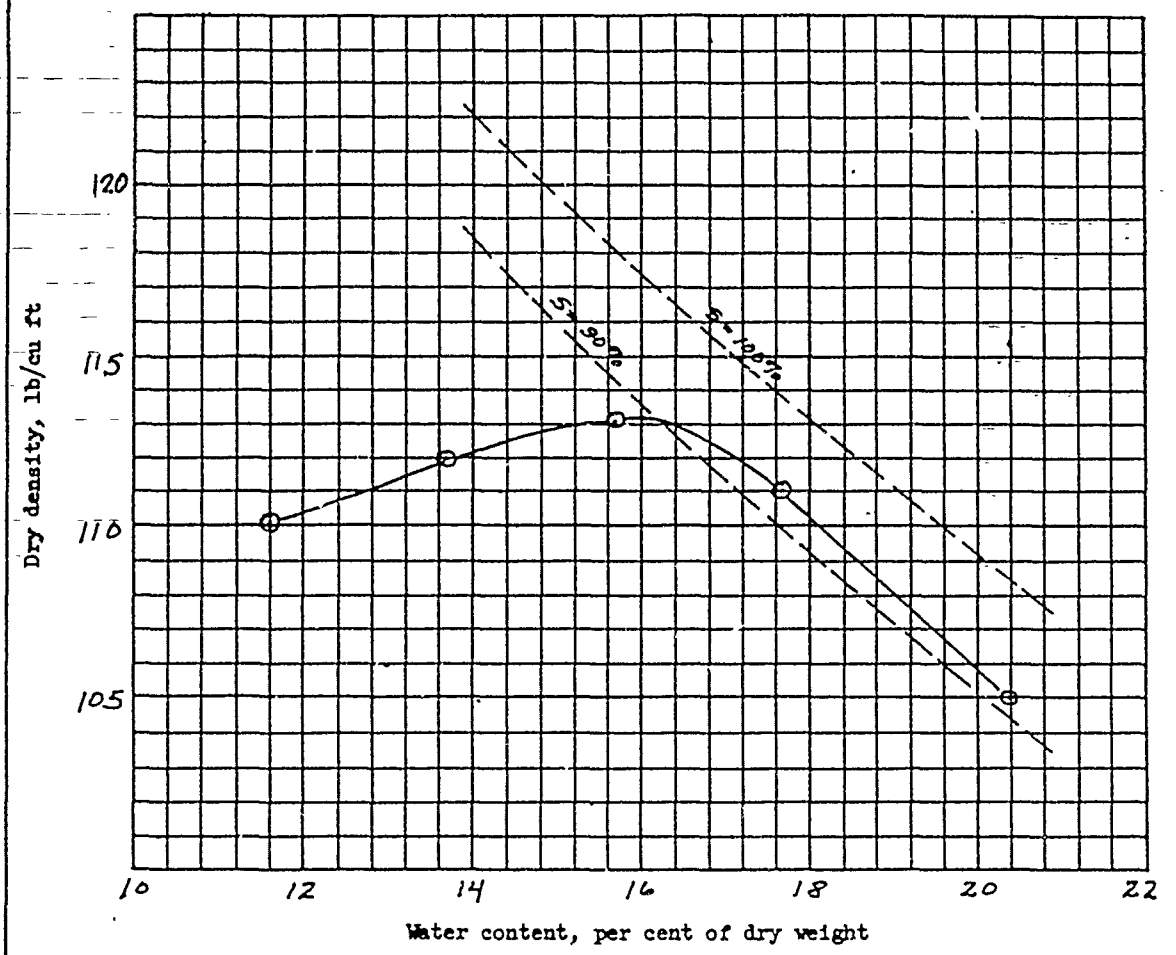
Sample No.	X-15010			
Natural water content in per cent				
Optimum water content in per cent	15.2			
Max dry density in lb/cu ft	113.8			

Remarks	Project DIERKS DAM
	Area Quarry
	Boring No. / Date SEP 71
	COMPACTION TEST REPORT

ENG FORM 2091 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

Plate No. 5

SWDED-GL Report 11227



Standard compaction test

25 blows per each of 3 layers, with 5.5 lb rammer and

12 inch drop. 4 inch diameter mold

Sample No.	Elev or Depth	Classification	G	LL	PL	% > No. 4	% > 3/4 in.
		Clayey SAND (SC)	2.69 est.	35	18		

Sample No.	X-15011			
Natural water content in per cent				
Optimum water content in per cent	16.0			
Max dry density in lb/cu ft	113.2			

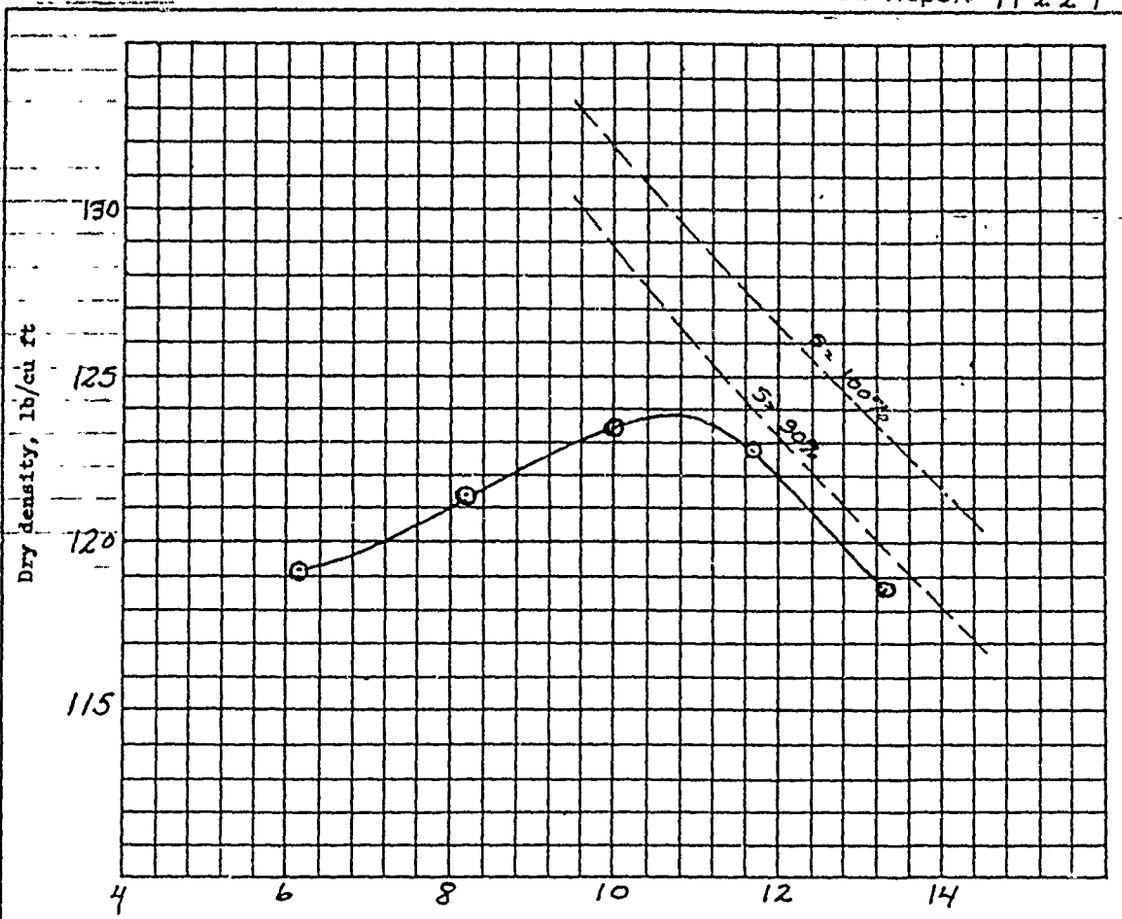
Remarks	Project DIERKS DAM
	Area Quarry
	Boring No. / Date SEP 71
	COMPACTION TEST REPORT

ENG FORM 2091 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

G 3425

Plate No. 6

SWDED-GL Report 11227



Standard compaction test

56 blows per each of 3 layers, with 5.5 lb rammer and

12 inch drop. 6 inch diameter mold

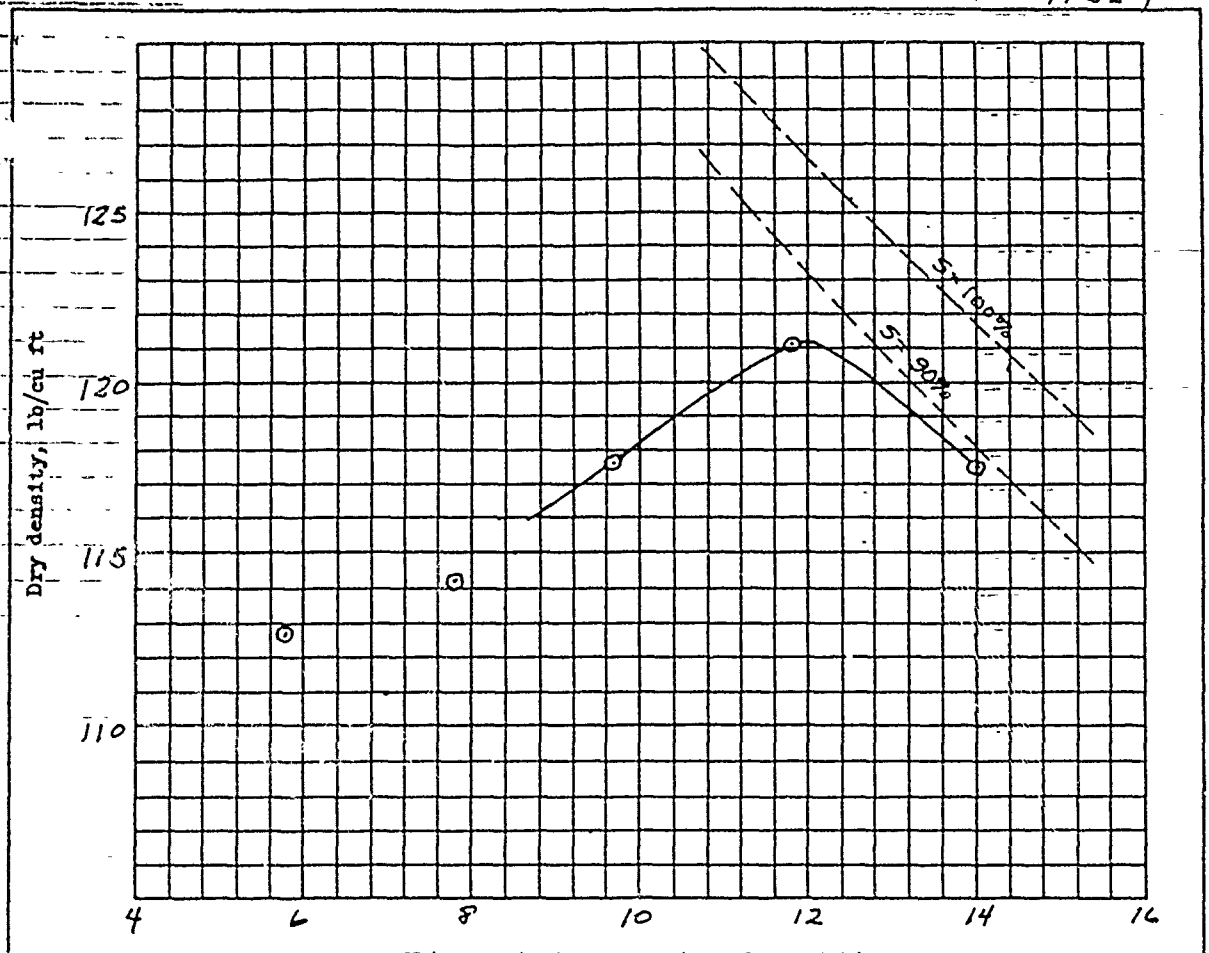
Sample No.	Elev or Depth	Classification	G	LL	PL	% > No. 4	% > 3/4 in.
		Clayey gravelly SAND (SC-SM)	2.68 est.	22	15	26	0

Sample No.	X-15012			
Natural water content in per cent				
Optimum water content in per cent	10.8			
Max dry density in lb/cu ft	123.8			

Remarks	Project DIERKS DAM
	Area Test Fill
	Boring No. Panel 1, So. end Date SEP 71
	COMPACTION TEST REPORT

ENG FORM 2091 — 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

Plate No. 7



Standard compaction test

25 blows per each of 3 layers, with 5.5 lb rammer and

12 inch drop. 4 inch diameter mold

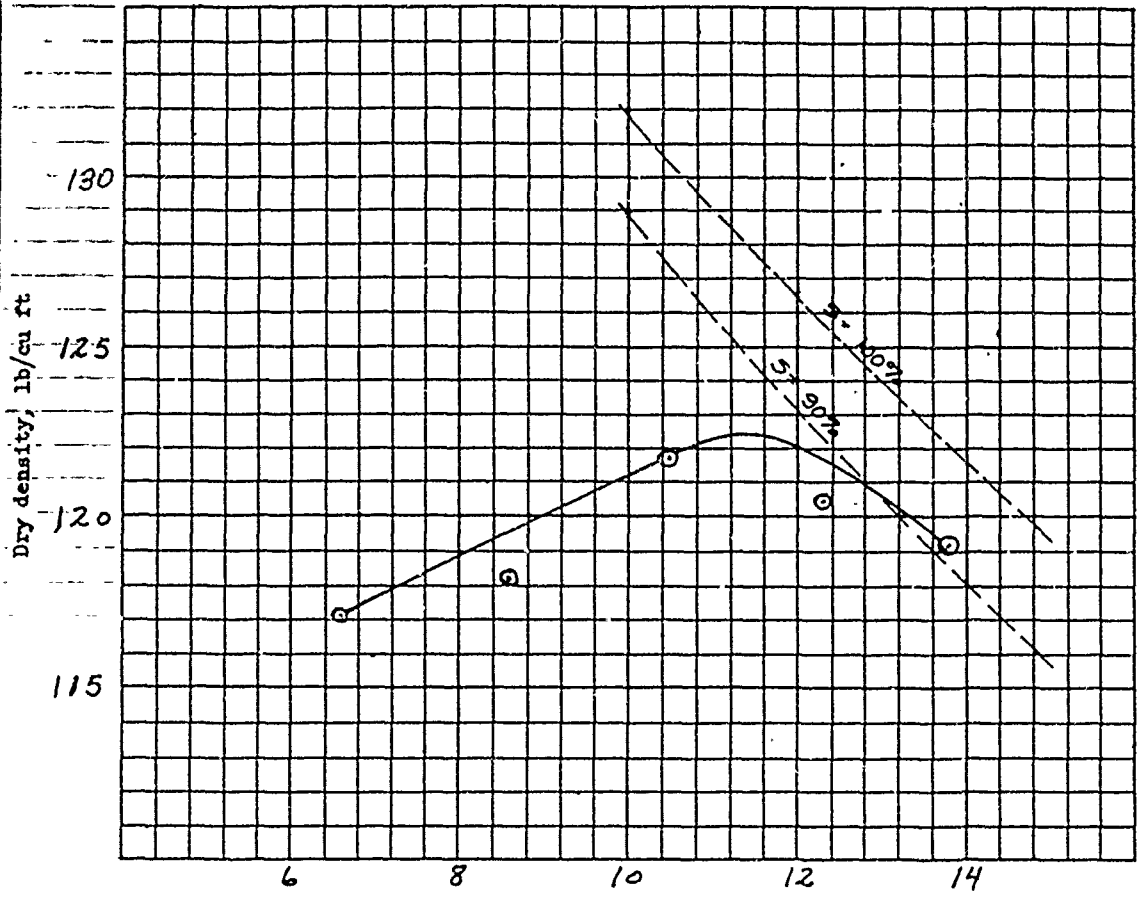
Sample No.	Elev or Depth	Classification	G	LL	PL	% > No. 4	% > 3/4 in.
		Silty SAND (SM-SC)	2.68 est.	21	16		

Sample No.	X-15013			
Natural water content in per cent				
Optimum water content in per cent	12.0			
Max dry density in lb/cu ft	121.2			

Remarks	Project DIERKS DAM
	Area Test fill
	Boring No. Panel 1, So. end Date SEP 71
	COMPACTION TEST REPORT

ENG FORM 2091 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

Plate No. 8



Standard compaction test

56 blows per each of 3 layers, with 5.5 lb rammer and

12 inch drop. 6 inch diameter mold

Sample No.	Elev or Depth	Classification	G	LL	PL	% > No. 4	% > 3/4 in.
		Clayey gravelly SAND (SC)	2.68 est.	27	16	26	0

Sample No.	X-15014			
Natural water content in per cent				
Optimum water content in per cent	11.4			
Max dry density in lb/cu ft	122.4			

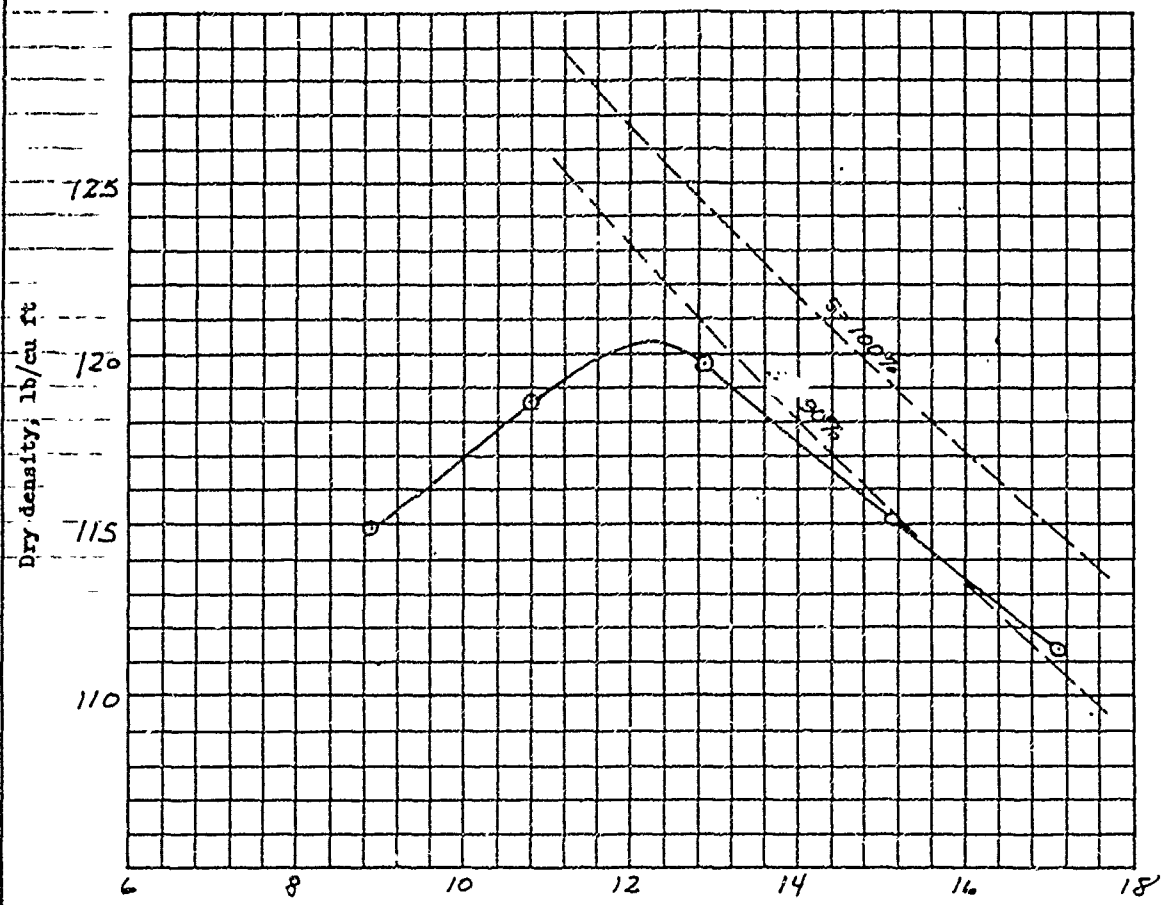
Remarks	Project DIERKS DAM	
	Area Test fill	
	Boring No. Panel 1 center	Date SEP 71
	COMPACTION TEST REPORT	

ENG FORM 2091 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

3425

Plate No. 9

SWDED-GL Report 11227



Standard compaction test

25 blows per each of 3 layers, with 5.5 lb rammer and

12 inch drop. 4 inch diameter mold

Sample No.	Elev or Depth	Classification	G	LL	PL	% > No. 4	% > 3/4 in.
		Clayey SAND (SC)	2.68 est.	27	15		

Sample No.	X-15015			
Natural water content in per cent				
Optimum water content in per cent	12.3			
Max dry density in lb/cu ft	120.3			

Remarks

Project DIERKS DAM

Area Test fill

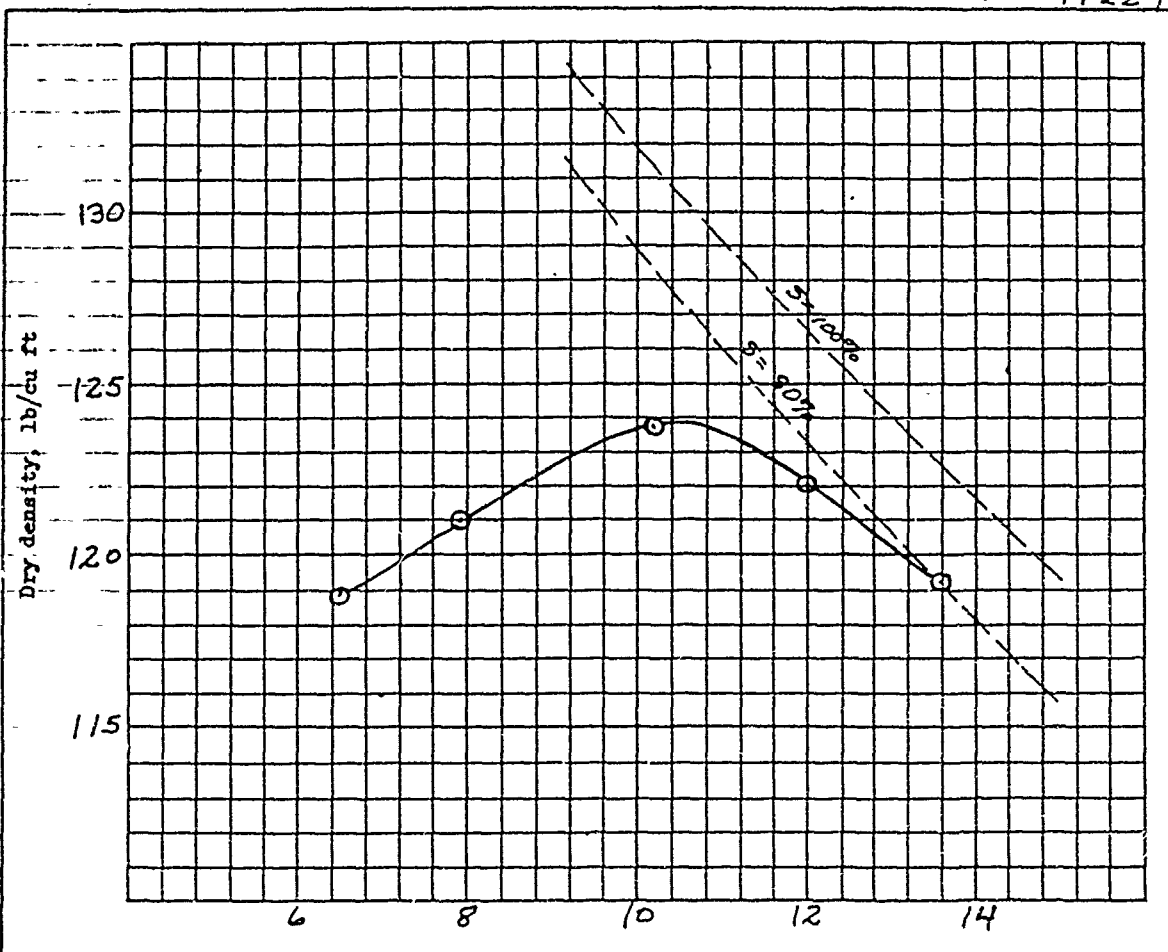
Boring No. Panel 1, center Date SEP 71

COMPACTION TEST REPORT

EHG FORM 1 MAY 63 2091 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

Plate No. 10

SWDED-GL Report 11227



Standard compaction test

56 blows per each of 3 layers, with 5.5 lb rammer and

12 inch drop. 6 inch diameter mold

Sample No.	Elev or Depth	Classification	G	LL	PL	% > No. 4	% > 3/4 in.
		Clayey gravelly SAND (SC)	2.68 est.	25	15	22	0

Sample No.	X-15016			
Natural water content in per cent				
Optimum water content in per cent	10.5			
Max dry density in lb/cu ft	123.9			

Remarks

Project DIERKS DAM

Area Test fill

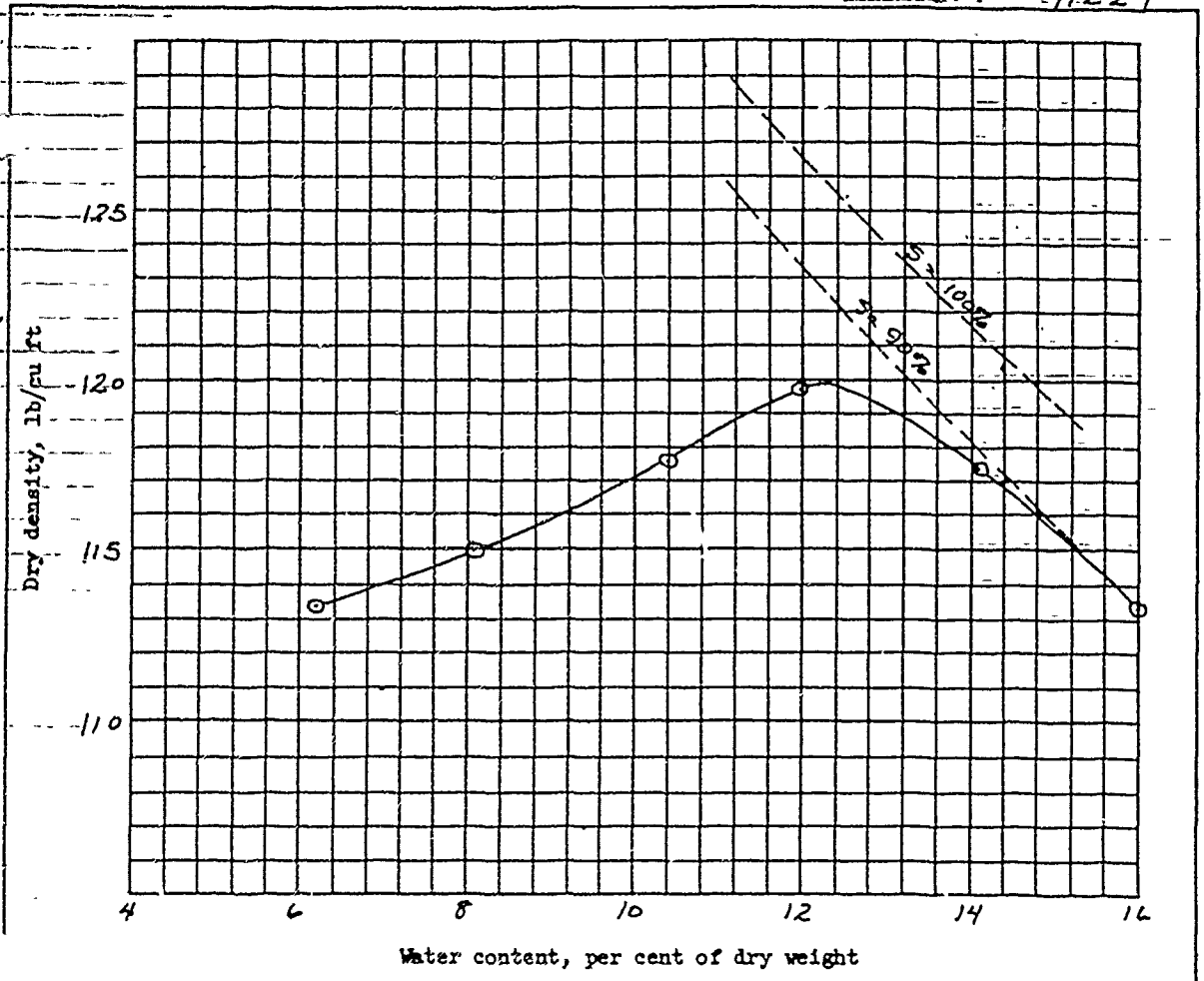
Boring No. Panel 1, Nb. end Date SEP 71

COMPACTION TEST REPORT

ENG FORM 1 MAY 63 2091 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

G 3426

Plate No. 11



Standard compaction test

25 blows per each of 3 layers, with 5.5 lb rammer and

12 inch drop. 4 inch diameter mold

Sample No.	Elev or Depth	Classification	G	LL	PL	% > No. 4	% > 3/4 in.
		Clayey SAND (SC)	2.68 est.	25	15		

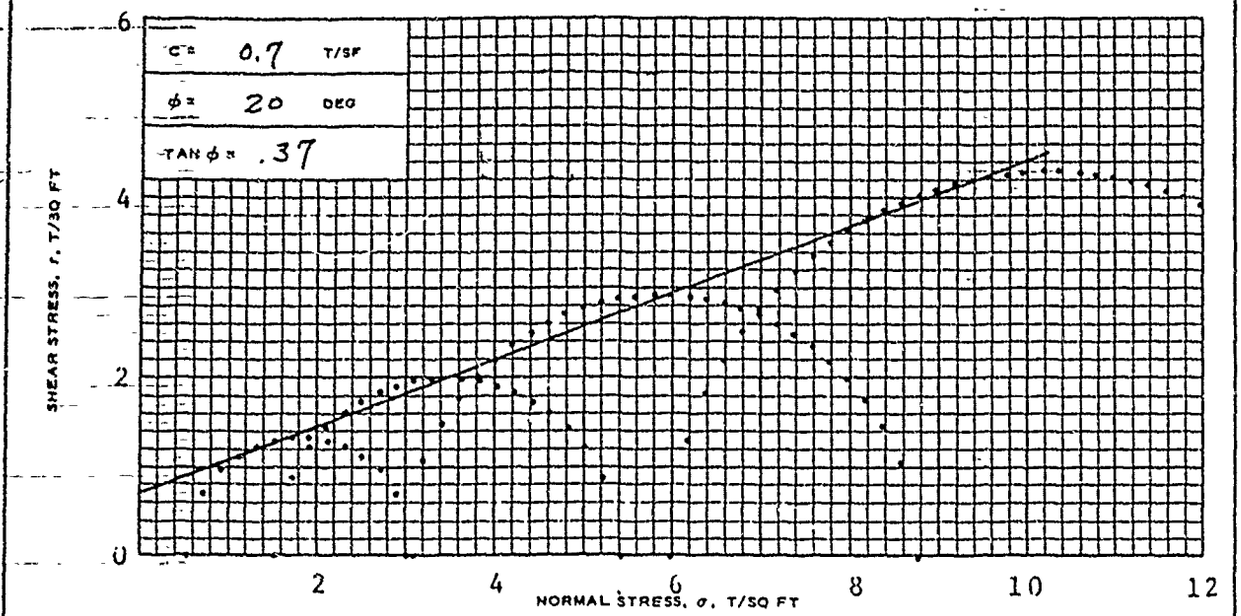
Sample No.	X-15017			
Natural water content in per cent				
Optimum water content in per cent	12.3			
Max dry density in lb/cu ft	119.8			

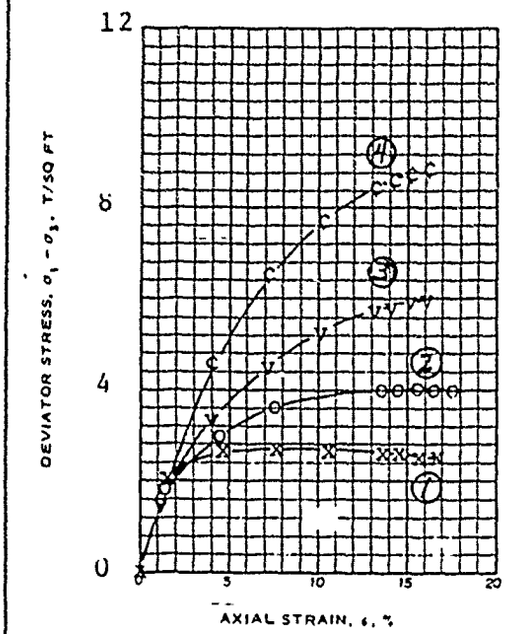
Remarks	Project DIERKS DAM
	Area Test fill
	Boring No. Panel 1, No. end / Date SEP 71
	COMPACTION TEST REPORT

EMG FORM 2091 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

Plate No. 12

SWDED-GL Report 11227





SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT, %	w_o	13.0	13.0	13.0	13.0
	DRY DENSITY LB/CU FT	γ_{d_o}	102	101	101	102
	SATURATION, %	S_o	54	53	54	55
	VOID RATIO	e_o	.637	.661	.648	.635
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γ_{d_c}				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	U_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	2.64	3.98	5.83	8.45
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	12	23	24	23
ULTIMATE DEVIATOR STRESS, T SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.3	1.3	1.3
INITIAL HEIGHT, IN.		H_o	2.9	2.9	2.9	2.9

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Clayey SAND (SC) Remolded (90% γ, w-3)

LL 35 | PL 18 | PI 17 | G_s 2.69 est.

REMARKS:

TYPE OF SPECIMEN Remolded | TYPE OF TEST Q

PROJECT Dierks Dam — 90%

BORING NO Quarry | SAMPLE NO. X-15011

DEPTH/ELEV

LABORATORY SWD | DATE SEP 71

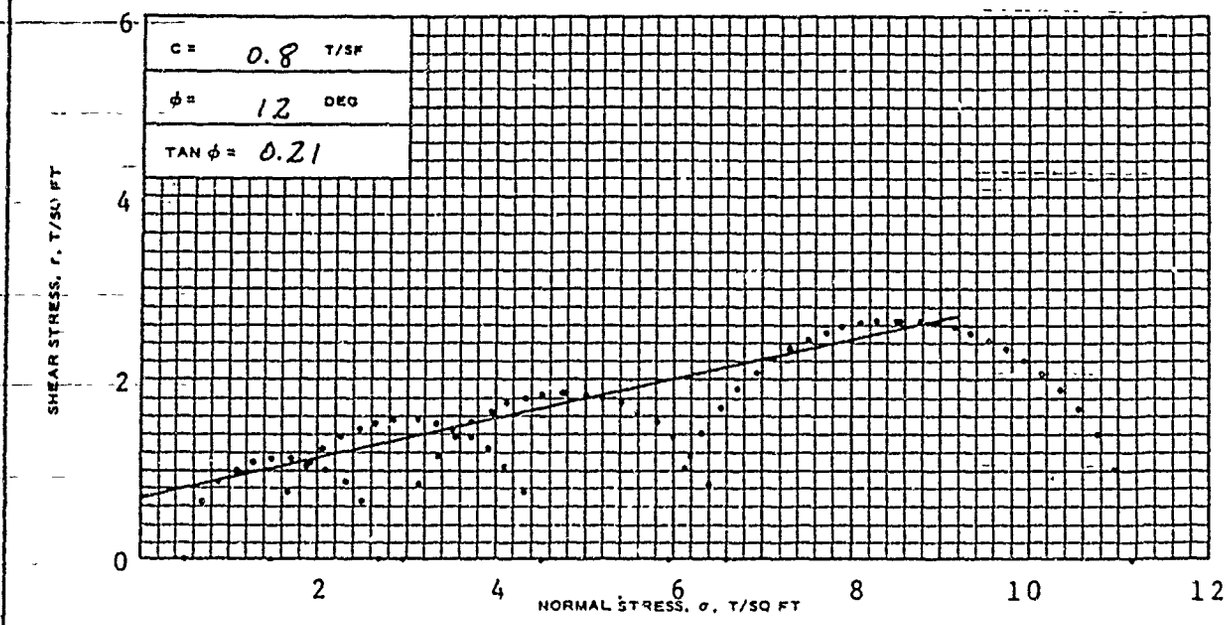
TRIAXIAL COMPRESSION TEST REPORT

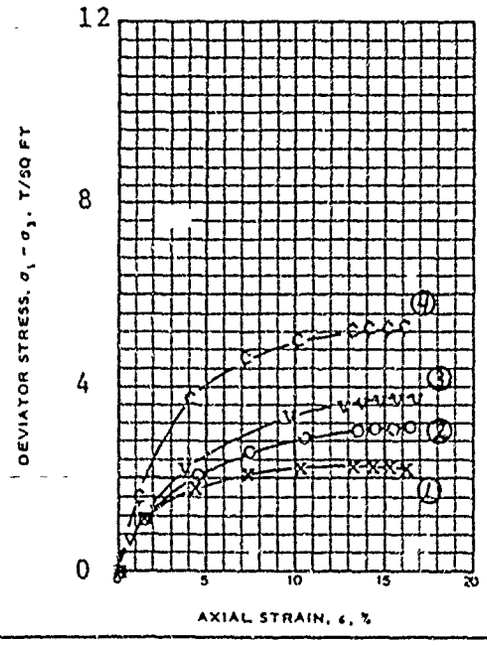
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE

TRANSLUCENT

Plate No. 13

SWDED-GL Report 11227





SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT, %	w_o	15.6	15.8	15.0	15.7
	DRY DENSITY LB/ CU FT	γd_o	102	102	102	102
	SATURATION, %	S_o	66	66	62	66
	VOID RATIO	e_o	.635	.637	.645	.637
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	2.26	3.10	3.70	5.29
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	22	22	23	24
ULTIMATE DEVIATOR STRESS, T SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.3	1.3	1.4	1.4
INITIAL HEIGHT, IN.		H_o	3.0	2.9	3.0	2.9

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Clayey SAND (SC) Remolded (90% γ, w)

LL 35 | PL 18 | PI 17 | G_s 2.69 est.

REMARKS:

TYPE OF SPECIMEN Remolded | TYPE OF TEST Q

PROJECT Dierks Dam

90%

BORING NO. Quarry | SAMPLE NO. X-15011

DEPTH/ELEV

LABORATORY SWD | DATE SEP 71

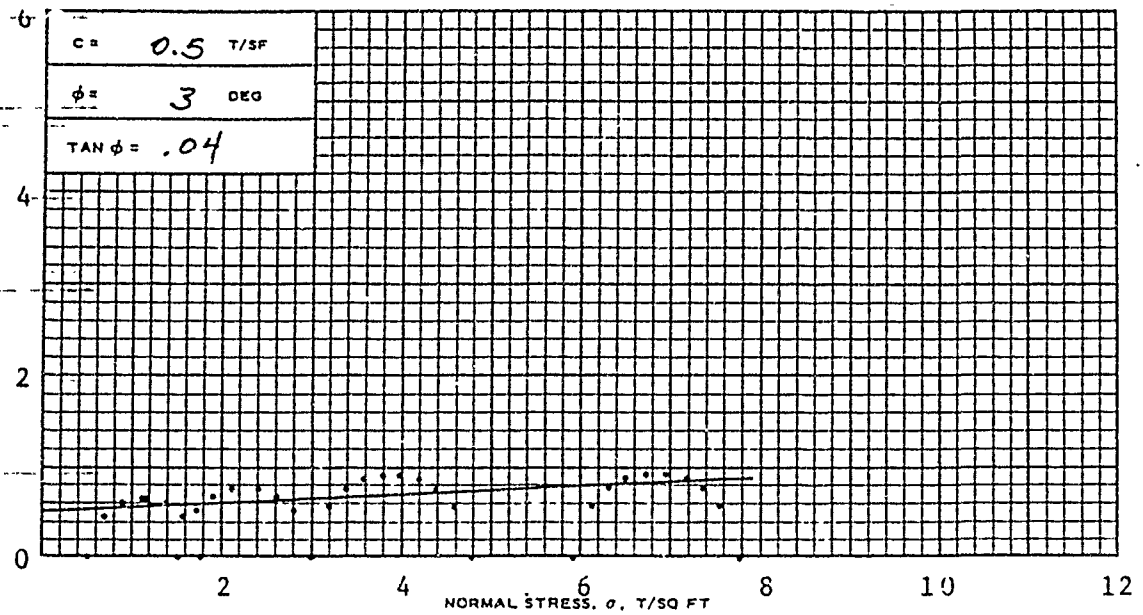
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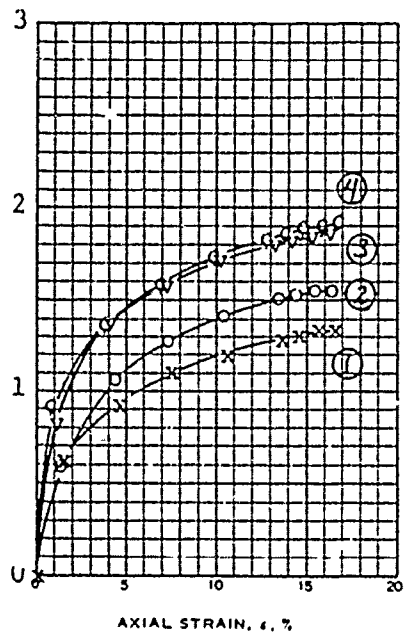
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE

TRANSLUCENT

Plate No. 14

SWDED-GL Report 11227





SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT, %	w_o	19.0	18.9	19.0	18.9
	DRY DENSITY LB/ CU FT	γd_o	102	101	102	102
	SATURATION, %	S_o	80	78	80	80
	VOID RATIO	e_o	.636	.650	.635	.635
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.30	1.54	1.81	1.89
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	23	22	22	23
ULTIMATE DEVIATOR STRESS, T SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.3	1.3	1.3	1.3
INITIAL HEIGHT, IN.		H_o	2.9	2.9	2.9	3.0

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Clayey SAND (SC) Remolded (90% γ, w+3)

LL 35	PL 18	PI 17	G_s 2.69 est.

TYPE OF SPECIMEN Remolded TYPE OF TEST Q

REMARKS:

PROJECT Dierks Dam

90%

BORING NO. Quarry SAMPLE NO. X-15011

DEPTH/ELEV

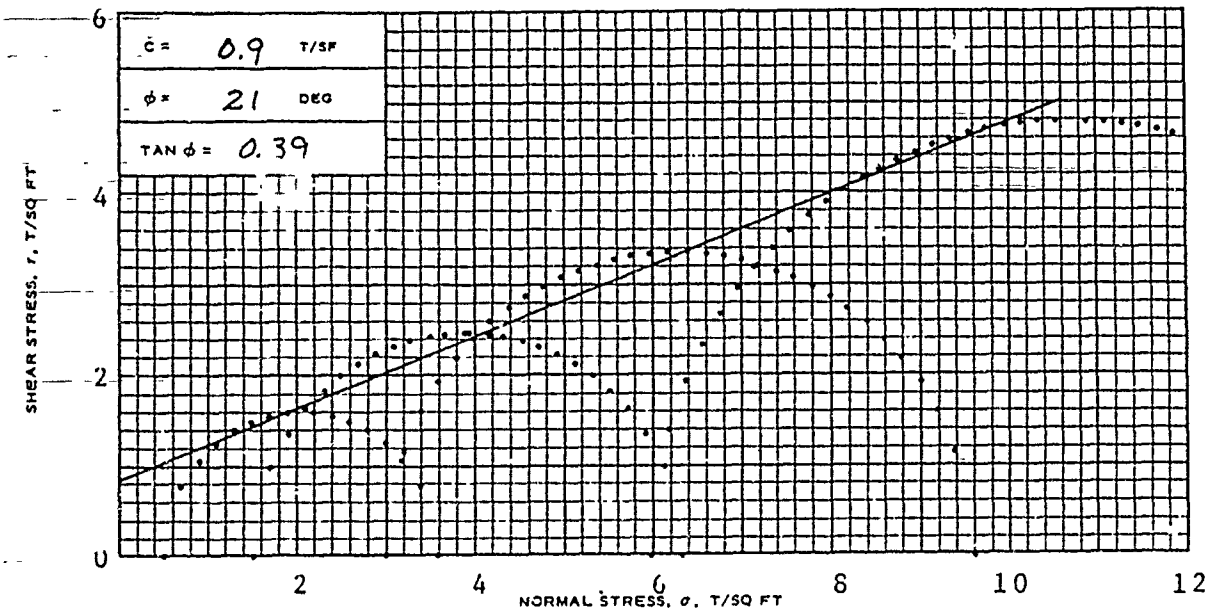
LABORATORY SWD DATE SEP 71

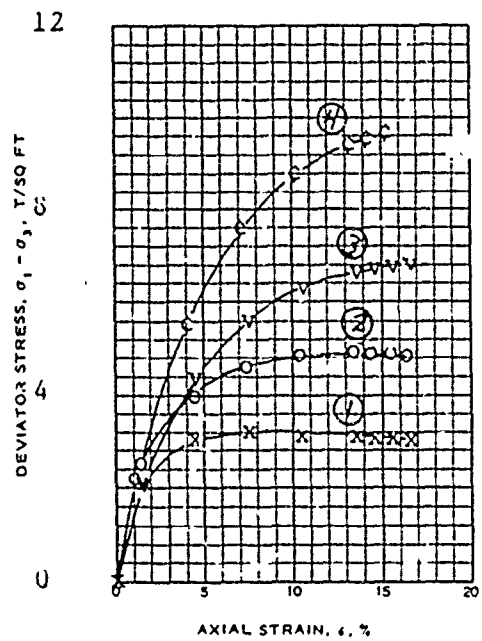
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

Plate No. 15

SWDED-GL Report 11227





SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT %	w_o	12.9	12.9	13.0	12.9
	DRY DENSITY LB/CU FT	γ_{d_o}	106	108	107	108
	SATURATION, %	S_o	60	63	62	62
	VOID RATIO	e_o	.575	.554	.558	.554
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γ_{d_c}				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	3.14	4.89	6.68	9.58
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	13	22	24	24
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.3	1.4	1.4	1.4
INITIAL HEIGHT, IN.		H_o	2.9	2.9	2.9	2.9

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Clayey SAND (SC) Remolded (95% γd, W-3)

LL 35 | PL 18 | PI 17 | G_s 2.69 est.

REMARKS:

TYPE OF SPECIMEN Remolded | TYPE OF TEST Q

PROJECT Dierks Dam

950

BORING NO. Quarry | SAMPLE NO. X-15011

DEPTH/ELEV

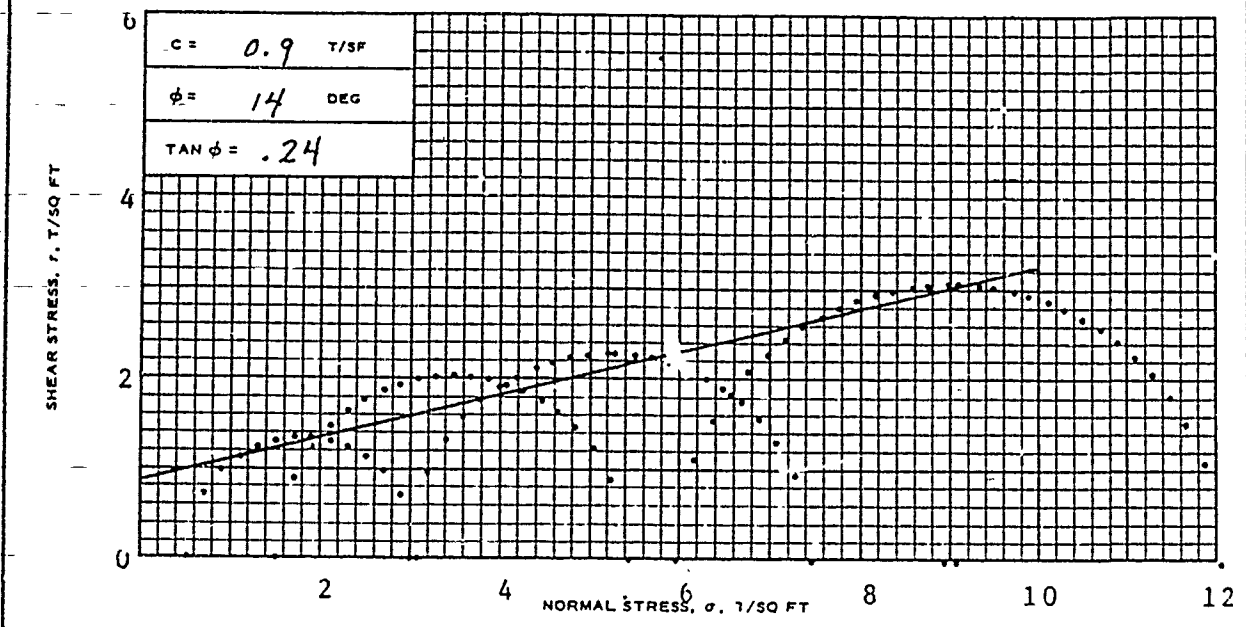
LABORATORY SWD | DATE SEP 71

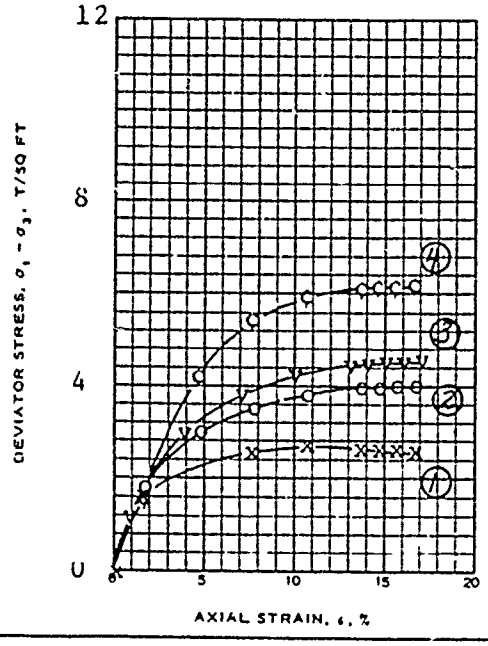
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

Plate No. 16

SWDED-GL Report 11227





SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT, %	w_o	15.5	15.5	15.6	15.5
	DRY DENSITY LB/ CU FT	γ_{d_o}	107	108	106	107
	SATURATION, %	S_o	74	76	73	74
	VOID RATIO	e_o	.562	.548	.570	.560
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γ_{d_c}				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	2.64	4.02	4.55	6.18
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	17	24	23	23
ULTIMATE DEVIATOR STRESS, T SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.3	1.4	1.4	1.4
INITIAL HEIGHT, IN.		H_o	2.9	3.0	2.9	3.0

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Clayey SAND (SC) Remolded (95% γ, w)

LL 35 | PL 18 | PI 17 | Gs 2.69 est.

REMARKS:

TYPE OF SPECIMEN Remolded | TYPE OF TEST Q

PROJECT Dierks Dam 95%

BORING NO. Quarry | SAMPLE NO. X-15011

DEPTH/ELEV

LABORATORY SWD | DATE SEP 71

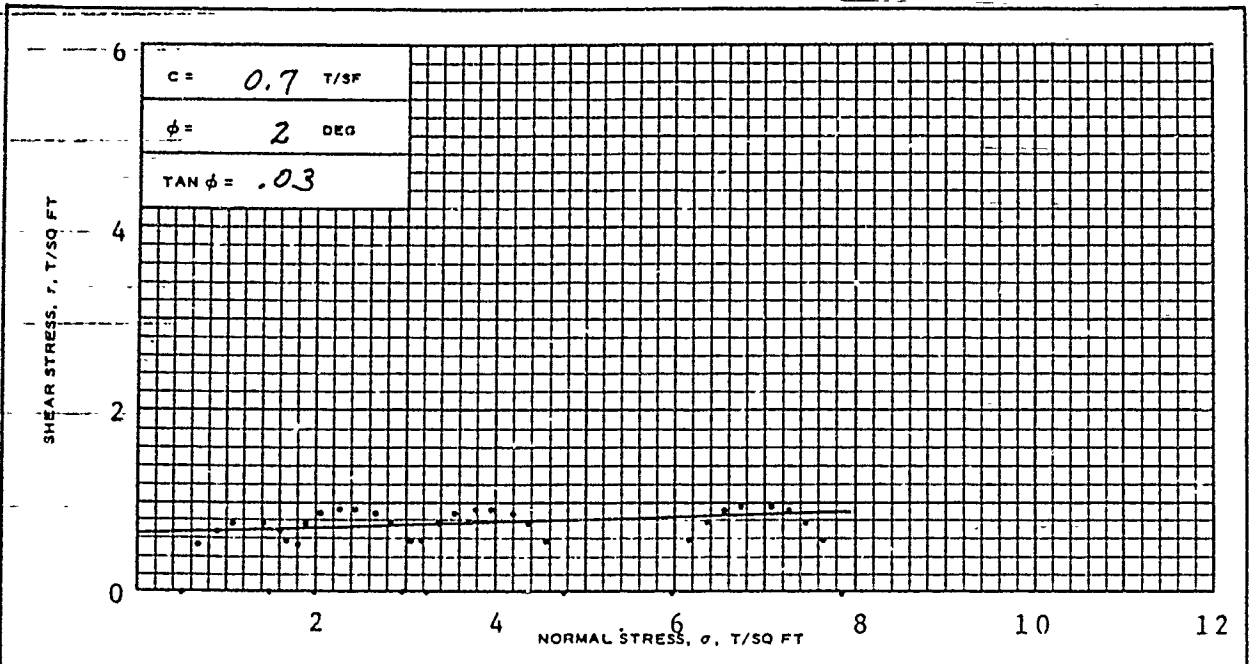
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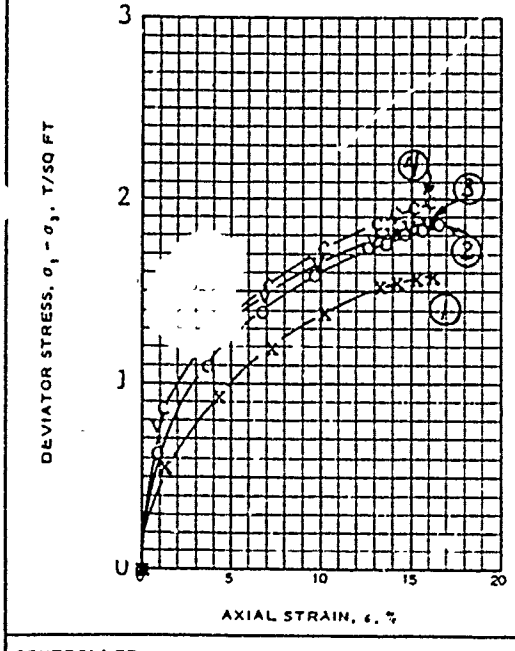
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TRANSLUCENT

Plate No. 17

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SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT, %	w_o	18.9	18.9	19.2	19.2
	DRY DENSITY LB/ CU FT	γ_{d_o}	107	108	106	107
	SATURATION, %	S_o	91	92	89	91
	VOID RATIO	e_o	.558	.553	.576	.567
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γ_{d_c}				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	U_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.56	1.82	1.85	1.95
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	23	23	22	24
ULTIMATE DEVIATOR STRESS, T SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER IN		D_o	1.4	1.4	1.4	1.4
INITIAL HEIGHT, IN.		H_o	2.9	3.0	2.9	2.9

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Clayey SAND (SC) (Remolded 95% γ, w+3)

LL	PL	PI	Gs
35	18	17	2.69 est.

TYPE OF SPECIMEN Remolded

TYPE OF TEST Q

REMARKS.

PROJECT Dierks Dam

95%

BORING NO. Quarry

SAMPLE NO. X-15011

DEPTH/ELEV

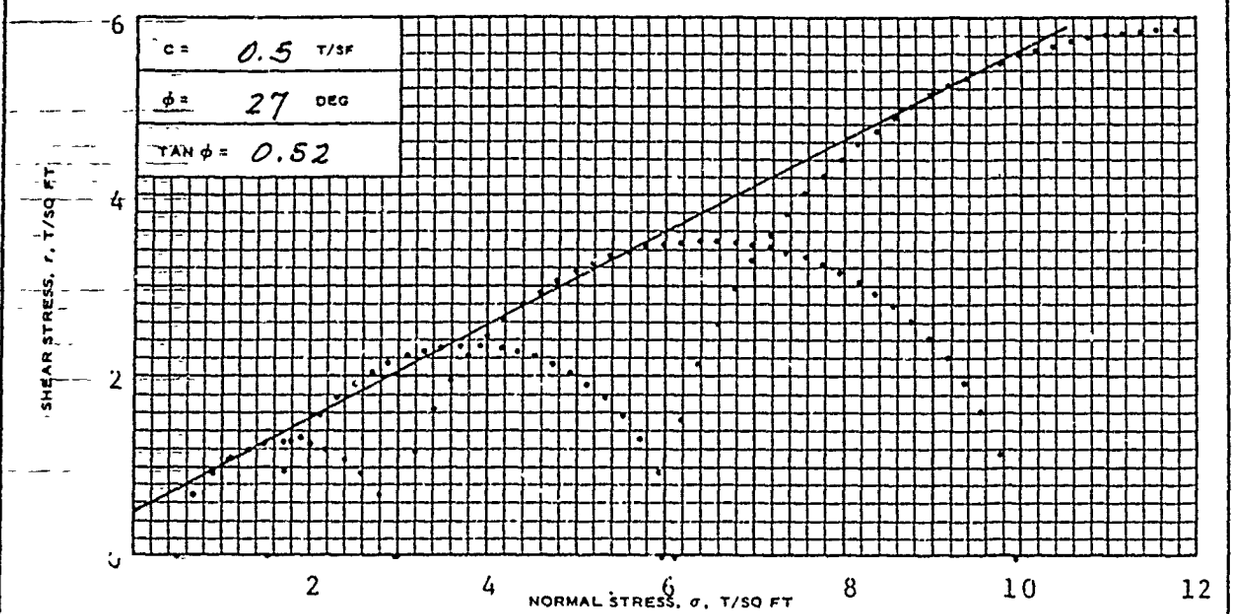
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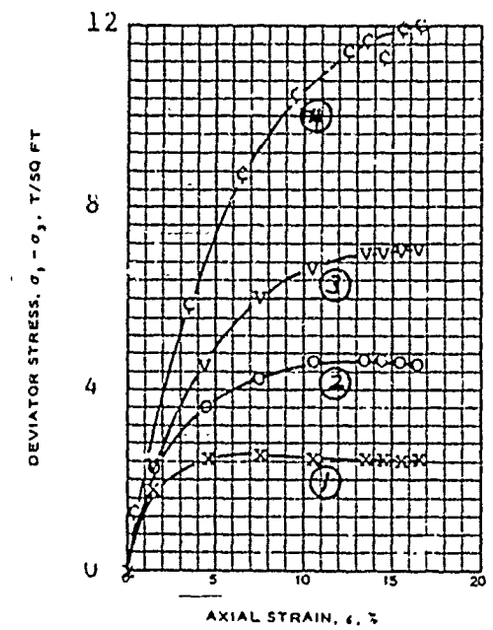
DATE SEP 71

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

Plate No. 18





SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT, %	w_o	9.2	9.2	9.2	9.1
	DRY DENSITY LB/CU FT	γd_o	108	108	107	107
	SATURATION, %	S_o	45	45	44	44
	VOID RATIO	e_o	.538	.540	.556	.553
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	2.54	4.69	7.03	11.84
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	13	21	24	24
ULTIMATE DEVIATOR STRESS, T SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.3	1.3	1.3	1.3
INITIAL HEIGHT, IN.		H_o	2.9	3.0	2.9	2.9

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Clayey SAND (SC) Remolded (90% γ, W-3)

LL 24	PL 15	PI 9	G_s 2.68 est.

REMARKS:

TYPE OF SPECIMEN Remolded TYPE OF TEST Q

PROJECT Dierks Dam

90%

BORING NO. Test fill SAMPLE NO. X-15017C

DEPTH/ELEV

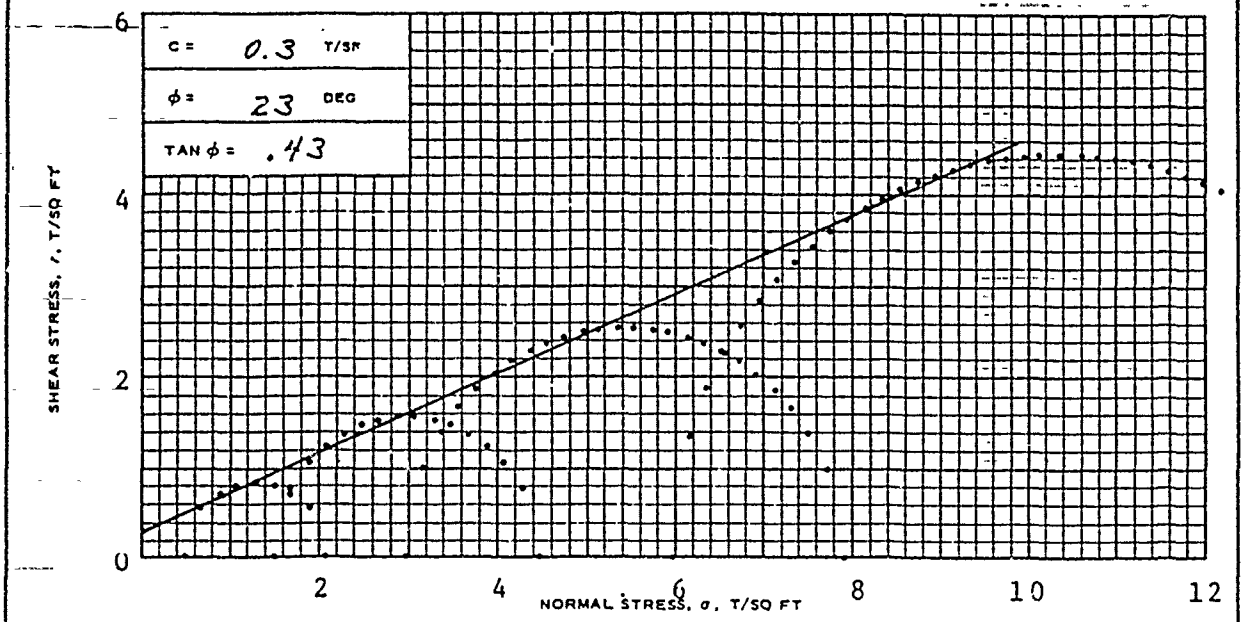
LABORATORY SWD DATE SEP 71

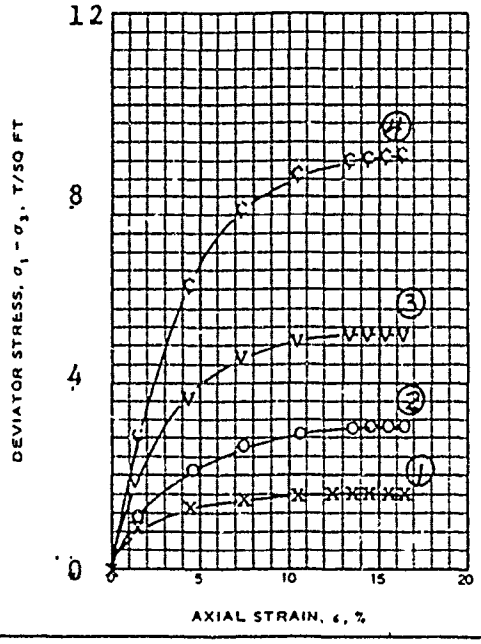
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

Plate No. 19

SWDED-GL Report 11227





SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT, %	w_o	12.0	11.8	11.7	11.8
	DRY DENSITY LB/ CU FT	γ_{d_o}	105	107	109	108
	SATURATION, %	S_o	54	57	59	59
	VOID RATIO	e_o	.587	.550	.527	.535
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γ_{d_c}				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.64	3.05	5.02	8.88
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	21	24	22	24
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN		D_o	1.3	1.3	1.3	1.3
INITIAL HEIGHT, IN		H_o	2.9	2.9	2.9	3.0

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Clayey SAND (SC) Remolded (90% δ, w)

LL 24	PL 15	PI 9	G_s 2.68 est.

REMARKS:

TYPE OF SPECIMEN Remolded | TYPE OF TEST Q

PROJECT Dierks Dam

90%

BORING NO. Test fill | SAMPLE NO. X-15017C

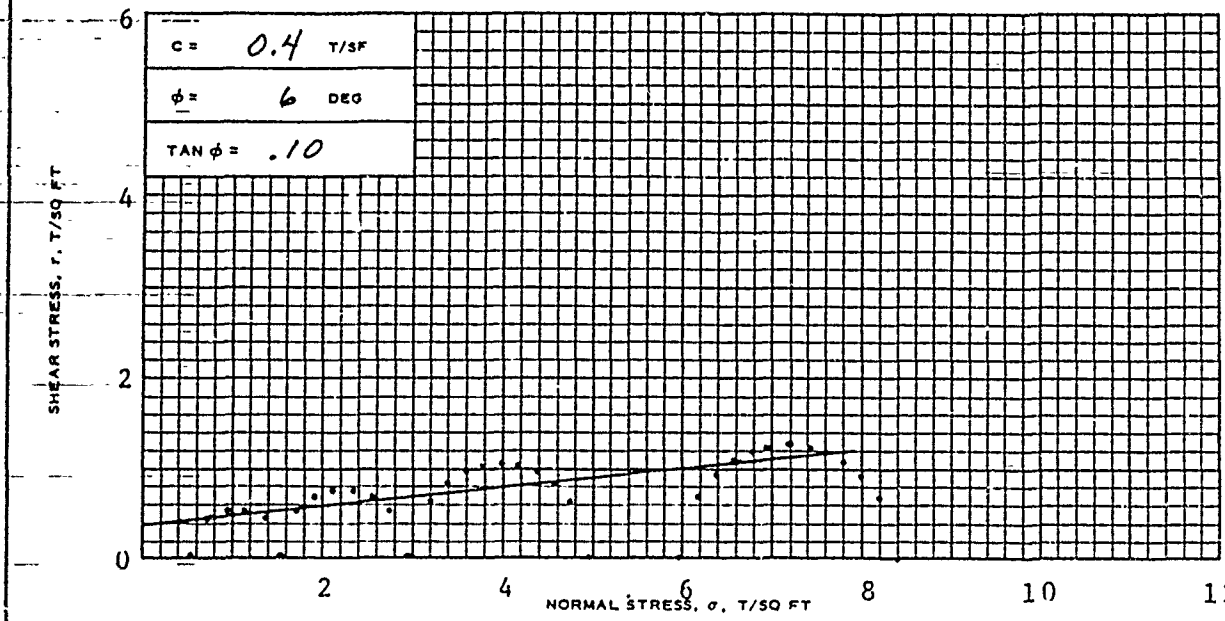
DEPTH/ELEV

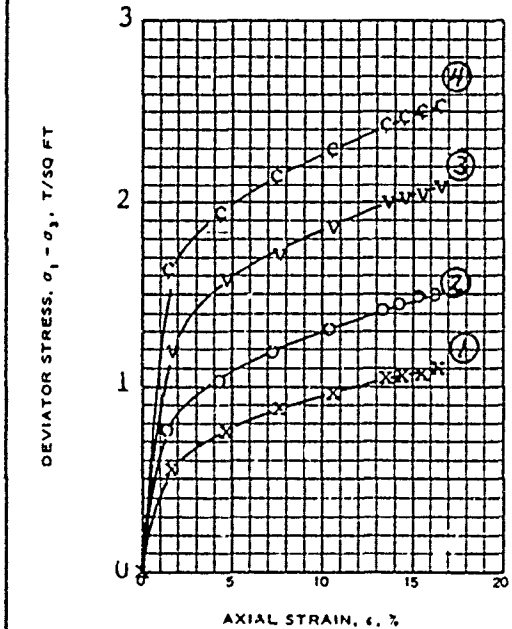
LABORATORY SWD | DATE SEP 71

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2009 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

Plate No. 20





SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT, %	w_o	15.1	14.9	15.0	15.1
	DRY DENSITY LB/ CU FT	γ_{d_o}	108	108	108	108
	SATURATION, %	S_o	75	74	73	74
	VOID RATIO	e_o	.539	.538	.545	.540
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γ_{d_c}				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.05	1.47	2.02	2.48
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	24	23	23	23
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN		D_o	1.4	1.4	1.3	1.4
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	2.9

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Clayey SAND (SC) Remolded (90% γ, W+3)

LL	PL	PI	G_s
24	15	9	2.68 est.

TYPE OF SPECIMEN Remolded

TYPE OF TEST Q

REMARKS:

PROJECT Dierks Dam

90%

BORING NO Test Fill

SAMPLE NO. X-150170

DEPTH/ELEV

LABORATORY SWD

DATE SEP 71

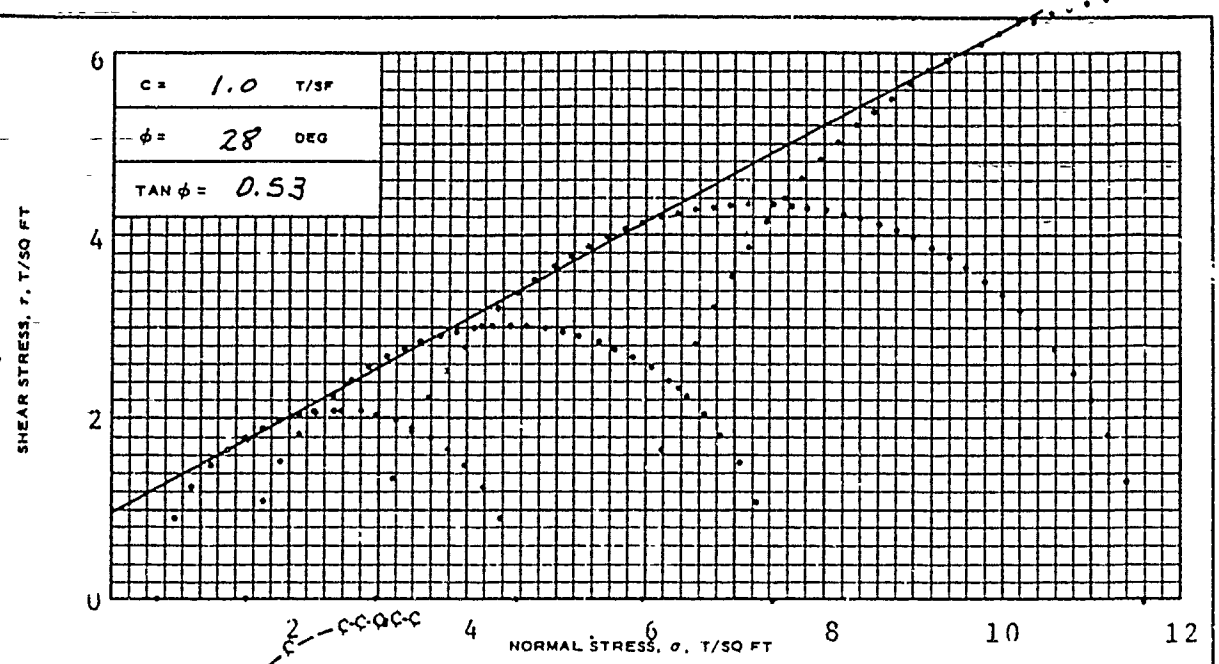
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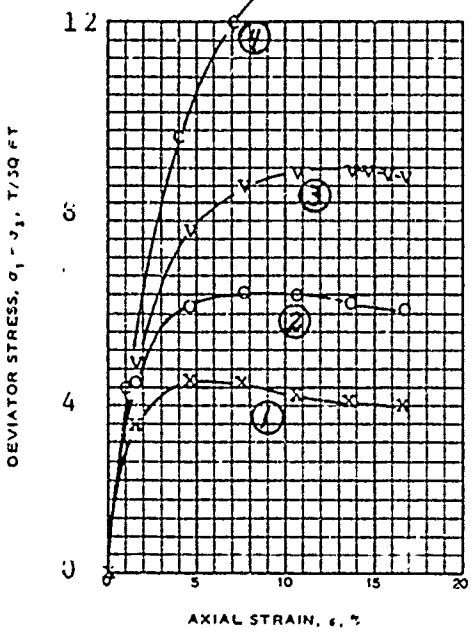
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE

TRANSLUCENT

Plate No. 21

SWDED-GL Report 11227





SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT, %	w_o	9.4	9.1	9.0	9.1
	DRY DENSITY LB./ CU FT	γd_o	114	113	114	114
	SATURATION, %	S_o	54	52	52	52
	VOID RATIO	e_o	.462	.468	.463	.467
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB./CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	4.14	6.02	8.70	13.73
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	9	12	21	24
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	1.4
INITIAL HEIGHT, IN.		H_o	2.9	2.9	2.9	2.9

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Clayey SAND, (SC) Remolded (95% γ, w-3)

LL 24	PL 15	PI 9	G_s 2.68 est.

TYPE OF SPECIMEN Remolded TYPE OF TEST Q

REMARKS:

PROJECT Dierks Dam

95%

BORING NO. Test fill SAMPLE NO. X-15017C

DEPTH/ELEV

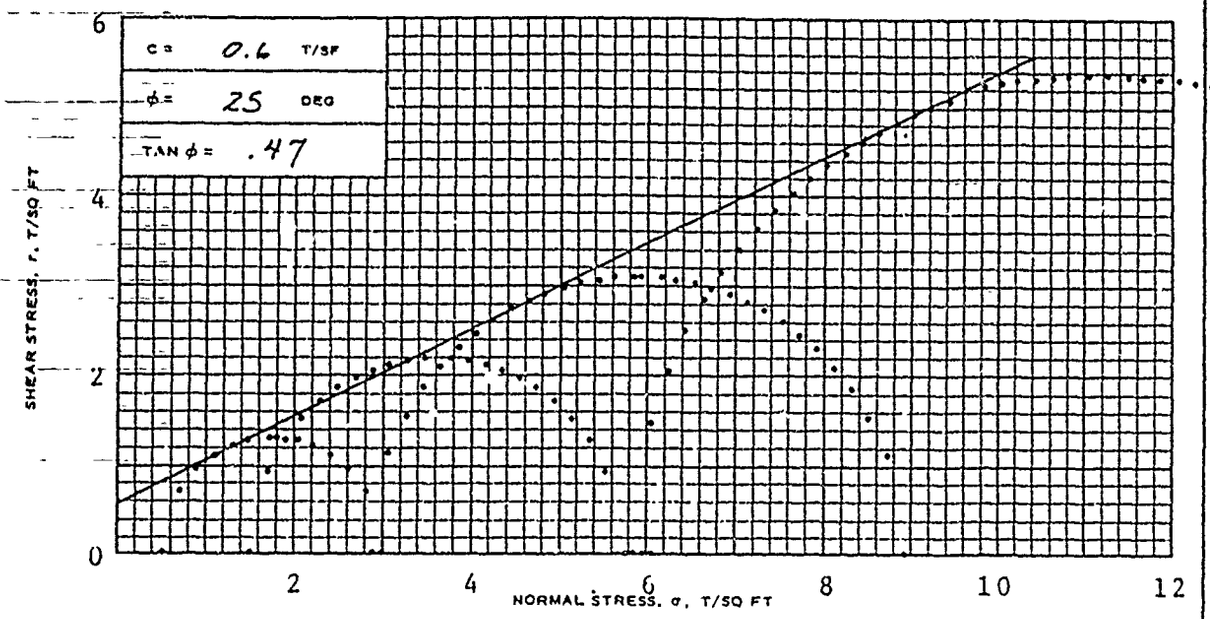
LABORATORY SWD DATE SEP 71

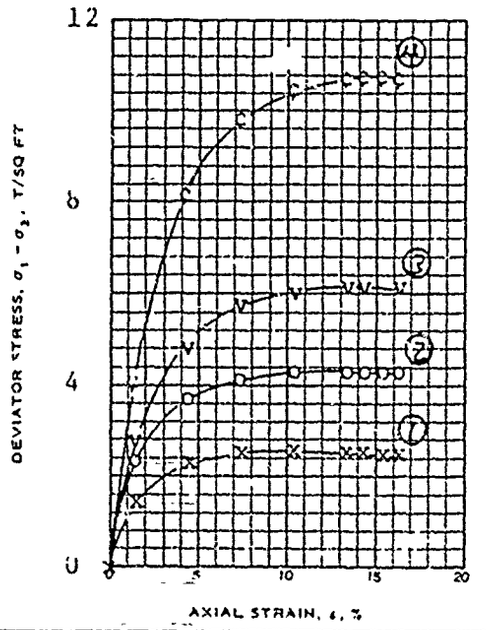
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

Plate No. 22

SWDED-GL Report 11227





SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT, %	w_o	11.9	12.1	11.7	11.8
	DRY DENSITY LB/ CU FT	γ_{d_o}	115	115	115	114
	SATURATION, %	S_o	71	72	70	69
	VOID RATIO	e_o	.447	.448	.445	.457
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB. CU FT	γ_{d_c}				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	2.56	4.32	6.14	10.69
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	17	23	23	24
ULTIMATE DEVIATOR STRESS, T SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.3	1.3	1.3	1.3
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	3.0

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Clayey SAND (SC) Remolded (95% γ, w)

LL 24	PL 15	PI 9	G_s 2.68 est.

REMARKS:

TYPE OF SPECIMEN Remolded | TYPE OF TEST: Q

PROJECT Dierks Dam

95%

BORING NO. Test fill | SAMPLE NO. X-15017C

DEPTH/ELEV

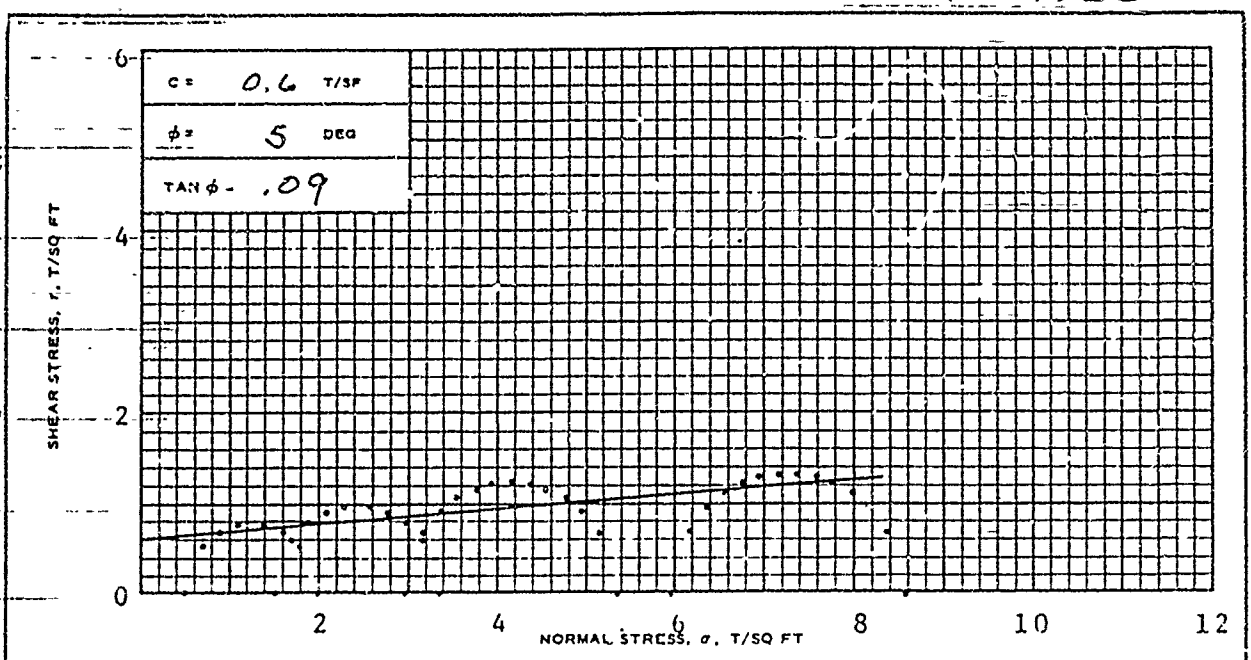
LABORATORY SWD | DATE SEP 71

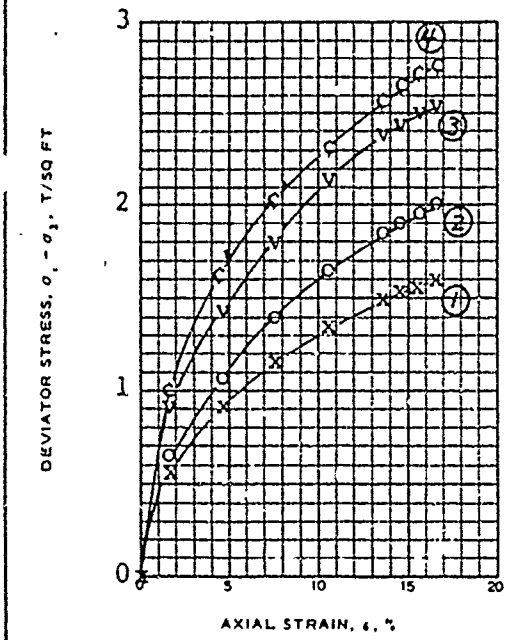
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

Plate No. 23

SWDED-GL Report 11227





SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT, %	w_o	15.3	15.2	15.1	15.3
	DRY DENSITY LB/ CU FT	γ_{d_o}	114	115	115	114
	SATURATION, %	S_o	90	90	90	89
	VOID RATIO	e_o	.455	.452	.448	.460
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB CU FT	γ_{d_c}				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.54	1.92	2.44	2.66
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	20	23	23	22
ULTIMATE DEVIATOR STRESS, T SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	1.4
INITIAL HEIGHT, IN.		H_o	3.0	3.0	2.9	2.9

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Clayey SAND (SC) Remolded (95% γ, W+3)

LL 24	PL 15	PI 9	G. 2.68 est.

TYPE OF SPECIMEN Remolded | TYPE OF TEST Q

REMARKS:

PROJECT Dierks Dam ~~95%~~

BORING NO. Test fill | SAMPLE NO. X-15017C

DEPTH/ELEV

LABORATORY SWD | DATE SEP 71

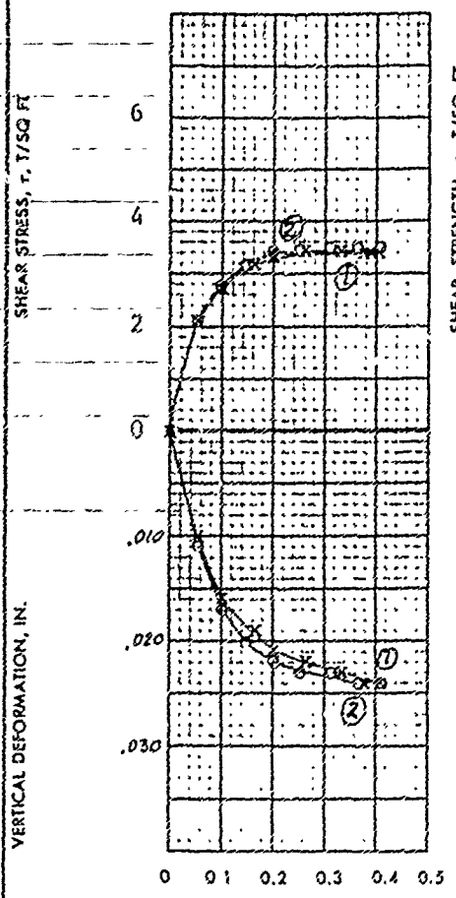
TRIAXIAL COMPRESSION TEST REPORT

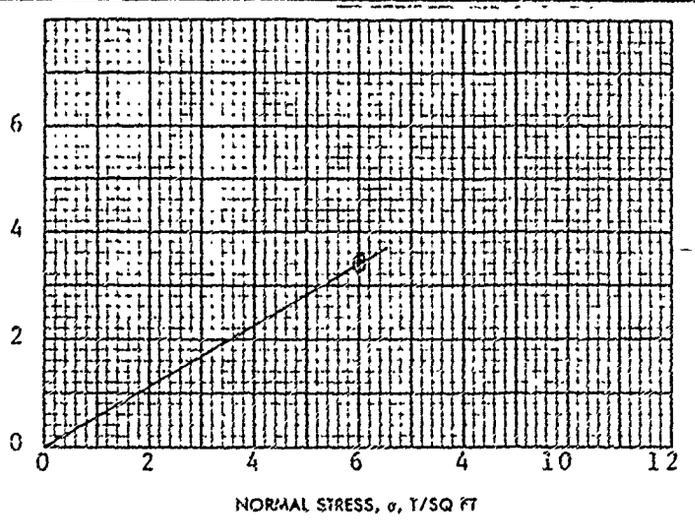
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE

TRANSLUCENT

Plate No. 24

SHADED GL Report 11227





SHEAR STRENGTH PARAMETERS

$\phi' = 30^\circ$

TAN $\phi' = 0.57$

$c' = 0.0$ T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	
INITIAL	WATER CONTENT	w_o	13.6%	13.5%	%	%
	VOID RATIO	e_o				
	SATURATION	S_o	%	%	%	%
	DRY DENSITY, LB/CU FT	γ_d	101	101		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	17.6%	17.9%	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	6.0	6.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	3.38	3.44		
ACTUAL TIME TO FAILURE, MIN		t_f	330	310		
RATE OF STRAIN, IN./MIN			.001	.001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN Remolded (90% γ, w-3) 3.0 IN. SQUARE 0.5 IN. THICK

CLASSIFICATION Clayey SAND (SC)

LL	PL	PI		G_s
35	18	17		

REMARKS

PROJECT DIERKS DAM

90%

AREA

BORING NO Quarry SAMPLE NO X-15011

DEPTH EL DATE SEP 71

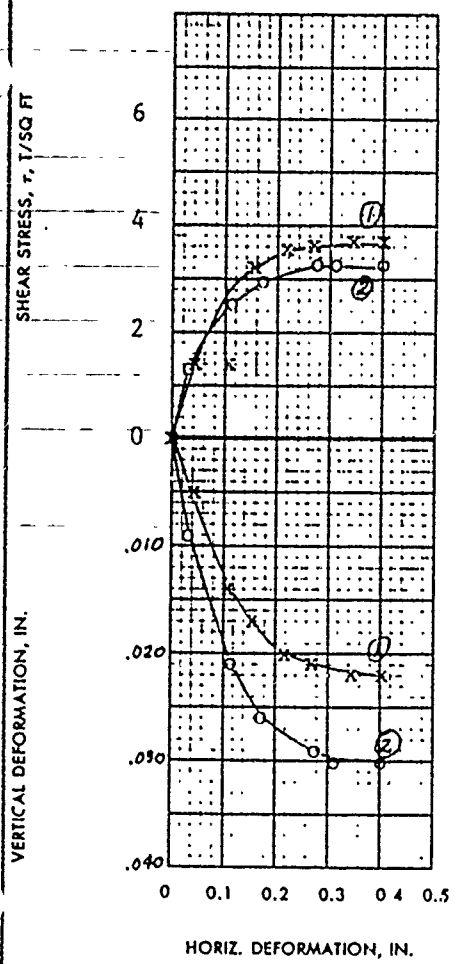
DIRECT SHEAR TEST REPORT

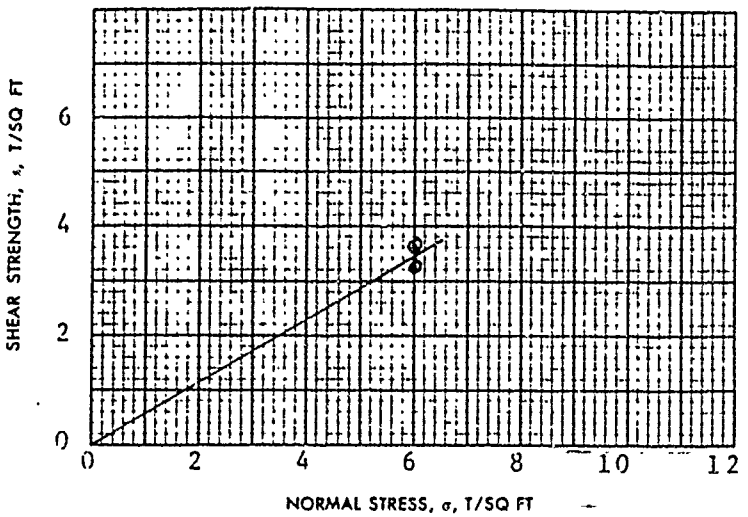
ENG FORM 2092 1 JUN 65 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1966 O-214-145

PLATE IX-3

Plate No. 25

SWDED-GL Report 11227





TEST NO.			1	2	3	
INITIAL	WATER CONTENT	w_o	16.1%	15.9%	%	%
	VOID RATIO	e_o				
	SATURATION	S_o	%	%	%	%
	DRY DENSITY, LB/CU FT	γ_d	101	101		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	18.6%	16.5%	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	6.0	6.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	3.64	3.24		
ACTUAL TIME TO FAILURE, MIN		t_f	4260	3150		
RATE OF STRAIN, IN./MIN			.0001	.0001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' = 30°

TAN ϕ' = 0.57

c' = 0.0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded (90% γ, w) 3.0 IN. SQUARE .5 IN. THICK

CLASSIFICATION Clayey SAND (SC)

LL 35 PL 18 PI 17 G_s

REMARKS

PROJECT DIERKS DAM

90%

AREA

BORING NO. Quarry SAMPLE NO. X-15011

DEPTH EL DATE SEP 71

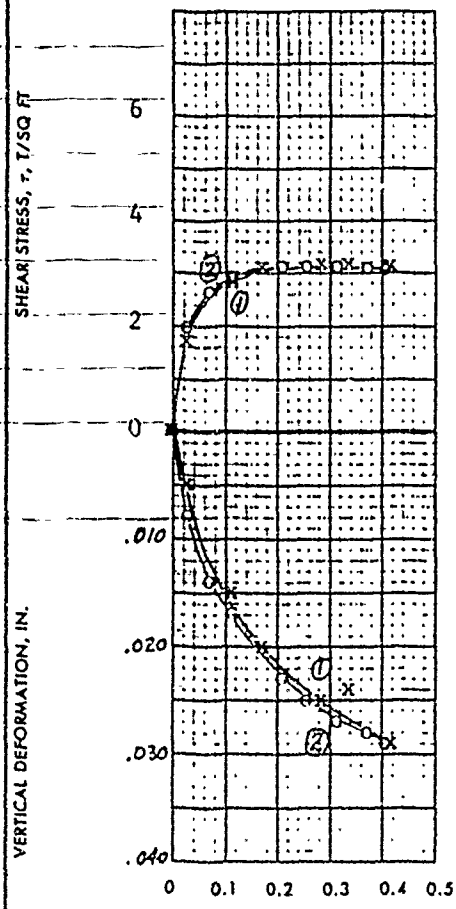
DIRECT SHEAR TEST REPORT

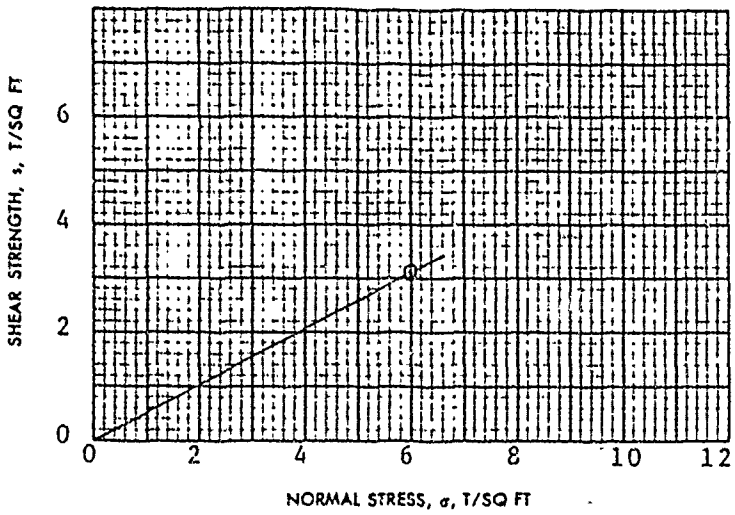
ENG FORM 1 JUN 65 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

GPO : 1966 OF—314-543

Plate No. 26 PLATE IX-3

SWDED-GL Report 11227





SHEAR STRENGTH PARAMETERS

$\phi' =$ 28°

TAN $\phi' =$ 0.52

$c' =$ 0.0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	
INITIAL	WATER CONTENT	w_c	18.8 %	18.7 %	%	%
	VOID RATIO	e_o				
	SATURATION	S_o	%	%	%	%
	DRY DENSITY, LB/CU FT	γ_d	102	102		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	19.1 %	17.4 %	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	6.0	6.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	3.11	3.06		
ACTUAL TIME TO FAILURE, MIN		t_f	2850	2850		
RATE OF STRAIN, IN./MIN			.0001	.0001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN Remolded (90% γ, w+3) 3.0 IN. SQUARE .5 IN. THICK

CLASSIFICATION Clayey SAND (SC)

LL 35 PL 18 PI 17 G$_s$

REMARKS

PROJECT DIERKS DAM

90%

AREA

BORING NO. Quarry SAMPLE NO X-15011

DEPTH EL DATE SEP 71

DIRECT SHEAR TEST REPORT

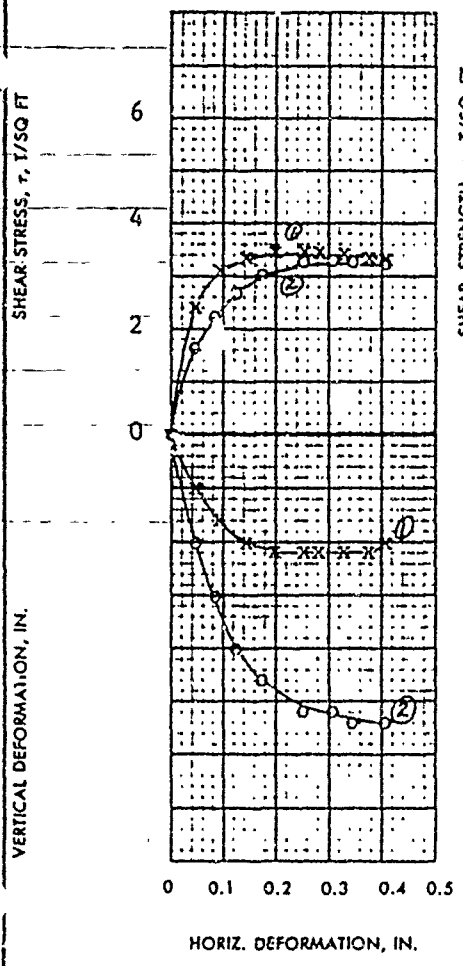
ENG FORM 2092 1 JUN 65 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

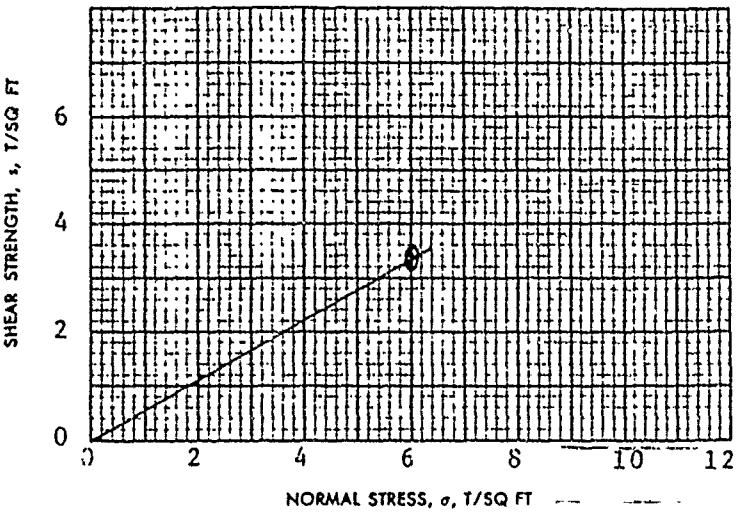
APD: 1968 OP—814-965

PLATE IX-3

Plate No. 27

SWDED-GL Report 11227





SHEAR STRENGTH PARAMETERS

$\phi' =$ 29°

TAN $\phi' =$ 0.56

$c' =$ 0.0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO			1	2	3	
INITIAL	WATER CONTENT	w_o	13.6 %	13.7 %	%	%
	VOID RATIO	e_o				
	SATURATION	S_o	%	%	%	%
	DRY DENSITY, LB/CU FT	γ_d	107	107		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	17.2 %	17.7 %	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	6.0	6.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	3.41	3.26		
ACTUAL TIME TO FAILURE, MIN		t_f	250	250		
RATE OF STRAIN, IN /MIN			.001	.001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN Remolded (95% γ, W-3) 3.0 IN. SQUARE .5 IN. THICK

CLASSIFICATION Clayey SAND (SC)

LL 35 PL 18 PI 17 G_s .00

REMARKS

PROJECT DIERKS DAM

95%

AREA

BORING NO Quarry SAMPLE NO. X-15011

DEPTH EL DATE SEP 71

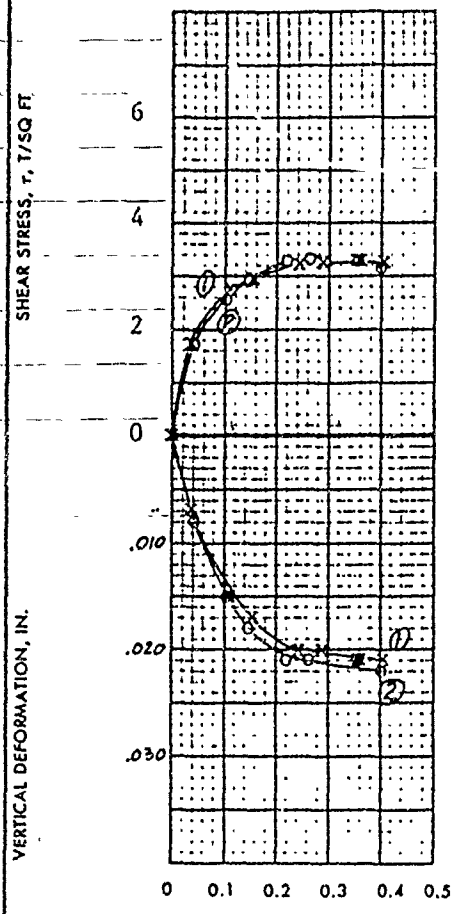
DIRECT SHEAR TEST REPORT

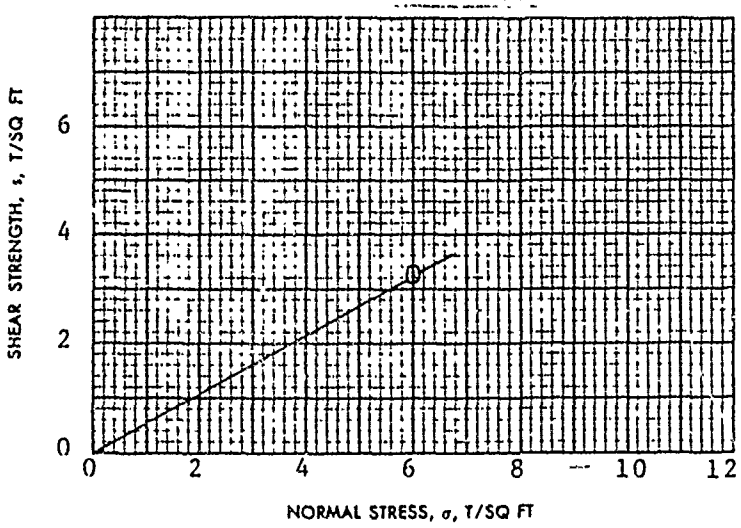
ENG FORM 2092 1 JUN 65 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1966 O-214-945

PLATE IX

Plate No. 28

SWDED-GL Report 11227





SHEAR STRENGTH PARAMETERS

$\phi' =$ 28°

TAN $\phi' =$ 0.54

$c' =$ 0.0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	
INITIAL	WATER CONTENT	w_o	15.8%	16.1%	%	%
	VOID RATIO	e_o				
	SATURATION	S_o	%	%	%	%
	DRY DENSITY, LB/CU FT	γ_d	107	107		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	18.3%	17.8%	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	6.0	6.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	3.23	3.27		
ACTUAL TIME TO FAILURE, MIN		t_f	4400	3250		
RATE OF STRAIN, IN /MIN			.0001	.0001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN Remolded (95% γ, w) 3.0 IN. SQUARE .5 IN. THICK

CLASSIFICATION Clayey SAND (SC)

LL 35 PL 18 PI 17 G_s .00

REMARKS

PROJECT DILRKS DAM

95%

AREA

BORING NO. Quarry SAMPLE NO. A-15011

DEPTH EL DATE SEP 71

DIRECT SHEAR TEST REPORT

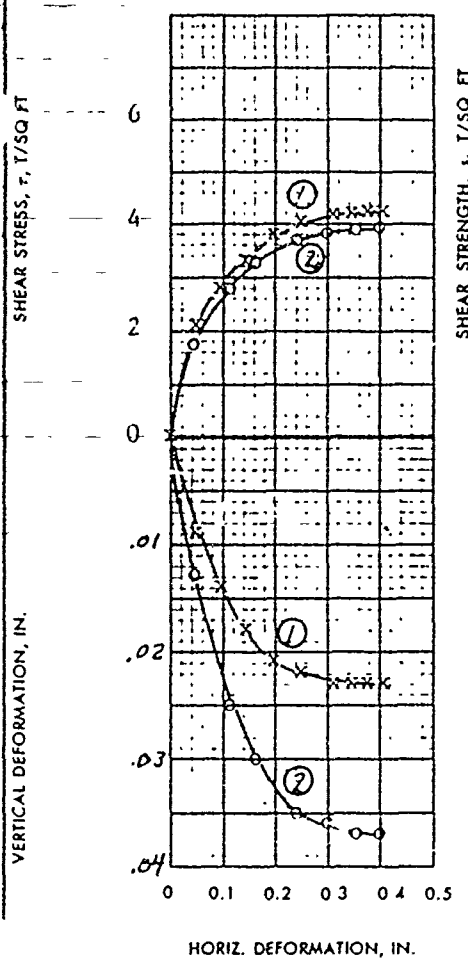
END FORM 1 JUN 63 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

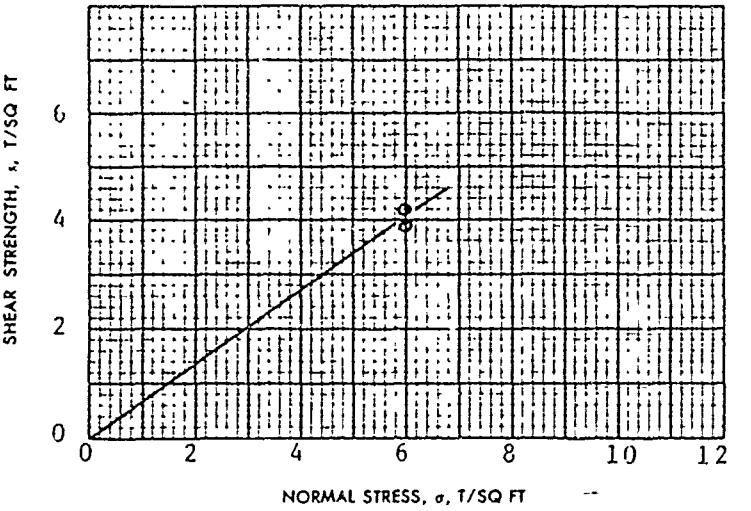
GPO : 1966 OF—214-945

PLATE IX-3

Plate No. 29

SWDED-GL Report 11227





TEST NO			1	2	3	
INITIAL	WATER CONTENT	w_o	9.3%	9.2%	%	%
	VOID RATIO	e_o				
	SATURATION	S_o	%	%	%	%
	DRY DENSITY, LB/CU FT	γ_d	106	108		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	14.2%	13.0%	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	6.0	6.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	4.20	3.87		
ACTUAL TIME TO FAILURE, MIN		t_f	380	410		
RATE OF STRAIN, IN /MIN			.001	.001		
ULTIMATE SHEAR STRESS T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' = 34

TAN ϕ' = 0.67

c' = 0.0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded (90% γ, w-3) 3.0 IN SQUARE .5 IN. THICK

CLASSIFICATION Clayey SAND (SC)

LL 24 PL 15 PI 9 G. ~~.00~~

REMARKS

PROJECT DIERKS DAM

90%

AREA

BORING NO Test fill SAMPLE NO X-15017C

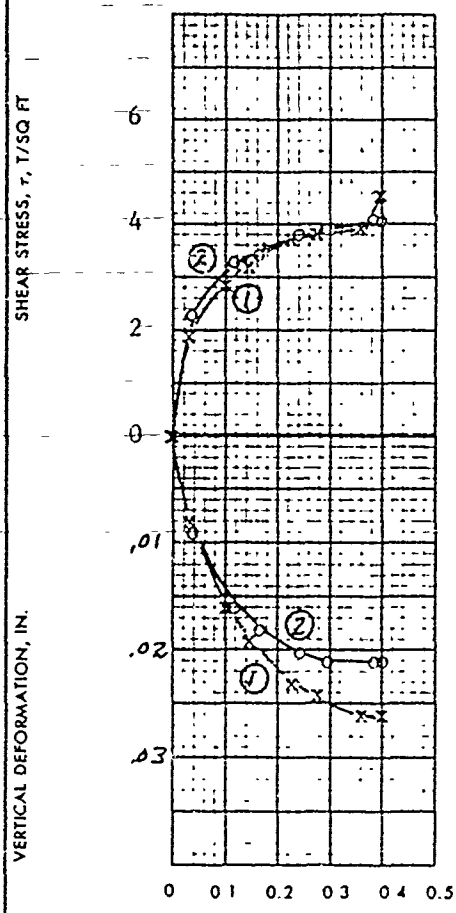
DEPTH EL DATE SEP 71

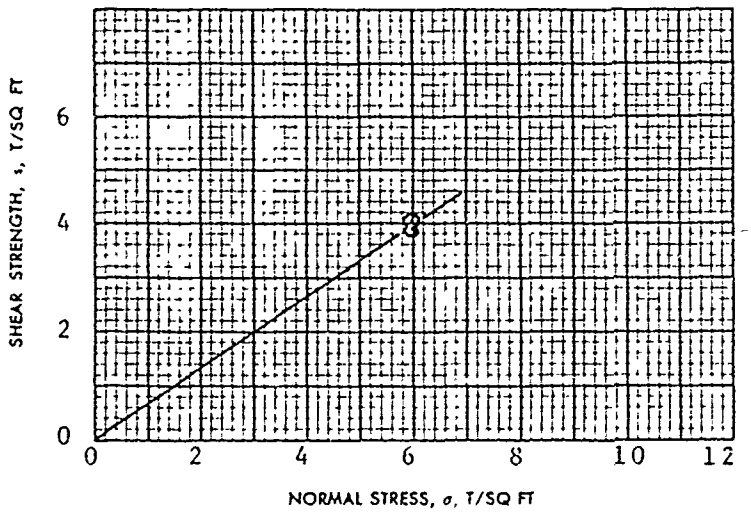
DIRECT SHEAR TEST REPORT

ENG FORM 2092 1 JUN 45 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO 1966 OF—214-945

PLATE IX-3

Plate No. 30





TEST NO			1	2	3	
INITIAL	WATER CONTENT	w_o	12.6 %	12.1 %	%	%
	VOID RATIO	e_o				
	SATURATION	S_o	%	%	%	%
	DRY DENSITY, LB/CU FT	γ_d	107	108		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	13.7 %	13.9 %	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	6.0	6.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	3.90	4.04		
ACTUAL TIME TO FAILURE, MIN		t_f	4300	4400		
RATE OF STRAIN, IN /MIN			.0001	.0001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' = 34

TAN ϕ = 0.66

c' = 0.0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded (90% γ, w) 3.0 IN SQUARE .5 IN THICK

CLASSIFICATION Clayey SAND (SC)

LL 24 PL 15 PI 9 G. .00

REMARKS

PROJECT DIERKS DAM

90%

AREA

BORING NO Test Fill SAMPLE NO X-15017C

DEPTH EL DATE SEP 71

DIRECT SHEAR TEST REPORT

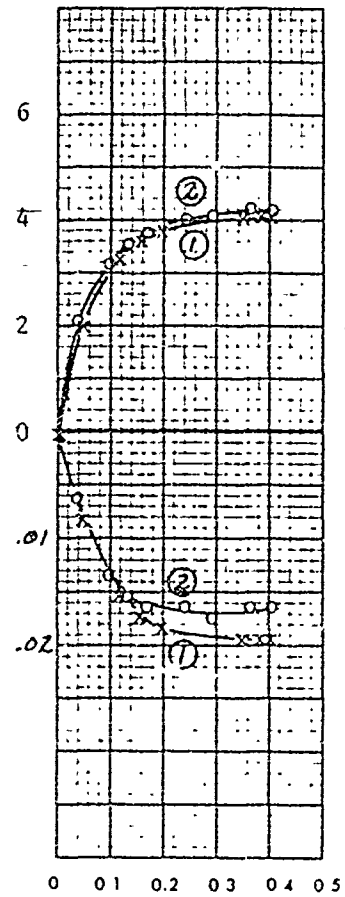
ENG FORM 1 JUN 65 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

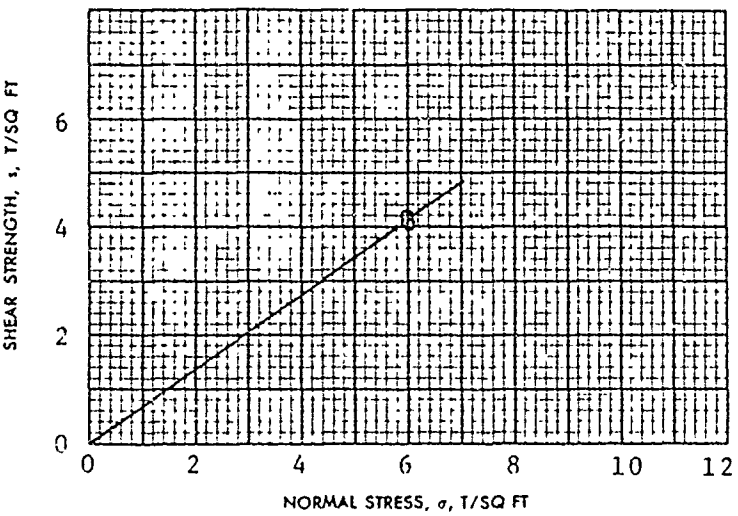
GPO 1966 O-214-948

PLATE IX-3

Plate No. 31

SWDED-GL Report 11227





TEST NO			1	2	3	
INITIAL	WATER CONTENT	w_o	15.3%	15.2%	%	%
	VOID RATIO	e_o				
	SATURATION	S_o	%	%	%	%
	DRY DENSITY, LB/CU FT	γ_d	108	108		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	14.9%	13.0%	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	6.0	6.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	4.05	4.21		
ACTUAL TIME TO FAILURE, MIN		t_f	4500	4300		
RATE OF STRAIN, IN /MIN			.0001	.0001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ = 35

TAN ϕ' = 0.69

c' = 0.0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded (90% γ, w+3) 3.0 IN SQUARE .5 IN THICK

CLASSIFICATION Clayey SAND (SC)

LL 24 PL 15 PI 9 G. .00

REMARKS

PROJECT DIERKS DAM

90%

AREA

BORING NO Test fill SAMPLE NO X-15017C

DEPTH EL DATE SEP 71

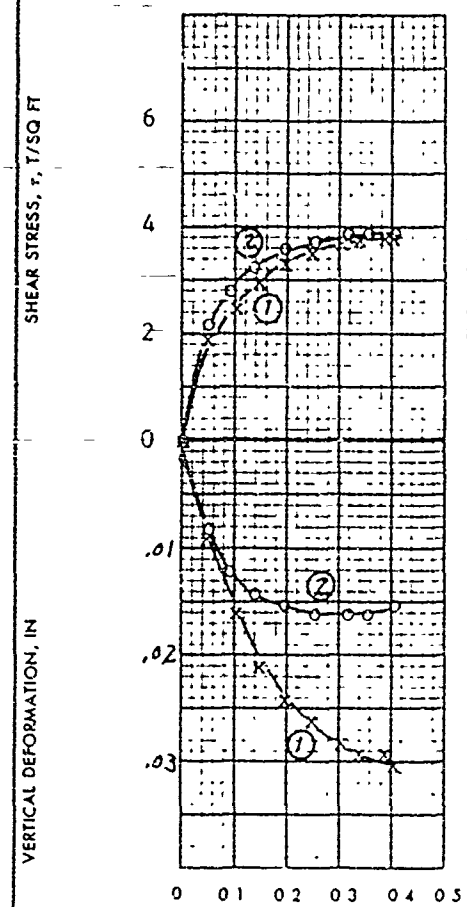
DIRECT SHEAR TEST REPORT

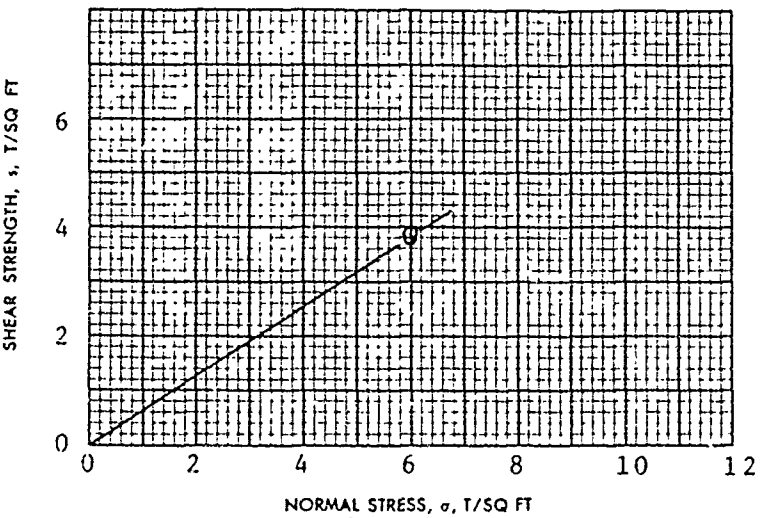
ENG FORM 2092 1 JUN 65 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO 1966 OF—214-945

PLATE IX-3

Plate No. 32

SWDEL-GL Report 11227





SHEAR STRENGTH PARAMETERS

ϕ' = 33

TAN ϕ = 0.64

c' = 0.0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO			1	2	3	
INITIAL	WATER CONTENT	w_o	9.3%	9.4%	%	%
	VOID RATIO	e_o				
	SATURATION	S_o	%	%	%	%
	DRY DENSITY, LB/CU FT	γ_d	114	114		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	14.1%	14.1%	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	6.0	6.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	3.79	3.88		
ACTUAL TIME TO FAILURE, MIN		t_f	400	350		
RATE OF STRAIN, IN / MIN			.001	.001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN Remolded (95% γ, w-3) 3.0 IN. SQUARE .5 IN. THICK

CLASSIFICATION Clayey SAND (SC)

LL 24 PL 15 PI 9 G. .00

REMARKS

PROJECT DIERKS DAM

95%

AREA

BORING NO Test fill SAMPLE NO X-15017C

DEPTH EL DATE SEP 71

DIRECT SHEAR TEST REPORT

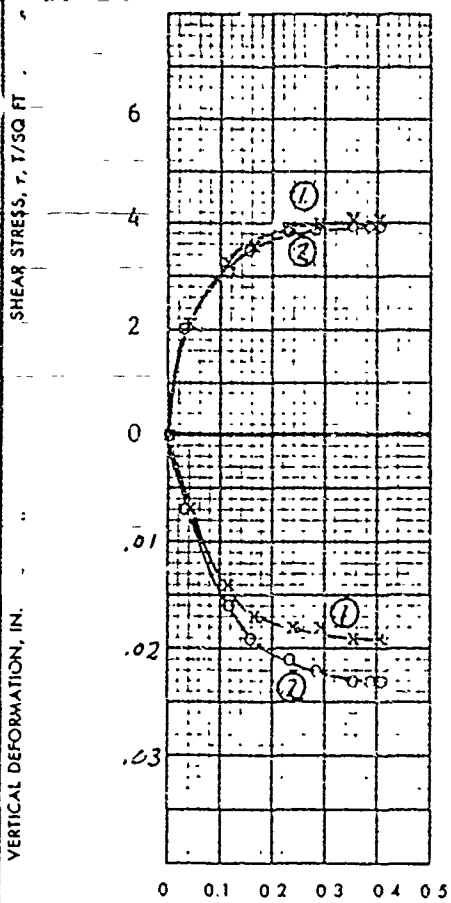
ENG FORM 2092 1 JUN 65 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

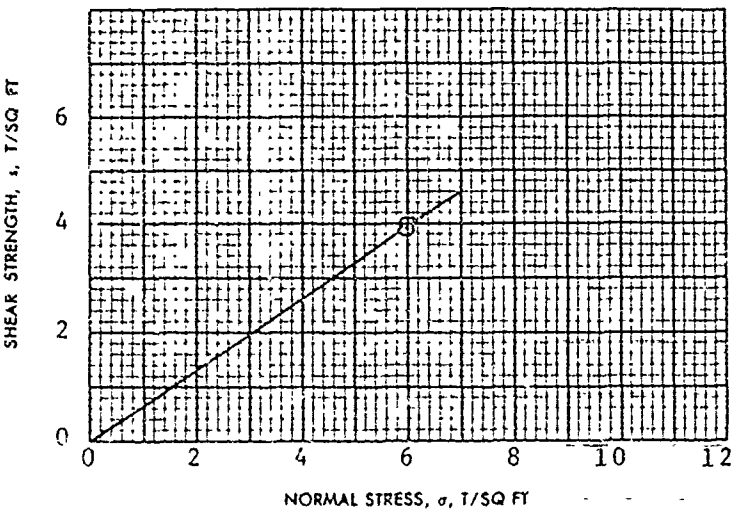
GPO : 1966 O-214-943

PLATE IX-3

Plate No. 33

SWDED-GL Report 11227





SHEAR STRENGTH PARAMETERS

$\phi' =$ 33

TAN $\phi =$ 0.66

$c' =$ 0.0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO			1	2	3	
INITIAL	WATER CONTENT	w_o	12.2%	12.1%	%	%
	VOID RATIO	e_o				
	SATURATION	S_o	%	%	%	%
	DRY DENSITY, LB/CU FT	γ_d	114	114		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	13.8%	13.4%	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	6.0	6.0		
MAXIMUM SHEAR STRESS T/SQ FT		τ_{max}	4.00	3.89		
ACTUAL TIME TO FAILURE MIN		t_f	4300	4500		
RATE OF STRAIN, IN /MIN			.0001	.0001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN Remolded (95% γ, w) 3.0 IN SQUARE .5 IN THICK

CLASSIFICATION Clayey SAND (SC)

LL 24 PL 15 PI 9 G. .00

REMARKS

PROJECT DIERKS DAM

95%

AREA

BORING NO Test fill SAMPLE NO X-15017C

DEPTH EL DATE SEP 71

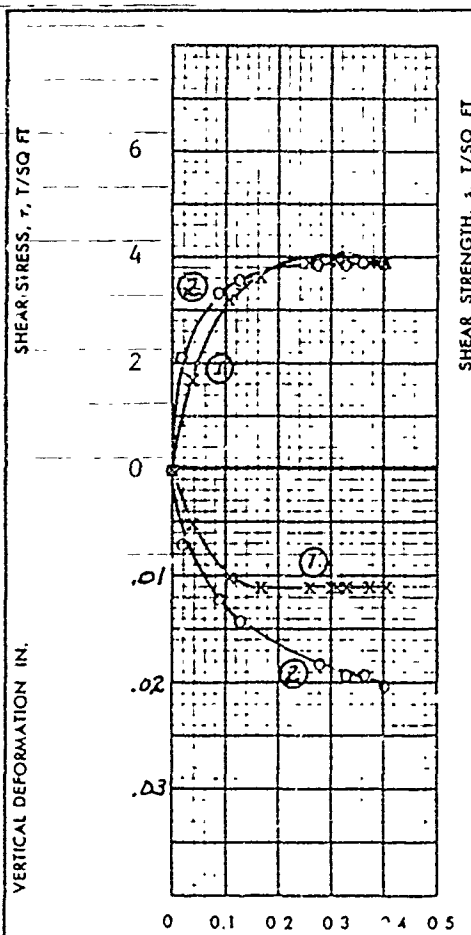
DIRECT SHEAR TEST REPORT

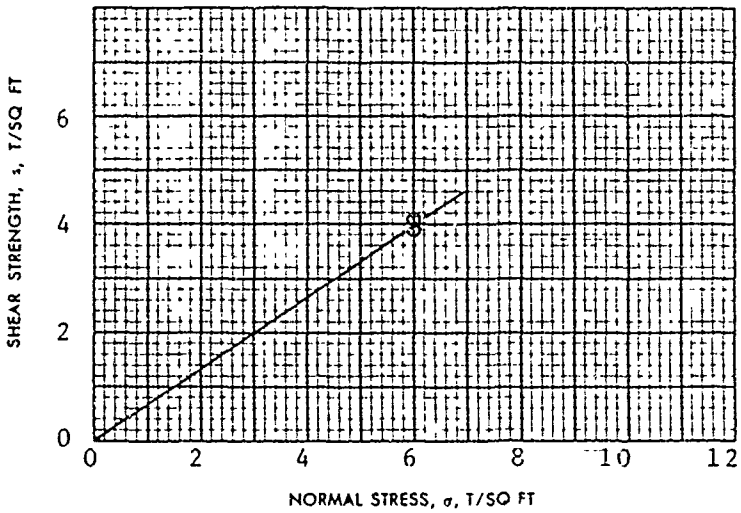
ENG FORM 2092 1 JU '65 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO 1966 O—214-945

PLATE IX-3

Plate No. 34

SWDED-CL Report 11227





SHEAR STRENGTH PARAMETERS

ϕ = 34

TAN ϕ = 0.66

c' = 0.0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO			1	2	3	
INITIAL	WATER CONTENT	w_o	15.3%	15.3%	%	%
	VOID RATIO	e_o				
	SATURATION	S_o	%	%	%	%
	DRY DENSITY, LB/CU FT	γ_d	114	114		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	13.8%	14.2%	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	6.0	6.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	4.07	3.87		
ACTUAL TIME TO FAILURE, MIN		t_f	4300	4300		
RATE OF STRAIN IN /MIN			.0001	.0001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN Remolded (95% γ, w+3) 3.0 IN SQUARE .5 IN THICK

CLASSIFICATION Clayey SAND (SC)

LL 24 PL 15 PI 9 G. .00

REMARKS

PROJECT DIERKS DAM

95%

AREA

BORING NO Test fill SAMPLE NO X-15017C

DEPTH EL DATE SEP 71

DIRECT SHEAR TEST REPORT

ENG FORM 2092 1 JUN 65 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO 1966 O-214-943

PLATE IX-3

Plate No. 35

APPENDIX C

SWDED - GL REPORT NO. 11332

DATED 13 JULY 1972

APPENDIX V

SWDED-GL REPORT NO. 11332
DATED 13 JULY 1972

REQUEST FOR AND RESULTS OF TESTS

PAGE NO: 1 | NO OF PAGES: 28

SECTION A - REQUEST FOR TEST TU-FM-72-20, 14 Feb 72 and Supp 1, 22 Feb 72

1 TO: (Include ZIP Code)	2 FROM: (Include ZIP Code)
Southwestern Division Laboratory US Army Engineer Division, Southwestern Corps of Engineers 4815 Cass Street Dallas, Texas 75235	Chief Fdn & Matls Branch Tulsa District
3 PRIME CONTRACTOR AND ADDRESS (Include ZIP Code) CONTRACT NUMBER	4 MANUFACTURING PLANT NAME AND ADDRESS (Include ZIP Code) P O NUMBER

5 END ITEM AND/OR PROJECT	6 SAMPLE NUMBER	7 LOT NO	8 REASON FOR SUBMITTAL	9 DATE SUBMITTED
Dierks Dam				

10 MATERIAL TO BE TESTED	10a QUANTITY SUBMITTED	11 QUANTITY REPRESENTED	12 SPEC. & AMEND AND/OR DRAWING NO & REV FOR SAMPLE & DATE
Shale Material	Two Bag Samples (3 bags each)		

13 PURCHASED FROM OR SOURCE	14 SHIPMENT METHOD	15 DATE SAMPLED AND SUBMITTED BY
Spillway Quarry	Govt Vehicle	

16 REMARKS AND/OR SPECIAL INSTRUCTIONS AND/OR WAIVERS

17 SEND REPORT OF TEST TO

Tulsa Dist Ofc

SECTION B - RESULTS OF TEST (Continue on plain white paper if more space is required)

1 DATE SAMPLE RECEIVED	2 DATE RESULTS REPORTED	3 LAB REPORT NUMBER
2 February 1972	13 July 1972	SWDED-GL 11332

4 TEST PERFORMED	RESULTS OF TEST	SAMPLE RESULT	REQUIREMENTS

See following pages.

This completes the requested testing.

DATE	TYPED NAME AND TITLE	SIGNATURE
13 Jul 72	HUGH E. GARRISON Director Southwestern Division Laboratory	

DD FORM 1 FEB 62 1222 REPLACES DD FORM 1222 1 JUL 58 WHICH IS OBSOLETE.

Results of Tests of Shale Material
Spillway Quarry
Dierks Dam - Tulsa District

1. Reference:

a. Test Request TU-FM-72-20 dated 14 February 1972, and Supplement No. 1 thereto dated 22 February 1972.

b. SWDED-GL Report No. 11227 dated 29 September 1971.

2. Two samples consisting of three bags each, marked Quarry 1 and Quarry 2, were received 2 February 1972, and were assigned SWD Nos. X-15623 and X-15624. Four bags (two of each sample) were combined for testing and the remaining two bags saved in their "as-received" condition for subsequent X-ray diffraction, slaking tests, accelerated expansion tests and megascopic examination.

3. The four composited samples were crushed to pass the No. 10 screen after an examination of the materials indicated that individual particle sizes were much smaller.

4. Atterberg limits tests were conducted on the minus ? fraction of the as-crushed material, on the material after 10 minutes of blenderizing, and after 30 minutes of blenderizing. Liquid limits were 25, 33 and 35, respectively. Gradation curves corresponding to each treatment are shown on Plate 1. A standard compaction test performed on the as-crushed material gave data shown on Plate 2.

5. Q triaxial specimens were remolded to densities near 90 and 95% of maximum density from the compaction test, at water contents of optimum and optimum -3%. Test data and results are shown on Plates 3 through 6.

6. R triaxial specimens were remolded to densities near 95 and 100% of maximum density from the compaction test, at water contents of optimum and optimum -3%. Test data and results are shown on Plates 7 through 10.

7. S direct shear specimens were remolded to densities near 90 and 95% of maximum density, at water contents of optimum and optimum -3%. Two specimens at each remolded condition were tested under normal stress of 8 T/sq ft, and strength envelopes drawn between the average strength value and the origin. Test data and results are shown on Plates 11 through 14.

8. In addition to the tests of the bag samples received 2 February 1972, R tests were performed on SWD Sample X-15011, received 20 August 1971, and previously tested for Q and S strengths (SWDED-GL Report 11227, 29 September 1971). Specimens were remolded to near 95% and 100% maximum density, at

Results of Tests of Shale Material
Spillway Quarry
Dierks Dam - Tulsa District
(Cont'd)

water contents of about optimum and optimum -3%. Test data and results are shown on Plates 15 through 18. Strength values agree closely with those obtained in tests of the new material.

9. The two bag samples which were saved in the "as-received" condition were combined and the pieces subjected to megascopic examination. (See Petrographic Report). In general, three materials appeared present: shale, an intermediate material initially designated silty shale, and shaly sandstone. Typical specimens of the shale and sandstone were submitted to Dr. A. J. Ehlmann, Texas Christian University, for X-ray analysis; his report is included at the conclusion of the text. The X-ray diffractograms are inclosed in an envelope inside the back cover of the originals of this report.

10. Specimens of each of the three materials were subjected to five cycles of slaking in distilled water and oven-drying. Photographs were taken before the tests were begun, at the end of the first slaking (before oven-drying) and after the third and fifth cycles; the photographs are found on Plate 20. The shale specimens began to disintegrate within minutes of the first immersion in water; the silty shale was affected to varying degrees; and the shaly sandstone was affected almost not at all. Atterberg limits tests were performed on a portion of the shale material after the slaking-drying test: liquid limit 41, plastic limit 21, plasticity index 20.

SWD Form 600-B Reinstated 4 May 59	PETROGRAPHIC REPORT	Corps of Engineers SWD Testing Laboratory Dallas, Texas	
Report No. SWDGL): 11332	Project Dierks Dam	Date 13 Jul 72	Initial GHH
Sample No.	Source See paragraph 2 below		

1. References. Reference is made to Tulsa District Test Request No. TU-FM-72-20 dated 14 February 1972 and to Supplement No. 1 dated 22 February 1972, requesting petrographic analysis and accelerated expansion tests on the sample described below.

2. Samples. Samples consisted of two bags of chunk rock from the spillway quarry selected at random from the six bags submitted. Chunk size ranged up to 11" x 6" x 5". The samples for petrographic examination, X-ray diffraction, accelerated expansion tests and slaking tests were selected from this portion of the total sample.

3. Description. The material from each bag was examined separately and divided into three types as noted below:

Type	Percent		
	Bag 1	Bag 2	Total
Shale	26	0	14
Silty Shale	7	42	24
Sandstone	67	57	62

a. The shale was black, soft and fissile with occasional thin stringers of very fine-grained sandstone. Some iron staining was noted. Simple staining tests with benzidine indicated the presence of a small percent of swelling-type clays although X-ray diffraction did not show this. This material broke down readily in both the accelerated expansion test (Plate 19) and in the slaking test (Plate 20).

b. The silty shale was dark gray and moderately hard. Thin, randomly oriented, carbonaceous inclusions up to 1-1/2" in diameter were noted throughout the rock. During the slaking test some of the particles broke down during the first cycle; others retained their general outward shape, but cracked on random planes during the test period (Plate 20). The only breakdown that occurred during the accelerated expansion test was random cracking in two particles and slight spalling in two particles (Plate 19). See below for a discussion of the latter test. It was found that after a short period of soaking in water, this material could be crumbled between the fingers, and with a little effort and the addition of more water, could be completely broken down. A small sample processed in this manner and sieved over a No. 325 (0.044 mm) sieve resulted in approximately 70 percent passing the sieve. The 30 percent retained consisted predominantly of quartz with a trace of chert. Twenty percent of the material passing was clay minerals with the remaining 80 percent consisting predominantly of quartz with small percents of miscellaneous minerals. Staining tests indicated a small percent of the clay minerals to be of the swelling type.

c. The sandstone was gray, moderately hard, highly argillaceous, and fine-grained. The sand grains were subrounded to subangular, and consisted predominantly of quartz with a trace of chert and quartzite. Some of the surfaces of the rock had thin, iron-stained, shale coatings with a trace of mica. Large chunks of the rock were difficult to break with a hammer, but it was possible to break off small pieces with the fingers. The rock was only slightly affected by either slaking or accelerated expansion tests (Plates 19 and 20).

4. Accelerated Expansion Tests. These tests were performed in accordance with the procedures in CRD-C 148-69. Photographs, taken at various intervals during the test, are shown on Plate 19. Breakdown of the shale began within five minutes after submerging the sample, and continued through 24 hours. No obvious additional breakdown occurred after that time. The silty shale showed no signs of breakdown during the first two hours, after which slight cracks appeared in two particles. At 24 hours, two particles had cracks through the entire particle, and two other particles began slight spalling. Only slight additional breakdown occurred during the remainder of the test. No evidence of any breakdown of the sandstone occurred other than small deposits of sand grains around each particle. The percent loss (passing the 3/4" sieve) of each type material at the end of testing is shown below:

Rock Type	Loss, %
Shale	37.7
Silty Shale	0.9
Sandstone	0.6

TEXAS CHRISTIAN UNIVERSITY
Fort Worth, Texas 76129

Department of Geology

March 30, 1972

Director
Southwestern Division Laboratory
U. S. Army Engineer Div. Southwestern
Corps of Engineers
4815 Cass Street
Dallas, Texas 75235

Dear Sirs:

The X-ray analysis of the two samples from Dierks Dam indicated:

1. Shaley sample:
   Illite ----------50% estimated
   Kaolinite ----------20% "
   Quartz ----------20% "
   Chlorite ----------10% "

The sample appears to be a non-expanding black shale.

2. Sandy sample:
   Quartz ----------60% estimated
   Kaolinite ----------20% "
   Illite ----------10% "
   Chlorite ----------10% "

The sample appears to be a sandstone of graywacke type differing from the type only in having no feldspar with the quartz.

If I can be of additional help on interpretation, do not hesitate to call me.

Very truly yours,

A. J. Ehlmann
Professor of Geology

AJE:vf

TEST DATA SUMMARY

SUPED-GL Report No. 11332

FEATURE

Sheet 1 of 2

Diarks Dam

Sample No.	Depth or Elev. of Sample	Laboratory Classification	Mechanical Analysis: Gravel %	Sand %	Fines %	D_{10}	Atterberg Limits: LL	PL	Specific Gravity	Nat. Water Cont. %	Natural Dry Density lbs/cu ft	Compaction Data: Opt. Water %	Maximum Dry Density lbs/cu ft	Shear Data: Initial %	Dry Density lbs/cu ft	ϕ_c %	ϕ_r %	ϕ_s %	Type Test	Specimen Size Inches	Test	σ_n T/sq ft	τ_f T/sq ft	c T/sq ft	ϕ degrees	Permeability: ϕ	K ft/min	Consolidation Data: σ_o T/sq ft	σ_c T/sq ft	C_c	t_{50}	Remarks
X-158+32		CL	0	16	84		33	14	2.70			12.6	117.0																			
														Approx remolded condition																		
														4.1	105	9.6	9.2	9.3	TC Q	1.4 x 3.0	1	0.5	2.98	0.5	37							
														4.09	104	9.5	9.2	9.2	-	-	2	1.5	5.96									
														5.84	106	9.5	9.3	9.3	-	1.4 x 3.0	3	3.0	9.64									98% max dens, opt-3%
														5.95	105	9.5		9.3	-	1.4 x 2.9	4	6.0	17.63									
														5.86	104	12.6		5.8	TC Q	1.4 x 3.0	1	0.5	2.65	0.6	19							
														5.83	104	12.4		5.7	-	1.4 x 2.9	2	1.5	4.86									
														6.03	105	12.2		5.5	-	1.4 x 3.0	3	3.0	7.70									99% max dens, opt
														5.95	105	12.2		5.5	-	1.4 x 2.9	4	6.0	13.44									
														5.23	110	9.5		4.9	TC-Q	1.4 x 3.0	1	0.5	3.49	0.7	27							
														5.11	111	9.5		5.0	-	-	2	1.5	7.11									
														5.22	110	9.5		4.9	-	-	3	3.0	10.94									95% max dens opt-3%
														5.14	111	9.5		4.9	-	1.4 x 2.9	4	6.0	15.23									
														5.03	111	12.5		6.6	TC Q	1.4 x 3.0	1	0.5	3.32	0.8	18							
														5.05	111	12.4		6.5	-	-	2	1.5	5.74									
														5.00	112	12.3		6.6	-	-	3	3.0	8.88									99% max dens opt
														5.04	111	12.6		6.7	-	-	4	6.0	13.99									
														5.26	110	9.9	17.6	5.1	TC R	1.4 x 3.0	1	1.7	2.79	0.1	15							
														5.15	111	9.9	16.4	5.2	-	-	2	3.9	10.92									
														5.20	111	9.7	16.7	5.0		1.4 x 3.1	3	6.0	10.72									95% max dens opt-3%
														5.03	112	9.9	16.2	5.3		1.4 x 3.0	4	3.0	5.76									
														5.12	111	12.8	17.6	4.7	TC-R	1.4 x 3.0	1	1.4	3.04	0.1	15							
														5.18	111	12.9	17.8	4.7			2	3.0	5.66									
														5.27	110	12.9	18.4	4.5	-		3	4.3	13.30									95% max dens opt
														5.20	111	12.7	16.3	4.6	-	-	4	6.0	10.85									
														4.40	117	9.9	16.2	4.0	TC-R	1.4 x 3.0	1	1.5	3.88	0.2	18							
														4.35	117	9.9	16.1	4.1	-	1.4 x 3.1	2	3.2	6.41									
														4.42	117	9.9	16.0	4.1		1.4 x 3.0	3	6.0	12.30									100% max dens opt-3%
														4.39	117	12.8	16.4		TC-R	1.4 x 3.1	1	1.6	4.33	0.4	15							
														4.39	117	12.9	15.4			1.4 x 3.0	2	3.0	6.75									
														4.47	116	12.9	17.8			1.4 x 3.1	3	3.6	11.88									100% max dens opt

ENG FORM 1 MAR 66 2086 (PREVIOUS EDITIONS MAY BE USED) (SAMPLE) (TRANSLUCENT)

TC = Triaxial Compression
UC = Unconfined Compression
DS = Direct Shear
UU = Unconsolidated Undrained
CD = Consolidated Drained
CU = Consolidated Undrained
*Values at Pressure

T/SQ FT

TEST DATA SUMMARY

Sheet 2 of 2

3WO5D-GL Report 11332

FEATURE Diversion Dam

BORING NO	SAMPLE NO	DEPTH OR ELEV OF SAMPLE	LABORATORY CLASSIFICATION	MECHANICAL ANALYSIS: GRAVEL %	SAND %	FINES %	D_{10}	ATTERBERG LIMITS: LL	PL	SPECIFIC GRAVITY	NAT WATER CONT %	NATURAL DRY DENSITY LBS/CU FT	COMPACTION DATA: OPT WATER %	MAXIMUM DRY DENSITY LBS/CU FT	LINEAR DATA: INITIAL %	DRY DENSITY LBS/CU FT	σ_1 %	σ_2 %	σ_3 %	TYPE TEST	SPECIMEN SIZE INCHES	TEST	σ_m T/SQ FT	σ_1 T/SQ FT	C T/SQ FT	ϕ DEGREES	PERMEABILITY: k	FT/MIN	CONSOLIDATION DATA: σ_0 T/SQ FT	σ_c T/SQ FT	$^{\circ}C_c$	t_{50}	REMARKS
X-1564	3-3'	Coal'd	CL	0	16	84		33	14	2.70																						Approx consol conditions
															602	105	9.5	15.4	43	D3-3	3 x 3 x 0.5	1			0	31						90% max dens, opt - 2%
															602	105	9.8	14.8	43		-	2										
															598	105	12.4	13.5	54	D3-3	3 x 3 x 0.5	1			0	31						90% max dens, opt
															597	105	12.4	14.1	54		-	2										
															517	111	9.6	15.4	50	D3-3	3 x 3 x 0.5	1			0	32						95% max dens, opt - 2%
															517	111	9.7	15.3	50		-	2										
															515	111	12.4	13.0	65	D3-3	3 x 3 x 0.5	1			0	30						95% max dens, opt
															515	111	12.5	13.0	65		-	2										

EMG FORM 1 MAR 66 2086 (PREVIOUS EDITIONS MAY BE USED) (SEM 1110-2-1906) (TRANSLUCENT)

TC – Triaxial Compression; UC – Unconfined Compression; DS – Direct Shear; UU – Unconsolidated Undrained; CB – Consolidated Drained; CU – Consolidated Undrained; *Values at Pressure; T/SQ FT

TEST DATA SUMMARY

Sheet 3 of 3

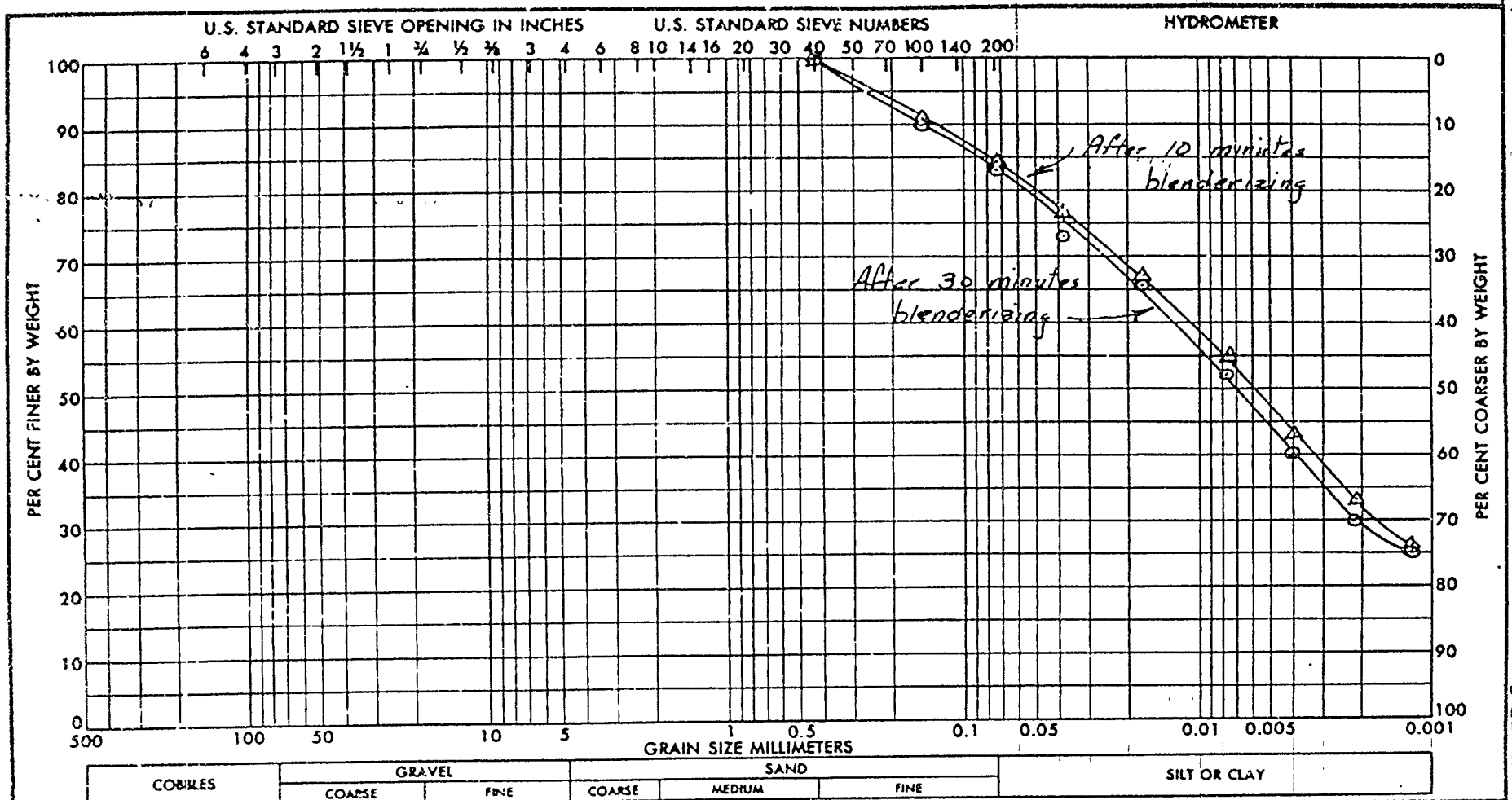
SWDED-GL Report 11332

FEATURE Dierks Dam

BORING NO.	SAMPLE NO.	DEPTH OR ELEV. OF SAMPLE	LABORATORY CLASSIFICATION	MECHANICAL ANALYSIS: GRAVEL %	SAND %	FINES %	D_{10}	ATTERBERG LIMITS: LL	PL	SPECIFIC GRAVITY	NAT. WATER CONT. %	NATURAL DRY DENSITY LBS/CU FT	COMPACTION DATA: OPT. WATER %	MAXIMUM DRY DENSITY LBS/CU FT	SHEAR DATA: INITIAL %	DRY DENSITY LBS/CU FT	W_c %	W_f %	S_f %	TYPE TEST	SPECIMEN SIZE INCHES	TEST	σ_3 T/SQ FT	σ_1 T/SQ FT	C T/SQ FT	ϕ DEGREES	PERMEABILITY: K	K FT/MIN	CONSOLIDATION DATA: P_o T/SQ FT	P_c T/SQ FT	C_c	t_{50}	REMARKS
X-19011			SC	0	53	47		35	18	2.69(est)			16.0	113.2																		Approx remold conditions
			Note: Classifications and compaction test data from SWDED-GL Report 11227, 29 Sep 1971												543	107	13.8	20.2	65	TC-R	1.4 x 3.0	1	1.7	2.62	0.1	16							
															547	107	14.9	18.5	66	-	-	2	3.0	5.32								95%	more dens, opt -3%
															565	107	13.8	17.3	64	-	-	3	6.0	11.10									
															578	104	14.7	20.4	71	TC-R	1.4 x 3.0	1	1.4	2.72	0.1	15							
															560	108	14.7	18.7	79	-	-	2	3.1	5.62								95%	more dens opt
															559	108	14.7	17.4	91	-	-	3	5.8	10.29									
															481	113	13.5	18.7	75	TC-R	1.4 x 3.0	1	1.5	3.81	0.4	16							
															486	112	13.8	18.0	74	-	1.4 x 3.1	2	3.2	6.87								100%	more dens, opt -3%
															494	112	13.9	17.0	75		1.4 x 3.0	3	6.0	11.84									
															496	113	16.5	18.1	91	TC-R	1.4 x 3.0	1	1.5	4.25	0.6	15							
															498	112	16.6	17.9	89	-	-	2	3.0	6.85								100%	more dens opt
															486	113	16.6	16.7	92	-	-	3	6.0	12.00									

ENG FORM 2086 1 MAR 68 (PREVIOUS EDITIONS MAY BE USED) (EM 1110-2-1902) (TRANSLUCENT)

TC – Triaxial Compression; UC – Unconfined Compression; DS – Direct Shear; Uu – Unconsolidate Undrained; CD – Consolidated Drained; CU – Consolidated Undrained; *Values at Pressure; T/SQ FT



SAMPLE NO.	ELEV OR DEPTH	CLASSIFICATION	NAT W%	LL	PL	PI
X-15623-24		Crushed SHALE-SANDSTONE				
		Not blenderized		25	15	10
		10' blenderized		33	16	17
		30' blenderized		35	—	—

GRADATION CURVES

PROJECT Dierks Dam

AREA

BORING NO

DATE July 72

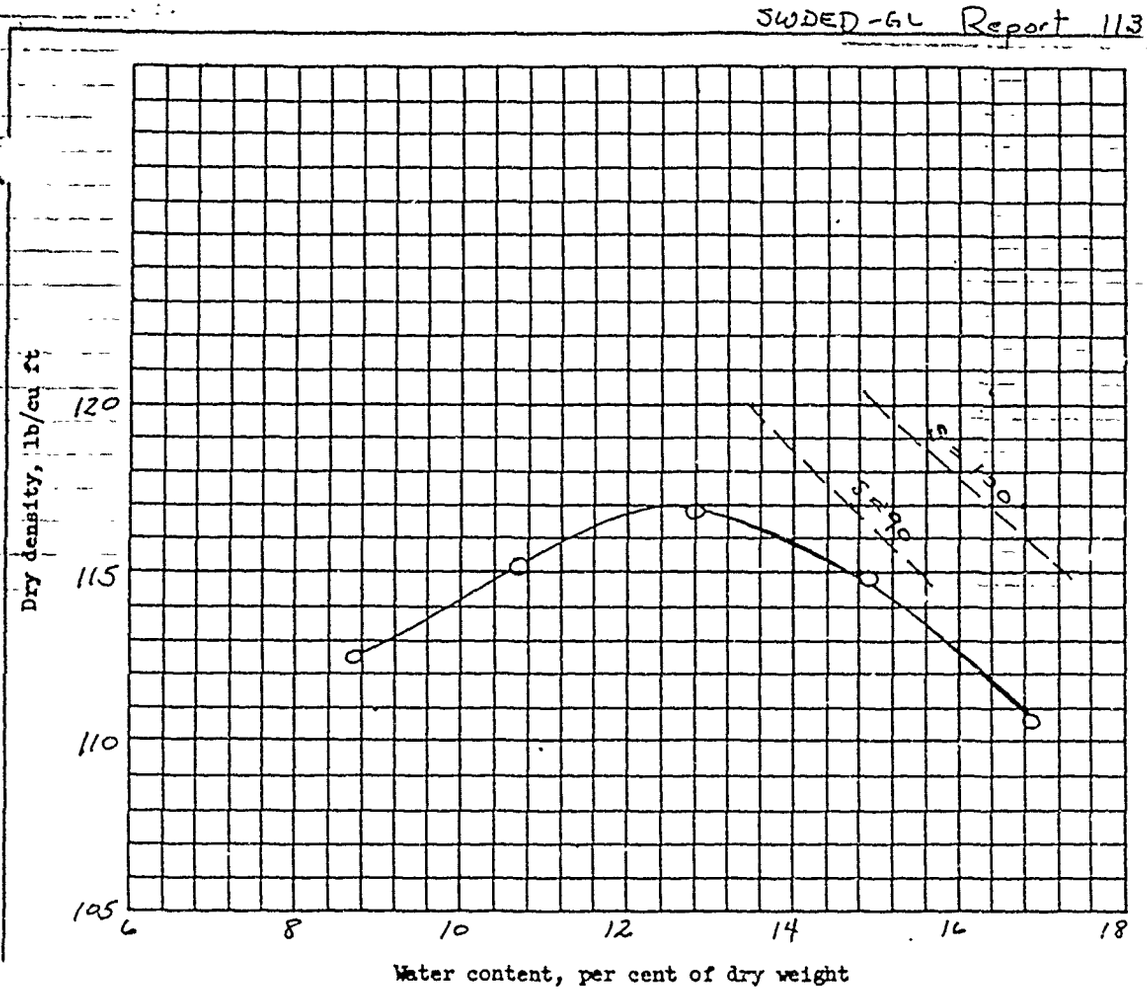
Plate 1

SWDED-GC Report 11332

U.S. GOVERNMENT PRINTING OFFICE 1963 O—700-126

ENG FORM 2087 1 MAY 63 REPLACES WES FORM NO 1241, SEP 1962, WHICH IS OBSOLETE

SWDED-GL Report 11332



Standard compaction test

25 blows per each of 3 layers, with 5.5 lb rammer and

12 inch drop. 4 inch diameter mold

Sample No.	Elev or Depth	Classification	G	LL	PL	% > No. 4	% > 3/4 in.
X-15623-16624		Scale material (CL)	2.70	33	16		

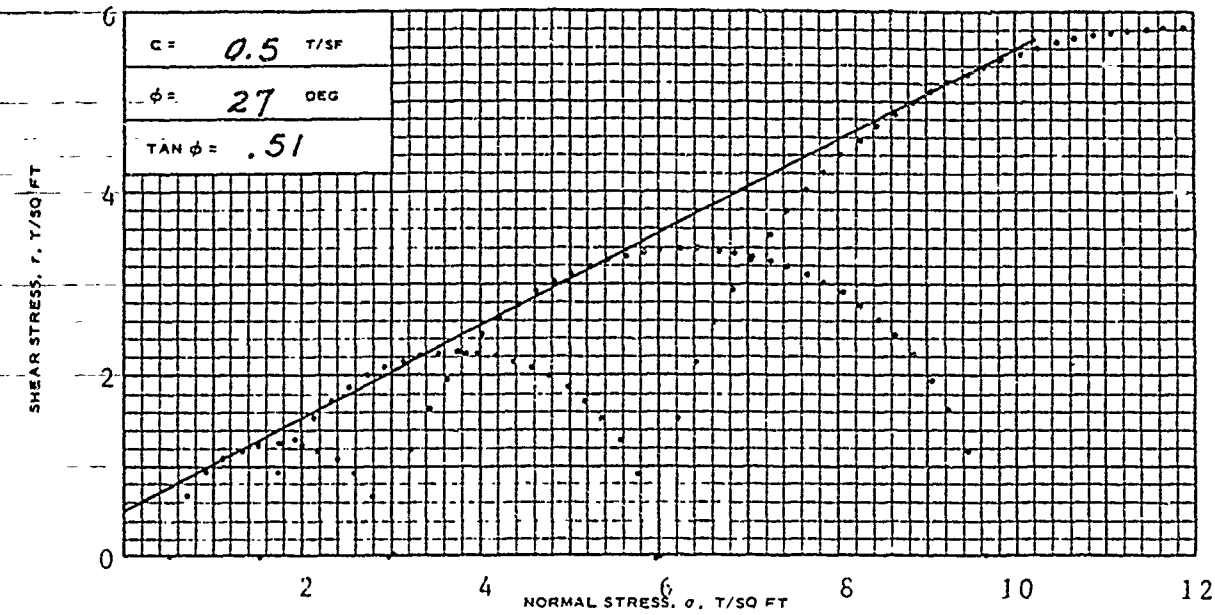
Sample No.	X-15623-24			
Natural water content in per cent				
Optimum water content in per cent	12.6			
Max dry density in lb/cu ft	117.0			

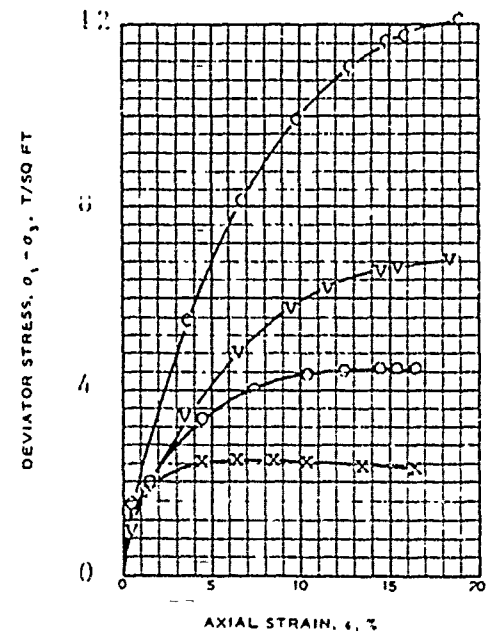
Remarks	Project Dierks Dam
	Area
	Boring No. / Date May 72
	COMPACTION TEST REPORT

ENG FORM 2091 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) 0 9426

Plate 2

SWDED-GL Report 11382





SPECIMEN NO.		–	1	2	3	4
INITIAL	WATER CONTENT, %	w_o	9.6	9.5	9.5	9.5
	DRY DENSITY LB/CU FT	γ_{d_o}	105	104	106	105
	SATURATION, %	S_o	43	42	43	43
	VOID RATIO	e_o	.601	.609	.586	.595
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γ_{d_c}				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	2.48	4.46	6.64	11.63
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	17	22	24	30
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.3	1.3	1.4
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	2.9

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Remolded to 90% max density at optimum water content - 3%.

LL 33 | PL 16 | PI 17 | G_s 2.70 | TYPE OF SPECIMEN Remolded | TYPE OF TEST Q

REMARKS:

PROJECT Dierks Dam

BORING NO | SAMPLE NO X-15623-24

DEPTH/ELEV

LABORATORY SWD | DATE May 72.

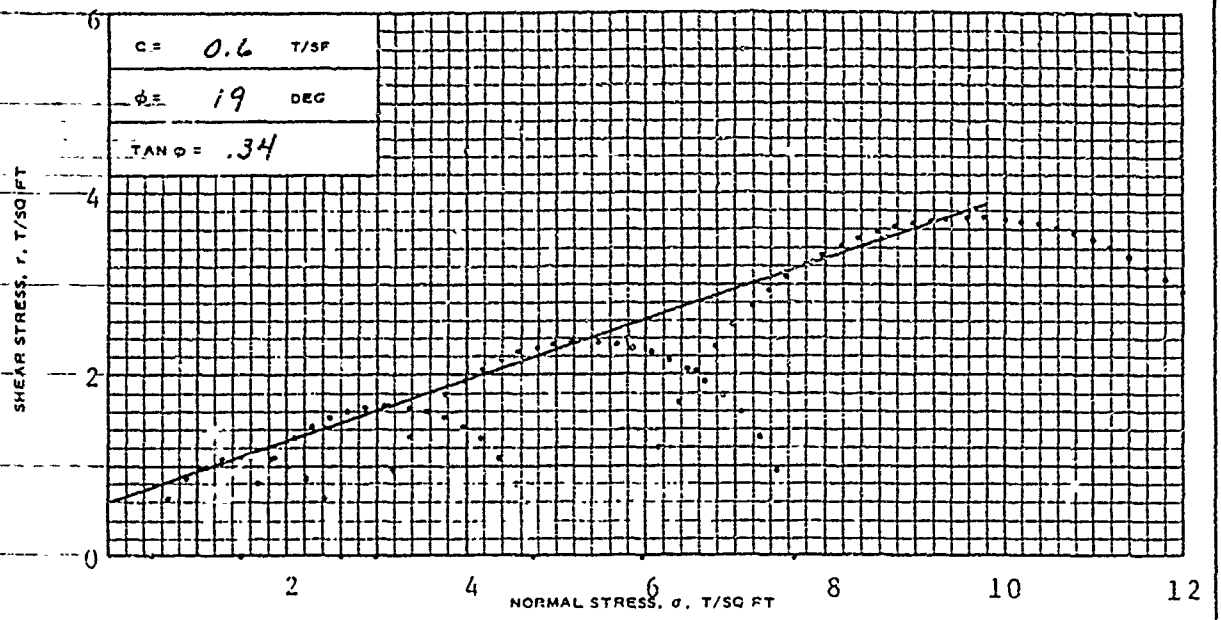
TRIAXIAL COMPRESSION TEST REPORT

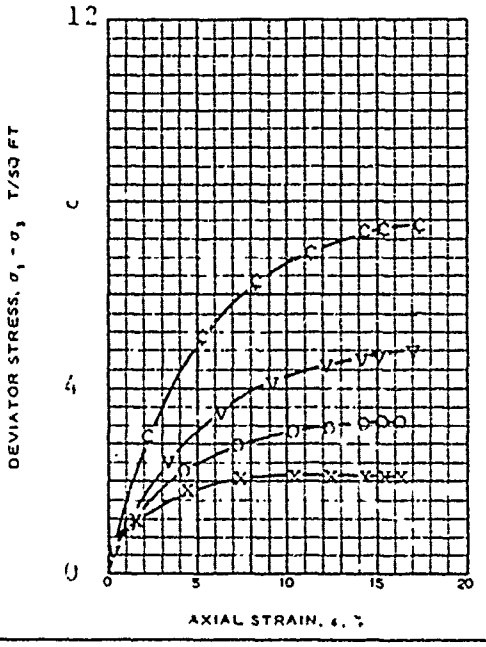
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE

TRANSLUCENT

Plate 3

SWDED-GL Report 11332





SPECIMEN NO		–	1	2	3	4
INITIAL	WATER CONTENT, %	w_o	12.6	12.4	12.4	12.2
	DRY DENSITY LB/CU FT	γ_{d_o}	106	106	105	105
	SATURATION, %	S_o	58	57	55	55
	VOID RATIO	e_o	.586	.583	.602	.595
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γ_{d_c}				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_b				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	2.15	3.30	4.70	7.44
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	23	22	23	23
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.3	1.3	1.4	1.3
INITIAL HEIGHT, IN.		H_o	3.0	2.9	3.0	2.9

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Remolded to approximately 90% max density at optimum water content.

LL 33	PL 16	PI 17	G 2.70

TYPE OF SPECIMEN Remolded TYPE OF TEST Q

REMARKS

PROJECT Dierks Dam

BORING NO SAMPLE NO X-15623-24

DEPTH/ELEV

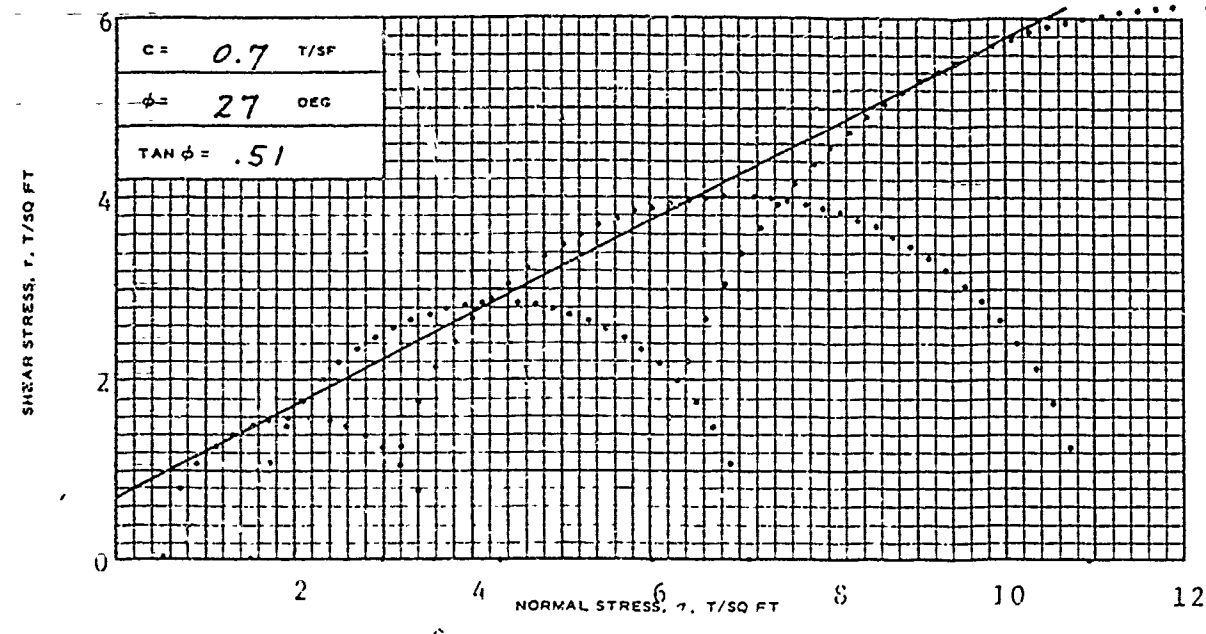
LABORATORY SWD DATE May 72

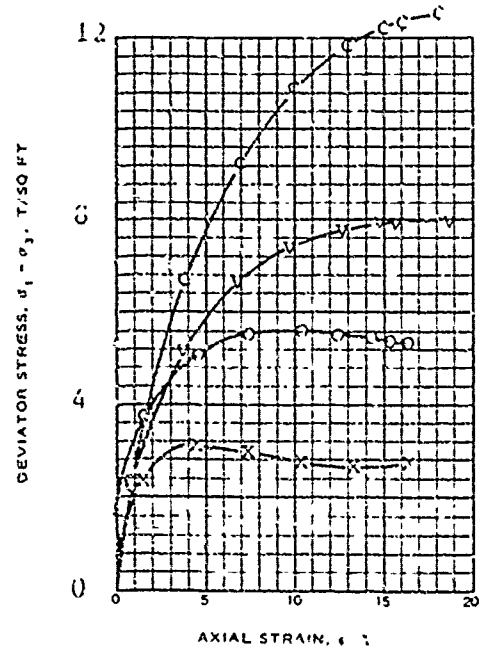
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

Plate 4

SWDED-GL Report 11332





SPECIMEN NO.		–	1	2	3	4
INITIAL	WATER CONTENT %	w_o	9.5	9.5	9.5	9.5
	DRY DENSITY LB/CU FT	γd_o	110	111	110	111
	SATURATION, %	S_o	49	50	49	49
	VOID RATIO	e_o	.523	.511	.522	.516
BEFORE SHEAR	WATER CONTENT %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	3.09	5.01	7.94	12.23
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	7	16	23	23
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN		D_o	1.4	1.4	1.4	1.3
INITIAL HEIGHT, IN		H_c	3.0	3.0	3.0	2.9

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Remolded to approximately 95% max density at optimum - 3%.

LL 33	PL 16	PI 17	G 2.70

TYPE OF SPECIMEN Remolded TYPE OF TEST Q

REMARKS:

PROJECT Dierks Dam

BORING NO SAMPLE NO X-15623-24

DEPTH/ELEV

LABORATORY SWD DATE May 72

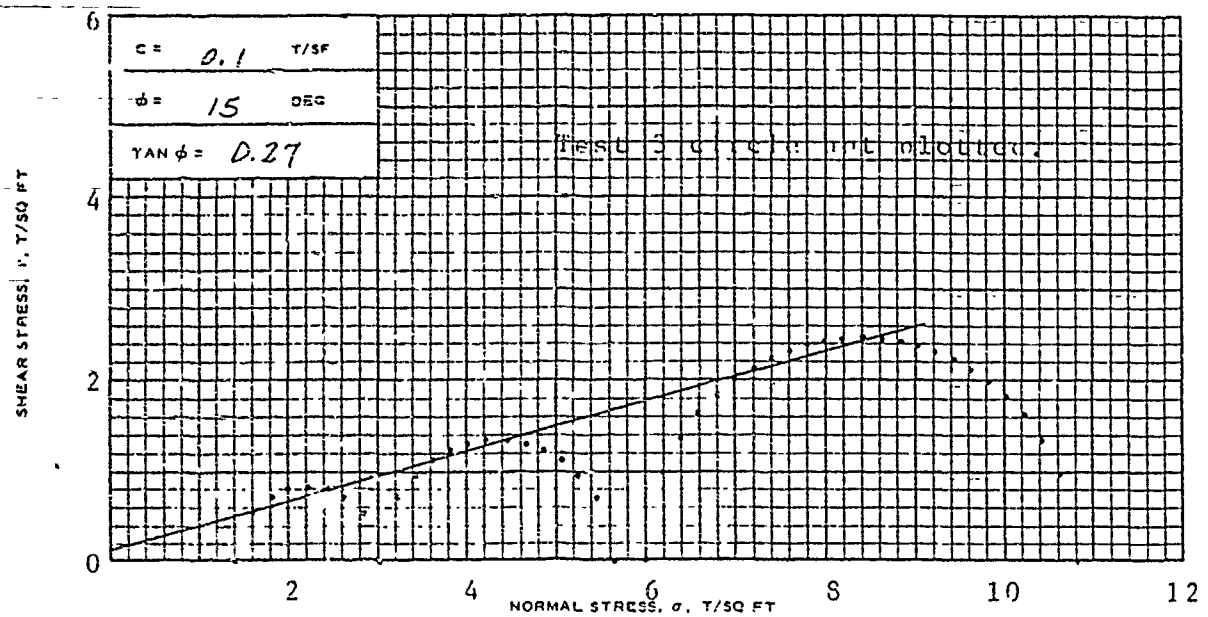
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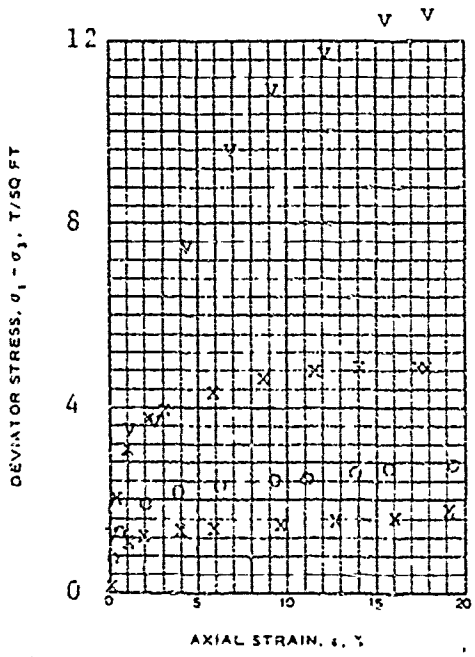
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

Plate 5

Plates 6 + 7 Not

available





SPECIMEN NO			1	2	3	4
INITIAL	WATER CONTENT, %	w_o	12.6	12.9	12.9	12.7
	DRY DENSITY LB/CU FT	γ_{d_o}	111	111	110	111
	SATURATION, %	S_o	67	67	65	66
	VOID RATIO	e_o	.512	.518	.537	.520
BEFORE SHEAR	WATER CONTENT, %	w_c	17.6	17.0	13.4	16.3
	DRY DENSITY LB/CU FT	γ_{d_c}	114	115	124	117
	SATURATION, %	S_c	100	100	100	100
	VOID RATIO	e_c	.476	.459	.361	.439
	FINAL BACK PRESSURE, T/SQ FT	u_o	7.4	12.0	14.4	12.3
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.4	3.0	6.3	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.64	2.66	6.00	4.53
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	270	300	240	300
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	1.4
INITIAL HEIGHT, IN		H_o	3.0	3.0	3.0	3.0

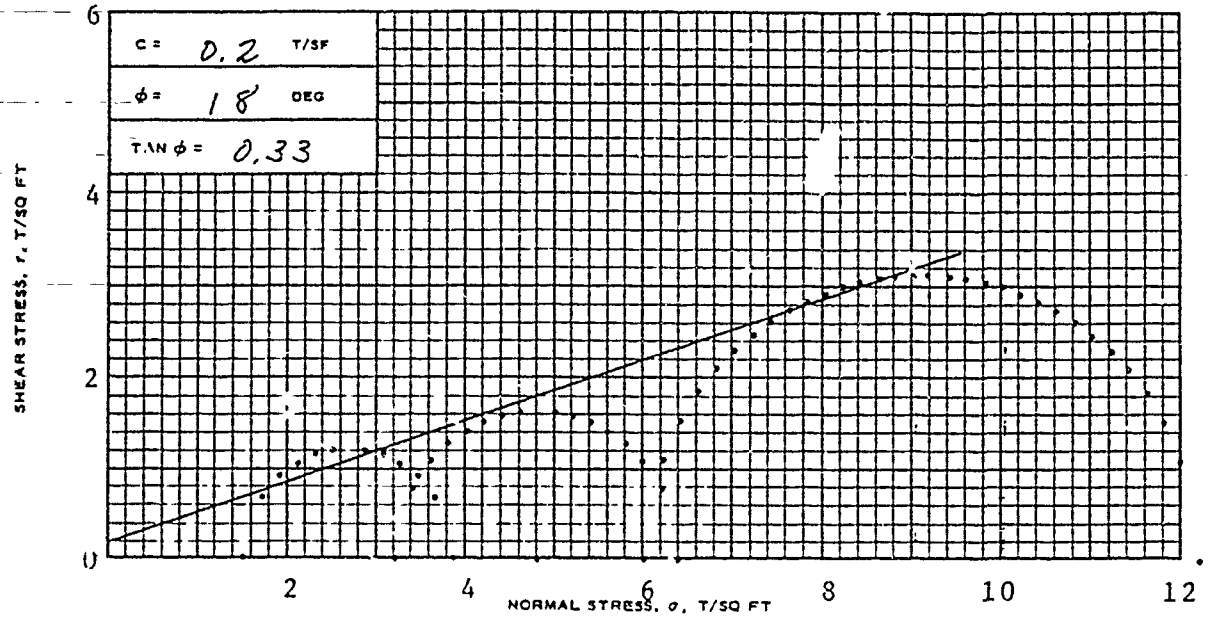
CONTROLLED- Strain TEST

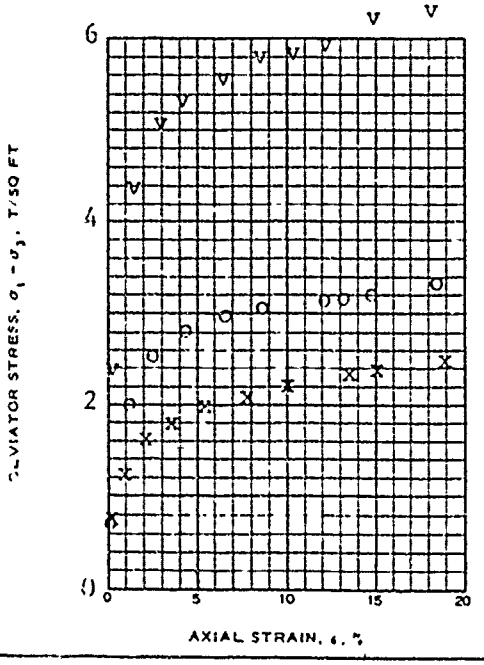
DESCRIPTION OF SPECIMENS Remolded to approx 95% max density at optimum.

LL 33	PL 16	PI 17	G_s 2.70	TYPE OF SPECIMEN	TYPE OF TEST R
REMARKS				PROJECT Dierks Dam	
				BORING NO	SAMPLE NO X-15623-24
				DEPTH/ELEV	
				LABORATORY SWD	DATE May 72
				TRIAXIAL COMPRESSION TEST REPORT	

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

Plate 8





SPECIMEN NO.			1	2	3
INITIAL	WATER CONTENT, %	w_o	9.9	9.9	9.9
	DRY DENSITY LB/ CU FT	γd_o	117	117	117
	SATURATION, %	S_o	60	61	61
	VOID RATIO	e_o	.440	.435	.442
BEFORE SHEAR	WATER CONTENT, %	w_c	16.2	16.1	16.0
	DRY DENSITY LB/CU FT	γd_c	117	117	118
	SATURATION, %	S_c	100	100	100
	VOID RATIO	e_c	.438	.435	.431
	FINAL BACK PRESSURE, T/SQ FT	u_o	8.8	14.6	18.2
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.5	3.2	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	2.38	3.21	6.20
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	340	340	280
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$			
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4
INITIAL HEIGHT, IN.		H_o	3.0	3.1	3.0

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Remolded to approx max density at optimum - 3%.

LL 33	PL 16	PI 17	G_s 2.70

TYPE OF SPECIMEN Remolded | TYPE OF TEST R

REMARKS:

PROJECT Dierks Dam

BORING NO | SAMPLE NO. X-15623-24

DEPTH/ELEV

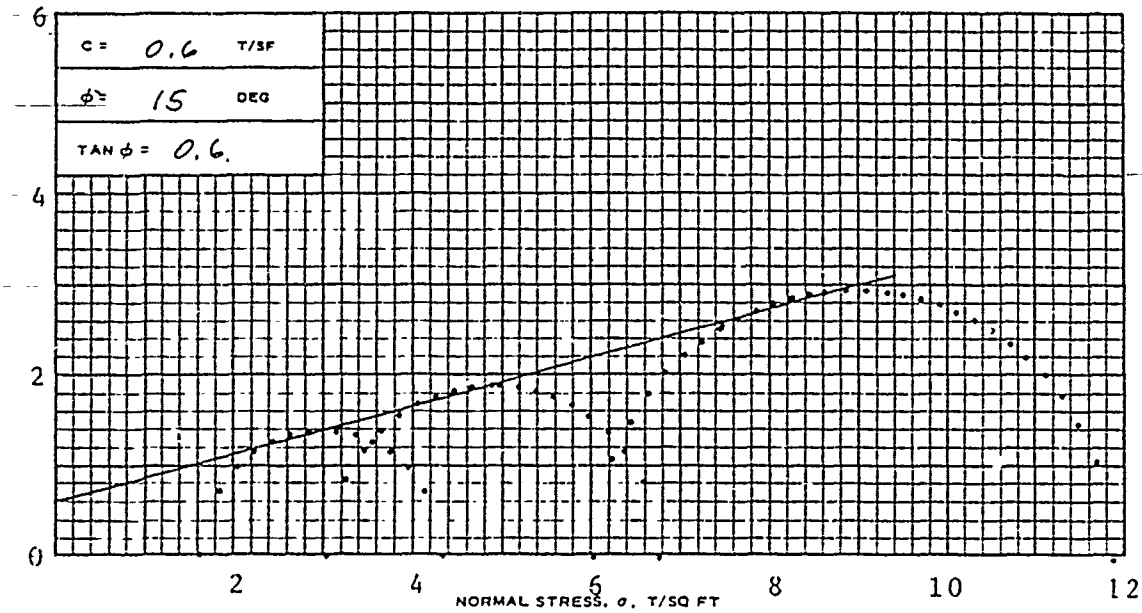
LABORATORY SWD | DATE May 72

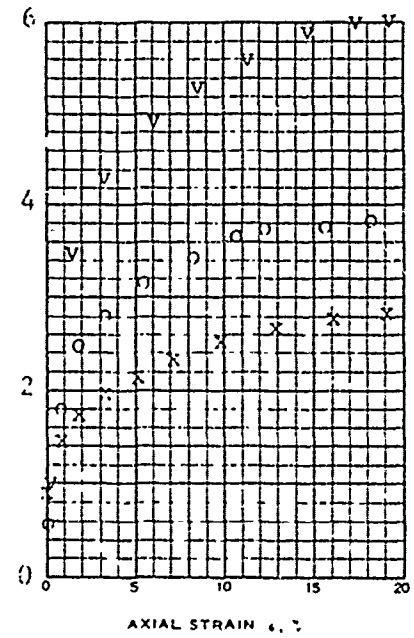
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE

TRANSLUCENT

Plate 9





SPECIMEN NO.		–	1	2	3
INITIAL	WATER CONTENT, %	w_o	12.8	13.0	12.9
	DRY DENSITY LB/CU FT	γ_{d_o}	117	117	116
	SATURATION, %	S_o	79	80	78
	VOID RATIO	e_o	.439	.439	.447
BEFORE SHEAR	WATER CONTENT, %	w_c	16.4	15.4	14.8
	DRY DENSITY LB/CU FT	γ_{d_c}	117	119	121
	SATURATION, %	S_c	100	100	100
	VOID RATIO	e_c	.441	.415	.398
	FINAL BACK PRESSURE, T/SQ FT	u_o	7.8	7.2	8.7
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.6	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	2.73	3.75	5.88
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	270	200	270
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$			
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4
INITIAL HEIGHT, IN.		H_o	3.1	3.0	3.1

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Remolded to approx max density at optimum.

LL 33	PL 16	PI 17	GS 2.70

REMARKS:

TYPE OF SPECIMEN Remolded TYPE OF TEST R

PROJECT Dierks Dam

BORING NO SAMPLE NO X-15623-24

DEPTH/ELEV

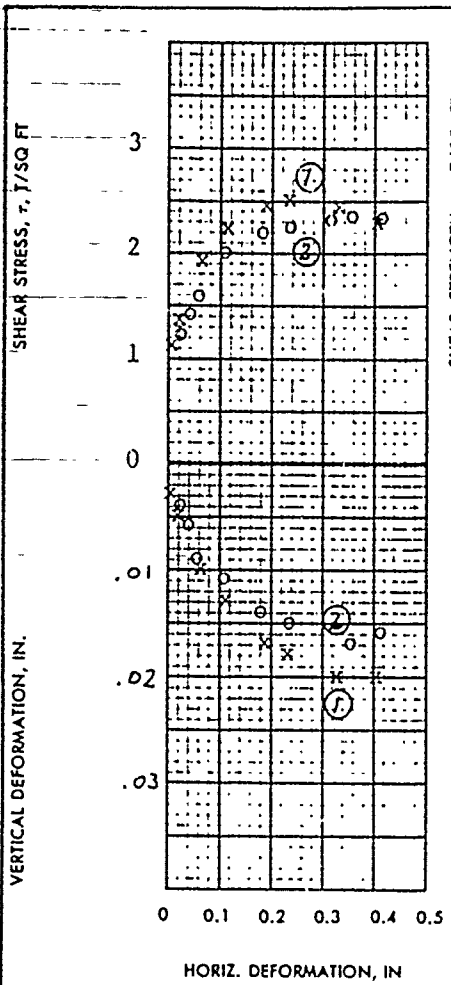
LABORATORY SWD DATE May 72

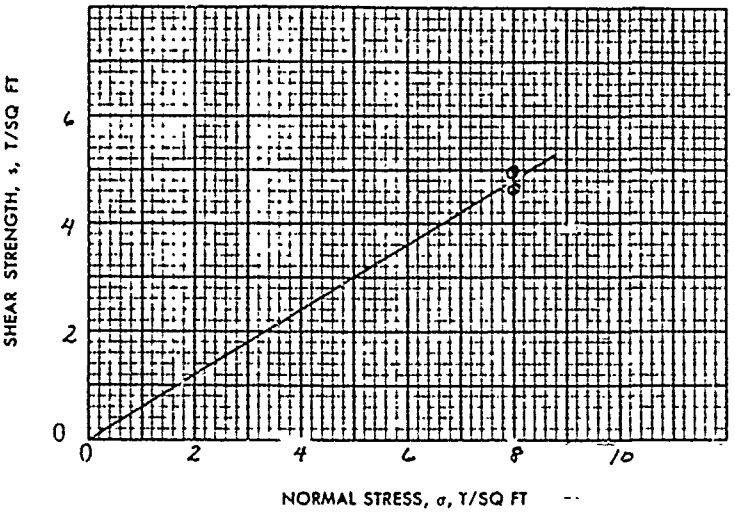
TRIAXIAL COMPRESSION TEST REPORT

FORM NO. 2089 / JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

Plate 10

JWDED-GL Report 11332





SHEAR STRENGTH PARAMETERS

$\phi' =$ 31°

TAN $\phi' =$ .60

$c' =$ 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	
INITIAL	WATER CONTENT	w_o	9.8%	9.8%	%	%
	VOID RATIO	e_o	.602	.602		
	SATURATION	S_o	43%	43%	%	%
	DRY DENSITY, LB/CU FT	γ_d	105	105		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	15.4%	14.7%	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	8.0	8.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	4.96	4.63		
ACTUAL TIME TO FAILURE, MIN		t_f	3250	5900		
RATE OF STRAIN, IN /MIN			.0001	.0001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN Remolded to approx 90% max dens at optimum - 3%. 3.0 IN. SQUARE .5 IN. THICK

CLASSIFICATION CL

LL 33 | PL 16 | PI 17 | | G_s 2.70

REMARKS

PROJECT Dierks Dam

AREA

BORING NO. | SAMPLE NO. X-15623-24

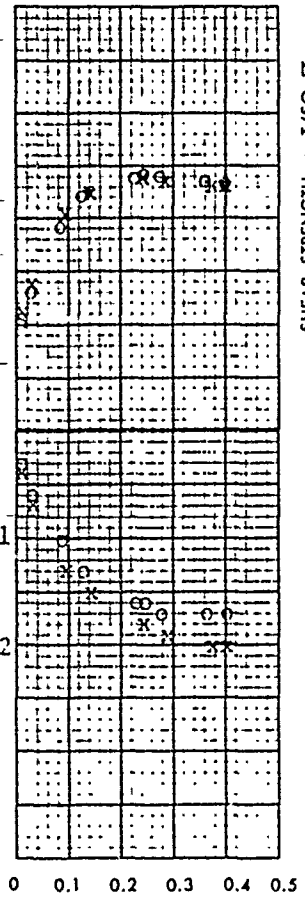
DEPTH EL | DATE May 72

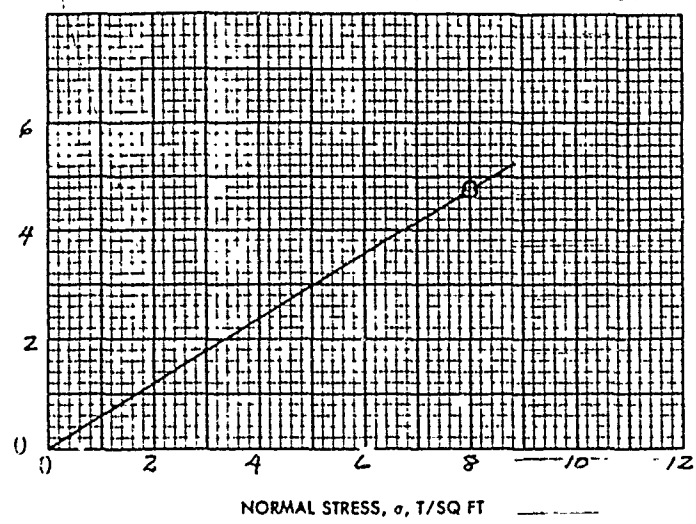
DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 63 **2092** (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1966 O-214-945

PLATE IX-3

Plate 11





SHEAR STRENGTH PARAMETERS

$\phi' =$ 31

TAN $\phi' =$ 0.60

$c' =$ 0.0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	
INITIAL	WATER CONTENT	w_o	12.6%	12.6%	%	%
	VOID RATIO	e_o	.598	.597		
	SATURATION	S_o	56%	56%	%	%
	DRY DENSITY, LB/CU FT	γ_d	105	105		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	13.5%	14.1%	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	8.0	8.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	4.72	4.60		
ACTUAL TIME TO FAILURE, MIN		t_f	2900	2600		
RATE OF STRAIN, IN /MIN						
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN: 3.0 IN. SQUARE, .5 IN. THICK

CLASSIFICATION: Remolded to approx 90% max density at optimum water. CL

LL 33 | PL 16 | PI 17 | | G_s 2.70

REMARKS

PROJECT: Dierke Dam

AREA

BORING NO. | SAMPLE NO. X-15623-24

DEPTH / EL | DATE May 72

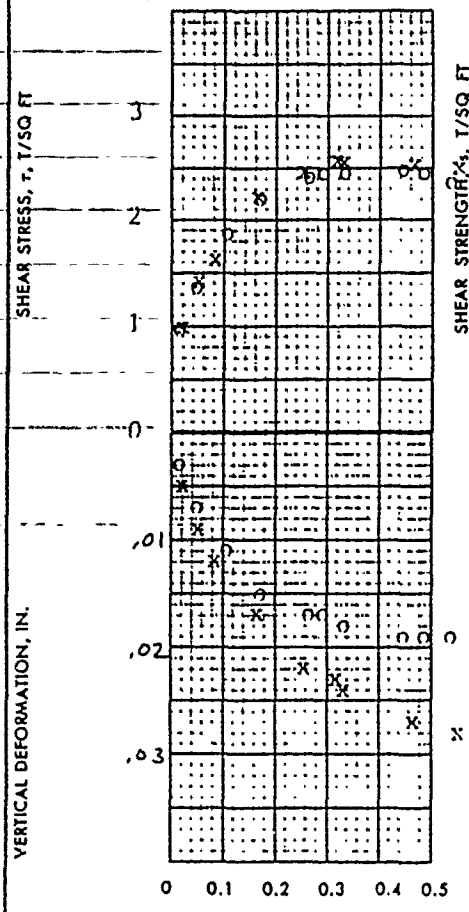
DIRECT SHEAR TEST REPORT

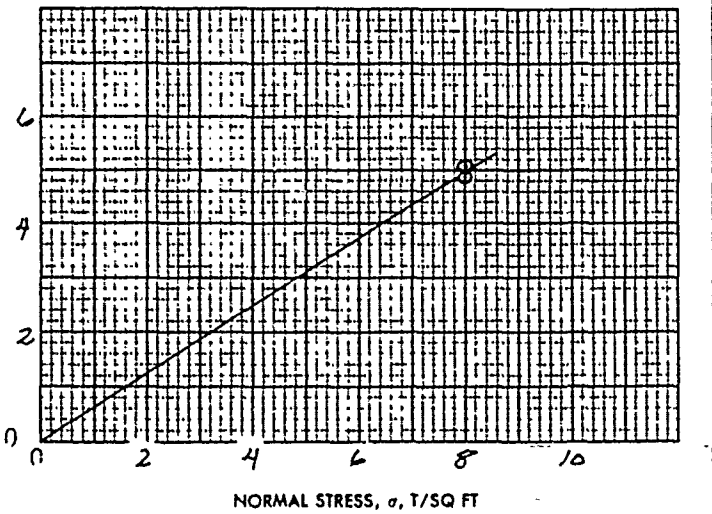
ENG FORM 2092 1 JUN 65 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

GPO : 1966 O—214-945

PLATE IX-3

Plate 12





SHEAR STRENGTH PARAMETERS

$\phi' =$ 32

TAN $\phi' =$ .62

$c' =$ 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	"
INITIAL	WATER CONTENT	w_o	9.6 %	9.7 %	%	%
	VOID RATIO	e_o	.517	.517		
	SATURATION	S_o	50 %	50 %	%	%
	DRY DENSITY, LB/CU FT	γ_d	111	111		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	15.4 %	15.3 %	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	8.0	8.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	5.07	4.86		
ACTUAL TIME TO FAILURE, MIN		t_f	5900	2900		
RATE OF STRAIN, IN./MIN			.0001	.0001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN Remolded to approx 95% maximum density at optimum - 3%. 3.0 IN. SQUARE .5 IN. THICK

CLASSIFICATION CL

LL	PL	PI		G.
33	16	17		2.70

REMARKS

PROJECT Dierks Dam

AREA

BORING NO. SAMPLE NO. X-15623-24

DEPTH EL DATE May 72

DIRECT SHEAR TEST REPORT

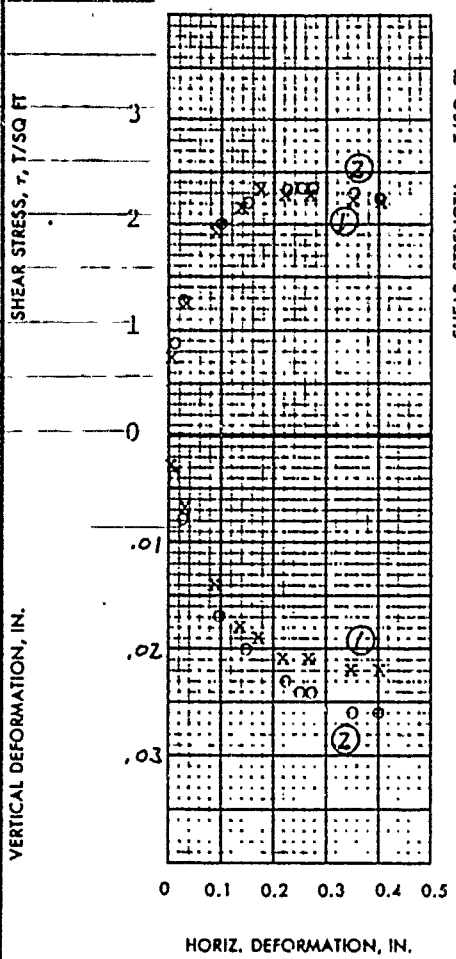
ENG FORM 1 JUN 65 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

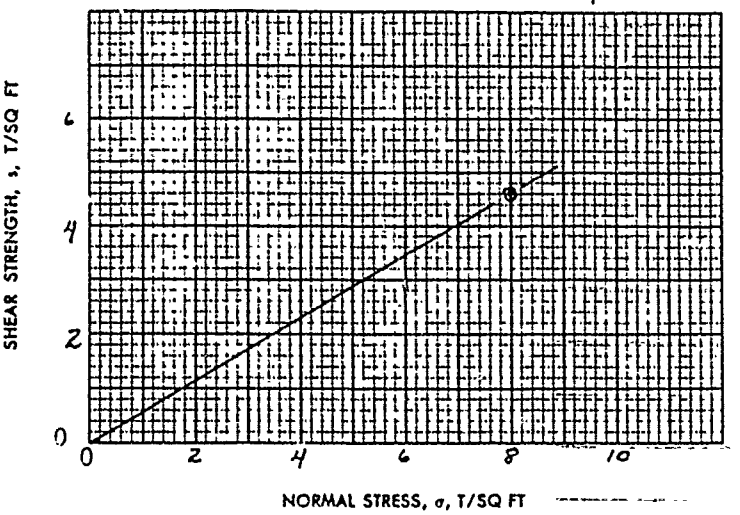
GPO: 1966 O-214-949

PLATE IX-3

Plate 13

SWDED-GL Report 11332





SHEAR STRENGTH PARAMETERS

ϕ' = 30°

TAN ϕ' = .58

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	
INITIAL	WATER CONTENT	w_o	12.6 %	[illegible] %	%	%
	VOID RATIO	e_o	.530	[illegible]		
	SATURATION	S_o	65 %	%	%	%
	DRY DENSITY, LB/CU FT	γ_d	111	[illegible]		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	15.[illegible] %	[illegible] %	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	[illegible]	[illegible]		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	[illegible]	[illegible]		
ACTUAL TIME TO FAILURE, MIN		t_f	2[illegible]			
RATE OF STRAIN, IN./MIN			.0001	.0001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN Remolded to approx 95% max dens at optimum water content. 2. IN. SQUARE .5 IN. THICK

CLASSIFICATION CL

LL 33 | PL 16 | PI 17 | | G_s 2.70

REMARKS

PROJECT Dierks Dam

AREA

BORING NO. | SAMPLE NO. X-15623-24

DEPTH EL | DATE May 72

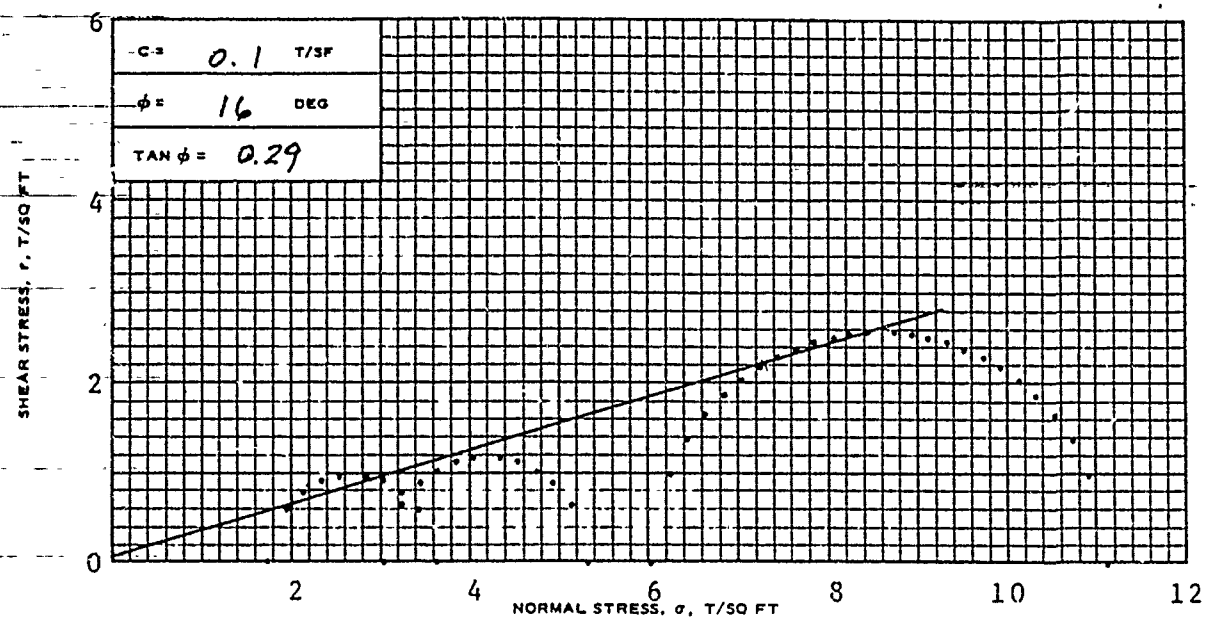
DIRECT SHEAR TEST REPORT

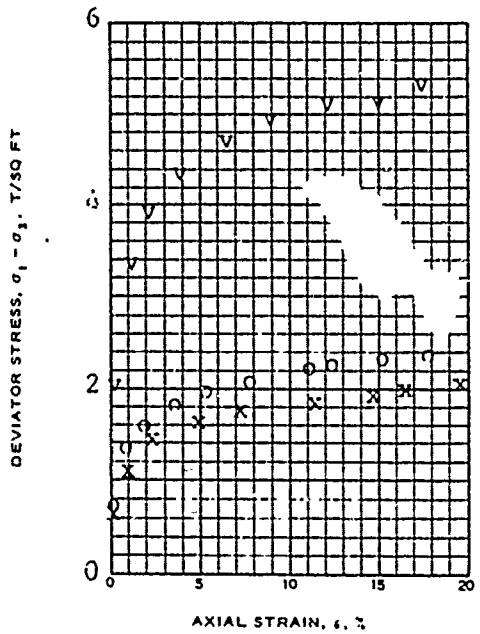
ENG FORM 2092 1 JUN 65 (EAI 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

GPO : 1966 O-214-945

PLATE IX-3

Plate 14





SPECIMEN NO.		–	1	2	3
INITIAL	WATER CONTENT, %	w_o	13.8	13.9	13.8
	DRY DENSITY LB/CU FT	γ_{d_o}	107	107	107
	SATURATION, %	s_o	65	66	66
	VOID RATIO	e_o	.565	.567	.565
BEFORE SHEAR	WATER CONTENT, %	w_c	20.2	18.8	17.3
	DRY DENSITY LB/CU FT	γ_{d_c}	109	112	115
	SATURATION, %	s_c	100	100	100
	VOID RATIO	e_c	.543	.506	.465
	FINAL BACK PRESSURE, T/SQ FT	u_o	12.6	14.6	16.9
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.7	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.92	2.32	5.10
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	280	230	280
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$			
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Remolded to approx 95% max density at optimum - 3%.

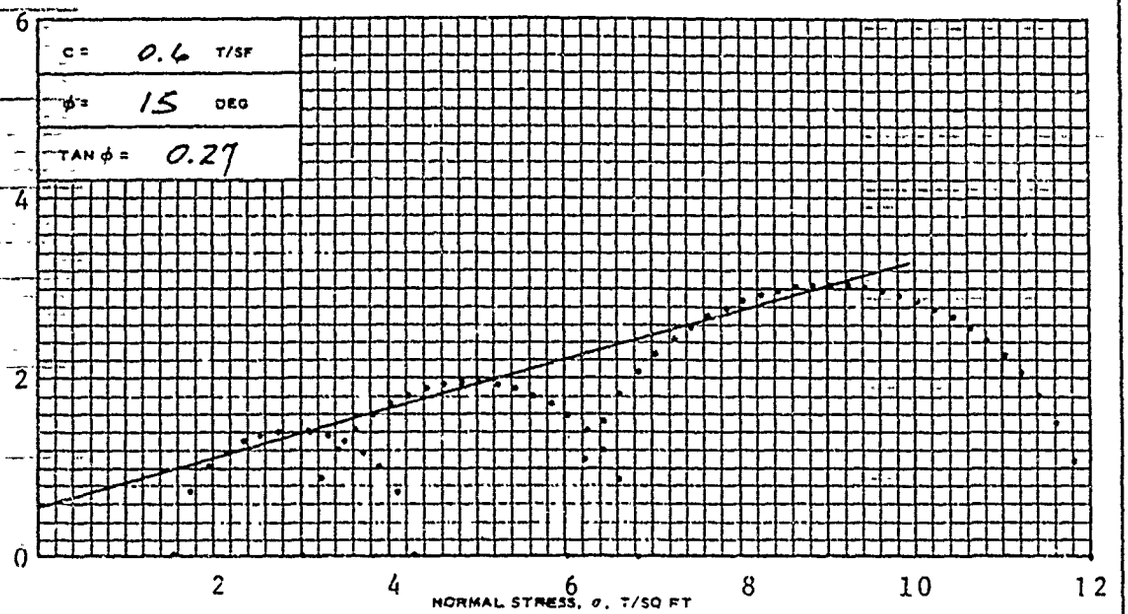
LL 35	PL 18	PI 17	G 2.69	TYPE OF SPECIMEN Remolded	TYPE OF TEST R
REMARKS:				PROJECT Dierks Dam	
				BORING NO. Quarry	SAMPLE NO. X-15011
				DEPTH/ELEV	
				LABORATORY SWD	DATE May 72
				TRIAXIAL COMPRESSION TEST REPORT	

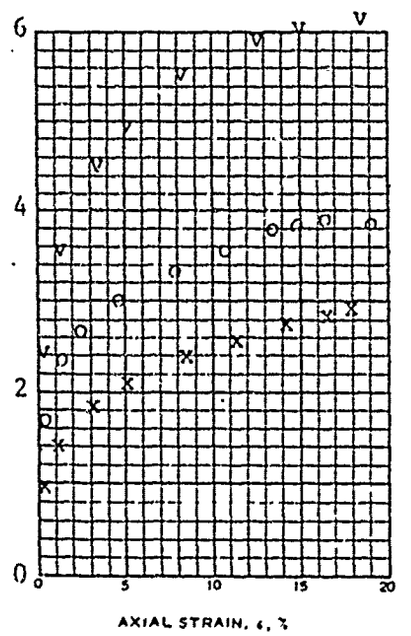
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

Plate 15

Plates 16 + 17 not

available





SPECIMEN NO.		–	1	2	3
INITIAL	WATER CONTENT, %	w_o	16.5	16.6	16.6
	DRY DENSITY LB/CU FT	γ_{d_o}	113	112	113
	SATURATION, %	S_o	91	89	92
	VOID RATIO	e_o	.486	.498	.486
BEFORE SHEAR	WATER CONTENT, %	w_c	18.1	17.9	16.7
	DRY DENSITY LB/CU FT	γ_{d_c}	113	113	116
	SATURATION, %	S_c	100	100	100
	VOID RATIO	e_c	.487	.481	.449
	FINAL BACK PRESSURE, T/SQ FT	u_o	7.2	5.2	8.2
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	2.78	3.83	6.00
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	320	310	280
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$			
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Remolded to approx max density at optimum.

LL 35	PL 18	PI 17	G 2.69	TYPE OF SPECIMEN Remolded	TYPE OF TEST R

REMARKS:

PROJECT Dierks Dam

BORING NO. Quarry SAMPLE NO. X-15011

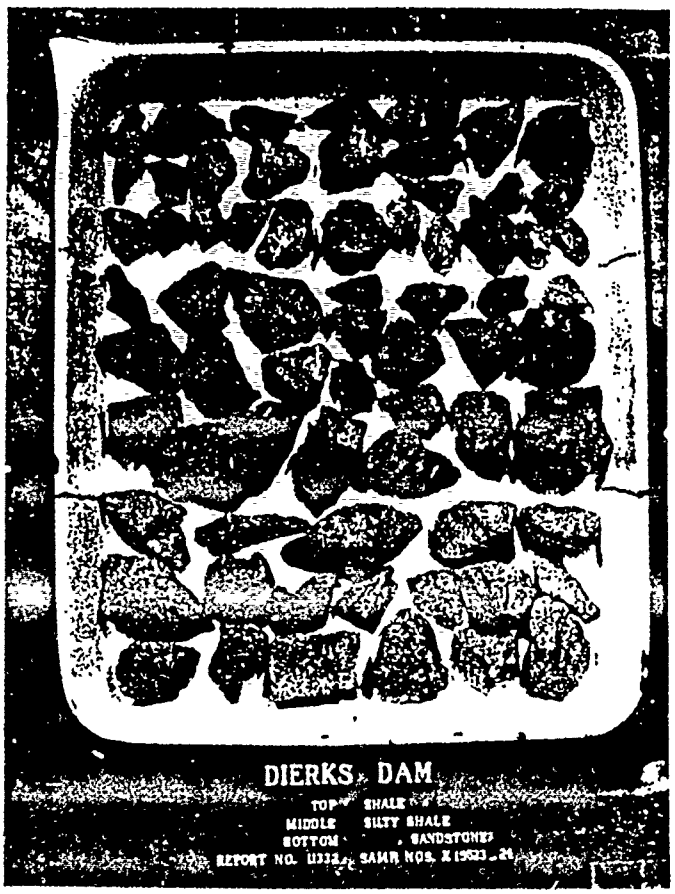
DEPTH/ELEV

LABORATORY SWD DATE May 72

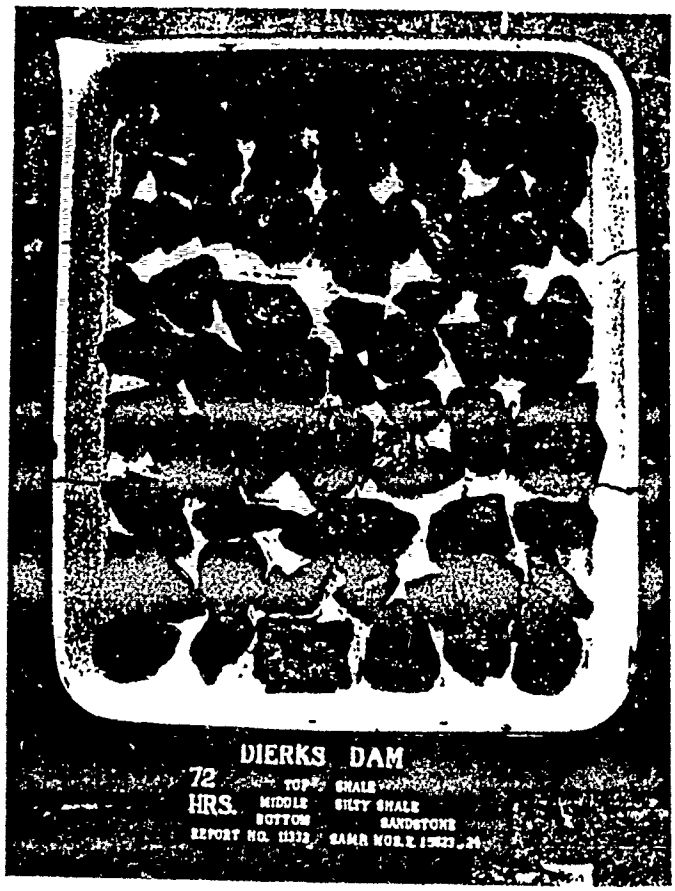
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

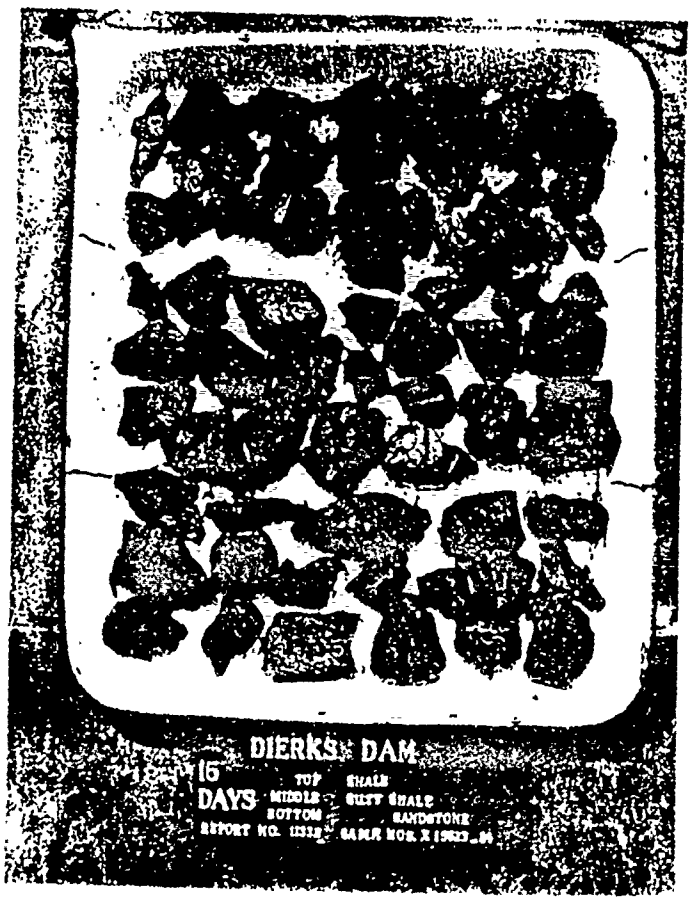
Plate 18



Accelerated Expansion Tests



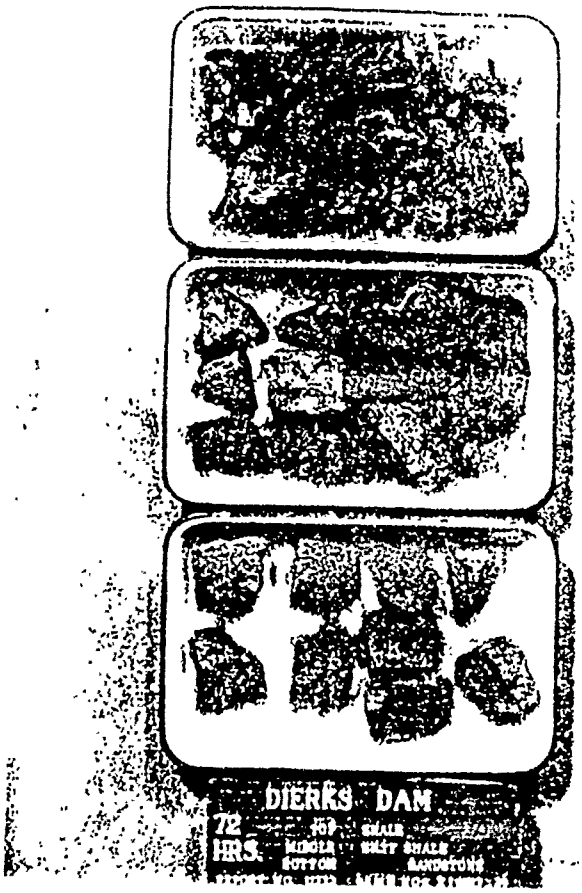
Accelerated Expansion Tests



Accelerated Expansion Tests



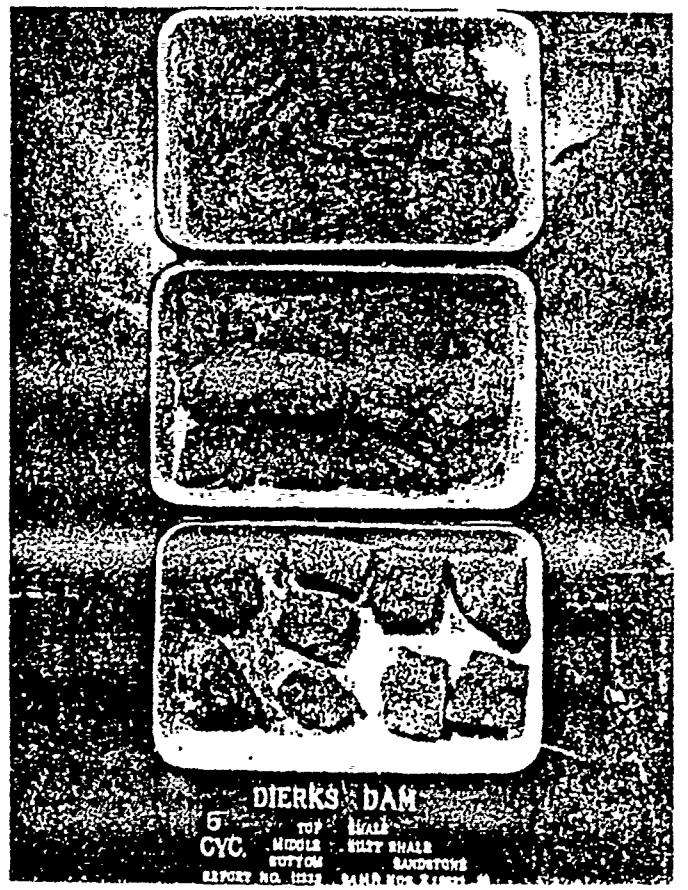
Slaking Tests



Slaking Tests



Slaking Tests



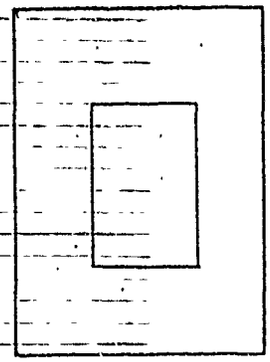
Slaking Tests

APPENDIX D

FOUNDATION MATERIALS

SECTION 1. UNCONFINED COMPRESSION TESTS

SWDGL Report N: 8992

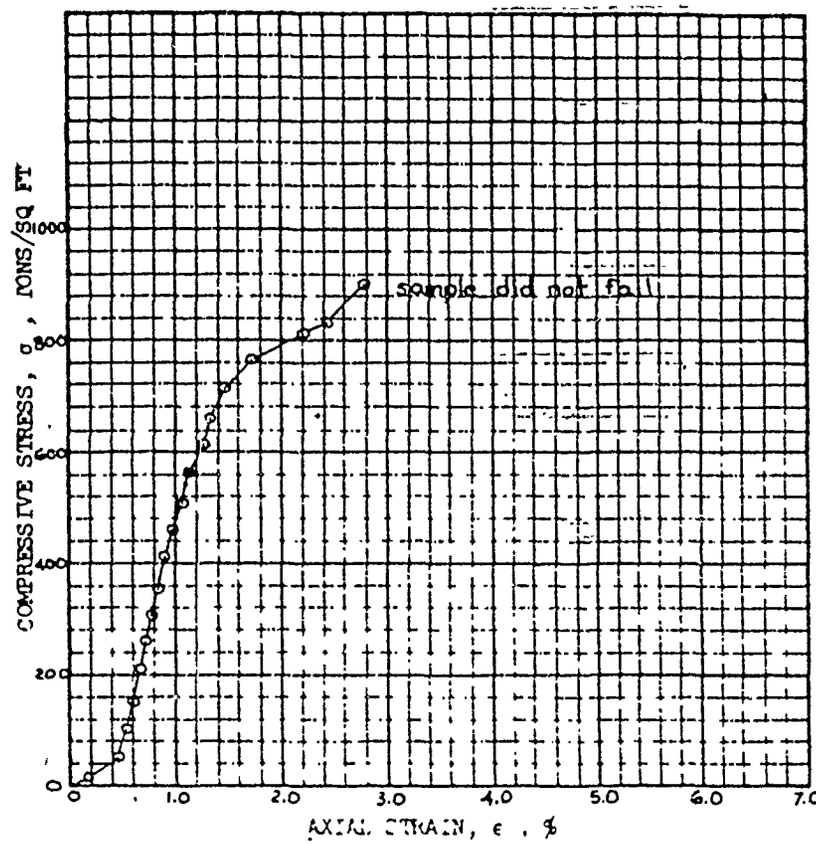


Sketch of specimen
~~after failure~~

TEST TYPE
(Check one)

☑ Controlled-stress
13,000 lbs/min.

☐ Controlled-strain



Type of specimen ☑ Undisturbed ☐ Remolded			Test No.	Test No.	Test No.	Test No.
Initial	Water content	w_c	— %	%	%	%
	Void ratio	e_o				
	Saturation	S_o	%	%	%	%
	Dry density, lb/cu ft	γ_d	160			
Time to failure, min.		t_f	27			
Unconfined compressive strength, tons/sq ft		q_u	8194			
Undrained shear strength, tons/sq ft		s_u	410			
Sensitivity ratio		S_t				

Classification SANDSTONE

LL	PL	PI	G_s

Specimen Diam 6.0 ~~cm~~ in. | Specimen Height 8.8 ~~cm~~ in.

Remarks

Project Oroville Dam

Area Foundation Material

Boring No. GS-37 Sample No. M-3919

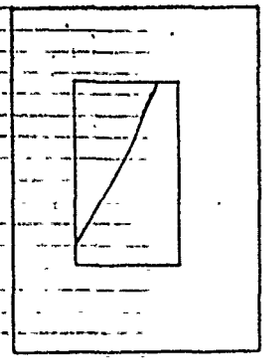
Depth, ~~ft~~ 25.6-26.5 Date OCT 64

UNCONFINED COMPRESSION TEST REPORT

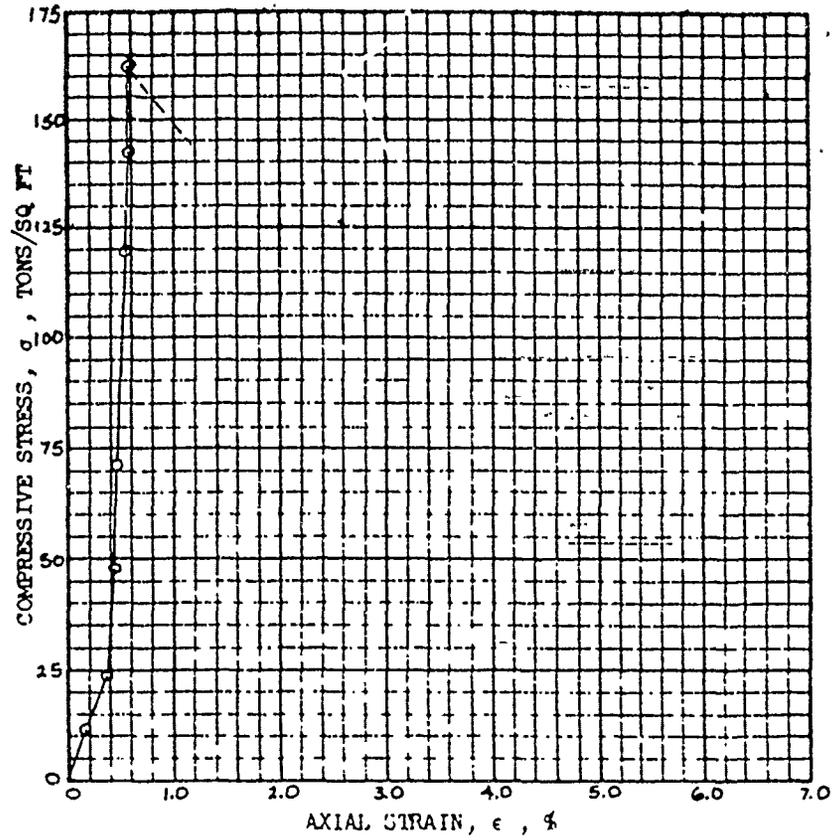
ENG FORM 1 MAY 63 3659 (TRANSLUCENT)

PLATE NO. 7
C 8927

PLATE XI-2



Sketch of specimen after failure



TEST TYPE
(Check one)

☒ Controlled-stress
8,600 lbs/min.

☐ Controlled-strain

Type of specimen ☒ Undisturbed ☐ Remolded			Test No.	Test No.	Test No.	Test No.
Initial	Water content	w_o	1.5 %	%	%	%
	Void ratio	e_o				
	Saturation	S_o	%	%	%	%
	Dry density, lb/cu ft	γ_d	158			
Time to failure, min		t_f	8			
Unconfined compressive strength, tons/sq ft		q_u	158			
Undrained shear strength, tons/sq ft		s_u	79			
Sensitivity ratio		S_t				

Classification SANDSTONE

LL	PL	PI	G_s

Specimen Diam 6.2 cm in. | Specimen Height 10.3 cm in.

Remarks

Project Oiarks Dam

Area ~~Area~~ Foundation Material

Boring No. GC-37 Sample No. M-3918

Depth, ft 181-190 Date OCT 64

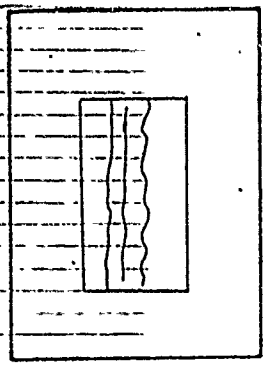
UNCONFINED COMPRESSION TEST REPORT

ENG FORM 1 MAY 63 3659 (TRANSLUCENT)

PLATE NO. 6
C 8927

PLATE XI-2 (3)

SWDGL Report No. 8927

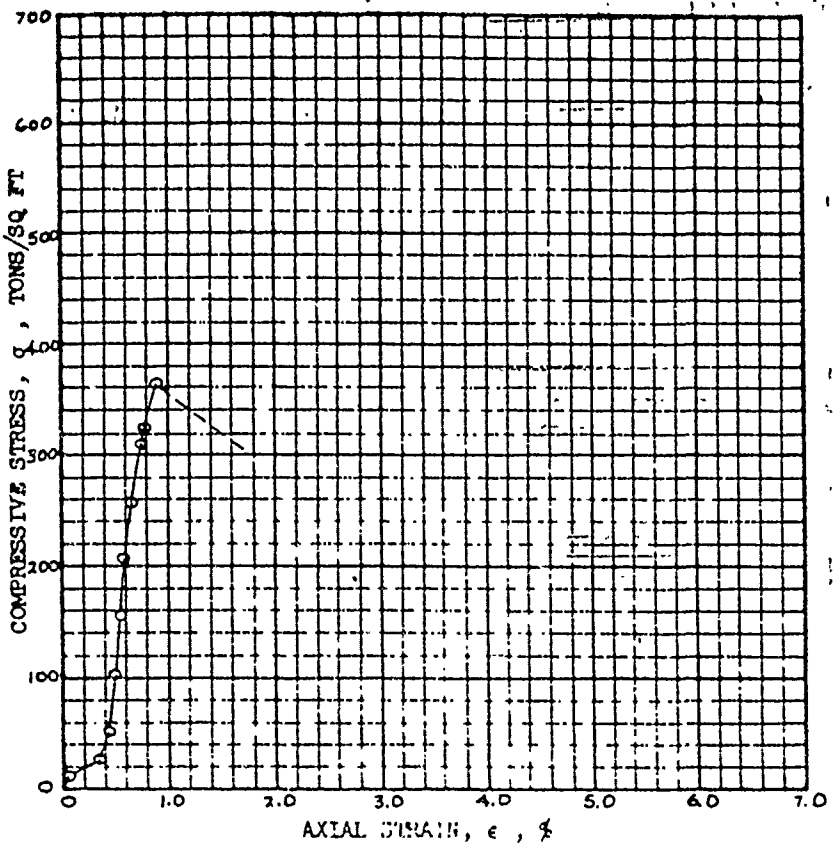


Sketch of specimen after failure

TEST TYPE
(Check one)

☒ Controlled-stress
9,300 lbs/min.

☐ Controlled-strain



Type of specimen: ☒ Undisturbed ☐ Remolded			Test No.	Test No.	Test No.	Test No.
Initial	Water content	w_o	0.2 %	%	%	%
	Void ratio	e_o				
	Saturation	S_o	%	%	%	%
	Dry density, lb/cu ft	γ_d	160			
Time to failure, min		t_f	15			
Unconfined compressive strength, tons/sq ft		q_u	353			
Undrained shear strength, tons/sq ft		s_u	177			
Sensitivity ratio		S_t				

Classification SANDSTONE

LL	PL	PI	G_s

Specimen Diam 6.0 cm / in. | Specimen Height 10.3 cm / in.

Remarks

Project Diarks Dam

~~Area~~ Foundation Material

Boring No. GDC-36 Sample No. M-3816

Depth, ~~ft~~ 340-349 Date OCT 68

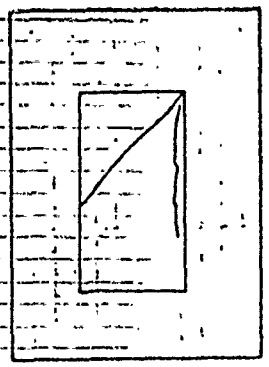
UNCONFINED COMPRESSION TEST REPORT

ENG FORM 3659 1 MAY 63 (TRANSLUCENT)

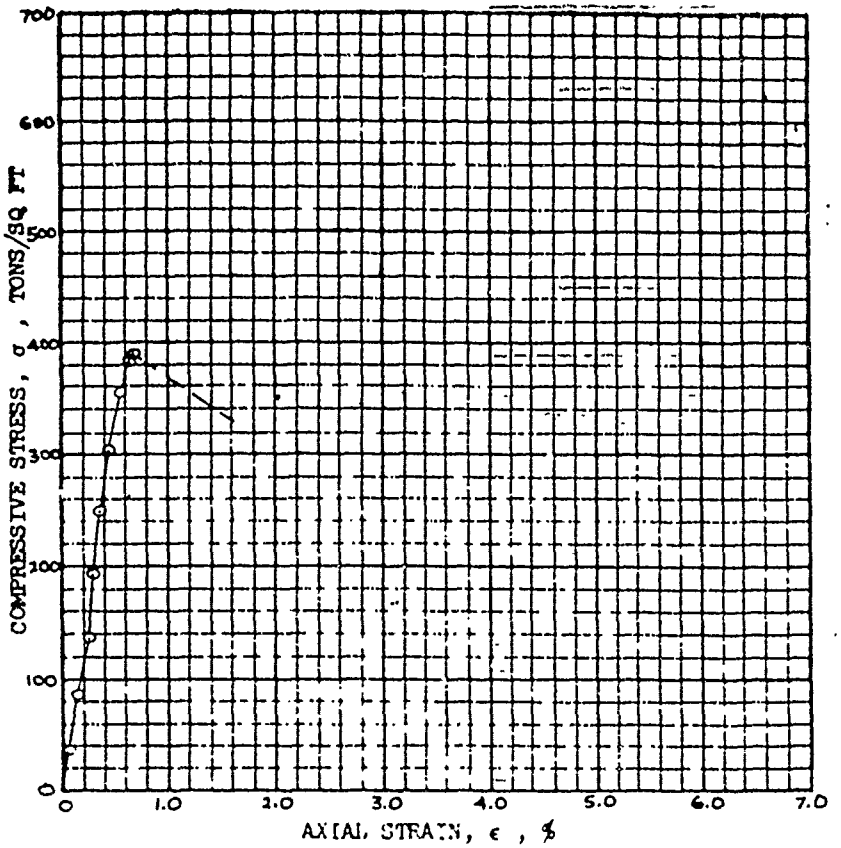
PLATE NO. 5
C 8927

PLATE XI-2(9)

SWDG-Report No 8992



Sketch of specimen after failure



TEST TYPE
(Check one)

[X] Controlled-stress
15,000 lbs/min.

[ ] Controlled-strain

Type of specimen	☒ Undisturbed ☐ Remolded		Test No.	Test No.	Test No	Test No.
Initial	Water content	w_o	0.7 %	%	%	%
	Void ratio	e_o				
	Saturation	S_o	%	%	%	%
	Dry density, lb/cu ft	γ_d	158			
Time to failure, min		t_f	9			
Unconfined compressive strength, tons/sq ft		q_u	3.81			
Undrained shear strength, tons/sq ft		s_u	1.91			
Sensitivity ratio		S_t				

Classification SANDSTONE

LL	PL	PI	G_s

Specimen Diam 5.7 cm in. | Specimen Height 10.3 cm in.

Remarks

Project Dierks Dam

Area Foundation Material

Boring No. GDC-36 Sample No. M-3814

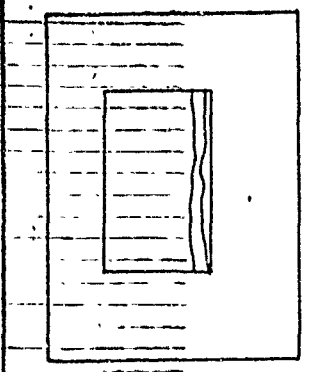
Depth, ft 23.1-24.0 Date OCT 64

UNCONFINED COMPRESSION TEST REPORT

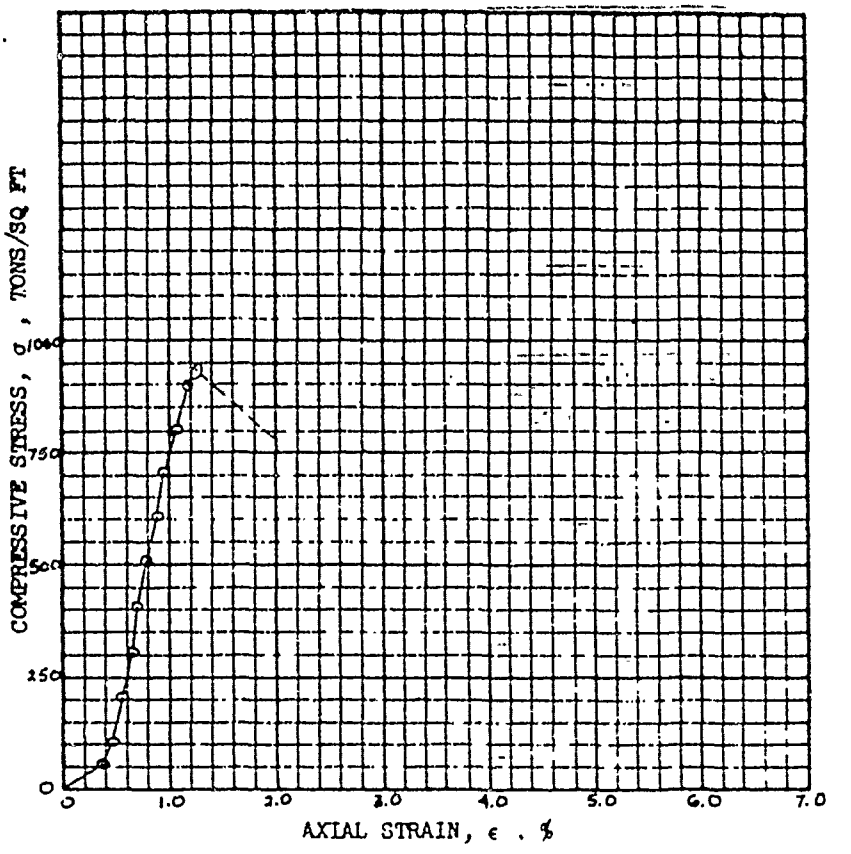
ENG FORM 3699 1 MAY 63 (TRANSLUCENT)

PLATE NO. 4
C 8927

PLATE XI-2 (5)



Sketch of specimen after failure



TEST TYPE
(Check one)

☒ Controlled-stress
15,000 lbs/min.

☐ Controlled-strain

Type of specimen ☒ Undisturbed ☐ Remolded			Test No.	Test No.	Test No.	Test No.
Initial	Water content	w_o	02 %	%	%	%
	Void ratio	e_o				
	Saturation	S_o	%	%	%	%
	Dry density, lb/cu ft	γ_d	161			
Time to failure, min		t_f	25			
Unconfined compressive strength, tons/sq ft		q_u	905			
Undrained shear strength, tons/sq ft		s_u	453			
Sensitivity ratio		S_t				

Classification SANDSTONE

LL	PL	PI	G_s

Specimen Diam 6.0 cm / in. | Specimen Height 9.9 cm / in.

Remarks

Project Clarks Dam

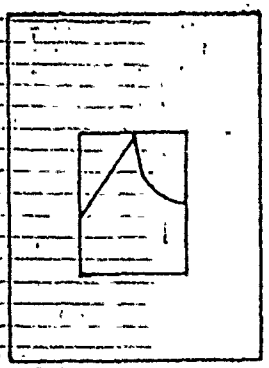
Area Foundation Material

Boring No. GD2C-17 Sample No. M-3833

Depth, ft 41.9 - 42.8 Date 10-84

UNCONFINED COMPRESSION TEST REPORT

SWDCL Report No 8932

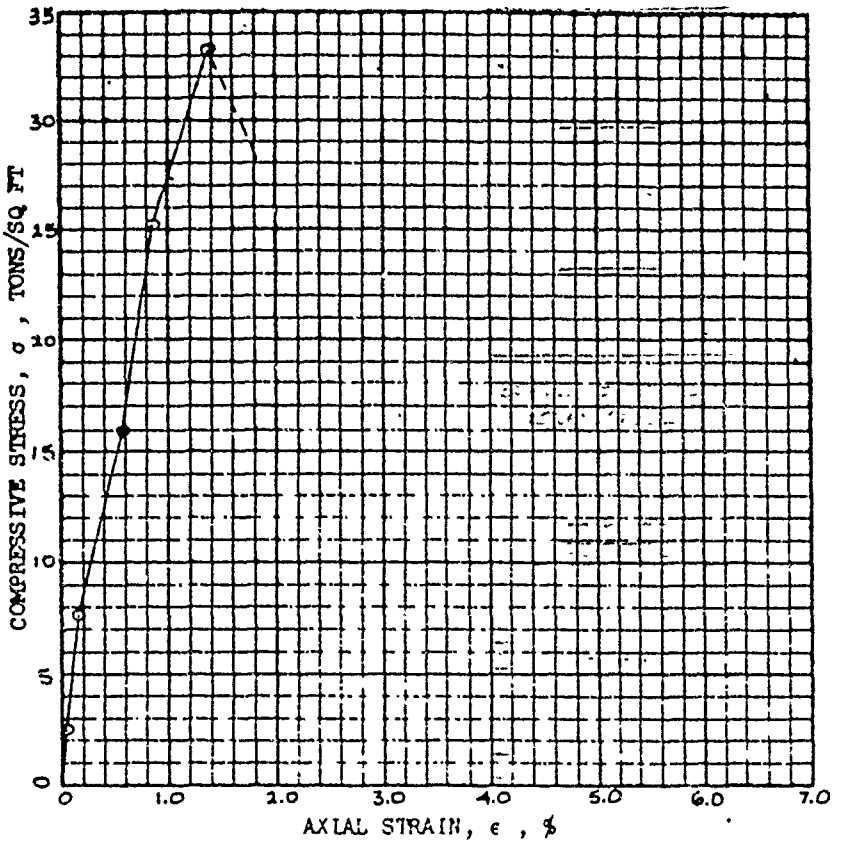


Sketch of specimen after failure

TEST TYPE
(Check one)

[X] Controlled-stress
1,500 lbs/min.

[ ] Controlled-strain



Type of specimen [X] Undisturbed [ ] Remolded			Test No.	Test No.	Test No.	Test No.
Initial	Water content	w_o	4.2 %	%	%	%
	Void ratio	e_o				
	Saturation	S_o	%	%	%	%
	Dry density, lb/cu ft	γ_d	144			
Time to failure, min		t_f	9			
Unconfined compressive strength, tons/sq ft		q_u	31.4			
Undrained shear strength, tons/sq ft		s_u	16.7			
Sensitivity ratio		S_t				

Classification SANDSTONE

LL	PL	PI	G_s

Specimen Diam 6.0 cm / in. | Specimen Height 7.8 cm / in.

Remarks

Project Dierks Dam

~~Area~~ Foundation Material

Boring No. GD2C-17 Sample No. M-3104

Depth, ~~ft~~ 11.4 - 12.3 Date OCT 64

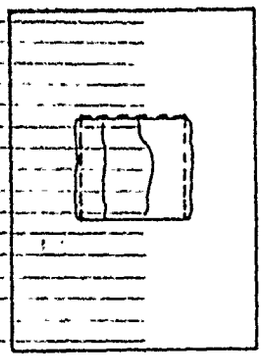
UNCONFINED COMPRESSION TEST REPORT

ENG FORM 3659 1 MAY 63 (TRANSLUCENT)

PLATE NO. 2
C 8927

PLATE XI-2

SWDGL Report No. 9125

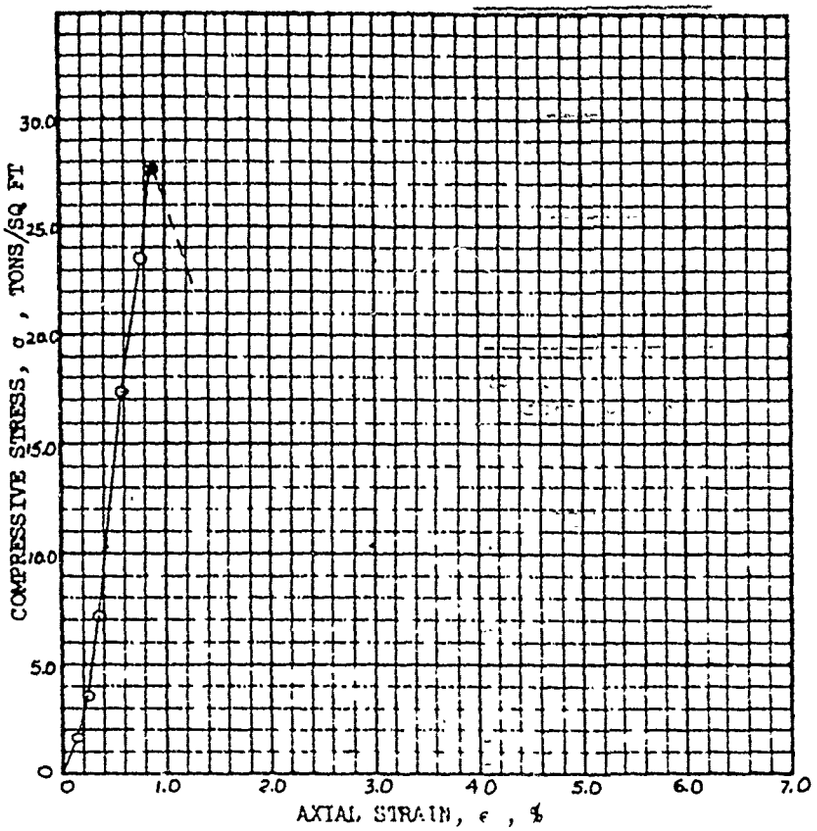


Sketch of specimen after failure

TEST TYPE
(Check one)

☑ Controlled-stress
232 lbs/min.

☐ Controlled-strain



Type of specimen ☑ Undisturbed ☐ Remolded			Test No.	Test No.	Test No.	Test No.
Initial	Water content	w_o	9.9 %	%	%	%
	Void ratio	e_o				
	Saturation	S_o	%	%	%	%
	Dry density, lb/cu ft	γ_d	133			
Time to failure, min		t_f	48			
Unconfined compressive strength, tons/sq ft		q_u	23.2			
Undrained shear strength, tons/sq ft		s_u	11.6			
Sensitivity ratio		S_t				

Classification SHALE

LL	PL	PI	G_s

Specimen Diam 6.0 cm in. | Specimen Height 5.9 cm in.

Remarks

Project Dierks Dam

Area Foundation Rock

Boring No. GC-13A Sample No. M-5069

Depth, ft 16.6-17.4 Date DEC 64

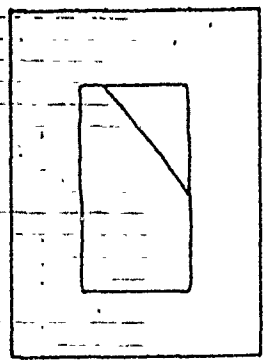
UNCONFINED COMPRESSION TEST REPORT

ENG FORM 3659 1 MAY 63 (TRANSLUCENT)

PLATE NO. 1 PLATE XI-2

C 8927

SWDGL Report 2609

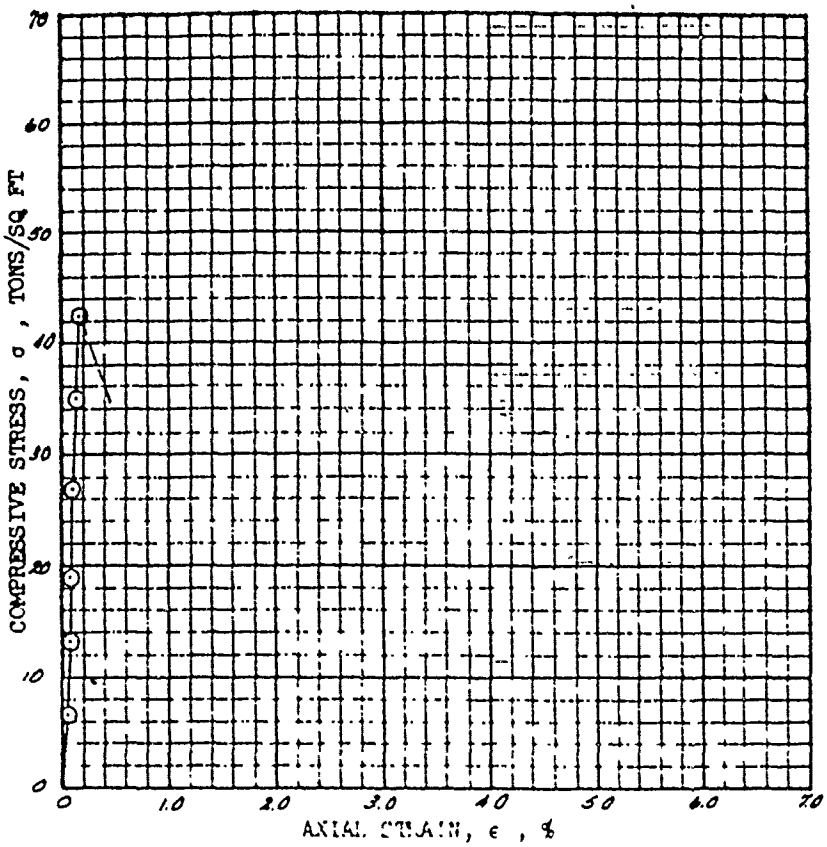


Sketch of specimen after failure

TEST TYPE
(Check one)

☑ Controlled-stress
Rate, 1.6 psi/sec

☐ Controlled-strain



Type of specimen ☑ Undisturbed ☐ Remolded		Test No.	Test No.	Test No.	Test No.
Initial: Water content	w_o	4.4 %	%	%	%
Initial: Void ratio	e_o				
Initial: Saturation	S_o	%	%	%	%
Initial: Dry density, lb/cu ft	γ_d	150			
Time to failure, min	t_f	6			
Unconfined compressive strength, tons/sq ft	q_u	41.8			
Undrained shear strength, tons/sq ft	s_u	20.9			
Sensitivity ratio	S_t				

Classification SHALE

LL	PL	PI	G_s

Specimen Diam 4.0 cm / in.	Specimen Height 7.5 cm / in.

Remarks SHALE, black; contains gray, hard, well cemented fine grained sandstone bands from hairline to 2" size, at 1/2" to 3" intervals. Bedding dip is about 60°.

Project Dierks Dam

Area Foundation Material

Boring No. 190 Sample No. M-11,767

Depth, ft 70 Date SEP 65

UNCONFINED COMPRESSION TEST REPORT

ENG 1 MAY 63 3659 (TRANSLUCENT)

C 8927

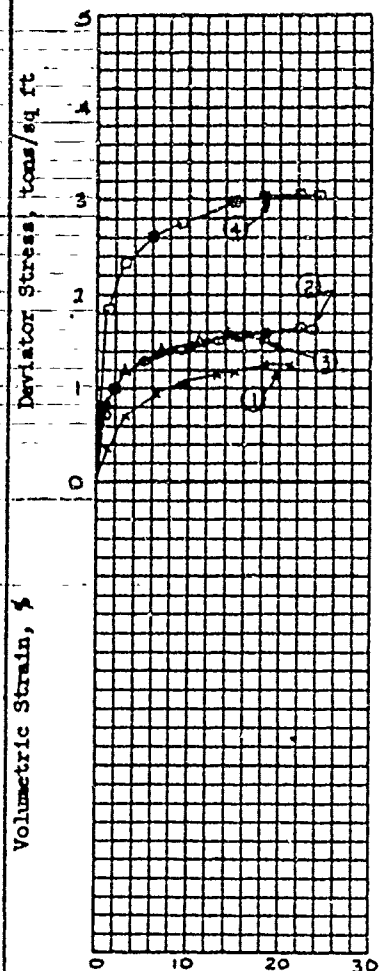
PLATE XI-2 (9)
Plate No.

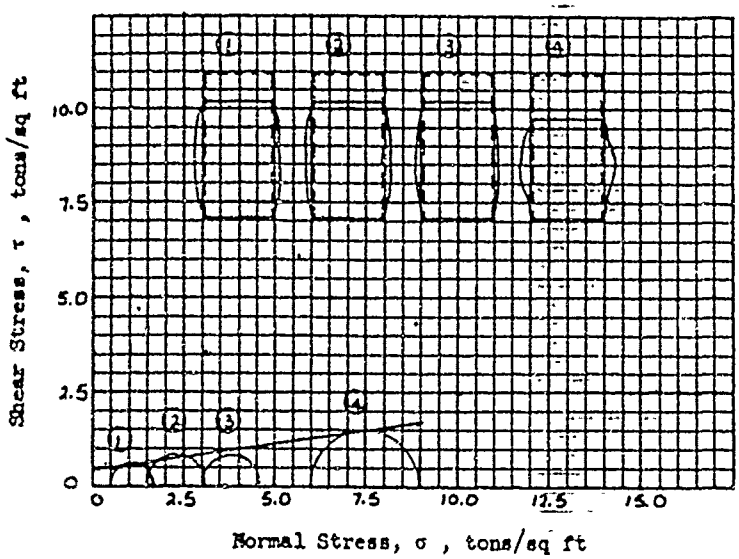
APPENDIX D

FOUNDATION MATERIALS

SECTION 2. Q TRIAXIAL TESTS

SWDGL Report No. 8992





Test No.			①	②	③	④
Initial	Water content	w_o	16.9 %	17.2 %	17.5 %	16.5 %
	Void ratio	e_o	.480	.508	.523	.485
	Saturation	S_o	94 %	90 %	89 %	91 %
	Dry density lb/cu ft	γ_d	112.2	110.1	109.0	111.8
Before Test	Water content	w_c	%	%	%	%
	Saturation	S_c	%	%	%	%
	Consolidation press., tons/sq ft	σ_c				
	Void ratio	e_c				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Major principal stress, tons/sq ft		σ_1	1.68*	3.05*	4.57	8.99*
Minor principal stress, tons/sq ft		σ_3	0.5	1.5	3.0	6.0
Time to failure, min			23*	23*	21	23*
Initial diameter, cm in			1.4	1.4	1.4	1.4
Initial height, H_o, cm in			3.0	2.9	3.0	3.0

Shear Values

ϕ = 8.1 °

tan ϕ = .142

c = 0.4 tons/sq ft

Type Test: Q

Method of Saturation _____ ☐ Controlled Stress ☒ Controlled Strain

Type of specimen UNDISTURBED Rate of strain 0.02 in./min

Classification Silty SAND (SM)

LL NP | PL NP | PI NP | ~~D_{10}~~ G 2.66

Remarks * At 15% strain

Project Dierks Dam

~~Area~~ Foundation Material

Boring No.. GD1C-11 | Sample No. M-2901*

Depth ~~ft~~ 5.0 - 7.0 | Date OCT 64

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 MAY 63 2089 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

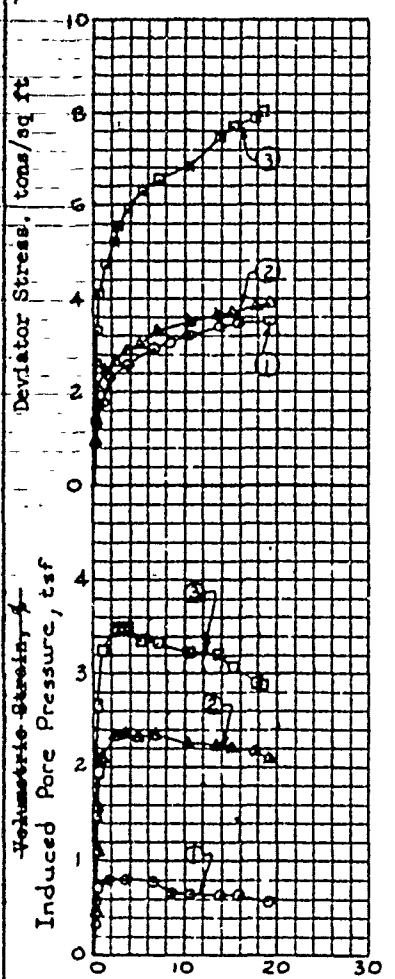
PLATE NO. 8 0 3426

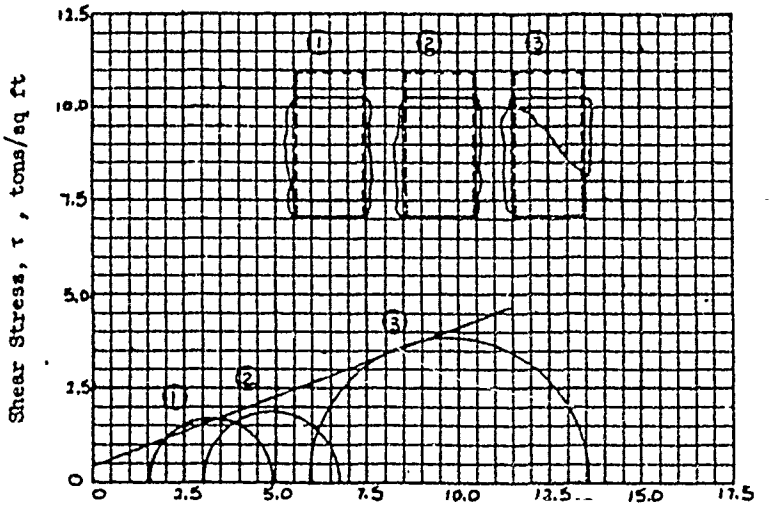
APPENDIX D

FOUNDATION MATERIALS

SECTION 3. R TRIAXIAL TESTS

SWDGI Report No 8992





Shear Values

ϕ = 20.2 °

tan ϕ = .367

c = 0.5 tons/sq ft

Test No.			①	②	③	
Initial	Water content	w_o	17.9 %	17.9 %	16.3 %	%
	Void ratio	e_o	.523	.549	.498	
	Saturation	S_o	91 %	87 %	87 %	%
	Dry density lb/cu ft	γ_d	109.0	107.2	110.9	
Before Test	Water content	w_c	16.6 %	16.1 %	15.4 %	%
	Saturation	S_c	100 %	100 %	100 %	%
	Consolidation press., tons/sq ft	σ_c	1.55	3.05	5.95	
	Void ratio	e_c	.441	.427	.410	
Final	Water content	w_f	16.6 %	16.1 %	15.4 %	%
	Void ratio At Failure	e_f	.441	.427	.410	
Major principal stress, tons/sq ft		σ_1	4.95*	6.73*	13.54*	
Minor principal stress, tons/sq ft		σ_3	1.55	3.05	5.95	
Time to failure, min			205*	230*	235*	
Initial diameter, ~~cm~~ in			1.4	1.4	1.4	
Initial height, H_o, ~~cm~~ in			3.0	3.0	3.0	

Type Test R

Method of Saturation Back Pressure ☐ Controlled Stress ☑ Controlled Strain

Type of specimen UNDISTURBED Rate of strain 0.002 (nominal) in./min

Classification Silty SAND (SM)

LL NP PL NP PI NP D_{10} G 2.66

Remarks *At 15% strain

Project Dix River Dam

Area Foundation Material

Boring No. 602C-11 Sample No. M-2901

Depth ~~Ft~~ 5.0 - 7.0 Date 8-7-64

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PLATE NO. 9

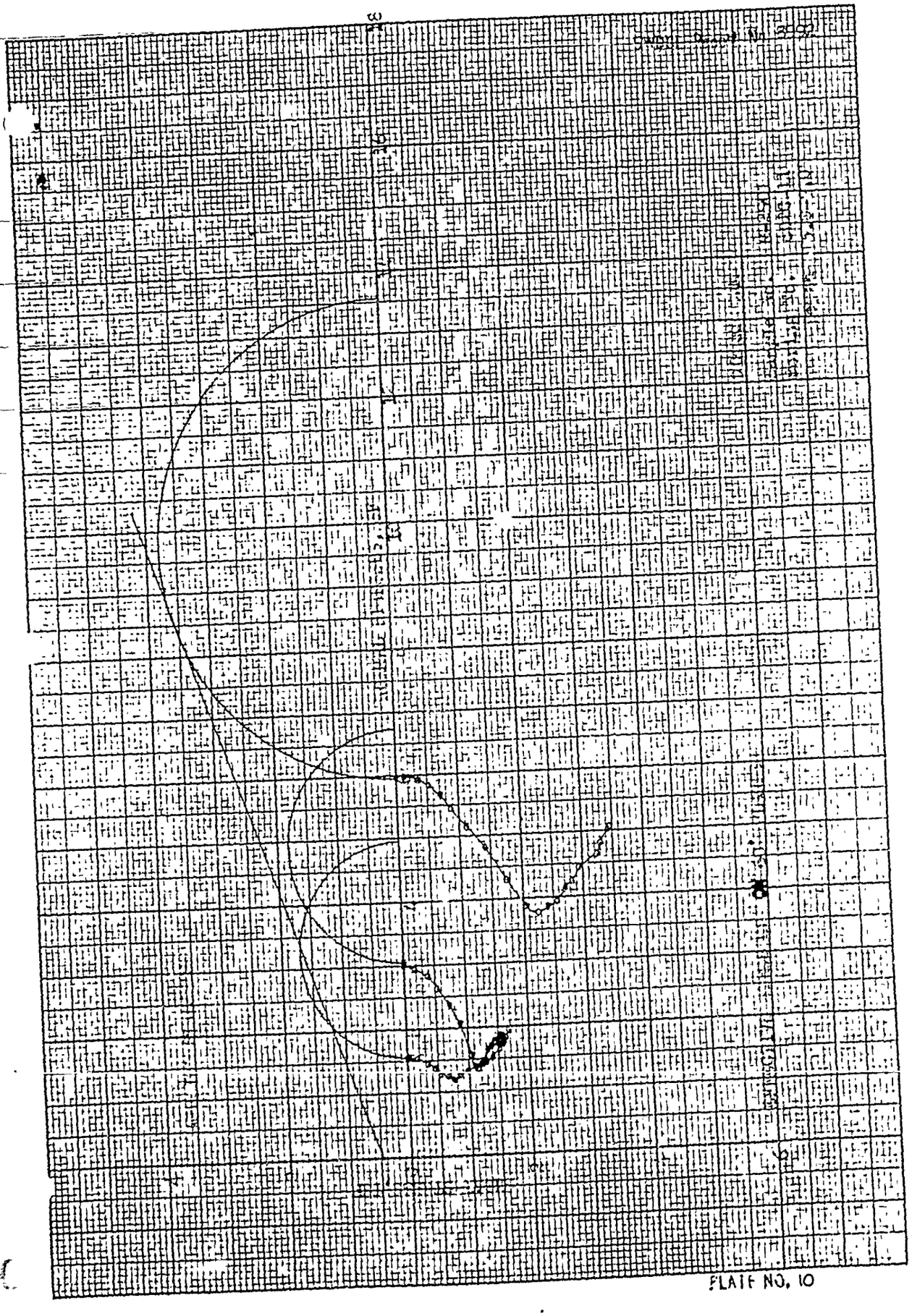


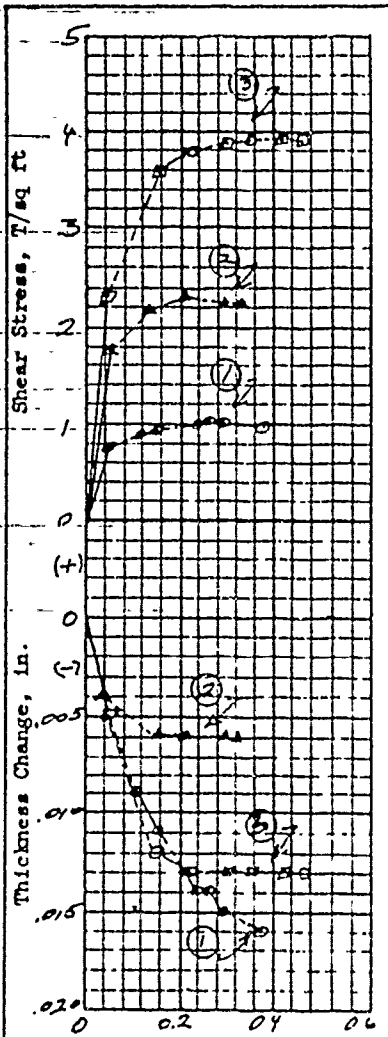
PLATE NO. 10

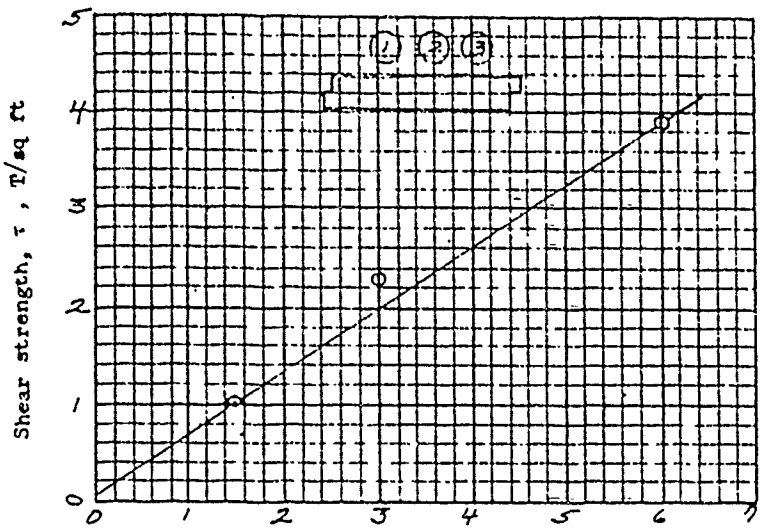
APPENDIX D

FOUNDATION MATERIALS

SECTION 4. DIRECT SHEAR TESTS

SWDGL Record No 8992





Test No.			(1)	(2)	(3)	
Initial	Water content	w_o	15.2 %	16.2 %	15.8 %	%
	Void ratio	e_o	.521	.546	.525	
	Saturation	S_o	80 %	79 %	80 %	%
	Dry density lb/cu ft	γ_d	109.2	107.4	108.9	
Void ratio after consolidation		e_c				
Time for 50% consolidation, min		t_{50}	—	—	< 1	
Final	Water content	w_f	14.5 %	14.9 %	14.5 %	%
	Void ratio	e_f				
	Saturation	S_f	%	%	%	%
Actual time to failure, min.		t_f	3100	1900	4365	
Normal stress T/sq ft		σ	1.5	3.0	6.0	
Maximum shear strength, T/sq ft		τ	1.02	2.28	3.69	

Shear Values

ϕ' = 32.6

tan ϕ' = .638

c' = 0.1

Test Type (Check One) ☐ Controlled, stress ☑ Controlled, strain

Type of Specimen UNDISTURBED | 3.0 in. Square | 0.5 in. Thickness

Classification silty SAND (SM)

LL NP | PL NP | PI NP | Dry 6-266

Remarks

Rate of shear: Test 1, .000009 in/min.
2, .0001 in/min.
3, .0001 in/min.

Project Dicks Dam

Area Foundation Material

Boring No. 602C-11 | Sample No M-2901

Depth 50-70 | Date OCT 64

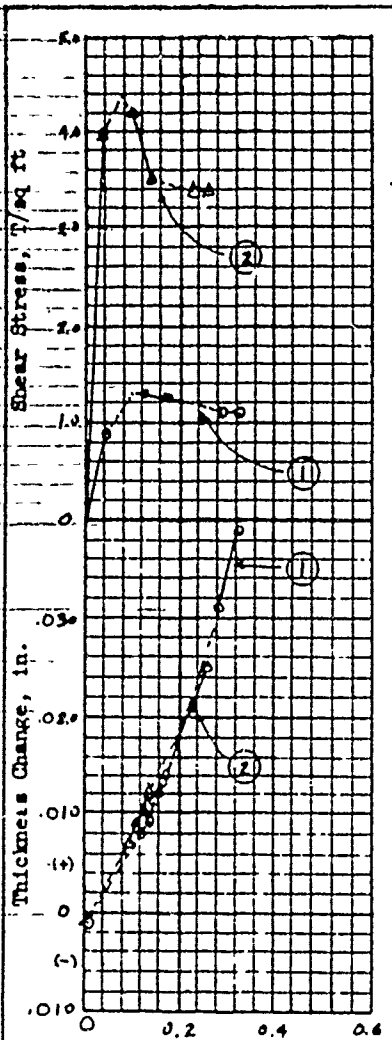
DIRECT SHEAR TEST REPORT

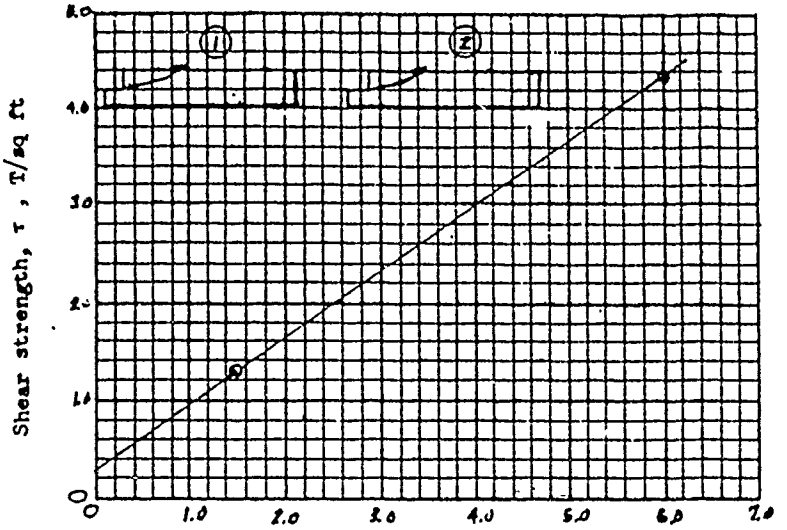
ENG FORM 2092 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PLATE NO 11 C 3437

13

SWDGL Report NO 9125





Test No.			①	②		
Initial	Water content	w_o	8.3 %	8.7 %	%	%
	Void ratio	e_o	.250	.263		
	Saturation	S_o	91 %	92 %	%	%
	Dry density lb/cu ft	γ_d	1368	1354		
Void ratio after consolidation		e_c				
Time for 50% consolidation, min		t_{50}				
Final	Water content	w_f	9.4 %	9.7 %	%	%
	Void ratio	e_f				
	Saturation	S_f	%	%	%	%
Actual time to failure, min.		t_f	900	900		
Normal stress T/sq ft		σ	1.5	6.0		
Maximum shear strength, T/sq ft		τ	1.28	4.35		

Shear Values

ϕ' = 34.3°

tan ϕ' = .681

c' = 0.3

Test Type (Check One) ☐ Controlled, stress ☑ Controlled, strain, 0.0001 in/min. (nominal)

Type of Specimen UNDISTURBED | 3.0 in. Square | 0.8 in. Thickness

Classification SHALE

LL 36 | PL 20 | PI 16 | ~~Bulk~~ G 2.74

Remarks

Project Dierke Dam

Area Foundation material

Boring No. 66-13A | Sample No. M-5070

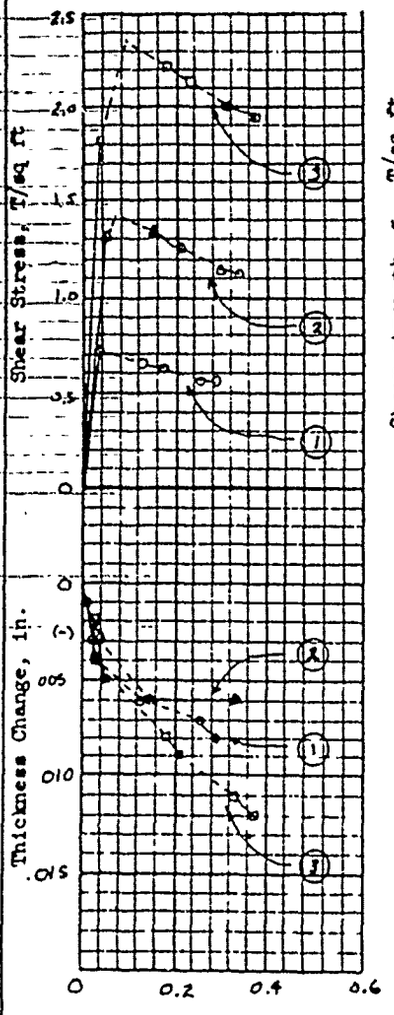
Depth ~~Ft~~ 18.3-19.0 | Date DEC 6

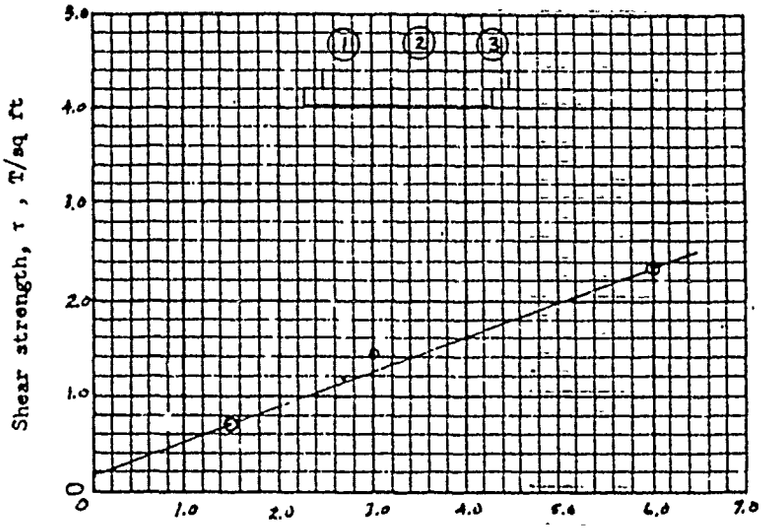
DIRECT SHEAR TEST REPORT

ENG FORM 1 MAY 63 2092 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) PLATE NO.2 C 3437

4

SWDGL Report No 9125





Test No.			①	②	③	
Initial	Water content	w_o	18.1 %	17.5 %	19.7 %	%
	Void ratio	e_o	.628	.650	.677	
	Saturation	S_o	80 %	72 %	81 %	%
	Dry density lb/cu ft	γ_d	106.2	104.8	103.1	
Void ratio after consolidation		e_c				
Time for 50% consolidation, min		t_{50}	—	—	1	
Final	Water content	w_f	25.5 %	24.2 %	22.0 %	%
	Void ratio	e_f				
	Saturation	S_f	%	%	%	%
Actual time to failure, min.		t_f	365	700	1200	
Normal stress T/sq ft		σ	1.6	3.0	6.0	
Maximum shear strength, T/sq ft		τ	0.71	1.41	2.35	

Shear Values

ϕ' = 20.0°

tan ϕ' = .364

c' = 0.2

Test Type (Check One) ☐ Controlled, stress ☑ Controlled, strain, 0.001 in./min (nominal)

Type of Specimen UNDISTURBED 3.0 in. Square 0.5 in. Thickness

Classification CLAY (CH) (weathered shale)

LL 54 PL 24 PI 30 G 2.77

Remarks

Project Dierks Dam

Area Foundation Materials

Boring No. BC-32-A Sample No. M-5075

Depth 2.5 – 3.5 Date 12-14

DIRECT SHEAR TEST REPORT

ENG FORM 2092 1 MAY 61 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PLATE NO 3 C 3457

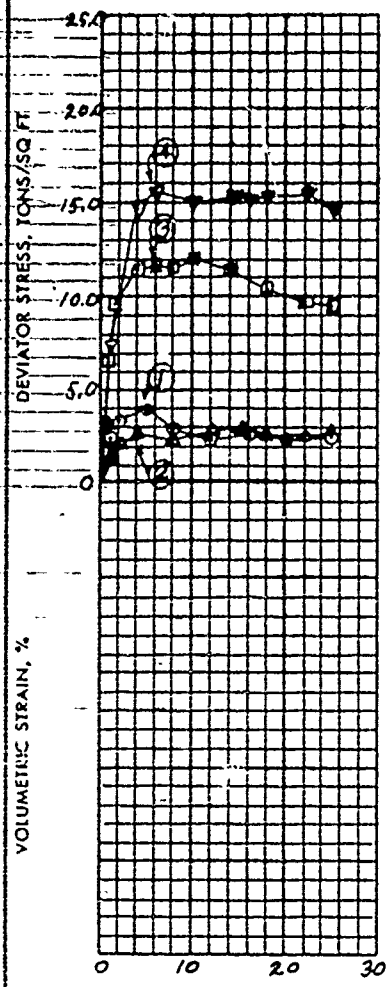
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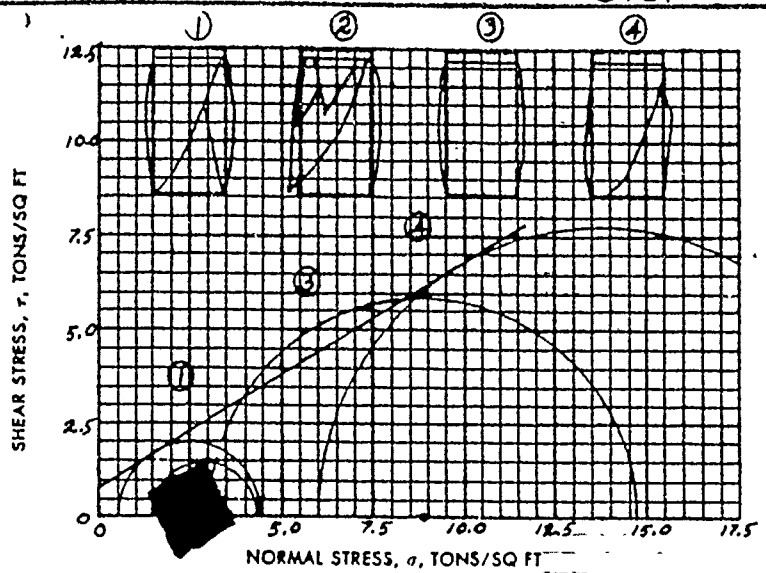
APPENDIX E

COMPACTED MATERIALS

SECTION 1. Q TRIAXIAL TESTS

SWDGL Report 9467





SHEAR VALUES

ϕ = 30.9 °

TAN ϕ = 600

c = 0.8 TONS/SQ FT

TEST NO			①	②	③	④
INITIAL	WATER CONTENT	w_o	11.5 %	11.6 %	11.5 %	11.6 %
	VOID RATIO	e_o	.426	.424	.410	.431
	SATURATION	S_o	72 %	73 %	75 %	72 %
	DRY DENSITY LB/CU FT	γ_d	116.9	117.0	118.2	116.3
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c				
	VOID RATIO	e_c		–		
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	4.49	4.29	14.65	21.62
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE MIN			9	8	12	13
INITIAL DIAMETER cm / IN			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, cm / IN			3.0	3.0	3.0	3.0

TYPE TEST Q

METHOD OF SATURATION _____ ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN .015 IN/MIN

CLASSIFICATION CLAY, sandy (CL-ML)

LL 21 PL 15 PI 6 G_s 2.67

REMARKS

PROJECT Dierks Dam

AREA Borrow Material

BORING NO. BA-200 (B,W) SAMPLE NO M-12,496

DEPTH FT 0.0-3.0 DATE NOV 65

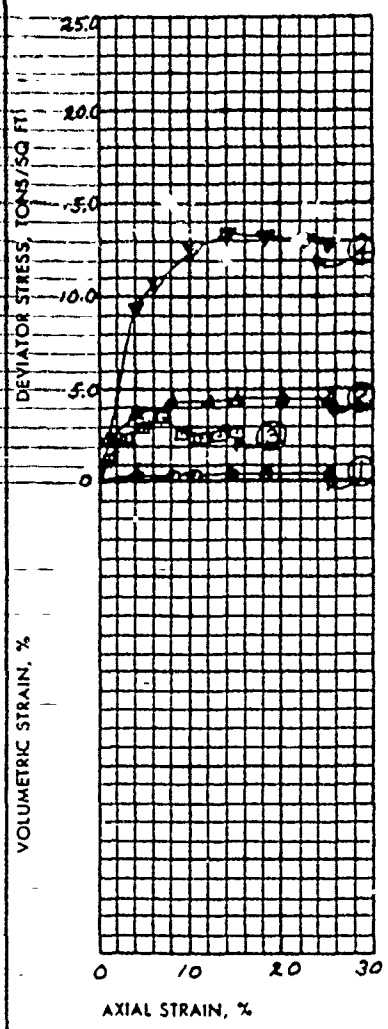
TRIAXIAL COMPRESSION TEST REPORT

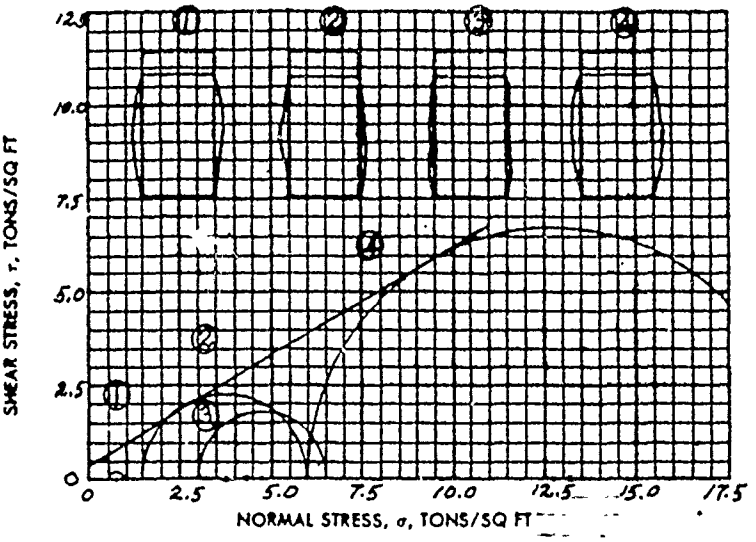
ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

GPO 1964 OF—714-729

Plate No. 15 (4)

SWDGL Report 9467





SHEAR VALUES

φ = 20.0 °

TAN φ = .377

c = 0.4 TONS/SQ FT

TEST NO.			①	②	③	④
INITIAL	WATER CONTENT	w_o	14.9%	14.3%	14.6%	14.6%
	VOID RATIO	e_o	.514	.501	.505	.507
	SATURATION	S_o	77 %	76 %	77 %	77 %
	DRY DENSITY LB/CU FT	γ_d	110.1	111.1	110.8	110.6
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	0.92	5.94*	647	19.40
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN			22	21*	17	25
INITIAL DIAMETER, cm IN			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, cm IN			3.0	3.0	30	30

TYPE TEST Q

METHOD OF SATURATION _____ ☐ CONTROLLED STRESS ☑ CONTROLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN .02 IN./MIN

CLASSIFICATION CLAY, sandy (CL-ML)

LL 21 PL 15 PI 6 Sp. G_s 2.67

REMARKS * At 15% strain

PROJECT Dierks Dam

AREA Borrow Material

BORING NO. BA-200 SAMPLE NO. M-12,496 (95', W73)

DEPTH 0.0 - 3.0 DATE NOV 65

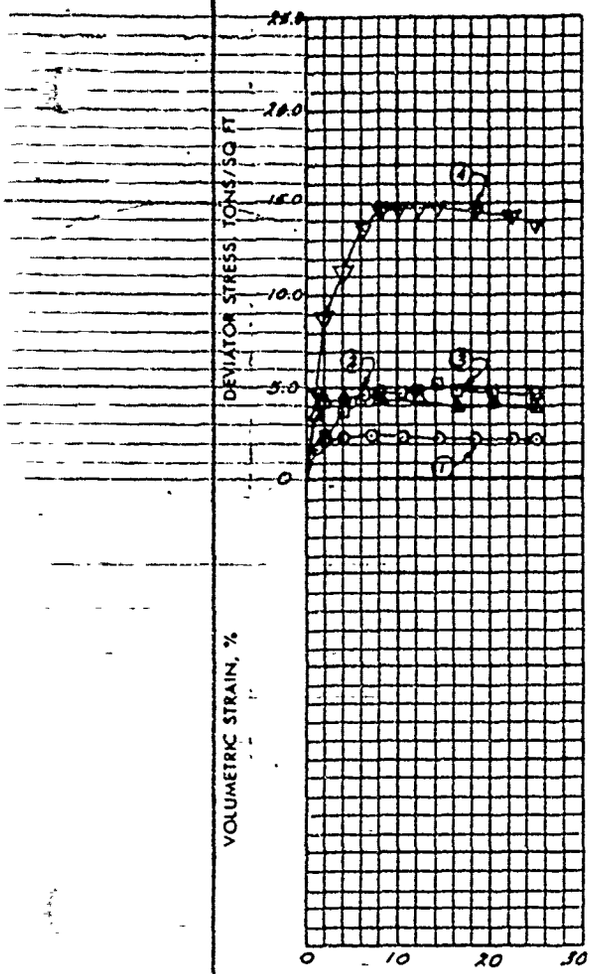
TRIAXIAL COMPRESSION TEST REPORT

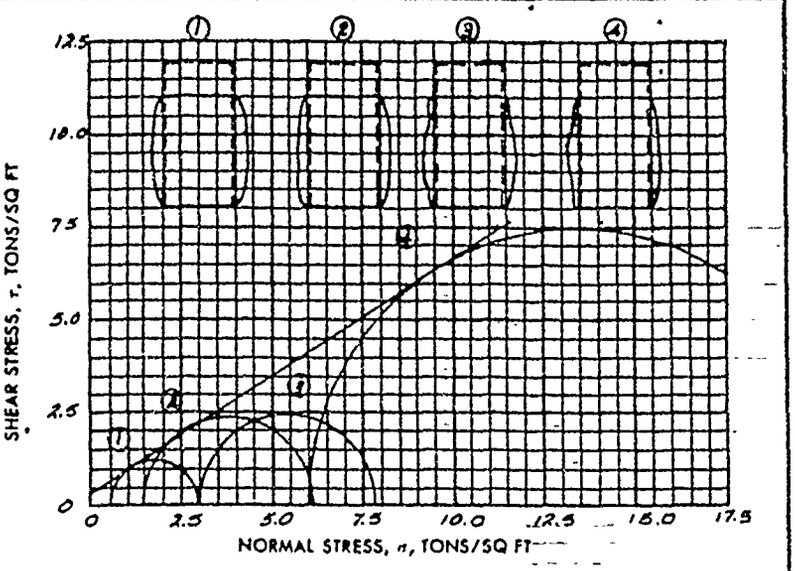
ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

GPO 1964 O-714-729

Plate No. 16 (4-5)

SWDGL Report 9467





SHEAR VALUES

ϕ = 32.0 °

TAN ϕ = .625

c = 0.4 TONS/SQ FT

TEST NO			①	②	③	④
INITIAL	WATER CONTENT	w_o	11.7 %	11.8 %	11.6 %	11.8 %
	VOID RATIO	e_o	.513	.506	.500	.514
	SATURATION	S_o	61 %	62 %	62 %	61 %
	DRY DENSITY LB/CU FT	γ_d	110.2	110.7	111.1	110.1
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	2.96	6.12	7.81	20.84
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN			15	13	18	28
INITIAL DIAMETER, cm IN			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, cm IN			3.0	3.0	3.0	3.0

TYPE TEST Q

METHOD OF SATURATION _____ ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN .015 IN/MIN

CLASSIFICATION CLAY, sandy (CL-ML)

LL 21 PL 15 PI 6 G_s 2.67

REMARKS

PROJECT Dierks Dam

AREA Borrow Material

BORING NO. BA-200 SAMPLE NO. (958, W) M-12,490

DEPTH FT 0.0-3.0 DATE NOV 65

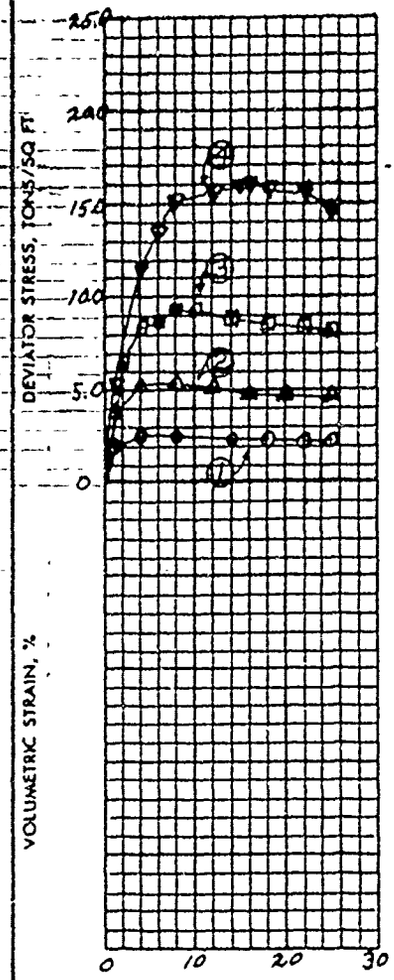
TRIAXIAL COMPRESSION TEST REPORT

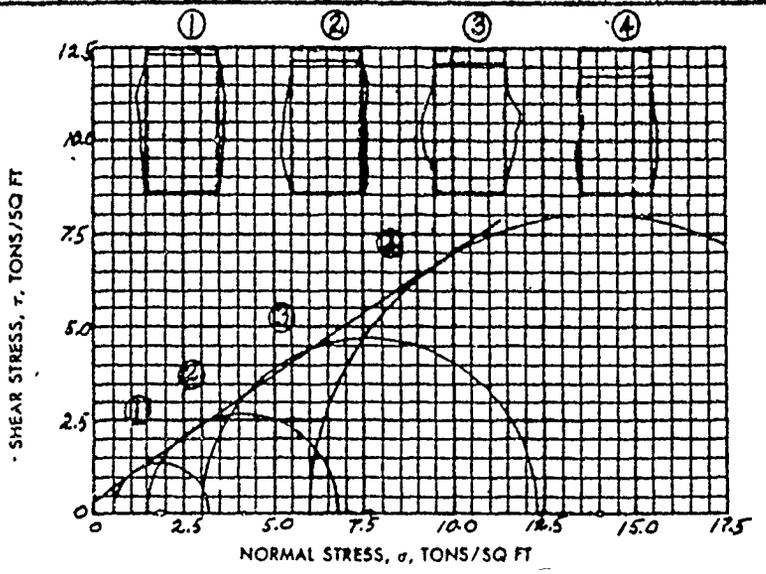
ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO 1964 OF-714-729

(47)

Plate No. 17

SWDGL Report 9467





SHEAR VALUES

ϕ = 33.2°

TAN ϕ = .654

c = 0.4 TONS/SQ FT

TEST NO			①	②	③	④
INITIAL	WATER CONTENT	w_o	8.7 %	8.6 %	8.7 %	8.5 %
	VOID RATIO	e_o	.505	505	.505	.504
	SATURATION	S_o	46 %	45 %	46 %	45 %
	DRY DENSITY LB/CU FT	γ_d	110.7	110.7	110.7	110.8
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	3.19	6.74	12.26	21.98 *
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN			8	16	14	33 *
INITIAL DIAMETER, CM IN			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, CM IN			3.0	3.0	3.0	3.0

TYPE TEST Q

METHOD OF SATURATION _____ ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN .015 IN/MIN

CLASSIFICATION CLAY, sandy (CL-ML)

LL 21 PL 15 PI 6 G_s 2.67

REMARKS * At 15% strain

PROJECT Dierks Dam

AREA Borrow Material

BORING NO. 8A-200 SAMPLE NO M-12,496 (958, W-3)

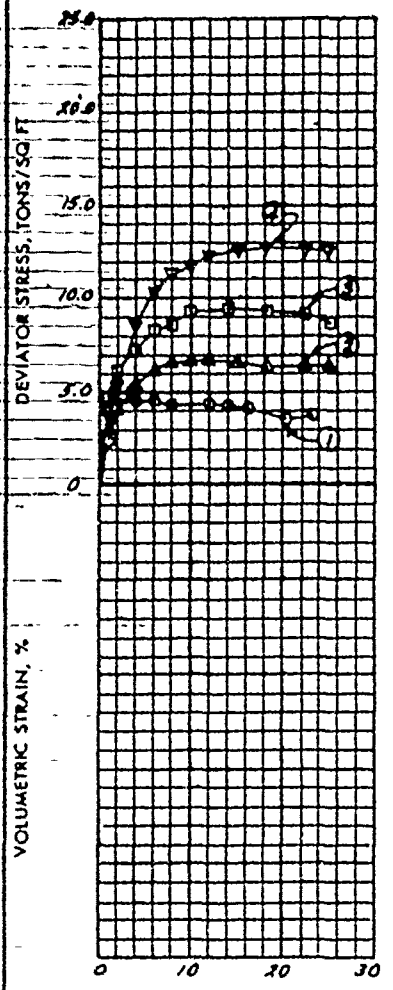
DEPTH 0.0 - 3.0 DATE NOV 65

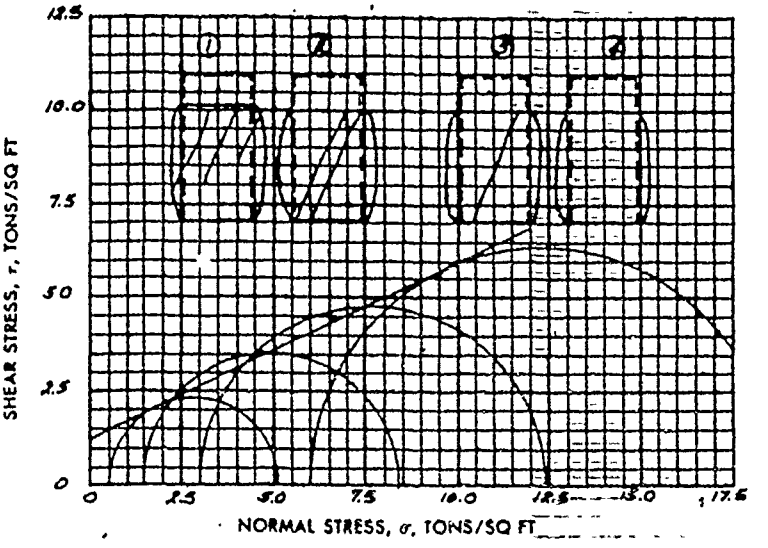
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

GPO 1966 O-714-789

Plate No. 18 (48)





TEST NO			(1)	(2)	(3)	(4)
INITIAL	WATER CONTENT	w_o	12.8 %	12.8 %	12.8 %	12.8 %
	VOID RATIO	e_o	.447	.442	.433	.450
	SATURATION	S_o	77 %	78 %	80 %	77 %
	DRY DENSITY LB/CU FT	γ_d	116.0	116.5	117.2	115.8
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	5.09	8.35	12.47	18.73 *
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN			7	20	23	25 *
INITIAL DIAMETER, D_o, IN			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, IN			3.0	3.0	3.0	3.0

SHEAR VALUES

ϕ = 25.2°

TA = 470

c = .12 TONS/SQ FT

TYPE TEST Q

METHOD OF SATURATION _____ ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.02 IN/MIN

CLASSIFICATION CLAY. (CL)

LL 30 PL 14 PI 16 G_s 2.69

REMARKS * At 15% Strain

PROJECT Dierks Dam

AREA Borrow Material

BORING NO. BA-203 SAMPLE NO. (T, W) M-12,500

DEPTH 20-30 DATE NOV 65

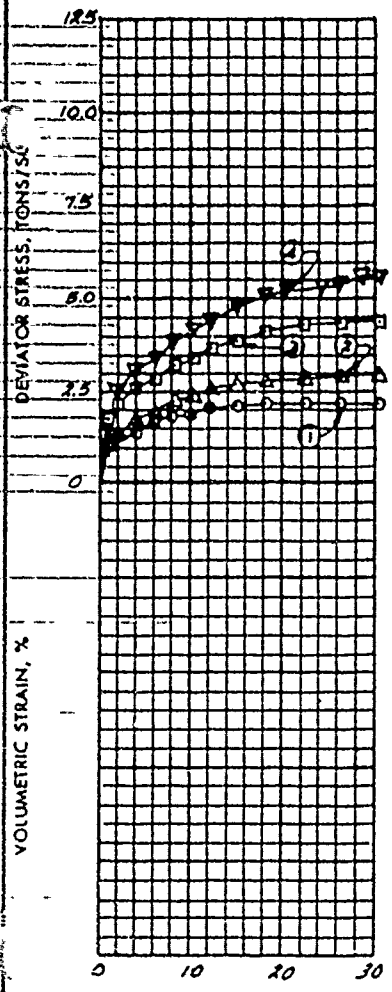
TRIAXIAL COMPRESSION TEST REPORT

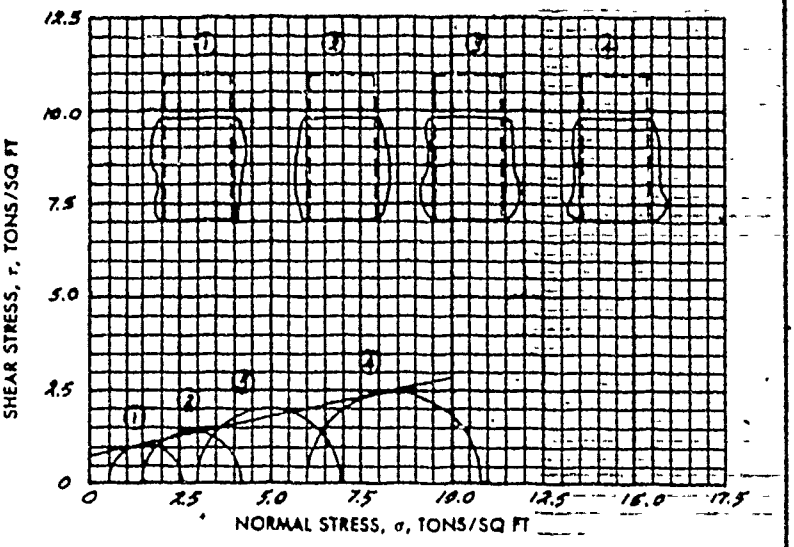
ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

GPO 1964 OP-716-129

Plate No. 19

SWDGL Report 9407





SHEAR VALUES

φ = 11.4 °

TAN φ = .202

c = 0.7 TONS/SQ FT

TEST NO			①	②	③	④
INITIAL	WATER CONTENT	w_o	15.9 %	15.9 %	15.8 %	15.7 %
	VOID RATIO	e_o	.525	.522	.515	.528
	SATURATION	S_o	81 %	82 %	83 %	80 %
	DRY DENSITY LB/CU FT	γ_d	110.1	110.3	110.9	109.9
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	2.57 *	4.20 *	6.92 *	10.78 *
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN			29 *	29 *	29 *	29 *
INITIAL DIAMETER, cm IN			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, cm IN			3.0	3.0	3.0	3.0

TYPE TEST Q

METHOD OF SATURATION _____ ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.015 IN./MIN

CLASSIFICATION CLAY (CL)

LL 30 PL 14 PI 16 G_s 2.69

REMARKS * At 15% Strain

PROJECT Dierks Dam

AREA Borrow Material

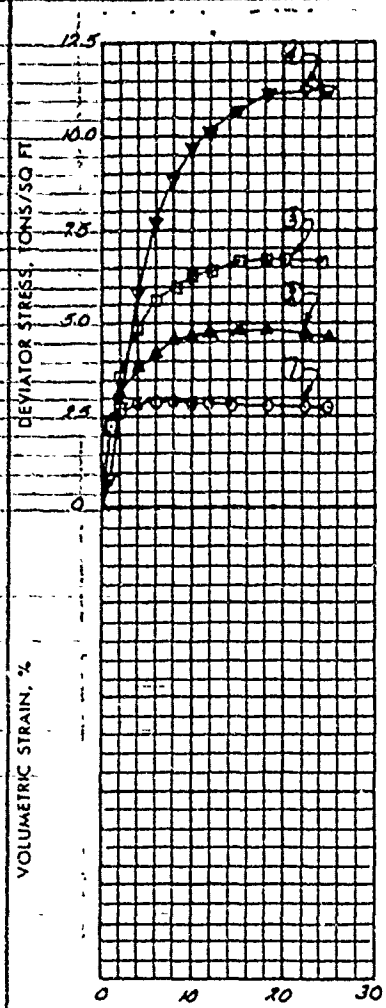
BORING NO. BA-203 SAMPLE NO. (95 1, ω+3) M-12,500

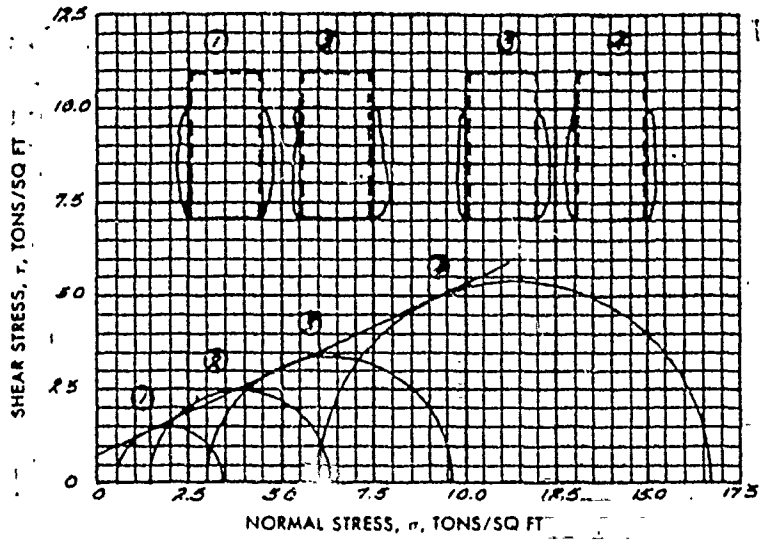
DEPTH ft 0.0 - 3.0 DATE NOV 65

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) 696 1964 OF—714-789

Plate No 50





SHEAR VALUES

ϕ = 24.4°

TAN ϕ = .454

c = 0.7 TONS/SQ FT

TEST NO			①	②	③	④
INITIAL	WATER CONTENT	w_o	12.9 %	12.9 %	12.9 %	12.9 %
	VOID RATIO	e_o	.526	.525	.521	.532
	SATURATION	S_o	66 %	66 %	67 %	65 %
	DRY DENSITY LB/CU FT	γ_d	110.0	110.1	110.4	109.6
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	3.48	6.31 *	9.61 *	10.69 *
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE MIN			14	24 *	24 *	24 *
INITIAL DIAMETER, CM IN			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, CM IN			3.0	3.0	3.0	3.0

TYPE TEST Q

METHOD OF SATURATION _____ ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.02 IN/MIN

CLASSIFICATION CLAY (CL)

LL	PL	PI	G_s
30	14	16	6 2.69

REMARKS * At 15% Strain

PROJECT Dierks Dam

AREA Borrow Material

BORING NO. BA-203 SAMPLE NO (95#, W) M-12,500

DEPTH FT 0.0-3.0 DATE NOV 65

TRIAXIAL COMPRESSION TEST REPORT

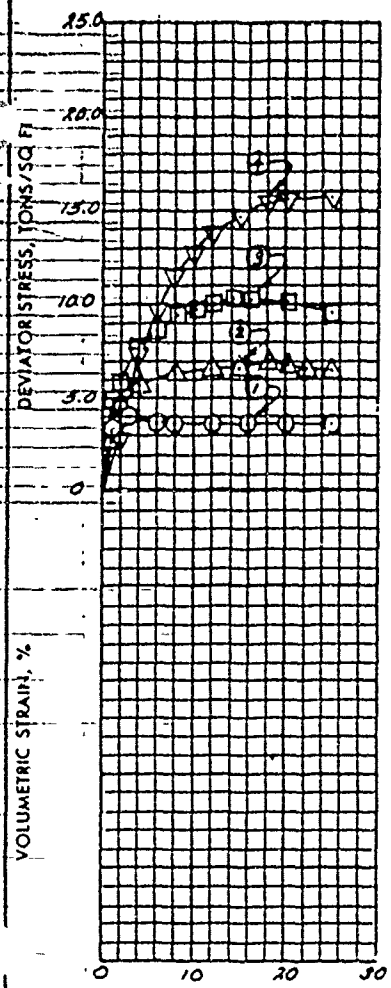
ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

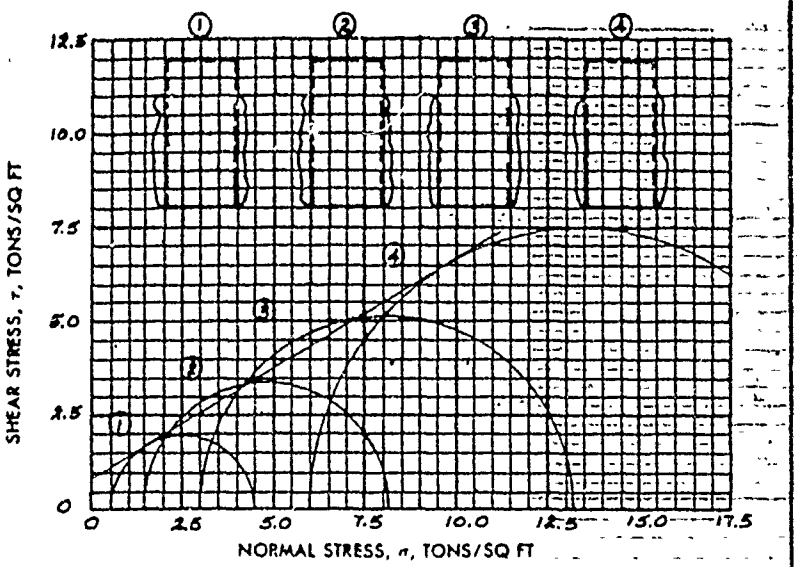
GPO 1964 OF-714-128

(S1)

Plate No. 21

SWDGL Report 9467





SHEAR VALUES

ϕ = 29.8°

TAN ϕ = .573

c = 0.9 TONS/SQ FT

TEST NO			(1)	(2)	(3)	(4)
INITIAL	WATER CONTENT	w_o	10.2 %	10.2 %	10.1 %	10.3 %
	VOID RATIO	e_o	.535	.531	.527	.540
	SATURATION	S_o	51 %	52 %	52 %	51 %
	DRY DENSITY LB/CU FT	γ_d	109.4	109.7	110.0	109.1
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	4.50	8.16 *	13.19	20.83 *
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN			9	45 *	39	50 *
INITIAL DIAMETER, D_o, IN			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, IN			3.0	3.0	3.0	3.0

TYPE TEST Q

METHOD OF SATURATION _____ ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN .001 IN/MIN

CLASSIFICATION CLAY (CL)

LL 30 PL 14 PI 16 G_s 2.69

REMARKS * At 15% Strain

PROJECT Dierks Dam

AREA Borrow Material

BORING NO. BA-203 SAMPLE NO. M-12,500 (958, W-3)

DEPTH 0.0-3.0 DATE NOV 68

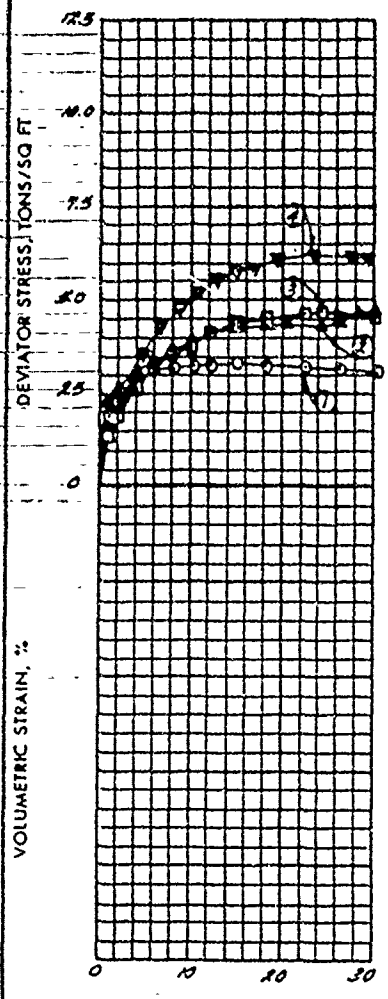
TRIAXIAL COMPRESSION TEST REPORT

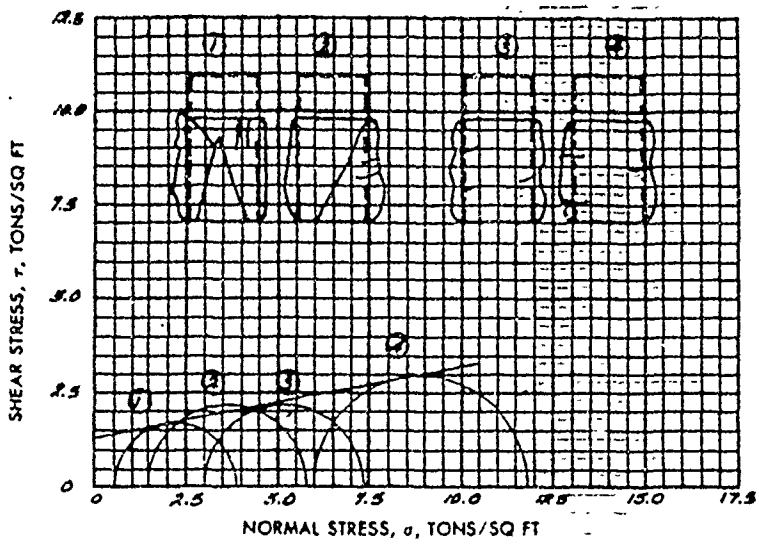
ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

GPO 1964 O-734-729

(52)

Plate No. 22





TEST NO			①	②	③	④
INITIAL	WATER CONTENT	w_o	16.8 %	16.2 %	16.3 %	16.7 %
	VOID RATIO	e_o	.584	.573	.574	.586
	SATURATION	S_o	78 %	77 %	77 %	77 %
	DRY DENSITY LB/CU FT	γ_d	106.8	107.6	107.5	106.7
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	3.88 *	5.78 *	7.40 *	11.84 *
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN			23 *	23 *	23 *	24 *
INITIAL DIAMETER, ~~CM~~ IN			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, ~~CM~~ IN			3.0	3.0	3.0	3.0

SHEAR VALUES

ϕ = 10.5 °

TAN ϕ = .185

c = 1.3 TONS/SQ FT

TYPE TEST Q

METHOD OF SATURATION _____ ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.02 IN/MIN

CLASSIFICATION CLAY (CL)

LL	PL	PI	G_s
40	13	27	2.71

REMARKS * At 15 % Strain

PROJECT Dierks Dam

AREA Borrow Material

BORING NO. BA-207 SAMPLE NO. (T, W) M-12,504

DEPTH FT 5.0 - 6.5 DATE NOV 65

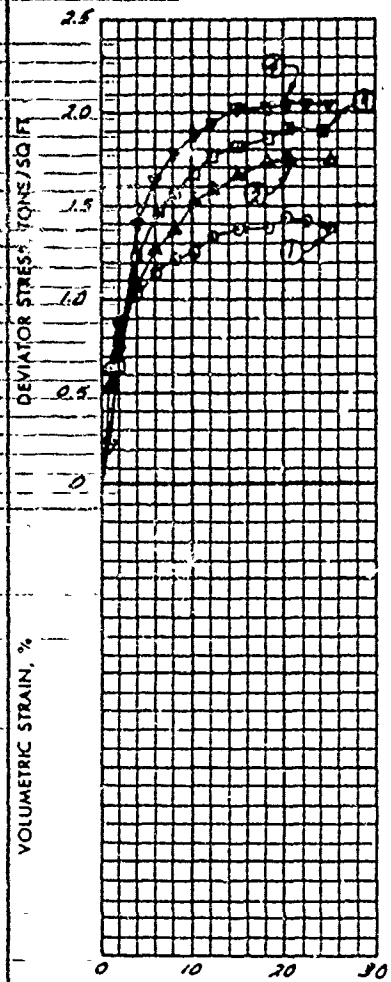
TRIAXIAL COMPRESSION TEST REPORT

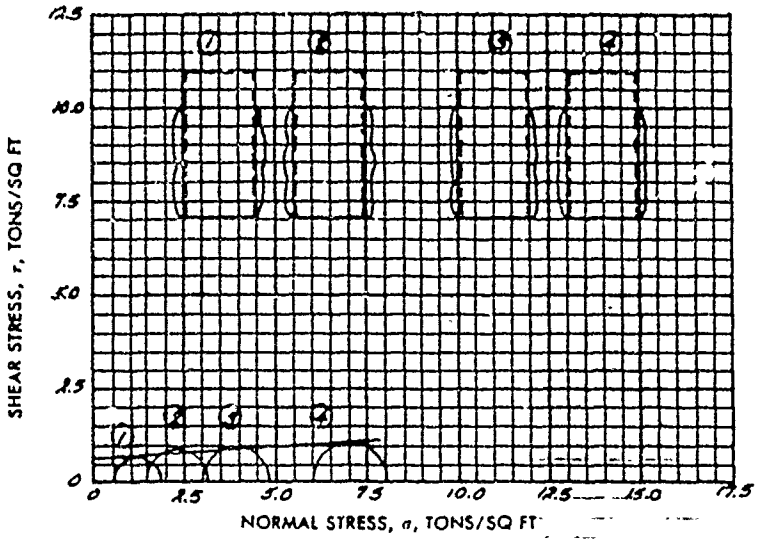
ENG FORM 2089 1 MAY 63 * PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO 1964 O-714-739

(53)

Plate No. 23

SWDGL Report 9467





SHEAR VALUES

ϕ = 31°

TAN ϕ = .054

c = .06 TONS/SQ FT

TEST NO.			①	②	③	④
INITIAL	WATER CONTENT	w_o	19.9 %	19.5 %	19.4 %	19.7 %
	VOID RATIO	e_o	.676	.675	.671	.678
	SATURATION	S_o	80 %	78 %	78 %	79 %
	DRY DENSITY LB/CU FT	γ_d	101.0	101.0	101.2	100.8
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	1.88 *	3.16 *	4.81 *	8.01 *
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN			24 *	23 *	25 *	24 *
INITIAL DIAMETER, IN			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, IN			3.0	3.0	3.0	3.0

TYPE TEST Q

METHOD OF SATURATION _____ ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.02 IN/MIN

CLASSIFICATION CLAY (CL)

LL	PL	PI	G_s
40	13	27	2.71

REMARKS * At 15% Strain

PROJECT Pierce Dam

AREA Borrow Material

BORING NO. BA-207 SAMPLE NO. (958, W+3) M-12,504

DEPTH ft 5.0-6.5 DATE NOV 85

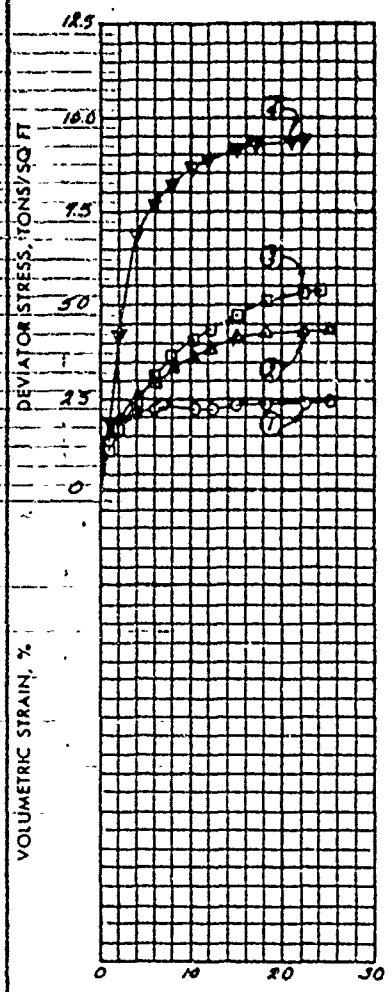
TRIAXIAL COMPRESSION TEST REPORT

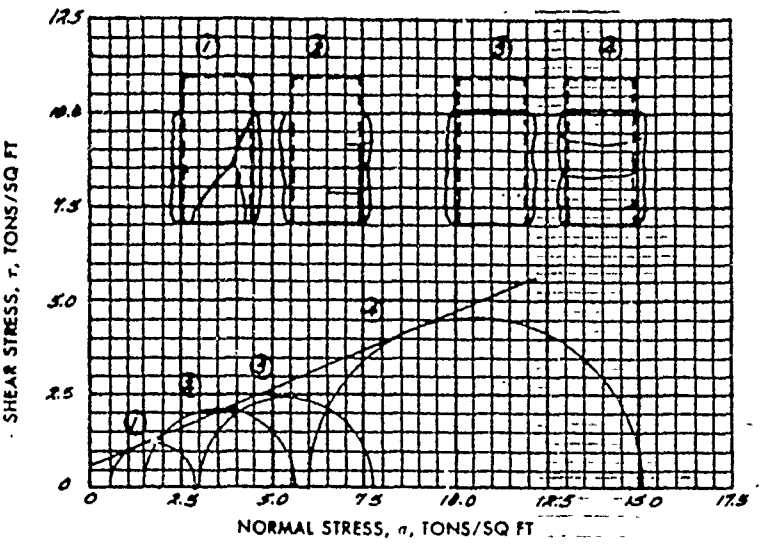
ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) GPO 1966 O-744-729

54

Plate No. 24

SWDGL Report 9467





SHEAR VALUES

ϕ = 22.3 °

TAN ϕ = .410

c = 0.6 TONS/SQ FT

TEST NO.			①	②	③	④
INITIAL	WATER CONTENT	w_o	16.0 %	16.2 %	16.7 %	16.6 %
	VOID RATIO	e_o	.670	.659	.667	.679
	SATURATION	S_o	65 %	67 %	68 %	66 %
	DRY DENSITY LB/CU FT	γ_d	101.3	102.0	101.5	100.7
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	2.88 *	5.61 *	7.74 *	15.09 *
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN			23 *	23 *	23 *	22 *
INITIAL DIAMETER, cm IN			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, cm IN			3.0	3.0	3.0	3.0

TYPE TEST Q

METHOD OF SATURATION _____ ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN .002 IN/MIN

CLASSIFICATION CLAY (CL)

LL 40 PL 13 PI 27 G_s 2.71

REMARKS * At 15% Strain

PROJECT Diecks Dam

AREA Borrow Mat'l

BORING NO. BA-207 SAMPLE NO. M-12504 (951, W)

DEPTH 5.0-6.5 DATE NOV 65

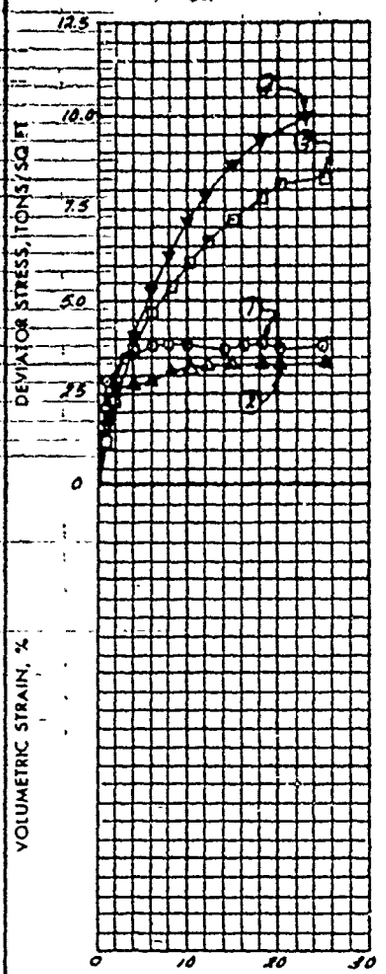
TRIAXIAL COMPRESSION TEST REPORT

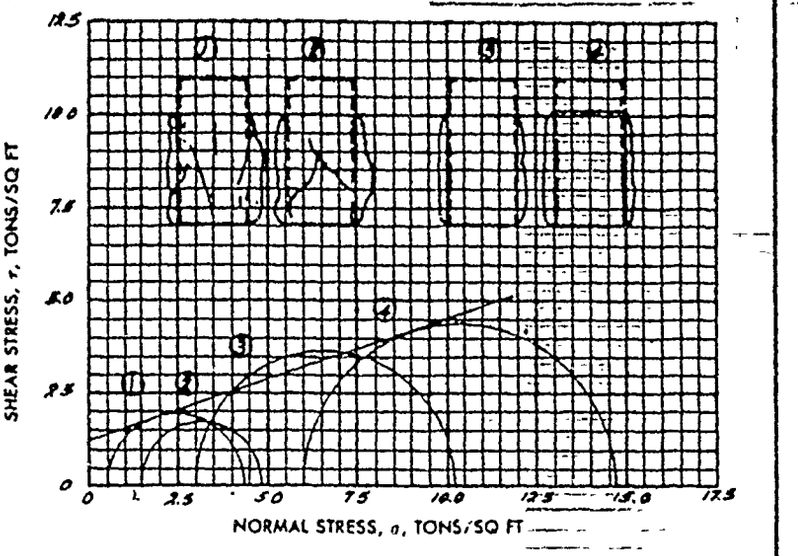
ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO 1966 O-714-789

(55)

Plate No. 25

SWDGL Report 9467





TEST NO			①	②	③	④
INITIAL	WATER CONTENT	w_o	13.4 %	13.7 %	13.6 %	13.7 %
	VOID RATIO	e_o	.661	.664	.658	.672
	SATURATION	S_o	55 %	56 %	56 %	55 %
	DRY DENSITY LB/CU FT	γ_d	101.9	101.7	102.0	101.2
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	4.35	4.83 *	10.24 *	14.67 *
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN			13	24 *	25 *	26 *
INITIAL DIAMETER, CM IN			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, CM IN			3.0	3.0	3.0	3.0

SHEAR VALUES

ϕ = 17.2 °

TAN ϕ = .319

c = .12 TONS/SQ FT

TYPE TEST Q

METHOD OF SATURATION _____ ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.02 IN/MIN

CLASSIFICATION CLAY (CL)

LL	PL	PI	D_m
40	13	27	G 2.71

REMARKS * At 15% Strain

PROJECT Dierks Dam

AREA Borrow Material

BORING NO BA-207 SAMPLE NO. (954, W-3) M-12,504

DEPTH 5.0-6.5 DATE NOV 65

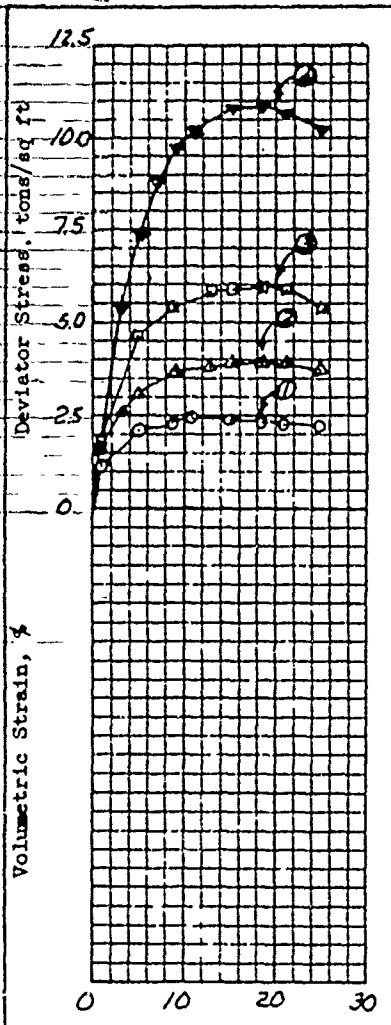
TRIAXIAL COMPRESSION TEST REPORT

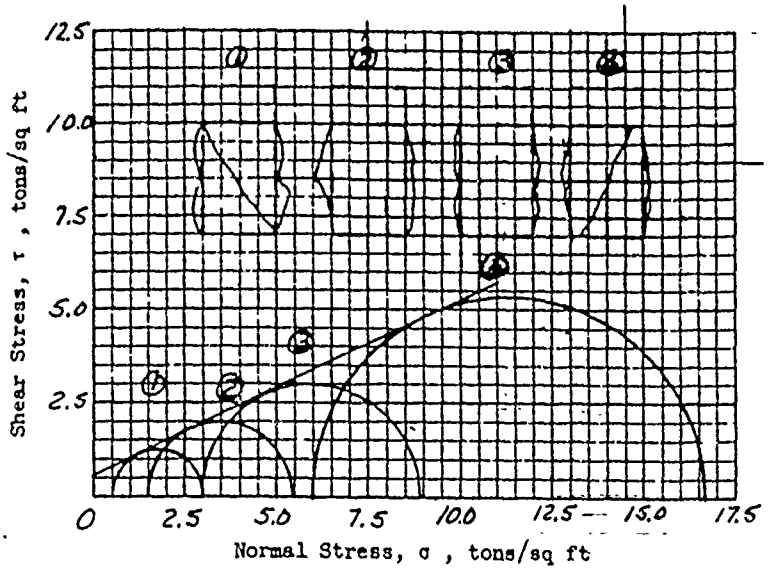
ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) GPO 1964 O—734-759

(56)

Plate No. 26

SWDGL Report 9469





Test No.			1	2	3	4
Initial	Water content	w_o	11.2 %	11.1 %	11.4 %	11.2 %
	Void ratio	e_o	.450	.454	.452	.460
	Saturation	S_o	67 %	66 %	67 %	65 %
	Dry density lb/cu ft	γ_d	115.4	115.1	115.3	114.8
Before Test	Water content	w_c	%	%	%	%
	Saturation	S_c	%	%	%	%
	Consolidation press., tons/sq ft	σ_c				
	Void ratio	e_c				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Major principal stress, tons/sq ft		σ_1	2.98	5.47*	8.87*	16.71*
Minor principal stress, tons/sq ft		σ_3	0.5	1.5	3.0	6.0
Time to failure, min			18	27*	32*	25*
Initial diameter, ~~cm~~ in.			1.4	1.4	1.4	1.4
Initial height, H_o, ~~cm~~ in.			3.0	3.0	3.0	3.0

Shear Values

ϕ = 25.4 °

tan ϕ = .475

c = 0.6 tons/sq ft

Type Test Q

Method of Saturation _____ ☐ Controlled Stress ☑ Controlled Strain

Type of specimen Remolded Rate of strain 0.02 (Nominal) in./min

Classification SILT, sandy (ML)

LL 17 PL 13 PI 4 ~~Dg~~ G 2.68

Remarks * At 15% strain.
** Composite of samples M-12,508, 12,509, 12,510, & 12,511

Project DIERKS DAM

Area Borrow Material

Boring No. 60C-165 Sample No. M-12,508 C** (95% W)

Depth 2.4 - 11.1 Date FEB 66

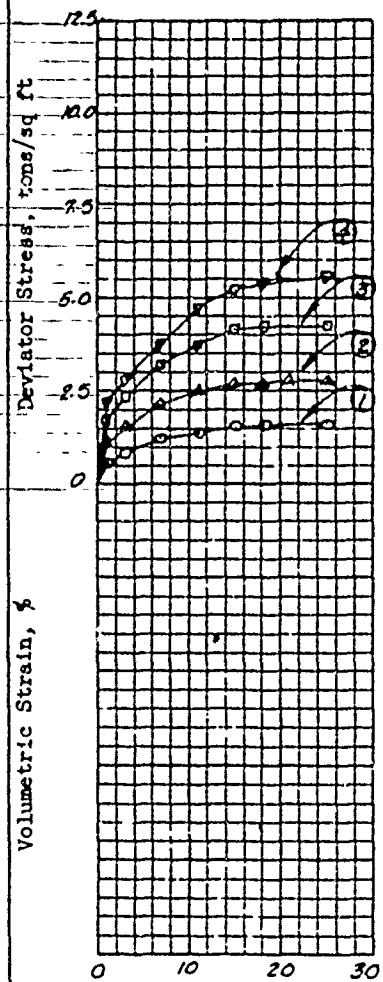
TRIAXIAL COMPRESSION TEST REPORT

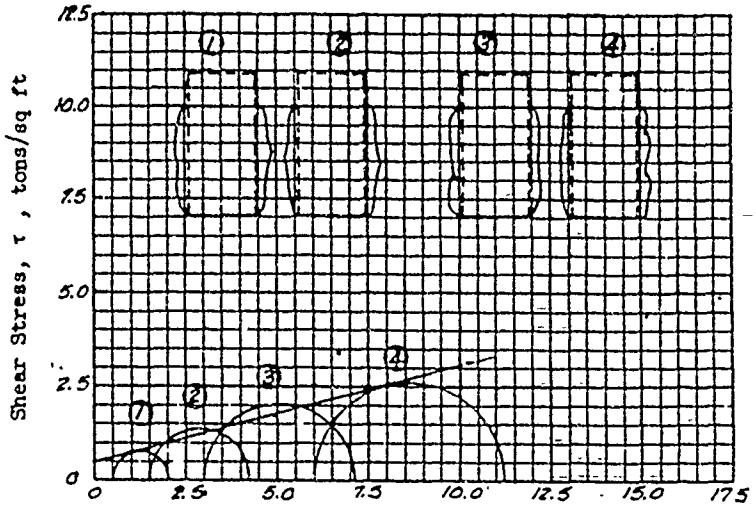
ENG FORM 1 MAY 63 2089 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) 1 9426

57

Plate No. 3

SWDGL Report 9469





Test No.			①	②	③	④
Initial	Water content	w_o	14.0 %	13.8 %	13.9 %	14.0 %
	Void ratio	e_o	.454	.453	.449	.463
	Saturation	S_o	83 %	82 %	83 %	81 %
	Dry density lb/cu ft	γ_d	115.2	115.2	115.6	114.4
Before Test	Water content	w_c	%	%	%	%
	Saturation	S_c	%	%	%	%
	Consolidation press., tons/sq ft	σ_c				
	Void ratio	e_c				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Major principal stress, tons/sq ft		σ_1	2.01*	4.14*	7.07*	11.19*
Minor principal stress, tons/sq ft		σ_3	0.5	1.5	3.0	6.0
Time to failure, min			26*	25*	24*	26*
Initial diameter, in.			1.4	1.4	1.4	1.4
Initial height, H_o, in.			3.0	3.0	3.0	3.0

Shear Values

ϕ = 14.5 °

tan ϕ = .258

c = 0.5 tons/sq ft

Type Test Q

Method of Saturation _____

☐ Controlled Stress ☑ Controlled Strain

Type of specimen Remolded Rate of strain 0.02 in./min

Classification SILT, sandy (ML)

LL	PL	PI	Dry G
17	13	4	2.68

Remarks * At 15 % strain

** Composite of samples M-12,508, 12,509, 12,510, & 12,511 (958, Wr3)

Project Dierks Dam

Area Borrow Material

Boring No. 6DC-165 Sample No. M-12,508 C**

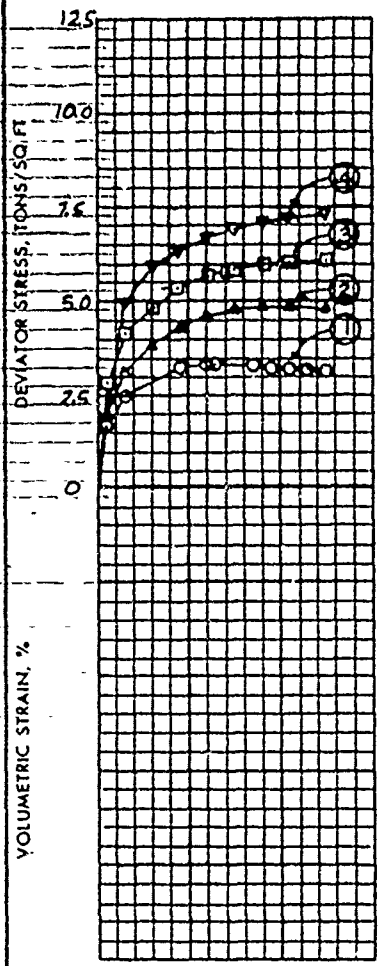
Depth 2.4 - 11.1 Date FEB 86

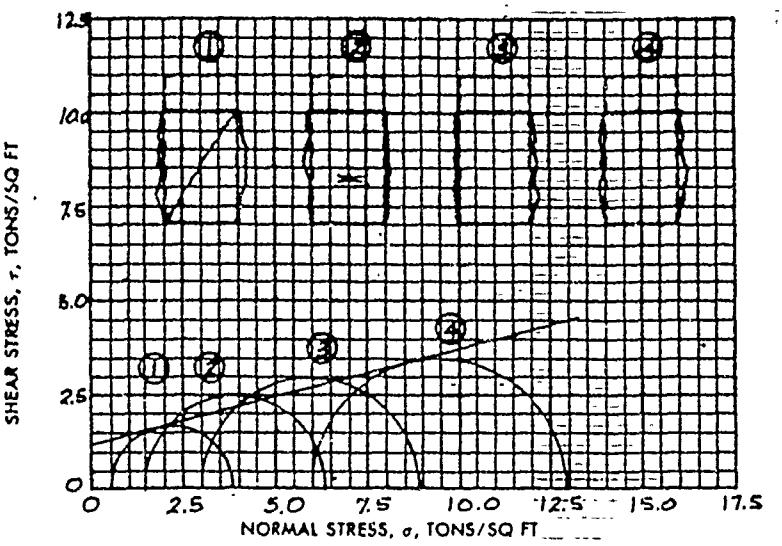
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

Plate No. 4 (5A)

SWDGL Report 9812





SHEAR VALUES

ϕ = 14.1°

TAN ϕ = .251

c = 1.2 TONS/SQ FT

TEST NO			①	②	③	④
INITIAL	WATER CONTENT	w_o	14.7%	14.7%	14.7%	14.8%
	VOID RATIO	e_o	.480	.483	.478	.485
	SATURATION	S_o	82%	82%	83%	82%
	DRY DENSITY LB/CU FT	γ_d	113.1	112.9	113.2	112.7
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	3.88	6.28	8.87	12.93
MINOR PRINCIPAL STRESS TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN			20	22	22	23
INITIAL DIAMETER, ~~cm~~ in			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, ~~cm~~ in			3.0	3.0	3.0	3.0

TYPE TEST Q

METHOD OF SATURATION _____ ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remold. ‡ RATE OF STRAIN 0.02 IN/MIN

CLASSIFICATION SAND, clayey (SC)

LL 31 PL 13 PI 18 G_s G = 2.68

REMARKS _____

PROJECT Dierks Dam

AREA Borrow Material (T, W)

BORING NO. 10A-2C-16B SAMPLE NO. M-17,973

DEPTH ~~ft~~ 1.0 - 3.3 DATE Jul 68

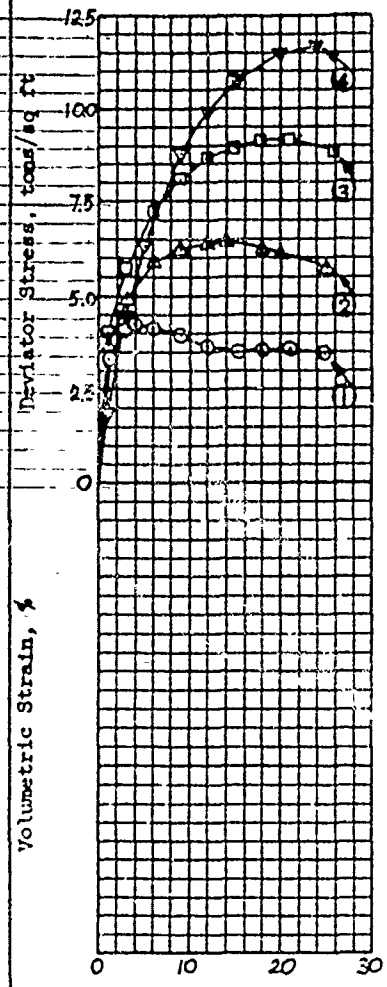
TRIAXIAL COMPRESSION TEST REPORT

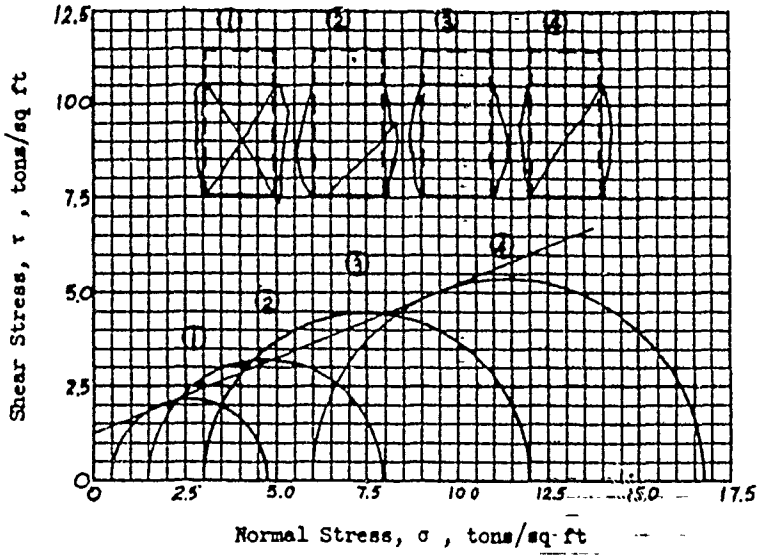
ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

GPO 1966 O-716-729

(59)

Plate No. 3





Test No.			①	②	③	④
Initial	Water content	w_o	11.9 %	11.9 %	11.8 %	11.8 %
	Void ratio	e_o	.551	.564	.548	.561
	Saturation	S_o	58 %	57 %	58 %	56 %
	Dry density lb/cu ft	γ_d	107.8	107.1	108.1	107.1
Before Test	Water content	w_c	%	%	%	%
	Saturation	S_c	%	%	%	%
	Consolidation press., tons/sq ft	σ_c				
	Void ratio	e_c				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Major principal stress, tons/sq ft		σ_1	4.76	7.93	11.96	16.75
Minor principal stress, tons/sq ft		σ_3	0.5	1.5	3.0	6.0
Time to failure, min			7	21	23	24
Initial diameter, cm in			1.4	1.4	1.4	1.4
Initial height, H_o, cm in			3.0	3.0	3.0	3.0

Shear Values

ϕ = 21.8 °

tan ϕ = .400

c = 1.2 tons/sq ft

Type Test Q

Method of Saturation _____ ☐ Controlled Stress ☑ Controlled Strain

Type of specimen Remolded Rate of strain 0.02 in./min

Classification SAND, Clayey (SC)

LL 31 PL 13 PI 18 G = 2.68

Remarks Major principal stresses are based on max. deviator stresses at or below 15% strain.

Project Dierks Dam

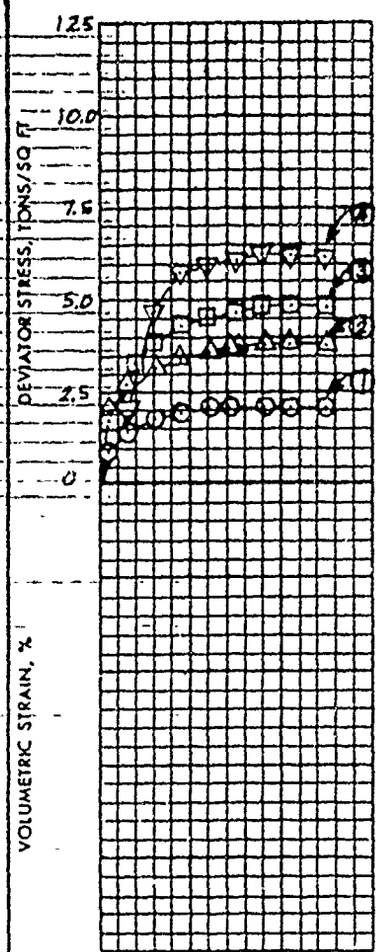
Area Borrow Material

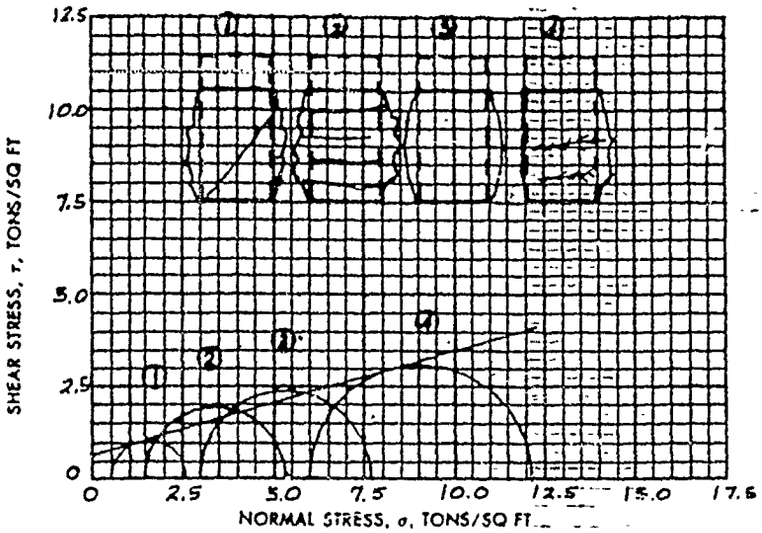
Boring No. 10A-2C-169 Sample No. M-17,973 (95 ft, W-3)

Depth ft 1.0 – 3.3 Date JUL 63

TRIAXIAL COMPRESSION TEST REPORT

SWDGL Rpt. 9812





SHEAR VALUES

ϕ = 15.8 °

TAN ϕ = .283

c = 0.6 TONS/SQ FT

TEST NO			①	②	③	④
INITIAL	WATER CONTENT	w_o	14.8 %	14.9 %	14.7 %	14.7 %
	VOID RATIO	e_o	.554	.562	.538	.561
	SATURATION	S_o	72 %	71 %	73 %	70 %
	DRY DENSITY LB/CU FT	γ_d	107.6	107.2	108.7	107.1
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	2.55	5.30	7.69	12.17
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN			21	23	23	23
INITIAL DIAMETER, ~~cm~~ in			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, ~~cm~~ in			3.0	3.0	3.0	3.0

TYPE TEST Q

METHOD OF SATURATION _____ ☐ CONTROLLED STRESS. ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.02 IN./MIN

CLASSIFICATION SAND, Clayey (SC)

LL 31 PL 13 PI 18 G_s G = 2.68

REMARKS Major principal stresses are based on max deviator stresses at or below 15 % strain.

PROJECT Dierks Dam

AREA Borrow Material

BORING NO. 101-2C-169 SAMPLE NO. (96 R,W) M-17,973

DEPTH ft 1.0 - 3.3 DATE 7-11 6?

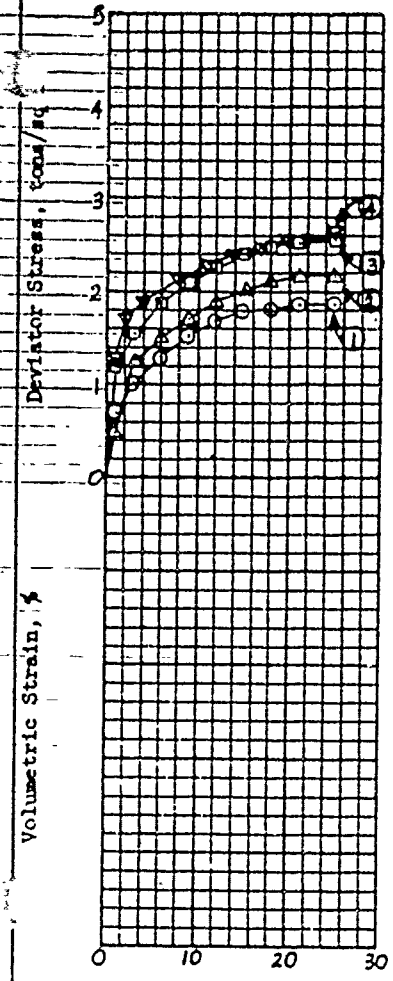
TRIAXIAL COMPRESSION TEST REPORT

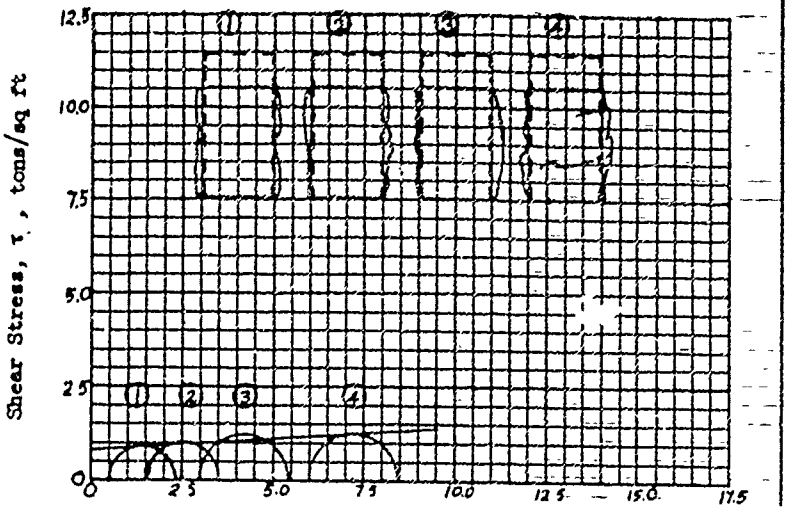
ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO 1964 O-714-729

(61)

Plate No. 5

SWDGL Report 9812





Test No.			(1)	(2)	(3)	(4)
Initial	Water content	w_o	17.7 %	17.6 %	17.6 %	17.7 %
	Void ratio	e_o	.548	.551	.545	.559
	Saturation	S_o	87 %	86 %	87 %	85 %
	Dry density lb/cu ft	γ_d	108.1	107.8	108.4	107.4
Before Test	Water content	w_c	%	%	%	%
	Saturation	S_c	%	%	%	%
	Consolidation press., tons/sq ft	σ_c				
	Void ratio	e_c				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Major principal stress, tons/sq ft		σ_1	2.29	3.52	5.40	8.43
Minor principal stress, tons/sq ft		σ_3	0.5	1.5	3.0	6.0
Time to failure, min			24	23	23	25
Initial diameter, ~~cm~~ in			1.4	1.4	1.4	1.4
Initial height, H_o, ~~cm~~ in			3.0	3.0	3.0	3.0

Shear Values

ϕ = 32 °

tan ϕ = .055

c = 0.6 tons/sq ft

Type Test Q

Method of Saturation _____ ☐ Controlled Stress ☑ Controlled Strain

Type of specimen Remolded Rate of strain 0.02 in./min

Classification SAND, Clayey (SC)

LL 31 PL 13 PI 18 ~~Sp~~ G = 2.68

Remarks Major principal stresses are based on max. deviator stresses at or below 15% strain.

Project Dierks Dam

Area Borrow Material

Boring No. 10A-2C-169 Sample No. M-17,973 (95 f.w+3)

Depth ~~ft~~ 1.0 - 3.3 Date JUL 66

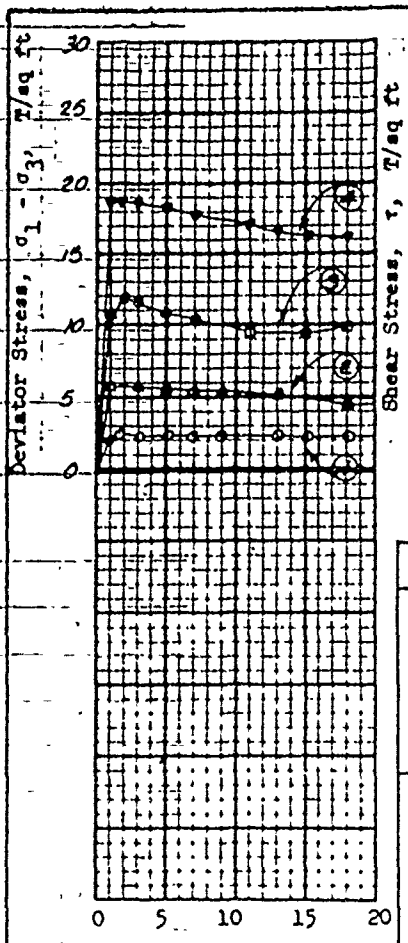
TRIAXIAL COMPRESSION TEST REPORT

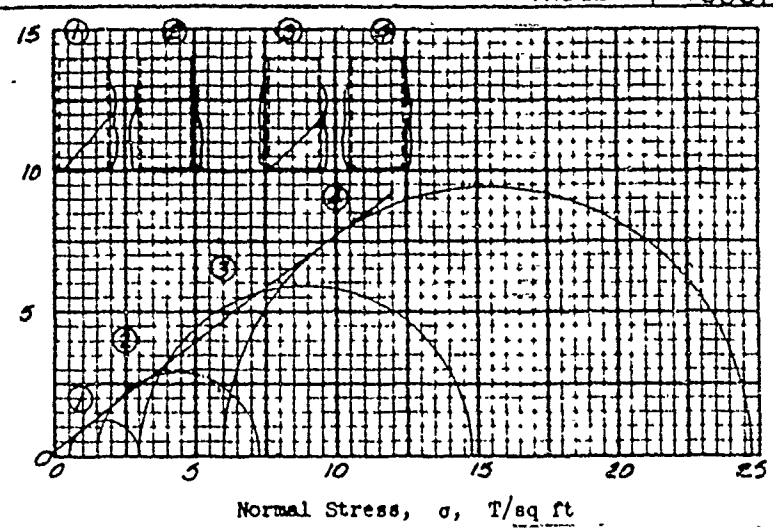
ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

0 3426

Plate No. 6 (62)

SWUGL REPORT 9891





Shear Strength Parameters

ϕ = .366 °

tan ϕ = .743

c = 0.3 T/sq ft

Method of saturation _____

☐ Controlled stress

☑ Controlled strain

Test No.			①	②	③	④
Initial	Water content	w_o	10.1 %	10.2 %	10.2 %	10.1 %
	Void ratio	e_o	.416	.422	.407	.426
	Saturation	S_o	65 %	65 %	67 %	63 %
	Dry density, lb/cu ft	γ_d	117.7	117.2	118.5	116.9
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	6.0
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	2.50	5.82	11.83	18.78
Time to failure, min		t_f	3	4	6	4
Rate of strain, percent/min			0.6	0.4	0.3	0.4
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.4	1.4	1.4	1.4
Initial height, in.		H_o	3.0	3.0	3.0	3.0

Type of test Q | Type of specimen Remolded

Classification SAND, silty (SM)

LL NP | PL NP | PI NP | | G_s 2.67

Remarks _____

Project DIERKS DAM

Area Borrow Material

Boring No. TP-488 | Sample No. (D,W) M-18,548

Depth 0.0-8.0 | Date OCT 66

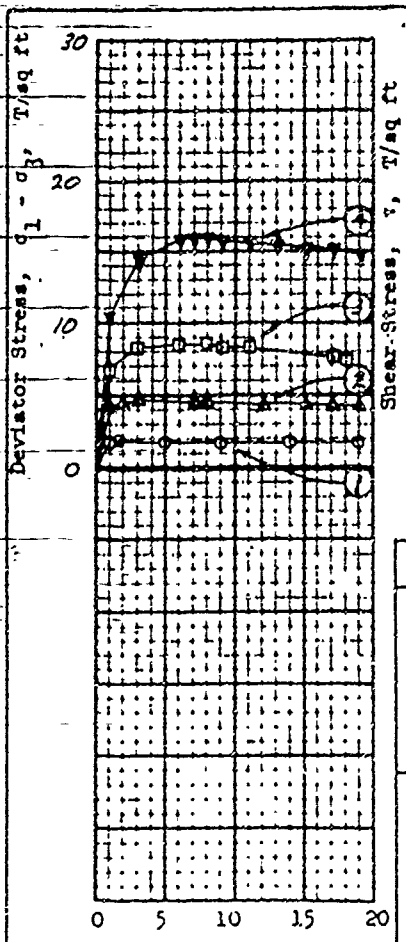
TRIAXIAL COMPRESSION TEST REPORT

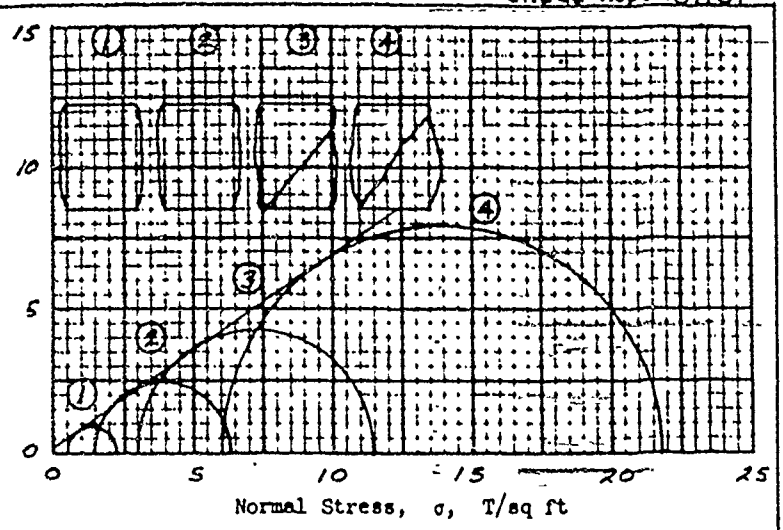
ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

TRANSLUCENT

Plate No. 11 (63)

SWUGL Report 9891





Test No.			①	②	③	④
Initial	Water content	w_o	10.2 %	10.2 %	10.3 %	10.0%
	Void ratio	e_o	.491	.492	.491	.489
	Saturation	S_o	55 %	55 %	56 %	54 %
	Dry density, lb/cu ft	γ_d	111.8	111.7	111.8	111.9
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	6.0
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	1.79	4.81	8.45	15.89
Time to failure, min		t_f	6	5	9	11
Rate of strain, percent/min			0.3	0.6	0.7	0.6
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.4	1.4	1.4	1.4
Initial height, in.		H_o	3.0	3.0	3.0	3.0

Shear Strength Parameters

ϕ = 34.2°

tan ϕ = .680

c = .01 T/sq ft

Method of saturation _____

☐ Controlled stress

☑ Controlled strain

Type of test Q | Type of specimen Remolded

Classification SAND, silty (SM)

LL NP | PL NP | PI NP | | G_s 2.67

Remarks _____

Project DIERKS DAM

Area Borrow Material

Boring No. TP-488 | Sample No. M-18,548 (958, ω)

Depth El 0.0-8.0 | Date Oct 68

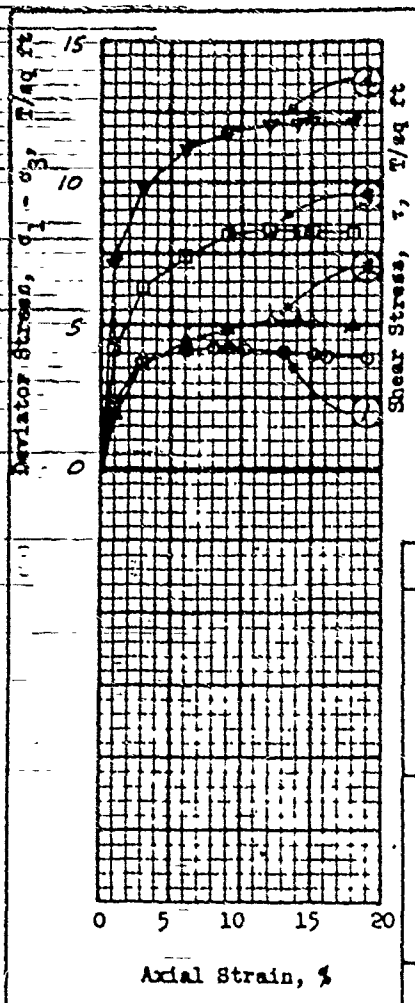
TRIAXIAL COMPRESSION TEST REPORT

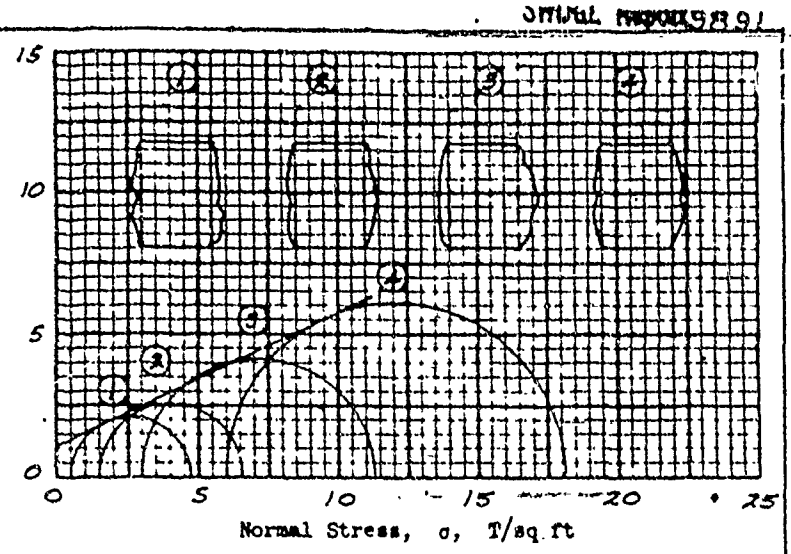
ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

TRANSLUCENT

(64)

Plate No. 12





Shear Strength Parameters

ϕ = 24.9 °

tan ϕ = .464

c = .11 T/sq ft

Method of saturation _____

☐ Controlled stress

☑ Controlled strain

Test No.			①	②	③	④
Initial	Water content	w_o	12.5 %	12.5%	12.6 %	12.5 %
	Void ratio	e_o	.419	.420	.425	.420
	Saturation	S_o	80 %	80 %	80 %	80 %
	Dry density, lb/cu ft	γ_d	118.4	118.2	117.9	118.3
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	6.0
Max deviator stress, T/sq ft	$(\sigma_1-\sigma_3)_{max}$		4.17	5.05	8.33	12.15
Time to failure, min		t_f	10	21	19	23
Rate of strain, percent/min			0.6	0.7	0.6	0.6
Ult deviator stress, T/sq ft	$(\sigma_1-\sigma_3)_{ult}$					
Initial diameter, in.		D_o	1.4	1.4	1.4	1.4
Initial height, in.		H_o	3.0	3.0	3.0	3.0

Type of test Q | Type of specimen Remolded

Classification CLAY, sandy (CL) — Composite of minus #10 fractions of SHO Samples M-18,564, -18,565, and 18567.

LL 25 | PL 12 | PI 13 | G_s 2.69

Remarks Major principal stresses are based on maximum deviator stresses at or below 15% strain.

Project DIERKS DAM

Area Borrow Materials

Boring No. TP-491/TP-493 | Sample No. M-18,564 (S,W) C

Depth El 2.0-10.1 | Date OCT 66

TRIAXIAL COMPRESSION TEST REPORT

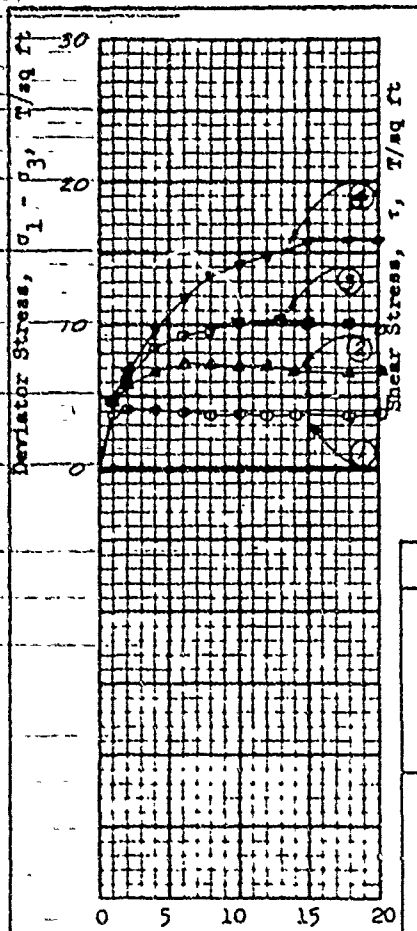
ENG FORM 2089 1 JUN 65 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

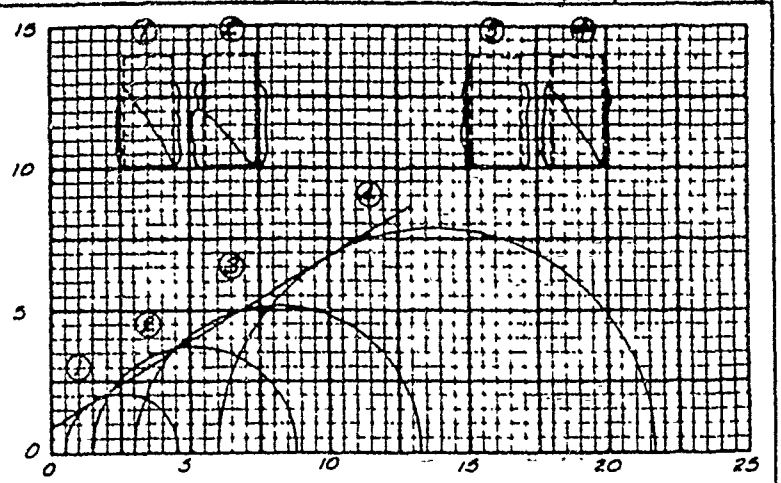
TRANSLUCENT

(65)

Plate No. 13

SWDGL Report 9891





Test No.			①	②	③	④
Initial	Water content	w_o	9.6 %	9.6 %	9.8 %	9.7 %
	Void ratio	e_o	.488	.487	.486	.498
	Saturation	S_o	53 %	53 %	54 %	52 %
	Dry density, lb/cu ft	γ_d	112.9	113.0	113.0	112.0
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	6.0
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	4.05	7.27	10.34	15.65
Time to failure, min		t_f	4	13	21	25
Rate of strain, percent/min			0.3	0.6	0.6	0.6
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.4	1.4	1.4	1.4
Initial height, in.		H_o	3.0	3.0	3.0	3.0

Shear Strength Parameters

ϕ = 30.9 °

tan ϕ = .599

c = 0.9 T/sq ft

Method of saturation _____

☐ Controlled stress

☑ Controlled strain

Type of test Q	Type of specimen Remolded		
Classification CLAY, sandy (CL)	Composite of minus No. 10 fractions of SWD Samples M-18,564, -18,565, and -18,567.		
LL 25	PL 12	PI 13	G_s 2.69

Remarks Major principal stresses are based on maximum deviator stresses at or below 15% strain.

Project DIERKS DAM

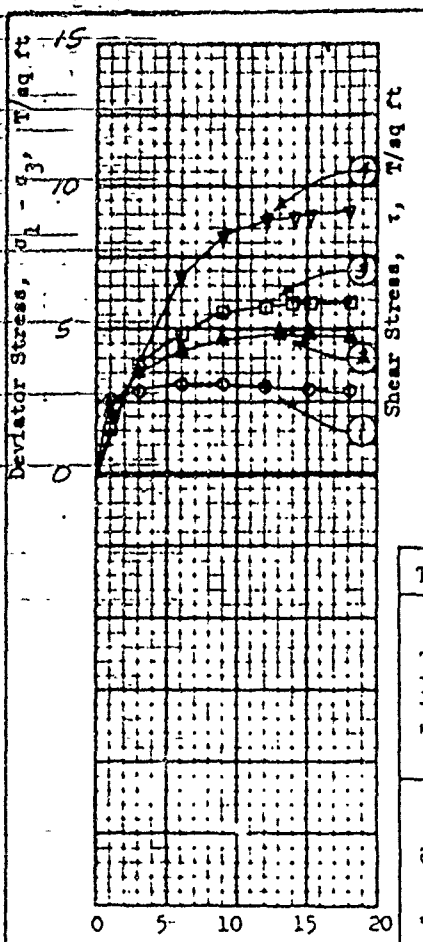
Area Borrow Material

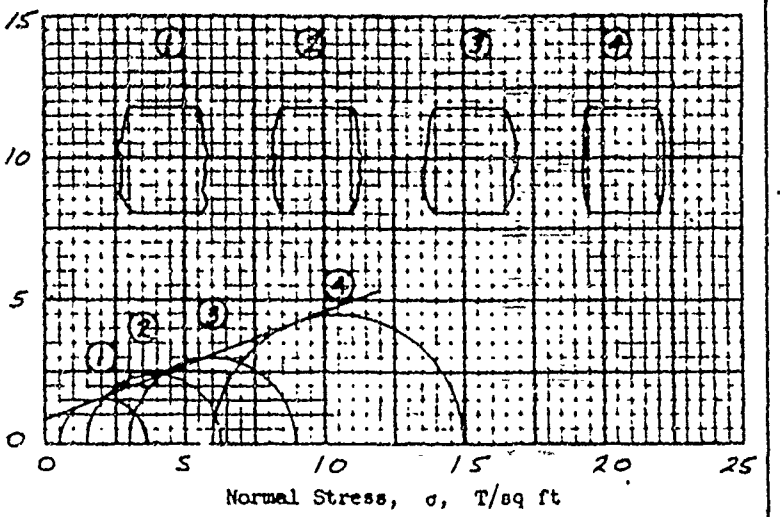
Boring No. TP-491 & TP-492 | Sample No. M-18,564-C (9588 W-3)

Depth 2.0 - 10.1 | Date

TRIAXIAL COMPRESSION TEST REPORT

SWDGL Report 9891





Shear Strength Parameters

ϕ = 20.4 °

tan ϕ = .372

c = 0.9 T/sq ft

Method of saturation

☐ Controlled stress

☑ Controlled strain

Test No.			①	②	③	④
Initial	Water content	w_o	12.6 %	12.4%	12.4%	12.5 %
	Void ratio	e_o	.491	.493	.487	.498
	Saturation	S_o	69 %	68 %	69 %	68 %
	Dry density, lb/cu ft	γ_d	112.6	112.5	112.9	112.1
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	6.0
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	3.10	4.81	5.90	8.97
Time to failure, min		t_f	14	21	22	18
Rate of strain, percent/min			0.6	0.6	0.6	0.8
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.4	1.4	1.4	1.4
Initial height, in.		H_o	3.0	3.0	3.0	3.0

Type of test Q | Type of specimen Remolded

Classification CLAY, sandy (CL) — Composite of minus No. 10 fractions of SWD Samples M-18,564, -18,565, and -18,567.

LL 25 | PL 12 | PI 13 | G_s 2.69

Remarks Major principal stresses are based on maximum deviator stresses at or below 15% strain.

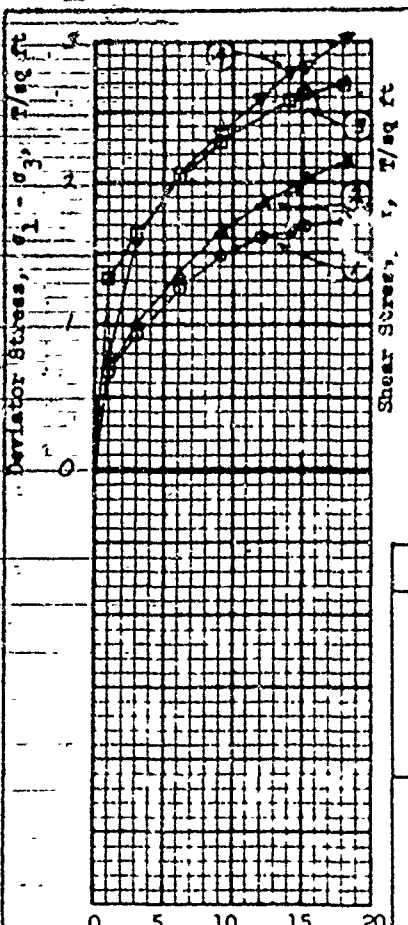
Project DIERKS DAM

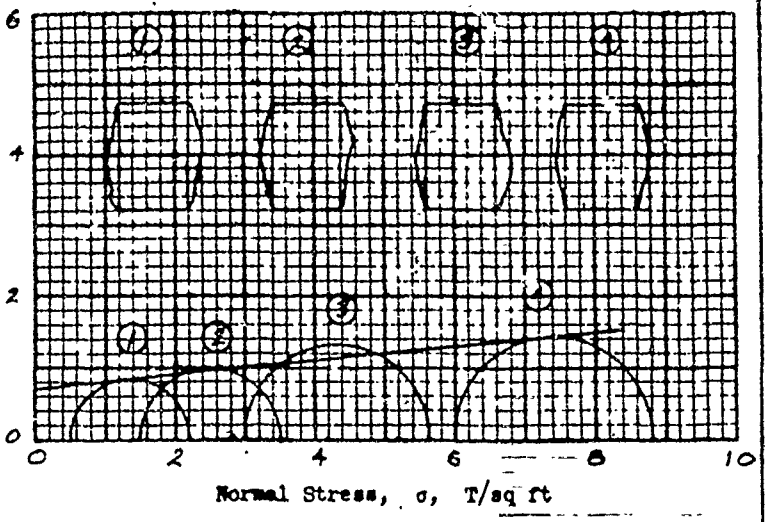
Area Borrow Material

Boring No. TP-491 & TP-493 | Sample No. M-18,564-C (S2, W)

Depth El. 2.0-10.1 | Date OCT 66

TRIAXIAL COMPRESSION TEST REPORT





Shear Strength Parameters

ϕ = 54 °

tan ϕ = .094

c = 0.7 T/sq ft

Method of saturation ____

☐ Controlled stress

☑ Controlled strain

Test No.			①	②	③	④
Initial	Water content	w_o	15.6 %	15.4%	15.5%	15.5%
	Void ratio	e_o	.488	.487	.486	.490
	Saturation	S_o	86 %	85 %	86 %	85 %
	Dry density, lb/cu ft	γ_d	112.9	112.9	113.0	112.7
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	6.0
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	1.68	2.01	2.62	2.82
Time to failure, min		t_f	24	21	23	22
Rate of strain, percent/min			0.6	0.7	0.6	0.7
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.4	1.4	1.4	1.4
Initial height, in.		H_o	3.0	3.0	3.0	3.0

Type of test Q | Type of specimen Remolded

Classification CLAY, sandy (CL) — Composite of minus No. 10 fractions of SWD Samples M-18,564, -18,565, and -18,567.

LL 35 | PL 12 | PI 13 | G_s 2.69

Remarks Major principal stresses are based on maximum deviator stresses at or below 15% strain.

Project DIKES DAM

Area Borrow Material

Boring No. TP-491 & TP-493 | Sample No. M-18,564 C

Depth ~~Ft~~ 2.0 - 10.1 | Date OCT 88

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

TRANSLUCENT

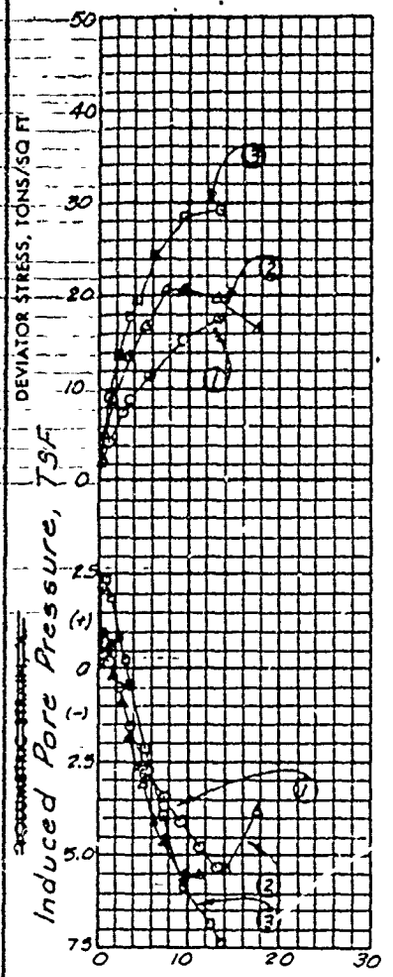
(68)

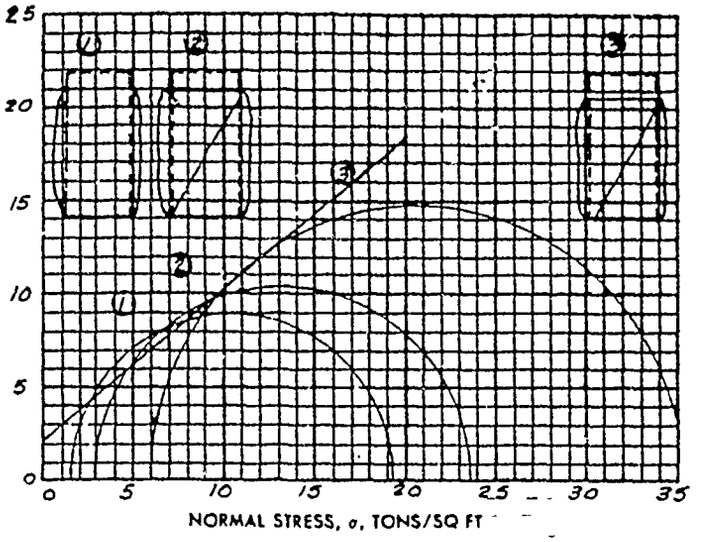
Plate No 16

APPENDIX E

COMPACTED MATERIALS

SECTION 2. R TRIAXIAL TESTS





TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_o	11.7 %	11.8 %	11.9 %	%
	VOID RATIO	e_o	.435	.430	.438	
	SATURATION	S_o	72 %	73 %	73 %	%
	DRY DENSITY LB/CU FT	γ_d	116.2	116.6	115.8	
BEFORE TEST	WATER CONTENT	w_c	16.4 %	16.7 %	16.6 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS, TONS/SQ FT	σ_c	1.45	2.95	6.00	
	VOID RATIO	e_c	.439	.445	.444	
FINAL	WATER CONTENT	w_f	16.4 %	16.7 %	16.6 %	%
	VOID RATIO At Failure	e_f	.439	.445	.444	
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	19.26	23.59	35.33	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.45	2.95	6.00	
TIME TO FAILURE, MIN			435	265	460	
INITIAL DIAMETER, ~~CM~~ IN.			1.4	1.4	1.4	
INITIAL HEIGHT, H_o, ~~CM~~ IN.			3.0	3.0	3.0	

ϕ AND R VALUES

ϕ = 38.6 °

TAN ϕ = .796

c = 2.2 TONS/SQ FT

TYPE TEST R

METHOD OF SATURATION Back pressure ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.001 (Nominal) IN/MIN

CLASSIFICATION CLAY, sandy (CL-ML)

LL 21 PL 15 PI 6 G_s 2.67

REMARKS

PROJECT Dierks Dam

AREA

BORING NO BA-200 SAMPLE NO. M-12,496 (S, W)

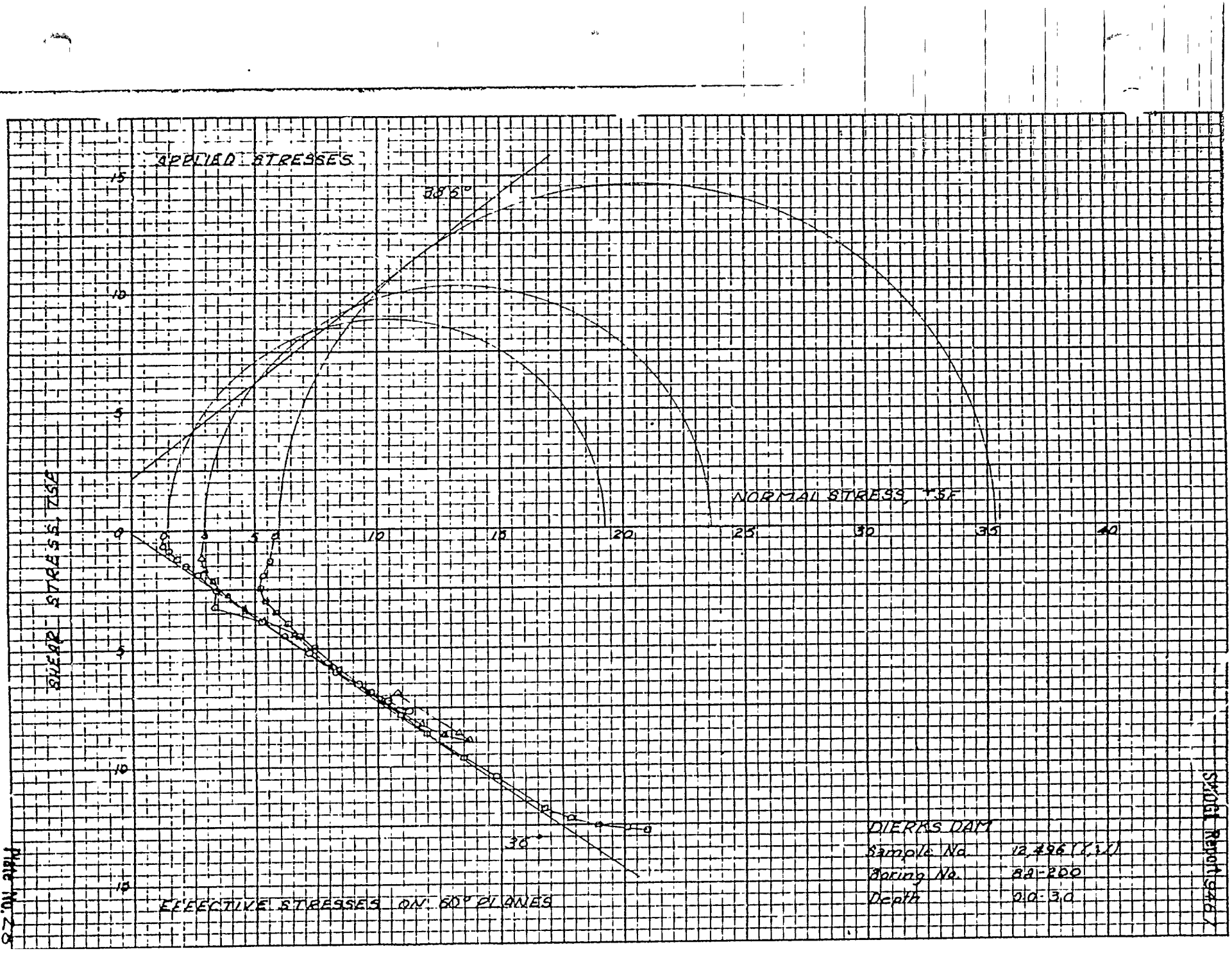
DEPTH ~~FT~~ 0.0-3.0 DATE NOV 85

TRIAXIAL COMPPESSION TEST REPORT

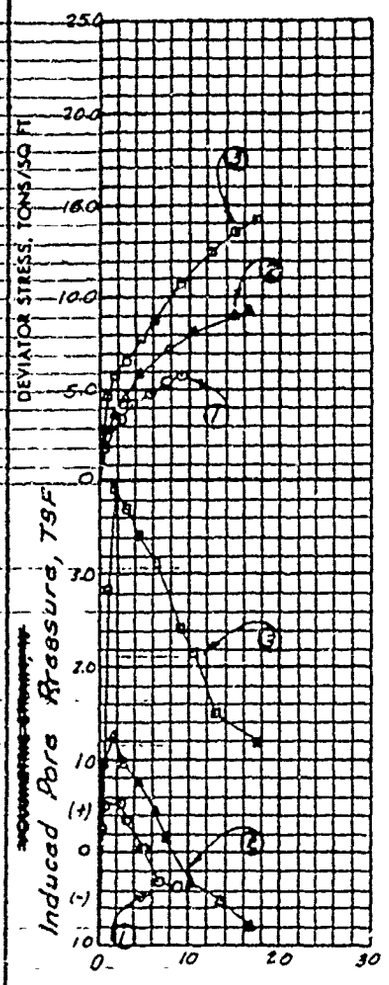
(TRANSLUCENT)

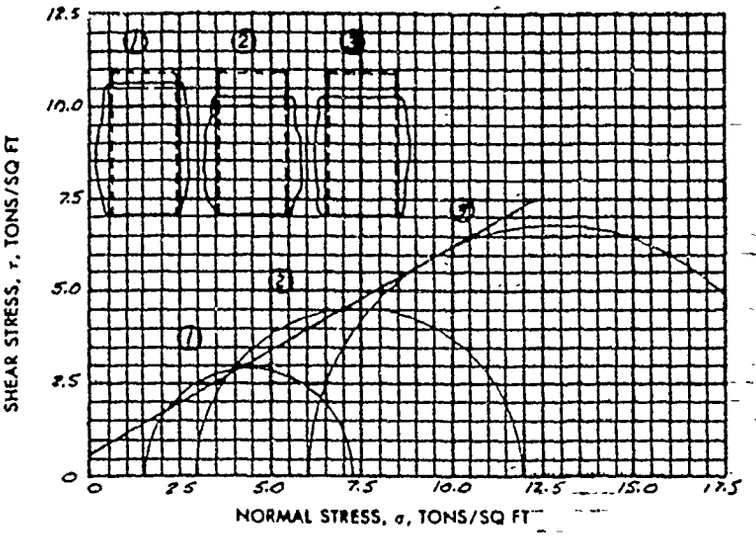
ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE GPO 1963 O-713-720

Plate No. 2


APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
0
5
10
15
20
25
30
35
40
EFFECTIVE STRESSES ON 60° PLANES
DIERKS DAM
Sample No. 12,496 (1,2,3)
Boring No. BB-200
Depth 21.0-31.0
PLATE NO. 22
STRUCT. REPORT 647

SWDGL Report 9467





SHEAR VALUES

φ = 29.0 °

TAN φ = .551

c = 0.6 TONS/SQ FT

TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_o	15.0 %	15.1 %	15.1 %	%
	VOID RATIO	e_o	.505	.499	.492	
	SATURATION	S_o	79 %	81 %	82 %	%
	DRY DENSITY LB/CU FT	γ_d	110.8	111.2	111.7	
BEFORE TEST	WATER CONTENT	w_c	19.7 %	17.6 %	16.7 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c	1.55	2.95	6.05	
	VOID RATIO	e_c	.527	.471	.447	
FINAL	WATER CONTENT	w_f	19.7 %	17.6 %	16.7 %	%
	VOID RATIO At Failure	e_f	.527	.471	.447	
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	7.28	11.95 *	19.59 *	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.55	2.95	6.05	
TIME TO FAILURE MIN			440	415 *	3.90 *	
INITIAL DIAMETER IN.			1.4	1.4	1.4	
INITIAL HEIGHT H_o, IN.			3.0	3.0	3.0	

TYPE TEST R

METHOD OF SATURATION Back pressure ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN See remarks IN/MIN

CLASSIFICATION CLAY, sandy; (CL-ML)

LL 21 PL 15 PI 6 Gs G 2.67

REMARKS * At 15% strain

Rate of strain

Test #1, 0.0005 in/min

Test #2 & 3, 0.001 in/min

PROJECT Dierks Dam

AREA

BORING NO. BA-200 SAMPLE NO. M-12,496 (95 t, W+4)

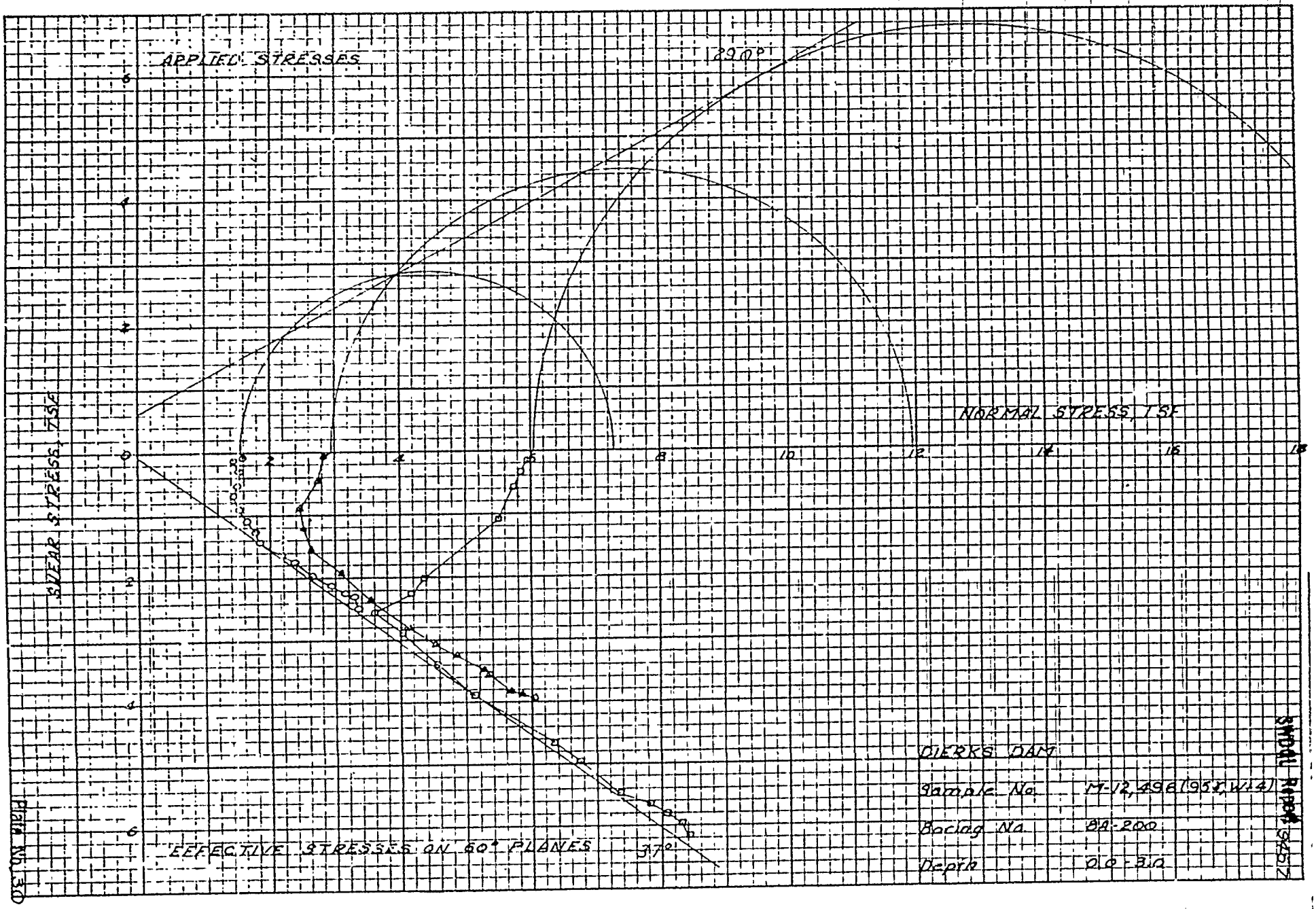
DEPTH 0.0 - 3.0 DATE NOV 65

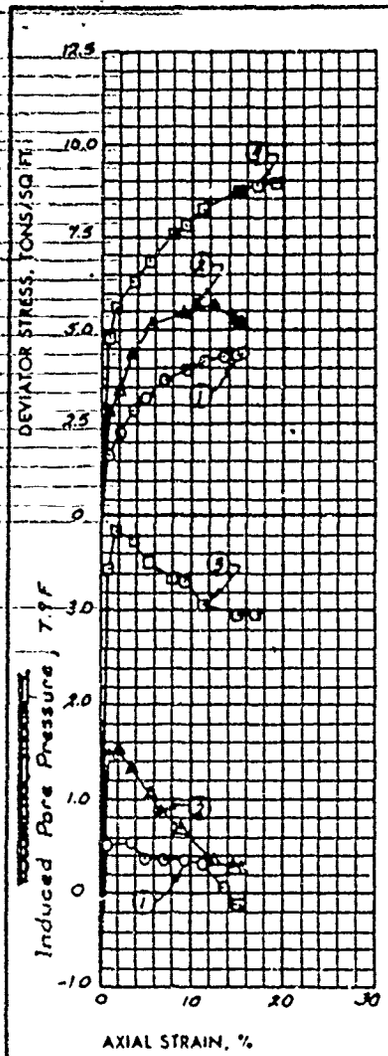
TRIAXIAL COMPRESSION TEST REPORT

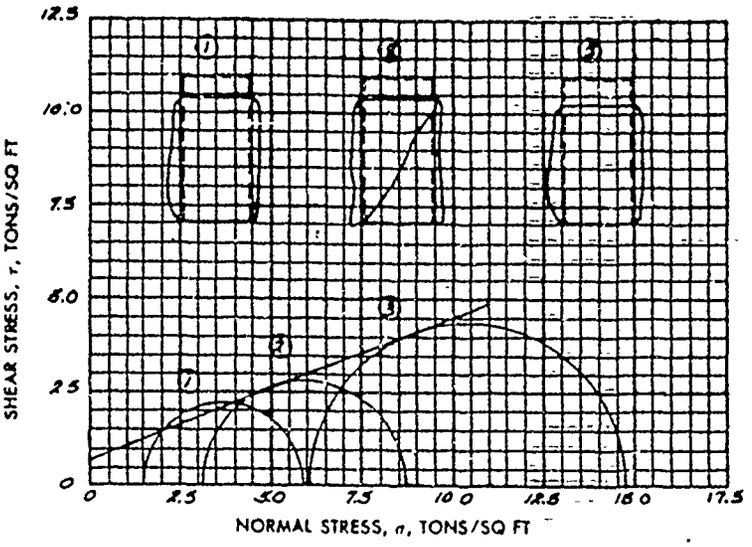
ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

GPO 1964 OP-716-729

Plate No. 2


APPLIED STRESSES
1290 psf
NORMAL STRESS, TSF
SHEAR STRESS, TSF
EFFECTIVE STRESSES ON 60° PLANES
37°
CLERKS DAM
Sample No. M-12,496 (95', W14)
Boring No. BA-200
Depth 210-310
SMDOH Report 94552
Plate No. 30





TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_o	11.6 %	11.8 %	11.8 %	%
	VOID RATIO	e_o	.504	.498	.512	
	SATURATION	S_o	61 %	63 %	62 %	%
	DRY DENSITY LB/CU FT	γ_d	110.8	111.4	110.3	
BEFORE TEST	WATER CONTENT	w_c	18.6 %	19.5 %	18.4 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c	1.50	3.15	6.05	
	VOID RATIO	e_c	.496	.520	.492	
FINAL	WATER CONTENT	w_f	18.6 %	19.5 %	18.4 %	%
	VOID RATIO (At Failure)	e_f	.496	.520	.492	
MAJOR PRINCIPAL STRESS TONS/SQ FT		σ_1	5.89 #	8.70	14.77 #	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.50	3.15	6.05	
TIME TO FAILURE, MIN			415 #	300	360 #	
INITIAL DIAMETER, CM IN			1.4	1.4	1.4	
INITIAL HEIGHT, H_o, CM IN			3.0	3.0	3.0	

SHEAR VALUES

ϕ = 20.8 °

TAN ϕ = .380

c = 0.7 TONS/SQ FT

TYPE TEST R

METHOD OF SATURATION Back Pressure ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.001 IN/MIN

CLASSIFICATION CLAY, sandy (CL-ML)

LL	PL	PI	D_m
21	15	6	G 2.67

REMARKS # At 15 % Strain

PROJECT Dworks Dam

AREA Borrow Material

BORING NO BA-200 SAMPLE NO (951, W) M-12.496

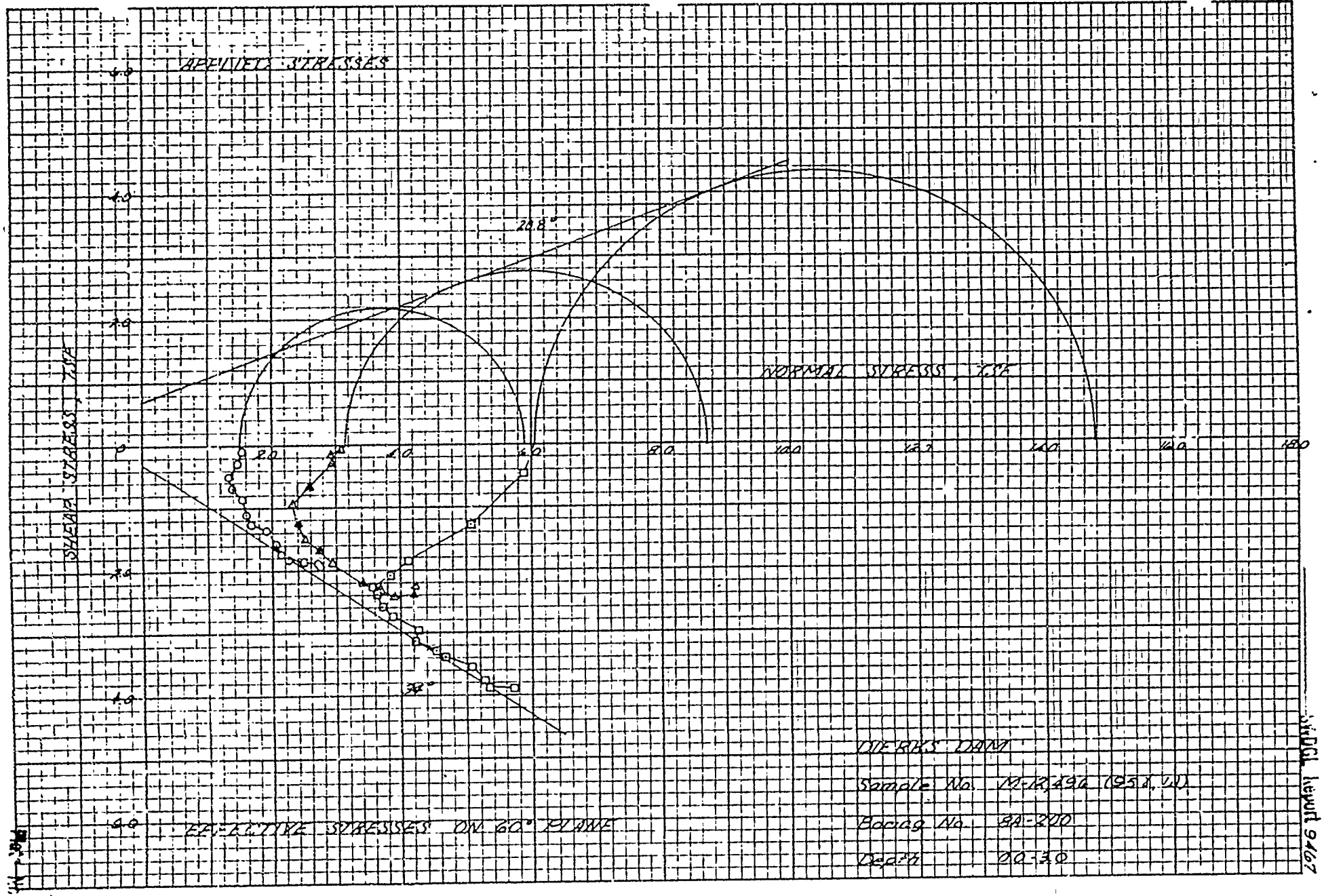
DEPTH 0.0 - 3.0 DATE NOV 65

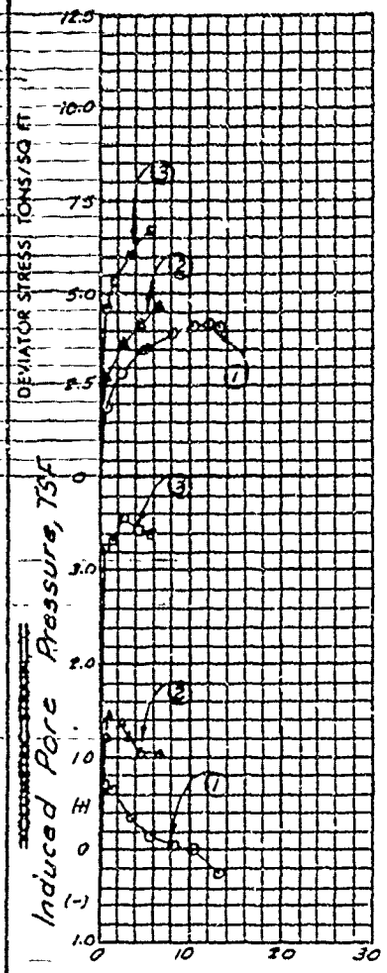
TRIAXIAL COMPRESSION TEST REPORT

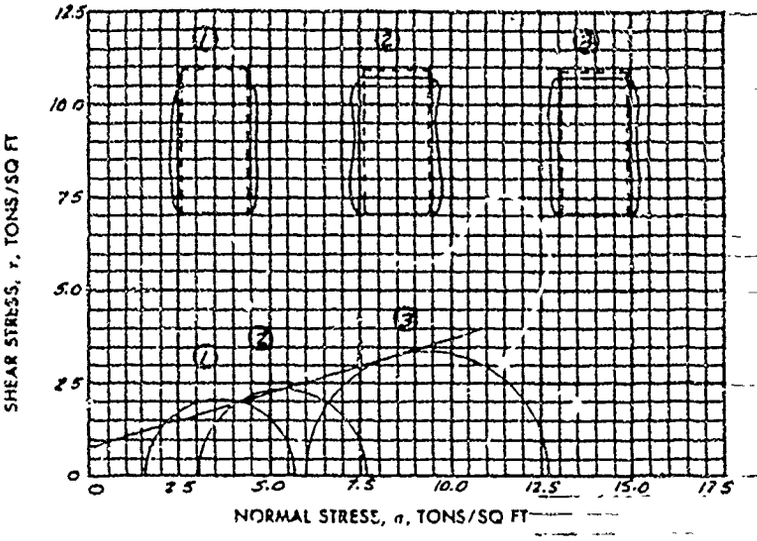
ENG FORM 2089 1 MAY 63. PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

GPO 1964 O-714-759

Plate No. 31


APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
20.8°
30°
EFFECTIVE STRESSES ON 60° PLANE
OTTAWA SAND
Sample No. M-18,492 (95% D.)
Boring No. 88-200
Depth 90-100





SHEAR VALUES

ϕ = 16.0°

TAN ϕ = .286

c = 0.8 TONS/SQ FT

TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_o	9.2 %	9.0 %	9.1 %	%
	VOID RATIO	e_o	.532	.505	.509	
	SATURATION	S_o	46 %	48 %	48 %	%
	DRY DENSITY LB/CU FT	γ_d	108.8	110.7	110.5	
BEFORE TEST	WATER CONTENT	w_c	19.0 %	21.5 %	20.5 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c	1.60	3.05	6.00	
	VOID RATIO	e_c	.507	.574	.549	
FINAL	WATER CONTENT	w_f	19.0%	21.5%	20.5%	%
	VOID RATIO At Failure	e_f	.507	.574	.549	
MAJOR PRINCIPAL STRESS TONS/SQ FT		σ_1	5.72	7.62	12.73	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.60	3.05	6.00	
TIME TO FAILURE, MIN			415	460	415	
INITIAL DIAMETER, IN.			1.4	1.4	1.4	
INITIAL HEIGHT, H_o, IN.			3.0	3.0	3.0	

TYPE TEST R

METHOD OF SATURATION Back pressure ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN See remacks IN / MIN

CLASSIFICATION CLAY, sandy (CL-ML)

LL 21 | PL 15 | PI 6 | G 2.67

REMARKS

Rate of strain.

Test # 1, 0.001 in./min.

Test # 2 & 3, 0.0005 in./min.

PROJECT Dierks Dam

AREA

BORING NO BA-200 (1958, W-2)

SAMPLE NO. M-12,496

DEPTH ft 0.0 - 3.0

DATE NOV 65

TRIAXIAL COMPRESSION TEST REPORT

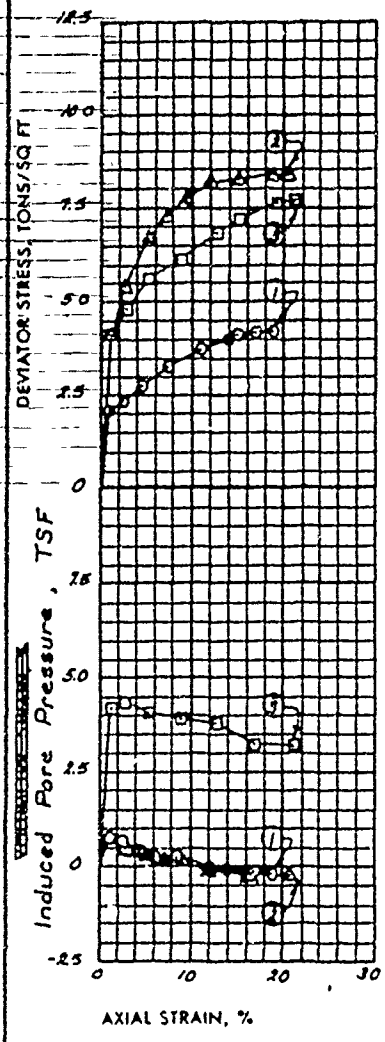
ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

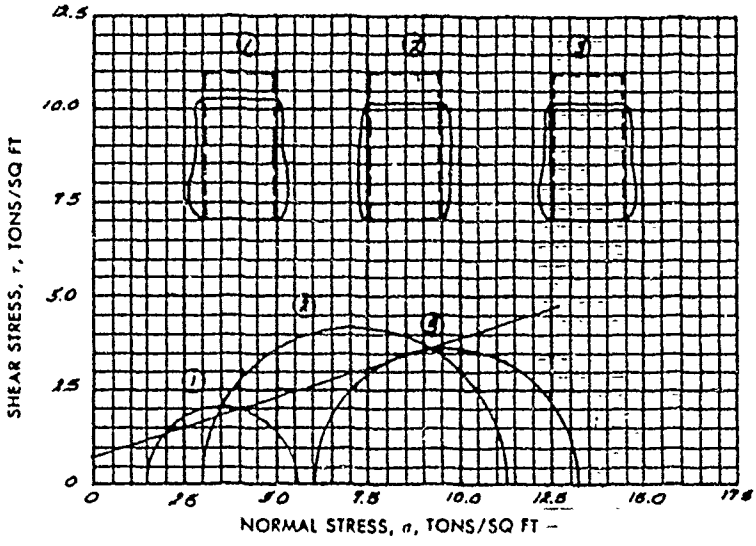
(175)

Plate No. 33

DIERKS WOOD
Stanislaus N.F.
80-2018
Hoopa
Redwood Valley
Ukiah
SANTA ROSA
SONOMA MOUNTAIN
SONOMA
SANTA ROSA NW
SANTA ROSA SW
SEBASTOPOL
GUERNEVILLE
GUERNEVILLE SW
GUERNEVILLE SE
GUERNEVILLE NE
GUERNEVILLE NW
GUERNEVILLE SE
GUERNEVILLE SW

SWDGL Report 9467





SHEAR VALUES

ϕ = 17.2

TAN ϕ = .310

c = 0.8 TONS/SQ FT

TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_o	12.8 %	12.9 %	12.9 %	%
	VOID RATIO	e_o	.448	.436	.453	
	SATURATION	S_o	77 %	80 %	77 %	%
	DRY DENSITY LB/CU FT	γ_d	116.0	117.0	115.6	
BEFORE TEST	WATER CONTENT	w_c	17.1 %	15.8 %	15.6 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c	1.50	3.00	6.05	
	VOID RATIO	e_c	.461	.426	.420	
FINAL	WATER CONTENT	w_f	17.1 %	15.8 %	15.6 %	%
	VOID RATIO	e_f	.461	.426	.420	
MAJOR PRINCIPAL STRESS TONS/SQ FT		σ_1	5.57 *	11.31 *	13.20 *	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.50	3.00	6.05	
TIME TO FAILURE, MIN			353 *	330 *	330 *	
INITIAL DIAMETER, cm IN			1.4	1.4	1.4	
INITIAL HEIGHT, H_o, cm IN			3.0	3.0	3.0	

TYPE TEST R

METHOD OF SATURATION Back Pressure ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.001 IN/MIN

CLASSIFICATION CLAY (CL)

LL 30 PL 14 PI 16 G_s 2.69

REMARKS * At 15 % Strain

PROJECT Dierks Dam

AREA

BORING NO BA-203 SAMPLE NO. (T, W) M-12,500

DEPTH ft 0.0-3.0 DATE NOV 65

TRIAXIAL COMPRESSION TEST REPORT

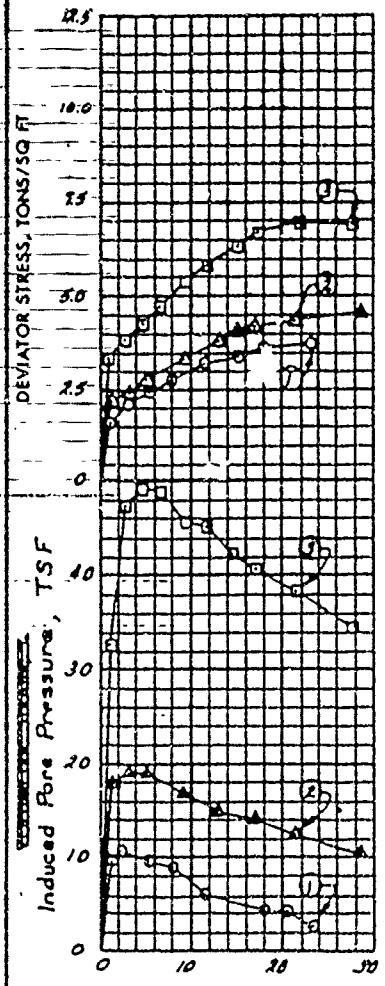
ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO 1964 O-714-729

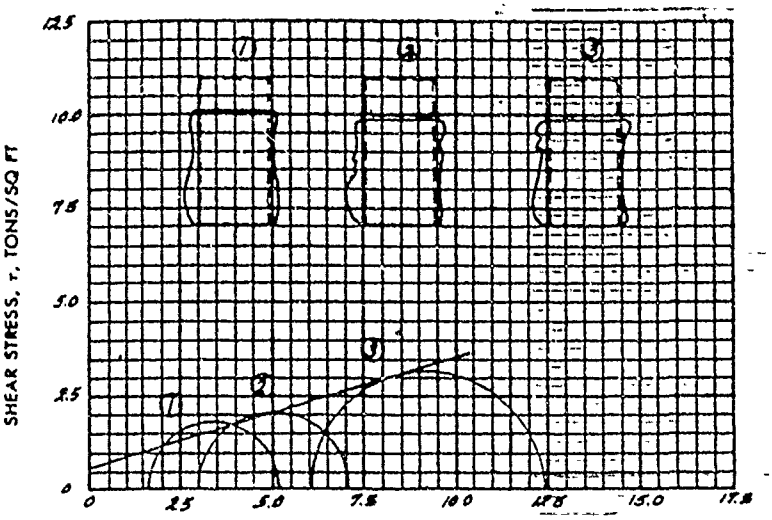
(77)

Plate No. 35

SWDGL Report 9467

Plate No. 36





SHEAR VALUES

ϕ = 16.7 °

TAN ϕ = .300

c = 0.6 TONS/SQ FT

TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_o	16.1 %	16.1 %	16.0 %	%
	VOID RATIO	e_o	.515	.512	.515	
	SATURATION	S_o	84 %	85 %	83 %	%
	DRY DENSITY LB/CU FT	γ_d	110.9	111.0	110.8	
BEFORE TEST	WATER CONTENT	w_c	17.4 %	16.9 %	15.9 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c	1.70	3.00	6.05	
	VOID RATIO	e_c	.467	.454	.428	
FINAL	WATER CONTENT	w_f	17.4 %	16.9 %	15.9 %	%
	VOID RATIO	e_f	.467	.454	.428	
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	5.16 *	7.02 *	12.42 *	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.70	3.00	6.05	
TIME TO FAILURE, MIN			220 *	170 *	210 *	
INITIAL DIAMETER OR IN			1.4	1.4	1.4	
INITIAL HEIGHT, H_o, OR IN			3.0	3.0	3.0	

TYPE TEST R

METHOD OF SATURATION Back Pressure ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.002 IN/MIN

CLASSIFICATION CLAY (CL)

LL 30 PL 14 PI 16 G_s 2.69

REMARKS * At 15% Strain

PROJECT Dicks Dam

AREA

BORING NO BA-203 SAMPLE NO. (951, W13) M-12,500

DEPTH FT 0.0-3.0 DATE NOV 85

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO 1964 O-716-789

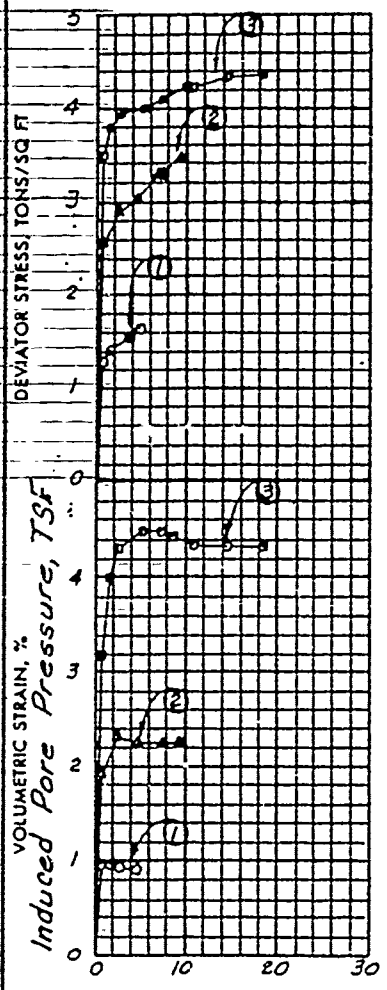
(79)

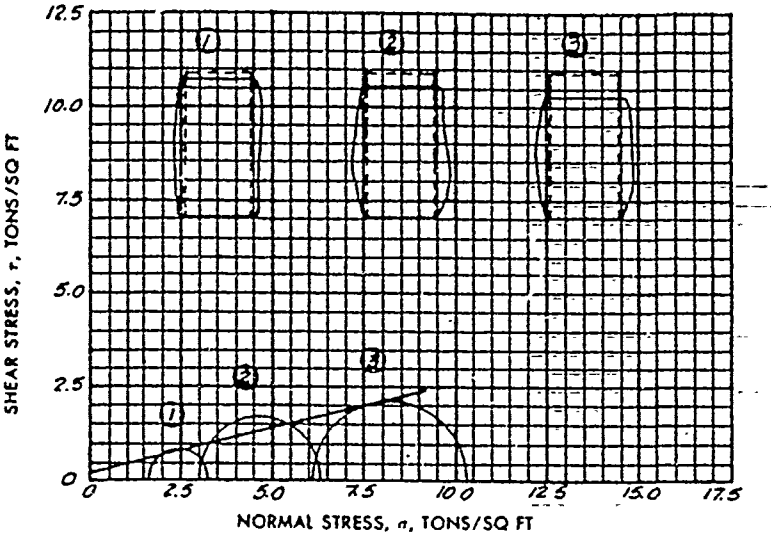
Plate No. 37

APPLIED STRESSES
SHEAR STRESS, TAU
EFFECTIVE STRESS, SIGMA PRIME
NORMAL STRESS, SIGMA
DIERKS DAM
Sample No. NA 12-302 (@ 5' 4")
Boring No. BA-308
Depth 90-130
12.7'

Plate No. 38

SWDGL Report 9467





SHEAR VALUES

ϕ = 13.5°

TAN ϕ = .240

c = 0.2 TONS/SQ FT

TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_o	13.2 %	12.7 %	13.1 %	%
	VOID RATIO	e_o	.518	.506	.519	
	SATURATION	S_o	69 %	68 %	68 %	%
	DRY DENSITY LB/CU FT	γ_d	110.6	111.5	110.6	
BEFORE TEST	WATER CONTENT	w_c	21.4 %	18.5 %	18.8 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c	1.65	3.00	6.10	
	VOID RATIO	e_c	.575	.497	.505	
FINAL	WATER CONTENT	w_f	21.4 %	18.5 %	18.8 %	%
	VOID RATIO At Failure	e_f	.576	.497	.505	
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	3.23	6.30	10.35	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.65	3.00	6.10	
TIME TO FAILURE, MIN			355	335	245	
INITIAL DIAMETER, cm/IN.			1.4	1.4	1.4	
INITIAL HEIGHT, H_o, cm/IN.			3.0	3.0	3.0	

TYPE TEST R

METHOD OF SATURATION Back pressure ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN See remarks IN./MIN

CLASSIFICATION CLAY (CL)

LL 30 PI 14 w_n 16 = G 2.69

REMARKS

Rate of strain:

Test # 1 0.0003 in./min.

Test # 2 0.0005 in./min.

Test # 3 0.001 in./min.

PROJECT Dierks Dam

AREA

BORING NO. BA-203 SAMPLE NO. M-12,500 (958,W)

DEPTH ft 0.0 - 3.0 DATE NOV 63

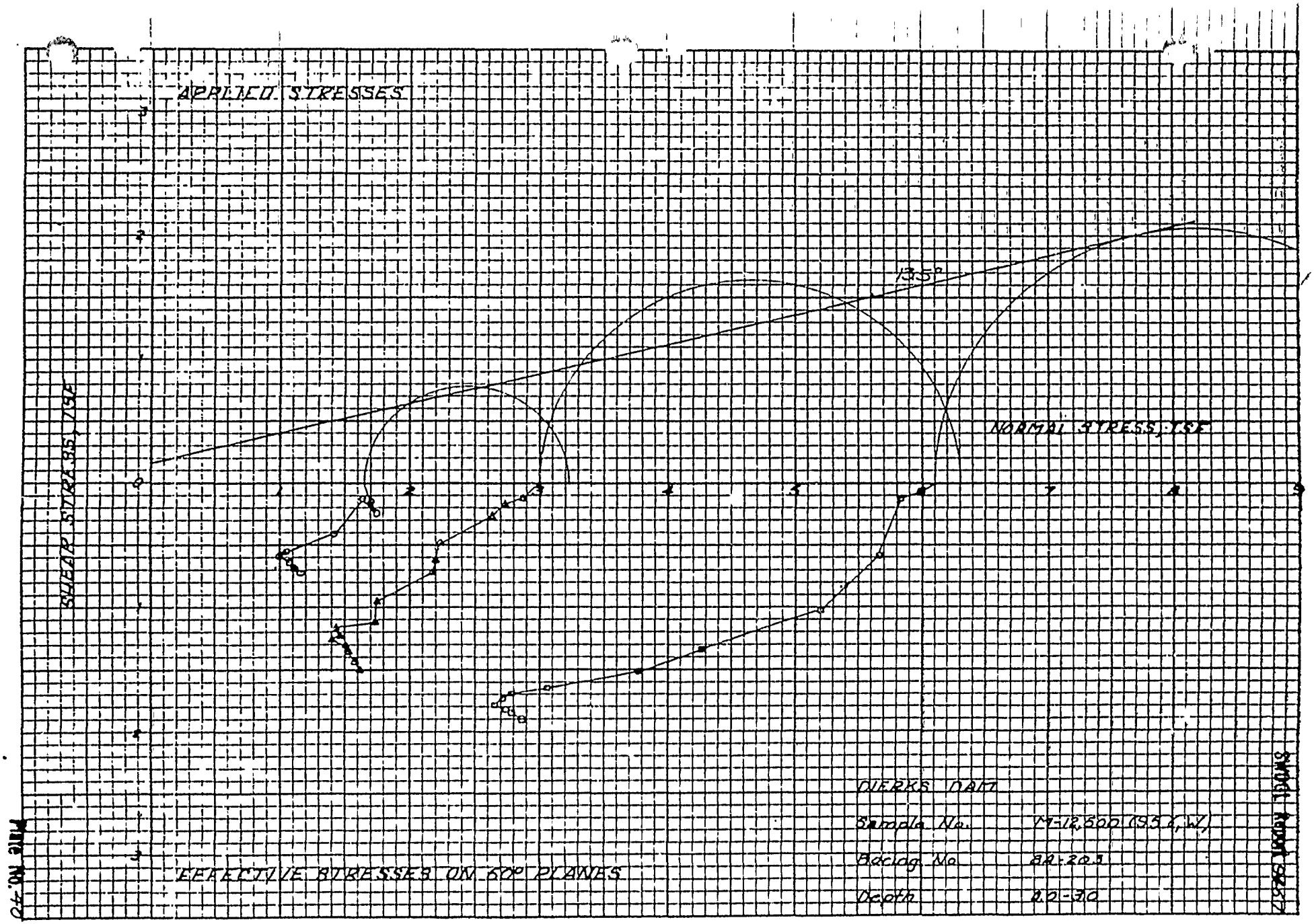
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

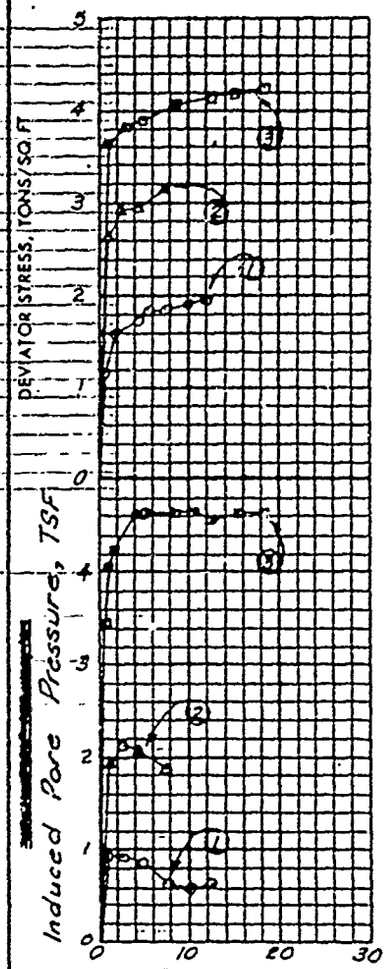
GPO 1964 O—714-729

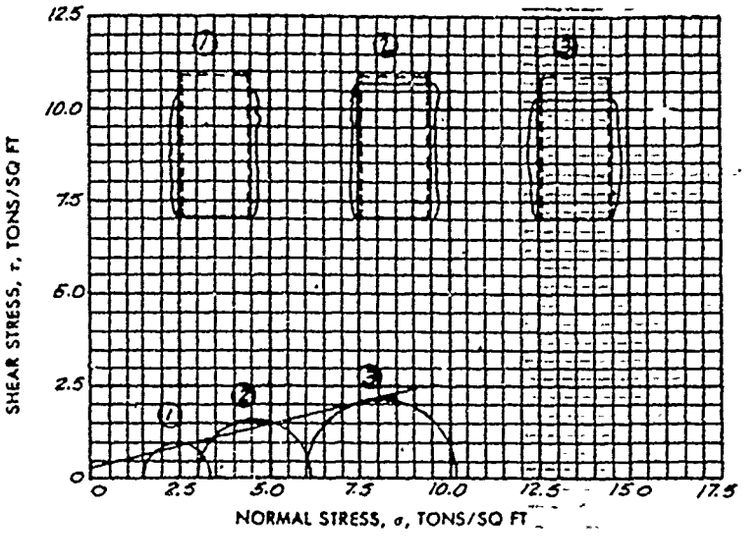
(81)

Plate No. 39


APPLIED STRESSES
13.5°
SHEAR STRESS, TSF
NORMAL STRESS, TSF
0
1
2
3
4
5
6
7
8
9
EFFECTIVE STRESSES ON 60° PLANES
CLERKS DATA
Sample No. VT-12,500 (95 ft, W)
Boring No. BR-203
Depth 80-90
FILE NO. 270
SMALL LOADS SHEET

SWDGL Report 9467





SHEAR VALUES

ϕ = 13.0 °

TAN ϕ = .230

c = 0.3 TONS/SQ FT

TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_o	10.3 %	10.2 %	10.2 %	%
	VOID RATIO	e_o	.528	.516	.528	
	SATURATION	S_o	52 %	53 %	52 %	%
	DRY DENSITY LB/CU FT	γ_d	109.9	110.8	109.9	
BEFORE TEST	WATER CONTENT	w_c	20.4%	20.2%	20.6%	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c	1.50	3.00	6.00	
	VOID RATIO	e_c	.548	.542	.558	
FINAL	WATER CONTENT	w_f	20.4 %	20.2%	20.6 %	%
	VOID RATIO At Failure	e_f	.548	.542	.558	
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	3.34	6.14	10.20 *	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.50	3.00	6.00	
TIME TO FAILURE, MIN			19.5	4.40	3.90 *	
INITIAL DIAMETER, cm/in			1.4	1.4	1.4	
INITIAL HEIGHT, H_o, cm/in			3.0	3.0	3.0	

TYPE TEST R

METHOD OF SATURATION Back pressure ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN See remarks IN./MIN

CLASSIFICATION CLAY (CL)

LL 30 PL 14 PI 16 G 2.69

REMARKS *At 15 % strain

Rate of strain:

Test #1 & 3, 0.001 in/min

Test #2, 0.0005 in./min.

PROJECT Dierks Dam

AREA

BORING NO. BA-203 SAMPLE NO. M-12,500 (958, W-3)

DEPTH 0.0 - 3.0 DATE NOV 65

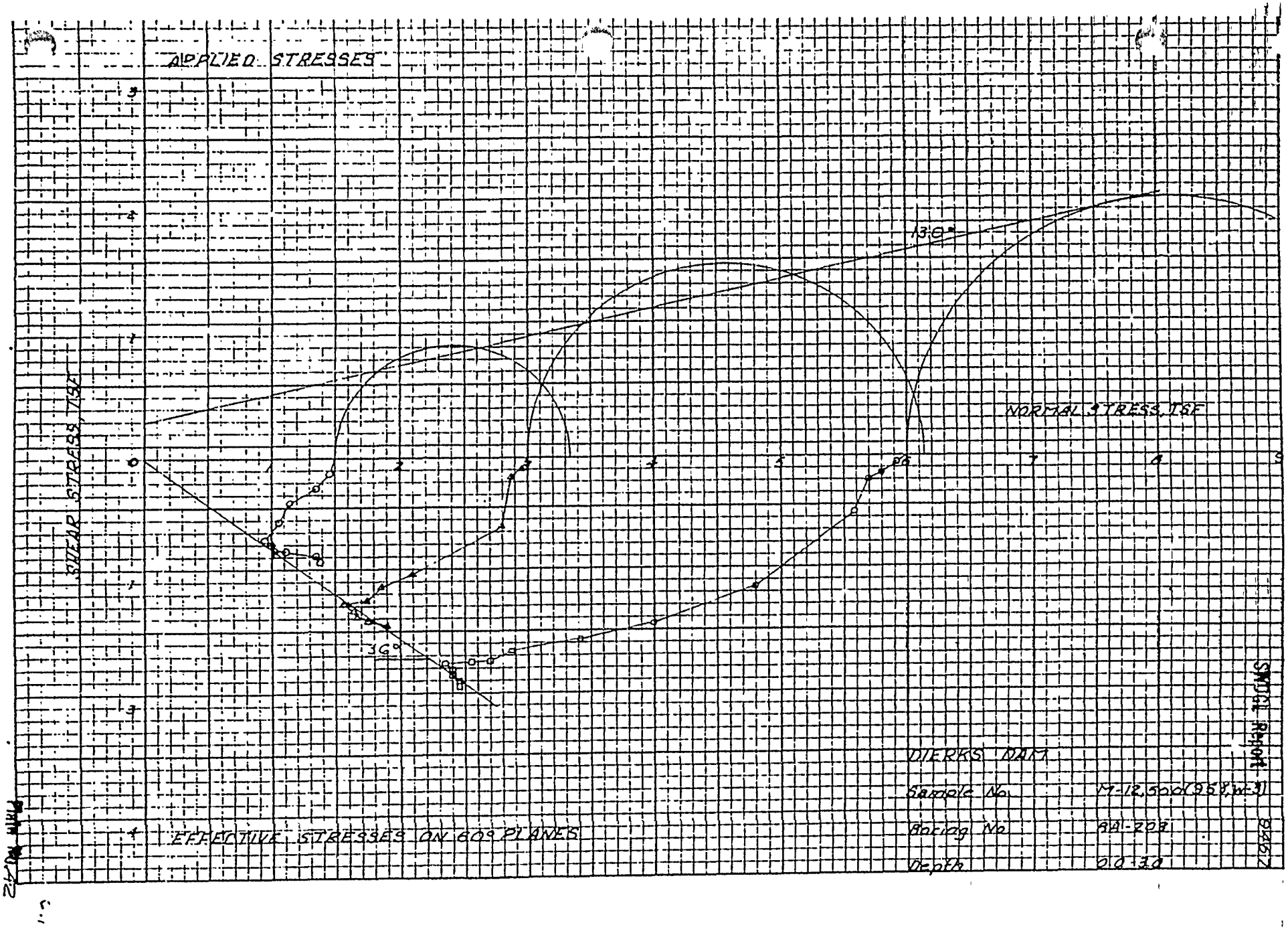
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

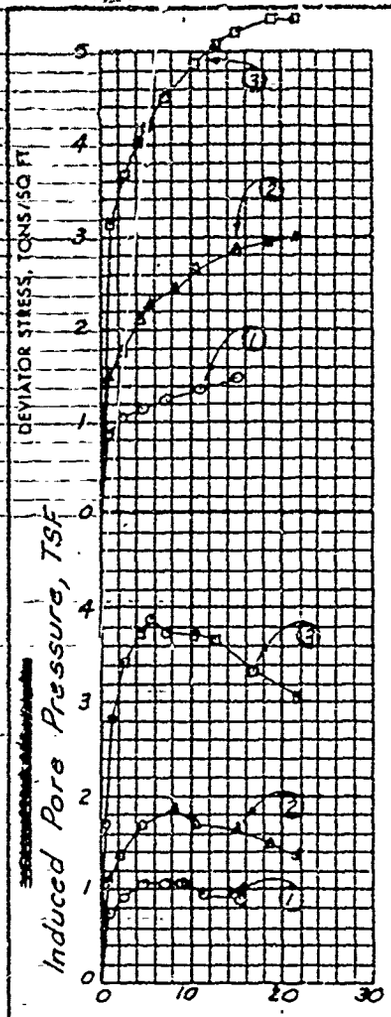
GPO 1964 O-714-759

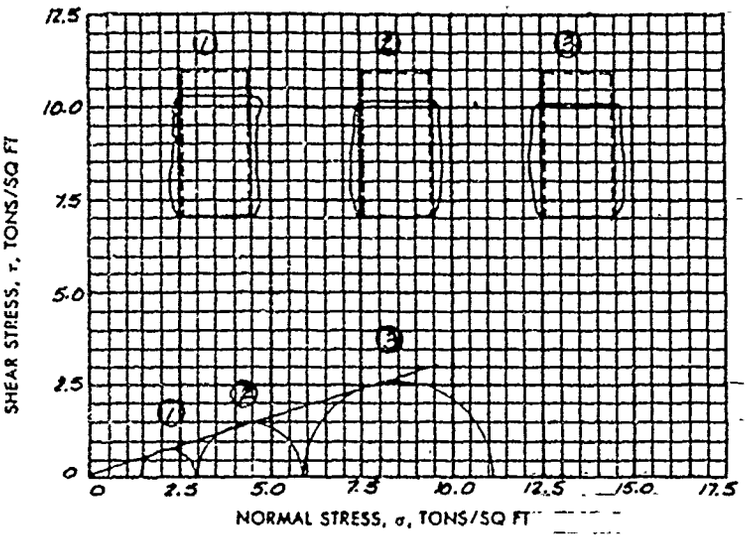
(83)

Plate No. 41


APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
130°
60°
P6
EFFECTIVE STRESSES ON 60° PLANES
DIERKS DAM
Sample No. 17-12,500(955,inc3)
Boring No. 98-203
Depth 210-30
SMALL RIGHT 82002

SWDGL Report 9467





SHEAR VALUES

ϕ = 17.2 °

TAN ϕ = .310

c = 0.1 TONS/SQ FT

TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_o	16.4 %	16.4 %	17.1 %	%
	VOID RATIO	e_o	.585	.572	.602	
	SATURATION	S_o	76 %	78 %	77 %	%
	DRY DENSITY LB/CU FT	γ_d	106.8	107.6	105.5	
BEFORE TEST	WATER CONTENT	w_c	22.4%	19.4%	17.2 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS, TONS/SQ FT	σ_c	1.45	2.95	5.90	
	VOID RATIO	e_c	.604	.524	.466	
FINAL	WATER CONTENT	w_f	22.4%	19.4 %	17.2 %	%
	VOID RATIO At Failure	e_f	.604	.524	.466	
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	2.93 #	5.85 #	11.11 #	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.45	3.00	5.90	
TIME TO FAILURE, MIN			410 #	450 #	320 #	
INITIAL DIAMETER, CM			1.4	1.4	1.4	
INITIAL HEIGHT, H_o, CM			3.0	3.0	3.0	

TYPE TEST R

METHOD OF SATURATION Back pressure ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN See remarks IN /MIN

CLASSIFICATION CLAY (CL)

LL 40 PL 13 PI 27 G 2.71

REMARKS # At 15% strain
Rate of strain:
Test # 1 & 2, 0.001 in./min.
Test # 3, 0.0015 in./min.

PROJECT Dierks Dam

AREA

BORING NO. 8A-207 SAMPLE NO (8,W) M-12,504

DEPTH 5.0 - 7.5 DATE NOV 65

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) GPO 1964 OF—716-729

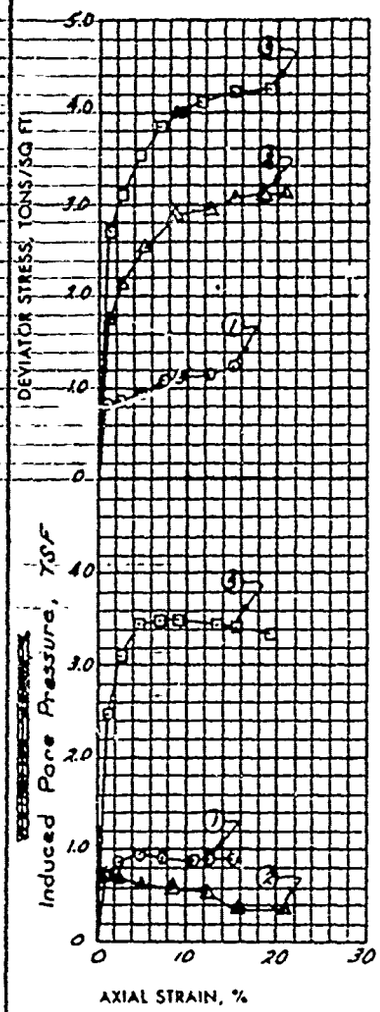
(55)

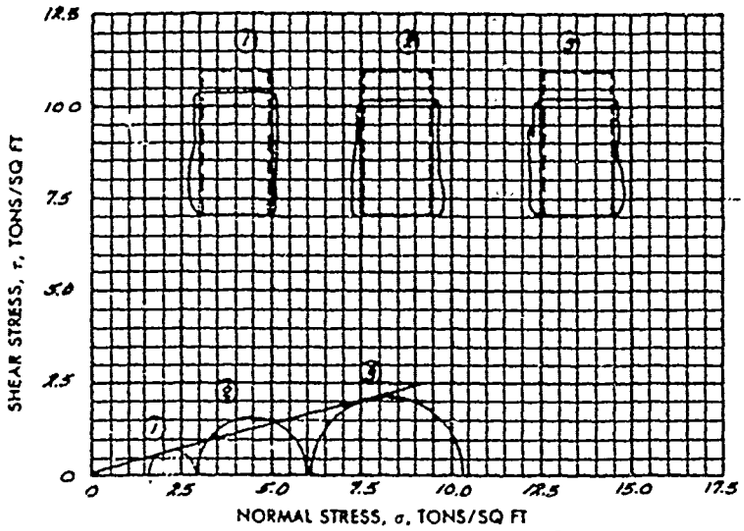
Plate No. 43

SWOGL Report 24617
NORMAL STRESS, TSF
SHEAR STRESS, TSF
APPLIED STRESSES
DIFFERENTIAL STRESSES ON 60° PLANES
DIERKS DAM
Sample No. 14-12 SCS-11
Boring No. BB-207
Depth 5.0-14.5

Plate No. 44

SWDGL Report 9467





TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_o	20.1 %	20.2 %	20.0 %	%
	VOID RATIO	e_o	.683	662	.682	
	SATURATION	S_o	80 %	82 %	79 %	%
	DRY DENSITY LB/CU FT	γ_d	100.6	101.7	100.6	
BEFORE TEST	WATER CONTENT	w_c	22.1 %	20.1 %	19.0 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c	1.65	2.95	6.10	
	VOID RATIO	e_c	.598	.544	.516	
FINAL	WATER CONTENT	w_f	22.1 %	20.1 %	19.0 %	%
	VOID RATIO (At Failure)	e_f	.598	.544	.516	
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	2.87 *	6.00 #	10.31 '	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.65	2.95	6.10	
TIME TO FAILURE, MIN			435 *	315 #	345 *	
INITIAL DIAMETER, cm IN			1.4	1.4	1.4	
INITIAL HEIGHT, H_o, cm IN			3.0	3.0	3.0	

SHEAR VALUES

ϕ = 14.6°

TAN ϕ = .260

c = 0.0 TONS/SQ FT

TYPE TEST R

METHOD OF SATURATION Back Pressure ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.001 IN/MIN

CLASSIFICATION CLAY (CL)

LL 40 PL 13 PI 27 G_s 2.71

REMARKS * At 15% Strain

PROJECT Dierks Dam

AREA

BORING NO. BA-207 SAMPLE NO. (95T, W+3) M-12,504

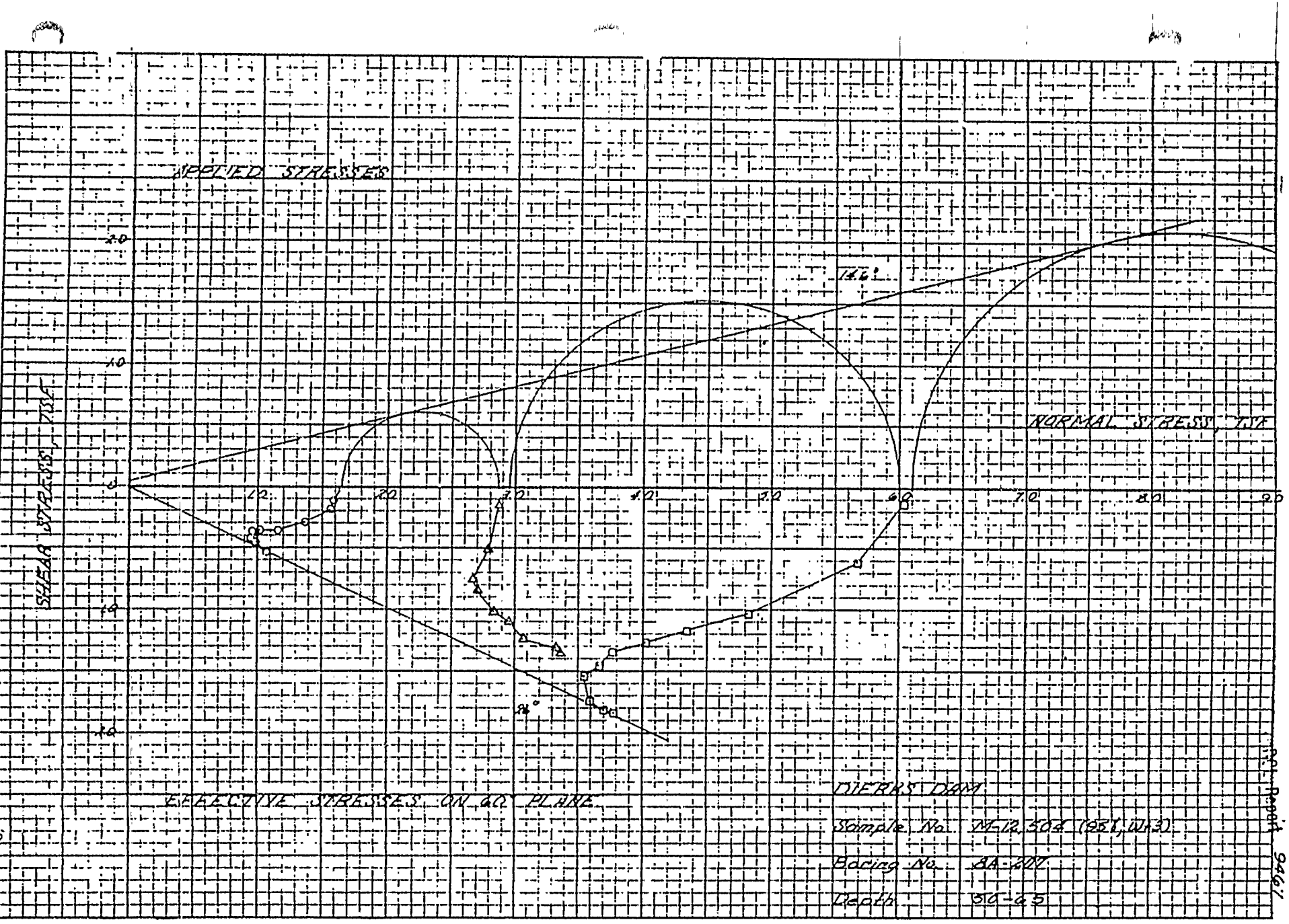
DEPTH FT 5.0-6.5 DATE NOV 65

TRIAXIAL COMPRESSION TEST REPORT

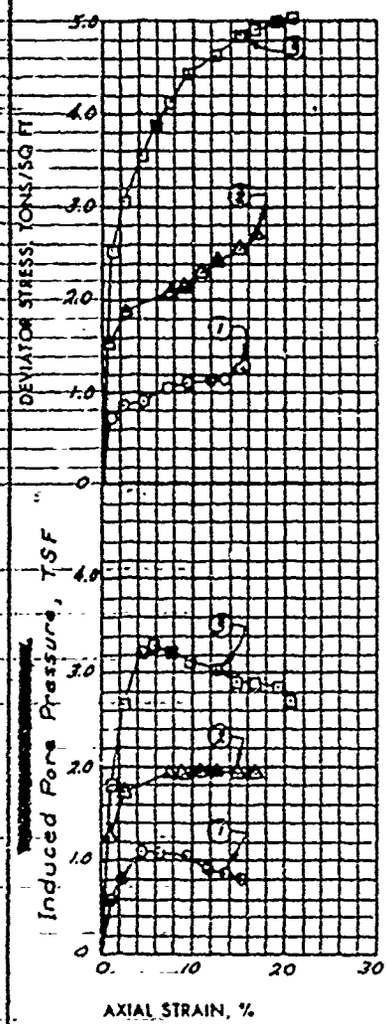
ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

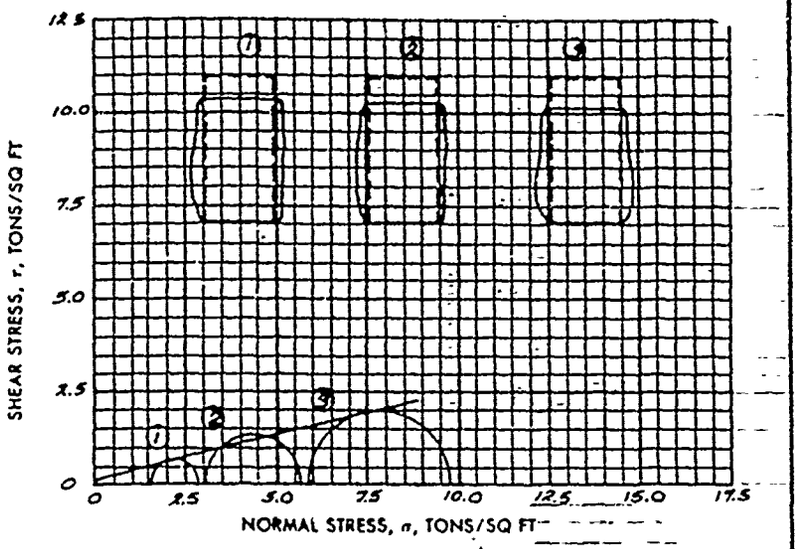
GPO 1966 O-244-329

Plate No 8


APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
EFFECTIVE STRESSES ON 60° PLANE
DIERKS DAM
Sample No. NE-12, 50ft (1951, WA-3)
Boring No. BA-207
Depth 310-45
Plate No. 46
U.S. Report 9467

SWDGL Report 9467





SHEAR VALUES

ϕ = 13.6°

TAN ϕ = .243

c = 0.1 TONS/SQ FT

TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_o	16.4 %	16.0 %	16.5 %	%
	VOID RATIO	e_o	.676	.654	.677	
	SATURATION	S_o	66 %	66 %	66 %	%
	DRY DENSITY LB/CU FT	γ_d	101.0	102.4	100.8	
BEFORE TEST	WATER CONTENT	w_c	22.3 %	19.4 %	18.9 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c	1.60	3.05	5.90	
	VOID RATIO	e_c	.605	.526	.513	
FINAL	WATER CONTENT	w_f	22.3 %	19.4 %	18.9 %	%
	VOID RATIO (At Failure)	e_f	.605	.526	.513	
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	2.85*	5.63*	9.73*	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.60	3.05	5.90	
TIME TO FARURE, MIN			430*	360*	335*	
INITIAL DIAMETER IN IN			1.4	1.4	1.4	
INITIAL HEIGHT, H_o, IN IN			3.0	3.0	3.0	

TYPE TEST R

METHOD OF SATURATION Back Pressure ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.001 IN / MIN

CLASSIFICATION CLAY (CL)

LL 40 PL 13 PI 27 G_s 2.71

REMARKS *At 15 % Strain

PROJECT Dierks Dam

AREA

BORING NO. BA-207 SAMPLE NO (95', W) M-12,504

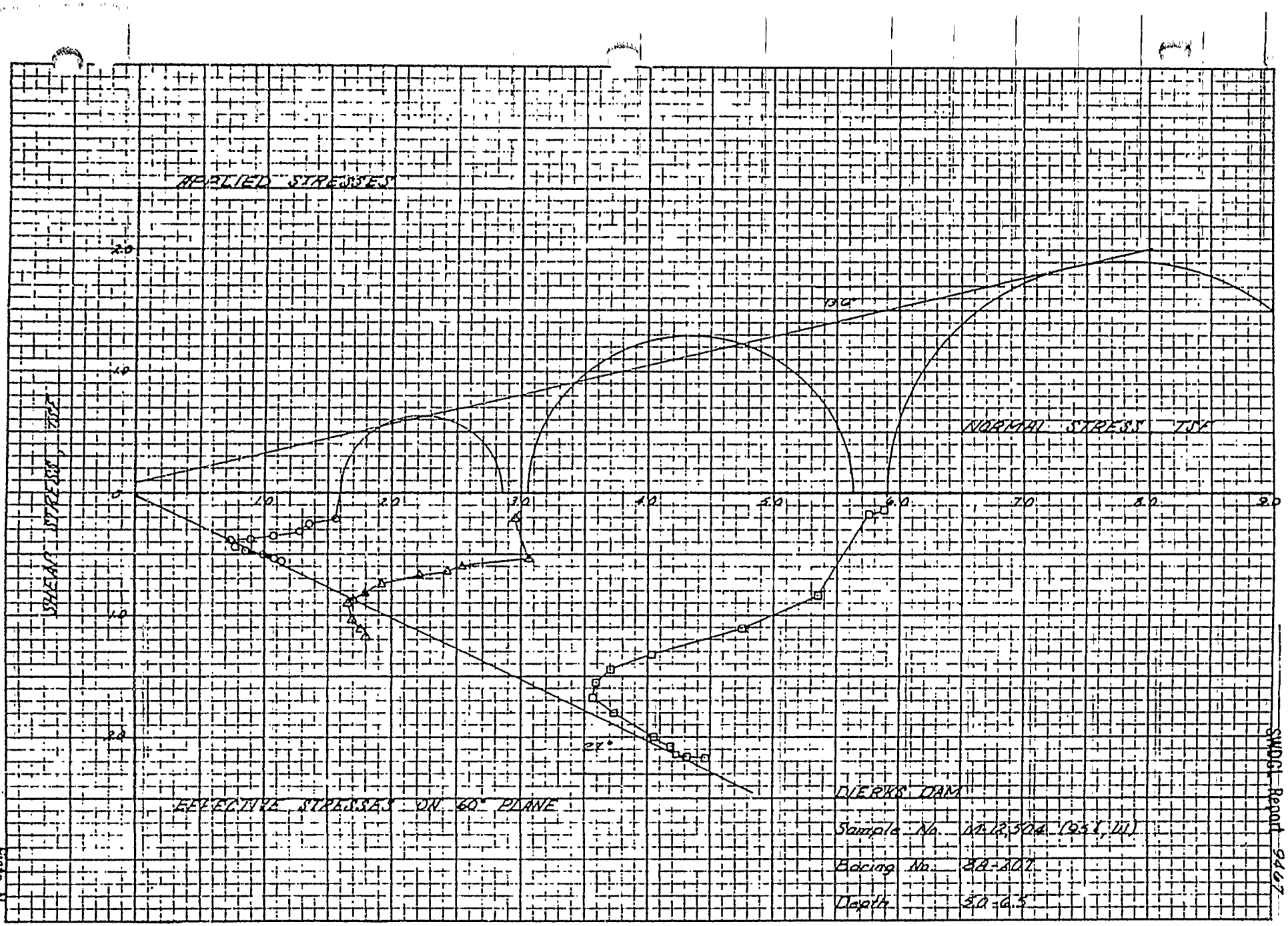
DEPTH FT 5.0-6.5 DATE NOV 65

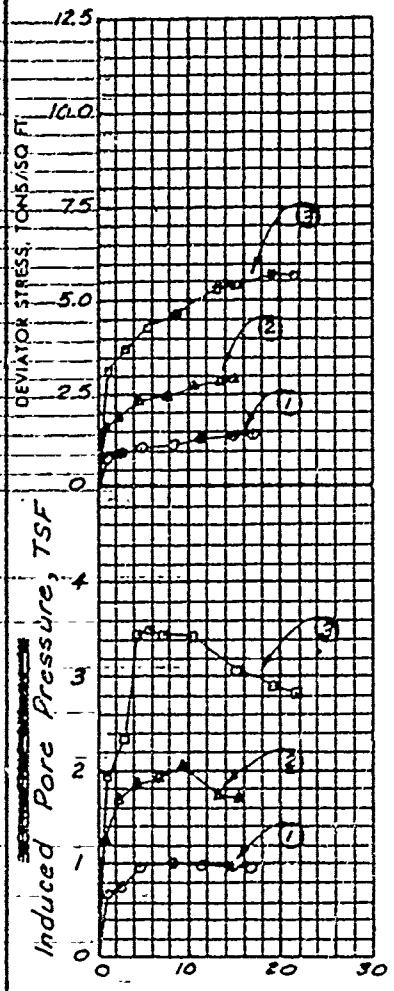
TRIAXIAL COMPRESSION TEST REPORT

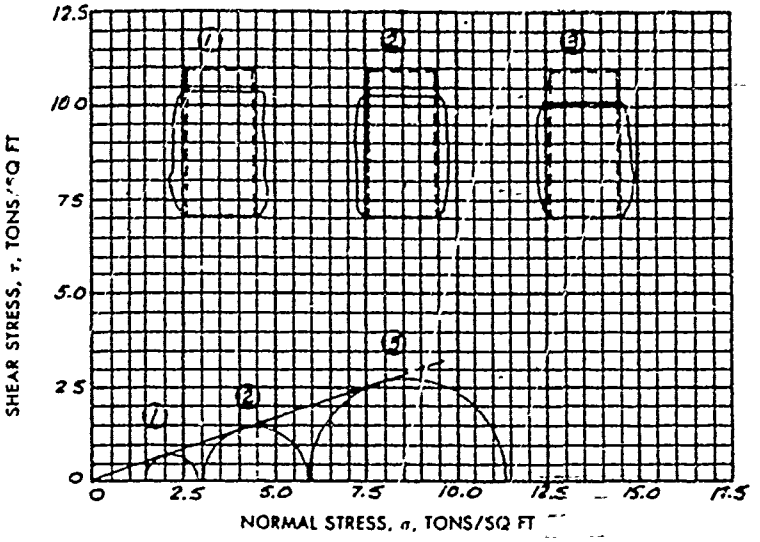
ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

GPO 1964 OF—716-729

Plate No. 47


APPLIED STRESSES
NORMAL STRESS TSF
SHEARING STRESS TSF
EFFECTIVE STRESSES ON 60° PLANE
27°
VERKS DAM
Sample No. VK-2,304 (Q.S.I, III)
Boring No. 28-SD2
Depth 50-6.5
SWDC-Report 9467
Plate No. 48





SHEAR VALUES

ϕ = 18.0°

TAN ϕ = .324

c = 0.0 TONS/SQ FT

TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_o	14.2 %	14.2 %	14.0 %	%
	VOID RATIO	e_o	.683	.670	.684	
	SATURATION	S_o	56 %	57 %	56 %	%
	DRY DENSITY LB/CU FT	γ_d	100.6	101.3	100.5	
BEFORE TEST	WATER CONTENT	w_c	23.1 %	19.4 %	17.6 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c	1.50	3.05	5.95	
	VOID RATIO	e_c	.628	.527	.477	
FINAL	WATER CONTENT	w_f	23.1 %	19.4 %	17.6 %	%
	VOID RATIO At Failure	e_f	.628	.527	.477	
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	2.90	5.94	11.34	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.50	3.05	5.95	
TIME TO FAILURE, MIN			395	375	310	
INITIAL DIAMETER, D_o, CM IN.			1.4	1.4	1.4	
INITIAL HEIGHT, H_o, CM IN.			3.0	3.0	3.0	

TYPE TEST R

METHOD OF SATURATION Back pressure ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN See remacks IN./MIN

CLASSIFICATION CLAY (CL)

LL 40 PL 13 PI 27 G_s 2.71

REMARKS * At 15 % strain

Rate of strain:

Test # 1 & 2 0.001 in./min.

Test # 3, 0.0015 in./min.

PROJECT Dierks Dam

AREA

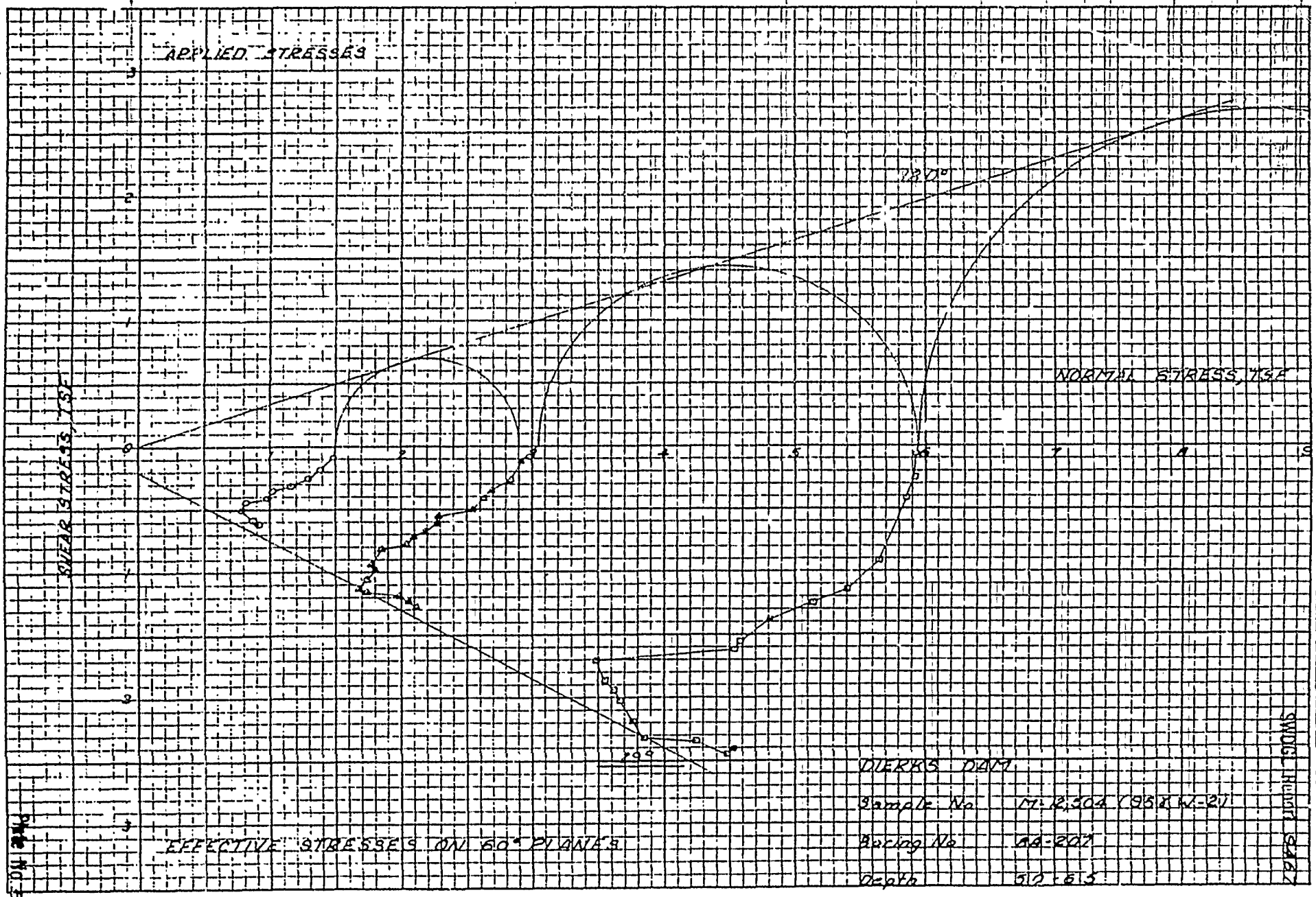
BORING NO. BA-207 SAMPLE NO. (958, W-2) M-12,504

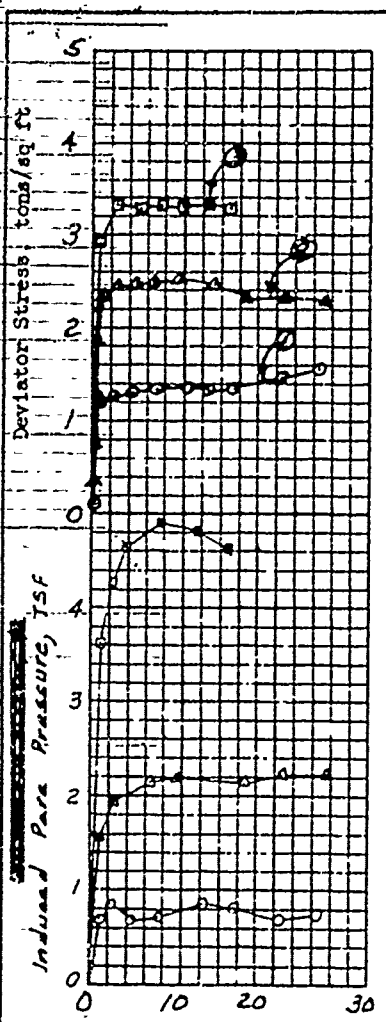
DEPTH 5.0 - 6.5 DATE NOV 65

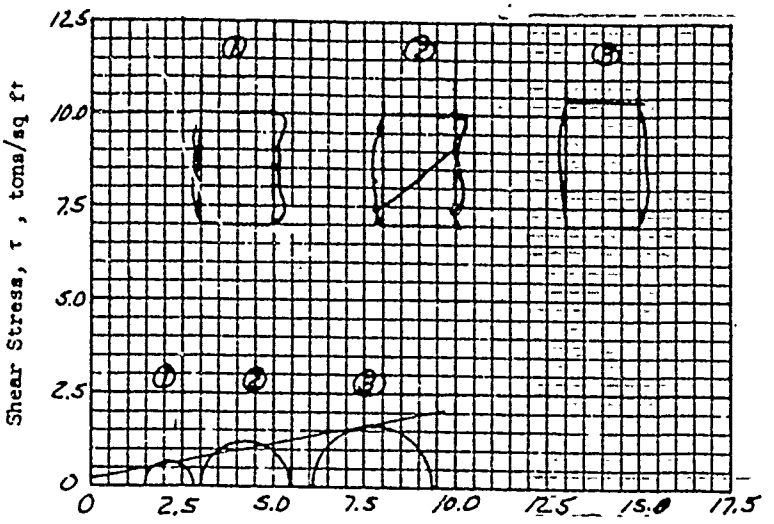
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) GPO 1964 O-714-789

Plate No. 4


APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
EFFECTIVE STRESSES ON 60° PLANES
DIERKS DAM
Sample No. M-R,304 (98 & M-27
Boring No. 66-207
Depth 50-65
SWOPE HUNT 8287





Test No.			1	2	3	
Initial	Water content	w_o	11.0 %	11.2 %	11.1 %	%
	Void ratio	e_o	.458	.457	.464	
	Saturation	S_o	64 %	66 %	64 %	%
	Dry density lb/cu ft	γ_d	114.8	114.9	114.3	
Before Test	Water content	w_c	17.7 %	17.3 %	17.3 %	%
	Saturation	S_c	100 %	100 %	100 %	%
	Consolidation press., tons/sq ft	σ_c	1.50	3.00	6.05	
	Void ratio	e_c	.475	.463	.463	
Final	Water content	w_f	17.7 %	17.3 %	17.3 %	%
	Void ratio	e_f	.475	.463	.463	
Major principal stress, tons/sq ft		σ_1	2.85 **	5.49	9.44	
Minor principal stress, tons/sq ft		σ_3	1.50	3.00	6.05	
Time to failure, min			260 *	160	310	
Initial diameter, in.			1.4	1.4	1.4	
Initial height, H_o, in.			3.0	3.0	3.0	

Shear Values

ϕ = 11.0 °

tan ϕ = .194

c = 0.2 tons/sq ft

Type Test R

Method of Saturation back pressure ☐ Controlled Stress ☑ Controlled Strain

Type of specimen Remolded Rate of strain .001 (Nominal) in./min

Classification SILT, sandy (ML)

LL 17 PL 13 PI 4 G 2.60

Remarks * At 15% strain

** Composite of samples No. M-12,508, -12,509, -12,510, & -12,511

Project DIERKS DAM

Area Borrow Material

Boring No. GDC-165 Sample No. M-12 508C (95 8, W) **

Depth 2.4 - 11.1 Date FEB 86

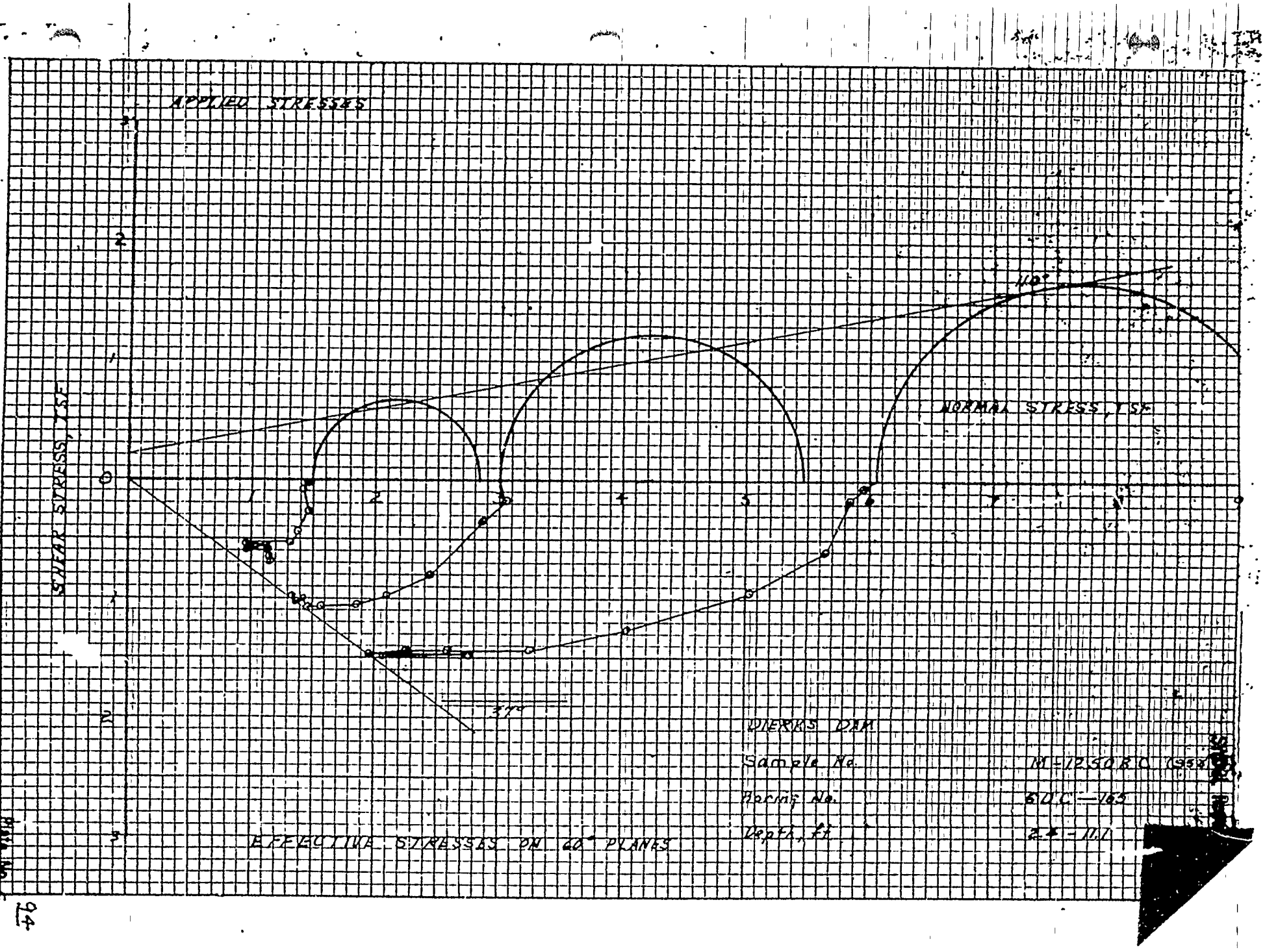
TRIAXIAL COMPRESSION TEST REPORT

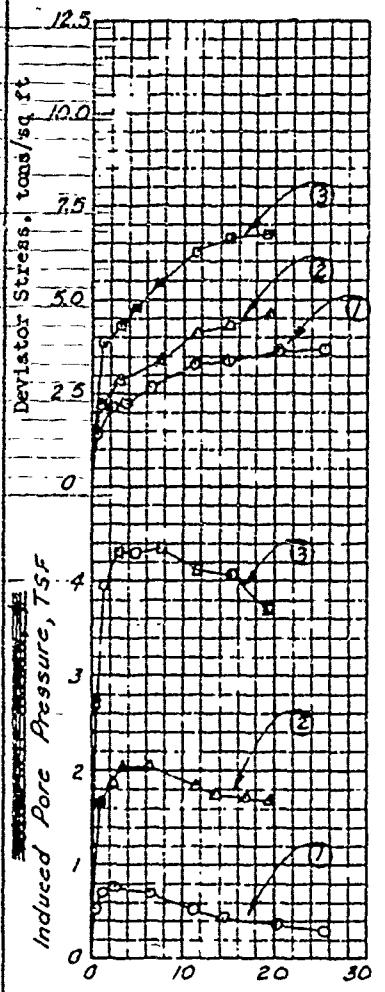
ENG FORM 2089 1 MAY 61 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

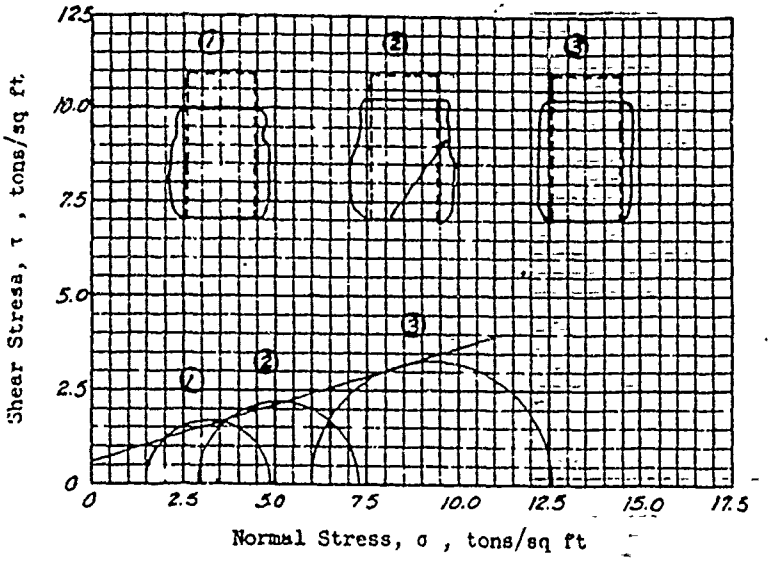
9426

93

Plate No. 5


APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
110°
270°
EFFECTIVE STRESSES ON 60° PLANES
PIERRES DAM
Sample No.
Boring No.
Depth, ft
M-12508C (S58)
6 U.C.—165
2.4 - 111





Shear Values

ϕ = 16.9 °

tan ϕ = .303

c = 0.6 tons/sq ft

Test No.			①	②	③	
Initial	Water content	w_o	14.1 %	14.3 %	13.9 %	%
	Void ratio	e_o	.457	.459	.461	
	Saturation	S_o	83 %	84 %	81 %	%
	Dry density lb/cu ft	γ_d	114.8	114.7	114.5	
Before Test	Water content	w_c	16.0 %	15.0 %	15.5 %	%
	Saturation	S_c	100 %	100 %	100 %	%
	Consolidation press., tons/sq ft	σ_c	1.50	2.95	6.00	
	Void ratio	e_c	.430	.402	.407	
Final	Water content	w_f	16.0 %	15.0 %	15.5 %	%
	Void ratio	e_f	.430	.402	.407	
Major principal stress, tons/sq ft		σ_1	4.90 *	7.27 *	12.56 *	
Minor principal stress, tons/sq ft		σ_3	1.50	2.95	6.00	
Time to failure, min			255 *	350 *	380 *	
Initial diameter, ~~mm~~ in			1.4	1.4	1.4	
Initial height, H_o, ~~mm~~ in			3.0	3.0	3.0	

Type Test R

Method of Saturation Back pressure ☐ Controlled Stress ☑ Controlled Strain

Type of specimen Remolded Rate of strain .0015 (Nominal) in./min

Classification SILT, sandy (ML)

LL 17 PL 13 PI 4 G 2.68

Remarks * At 15 % strain

** Composite of samples from 12,508, 12,509, 12,510 & 12,511

Project Dierks Dam

Area Borrow Material

Boring No. 60C — 165 Sample No. M-12,508 C ** (958, WT3)

Depth 2.4 - 11.1 Date FEB 66

TRIAXIAL COMPRESSION TEST REPORT

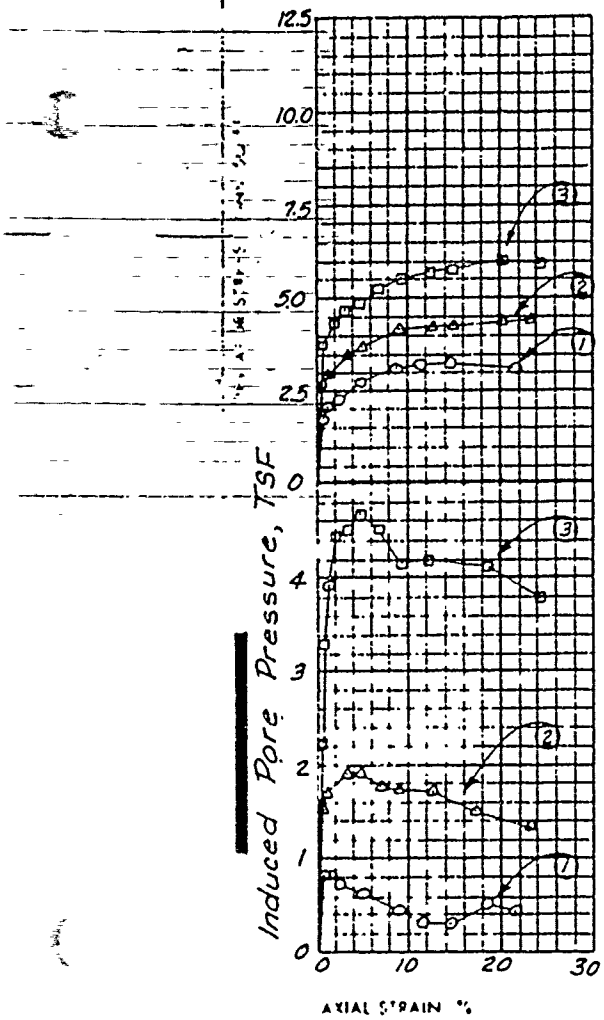
ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) 9428

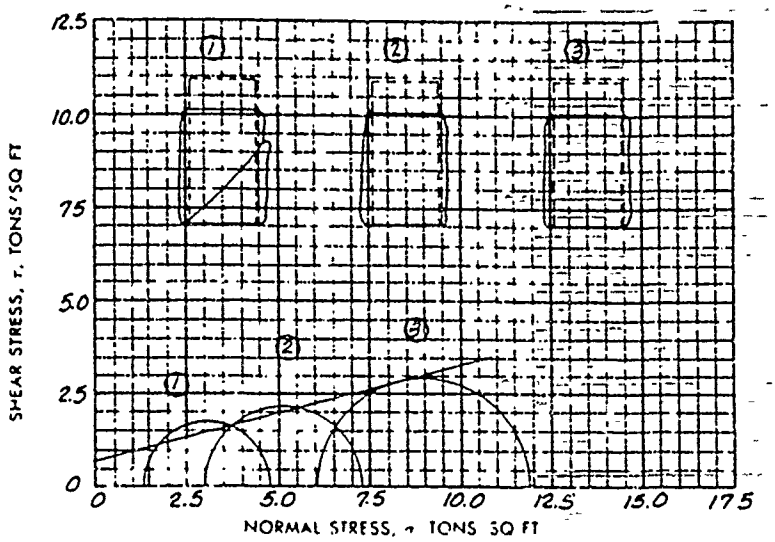
Plate No. 7

SWDG Report 9250
APPLIED STRESSES
EFFECTIVE STRESSES ON 60° PLANES
NORMAL STRESS, TSF
SHEAR STRESS, TSF
16.9°
Sample No.
Boring No.
Depth
Remarks Data
Ø = 30° (1.93 T/FT²)
SDC = 160
Ø = 11°

Plate No.8

9812





SHEAR VALUES

145

TAN φ .258

c 0.7 TONS/SQ FT

TEST NO		①	②	③
INITIAL	WATER CONTENT %	15.0	15.0	15.0
	VOID RATIO	.477	.471	.479
	SATURATION %	84	85	84
	DRY DENSITY LB CU FT	113.1	113.5	112.9
BEFORE TEST	WATER CONTENT %	17.4	16.6	16.1
	SATURATION %	100	100	100
	CONSOL. CELL PRESS. TONS SQ FT	1.40	3.00	6.05
	VOID RATIO	.467	.444	.430
FINAL	WATER CONTENT %	17.4	16.6	16.1
	VOID RATIO	.467	.444	.430
MAJOR PRINCIPAL STRESS TONS SQ FT		4.70	7.31	11.93
MINOR PRINCIPAL STRESS TONS SQ FT		1.40	3.00	6.05
TIME TO FAILURE MIN		270	265	270
INITIAL DIAMETER ■ in		1.4	1.4	1.4
INITIAL HEIGHT H_o, ■ in		3.0	3.0	3.0

TYPE TEST R

METHOD OF SATURATION Back pressure ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN RATE OF STRAIN 0.0015 (Nominal) IN MIN

CLASSIFICATION SAND, clayey (SC)

LL 31 PL 13 PI 18 ■ G 268

REMARKS Major principal stresses are based on maximum deviator stresses at or below 15 % strain.

PROJECT DIERKS DAM

AREA

BORING NO. 10A-2C-16.9 SAMPLE NO. (8,W) M-17,973

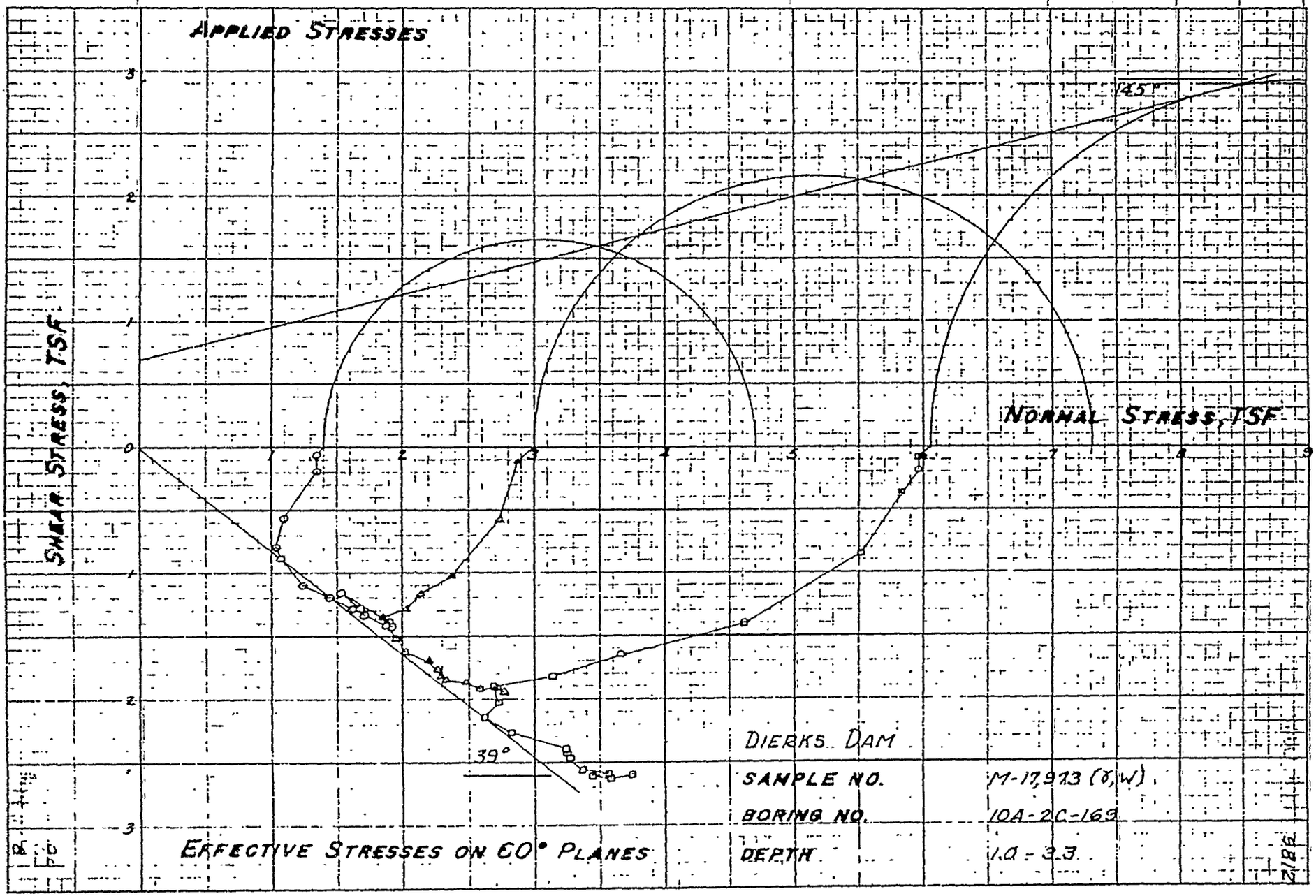
DEPTH ■ 1.9 - 3.3 DATE

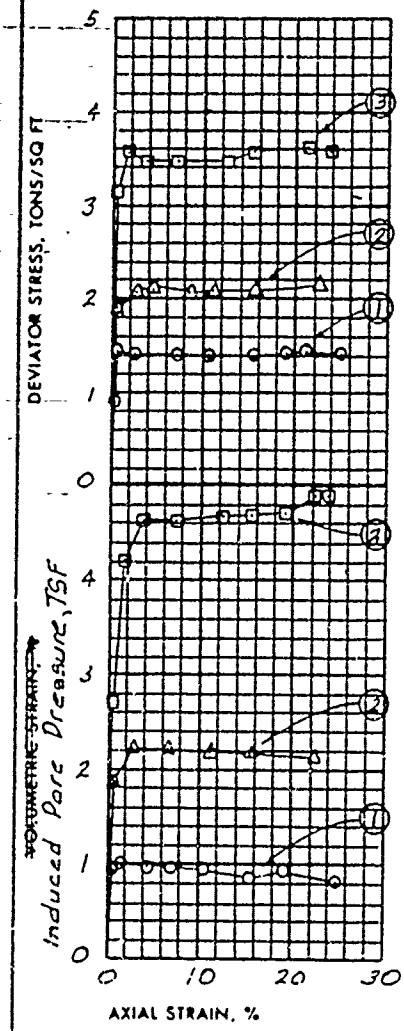
TRIAXIAL COMPRESSION TEST REPORT

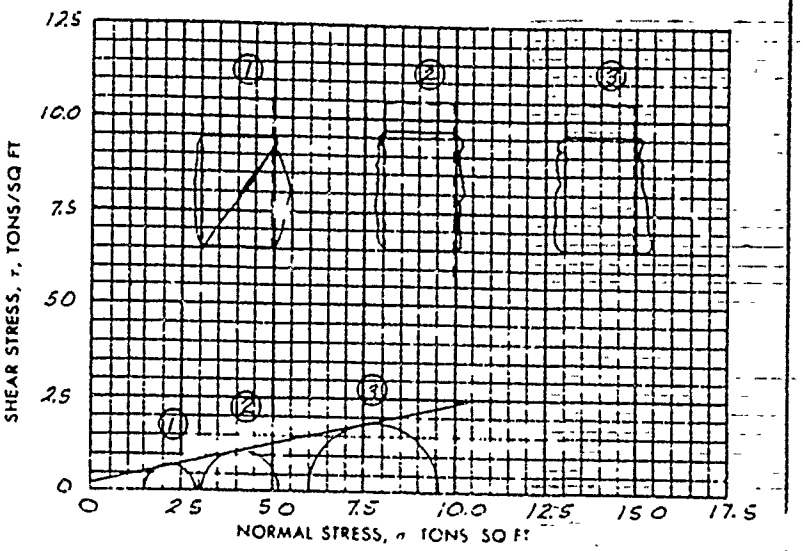
ENG FORM 2089 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE TRANSIENT

9-1

7


APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
45°
39°
EFFECTIVE STRESSES ON 60° PLANES
DIERKS DAM
SAMPLE NO. M-17,913 (δ,W)
BORING NO. 10A-2C-169
DEPTH 1.0 - 3.3
2186





SHEAR VALUES

ϕ = 11.5 °

TAN ϕ = .203

c = 0.2 TONS/SQ FT

TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_o	12.1 %	11.9 %	11.8 %	%
	VOID RATIO	e_o	.546	.542	.546	
	SATURATION	S_o	59 %	59 %	58 %	%
	DRY DENSITY LB. CU FT	γ_d	108.1	108.4	108.1	
BEFORE TEST	WATER CONTENT	w_c	20.3 %	19.5 %	17.4 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS. TONS SQ FT	σ_c	1.45	3.05	6.00	
	VOID RATIO	e_c	.545	.522	.466	
FINAL	WATER CONTENT	w_f	20.3 %	19.5 %	17.4 %	%
	VOID RATIO	e_f	.545	.522	.466	
MAJOR PRINCIPAL STRESS TONS/SQ FT		σ_1	2.94	5.16	9.54	
MINOR PRINCIPAL STRESS TONS/SQ FT		σ_3	1.50	3.05	6.00	
TIME TO FAILURE MIN			13	83	38	
INITIAL DIAMETER ~~CM~~			1.4	1.4	1.4	
INITIAL HEIGHT H_o, ~~CM~~			3.0	3.0	3.0	

TYPE TEST R

METHOD OF SATURATION BACK PRESSURE ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN RATE OF STRAIN 0.0015 (NOMINAL) IN MIN

CLASSIFICATION SAND, clayey (SC)

LL 31 PL 13 PI 18 G_s 2.68

REMARKS

PROJECT Dierks Dam

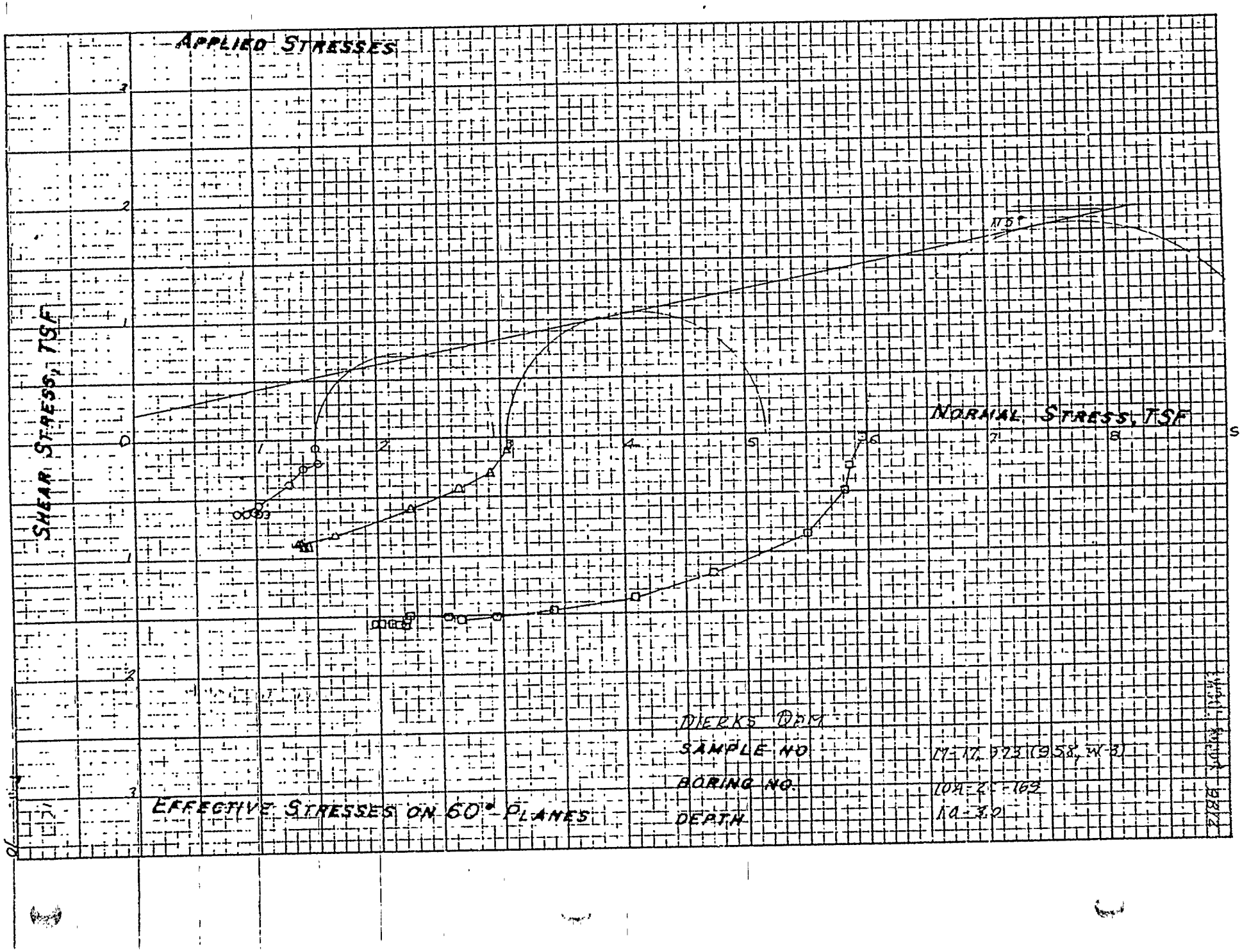
AREA

BORING NO 10A-2C-169 SAMPLE NO (958, W-3) M-17 973

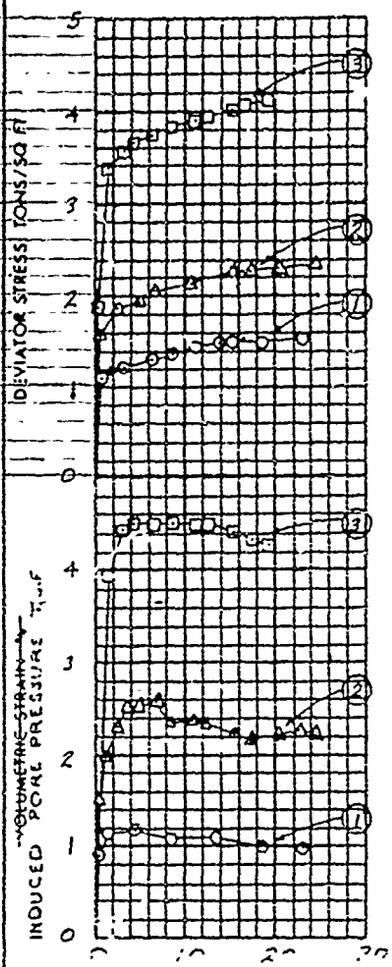
DEPTH ~~ft~~ 10-33 DATE

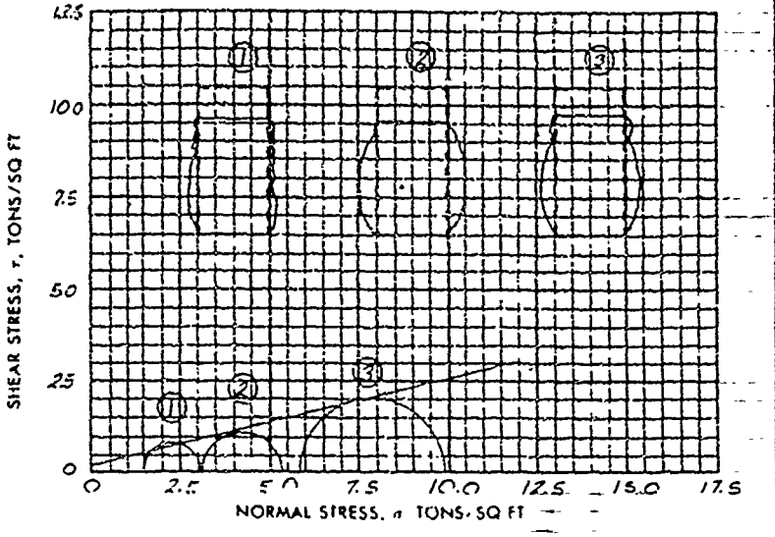
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)


APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
EFFECTIVE STRESSES ON 60° PLANES
DIERKS DAM
SAMPLE NO
BORING NO.
DEPTH
M-17, 923 (958, W-3)
10A-2-169
1A-3.0

9812





TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_o	14.8%	14.9	14.9%	%
	VOID RATIO	e_o	.554	.552	.569	
	SATURATION	S_o	72%	72%	70	%
	DRY DENSITY LB/CU FT	γ_d	107.7	107.9	106.7	
BEFORE TEST	WATER CONTENT	w_c	20.0%	18.9%	17.1%	%
	SATURATION	S_c	100%	100%	100%	%
	CONSOLIDATION PRESS TONS/SQ FT	σ_c	1.50	3.05	5.85	
	VOID RATIO	e_c	.535	.506	.460	
FINAL	WATER CONTENT	w_f	20.0%	18.9%	17.1%	%
	VOID RATIO	e_f	.535	.506	.460	
MAJOR PRINCIPAL STRESS TONS/SQ FT		σ_1	3.01	5.35	9.85	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.50	3.10	5.85	
TIME TO FAILURE, MIN			292	263	340	
INITIAL DIAMETER ~~CM~~ in			1.4	1.4	1.4	
INITIAL HEIGHT, H_o, ~~CM~~ in			3.0	3.0	3.0	

SHEAR VALUES

ϕ = 15.3°

TAN ϕ = .287

c = 0.2 TONS/SQ FT

TYPE TEST R

METHOD OF SATURATION BACK PRESSURE ☐ CONTROLLED STRESS ☒ CONTROLLED STRAIN

TYPE OF SPECIMEN RATE OF STRAIN .0015 NOMINAL % MIN

CLASSIFICATION SAND, clayey (SC)

LL	PL	PI	G
31	13	18	2.68

REMARKS

Major principal stresses are based on maximum deviator stresses at or below 15% strain.

PROJECT Dierks Dam

AREA

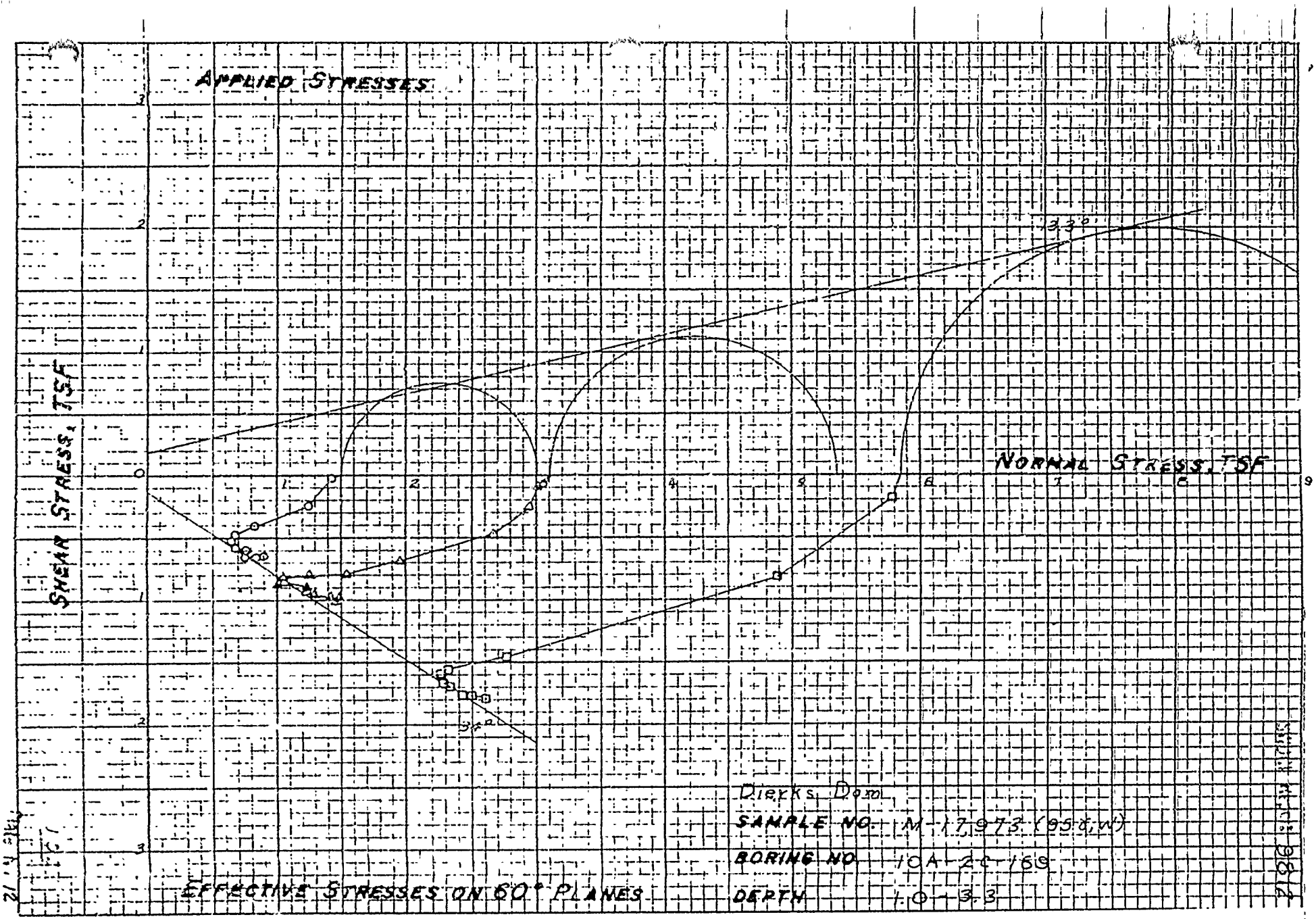
BORING NO 10A-2C-16.9 SAMPLE NO (958, W) M-17,973

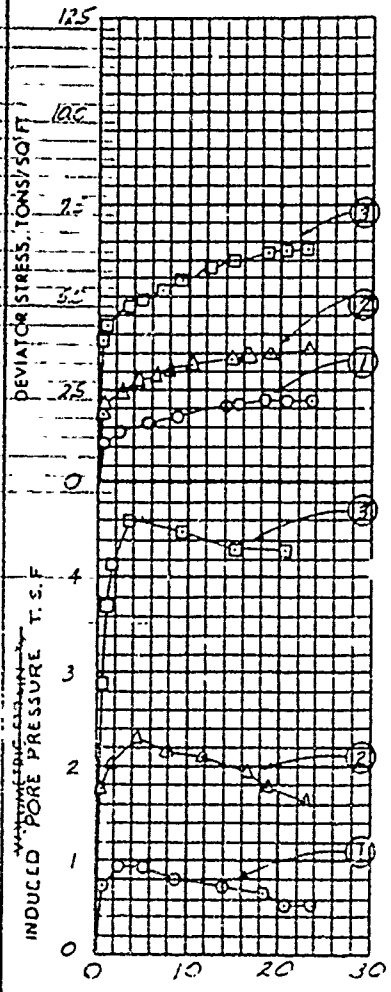
DEPTH ~~ft~~ 10-3.3 DATE

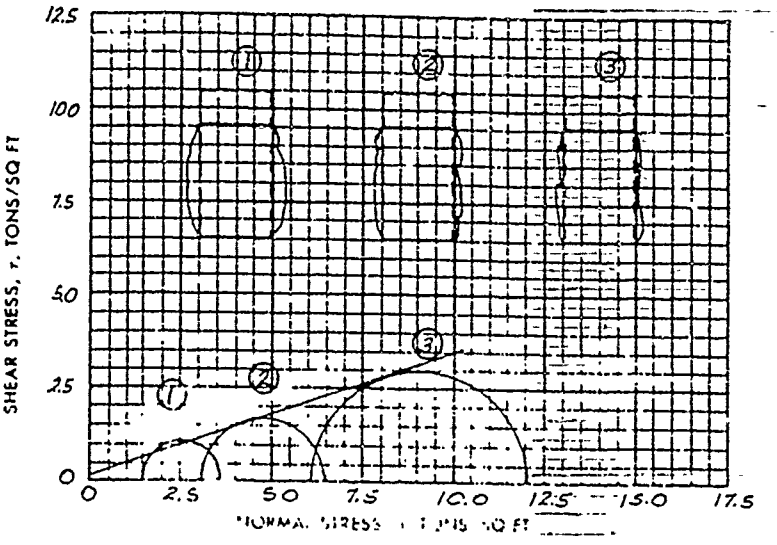
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

11


APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
23°
35°
Dieyks Dam
SAMPLE NO. M-17973 (95 t, W)
BORING NO. 10A-2C-16S
DEPTH 1.0-3.3
EFFECTIVE STRESSES ON 60° PLANES





TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_o	17.9 %	18.0 %	17.9 %	%
	VOID RATIO	e_o	.554	.553	.555	
	SATURATION	S_o	87 %	87 %	86 %	%
	DRY DENSITY LB/CU FT	γ_o	107.6	107.6	107.3	
BEFORE TEST	WATER CONTENT	w_c	18.5 %	17.3 %	16.0 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS TONS/SQ FT	σ_c	1.50	3.10	6.05	
	VOID RATIO	e_c	.497	.463	.429	
FINAL	WATER CONTENT	w_f	18.5 %	17.3 %	16.0 %	%
	VOID RATIO	e_f	.497	.463	.429	
MAJOR PRINCIPAL STRESS TONS/SQ FT		σ_1	3.55	6.48	12.05	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.50	3.10	6.05	
TIME TO FAILURE MIN			272	274	275	
INITIAL DIAMETER ~~CM~~ IN			1.4	1.4	1.4	
INITIAL HEIGHT H_o, ~~CM~~ IN			3.0	3.0	3.0	

SHEAR VALUES

ϕ = .181 °

TAN ϕ = .327

c = .02 TONS/SQ FT

TYPE TEST R

METHOD OF SATURATION BACK PRESSURE ☐ CONTROLLED STRESS ☒ CONTROLLED STRAIN

TYPE OF SPECIMEN

RATE OF STRAIN 0.0015 (NOMINAL) IN MIN

CLASSIFICATION SAND, clayey (SC)

LL 31 PL 13 PI 18 G_s 2.68

REMARKS

Major principal stresses are based on maximum deviator stresses at or below 15% strain.

PROJECT Dierks Dam

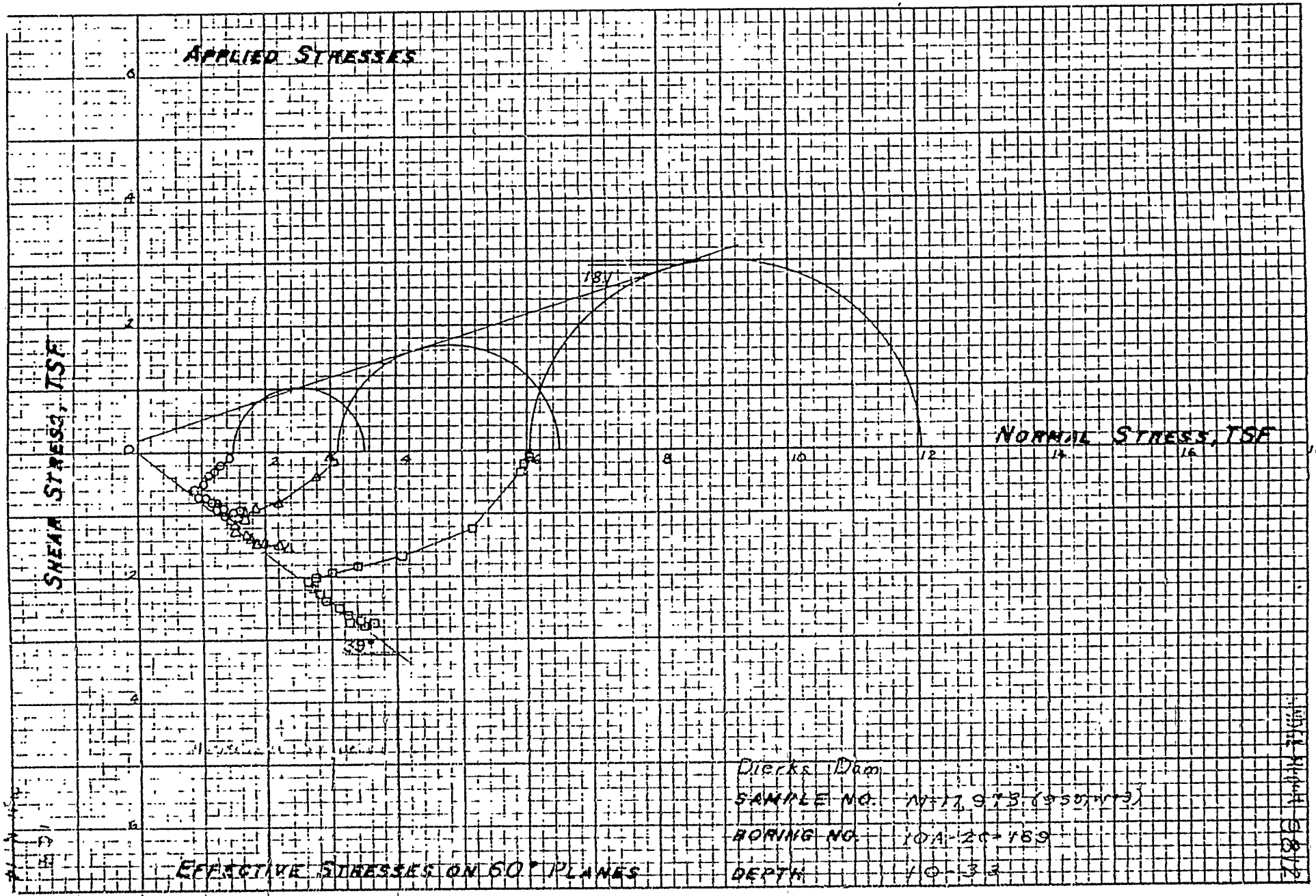
AREA

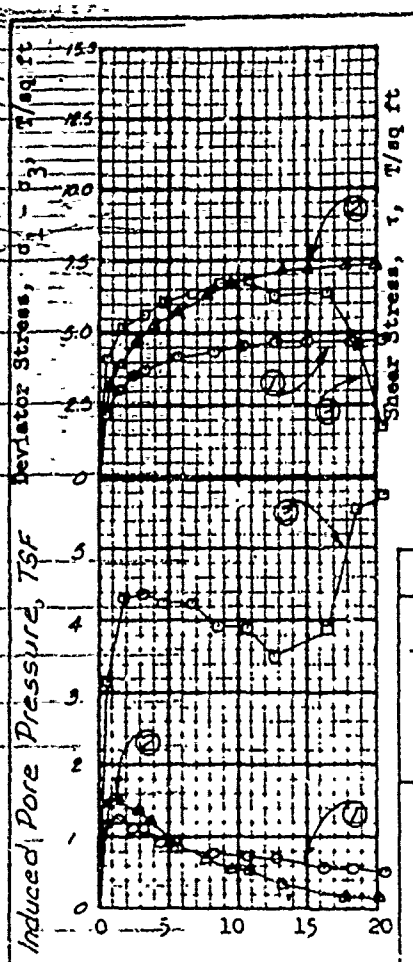
BORING NO 10A-2C-169 SAMPLE NO M-17,973 (958, W73)

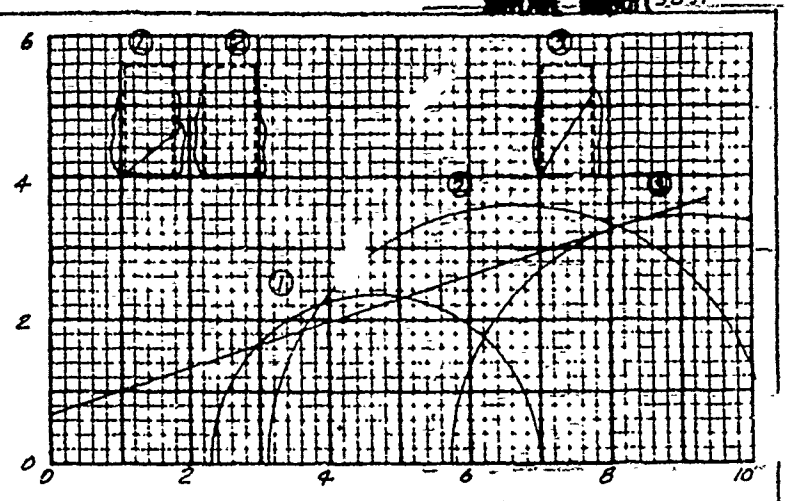
DEPTH ft 1.0 - 3.3 DATE

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)


APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
18°
39°
Dierks Dam
SAMPLE NO. NW-11 9 T5 (9 SOUTH 73)
BORING NO. 10A-20-169
DEPTH 10-33
EFFECTIVE STRESSES ON 60° PLANES
8812





Test No.			①	②	③	
Initial	Water content	w_o	12.7 %	12.8 %	12.8 %	%
	Void ratio	e_o	.421	.408	.427	
	Saturation	S_o	81 %	84 %	81 %	%
	Dry density, lb/cu ft	γ_d	118.2	119.2	117.6	
Before Shear	Water content	w_c	15.5 %	14.9 %	16.1 %	%
	Void ratio	e_c	.416	.401	.432	
	Saturation	S_c	100 %	100 %	100 %	%
	Final back pressure, T/sq ft	u_o	6.66	10.40	10.79	
Final	Water content	w_f	15.5 %	14.9 %	16.1 %	%
	Void ratio	e_f	.416	.401	.432	
Minor principal stress, T/sq ft		σ_3	2.30	3.10	5.75	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	4.67	7.16	6.84	
Time to failure, min		t_f	270	260	170	
Rate of strain, percent/min			0.06	0.06	0.06	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.4	1.4	1.4	
Initial height, in.		H_o	3.0	3.0	3.0	

Shear Strength Parameters

ϕ = 17.6 °

tan ϕ = .328

c = 0.7 T/sq ft

Method of saturation

Back pressure

☐ Controlled stress

☑ Controlled strain

Type of test R	Type of specimen [illegible]			
Classification CLAY, sandy (CL)	Composite of minus No. 10 fractions of SWD Samples M-18564, -18565, and -18567.			
LL 25	PL 12	PI 13		G_s 2.69

Remarks: Major principal stresses are based on maximum deviator stresses at or below 15% strain.

Test No.3 probably had a membrane leak after failure.

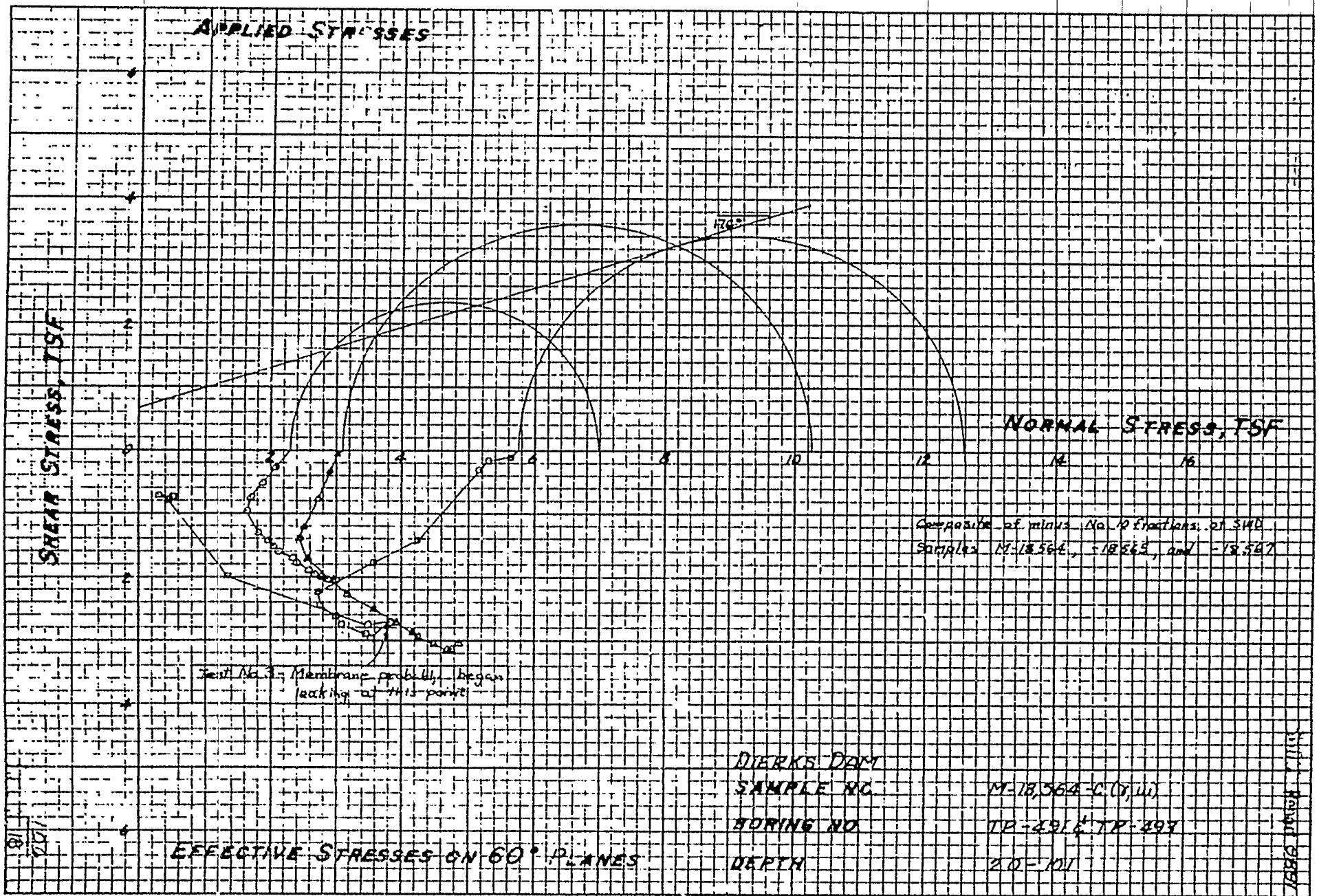
Project: DIERKS DAM

Area: [illegible]

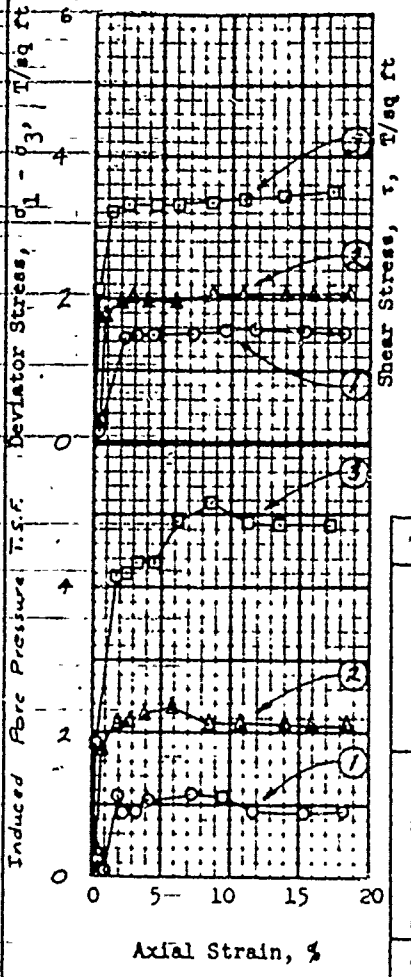
Boring No. TP-491 & TP-493 Sample No. M-18,564-C (8, W)

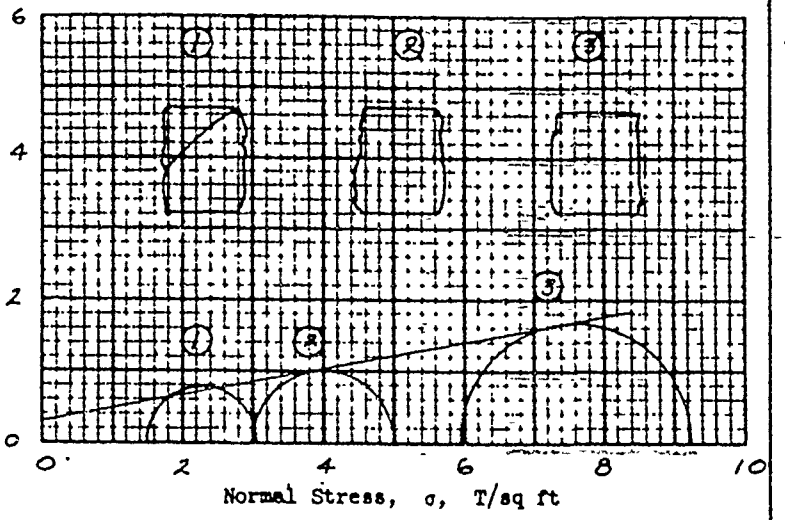
Depth 2.0 - 10.1 Date

TRIAXIAL COMPRESSION TEST REPORT


APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
120°
2
4
6
8
10
12
14
16
Composite of minus No. 10 fractions of SHD Samples M-18,564, -18,565, and -18,567
Test No. 3 - Membrane probably began leaking at this point
DIERKS DAM
SAMPLE NO. M-18,564-C (1,4)
BORING NO. TP-491 & TP-497
DEPTH 2.0-10.1
EFFECTIVE STRESSES ON 60° PLANES

SWDGL Report 9891





Test No.			①	②	③	
Initial	Water content	w_o	10.1 %	10.2%	9.9 %	%
	Void ratio	e_o	.505	.501	.509	
	Saturation	S_o	54 %	55 %	53 %	%
	Dry density, lb/cu ft	γ_d	111.6	111.9	111.3	
Before Shear	Water content	w_c	17.8 %	17.5%	15.5 %	%
	Void ratio	e_c	.478	.472	.416	
	Saturation	S_c	100 %	100%	100%	%
	Final back pressure, T/sq ft	u_o	14.91	18.28	15.51	
Final	Water content	w_f	17.8 %	17.5 %	15.5%	%
	Void ratio	e_f	.478	.472	.416	
Minor principal stress, T/sq ft		σ_3	1.50	3.00	5.95	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	1.56	2.00	3.30	
Time to failure, min		t_f	196	53	43	
Rate of strain, percent/min			0.06	0.05	0.06	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.4	1.4	1.4	
Initial height, in.		H_o	3.0	3.0	3.0	

Shear Strength Parameters

ϕ = 10.3 °

tan ϕ = .182

c = 0.3 T/sq ft

Method of saturation Back Pressure

☐ Controlled stress

☑ Controlled strain

Type of test R | Type of specimen Remold

Classification CLAY, sandy (CL) — Composite of minus No. 10 fractions of SWD samples M-18564, -18565, and -18567

LL	PL	PI		G_s
25	12	13		2.69

Remarks Major principal stresses are based on maximum deviator stresses at or below 15% strain

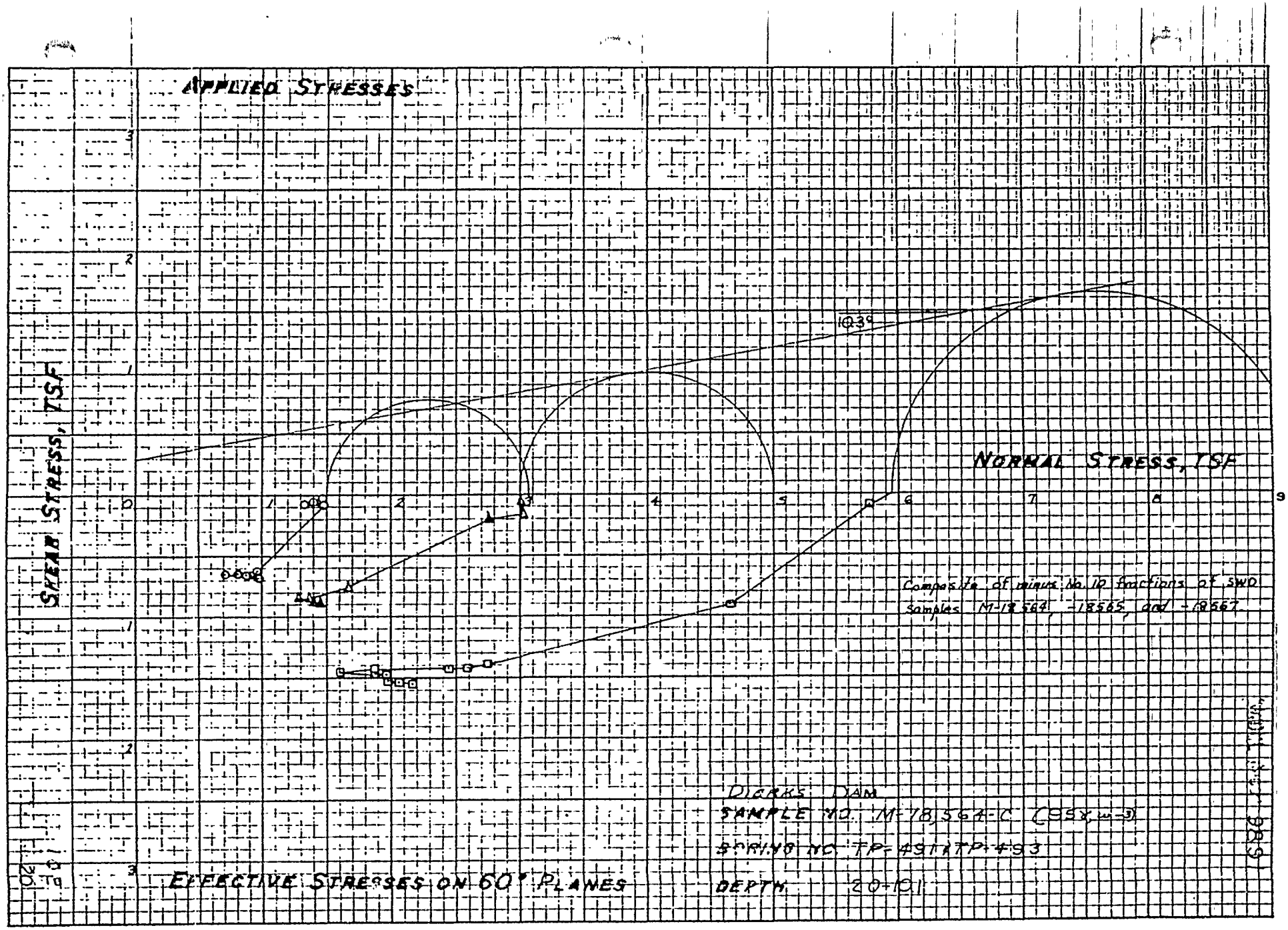
Project DIERKS DAM

Area Borrow Material

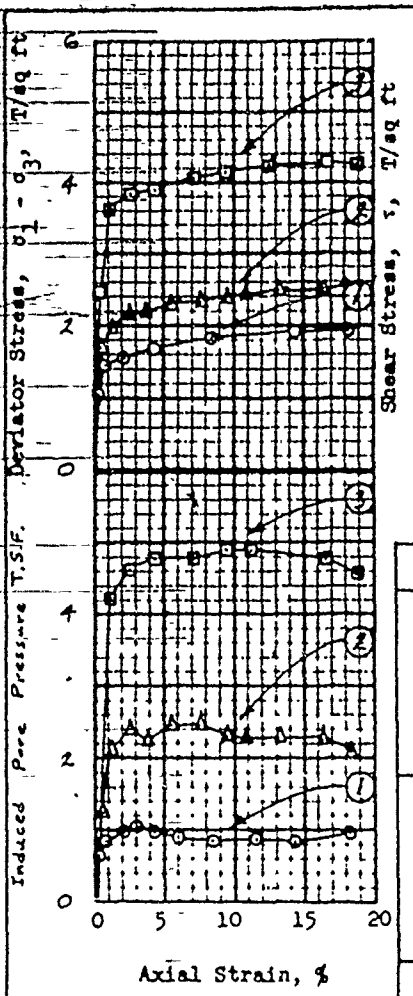
Boring No. TP-491/TP-493 | Sample No. (958, w-3) M-18,564-C

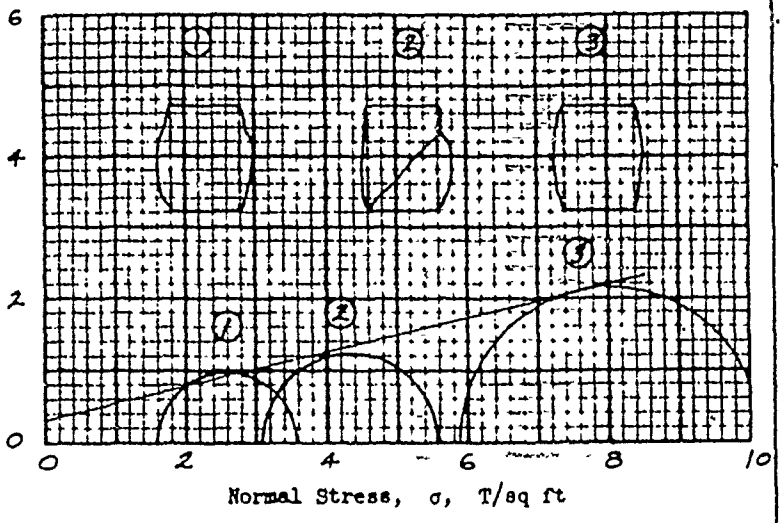
Depth ~~ft~~ 2.0-10.1 | Date

TRIAXIAL COMPRESSION TEST REPORT


APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
103°
Composite of minus No. 10 fractions of SWD samples M-18564, -18565, and -18567
DIERKS DAM
SAMPLE NO. M-18,564-C (95% w-3)
BORING NO. TP-491 & TP-493
DEPTH 20-101
EFFECTIVE STRESSES ON 60° PLANES

SWUGL Rep. 9891





Test No.			①	②	③	
Initial	Water content	w_o	12.5 %	12.9%	12.9%	%
	Void ratio	e_o	.489	.491	.500	
	Saturation	S_o	69 %	71 %	70 %	%
	Dry density, lb/cu ft	γ_d	112.8	112.6	112.0	
Before Shear	Water content	w_c	17.7 %	17.0%	16.0%	%
	Void ratio	e_c	.477	.457	.430	
	Saturation	S_c	100 %	100%	100%	%
	Final back pressure, T/sq ft	u_o	10.72	13.70	12.28	
Final	Water content	w_f	17.7 %	17.0%	16.0%	%
	Void ratio	e_f	.477	.457	.430	
Minor principal stress, T/sq ft		σ_3	1.60	3.10	5.90	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	1.93	2.48	4.26	
Time to failure, min		t_f	188	246	228	
Rate of strain, percent/min			0.08	0.06	0.07	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.4	1.4	1.4	
Initial height, in.		H_o	3.0	3.0	3.0	

Shear Strength Parameters

ϕ = 13.1 °

tan ϕ = .233

c = .03 T/sq ft

Method of saturation

Back Pressure

☐ Controlled stress

☑ Controlled strain

Type of test R | Type of specimen Remold

Classification CLAY, sandy (CL) — Composite of minus No. 10 fractions of SWD samples M-18564, -18565, and -18567.

LL 25 | PL 12 | PI 13 | G_s 2.69

Remarks Major principal stresses are based on maximum deviator stresses at or below 15% strain.

Project DIERKS DAM

Area Borrow Material

Boring No. TP-491 / TP-493 | Sample No. M-18,564-C (95%, w)

Depth 2.0-10.1 | Date

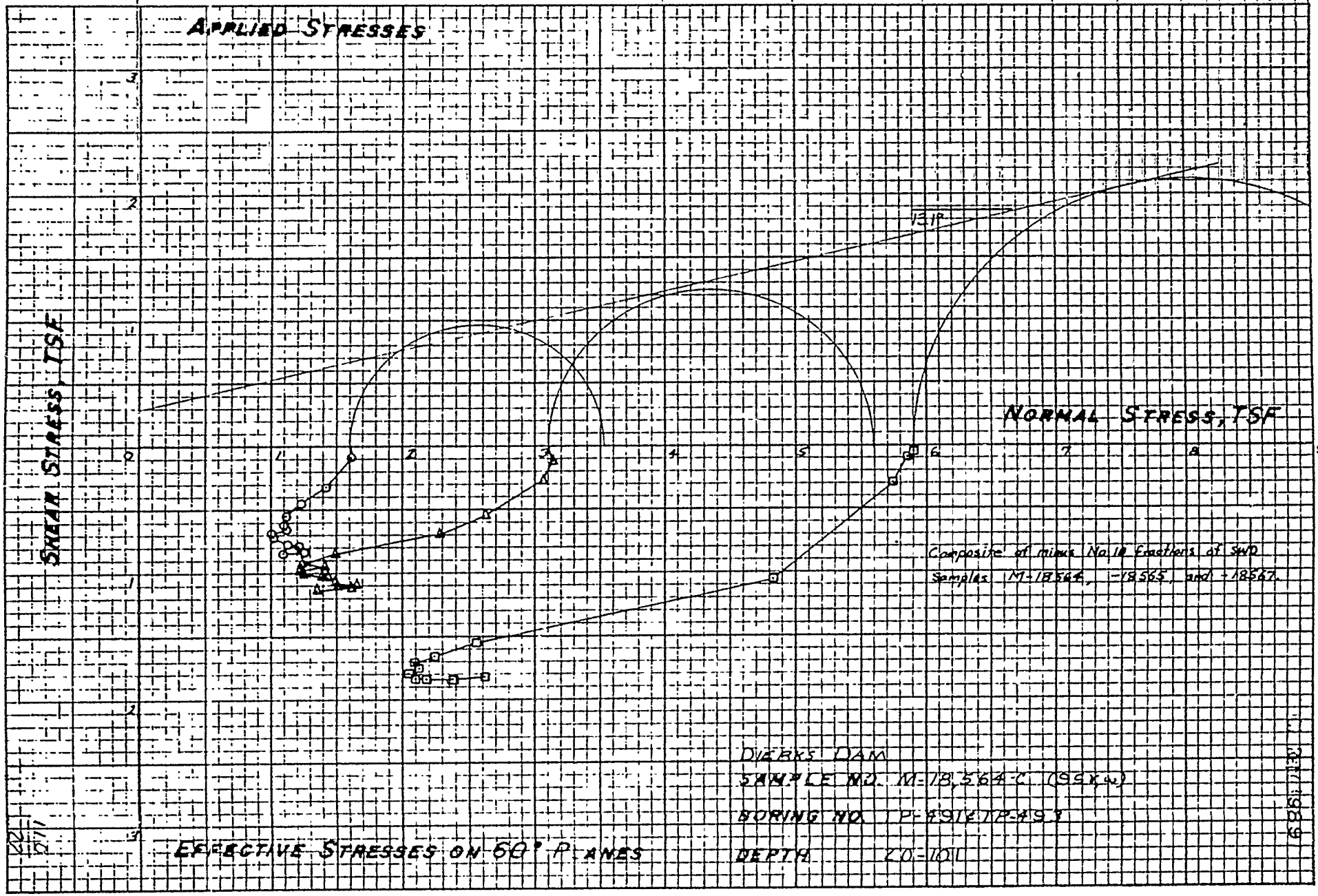
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 63 2089— (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

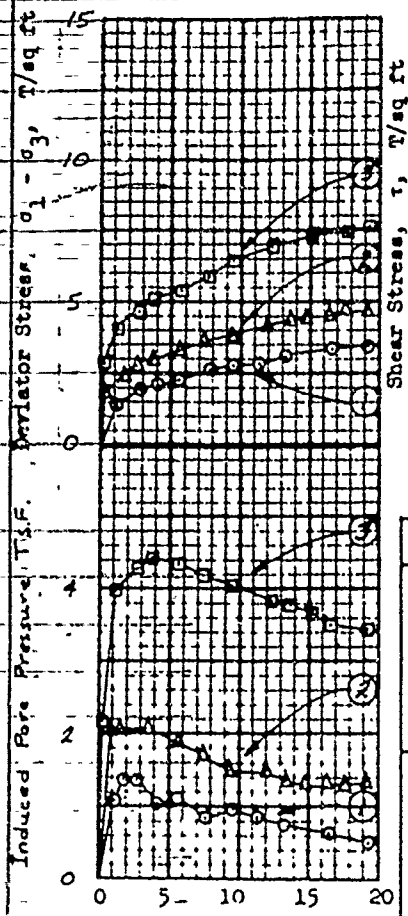
TRANSLUCENT

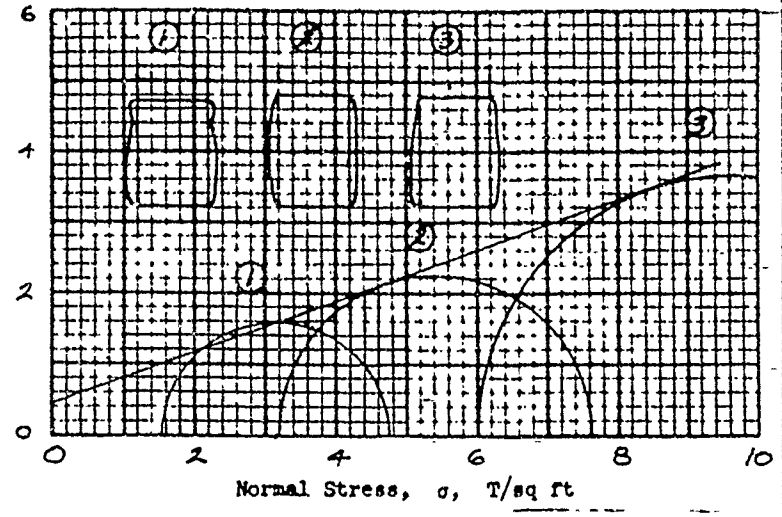
109

Plate N. 21


APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
131°
Composite of minus No.10 fractions of SWD
Samples M-18564, -18565, and -18567.
DIVERKS DAM
SAMPLE NO. M-18,564-C (99%)
BORING NO. P-491 & P-493
DEPTH 20'-101'
EFFECTIVE STRESSES ON 60° PLANES
GBS-11-62

Initial Report 9891





Shear Strength Parame...

ϕ = 19.7 °

tan ϕ = .358

c = .04 T/sq ft

Method of saturation

Back Pressure

☐ Controlled stress

☑ Controlled strain

Test No.			①	②	③	
Initial	Water content	w_o	16.0 %	15.9%	15.9 %	%
	Void ratio	e_o	.497	.494	.499	
	Saturation	S_o	87 %	87 %	86 %	%
	Dry density, lb/cu ft	γ_d	112.2	112.4	112.0	
Before Shear	Water content	w_c	15.7 %	14.9%	14.1 %	%
	Void ratio	e_c	.422	.400	.381	
	Saturation	S_c	100 %	100%	100%	%
	Final back pressure, T/sq ft	u_o	7.13	8.92	8.87	
Final	Water content	w_f	15.7 %	14.9%	14.1 %	%
	Void ratio	e_f	.422	.400	.381	
Minor principal stress, T/sq ft		σ_3	1.55	3.20	6.00	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	3.19	4.43	7.30	
Time to failure, min		t_f	216	368	332	
Rate of strain, percent/min			0.07	0.05	0.05	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.4	1.4	1.4	
Initial height, in.		H_o	3.0	3.0	3.0	

Type of test R | Type of specimen Remolded

Classification CLAY, sandy (CL) Composite of minus No. 10 fractions of SW0 Samples M-18564, -18565, and -18567.

LL 25 | PL 12 | PI 13 | G_s 2.69

Remarks Major principal stresses are based on maximum deviator stresses at or below 15% strain.

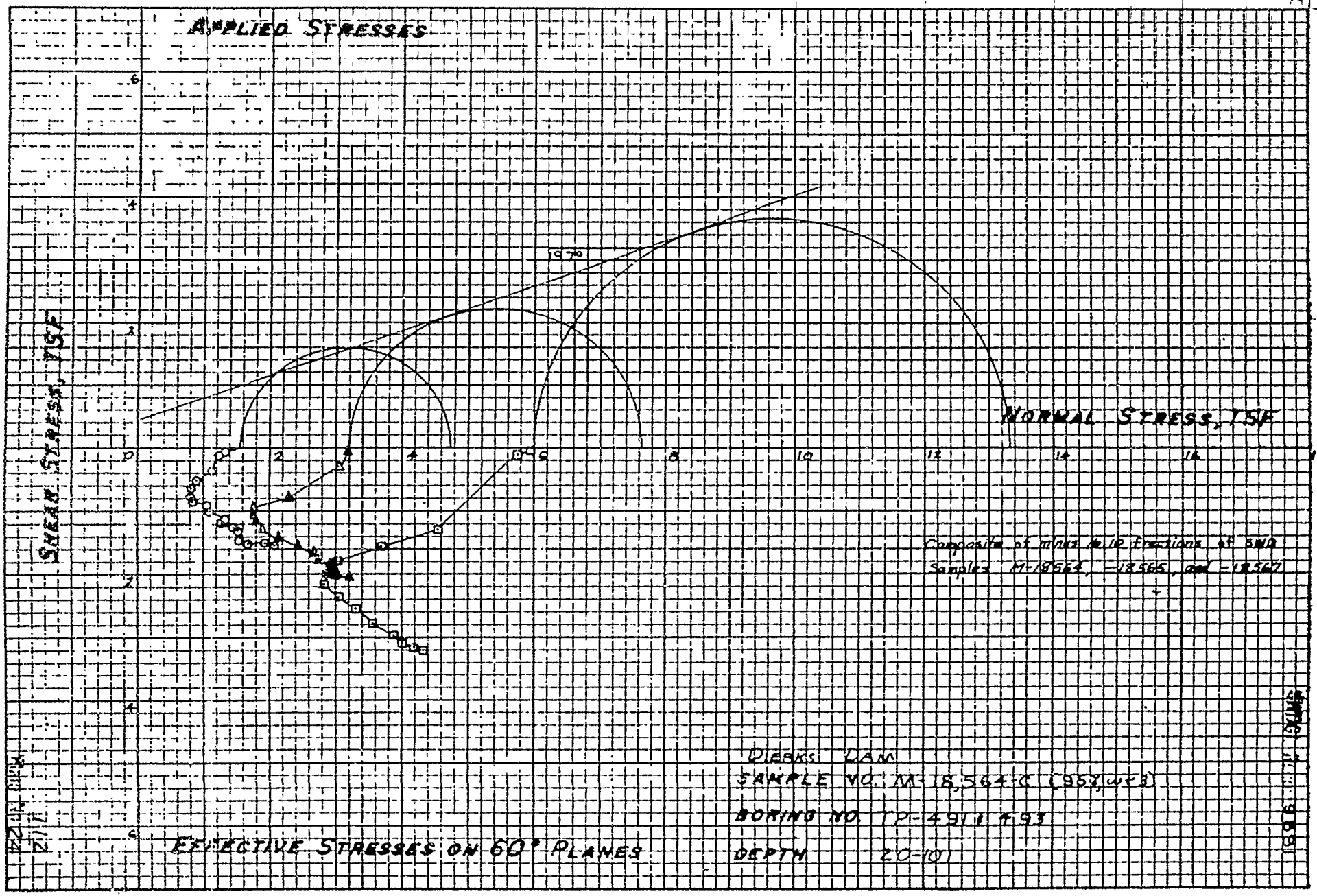
Project DIERKS DAM

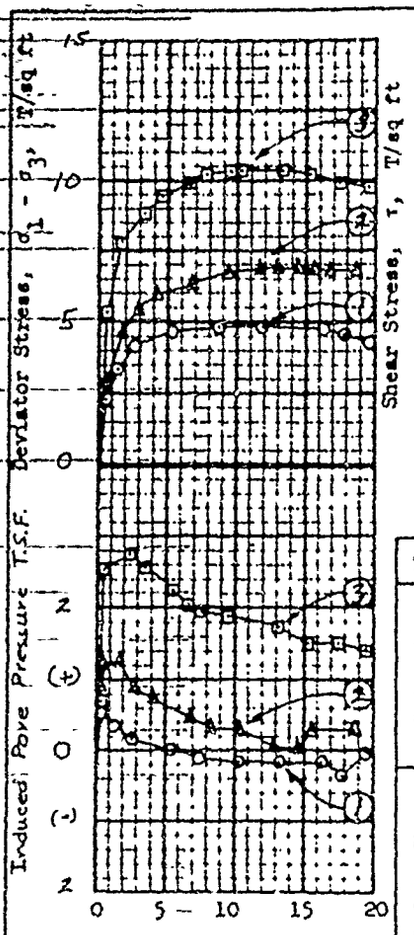
Area Borrow Material

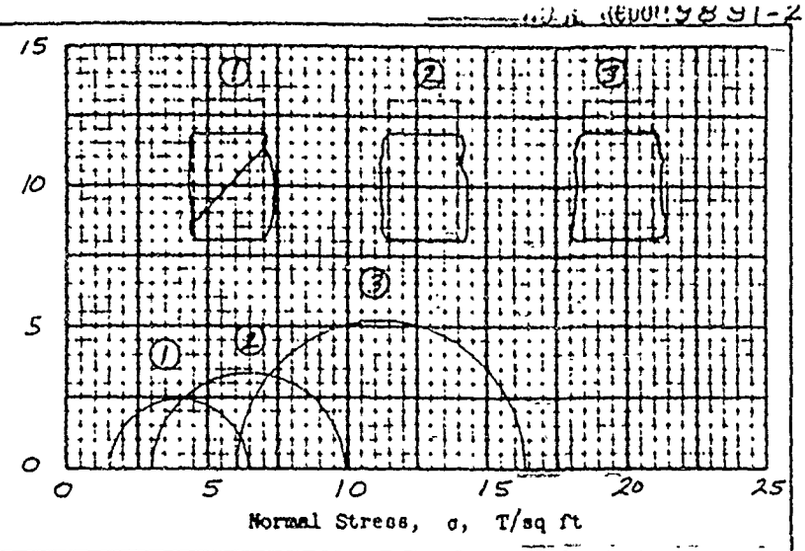
Boring No. TP-491 & TP-493 | Sample No. (96% w+#) M-18,564-C

Depth Ft 2.0-10.1 | Date [illegible]

TRIAXIAL COMPRESSION TEST REPORT


APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
0
2
4
6
8
10
12
14
16
18
Composite of minus No 10 fractions of SMD
Samples M-18564, -18565, and -18567
DIERKS DAM
SAMPLE NO. M-18,564-C (95% w=3)
BORING NO. TP-491 & 93
DEPTH 20-101
EFFECTIVE STRESSES ON 60° PLANES





Test No.			①	②	③	
Initial	Water content	w_o	6.9 %	7.0 %	7.0 %	%
	Void ratio	e_o	.486	.481	.488	
	Saturation	S_o	39 %	39 %	38 %	%
	Dry density, lb/cu ft	γ_d	112.2	112.5	112.1	
Before Shear	Water content	w_c	17.9 %	18.1 %	17.2 %	%
	Void ratio	e_c	.478	.483	.460	
	Saturation	S_c	100 %	100 %	100 %	%
	Final back pressure, T/sq ft	u_o	14.4	13.5	15.1	
Final	Water content	w_f	17.9 %	18.1 %	17.2 %	%
	Void ratio	e_f	.478	.483	.460	
Minor principal stress, T/sq ft		σ_3	1.55	3.00	6.05	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	4.91	6.91	10.35	
Time to failure, min		t_f	208	254	208	
Rate of strain, percent/min			0.06	005	005	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.4	1.4	1.4	
Initial height, in.		H_o	3.0	3.0	3.0	

Shear Strength Parameters

ϕ = ____ °

tan ϕ = ____

c = ____ T/sq ft

Method of saturation ____

Back Pressure

☐ Controlled stress

☑ Controlled strain

Type of test R | Type of specimen: [illegible]

Classification SAND, silty (SM)

LL NP | PL NP | PI NP | | G_s 2.67

Remarks

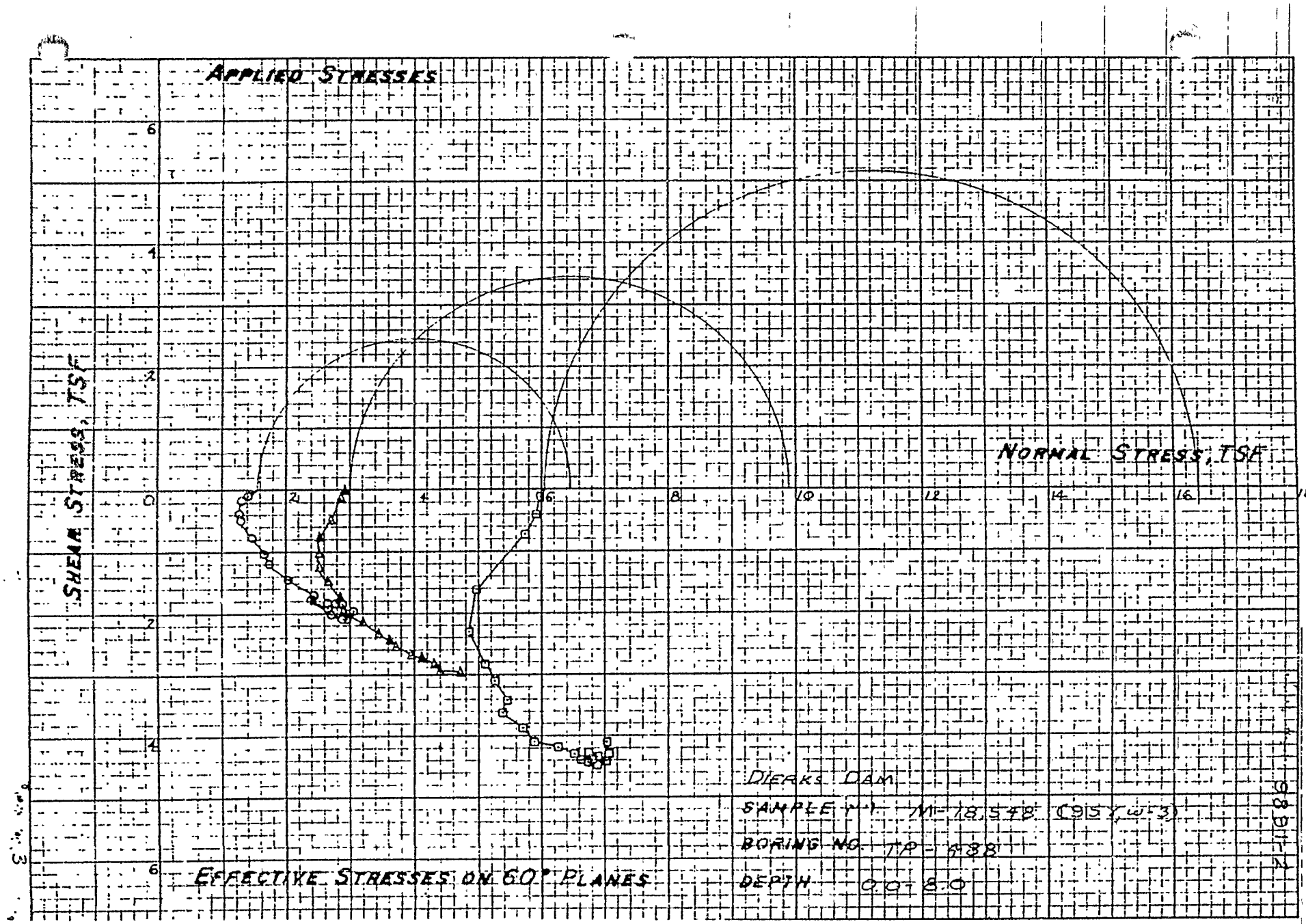
Project DIERKS DAM

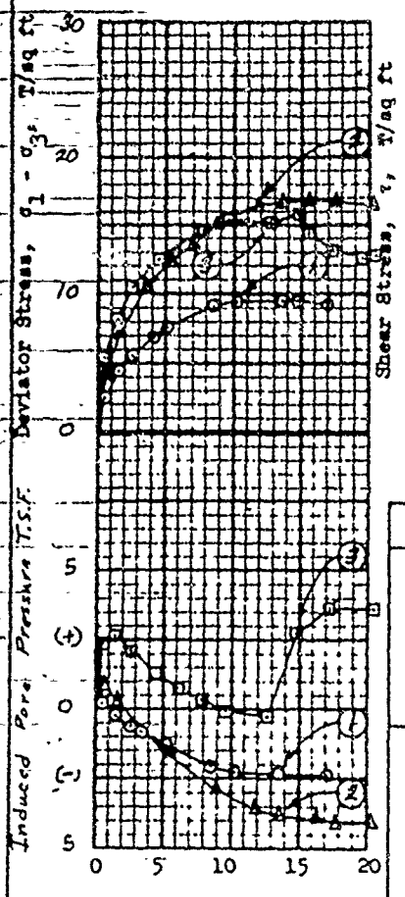
Area [illegible] Material

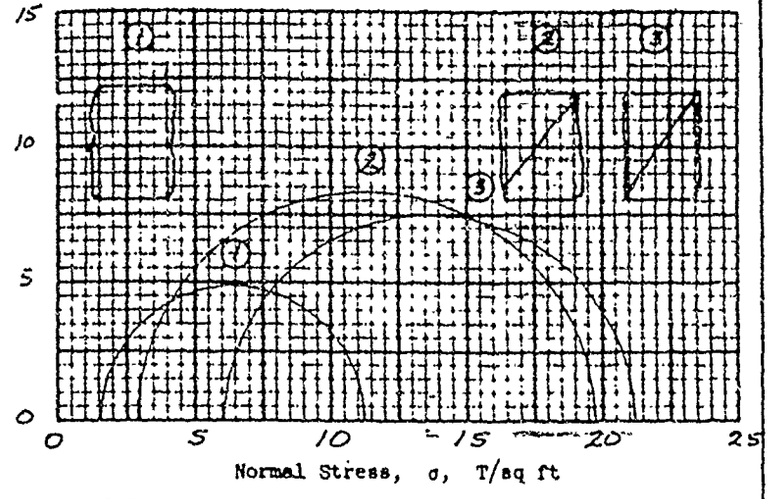
Boring No. TP-488 | Sample No. M-18,548 (95%, w-3)

Depth 0.0-8.0 | Date JAN 87

TRIAXIAL COMPRESSION TEST REPORT


APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
EFFECTIVE STRESSES ON 60° PLANES
DIEAKS DAM
SAMPLE # 1 M=18.5±2 C=15 φ=3
BORING NO. TP-688
DEPTH 0.0-8.0





Test No.			①	②	③	
Initial	Water content	w_o	9.5 %	9.4 %	9.6 %	%
	Void ratio	e_o	.480	.476	.482	
	Saturation	S_o	53 %	53 %	53 %	%
	Dry density, lb/cu ft	γ_d	112.7	112.9	112.5	
Before Shear	Water content	w_c	17.2 %	17.4 %	17.2 %	%
	Void ratio	e_c	.458	.465	.459	
	Saturation	S_c	100 %	100 %	100 %	%
	Final back pressure, T/sq ft	u_o	15.0	14.5	17.8	
Final	Water content	w_f	17.2 %	17.4 %	17.2 %	%
	Void ratio	e_f	.458	.465	.459	
Minor principal stress, T/sq ft		σ_3	1.55	2.90	6.05	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	9.68	16.80	15.19	
Time to failure, min		t_f	395	325	207	
Rate of strain, percent/min			0.04	0.05	0.05	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.4	1.4	1.4	
Initial height, in.		H_o	3.0	3.0	3.0	

Shear Strength Parameters

ϕ = _____ °

tan ϕ = _____

c = _____ T/sq ft

Method of saturation _____

Back Pressure

☐ Controlled stress

☑ Controlled strain

Type of test R | Type of specime

Classification SAND, silty (SM)

LL NP | PL NP | PI NP | | G_s 2.67

Remarks _____

Project DIERKS DAM

Area Borrow Material

Boring No. TP-488 | Sample No. M-18,548 (C958 W)

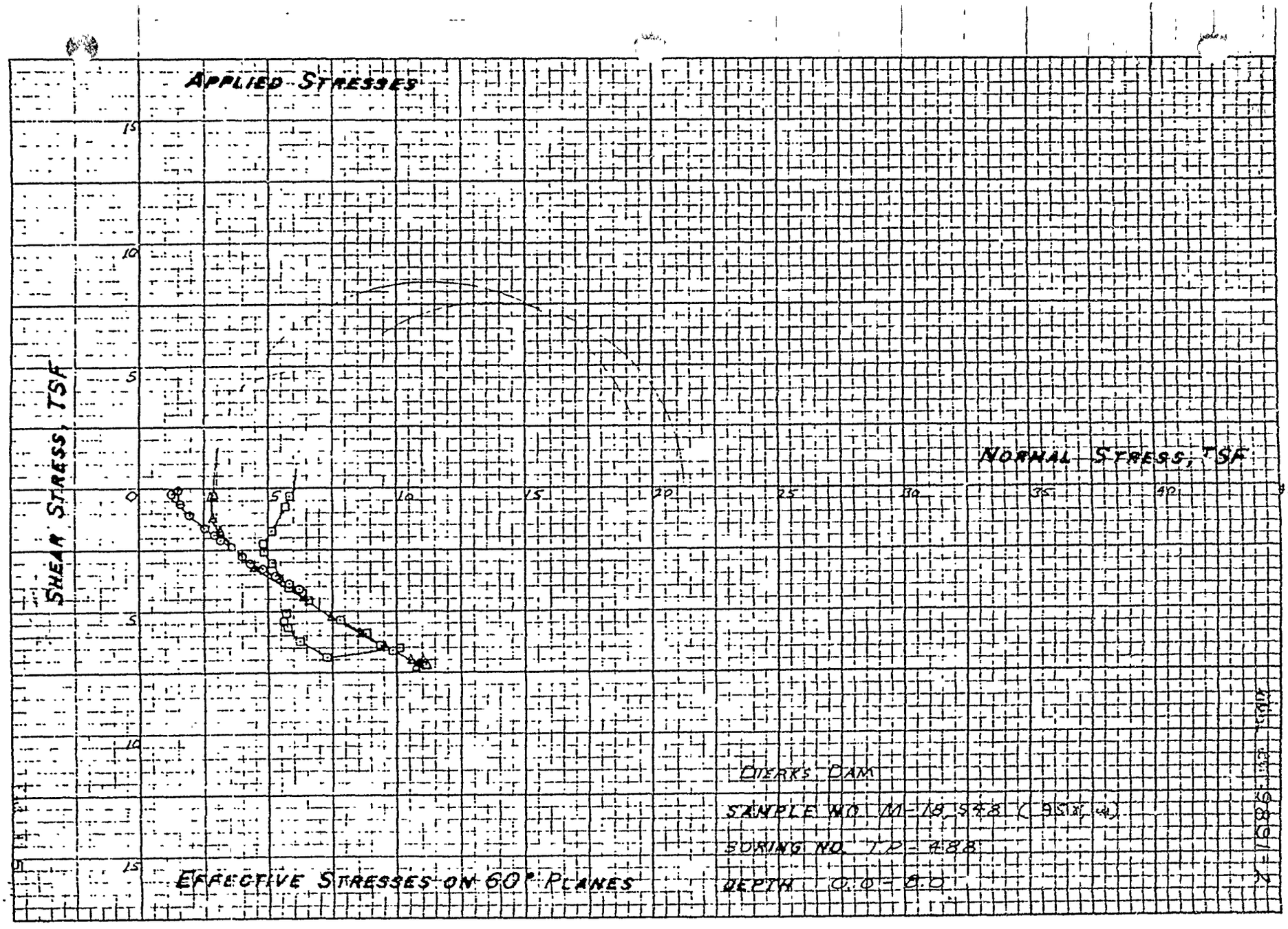
Depth 0.0-8.0 | Date JA

TRIAXIAL COMPRESSION TEST REPORT

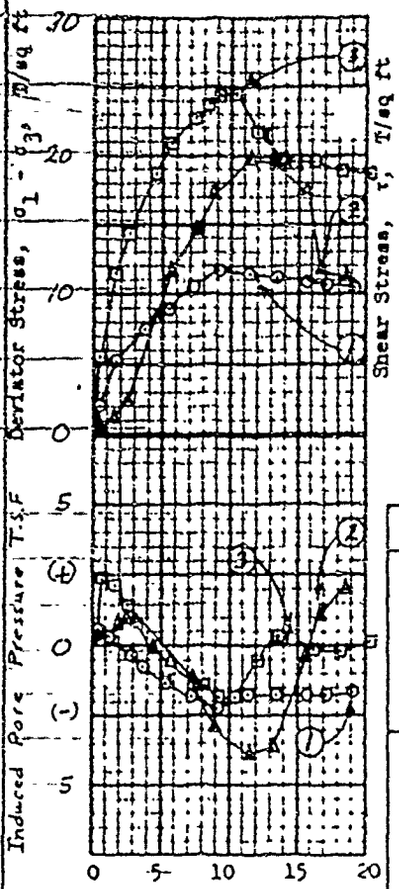
ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

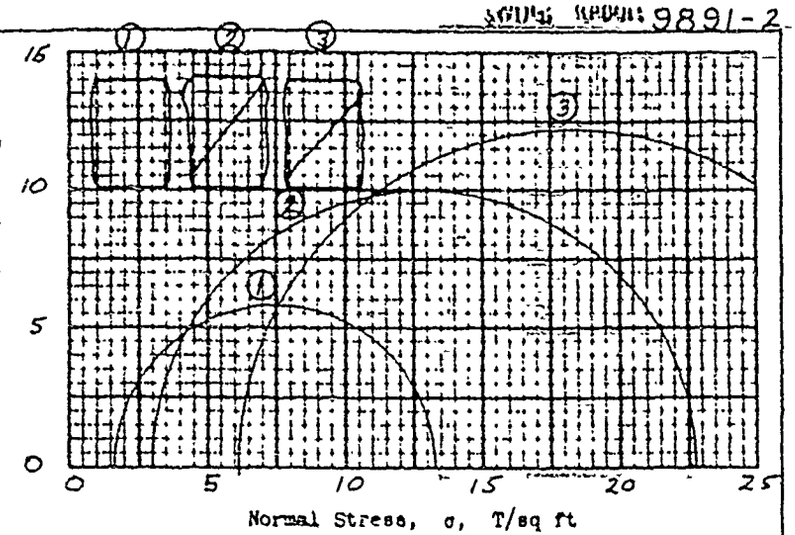
TRANSLUCENT

Plate No. 4


APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
EFFECTIVE STRESSES ON 60° PLANES
CLERK'S CAM
SAMPLE NO. M-18,548 (95'x 4)
BORING NO. T.P.-488
DEPTH 0.0 - 9.0
15
10
5
0
5
10
15
5
10
15
20
25
30
35
40
45

AGDW Report 9891-2





Test No.			①	②	③	
Initial	Water content	w_o	14.4%	14.9%	13.9%	%
	Void ratio	e_o	.506	.509	.509	
	Saturation	S_o	76 %	78 %	73 %	%
	Dry density, lb/cu ft	γ_d	110.7	110.4	110.4	
Before Shear	Water content	w_c	16.7 %	17.1 %	16.8%	%
	Void ratio	e_c	.445	.458	.448	
	Saturation	S_c	100 %	100 %	100 %	%
	Final back pressure, T/sq ft	u_o	10.9	9.8	15.0	
Final	Water content	w_f	16.7%	17.1 %	16.8%	%
	Void ratio	e_f	.445	.458	.448	
Minor principal stress, T/sq ft		σ_3	1.60	3.00	6.10	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	11.72	19.74	24.35	
Time to failure, min		t_f	169	278	220	
Rate of strain, percent/min			0.05	0.04	0.05	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.4	1.4	1.4	
Initial height, in.		H_o	3.0	3.0	3.0	

Shear Strength Parameters

ϕ = _____ °

$\tan \phi$ = _____

c = _____ T/sq ft

Method of saturation _____

Back Pressure

☐ Controlled stress

☑ Controlled strain

Type of test R | Type of specimen

Classification SAND, silty (SM)

LL NP | PL NP | PI NP | | G_s 2.67

Remarks

Project DIERKS DAM

Area Borrow Materia

Boring No. TP-488 | Sample No. M-18, 548 (95%, w+4)

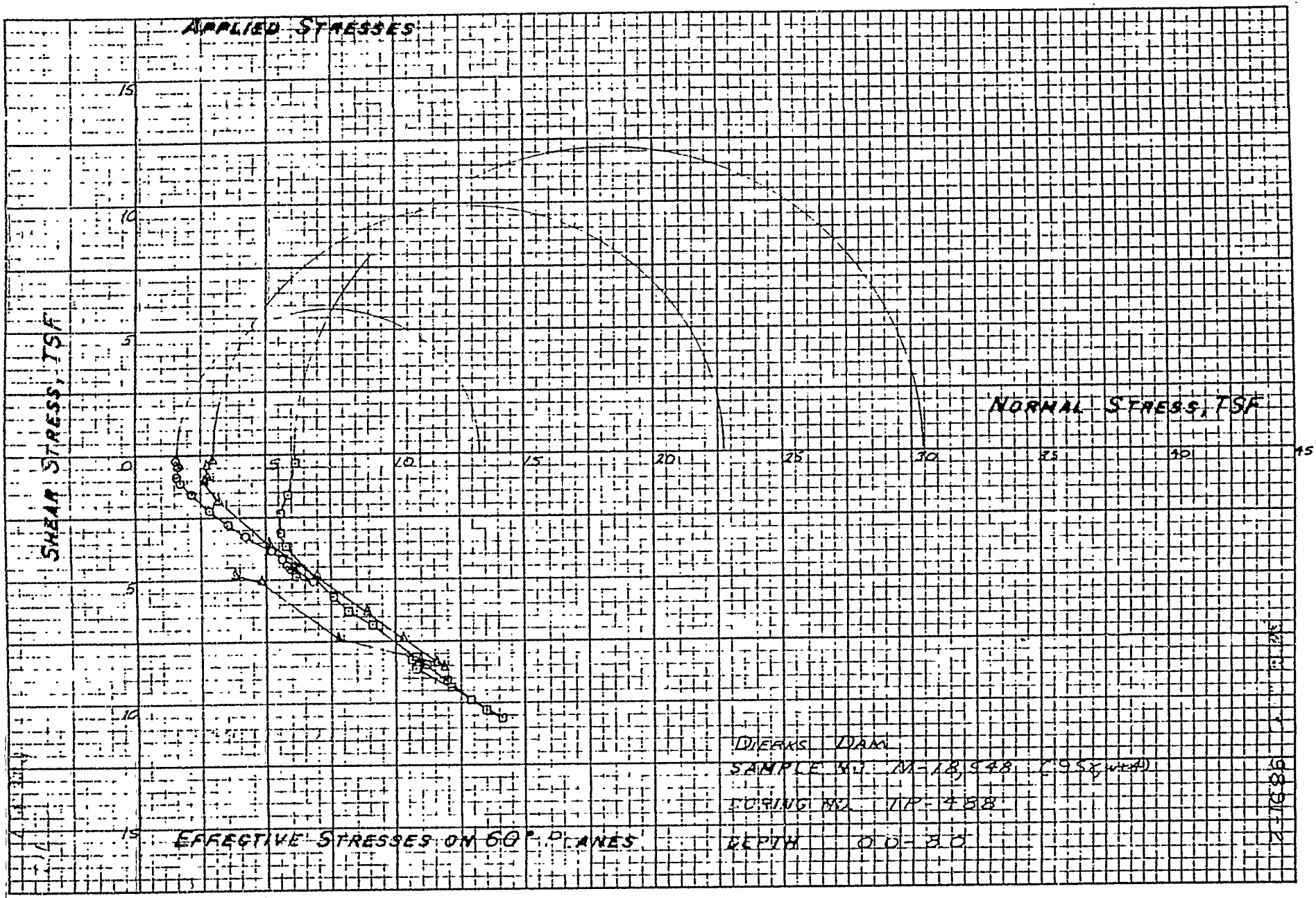
Depth 0.0 - 8.0 | Date

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

TRANSLUCENT

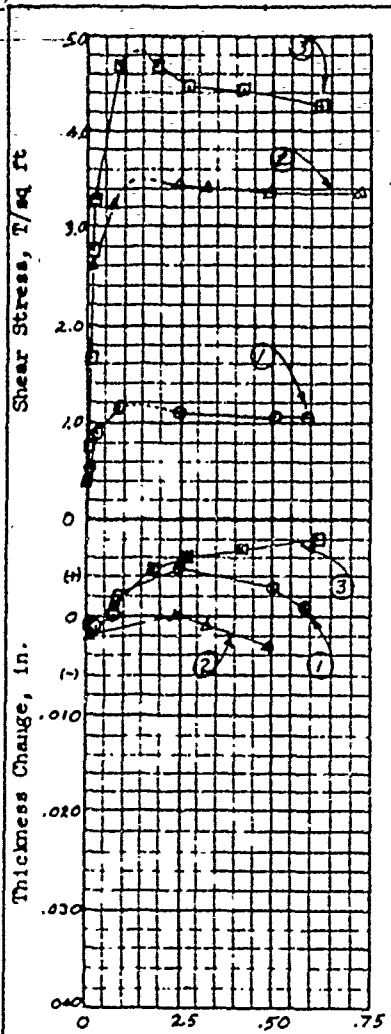
Plate No. 6

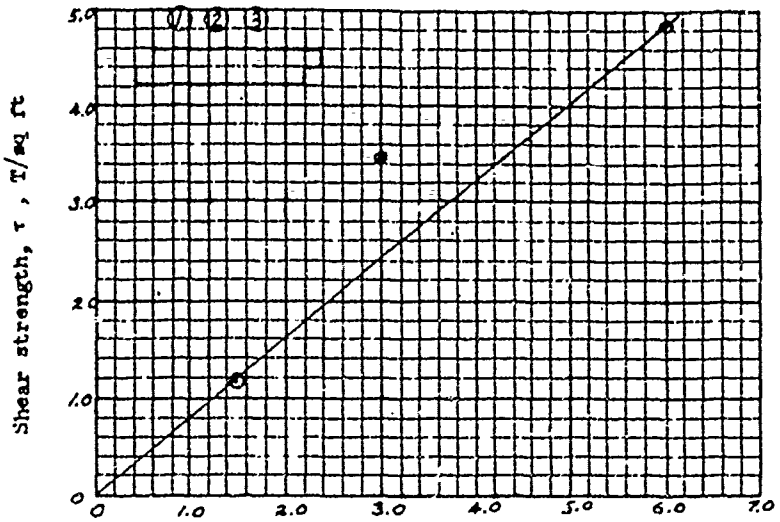

APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
EFFECTIVE STRESSES ON 60° PLANES
DIERKS DAM
SAMPLE NO. M-18,548 (95% mod)
CURING NO. 1P-488
DEPTH 00-30
5
10
15
20
25
30
35
40
45

APPENDIX E

COMPACTED MATERIALS

SECTION 3. DIRECT SHEAR TESTS





Test No.			①	②	③	
Initial	Water content	w_o	14.7 %	14.7 %	14.7 %	%
	Void ratio	e_o	.503	.508	.507	
	Saturation	S_o	78 %	77 %	77 %	%
	Dry density lb/cu ft	γ_d	110.8	110.6	110.7	
Void ratio after consolidation		e_c				
Time for 50% consolidation, min		t_{50}	—	—	4	
Final	Water content	w_f	15.5 %	15.7 %	14.4 %	%
	Void ratio	e_f				
	Saturation	S_f	%	%	%	%
Actual time to failure, min.		t_f	700	700	700	
Normal stress T/sq ft		σ	1.5	3.0	6.0	
Maximum shear strength, T/sq ft		τ	1.17	3.47	4.85	

Shear Values

ϕ' = 39.0°

tan ϕ' = .808

c' = 0.0

Test Type (Check One) ☐ Controlled, stress ☑ Controlled, strain .0002 in./min.

Type of Specimen Remolded | 30 in. Square | 0.5 in. Thickness

Classification CLAY, sandy (CL-ML)

LL 21 | PL 15 | PI 6 | ~~Pro~~ G_s 2.67

Remarks

Project Dierks Dam

Area Borrow Material

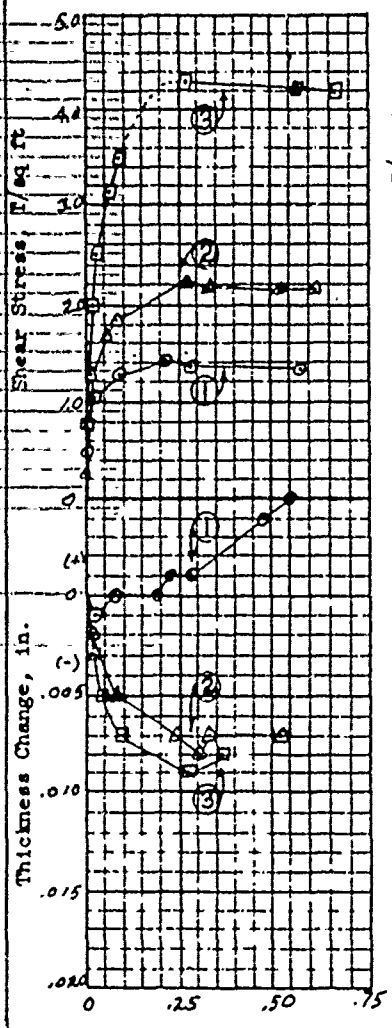
Boring No. 8A-200 (958, 1+73) Sample No. M-12,496

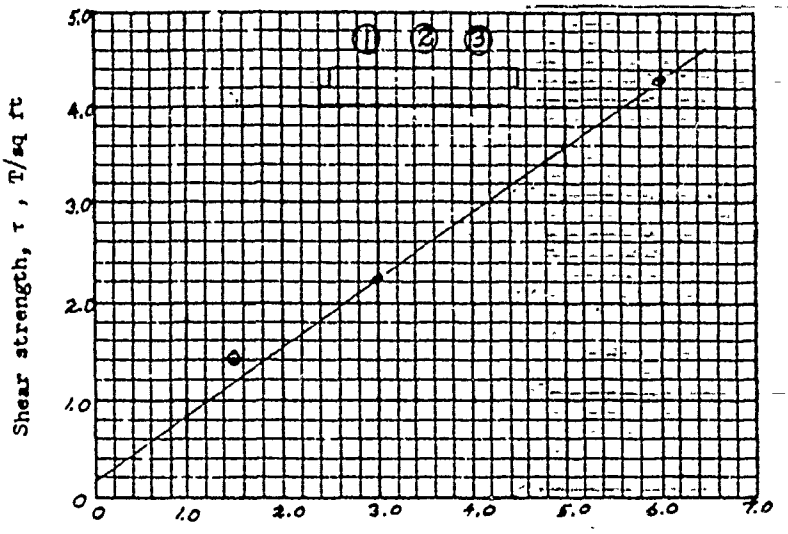
Depth ~~Ft~~ 0.0 - 3.0 Date NOV 65

DIRECT SHEAR TEST REPORT

ENG FORM 1 MAY 63 2022 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) C 3437

SWDGL Report 9467





Test No.			①	②	③	
Initial	Water content	w_o	15.9 %	15.9 %	15.9 %	%
	Void ratio	e_o	.519	.526	.517	
	Saturation	S_o	82 %	81 %	83 %	%
	Dry density lb/cu ft	γ_d	110.6	110.0	110.7	
Void ratio after consolidation		e_c				
Time for 50% consolidation, min		t_{50}	—	—	1	
Final	Water content	w_f	16.4 %	15.4 %	14.4 %	%
	Void ratio	e_f				
	Saturation	S_f	%	%	%	%
Actual time to failure, min.		t_f	1600	1500	1000	
Normal stress T/sq ft		σ	1.5	3.0	6.0	
Maximum shear strength, T/sq ft		τ	1.40	2.22	4.23	

Shear Values

ϕ' = 34.6°

tan ϕ' = .690

c' = 0.2

Test Type (Check One) ☐ Controlled, stress ☑ Controlled, strain .0002 in./min.

Type of Specimen Remolded 3.0 in. Square 0.5 in. Thickness

Classification CLAY (CL)

LL 30 PL 14 PI 16 D_{50} G_s 2.69

Remarks

Project Dierks Dam

Area Borrow Material

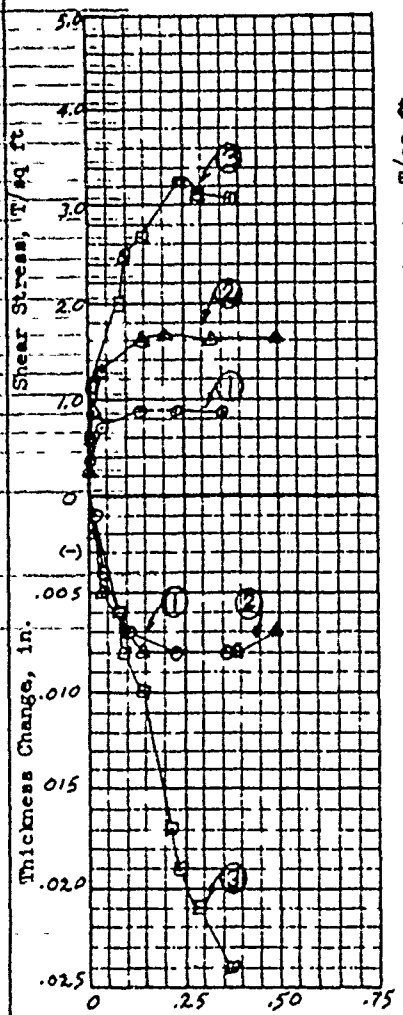
Boring No. BA-203 Sample No. M-12,500 (958, W+3)

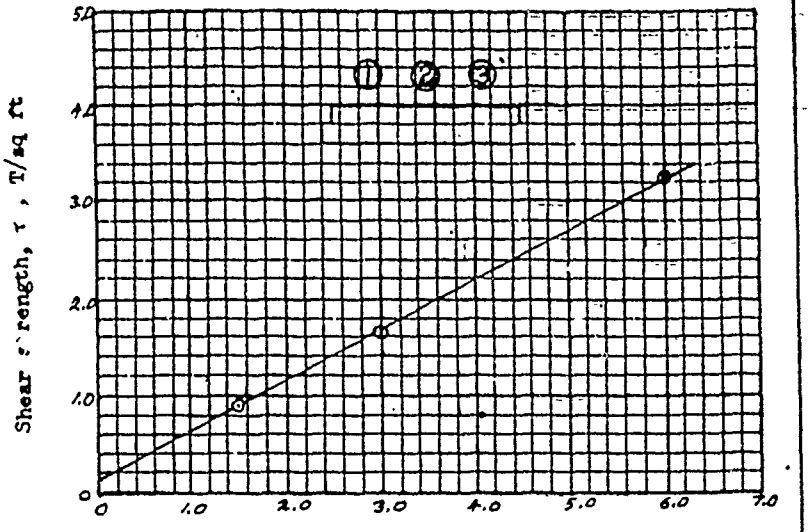
Depth Ft 0.0 - 3.0 Date NOV 65

DIRECT SHEAR TEST REPORT

ENG FORM 2092 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) C 3437

Plate No. 52





Test No.			①	②	③	
Initial	Water content	w_o	19.9 %	19.9 %	19.9 %	%
	Void ratio	e_o	.672	.672	.672	
	Saturation	S_o	80 %	80 %	80 %	%
	Dry density lb/cu ft	γ_d	101.2	101.2	101.2	
Void ratio after consolidation		e_c				
Time for 50% consolidation, min		t_{50}	—	—	1	
Final	Water content	w_f	20.6 %	18.9 %	19.0 %	%
	Void ratio	e_f				
	Saturation	S_f	%	%	%	%
Actual time to failure, min.		t_f	2300	1800	3600	
Normal stress T/sq ft		σ	1.5	3.0	6.0	
Maximum shear strength, T/sq ft		τ	0.90	1.64	3.22	

Shear Values

ϕ' = 27.3°

tan ϕ' = .516

c' = 0.1

Test Type (Check One) ☐ Controlled, stress ☑ Controlled, strain .0001 in./min.

Type of Specimen Remolded | 3.0 in. Square | 0.5 in. Thickness

Classification CLAY (CL)

LL 40 | PL 13 | PI 27 | D_{50} G_s 2.71

Remarks

Project Dierks Dam

Area Borrow Material

Boring No. BA-207 | Sample No. (95δ, W+3) M-12,504

Depth 5.0 - 6.5 | Date NOV 65

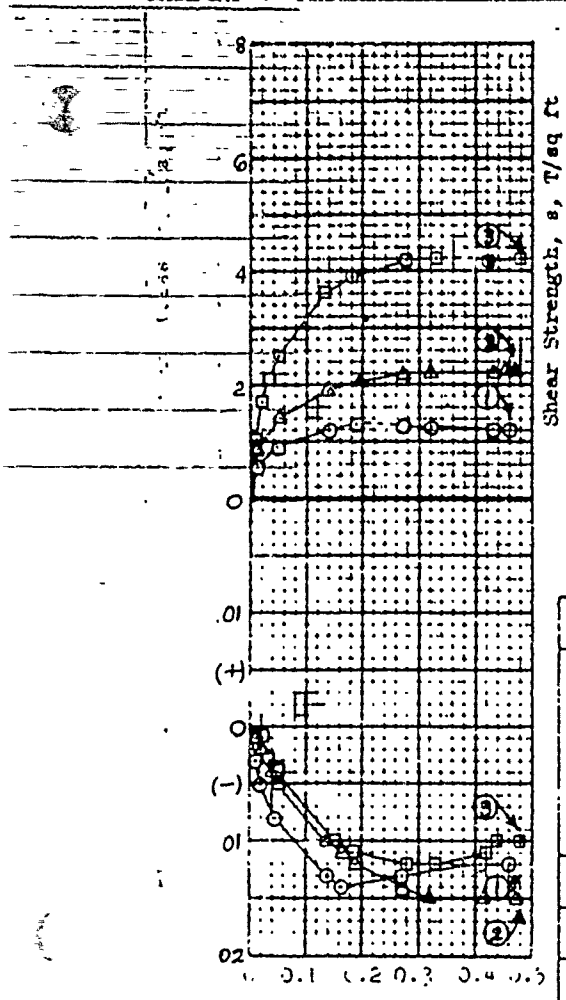
DIRECT SHEAR TEST REPORT

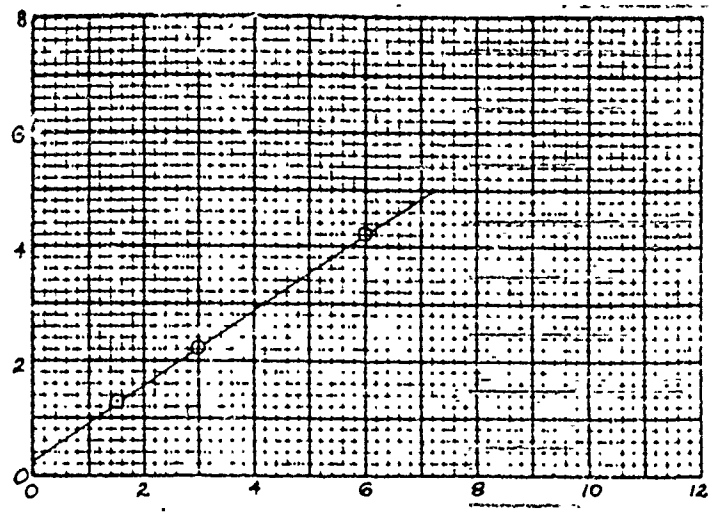
ENG FORM 2092 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) C 3437

115

Plate No. 53

9812





Test No.			①	②	③	
Initial	Water content	w_c	17.9 %	17.8 %	17.8 %	%
	Void ratio	e_c	.554	.554	.552	
	Saturation	S_c	87 %	86 %	86 %	%
	Dry density, lb/cu ft	γ_d	107.7	107.7	107.8	
Void ratio after consolidation		e_c				
Time for 50 percent consolidation, min		t_{50}				
Final	Water content	w_f	17.1 %	16.0 %	14.5 %	%
	Void ratio	e_f				
	Saturation	S_f	%	%	%	%
Normal stress, T/sq ft		σ	1.5	3.0	6.0	
Maximum shear stress, T/sq ft		τ_{max}	1.30	2.24	4.22	
Actual time to failure, min		t_f	2000	3100	3800	
Rate of strain, in./min			0.0001	0.00015	0.0001	
Ultimate shear stress, T/sq ft		τ_{ult}				

Shear Strength Parameters

ϕ' = 33.4°

$\tan\phi'$ = .660

c' = 0.3 T/sq ft

☐ Controlled stress

☑ Controlled strain

Type of specimen: 3.0 in. square; 0.5 [illegible]

Classification: SAND, clayey (SC)

LL 31 | PL 13 | PI 18 | G_s 2.68

Remarks

Project: Dierks Dam

Area

Boring No. 10A-2C-169 | Sample No. M-17,973 (95 % (w+3))

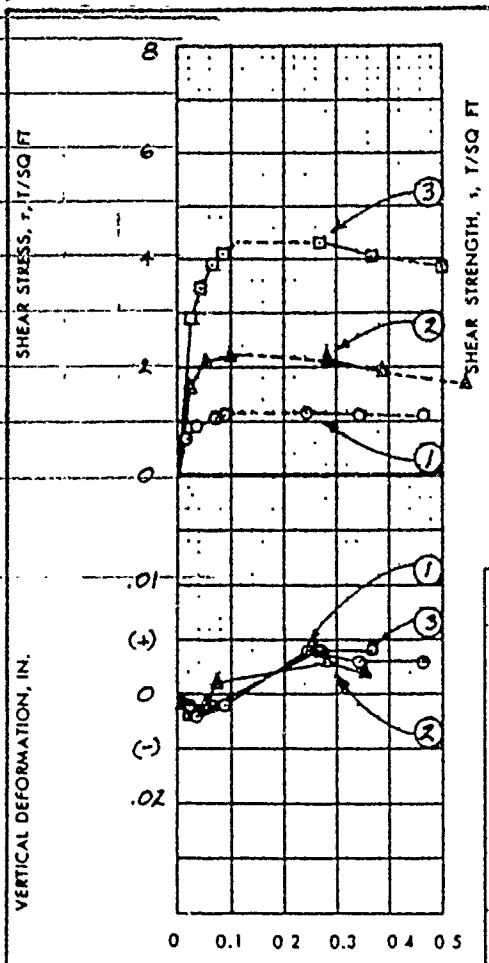
Depth 10 - 33 | Date

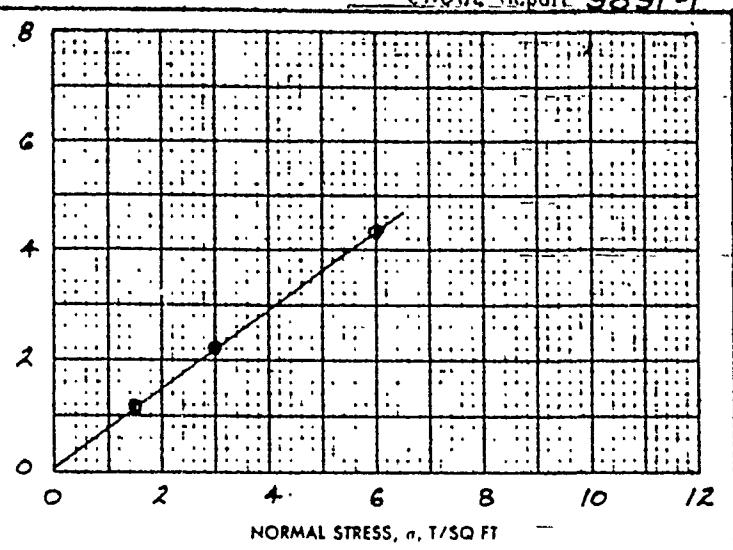
DIRECT SHEAR TEST REPORT

FORM 2097 PREVIOUS EDITION ARE OBSOLETE PLATE X-3

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SWDGL Report 9891-1





SHEAR STRENGTH PARAMETERS

φ = 35.5°

TAN φ = .707

c = .01 T/SQ FT

☐ CONTROLLED STRESS

☑ CONTROLLED STRAIN

TEST NO		①	②	③	
INITIAL — WATER CONTENT	w_o	10.3%	10.3%	10.3%	%
INITIAL — VOID RATIO	e_o	.492	.492	.491	
INITIAL — SATURATION	S_o	56 %	56 %	56 %	%
INITIAL — DRY DENSITY, LB/CU FT	γ_d	111.7	111.7	111.8	
VOID RATIO AFTER CONSOLIDATION	e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN	t_{50}				
FINAL — WATER CONTENT	w_f	14.8%	14.4%	14.8%	%
FINAL — VOID RATIO	e_f				
FINAL — SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT	σ	1.5	3.0	6.0	
MAXIMUM SHEAR STRESS, T/SQ FT	τ_{max}	1.16	2.21	4.33	
ACTUAL TIME TO FAILURE MIN	t_f	500	600	600	
RATE OF STRAIN IN /MIN		0.0002	0.0002	0.0002	
ULTIMATE SHEAR STRESS, T/SQ FT	τ_{ult}				

TYPE OF SPECIMEN Remolded — 3.0 IN SQUARE — 0.5 IN. THICK

CLASSIFICATION SAND, silty (SM)

LL NP | PL NP | PI NP | G. 2.67

REMARKS

PROJECT DIERKS DAM

AREA

BORING NO. TP-488 | SAMPLE NO (USAE) M-18,548

DEPTH EL 0.0-8.0 | DATE 5/8

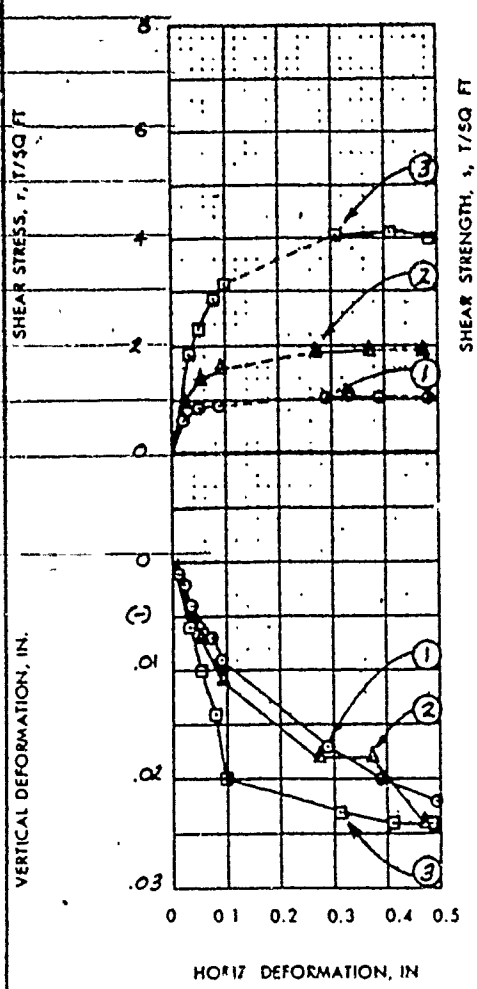
DIRECT SHEAR TEST REPORT

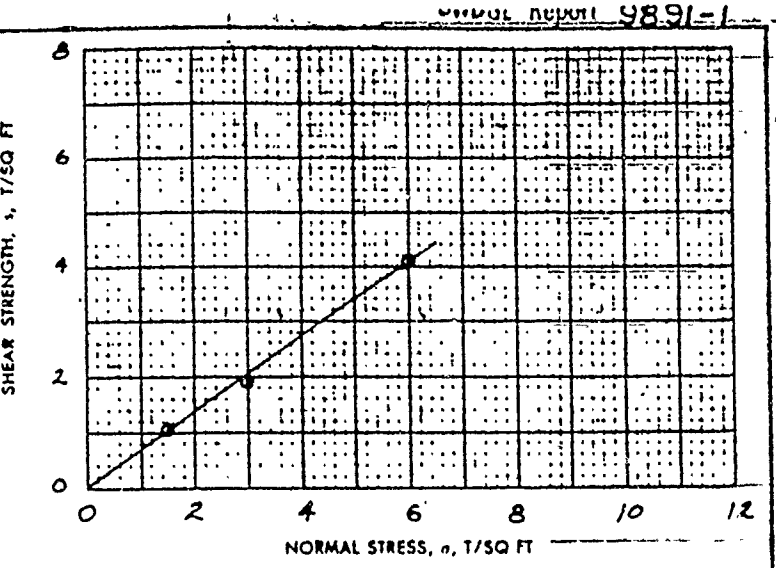
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ENG FORM 2092 1 JUN 68 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO 1966 O—214-965

PLATE IX-3

Date No. 25





TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_c	12.5 %	12.5 %	12.7 %	%
	VOID RATIO	e_o	.490	.494	.495	
	SATURATION	S_o	69 %	68 %	69 %	%
	DRY DENSITY, LB/CU FT	γ_d	112.7	112.4	112.3	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION MIN		t_{50}				
FINAL	WATER CONTENT	w_f	14.6 %	13.7 %	12.2 %	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS T/SQ FT		σ	1.5	3.0	6.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	1.04	1.92	4.11	
ACTUAL TIME TO FAILURE, MIN		t_f	1600	2000	2000	
RATE OF STRAIN, IN /MIN			0.0002	0.0002	0.0002	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ = 34.3°

TAN ϕ = .682

c' = 0.0 T/SQ FT

☐ CONTROLLED STRESS

☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded — 3.0 IN. SQUARE — 0.5 IN. THICK

CLASSIFICATION CLAY, sandy (CL)

LL 25 | PL 12 | PI 13 | G. 2.69

REMARKS

PROJECT DIERKS DAM

AREA Narrow Mountain (95%w)

BORING NO TP-491/TR193 SAMPLE NO M-18,564-C

DEPTH ft 2.0-10.1 DATE NOV 68

DIRECT SHEAR TEST REPORT

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PLATE II-2

APPENDIX F

MONTHLY SUMMARIES OF COMPACTION AND WATER CONTENT TESTS

(MAIN FORM)

RCS: ENGCW-E-11(R1)

(1) Periodic SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

PROJECT: Dierks Dam Cofferdam + RT. Embank.
RIVER: Saline
STATE: Ark.
TOWN: Dierks
CONTRACT NO: DACW-56-C-71-0159
CONTRACTOR: Amis Const. Co.
DATE OF REPORT: 4-23-71
REPORT NO.: 1
SHEET 1 OF 1

SPACE RESERVED FOR PUNCH CARD OPERATOR
1-2 ____ 6-7 ____
3-4 ____ 8-9 ____
5 ____ 10-13 ____

EMBANKMENT ZONE: D/S Random
SPECIFIED: % COMP 95 ; W % LIMITS ±3
COMPACTION EQUIPMENT (1): SFR / VT
LOOSE LIFT THICKNESS (IN.): 12
NUMBER OF PASSES: 4
CONTACT PRESSURE (PSI):

TEST IDENTIFICATION									CLASSIFICATION					IN PLACE DATA				LABORATORY TEST DATA (RCM)				FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		FRACTION		STANDARD METHOD						
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27, Inspection
R-1	9-28-70	WV	5+50	℄	455	6	D/S Cofferdam	Diversion Channel	Tan SM(G)								108.0	9.8				120.0	9.8	0	90	add. rolling
R-1A	"	"	4+80	10'RT	"	"	"	"	"								118.1	12.5				"	"	+2.7	98	Recheck
R-2	9-30-70	"	5+25	12'RT	456	"	"	"	"								110.1	9.3				"	"	-0.5	92	Inspection add. rolling
R-2A	10-1-70	"	"	"	"	"	"	"	"								114.4	8.1				"	"	-1.7	95	Recheck
R-3	10-5-70	"	3+65	10'RT	459	"	"	"	"								117.9	9.7				"	"	-0.1	98	
R-4	10-21-70	"	7+50	℄	466	"	"	"	Tan SM-SC (ES)								116.0	14.1				116.6	13.3	+0.8	99	
R-5	11-13-70	"	0+25	℄	453	"	U/S Cofferdam	"	"								115.4	11.6				117.5	15.0	-3.4	98	In connection with procedure stated raining
R-6	11-16-70	"	3+20	8'RT	452	"	"	"	"								118.6	15.3				"	"	+0.3	101	
R-7	11-17-70	"	1+25	℄	455	"	"	"	Tan SM(E)								124.1	10.0				124.7	9.7	+0.3	100	
R-8	11-19-70	"	0+75	℄	470	"	"	N. Ridge Spillway	"								117.3	14.4				117.5	15.0	-0.6	100	
R-9	3-1-71	"	5+10	400'RT	"	"	RT. Emb.	"	Red SC(-)								113.8	12.0				117.7	14.8	-2.8	97	
R-10	3-12-71	"	4+75	275'RT	473	"	"	"	"								109.3	15.3				111.4	16.7	-1.4	98	

Note: When embankment construction begins in earnest, reports will be made monthly.
A gradation test was inadvertantly omitted on Test R-10

NOTE: (1) FILL IN APPROPRIATE WORD DAILY WEEKLY, MONTHLY OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)
COL 3 CYLINDER (CYL) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 9 E.G.: AREA C SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
COL 20 STANDARD METHOD: (A) 4-IN. DIAM MOLD, (B) 6-IN. DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX. PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX. DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL, LIQUID LIMIT CORRELATION, VISUAL COMPARISON, ETC
COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 + COL 21 OR COL 23 INDICATE BY A OR B RESPECTIVELY FOR COL 18 + COL 21 OR COL 23 INDICATE BY C OR D RESPECTIVELY
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U.S. ARMY ENGINEER
CORPS OF ENGINEERS
PREPARED BY: R.M. Logan
SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(1) Monthly — SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENGCW-E-11(R1)

PROJECT:	RIVER: / STATE: / TOWN:	CONTRACT NO	CONTRACTOR	DATE OF REPORT.	REPORT NO: / SHEET
Dierks Dam	Saline / Ark. / Dierks	DACW 56-C-71-0159	Amis Const. Co.	10-4-71	2 / 1 of 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2 ____ 6-7 ____ 3-4 ____ 8-9 ____ 5 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (B)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
RT. Emb. Random	95	± 3	SFR	12	8	
			VT	12	4	

TEST IDENTIFICATION									CLASSIFICATION					IN PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION		STANDARD METHOD			RECOM			
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-11	6-17-71	WV	2+50	100'LT	490	12	RT. Emb	N. Ridge Spillway	Tan SM (E)								112.2	19.5				116.8	19.7	-0.2	96	watered & reworked
R-12	"	"	3+10	300'RT	485	"	"	"									123.0	11.1				128.8	14.1	-3.0	96	"
R-13	6-22	"	4+50	280'RT	"	"	"	"									118.4	5.8				124.9	9.0	-3.2	95	reduced lifts additional roll
R-14	6-24	"	5+25	250'RT	487	"	"	"	Tan SC (E)								103.0	18.0				110.5	18.3	-0.3	93	
R-15	"	"	4+75	"	"	"	"	"	"								105.6	19.1				"	"	+0.8	96	
R-16	6-30	"	5+50	300'RT	496	"	"	"	Tan SM-SC (E)								109.4	16.9				111.7	18.4	-1.5	98	
R-17	"	"	4+50	275'RT	"	"	"	"	Tan SC (E)								105.4	17.8				"	"	-0.6	95	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY OR PERIODIC
(B) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)
COL 5: CYLINDER (CYL) CHUNK (CK), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ( )
COL 6: RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AX'S
COL 7: DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8: E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10: ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13: WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
COL 30: STANDARD METHOD: (A) 4-IN. DIAM MOLD, (B) 6-IN. DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS MS UNDER COL 30 AND REPORT DETAILS OF PROCEDURE.
COL 21-22: 1- OR 2 POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24: FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION, VISUAL COMPARISON, ETC
COL 25: COL 17 OR COL 19 MINUS COL 23 OR COL 24
COL 26: INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 16 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY.
COL 27: IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U. S. ARMY ENGINEER
CORPS OF ENGINEERS
PREPARED BY: R.M. Rogers
SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

* U.S. GOVERNMENT PRINTING OFFICE: 1967 546-025 (81)

(MAIN FORM)

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT: Dierks Dam | RIVER Saline | STATE Ark | TOWN Dierks | CONTRACT NO. DACW 56-C-71-0159 | CONTRACTOR Amis Const. Co. | DATE OF REPORT. 10-4-71 | REPORT NO: 2 | SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2 ____ 3-4 ____ 5 ____ 6-7 ____ 8-9 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious Core	95	+2.8 -1.7	SER	12	8	
RT. Emb.						

1-10	11-13	20	21-30	31-34	35-36	37-38	39	40	41	42	43-46	47-50	51-53	54-56	57-60	61-63	64-67	68-70	71	72-75	76-79	72-75	76-78			
TEST IDENTIFICATION									CLASSIFICATION						IN PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		- #3/4" FRACTION		STANDARD METHOD			RCCM				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-1	6-4-71	WV	2+82	℄	480 S	12	RT Emb Impervious	Area E	Red CL (E)			72	34.3				101.9	17.6				105.4	19.4	-1.8	97	watered & reworked
I-1A	6-10-71	"	2+85	℄	482	"	"	"	"								110.0	18.7				"	"	-0.7	104	Rechack
I-2	"	"	3+15	℄	484	"	"	"	"								105.5	20.6				"	"	+1.2	100	
I-3	6-15-71	"	2+50	℄	489	"	"	"	"								107.2	17.0				108.2	17.6	-0.6	99	
I-4	6-21-71	"	2+35	10' LT	495	"	"	"	"								108.1	17.7				"	"	+0.1	100	
I-5L	6-28-71	"	3+80	℄	499	"	"	"	"								104.4	17.8				109.7	18.4	-0.6	95	

NOTE: (a) FILL IN APPROPRIATE WORK: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 5 CYLINDER (CYL), CHUNK (C), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____

COL 6 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED. NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD. (A) 4-IN -DIAM MOLD, (B) 6-IN -DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906 IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST. NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.

COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION, VISUAL COMPARISON ETC

COL 25 COL 17 OR COL 18 MINUS COL 22 OR COL 24

COL 26 INDICATE DERIVATION, E.G. FOR COL 18 + COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 + COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U. S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: C.M. Layne

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

* U.S. GOVERNMENT PRINTING OFFICE: 1967 766-021 (R1)

(MAIN FORM)

(3) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENGCW-E-11(R1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT:	REPORT NO.
Dierks Dam	Saline / Ark / Dierks	DAWC 56-C-71-0159	Amis Const. Co.	10-4-71	3 SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2, 3-4, 5, 6-7, 8-9, 10-13

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (8)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Rt. Emb. Random	95	± 3%	SFR	12	8	
			VT	12	4	

TEST IDENTIFICATION									CLASSIFICATION						IN PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#3/4 FRACTION		STANDARD METHOD			RCCM				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-18	7-1-71	WV	4+50	270'RT	499	12	Rt. Emb. Random	N. Ridge Spillway									111.0	18.5				113.8	15.4	+3.1	98	Disced + rerolled
R-19	"	"	5+25	150'RT	501	"	"	"									116.9	15.1				"	"	-0.3	103	
R-20	7-7-71	"	4+60	285'RT	504	"	"	"									116.5	11.6				120.8	12.2	-0.6	97	
R-21	"	"	5+25	200'RT	504	"	"	"									121.8	13.4				"	"	+1.2	101	
R-22	7-8-71	"	3+65	110'RT	507	"	"	"									119.0	11.7				118.9	12.7	-1.0	100	
R-23	"	"	2+25	50'LT	510	"	"	"									121.1	13.0				120.1	15.1	-2.1	101	
R-24B	7-9-71	"	4+75	300'RT	508	"	"	"									98.4	13.3				111.2	13.9	-0.6	89	Ripped up reworked
R-24A	7-13-71	"	4+75	275'RT	505	"	"	"									109.4	16.5				109.7	18.2	-1.7	100	Recheck
R-25	"	"	4+50	80'RT	511	"	"	"									108.1	18.0				"	"	-0.2	99	
R-26	7-15-71	"	3+75	150'RT	512	"	"	"									113.4	9.1				119.6	11.6	-2.5	95	
R-27	7-19-71	"	2+20	60'RT	518	"	"	"									119.8	15.0				115.6	15.2	-0.2	104	
R-28	7-23-71	"	4+50	190'RT	520	"	"	"									100.9	17.1				114.8	16.8	+0.3	88	
R-28A	7-27-71	"	"	"	"	"	"	"									119.8	15.2				120.6	14.4	+0.8	99	Recheck

NOTE: (3) FILL IN APPROPRIATE WORD DAILY, WEEKLY MONTHLY, OR PERIODIC
(8) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)
COL 3 CYLINDER (CYL) CHUNK (CH), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
COL 20 STANDARD METHOD: (A) 4-IN -DIAM MOLD, (B) 6-IN -DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON ETC
COL 25 COL 17 OR COL 18 MINUS COL 22 OR COL 24.
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 15 ÷ COL 21 OR COL 23, INDICATE BY C OR D RESPECTIVELY.
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U. S. ARMY ENGINEER
CORPS OF ENGINEERS
PREPARED BY: R M Boyce
SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

* U.S. GOVERNMENT PRINTING OFFICE: 1967 550-621 (R1)

(MAIN FORM)

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT	REPORT NO. / SHEET
Dierks Dam	Saline / Ark / Dierks	DACW 56-C-71-0159	Amis Const. Co.	10-4-71	3 / SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATIIR

1-2 ____ 6-7 ____
3-4 ____ 8-9 ____
5 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
RT. Emb. Impervious	95	+3% -1%	SFR	12	8	

TEST IDENTIFICATION									CLASSIFICATION					IN-PLACE DATA				LABORATORY TEST DATA						FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-¾" FRACTION		STANDARD METHOD			RCCM				
TEST NO.	DATE MADE	TYPE TEST	STATION	OFFSET (FV)	ELEVATION (FT)	DEPTH (IN)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-6	7-7-71	NV	4+00	℄	506	12	RT Emb. Impervious	Area E	Red CL (C)								112.1	18.0				108.2	17.6	+0.4	104	
I-7	7-14-71	"	3+00	℄	512	"	"	"	"			70.3	32.7				117.2	11.0				119.2	13.2	-2.2	98	Ripped up, watered, Rerolled
I-8	7-15-71	"	2+80	℄	514	"	"	"	"								108.2	13.6				"	"	+0.4	91	Rerolled
I-8A	"	"	2+85	℄	514	"	"	"	"								118.1	14.1				"	"	+0.9	99	Recheck
I-9	7-19-71	"	4+00	3' RT	521	"	"	"	"								117.1	14.3				113.5	16.6	-2.3	103	Ripped up, watered, Rerolled
I-10	7-21-71	"	3+90	3' LT	523	"	"	"	"								108.9	16.1				"	"	-0.5	96	
I-11L	7-23-71	"	2+00	℄	523	"	"	"	Red CL			77.2	38.1				101.1	12.8				112.5	13.5	-0.7	90	
I-11A	7-27-71	"	"	"	"	"	"	"	"								116.1	14.6				115.5	14.9	-0.3	101	Recheck

NOTE. (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN. -DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS IN B UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.

COL 21-22 1- OR 3-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION, VISUAL COMPARISON ETC

COL 25 COL 17 OR COL 19 MINUS COL 23 OR COL 24

COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY.

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U S ARMY ENGINEER
COPPS OF ENGINEERS

PREPARED BY: R.M. Rogers

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

* U.S. GOVERNMENT PRINTING OFFICE: 1967 34-421 (R)

(MAIN FORM)

(1)_____ SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT.	REPORT NO:
Dierks Dam	Saline / Ark / Dierks	DACW-56-C-71-0159	AMIS Const. Co.	10-4-71	4

SHEET 1 OF 3

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 _____ 6-7 _____
3-4 _____ 8-9 _____
5 _____ 0-13 _____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
RT. Emb. Random	95	±3%	SFR	12	8	
			VT	12	4	

TEST IDENTIFICATION									CLASSIFICATION					IN-PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		- ¾" FRACTION		STANDARD METHOD			RCCM				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-29	8-2-71	WV	4+25	150'RT	530	12	RT Emb. Random	N. Ridge Spillway	Tan SM (E)								116.1	15.8				119.5	14.9	+0.9	97	
R-30	8-3-71	"	5+00	120'RT	"	"	"	"	"								118.3	12.8				118.1	13.8	-1.0	100	
R-31	8-4-71	"	1+80	50'LT	"	"	"	"	"								112.3	10.7				117.9	13.1	-2.4	95	
R-32	8-5-71	"	3+18	"	"	"	"	"	"								115.5	15.8				112.2	15.8	+0	103	
R-33	8-16-71	"	5+00	155'RT	532	"	"	"	"								108.0	11.1				123.5	12.6	-1.5	88	unTared Recalled
R-33A	8-19-71	"	"	100'RT	533	"	"	"	"								116.0	12.2				121.0	12.6	-0.4	96	Recheck
R-34	8-16-71	"	3+00	120'RT	535	"	"	"	"								120.0	11.5				121.6	12.5	-1.0	99	
R-35	8-17-71	"	3+75	50'RT	533	"	"	"	Tan GM(E)								114.9	12.6				118.1	14.4	-1.8	97	
R-36	"	"	3+50	78'LT	530	"	"	"	"								118.0	14.8				120.0	13.9	+0.9	98	
R-37	8-18-71	"	1+60	50'LT	531	"	"	"	Tan SM(E)								118.5	15.7				116.6	15.9	-0.2	102	
R-38	8-19-71	"	3+18	75'LT	533	"	"	"	Tan GC (E)								117.0	11.1				117.5	12.9	-1.8	100	
R-39	8-20-71	"	4+25	150'RT	534	"	"	"	"								104.9	16.2				121.1	14.3	+1.9	87	
R-39A	8-23-71	"	"	"	"	"	"	"	"								118.1	13.5				118.3	14.4	-0.9	100	Recheck
R-40	"	"	3+20	85'LT	535	"	"	"	"								118.1	12.5				122.0	12.5	±0	97	
R-41	8-24-71	"	1+60	40'LT	537	"	"	"	"								115.5	16.8				115.6	16.2	0.6	100	
R-42	"	"	4+90	50'RT	538	"	"	"	"								121.9	11.2				119.1	12.5	-1.3	102	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL) CHUNK (CK), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER_____ ( )

COL 6 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-15 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN. DIAM MOLD, (B) 6-IN. DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906 IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE

COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC.

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24

COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 16 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U S ARMY ENGINEER _____
CORPS OF ENGINEERS

PREPARED BY: R.M. Rogers

SUBMITTED BY: _____
RESIDENT ENGINEER

ENG FORM 4080

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT:	REPORT NO: / SHEET
Dierks Dam	Saline / Ark / Dierks	DACW 56-C-71-0159	Amis Const. Co.	10-4-71	4 / SHEET 2 OF 3

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2 ____ 6-7 ____ 3-4 ____ 8-9 ____ 5 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (8)	LOOSE LIFT THICKNESS (IN)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
RT. Emb Random	95	± 3%	SER	12	8	
			VT	12	4	

TEST IDENTIFICATION									CLASSIFICATION						IN PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 3/4" FRACTION		STANDARD METHOD			RCCM				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-43	8-25-71	WV	3+75	5'LT	539	12	RT. Emb Random	N. Ridge Spillway	Tan GM(E)								116.6	15.8				120.4	12.9	+2.9	98	
R-44	"	"	3+00	66'RT	540	"	"	"	"								120.4	13.5				116.9	15.7	-3.2	100	
R-45	8-26-71	"	4+85	70'RT	537	"	"	"	Tan GC(E)								108.4	17.3				107.4	17.5	-1.2	101	
R-46	"	"	4+00	100'RT	"	"	"	"	Tan GM(E)								116.0	13.5				120.0	13.7	-0.2	97	
R-47	8-27-71	"	3+20	50'RT	538	"	"	"	"								118.6	11.0				122.5	12.6	-1.6	97	
R-48	"	"	3+75	40'LT	535	"	"	"	"								114.2	15.9				116.6	15.8	+0.1	98	
R-49	8-30-71	"	3+00	40'RT	538	"	"	"	"								116.6	15.0				114.9	14.7	+0.3	102	
R-50	"	"	3+10	110'RT	"	"	"	"	"								109.2	14.5				112.4	15.1	-0.6	97	
R-51	8-31-71	"	5+00	110'RT	537	"	"	"	Tan GC(E)								108.9	21.6				106.1	22.3	-1.2	103	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 2: CYLINDER (CYL) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER (_____)

COL 6: RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7: DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 8: E.G.: AREA C, SPILLWAY EXCAVATION, ETC

COL 10: ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-19: WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20: STANDARD METHOD: (A) 4-IN-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE

COL 21-22: 1- OR 2 POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24: FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC

COL 25: COL 17 OR COL 19 MINUS COL 22 OR COL 24

COL 26: INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 16 ÷ COL 21 OR COL 23 INDICATE BY C OR D RESPECTIVELY

COL 27: IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U.S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: [signature]

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

*U.S. GOVERNMENT PRINTING OFFICE: 1971 O-455-423 (11)

(MAIN FORM)

RCS: ENGCW-E-11(R1)

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

PROJECT	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO. / SHEET
Dierks Dam	Saline / Ark / Dierks	DAWC 56-C-71-0159	Ami's Const. Co.	10-4-71	4 / SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2 ____ 3-4 ____ 5 ____ 6-7 ____ 8 9 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
RT. Emb. Impervious	95	+2.2 -1%	SFR	12	8	

TEST IDENTIFICATION									CLASSIFICATION						IN PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		- 3" FRACTION #4		STANDARD METHOD			RCCM				
TEST NO.	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
							RT Emb.		Red CL																	
I-12	8-3-71	WV	1+65	6' LT	529	12	Impor.	Area E				62.0	52.5				114.2	15.4				115.2	15.0	+0.4	99	
I-13	8-17-71	"	4+25	5' RT	535	"	"	"	Red LL (E)								112.3	17.1				111.7	17.4	-0.3	100	
I-14	8-20-71	"	4+60	℄	"	"	"	"	"								110.0	16.7				115.9	15.2	+1.1	95	
I-15	8-31-71	"	1+66	"	541	"	"	"	"								112.9	15.1				113.3	15.2	-0.1	100	

NOTE: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3: CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____
COL 5: RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7: DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 9: E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10: ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13: WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
COL 20: STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906 IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21-22: 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24: FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC
COL 25: COL 17 OR COL 19 MINUS COL 23 OR COL 24.
COL 26: INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 16 ÷ COL 21 OR COL 23 INDICATE BY C OR D RESPECTIVELY.
COL 27: IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U.S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: K.M. Cayce

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080

* U.S. GOVERNMENT PRINTING OFFICE: 1967 O-250-021 (R1)

(MAIN FORM)

(S) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT: Dierks Dam	RIVER Saline STATE. Ark TOWN Dierks	CONTRACT NO DACW 56-C-71-0159	CONTRACTOR Amis Const. Co.	DATE OF REPORT 10-5-71	REPORT NO: 5 SHEET 2 OF 3

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2 ___ 3-4 ___ 5 ___ 6-7 ___ 8-9 ___ 10-13 ___

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w% LIMITS	COMPACTION EQUIPMENT (I)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
RT. Emb. Random	95	± 3%	SFR	12	8	
			VT	12	4	

TEST IDENTIFICATION									CLASSIFICATION						IN PLACE DATA				LABORATORY TEST DATA						FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-3/4 FRACTION		STANDARD METHOD			RCCM					
TEST NO	DATE MADE	TY * TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
							RT Emb	N. Ridge	Tan																	Too rocky
R-68	9-22-71	WV	5+00	100'RT	553	12	Random	Spillway	GC(E)																	To density Very rocky
R-69	"	"	4+75	35'LT	548	"			"								128.1	9.7				120.6	12.8	-3.1	106	
R-70	9-24-71	"	4+00	50'RT	553	"			Tan SC(E)	2	64	43														Too rocky To density
R-71	"	"	4+00	30'LT	548	"											119.2	13.9				119.5	13.3	+0.6	100	
R-72	9-27-71	"	4+25	60'LT	552	"			Tan GC(E)	2	47	27														Too rocky To density

NOTES: (S) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(I) ENTER TYPE OF EQUIPMENT USED E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3: CYLINDER (CYL) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ___ (___)

COL 5: RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7: DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 8: E.G.: AREA C, SPILLWAY EXCAVATION, ETC

COL 10: ENTER SOIL CLASS OR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-13: WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20: STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906 IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS M1 UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.

COL 21 22: 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22 MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24: FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK E.G. 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON ETC

COL 25: COL 17 OR COL 19 MINUS COL 23 OR COL 24

COL 26: INDICATE DERIVATION, E.G. FOR COL 15 & COL 21 OR COL 23 INDICATE BY A OR B, RESPECTIVELY FOR COL 19 & COL 21 OR COL 23, INDICATE BY C OR D RESPECTIVELY

COL 27: IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U.S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: R.M. Rogers

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

U.S. GOVERNMENT PRINTING OFFICE: 1967 O-249-021 (R1)

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENGCW-E-11(R1)

PROJECT: Dierks Dam | RIVER. Saline | STATE. Ark | TOWN Dierks

CONTRACT NO: ~~Ames Const. Co.~~ DACW 56-C-71-0159 | CONTRACTOR: Ames Const. Co. | DATE OF REPORT: 10-5-71 | REPORT NO 5 | SHEET 1 OF 3

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2, 3-4, 5, 6-7, 8-9, 10-13

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
RT Emb Random	95	±3%	SFR	12	8	
			VT	12	4	

TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	CLASSIFICATION: GRADATION MAX PART SIZE (IN)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	ATTERBERG LIMITS LL	PI (NOT PL)	IN-PLACE DATA: TOTAL SAMPLE DRY DENSITY (PCF)	TOTAL SAMPLE WATER CONTENT (%)	-¾" FRACTION DRY DENSITY (PCF)	-¾" FRACTION WATER CONTENT (%)	LABORATORY TEST DATA: STANDARD METHOD TEST	STANDARD METHOD MAX DRY DENSITY (PCF)	STANDARD METHOD OPT WATER CONTENT (%)	RCCM MAX DRY DENSITY (PCF)	RCCM OPT WATER CONTENT (%)	FIELD AND LABORATORY CORRELATION W % + OR −	FIELD AND LABORATORY CORRELATION PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
							RT Emb	N. Ridge																		
R-52G	9-7-71	WV	3+50	56'LT	539	12	Random	Spillway	Tan SC(E)	1	70	43					116.5	12.4				115.4	13.4	-1.0	101	
R-53	"		2+75	50'RT	541												110.7	13.4				111.5	16.8	-3.4	99	
R-54	9-8-71		1+75	100'LT	538												110.6	12.2				112.7	14.4	-2.2	98	
R-55	9-9-71		4+50	100'RT	541												117.8	15.5				115.9	15.6	-0.1	102	
R-56	"		2+75	75'LT	538												114.2	18.1				114.1	15.8	+2.3	100	
R-57	9-10-71		4+00	100'RT	545												109.6	15.6				114.6	16.4	-0.8	96	
R-58	9-13-71		4+90	60'RT	542												120.0	12.6				115.6	13.9	-1.3	104	42% +¾" Too rocky To density
R-59	"		0+50	40'LT	555																					10% +¾" Test not valid
R-60G	9-14-71		3+70	80'RT	548				Tan GW-GM	4	17	10					113.0	10.4				120.5	12.7	-2.3	94	Too rocky To test
R-61	"		3+00	75'RT	548																					Entire area Too rocky To test
			4+00	60'LT	547																					
R-62	9-15-71		2+90	50'LT	549												124.2	12.3				123.5	12.1	+0.2	101	
			3+00	70'LT	550																					
R-63	"		3+05	45'RT	548																					Too rocky To test
			1+50	45'LT	554																					Unable to get check, Too rocky
R-64	9-16-71		3+00	30'LT	551				Tan GM(E)	4	21	13					109.4	9.7				120.8	12.1	-2.4	91	
			3+50	70'LT	550																					
R-65	9-17-71		3+01	60'RT	553																					Too rocky To density
R-66	9-20-71		5+50	75'RT	551				Tan SC(E)	2	57	39					113.4	11.5				119.8	13.4	-1.9	95	
R-67	"	↓	4+00	40'LT	547	↓	↓	↓																		

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(1b) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)
COL 3 CYLINDER (CYL) CHUNK (CH) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ( )
COL 5 RECORD OFFSET IN DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR REPORT CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-15 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE LARGER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS MS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL. 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS.
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON ETC
COL 25 COL 17 OR COL 19 MINUS COL 23 OR COL 24.
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY
FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY C OR D RESPECTIVELY
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U.S. ARMY ENGINEER
CORPS OF ENGINEERS
PREPARED BY: R.H. Logan
SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

U.S. GOVERNMENT PRINTING OFFICE: 1967 O-249-241

(MAIN FORM)

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT: Dierks Dam | RIVER Saline, STATE. Ark, TOWN Dierks | CONTRACT NO. DACW 56-C-71-0159 | CONTRACTOR Amis Const. Co | DATE OF REPORT: 10-5-71 | REPORT NO: 5, SHEET 3 OF 3

SPACE RESERVED FOR PUNCH CARD OPERATOR (1-2, 3-4, 5, 6-7, 8-9, 10-13)

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
RT Emb. Impervious	95	+3% -1%	SFR	±6"	8	

TEST IDENTIFICATION									CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA						FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION		STANDARD METHOD			ASTM					
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-16L(R)	9-2-71	W+	3+00	℄	539 Z	12	RT. Emb. Imper.	Area E				45.0	31.4				118.7	14.8				116.9	15.0	-0.2	102	
I-17	9-8-71		2+00	5'LT	542												110.6	14.9				115.3	15.4	-0.5	96	
I-18	9-10-71		2+50	℄	546 S												113.6	17.1				112.1	16.6	+0.5	101	
I-19	9-14-71		1+25	℄	555												109.5	15.8				111.6	16.2	-0.4	98	
I-20L	9-16-71		3+50	℄	550							36.7	32.6				108.4	12.4				116.5	14.0	-1.6	93	Ripped up & Tamped Rerolled
I-20A	9-17-71		3+00	℄	550												112.2	14.8				116.5	14.7	+0.1	96	Rocheck
I-21	9-20-71		17+79E	6' E. of Cond.	449 ±		Conduit Backfill										108.0	17.6				112.9	16.4	+1.2	96	
I-22	"		18+59E	12' E. of Conduit	448 ±												109.1	18.3				109.9	17.7	+0.6	99	
I-23	"		17+85E	9' W. of Conduit	449												110.1	19.3				113.2	17.7	+1.6	97	
I-24	9-21-71		18+23E	10' W. of Conduit	450 S												107.1	19.5				109.9	19.5	±0	98	
I-25L	"		17+80E	5' E. of Conduit	451		RT. Emb					57.9	35.0				105.4	21.1				109.6	19.1	+2.0	96	
I-26	9-27-71		5+00	℄	532												105.7	20.0				109.8	18.1	+1.9	96	
I-27	9-28-71		20+25E 19+30A		444		Conduit Backfill RT. Emb.										108.7	18.4				110.1	16.6	+1.8	99	
I-28	9-30-71		5+40	3'RT	557												111.6	15.7				112.7	16.8	-1.1	99	
I-29	"		20+30E	5'RT	448		Conduit Backfill										108.2	18.5				113.3	16.2	+2.3	96	
I-30L	"	↓	20+25E	15 RT	449	↓	↓	↓				60.9 ~~59.2~~	34.5 ~~33.5~~				108.6	17.5				112.9	15.5	+2.0	96	

NOTES: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3: CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ( )
COL 6: RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7: DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8: E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10: ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-15: WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20: STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS HS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.
COL 21-22: 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24: FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC
COL 25: COL 17 OR COL 18 MINUS COL 22 OR COL 24.
COL 26: INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY
COL 27: IF TEST RESULTS DO NOT MEET SPECIFICATIONS DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U. S. ARMY ENGINEER
CORPS OF ENGINEERS
PREPARED BY: R. M. Rogan
SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

U.S. GOVERNMENT PRINTING OFFICE: 1967 O-246-061 (R1)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF PERVIOUS SOILS AND ROCKFILL FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO. / SHEET
Dierks Dam	Saline / Ark / Dierks	DACW 56-C-71-0159	Amis. Const. Co.	10-6-71	5 / SHEET 4 OF 4

SPACE RESERVED FOR PUNCH CARD OPERATOR
1 — CARD NO. 1 AND CARD NO 2
2-3 ___ 7-8 ___ 15 ___
4-5 ___ 9-10 ___ 16 ___
6 ___ 11-14 ___ 17-19 ___

EMBANKMENT ZONE	SPECIFIED (%) COMP	REL DEN	COMPACTION EQUIP (3)	LOOSE LIFT THICKNESS (IN.)	NO OF PASSES	WEIGHT (LB) OR CONT PRESS (PSI)
Random Earth	95		SFR	12	8	27,240
			VT	12	4	21,700

EMBANKMENT ZONE	ROCK DESCRIPTION TYPE	COLOR	HARDNESS	% WEATHERED

— — —	20-25	26	27-32	33-37	38-42	43-48	49	50	51	52-55	56-58	59-61	62-64	65-67	68-70	71-73	74-76	77-79	— — —	— — —	— — —	— — —	80-84	85-87	88-90	91-94	95	96-99	100-103	104-107	108-111	— — —
	TEST IDENTIFICATION									GRADATION																DRY DENSITY					
													PERCENT PASSING												APPARENT SPECIFIC GRAVITY			LABORATORY				
													TOTAL SAMPLE								-#FRACTION		+#FRACTION		UNIF COEF C_u D_{60}/D_{10}							
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN) OR VOLUME (CF)	EMBANKMENT ZONE	SOURCE	CLASSIFICATION LETTER SYMB	MAX PART SIZE (IN)			6"	3"	2"	1'	3/4	3/8	#40	#200		#4		#200		+#4	-#4	FIELD (PCF)	TEST METHOD	MAXIMUM (PCF)	MINIMUM (PCF)	% COMP OR REL DEN	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11			COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27	COL 28	COL 29	COL 30	COL 31	COL 32
R-52 G	9-7-71	WY	3+50	53'LT	539	12"	Random Earth	N. Ridge Spillway	SC (E)				100	100	100	95	89	80	51	43												
R-60 G	9-14-71	"	3+70	80'RT	548	"	"	"	GW-GM (E)				100	72	47	27	23	20	13	10												
R-64	9-16-71	GS	1+50 3+00 3+50	45'LT 30'LT 30'LT	534 551 550	"	"	"	GM (E)				100	89	76	49	42	23	17	13												
R-66	9-20-71	"	5+50	75'RT	551	"	"	"	SC (E)				100	100	95	77	71	60	51	39												
R-70 G	9-24-71	"	4+00	50'RT	553	"	"	"	"				100	100	97	93	77	68	56	43												
R-72	9-27-71	"	4+25	60'LT	552	"	"	"	GC (E)				100	100	84	66	61	50	42	27												

NOTE: (2) FILL IN APPROPRIATE WORD: DAILY WEEKLY MONTHLY OR PERIODIC
(3) ENTER TYPE OF EQUIPMENT USED E G: PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR) CRAWLER TRACTOR (CT), RUBBER TIRED TRACTOR (RTT) STEEL TAMPING PLATE (STP), OTHER ___ ( )

COL 5 FOR GRAVEL OR SAND FILL WATER VOLUME (WV) SAND VOLUME (SV) NUCLEAR METHOD (NM), GRADATION SAMPLE (GS), OTHER ___ ( ) FOR ROCKFILL: GRADATION SAMPLE (GS) DENSITY TEST (DT).

COL 6 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 GRAVEL OR SAND FILL, SHOW DEPTH BELOW COMPACTED SURFACE TO TOP OF DENSITY TEST (E G "6"), ROCKFILL, SHOW VOLUME OF DENSITY TEST HOLE (E G "215 CY")

COL 8 E G AREA C, SPILLWAY EXCAVATION, ETC

COL 10 WHEN CLASSIFICATION ESTIMATED NOTE BY LETTER (E)

COL 27 IF ESTIMATED SO NOTE AS 110-E AND STATE HOW ESTIMATED IN FOOTNOTE

COL 28 VIBRATORY TABLE (VT) PROVIDENCE VIBRATED DENSITY (PVD) OTHER ___ ( )
REPORT SEPARATELY DETAILS OF SPECIAL LABORATORY PROCEDURES USED

COL 31 INDICATE HOW DERIVED, E G PERCENT COMPACTION (D_w) OR RELATIVE DENSITY (D_R) BY PLACING APPROPRIATE SYMBOL (D_w OR D_R) OVER VALUE OBTAINED

COL 32 IF TEST RESULTS DO NOT MEET SPECIFICATIONS DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA REWORKED AND RETESTED DENOTE BY LETTER (R)

U. S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: R.M. Rogan

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4081
JUN 67

* U.S. GOVERNMENT PRINTING OFFICE: 1967 306-021 (R1)

(MAIN FORM)

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT:	RIVER. / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT:	REPORT NO. / SHEET
Dierks Dam	Saline / Ark. / Dierks	DACW 56-C-71-0159	Ames Const. Co.	11-3-71	6 / SHEET 1 OF 4

SPACE RESERVED FOR PUNCH CARD OPERATOR (1-2, 3-4, 5, 6-7, 8-9, 10-13)

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
RT Emb. Random	95	±2	SFR	12	8	

	14-19	20	21-26	27-31	32-36	37-38	39	40	41	42	43-46	47-50	51-53	54-56	57-60	61-63	64-67	68-70	71	72-75	76-78	72-75	76-78			
	TEST IDENTIFICATION								CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION		STANDARD METHOD			RCCM				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (HOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-73	10-1-71	WV	5+80	120'RT	557	12	RT Emb Random	Spillway									111.8	15.3				117.3	15.3	0	95	
R-74	10-5-71	↓	3+50	110'RT	558	↓	↓	↓									117.3	14.8				117.6	14.7	+0.1	100	
R-75	10-6-71		4+50	35'LT	560					8	63 48	24														Too rocky To density
R-76	10-12-71		4+50	110'RT	560												115.8	13.2				118.6	13.3	-0.1	98	
R-77	10-13-71		4+00	30'LT	566					8	43 25	16														Too rocky To density
R-78	10-28-71	↓	2+50	25'LT	573	↓	↓	↓		8	43 25	10														"

NOTE: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____ (specify)
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER AS IN THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906 IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.
COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON ETC
COL 25 COL 17 OR COL 18 MINUS COL 22 OR COL 24
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23 INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (L) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U S ARMY ENGINEER
CORPS OF ENGINEERS
PREPARED BY: [signature]
SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

* U.S. GOVERNMENT PRINTING OFFICE: 1967 O-246-611 (11)

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO.
Dierks Dam	Saline / Ark. / Dierks	DACW 56-C-71-0159	Ami Const. Co.	11-3-71	6 SHEET 2 OF 34

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2, 3-4, 5, 6-7, 8-9, 10-13

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
RT Emb & Main Emb. Impervious	95	+2.2 -1.7	SER	8	8	

—	14-19	20	21-26	27-31	32-36	37-38	39	40	41	42	43-46	47-50	51-53	54-56	57-60	61-63	64-67	68-70	71	72-75	76-78	72-75	76-78	—	—	—
TEST IDENTIFICATION									CLASSIFICATION						IN PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION		STANDARD METHOD			RCCM				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-31	10-1-71	WV	20+00 E 19+50 E		444	12	Conduit Backfill	Area E	Red CL(E)								105.7	17.2				111.8	16.4	+0.6	95	
I-32	10-4-71		18+15 E 20+15 A		454		"		"								107.6	17.7				113.7	15.9	+1.8	95	
I-33	"		20+00 E 20+35 A		450 E		"		"								108.4	16.8				113.6	15.5	+1.3	95	
I-34	10-5-71		5+00	℄	558		RT. Emb.		"								114.1	14.1				113.8	15.2	-1.1	100	
I-35L	"		20+00 E 19+60 A		449		Conduit Backfill		"			59.2	37.5				102.4	21.4				110.6	17.3	+4.1	93	Ripped up & Remixed
I-35A	10-6-71		19+60 A 20+00 E		"		"		"								102.3	21.2				109.2	18.4	+2.8	94	Reslack Unsatisfactory
I-35B	10-7-71		"		"		"		"								101.0	21.5				110.2	17.2	+4.3	92	"
I-35C	"		"		"		"		"								110.2	18.2				111.8	16.5	+1.7	99	2' fill removed Allowed To dry RECHECK
I-36	10-6-71		20+08 A 19+18 E		454		"		"								111.3	15.3				117.6	15.2	+0.1	95	
I-37	10-7-71		20+15 A 18+80 E		453 E		"		"								108.4	15.5				114.6	15.5	0	95	
I-38	"		19+85 A 18+05 E		454		"		"								112.4	17.4				114.5	16.0	+1.4	98	
I-39	10-8-71		19+90 A 19+10 E		457		"		"								105.6	18.4				108.4	18.7	-0.3	97	
I-40 L	"		20+15 A 18+00 E		457		"		"			57.1	41.0				111.7	16.3				110.9	17.1	-0.8	101	
I-41	10-11-71		19+85 A 18+50 E		460		"		"								105.4	17.7				109.9	18.1	-0.4	96	
I-42	"		20+60 A	20' RT	454		"		"								110.7	16.1				112.4	16.7	-0.6	99	
I-43	10-14-71		3+00	4' LT	570		RT. Emb.		"								111.9	13.0				115.0	15.0	-2.0	97	Ripped up, mixed, rerolled

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY OR PERIOD C
(2) ENTER TYPE OF EQUIPMENT USED, E G : SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 8 E G : AREA C, SPILLWAY EXCAVATION, ETC.

COL 10 ENTER SOIL COLOR BEFORE CL USE WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN -DIAM MOLD, (B) 6-IN -DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST NOTE AS MS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE

COL 21-22 1- OR 3-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E G 3-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24

COL 26 INDICATE DERIVATION, E G FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY C OR D RESPECTIVELY

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U S ARMY ENGINEER
COMPS OF ENGINEERS
PREPARED BY: R.M. Rogers
SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

GOVERNMENT PRINTING OFFICE: 1967 O-249-231 (R1)

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT.	REPORT NO.
Dierks Dam	River: Saline State: Ark Town: Dierks	DACW 56-C-71-0159	Ami's Const. Co.	11-3-71	6 SHEET 3 OF 4

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2, 3-4, 5, 6-7, 8-9, 10-13

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (3)	LOOSE LIFT THICKNESS (IN)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
RT Emb + Main Emb						
Impervious	95	+3 -1	SFR	8	8	

—	14-19	20	21-26	27-31	32-36	37-38	39	40	41	42	43-46	47-50	51-53	54-56	57-60	61-63	64-67	68-70	71	72-75	76-79	72-75	76-79	—	—	—
TEST IDENTIFICATION									CLASSIFICATION						IN PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION (74)		STANDARD METHOD			RCCM				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART. SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-44	10-14-71	WV	Main Emb + K	5' RT	439	12	Main Emb.	Area E	Red CL (6)								110.7	17.4				112.4	15.4	+2.0	99	
I-45L	"	"	19+05	℄	441	"	"	"	"			52.0	36				110.7	16.3				110.9	16.9	-0.6	100	
I-46	10-22-71	"	19+10	℄	443	"	"	"	"								109.3	18.3				108.2	18.9	-0.6	101	
I-47	10-25-71	"	19+50	℄	455	"	"	"	"								111.6	17.3				113.5	15.9	+1.4	98	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(3) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)
COL 3 CYLINDER (CYL) CHUNK (CK), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ( )
COL 6 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS MS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21 22 1- OR 3 POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON ETC
COL 25 COL 17 OR COL 18 MINUS COL 22 OR COL 24
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23 INDICATE BY A OR B, RESPECTIVELY. FOR COL 16 ÷ COL 21 OR COL 23 INDICATE BY C OR D RESPECTIVELY.
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U S ARMY ENGINEER
CORPS OF ENGINEERS
PREPARED BY: [signature]
SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

U.S. GOVERNMENT PRINTING OFFICE: 1971 O-424-421 (11)

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF PERVIOUS SOILS AND ROCKFILL FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT: Dierks Dam
RIVER: Saline
STATE: Ark
TOWN: Dierks
CONTRACT NO: DACW 56-C-71-0159
CONTRACTOR: Ami's Concr. Co.
DATE OF REPORT: 11-3-71
REPORT NO: 6
SHEET 4 OF 4

SPACE RESERVED FOR PUNCH CARD OPERATOR
1 — CARD NO. 1 AND CARD NO. 2
2-3 ___ 7-8 ___ 15 ___
4-5 ___ 9-10 ___ 16 ___
6 ___ 11-14 ___ 17-19 ___

EMBANKMENT ZONE	SPECIFIED (%) COMP	SPECIFIED (%) REL DEN	COMPACTION EQUIP (b)	LOOSE LIFT THICKNESS	NO OF PASSES	WEIGHT (LB) OR CONT PRESS (PSI)
Random Earth	95		SFR	1½	8	25,250

EMBANKMENT ZONE	ROCK DESCRIPTION TYPE	COLOR	HARDNESS	% WEATHERED

— — —	20-25	26	27-30	31-37	38-42	43-48	49	50	51	52-55	56-58	59-61	62-64	65-67	68-70	71-73	74-76	77-79	— — —	— — —	— — —	— — —	82-84	85-87	88-90	91-94	95	96-99	70-73	74-77	— — —
TEST IDENTIFICATION										GRADATION																	DRY DENSITY				
												PERCENT PASSING													APPARENT SPECIFIC GRAVITY			LABORATORY				
												TOTAL SAMPLE								"-" FRACTION		-#4 FRACTION										
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN) OR VOLUME (CF)	EMBANKMENT ZONE	SOURCE	CLASS LET TER SYMB	MAX PART SIZE (IN)		6"	3"	2"	1"	¾"	⅜"	#40	#200		#4		#200	UNIF COEF $C_u = D_{60}/D_{10}$	+#4	-#4	FIELD (PCF)	TEST METHOD	MAXIMUM (PCF)	MINIMUM (PCF)	% COMP OR REL DEN	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11		COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27	COL 28	COL 29	COL 30	COL 31	COL 32
R-75	10-6-71	65	4+50	35'LT	560	12	RT Emb Random	Spillway				100	100	94	72	63	44	34	24													
R-77	10-13-71	"	4400	30'LT	566	"	"	"				100	91	73	49	43	28	22	16													
R-78	10-29-71	"	2+50	25'LT	573							100	87	76	53	45	35	19	10													

NOTE (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED E G : PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) CRAWLER TRACTOR (CT) RUBBER-TIRED TRACTOR (RT) STEEL TAMPING PLATE (STP) OTHER ( )

COL 3 FOR GRAVEL OR SAND FILL WATER VOLUME (WV) SAND VOLUME (SV) NUCLEAR METHOD (NM) GRADATION SAMPLE (GS) OTHER ( ) FOR ROCKFILL: GRADATION SAMPLE (GS) DENSITY TEST (TS)

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 GRAVEL OR SAND FILL: SHOW DEPTH BELOW COMPACTED SURFACE TO TOP OF DENSITY TEST (E G "6"), ROCKFILL: SHOW VOLUME OF DENSITY TEST HOLE (E G "215 CY")

COL 8 E G AREA C SPILLWAY EXCAVATION ETC

COL 10 WHEN CLASSIFICATION ESTIMATED NOTE BY LETTER (E)

COL 27 IF ESTIMATED SO NOTE AS 110-E AND STATE HOW ESTIMATED IN FOOTNOTE

COL 28 VIBRATORY TABLE (VT) PROVIDENCE VIBRATED DENSITY (PVD) OTHER ( )

REPORT SEPARATELY DETAILS OF SPECIAL LABORATORY PROCEDURES USED

COL 31 INDICATE HOW DERIVED, E G PERCENT COMPACTION (D_c) OR RELATIVE DENSITY (D_R) BY PLACING APPROPRIATE SYMBOL D_c OR D_R) OVER VALUE OBTAINED

COL 32 IF TEST RESULTS DO NOT MEET SPECIFICATIONS DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA REWORKED AND RETESTED DENOTE BY LETTER (R)

U. S. ARMY ENGINEER
COE(o) OF ENGINEER(a)

PREPARED BY: R. M. Rogers

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4081 JUN 67

* U.S. GOVERNMENT PRINTING OFFICE: 1967 306-021 (N)

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT:	REPORT NO.:
Dierks Dam	Saline / Ark. / Dierks	DACW 56-C-71-0159	Amis Const. Co.	12-10-71	7

SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2, 3-4, 5, 6-7, 8-9, 10-13

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random	95	±3	SER	12	8	

TEST IDENTIFICATION									CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA						FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#3/4 FRACTION		STANDARD METHOD			IRREM				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-79	11-2-71	WY	2+50	410 RT	574	12	Random RT. Emb.	Spillway																		
R-80b	11-3-71		19+50	30' RT	453		Random Main Emb			8	78	19					121.0	10.1				123.2	11.3	-1.2	98	
R-81	11-4-71		19+90	30' RT	454		"										117.9	12.5				126.7	11.0	+1.5	95	
R-82	11-5-71		20+15	30' RT	457		"										117.1	12.3				122.9	12.3	0	95	
R-83	11-17-71		21+75	56' LT	460		"										116.5	9.4				122.0	11.4	-2.0	95	
R-84	11-26-71		5+00	20' LT	578		Random RT. Emb.			8	30	9					120.8	12.4				122.4	12.5	-0.1	98	
																										Too rocky to density

NOTES: (1): FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2): ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC RUBBER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3: CYLINDER (CYL) CHUNK (CK), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ( )
COL 5: RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7: DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8: E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10: ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13: WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20: STANDARD METHOD (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906
COL 21-22: IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST NOTE AS #5 UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24: FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E.G., 1 POINT STANDARD METHOD, RAPID COMPACTION CONTROL, LIQUID LIMIT CORRELATION, VISUAL COMPARISON ETC
COL 25: COL 17 OR COL 19 MINUS COL 23 OR COL 24
COL 26: INDICATE DERIVATION E.G. FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY
COL 27: IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U.S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: [signature]

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN.	CONTRACT NO	CONTRACTOR	DATE OF REPORT:	REPORT NO.:
Dierks Dam	River Saline State Ark. Town. Dierks	DACW 56-C-71-0159	Amis Const. Co.	12-10-71	7 SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2, 3-4, 5, 6-7, 8-9, 10-13

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious	95	+3 -1	SFR	8	8	

	14-19	20	21-26	27-31	32-36	37-38	39	40	41	42	43-46	47-50	51-53	54-56	57-60	61-63	64-67	68-70	71	72-75	76-79	72-75	76-79			
	TEST IDENTIFICATION								CLASSIFICATION						IN PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		- #4 FRACTION		STANDARD METHOD			RCCM				
TEST NO.	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-48	11-4-71	WV	19+40	℄	455	12	Main Emb. Impervious	Area E	Red CL (6)								110.2	16.8				112.2	16.5	+0.3	98	
I-49	11-5-71		20+40	10' RT	458												116.7	11.3				118.1	13.1	-1.8	99	Ripped up watered, rerolled
I-50	11-15-71		21+75	℄	457												104.2	17.8				110.0	17.8	0	95	
I-51L	11-16-71		22+00	15' LT	456							47	30				110.4	16.7				114.1	15.4	+1.3	98	
I-52	11-17-71		21+40	5' LT	459												102.9	19.8				111.7	18.4	+1.4	92	Rejected
I-52A	"		"	"	"												114.7	16.0				113.0	15.6	+0.4	101	Recheck
I-53	11-22-71		22+10	25' LT	458												110.0	16.9				109.5	17.6	-0.7	101	
I-54	11-23-71		19+90A 17+04E		453												107.8	16.6				112.6	16.7	+1.9	96	
I-55L	11-27-71		4+50	℄	583		Rt. Emb. Impervious					21	28				118.7	12.3				120.3	12.6	-0.3	98	
I-56	"		20+15A 17+03E		456		Main Emb. Impervious										111.8	16.1				115.8	15.5	+0.6	97	
I-57	11-29-71		20+00A 17+20E		464		"										108.1	17.5				115.6	16.0	+1.5	95	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G. SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL), CHUNK (CK) SAND VOLUME (SV), WATER VOLUME (WV) NUCLEAR METHOD (NU) OTHER ____
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
COL 20 STANDARD METHOD: (A) 4-IN. DIAM. MOLD, (B) 6-IN. DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS (C) UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21 22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, MAPSO COMPACTION CONTROL, LIQUID LIMIT CORRELATION, VISUAL COMPARISON, ETC
COL 25 COL 15 OR COL 16 MINUS COL 23 OR COL 24
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 23 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 15 ÷ COL 21 OR COL 22, INDICATE BY C OR D RESPECTIVELY.
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U.S. ARMY ENGINEER
CORPS OF ENGINEERS
PREPARED BY: C.M. Sykes
SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

U.S. GOVERNMENT PRINTING OFFICE: 1967 O-251-441 (11)

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT	REPORT NO. / SHEET
Dierks Dam	Saline / Ark / Dierks	DACW56-C-71-0159	Anis Const. Co.	1-17-72	8 / SHEET 1 OF 1

SPACE RESERVED FOR PUNCH CARD OPERATOR
1-2 ____ 6-7 ____
3-4 ____ 8-9 ____
5 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (3)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random Earth	95	±3	SFR	12	8	
Impervious Core	95	+3 -1	"	8	8	

14-19	20	21-26	27-31	32-36	37-42	43-46	47-50	51-53	54-56	57-60	61-63	64-67	68-70	71	72-75	76-79	72-75	76-79				

TEST IDENTIFICATION									CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		- #4 FRACTION		STANDARD METHOD							
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (F.T)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
					No Random or Impervious mat'l placed during Dec 1971																					

(MAIN FORM)

(8) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT	REPORT NO.
Dierks Dam	Saline / Ark. / Dierks	DACW 56-C-71-0159	Ames Const. Co.	2-3-72	9 SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATION
1-2 ____ 6-7 ____
3-4 ____ 8-9 ____
5 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (8)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random	95	± 3	SFR	12	8	

	14-19	20	21-26	27-31	32-36	37-38	39	40	41	42	43-46	47-56	51-53	54-56	57-60	61-63	64-67	68-70	71	72-75	76-79	72-76	76-79			
	TEST IDENTIFICATION								CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION		STANDARD METHOD			RECP				
TEST NO.	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
	COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
	R-85	1-25-72	WV	19+35	45 LT	464	12	Main Emb	Spillway	CL							112.9	17.3				114.2	16.7	+0.6	99	
	R-86	1-31-72	"	20+75	45 RT	460	"	"	"	"							111.8	10.6				123.3	12.5	-1.9	91	See Report for recheck

NOTE: (1a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY MONTHLY, OR PERIODIC
(1b) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL), CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER (1) (2)

COL 8 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 9 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 8 E.G.: AREA C SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906

IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE

COL 21 22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24

COL 26 INDICATE DERIVATION E.G. FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY.

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U. S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: R.M. Rogers

SUBMITTED BY: ____
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO / SHEET
Dierks Dam	River Saline State Ark. Town Dierks	DACW 56-C-71-0159	Amis Const. Co.	2-3-72	9 Sheet 2 of 2

SPACE RESERVED FOR PUNCH CARD OPERATOR
1-2 ____ 5-7 ____
3-4 ____ 8-9 ____
5 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious	95	+3, -1	SFR	8	8	

TEST IDENTIFICATION									CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA						FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-¾ FRACTION		STANDARD METHOD			RCCM				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	B TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-58	12-1-71	WV	1+00	℄	587	12	Rt Emb 2nd Stage	Area "E"	Red CL								116.8	12.1				119.5	12.5	-0.4	97	
I-59	1-24-72		19+25	335' Lt	461	"	Cutthrough	"	"								110.1	11.2				113.9	16.0	+0.2	97	
I-60	1-25-72		"	℄	462	"	Main Emb	"	"								109.5	15.6	B	114.5	15.0	114.5	15.7	-0.1	96	
I-61	1-31-72		20+65	10' Rt	463	"	"	"	"								114.9	16.6				113.4	16.1	+0.5	101	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.

COL 21 22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23 24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION, VISUAL COMPARISON ETC

COL 25 COL 17 OR COL 19 MINUS COL 23 OR COL 24

COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY

COL 27 FOR COL 18 ÷ COL 21 OF COL 23 INDICATE BY C OR D RESPECTIVELY
IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U S ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: [signature]

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(2) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENGCW-E-11(R1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT	REPORT NO.
Dierks Dam	River Saline State: Ark. Town Dierks	DACW-56-C-71-0159	Amis Const. Co.	3-3-72	10 Sheet 1 of 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (3)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random Earth	95	±3	SFR	12	8	

TEST IDENTIFICATION									CLASSIFICATION						IN PLACE DATA				LABORATORY TEST DATA						FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		- #4 FRACTION		STANDARD METHOD			RCCM				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (F) (I)	ELEVATION (FT)	DEPTH (IN)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-86R	2-7-72	WV	20+75	4' RT	470	12	Main Emb	Spillway									120.6	15.1				117.5	15.2	-0.1	103	Rockock
R-87	"	"	21+00	4' LT	471	"	"	"									121.5	12.1				119.5	13.8	-1.7	102	
R-58	2-16-72	"	22+50	3' RT		"	"	"		8	65	21														Too rocky to density

NOTE: (2) FILL IN APPROPRIATE WORD, DAILY, WEEKLY, MONTHLY, OR PERIODIC
(3) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFA), PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL) CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____

COL 4 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC.

COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906

IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE

COL 21 22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC

COL 25 COL 17 OR COL 19 MINUS COL 23 OR COL 24

COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U.S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: R. M. Rogers

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

* U.S. GOVERNMENT PRINTING OFFICE: 1972 O - 767-444 (1)

(MAIN FORM)

(1) MacTaly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN.	CONTRACT NO	CONTRACTOR	DATE OF REPORT.	REPORT NO :
Dierks Dam	Saline / Ark. / Dierks	DACW-56-C-71-0159	Amis Const Co.	3-3-72	10

SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2 ____ 7 ____ ; 3-4 ____ 8-9 ____ ; 5 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (5)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious Core	95	+3 To -1	SFR	8	8	

TEST IDENTIFICATION									CLASSIFICATION						IN PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#/3/4 FRACTION		STANDARD METHOD			RCLM				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORK OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-62	2-7-72	WV	21+10	15' LT	468	12	Main Emb	Recm. E	CL								118.3	14.8				114.6	13.8	+1.0	104	
I-63	2-9-72	"	19+25	℄	465	"	"	"	"								113.1	17.6				108.4	18.4	-0.8	104	
I-64	2-11-72	"	22+80	"	471	"	"	"	"								114.9	14.6				117.3	14.6	±0	98	
I-65	2-22-72	"	21+00	20' LT	469	"	"	"	"								113.5	14.1				116.7	14.8	-0.7	97	
I-66	2-29-72	"	21+00	℄		"	"	"	"								114.8	16.4				116.7	16.6	-0.2	98	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)
COL 3 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____ ( )
COL 6 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
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COL 20 STANDARD METHOD: (A) 4-IN -DIAM MOLD, (B) 6-IN -DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906
IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS IN 5 UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21 22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1 POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC
COL 25 COL 17 OR COL 19 MINUS COL 23 OR COL 24
COL 26 INDICATE DERIVATION, E.G. FOR COL 15 ÷ COL 21 OR COL 23 INDICATE BY A OR B, RESPECTIVELY. FOR COL 16 ÷ COL 21 OR COL 23 INDICATE BY C OR D RESPECTIVELY
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U.S. ARMY ENGINEER ____
CORPS OF ENGINEERS
PREPARED BY: [signature]
SUBMITTED BY ( )
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO
Dierks Dam	Saline / Ark / Dierks	DACW-56-C-71-0159	Amos Const. Co.	4-17-72	11

SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR
1-2 ____ 6-7 ____
3-4 ____ 8-9 ____
5 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (1b)	LOOSE LIFT THICKNESS (IN)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious Core	95	+3 To -1	SPR	8	8	

	14-19	20	21-26	27-31	32-36	37-38	39	40	41	42	43-46	47-50	51-53	54-56	57-60	61-63	64-67	68-70	71	72-75	76-79	72-75	76-79			
	TEST IDENTIFICATION								CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION		STANDARD METHOD			RCEM				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PC.)	OPT WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
	COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-67	3-14-72	WV	20+20	U/S Cofferdam	473.6	12	Main Emb	Area E	CL								113.4	11.9				113.7	11.6	+0.3	100	
I-68	3-23-72	"	20+00	E	474.5	"	"	"	"								109.6	18.5				110.9	19.2	-0.7	99	
I-69	3-28-72	"	18+00	U/S Cofferdam	475	"	"	"	"								108.4	20.3				109.7	20.4	-0.1	99	
I-70	3-31-72	"	16+50	"	475	"	"	"	"								116.2	16.1				114.2	15.3	+0.8	102	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL); CHUNK (C); SAND VOLUME (SV); WATER VOLUME (WV); NUCLEAR METHOD (NM); OTHER ____ (1)
COL 6 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED. NOTE BY LETTER (E)
COL 11-15 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
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COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC.
COL 25 COL 17 OR COL 18 MINUS COL 23 OR COL 24
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 + COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (L) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U.S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: [signature]

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

U.S. GOVERNMENT PRINTING OFFICE: 1967 O-249-243 (1)

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT.	REPORT NO. / SHEET
Dierks Dam	Saline / Ark. / Dierks	DACW-66-C-3159	Ames Const. Co.	4-18-72	11 / SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2, 3-4, 5, 6-7, 8-9, 10-13

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED ± % LIMITS	COMPACTION EQUIPMENT (8)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random Earth						

14-19	20	21-26	27-31	32-36	37-40	39	40	41	42	43-46	47-50	51-53	54-56	57-60	61-63	64-67	68-70	71	72-75	76-79	72-75	76-79			
TEST IDENTIFICATION								CLASSIFICATION						IN PLACE DATA				LABORATORY TEST ORACM					FIELD AND LABORATORY CORRELATION		
									GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION		STANDARD METHOD							
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
K-87	3-1-72	VV	21+00	30' LT	474	12	Random Earth	Spillway				-					123.5	10.0				129.1	10.3	-0.3	96	
	3-2-72	"	22+00	D/S	472	"	"	"		6	46	40														Grade Two only
K-90	3-23-72	"	19+50	30' LT	475	"	"	"									120.2	12.5				119.2	13.3	-0.8	104	

NOTES: (1) FILL IN APPROPRIATE WORD DAILY, WEEKLY MONTHLY, OR PERIODIC
(8) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL), CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ( )
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL, LIQUID LIMIT CORRELATION, VISUAL COMPARISON, ETC.
COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24
COL 26 INDICATE DERIVATION, E.G. FOR COL 15 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY FOR COL 15 ÷ COL 21 OR COL 23 INDICATE BY C OR D RESPECTIVELY
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U.S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: [signature]

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

(MAIN FORM)

(1) Mo. 7th SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENGCW-E-11(R1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO / SHEET
Dierks Dam	Saline / Ark. / Dierks	DACW-52-C-71-171	Ross Const Co.	6-6-72	12 / SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2, 3-4, 5, 6-7, 8-9, 10-13

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious Core	-	+2 T -1	SFR	8	8	

TEST IDENTIFICATION									CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		- 0.2 in 3/4 FRACTION		STANDARD METHOD			BCCM				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DAY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-71-L(R)	4-11-72	WV	20+50	C	480	12	Main Fab	Area E	CL								112.8	17.4				112.0	17.2	-0.2	101	LL=37.8 PI=16.0 Second sample
I-72	5-3-72	"	21+50	"	486	"	"	"	"								104.8	11.8				117.5	13.0	-1.2	89	Reworked
I-72A	5-4-72	"	"	"	"	"	"	"	"								111.2	14.7				112.6	14.0	+2.7	98	Recheck
I-73	5-11-72	"	23+25	11' RT	492	"	"	"	"								106.7	16.5				112.4	18.6	-2.1	95	Watered Reworked
I-74	5-11-72	"	23+50	11' LT	495	"	"	"	"								118.3	16.1				118.3	14.1	+2.0	100	
I-75L	5-16-72	"	21+50	15' LT	494	"	"	"	"								105.8	17.2				107.4	19.0	-1.8	99	Watered Reworked
I-75L-A	5-17-72	"	-1+50	"	"	"	"	"	"								114.5	11.5				117.8	13.5	-2.0	98	Recheck
I-75L-B	5-19-72	"	"	"	"	"	"	"	"								117.2	13.6				117.0	13.7	-0.1	100	Recheck
I-76	5-22-72	"	22+50	11' LT	498	"	"	"	"								111.4	18.1				114.2	17.1	+1.0	98	
I-77	5-26-72	"	22+00	C	496	"	"	"	"								115.5	11.7				115.3	13.8	-2.1	100	Watered Reworked
I-77A	5-29-72	"		"	"		"	"	"								112.6	16.2				114.8	15.0	+1.2	98	Recheck
I-78	5-31-72	"	23+00	C	506	"	"	"	"								119.6	13.8				117.5	12.7	+1.1	100	

NOTES: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G. SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC + SHEEPSFOOT ROLLER (PSFR) PNEUMATIC + VIBRATORY ROLLER (PVR) PNEUMATIC + RUBBER TIRED TAMPER (PRT) OR VIBRATORY TAMPER (VT) CYLINDER (CYL) CHUNK (CK), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER (EXPLAIN)

COL 3: RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7: DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8: E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10: ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13: WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20: STANDARD METHOD: (A) 4-IN. DIAM MOLD, (B) 6-IN. DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906 IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21-22: 1- OR 2 POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24: FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC
COL 25: COL 17 OR COL 18 MINUS COL 22 OR COL 24
COL 26: INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY C OR D RESPECTIVELY
COL 27: IF TEST RESULTS DO NOT MEET SPECIFICATIONS DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U.S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: L. M. [illegible]

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

(MAIN FORM)

(MAIN FORM)

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT:	REPORT NO. / SHEET
Dierks Dam	River Saline State Ark. Town Dierks	DACW-56-C-71-M159	Amis Const. Co.	6-6-72	12 Sheet 2 of 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2 ____ 6-7 ____ 3-4 ____ 8-9 ____ 5 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random Earth	95	±3	SPR	12	8	

1-10	10	11-20	21-26	27-31	32-36	37-38	39	40	41	42	43-46	47-50	51-53	54-56	57-60	61-63	64-67	68-70	71	72-75	76-78	72-75	76-78			
TEST IDENTIFICATION									CLASSIFICATION						IN PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION		STANDARD METHOD			RCCM				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-91 (RS)	4-11-72	IWV	21+00	30'RT	480	12	Main Emb	Spillway Area									118.8	11.3				121.2	12.4	-1.1	98	Record Sample
R-92 (RS)	"	"	20+50	45'LT	480	"	"	"									117.0	13.4				120.9	13.7	-0.3	97	" "
R-93	5-3-72	"	21+00	60'RT	486	"	"	"									111.5	17.1				114.9	16.6	+0.5	97	
R-94	5-10-72	"	21+00	60'LT	490	"	"	Random Stockpile									120.0	13.8				119.7	14.0	-0.2	100	
R-95	5-11-72	"	17+90	50'LT		"	"	"									119.6	11.0				124.3	11.6	-0.6	96	
R-96	5-11-72	"	17+20	70'LT		"	"	"		6"	58	15														Too rocky To Test
R-97	5-16-72	"	21+55	50'RT	494	"	"	"									119.9	13.0				120.9	13.2	-0.2	99	
R-98	5-19-72	"	18+30	70'LT	467	"	"	"									119.7	11.2				120.8	12.8	-1.6	99	
R-99	"	"	17+40	75'LT	464	"	"	"									117.3	10.7				123.9	11.8	-1.1	95	
R-100	5-22-72	"	22+50	50'LT	498	"	"	"		6"	64	24														Too rocky To density
R-101	5-23-72	"	18+75	70LT	475	"	"	"									109.8	12.5				122.9	12.4	+0.1	89	Recompacted
R-101A	5-24-72	"	"	"	"	"	"	"									123.6	13.9				121.2	11.4	+2.5	102	Recheck
R-102	5-23-72	"	11+25	55'LT	470	"	"	"									121.6	11.9				124.3	11.8	+0.1	98	
R-103	5-25-72	"	23+75	40'RT	500	"	"	"									119.3	11.7				125.1	9.0	+2.7	95	
R-104	5-31-72	"	23+25	60'LT	503	"	"	"									126.1	10.3				123.4	10.9	-0.6	102	

NOTE: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (HT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____

COL 6 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED. NOTE BY LETTER ___

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS IN COL 20 AND REPORT DETAILS OF PROCEDURE

COL 21-22 1- OR 3-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL, LIQUID LIMIT CORRELATION, VISUAL COMPARISON, ETC

COL 25 COL 17 OR COL 19 MINUS COL 23 OR COL 24

COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 16 ÷ COL 21 OR COL 24, INDICATE BY C OR D RESPECTIVELY.

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U.S. ARMY ENGINEER
CORPS OF ENGINEERS
PREPARED BY: [signature]
SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(8) MONTHLY — SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENGCW-E-11(R1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO. / SHEET
Dierks Dam	Saline / Ark. / Dierks	DACW-55-[illegible]-71-C159	Ames Const. Co.	7-7-72	13 / SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATION: 1-2, 3-4, 5, 6-7, 8-9, 10-13

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED ± LIMITS	COMPACTION EQUIPMENT (8)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious Core	95	±3	SFR	8	8	

TEST IDENTIFICATION									CLASSIFICATION						IN PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION		STANDARD METHOD			RECOM				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	% + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-79	6-8-72	WV	23+50	12' LT	511	12	Main Emb	Area E	CL								114.4	14.1				119.1	11.9	+2.2	96	
I-80 (C)	6-12-72	"	23+00	10' LT	507	"	"	"	"	1½	86.0	41.7	28.7				113.0	17.3	B	117.6	14.7	116.8	14.7	+2.6	97	
I-81	6-15-72	"	24+25	℄	516	"	"	"	"			41.5					111.7	16.6				115.8	16.0	+0.6	99	
I-82	6-20-72	"	21+00	℄	522	"	"	"	"								122.9	13.2				120.4	13.4	-0.2	102	
I-83	6-29-72	"	23+50	℄	520	"	"	"	"								108.5	14.0				114.6	16.5	-2.4	95	Watered rerolled
I-83 A	6-30-72	"	23+00	℄	517	"	"	"	"								113.8	17.6				118.9	14.3	+3.3	96	Rechecked Accepted

NOTE: (7) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(8) ENTER TYPE OF EQUIPMENT USED, E.G., SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT) CYLINDER (CYL) CHUNK (C-C) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER — 1 3

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8 E.G., AREA C, SPILLWAY EXCAVATION, ETC
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COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE TWO SUPPLEMENTAL FORMS ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906
COL 21 22 IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST NOTE AS (9) UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 23 24 1- OR 3-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 3-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON ETC
COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY FOR COL 16 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (N) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U S ARMY ENGINEER
CORPS OF ENGINEERS
PREPARED BY: [signature]
SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT:	RIVER, STATE, TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO:
Dierks Dam	Saline River, Ark., Dierks	DACW-56-C-71-0159	Ames Const. Co.	7-10-72	13 SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR	EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED ± % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
1-2 ___ 5-6 ___ 7-8 ___ 9-10 ___ 11-13 ___	Random Earth	95	± 3	SFR	12	8	

TEST IDENTIFICATION									CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION 3/4		STANDARD METHOD			RCCM			
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX ART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-105	6-1-72	WV	21+50	70'LT	496	12	Main Emb	Random Stockpile									119.6	12.5				120.9	13.1	— 0.6	99	
R-106	"	"	17+50	65'LT	478	"	"	"									121.5	13.8				122.0	11.8	+ 2.0	100	Unable To Complete Test because stone
R-107	6-5-72	"	22+50	30'RT	506	"	"	"									125.0	11.4				122.0	11.5	— 0.1	102	
R-108	"	"	19+00	15'LT	486	"	"	"									115.4	14.4				120.8	12.5	+ 1.9	96	
R-109	6-7-72	"	22+50	65'LT	506	"	"	"									122.6	11.6				125.9	10.3	+ 1.3	97	
R-110	6-9-72	"	23+50	15'LT	510	"	"	"		4	62.3	27.0					125.8	10.8				124.5	11.1	— 0.3	101	
R-111	"	"	16+50	70'LT	476	"	"	"									120.8	12.5				119.7	13.4	— 0.9	101	
R-112	6-16-72	"	23+25	75'LT	515	"	"	"									124.3	11.2				124.3	12.0	— 0.8	100	
R-113	"	"	17+60	80'LT	500	"	"	"									121.5	14.0				117.4	15.8	— 1.8	104	
R-114	6-21-72	"	22+50	65'LT	512	"	"	"									119.6	12.7				121.4	13.1	— 0.4	99	
R-115	"	"	19+00	60'LT	496	"	"	"									118.7	12.6				122.9 ~~117.5~~	10.9	+ 1.7	97	
R-116	6-28-72	"	23+00	40'LT	518	"	"	"																		

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CY.) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ( )

COL 6 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED. NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD. (A) 4-IN.-DIAM MOLD, (2) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS (3) UNDER COL 20 AND REPORT DETAILS OF PROCEDURE

COL 21-22 1- OR 3-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G., 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24

COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 19 ÷ COL 21 OR COL 23, INDICATE BY C OR D RESPECTIVELY.

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U.S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: M. Hennessy

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-61(R1)

PROJECT:	RIVER. Saline STATE. Ark. TOWN Dierks	CONTRACT NO. DACW-56-C-71-1159	CONTRACTOR Amis Const. Co.	DATE OF REPORT: 8-9-72	REPORT NO. 14 SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2 ___ 6-7 ___ ; 3-4 ___ 8-9 ___ ; 5 ___ 10-13 ___

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (3)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious Core	95	-3 +1	SFR	8	8	

— — — — —	14-19	20	21-26	27-31	32-36	37-38	39	40	41	42	43-46	47-50	51-53	54-56	57-60	61-63	64-67	68-70	71	72-75	76-78	72-75	76-78	—	— — —	— — — — —
TEST IDENTIFICATION									CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION 3/4		STANDARD METHOD			RCCM				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-84	7-6-72	101A	23+50	5'RT	522	12	Main Emb	Arch E									106.4	17.6				109.1	21.2	+1.4	98	
I-85L	7-11-72	"	22+00	10'RT	520	"	"	"				35.8	26.3				120.5	13.5				123.5	11.7	+1.8	99	
I-86	7-13-72	"	21+50	8'	521	"	"	"									115.9	17.6				114.6	15.9	+1.7	101	
I-87	7-17-72	"	22+00	4'	523	"	"	"									114.7	17.3				111.3	17.5	-0.2	103	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY MONTHLY, OR PERIODIC
(3) ENTER TYPE OF EQUIPMENT USED, E.G. SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL), CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ( )
COL 6 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.
COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
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COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST NOTE AS #5 UNDER COL 40 AND REPORT DETAILS OF PROCEDURE
COL 21-23 1- OR 2 POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC
COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D RESPECTIVELY
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U. S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY:

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS. RCS: ENGCW-E-11(R1)

PROJECT:		CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO.
Dierks Dam	RIVER Saline STATE Ark. TOWN Dierks	DACW-56-C-71-0159	Anis Const. Co.	8-9-72	14 SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR
1-2 ___ 5-7 ___
3-4 ___ 8-9 ___
5 ___ 10-13 ___

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random Earth	95	±3	SFR	12	8	

TEST IDENTIFICATION									CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-3"/4 FRACTION		STANDARD METHOD			RCCM				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-117	7-6-72	WV	23+50	45'LT	525	12	Main Emb	Random Stockpile									115.4	18.5				116.5	18.9	-0.4	99	
R-118	7-11-72	"	24+00	65'LT	525	"	"	"									127.5	10.4				125.5	10.4	0	102	
R-119	7-13-72	"	21+50	55'LT	521	"	"	"									125.5	11.4				126.8	11.7	-0.3	99	
R-120	7-17-72	"	22+00	40'RT	523	"	"	"									122.2	13.2				119.4	13.4	-0.2	107	
R-121	"	"	21+75	50'LT	522	"	"	Spillway																		Too rocky To dessify
R-122	7-18-72	"	24+50	50'RT	530	"	"	"									120.3	11.8				116.7	13.7	-1.9	103	
R-123	7-20-72	"	24+00	70'LT	530	"	"	"									113.2	14.4				115.4	15.1	-0.7	98	
R-124	7-20-72	"	23+50	40'RT	529	"	"	"									119.4	14.9				119.0	13.7	+1.2	100	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SPR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3: CYLINDER (CYL) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ___
COL 5: RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF ABUT.
COL 7: DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8: E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10: ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED. NOTE BY LETTER (E)
COL 11-13: WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20: STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21 22: 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-26: FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC
COL 25: COL 17 OR COL 18 MINUS COL 22 OR COL 24
COL 26: INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23 INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY
COL 27: IF TEST RESULTS DO NOT MEET SPECIFICATIONS DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U.S. ARMY ENGINEER
CORPS OF ENGINEERS
PREPARED BY: [signature]
SUBMITTED BY
RESIDENT ENGINEER

ENG FORM 4080
JUN 57

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT:	RIVER: Saline STATE: Ark.	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO..
Dierks Dam	TOWN Dierks	DACW-56-C-71-0151	Ames Const. Co	9-5-72	15

SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 | 6 7 |
3-4 | 8-9 |
5 | 10 13 |

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED ± % LIMITS	COMPACTION EQUIPMENT (3)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious Core	95	±3 -13	SFR	8	8	

14-19	20	21-28	29-31	32-36	37-38	39	40	41	42	43-46	47-50	51-53	54-56	57-60	61-63	64-67	68-70	71	72-75	76-78	72-75	76-78			

TEST IDENTIFICATION									CLASSIFICATION					IN-PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION		STANDARD METHOD			RCCM				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W ± OP	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-88	8-11-72	1:14	144+25	36'LT	444	12	#2 Cofferdam	Area "E"	CL								113.0	14.2				115.9	13.7	+0.5	98	
I-89	8-16-72	"	154+15	30'LT	442	"	Main Emb	"	"								118.4	13.9				117.2	14.4	-0.5	101	
I-90A(C)	8-21-72	"	13+00	U/S blanket	463	"	#2 Cofferdam	"	"			60.0	24.5				103.4	12.7	B	117.3	14.1	115.0	14.1	-1.4	90	Plowed up, watered, rerolled
I-90A	8-22-72	"	"	"	"	"	"	"	"								116.7	13.7				114.6	14.9	-1.2	102	Recheck
I-91	8-25-72	"	16+25	15'RT	435	"	Main Emb	"	"								122.8	14.6				116.8	14.8	-0.2	105	
I-92	8-28-72	"	18+25	10'RT	434	"	"	"	"								123.5	15.5				118.0	13.7	+1.8	105	
I-93	"	"	17+75	10'LT	437	"	"	"	"								117.1	14.7				116.0	14.7	0	101	
I-94	8-29-72	"	14+15	U/S blanket	467	"	#2 Cofferdam	"	"								107.7	10.3				120.9	13.3	-3.0	89	Plowed, watered, rerolled
I-94A	"	"	"	"	"	"	"	"	"								119.1	16.8				117.5	13.6	+3.2	101	Recheck
I-95	"	"	18+25	5'RT Mat'l C	440	"	Main Emb	"	"								114.7	15.6				115.0	14.9	+0.7	100	
I-96	8-31-72	"	17+75	10'RT	447	"	"	"	"								119.1	15.7				117.5	13.8	+1.9	101	

NOTE: (1) FILL IN APPROPRIATE WORD. DAILY, WEEKLY, MONTHLY, OR PERIODIC

(3) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC AND TAMPER (PNT) OR VIBRATORY TAMPER (VT)

COL 5 CYLINDER (CYL) CHUNK (CK), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER

COL 6 RECORD OFFSET BY DISTANCE IN FEET IN OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL LOCOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-19 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

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COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC

COL 25 COL 17 OR COL 18 MINUS COL 23 OR COL 24

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U. S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY:

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — — RCS: ENGCW-E-11(R1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO
Dierks Dam	River Saline State Ark Town Dierks	DACW-56-C-71-0151	Ames Const. Co.	9-5-72	15 Sheet 2 of 2

SPACE RESERVED FOR PUNCH CARD OPERATOR — 1-2, 3-4, 5, 6-7, 8-9, 10-13

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W ± LIMITS	COMPACTION EQUIPMENT (2)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random Earth	95	±3.2	SFR	12	8	

TEST IDENTIFICATION									CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA							FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION		STANDARD METHOD			RCEM					
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR −	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-125	8-14-72	WV	13+45	80'LT	441	12	Main Emb.	Regd Excav.									124.6	11.4				122.8	11.4	0	102	
R-126	8-16	"	14+50	70'LT	449	"	"	"									119.6	13.5				121.6	13.1	+0.4	98	
R-127	"	"	13+45	90'LT	451	"	"	"									117.5	13.3				120.9	12.8	+0.5	97	
R-128	8-18	"	14+75	65'LT	458	"	"	"									125.2	11.3				123.3	11.6	-0.3	102	
R-129	8-21	"	14+00	70'LT	460	"	"	"									121.3	8.7				122.9	11.3	-2.6	96	
R-130	8-23	"	"	85'LT	465	"	"	"									134.6	8.5				129.0	9.2	-0.7	104	
R-131	8-25	"	16+25	35'RT	435	"	"	"									124.6	8.9				127.7	9.3	-0.4	98	
R-132	8-28	"	14+50	90'LT	469	"	"	"									126.9	9.1				126.1	10.0	-0.9	101	
R-133	8-29	"	18+40	30'RT	433	"	"	"									126.1	9.0				126.9	10.0	-1.0	99	
R-134	8-30	"	16+50	40'RT	440	"	"	"									135.9	10.3				124.1	10.8	-0.5	110	Results questionable
R-135	8-31	"	14+00	100'LT	469	"	"	"									121.4	15.3				116.5	14.5	+0.8	104	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
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COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION, VISUAL COMPARISON; ETC
COL 25 COL 17 OR COL 18 MINUS COL 22 OR COL 24
COL 26 INDICATE DERIVATION E.G. FOR COL 18 ÷ COL 21 OR COL 24, INDICATE BY A OR B RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D RESPECTIVELY
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U.S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: [signature]

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE: / TOWN:	CONTRACT NO	CONTRACTOR	DATE OF REPORT:	REPORT NO. / SHEET
Dierks Dam	Saline / AR / Dierks	DACW41-72-C-0159	Amis Const. Co.	9-21-72	16 / 1 of 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2, 3-4, 5, 6-7, 8-9, 10-13

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (9)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious Core	95	-3 To -1	SPR	6	8	

TEST IDENTIFICATION									CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA						FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION		STANDARD METHOD			RCCM				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-97L	9-8-72	WV	14+00	℄	446	12	Main Emb.	Area "E"	CL			38.9	27.3				121.4	13.7				117.6	13.3	-0.4	103	
I-98	"	"	17+50	6' LT	452	"	"	"	"								117.5	12.1				122.2	11.9	+0.2	96	
I-99	9-12-72	"	14+75	10' RT	452	"	"	"	"								123.5	11.4				122.6	11.6	-0.2	101	
I-100	9-13-72	"	18+75	℄	456	"	"	"	"								118.9	12.0				119.1	12.3	-0.3	100	
I-101L(C)	9-20-72	"	18+50	10 RT	456	"	"	"	"			34.9	31.1				121.2	13.8	B	122.3	11.5	119.2	13.2	+0.6	102	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY OR PERIODIC

COL 3 ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)

COL 9 CYLINDER (CYL), CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____ (1) (3)

COL 6 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE

COL 21 22 1- OR 2 POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON ETC

COL 25 COL 17 OR COL 19 MINUS COL 23 OR COL 24.

COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23 INDICATE BY A OR B RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D RESPECTIVELY

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U.S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: [signature]

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: EP-GCV-E-11(R1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO. / SHEET
Dierks Dam	Saline / Ark. / Dierks	DACW-56-C-71-0159	Amis Const. Co.	9-21-72	16 / SHEET 2 OF 3

SPACE RESERVED FOR PUNCH CARD OPERATOR (1-2, 3-4, 5, 6-7, 8-9, 10-13)

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (3)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random Earth	95	±3	SFR	12	8	

14-19	20	21-26	27-31	32-36	37-38	39	40	41	42	43-46	47-50	51-53	54-56	57-60	61-63	64-67	68-70	71	72-75	76-79	72-75	76-79	—	—	—

TEST IDENTIFICATION									CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA						FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION		STANDARD METHOD			RCCM					
TEST NO.	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PLI)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-136	9-1-72	WV	13+10	55'RT	1134	12	Main Emb.	Reqd Excav									129.1	11.0				126.7	10.0	0	102	
R-137	"	"	15+20	100'LT	1175	"	"	"									128.2	9.4				125.4	9.9	-0.5	102	
R-138	9-7-72	"	18+00	50'RT	1151	"	"	"									117.4	11.8				119.6	14.0	-2.2	98	
R-139	"	"	16+25	85'RT	1148	"	"	"									115.9	13.9				117.3	14.1	-0.2	99	
R-140G	9-12-72	"	15+25	60'RT	1148	"	"	"		3	83	36					115.5	11.3				119.8	12.5	-1.2	95	
R-141	"	"	14+50	125'RT	1144	"	"	"									118.8	14.1				114.2	16.0	-1.9	102	
R-142	9-13-72	"	18+25	30'RT	1152	"	"	"									121.0	12.1				123.0	11.8	+0.3	99	
R-143	9-15-72	"	13+25	80'RT	1151	"	"	"									121.6	12.5				122.0	12.6	-0.1	100	
R-144	"	"	15+50	100'RT	1153	"	"	"									125.5	11.6				124.8	11.6	0	101	
R-145	9-20-72	"	18+50	40'RT	1156	"	"	"									121.0	15.9				116.7	15.3	+0.6	104	

NOTES: (1) FILL IN APPROPRIATE WORD DAILY, WEEKLY MONTHLY, OR PERIODIC
(3) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)
COL 5: CYLINDER (CYL) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER_____( )
COL 6: RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7: DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8: E.G.: AREA C SPILLWAY EXCAVATION, ETC
COL 10: ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13: WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
COL 20: STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS #3 UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21-22: 1- OR 3-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24: FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON ETC
COL 25: COL 17 OR COL 18 MINUS COL 23 OR COL 24
COL 26: INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 23 OR COL 25 INDICATE BY A OR B, RESPECTIVELY
FOR COL 16 ÷ COL 23 OR COL 25 INDICATE BY C OR D RESPECTIVELY
COL 27: IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U.S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: [signature]

SUBMITTED BY: [signature]
RESIDENT ENGINEER

ENG FORM 4080

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS (MAIN FORM)

RCS: ENGCW-E-11(R1)

PROJECT: Dierks DAM | RIVER: Saline | STATE: Ark. | TOWN: Dierks | CONTRACT NO: DACW-56-C-71-0157 | CONTRACTOR: Ames Const. Co. | DATE OF REPORT: 10-27-72 | REPORT NO.: 17 | SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR
1-2 ____ 6-7 ____
3-4 ____ 8-9 ____
5 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W% LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious	95	+3 To -1	SFR	8	8	

TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	CLASSIFICATION: GRADATION MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI (NOT PL)	IN PLACE DATA: TOTAL SAMPLE DRY DENSITY (PCF)	TOTAL SAMPLE WATER CONTENT (%)	-#4 3/4" FRACTION DRY DENSITY (PCF)	-#4 3/4" FRACTION WATER CONTENT (%)	LABORATORY TEST DATA: STANDARD METHOD TEST	STANDARD METHOD MAX DRY DENSITY (PCF)	STANDARD METHOD OPT WATER CONTENT (%)	ACCM MAX DRY DENSITY (PCF)	ACCM OPT WATER CONTENT (%)	FIELD AND LABORATORY CORRELATION W % + OR -	FIELD AND LABORATORY CORRELATION PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-102	9-22-72	WV	15+50	℄	159	12	Main Emb	Area "E"									123.7	11.6				120.6	12.4	-0.8	103	
I-103	9-27-72	"	12+00	245 LT	498	"	"	"									121.2	17.8				113.9	16.1	+1.7	106	
I-104	10-3-72	"	14+00	230' LT	504	"	"	"									118.6	13.7				115.8	14.7	-1.0	102	
I-105L	10-6-72	"	19+50	10' LT	471	"	"	"				27.0	34				114.8	12.5				117.2	13.9	-1.4	98	
I-106	"	"	20+25	10' RT	478	"	"	"									106.9	15.3				111.4	16.2	-0.9	96	
I-107	10-16-72	"	16-25	5' LT	461	"	"	"									110.6	17.8				112.7	15.8	+2.0	98	
I-108	"	"	14+00	10' RT	455	"	"	"									105.1	19.3				108.7	18.5	+0.8	97	

NOTE: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR); PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)
COL 5: CYLINDER (CYL); CHUNK (CK); SAND VOLUME (SV); WATER VOLUME (WV); NUCLEAR METHOD (NM); OTHER ____ (I)
COL 6: RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7: DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 9: E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10: ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED. NOTE BY LETTER (E)
COL 11-13: WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
COL 20: STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21-22: 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24: FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING (I) BLANK, E.G. 5-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC
COL 25: COL 17 OR COL 19 MINUS COL 23 OR COL 24
COL 26: INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23 INDICATE BY A OR B, RESPECTIVELY FOR COL 18 ÷ COL 23 OR COL 23 INDICATE BY C OR D RESPECTIVELY.
COL 27: IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U.S. ARMY ENGINEER
CORPS OF ENGINEERS
PREPARED BY: [signature]
SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

(MAIN FORM)

(a) Monthly — SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENGCW-E-11(R1)

PROJECT:		CONTRACT NO.	CONTRACTOR	DATE OF REPORT:	REPORT NO.
Dierks Dam	RIVER: Saline STATE: Ark. TOWN: Dierks	DACW-56-C-71-0159	Ames Const Co.	10-27-72	17 SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2, 3-4, 5, 6-7, 8-9, 10-13

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (a)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random Earth	95	±3	SPR	12	8	

TEST IDENTIFICATION									CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4, 3/4" FRACTION		STANDARD METHOD			RCCM				
TEST NO.	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CL, GS, WOOD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR −	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-146	9-22-72	NV	17+00	60'RT	455	12	Main Emb	Spillway Excav.									135.7	12.6				121.9	12.7	-0.1	96	
R-147	"	"	15+00	70'RT	450	"	"	"									128.4	11.0				123.7	11.4	-0.4	103	
R-148	9-22-72	"	15+25	130'RT	452	"	"	"									120.6	12.2				122.1	11.9	+0.3	99	
R-149	10-2-72	"	13+75	45'LT	464	"	"	"									114.7	16.9				112.6	16.7	+0.6	102	
R-150	10-3-72	"	16+00	60'LT	468	"	"	"									121.6	14.2				116.2	14.6	-0.4	105	
R-151	10-4-72	"	15+50	70'LT	476	"	"	"									121.9	12.5				118.0	14.2	-1.7	104	
R-152	10-9-72	"	15+14	90'LT	500	"	"	"									119.3	12.2				117.7	13.2	-1.0	101	

NOTE: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 5 CYLINDER (CYL) CHUNK (CH), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ( )
COL 6 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF ITEMS TY TEST
COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.
COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
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COL 25 COL 17 OR COL 19 MINUS COL 23 OR COL 24
COL 26 INDICATE DERIVATION, E.G. "ON COL 16 + COL 21 OR COL 22 INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 + COL 21 OR COL 22, INDICATE BY C OR D, RESPECTIVELY.
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

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CORPS OF ENGINEERS

PREPARED BY: [signature]

SUBMITTED BY: [signature]
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(3) Monthly — SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENGCW-E-11(R1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT.	REPORT NO.
Dierks Dam	Saline / Ark. / Dierks	DACW-56-C-71-7159	Ames Const. Co.	11-20-72	18 SHEET 1 OF 1

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2 ____ 4-7 ____ 3-4 ____ 8-9 ____ 5 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (5)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious	15	+3 to -1	SPK	8	8	
Random	15	±3	"	12	8	

—	16-19	20	21-26	27-31	32-36	37-38	39	40	41	42	43-46	47-50	51-53	54-56	57-60	61-63	64-67	68-70	71	72-75	76-78	72-75	76-78	—	—	—
	TEST IDENTIFICATION								CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA						FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION		STANDARD METHOD			ACCM				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	D PERCENT COMPACTION	COMMENTS ON TESTS
	COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
T-101	11-15-72	WV	14+00		519	12	U/S Cofferdam	"E"									111.0	16.0				116.7	14.4	+1.6	95	
T-110L(c)	"	"	17+00		514	"	"	"									111.7	13.7	B	116.2	14.2	114.6	14.8	-1.1	98	
K-153	11-25-72	WV	13+50	125' RT	456	12	Main Emb.	Spillway Excav.									115.2	10.7				124.0	12.1	-1.4	95	

NOTES: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E G SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)
COL 5 CYLINDER (CYL), CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____ ( )
COL 6 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8 E G, AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
COL 20 STANDARD METHOD: (A) 4-IN -DIAM MOLD, (B) 6-IN -DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST NOTE AS MS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
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COL 23-24 FOR USE OF MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E G 3-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION, VISUAL COMPARISON ETC
COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24
COL 26 INDICATE DERIVATION, E G FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D RESPECTIVELY.
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED DENOTE BY (R).

U S ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: [signature]

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT		CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO
Lewis Dam	RIVER Saline STATE Ark TOWN Lewis	WACW 55-6	Ames Const. Co.	12-21-72	19 SHEET 1 OF 1

SPACE RESERVED FOR PUNCH CARD OPERATOR

EMBANKMENT ZONE	COL	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (3)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious	15	+3 -1	SPK	5	8	
Random Earth	15	±3	SPR	12	8	

TEST IDENTIFICATION									CLASSIFICATION						IN PLACE DATA				LABORATORY TEST DATA						FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION		STANDARD METHOD			AASHO					
	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-111	11-29-72	IUV	16+00		420	12	Impervious	Area E	Red SC(E)								114.6	15.4				115.8	15.1	+0.3	99.0	
I-112	11-30	"	15+00	℄	457	"	Main Emb.	"	"								107.5	20.4				112.2	17.5	+2.9	95.9	
I-113	12-1	"	17+00	"	461	"	"	"	"								98.0	23.4				98.9	25.2	-1.4	99.1	Reworked Watered
I-114	"	"	15+00	10' RT	458	"	"	"	"								15.5	13.9				114.9	111.3	-0.4	100.5	
I-115L	12-4	"	16+80	5' RT	461	"	"	"	Red SC	3/4	83	33	36.5	20.2			118.3	15.1				114.7	15.4	-0.3	103.2	
I-116	"	"	13+50	℄	461	"	"	"	Red SC(E)								119.4	13.3				122.4	13.2	+0.1	97.5	
I-117	12-6	"	19+00	10' RT	464	"	"	"	"								115.6	16.0				116.8	17.7	-1.3	104.3	Watered Reworked
											93	40														
R-154	11-27	"	16+60	75 RT	456	"	"	Spillway Excav.									115.7	14.4				121.4	13.5	+0.9	98.8	
R-155L	11-28	"	15+50	130' RT	451	"	"	"	Brown GC	3	100	24	27.2	13.1			121.0	10.7				124.2	12.2	-1.5	97.4	
R-156	11-29	"	15+75	55' LT	455	"	"	"	Brown GC(E)								123.1	10.6				121.5	10.8	-0.2	101.3	
R-157	11-30	"	13+50	110 RT	451	"	"	"	Brown GC(E)								124.2	14.3				119.8	14.0	+0.3	103.7	
R-158	12-7	"	16+00	50' RT	463	"	"	"		4	97	21														Too rocky To density
R-159	12-12	"	18+00	75 RT	466	"	"	"		4	96	14														"
R-160G	"	"	15+50	90' LT	464	"	"	"		3	100	14														"
R-161	12-18	"	14+50	100' RT	474	"	"	"		4	86	17														"

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(3) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)
COL 3 CYLINDER (CYL) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ( )
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
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COL 21 22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
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COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23 INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D RESPECTIVELY.
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U.S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: Bill Engineer

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENGCW-E-11(R1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO. / SHEET
Dierks Dam	Saline / Ark. / Dierks	DACW 56-C-71-0159	Amis Const. Co.	1-22-73	20 / SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2, 3-4, 5, 6-7, 8-9, 10-13

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W% LIMITS	COMPACTION EQUIPMENT (5)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious	95	+3 -1	SFK	8	8	

TEST IDENTIFICATION									CLASSIFICATION					IN PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 or 3/4" FRACTION		STANDARD METHOD			RECM				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-118	12-21-72	INV	16+50	20' RT	463	12	Main Emb.	Area E	Red SC (E)								113.1	11.9				113.3	12.2	- 0.3	99.8	
I-119	12-26	"	16+00	10' RT	466	"	"	"	"								116.4	15.1				114.6	15.0	0	101.7	
I-120 L(E)	12-27	"	13+25	℄	463	"	"	"	Red SC	1½	56.1	12.1	41.3	23.7			104.9	16.6	B	111.2	16.6	109.4	18.0	- 1.4	95.8	
I-121	1-2-73	"	16+60	10' LT	470	"	"	"	Red SC (E)								107.5	16.3				110.6	16.7	- 0.4	97.2	
I-122	"	"	14+50	℄	469	"	"	"	"								111.0	17.7				110.7	17.8	- 0.1	100.2	
I-123	1-13	"	16+00	10' RT	470	"	"	"	"								113.4	18.3				111.3	17.5	+ 0.8	101.9	
I-124	1-16	"	11+00	℄	468	"	"	"	"			33.5	36.8	18.2			109.4	15.5				115.1	15.9	- 0.4	102.6	
I-125 L	1-19	"	15+50	℄	472	"	"	"	Red SC	1½	88.3	51.7	43.3	24.8			111.4	18.6				109.2	19.2	- 0.6	102.0	
I-126	"	"	13+00	℄	470	"	"	"	Red SC (E)								110.1	17.6				111.5	16.8	+ 0.8	98.8	

NOTES: (3) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(5) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3: CYLINDER (CYL), CHUNK (CH) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____
COL 6: RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7: " "FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8: E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10: ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13: WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

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COL 21-22: 1 OR 2 POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
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COL 25: COL 17 OR COL 16 MINUS COL 23 OR COL 24
COL 26: INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 23 OR COL 23, INDICATE BY A OR B RESPECTIVELY. FOR COL 16 ÷ COL 23 OR COL 23 INDICATE BY C OR D, RESPECTIVELY.
COL 27: IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U.S. ARMY ENGINEER
CORPS OF ENGINEERS
PREPARED BY: [signature]
SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(1) Nov 1971 SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO. / SHEET
Dierks Dam	Saline / Ark. / Dierks	1-ACW-01-C-71-0151	Ames Const Co.	1-22-73	20 / SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR (1-2, 3-4, 5, 6-7, 8-9, 10-13)

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (3)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random Earth	95	± 2	SPR	12	8	

TEST IDENTIFICATION									CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION		STANDARD METHOD			RECOM				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (FT)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-162	12-22-72	W V	14+00	75'RT	463	12	Main Emb	Spillway Excav.	Br GC(L)								119.5	14.1				121.4	13.8	+ 0.3	98.5	
R-163	"		15+00	50'RT	464				"								119.6	13.4				117.6	14.3	- 0.9	101.6	
R-164	12-27		16+25	130'RT	456	1			"								120.1	13.7				119.8	14.0	- 0.3	100.2	
R-165	1-1-73		14+50	80'RT	462	1			Gr. SC			31.6	33.8	17.0			120.6	15.2				116.5	15.2	0	103.5	
R-166	"		18+50	130'RT	464				Gr SC(L)								115.2	15.7				116.2	15.1	+ 0.6	99.2	
R-167	1-2		13+00	100'RT	462				Br GC(L)								110.9	16.1				119.3	14.5	+ 1.6	94.7	
R-168	1-13		16+50	75'RT	467				"								123.5	13.3				120.5	12.7	- 0.6	102.5	
R-169	"		15+00	90'RT	466				"								117.6	12.6				121.0	13.9	- 0.3	97.1	
R-170	1-15		17+00	70'RT	467	1				4	25	15														Too rocky To density
R-171	"		13+25	110'RT	464					"	30	20														"
R-172	"		15+00	"	466					"	29	18														"
R-173	1-16		15+00	80'RT	"					"	30	16														"
R-174	"		18+00	70'RT	470					"	30	15														"
R-175	1-14		16+25	65RT	468					"	34	20.2	33.6	14.0												"
R-176	"	↓	13+50	100'RT	465	↓	↓	↓		"	51	26														"

NOTE: (1) FILL IN APPROPRIATE BOXES: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(3) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR); PNEUMATIC ROLLER (PR); VIBRATORY ROLLER (VR); PNEUMATIC HAND TAMPER (PHT); OR VIBRATORY TAMPER (VT)

COL 2: CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER ( )
COL 6: RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7: DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8: E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10: ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13: WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20: STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS #6 UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21-22: 1 OR 2 POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24: FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC
COL 25: COL 17 OR COL 18 MINUS COL 23 OR COL 24
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U.S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY:

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(8) M. T. S. — SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENGCW-E-11(R1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT	REPORT NO.
Darks Dam	River Saline State A-K Town Darks	DACW 51 C [illegible] 1	P. C. T. Co.	2-21-73	21 Sheet 1 of 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2, 3-4, 5, 6-7, 8-9, 10-13

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (8)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)

1-10	10	21-26	27-31	32-36	37-38	39	40	41	42	43-46	47-50	51-53	54-56	57-60	61-63	64-67	68-70	71	72-75	76-78	72-75	76-78	—	— —	— — — —
TEST IDENTIFICATION								CLASSIFICATION						IN PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
									GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION		STANDARD METHOD			[illegible]				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
1-111	1-29-73	[illegible]	[illegible]+50	12' LT	477	16	N1 - 1-4		SC (E)								123.1	11.4				122.3	12.2	-1.2	98.5	
179	"		1+[illegible]	95' RT	"				CL (E)								123.1	13.7				123.3	13.6	10.3	102.7	
179	"		3+75	1' RT	475				CL (E)								119.1	12.9				123.1	12.8	-1.9	96.8	
180(C)	[illegible]-25		[illegible]	3' LT	478				CL			31.1	12.5	18.2			111.7	12.3	B	119.1	12.1	111.4	15.1	-1.8	91.6	
181	1-21		[illegible]	75' LT	477				CL (E)								117.3	12.4				122.9	11.1	+1.4	95.4	
182	1-31		[illegible]	110' LT	475				"								121.1	9.9				122.7	9.6	+0.3	94.1	
183	"		[illegible]	115 RT	"				SM (E)								111.4	11.3				115.6	11.4	+1.9	99.3	
184	2-2		17+20	75' RT	479				CL (E)								123.3	13.5				122.7	13.5	0	101.4	
185	"		14+10	30' LT	483				SC			✓	41.6	11.8			111.9	15.1				115.8	14.5	+0.6	95.7	
186	2-5		13+50	100' RT	475				CL (E)								114.4	10.4				119.2	13.9	-3.5	97.7	
187	"		12+00	50' LT	480				SC (E)								110.8	16.2				116.4	14.1	+2.1	95.3	
188	2-8		11+40	15' RT	482				CL (E)								109.7	17.9				110.7	18.1	-0.2	99.1	
189	2-12		17+11	110' LT	479					4	34	-														Too sandy for density
190(CC)	2-14		15+[illegible]	50' LT	488				SC			14	22	20.6			112.5	14.9	B	119.3	13.6	118.1	14.6	+0.3	95.3	
191	"		13+25	40' LT	491				CL (E)								113.3	14.7				117.4	15.0	-0.3	96.4	
192	2-20		12+30	75' RT	485				"								119.6	12.0				118.9	13.6	-1.6	100.5	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(8) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____
COL 6 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED. NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
COL 20 STANDARD METHOD: (A) 4-IN.-DIAM. MOLD, (B) 6-IN.-DIAM. MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX. PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS.
COL 23-24 FOR USE WHEN MAX. DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC.
COL 25 COL 17 OR COL 19 MINUS COL 23 OR COL 24
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23 INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY.
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U.S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: J. M. Y.

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(1) Final SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT.	REPORT NO. / SHEET
Dworks Dam	Saline / KsK / Dworks	DACW 56-C-71-0151	Unit Const. Co.	2-21-73	21 / SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR (1-2, 3-4, 5—, 6-7, 8-9, 10-13)

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (3)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
In section 3	95	+3-1	SPK	8	8	

TEST IDENTIFICATION									CLASSIFICATION						IN PLACE DATA				LABORATORY TEST DATA						FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		- #4 FRACTION		STANDARD METHOD			KEEM				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 3	COL 5	COL 4	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-127	2-9-73	WV	16+60	10'RT	1187	12	Main Emb.	Area "E"	Red SC (E)								116.8	15.8				115.8	13.9	+1.9	100.9	
128	"	"	13+75	6'RT	"	"	" "	"	"								111.9	15.4				118.3	13.1	+2.3	94.6	
129	2-1	"	17+20	℄	1181		" "	"	"								117.7	15.5				115.4	15.7	-0.2	101.9	
130(cc)	2-2	"	14+00	"	482	"	" "	"	Red SC	3		37.4	42.4	21.8			111.7	16.1	13	113.3	15.8	112.8	16.3	+0.3	95.9	
131	2-8	"	15+00	"	1183	"	" "	"	Red SC (E)								101.6	18.8				108.0	17.5	+1.0	98.9	
132	2-20	"	11+90	10'RT	486	"	" "	"	"								110.5	18.6				113.9	16.5	+2.1	97.0	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 5 CYLINDER (CYL) CHUNK (CK), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER (E.G.)
COL 6 RECORD OFFSET BY DISTANCE UPSTREAM OF DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906 IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22 MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON ETC
COL 25 COL 17 OR COL 18 MINUS COL 22 OR COL 24
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23 INDICATE BY A OR B, RESPECTIVELY FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D RESPECTIVELY.
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED DENOTE BY (R)

U.S. ARMY ENGINEER
CORPS OF ENGINEERS
PREPARED BY:
SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(1) MacTitle SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT:	RIVER: Salina	CONTRACT NO.	CONTRACTOR	DATE OF REPORT:	REPORT NO..
Dicks Dam	STATE: Ark	DACW 56-C 71-4151	Bois Const Co.	3-21-73	22
	DAM: Dicks				SHEET 1 OF 1

SPACE RESERVED FOR PUNCH CARD OPERATOR
1-2 ___ 6-7 ___
3-4 ___ 8-9 ___
5 ___ 10-13 ___

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (3)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Core	95	-3	SFR	6	8	
Impervious	95	+3-4	SFR	8	8	

TEST IDENTIFICATION									CLASSIFICATION						IN PLACE DATA				LABORATORY TEST DATA							FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 3/4 FRACTION		STANDARD METHOD								
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
																						NCCM				
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	CO. 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
T-123	2-27-73	WV	18+101	10' LT	485	12	Main Emb	Bor E	Red SC(E)								117.5	15.7				116.7	16.9	-1.2	100.7	
124	"	"	14+30	5' RT	484	"	"	"	Br SC(E)								119.5	13.4				121.0	12.4	+0.2	98.4	
125	2-28	"	16+40	50' LT	490	"	"	"	Br SC	1½	41.2	17.5	31.7	13.1			119.8	13.1				116.7	12.0	+1.1	102.7	
T-133	2-28	"	16+50	¾	489	"	"	"	Red SC(E)								119.1	17.5				113.2	17.5	0	96.4	
134	3-1	"	16+20	5' RT	490	"	"	"	Red ML(E)								111.7	14.4				116.0	12.6	+1.8	96.3	

NOTES: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)
COL 9 CYLINDER (CYL) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ___
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC.
COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS MS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS.
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 5-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC.
COL 25 COL 17 OR COL 18 MINUS COL 23 OR COL 24
COL 26 INDICATE DERIVATION, E.G. FOR COL 18 + COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 + COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U. S. ARMY ENGINEER
CORPS OF ENGINEERS
PREPARED BY:
SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(1) [illegible] SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-23(R1)

PROJECT:	RIVER:	CONTRACT NO.	CONTRACTOR.	DATE OF REPORT:	REPORT NO.:
[illegible] Dam	STATE: [illegible]	[illegible]	[illegible]	4-23-73	23
	TOWN: [illegible]				SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 6-7 ____
3-4 ____ 8-9 ____
5 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (5)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Core	100	[illegible]	SPR	8	8	
Impervious	100	+3 -1	SPR	8	8	

TEST IDENTIFICATION									CLASSIFICATION					IN PLACE DATA				LABORATORY TEST DATA						FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		FRACTION		STANDARD METHOD			LAB				
TEST NO.	DATE MADE	TYPE TES	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD & LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
K-176	3-21	SPR	1+50	70 LT	1170	12	Emb	Pond	SC (C)								111.2	1.7				111.7	11.9	0	99.2	
177	3-21		12+50	80 LT	"				CL (C)								116.4	17.2				113.5	13.5	-0.3	97.2	
178	"		13+50	80 LT	1155				SC (C)								113.4	11.3				117.5	10.1	1.1	99.0	
179	3-22		17+00	60 RT	1191				CL (C)								111.3	11.2				110.2	12.5	-0.3	97.4	
200 (K)	3-23		15+50	120 LT	1138				CL (C)	1/2	65.4	[illegible]	[illegible].7	14.9			108.2	11.7	B	110.4	17.5	109.2	11.9	-1.2	99.1	
201	"		13+00	70 LT	1135				SC (C)								117.1	11.5				112.9	13.5	-1.6	99.1	
202	4-2		17+50	45 LT	1199												111.4	13.4				112.6	13.0	-0.4	99.4	
203	4-3		14+50	70 LT	1174				"								113.0	21.6				113.2	13.7	1.4	99.1	
204	"		12+16	50 LT	1176												112.4	21.7				105.7	21.5	0.2	91.7	
205 (K)	4-4		15+00	50 LT	1200					C		[illegible].4					108.8	18.7				108.2	19.5	-0.8	100.6	
206	4-5		13+00	40 LT	1171				CL (C)								112.3	12.6				118.7	13.8	-1.5	94.7	
207	"		14+00	60 LT	1178				CL (C)								105.2	17.9				108.7	17.8	1.7	96.7	
208	4-6		13+30	75 RT	1221				CL (C) Karl GC (C)								123.7	11.9				122.6	12.0	-0.1	100.9	Test inaccurate
209	4-9		11+30	60 RT	"				"								114.4	16.2				127.6	10.6	-5.4	89.7	Too rocky Test inaccurate
210	4-10		13+50	50 LT	1172				"			[illegible].1	Probable Error				101.0	16.2	B	118.7	13.0	115.8	16.0	+0.1	87.3	Too rocky Test inaccurate for density
210A	4-11		"	"	"							[illegible].1	[illegible]	3/4"												

NOTES: (1) FAL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) SHTL = TYPE OF EQUIPMENT USED, E.G.: SF (SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT); CYLINDER (CYL), OPENING (OH), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER ____

COL 5: RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7: DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.
COL 8: E.G.: AREA C, SPILLWAY EXCAVATION, ETC.
COL 9: ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED. NOTE BY LETTER (E).
COL 11-13: WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S.

COL 20: F STANDARD METHOD: (A) 4-IN.-DIAM. MOLD, (B) 6-IN.-DIAM. MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. F MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS M3 UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.
COL 21-22: 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS.
COL 23-26: FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC.
COL 25: COL 23 OR COL 18 MINUS COL 22 OR COL 24.
COL 26: INDICATE DERIVATION, E.G. FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY.
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U. S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: [illegible]

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4070
JUN 67

(MAIN FORM)

(1) Martin SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R5)

PROJECT:	RIVER:	CONTRACT NO.:	CONTRACTOR:	DATE OF REPORT:	REPORT NO.:
Dierks Dam	STATE: Ark. TOWN: Dierks	DACW56-67-C-0154	Ames Const. Co.	4-23-73	23 SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATION

1-2 ____ 6-7 ____
3-4 ____ 8-9 ____
5 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (5)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)

14-18	20	21-26	27-31	32-36	37-38	39	40	41	42	43-46	47-50	51-53	54-56	57-60	61-63	64-67	68-70	71	72-76	77-79	80	1-5	6-10	11-15

TEST IDENTIFICATION

TEST NO	DATE MADE	*TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS GRP OR LETTER SYMBOL	GRADATION: MAX PART. SIZE (IN.)	GRADATION: % PASSING #4 SIEVE	GRADATION: % PASSING #200 SIEVE	ATTERBERG LIMITS: LL	ATTERBERG LIMITS: PI (NOT PL)	IN PLACE DATA: TOTAL SAMPLE: DRY DENSITY (PCF)	IN PLACE DATA: TOTAL SAMPLE: WATER CONTENT (%)	IN PLACE DATA: -#4 FRACTION: DRY DENSITY (PCF)	IN PLACE DATA: -#4 FRACTION: WATER CONTENT (%)	LABORATORY TEST DATA: STANDARD METHOD: TEST	LABORATORY TEST DATA: STANDARD METHOD: MAX DRY DENSITY (PCF)	LABORATORY TEST DATA: STANDARD METHOD: OPT WATER CONTENT (%)	LABORATORY TEST DATA: K-1 CM: MAX DRY DENSITY (PCF)	LABORATORY TEST DATA: K-1 CM: OPT WATER CONTENT (%)	FIELD AND LABORATORY CORRELATION: w % + OR -	FIELD AND LABORATORY CORRELATION: PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	CC +	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	
R-211	4-12-73	WV	16+50	100'LT	504	12	Main Emb.	Area "E"	Br SC (C)								116.9	12.5				110.1	12.6	-0.1	97.1	
I-135(6)	3-30		17+50	C	491				Red CL	3	88.7	51.9	39.7	17.2			112.7	15.1				114.0	15.2	-0.1	98.8	
-136	3-22		13+50	8'RT	492				Red SC (E)								117.7	14.4				118.5	14.0	+0.4	99.3	
137	4-2		12+50	16'RT	495				"								114.0	15.5				114.3	16.8	-0.3	97.8	
138(R5)	4-4		15+00	C	499					1	-	53.5					108.6	18.0				108.9	17.7	-0.3	99.1	
139	4-6		18+50	8'RT	501				Red SC (E)								110.7	14.3				110.1	17.6	+0.7	100.5	
140 (C)	4-9		14+00	C	501					1½	-	42.3					109.0	15.9	B	113.7	14.7	114.2	15.8	-0.1	95.4	
141	4-12		15+50	11'RT	502				Br SC (E)								104.2	21.0				105.4	20.9	-0.1	98.9	
													Atterberg Limits incomplete												
													I-405, 210												
													I-138, 140												

NOTES: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC.
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PN), VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3: CYLINDER (CYL), CHUNK (CH), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM) OTHER ____
COL 4: RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM BY CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7: DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.
COL 9: E.G.: AREA C, SPILLWAY EXCAVATION, ETC.
COL 10: ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED, NOTE BY LETTER (E)
COL 10-13: WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL SHEET ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20: STANDARD METHOD: (A) 4IN MOLD, (B) 6IN MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 1/4 IN OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPEAT DETAILS OF PROCEDURE.
COL 21-23: 1- OR 3-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 24-26: FOR USE WHEN % DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G., 3-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC
COL 25: COL 17 OR COL 18 MINUS COL 22 OR COL 24.
COL 26: INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY.
COL 27: IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U. S. ARMY ENGINEER
CORPS OF ENGINEERS
PREPARED BY: L. Wilson
SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(8) Plate ____ SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT:	RIVER:	CONTRACT NO.	CONTRACTOR	DATE OF REPORT:	REPORT NO.:
Hicks Dam	STATE: [illegible]	[illegible] -C-1 [illegible]	[illegible] Const. Co.	5-27-73	24
	TOWN: [illegible]				SHEET 1 OF [illegible]

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 4-5 ____
3-4 ____ 6-9 ____
6 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (8)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Core	[illegible]	[illegible]	SPR	12	8	
Transitions	95	+3 -1	SPR	8	8	

14-19	20	21-25	27-31	32-36	37-42	43	44	45-46	47-50	51-52	53-56	57-60	61-63	64-67	68-70	71	72-75	76-79	72-75	76-79			
TEST IDENTIFICATION						CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
							GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION		STANDARD METHOD			[illegible]				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % (+ OR -)	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
S-212	5-5-73	WV	18+50	21' Rt	513	12	Main Emb	Area "X"	Br. SC (E)								112.3	13.-				112.6	15.6	- 2.0	99.1	
213	"		15+10	5' Rt	505				Br. SC (E)								115.7	12.3				114.5	12.1	+ 0.2	101.1	
214	5-8		14+00	45' Lt	510				"								107.3	13.-				118.5	14.0	- 0.3	91.0	
215(L)	"		12+10	45' Rt	505				Br SC	1	84.8	43.5	24.3	15.6			110.5	11.4				115.4	11.3	+ 0.1	95.7	
216	5-9		17+50	45 Rt	507				Lean CL (E)								108.1	18.0				105.6	20.0	- 2.0	102.3	
217	"		17+40	40' Lt	510				"								105.9	17.8				105.2	19.6	- 1.8	99.1	
218	5-10		19+15	35' Lt	509				Gray SM (E)								116.2	12.9				115.7	12.5	+ 1.4	97.9	
219	5-14		18+00	70' Lt	512				Br. SC (E)								107.7	17.6				110.1	18.0	- 0.3	97.8	
220(L)	"		12+40	10' Lt	512												105.3	18.1	B	107.7	19.7	104.8	19.8	- 0.4	98.6	
221	5-15		17+00	80 Rt	508				Br CL (E)								104.0	18.3				106.9	18.5	- 0.2	97.2	
222	"		20+50	45' Lt	514				"								101.7	11.7				105.8	11.4	+ 0.1	96.1	
223	5-16		15-50	70' Lt	514				Br. SC (E)								104.2	14.7				108.8	16.1	- 1.4	100.5	
224	5-17		11+75	50 Rt	512				Grey SC (E)								115.1	14.3				121.6	11.3	+ 3.0	94.7	
225(L)	"		17+50	45' Lt	512												103.2	18.8				106.9	19.5	- 0.7	96.5	
226	5-18		15+00	35' Lt	513												108.2	15.5				109.9	17.3	- 1.8	98.5	

NOTE: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR); PNEUMATIC ROLLER (PR); VIBRATORY ROLLER (VR); PNEUMATIC W/ HD TAMPER (PHT); OR VIBRATORY TAMPER (VT)

COL 5 CYLINDER (CYL); CHUNK (CK); SAND VOLUME (SV); WATER VOLUME (WV); NUCLEAR METHOD (NM); OTHER ____ ( )
COL 6 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS.
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.
COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC.
COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED. NOTE BY LETTER (E)
COL 11-15 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906 IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC
COL 25 COL 13 OR COL 14 MINUS COL 22 OR COL 24
COL 26 INDICATE DERIVATION, E.G. FOR COL 14 + COL 21 OR COL 22, INDICATE BY A OR B, RESPECTIVELY. FOR COL 14 + COL 21 OR COL 22, INDICATE BY C OR D, RESPECTIVELY.
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (N) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U. S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: [illegible]

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(M1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT	REPORT NO. / SHEET
Dierks Dam	Saline / Ark. / Dierks	DACW 56-C-11-14	Arms Const Co	5-23-73	24 / Sheet 2 of 2

PLACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ___ 6-7 ___
3-4 ___ 8-9 ___
5 ___ 10-13 ___

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (3)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)

14-19	20	21-26	27-31	32-34	35-38	39	40	41	42	43-46	47-50	51-53	54-56	57-60	61-63	64-67	68-73	74	75	76-78	79-80				
TEST IDENTIFICATION									CLASSIFICATION					IN-PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS	TOTAL SAMPLE		-#4 FRACTION		STAND		OD	Rec'd				
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART. SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
									Red SC (E)								109.7	16.7				112.7	16.7	0	97.0	
-142	5-5-73	WV	18+50	6 RT	504	12	Lwr Emb	Area "X"	Red CL (E)								105.0	19.1				110.5	16.9	+ 2.2	95.1	
143	5-8		12+50	10 RT	507				Red SC (E)								120.7	14.0				117.5	13.7	+ 0.3	102.8	
144	5-9		17+50	8	508				Red CL	1	93.8	72.4	27.3	12.9			110.8	15.0				112.3	15.2	0	98.6	
145(L)	5-10		19+10	5 RT	513				Red CL (E)								109.7	14.8				113.6	14.9	- 0.1	91.8	
146	5-16		13+00	5 RT	512				Red SC (E)								119.7	12.6				122.0	11.2	+ 1.4	98.1	
147	5-18		15+00	10 RT	513																					

NOTES: (1) FILL IN APPROPRIATE "ORDINARY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)
COL 3: CYLINDER (CY), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____
COL 5: ALIGNED OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7: DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8: E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 9: ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-15: WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20: STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.
COL 21-22: 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24: FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G.: 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC
COL 25: COL 17 OR COL 19 MINUS COL 22 OR COL 24.
COL 26: INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY.
COL 27: IF TEST RESULTS DO NOT MEET SPECIFICATIONS DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U S ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: [signature]

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4000
JUN 67

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS (MAIN FORM) RCS: ENGCW-E-1(R1)

PROJECT:	RIVER: Saline STATE: Ark. TOWN: Dierks	CONTRACT NO: DACW 54-C-71-0159	CONTRACTOR: Amis Const. Co	DATE OF REPORT: 5-27-73	REPORT NO.: 25 SHEET 1 OF 2
Dierks Dam					

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2 ___ 6-7 ___ 3-4 ___ 8-9 ___ 5 ___ 10-13 ___

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED ±3 LIMITS	COMPACTION EQUIPMENT (3)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random	95	-2	SFR	12	8	
Impervious	95	+2	SFR	8	8	

TEST IDENTIFICATION									CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		FRACTION		STANDARD METHOD							
TEST NO.	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	WET DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TEST
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-227	5-22-73	WK	14+40	50' Lt.	515	12	Main Emb	Area X	Br. SC(E)								103.9	19.3				106.3	20.6	-1.3	97.7	
R-228	"		19+75	41' Lt.	519				"								112.7	13.7				116.3	19.6	-0.9	96.9	
R-229	5-23-73		15+50	45' Lt.	515				Br. CL(E)								109.3	13.0				115.4	14.9	-1.9	94.7	
R-230(E)	5-24-73		13+20	50' Lt	518				Bd S.C.	2	88.2	42.6	34.3	17.0			114.8	13.2	B.	118.3	12.9	116.1	14.1	-1.2	98.9	
R-231	"		18+50	35' Lt.	519																					Too Rocky For Dens: Tst
R-232	5-29-73		15+25	35' Lt.	517				Br. SC(E)								101.6	21.0				105.7	20.5	+0.5	96.1	
R-233	5-30-73		13+50	35' Rt.	518				"								101.7	18.6				106.2	19.2	-0.6	95.8	
R-234	5-31-73		18+10	20' Lt.	520				Br. S.C(E)								106.5	14.6				112.2	16.4	-1.8	94.9	
R-235(E)	"		18+00	30' Rt.	518				Br. S.C.	1	58.5	55.3	22.9	7.7			107.1	15.2				112.3	15.6	-0.4	95.4	
R-236	6-1-73		17+50	25' Lt.	520				Br. CL(E)								109.2	13.6				114.8	13.6	0	95.2	
R-237	6-8-73		15+50	35' Lt	519																					Too Rocky For Dens: Tst
R-238	"		19+50	30' Lt.	520				Br. SC(E)								117.0	17.5				114.6	17.6	-0.1	94.7	
R-239	6-6-73		24+00	40' Ot.	528				Br. CL(E)	1							113.0	15.8				114.5	15.7	+0.1	95.6	
R-240(E)	"		15+00	45' Rt.	519				Br. CL.	1	78.9	42.7	28.2	7.4			111.2	13.8	B.	116.5	12.7	114.9	14.5	-2.7	96.8	Record Sample.
R-241	6-11-73		15+00	25' Lt	522				Blue(E)								111.6	14.6				116.3	14.8	-0.2	95.0	
R-242	6-14-73		19+75	40' Lt.	522												114.3	13.6				114.1	15.2	-1.6	100.2	
R-243	6-15-73		13+50	40' Ot	521				Dark Br. SC(E)								105.8	13.3				110.2	23.7	-0.4	95.1	
R-244	"		18+75	30' Rt	522				A.L.C.(E)								110.7	18.1				113.3	18.9	-0.8	97.7	
									Br. C.(E)																	

NOTES: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(3) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATOR / TAMPER (VT)
COL 5: CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER ___ (T)
COL 6: RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENT.-LINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7: DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.
COL 9: E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10: ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED (NOTE BY LETTER (E))
COL 11-13: WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
COL 20: STANDARD METHOD: (A) 4-IN.-DIAM. MOLD, (B) 6-IN.-DIAM. MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX. PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS IN USE R COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21-22: 1- OR 3-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL. 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS.
COL 23-24: FOR USE WHEN MAX. DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL, LIQUID LIMIT CORRELATION, VISUAL COMPARISON, ETC.
COL 25: COL. 17 OR COL. 19 MINUS COL. 22 OR COL. 24.
COL 26: INDICATE DERIVATION, E.G. FOR COL. 16 ÷ COL. 21 OR COL. 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL. 16 ÷ COL. 21 OR COL. 23, INDICATE BY C OR D, RESPECTIVELY.
COL 27: IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U. S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: W. F. McGerin Jr.

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT:	RIVER: Sulphur / STATE: Ark / TOWN: Dierks	CONTRACT NO: DACW 56-C-71-0159	CONTRACTOR: Amis Const. Co	DATE OF REPORT: 5-27-73	REPORT NO.: 25 SHEET 2 OF 2
Dierks Dam					

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2, 3-4, 5-, 6-7, 8-9, 10-12

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious	95	-3 -1	SFR	8	8	

TEST IDENTIFICATION									CLASSIFICATION						IN PLACE DATA				LABORATORY TEST DATA						FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		- #4 FRACTION		STANDARD METHOD							
TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	(2) 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-148	5-23-73	NM	152+60	℄	514	12	Main Emb	Area X	Br. S.C(E)								113.1	14.2				114.2	15.2	-0.9	99.1	
I-149	5-28-73		172+00	℄	517				"								114.1	15.2				116.3	15.5	-0.2	98.1	
I-150(E)	5-30-73		137+50	℄	518				Br. S.C	1	89.9	49.0	22.9	13.5			118.0	14.5				117.6	13.5	-1.0	100.4	
I-151	6-1-73		207+00	℄	521				Br. S.C	1	89.1	43.4	23.8	16.1			113.2	14.8				114.5	15.3	-0.5	98.8	Record Sample
I-152	6-5-73		154+50	℄	519				Br. C.L.(E)								113.0	14.2				119.0	13.7	+0.5	94.9	
I-153	6-11-73		322+50	℄	532				"								117.3	13.0				120.9	12.1	+0.9	97.1	
I-154	6-13-73		197+00	℄	522				"								118.0	14.7				119.8	14.7	+0.4	98.5	
I-155(E)	6-14-73		127+75	10' Rt	522				Br. S.C(E)	1	80.0	44.3	27.1	12.9			118.6	11.2				124.3	11.4	-0.2	95.4	

NOTES: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PT) OR VIBRATORY TAMPER (VT)

COL 3: CYLINDER (CY) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____
COL 6: RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7: DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.
COL 8: E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10: EN TER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED, NOTE BY LETTER (E)
COL 11-13: WHEN BOTH GRADATION AND WATER-CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
COL 20: STANDARD METHOD: (A) 4-IN. DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.
COL 21-22: 1- OR 2 POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24: FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC
COL 25: COL 17 OR COL 19 MINUS COL 23 OR COL 24.
COL 26: INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY.
COL 27: IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U.S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: Walt. M. E. Cunningham

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN PUNCH)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT:	RIVER: Saline STATE: Ark. TOWN: Dierks	CONTRACT NO.:	CONTRACTOR:	DATE OF REPORT:	REPORT NO.:
Dierks Dam		DACW-56-C-73-0159	Amis Const Co.	23 July 1973	26. SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2, 3-4, 5-, 6-7, 8-9, 10-13

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W% LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random	95	+3	S.F.R	12	8	

TEST IDENTIFICATION									CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA						FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		FRACTION #4		STANDARD METHOD								
TEST NO.	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART. SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-245	6-21-73	W,V	16+20	35' Lt.	527	12	Main Emb	Area X	Br. S.C. (F)	2	73.5	37.3	27.7	12.0			118.8	13.9				113.6	15.7	-1.8	96.8	
R-246	"		14+00	60' Rt.	522				Br. S.C.								107.6	16.1				112.7	15.8	+0.3	95.5	
R-247	6-22-73		17+50	35' Rt.	526				Br. & Gr. SC (F)								110.4	14.3				115.2	15.5	-1.2	95.8	
R-248	6-25-73		20+00	35' Lt.	526				"								113.5	15.0				114.3	15.3	-0.3	99.2	
R-249	"		19+50	40' Rt.	525				Br. G.C. (F)								108.5	14.5				113.3	15.4	-0.9	95.8	
R-250(C)	6-26-73		14+00	20' Lt.	527				Gr. & Br. S.C.	2	76.4	42.9	29.7	12.9			115.6	14.0	B	117.0	14.9	114.9	15.2	-1.2	100.6	
R-251	"		15+25	30' Rt.	525				Gr. + Br. SC (F)								103.1	17.3				107.0	19.2	-1.9	96.3	
R-252	6-27-73		15+50	35' Lt.	528				"								120.0	11.0				122.3	12.2	-1.2	98.1	
R-253	7-2-73		17+20	30' Rt.	531				Br. S.C. (F)								102.6	18.2				101.8	18.4	-0.2	97.0	
R-254	"		13+25	35' Rt.	529				Br. & Gr. S.C. (F)								116.6	11.0				123.2	11.7	-0.7	94.7	
R-255(C)	7-4-73		16+00	30' Lt.	531				Br. & Gr. SC.	1	59.3	31.0	34.8	14.5			106.9	16.1				109.8	18.2	-2.1	97.3	
R-256	"		19+00	40' Rt.	531				Br. & Gr. S.C. (F)								107.4	15.6				111.3	17.0	-1.4	96.5	
R-257	7-12-73		18+50	35' Lt.	533				Br. G.C. (F)								118.2	13.1				124.5	13.1	0	97.3	
R-258	"		15+00	30' Rt.	532				Br. S.C. (F)								118.0	14.1				118.7	14.1	0	99.4	
R-259	"		15+00	25' Lt.	532				Br. S.C. (F)								110.1	16.9				109.8	18.0	-1.1	100.2	
R-260(C)	7-16-73		22+50	40' Rt.	535					1	11.6	25.4	16.9	5.1			101.7	17.2	B	111.2	15.3	106.8	19.8	-2.6	95.2	
R-261	"		13+50	35' Rt.	535				Br. & G.C. (F)								114.6	17.2				113.2	16.2	+1.0	101.2	
R-262	"		16+50	25' Lt.	534				Br. S.C. (F)								119.3	14.1				118.8	14.4	-0.3	100.4	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC.
(1a) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)
COL 5 CYLINDER (CYL), CHUNK (CH), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER (O).
COL 6 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF ABUT.
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.
COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC.
COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED, NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.
COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS.
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC.
COL 25 COL 17 OR COL 19 MINUS COL 23 OR COL 24.
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY.
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMED- L TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U. S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: J.H. McFerrin Jr.

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4030 JUN 67

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS ; RCS: ENGCW-E-11(R1)

PROJECT:	RIVER: Saline / STATE: Ark. / TOWN: Dierks	CONTRACT NO.:	CONTRACTOR:	DATE OF REPORT:	REPORT NO.:
Dierks, Dam		DACW 56-C-71-1159	Amis Const. Co.	23 July 1973	26 SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2, 3-4, 5, 6-7, 8-9, 10-13

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious S.	95	-3 to -1	S.P.R.	8	8	

TEST IDENTIFICATION									CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA							FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION		STANDARD METHOD									
TEST NO.	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART. SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % - OPT W %	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
T-156	6-27-73	IN-V	17+50	5' Rt.	527	12	Main Emb	Area X	R.J.S.C.(E)	1							116.9	11.7				122.8	11.8	-0.1	95.1	
T-157	6-25-73		19+75	℄	526				L.J.C.L. (E)								121.7	12.8				120.8	12.9	-0.1	100.7	
T-158	6-27-73		15+50	5' Lt.	528				B.J.S.C. (E)								125.2	11.5				124.7	10.9	+0.6	100.4	
T-159	7-3-73		20+75	5' Rt.	532				L.J.S.C. (E)								119.9	14.0				118.7	13.8	+0.2	101.0	
T-160(C)	11		14+00	℄	532				R.J.S.C.	1	84.1	38.1	28	13.3			115.5	14.1	B	119.3	13.0	118.6	14.0	+0.1	97.4	
T-161	7-17-73		15+00	10' Rt	534				R.J.S.C. (E)								122.0	13.9				119.3	13.4	+0.5	103.3	
T-162	4		17+50	10' Rt.	534				R.J.S.C. (E)								114.3	13.5				116.7	13.4	+0.1	98.4	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT).
COL 3: CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER ____ (L, S, ...)
COL 5: RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7: DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.
COL 8: E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10: ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED. NOTE BY LETTER (E)
COL 11-13: WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
COL 20: STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL IS WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS MS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.
COL 21-22: 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS.
COL 23-24: FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC.
COL 25: COL 17 OR COL 19 MINUS COL 22 OR COL 24
COL 26: INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY.
COL 27: IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U.S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: W. McGavin Jr.

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

(MAIN FORM)

(1) Monthly. SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS ENGCW-E-55(R1)

PROJECT:	RIVER: Saline STATE: Ark. TOWN: Dierks, Ark.	CONTRACT NO.:	CONTRACTOR:	DATE OF REPORT:	REPORT NO.:
Dierks Dam.		DACW 56-C-71-0159	Amis Const. Co.	23 Aug 1973	27 SHEET 1 OF 21

SPACE RESERVED FOR PUNCH CARD OPERATOR
1-2 ____ 6-7 ____
3-4 ____ 8-9 ____
5 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED LL LIMITS	COMPACTION EQUIPMENT (3)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random	95	35	SPR	12	8	

TEST IDENTIFICATION									CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA						FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		- 3/4 FRACTION		STANDARD METHOD								
TEST NO.	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 5	COL 4	COL 6	COL 8	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-263	7-24-73	M.V.	12+90	25' Rt	535	12	Random	Area C	Gr. G.C. (F)								96.2	17.9				101.9	14.7	-1.8	94.9	Too Rocky for Density
R-264	"		14+00	25' Lt	535																					
R-265(R)	7-26-73		15+50	25' Rt	535																					Too Rocky for Density
R-266	7-27-73		19+00	30' Rt	535				Gr. G.C. (F)								95.4	21.0				100.8	23.2	-3.2	94.6	
R-267	"		21+50	30' Rt	535				Br. S.C. (F)								111.6	14.2				113.1	14.1	-2.9	97.8	
R-268	8-1-73		13+00	35' Lt	537				Br. S.C. (F)								104.6	22.2				103.3	21.4	+0.8	98.4	
R-269	"		19+25	30' Rt	538				Br. S.C. (F)								112.3	16.2				113.9	16.3	-0.1	98.6	
R-270(C)	8-3-73		18+50	35' Lt	539				Br. S.C.	2	55.2	26.7	24.0	11.7			111.9	14.4	B	117.2	13.6	116.1	15.1	-0.7	96.4	
R-271	8-6-73		12+00	25' Rt	540				Br. G.C. (F)								112.9	16.9				113.2	17.3	-0.4	99.8	
R-272	8-6-73		15+00	40' Lt	540				Br. S.C.	2	86.0	44.0	33.1	15.6			105.1	16.5				109.0	18.3	-1.8	96.4	Record Sample
R-273	8-13-73		15+00	20' Lt	541				Br. S.C. (F)								114.4	14.9				112.4	14.8	-0.9	99.6	
R-274	"		16+00	20' Rt	541				Br. S.C. (F)								104.7	16.0				106.6	18.5	-2.5	96.3	
R-275(R)	8-14-73		13+00	20' Lt	541				Br. S.C.	2	24.6	26.5	21.3	6.1			106.6	14.2				112.5	16.0	-1.8	96.5	
R-276	"		24+00	20' Rt	541				Br. S.C. (F)								109.5	15.2				111.7	17.4	-2.2	98.9	
R-277	8-15-73		14+00	35' Rt	542				P. S.C. (F)								110.0	13.4				111.6	13.5	-2.1	98.4	
R-278	"		15+50	30' Lt	542				"								107.6	16.2				112.7	19.2	-1.0	95.5	
R-279	8-16-73		20+00	35' Lt	542				"								102.7	18.0				103.3	20.3	-2.3	100.3	
R-280(R)	8-20-73		16+50	20 Rt	543				Br. S.C.	2	42.0	17.1		N/P			122.6	14.0	B	123	9.6	114.8	11.4	+2.6	96.8	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY MONTHLY, OR PERIODIC
(3) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT).
COL 5 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER (O).
COL 6 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS.
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.
COL 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC.
COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CL ISS ESTIMATED. NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.
COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G., 5-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC.
COL 25 COL 17 OR COL 19 MINUS COL 23 OR COL 24.
COL 26 INDICATE DERIVATION, E.G., FOR COL 15 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY.
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U. S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY:
Signature illegible

SUBMITTED BY:

RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT:	RIVER: Saline	CONTRACT NO.:	CONTRACTOR:	DATE OF REPORT:	REPORT NO.:
Dierks Dam	STATE: Ark. TOWN: Dierks.	DACW-56-C-71-134	Ames Const. Co	23 July 1973	27 SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR (1-2, 3-4, 5, 6-7, 8-9, 10-13)

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (3)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious.	95	3% to -1	SPR	8	8	

TEST IDENTIFICATION									CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA						FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION		STANDARD METHOD								
TEST NO.	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX. PART. SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-163	7-24-73	WV	16+00	10' Rt	535	12	Main Emb.	Area X	Red S.C (E)								120.7	12.7				120.3	19.1	-1.4	100.3	
I-164	7-26-73		15+50	℄	536				Red S.C (E)								121.9	11.2				123.6	11.0	+0.2	98.6	
I-165(A)	8-2-73		18+60	5' Rt	538				Red S.C	1	73.9	35.1	35.1	—			114.5	13.3				119.3	13.5	-0.2	100.1	
I-166	8-4-73		15+00	℄	539				Red P.L	1	86.4	59.2	24.7	6.0			116.6	14.1				119.5	13.8	+0.3	97.5	Record Sample.
I-167	8-13-73		15+50	℄	541				Red S.C (E)								122.2	13.9				119.3	13.7	+0.2	102.4	
I-168	8-14-73		23+50	℄	541				Red S.C (E)								123.5	12.5				120.9	12.8	-0.3	102.1	
I-169	8-16-73		15+20	℄	542				Red S.C (E)								122.0	11.7				122.9	11.8	-0.1	99.3	
I-170	8-20-73		20+50	℄	543				Red SC	1	66.5	44.7	27.5	11.2			117.6	12.7	B	121.7	12.9	120.5	12.9	-0.2	97.6	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC.
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT).
COL 5 CYLINDER (CYL), CHUNK (CH), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER ____
COL 6 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.
COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC.
COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED, NOTE BY LETTER (E).
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NE UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.
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COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL, LIQUID LIMIT CORRELATION, VISUAL COMPARISON, ETC.
COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24.
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY.
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U. S. ARMY ENGINEER
CORPS OF ENGINEERS
PREPARED BY: W. E. McGevin Jr.
SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

(1) MONTHLY SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-

PROJECT:	RIVER: SALINE	CONTRACT NO.:	CONTRACTOR:	DATE OF REPORT:	REPORT NO.:
DIERKS DAM	STATE: ARKANSAS TOWN: DIERKS ARKANSAS	DACW 56-C-71-0159	AMIS CONST. CO.	21 SEPT. 1973	28 SHEET 1 OF 1

SPACE RESERVED FOR PUNCH CARD OPERATOR

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (5)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
RANDOM	95	±3	SHEEPSFOOT ROLLER	12	8	
IMPERVIOUS	95	+2 TO -1	SHEEPSFOOT ROLLER	8	8	

TEST IDENTIFICATION									CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA						FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION		STANDARD METHOD								
TEST NO.	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX. PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT OF COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-281	8-28-73	W.V.	20+50	20' LT	545	12	MAIN EMBANK.	AREA "X"	(E) BR.S.C.								122.5	12.2				122.9	11.8	+0.4	99.6	
R-282	"		20+40	30' RT	546				(E) BR.G.C.								124.9	9.2				130.8	11.4	-2.2	95.5	
R-283	8-29-73		13+60	35' LT	546				(E) BR.S.C.								124.8	10.2				125.3	10.6	-0.4	99.6	
R-284	"		17+00	25' LT	546				(L) BR.S.M.								124.3	8.6				126.1	9.9	-1.3	98.6	
R-285(L)	8-31-73		14+00	25' LT	547																					TOO ROCKY FOR DENSITY
R-286	"		14+00	25' RT	547																					TOO ROCKY FOR DENSITY
R-287	9-4-73		23+50	40' LT	549				(L) BR.G.C.								126.8	10.9				125.4	11.1	-0.2	101.1	
R-288	"		22+00	40' RT	549				(L) BR.G.C.								121.6	8.5				127.1	9.8	-1.3	95.6	
I-171	8-22-73	W.V.	22+00	5' LT	544	8	MAIN EMBANK.	AREA "X"	(E) RED.CL.								119.6	11.6				122.8	11.9	-0.3	97.4	
I-172	"		18+50	5' LT	549				(E) BR.S.C.								124.2	10.8				121.3	12.2	-1.4	102.4	
I-173	9-11-73		15+50	4	550				(E) RED.S.C.								117.6	12.3				122.3	12.2	+0.1	96.2	
I-174	"		22+50	2	550				(L) BR.C.L.								113.9	15.2				120.1	12.1	+3.1	94.8	
I-175	9-21-73		17+25	6	560												100.6	25.7				95.9	25.7	+0.1	104.8	L.L. & W.L. TEST NOT Completed

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC.
(5) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)

COL 5 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER (1)

COL 6 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS.

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.

COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC.

COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED, NOTE BY LETTER (E)

COL 11-15 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S.

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.

COL 21-22 1- OR 3-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G.: 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION, VISUAL COMPARISON, ETC.

COL 25 COL 17 OR COL 18 MINUS COL 23 OR COL 24.

COL 26 INDICATE DERIVATION, E.G., FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY.

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U. S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: Simpson & Hill

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT:	RIVER: Saline / STATE: Arkansas / TOWN: Dierks	CONTRACT NO.:	CONTRACTOR:	DATE OF REPORT:	REPORT NO.:
Dierks Dam		DACW-56-C-74-159	Amis Const. Co	20 Oct 1973	29 SHEET 1 OF 1

SPACE RESERVED FOR PUNCH CARD OPERATOR (1-2, 3-4, 5, 6-7, 8-9, 10-13)

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w% LIMITS	COMPACTION EQUIPMENT (5)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random	96	±3	Sheep Foot Roller	12	8	
Impervious	95	+3 to -1	" " "	8	6	

TEST IDENTIFICATION										CLASSIFICATION					IN-PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
											GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION		STANDARD METHOD						
TEST NO.	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	P. ICENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-289	10-25-73	W.V	17+30	25' Rt	554	12	Main Emb	Bor X	Br. S.C. (E)								105.7	13.3				114.7	14.9	-1.6	91.3	
R-290	9-27-73		21+22	25' Rt	555				(E) Br. C.L.		—	—	13.3	12			107.8	15.0				112.6	13.7	-1.7	99.7	-#200 and Sum on test
R-291	"		22+50	20' Rt	556				Br. S.C. (E)								97.2	18.8				107.3	10.7	-1.9	96.1	
R-292	10-3-73		17+25	20' Rt	557				Br. S.C. (E)								110.7	14.1				107.6	14.0	+0.1	102.8	
R-293	"		17+00	35' Lt	558				R. SC.L. (E)								99.9	22.8				104.5	24.2	-1.4	95.6	
R-294	10-4-73		21+50	25' Lt	558				Br. S.C. (E)								102.3	17.7				107.4	19.5	-1.8	95.3	
R-295	10-9-73		22+50	30' Rt	558				Br. S.L. (E)		75.2	49.7	—	—			107.1	16.6				112.7	16.5	-0.1	95.1	#2 NOT FOR
R-296	"		22+50	20' Rt	556				Br. C.L. (E)								100.7	20.3				106.2	19.6	+1.1	94.5	
T-175	9-21-73	W.V	107+5	9	560	12	Main Emb	Bor X	R.C.C.N		26.0	20.2	13.6	11.3			101.6	25.7				95.9	25.6	+0.1	104.8	
T-176	9-25-73		17+30	C	554				R.S.C.L. (E)								111.8	15.0				104.2	20.1	-1.1	92.7	
T-177	10-4-73		21+50	C	558				Br. C.L. (E)								106.9	16.0				112.2	16.5	-0.5	95.2	
T-178	10-13-73		14+40	C	559				R.C.C.L. (E)								110.6	15.7				114.7	14.9	+0.8	96.5	
T-179	"		24+50	C	560				R.S.C.L. (E)								114.8	11.1				112.5	16.7	+0.4	102.1	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC.
(5) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PNR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL), CHUNK (CH), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER ____
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS.
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.
COL 8 E.G., AREA C, SPILLWAY EXCAVATION, ETC.
COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
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U. S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: W. M. Garrison Jr.

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

(1) Morley SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT:	RIVER: Saline	CONTRACT NO.:	CONTRACTOR:	DATE OF REPORT:	REPORT NO.:
Dierks Dam	STATE: Arkansas	DACW-56-C-71-0159	Amis Const. Co.	28 Nov. 1973	30
	TOWN: Dierks				SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2, 3-4, 5, 6-7, 8-9, 10-11

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (3)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random	95	±3	S.P.R.	12	8	

TEST IDENTIFICATION									CLASSIFICATION					IN-PLACE DATA				LABORATORY TEST DATA						FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS	TOTAL SAMPLE		FRACTION		STANDARD METHOD								
TEST NO.	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-297	11-22-73	W.V.	16+50	21' Rt.	559	LR	Random	Area X	S.C.L.E.								112.4	15.4				114.4	13.5	-2.1	98.3	
R-298	"		15+75	21' Rt.	559																					Too Rocky for Density
R-299	11-15-73		14+00	30' Rt.	558				Sandy C(E)																	
R-300(R)	"		14+00	25' Rt.	558						#4	#1	NP	NP			104.1	13.8				102.9	12.0	-3.2	96.5	
R-301	11-28-73		13+50	20' Rt.	560				El. S.C. (E)								101.5	12.5				103.8	24.1	-6.6	97.8	
R-302	"		13+50	35' Rt.	560												92.7	16.6				103.5	15.7	-3.1	89.3	
R-303	11-30-73		14+25	21' Rt.	559																					Too Rocky for Density
R-304	12-7-73		20+00	25' Rt.	560				Sl. SC (E)								108.2	8.3				109.5	18.4	-0.6	98.8	
R-305	11-29-73		17+15	35' Lt.	561				Sl. Cl.		#4	#200	LL	PI			111.6	11.8				109.4	12.7	-0.9	99.4	Revised Sample
R-306	"		17+85	35' Lt.	561				Sl. SC (E)		44.8	20.5	25	12.9			111.4	12.3				112.0	12.3	0	99.6	
R-307	11-29-73		23+25	20' Lt.	564				Sl. SC (E)								111.4	11.8				111.3	11.9	-0.1	100.0	
R-308	"		24+00	11' Lt.	564												104.4	15.3				110.1	15.8	-0.5	94.8	
R-309	11-15-73		14+00	20' Lt.	565																					Too Rocky for Density
R-310	"		13+50	10' Rt.	565				Sl. GC (E)*								92.1	19.5				104.0	21.8	-2.3	88.6	Too Rocky for Density 11.4 Ret. on 1" Sieve
R-311	11-14-73		19+00	25' Rt.	565				Sl. SC (E)								111.4	14.5				112.4	14.4	+0.1	99.1	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(3) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)
COL 3: CYLINDER (CYL), CHUNK (CH), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER (I)
COL 5: RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7: DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.
COL 8: E.G.: AREA C, SPILLWAY EXCAVATION, ETC.
COL 10: ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED, NOTE BY LETTER (E)
COL 11-18: WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
COL 20: STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906 IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS MS U-DIAM COL 20 AND REPORT DETAILS OF PROCEDURE.
COL 21-22: 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS.
COL 23-24: FOR USE WHEN MAX DENSITY NO OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E.G., 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION, VISUAL COMPARISON, ETC.
COL 25: COL 17 OR COL 18 MINUS COL 23 OR COL 24.
COL 26: INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 23 OR COL 25, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 23 OR COL 25, INDICATE BY C OR D, RESPECTIVELY.
COL 27: IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U.S. ARMY ENGINEER
CORPS OF ENGINEERS
PREPARED BY: Jack McGerin Jr.
SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS MAIN FORM

RCS: ENGCW-E-11(R1)

PROJECT:	RIVER: Saline	CONTRACT NO.:	CONTRACTOR:	DATE OF REPORT:	REPORT NO.:
Dierks Dam	STATE: Arkansas TOWN: Dierks	DACW-54-C-11-0157	Ames Const. Co.	20 Nov. 1973	30

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 5-7 ____
3-4 ____ 8-9 ____
6 ____ 10-13 ____

SHEET 2 OF 2

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious	95	12 to -1	S.P.R.	8	8	

TEST IDENTIFICATION									CLASSIFICATION					IN-PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		FRACTION		STANDARD METHOD						
TEST NO.	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS. WORD OR LETTER SYMBOL	MAX. PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX. DRY DENSITY (PCF)	OPT. WATER CONTENT (%)	MAX. DRY DENSITY (PCF)	OPT. WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS OR TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
T-180C	16-23-73	W.V	24+25	℄	560	12	Main Emb	Area X	X-Ray Cl. (E)									21.7							
T-181	"		14+00	5' Ut.	560				Cl. S.C. (E)									18.0							
T-182	16-30-73		18+25	℄	560				Cl. Cl. (E)									18.9							
T-183	11-7-73		20+00	℄	560				Cl. S.C.		91.0	45.0	34.0	12.8				14.9							
T-184	11-9-73		17+00	5' Ut.	562				Cl. Cl. (E)									18.0							Bleed Sample
T-185(2)	11-14-73		23+50	5' Ut.	564				Cl. S.C. (E)		(71.5?	41.7	29	11				14.5							
T-186	11-15-73		12+50	℄	565				Cl. S.C. (E)									14.5							
T-187	11-16-73		13+00	℄	565				Cl. S.C. (E)									13.1							
																		13.9							

NOTES: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)

COL 5: CYLINDER (CYL), CHUNK (CH), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER ____ ( ).
COL 6: RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF ABT.
COL 7: DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.
COL 8: E.G.: AREA C, SPILLWAY EXCAVATION, ETC.
COL 10: ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED, NOTE BY LETTER (E)
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U. S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: Walter McGowin Jr.

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

(MAIN [illegible])

(1) [illegible] SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENG-4-R-11(NI)

PROJECT:	RIVER: Saline STATE: Kansas TOWN: [illegible]	CONTRACT NO.: DACW-57-C-11-0159	CONTRACTOR: Amis Const. Co.	DATE OF REPORT: 20 Dec 1973	REPORT NO.: 31 SHEET 1 OF 2
Dicks Dam					

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2 ___ 3-4 ___ 5 ___ 6-7 ___ 8-9 ___ 10-13 ___

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random	95	2 3	Sh. R.	12	8	

TEST IDENTIFICATION									CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION	
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION		STANDARD METHOD						
TEST NO.	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART. SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-312	1-21-73	RV	22+00	35' Rt.	567	12	Main Emb.	Stock P	G.S.C (5)								115.0	13.7				115.2	15.4	-1.7	99.8	
R-313	1-25-73		14+25	20' Lt.	568												103.2	20.4				106.3	19.9	-0.5	97.1	Rocky - for density Tests Transition Mat.
R-314	"		14+80	25' Rt.	568			Spillway																		"
R-315	1-6-73		22+00	20' Lt.	571																					"
R-316	"		22+00	20' Rt.	571																					"
R-317	"		13+00	25' Lt.	569																					"
R-318	1-11-73		23+10	15' Rt.	572																					"
R-319	"		23+00	15' Lt.	572																					"
R-320	"		14+50	20' Rt.	568																					"
R-321	1-11-73		16+50	20' Lt.	570																					
R-322	"		16+50	20' Rt.	569			Spillway									102.9	17.1				106.7	14.4	-2.7	96.4	Rocky - for density Tests Random Soil
R-323	1-14-73		15+00	30' Lt.	573																					"
R-324	"		15+25	20' Rt.	573																					"
R-325	"		21+00	20' Lt.	575																					"
R-326	1-11-73		19+40	20' Lt.	575																					"
R-327	"		19+90	20' Rt.	575																					"

NOTES: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G. SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)

COL 3: CYLINDER (CYL), CHURN (CH), SAND REPLACEMENT (SR), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER ___.
COL 6: RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7: DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 9: E.G., AREA C, SPILLWAY EXCAVATION, ETC.
COL 10: ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED, NOTE BY LETTER (E)
COL 11-13: WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20: STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS IN COL 20 AND REPORT DETAILS OF PROCEDURE.
COL 21-22: 1- OR 3-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS.
COL 23-24: FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC.
COL 25: COL 17 OR COL 19 MINUS COL 23 OR COL 24.
COL 26: INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 22, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 22, INDICATE BY C OR D, RESPECTIVELY.
COL 27: IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U S ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: [illegible]

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 69

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT:	RIVER: Sylvine / STATE: Arkansas / TOWN: Dierks	CONTRACT NO.:	CONTRACTOR:	DATE OF REPORT:	REPORT NO.:
Dierks Dam		DACW-56-C-71-0159	Amis Const Co	20 Dec 1973	31 SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2 ___ 3-4 ___ 5 ___ 6-7 ___ 8-9 ___ 10-13 ___

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (1b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious	95	+3 to -1	S.P. 12	8	8	

1-10	11	12-15	16-20	21-25	26-30	31-32	33-36	37-40	41	42	43-46	47-50	51-53	54-56	57-60	61-63	64-67	68-70	71	72-75	76-79	72-75	76-79			
TEST IDENTIFICATION									CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA					FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		- #4 FRACTION		STANDARD METHOD							
TEST NO.	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-188	11-21-73	UV	22+00	5' Rt.	567	12	Main Emb	Area X	CL (E)								119.2	14.1				118.8	14.0	+0.1	100.4	
I-189	11-26-73		14+75	5' Rt.	566				CL (E)								120.3	14.2				118.9	13.4	+0.8	101.2	
I-190	12-6-73		15+00	℄	568				CL		75.3	46.3	28.6	12.6			106.9	15.6				110.8	17.6	-2.0	96.5	
I-191	"		20+50	5' Lt.	572				L.L.CL (E)								112.2	17.7				110.8	16.9	+0.4	101.3	Std Dry Wt 113.0 @ 17% N.O.M.
I-192	12-18-73		11+50	℄	568				Rd CL (E)								123.5	12.1				124.9	9.7	+1.4	98.8	
I-193	"		15+00	5' Rt	574				Rd CL (E)								114.7	13.9				110.7	13.9	0	97.7	

NOTE: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM) OTHER ___

COL 8 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.

COL 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED, NOTE BY LETTER (E)

COL 11-19 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS HI UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.

COL 21-23 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 23, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 24-26 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC.

COL 25 COL 22 OR COL 18 MINUS COL 22 OR COL 24

COL 26 INDICATE DERIVATION, E.G. FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR 23, INDICATE BY C OR D, RESPECTIVELY.

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U. S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: W. H. McFerrin, Jr.

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN + DRM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT:	RIVER: Saline STATE: Arkansas TOWN: Dierks	CONTRACT NO.: DACW 56-C-71-0159	CONTRACTOR Ames Const. Co.	DATE OF REPORT: 16 Jan 1974	REPORT NO.: 32 SHEET 1 OF 1
Dierks Dam					

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2 ____ 3-4 ____ 5 ____ 6-7 ____ 8-9 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious	95	+3% -1	S.E.R	8	8	
Random	95	±3	S.E.R	12	8	

TEST IDENTIFICATION										CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA						FIELD AND LABORATORY CORRELATION		
											GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		-#4 FRACTION		STANDARD METHOD								
TEST NO.	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	E-EVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX. PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-194	1-7-74	UNV	12+50	℄	575	12	Main	Area X	RJCL (E)								117.5	14.2				115.2	13.5	+1.6	104	
I-195	"		18+00	℄	576		"		Random CL		88.5	54.4	31.5	14.3			120.5	12.7				117.2	14.0	-1.3	100.2	
I-196	"		22+00	℄	578		"		Rock (E)								119.3	16.3				114.6	15.1	+1.2	104.1	
R-328	1-7-74		13+00	20' Lt.	575		"																		Visual Soil Classification	
R-329	"		13+00	20' Rt.	574		"																		"	"
R-330	"		18+50	25' Rt.	575		"																		"	"

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
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COL 3: CYLINDER (CYL); CHUNK (CH); SAND VOLUME (SV); WATER VOLUME (WV); NUCLEAR METHOD (NM); OTHER ____ (__).

COL 5: RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS.

COL 7: DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.

COL 8: E.G.: AREA C, SPILLWAY EXCAVATION, ETC.

COL 10: ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED, NOTE BY LETTER (E)

COL 11-13: WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

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COL 25: COL 17 OR COL 16 MINUS COL 23 OR COL 24

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U.S. ARMY ENGINEER
CORPS OF ENGINEERS

PREPARED BY: W. R. McEachern Jr.

SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080 JUN 67

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT: Dierk's Dam | RIVER: Saline | STATE: Arkansas | TOWN: Benton | CONTRACT NO.: DACW 26-1-71-0159 | CONTRACTOR: Amis Const Co | DATE OF REPORT: 19 FEB 1974 | REPORT NO.: 33 | SHEET 1 OF 1

SPACE RESERVED FOR PUNCH CARD OPERATOR
1-2 ____ 6-7 ____
3-4 ____ 8-9 ____
5 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (3)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious	95	3.7 - 1	SFR	8	8	

TEST IDENTIFICATION									CLASSIFICATION						IN-PLACE DATA				LABORATORY TEST DATA						FIELD AND LABORATORY CORRELATION		
										GRADATION			ATTERBERG LIMITS		TOTAL SAMPLE		% FINER THAN #4 SIEVE FRACTION		STANDARD METHOD								
TEST NO.	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PLI)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
T-197	1-25-74	W.I.	22+00	℄	581	12	Main	X	ENTER (F)								113.6	14.1				112.2	12.4	+1.7	101.3	
T-198	"	"	15+00	℄	580				ENTER (F)								114.7	12.9				114.8	11.2	+1.7	102.6	
T-199	1-31-74		24+00	℄	585				ENTER (F)								110.8	11.1				114.0	11.2	-0.1	97.1	
T-200	"		11+00	℄	584				ENTER (F)								110.0	10.2				113.8	11.2	+2.1	96.7	
T-201	2-6-74		14+50	℄	587				ENTER (F)								116.2	14.9				117.0	12.7	+1.6	98.5	
T-202	"		21+00	℄	587				ENTER (F)								112.5	14.9				117.0	14.1	+0.8	96.5	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)
COL 5 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM) OTHER ____
COL 6 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS.
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.
COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED, NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 2 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.
COL. 21-22 1- OR 3-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION, VISUAL COMPARISON, ETC.
COL 25 COL 17 OR COL 19 MINUS COL 23 OR COL 24.
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY.
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U S ARMY ENGINEER
CORPS OF ENGINEERS
PREPARED BY: [signature]
SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

APPENDIX G

SOIL TEST DATA SUMMARY

TEST DATA SUMMARY

SHEET No. 9891-2 FEATURE Jo Waters

Sheet ___ of ___

DIERKS DAM

BORING NO.	SAMPLE NO.	DEPTH OR ELEV. OF SAMPLE	LABORATORY CLASSIFICATION	MECHANICAL ANALYSIS: GRAVEL %	SAND %	FINES %	No.	ATTERBERG LIMITS: LL	PL	SPECIFIC GRAVITY	NAT. WATER CONT. %	NATURAL DRY DENSITY LBS CU FT	COMPACTION DATA: DRY DENSITY LBS CU FT	MAXIMUM DRY DENSITY LBS CU FT	SHEAR DATA: INITIAL %	DRY DENSITY LBS CU FT	%	%	%	TYPE TEST	SPECIMEN DIA INCHES	TEST	σ3 LBS/SQ IN	σ1 LBS/SQ IN	c DEGREES	φ DEGREES	REMARKS
TP-48A																										
	S48A	00-80	SM	3	71	26		NP	NP																	
			SAND & fy gallaugh brown																							
													Remolded to 95%	486	112.2	6.9	17.9	37	TC:R	1.4x3.0	1	1.55	6.46	—	—	
													maximum density at	481	112.5	7.0	18.1	39	"	"	2	3.00	9.91			
													optimum +3%	488	112.1	7.0	17.2	38	"	"	3	6.05	16.40			
													Remolded to 95%	480	112.7	9.5	17.2	53	TC:R	1.4x3.0	1	1.55	11.23	—	—	
													maximum density at	476	112.9	9.4	17.4	53	"	"	2	2.90	19.70			
													optimum water content	482	112.5	9.6	17.2	53	"	"	3	6.05	21.24			
													Remolded to 95%	506	110.7	14.4	16.7	76	TC:R	1.4x3.0	1	1.60	13.32	—	—	
													maximum density at	509	110.4	14.9	17.1	78	"	"	2	3.00	22.79			
													optimum +4%	509	110.4	13.9	16.8	73	"	"	3	6.10	30.45			

ENG FORM 1 JAN 58 2086 (PREVIOUS EDITIONS MAY BE USED) (EM 1110-2-1906) (TRANSLUCENT)

TC = Triaxial Compression DS = Direct Shear CD = Consolidated Drained *Values at Pressure T/50 FT
UC = Unconfined Compression UU = Unconsolidated Undrained R = Consolidated Undrained

TEST DATA SUMMARY

FEATURE FOUNDATION EXCAVATION

DISTRICT OFF.
FOUNDATION MATERIALS
UNDISTURBED TESTS

Page 2 of 4
DM #10

SAMPLING NO.	LAB NO.	DEPTH OR ELEV. OF SAMPLE	LABORATORY CLASSIFICATION	MECHANICAL ANALYSIS: GRAVEL %	SAND %	FINES %	D_{10}	ATTERBERG LIMITS: LL	PL	SPECIFIC GRAVITY	NAT. WATER CONT. %	NATURAL DRY DENSITY LBS/CU FT	COMPACTION DATA: OPT. WATER %	MAXIMUM DRY DENSITY LBS/CU FT	SHEAR DATA: INITIAL %	DRY DENSITY LBS/CU FT	ϕ_c	ϕ_r	c_r	TYPE TEST	SPECIMEN SIZE INCHES	TEST	ϕ_u TONS/SQ FT	c_u TONS/SQ FT	ϕ_d TONS/SQ FT	c_d TONS/SQ FT	PERMEABILITY: K	K FT/MIN	CONSOLIDATION DATA: C_v TONS/SQ FT	C_v TONS/SQ FT	C_c	e_o	REMARKS
6sec-10																																
	2884	1.0-2.0	CL					32	12		13.3	112																				
	2984	0.8-1.8	CL								15.7	107																				
	2984-A	1.8-2.8	CL					27	11		20.3	102																				
	2985	2.8-4.4	CL								18.4	108																				
6sec-11																																
	2900	3.0-5.0	SM								10.3	104																				
	2901	5.0-7.0	SM					NP	NP		16.8	107				110.8	17.0		91	T-Q	1.4 x 3.0				0.4	8.1						
																109.0	17.4	16.0	88	T-R	1.4 x 3.0				0.5	20.2						
																108.5	15.9	14.6	89	DS-S	1 x 1 x .5				0.1	12.6						
	2902	7.0-9.0	CL								14.4	108																				
6sec-17																																
	3204	11.4-12.1	Sandstone								6.5	141				141	4.2			UC	6.0 x 7.8		0.0	31.4								
	3205	17.5-18.1	Graywacke								7.2	129																				
	3833	41.9-42.8	Sandstone								0.2	161				161	0.2			UC	6.0 x 9.9		0.0	905								
6sec-31																																
	2991	0.6-2.6	CL								20.9	103																				
6sec-34																																
	2765	0.4-1.5	SM								14.4	101																				
	2768-A	1.5-3.5	SM								15.6	105																				
	2769	3.5-5.5	SM								12.2	113																				
	2770	5.5-7.5	SM								15.5	108																				
	2771	7.5-9.5	SM								11.4	107																				

FORM P-5BR 2886 (PREVIOUS EDITIONS MAY BE USED) (SATURATED) (TRANSLUCENT)

TC = Triaxial Compression
UC = Unconfined Compression
DS = Direct Shear
UU = Unconsolidated Undrained
CD = Consolidated Drained
CU = Consolidated Undrained
*Values at Pressure
T/SQ FT

TEST DATA SUMMARY

FEATURE FOUNDATION EXCAVATION

DIVERS DAM
FOUNDATION MATERIALS
UNDISTURBED TESTS

Sheet 2 of 6
DM # 8

Boring No.	Sample No.	Depth or Elev. of Sample	Laboratory Classification	Mechanical Analysis: Gravel %	Sand %	Fines %	D_{10}	Atterberg Limits: LL	PL	Specific Gravity	Nat. Water Cont. %	Natural Dry Density lbs/cu ft	Compaction Data: Opt. Water %	Maximum Dry Density lbs/cu ft	Shear Data: Initial %	Dry Density lbs/cu ft	σ_3	σ_d	σ_1	Type Test	Specimen Size Inches	Test	σ_3 T/sq ft	σ_1 T/sq ft	c T/sq ft	ϕ degrees	Permeability: K	K ft/min	Consolidation Data: σ_o T/sq ft	σ_c T/sq ft	C_c	C_v	Remarks
6RC-35																																
	3814	23.1-24.0	Sandstone								0.7	159				158	0.7			UC	5.7 x 10.3		0.0	39.2									
	3815	29.5-30.5	Argillite								--	156																					
	3816	34.0-34.9	Sandstone								0.2	161				160	0.2			UC	6.0 x 10.3		0.0	353									
6C-37																																	
	3818	18.1-19.0	Sandstone								1.5	158				158	1.5			UC	6.2 x 10.3		0.0	158									
	3819	25.6-26.5	Sandstone								--	160				160	--			UC	6.0 x 8.8		0.0	919									
6C-8A																																	
	5065	6.7-7.7	Sandstone								4.8	133																					
	5066	8.3-9.1	CH								17.5	112																					
	5067	10.2-11.0	Sandstone								4.4	140																					
6C-13A																																	
	5068	13.3-13.5	CL					39	20		12.4	119																					
	5069	16.6-17.4	Shale								10.2	132				133	9.9			UC	6.0 x 5.9		0.0	23.2									
	5070	18.3-19.0	Shale					36	20		9.2	133				136.1	8.5	9.6	91	DS	3 x 3 x 0.5				0.3	34.3							
	5071	22.2-23.1	Sandstone								1.4	155																					
	5072	24.9-25.8	Shale								7.1	137																					
	5073	26.5-27.4	Sandstone								5.9	141																					
	5074	28.7-29.6	Shale								6.?	140																					
6C-32A																																	
	5075	2.5-3.5	Weathered Shale (CH)					54	24		14.0	107				104.7	1.4	22.9	7?	?S	? x ? x 0.5				0.2	20.0							
	5076	4.5-5.2	Weathered Shale (CL)					48	25		17.?	99																					
6C-19D																																	
	11	767	70								4.4	150												22.?									

EMS FORM 1 MAR 66 2086 (PREVIOUS EDITIONS MAY BE USED) (TRANSLUCENT)

TC = Triaxial Compression
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CD = Consolidated Drained
CU = Consolidated Undrained
*Values at Pressure
T/SQ FT

TEST DATA SUMMARY

FEATURE FOUNDATION EXCAVATION

SAMPLE NO.	BAG NO.	DEPTH OF ELEV. OF SAMPLE	LABORATORY CLASSIFICATION	MECHANICAL ANALYSIS: GRAVEL %	SAND %	FINES %	-#10	ATTERBERG LIMITS: LL	PI	SPECIFIC GRAVITY	MAX. DRY DENSITY LBS/CU FT	OPTIMUM MOISTURE %	COMPACTION DATA: MAX DRY DENSITY LBS/CU FT	SHEAR DATA: INITIAL MOISTURE %	DRY DENSITY LBS/CU FT	ϕ_u	C_u	ϕ_d	TYPE TEST	APPROX CONSOLIDATION PRESSION	TEST	ϕ_{cu} FISH PT	ϕ_d FISH PT	C_{cu} FISH PT	ϕ_{cu} REMOLD	PERMEABILITY: K FISH PT	K REMOLD	CONSOLIDATION DATA: P_c FISH PT	P_c REMOLD	C_c	γ_s	REMARKS
Exc-163													111.4	120.9																		FOUNDATION EXCAVATION
	508-5	2.4-11.1	SC	0	49	51		17	13	2.68																						
															115.1	11.2			95	Cpt					0.2	25.4						
															115.1	13.9			95	+3.0					0.3	14.5						
															114.7	11.1			95	Cpt					0.2	11.0						
															114.7	14.1			95	+3.0					0.5	16.9						
																															11	
EM-2C-165	M-17 973	1.0-3.1	SC	14	39	47		31	13	2.68			14.4	113.8																		
															113.0	14.7			100	Cpt					1.2	14.1						
															107.9	17.6			95	+3.0					0.4	7.0						
															107.6	14.8			95	Cpt					0.7	16.0						
															107.5	11.8			95	-3.0					1.4	22.5						
															113.2	15.0			100	Cpt					0.7	14.5						
															107.5	17.9			95	+3.0					0.6	15.5						
															107.3	14.9			95	Cpt					0.4	10.7						
															108.2	11.9			95	-3.0					0.3	9.5						
															107.7	17.8			95	+3.0					0.2	33.0						
	M-17 974	3.1-6.0	GC-GP	65	23	12		29	12	2.69																						
	975	6.0-11.2	GC	73	14	13		29	12	2.68	Ja	113.6	Max.																			
										2.69	Ca	98.1	Min.																			
	976	11.2-16.7	GP-GP	70	20	10		24	11	2.58	Ca	120.9	Max.																			
										2.69	Ga	96.9	Min.																			
																															1	
TP-A86	M-18 545	1.7-4.8	SC	32	46	25		30	13																							
TP-A87	M-16 546	0.0-3.0	GM-GC	66	20	14		15	11																							
	547	3.0-5.0	GC	43	38	19		27	12																							
TP-A88	M-18 548	0.0-8.0	SM	4	71	25		NP	NP	2.67			10.1	117.7																		
															.418	117.6	10.1		65	100 Opt					0.3	36.3						
															.491	111.8	10.2		65	95 Cpt					0.1	34.2						
															.498	111.7	10.3		65	95 Cpt					0.1	35.3						
	549	8.0-12.0	SM	3	73	24		NP	NP																							
	550	12.0-16.0	SP-SC	43	45	12		18	11																							

TC = Triaxial Compression
UC = Unconfined Compression
DS = Direct Shear
UU = Unconsolidate Undrained
CB = Consolidated Drained
CU = Consolidated Undrained

EME FORM 2086 (PREVIOUS EDITIONS MAY BE USED) (TRANSLUCENT)

TEST DATA SUMMARY

FEATURE FOUNDATION EXCAVATION

DIERKS DAM
COMPACTED SOILS

Sheet 5 of 8
DM-8

Sample No.	Lab. No.	Depth or Elev. of Sample	Laboratory Classification	Mechanical Analysis: Gravel %	Sand %	Fines %	D_{10}	Atterberg Limits: LL	PL	Specific Gravity	Nat. Water Cont. %	Natural Dry Density Lbs/Cu Ft	Compaction Data: Opt. Water %	Maximum Dry Density Lbs/Cu Ft	Shear Data: Initial %	Dry Density Lbs/Cu Ft	σ_3	σ_d	σ_1	Type Test	Rate of Strain / Consolidation	Test	σ_3 T/SQ FT	σ_1 T/SQ FT	c T/SQ FT	ϕ Degrees	Permeability: k	k cm/sec.	Consolidation Data: σ_0 T/SQ FT	σ_1 T/SQ FT	C_c	t_{50}	Remarks
TP-490	K-18																															
	562	6.8-9.4	SM	41	45	14		NP	NP																							FOUNDATION EXCAVATION
	563	13.1-15.5	SM	27	53	20		NP	NP																							
TP-491	K-18																															
	564	3.7-6.0	GC	62	22	16		24	11																							
	565	6.0-10.1	GC	67	19	14		26	12																							
TP-492	K-18																															
	566	8.1-9.4	GC	52	25	23		21	12																							
TP-493	K-18																															
	567	2.0-4.0	GC	60	23	17		25	13																							
	568	5.4-7.1	GP-GC	64	24	12		26	14																							
TP-494 & TP-495	K-18																															
	564C	2.0-10.1	SCL (GC)	0	49	51		25	12	2.69			12.4	118.4																		
															.421	118.2	12.5		80	Q	100% ? Opt				1.1	24.9						
															.490	112.7	9.7		53	?	95% ? -3.0				0.7	35.5						
															.493	112.6	12.5		69	Q	95% ? Opt				0.9	20.5						
															.488	112.9	15.5		86	?	95% ? +3.0				0.7	5.5						
															.421	118.2	12.8	15.5	81	Q	100% ? Opt				0.7	17.6						
															.505	111.6	10.1	17.5	54	Q	95% ? -3.0				0.3	9.5						
															.491	112.6	12.9	17.0	70	?	95% ? Opt				0.4	10.7						
															.497	112.2	15.9	14.9	87	Q	95% ? +3.0				0.6	15.5						
															.494	112.4	12.7	13.7	69	?	95% +? Opt				0	34.0						

CMS FORM 1 MAR 56 2956 (PREVIOUS EDITIONS MAY BE USED) (SAM 1110-2-1906) (TRANSLUCENT)

* K-18, 564C - a composite of minus No. 10, 10 fractions of ASTD samples K-18, 564, -18, 565 and -18, 567

TC - Triaxial Compression
UC - Unconfined Compression

DS - Direct Shear
UU - Unconsolidated Undrained

CD - Consolidated Drained
CU - Consolidated Undrained

+Values at Pressure T/SQ FT

TEST DATA SUMMARY

FEATURE IMPERVIOUS BORROW

DIKES DAM
COMPACTED FILL

Sheet 6 of 6
DM-8

SAMPLE NO.	BORING NO.	DEPTH OR ELEV OF SAMPLE	LABORATORY CLASSIFICATION	MECHANICAL ANALYSIS: GRAVEL %	SAND %	FINES %	#10	ATTERBERG LIMITS: LL	PL	SPECIFIC GRAVITY	NAT MOISTURE CONT %	NATURAL DRY DENSITY LBS/CU FT	COMPACTION DATA: DRY DENSITY	MAXIMUM DRY DENSITY LBS/CU FT	INITIAL %	SHEAR DATA: DRY DENSITY LBS/CU FT	%	%	%	TEST	APPROX CONDITION	TEST	σ_3 TSF OR PSI	σ_1 TSF OR PSI	c TSF OR PSI	ϕ DEGREES	PERMEABILITY: %	FT/MIN	CONSOLIDATION DATA: σ_0 TSF OR PSI	σ_c TSF OR PSI	C_c	t_{50}	REMARKS
BA-200	496	0.0-3.0	CL-ML	10	24	66		21	15	2.67			11.5	116.0		117.1	11.5		73	c	100% Opt					0.8	30.9							IMPERVIOUS BORROW
																110.6	14.6		77	c	95% Opt +3.0					0.4	30.0							
																110.5	11.7		61	c	95% Opt					0.4	32.0							
																110.7	8.6		45	c	95% Opt -3.0					0.4	33.2							
																116.2	11.0		73	c	100% Opt					2.2	38.6							
																111.2	15.1		00	c	95% Opt +4.0					2.9	29.0							
																110.5	11.7		62	c	95% Opt					1.0	19.0							
																110.0	9.1		47	c	95% Opt -2.0					1.1	14.0							
																110.7	14.7		77	c	95% Opt +3.0					0.0	39.0							
	497	3.0-6.0	CL	4	18	78		25	14				13.0	116.8																			
BA-200	498	6.0-8.0	CL	0	19	81		28	13				13.8	115.1																			
BA-205	501	3.0-7.0	CL	0	14	86		29	13				13.8	115.7																			
BA-203	500	0.0-3.0	CL	0	14	86		30	14	2.69			12.8	116.3																			
																116.4	12.8		76	c	100% Opt	—				1.2	25.2							
																110.3	15.0		71	c	95% Opt +3.0					0.7	12.5							
																110.0	12.9		66	c	95% Opt					0.7	24.4							
																109.5	10.2		51	c	95% Opt -3.0					0.7	31.0							
																116.2	12.9		78	c	100% Opt					0.6	17.2							
																110.9	16.1		69	c	95% Opt +3.0					0.7	14.0							
																109.0	13.0		68	c	95% Opt					0.3	11.5							
																110.2	10.2		52	c	95% Opt -3.0					0.4	12.0							
																110.4	15.9		82	c	95% Opt +3.0					0.1	36.6							
BA-207	503	0.0-5.0	CL	0	9	91		36	14				17.1	107.8																			
	504	5.0-6.5	CL	0	8	92		40	13	2.72			16.5	106.7																			
																107.2	16.5		77	c	100% Opt	—				1.3	10.5							
																101.0	19.6		79	c	95% Opt +3.0					0.6	3.1							
																101.4	16.4		67	c	95% Opt					0.6	22.0							
																101.7	13.6		55	c	95% Opt -3.0					1.0	24.0							
																106.7	16.7		77	c	100% Opt					0.1	17.2							
																101.0	20.1		80	c	95% Opt +3.0					0.1	13.5							
																101.4	16.3		66	c	95% Opt					0.1	14.0							
																100.3	14.1		56	c	95% Opt -2.0					0.0	16.5							
																101.2	19.9		80	c	95% Opt +3.0					0.1	27.3							
BA-207	505	6.5-8.0	CL	0	10	90		41	14				17.1	107.9																			
BA-203	502	7.0-8.4	CL	0	11	89		43	15				10.6	105.7																			
BA-207	506	8.0-9.0	CL	0	10	90		47	14				19.6	103.5																			
BA-200	499	8.0-9.0	CL	0	5	95		47	19				23.2	98.7																			

FHR FORM 1 MAR 64 2006 (PREVIOUS EDITIONS MAY BE USED) (NO STANDARD) (TRANSLUCENT)

TC – Triaxial Compression
UC – Unconfined Compression
DS – Direct Shear
UU – Unconsolidated Undrained
CD – Consolidated Drained
CU – Consolidated Undrained
*Values at Pressure
T/SQ FT

APPENDIX H

PLATES

DIERKS DAM AND RESERVOIR
SALINE RIVER, ARKANSAS

EMBANKMENT CRITERIA AND PERFORMANCE REPORT

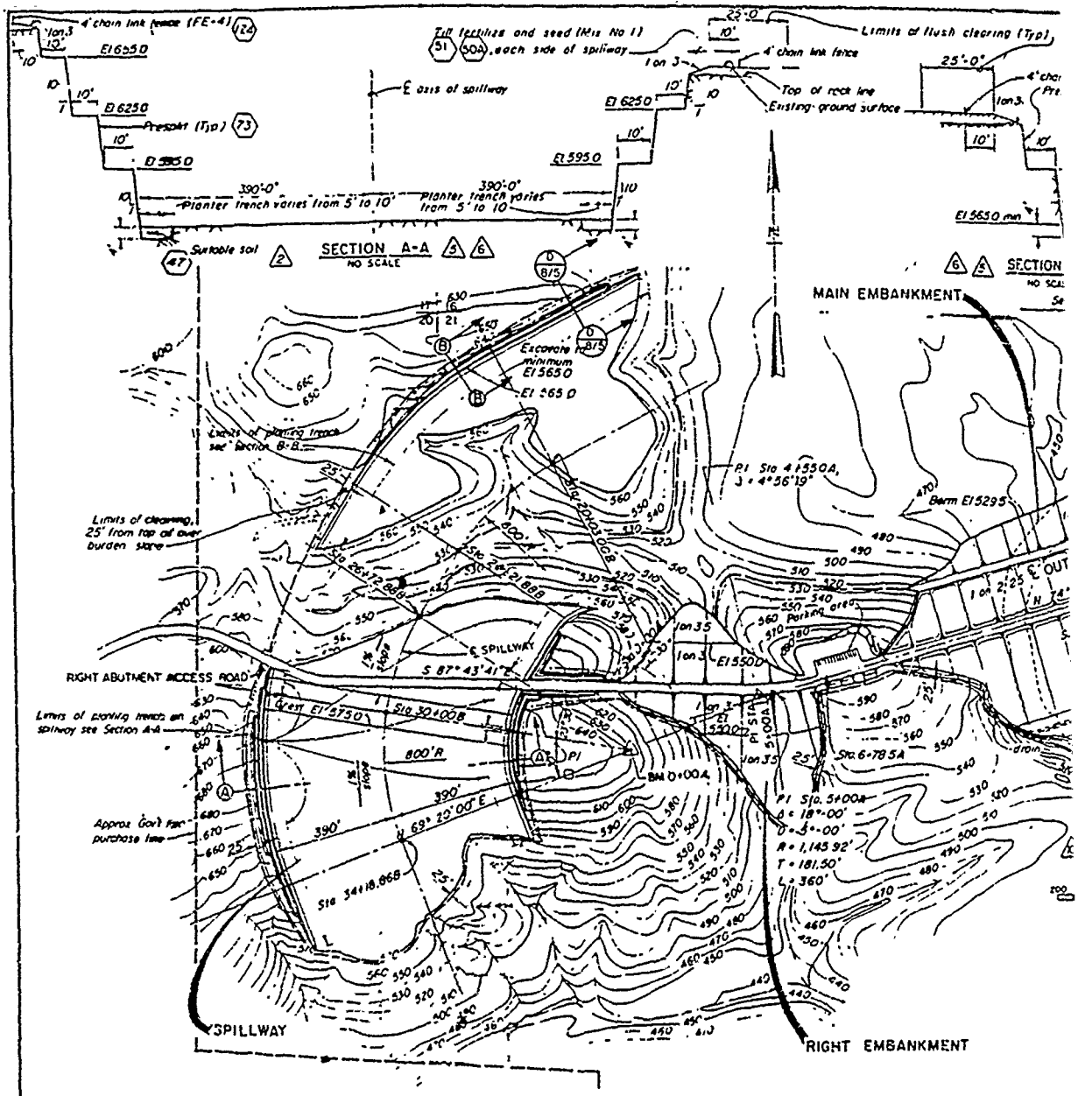
APPENDIX H - PLATES

Plate No.	Drawing No.	Title
1	1960-C3-2/1.10	General Plan and Sections
2	1960-C3-98/2	Foundation Exploration: Top of Rock Contours - Flood Plain
3	1960-C3-12/1.5	Embankment Plan and Profile
4	1960-C3-13/1.2	Engineering Measurement Devices: Embankment, Plan & Sections
5	1960-C3-98/3	Overburden Investigation: Sections AA, BB & CC - Borings & Test Pits
6	1960-C3-98/4	Overburden Investigation: Sections DD, EE & FF - Borings & Test Pits
7	1960-C3-98/5	Overburden Investigation: Sections GG & HH - Borings & Test Pits
8	1960-C3-98/6	Overburden Investigation: Sections II & JJ - Borings & Test Pits
9	1960-C3-98/7	Overburden Investigation: Sections LL, MM & KK - Borings & Test Pits
10	1960-C3-98/8.1	Overburden Investigation: Borrow Areas D & E - Plan & Logs
11	1960-C3-98/9A.1	Overburden Investigation: Borrow Area C - Plan & Logs
12	1960-C3-98/10	Foundation Exploration: General Geology & Plan of Exploration
13	1960-C3-98/11	Foundation Exploration: Geologic Sections A-A thru C-C
14	1960-C3-98/12	Foundation Exploration: Geologic Sections D-D thru F-F
15	1960-C3-98/13	Foundation Exploration: Geologic Sections G-G thru M-M
16	1960-C3-98/14	Foundation Exploration: Geologic Sections N-N thru P-P
17	1960-C3-98/15	Foundation Exploration: Geologic Sections & Rock Classification
18		Impervious Density Test Plot Profile Along Dam Axis
19		Density Test Plot Typical Embankment Sections "A" and "B"
20		Density Test Plot Typical Embankment Sections "C" and "D"
21		Density Test Plot Typical Embankment Section "E" and Right Embankment Section
22	1960-C3-8/5.4	Diversion & Excavation: Spillway Excavation - Plan, Profile & Section

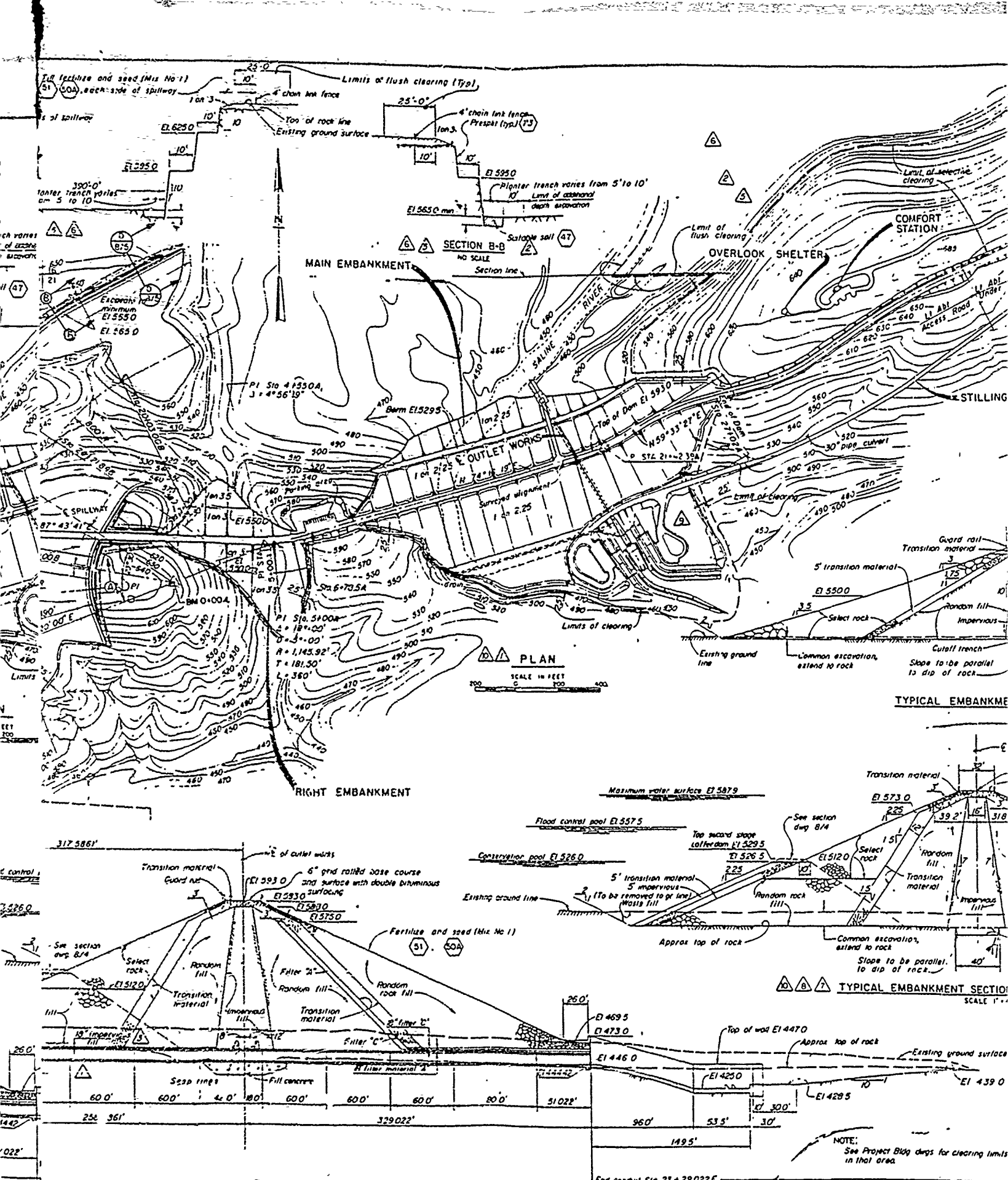
APPENDIX H - PLATES
(continued)

Plate No.	Drawing No.	Title
23	1960-C3-13/2.5	Engineering Measurement Devices: Embankment Sections and Details
24	1960-C3-13/3	Engineering Measuring Devices: Outlet Works and Service Bridge - Plan, Sections and Details
25	1960-C3-22/22.1	Outlet Works - Conduit: Concrete & Reinforcing - Conduit and Seep Rings - Sections & Details I
26	1960-C3-22/24.1	Outlet Works - Stilling Basin: General Plan, Excavation & Details
27	1960-C3-8/4.5	Diversion & Excavation: First Stage & Second Stage Diversion - Plans & Sections
28	1960-C3-12/2.10	Embankment: Typical Sections
29	1960-DM8-12/5	Main Embankment: Typical Sections
30	1960-DM8-97/10	Right Embankment: Upstream Sta. 2+50 - Stability Analysis - Sudden Drawdown Cond.
31	1960-DM8-97/11	Right Embankment: Downstream Sta. 5+20 - Stability Analysis - Steady Seepage Cond.
32	1960-DM8-97/12	Right Embankment: Upstream Sta. 2+50 - Stability Analysis - Partial Pool Condition
33	1960-DM8-97/13	Right Embankment: Downstream Sta. 5+20 - Stability Analysis - End of Construction Cond.
34	1960-DM8-97/12	Embankment and Spillway Stability Analysis - Partial Pool
35	1960-DM8-97/15	Embankment and Spillway Stability Analysis - Sudden Drawdown
36	1960-DM8-97/16	Embankment and Spillway Stability Analysis - Steady Seepage
37	1960-DM8-97/17	Embankment and Spillway Stability Analysis - End of Construction
38		Embankment: Typical Section
39		Part I Foundation Emb. Grouting - Grouting Profile Sta. 0+00 to 7+00
40		Part I Foundation Emb. Grouting - Grouting Profile Sta. 7+00 to 14+00
41		Part I Foundation Emb. Grouting - Grouting Profile Sta. 14+00 to 21+00
42		Part I Foundation Emb. Grouting - Grouting Profile Sta. 21+00 to 27+00
43	1960-C3-13/4	Engineering Measurement Devices - Conduit - Sections and Detail
44	1960-C3-13/5	Engineering Measurement Devices - Embankment - Terminal Cabinet - Sections, Elevation and Details
45	1960-DM8-97/1	Materials Usage Chart - Contract
46	1960-DM8-97/18	Embankment and Spillway Materials Usage Chart - August 1972

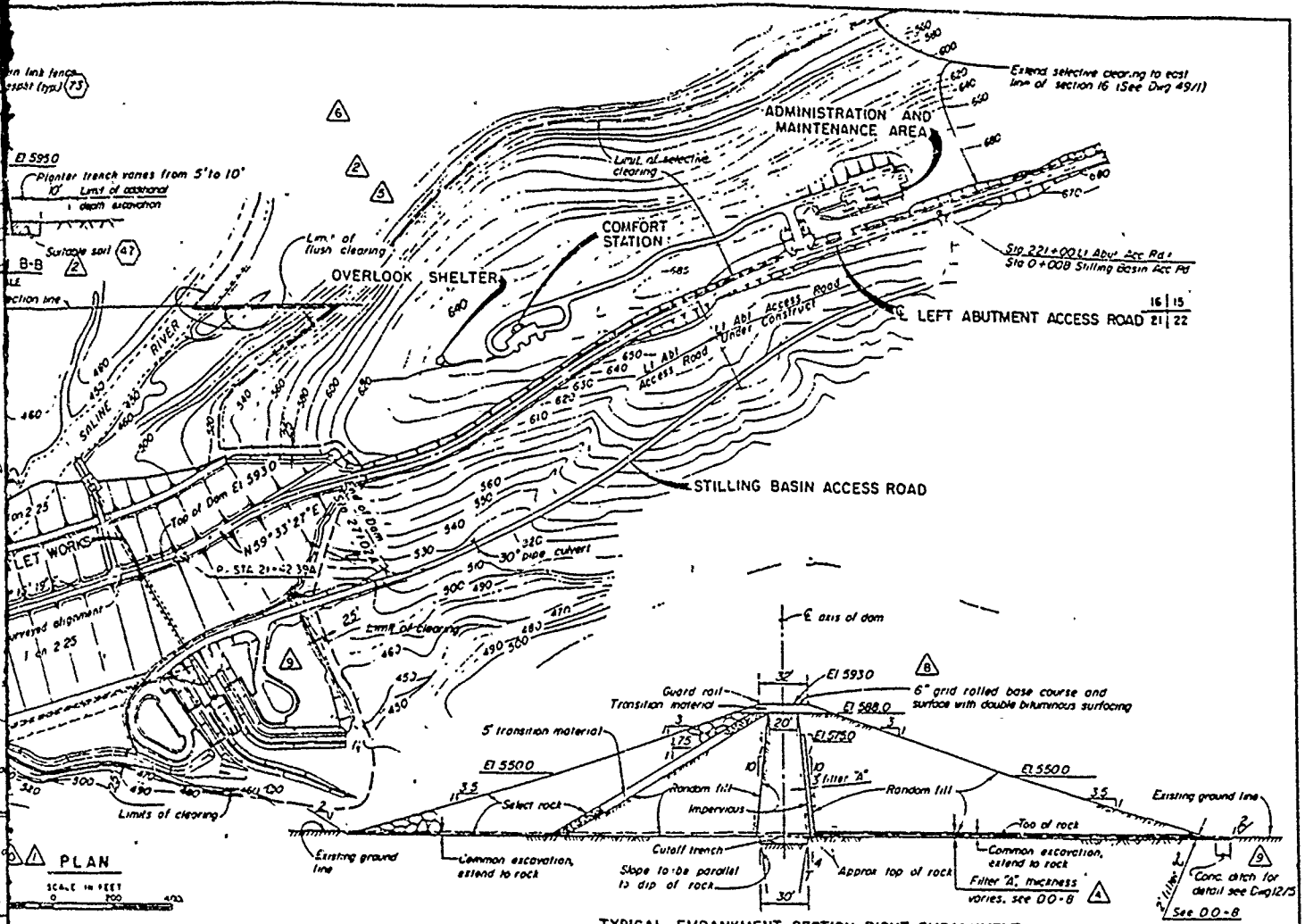
*U.S. GPO:1989-662-870



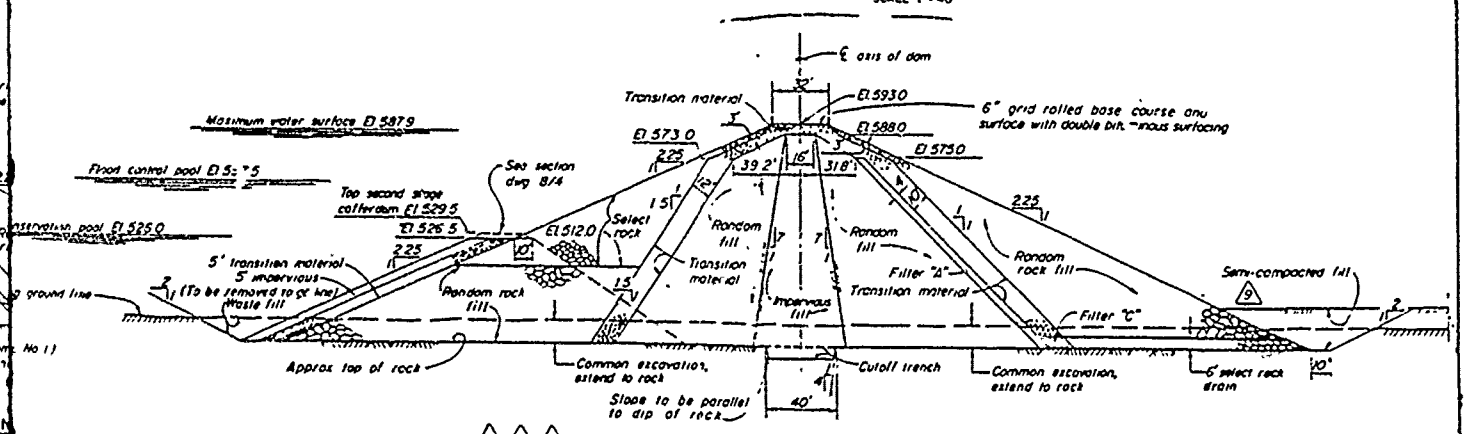
THIS DRAWING
FOR USE AS
WAS REPRODUC



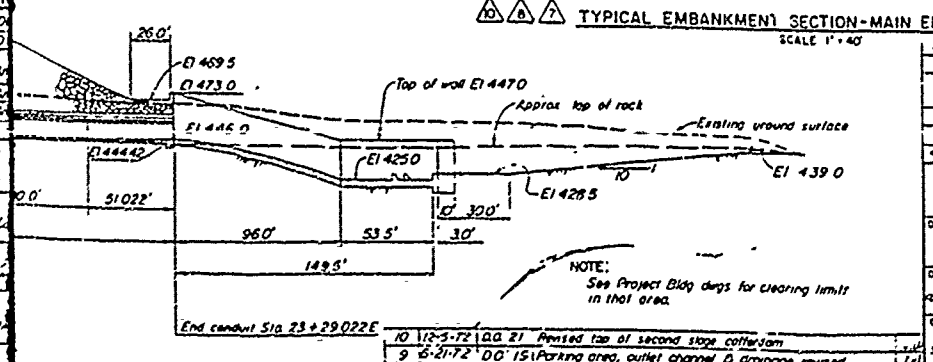
10	12-5-72	DO 21	Revised top of second stage cofferdam	
9	6-21-72	DO 19	Parking area, outlet channel & drainage revised	
8	4-6-72	DO 18	Main embankment sections revised	
7	11-1-71	DO 13	Main embankment sections revised	
6	9-13-71	Supl 1 DO 11	Spillway & Spillway approach berms revised approach slopes revised	



TYPICAL EMBANKMENT SECTION-RIGHT EMBANKMENT
SCALE 1" = 40'



TYPICAL EMBANKMENT SECTION-MAIN EMBANKMENT
SCALE 1" = 40'



10	12-5-72	DD 21	Revised top of second stage cofferdam
9	6-21-72	DD 15	Parking area, outlet channel & drainage revised
8	4-6-72	DD 18	Main embankment sections revised
7	11-1-71	DD 13	Main embankment sections revised
6	9-13-71	Subst 1 DD 11	Spillway & Spillway approach berms revised Spillway approach slopes revised

5	7-30-71	DD-11	Spillway & spillway approach berms revised & masonry planters added. Spillway approach slopes revised
4	15-4-71	100-8	Limits of filter "A" & filter "C" revised
3	5-22-70	Am'd 005	Section along ℄ outlet works, revised impervious fill along conduit
2	5-18-70	Am'd 004	Changed 'topsoil' to 'suitable soil'
1	11-5-70	plan 001	Added limits of clearing, dam details & pay items
NO.	DATE	CHANGE	REVISION INDICATED BY A1

U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

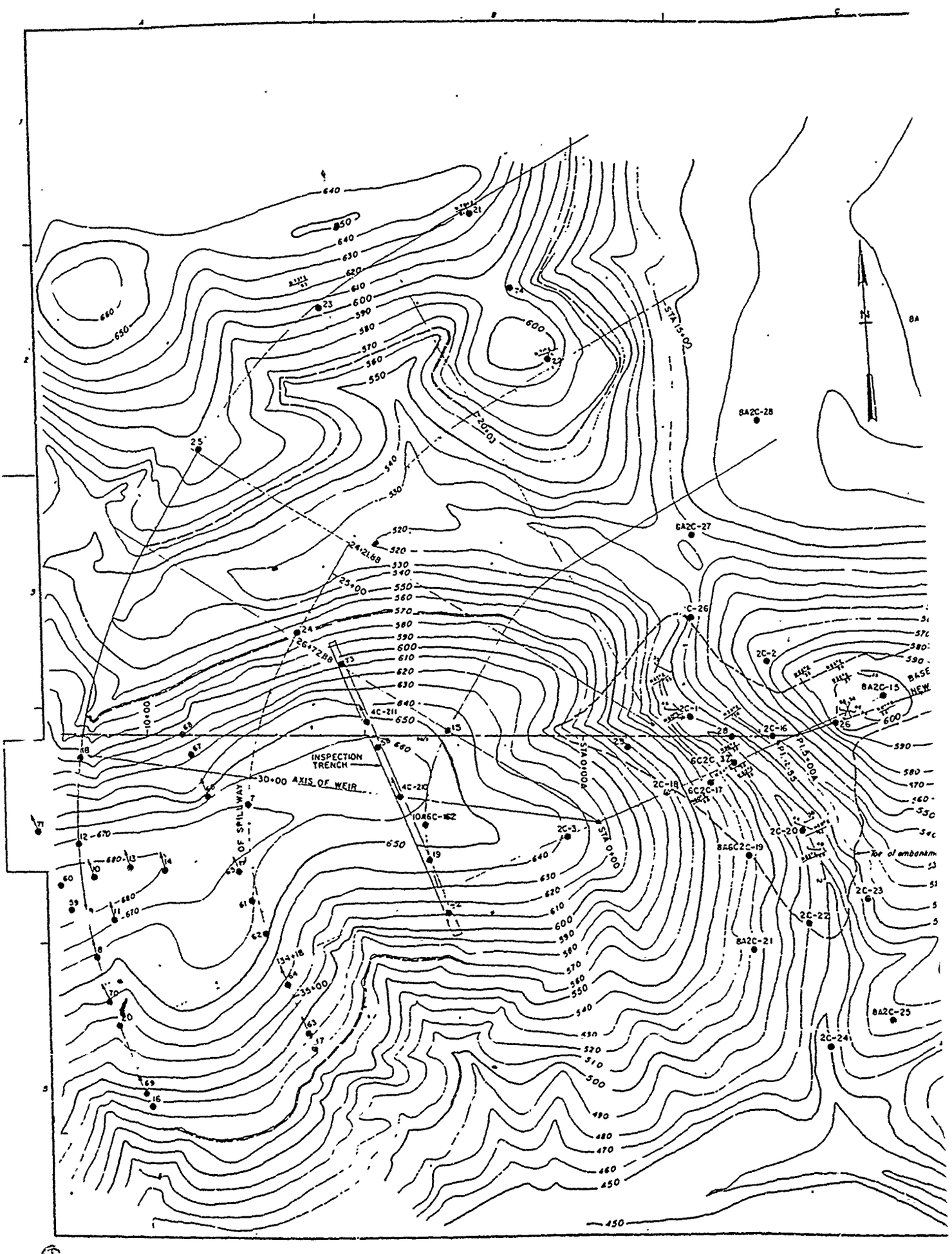
DESIGNED BY
DRAWN BY
CHECKED BY
SUBMITTED

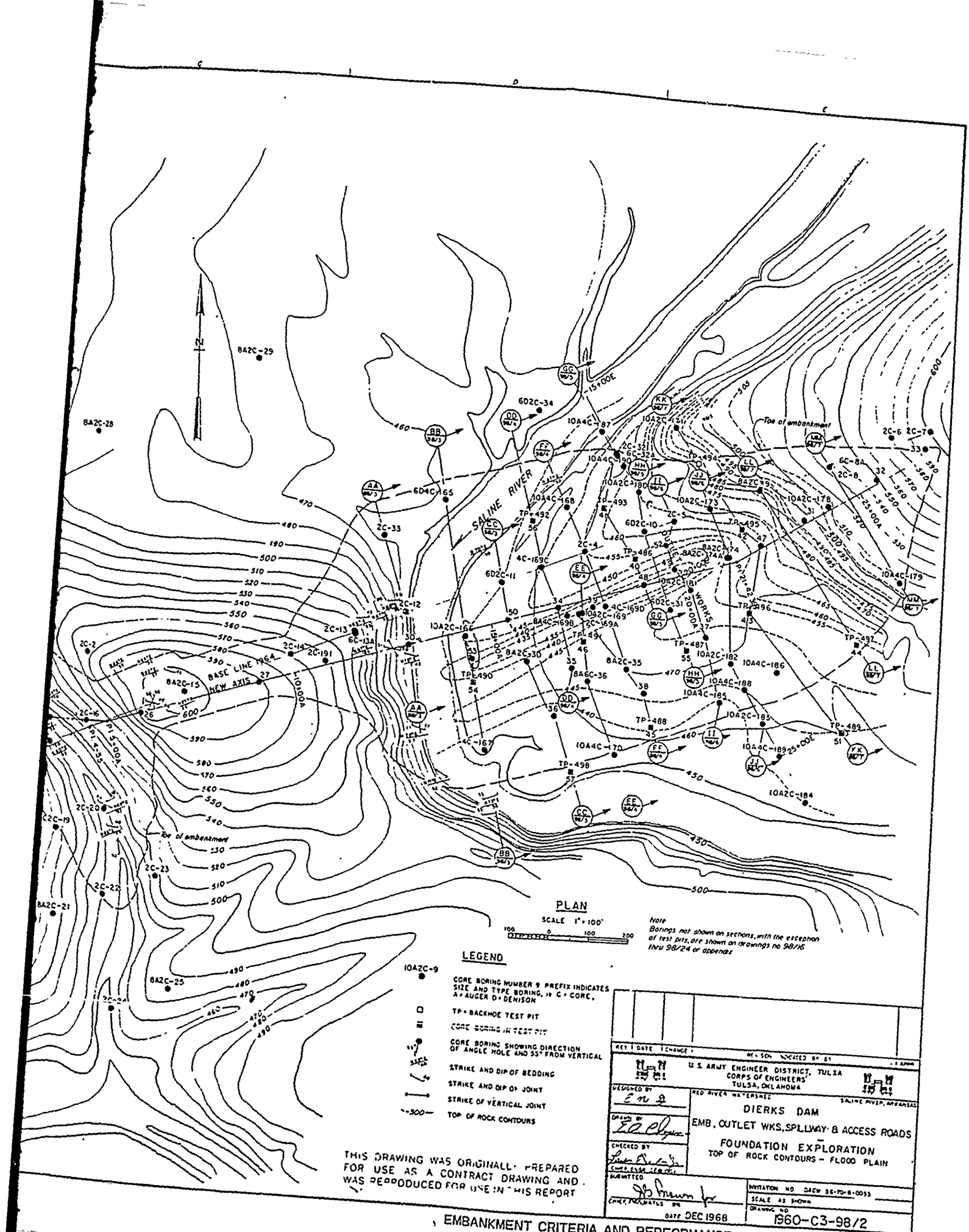
DIERKS DAM
EMB, OUTLET WORKS, SPILLWAY & ACCESS ROS
GENERAL PLAN
PLAN AND SECTIONS

INVITATION NO DACW56-72-B-0083
SCALE AS SHOWN
DRAWING NUMBER 1960-C3-2/1.10
DATE DEC 1968

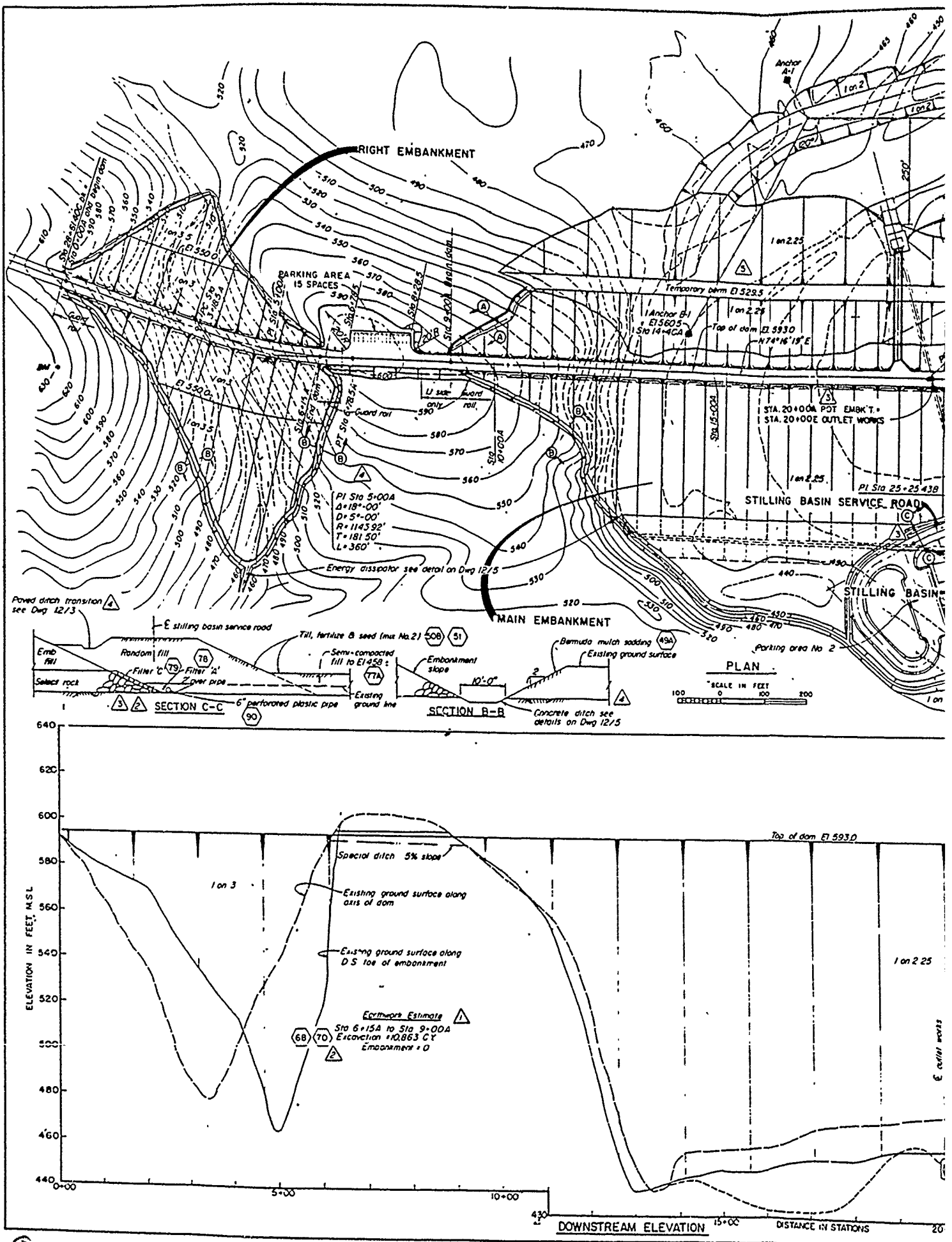
WAS ORIGINALLY PREPARED AS A CONTRACT DRAWING AND IS FOR USE IN THIS REPORT

EMBANKMENT CRITERIA AND PERFORMANCE REPORT - PLATE NO. 1

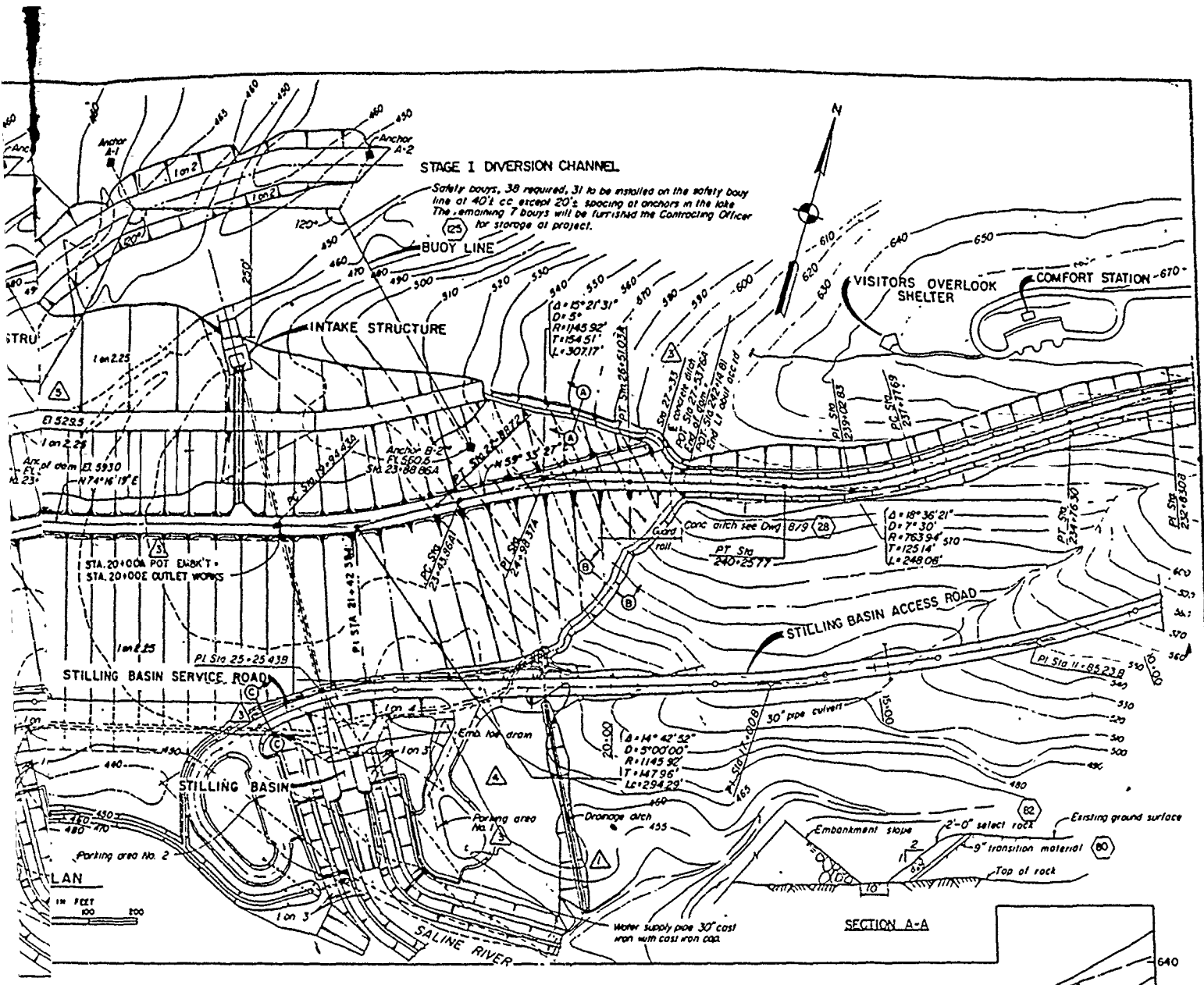

INSPECTION TRENCH
30+00 AXIS OF WEIR
OF SPILLWAY
STA 0+00A
STA 15+00
STA 10+00
8A2C-28
8A2C-27
8A2C-15
8A2C-21
8A2C-25
8A6C2C-19
6C2C-32
6C2C-17
2C-1
2C-2
2C-3
2C-16
2C-18
2C-20
2C-22
2C-23
2C-24
4C-21
4C-20
10A6C-162
C-26
640
650
630
620
610
600
590
580
570
560
550
540
530
520
510
500
490
480
470
460
450



EMBANKMENT CRITERIA AND PERFORMANCE REPORT - PLATE NO. 2


RIGHT EMBANKMENT
MAIN EMBANKMENT
PARKING AREA 15 SPACES
STILLING BASIN SERVICE ROAD
STILLING BASIN
Anchor A-1
Anchor B-1 El 5605 Sta 14+46 CA
Top of dam El 5930 N 74° 16' 19" E
Temporary berm El 529.5
STA. 20+00A POT EMB'K'T.
STA. 20+00E OUTLET WORKS
PI Sta 5+00A Δ=18°-00' D=5°-00' R=1145.92' T=181.50' L=360'
PI Sta 25+25.438
Energy dissipator see detail on Dwg 12/5
Paved ditch transition see Dwg 12/3
Parking area No 2
1 on 2.25
1 on 2
1 on 3
1 on 3.5
SECTION C-C
SECTION B-B
PLAN
Emb fill
Random fill
Filter 'C'
Filter 'A'
Select rock
2" over pipe
6" perforated plastic pipe
Till, fertilize & seed (mix No. 2)
Semi-compacted fill to El 458±
Existing ground line
Embankment slope
Bermuda mulch sodding
Existing ground surface
Concrete ditch see details on Dwg 12/5
SCALE IN FEET
Special ditch 5% slope
Existing ground surface along axis of dam
Existing ground surface along D S toe of embankment
Earthwork Estimate
Sta 6+15A to Sta 9+00A
Excavation = 10,863 C.Y.
Embankment = 0
Top of dam El 5930
ELEVATION IN FEET M.S.L.
DOWNSTREAM ELEVATION
DISTANCE IN STATIONS

(1)



THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

5	12-5-72 00 21	Revised upstream embankment berm
4	6-21-72 00 19	Parking area, outlet channel & drainage revised
3	5-21-70 Am 0005	Revised Plan & Section C-C
2	1-5-70 Am 1996	Revised key trench
1	11-5-70 Am 0001	Added note and limit of semi-compacted fill

U.S. ARMY ENGINEER DISTRICT TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

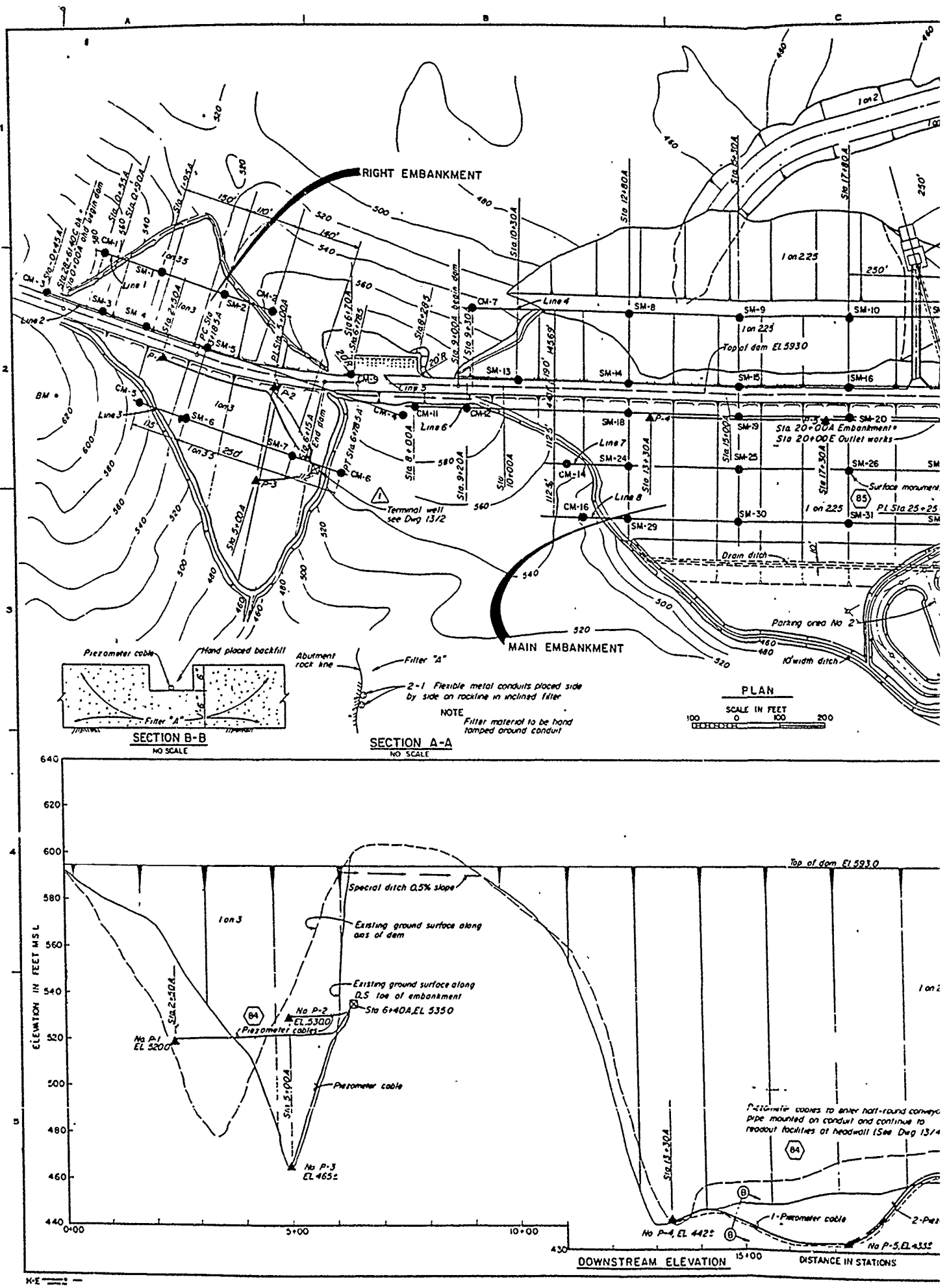
RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

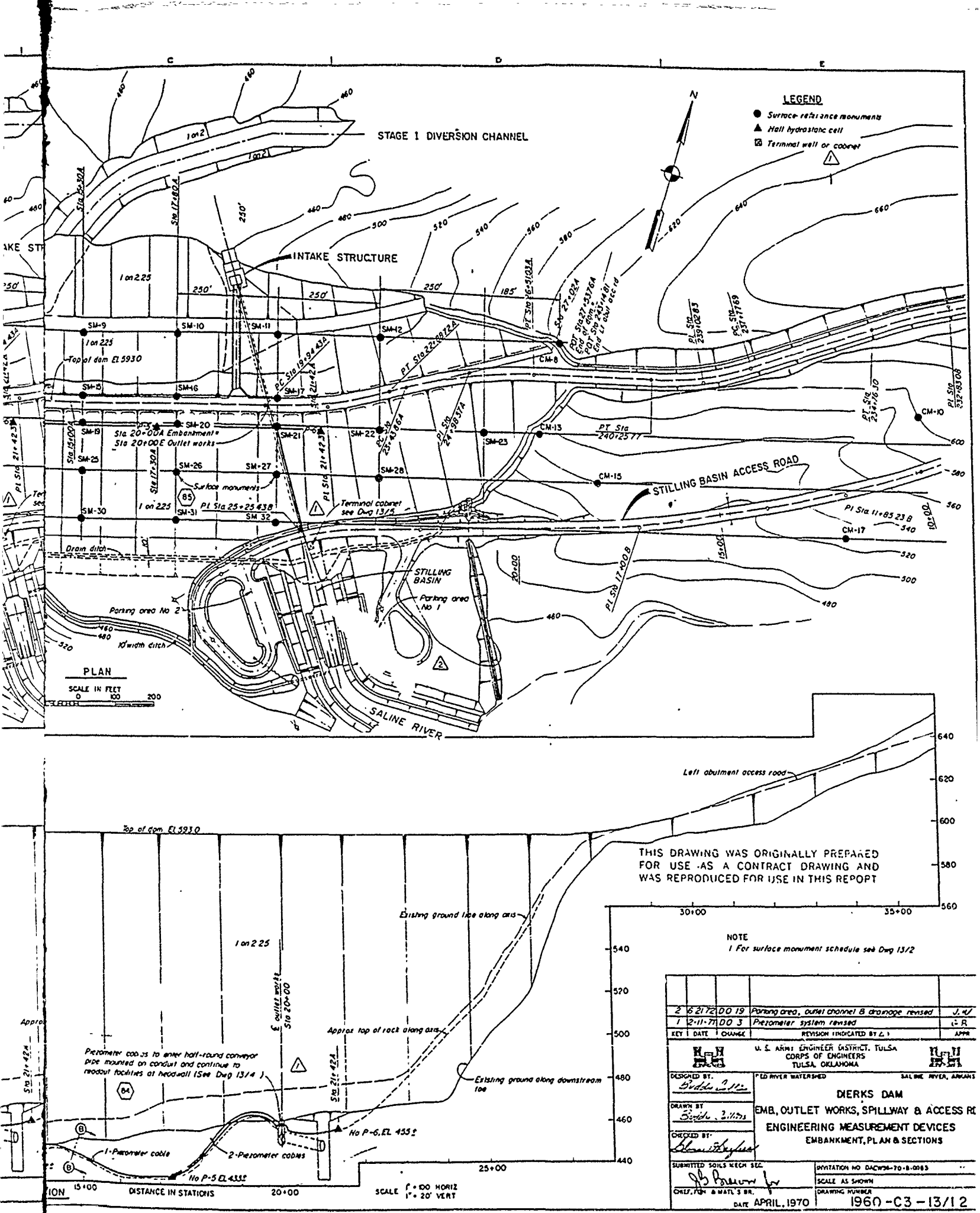
DESIGNED BY
DRAWN BY
CHECKED BY
SUBMITTED BY
Chief, C&C Engr Sec A
DATE DEC. 1968

DIERKS DAM
EMB, OUTLET WORKS, SPILLWAY & ACCESS RDS.
EMBANKMENT
PLAN & PROFILE

INVITATION NO DACW 56-70-B-0033
SCALE AS SHOWN
DRAWING NO 1960-C3-12/1.5

EMBANKMENT CRITERIA AND PERFORMANCE REPORT - PLATE NO. 3


RIGHT EMBANKMENT
MAIN EMBANKMENT
Top of dam EL 5930
Sta 20+00A Embankment
Sta 20+00E Outlet works
Surface monument
Drain ditch
Parking area No 2
10' width ditch
Terminal well see Dwg 13/2
PLAN
SCALE IN FEET
SECTION B-B
NO SCALE
Piezometer cable
Hand placed backfill
Filter "A"
SECTION A-A
NO SCALE
Abutment rock line
2-1 Flexible metal conduits placed side by side on rockline in inclined filter
NOTE
Filter material to be hand tamped around conduit
ELEVATION IN FEET M.S.L.
Top of dam El 593.0
Special ditch 0.5% slope
Existing ground surface along axis of dam
Existing ground surface along D.S. toe of embankment
Sta 6+40A, EL 5350
No P-2 EL 5300
(Piezometer cables)
No P-1 EL 5200
Piezometer cable
No P-3 EL 465±
No P-4, EL 442±
No P-5, EL 433±
1-Piezometer cable
DOWNSTREAM ELEVATION
DISTANCE IN STATIONS



THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

NOTE
1 For surface monument schedule see Dwg 13/2

KEY	DATE	CHANGE	REVISION INDICATED BY Δ	APPR
2	6 21 72	00 19	Parking area, outlet channel & drainage revised	J.W
1	2-11-71	00 3	Piezometer system revised	C.R

U. S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

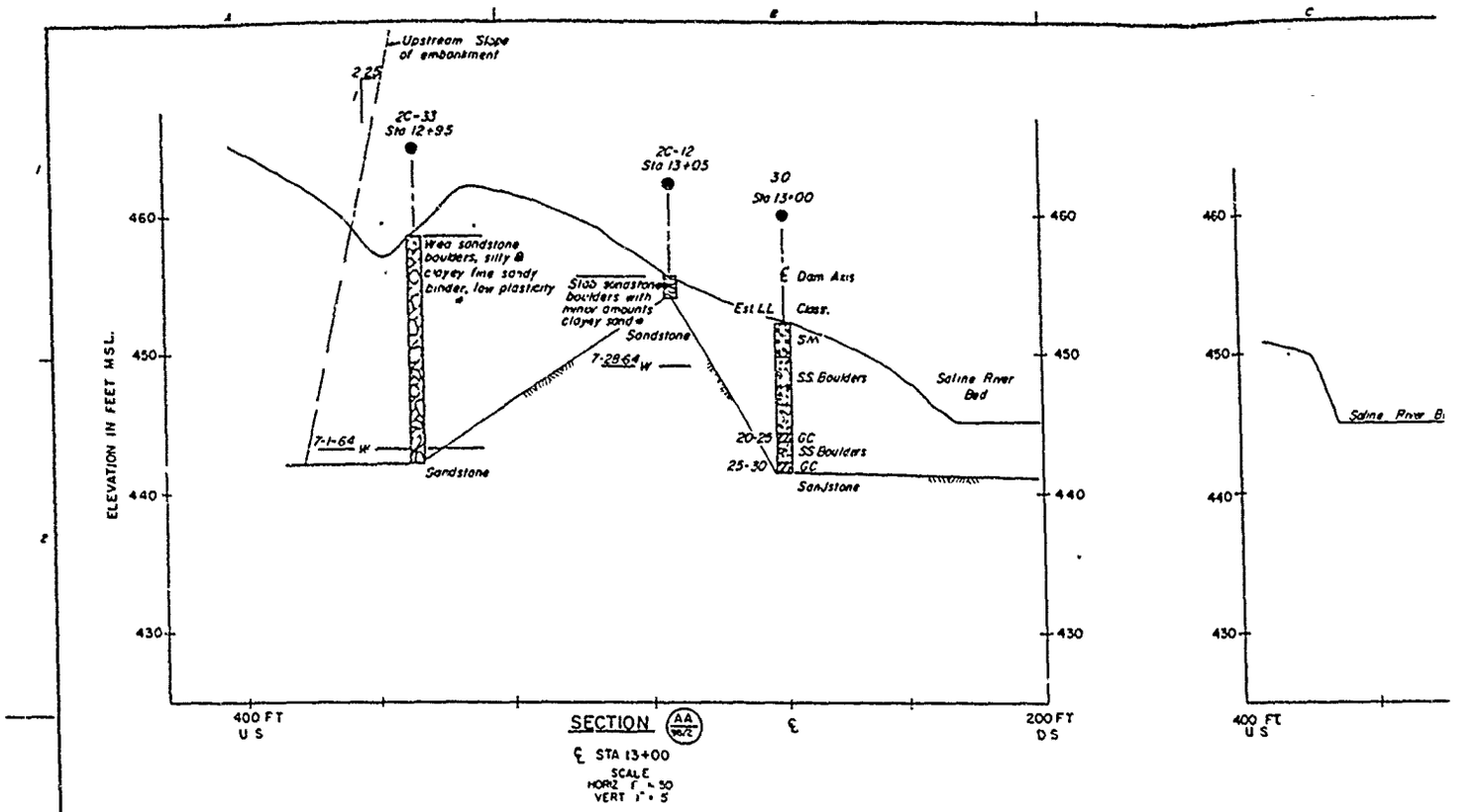
RED RIVER WATERSHED — SALINE RIVER, ARKANS

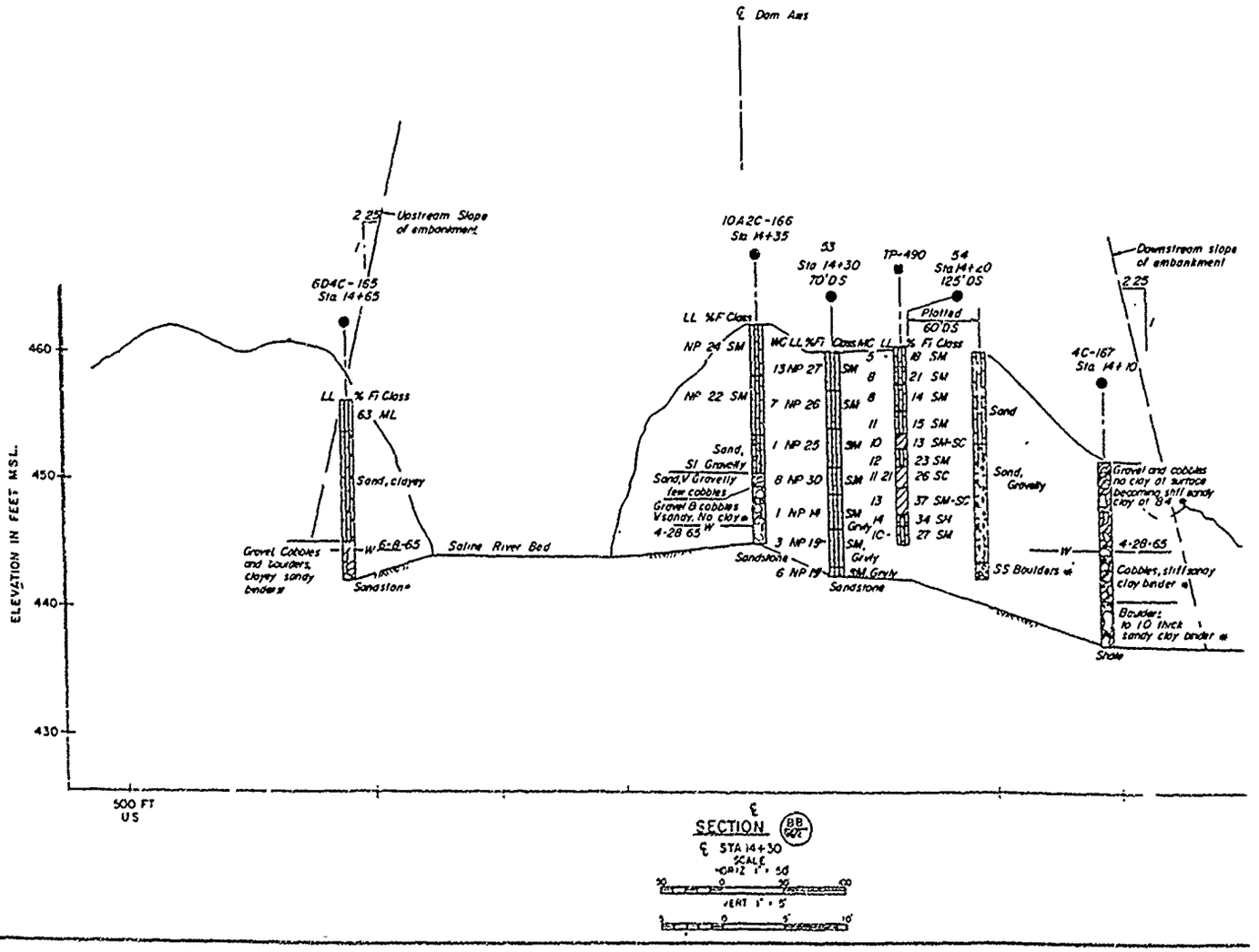
DESIGNED BY: Budd Sills
DRAWN BY: Budd Sills
CHECKED BY: Glenn Boyles
SUBMITTED SOILS MECH SEC: J.B. Patterson for
CHIEF, FDN & MAT'L'S BR.
DATE APRIL, 1970

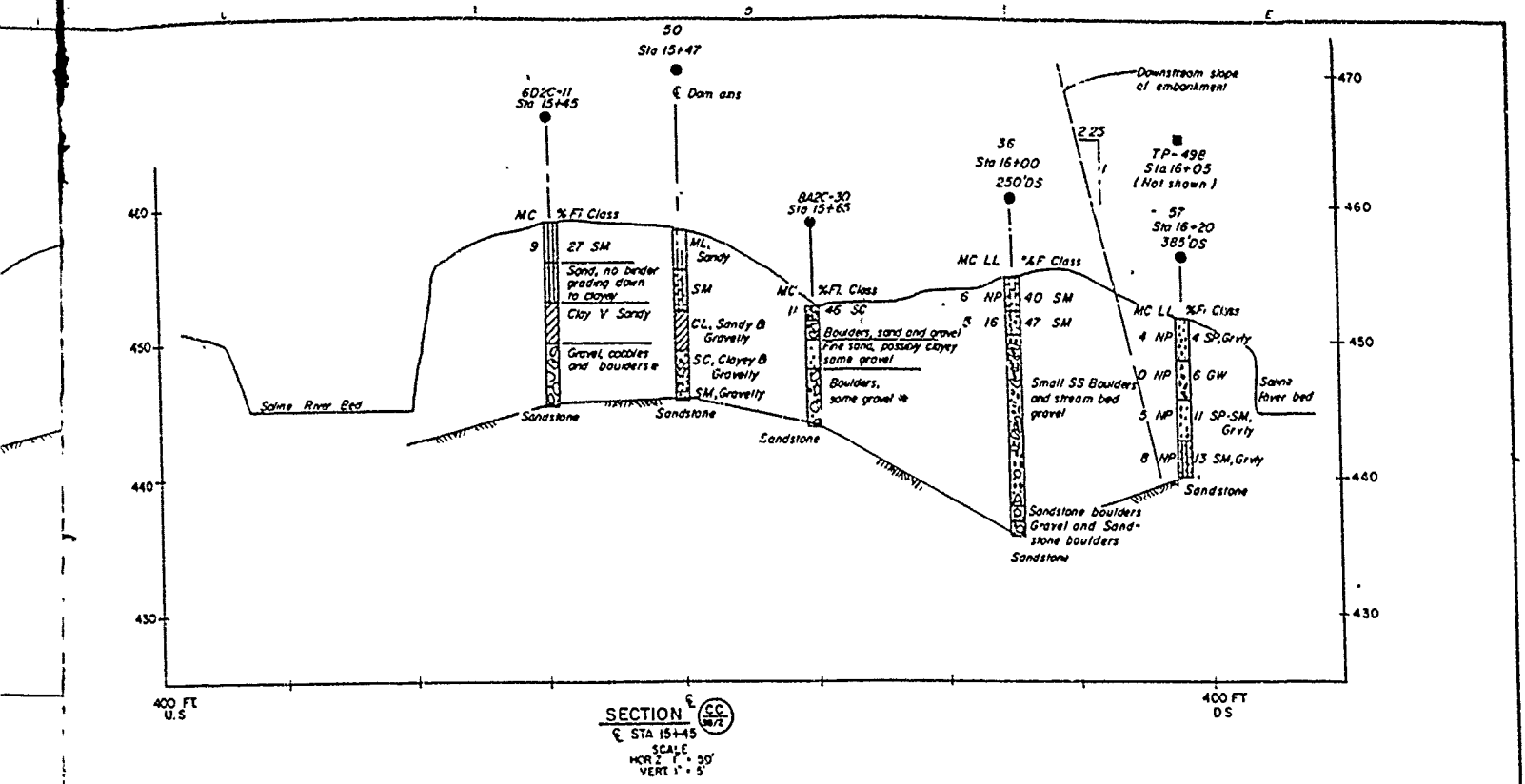
DIERKS DAM
EMB, OUTLET WORKS, SPILLWAY & ACCESS RO
ENGINEERING MEASUREMENT DEVICES
EMBANKMENT, PLAN & SECTIONS

INVITATION NO DACW56-70-B-0083
SCALE AS SHOWN
DRAWING NUMBER 1960-C3-13/12

EMBANKMENT CRITERIA AND PERFORMANCE REPORT - PLATE NO. 4

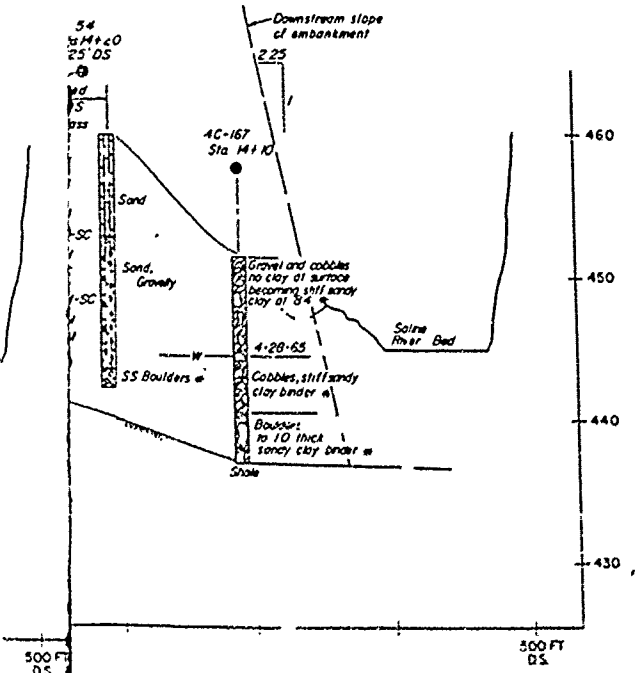

Upstream Slope of embankment
2.25
1
2C-33
Sta 12+95
2C-12
Sta 13+05
30
Sta 13+00
℄ Dam Axis
Est LL Class.
Weathered sandstone boulders, silty & clayey fine sandy binder, low plasticity
Slab sandstone boulders with minor amounts clayey sand
Sandstone
7-28-64 W
7-1-64 W
SM
SS Boulders
Saline River Bed
20-25 GC SS Boulders
25-30 GC
Sandstone
ELEVATION IN FEET MSL.
460
450
440
430
400 FT US
SECTION AA
℄ STA 13+00
SCALE
HORIZ 1" = 50
VERT 1" = 5
200 FT DS
Saline River Bed


℄ Dam Axis
2.25
Upstream Slope of embankment
1
6D4C-165
Sta 14+65
LL %F Class
63 ML
Sand, clayey
Gravel Cobbles and boulders, clayey sandy binder
7-8-65 W
Sandstone
Saline River Bed
10A2C-166
Sta 14+35
53
Sta 14+30
70' DS
TP-490
54
Sta 14+20
125' DS
Plotted 60' DS
WC LL %F Class MC
NP 24 SM
13 NP 27 SM
NP 22 SM
7 NP 26 SM
1 NP 25 SM
Sand, SI Gravelly
Sand, V Gravelly few cobbles
8 NP 30 SM
Gravel & cobbles V sandy, No clay
1 NP NP
4-28-65 W
3 NP 19 SM, Gravelly
Sandstone
6 NP NP SM Gravelly
Sandstone
LL %F Class
5 18 SM
8 21 SM
8 14 SM
11 15 SM
10 13 SM-SC
12 23 SM
11 21 26 SC
13 37 SM-SC
14 34 SM
27 SM
Sand
Sand, Gravelly
SS Boulders
Downstream slope of embankment
2.25
1
4C-167
Sta 14+10
Gravel and cobbles no clay at surface becoming stiff sandy clay at 8'
4-28-65 W
Cobbles, stiff sandy clay binder
Boulders to 1.0 thick sandy clay binder
Shale
ELEVATION IN FEET MSL.
460
450
440
430
500 FT US
℄ SECTION BB
℄ STA 14+30
SCALE
HORIZ 1" = 50
VERT 1" = 5



SECTION ℄ STA 15+45 (CC 98/2)

SCALE
HOR 1" = 50'
VERT 1" = 5'



LEGEND

LABORATORY CLASSIFICATION

GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
GM	Silty gravels, gravel-sand-silt mixtures
GC	Clayey gravels, gravel-sand-clay mixtures
SP	Poorly-graded sands, gravelly sands, little or no fines
SM	Silty sands, sand-silt mixtures
SC	Clayey sands, sand-clay mixtures
ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
CL	Inorganic clays of low plasticity gravelly clays, sandy clays, silty clays, lean clays
CH	Inorganic clays of high plasticity, fat clays
NP	Non-Plastic
∗	Visual classification only, from wash samples

NOTE

1 See Dwg 98/2 for additional legend

2 In holes where no water table is shown, the table was not obtained. Absence of water table elevations on logs does not necessarily mean that ground water will not be encountered at the locations and within the vertical reaches of these borings

KEY	DATE	CHANGE	REVISION INDICATED BY 31	APP'D

U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

DESIGNED BY L. Milland
DRAWN BY L. Milland
CHECKED BY
CHIEF SOILS MECH SEC

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

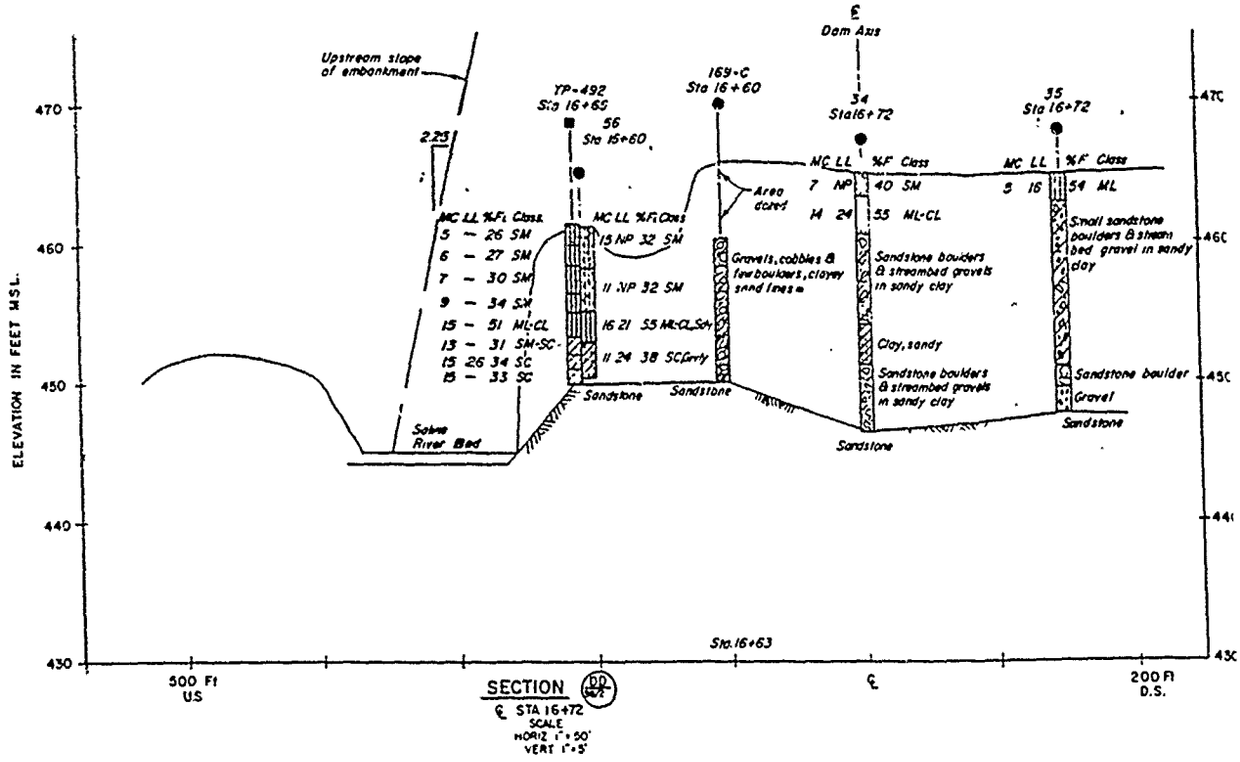
DIERKS DAM
EMB, OUTLET WORKS, SPILLWAY & ACCESS RDS
OVERBURDEN INVEST. - MAIN EMB. FOUNDATION
SECTIONS AA, BB, & CC - BORINGS & TEST PITS

SUBMITTED
CHIEF ENG DIV
DATE DEC 1968

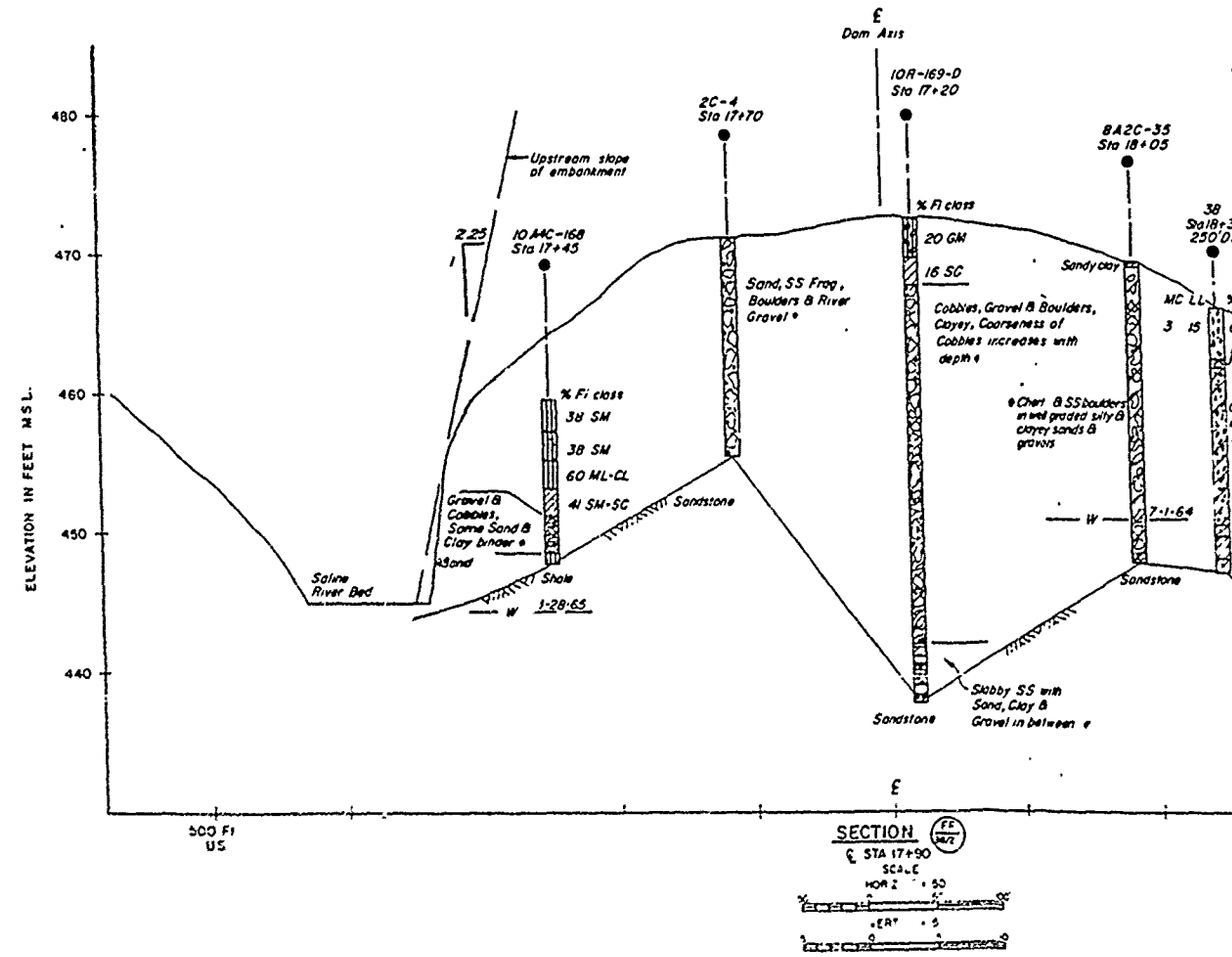
INVITATION NO DACW 56-70-B-0053
SCALE AS SHOWN
DRAWING NO 1960-C3-98/3

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

EMBANKMENT CRITERIA AND PERFORMANCE REPORT - PLATE NO. 5

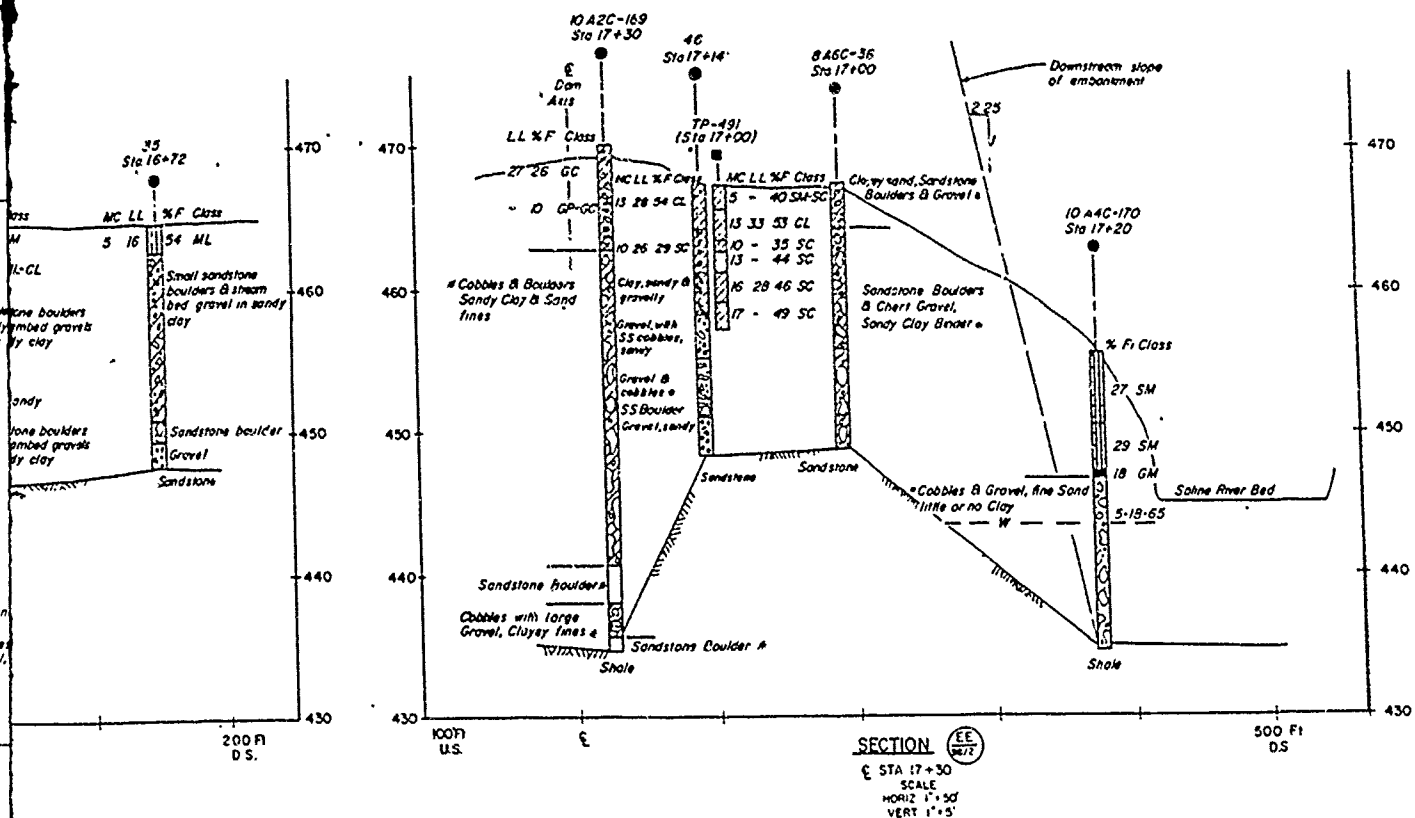


SECTION (DD 5/72)
℄ STA 16+72
SCALE
HORIZ 1" = 50'
VERT 1" = 5'

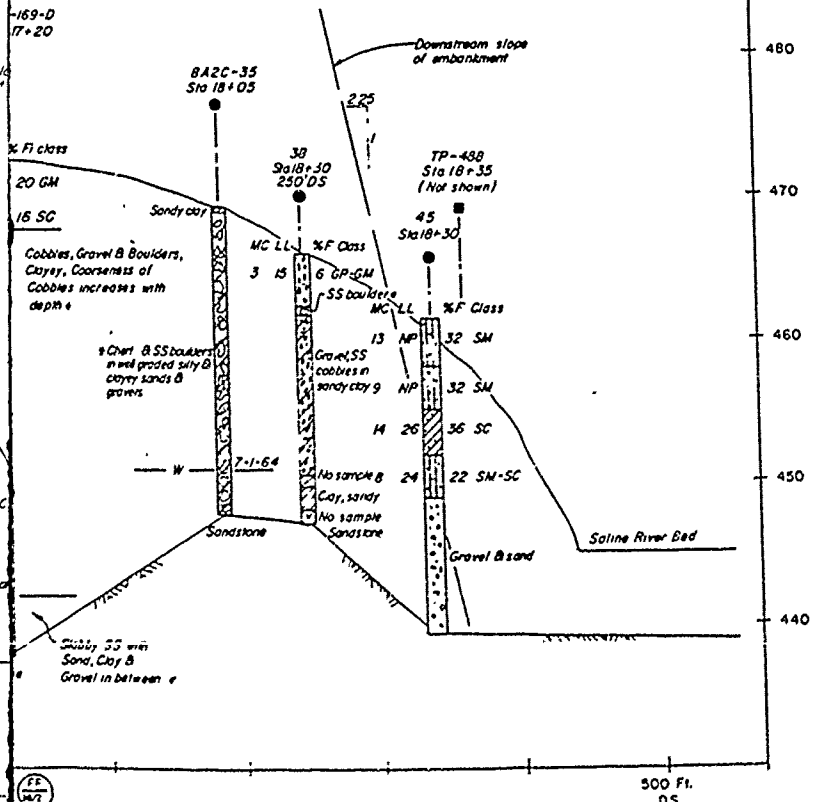


SECTION (FF 5/72)
℄ STA 17+90
SCALE
HOR 2" = 50'
VERT = 5'

(1)



SECTION (EE 98/2)
℄ STA 17+30
SCALE
HORIZ 1"=50'
VERT 1"=5'

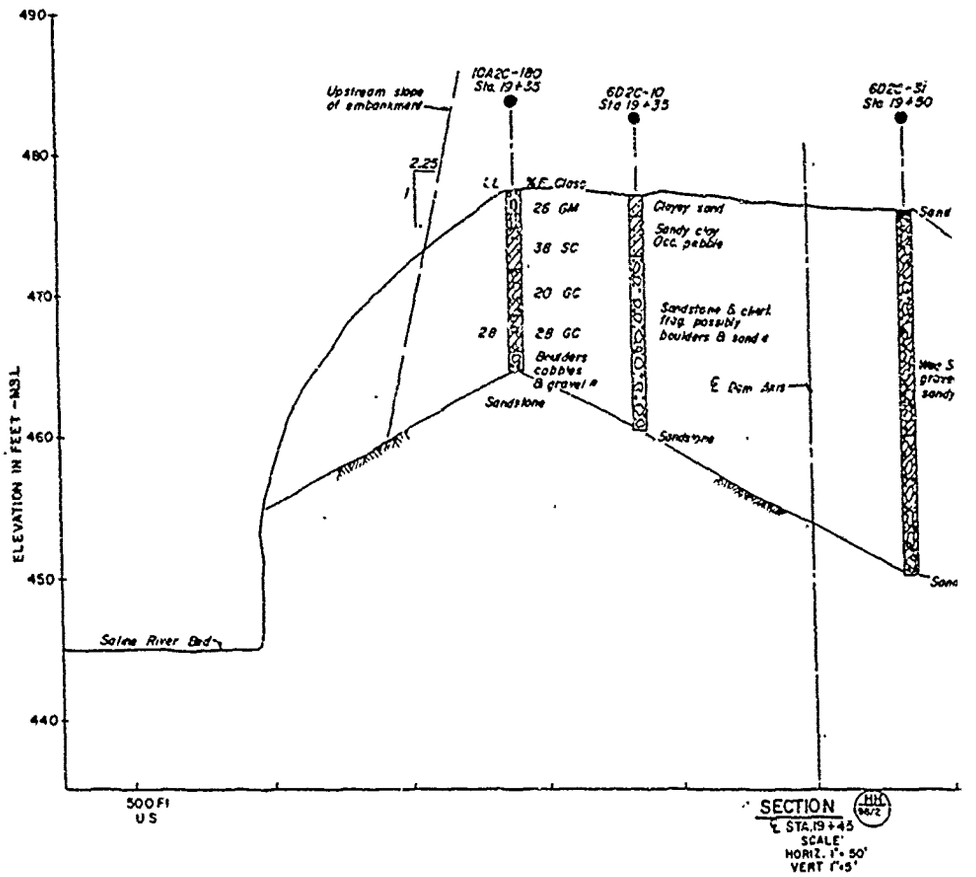


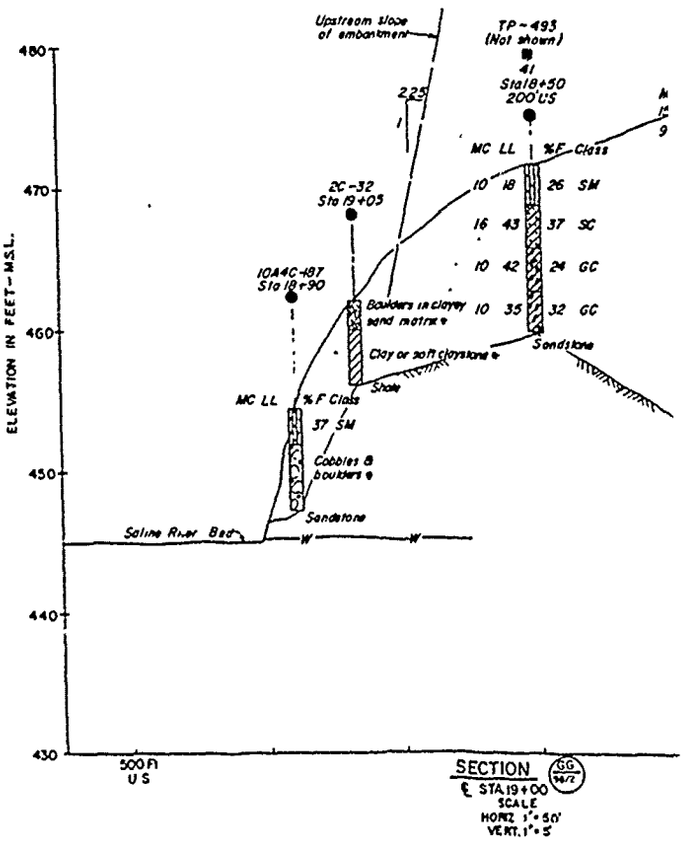
NOTES
1 See Dwg 98/2 B 3 for legend

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

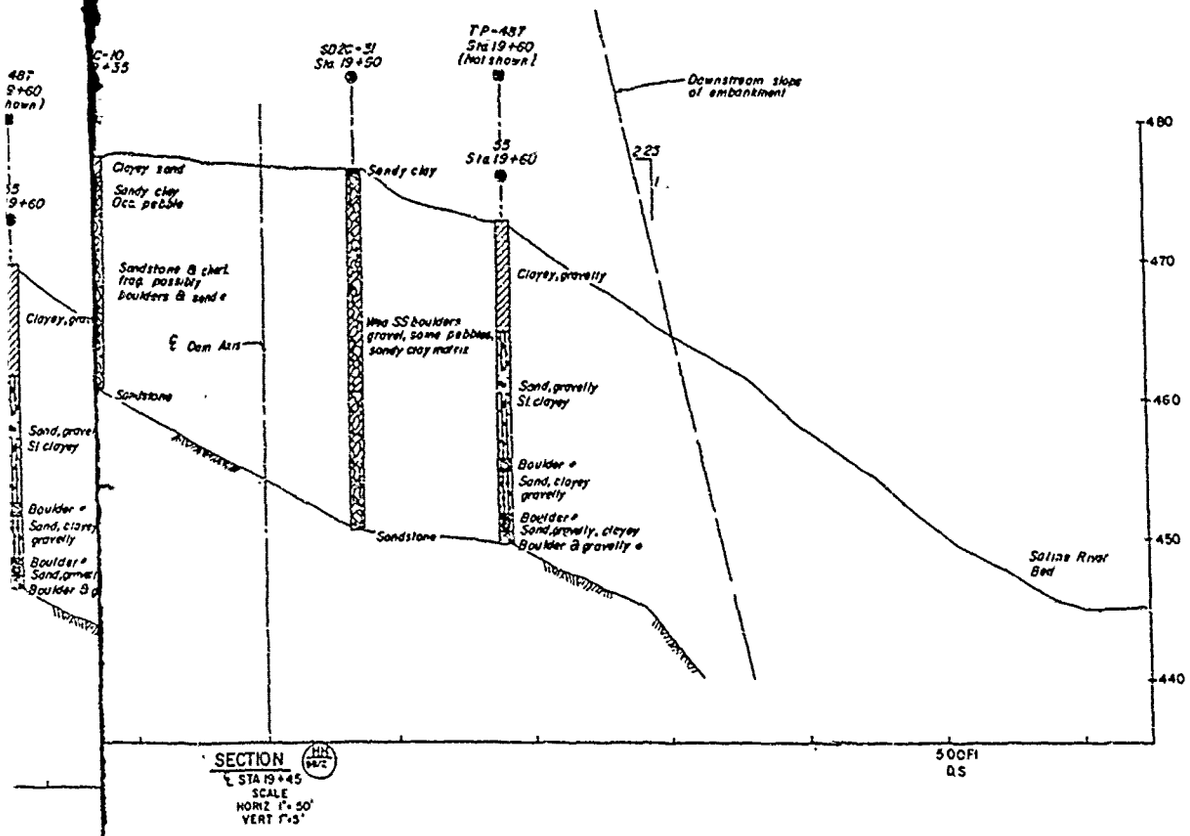
U.S. ARMY ENGINEER DISTRICT, TULSA CORPS OF ENGINEERS TULSA, OKLAHOMA	
DESIGNED BY	DIERKS DAM
DRAWN BY	EMB, OUTLET WORKS, SPILLWAY & ACCESS R
CHECKED BY CHIEF, SOILS MECH. SEC.	OVERBURDEN INVEST-MAIN EMB FOUNDAT
SUBMITTED CHIEF, ENG. GEOLOGY BR	SECTIONS CC, EE, & FF - BORINGS & TEST PITS
	INVITATION NO DACW 56-70-B-0033
	SCALE AS SHOWN
DATE DEC 1968	DRAWING NO 1960-C3-98/

EMBANKMENT CRITERIA AND PERFORMANCE REPORT - PLATE NO.

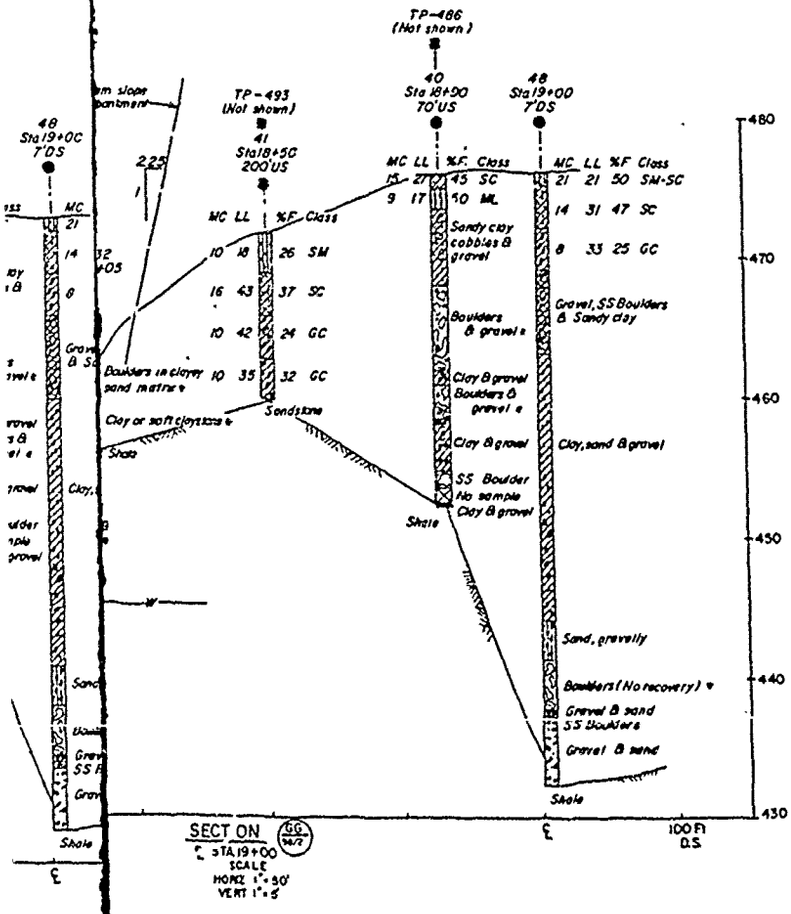

ELEVATION IN FEET – MSL
490
480
470
460
450
440
Upstream slope of embankment
10A2C-180
Sta 19+35
6D2C-10
Sta 19+35
6D2C-31
Sta 19+50
2.25
1
LL
%F Class
25 GM
38 SC
20 GC
28
28 GC
Boulders cobbles & gravel
Sandstone
Clayey sand
Sandy clay
Occ. pebble
Sandstone & chert frag. possibly boulders & sand
℄ Dam Axis
Sandstone
Sand
Weak S grave sandy
Saline River Bed
500 Ft
U S
SECTION
℄ STA. 19+45
SCALE
HORIZ. 1"=50'
VERT 1"=5'


ELEVATION IN FEET – M.S.L.
480
470
460
450
440
430
Upstream slope of embankment
TP-493
(Not shown)
41
Sta 18+50
200' U/S
2.25
1
MC LL
%F Class
10 18 26 SM
16 43 37 SC
10 42 24 GC
10 35 32 GC
2C-32
Sta 19+05
10A4C-197
Sta 18+90
Boulders in clayey sand matrix
Clay or soft claystone
Sandstone
Shale
MC LL
%F Class
37 SM
Cobbles & boulders
Sandstone
Saline River Bed
500 Ft
U S
SECTION
℄ STA. 19+00
SCALE
HORIZ. 1"=50'
VERT. 1"=5'

(1)



SECTION (HH 98/2)
℄ STA 19+45
SCALE
HORIZ 1"=50'
VERT 1"=5'



SECTION (GG 98/2)
℄ STA 19+00
SCALE
HORIZ 1"=50'
VERT 1"=5'

NOTES:
1 See dwg 98/2 & 3 for legend

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

KEY	DATE	CHANGE	REVISION NO CHKD BY	APPD

U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

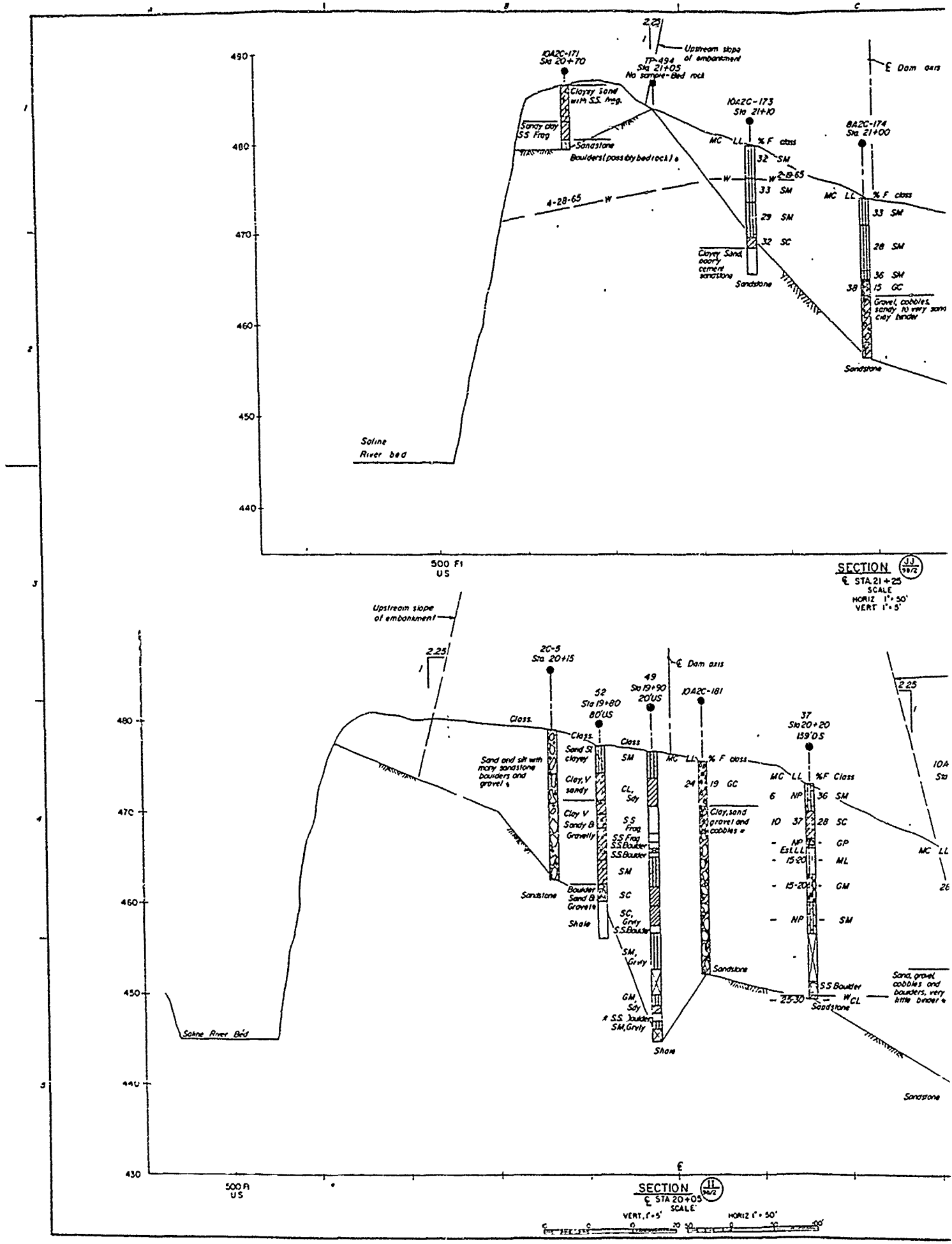
DESIGNED BY
DRAWN BY
CHECKED BY
CHIEF SOILS MECH SEC
SUBMITTED
CHIEF ENG DIV BR

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

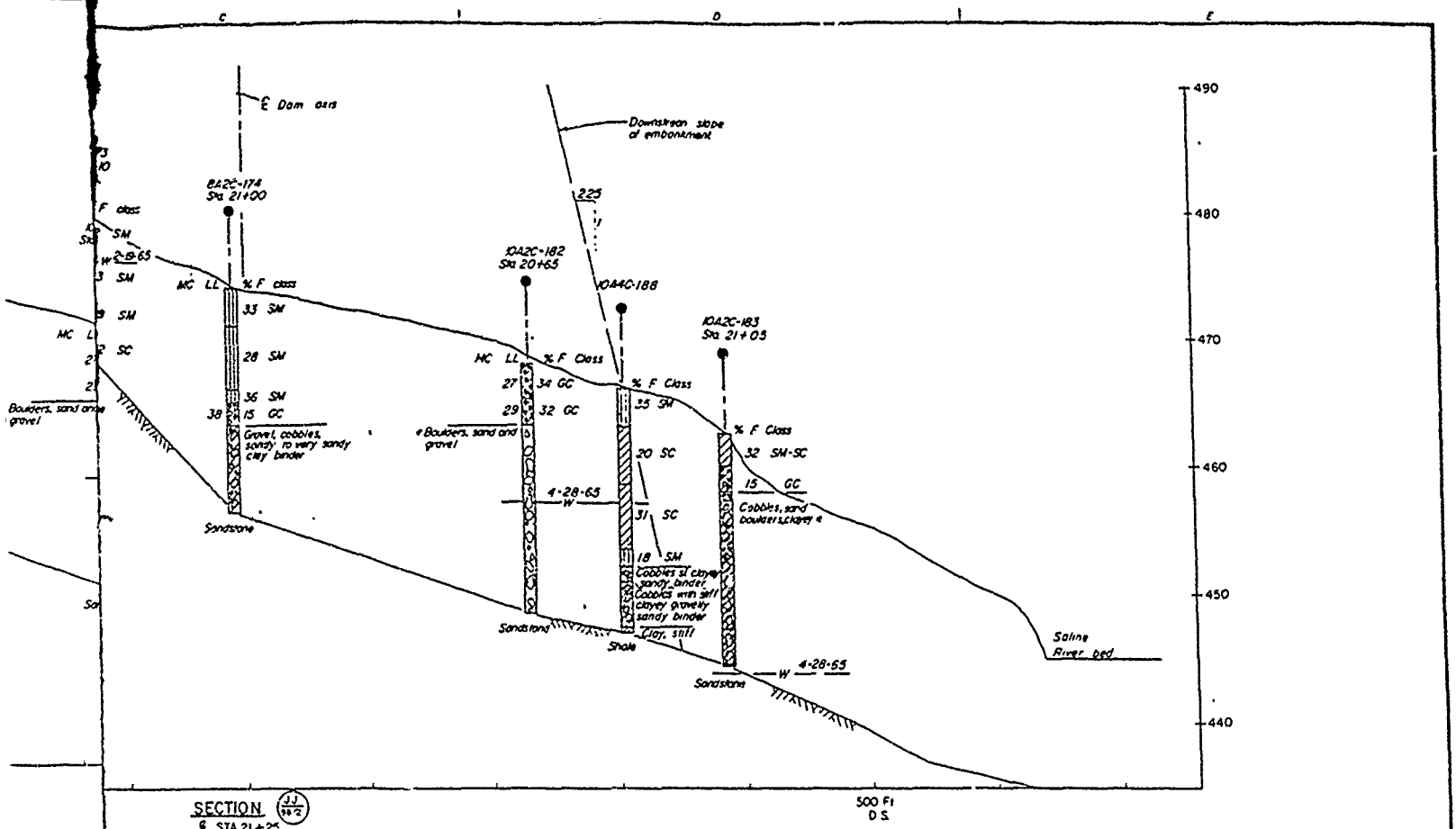
DIERKS DAM
EMB, OUTLET WORKS, SPILLWAY & ACCESS RDS
OVERBURDEN INVEST.-MAIN EMB FOUNDATIO
SECTIONS GG, & HH-BORINGS & TEST PITS

INVITATION NO DACW 56-70-B-0055
SCALE AS SHOWN
DRAWING NO 1960-C3-98/5
DATE DEC 1968

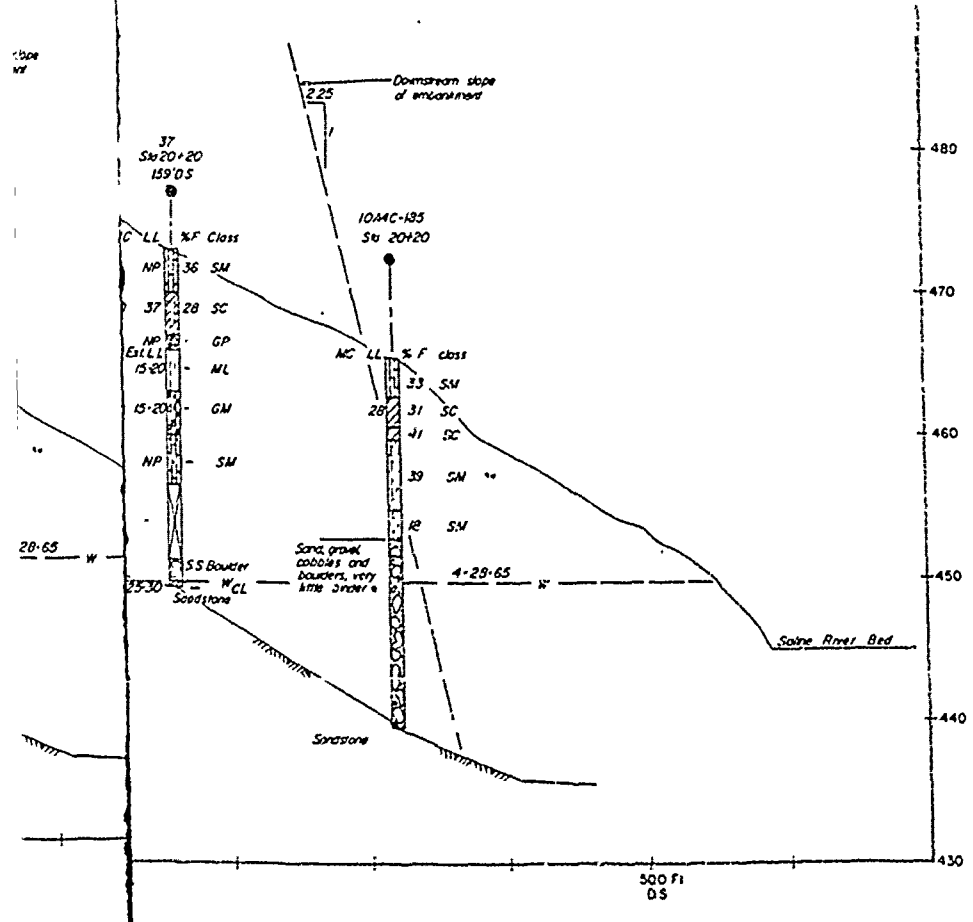
EMBANKMENT CRITERIA AND PERFORMANCE REPORT - PLATE NO. 7


10A2C-171
Sta 20+70
TP-494
Sta 21+05
No sample-Bed rock
Upstream slope of embankment
2.25
1
Clayey Sand with SS. frag.
Sandy clay SS Frag
Sandstone
Boulders (possibly bedrock) ±
10A2C-173
Sta 21+10
BA2C-174
Sta 21+00
℄ Dam axis
MC LL % F class
32 SM
33 SM
29 SM
32 SC
4-28-65 W
Clayey Sand, poorly cemented sandstone
Sandstone
33 SM
28 SM
36 SM
38 15 GC
Gravel, cobbles, sandy to very sandy clay binder
Sandstone
Saline River bed
490
480
470
460
450
440
500 Ft US
SECTION
℄ STA 21+25
SCALE
HORIZ 1" = 50'
VERT 1" = 5'
JJ 9/67
Upstream slope of embankment
2.25
1
2C-5
Sta 20+15
52
Sta 19+80
80' US
49
Sta 19+90
20' US
10A2C-181
37
Sta 20+20
159' DS
℄ Dam axis
Class.
Sand and silt with many sandstone boulders and gravel ±
Sand SI clayey
Clay, V sandy
Clay V Sandy & Gravelly
SM
CL, Sdy
SS Frag
SS Frag
SS Boulder
SS Boulder
SM
SC
Boulders Sand & Gravels
Shale
SC, Grvly
SS Boulder
SM, Grvly
GM, Sdy
± SS Boulder
SM, Grvly
Shale
Sandstone
MC LL % F class
24 19 GC
Clay, sand gravel and cobbles ±
Sandstone
MC LL %F Class
6 NP 36 SM
10 37 28 SC
- NP Est LL - GP
- 15-20 - ML
- 15-20 - GM
- NP - SM
SS Boulder
WCL
25-30
Sandstone
Sand, gravel, cobbles and boulders, very little binder ±
Sandstone
Saline River Bed
480
470
460
450
440
430
℄
500 Ft US
SECTION
℄ STA 20+05
SCALE
VERT. 1" = 5'
HORIZ 1" = 50'
JJ 9/67

(1)



SECTION (JJ 98/2)
℄ STA 21+25
SCALE
HORIZ 1" = 50'
VERT 1" = 5'



NOTES
1 See dwg 98/2 B 3 for legend

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

KEY	DATE	CHANGE	REVISION INDICATED BY

U. S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

DESIGNED BY K. Eisenhut
DRAWN BY K. Eisenhut
CHECKED BY W. Rowan
CHIEF SOILS MECH SEC

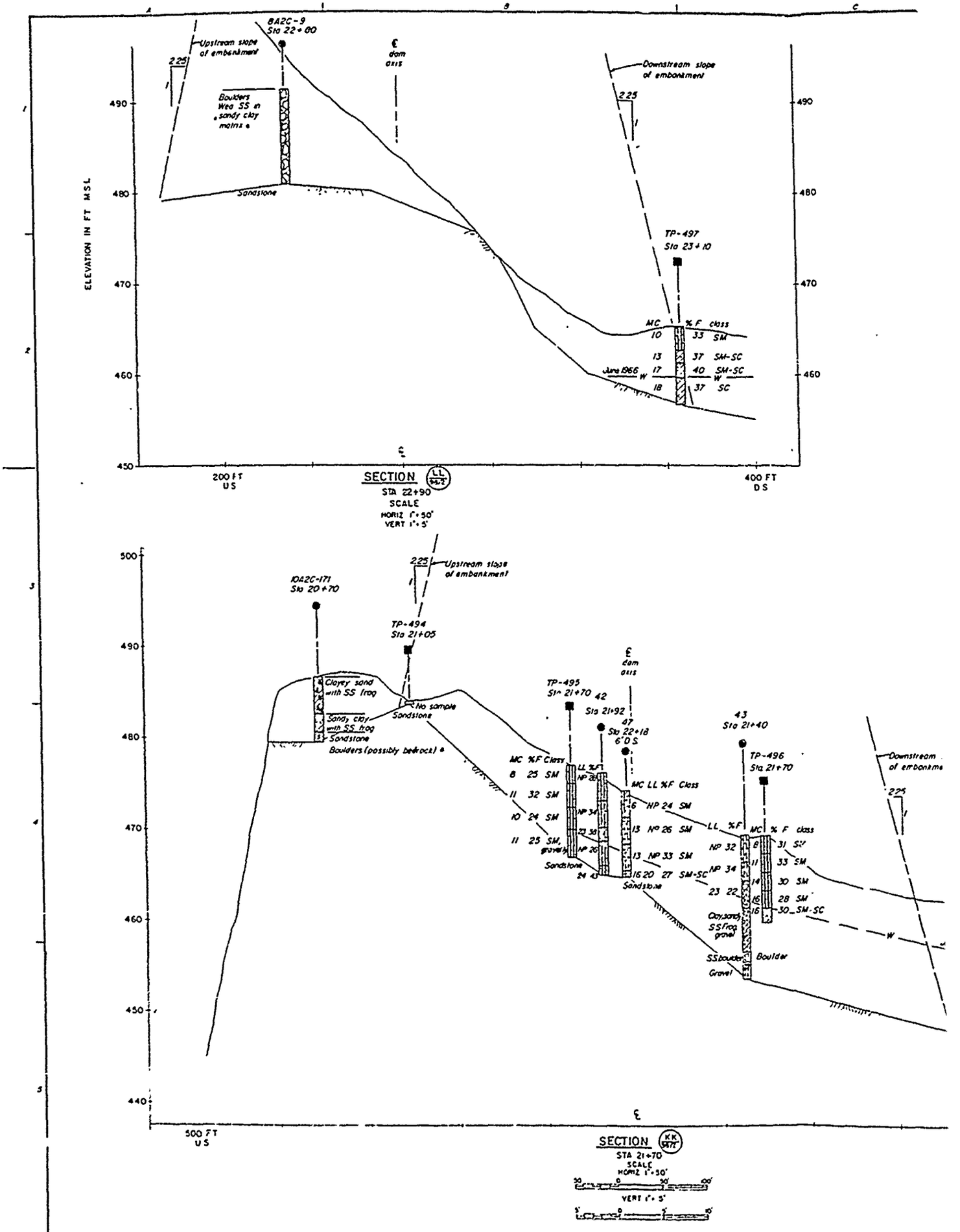
RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

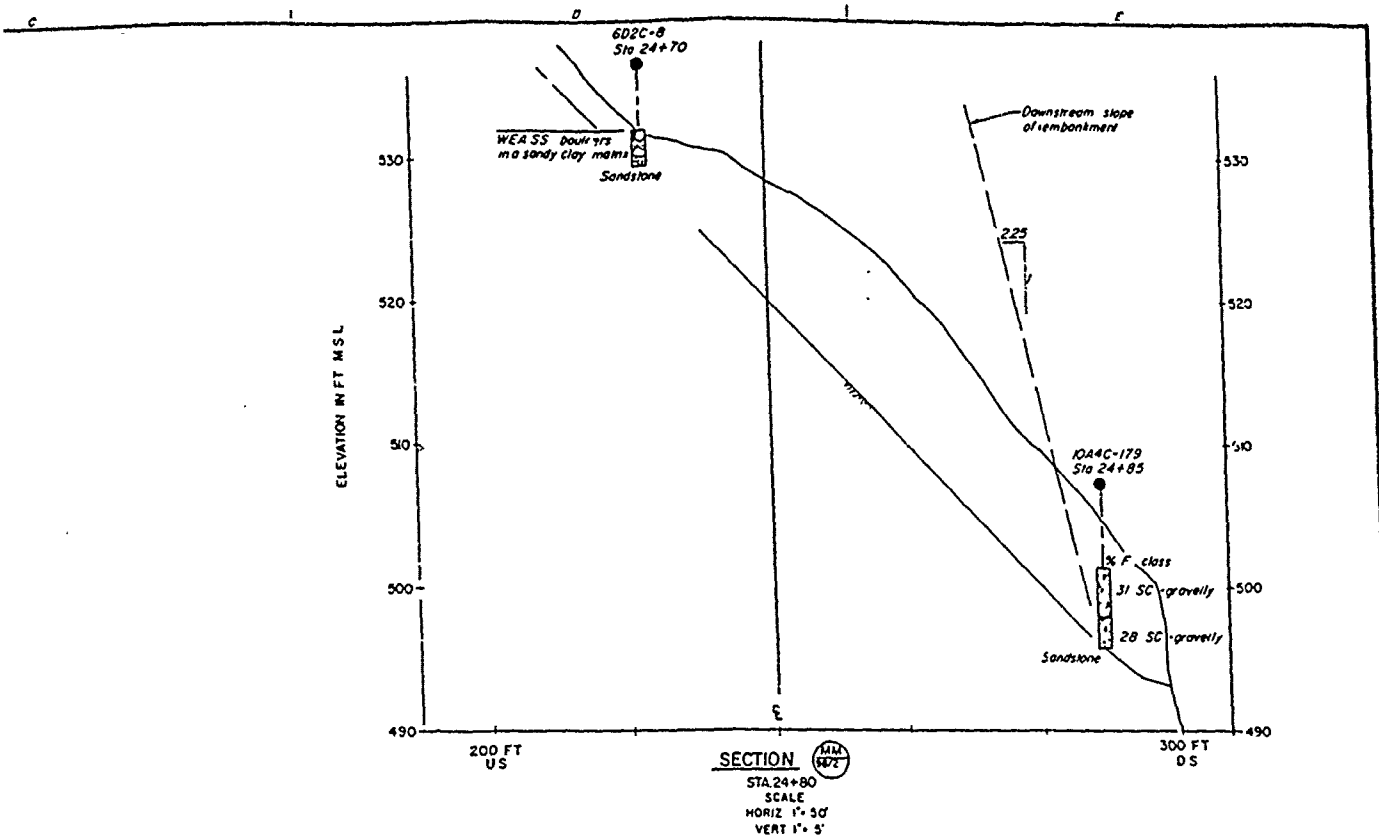
DIERKS DAM
EMB, OUTLET WORKS, SPILLWAY & ACCESS RDS
OVERBURDEN INVEST.-MAIN EMB. FOUNDATION
SECTIONS II, & JJ - BORINGS & TEST PITS

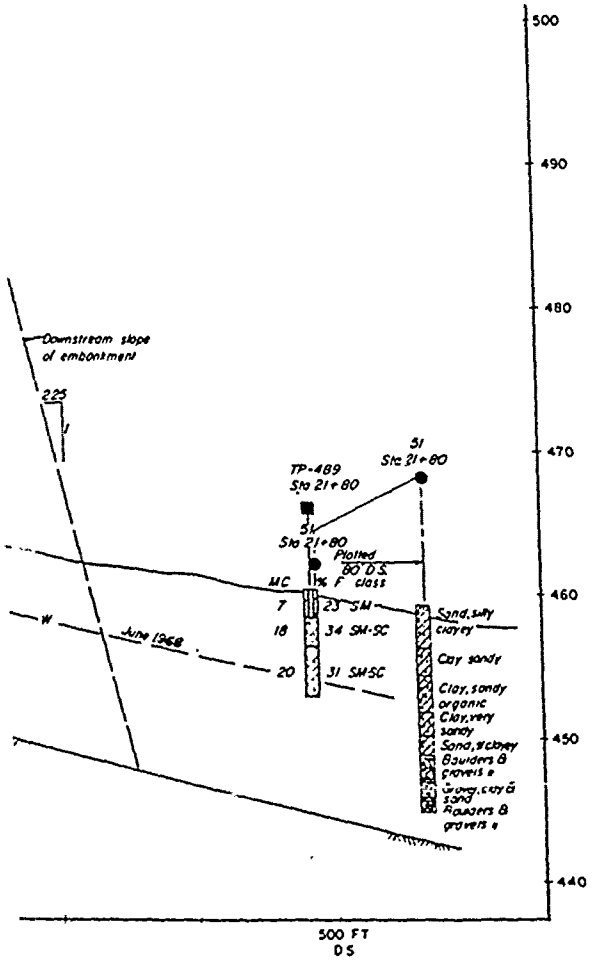
SUBMITTED W. R. Rowan, Jr.
CHIEF ENG DIVISION

INVITATION NO DACW 56-70-B-0032
SCALE AS SHOWN
DRAWING NO 1960-C3-98/6
DEC 1968

EMBANKMENT CRITERIA AND PERFORMANCE REPORT - PLATE NO. 8


8A2C-9
Sta 22+60
Upstream slope of embankment
2.25
1
℄ dam axis
Boulders
Wea SS in a sandy clay matrix
Sandstone
Downstream slope of embankment
TP-497
Sta 23+10
MC
% F class
10
33 SM
13
37 SM-SC
June 1966
17
40 SM-SC
W
W
18
37 SC
ELEVATION IN FT MSL
490
480
470
460
450
200 FT US
400 FT DS
SECTION
LL
54-7
STA 22+90
SCALE
HORIZ 1"=50'
VERT 1"=5'
10A2C-171
Sta 20+70
TP-494
Sta 21+05
Clayey sand with SS frag
Sandy clay with SS frag
Sandstone
Boulders (possibly bedrock)
No sample
Sandstone
TP-495
Sta 21+70
42
Sta 21+92
47
Sta 22+18
6'0S
43
Sta 21+40
TP-496
Sta 21+70
MC %F Class
8 25 SM
11 32 SM
10 24 SM
11 25 SM, gravelly
LL %F
NP 28
NP 34
23 39
NP 26
Sandstone
24 43
MC LL %F Class
6 NP 24 SM
13 NP 26 SM
13 NP 33 SM
16 20 27 SM-SC
Sandstone
LL %F
NP 32
NP 34
23 22
Clay, sandy SS frag gravel
SS boulder Gravel
Boulder
MC % F class
6 31 SM
11 33 SM
14 30 SM
16 28 SM
16 30 SM-SC
W
Downstream of embankme
2.25
500
490
480
470
460
450
440
500 FT US
SECTION
KK
54-7
STA 21+70
SCALE
HORIZ 1"=50'
50 0 50 100
VERT 1"=5'
5 0 5 10





NOTES
1 See dwg 98/2 B 3 for legend.

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

REV	DATE	CHANGE	REVISION INDICATED BY

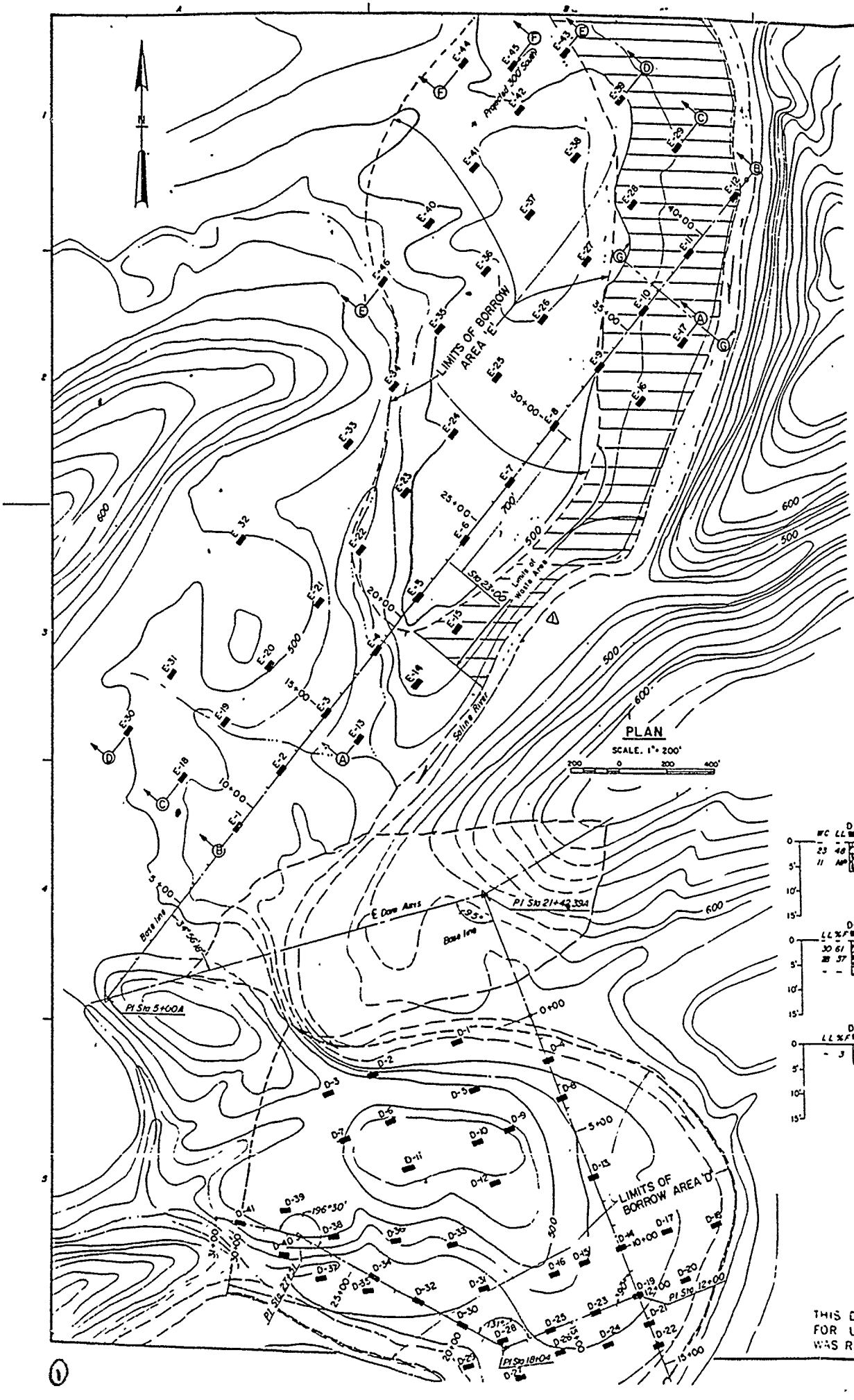
U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

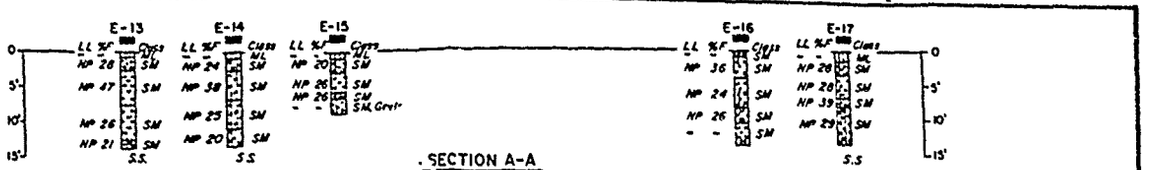
RED RIVER WATERSHED — SALINE RIVER ARKANSAS

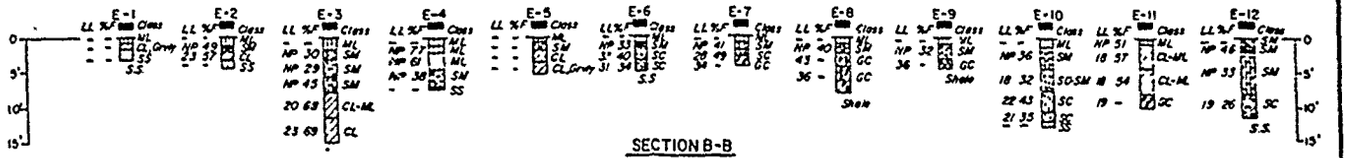
DESIGNED BY K Eiland
DRAWN BY K Eiland
CHECKED BY
CHIEF, SOILS MECH. SEC.
SUBMITTED
CHIEF, ENGR. DIV.
SPECIFICATIONS BY
DATE DEC 1968

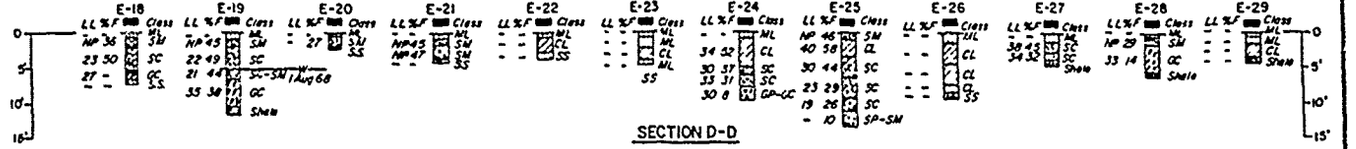
DIERKS DAM
EMB., OUTLET WORKS, SPILLWAY & ACCESS RDS.
OVERBURDEN INVEST-MAIN EMB. FOUNDATION
SECTIONS LL, MM, & KK - BORINGS & TEST PITS

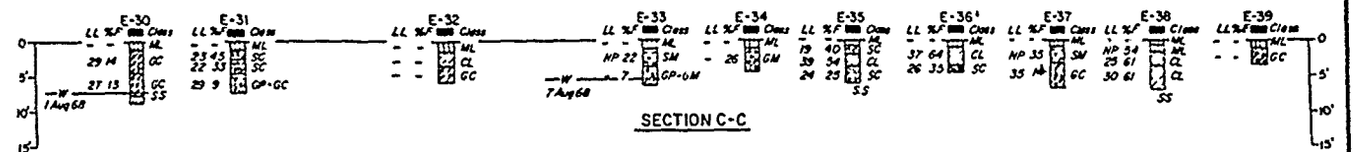
INVITATION NO DACW 56-70-B-0033
SCALE AS SHOWN
DRAWING NO 1960-C3-98/7

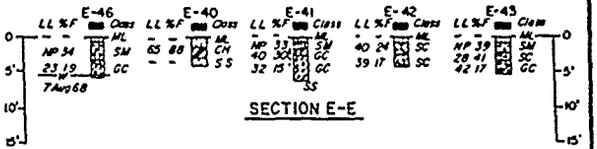

LIMITS OF BORROW AREA 'E'
LIMITS OF BORROW AREA 'D'
Proposed 300' South
Limits of Waste Area
Sta 23+08
Saline River
Base line
℄ Dam Axis
Pl Sta 21+42.39A
Pl Sta 5+00A
Pl Sta 27+
Pl Sta 18+04
Pl Sta 12+00
196°30'
95°
PLAN
SCALE. 1" = 200'
SECTION G-G
Waste Area
Natural Ground
E-1
E-18
E-30
D-1
D-2
D-3
D-15
D-16
D-17
D-29
D-30
D-31
LL %F Class
WC
NP
1 Aug 68
Test pits
Liquid limit
Plasticity index
Non-plastic
Water content
%Gr - Gravel(plus No 4 sie
%F - Fines(minus No 200 s
CL - Clay, lean, medium
CH - Clay, fat, high plas
SP - Sand, poorly grade
THIS DRAWING WAS ORIGINALLY PREPA
FOR USE AS A CONTRACT DRAWING
WAS REPRODUCED FOR USE IN THIS REP

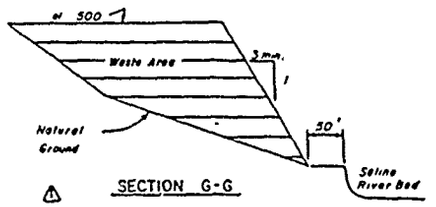




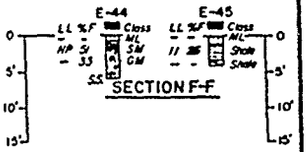


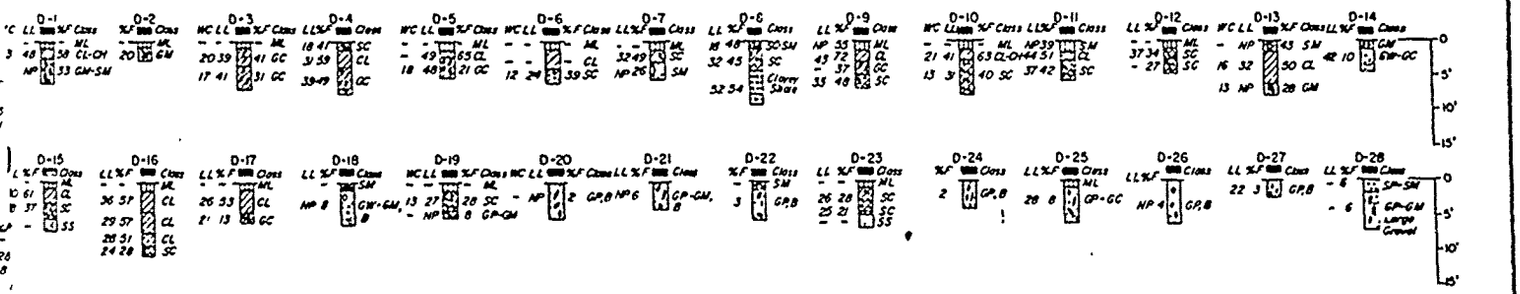


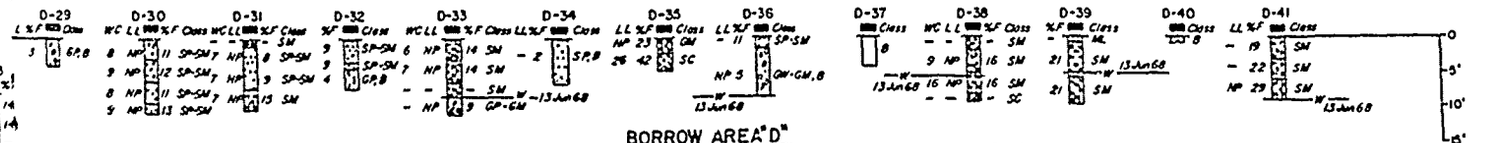




BORROW AREA "E"
HORIZ. SCALE 1"=200'
VERT. SCALE 1"=10'







BORROW AREA "D"
HORIZ. SCALE 1"=200'
VERT. SCALE 1"=10'

NOTES
1 All holes are test pit explorations
2 See Dwg 98/1 for location of Borrow Areas "D" & "E"
3 Class are field classification where laboratory tests are not shown

LEGEND

⊕ – Test pits
LL – Liquid limit
PI – Plasticity index
NP – Non-plastic
WC – Water content
%Gr – Gravel (plus No 4 sieve size)
%F – Fines (minus No 200 sieve size)
CL – Clay, lean, medium plasticity
CH – Clay, fat, high plasticity
SP – Sand, poorly graded
SM – Sand, silty
FL – Forest litter
ML – Silt, clayey to sandy, low plasticity
SC – Sand, clayey
GP – Gravel, poorly graded
GM – Gravel, silty
GW – Gravel, well graded
GC – Gravel, clayey
SS – Sandstone
B – Boulders (plus 6")
Sh – Shale
W – Water table
(1) – Field classification, no sample taken

△4 Borrow area D is primarily a reserve source of sand and gravel for filter materials. Excavation is not to be made in this area until all available sand and gravel has been salvaged from required excavation.

DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND IS REPRODUCED FOR USE IN THIS REPORT

NO	DATE	REVISION (INDICATED BY Δ)	CHKD	REC	APPR
1	5-1-70	Added note number 4.			
1	5-1-70	Added waste area and section G-G			

U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

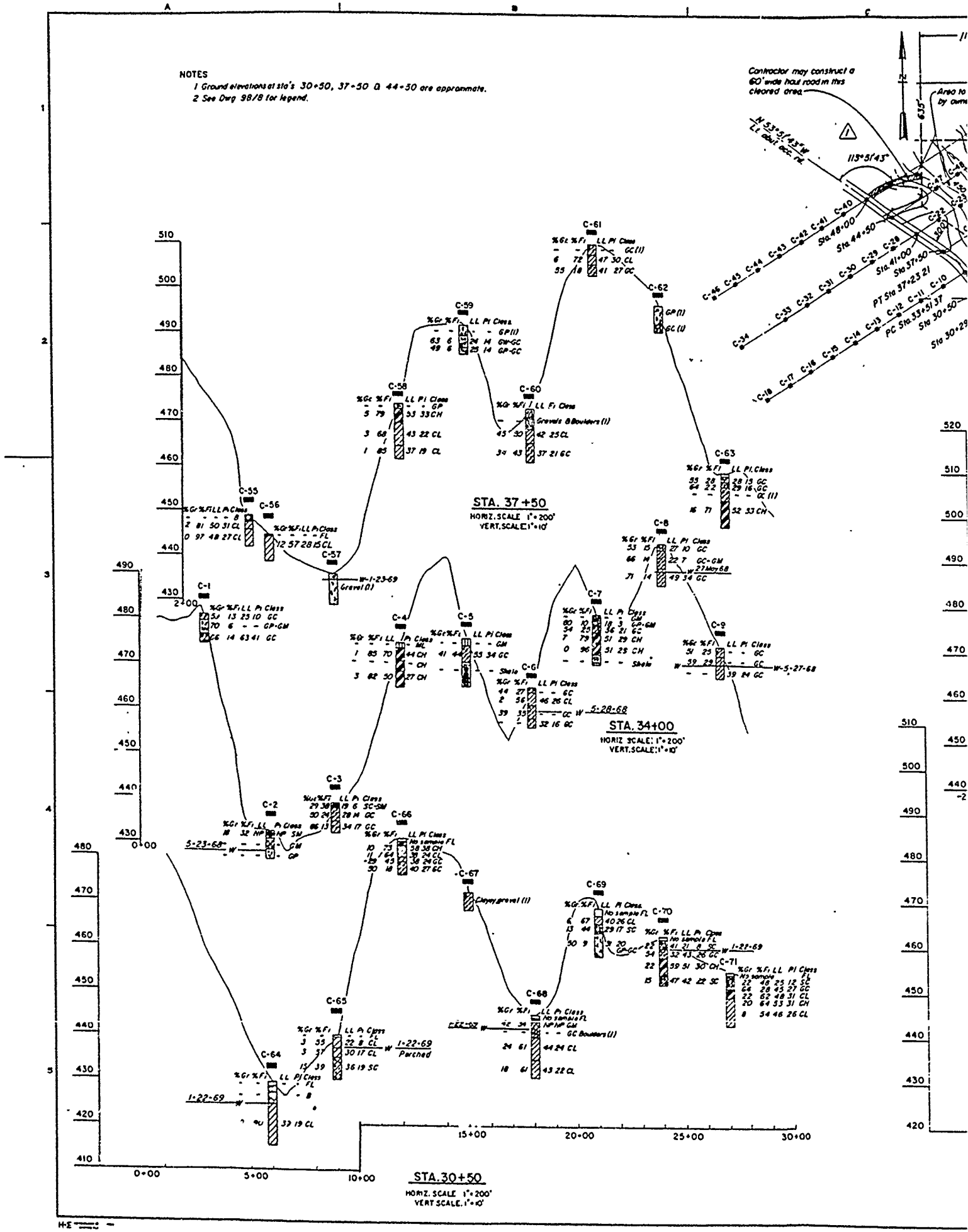
DESIGNED BY K. Ireland
DRAWN BY Ed. Nail
CHECKED BY
CHIEF, SOILS MECH. SEC.
SUBMITTED
CHIEF, ENG. GEOLS. BR.
DATE DEC 1968

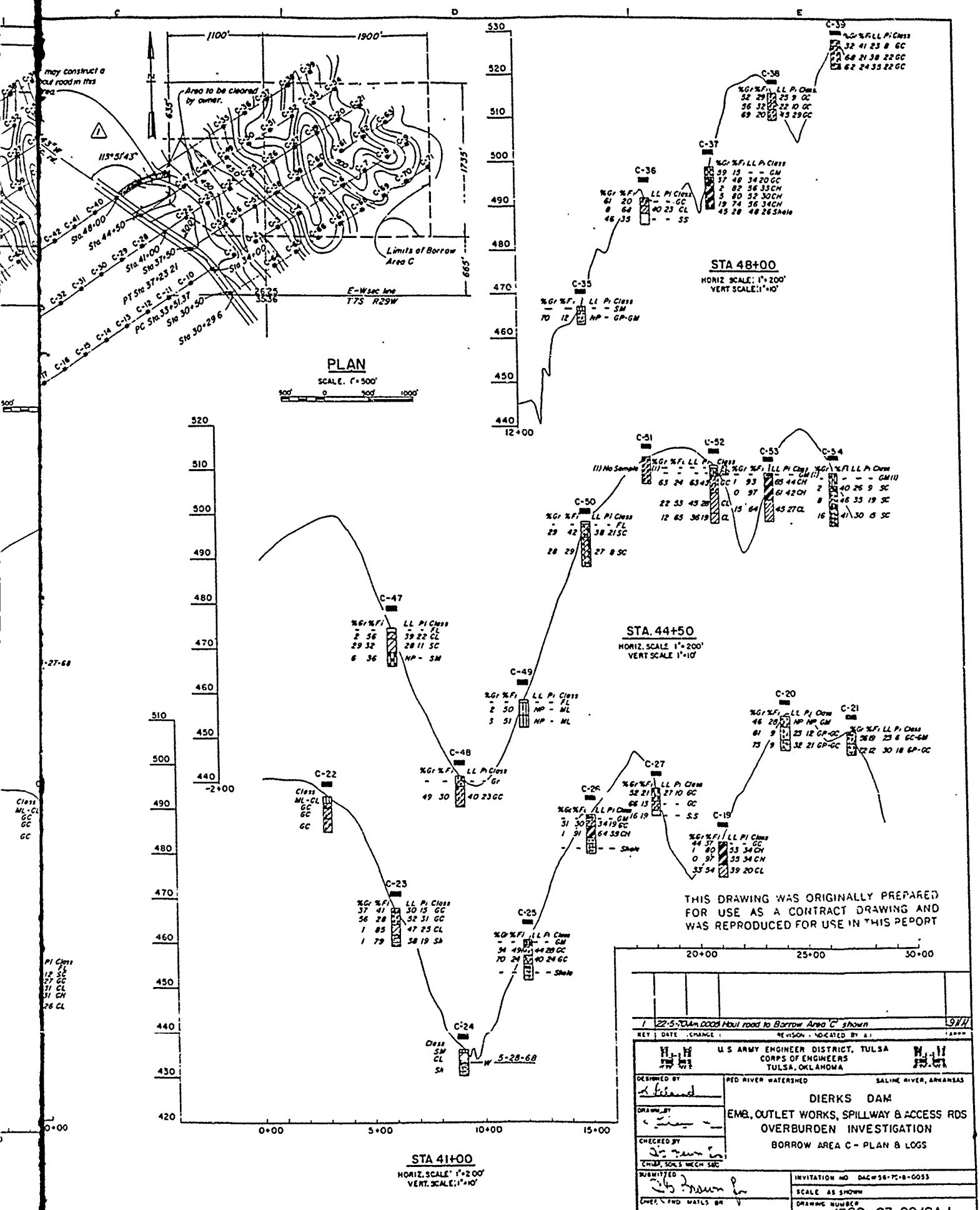
RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

DIERKS DAM
EMB, OUTLET WORKS, SPILLWAY & ACCESS RDS.
OVERBURDEN INVESTIGATION
BORROW AREAS D&E – PLAN & LOGS

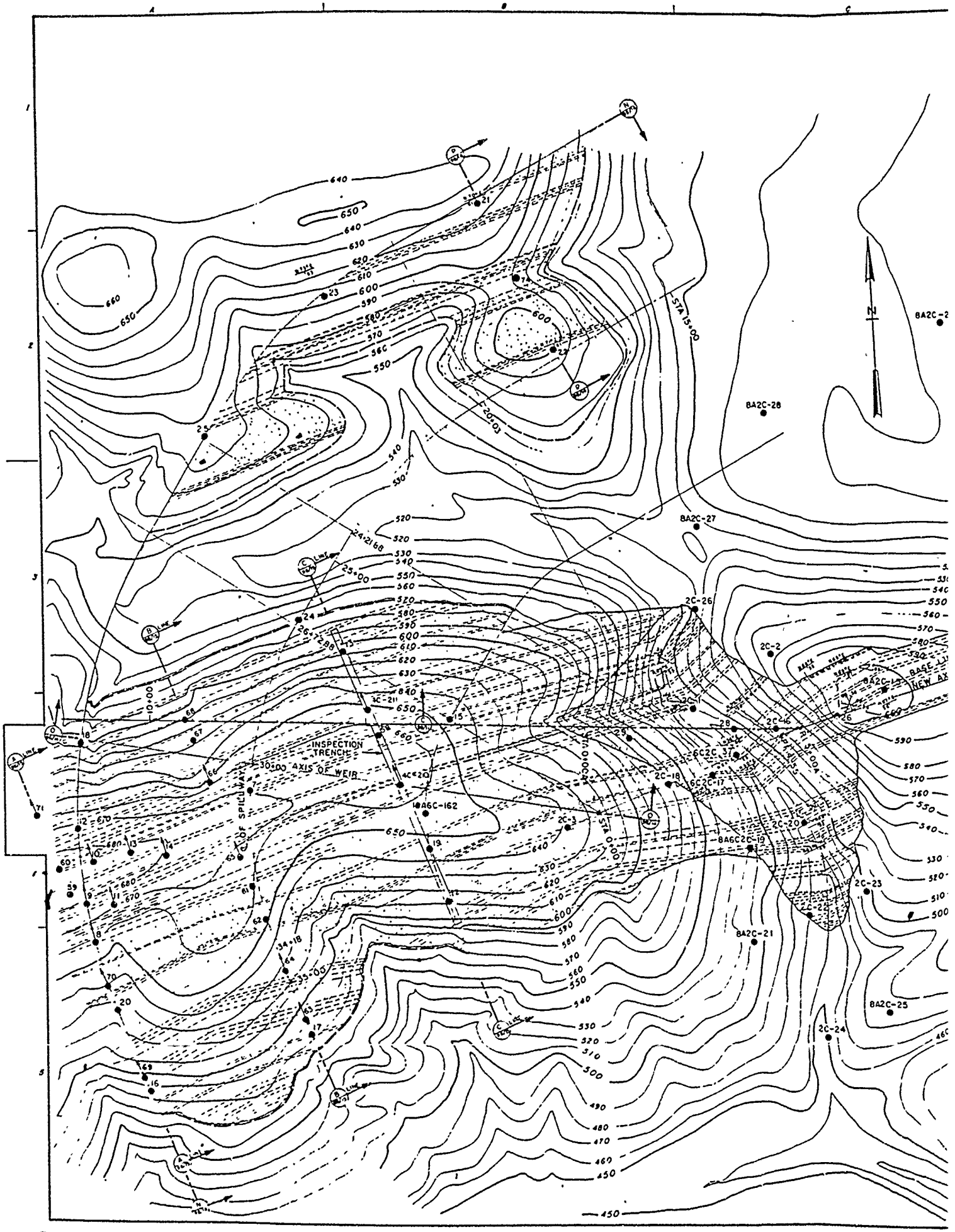
INVITATION NO DACW 56-70-B-0033
SCALE AS SHOWN
DRAWING NO 1960-C3-98/8.1

EMBANKMENT CRITERIA AND PERFORMANCE REPORT - PLATE NO. 10

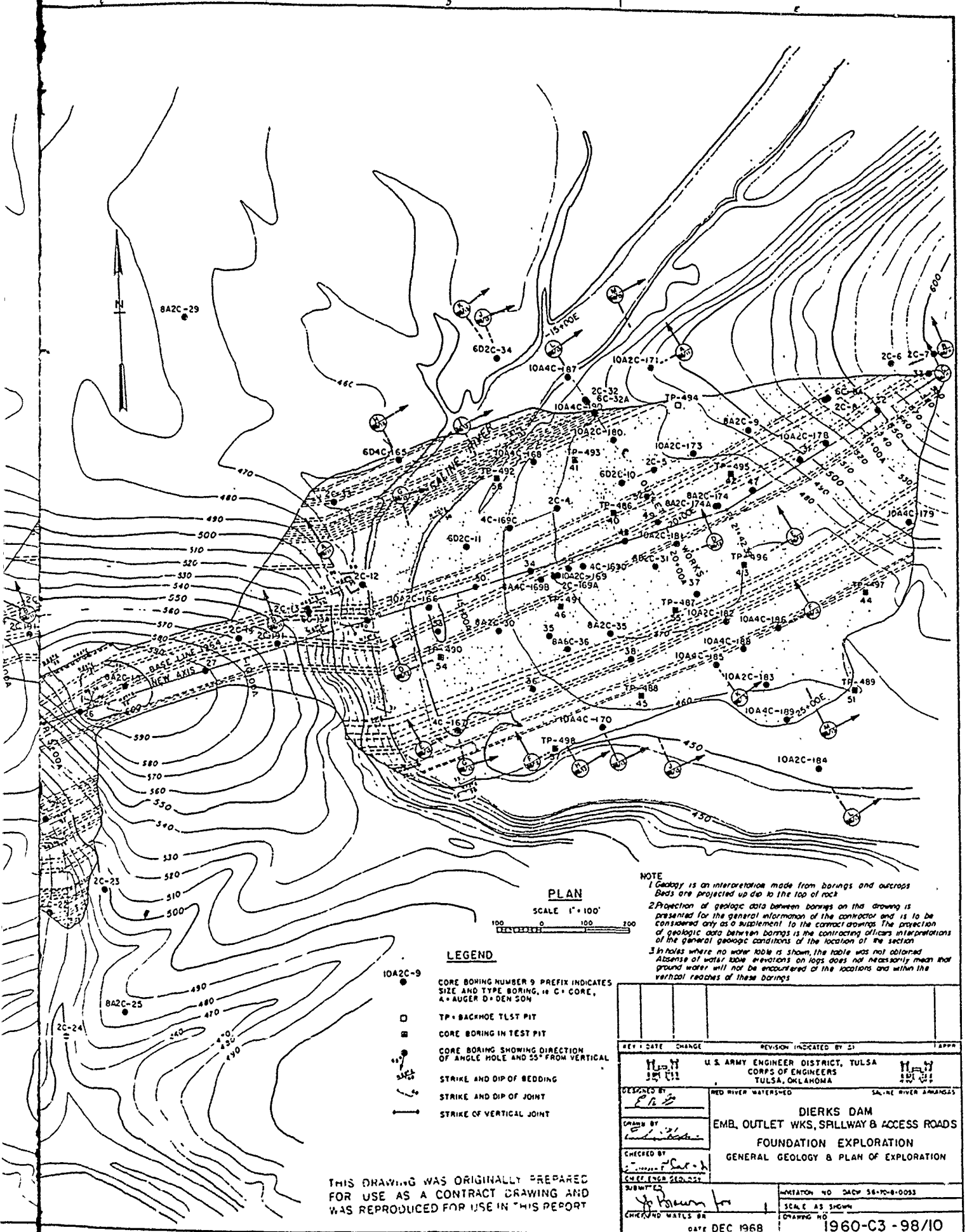

NOTES
1 Ground elevations at sta's 30+50, 37+50 & 44+50 are approximate.
2 See Dwg 98/8 for legend.
Contractor may construct a 60' wide haul road in this cleared area
STA. 37+50
HORIZ. SCALE 1"=200'
VERT. SCALE 1"=10'
STA. 34+00
HORIZ. SCALE 1"=200'
VERT. SCALE 1"=10'
STA. 30+50
HORIZ. SCALE 1"=200'
VERT. SCALE 1"=10'
Sta 48+00
Sta 44+50
Sta 41+00
Sta 37+50
Sta 30+50
PT Sta 37+23.21
PC Sta 33+51.37
C-1
C-2
C-3
C-4
C-5
C-6
C-7
C-8
C-9
C-55
C-56
C-57
C-58
C-59
C-60
C-61
C-62
C-63
C-64
C-65
C-66
C-67
C-68
C-69
C-70
C-71



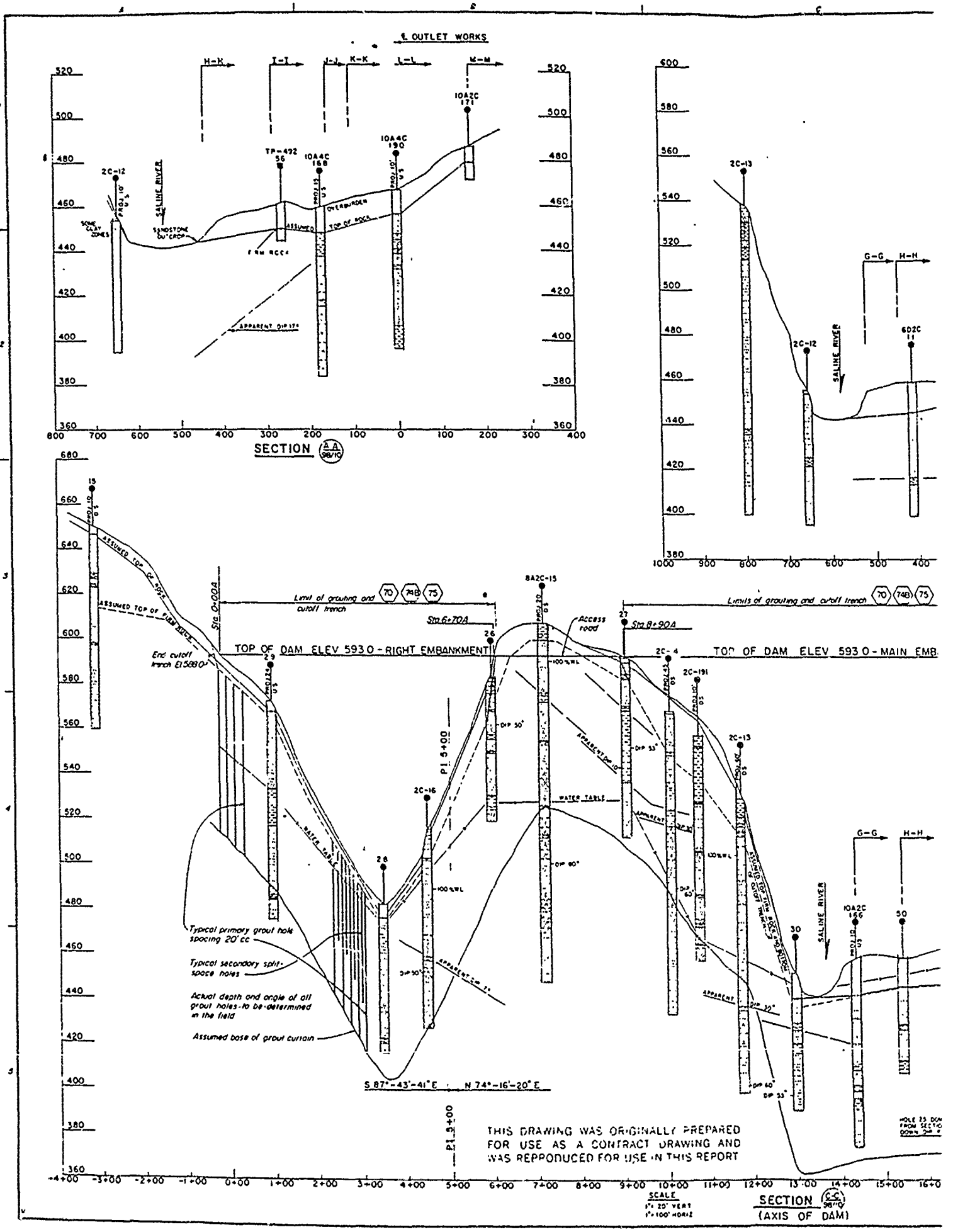
EMBANKMENT CRITERIA AND PERFORMANCE REPORT - PLATE NO. 11

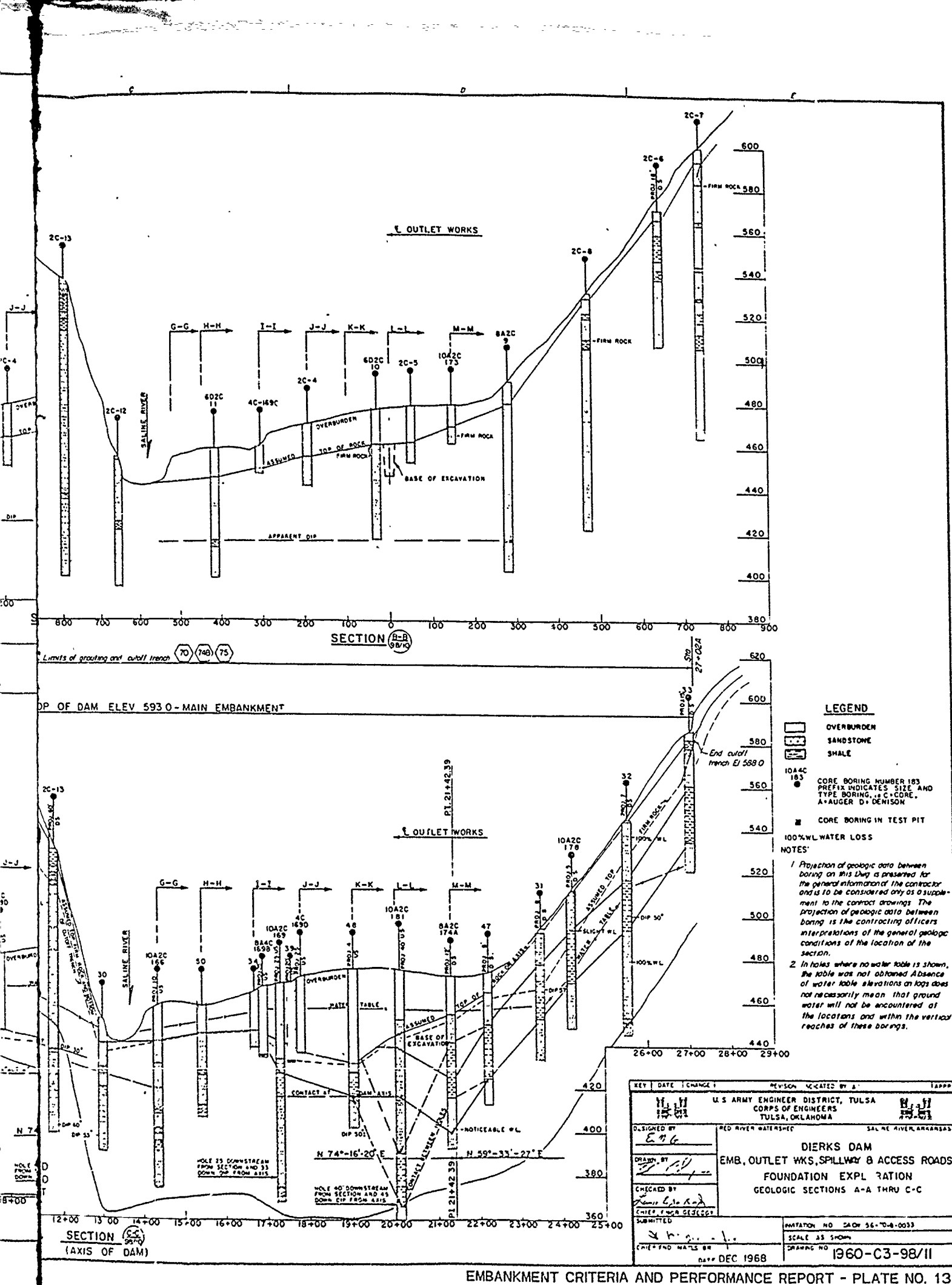

INSPECTION TRENCH
AXIS OF WEIR
SPILLWAY
STA 15+00
STA 20+00
STA 25+00
STA 30+00
STA 35+00
8A2C-28
8A2C-27
8A2C-21
8A2C-25
8A2C-2
2C-26
2C-2
2C-18
2C-20
2C-23
2C-24
2C-3
8A6C-162
8A6C2C-19
6C2C-17
6C2C-3
2C-46
BASE LI
NEW AX
N

(1)

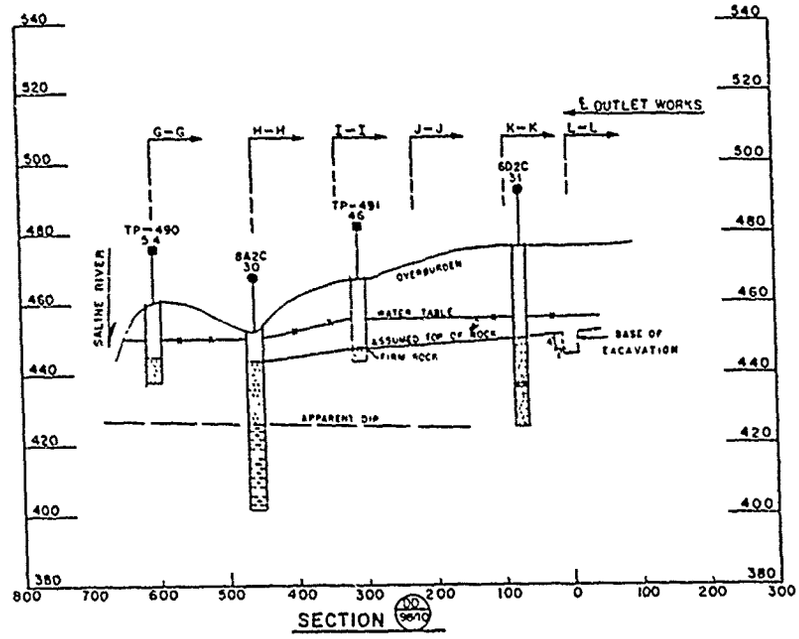


EMBANKMENT CRITERIA AND PERFORMANCE REPORT - PLATE NO. 12

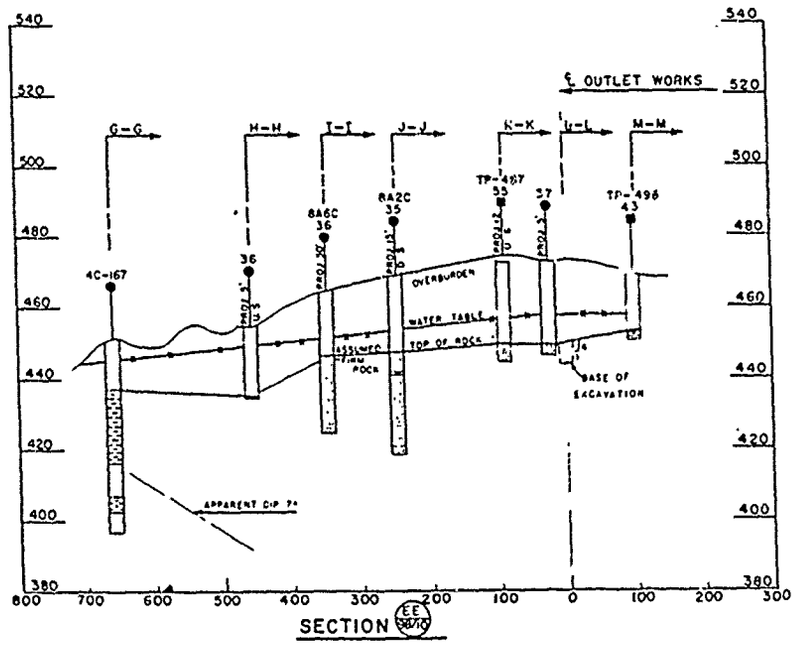

℄ OUTLET WORKS
H-K
I-I
J-J
K-K
L-L
M-M
2C-12
SALINE RIVER
SANDSTONE OUTCROP
SOME CLAY ZONES
OVERBURDEN
TOP OF ROCK
APPARENT DIP 17°
10A4C 168
10A4C 190
10A2C 171
SECTION AA 98/10
2C-13
2C-12
SALINE RIVER
G-G
H-H
6D2C 11
Sta 0+00A
Sta 6+70A
Sta 8+90A
Limit of grouting and cutoff trench
70
74B
75
TOP OF DAM ELEV 593.0 - RIGHT EMBANKMENT
TOP OF DAM ELEV 593.0 - MAIN EMB.
Access road
End cutoff trench El 588.0'
ASSUMED TOP OF ROCK
8A2C-15
2C-16
2C-4
2C-191
2C-13
WATER TABLE
APPARENT DIP 10°
DIP 50°
DIP 80°
DIP 53°
DIP 60°
100% WL
P.I. 5+00
P.I. 3+00
Typical primary grout hole spacing 20' cc
Typical secondary split-space holes
Actual depth and angle of all grout holes to be determined in the field
Assumed base of grout curtain
S 87°-43'-41" E ; N 74°-16'-20" E
10A2C 166
SALINE RIVER
THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT
SCALE
1" = 20' VERT
1" = 100' HORIZ
SECTION (C-C 98/10) (AXIS OF DAM)



EMBANKMENT CRITERIA AND PERFORMANCE REPORT - PLATE NO. 13

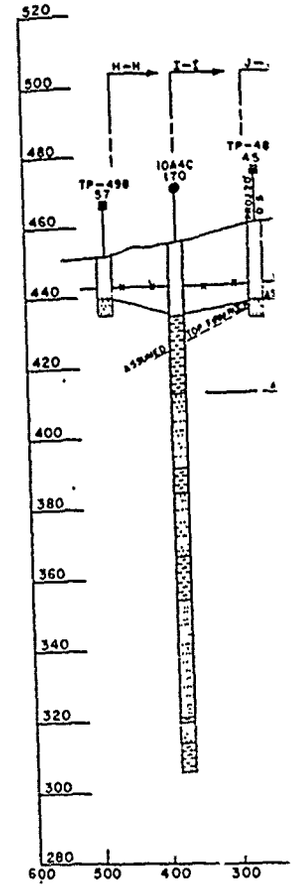


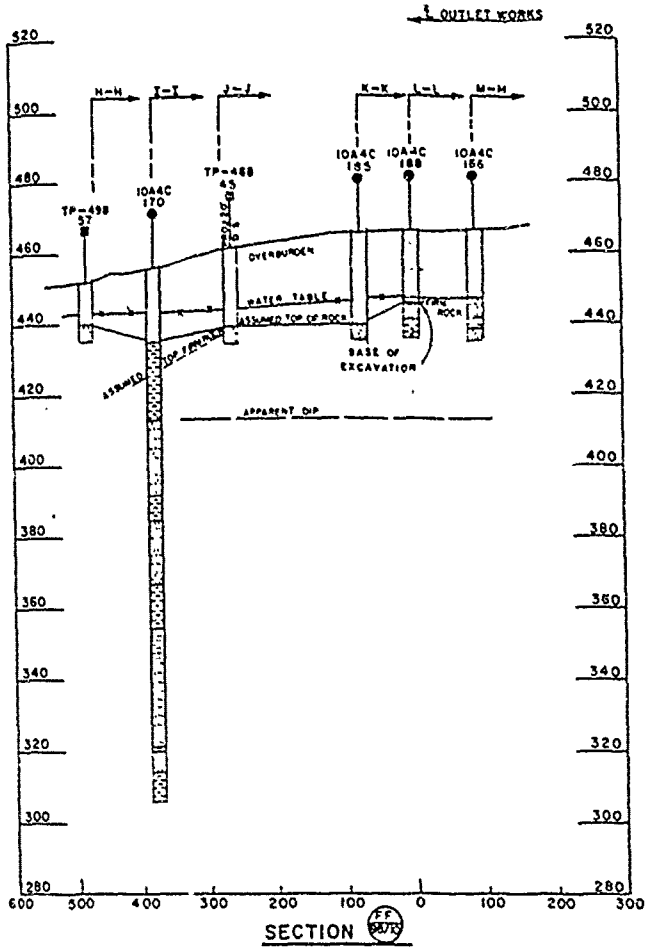
SECTION (AD 98-10)



SECTION (EE 98-10)

SCALE
1" = 20' VERT.
1" = 100' HORIZ.





SECTION

LEGEND

- OVERBURDEN
- SANDSTONE
- SHALE
- 10A4C 183 — CORE BORING NUMBER 183 PREFIX INDICATES SIZE AND TYPE BORING, e.g. C=CORE, A=AUGER D=DENISON
- CORE BORING IN TEST PIT
- 100%WL WATER LOSS

NOTES

1. *Projection of geologic data between boring on this Dwg is presented for the general information of the contractor and is to be considered only as a supplement to the contract drawings The projection of geologic data between boring is the contracting officers interpretations of the general geologic conditions of the location of the section*
2. *In holes where no water table is shown, the table was not obtained Absence of water table elevations on logs does not necessarily mean that ground water will not be encountered at the locations and within the vertical reaches of these borings*

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT.

KEY	DATE	CHANGE	REVISION INDICATED BY △	APPD

U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

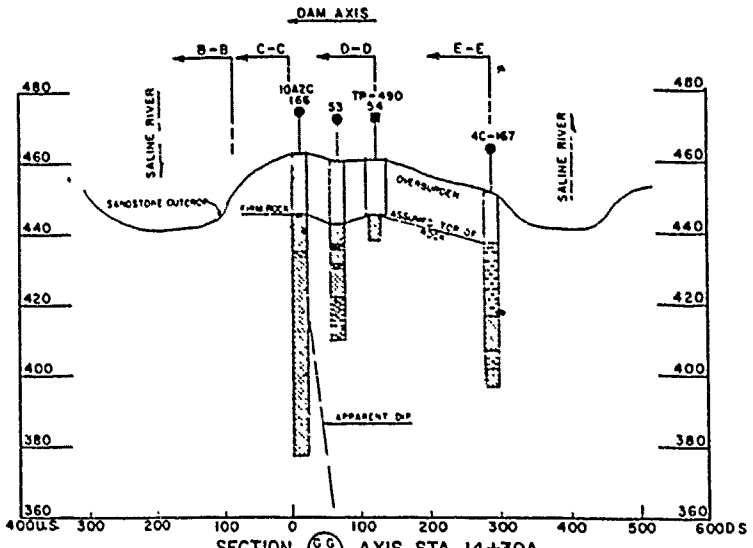
DESIGNED BY E.M.E.
DRAWN BY
CHECKED BY
CHIEF ENGR-GEOLOGY

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

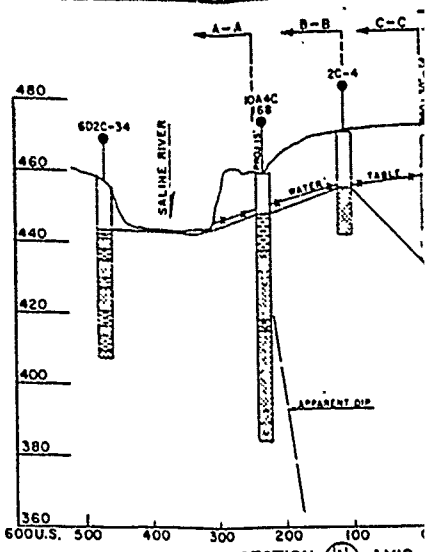
DIERKS DAM
EMB., OUTLET WORKS, SPILLWAY & ACCESS ROADS
FOUNDATION EXPLORATION
GEOLOGIC SECTIONS D-D THRU F-F

SUBMITTED
CHIEF ENGR WATLS BR

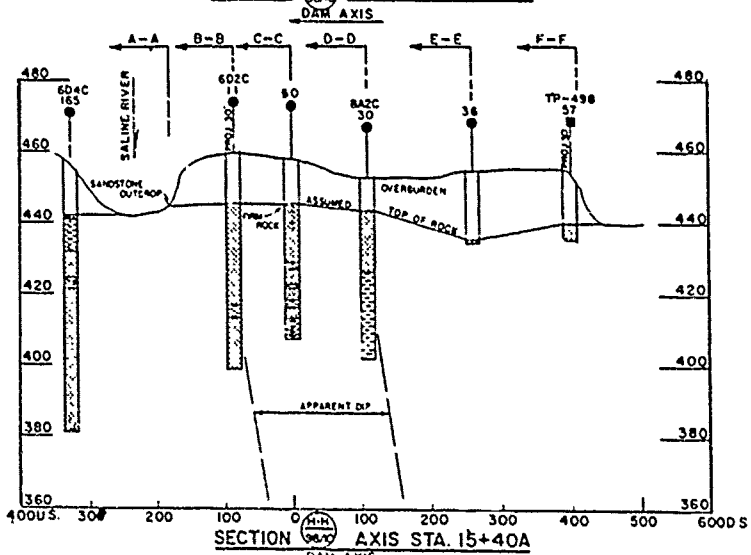
INVITATION NO. 24 OR 36-10-B-0053
SCALE AS SHOWN
DRAWING NO. 1960-C3-98/12
DATE DEC 1968



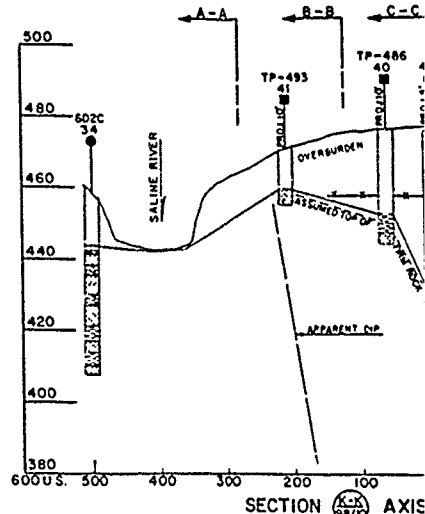
SECTION (CC 98/K) AXIS STA. 14+30A



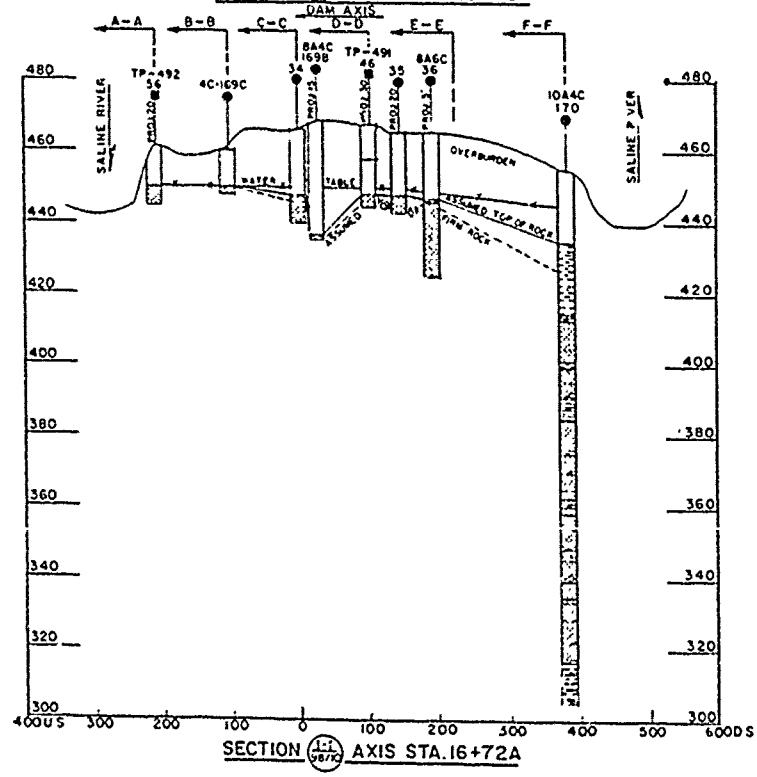
SECTION (JJ 98/K) AXIS



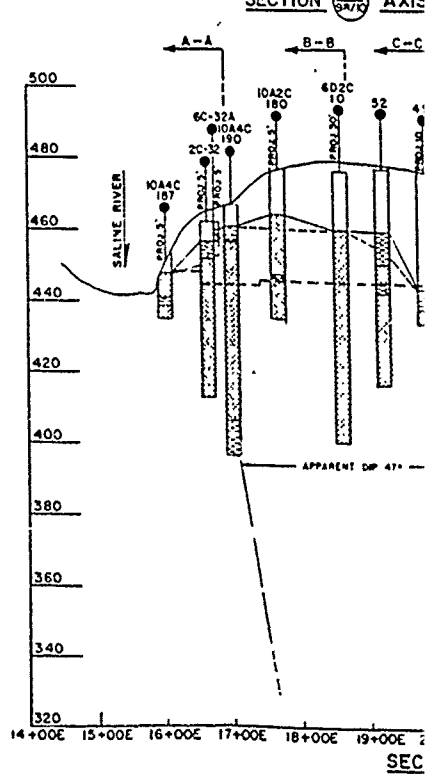
SECTION (HH 98/K) AXIS STA. 15+40A



SECTION (KK 98/K) AXIS



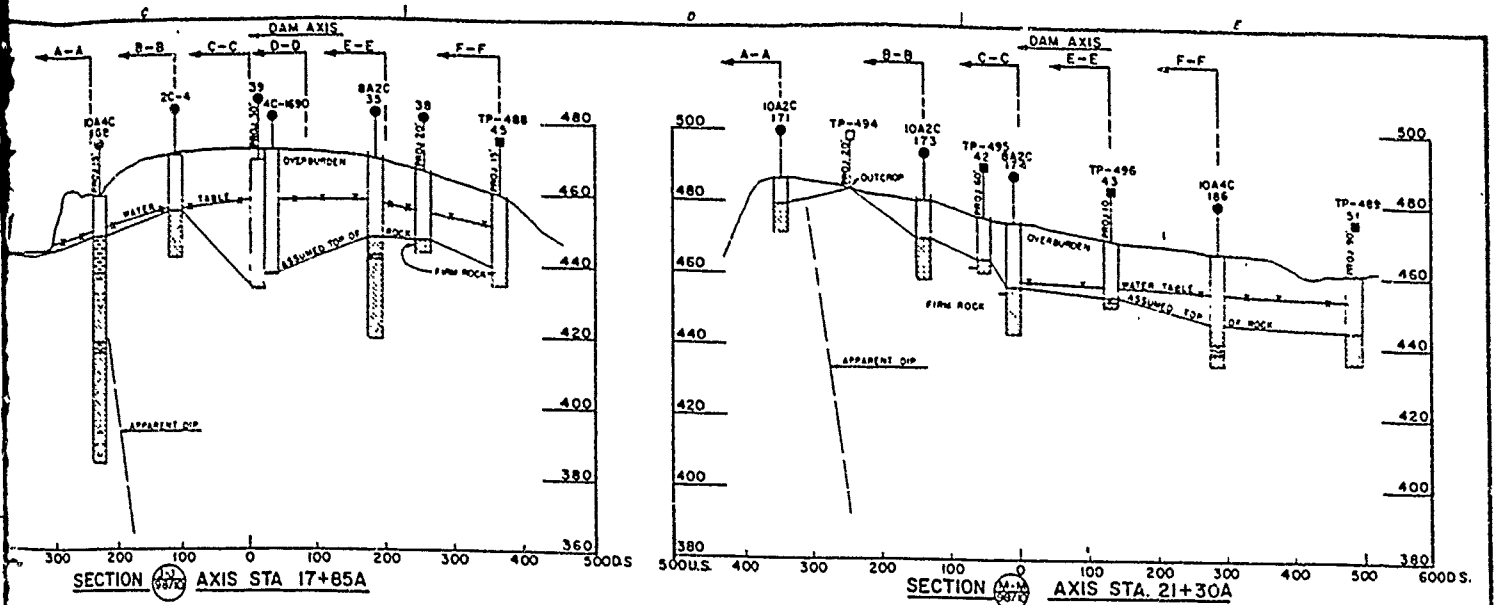
SECTION (LL 98/K) AXIS STA. 16+72A



SEC

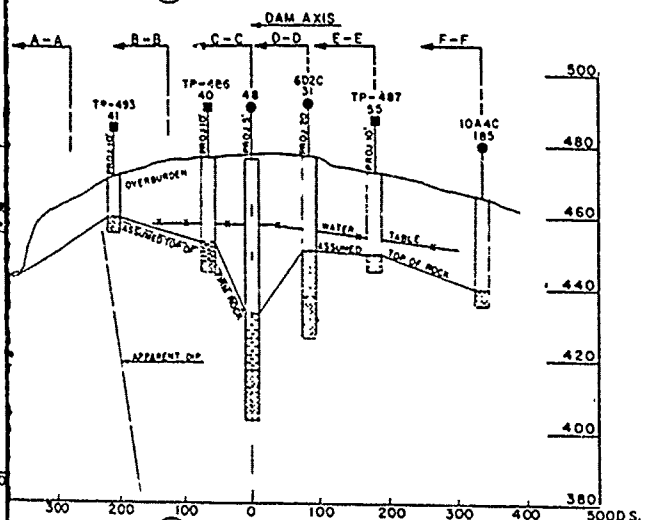
SCALE
1" = 20' VERT
1" = 100' HORIZ.

(1)

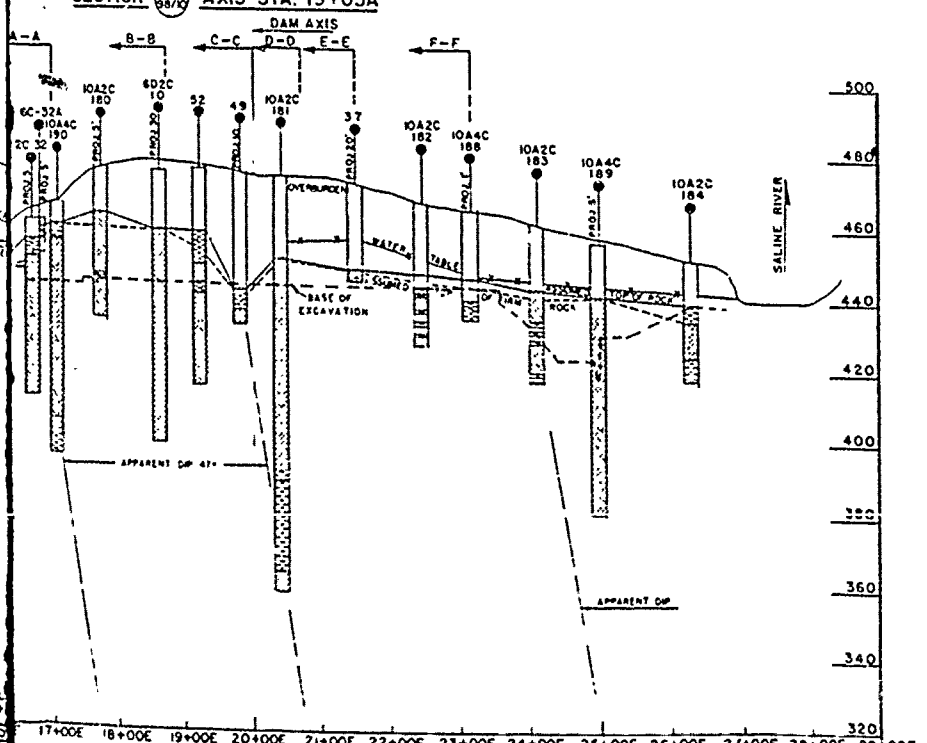


SECTION (J-J 98/C) AXIS STA 17+85A

SECTION (M-M 98/C) AXIS STA. 21+30A



SECTION (K-K 98/C) AXIS STA. 19+05A



SECTION (L-L 98/C) AXIS STA. 20+00A
(ON ℄ OUTLET WORKS)

NOTES

1. *Projection of geologic data between boring on this Dwg is presented for the general information of the contractor and is to be considered only as a supplement to the contract drawings. The projection of geologic data between boring is the contracting officers interpretations of the general geologic conditions of the location of the section.*
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LEGEND

- OVERBURDEN
- SANDSTONE
- SHALE
- 10A4C 183 — CORE BORING NUMBER 183 PREFIX INDICATES SIZE AND TYPE BORING, ie C= CORE, A= AUGER D= DENISON
- TP = BACKHOE TEST PIT
- CORE BORING IN TEST PIT

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

KEY	DATE	CHANGE	REVISION INDICATED BY A

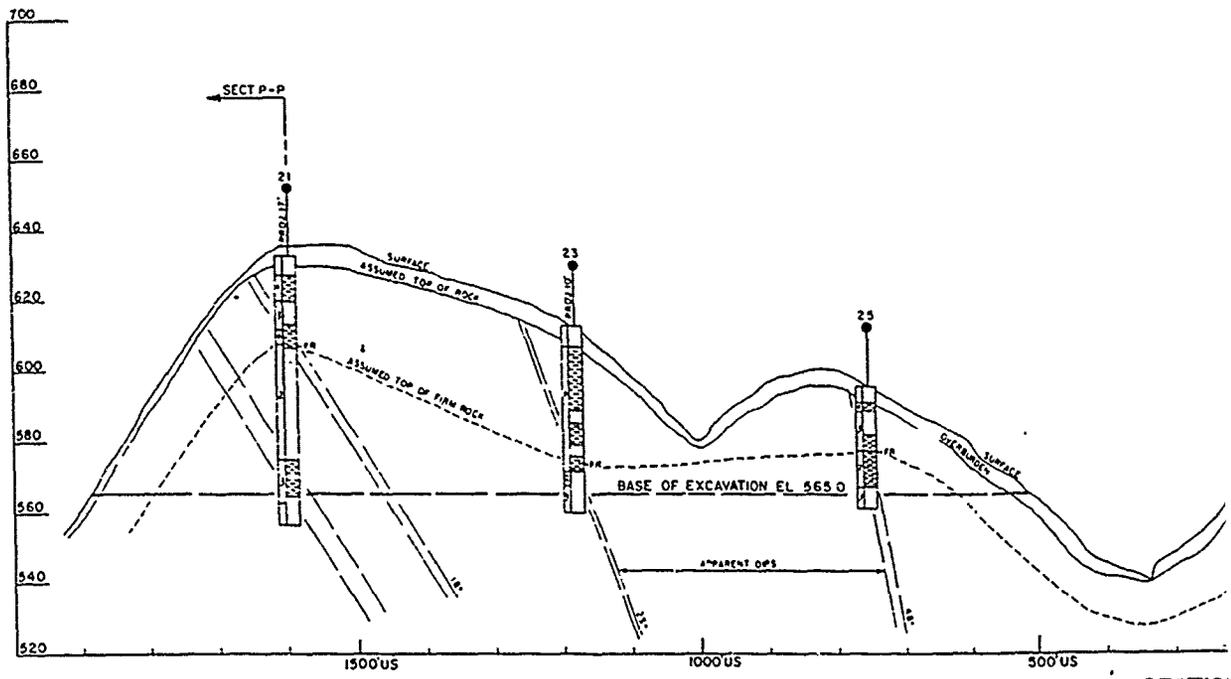
U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

DESIGNED BY FNC
RED RIVER WATERSHED — SALINE RIVER ARKANSAS

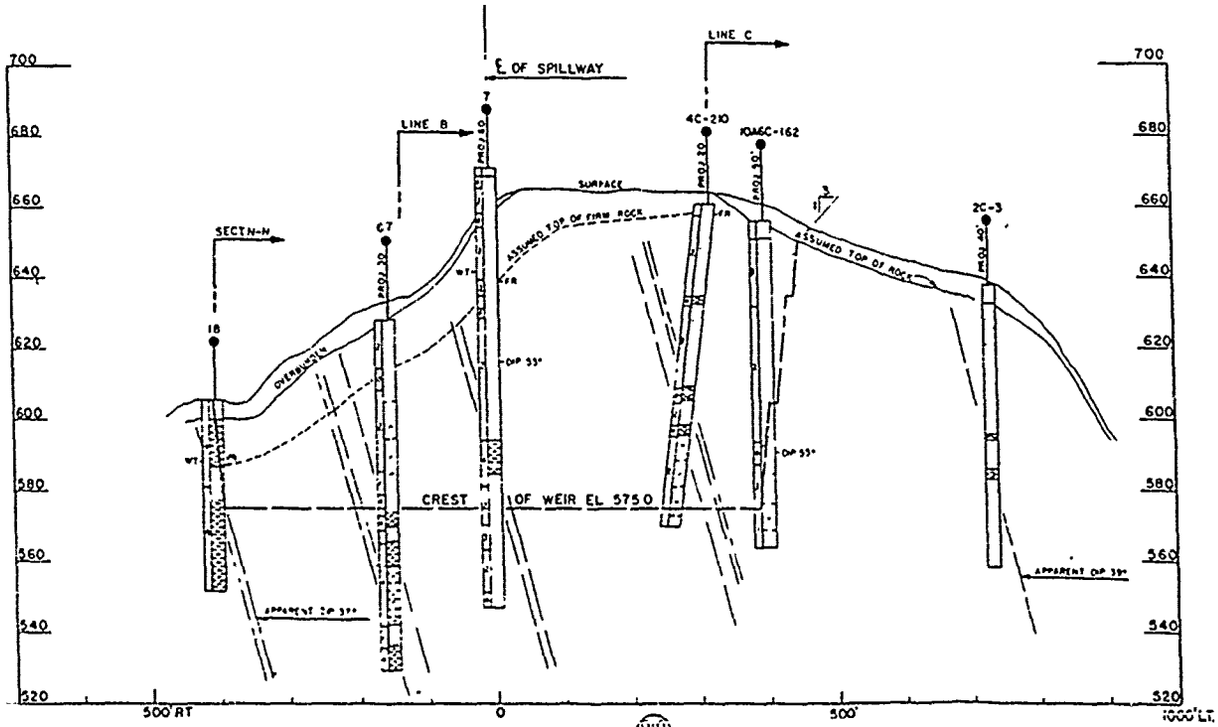
DRAWN BY P.P.
CHECKED BY
SUBMITTED
CHIEF, ENGINEERING DIVISION

DIERKS DAM
EMB., OUTLET WKS., SPILLWAY & ACCESS ROADS
FOUNDATION EXPLORATION
GEOLOGIC SECTIONS G-G THRU M-M

INVITATION NO. DA CW 56-[illegible]-0053
SCALE AS SHOWN
DRAWING NO. 1960-C3-98/13
DEC 1968



SECTIO
(400' RT ℄ OF



SECTION
(AXIS OF WEIR)

LEGEND

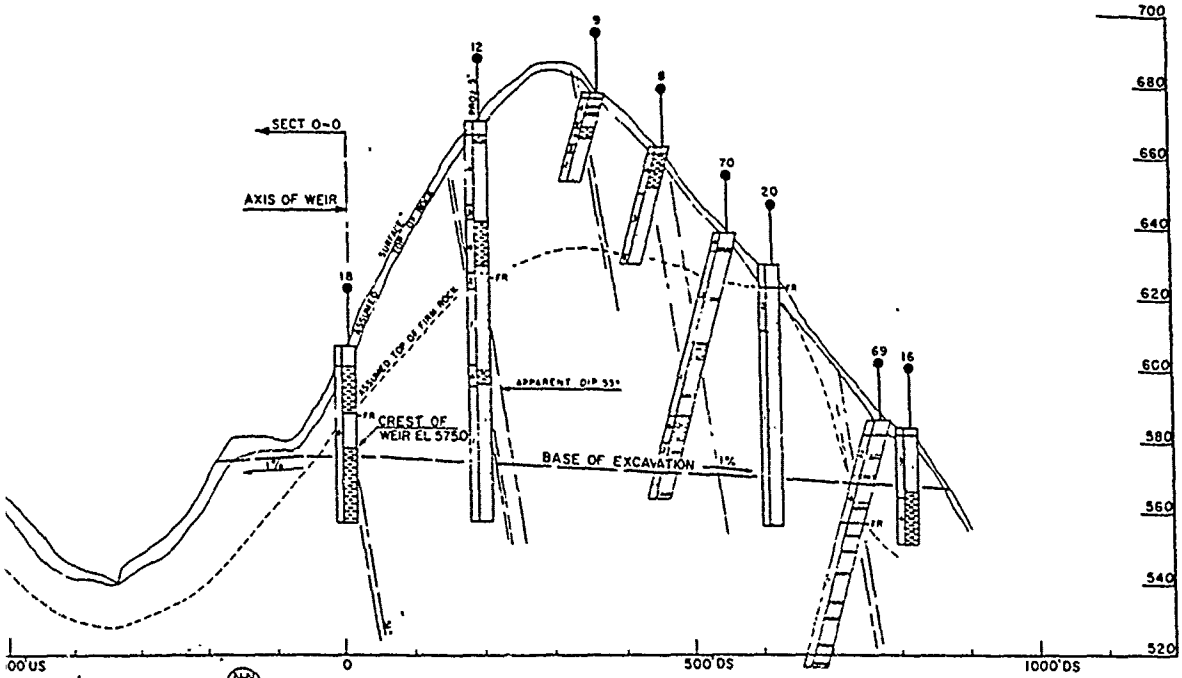
OVERBURDEN

SANDSTONE

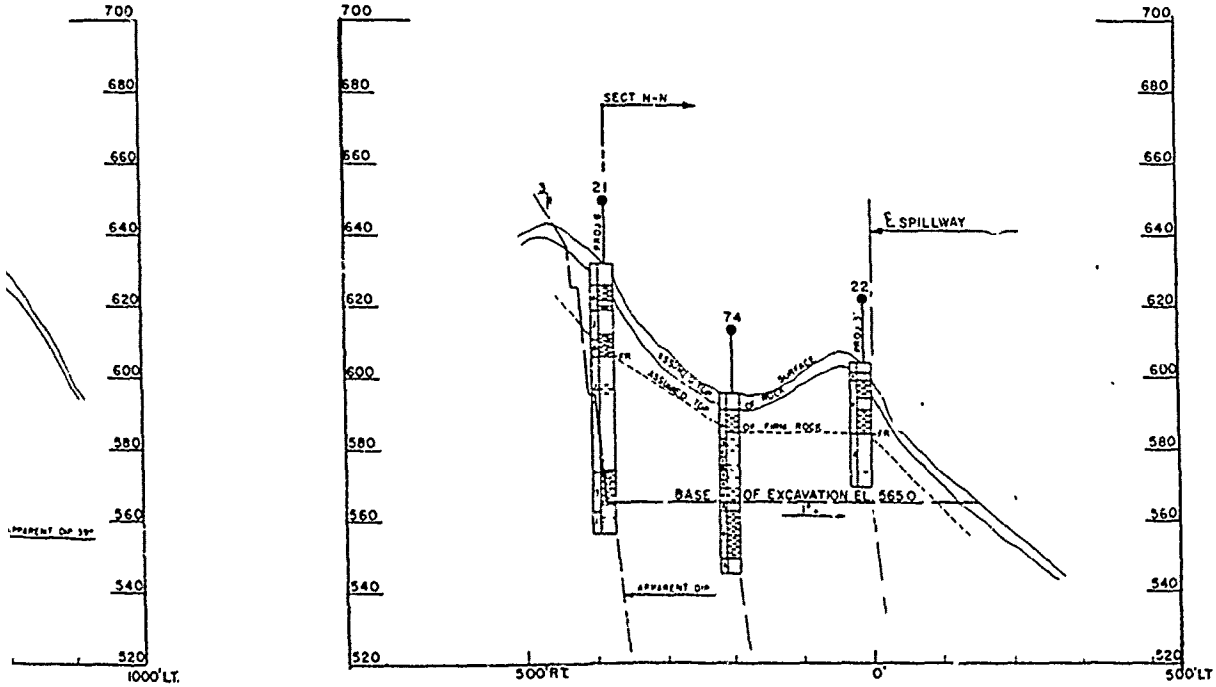
SHALE

10A4C 183 — CORE BORING NUMBER 183 PREFIX INDICATES SIZE AND TYPE BORING, e.g. C=CORE, A=AUGER D=DENISON

THIS DRAWING WAS ORIGINALLY PR
FOR USE AS A CONTRACT DRAWIN
WAS REPRODUCED FOR USE IN THIS P



SECTION (400' RT ℄ OF SPILLWAY)



SECTION

NOTES

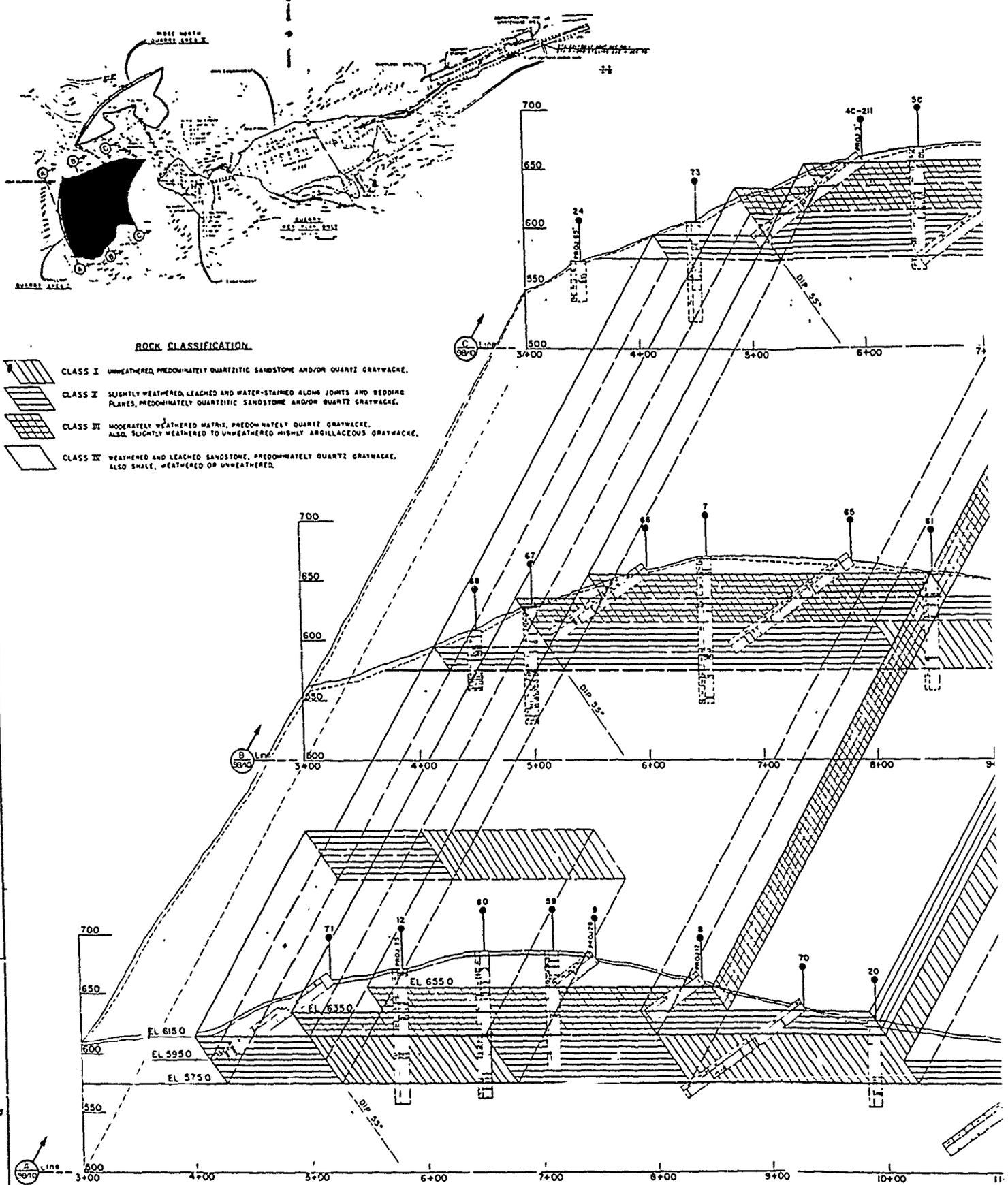
1. *Projection of geologic data between bo rings this Dwg is presented for the general information of the contractor and is to be considered only as a supplement to the contract drawings. The projection of geologic data between boring is the contracting officers interpretations of the general geologic conditions of the location of the section.*
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AS ORIGINALLY PREPARED CONTRACT DRAWING AND D FOR USE IN THIS REPORT

KEY | DATE | CHANGE	REVISION INDICATED BY 6	APPR
U.S. ARMY ENGINEER DISTRICT, TULSA CORPS OF ENGINEERS TULSA, OKLAHOMA		
DESIGNED BY	RED RIVER WATERSHED	SALINE RIVER, ARKANSAS
DRAWN BY	DIERKS DAM EMB., OUTLET WKS., SPILLWAY & ACCESS ROADS FOUNDATION EXPLORATION GEOLOGIC SECTIONS N-N THRU P-P	
CHECKED BY		
CHIEF ENGR. GEOLOGIST		
SUBMITTED	INVITATION NO. DACW 56-70-B-0089	
CHIEF, ENG. DIV.	SCALE AS SHOWN	
DEC 1968	DRAWING NO. 1960-C3-98/14	

EMBANKMENT CRITERIA AND PERFORMANCE REPORT - PLATE NO. 16

(2)

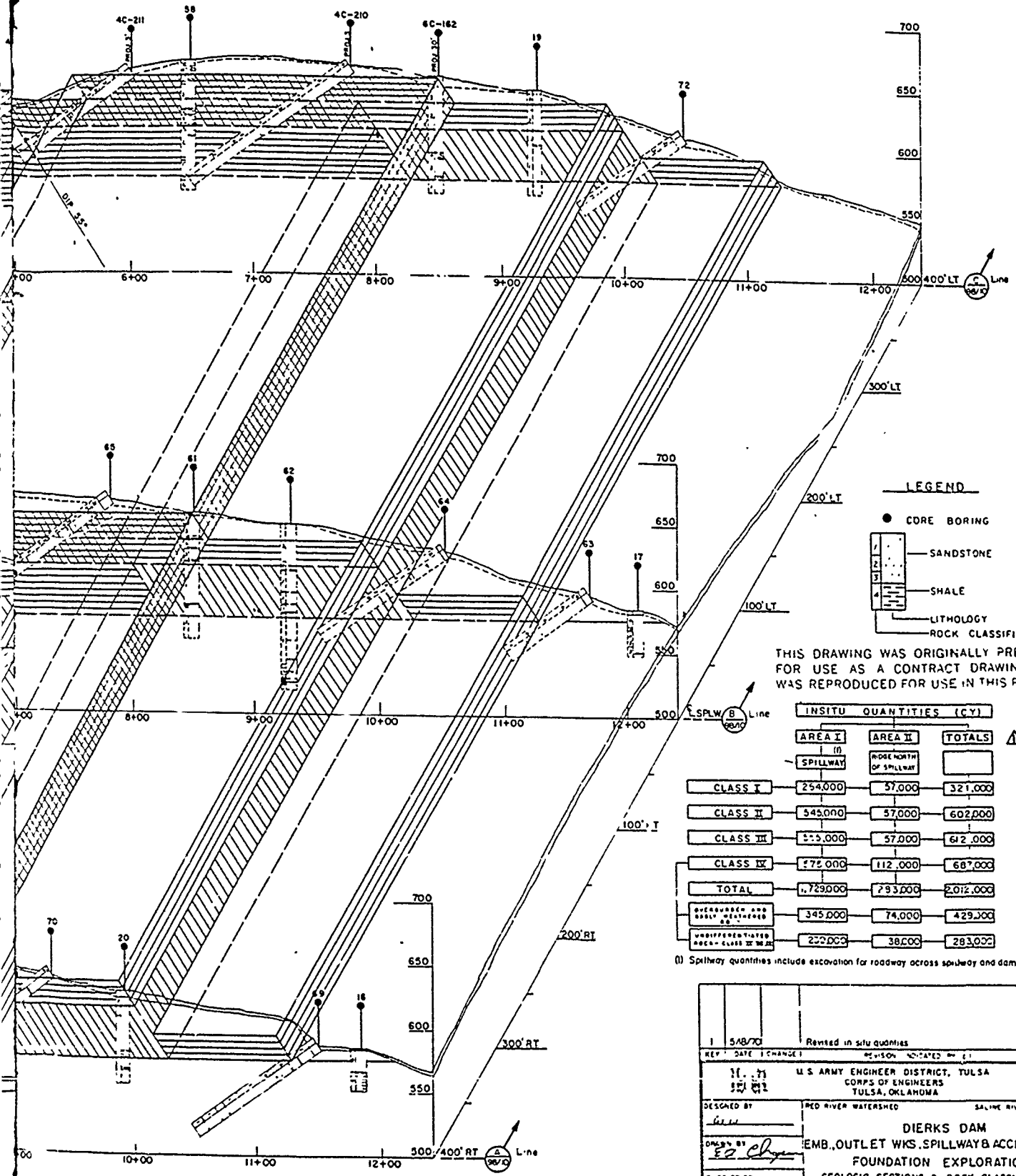


SPILLWAY QUARRY
(SOURCE AREA I)
SCALE 1"=40

NOTES

1 Projection of geologic data between boring on this Dwg is pr
for the general information of the contractor and is to be cons
as a supplement to the contract drawings. The projection o
data between boring is the contracting officers inter
of the general geologic conditions of the location of the so

(1)



LEGEND

- CORE BORING
- SANDSTONE
- SHALE
- LITHOLOGY
- ROCK CLASSIFICATION

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

INSITU QUANTITIES (CY) ⚠

	AREA I (1) SPILLWAY	AREA II RIDGE NORTH OF SPILLWAY	TOTALS
CLASS I	264,000	57,000	321,000
CLASS II	545,000	57,000	602,000
CLASS III	555,000	57,000	612,000
CLASS IV	675,000	112,000	687,000
TOTAL	1,729,000	283,000	2,012,000
OVERBURDEN AND BADLY WEATHERED R.R.	345,000	74,000	429,000
UNDIFFERENTIATED ROCK - CLASS III & IV	220,000	38,000	283,000

(1) Spillway quantities include excavation for roadway across spillway and dam

1 5/8/70 Revised in situ quantities

U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

DESIGNED BY
DRAWN BY E.D. Chyn
CHECKED BY
CHIEF ENGR SECTION
SUBMITTED
CHIEF, ENG GEOLS BR
DATE DEC 1968

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

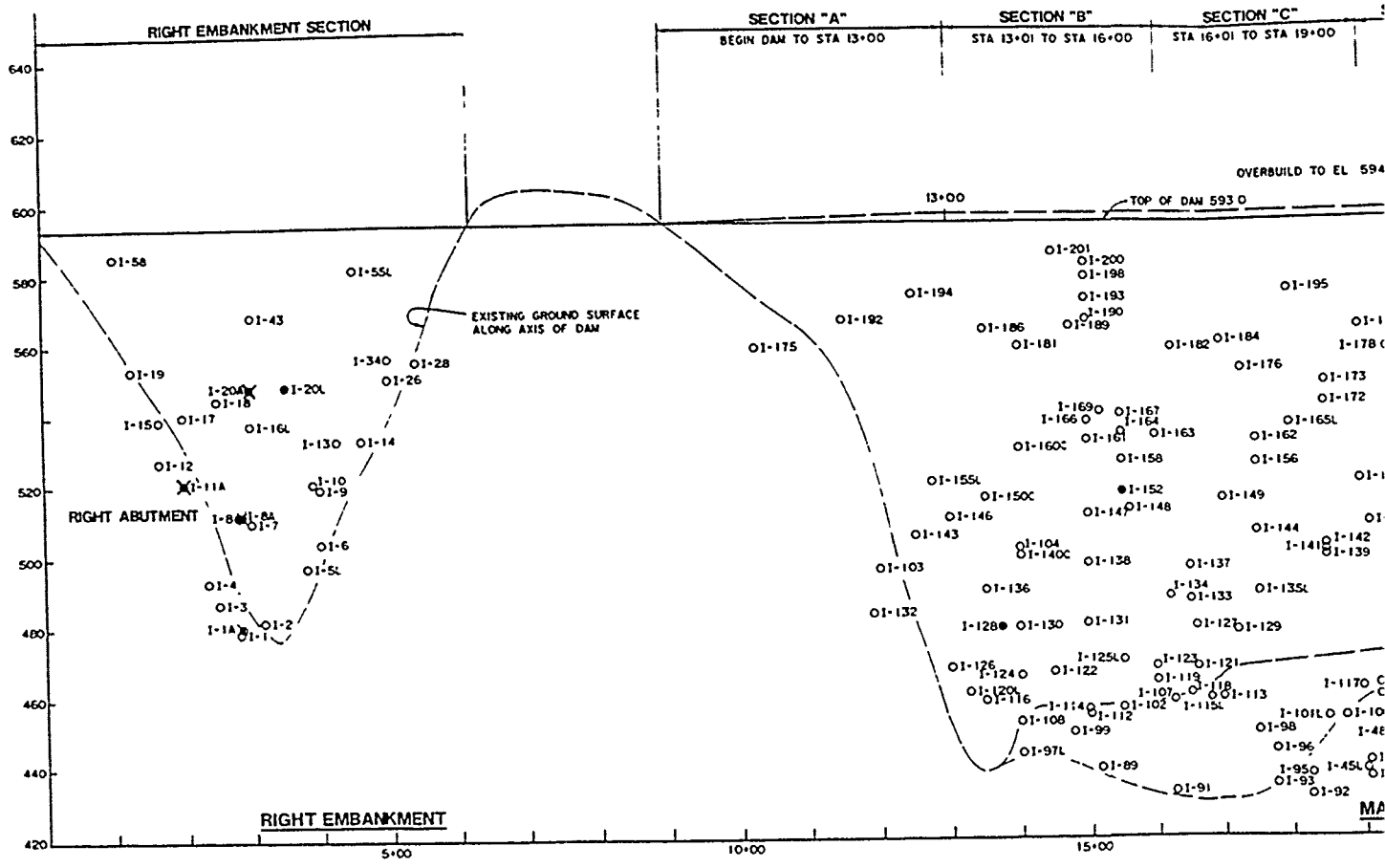
DIERKS DAM
EMB., OUTLET WKS., SPILLWAY & ACCESS ROADS
FOUNDATION EXPLORATION
GEOLOGIC SECTIONS & ROCK CLASSIFICATIONS

INVITATION NO DA-03-38-ENG-3053
SCALE AS SHOWN
DRAWING NO 1960-C3-98/151

...on of geologic data between boring on this Dwg is presented ...general information of the contractor and is to be considered only ...plement to the contract drawings. The projection of geologic ...tween boring is the contracting officers interpretations ...general geologic conditions of the location of the sections.

2. In holes where no water table is shown, the table was not obtained. Absence of water table elevations on logs does not necessarily mean that ground water will not be encountered at the locations and within the vertical reaches of these borings.

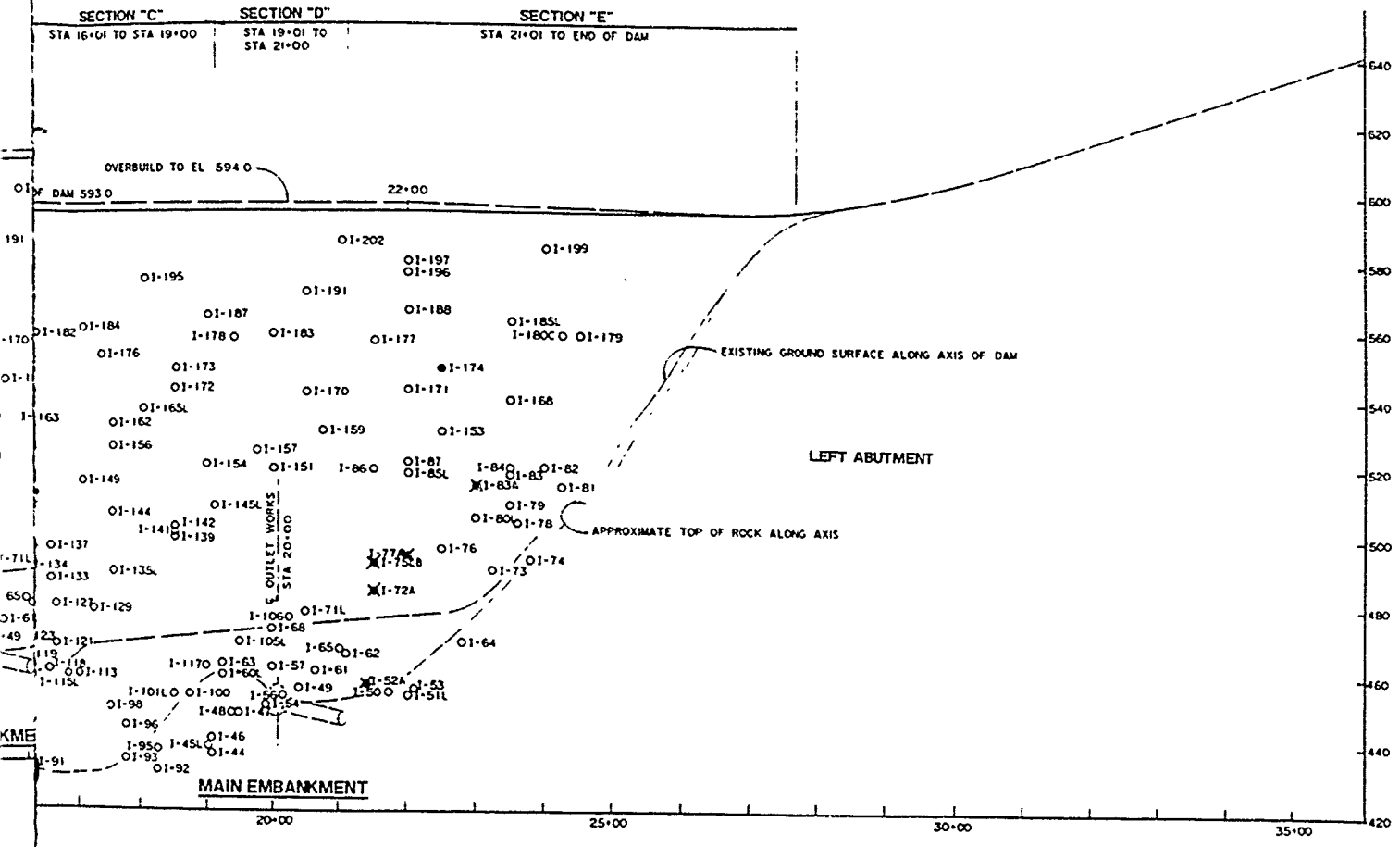
EMBANKMENT CRITERIA AND PERFORMANCE REPORT - PLATE NO. 17



IMPERVIOUS DENSITY TEST PLOT

PROFILE ALONG DAM AXIS

SCALE 1" = 100' HOR
1" = 20' VERT



ENSITY TEST PLOT
LONG DAM AXIS

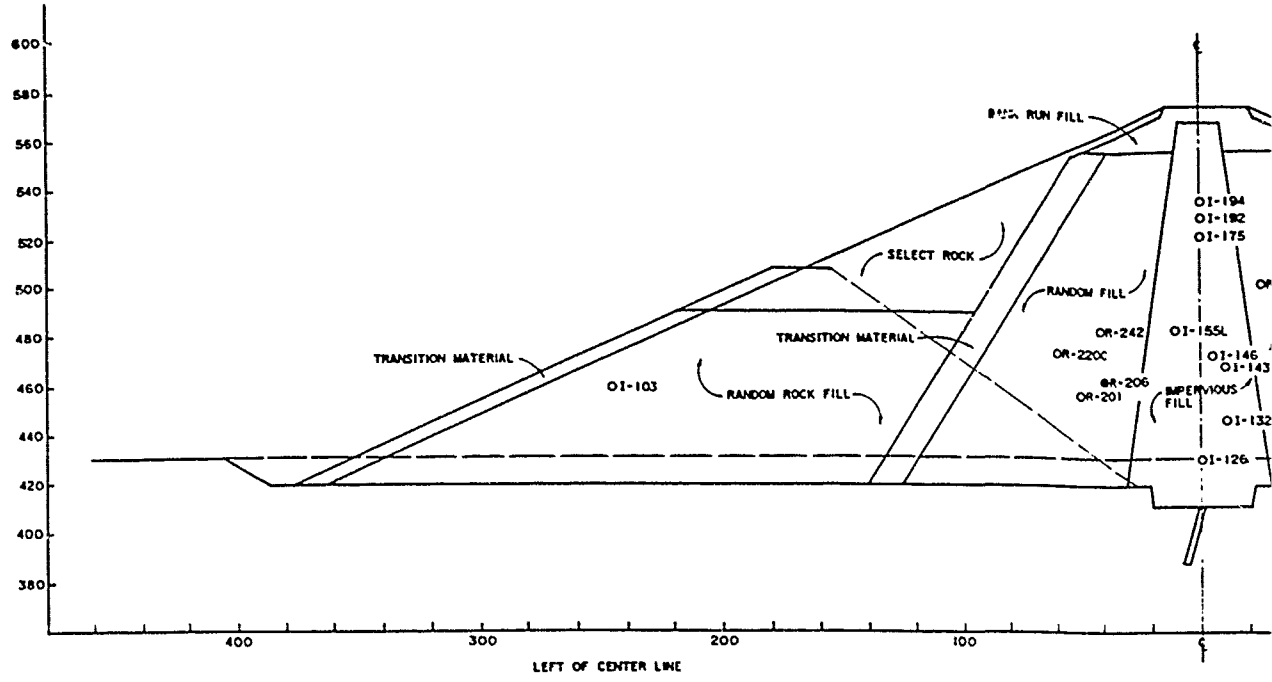
1" = 100' HOR
1" = 20' VERT

NOTES

1. ALL TEST SHOWN HAVE BEEN PROJECTED ONTO THE DAM CENTERLINE
2. TESTS FALLING OUTSIDE LIMITS SHOWN FOR THE TOP OF ROCK INDICATE AREAS OF DEEPER CORE TRENCH EXCAVATION OR VARIATION IN EMBANKMENT WIDTH FROM CENTER LINE PROFILE

LEGEND
O DENSITY TEST PASSED
● DENSITY TEST FAILED
⊗ DENSITY TEST RECHECK PASSED

IMPERVIOUS DENSITY
TEST PLOT PROFILE
ALONG DAM AXIS

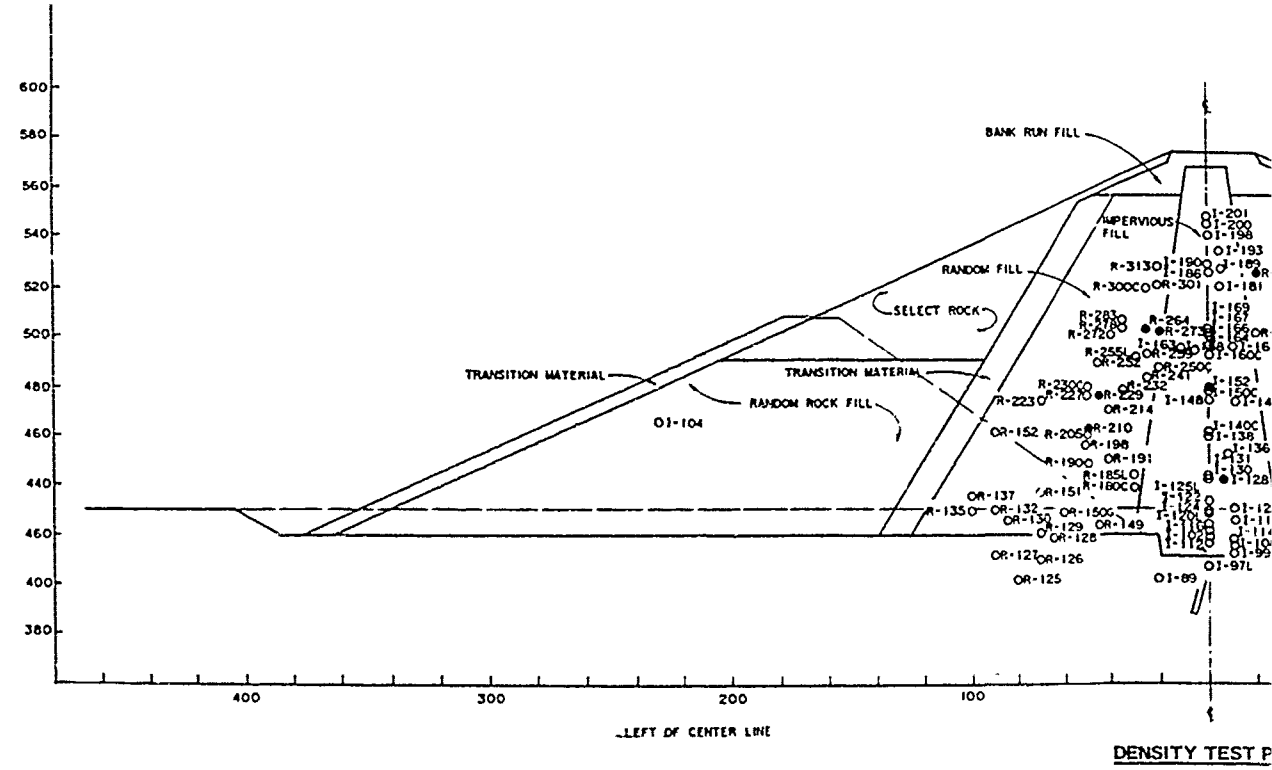


DENSITY TEST PI

SECTION "A" – BEGIN DAM T

SCALE: 1" = 30'

30 0 30'

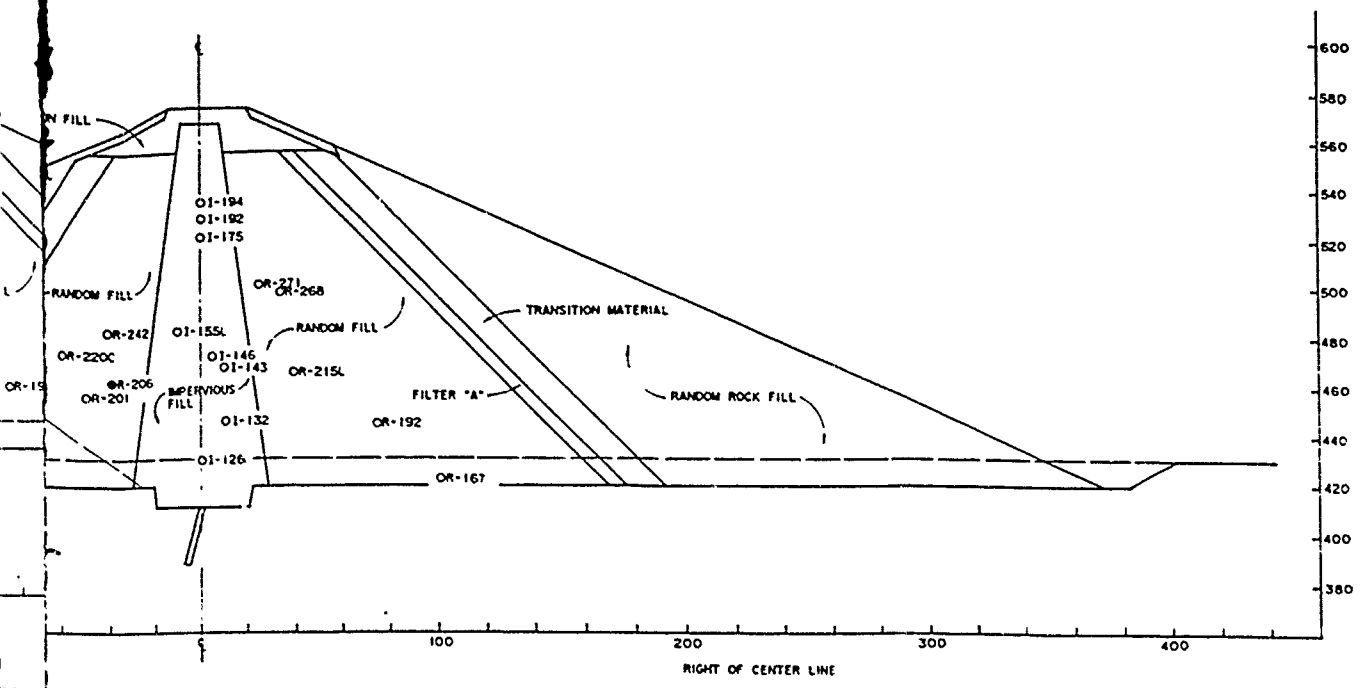


DENSITY TEST P

SECTION "B" – STA 13+01

SCALE 1" = 30'

30 0 30

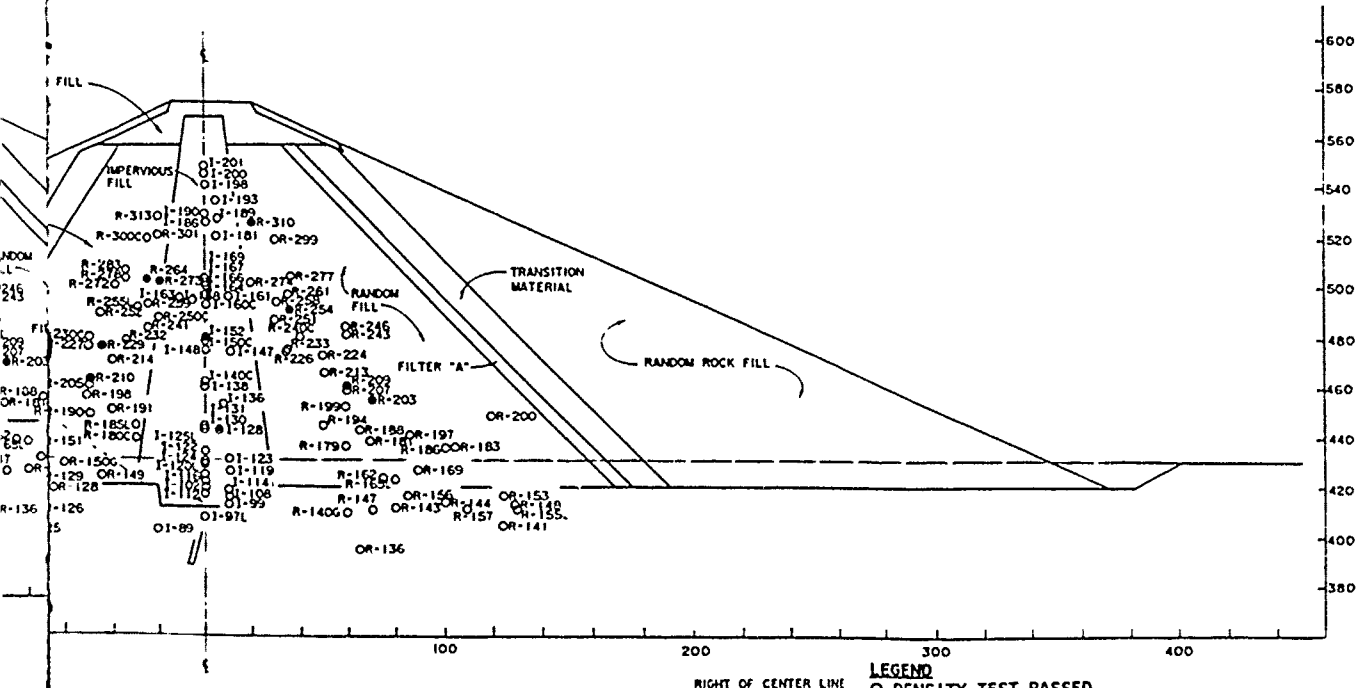


DENSITY TEST PLOT

TION "A" - BEGIN DAM TO STA 13+00

SCALE 1" = 30'

30 0 30' 60' 90



DENSITY TEST PLOT

TION "B" - STA 13+01 TO STA 10+00

SCALE 1" = 30

30 0 30 60 90

LEGEND

O DENSITY TEST PASSED

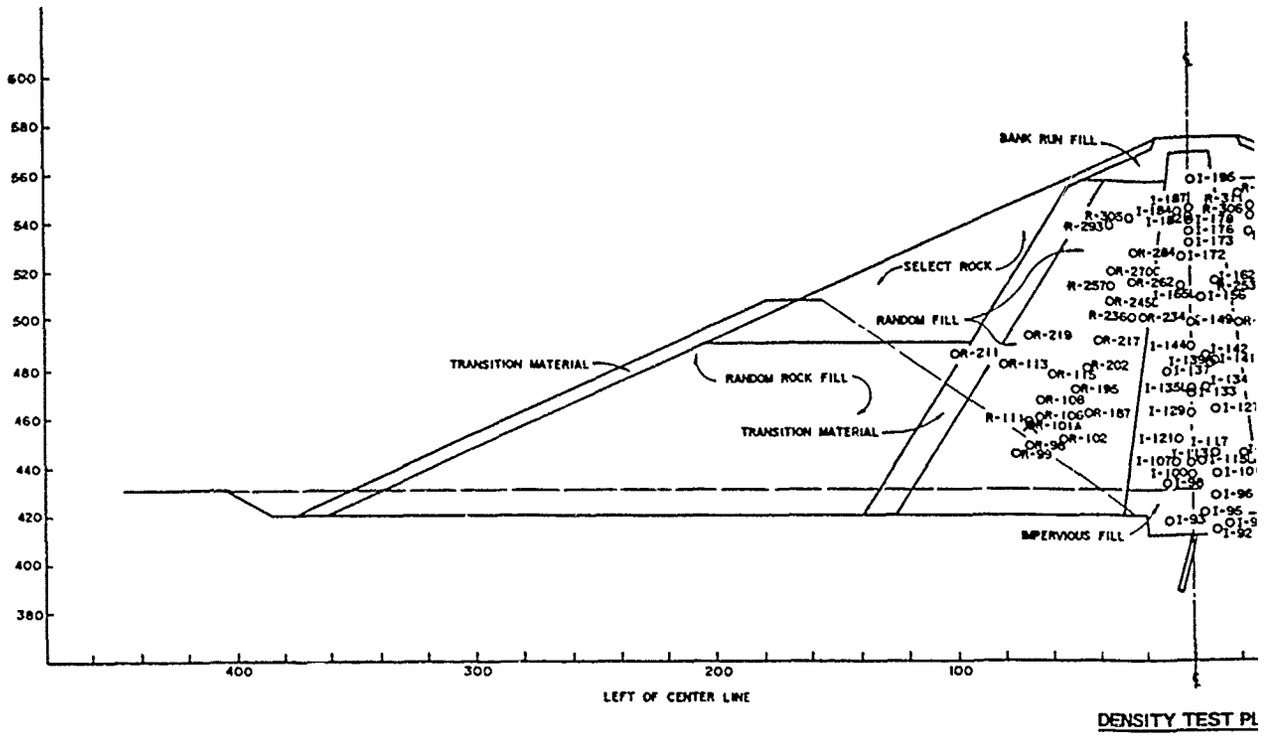
● DENSITY TEST FAILED

⊗ DENSITY TEST RECHECK PASSED

NOTE

1 TESTS OCCURRING BETWEEN THE INDICATED STATIONS ARE SHOWN PLOTTED ON A TYPICAL SECTION

DENSITY TEST PLOT
TYPICAL EMBANKMENT SECTIONS
"A" AND "B"

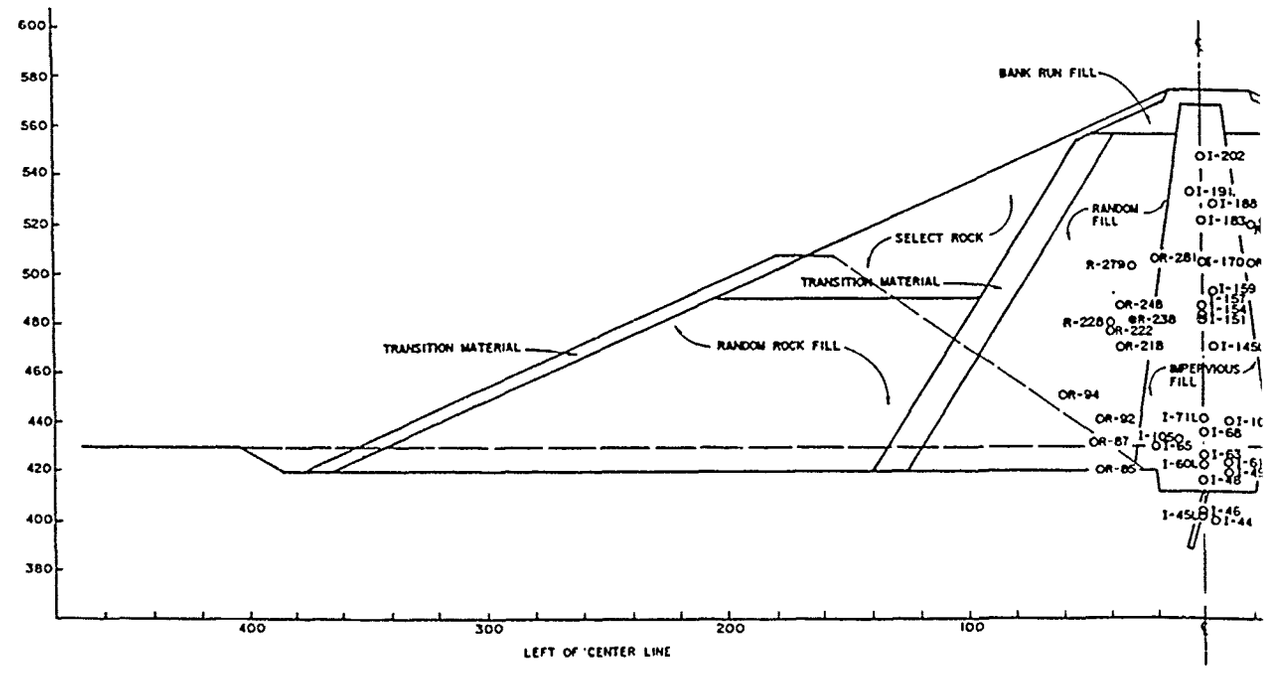


DENSITY TEST PL

SECTION "C" - STA 16+01 T

SCALE. 1" = 30'

30' 0 30'

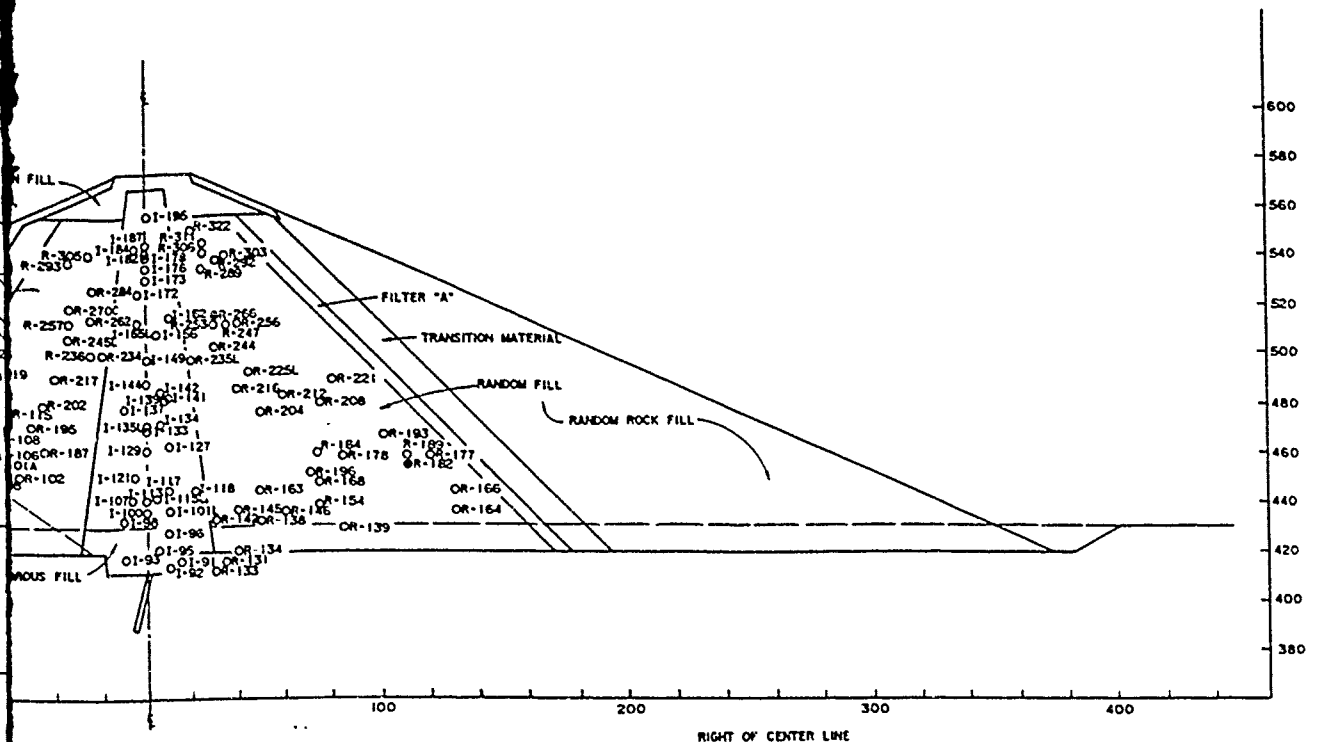


DENSITY TEST P

SECTION "D" - STA 19+01

SCALE 1" = 30'

30' 0 30'

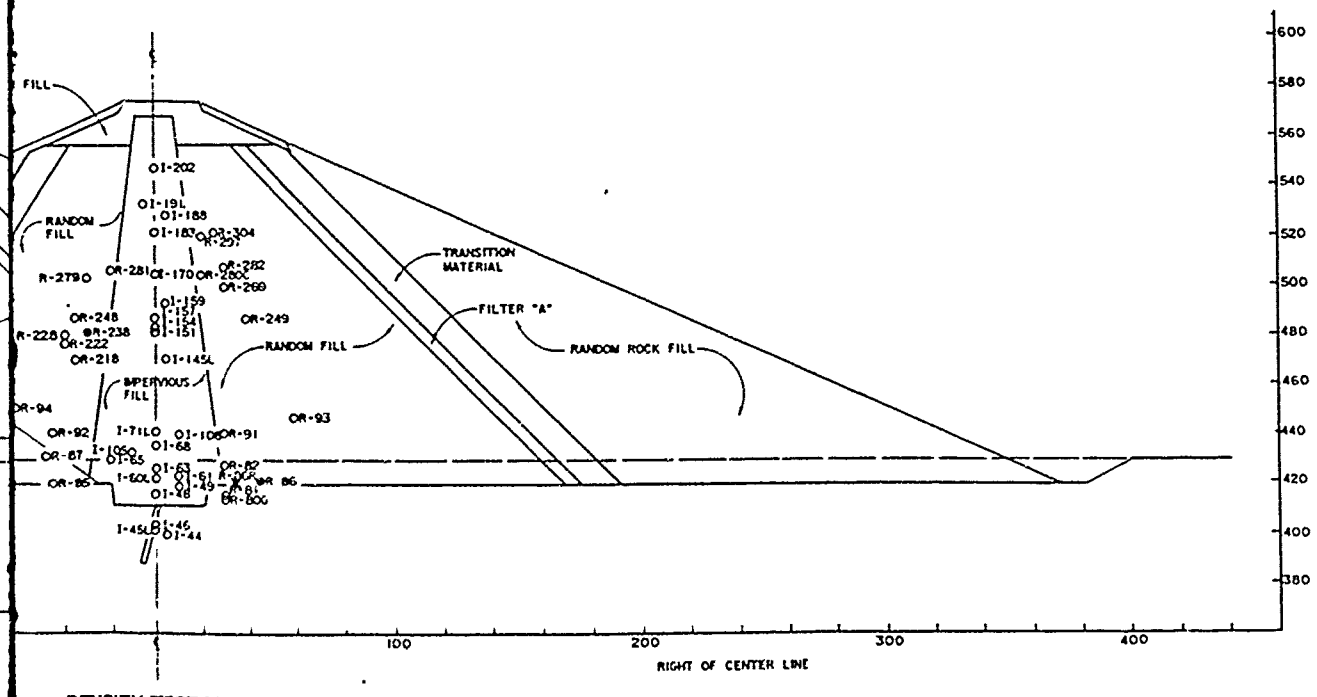


DENSITY TEST PLOT

ON "C" - STA 16+01 TO STA 19+00

SCALE. 1" = 30'

0' 0 30' 60' 90



DENSITY TEST PLOT

TION "D" - STA 19+01 TO STA 21+00

SCALE 1" = 30

30 0 30 60 90

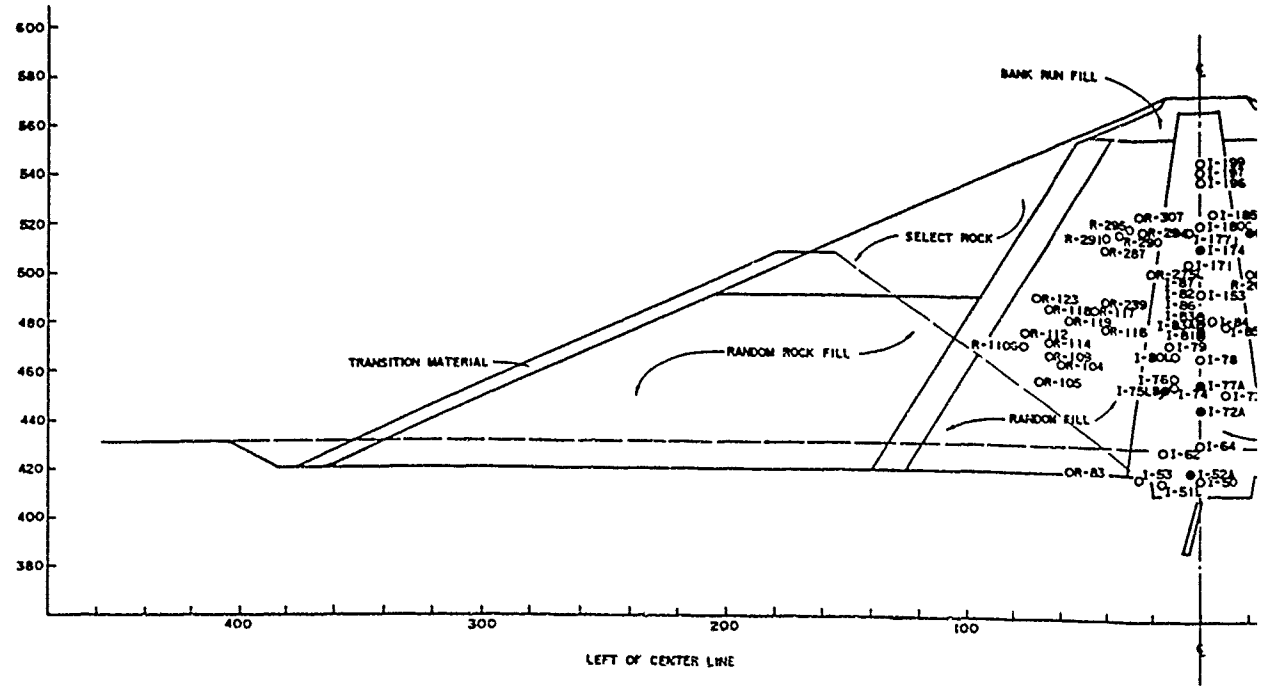
NOTE

1 TESTS OCCURRING BETWEEN THE INDICATED STATIONS ARE SHOWN PLOTTED ON A TYPICAL SECTION

LEGEND

- ○ DENSITY TEST PASSED
- ● DENSITY TEST FAILED
- ⊗ DENSITY TEST RECHECK PASSED

DENSITY TEST PLOT
TYPICAL EMBANKMENT SECTIONS
"C" AND "D"

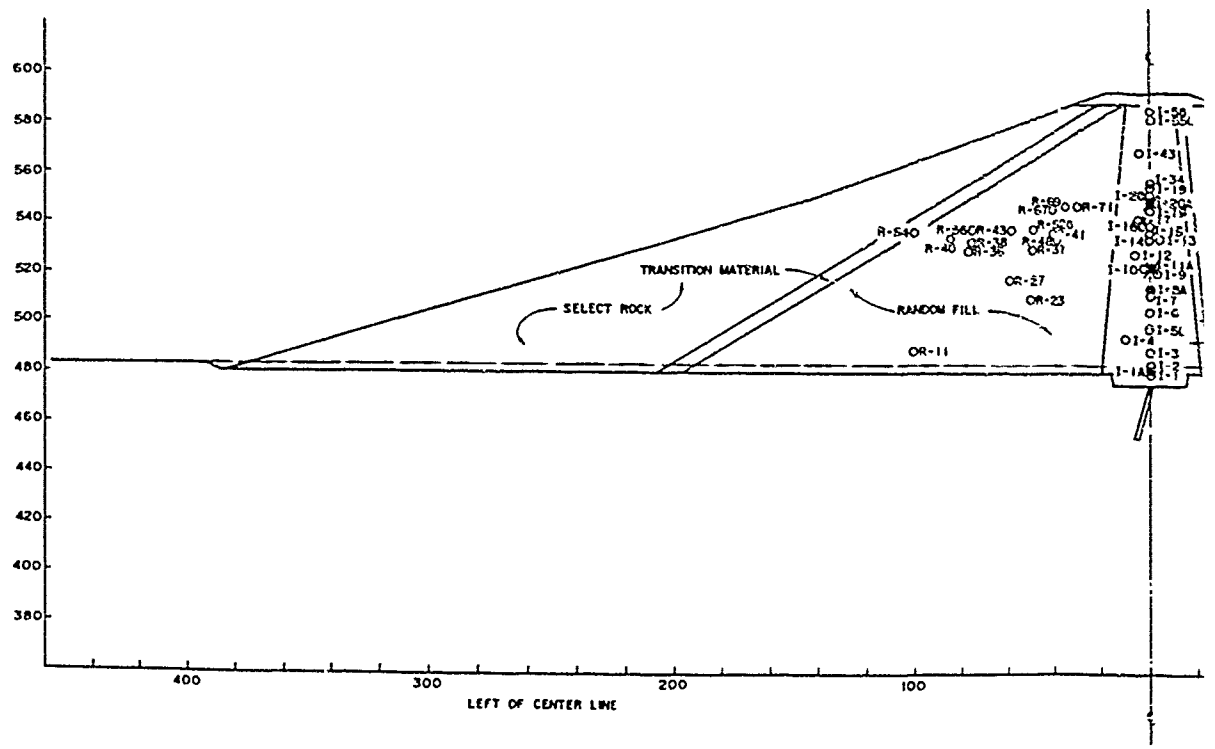


DENSITY TEST

SECTION "E" - STA 21+01 T

SCALE - 1" = 30'

30' 0 30'

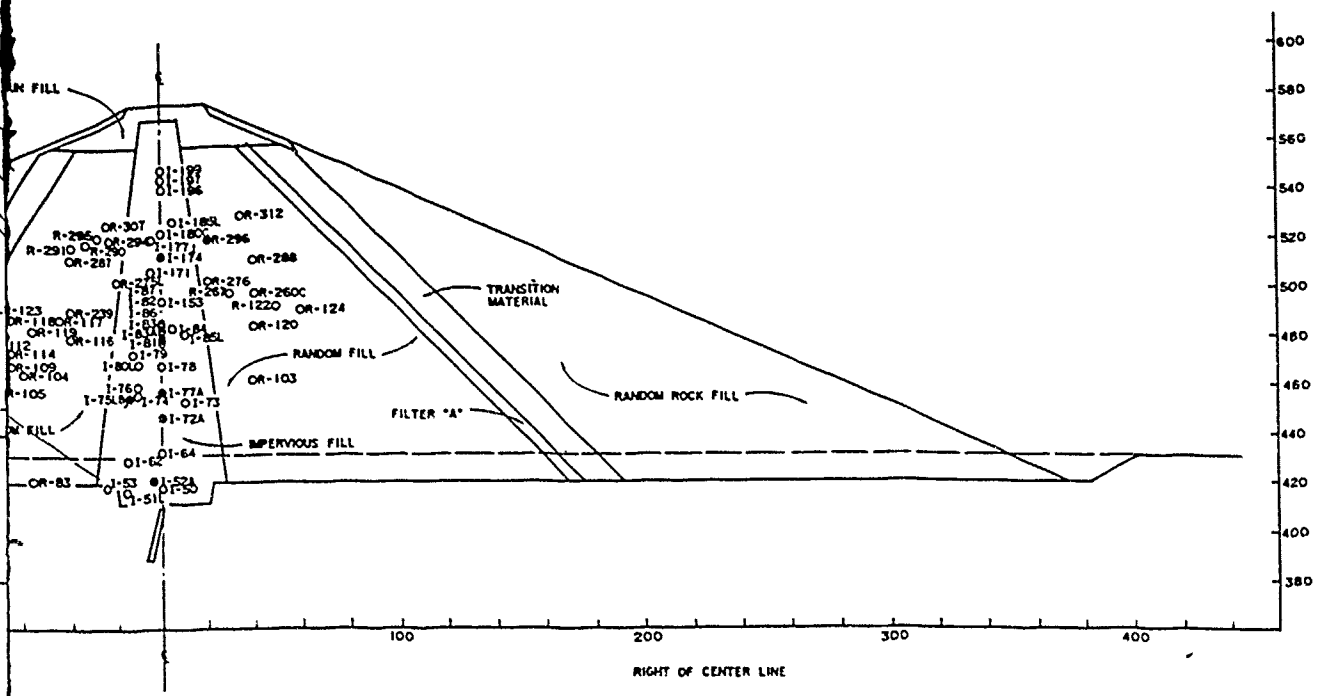


DENSITY TEST

RIGHT EMBANKMENT

SCALE - 1" = 30'

30' 0 30'

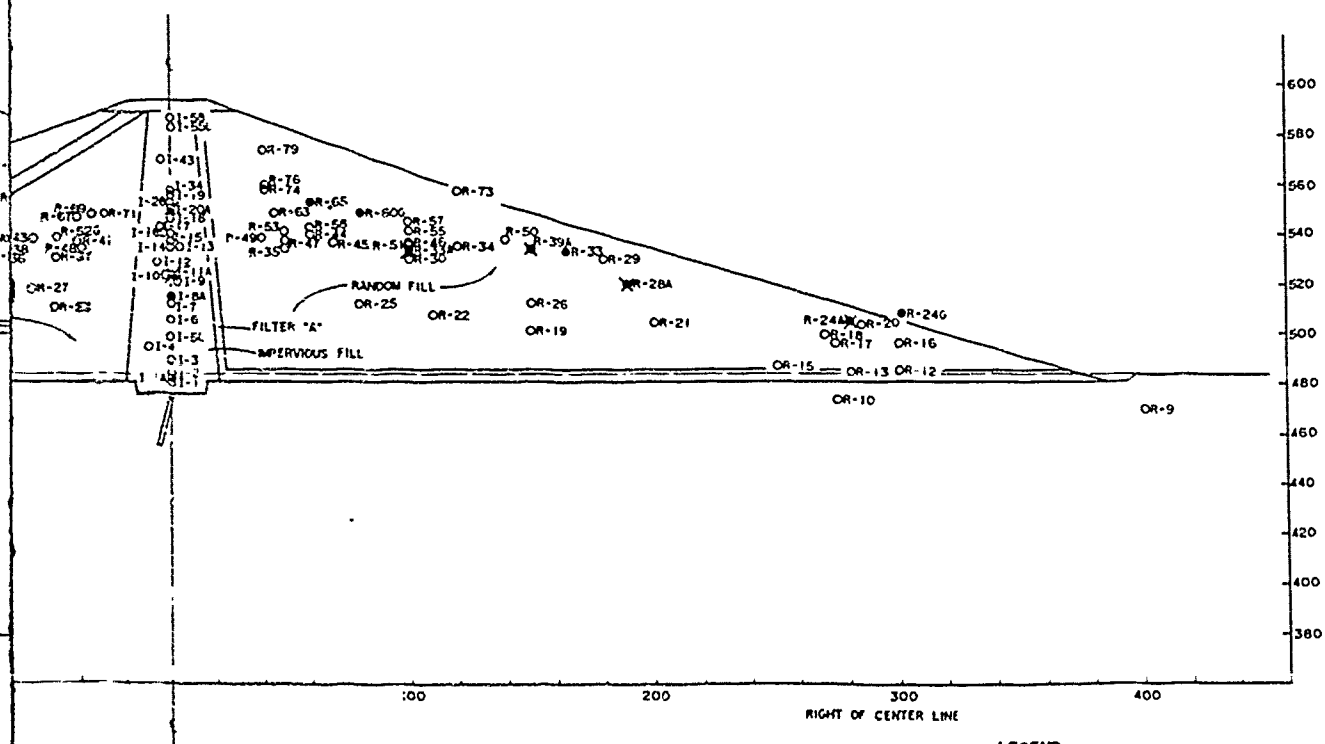


DENSITY TEST PLOT

TION "E" - STA 21+01 TO END OF DAM

SCALE: 1" = 30'

30' 0 30' 60' 90'



DENSITY TEST PLOT

RIGHT EMBANKMENT SECTION

SCALE 1" = 30'

30 0 30' 60' 90

NOTE

1 TESTS OCCURRING BETWEEN THE INDICATED STATIONS ARE SHOWN PLOTTED ON A TYPICAL SECTION

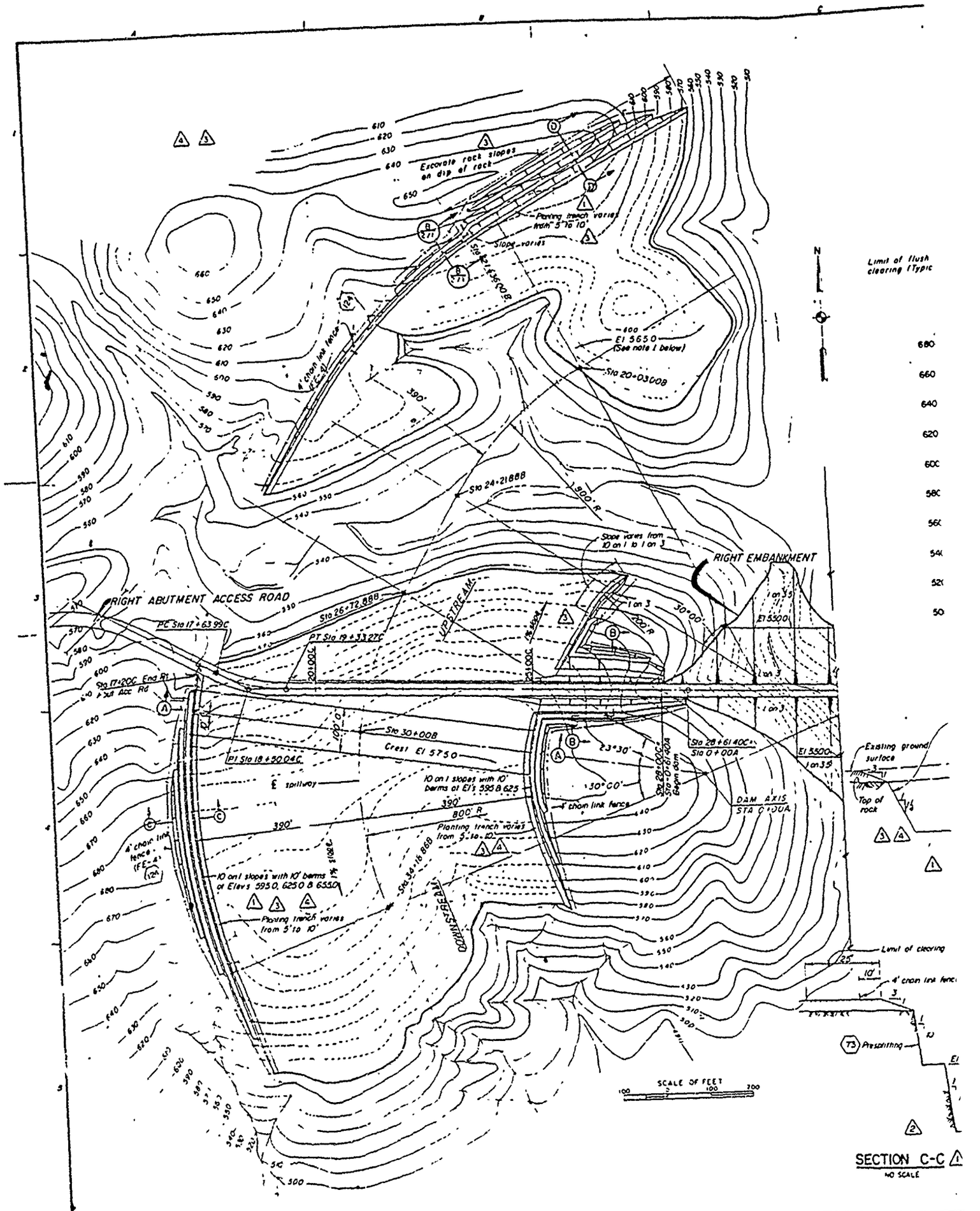
LEGEND

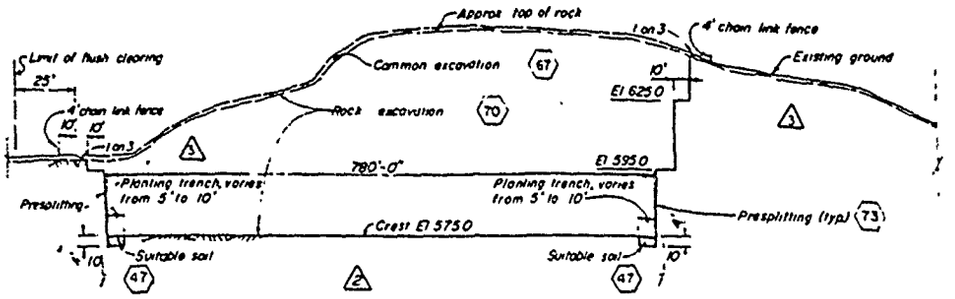
O DENSITY TEST PASSED

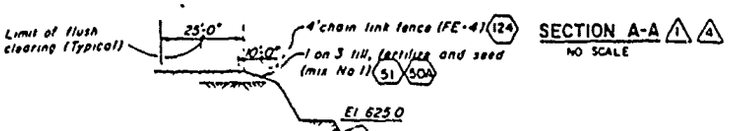
● DENSITY TEST FAILED

⊠ DENSITY TEST RECHECK PASSED

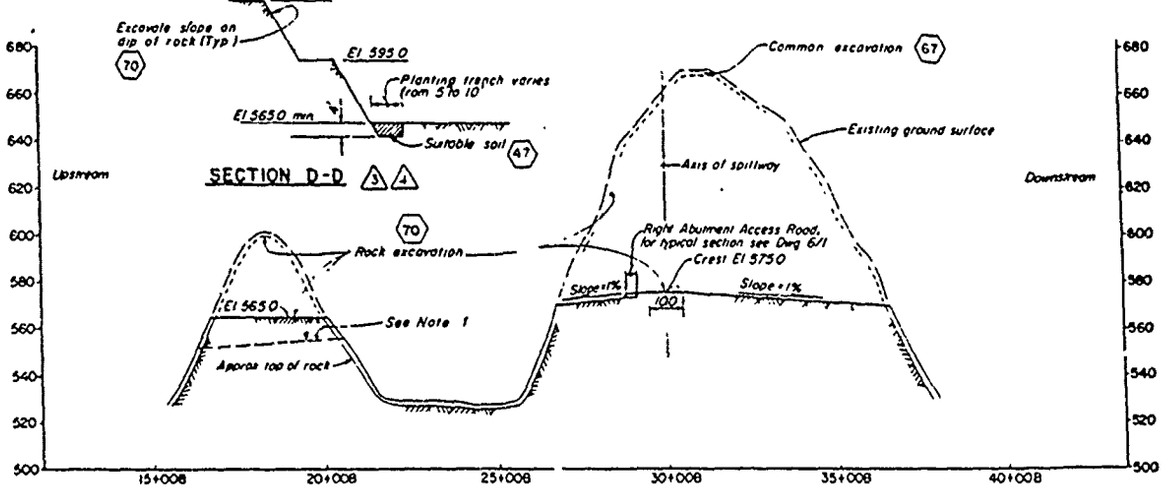
DENSITY TEST PLOT
TYPICAL EMBANKMENT SECTION "E"
AND
RIGHT EMBANKMENT SECTION


RIGHT ABUTMENT ACCESS ROAD
RIGHT EMBANKMENT
Excavate rock slopes on dip of rock
Planting trench varies from 5' to 10'
Slope varies
Limit of flush clearing (Typ)
El 5650 (See note 1 below)
Sta 20+03.00B
4' chain link fence (FE-4)
Sta 24+21.88B
Slope varies from 10 on 1 to 1 on 3
Sta 26+72.88B
PC Sta 17+63.99C
PT Sta 19+33.27C
UPSTREAM
Sta 17+20C End Rt Abut Acc Rd
Sta 30+00B
Crest El 5750
PI Sta 18+50.04C
℄ spillway
10 on 1 slopes with 10' berms at El's 5958 625
Sta 28+00C
Sta 0+61.40A
Basin dam
DAM AXIS
STA 0+00A
Existing ground surface
Top of rock
Limit of clearing
25'
10'
4' chain link fence
73 Presplitting
SCALE OF FEET
100 0 100 300
SECTION C-C
NO SCALE

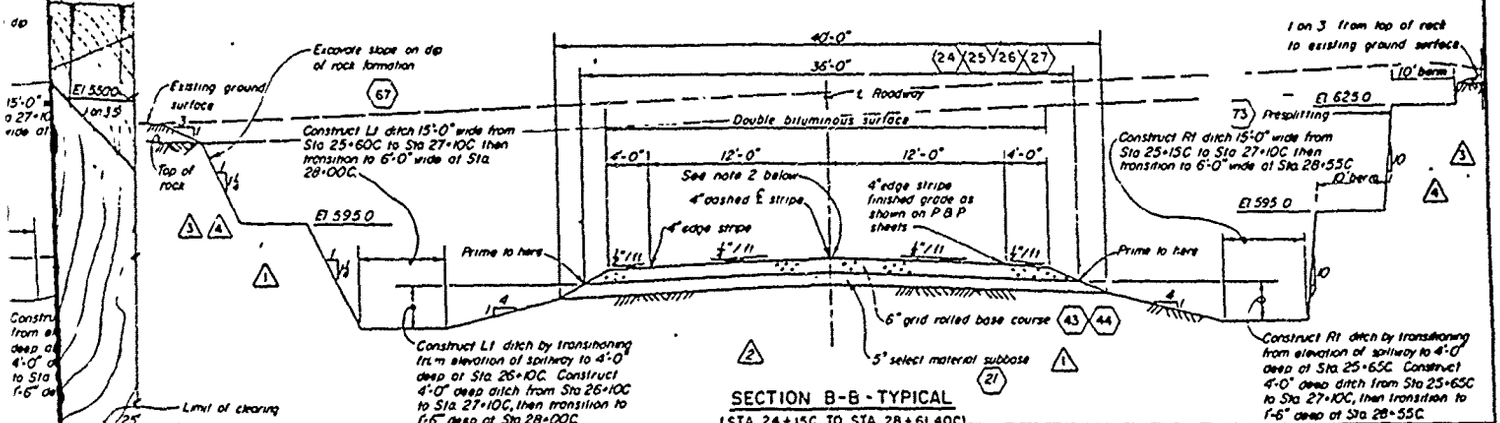




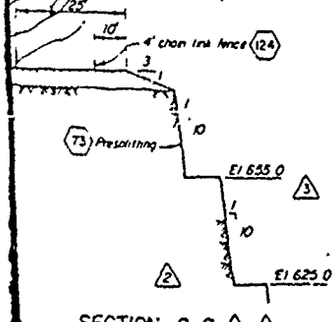
SECTION A-A 1 4
NO SCALE



PROFILE ALONG ℄ SPILLWAY LOOKING EAST
SCALE 1" = 200' HORIZONTAL
1" = 30' VERTICAL



SECTION B-B - TYPICAL
(STA 24+15C TO STA 28+61.40C)
(NO SCALE)



SECTION C-C 1 4
NO SCALE

NOTE
1 This area is to be deepened as necessary for rock borrow. Deepening will be done by successive excavation of the entire area and not by localized excavation. A 10' berm will be maintained at El 565.0 and the 10 on 1 back slopes shall be continued to the bottom of the final excavation.
2 Transition the crown of the roadway as shown on Section B-B to that shown on the typical section for the roadway across the spillway (see Dwg 6/11 from Sta 24+15C to Sta 24+65C.

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

REV	DATE	CHANGE	REVISION NO DATED BY BY	APPD
4	9 13-71	Sub 1 DO 11	Spillway approach & roadway berms revised Spillway approach slopes revised	
3	7-30-71	DO 11	Spillway approach & roadway berms revised & masonry planters added Spillway approach slopes revised	
2	5-18-70	um0004	Changed 'topsoil' to 'suitable soil'	
1	5-11-70	swh0003	Revised details and qty items	

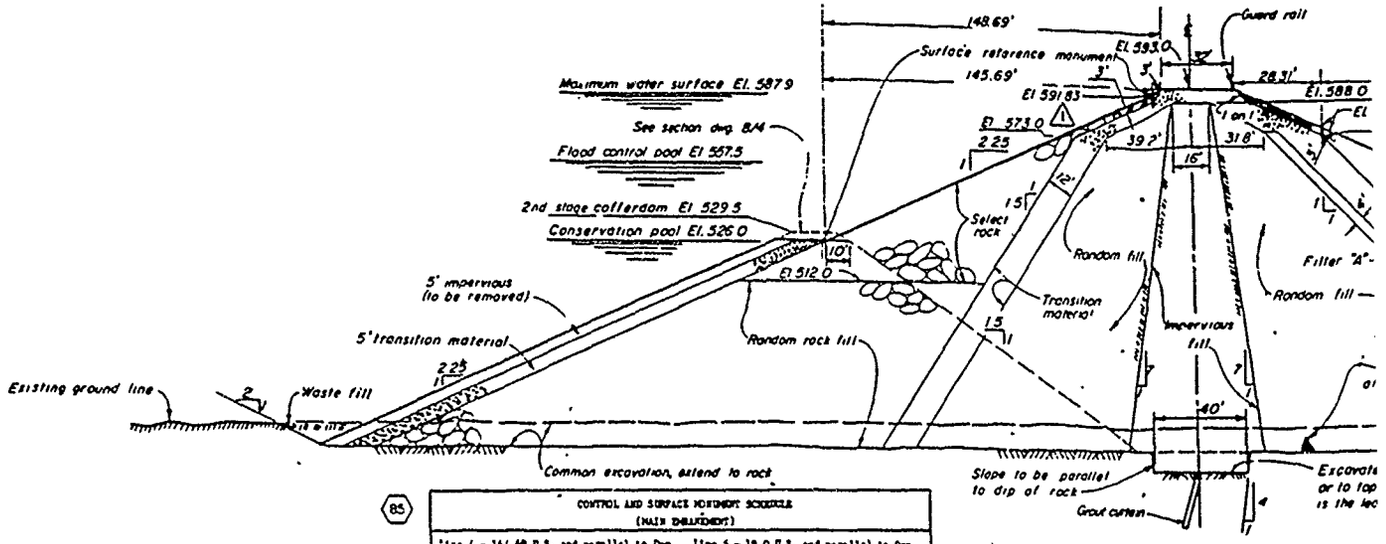
U S ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

DESIGNED BY [signature] — RED RIVER WATERSHED — SALINE RIVER, ARKANSAS
DRAWN BY [signature]
CHECKED BY [signature]

DIERKS DAM
EMB, CONCRETE WORKS, SPILLWAY & ACCESS RDS
DIVERSION & EXCAVATION
SPILLWAY EXCAVATION - PLAN, PROFILE & SECTION

SUBMITTED [signature]
CHIEF, ENGINEERING SECTION
DATE DEC 1968

INVITATION NO DACW56-[illegible]-0053
SCALE AS SHOWN
DRAWING NO 1960-C3-8/5.4



MAIN EMBANKMENT (3)

(TYPICAL SECTION)

SCALE: 1" = 30'

(85)

CONTROL AND SURFACE MONUMENT SCHEDULE

(MAIN EMBANKMENT)

Line 4 - 144.69' U.S. and parallel to Dam Axis at Sta. 9+30A

SM-7	Sta. 9+30A
SM-8	350' East of SM-7
SM-9	600' East of SM-7
SM-10	850' East of SM-7
SM-11	1100' East of SM-7
SM-12	1350' East of SM-7
SM-6	1785' East of SM-7

Line 5 - 19.0 U.S. and parallel to Dam Axis at Sta. 10+30A

SM-8	Sta. 9+70A
SM-13	360' East of SM-8
SM-14	610' East of SM-8
SM-15	860' East of SM-8
SM-16	1110' East of SM-8
SM-17	1360' East of SM-8
SM-10	2920' East of SM-8

Line 6 - 44.31' U.S. and parallel to Dam Axis at Sta. 8+00A

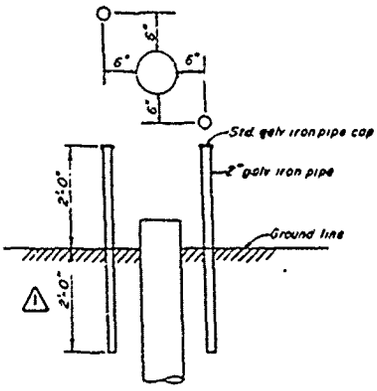
SM-11	Sta. 8+00A
SM-12	120' East of SM-11
SM-18	480' East of SM-11
SM-19	730' East of SM-11
SM-20	980' East of SM-11
SM-21	1230' East of SM-11
SM-22	1480' East of SM-11
SM-23	1730' East of SM-11
SM-13	1865' East of SM-11

Line 7 - 134.81' U.S. and parallel to Dam Axis at Sta. 12+80A

SM-24	135' West of SM-24
SM-24	Sta. 12+80A
SM-25	250' East of SM-24
SM-26	500' East of SM-24
SM-27	750' East of SM-24
SM-28	1000' East of SM-24
SM-15	1330' East of SM-24

Line 8 - 269.31' U.S. and parallel to Dam Axis at Sta. 12+80A

SM-16	100' West of SM-29
SM-29	Sta. 12+80A
SM-30	250' East of SM-29
SM-31	500' East of SM-29
SM-32	750' East of SM-29
SM-17	2130' East of SM-29



(85) SURFACE MONUMENT GUARD

NO SCALE

(85)

(1)

CONTROL AND SURFACE MONUMENT SCHEDULE

(RIGHT EMBANKMENT)

Line 1 - 143.75' U.S. and parallel to Dam Axis at Sta. 0+55A

SM-1	Sta. 0+55A
SM-1	110' East of SM-1
SM-2	290' East of SM-1
SM-2	600' East of SM-1

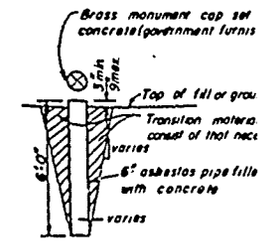
Line 2 - 19' U.S and parallel to Dam Axis at Sta. 0+45A

SM-3	Sta. 0+45A
SM-3	135' East of SM-3
SM-4	210' East of SM-3
SM-5	390' East of SM-3
SM-4	690 East of SM-3

(1)

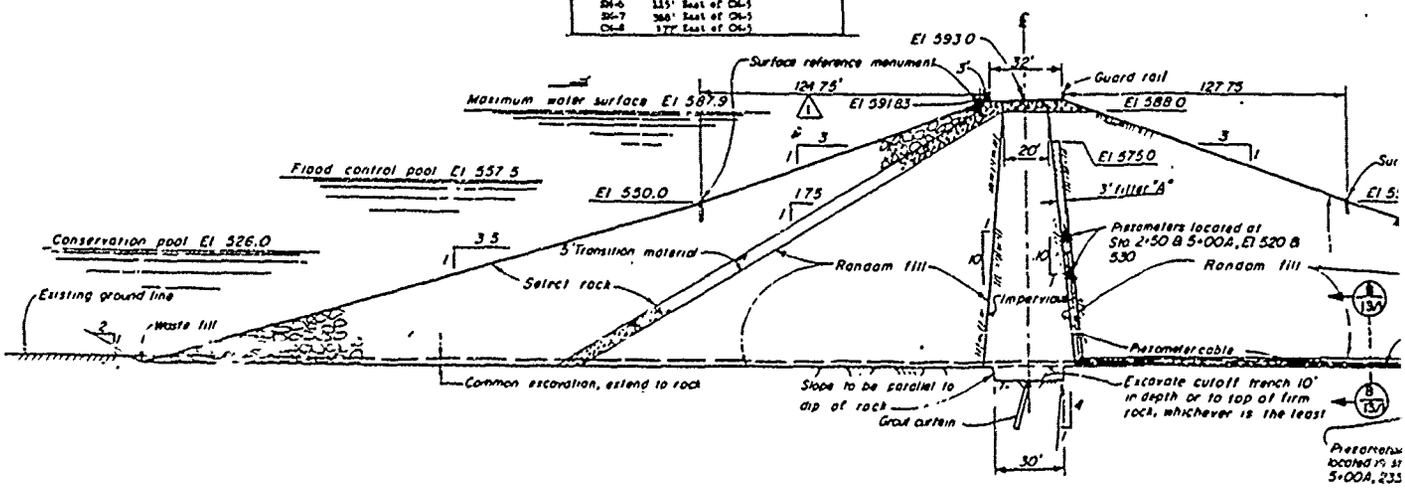
Line 3 - 143.75' U.S. and parallel to Dam Axis at Sta. 2+30A

SM-5	Sta. 2+30A
SM-6	135' East of SM-5
SM-7	386' East of SM-5
SM-8	177' East of SM-5



(85) SURFACE REFERENCE MO

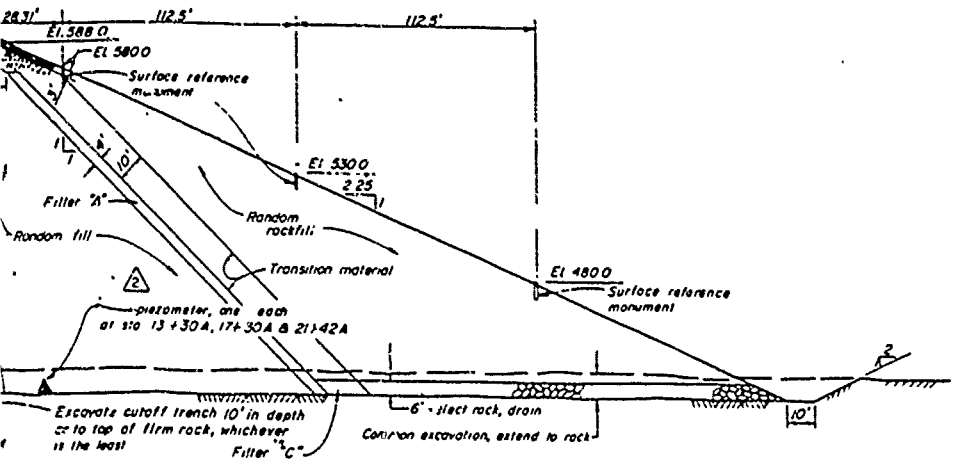
NO SCALE



RIGHT EMBANKMENT

(TYPICAL SECTION)

SCALE 1" = 30'



MENT (3) (4) (5)

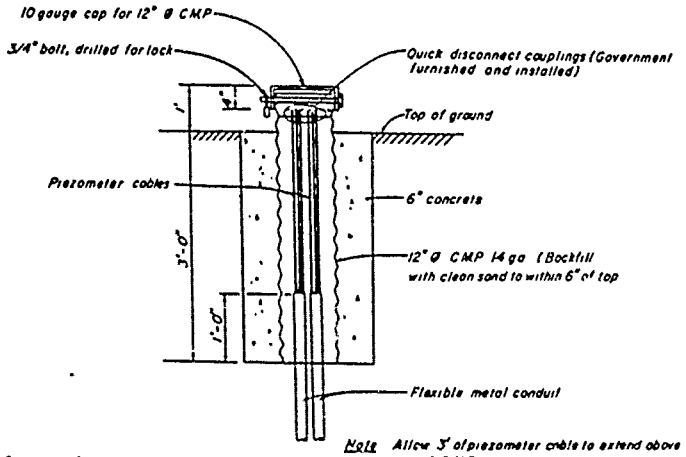
ON)

onument cap set in (government furnished)

Top of fill or ground line

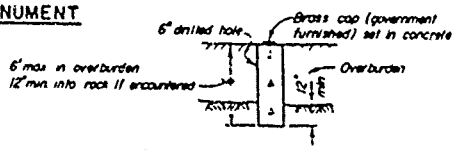
Transition material (excavation to consist of that necessary to install pipe) (1)

asbestos pipe filled concrete



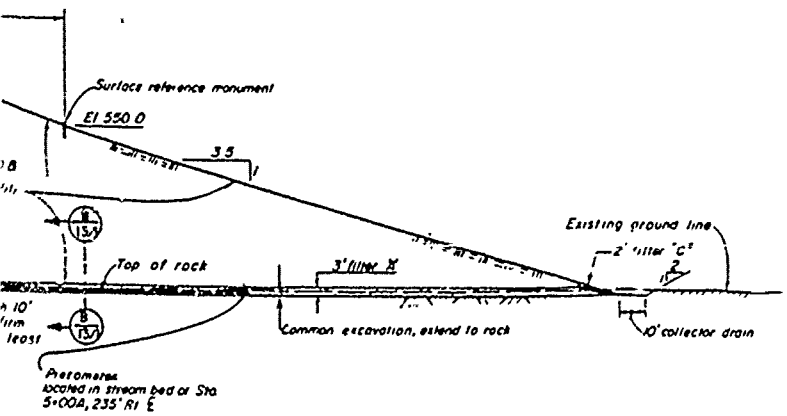
Note Allow 3' of piezometer cable to extend above top of C.M.P.

ERENCE MONUMENT
NO SCALE



(1) CONTROL MONUMENT
NO SCALE

RIGHT EMBANKMENT MONITORING POINT FOR PIEZOMETERS (84)
(2)
NO SCALE



Note
1. Piezometers and cables are government furnished
2. All control monuments locations are approximate

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

5	12-5-72	DO 21	Revised top of second stage cofferdam	J.W.
4	4-6-72	DO 18	Typical section of main embankment revised	J.W.
3	11-1-71	DO 13	Typical section of main embankment revised	G.L.
2	2-11-71	DO 3	Piezometer system revised	G.L.
1	5-18-70	Amdt 10004	Revised Control and Surface Monument Schedule and embankment elevations and dimensions and added details	J.W.
KEY	DATE	CHANGE	REVISION INDICATED BY A	APPR

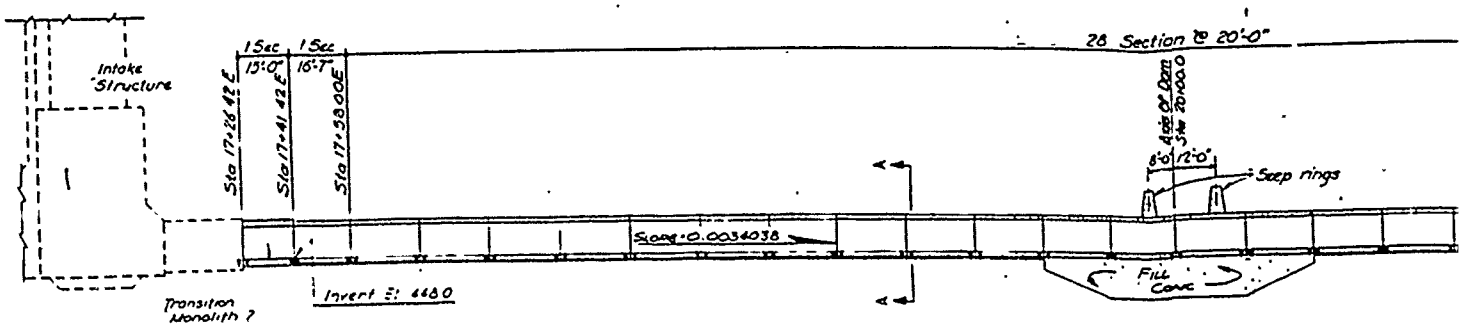
U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA OKLAHOMA

DESIGNED BY — RED RIVER WATERWAYS — SALINE RIVER, ARKANSAS
DRAWN BY
CHECKED BY

DIERKS DAM
EMB, OUTLET WORKS, SPILLWAY & ACCESS RDS.
ENGINEERING MEASUREMENT DEVICES
EMBANKMENT
SECTIONS AND DETAILS

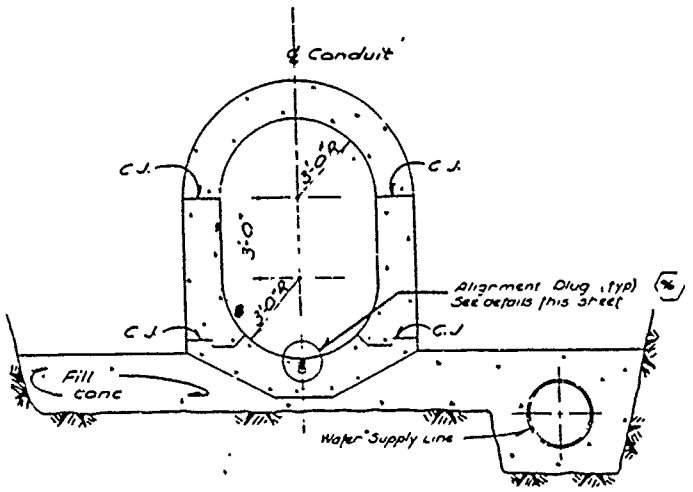
SUBMITTED
Chief, Design & Media Br.
DATE APR 1970

INVITATION NO DACW56-70-B-0053
SCALE AS SHOWN
DRAWING NUMBER 1960-C3-13/2.5



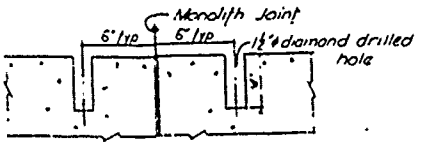
SECTION ALONG ℄ CONDUIT

Scale : 1" = 80'

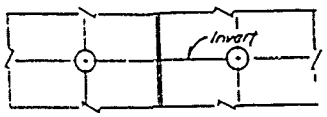


SECTION A-A

Scale . 3/8" = 1'0"



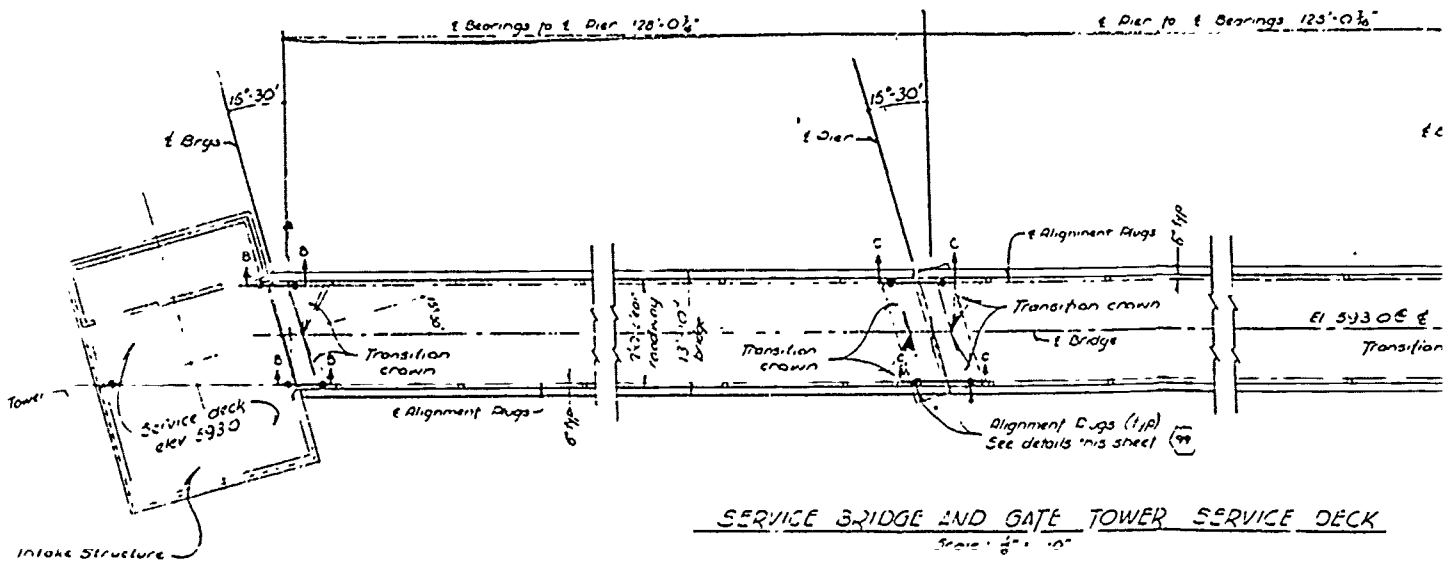
SECTION



PLAN

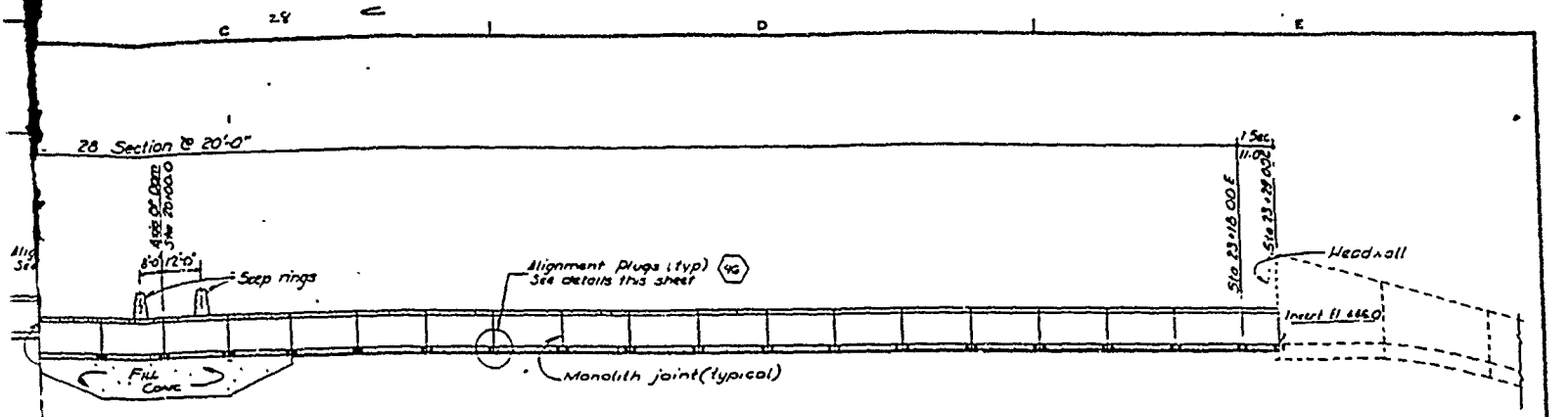
CONDUIT ALIGNMENT FACILITIES

SCALE. 3/8" = 1'0"



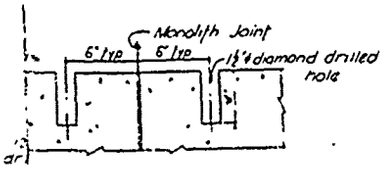
SERVICE BRIDGE AND GATE TOWER SERVICE DECK

Scale : 1/8" = 1'0"

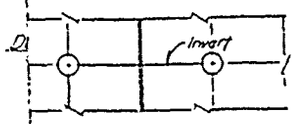


CTION ALONG ℄ CONDUIT

Scale : 1" = 80'

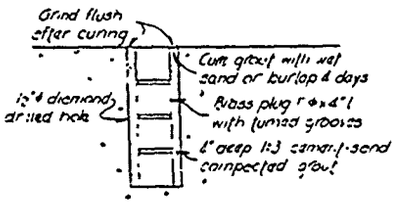


SECTION

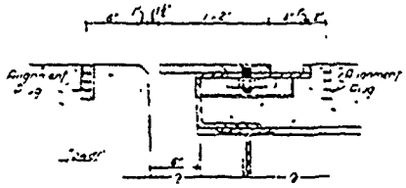


PLAN

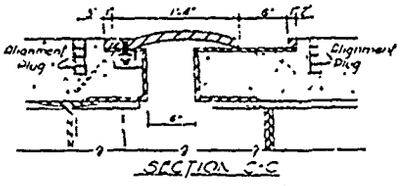
CONDUIT
IGNMENT FACILITIES
SCALE. ½"=1'0"



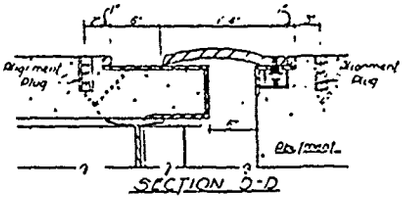
DETAIL OF ALIGNMENT PLUG (TYPICAL)
SCALE: half



SECTION B-B

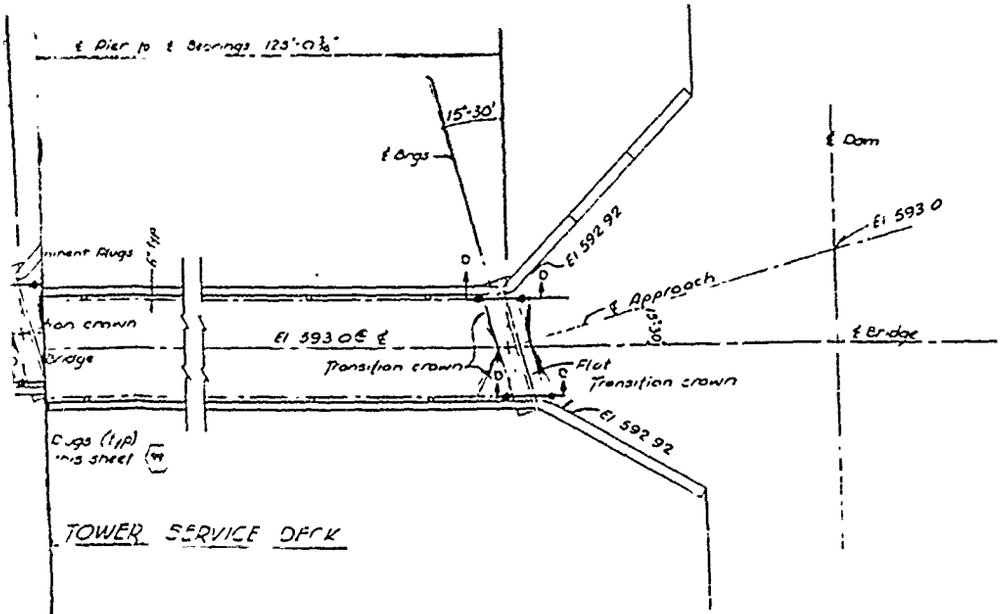


SECTION C-C



SECTION D-D

SERVICE BRIDGE
ALIGNMENT FACILITIES
SCALE. ½" 1'0"



TOWER SERVICE DECK

Note:
1. Brass alignment plugs will be govt furnished

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

KEY	DATE	CHANGE	REVISION INDICATED BY Δ 1	APPR

U. S. ARMY ENGINEER DISTRICT TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

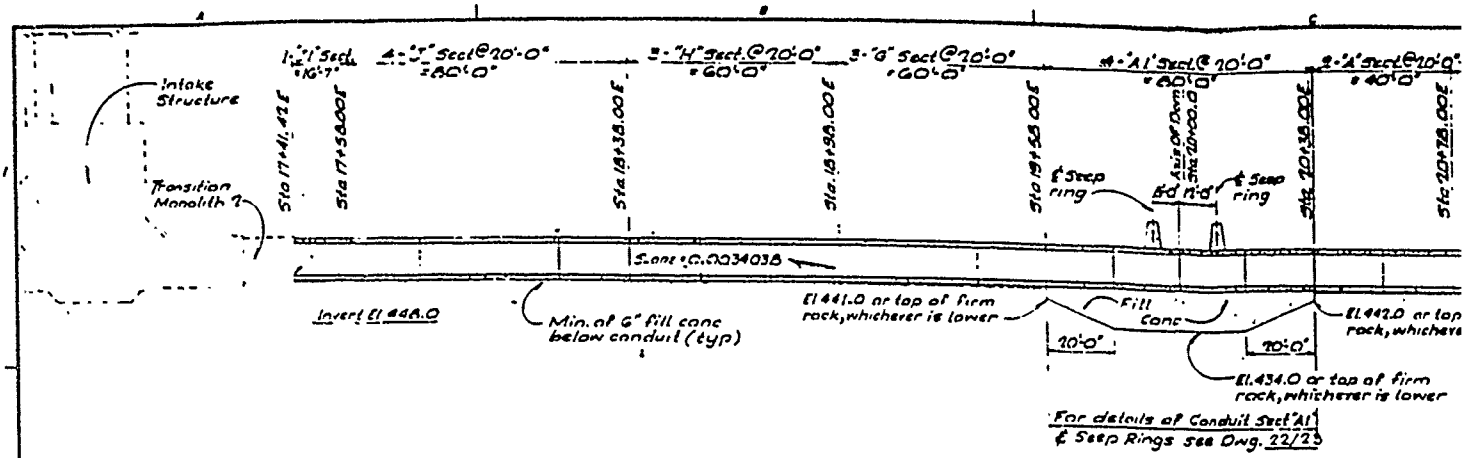
RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

DESIGNED BY C Davis
DRAWN BY C Davis
CHECKED BY

DIERKS DAM
EMB., OUTLET WORKS, SPILLWAY & ACCESS ROS.
ENGINEERING MEASURING DEVICES
OUTLET WORKS AND SERVICE BRIDGE - PLAN, SECTIONS AND DETAILS

SUBMITTED H C Dyton
CHIEF, ENGR SEC
DATE APRIL 1970

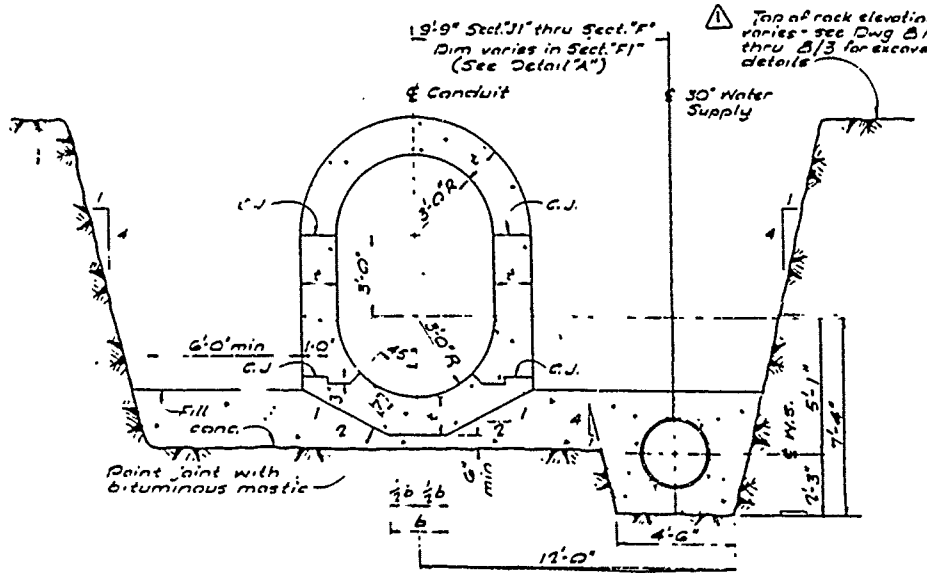
INVITATION NO DACW56-70-B-0033
SCALE AS SHOWN
DRAWING NUMBER 1960-C3-13/3



For details of Conduit Sect "A1" & Seep Rings see Dwg. 22/23

SECTION ALONG ℄ CONDUIT

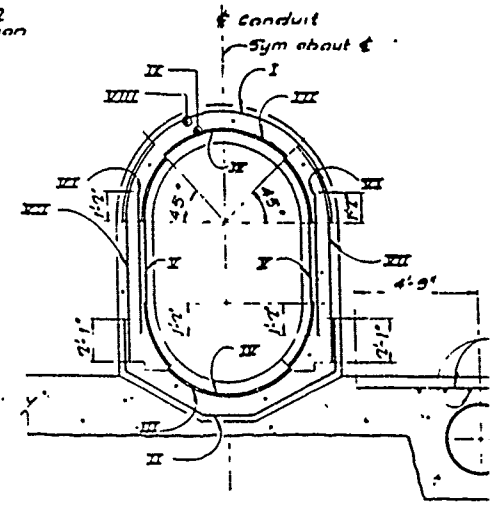
Scale: 1" = 20'



CONCRETE TYPICAL SECTION

(Except Sect "A1")

Scale: 3/8" = 1'-0"



REINFORCEMENT TYPICAL SECTION

(Except Sect "A1")

Scale: 3/8" = 1'-0"

CONCRETE SCHEDULE

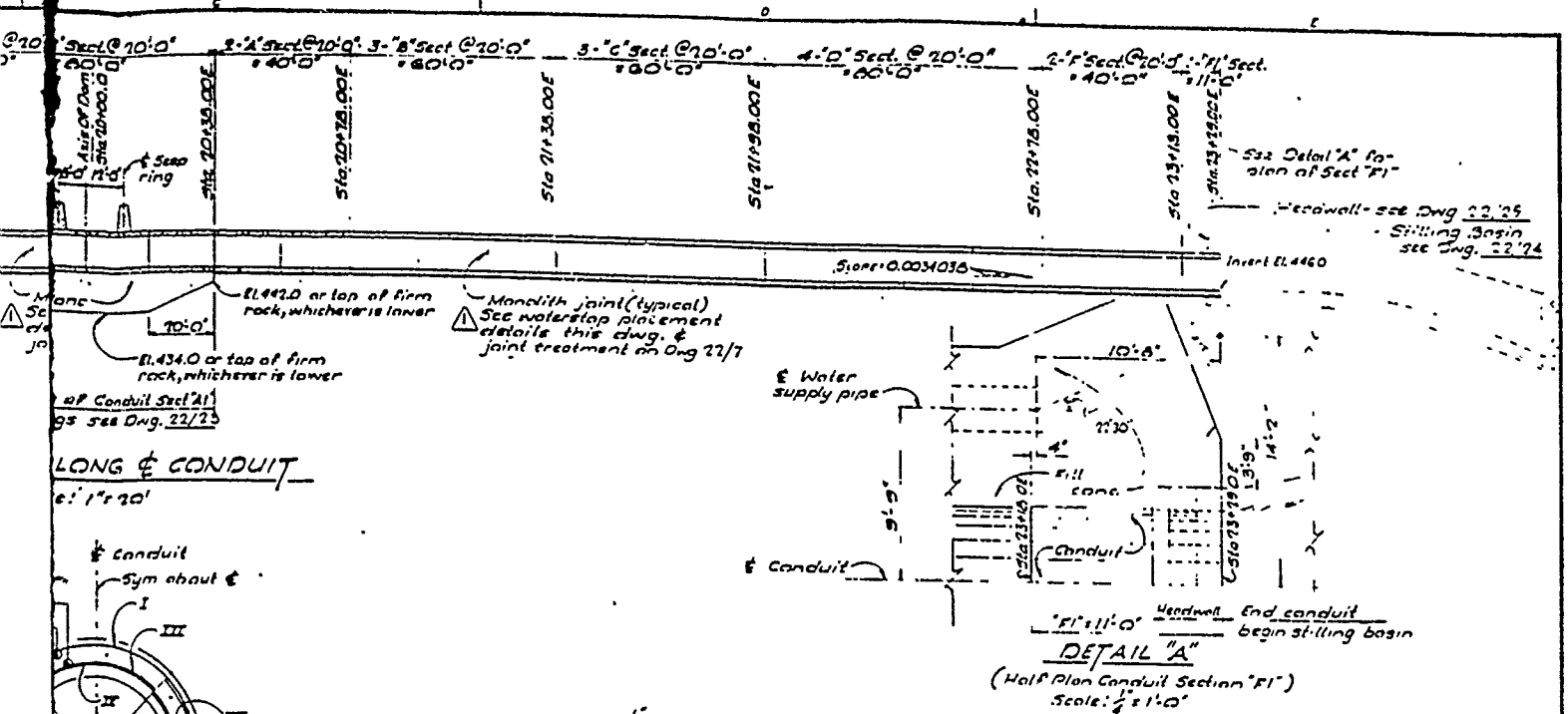
SECTION	NO. SECTIONS REQ'D	b	t	LENGTH
A	2	2'-7"	1'-7"	20'-0"
B	3	2'-7"	1'-5"	20'-0"
C	3	2'-7"	1'-5"	20'-0"
D	4	2'-0"	1'-7"	20'-0"
F	2	2'-0"	1'-7"	20'-0"
G	3	2'-7"	1'-7"	20'-0"
H	3	2'-7"	1'-5"	20'-0"
J	4	2'-7"	1'-5"	20'-0"
F1	1	2'-0"	1'-7"	11'-0"
J1	1	2'-7"	1'-5"	16'-7"
A1	4	See Dwg. 22/23		

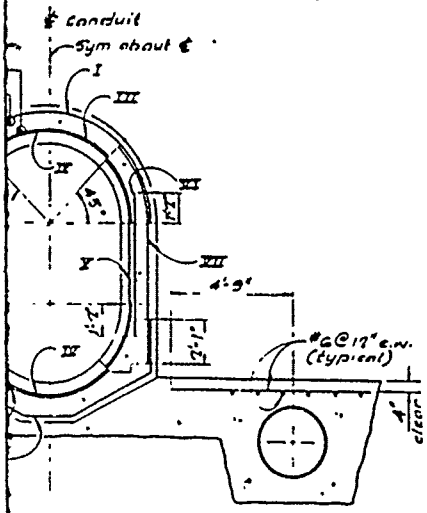
⚠ ⚠ REINFORCEMENT SCHEDULE ⚠

SECTION	NO. SECTIONS REQ'D	I SIZE & SPACING	II SIZE & SPACING	III SIZE & SPACING	IV SIZE & SPACING	V SIZE & SPACING	VI SIZE & SPACING	VII SIZE & SP
A	2	#6 @ 12"	#6 @ 12"	#7 @ 12"	#6 @ 12"	#11 @ 12"	#6 @ 12"	#6 @
B	3	#6 @ 12"	#6 @ 12"	#7 @ 12"	#7 @ 12"	#10 @ 12"	#7 @ 12"	#6 @
C	3	#6 @ 12"	#6 @ 12"	#6 @ 12"	#6 @ 12	#8 @ 12"	#7 @ 12"	#8 @
D	4	#6 @ 12"	#6 @ 12"	#6 @ 12"	#6 @ 12"	#9 @ 12"	#7 @ 12"	#5 @
F	2	#6 @ 12"	#6 @ 12"	#5 @ 12"	#5 @ 12"	#6 @ 12"	#6 @ 12"	#6 @
G	3	#6 @ 12"	#6 @ 12"	#6 @ 12"	#7 @ 12"	#9 @ 12"	#9 @ 12"	#6 @
H	3	#6 @ 12"	#6 @ 12"	#6 @ 12"	#7 @ 12"	#10 @ 12"	#10 @ 12"	#6 @
J	4	#6 @ 12"	#6 @ 12"	#5 @ 12"	#6 @ 12"	#9 @ 12"	#9 @ 12"	#6 @
F1	1	#6 @ 12"	#6 @ 12"	#5 @ 12"	#5 @ 12"	#6 @ 12"	#6 @ 12"	#6 @
J1	1	#6 @ 12"	#6 @ 12"	#5 @ 12"	#6 @ 12"	#9 @ 12"	#9 @ 12"	#6 @
A1	4	See Dwg. 22/23						

Notes:

1. For "General Notes" and "General Reinforcement Notes" see Dwg 22/2
2. Concrete
   a. Concrete for conduit sections will be paid for under Bid Item ⬡—96
   b. Concrete for seep rings under Bid Item ⬡—101
   c. Fill concrete when used as conduit base and water supply pipe encasement under Bid Item ⬡—101
   d. Fill concrete when used as excavation fill under Bid Item ⬡—101
3. Conduit reinf. is 4 face and 3" clear ou





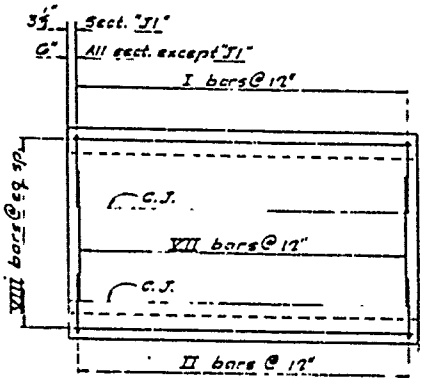
LONG ℄ CONDUIT

e: 1"=20'

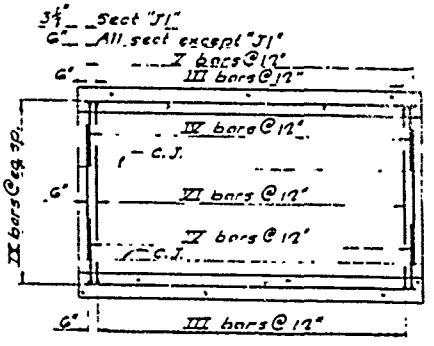
ORCEMENT
L SECTION
ET SECT 'A1')
: 3/8"=1'-0"

"F1" = 11'-0" Headwall End conduit begin stilling basin

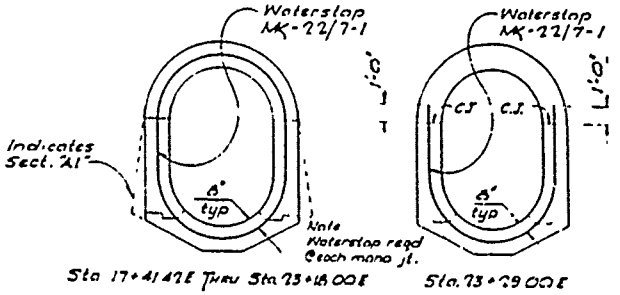
DETAIL "A"
(Half Plan Conduit Section "F1")
Scale: 1/4" = 1'-0"



ELEVATION
(Showing Outside Face Reinf)
Scale: 1/4" = 1'-0"



SECTIONAL ELEVATION
(Showing Inside Face Reinf.)
Scale: 1/4" = 1'-0"



WATERSTOP PLACEMENT
Scale: 1/4" = 1'-0"

SCHEDULE

XIII	X	XI	XII	XIII *	IX *
, SIZE & SPACING	E & SPACING	SIZE & SPACING	SIZE & SPACING	QUAN, SIZE & SPACING	QUAN, SIZE & SPACING
# 5 @	11 @ 12"	#6 @ 12"	#6 @ 12"	24 - # 5 @ eq sp	21 - # 5 @ eq sp.
# 5 @	10 @ 12"	#7 @ 12"	#6 @ 12"	21 - # 5 @ eq sp.	19 - # 5 @ eq sp
# 5 @	8 @ 12"	#7 @ 12"	#5 @ 12"	21 - # 5 @ eq. sp	19 - # 5 @ eq. sp.
# 5 @	9 @ 12"	#7 @ 12"	#5 @ 12"	20 - # 5 @ eq sp.	19 - # 5 @ eq sp
# 5 @	6 @ 12"	#6 @ 12"	#5 @ 12"	20 - # 5 @ eq. sp.	19 - # 5 @ eq sp
# 5 @	9 @ 12"	#9 @ 12"	#6 @ 12"	24 - # 5 @ eq. sp.	21 - # 5 @ eq sp.
# 5 @	10 @ 12"	#10 @ 12"	#5 @ 12"	21 - # 5 @ eq. sp.	19 - # 5 @ eq. sp
# 5 @	9 @ 12"	#9 @ 12"	#5 @ 12"	21 - # 5 @ eq. sp.	19 - # 5 @ eq. sp.
# 5 @	6 @ 12"	#6 @ 12"	#5 @ 12"	20 - # 5 @ eq. sp.	19 - # 5 @ eq. sp.
# 5 @	9 @ 12"	#9 @ 12"	#5 @ 12"	21 - # 5 @ eq. sp.	19 - # 5 @ eq. sp.

ventil...

* Quantities shown for one conduit section

3 Conduit reinf. is 4" clear inside face and 3" clear outside face.

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

REV	DATE	CHANGE	REVISION INDICATED BY #	APP'D
1	11 MAY '70	Mod 3007 Revised # 12 of reinf bars I, II & VII & deleted #5		

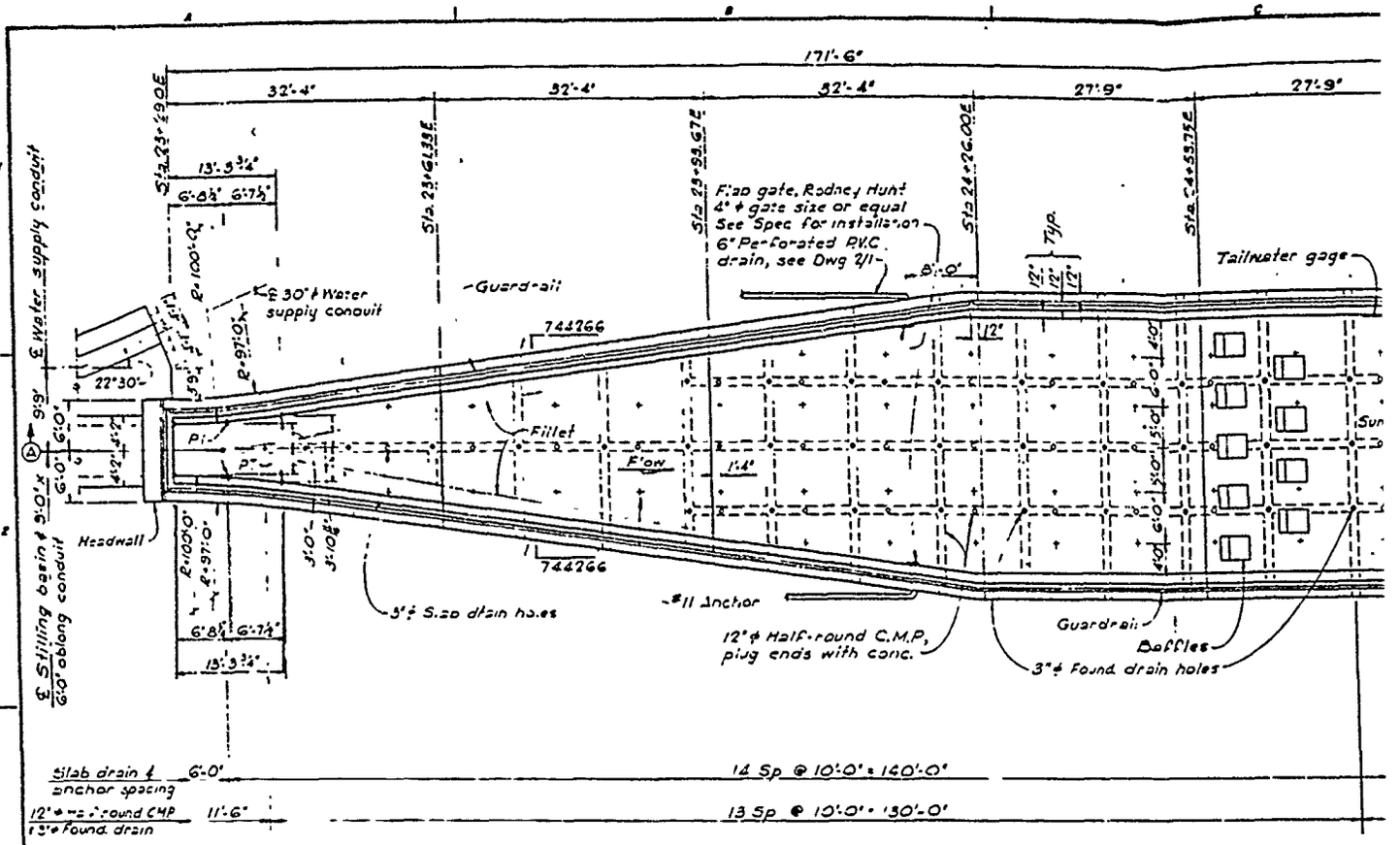
U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

DESIGNED BY W. Scott Clinton
DRAWN BY Don Prentice
CHECKED BY Lester Starr
SUBMITTED L. Starr
CHIEF STR. SEC. 'A'
DATE APRIL 1970

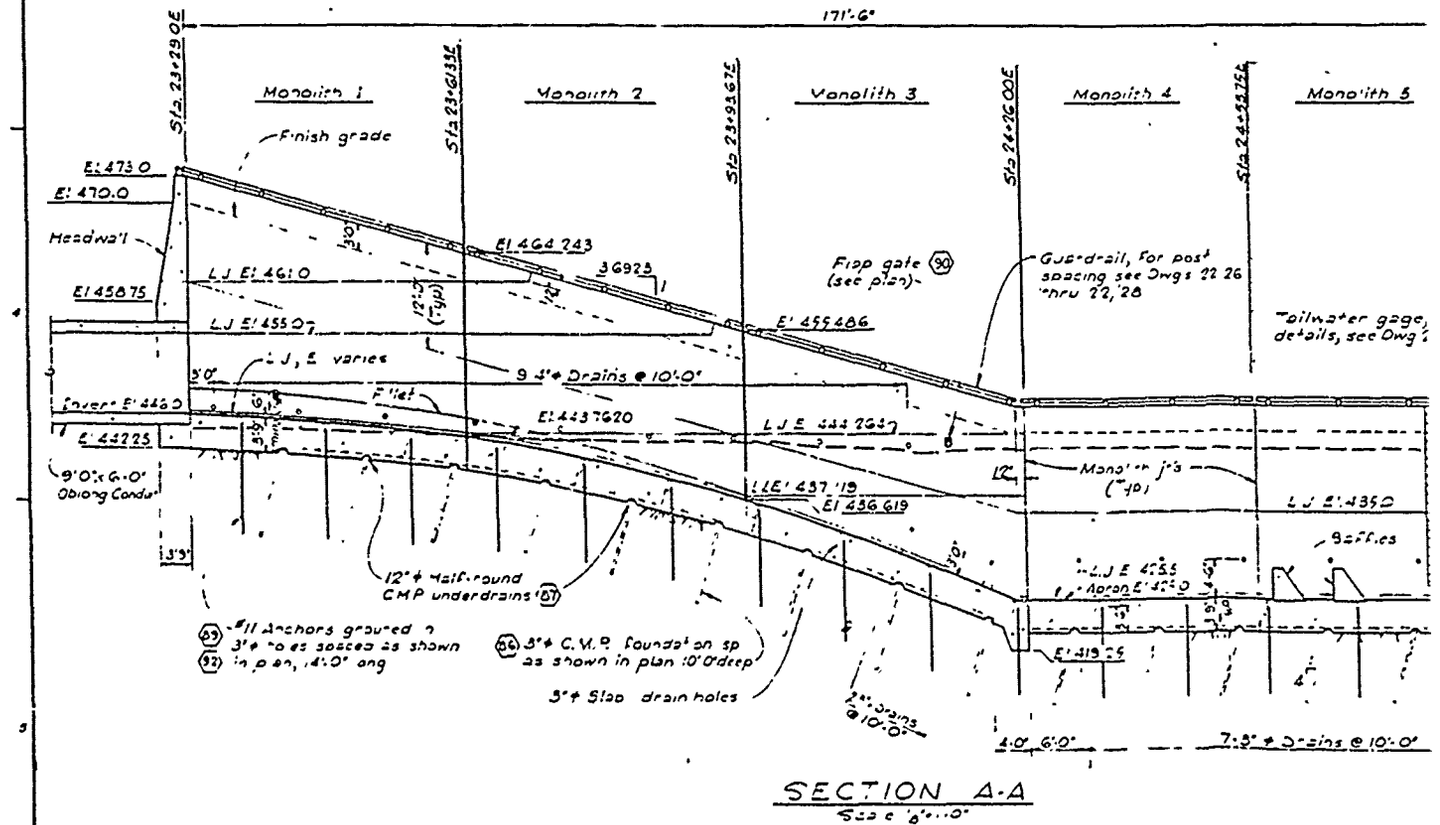
RED RIVER WATERSHED — SAL NE RIVER, ARKANSAS

DIERKS DAM
EMB, OUTLET WORKS, SPILLWAY & ACCESS RDS
OUTLET WORKS - CONDUIT
CONCRETE AND REINFORCING - CONDUIT AND SEEP RINGS - SECTIONS AND DETAILS I

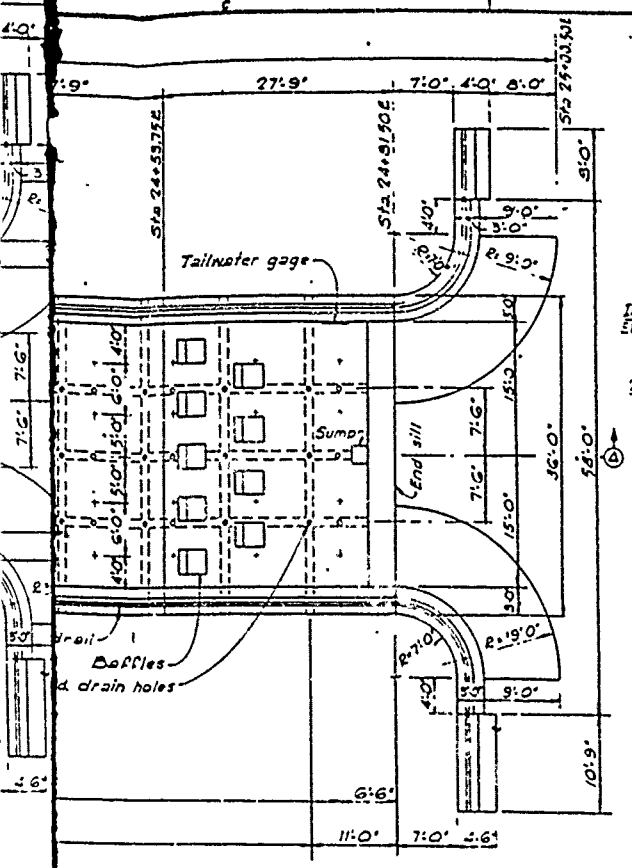
INVITATION NO DACW56-70-B-0053
SCALE AS SHOWN
DRAWING NUMBER 1960-C3-22/22.1

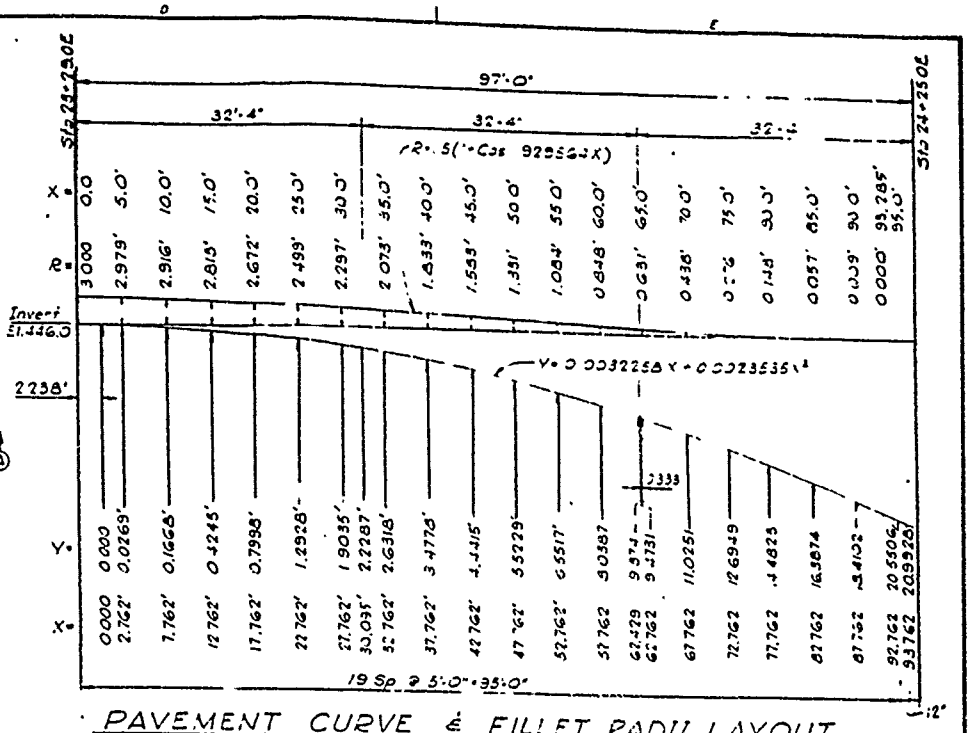


PLAN
Scale: 1/8" = 1'-0"



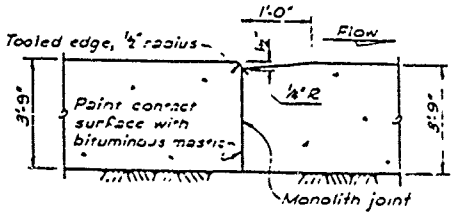
SECTION A-A
Scale: 1/8" = 1'-0"





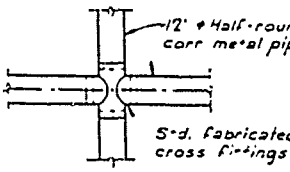
PAVEMENT CURVE & FILLET RADII LAYOUT

Scale: 1/8" = 1'-0"



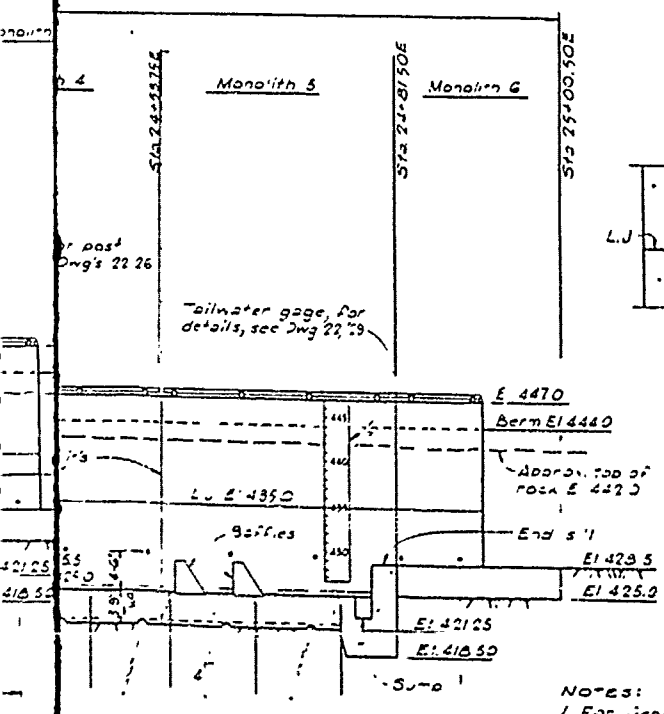
TYP. SLAB MONO. JT.

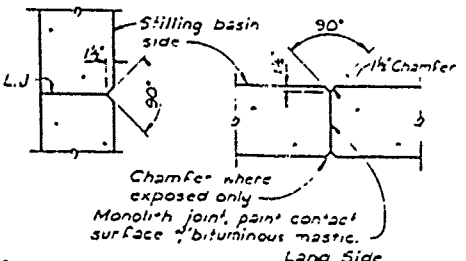
No Scale



PIPE CROSS DETAIL

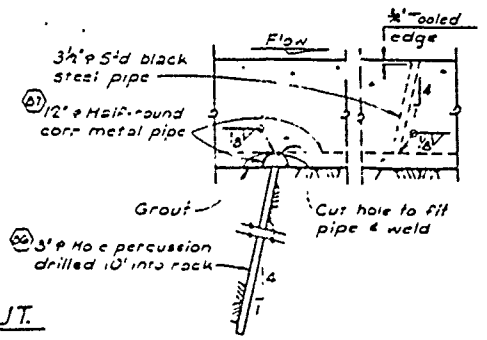
No Scale





TYP. WALL MONO. & LIFT JT.

No Scale



SLAB DRAIN HOLE DETAIL

No Scale

Notes:

1. For General Concrete & Reinf. Notes, see Dwg 22 2
2. For wall drain details, see Dwg 22 26 & 22 27
3. Tailwater gage on e" wall only.
4. For baffle details & reinf., see Dwg 22 25
5. Concrete shown on this drawing to be paid for under Bid Item (97).
6. For details and location of electrical sensor recess see Dwg 70/8.1

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

KEY	DATE	CHANGE	REVISION INDICATED BY &	APPD
1	12-71	00°6	Added Note # 6	LS

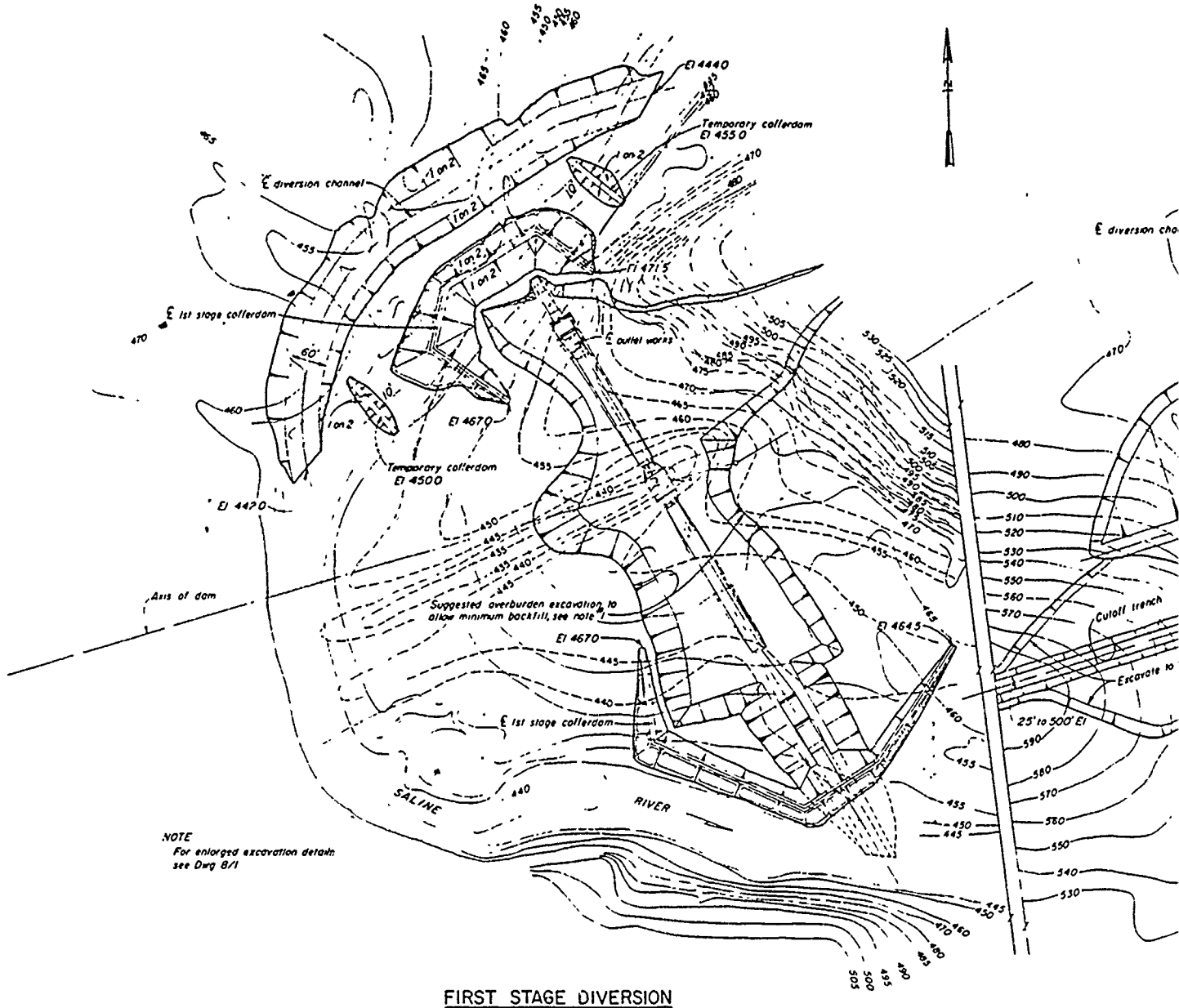
U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

DESIGNED BY: C.Y. Chang
DRAWN BY: Gary D. Chesnutt
CHECKED BY: C. Starr
SUBMITTED: J. Starr, CHIEF STR. SEC. A

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

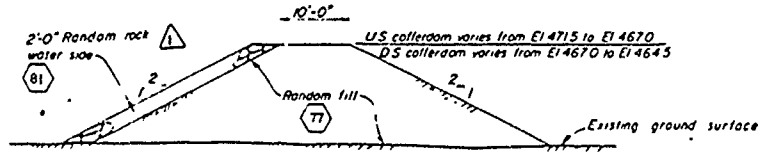
DIERKS DAM
EMB., OUTLET WORKS, SPILLWAY & ACCESS RDS.
OUTLET WORKS - STILLING BASIN
GENERAL PLAN, ELEVATION & DETAILS

INVITATION NO. DACW56-70-B-0039
SCALE: AS SHOWN
DRAWING NUMBER: 1960-C3-22/25.1
DATE: APRIL 1970



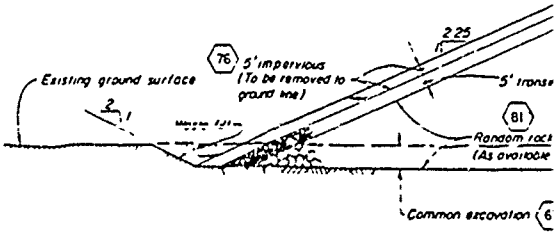
FIRST STAGE DIVERSION

SCALE 1 INCH = 100 FEET

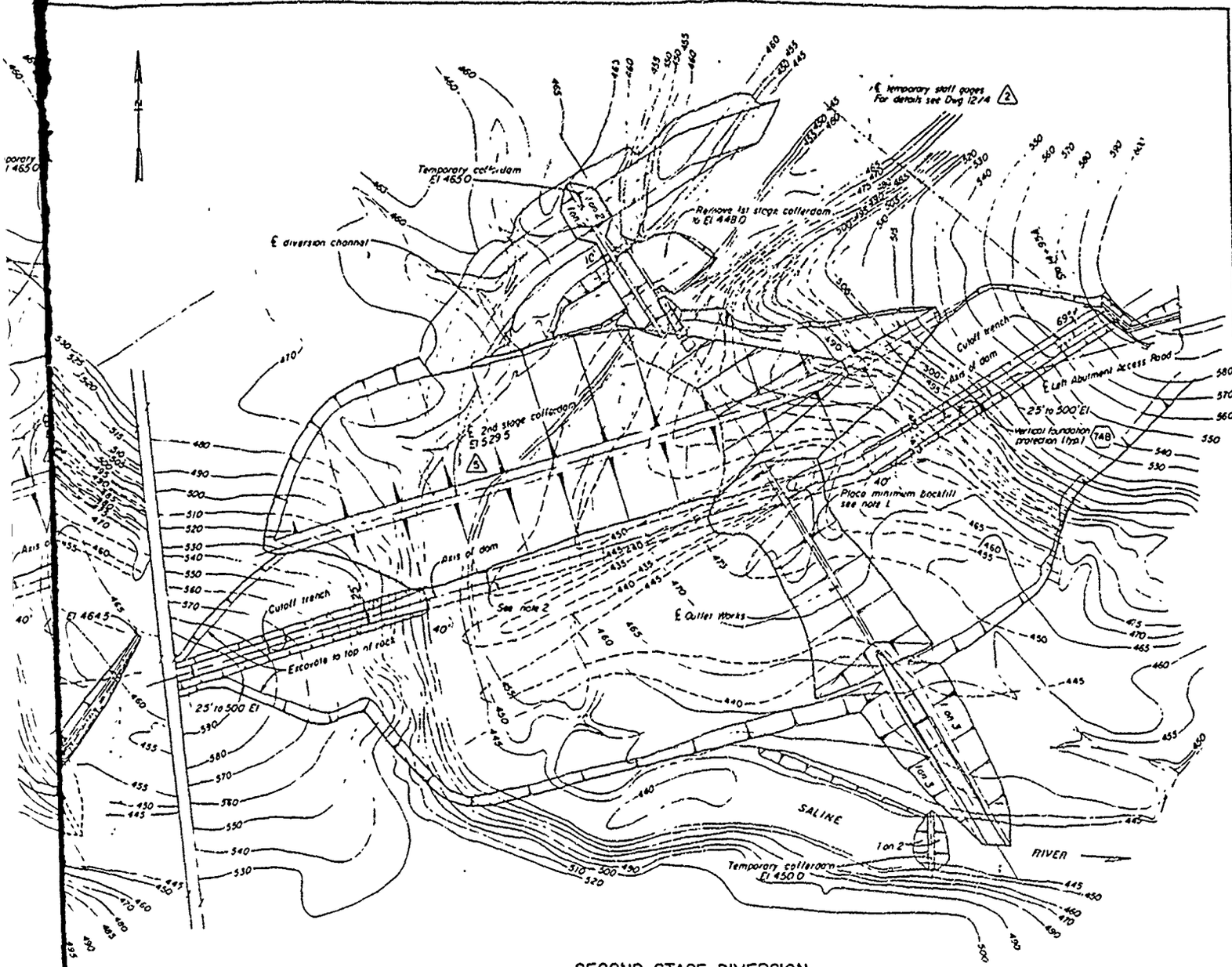


FIRST STAGE COFFERDAM

NO SCALE



SECOND S



SECOND STAGE DIVERSION

SCALE 1 INCH = 100 FEET

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

LEGEND

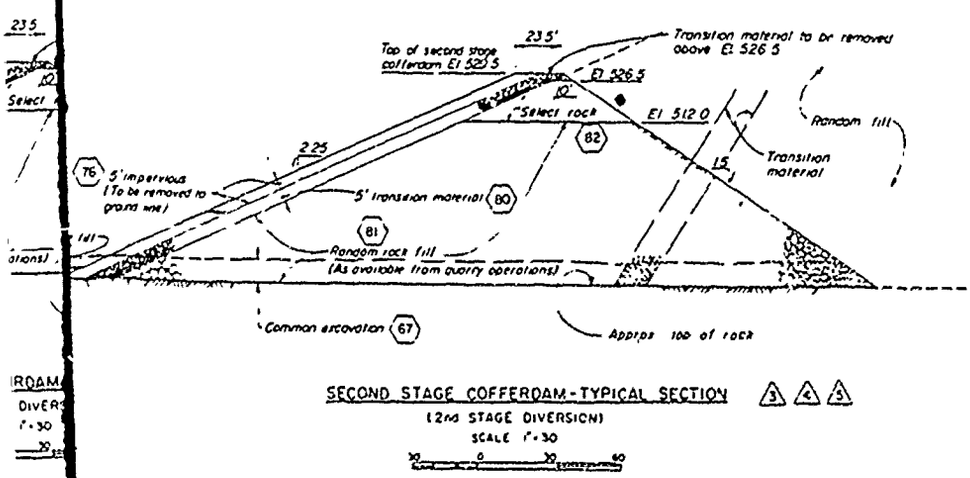
—— Top of ground contours

- - - Top of rock contours

NOTE

1 It is mandatory to place permanent backfill over the conduit to El 469.0, before diverting through the structure

2 Generally, there will be no well defined trench across the flood plain



SECOND STAGE COFFERDAM - TYPICAL SECTION

(2nd STAGE DIVERSION)

SCALE 1" = 30'

REV	DATE	CHANGE	REVISED OR ISSUED BY	APPD
5	12-5-72	DO 21 Revised top of second stage cofferdam		JW
4	4-6-72	DO-18 Typical section of 2nd stage cofferdam revised		JW
3	11-1-71	DO-13 Typical section of 2nd stage cofferdam revised		JWH
2	1-29-71	SO #6 Temporary staff gages added		JWH
1	11-16-70	ADMIN. Revised slope of riprap on random rock		JWH

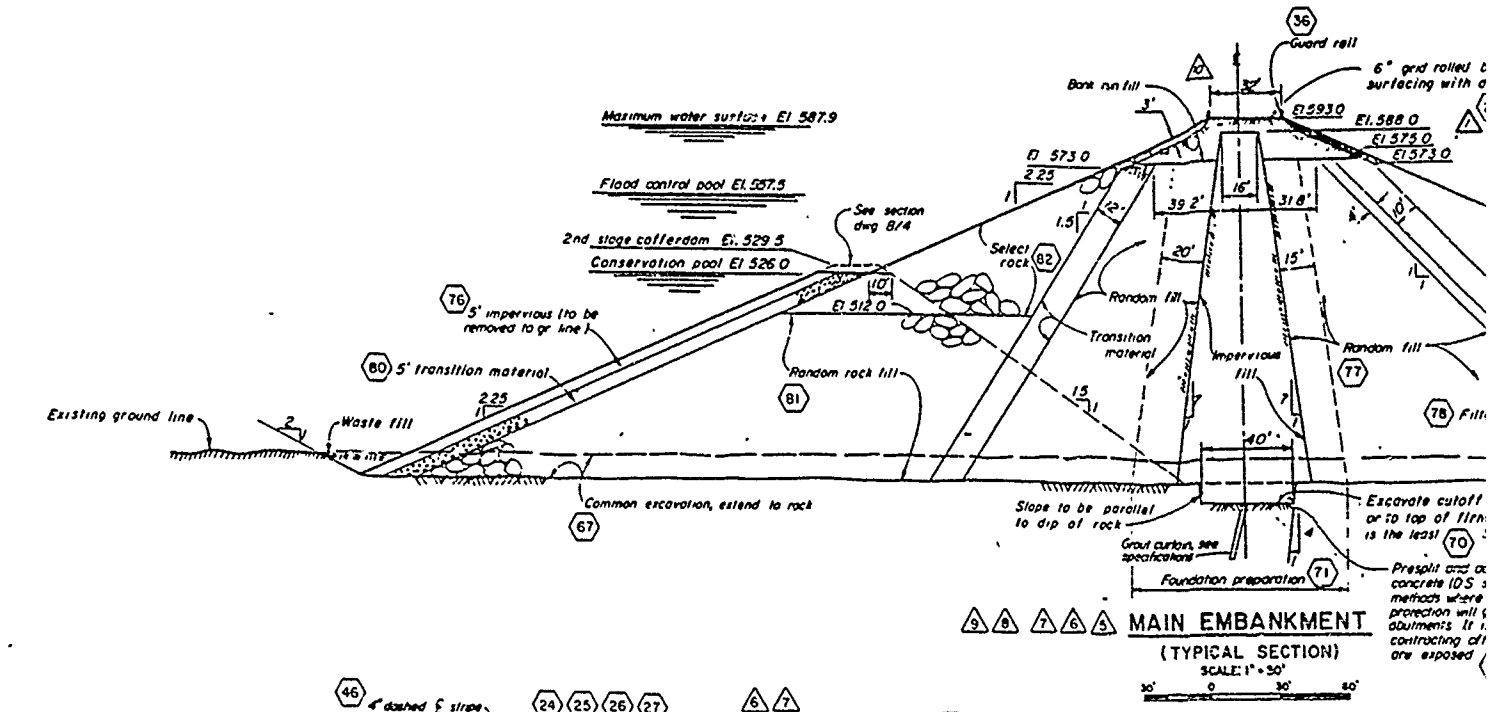
U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA OKLAHOMA

DESIGNED BY Frank Lewis
DRAWN BY J.E. Thompson
CHECKED BY J.W. Hansen
SUBMITTED Frank E. Lewis
CHIEF, ENGR. DIV. SEC. P
DATE JUNE 1970

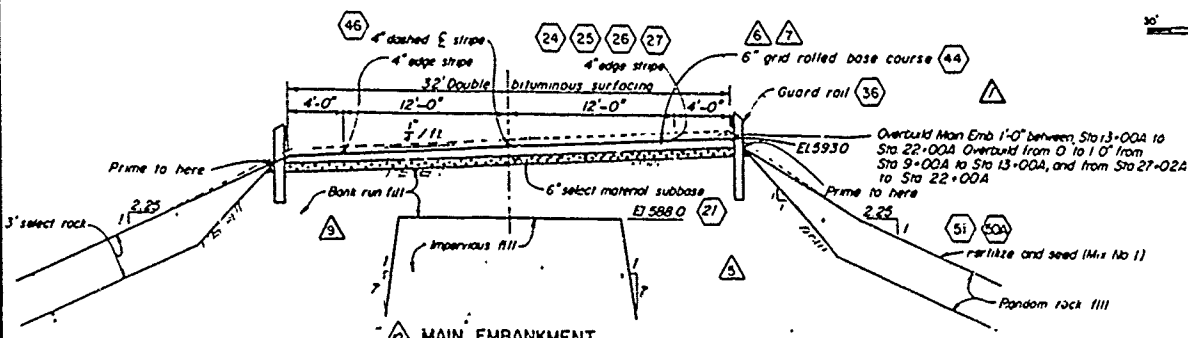
RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

DIERKS DAM
EMB., OUTLET WORKS, SPILLWAY & ACCESS RDS
DIVERSION & EXCAVATION
FIRST STAGE & SECOND STAGE DIVERSION - PLANS & SECTIONS

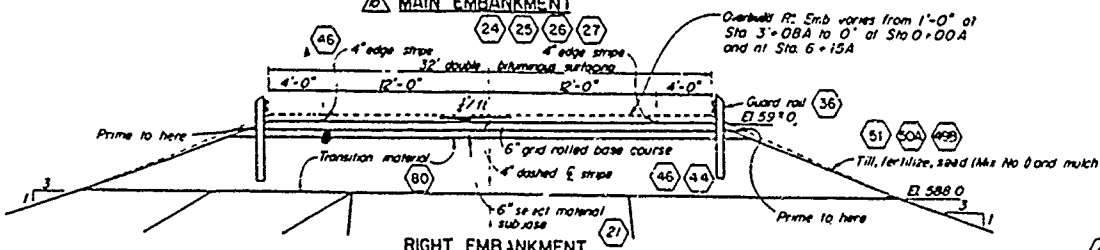
INVITATION NO DACW 56-70-B-0005
SCALE AS SHOWN
DRAWING NO 1960-C3-8/4.5



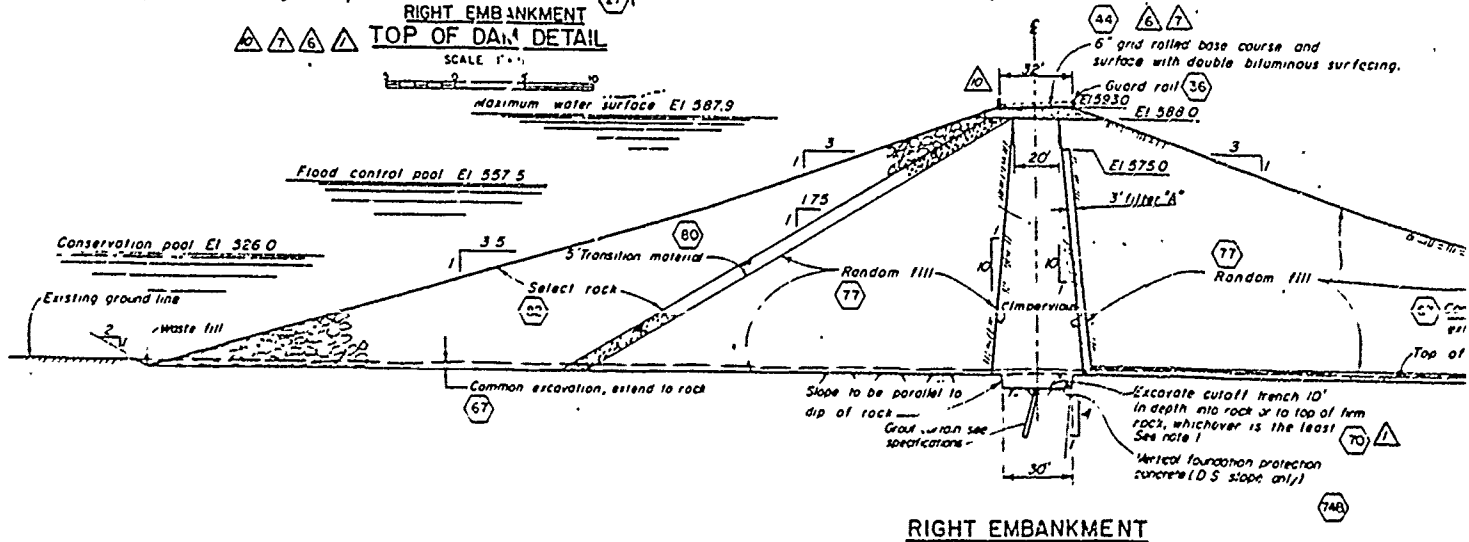
MAIN EMBANKMENT
(TYPICAL SECTION)
SCALE 1" = 30'



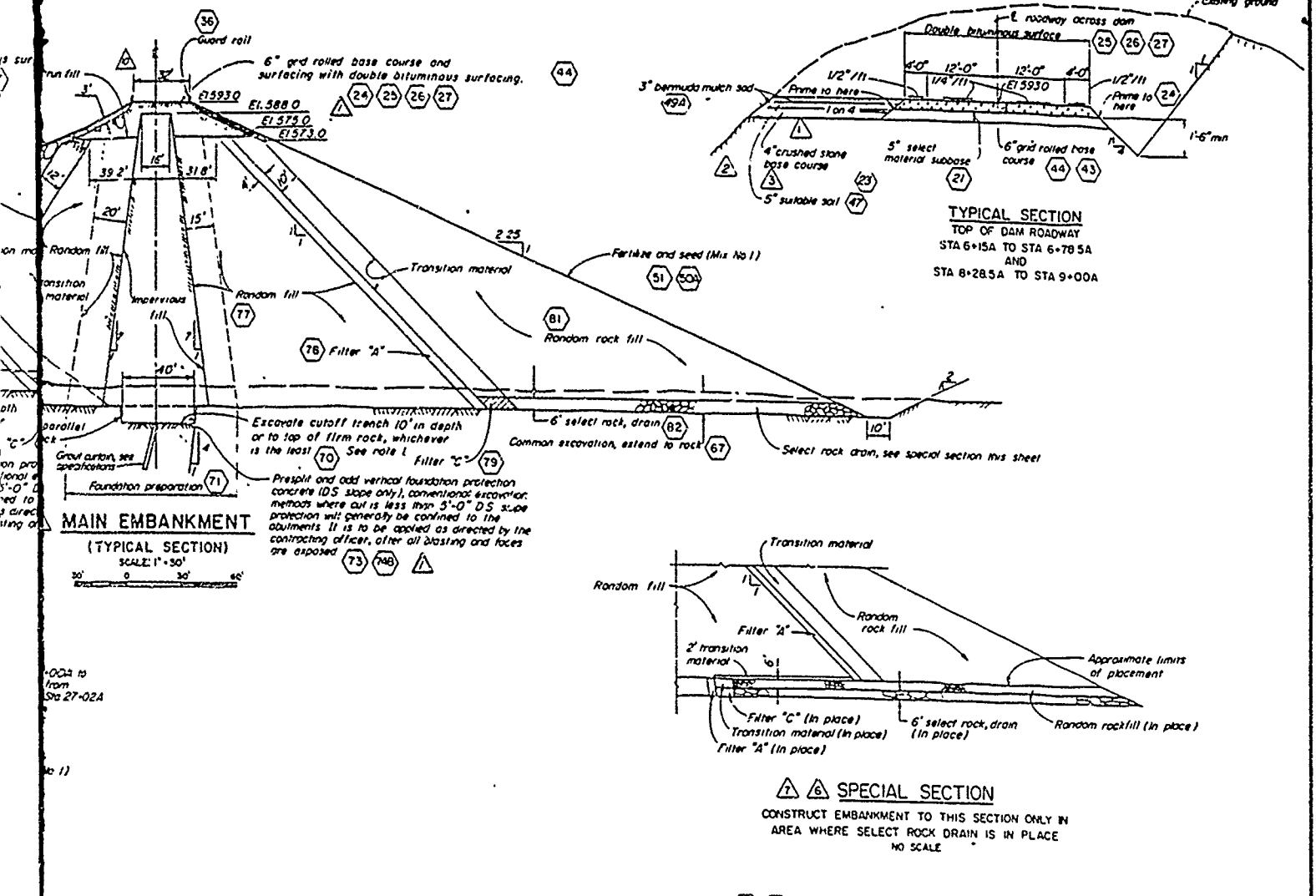
MAIN EMBANKMENT



RIGHT EMBANKMENT TOP OF DAM DETAIL
SCALE 1" = 10'



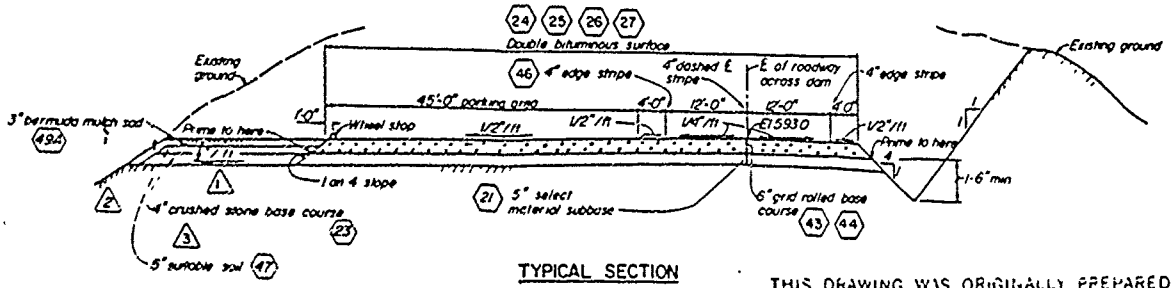
RIGHT EMBANKMENT
SCALE 1" = 30'



MAIN EMBANKMENT
(TYPICAL SECTION)
SCALE: 1" = 30'

TYPICAL SECTION
TOP OF DAM ROADWAY
STA 6+15A TO STA 6+78.5A
AND
STA 8+28.5A TO STA 9+00A

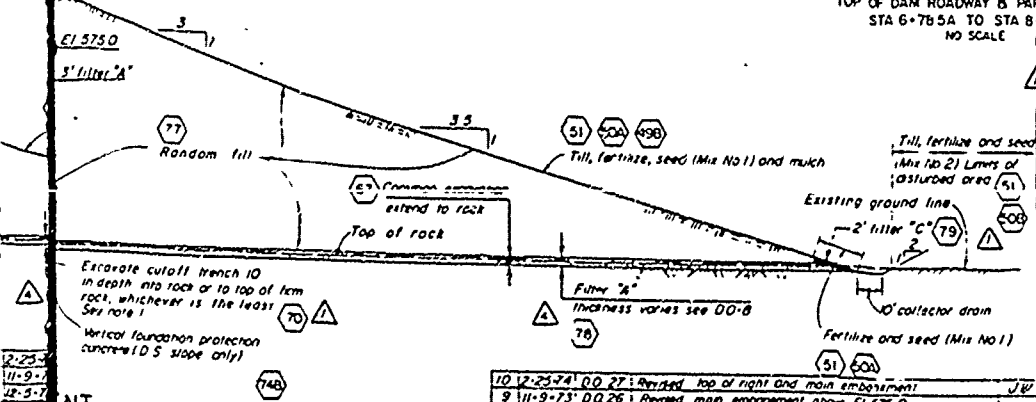
SPECIAL SECTION
CONSTRUCT EMBANKMENT TO THIS SECTION ONLY IN AREA WHERE SELECT ROCK DRAIN IS IN PLACE
NO SCALE



TYPICAL SECTION
TOP OF DAM ROADWAY & PARKING AREA
STA 6+78.5A TO STA 8+28.5A
NO SCALE

NOTE
⚠ ℄ Excavate cut-off trench approx 10' in depth into rock or to top of firm rock which ever is the least Final depth of cut-off trench will be determined by the Contracting Officer, after the foundation is exposed

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT



10	12-23-74	DO 27	Revised top of right and main embankment
9	11-9-73	DO 26	Revised main embankment above El 575.0
8	12-5-72	DO 21	Revised top of second stage cofferdam
7	25-8-72	DO-18 Supl #1	Typical section of main embankment revised and add control for foundation preparation
6	4-6-72	DO 18	Typical section of main embankment revised
5	11-1-71	DO 13	Typical section of main embankment revised

4	15-6-71	DO 8	Limits of filter "A" & filter "C" revised
3	30-7-70	Dsgn	Delete 50% density on base course
2	22-5-70	Am 0005	Added material upstream of top of dam roadway
1			Deleted bermuda mulch sod

KEY | DATE | CHANGE | RE-SON INDICATED BY Δ

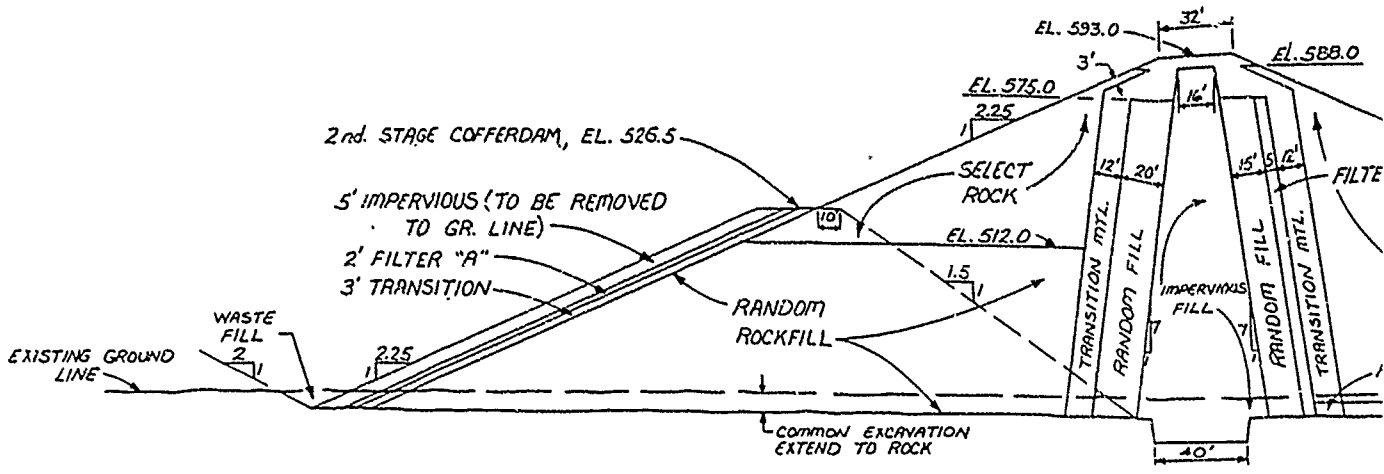
U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

DESIGNED BY
DRAWN BY
CHECKED BY
SUBMITTED
CHIEF, ENGINEERING DIV
DATE DEC 1968

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

DIERKS DAM
EMB, OUTLET WORKS, SPILLWAY & ACCESS RDS
EMBANKMENT
TYPICAL SECTIONS

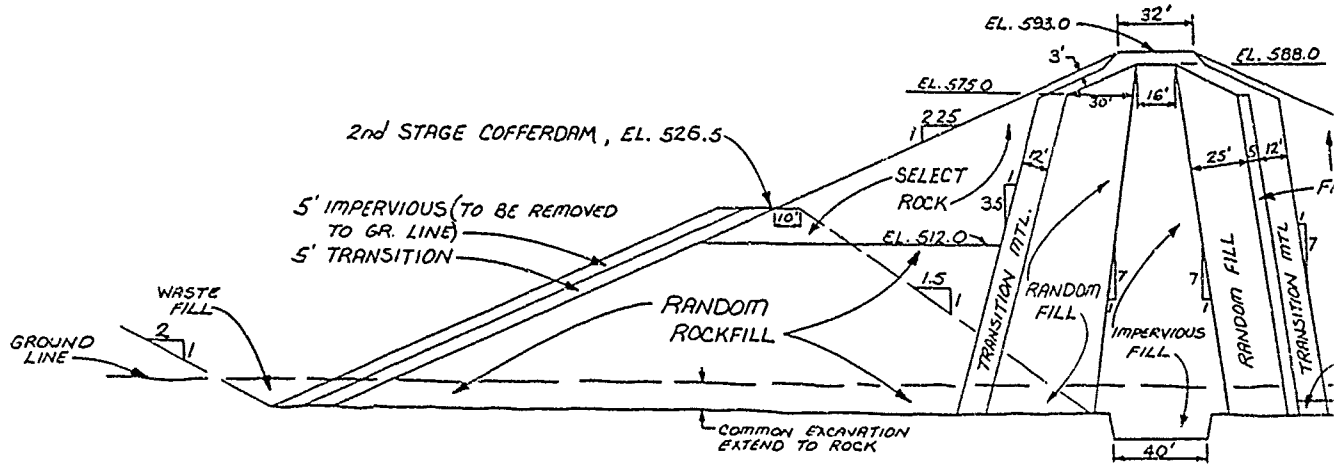
INVITATION NO DACW56-70-B-0033
SCALE AS SHOWN
DRAWING NUMBER 1960-C3-12/2.10



MAIN EMBANKMENT

TYPICAL CONTRACT SECTION

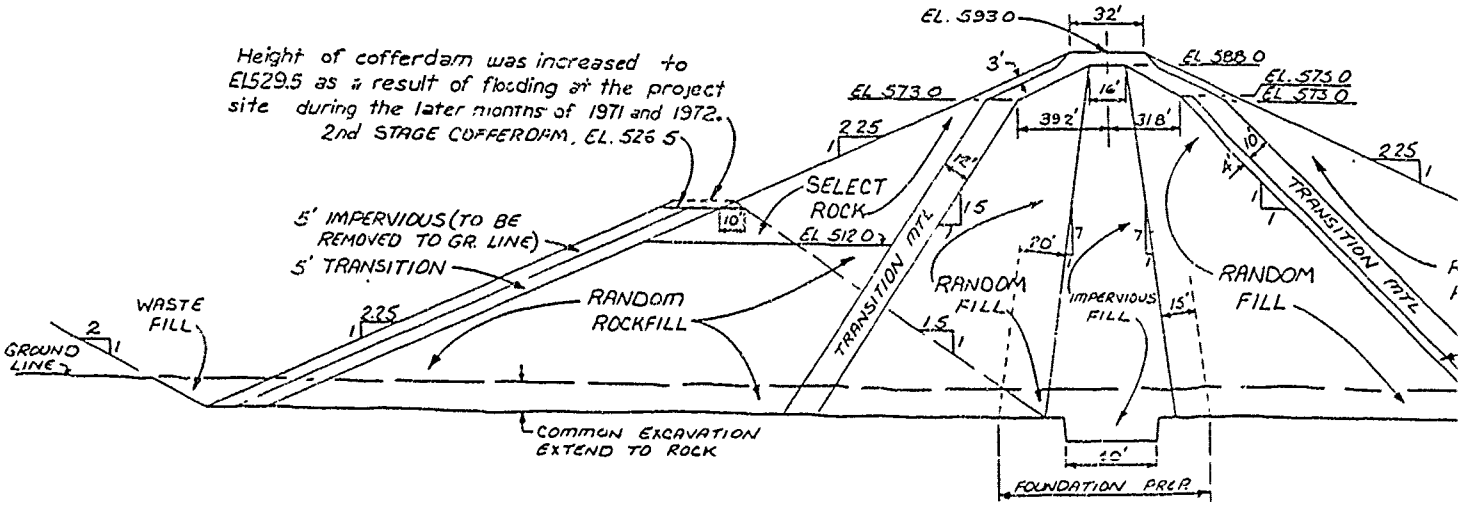
NO SCALE



MAIN EMBANKMENT

TYPICAL SECTION - SEPTEMBER 1971 R

NO SCALE

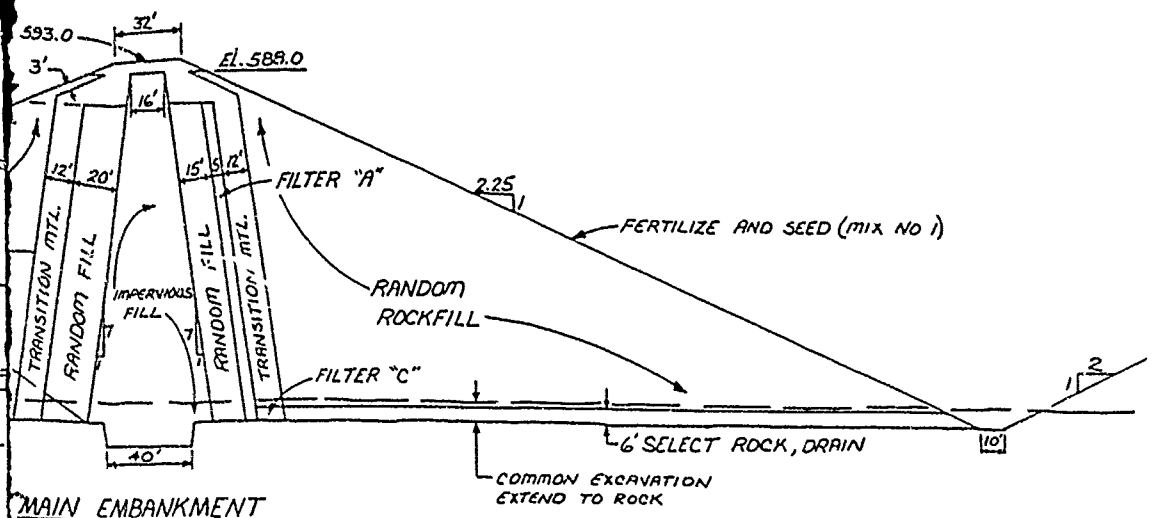


MAIN EMBANKMENT

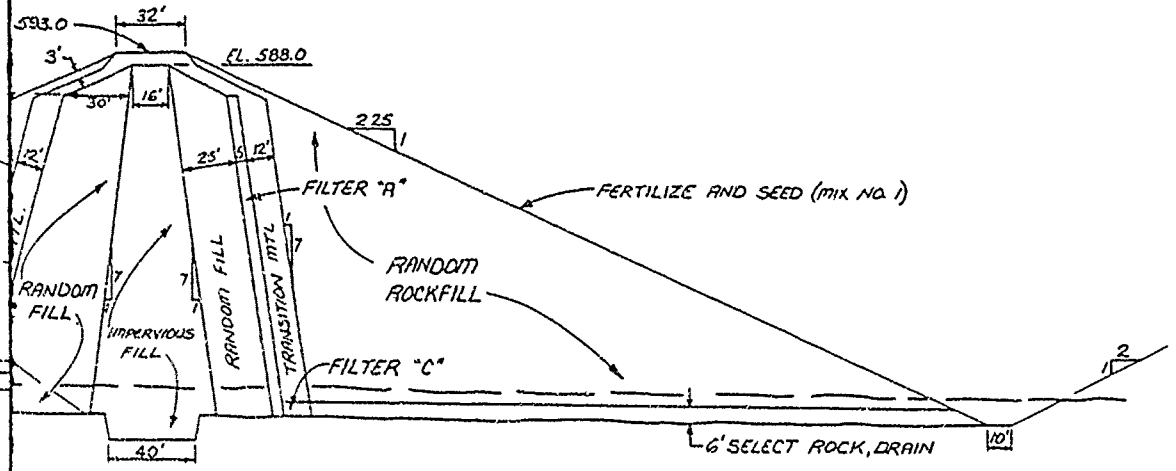
TYPICAL SECTION - MARCH 1972 REVISION

NO SCALE

(1)



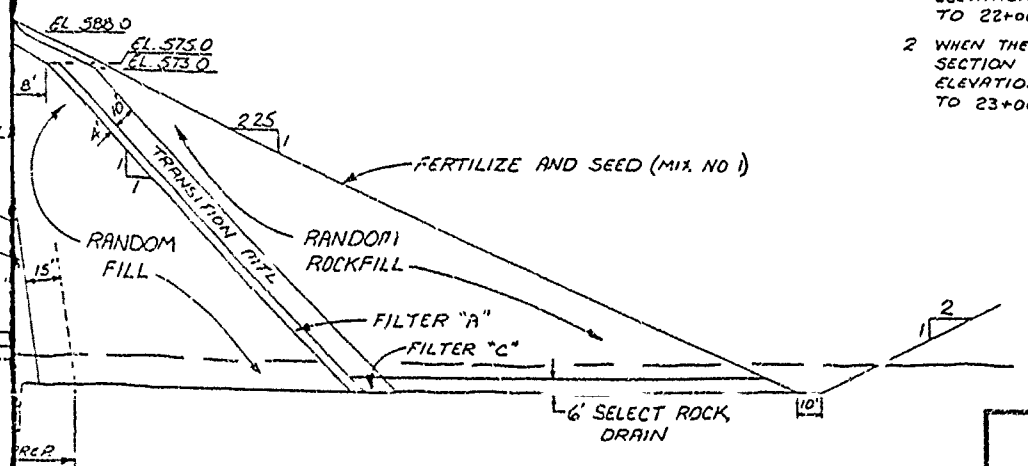
MAIN EMBANKMENT
TYPICAL CONTRACT SECTION
NO SCALE



MAIN EMBANKMENT
SECTION - SEPTEMBER 1971 REVISION
NO SCALE

NOTES:

1. WHEN THE SEPT 1971 REVISION WAS ISSUED, THE ORIGINAL CONTRACT SECTION HAD BEEN CONSTRUCTED TO APPROXIMATE ELEVATION 450± BETWEEN APPROXIMATE STATIONS 18+00 TO 22+00.
2. WHEN THE MARCH 1972 REVISION WAS ISSUED, THE SEPT 1971 SECTION HAD BEEN CONSTRUCTED TO APPROXIMATE ELEVATION 480± BETWEEN APPROXIMATE STATIONS 15+50 TO 23+00.



MENT
MARCH 1972 REVISION
CALE

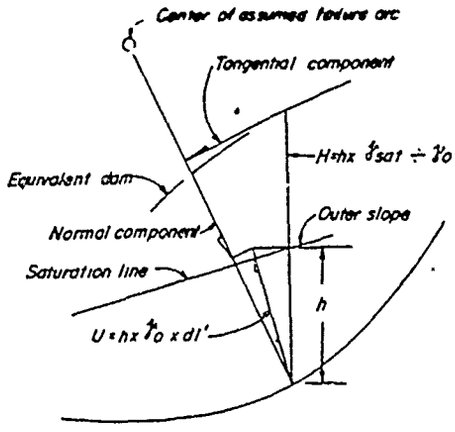
U S ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

DESIGNED BY K. Poland
DRAWN BY K. Poland
CHECKED BY R. Barker
SUBMITTED William F. Brown, Jr. CHIEF, SOILS MECH. BR.
DATE DEC 1972

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

DIERKS RESERVOIR
EMBANKMENT AND SPILLWAY
MAIN EMBANKMENT
TYPICAL SECTIONS

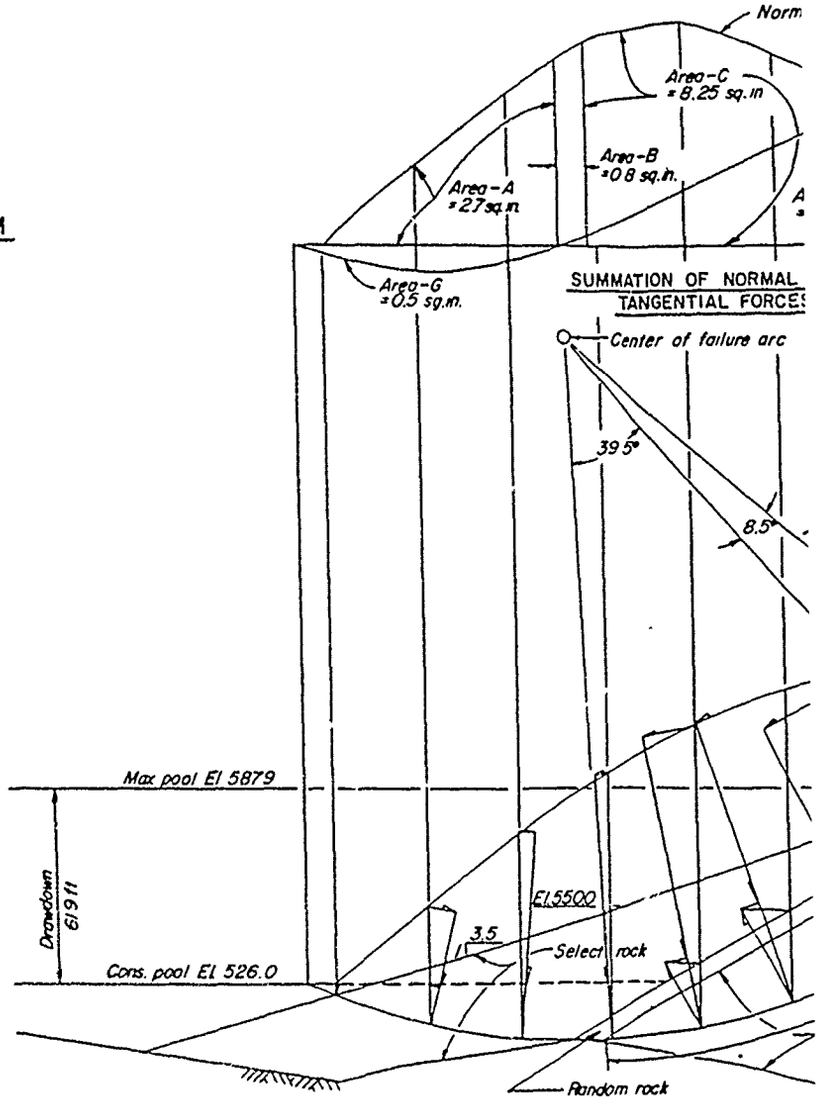
SCALE AS SHOWN
TO ACCOMPANY SUPPLEMENT NO 2
DRAWING NO 1960-DM8-12/5



TYPICAL FORCE DIAGRAM

1 sq. in = 28.125 Tons

AREA SCALE



SAFETY FACTOR SUMMARY			
Radius (feet)	Coordinates (center of arc)		Safety factor
	X (ft)	Y (ft)	
61	-50	9	1.87
68	-59	5	1.74
94	-85	20	1.50
97	-107	6	1.55
104	-85	54	1.77
108	-112	42	1.76
140	-138	54	1.49
222	-162	137	1.41
301	-168	229	1.73
310	-232	219	1.81

NOTES:

The above table includes results of all arcs analyzed for the sudden drawdown condition

Coordinates for arc centers are referenced from the ℄ and crest of the dam

STABILITY ANALYSIS OF UPSTREAM SLOPE

CONDITION OF SUDDEN DRAWDOW

SCALE: 1" = 30'

30' 0 30' 60'

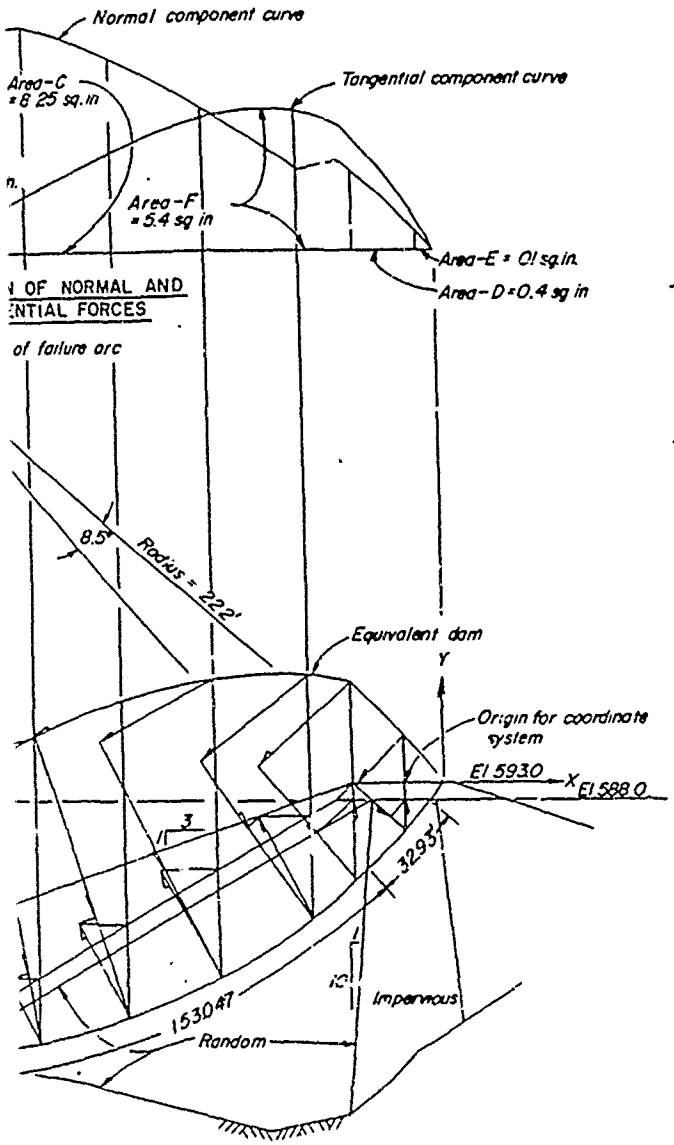
(1)

q. in
.125
ons

SCALE

ADOPTED DESIGN DATA					
Materials	Unitweight lbs / cu.ft		Shear strengths (*)		
	Saturated	Submerged	Q	R	S
Select rock	135	72.6	ϕ=39° C=0	ϕ=39° C=0	ϕ=39° C=0
Random rock	135	72.6	ϕ=33° C=0	ϕ=33° C=0	ϕ=33° C=0
Transition mat'l	135	72.6	ϕ=33° C=0	ϕ=33° C=0	ϕ=33° C=0
Impervious	125	62.5	ϕ=10° C=0.6	ϕ=14° C=0.1	ϕ=21° C=0
Random	125	62.5	ϕ=10 C=0.4	ϕ=12° C=0.4	ϕ=29° C=0

(*) ϕ = Angle of internal friction (degrees)
C = Cohesion (Tons/ft²)



FORCES ACTING ON FAILURE ARC

Positive tangential force Area – F = 151.875 Tons
Negative tangential force Area – G = -14.063 Tons
Total = 137.812

NORMAL AND RESISTING FORCES

Normal force Area ——— A = 75,938 Tons
Normal force Area ——— B+E = 22.031 Tons
Normal force Area ——— C = 232.031 Tons
Normal force Area ——— D = 11.250 Tons
Cohesion (LC)
= (153.047 x 0.4) + (32.93 x 0.1) ——— 64.509 Tons

SAFETY FACTOR COMPUTATIONS

Formula $S.F. = \frac{\Sigma N \times \tan\phi + LC}{\Sigma T}$

For consolidated undrained (R) condition

$S.F. = \frac{75.938 \times \tan 39° + 22.781 \times \tan 33° + 232.031 \times \tan 12° + 11.250 \times \tan 14° + 64.509}{137.812}$

S.F. = 1.40

REAM SLOPES UNDER
N DRAWDOWN

50'

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE IN A DESIGN MEMORANDUM AND WAS REPRODUCED FOR USE IN THIS REPORT

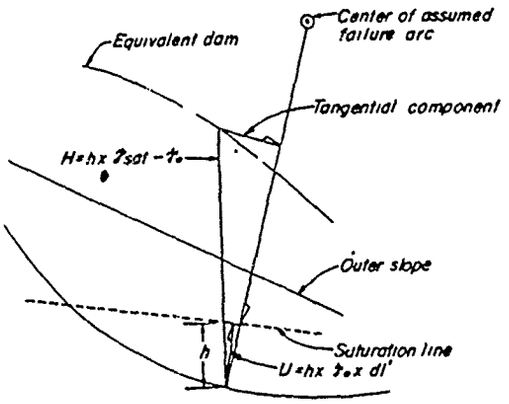
U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

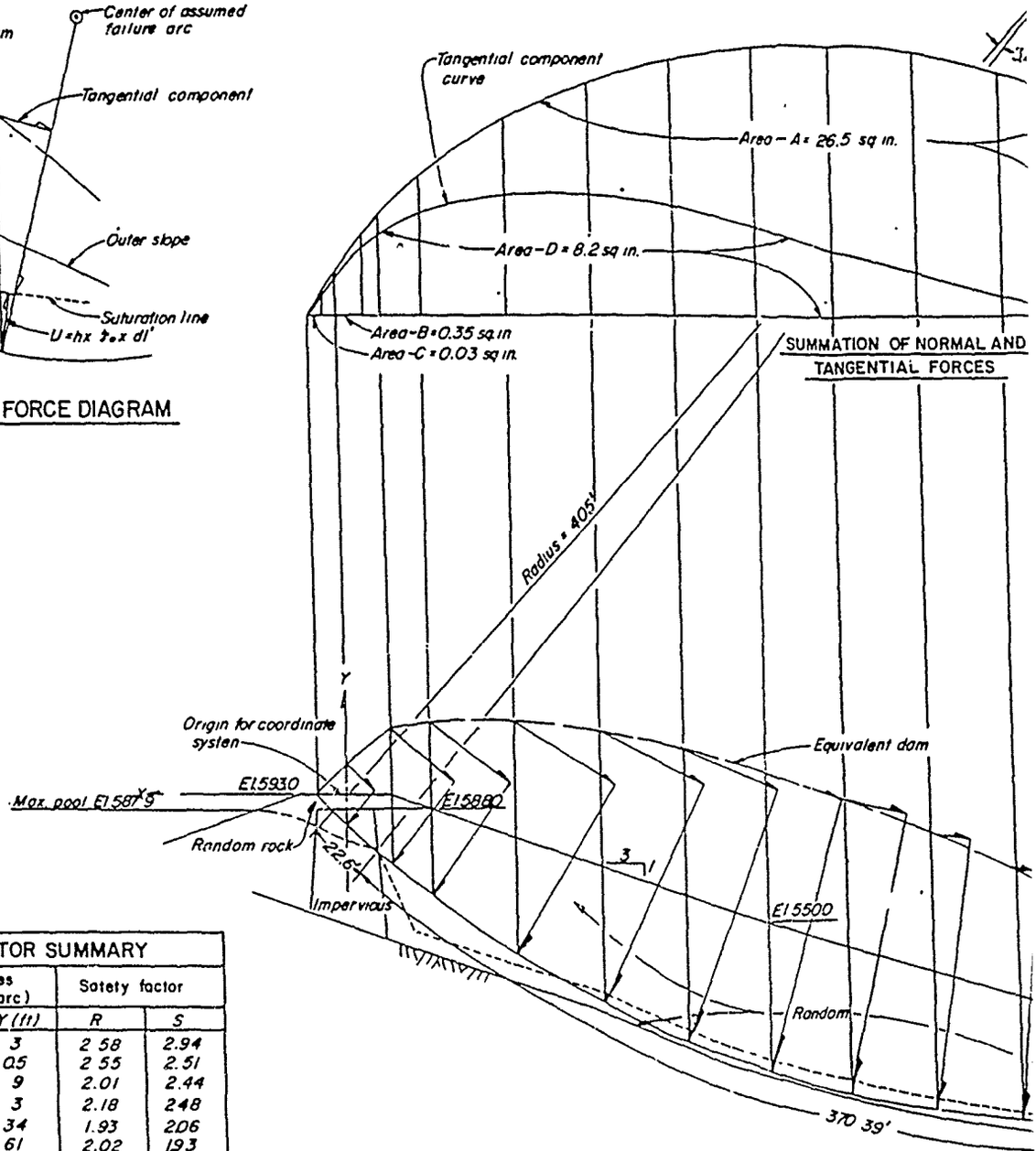
DESIGNED — BY — CHKD
DRAWN
TRACED
SUBMITTED
CHIEF, SPEC. SEC.
RECOMMENDED
CHIEF, ENGR. & MAINT. SEC.
APPROVED
CHIEF, ENGR. DIV. FOR THE DIST. ENGINEER

DIERKS DAM AND RESERVOIR
RIGHT EMBANKMENT
UPSTREAM STA. 2+50
STABILITY ANALYSIS-SUDDEN DRAWDOWN COND.

DATE: NOV. 1967
SCALE AS SHOWN
DRAWING NO. 1960-DM8-97/10



TYPICAL FORCE DIAGRAM



SAFETY FACTOR SUMMARY				
Radius (feet)	Coordinates (center of arc)		Safety factor	
	X (ft)	Y (ft)	R	S
58	43	3	2 58	2.94
54	67	05	2 55	2.51
72	68	9	2.01	2.44
70	79	3	2.18	248
94	94	34	1.93	206
112	97	61	2.02	193
135	71	100	2 49	225
149	110	76	1 59	203
208	191	108	1.53	194
198	179	109	1 64	156
195	162	122	1 79	181
192	128	143	2.23	182
276	163	194	1 54	199
290	233	189	1 59	192
405	271	291	1.41	189
515	350	389	1.54	187

NOTES

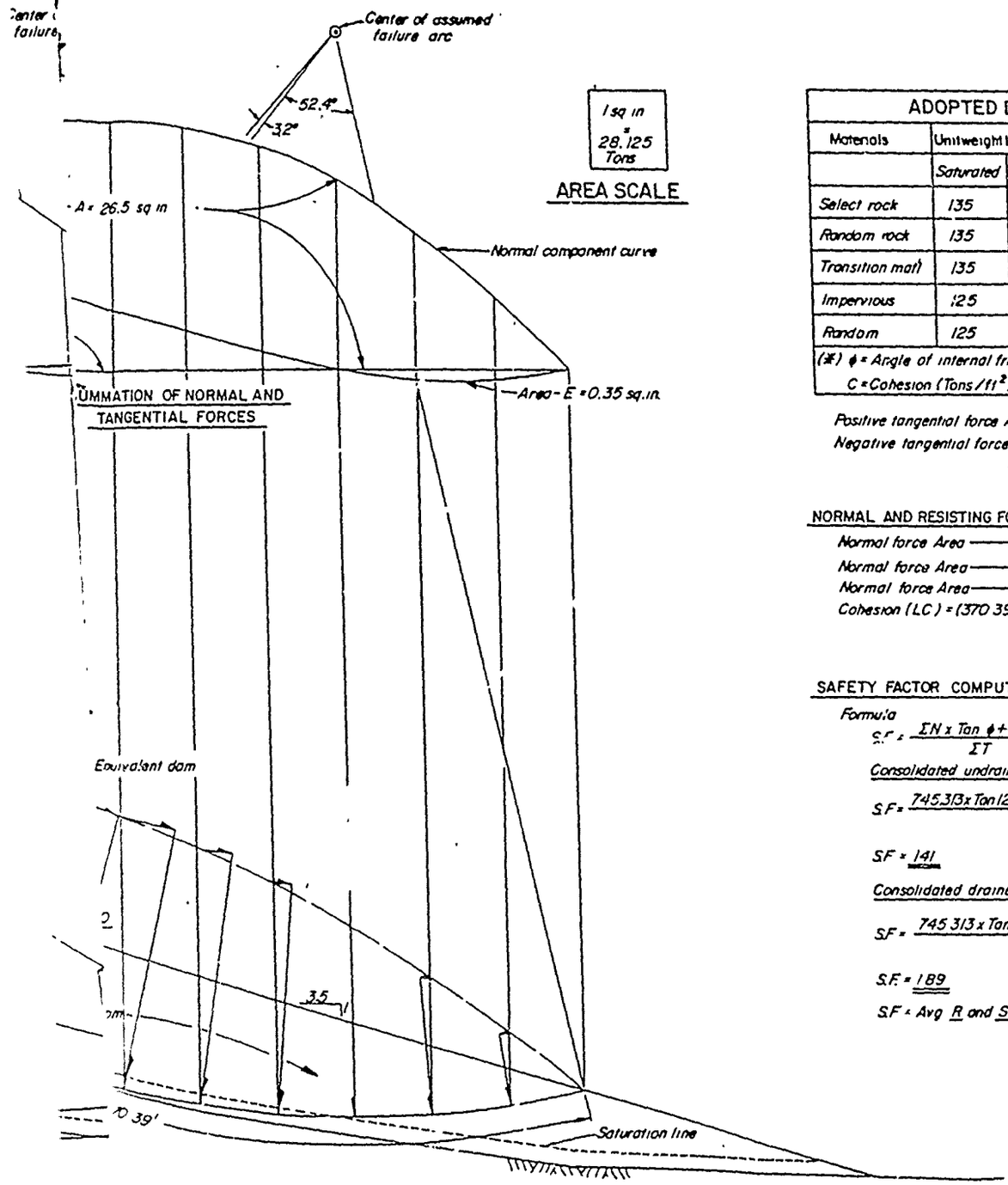
The above table includes results for all arcs analyzed for the steady seepage condition The coordinates represent arc centers and are referenced from the ℄ and crest of dam

STABILITY ANALYSIS OF DOWNSTREAM S

CONDITION OF STEADY SEEPAG

SCALE 1" = 30'

30' 0 30' 60'



1 sq in = 28.125 Tons

AREA SCALE

ADOPTED DESIGN DATA					
Materials	Unitweight lbs./cu ft		Shear strengths *		
	Saturated	Submerged	Q	R	S
Select rock	135	72.6	ϕ=39° C=0	ϕ=39° C=0	ϕ=39° C=0
Random rock	135	72.6	ϕ=33° C=0	ϕ=33° C=0	ϕ=33° C=0
Transition matl	135	72.6	ϕ=33° C=0	ϕ=33° C=0	ϕ=33° C=0
Impervious	125	62.5	ϕ=10° C=0.6	ϕ=14° C=0.1	ϕ=27° C=0
Random	125	62.5	ϕ=10° C=0.4	ϕ=12° C=0.4	ϕ=29° C=0

(*) ϕ = Angle of internal friction (degrees)
C = Cohesion (Tons/ft^2)

Positive tangential force Area-D = 230 625 Tons
Negative tangential force Area-E −9 844 Tons
Σ Total = 220781 Tons

NORMAL AND RESISTING FORCES

Normal force Area ——— A=745 313 Tons
Normal force Area ——— B= 9 844 Tons
Normal force Area ——— C= 0.844 Tons
Cohesion (LC) = (370 39x0 4)+(22 6x0 1) = 150 416 Tons

SAFETY FACTOR COMPUTATIONS

Formula

$$S.F. = \frac{\Sigma N \times \tan \phi + LC}{\Sigma T}$$

Consolidated undrained condition (R)

$$S.F. = \frac{745313 \times \tan 12° + 9844 \times \tan 14° + 0844 \times \tan 33° + 150416}{220781}$$

S.F. = 1.41

Consolidated drained (s) (neglecting cohesion)

$$S.F. = \frac{745313 \times \tan 29° + 9844 \times \tan 27° + 0844 \times \tan 33°}{220781}$$

S.F. = 1.89

S.F. = Avg R and S = 1.65

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE IN A DESIGN MEMORANDUM AND WAS REPRODUCED FOR USE IN THIS REPORT

NDER DOWNSTREAM SLOPES UNDER STEADY SEEPAGE

E 1" = 30'
30' 60'

U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

DESIGNED BY
DRAWN BY
TRACED BY
SUBMITTED BY
CHIEF, SOILS DESIGN SEC.

DIERKS DAM AND RESERVOIR
RIGHT EMBANKMENT
DOWNSTREAM STA. 5+20
STABILITY ANALYSIS - STEADY SEEPAGE COND.

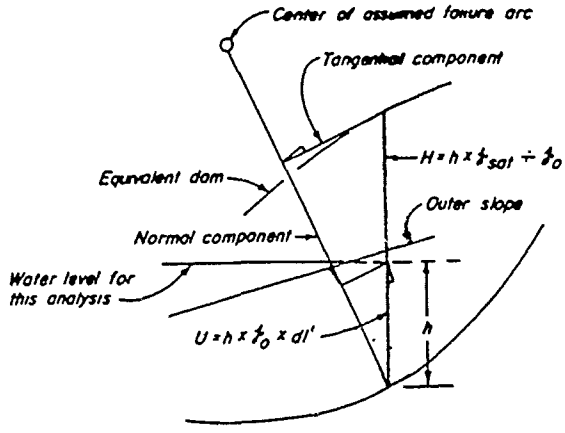
RECOMMENDED
CHIEF, FND & MATLS SEC.

APPROVED
CHIEF, ENGRG DIV FOR THE DIST ENGINEER

DATE NOV 1967

SCALE AS SHOWN

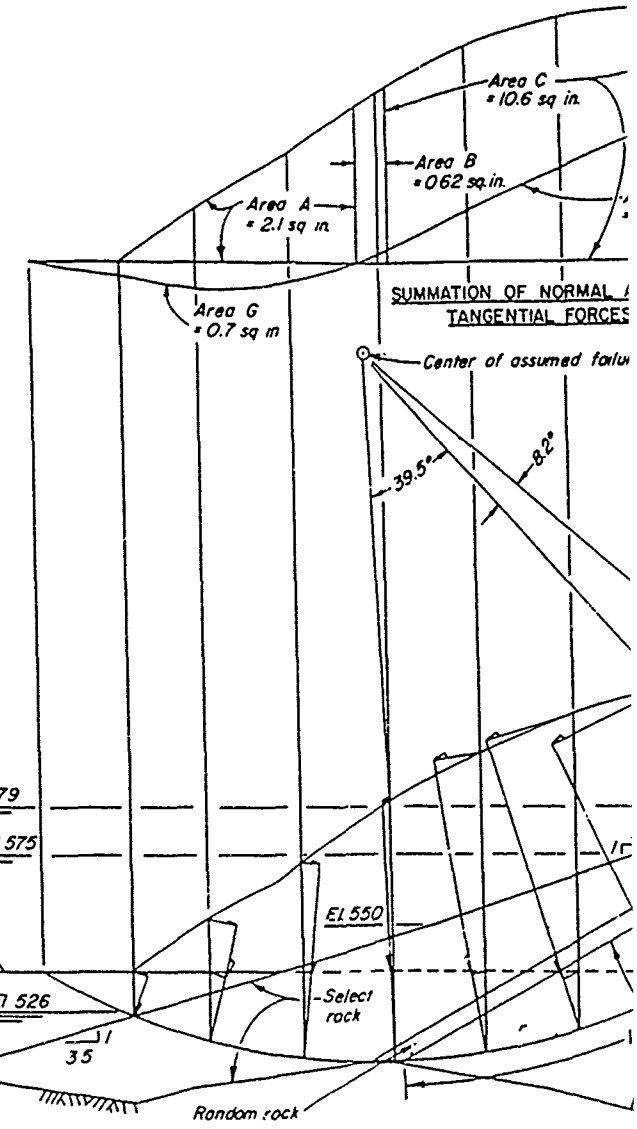
DRAWING NO. 1960-DM8-97/11

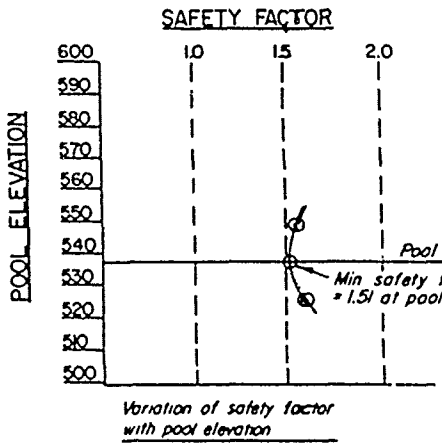


TYPICAL FORCE DIAGRAM

1 sq. in. = 28.125 Tons

AREA SCALE





Variation of safety factor with pool elevation

STABILITY ANALYSIS OF UPSTREAM SLO

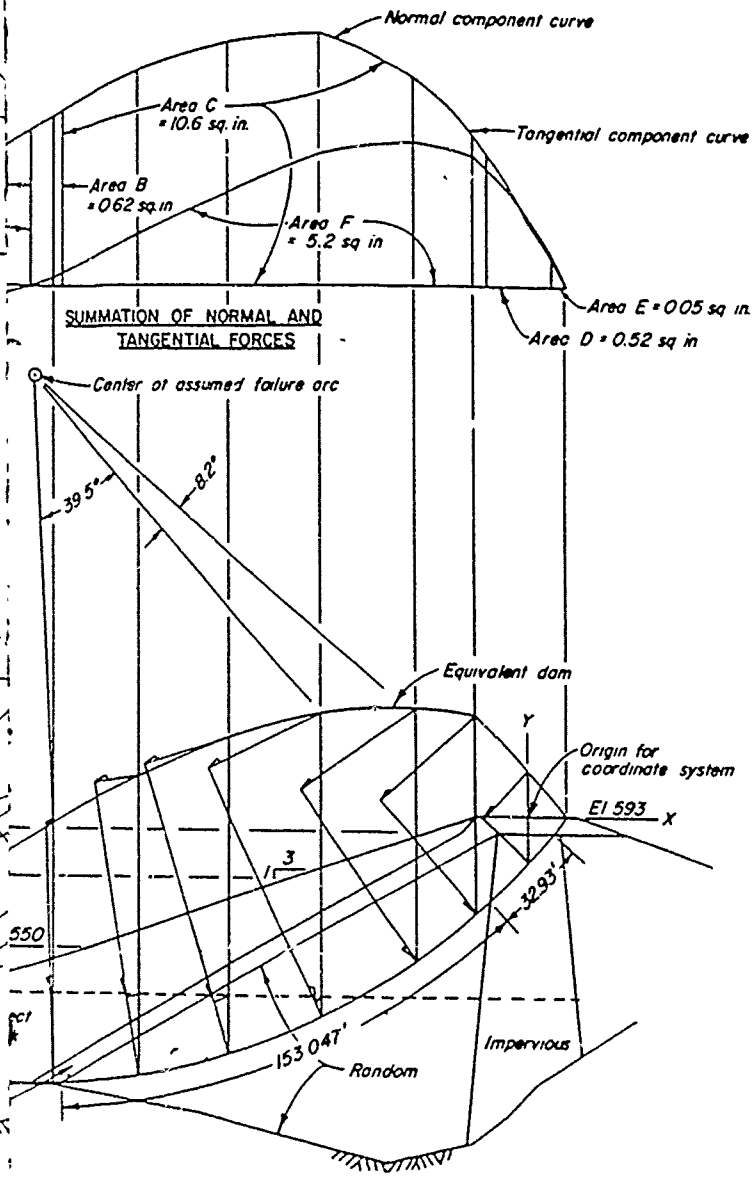
CONDITION OF PARTIAL POOL

SCALE: 1" = 30'

30' 0 30' 60'

1 sq in = 28.125 Tons

AREA SCALE



ADOPTED DESIGN DATA					
Materials	Unitweight lbs./cu.ft.		Shear Strengths *		
	Saturated	Submerged	Q	R	S
Select rock	135	72.6	ϕ=39° C=0	ϕ=39° C=0	ϕ=39° C=0
Random rock	135	72.6	ϕ=33° C=0	ϕ=33° C=0	ϕ=33° C=0
Transition mat'l	135	726	ϕ=33° C=0	ϕ=33° C=0	ϕ=33° C=0
Impervious	125	62.5	ϕ=10° C=06	ϕ=14° C=01	ϕ=27° C=0
Random	125	62.5	ϕ=10° C=04	ϕ=12° C=04	ϕ=29° C=0

(*) ϕ = Angle of internal friction (degrees)
C = Cohesion (Tons/ft²)

FORCES ACTING ON FAILURE ARC

Positive tangential force Area ____ F = 146 250 Tons
Negative tangential force Area ____ G = -19685 Tons
Σ Total = 126565 Tons

NORMAL AND RESISTING FORCES

Normal force Area ____ A = 59063 Tons
Normal force Area ____ B+E = 18 844 Tons
Normal force Area ____ C = 298125 Tons
Normal force Area ____ D = 14625 Tons

Cohesion (LC)
= (153047x04)+(32 93x01) ____ = 64509 Tons

SAFETY FACTOR COMPUTATIONS

Formula S.F. = $\frac{\Sigma N \times \text{Tan}\,\phi + LC}{\Sigma T}$

For consolidated undrained (R) condition

S.F. = $\frac{59063 \times \text{Tan } 39° + 18844 \times \text{Tan } 33° + 298125 \times \text{Tan } 12° + 14625 \times \text{Tan } 14° + 64509}{126.565}$

S F = 1.51

DER

IS OF UPSTREAM SLOPES UNDER
ON OF PARTIAL POOL

SCALE 1" = 30'
0 30 60

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE IN A DESIGN MEMORANDUM AND WAS REPRODUCED FOR USE IN THIS REPORT

U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

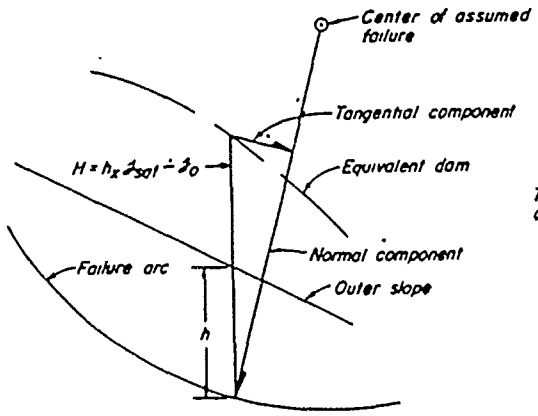
RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

DESIGNED KT
DRAWN JWM
TRACED
SUBMITTED
CHIEF, DESIGN SECTION
RECOMMENDED
CHIEF, ENGR & MATLS BR

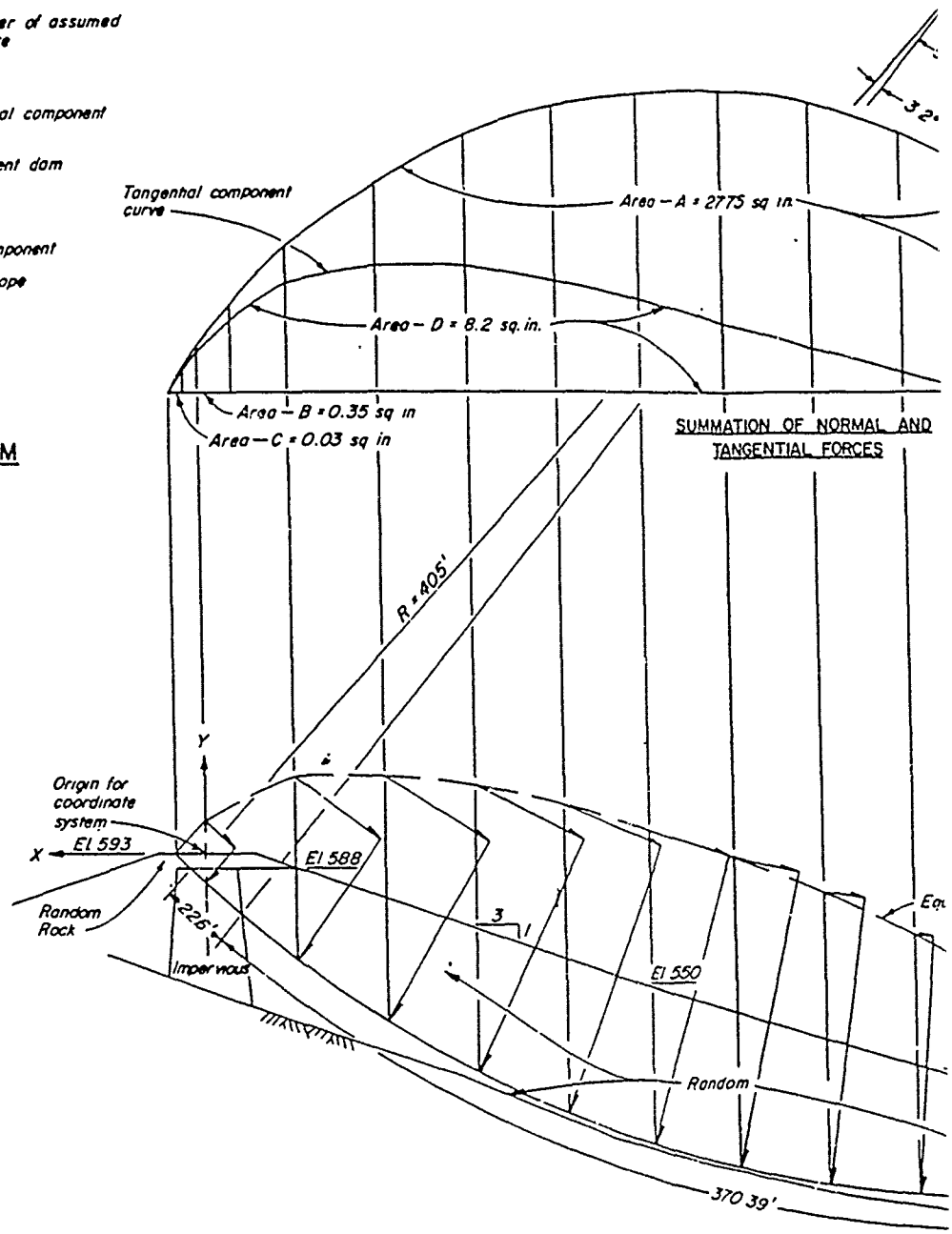
DIERKS DAM AND RESERVOIR
RIGHT EMBANKMENT
UPSTREAM STA. 2 + 50
STABILITY ANALYSIS- PARTIAL POOL CONDITION

APPROVED
CHIEF, ENGR DIV FOR THE DIST ENGINEER

DATE NOV. 1967
SCALE AS SHOWN
DRAWING NO 1960 - DM8-97/12



TYPICAL FORCE DIAGRAM



SAFETY FACTOR SUMMARY			
Radius (feet)	Coordinates (center of arc)		Safety factor
	X (ft)	Y (ft)	
58	43	3	3.13
54	67	05	2.39
72	68	9	2 26
70	79	3	2 07
94	94	34	1 83
112	97	61	1.96
135	71	100	2 76
149	110	76	1.67
208	191	108	1 42
198	179	109	1.50
195	162	122	1.67
192	128	143	2 19
276	163	194	1.50
290	233	189	1 46
405	271	251	1.36
515	350	389	1 43

Notes

The above table includes results of all arcs analyzed for end of construction condition. Coordinates for arc centers are referenced from the ℄ and crest of the dam

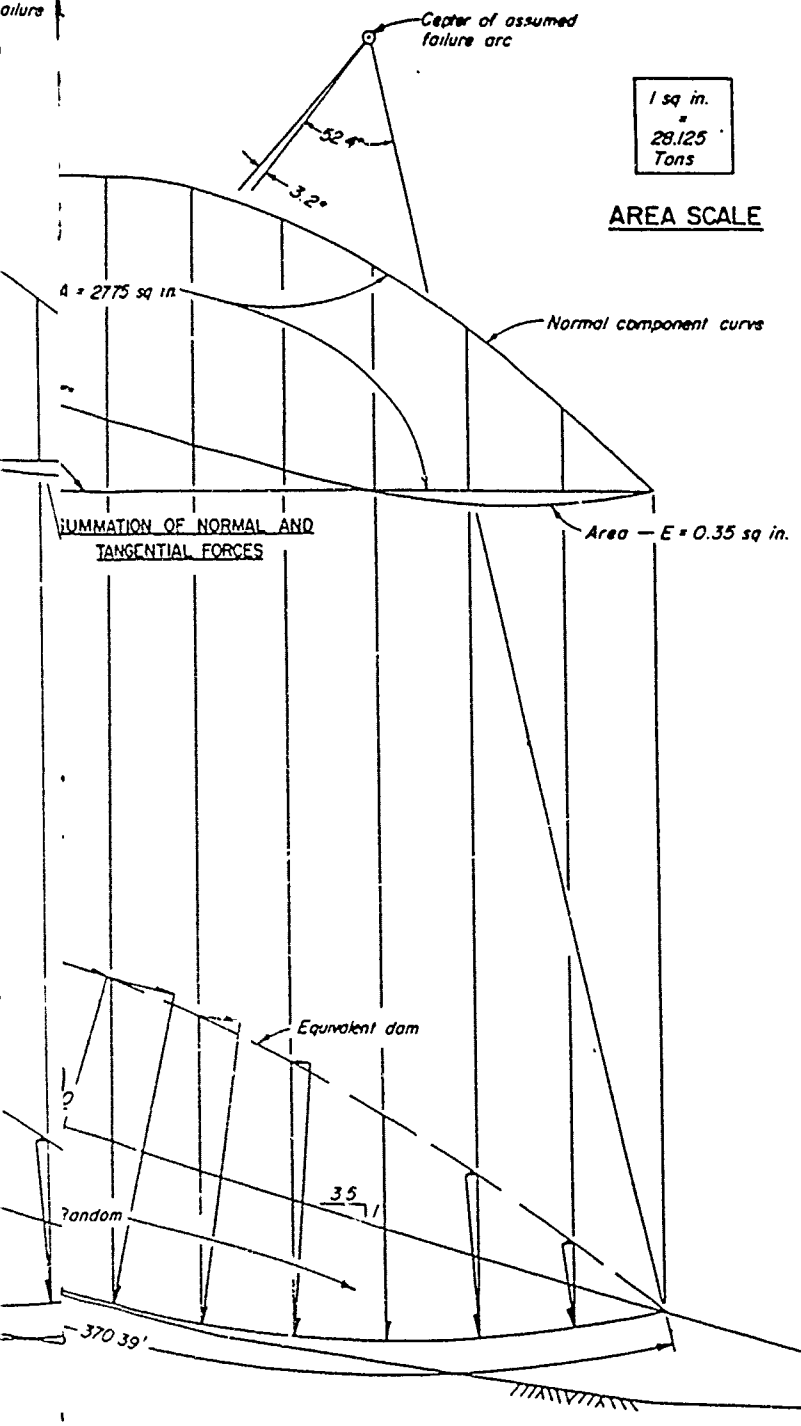
STABILITY ANALYSIS OF DOWNSTREAM SL

CONDITION OF END OF CONSTRUCT

SCALE 1" = 30'

30' 0 30' 60'

(1)



ADOPTED DESIGN DATA					
Materials	Unitweight lbs / cu. ft.		Shear Strengths (*)		
	Saturated	Submerged	Q	R	S
Select rock	135	72.6	$\phi = 39°$ $C = 0$	$\phi = 39°$ $C = 0$	$\phi = 39°$ $C = 0$
Random rock	135	72.6	$\phi = 33°$ $C = 0$	$\phi = 33°$ $C = 0$	$\phi = 33°$ $C = 0$
Transition mat'l.	135	72.6	$\phi = 33°$ $C = 0$	$\phi = 33°$ $C = 0$	$\phi = 33°$ $C = 0$
Impervious	125	62.5	$\phi = 10°$ $C = 0.6$	$\phi = 14$ $C = 0.1$	$\phi = 27°$ $C = 0$
Random	125	62.5	$\phi = 10°$ $C = 0.4$	$\phi = 12°$ $C = 0.4$	$\phi = 29°$ $C = 0$

(*) ϕ = Angle of internal friction (degrees)
C = Cohesion (Tons/ft²)

FORCES ACTING ON FAILURE ARC

Positive tangential force Area D = 230625 Tons
Negative tangential force Area E = − 9844 Tons
Σ Total = 220781 Tons

NORMAL AND RESISTING FORCES

Normal force Area _____ A = 780469 Tons
Normal force Area _____ B = 9844 Tons
Normal force Area _____ C = 0.844 Tons

Cohesion (LC) = (370.39 × 0.4) + (22.6 × 0.6) = 161.716 Tons

SAFETY FACTOR COMPUTATIONS

Unconsolidated undrained (Q) condition

$$SF = \frac{\Sigma N \times \text{Tan}\,\phi + LC}{\Sigma T}$$

$$SF = \frac{790.313 \times \text{Tan } 10° + 0.844 \times \text{Tan } 33° + 161.716}{220.781}$$

$$SF = 1.36$$

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE IN A DESIGN MEMORANDUM AND WAS REPRODUCED FOR USE IN THIS REPORT.

OF DOWNSTREAM SLOPES UNDER
F END OF CONSTRUCTION

SCALE 1" = 30'
0 30 60'

U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

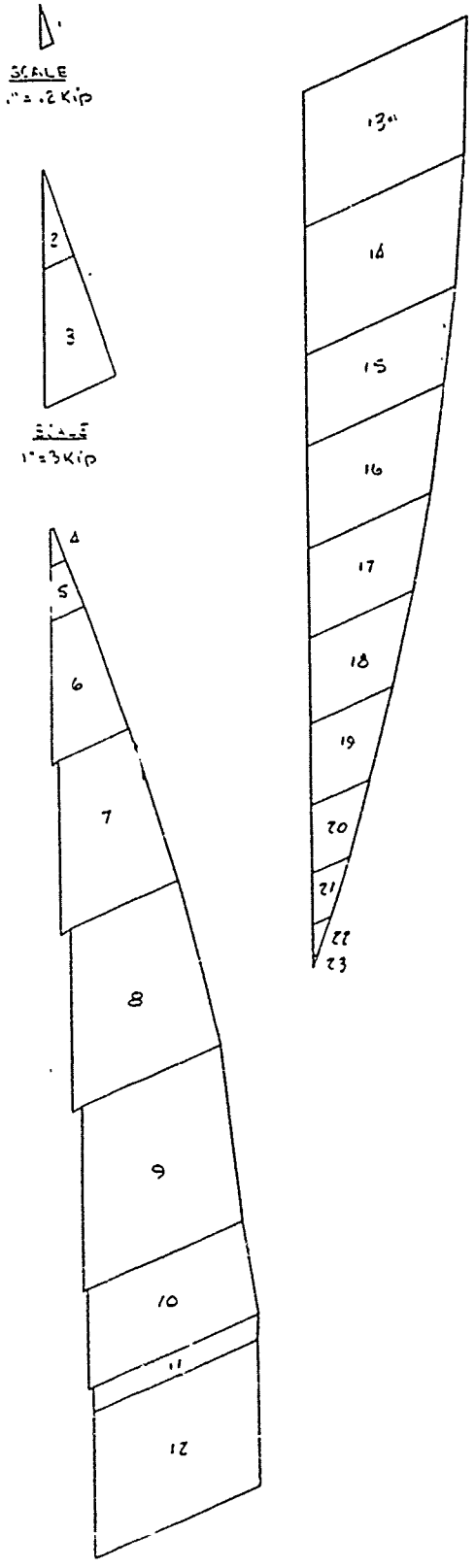
DESIGNED KZ
DRAWN JWM
TRACED
SUBMITTED

DIERKS DAM AND RESERVOIR
RIGHT EMBANKMENT
DOWNSTREAM STA. 5+20
STABILITY ANALYSIS — END OF CONSTRUCTION CONDITION

RECOMMENDED
APPROVED
DATE NOV. 1967

SCALE AS SHOWN

DRAWING NO. 1960-DM8-97/13

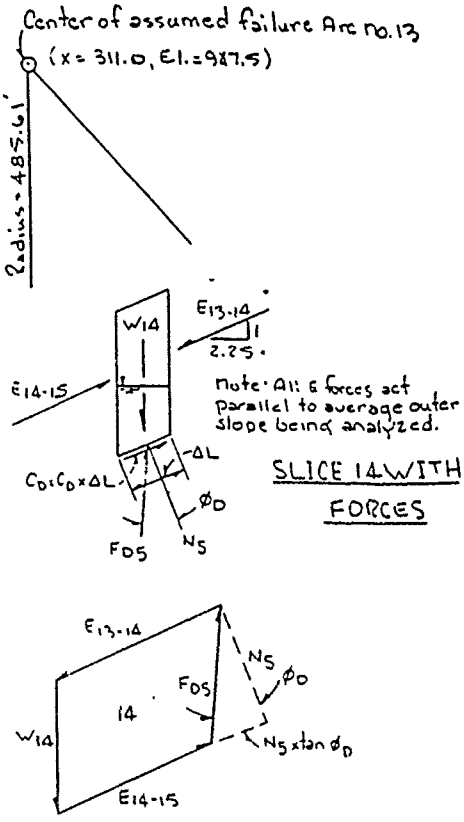


COMPOSITE FORCE POLYGON

FOR F.S. = 1.40

SCALE: 1 INCH = 50 Kips

Note: N_D was first determined using the S-Strength if $\Sigma\Delta L$ was greater than the break point stress, i.e. 50 ksf for the impervious zone and 194 ksf for the Random & Transition zones) the force polygon was redrawn using the ksf S strength



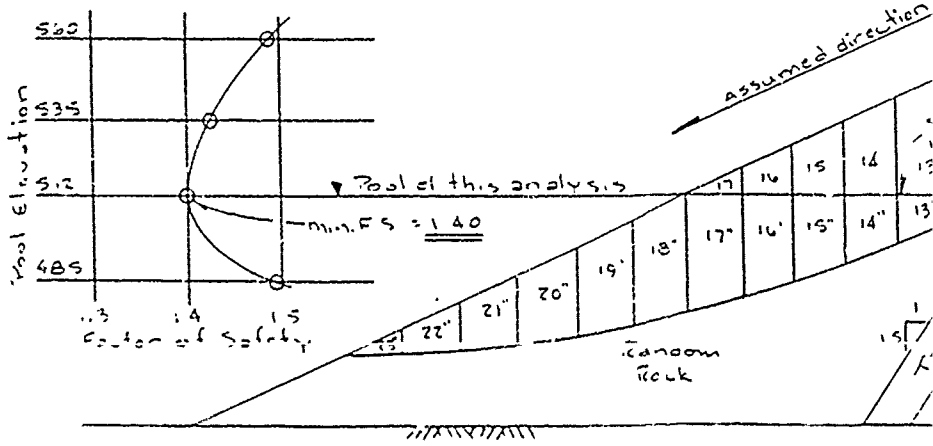
SLICE 14 WITH FORCES

FORCE POLYGON FOR SLICE 14

LEGEND.

W = Weight of slice.
E = Earth force on side of slice.
C_D = Developed Cohesion force
F_D = Resultant of normal and developed friction force.
N = Normal to base of slice.
ΔL = Length across base of slice
ϕ_D = Developed angle of internal friction of soil.

$c_D = \frac{c}{F.S.}$ $\phi_D = \arctan \frac{\tan \phi}{F.S.}$

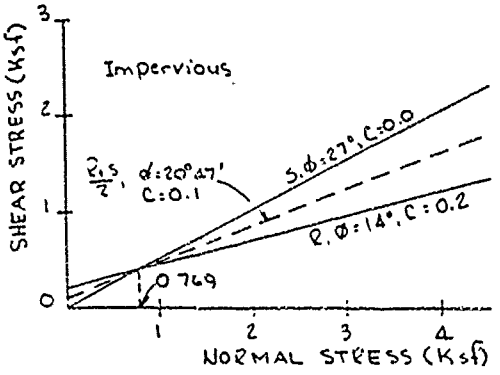


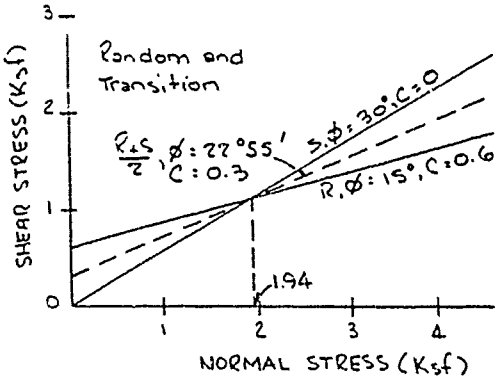
STABILITY ANALYSIS

UNDER CONDITION OF

SCALE IN F

DEVELO





DEVELOPED SHEAR STRENGTH FOR F.S. = 1.40

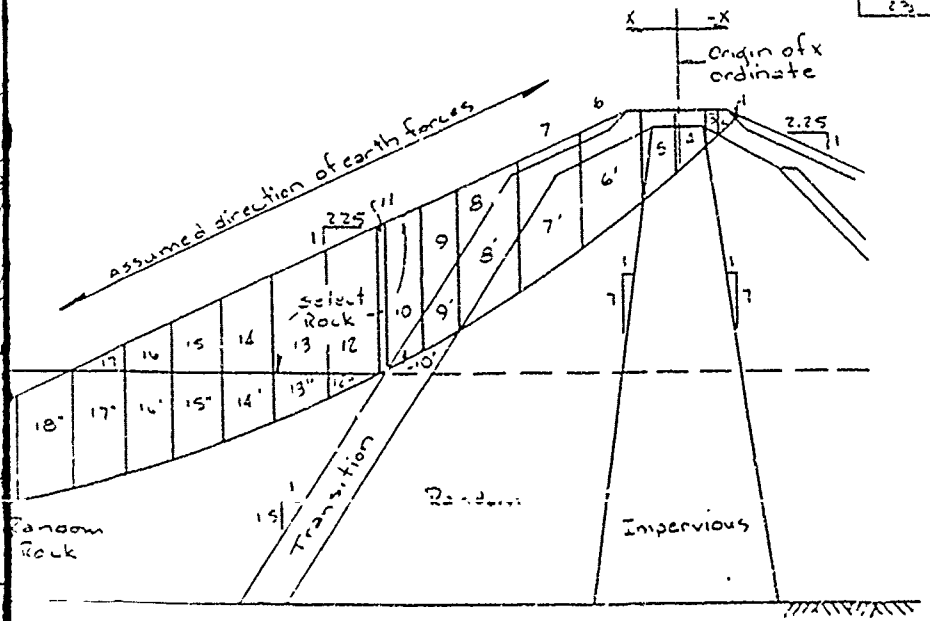
material	Shear strength	ϕ_D	C_D (Ksf)
Random Rock	S	24.88°	0.0
Select Rock	S	30.04°	0.0
Rand. & Trans	S	22.42°	0.0
	$\frac{R+S}{2}$	16.77°	0.214
Impervious	S	20.00°	0.0
	$\frac{R+S}{2}$	15.17°	0.071

ADOPTED DESIGN DATA

Material	Tan ϕ			Cohesion (Ksf)			Wt. (Kcf)	
	R	S	(R+S)/2	R	S	(R+S)/2	Sat.	Sub.
Sel Rock	.8097	.8097	.8097	0.0	0.0	0.0	.135	.0726
Rand. Rock	.6494	.6494	.6494	0.0	0.0	0.0	.135	.0726
Impervious	.2493	.5095	.3794	0.2	0.0	0.1	.125	.0625
Rand. & Trans	.2679	.5773	.4226	0.6	0.0	0.3	.125	.0625
Filter	.6094	.6494	.6494	0.0	0.0	0.0	.125	.0625

* Saturated surface dry wt. (40% Voids)

Slice no.	Area ft²	Wt. Sat. .105 Kip	Wt. Sat. .125 Kip	Wt Sub .0726 Kip	Total Wt. Kips	Base Length ΔL	Cohesion $C_D \Delta L$
1	0.0	0.1	-	-	0.1	1.3	0.0
2	27.0	1	33	-	33	7.7	0.0
3	36.0	-	4.5	-	4.5	3.1	0.0
4	133.0	-	19.1	-	19.1	3.1	0.9
5	234.0	-	29.3	-	29.3	12.9	0.9
6	405	4.2	-	-	78.0	-	-
6'	590.4	-	73.8	-		24.8	5.3
7	665	6.3	-	-	92.0	-	-
7'	693.6	-	86.7	-		24.0	5.1
8	225.0	23.6	-	-	98.8	-	-
8'	601.6	-	75.2	-		23.2	5.0
9	288.6	30.3	-	-	55.1	-	-
9'	198.0	-	24.8	-		12.8	2.7
10	460.0	48.3	-	-	53.9	-	-
10'	52.9	-	6.6	-		12.6	2.7
11	126.0	13.2	-	-	13.2	3.1	0.0
12	693.0	72.8	-	-	78.1	-	-
12"	73.5	-	-	5.34		18.8	0.0
13	558.3	58.7	-	-	73.1	-	-
13'	198.0	-	-	14.4		18.5	0.0
14	459.0	48.2	-	-	68.9	-	-
14"	271.7	-	-	20.7		18.2	0.0
15	315.0	33.1	-	-	49.2	-	-
15"	374.0	-	-	28.5		18.0	0.0
16	189.0	19.85	-	-	54.5	-	-
16"	454.1	-	-	34.6		17.7	0.0
17	81.0	8.5	-	-	47.4	-	-
17"	510.5	-	-	38.9		17.6	0.0
18"	639.0	-	-	46.4	46.4	19.2	0.0
19"	576.0	-	-	43.9	43.9	19.1	0.0
20"	477.0	-	-	36.3	36.3	19.0	0.0
21"	360.0	-	-	27.4	27.4	16.9	0.0
22"	225.0	-	-	17.1	17.1	16.8	0.0
23"	81.0	-	-	6.2	6.2	16.8	0.0



LITY ANALYSIS OF UPSTREAM SLOPE
ER CONDITION OF PARTIAL POOL

SCALE IN FEET

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE IN A DESIGN MEMORANDUM AND WAS REPRODUCED FOR USE IN THIS REPORT

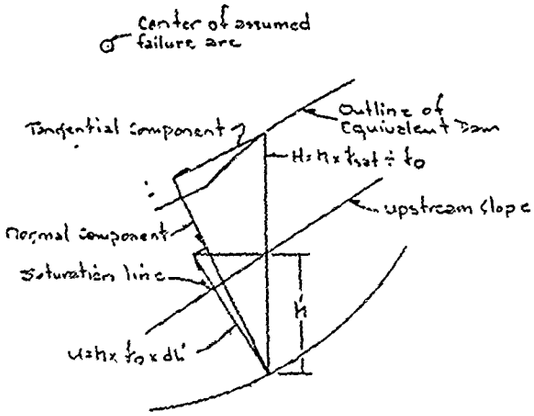
U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

DESIGNED BY K. Eiland
DRAWN K. Eiland
CHECKED BY
SUBMITTED
CHIEF, SOILS MECH SEC
DATE DEC 1972

RED RIVER WATERSHED — SALINE RIVER ARKANSAS

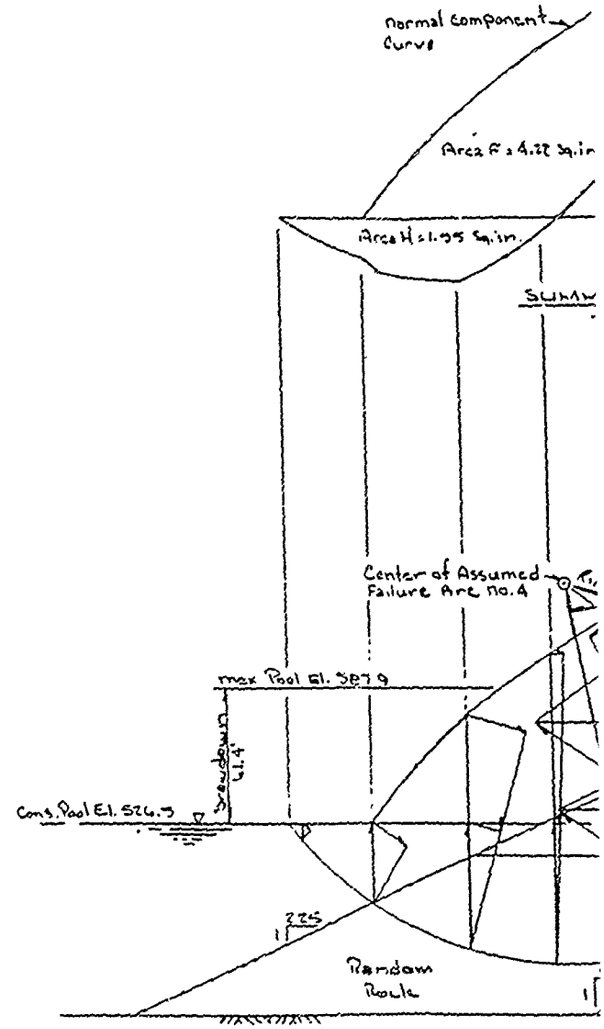
DIERKS RESERVOIR
EMBANKMENT AND SPILLWAY
STABILITY ANALYSIS
PARTIAL POOL

SCALE AS SHOWN
TO ACCOMPANY SUPPLEMENT NO. 2
DRAWING NO 1960-DM-8-97/12



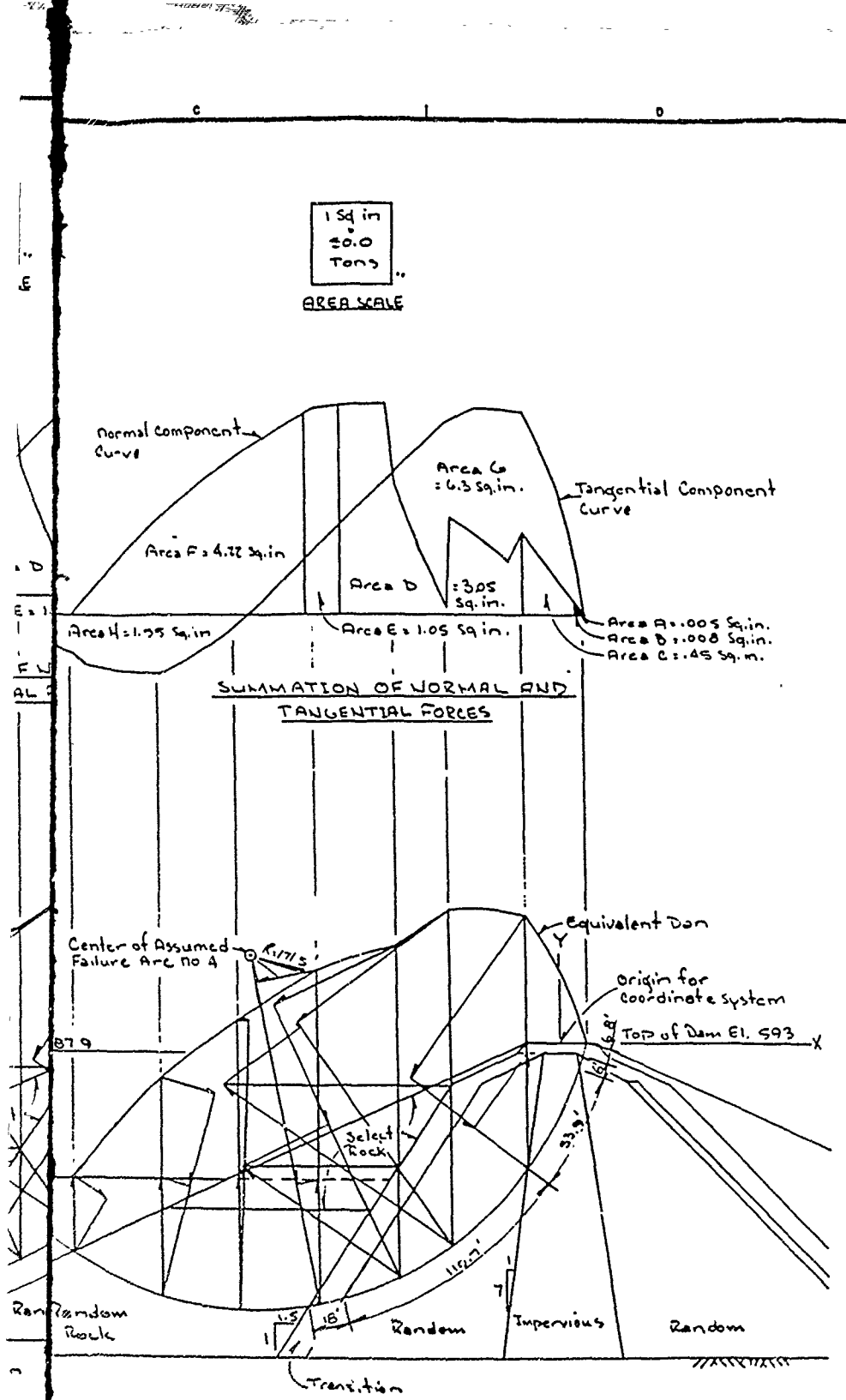
TYPICAL FORCE DIAGRAM

SAFETY FACTOR SUMMARY				
ARC NO	RADIUS (FEET)	COORDINATES (CENTER OF ARC) X (FT)	Y (FT)	SAFETY FACTOR
1	335.8	-262.0	184.0	1.12
2	508.2	-348.5	358.0	1.22
3	217.3	-186.3	65.5	1.06
4	171.5	-154.0	42.0	1.03
5	485.6	-311.0	354.5	1.16
6	276.2	-252.0	128.0	1.26
7	356.1	-238.5	238.0	1.08
8	216.0	-181.0	111.5	1.10



STABILITY ANALYSIS OF UPSTREA
SUDDEN D

40' 0
SCALE



SIS OF UPSTREAM SLOPE UNDER CONDITION OF SUDDEN DRAWDOWN

40' 0 40' 80'

SCALE OF FEET

ADOPTED DESIGN DATA				
Materials	Soil wts. Lbs/ft³ Saturated	Submerged	Shear Strengths *	R
Select Rock	105 ** 135	72.6	Ø 39 C 0	
Random Rock	135	72.6	Ø 33 C 0	
Random	125	62.5	Ø .5 C 0.3	
Impervious	125	62.5	Ø 14 C 0.1	
Transition	125	62.5	Ø 15 C 0.3	

* Ø: Angle of internal friction (degrees)
C: Cohesion (Tons/ft²)
** Saturated surface dry wt (40% Voids)

FORCES ACTING ON FAILURE ARC

Positive tangential force Area G = 315.00 Ton
Negative tangential force Area H = -77.50 Ton
Σ Total = 237.50 Ton

NORMAL AND RESISTING FORCES

Normal force Area A = 1.25 Ton
Normal force Area B = 0.40 Ton
Normal force Area C = 22.50 Ton
Normal force Area D = 152.50 Ton
Normal force Area E = 52.50 Ton
Normal force Area F = 211.00 Ton

Cohesion $\overline{LC}$

141.5' x 0.3 = 42.45 Ton
53.9' x 0.1 = 5.39 Ton

SAFETY FACTOR COMPUTATIONS

Formula: $S.F. = \frac{\Sigma N \times \tan\phi + \overline{LC}}{\Sigma T}$

For consolidated undrained (R)

$S.F. = \frac{(211.00 \times \tan 33\frac{1}{2}^\circ) + (105.65 \times \tan 15^\circ) + (22.5 \times \tan 14^\circ) + 47.84}{237.5}$

$= \frac{245.56}{237.5}$

$= \underline{1.03}$

NOTES:

The sudden drawdown condition was analyzed using the methods outlined in EM 1110-2-1902 Dec 1960. The computer program utilizing EM 1110-2-1902 April 1970 does not provide for the multiple Select Rock weights.

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE IN A DESIGN MEMORANDUM AND WAS REPRODUCED FOR USE IN THIS REPORT.

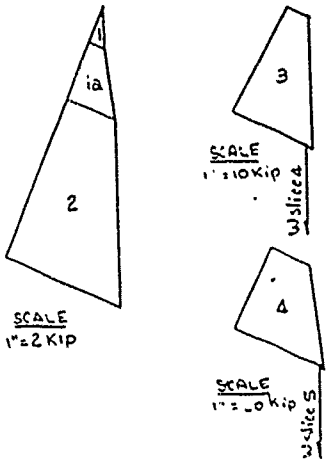
U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

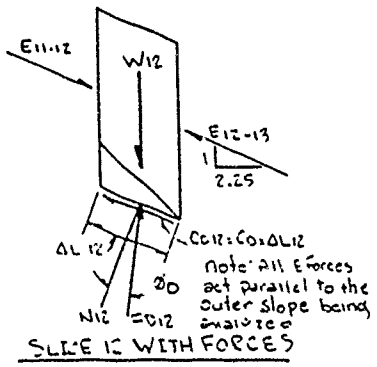
DESIGNED BY K. Peland
DRAWN BY K. Peland
CHECKED BY L Barker
SUBMITTED Chief, Soils Design Sec
DEC 1972

RED RIVER WATERSHED — BAYOU RIVER, ARKANSAS

DIERKS RESERVOIR
EMBANKMENT AND SPILLWAY
STABILITY ANALYSIS
SUDDEN DRAWDOWN

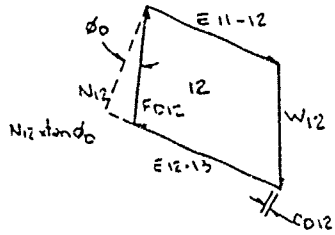
SCALE AS SHOWN | TO ACCOMPANY SUPPLEMENT NO. 8
DRAWING NO 1960-DM8-97/15





SLICE 12 WITH FORCES

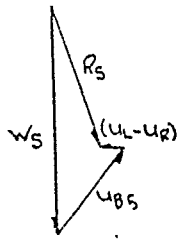
RESULTANTS OF WEIGHT AND WATER FORCE OF SLICES				
SLICE no.	U, Left (K.ips)	U, Right (K.ips)	U, Base (K.ps)	Resultant (K.ips)
12	0.0	0.7	0.7	1.5
2	0.7	1.5	1.8	3.9
3	1.5	8.8	10.6	14.0
4	8.8	18.2	17.9	21.8
5	18.2	26.4	36.4	46.0
6	26.4	22.1	36.7	67.0
7	22.1	14.3	30.6	74.0
8	14.3	7.3	22.7	93.0
9	7.3	2.0	14.1	105.0
10	2.0	0.0	4.8	117.0



FORCE POLYGON FOR SLICE 12

LEGEND:
W = Weight of slice.
E = Earth force on side of slice.
FD: Resultant of normal and developed frictional force
N = Normal to base of slice.
ΔL = Length across base of slice
Ød : Developed angle of internal friction of soil.

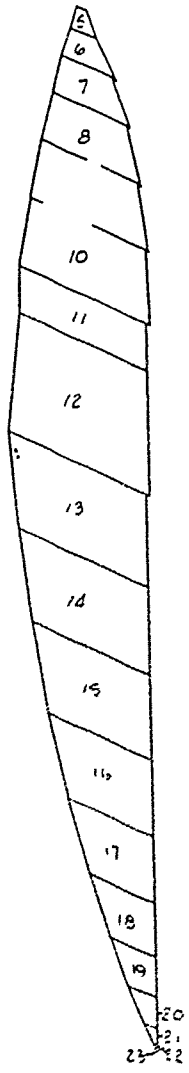
$C_D = \frac{C}{F.S.}$ $\Phi_D = \arctan \frac{\tan \phi}{F.S.}$



WATER FORCES FOR SLICE 5

SCALE
1" = 30 K.p

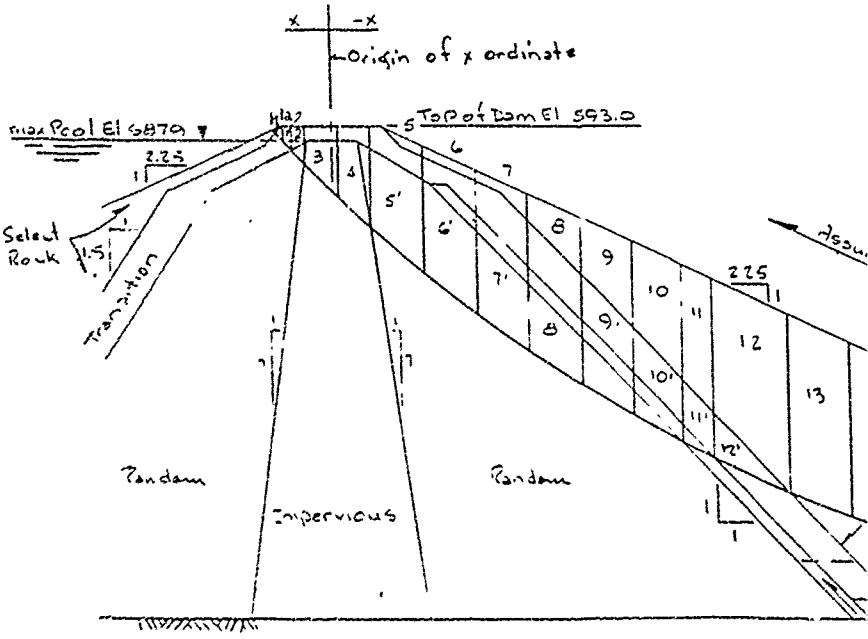
LEGEND:
UL = Hydrostatic force on left side of slice
UR = Hydrostatic force on right side of slice
UB = Hydrostatic uplift force normal to base of slice
R = Resultant of weight and hydrostatic forces on slice



COMPOSITE FORCE POLYGON FOR FS = 1.37

SCALE: 1 INCH = 150 KIPS

Note: No was first determined using the S-Strength. If No/ΔL was greater than the break point stress, 1.769 ksf for the impervious zone and 1.94 ksf for the Random & Transition Zones the force polygon was redrawn using the $\frac{R+S}{2}$ strengths.



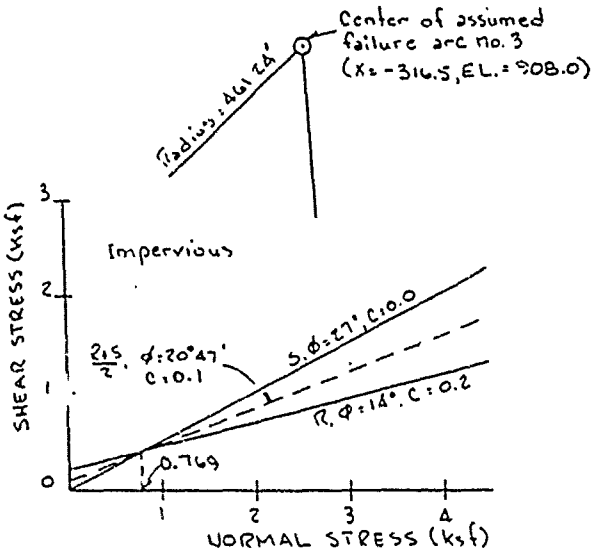
STABILITY ANALYSIS OF DOWNSTREAM SLO

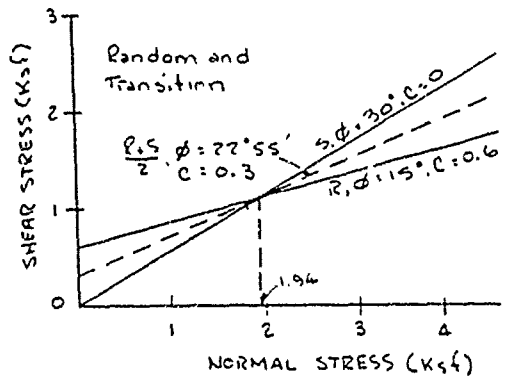
STEADY SEEPAGE

30 0 30

SCALE IN FT.

IGHT AND SLICES	
U. Base (K.ps)	Resultant (K.ps)
0.7	1.5
1.8	3.9
10.6	14.0
17.9	31.8
36.4	46.0
36.7	67.0
30.6	79.0
22.7	93.0
14.1	105.0
4.8	117.0





ADOPTED DESIGN DATA									
Material	Tan φ			Cohesion (ksf)			Weight (Kcf)		
	R	S	½(R+S)	R	S	½(R+S)	Sat	Sub
Sel. Rock	1.8097	.9097	.8097	0.0	0.0	0.0	135	.0726
Rand. Rock	.6494	.6494	.6494	0	0.0	0.0	.135	.0726
Impervious	.2493	.5095	.3794	0.2	0.0	0.1	.125	.0625
Rand+Trans	.2679	.5773	.4226	0.6	0.0	0.3	.125	.0625
Filter	.6494	.6494	.6494	0.0	0	0	0	.125	.0625

+ Saturated surface dry wt (40% voids)

Slice no.	Area (Ft²)	Wt Sat. 135 Kcf	Wt. Sat 125 Kcf	Wt. Sub .075 Kcf	Total wt Kcf	Resistance ΔL (Ft)	Cohesion ΔL x c
1	6.75	-	.84	-	2.8	4.4	0
1a	15.75	-	1.96	-		4.0	0
2	40.5	-	5.1	-	5.1	6.0	0
3	171.0	-	21.4	-	21.4	14.4	1.05
4	279.0	-	34.8	-	34.8	14.0	1.02
5	27.0	3.6	-	-	3.6	-	-
5'	567.0	-	70.9	-		21.9	0
6	54.0	7.3	-	-	89.4	-	-
6'	657.0	-	82.1	-		21.1	4.6
7	67.5	9.1	-	-	99.9	-	-
7'	726.4	-	90.8	-		20.4	4.4
8	216.0	29.1	-	-	108.9	-	-
8'	639.0	-	79.8	-		19.8	4.3
9	378.0	51.0	-	-	116.8	-	-
9'	518.4	-	64.8	-		19.3	4.2
10	531.0	71.7	-	-	121.2	-	-
10'	396.0	-	49.5	-		16.9	4.1
11	396.0	49.5	-	-	72.0	-	-
11'	180.0	-	22.5	-		11.8	0
12	1540.0	176.1	-	-	198.6	-	-
12'	180.0	-	22.5	-		22.0	5.5
13	1053.0	142.1	-	-	142	20.4	0
14	1008.0	136.1	-	-	136.1	20.1	0
15	963.0	130.0	-	-	130.0	19.8	0
16	873.0	117.8	-	-	118.1	-	-
16'	4.5	-	-	0.3		19.6	0
17	720.0	97.2	-	-	102.9	-	-
17'	72.0	-	-	5.7		9.4	0
18	585.0	78.9	-	-	84.6	-	-
18'	117.0	-	-	8.5		19.3	0
19	405.0	54.7	-	-	82.2	-	-
19'	180.0	-	-	13.1		19.2	0
20	252.0	34.0	-	-	84	-	-
20'	198.0	-	-	14.4		9.1	0
21	90.0	12.2	-	-	26.6	-	-
21'	216.0	-	-	15.7		19.1	0
22'	90.0	-	-	7.2	7.2	11.7	0
23'	27.0	-	-	2.0	2.0	11.7	0

(UL-UR)

ABS

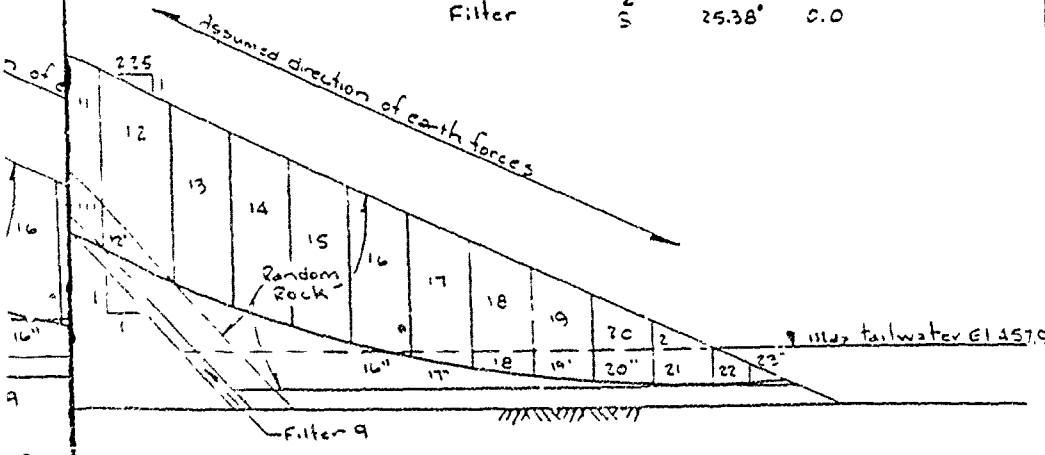
CES

S

force on left side of slice
force on right side of slice
uplift force normal to base
weight and hydrostatic force

DEVELOPED SHEAR STRENGTHS FOR F.S. = 1.37

material	shear strength	ϕ_D	C_D
Random Rock	S	25.38°	0.0
Impervious	$\frac{R+S}{2}$	15.5°	0.073
Rand. & Trans	S	22.86°	0.0
	$\frac{R+S}{2}$	17.14°	0.219
Filter	S	25.38°	0.0



SAFETY FACTOR SUMMARY

Arc no	Radius (Ft)	Coordinates (Center of Arc) X (Ft)	Y (EL MSL)	Safety Factor
1	201.40	-184.50	649.50	1.69
2	358.83	-237.50	755.00	1.40
3	461.24	-316.50	908.00	1.37
4	493.60	-303.50	947.00	1.43
5	358.53	-260.50	804.00	1.37
6	179.34	-154.50	644.50	1.35
7	295.30	-168.00	897.00	1.32
8	200.93	-235.00	713.00	.93

STREAM SLOPE UNDER CONDITION OF STEADY SEEPAGE

0 30 60

SCALE IN FT

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE IN A DESIGN MEMORANDUM AND WAS REPRODUCED FOR USE IN THIS REPORT

U S ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

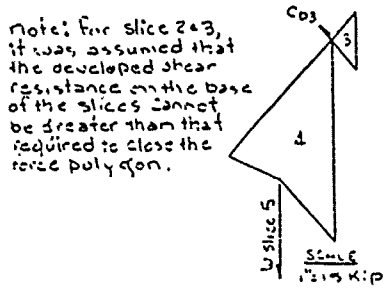
RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

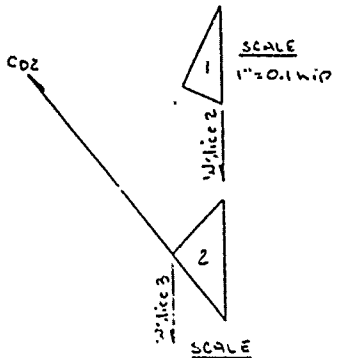
DESIGNED BY K. Leland
DRAWN K. Leland
CHECKED BY R. Cooksey
SUBMITTED Vish. Pl. Chief, SOILS MECH SEC DATE DEC 1977

DIERKS RESERVOIR
EMBANKMENT AND SPILLWAY
STABILITY ANALYSIS
STEADY SEEPAGE

TO ACCOMPANY SUPPLEMENT NO 2
SCALE AS SHOWN
DRAWING NO 1960-DM8-97/16

Note: For slice 2 & 3, it was assumed that the developed shear resistance on the base of the slices cannot be greater than that required to close the force polygon.



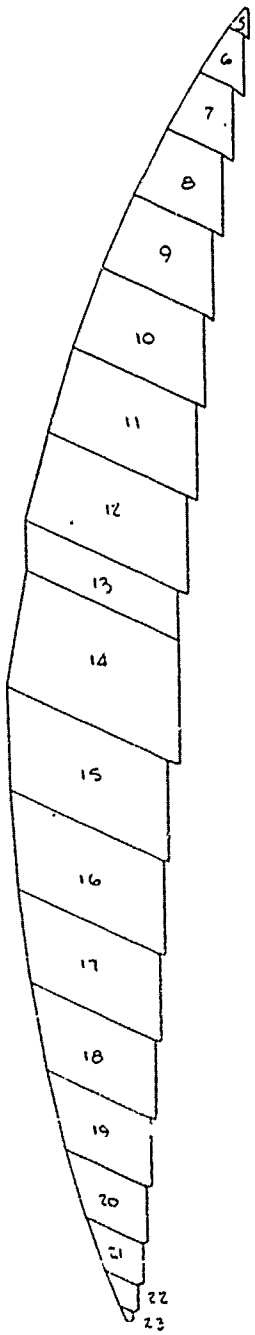


ADOPTED DESIGN DA			
Material	Q Strength		
	$\phi°$	tan ϕ	C (ts
Select Rock	39	.8097	0.0
Random Rock	25	.4663	0.4
Random & Trans.	12	.2125	0.8
Impervious	10	.1763	0.0
Filter	33	.6494	0

*Saturated Surface dry wt. (40%

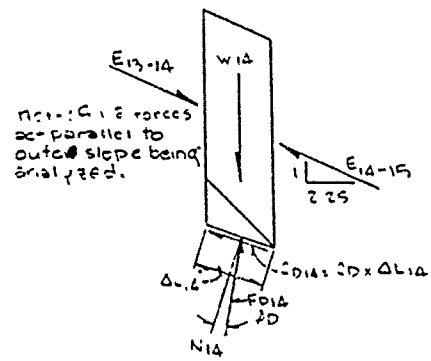
DEVELOPED SHEAR STRENG

material	ϕ	ϕ_D
Select Rock	39°	27.02°
Random Rock	25°	16.37°
Random & Trans.	12°	7.62°
Impervious	10°	6.34°
Filter	33°	22.25°

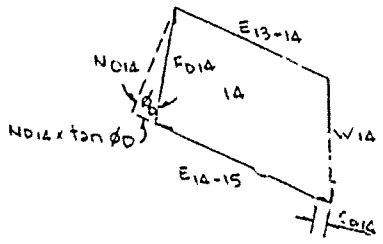


COMPOSITE FORCE POLYGON FOR F.S. = 1.22

SCALE: 1 inch = 150 Kips



SLICE 14 WITH FORCES

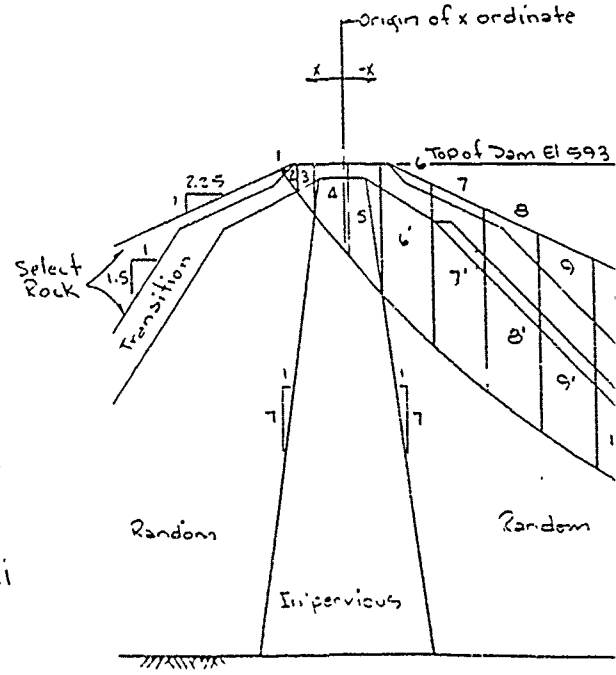


FORCE POLYGON FOR SLICE 14

LEGEND:

W = Weight of slice.
E = Earth force on side of slice.
C_D = Developed cohesion force.
F_D = Resultant of normal and developed friction force.
N = Normal to base of slice.
ΔL = Length across base of slice.
ϕ_D = Developed angle of internal friction of soil

$C_D = \frac{c}{F.S}$ $\quad \phi_D = \arctan \frac{\tan \phi}{F.S}$



STABILITY ANALYSIS OF

CONDITION OF EN

ADOPTED DESIGN DATA				
	Q Strength			unit Wt. (PCF)
	ϕ°	tan ϕ	C (tsf)	Sat. / Sub.
	39	.8097	0.0	135 * / 72.6
	25	.4663	0.4	135 / 72.6
	12	.2125	0.8	125 / 62.5
	10	.1763	0.6	125 / 62.5
	33	.6494	0.0	125 / 62.5

Surface dry wt. (40% voids)

ELOPED SHEAR STRENGTHS FOR F.S.=1.58

ϕ	ϕD	C	CD
39°	27.02°	0	0
25°	16.37°	0.8 psf	.504 ksf
12°	7.62°	1.6 Ksf	1.008 Ksf
10°	6.34°	1.2 Ksf	.756 Ksf
33°	22.25°	0	0

Center of assumed failure arc 170 S (x=-266.5, El.=8060)

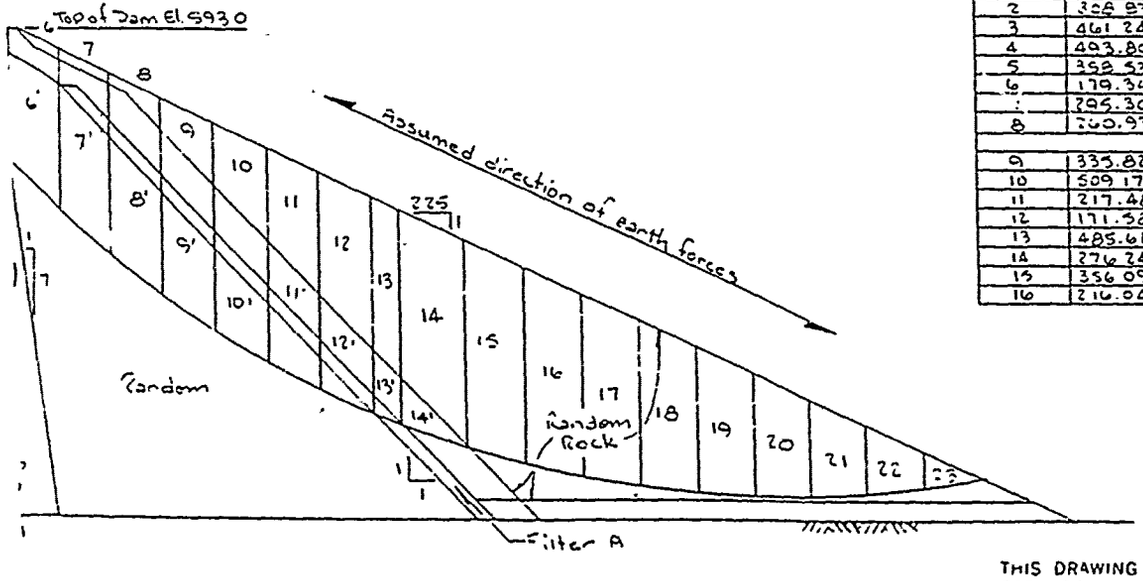
Radius = 358.53'

Slice no.	Area (Ft²)	Weight (Kips) 135 lb. Sat.	Weight (Kips) 125 lb. Sat.	Total Weight (Kips)	Base Length ΔL (Ft.)	(tan ϕ) × ΔL (Kips)
1	2.0	0.1	-	0.1	1.8	-
2	18.0	-	2.3	2.3	6.5	5.6
3	72.0	-	9.0	9.0	9.2	5.3
4	252.0	-	31.5	31.5	16.4	12.0
5	396.0	-	49.5	49.5	16.4	12.4
6	36.0	4.9	-	28.3	22.4	33.6
6'	223.0	-	23.4			
7	54.0	7.3	-	0.4	2.2	2.3
7'	873.0	-	109.1			
8	99.0	13.3	-	125.3	21.3	21.3
8'	922.0		115.0			
9	272.0	36.5	-	55.0	20.5	20.5
9'	828.0	-	103.5			
10	435.0	58.3	-	67.1	19.8	19.8
10'	711.0	-	88.9			
11	556.0	75.3	-	91.8	19.3	19.3
11'	613.0	-	76.5			
12	729.0	98.4	-	83.5	18.8	18.8
12'	661.0	-	55.1			
13	422.0	60.8	-	77.4	0.5	0
13'	135.0	-	16.8			
14	1287.0	173.7	-	32.5	22.0	22.0
15	117.0	15.9	-	57.9	6.1	0.6
16	1098.0	148.2	-	152.7	12.9	5.5
17	1008.0	136.1	-	36.1	18.7	6.4
18	900.0	121.5	-	121.5	16.61	6.4
19	774.0	104.5	-	104.5	6.5	3.3
20	639.0	86.2	-	86.2	18.5	0.3
21	477.0	64.4	-	64.4	16.5	3.3
22	297.0	40.1	-	40.1	18.5	0.3
23	99.0	13.4	-	13.4	18.7	9.4

SAFETY FACTOR SUMMARY

Arc no.	Radius (Ft.)	Coordinates (Center of Arc) X (Ft.)	Y (El. MSL)	Safety Factor
DOWNSTREAM				
1	761.40	-184.50	649.00	1.90
2	308.93	-237.50	755.50	1.60
3	461.24	-316.50	1908.00	1.61
4	493.80	-343.50	942.00	1.72
5	358.53	-266.50	806.00	1.58
6	179.34	-154.50	604.50	2.01
7	295.30	-188.00	797.00	1.92
8	760.93	-235.00	713.00	1.72
UPSTREAM				
9	335.82	262.00	777.00	1.71
10	509.17	348.50	951.00	1.76
11	217.48	186.50	658.50	2.02
12	171.52	154.00	635.00	2.21
13	485.61	311.00	947.50	1.83
14	276.24	252.00	721.00	1.60
15	356.09	238.50	831.00	1.83
16	216.04	181.00	704.50	2.03

Origin of x ordinate



ANALYSIS OF DOWNSTREAM SLOPE UNDER ITION OF END OF CONSTRUCTION

30 0 30 60

SCALE IN FT

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE IN A DESIGN MEMORANDUM AND WAS REPRODUCED FOR USE IN THIS REPORT

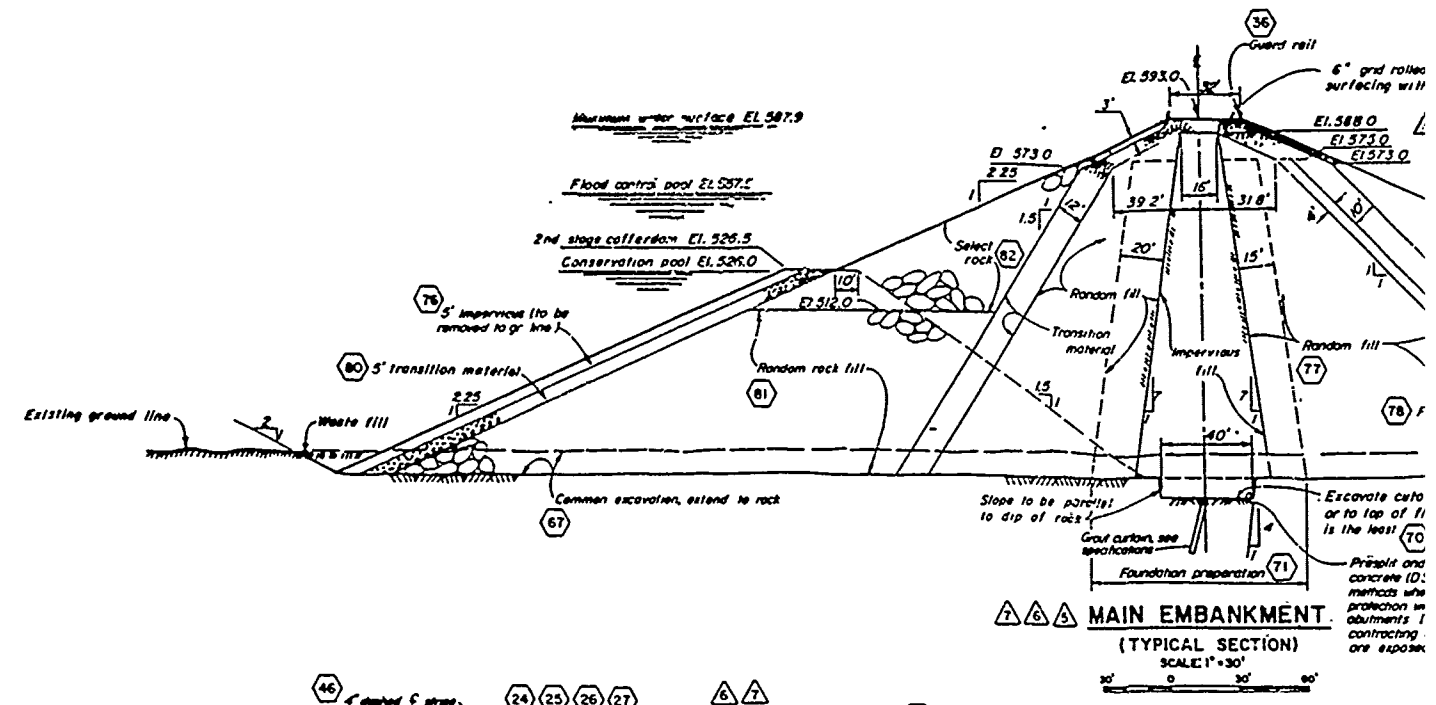
U.S ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

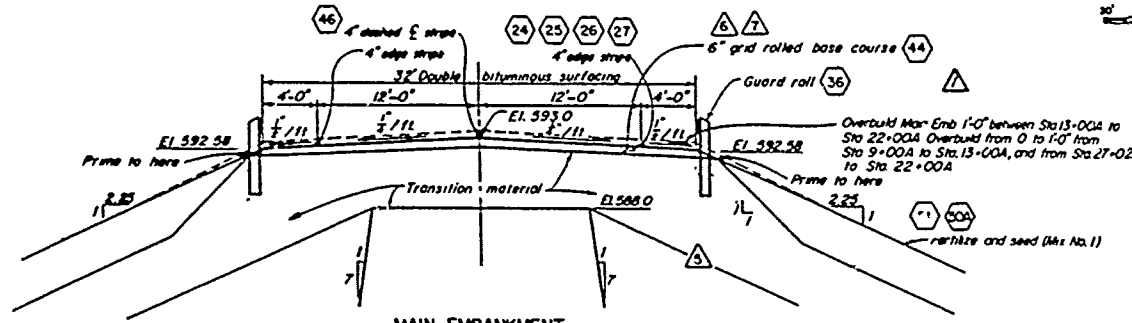
DESIGNED BY K. Ruland
DRAWN BY K. Ruland
CHECKED BY L. Barker
SUBMITTED [illegible] CHIEF, SOILS MECH SEC
DATE DEC. 1972

DIERKS RESERVOIR
EMBANKMENT AND SPILLWAY
STABILITY ANALYSIS
END OF CONSTRUCTION

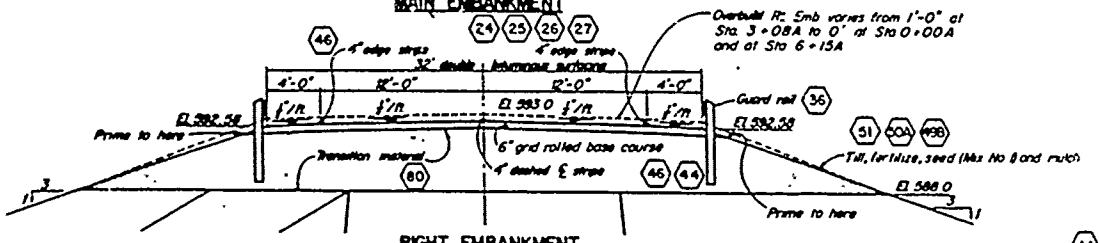
SCALE AS SHOWN — TO ACCOMPANY SUPPLEMENT NO 2
DRAWING NO 1960-DM8-97/17



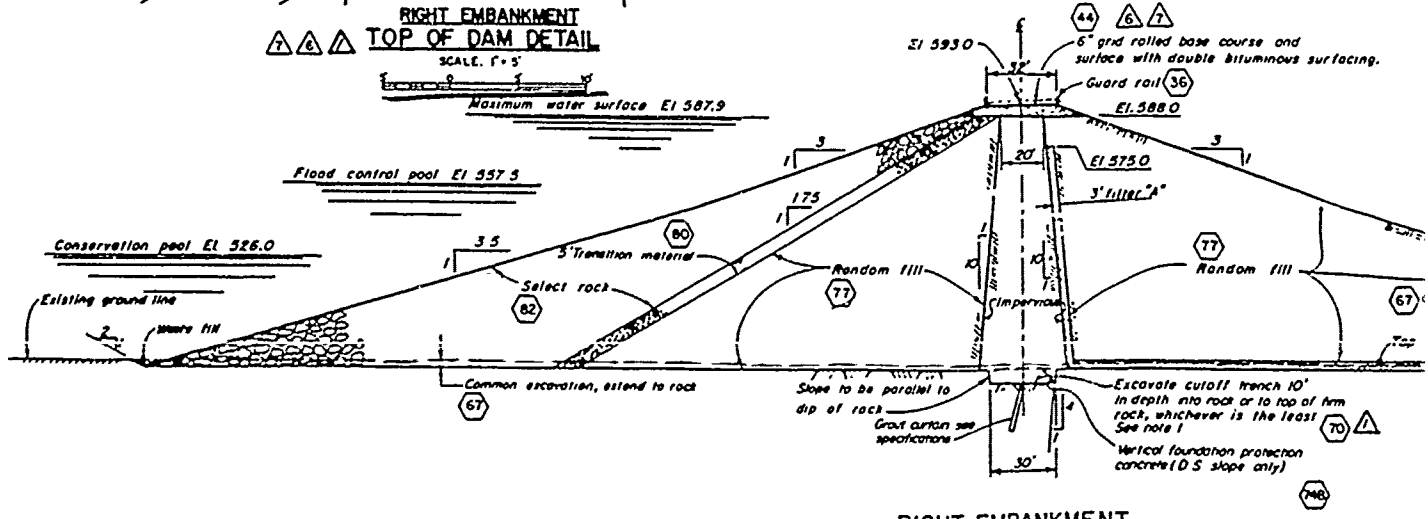
MAIN EMBANKMENT
(TYPICAL SECTION)
SCALE: 1" = 30'



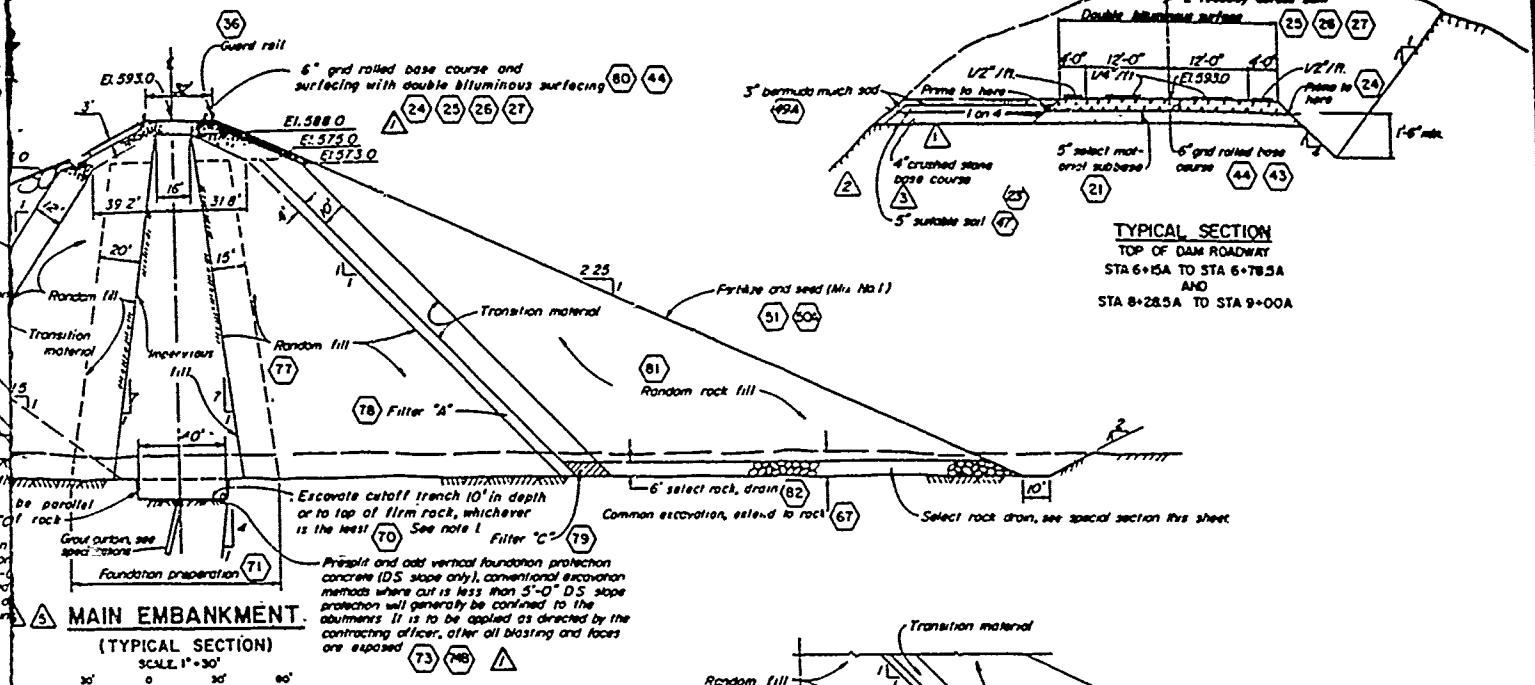
MAIN EMBANKMENT



RIGHT EMBANKMENT
TOP OF DAM DETAIL
SCALE: 1" = 5'



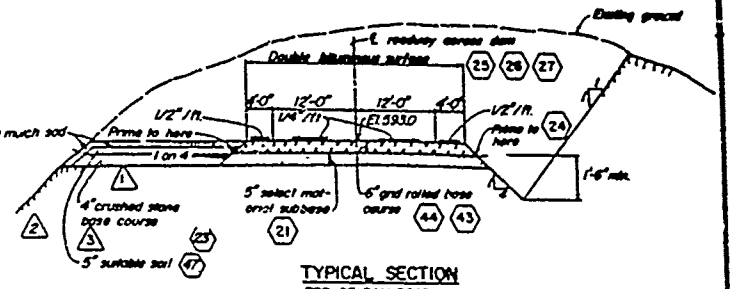
RIGHT EMBANKMENT
SCALE: 1" = 30'



MAIN EMBANKMENT.

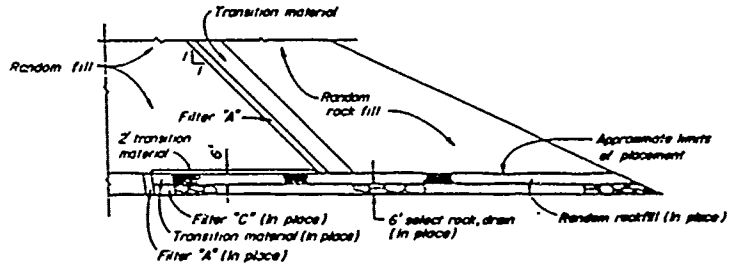
(TYPICAL SECTION)

SCALE 1" = 30'



TYPICAL SECTION

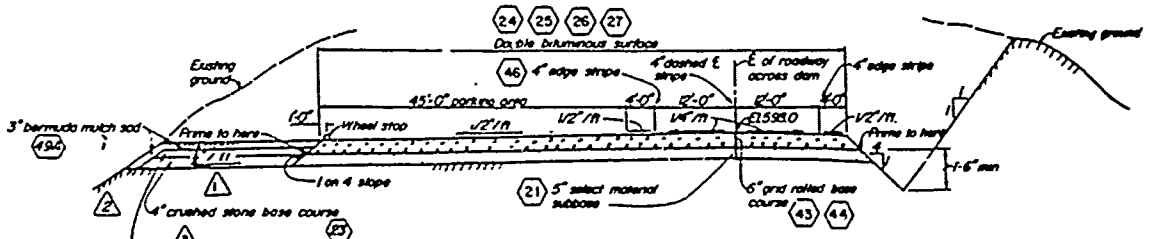
TOP OF DAM ROADWAY
STA 6+15A TO STA 6+78.5A
AND
STA 8+28.5A TO STA 9+00A



SPECIAL SECTION

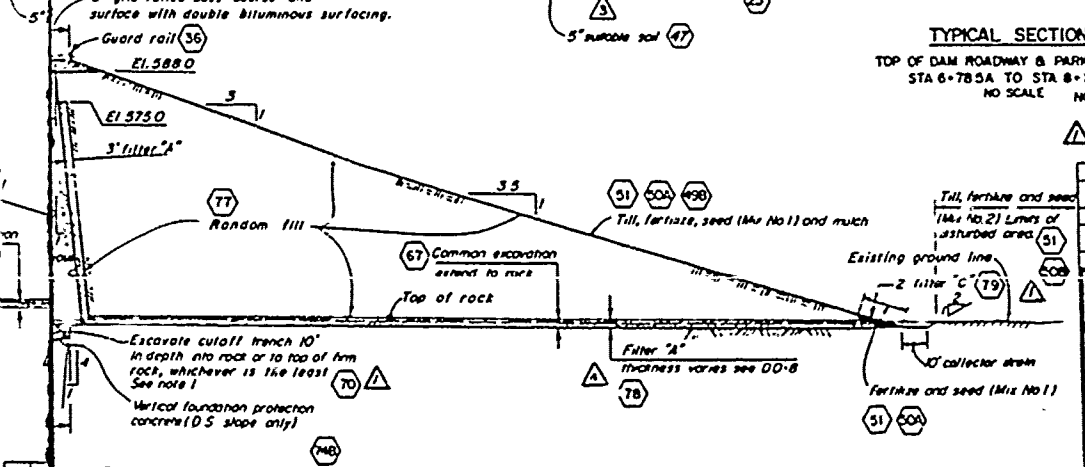
CONSTRUCT EMBANKMENT TO THIS SECTION ONLY IN AREA WHERE SELECT ROCK DRAIN IS IN PLACE

NO SCALE



TYPICAL SECTION

TOP OF DAM ROADWAY & PARKING AREA
STA 6+78.5A TO STA 8+28.5A
NO SCALE



NOTE

1 Excavate cut-off trench approx. 10' in depth into rock or to top of firm rock which ever is the least Final depth of cut-off trench will be determined by the Contracting Officer, after the foundation is exposed

REV	DATE	CHANGE	REVISION (INDICATED BY Δ)	APPR.
4	15-4-71	DD-8	Limits of filter "A" & filter "C" revised	
3	30-3-70	Gr (81)	Delete 50% density on base course	
2	22-5-70	Am. DD08	Added material upstream of top of dam roadway	
1	4-5-70	Am. DD08	Deleted bermuda mulch seal Notes and typical plans added	

U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — WALNUT RIVER, ARKANSAS

DESIGNED BY: Joseph L. Wilson
DRAWN BY: Thomas L. Briggs
CHECKED BY: J. F. Harris

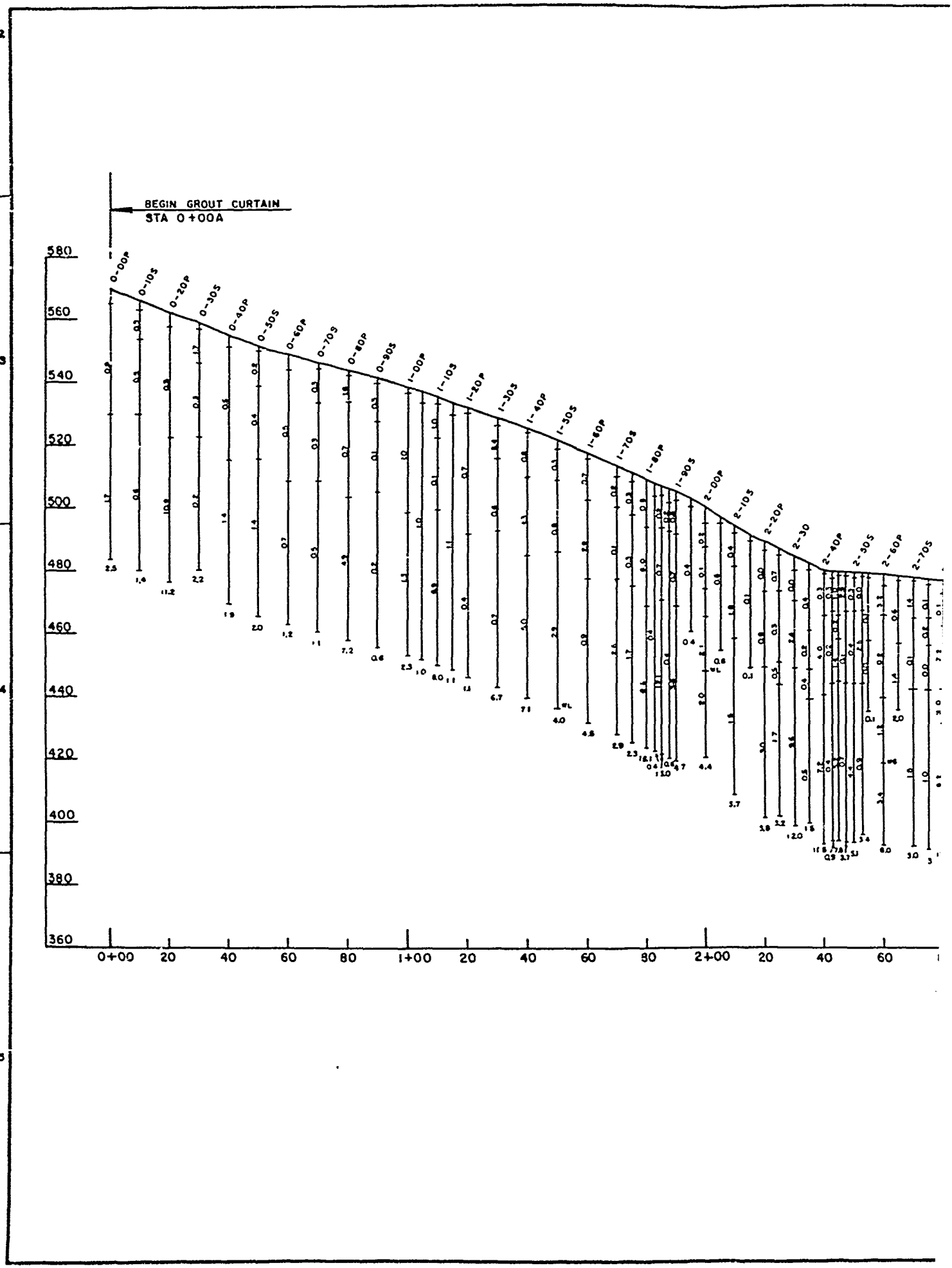
DIERKS DAM
EMB., OUTLET WORKS, SPILLWAY & ACCESS ROAD
EMBANKMENT
TYPICAL SECTIONS

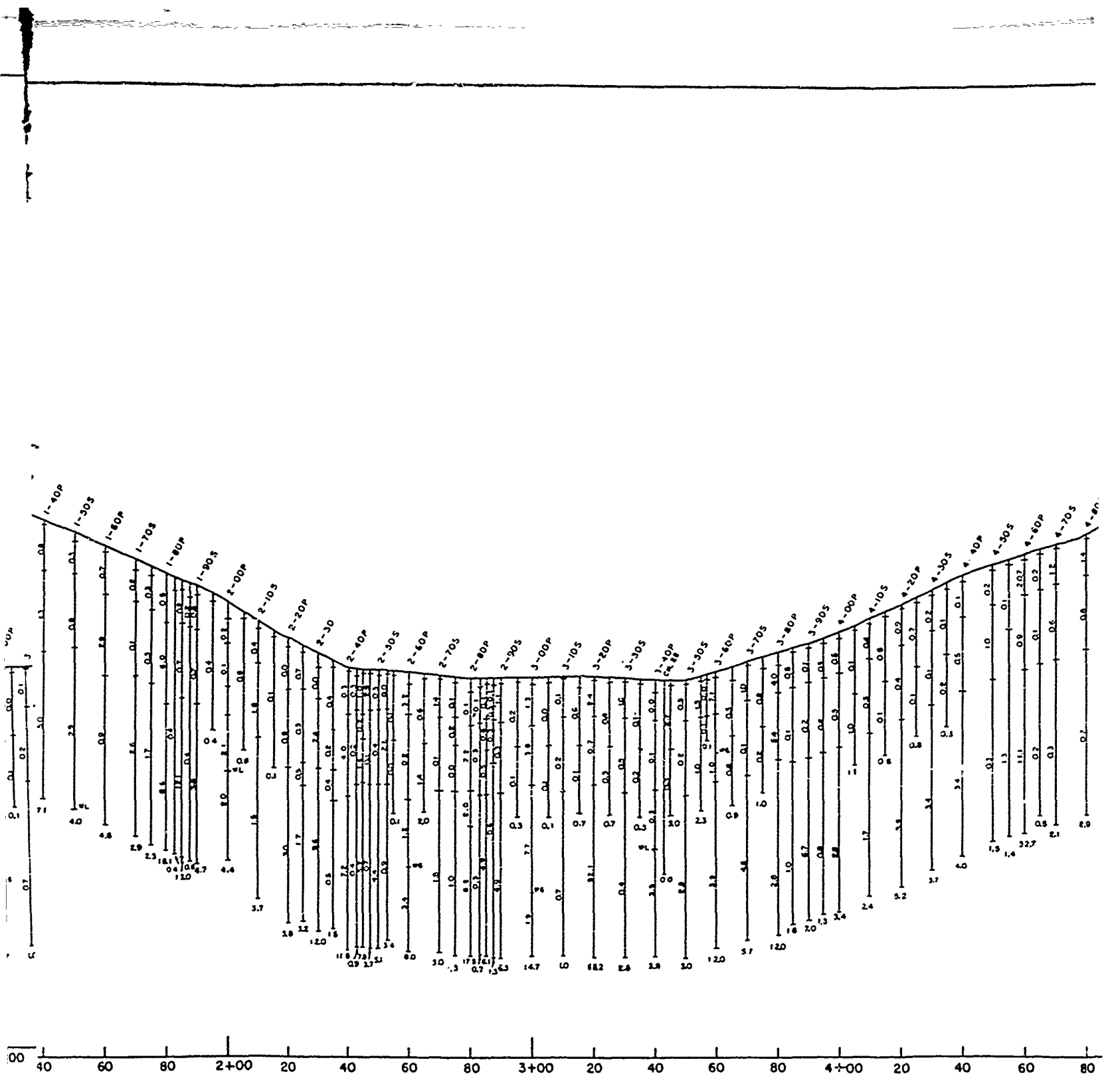
SUBMITTED: Joseph L. Wilson
DATE OF DSGN. DEC. 1968

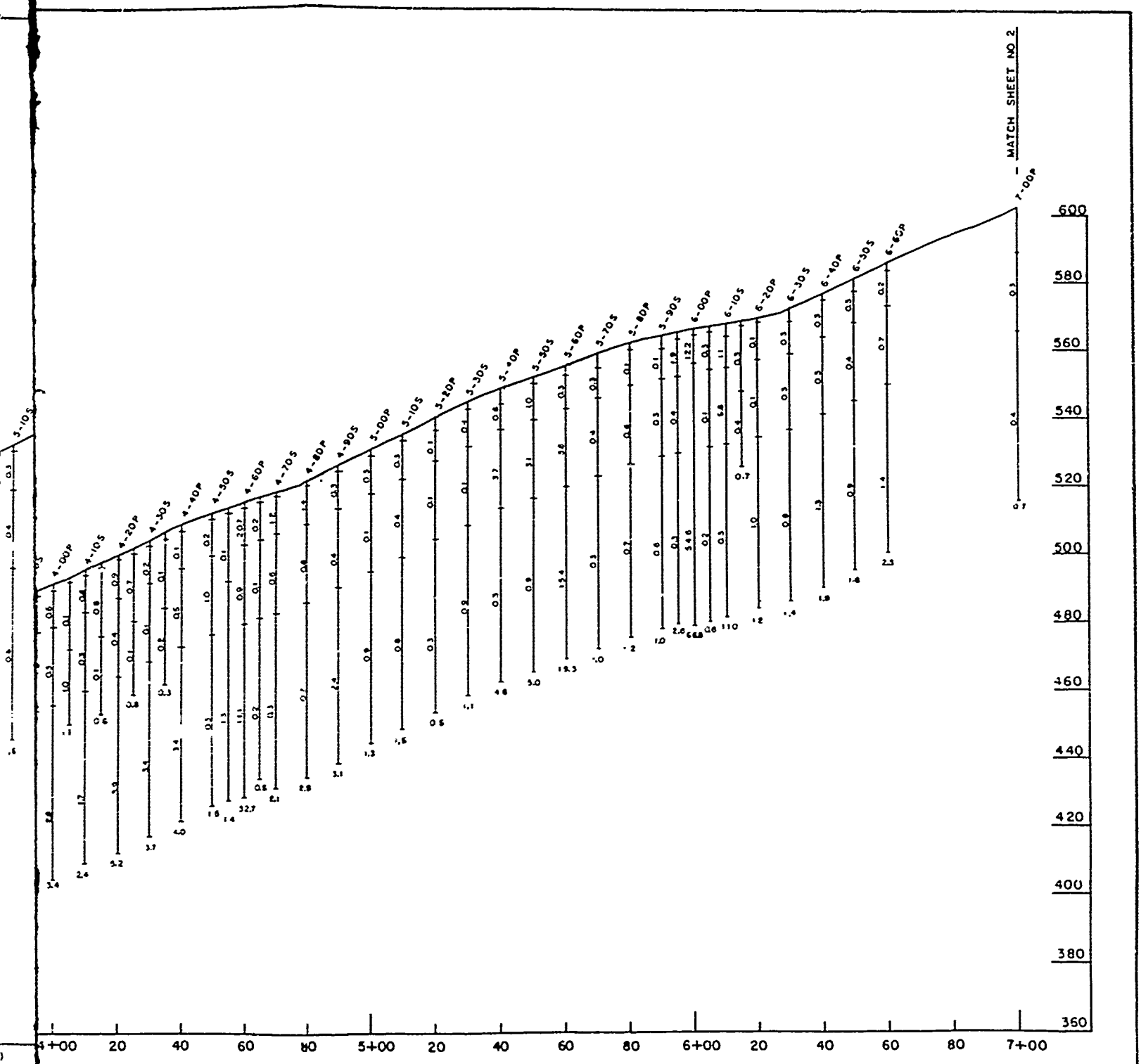
SCALE: AS SHOWN

PLATE NO. 3

7	25-8-72	DD-18	Typical section of main embankment revised and add Supl #1 control for foundation preparation	J.W.
6	4-6-72	DD-18	Typical section of main embankment revised	
5	11-1-71	DD-18	Typical section of main embankment revised	


BEGIN GROUT CURTAIN
STA 0+00A
580
560
540
520
500
480
460
440
420
400
380
360
0+00
20
40
60
80
1+00
20
40
60
80
2+00
20
40
60
0-00P
0-10S
0-20P
0-30S
0-40P
0-50S
0-60P
0-70S
0-80P
0-90S
1-00P
1-10S
1-20P
1-30S
1-40P
1-50S
1-60P
1-70S
1-80P
1-90S
2-00P
2-10S
2-20P
2-30
2-40P
2-50S
2-60P
2-70S


1-40P
1-30S
1-60P
1-70S
1-80P
1-90S
2-00P
2-10S
2-20P
2-30
2-40P
2-30S
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2-80P
2-90S
3-00P
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3-20P
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3-70S
3-80P
3-90S
4-00P
4-10S
4-20P
4-30S
4-40P
4-50S
4-60P
4-70S
00
40
60
80
2+00
20
40
60
80
3+00
20
40
60
80
4+00
20
40
60
80



LEGEND

- GROUT HOLE
- PACKER SETS
- GROUT TAKES (SACKS)
- TOTAL TAKE

WL WATER LOSS
WO WATER GAIN

DEPARTMENT OF THE ARMY
TULSA DISTRICT CORPS OF ENGINEERS
TULSA, OKLAHOMA

DESIGNED BY: Pete W. Winston
DRAWN BY: Ed Chapman
CHECKED BY: Jack Hawking

RED RIVER WATERSHED — SALINE RIVER, ARK

DIERKS DAM FOUNDATION REPORT

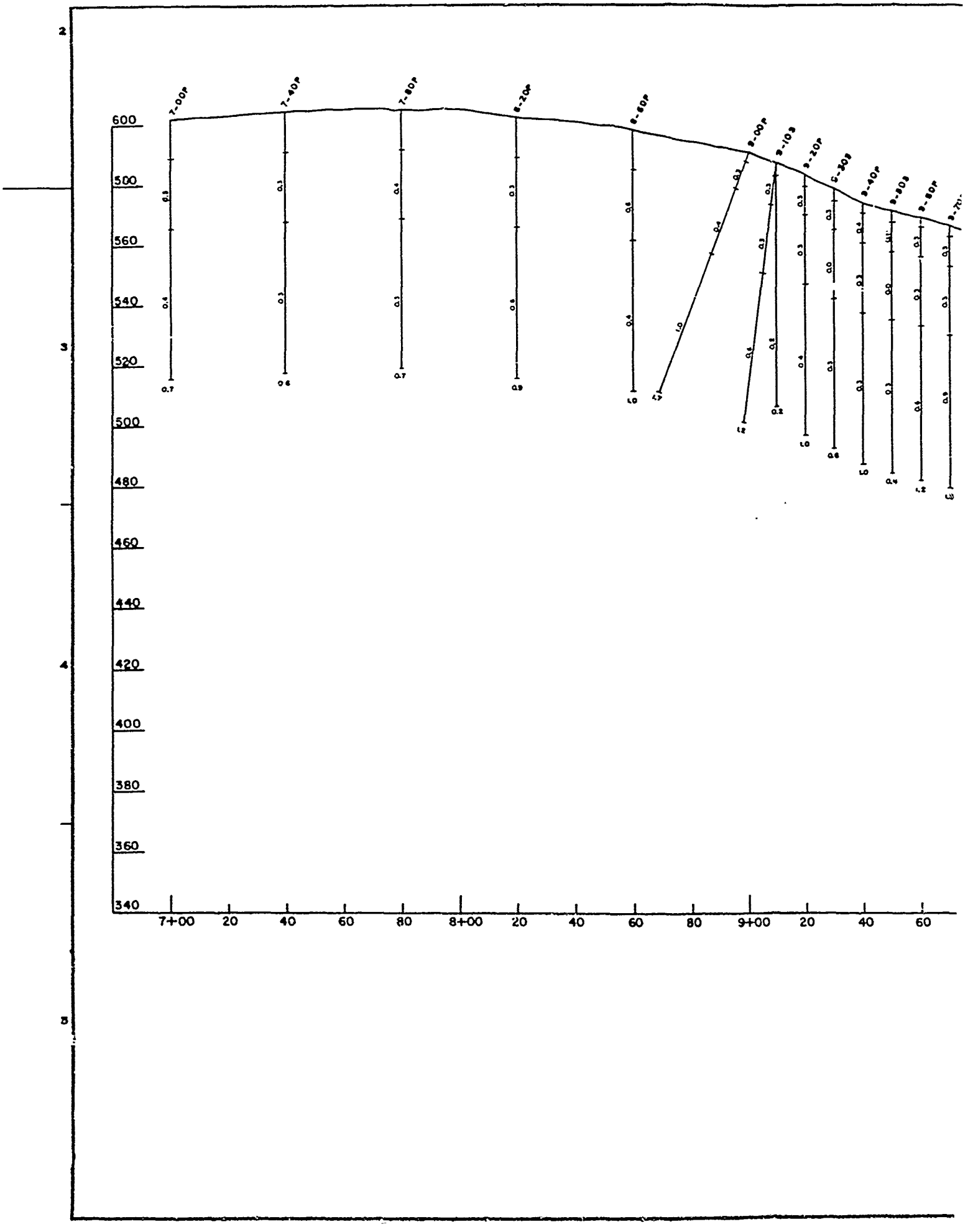
PART I FOUNDATION EMB. GROUTING

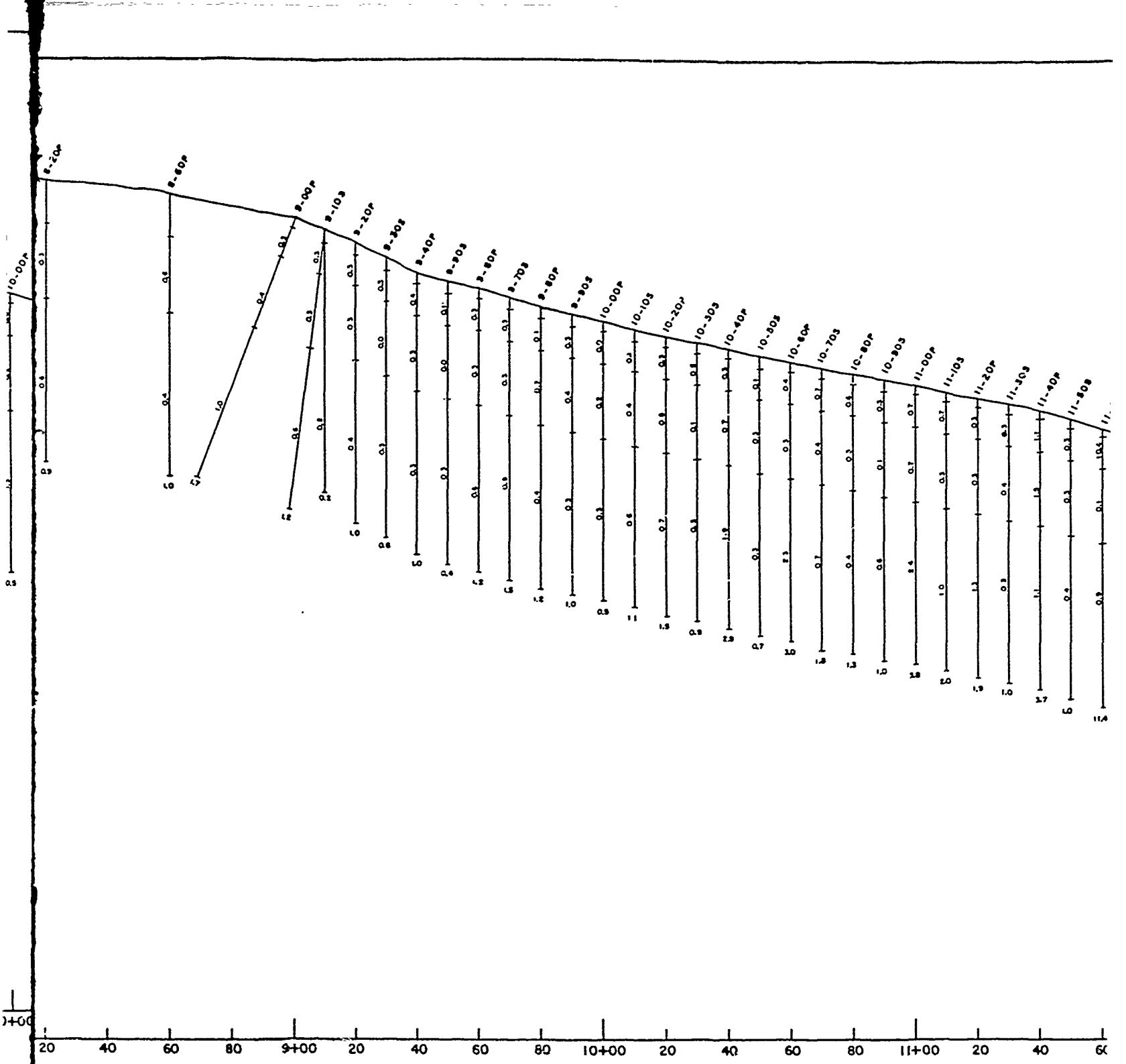
GROUTING PROFILE STA. 0+00 TO 7+00

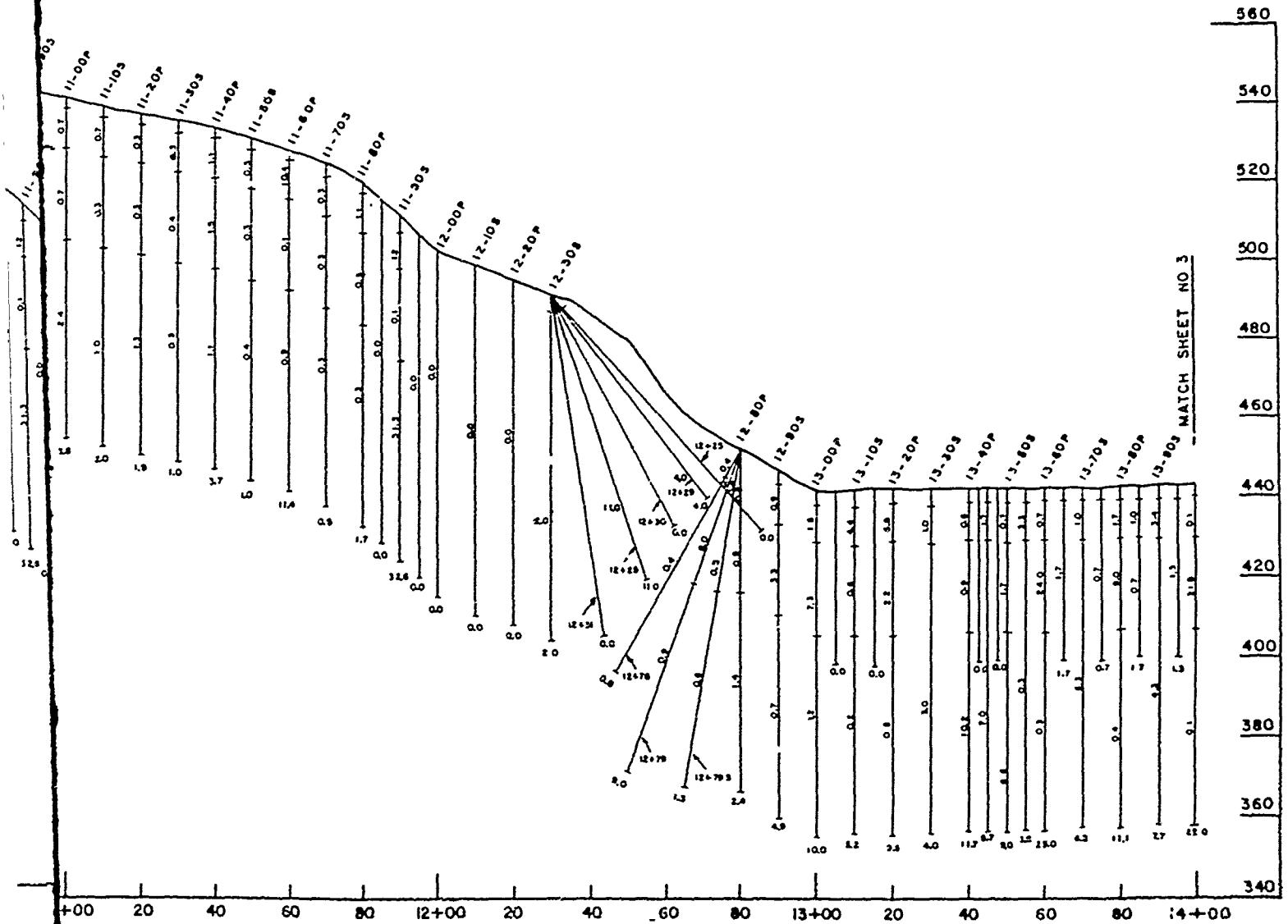
SUBMITTED: _____ GEOLOGIST DATE: 5 Dec 1972

APPROVED: _____ RESIDENT ENG DATE

EMBANKMENT CRITERIA AND PERFORMANCE REPORT - PLATE NO. 39


600
500
560
540
520
500
480
460
440
420
400
380
360
340
7+00
20
40
60
80
8+00
20
40
60
80
9+00
20
40
60


9-50P
9-60P
9-00P
9-10S
9-20P
9-30S
9-40P
9-50S
9-60P
9-70S
9-80P
9-90S
10-00P
10-10S
10-20P
10-30S
10-40P
10-50S
10-60P
10-70S
10-80P
10-90S
11-00P
11-10S
11-20P
11-30S
11-40P
11-50S
20
40
60
80
9+00
20
40
60
80
10+00
20
40
60
80
11+00
20
40
60



DEPARTMENT OF THE ARMY
TULSA DISTRICT CORPS OF ENGINEERS
TULSA, OKLAHOMA

DESIGNED BY: Pete Williamson

DRAWN BY: Ed Chapman

CHECKED BY: Jack Harding

RED RIVER WATERSHED — SALINE RIVER, ARK.

DIERKS DAM FOUNDATION REPORT

PART I FOUNDATION EMB. GROUTING

GROUTING PROFILE STA. 7+00 TO 14+00

SUBMITTED:

GEOLOGIST

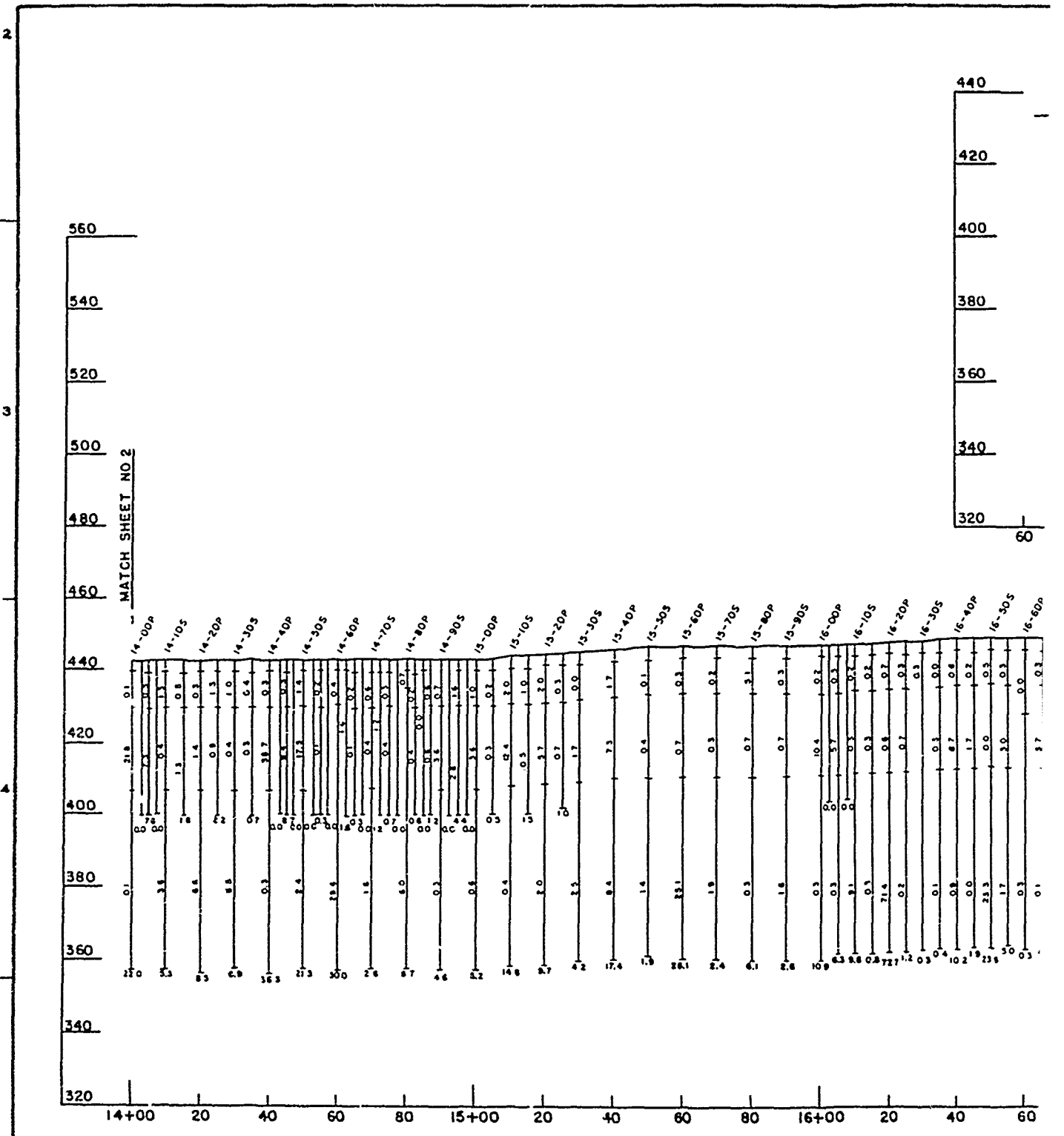
DATE: 5 Dec 1973

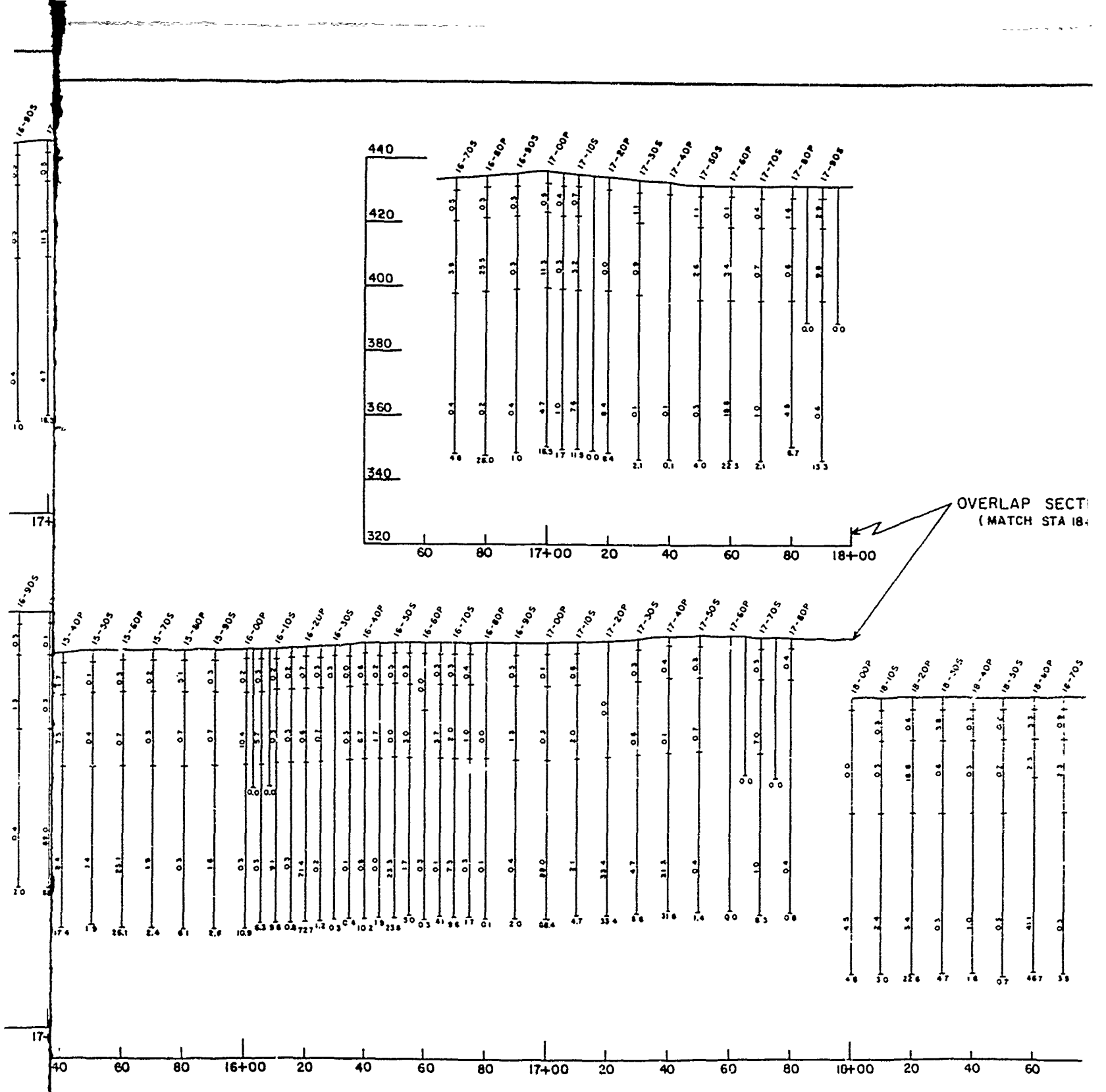
APPROVED

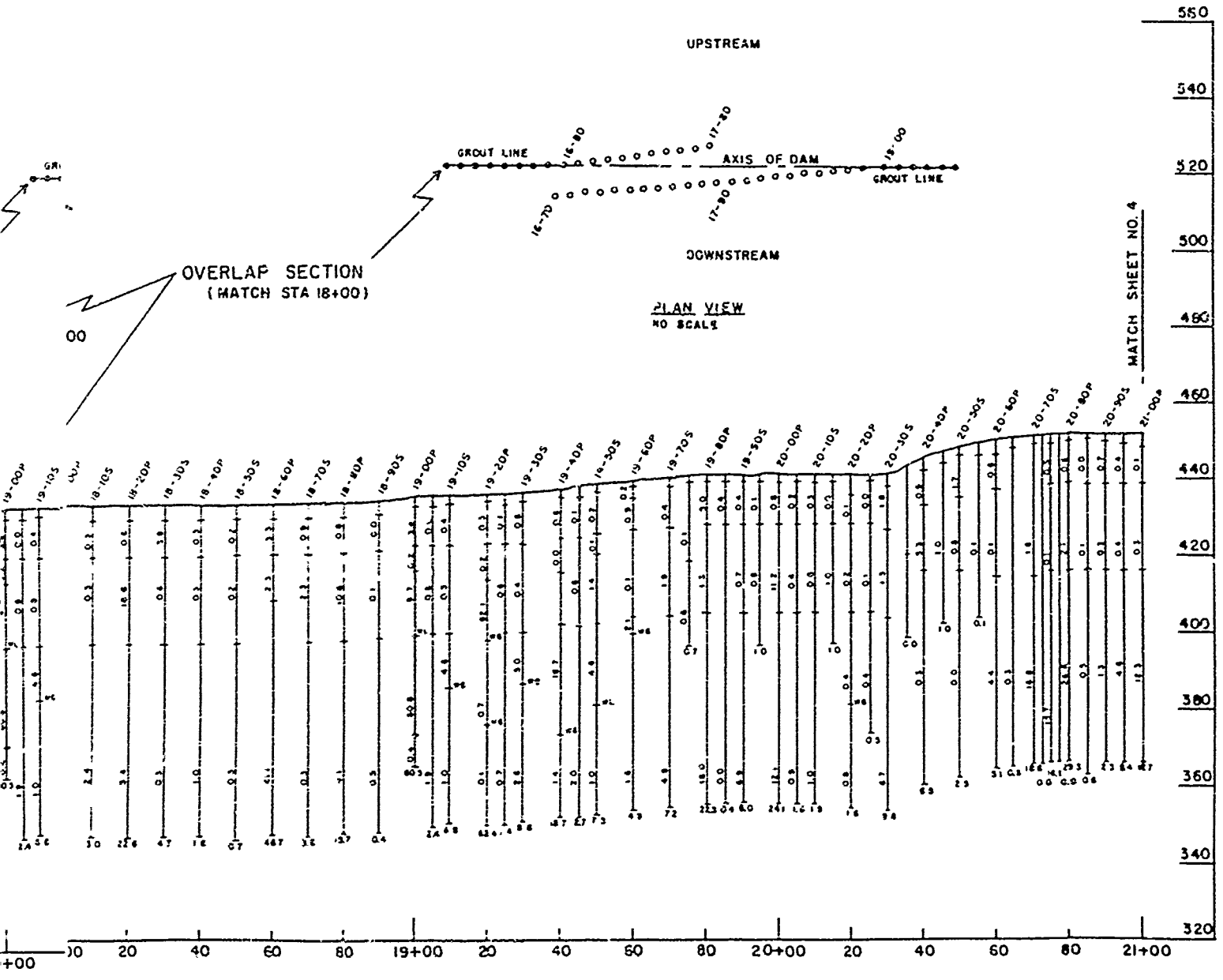
RESIDENT ENG

DATE

EMBANKMENT CRITERIA AND PERFORMANCE REPORT - PLATE NO. 40


MATCH SHEET NO 2
560
540
520
500
480
460
440
420
400
380
360
340
320
14+00
20
40
60
80
15+00
20
40
60
80
16+00
20
40
60
440
420
400
380
360
340
320
60


440
420
400
380
360
340
320
60
80
17+00
20
40
60
80
18+00
OVERLAP SECT
(MATCH STA 18+
16+00
20
40
60
80
17+00
20
40
60
80
18+00
20
40
60



DEPARTMENT OF THE ARMY
TULSA DISTRICT CORPS OF ENGINEERS
TULSA, OKLAHOMA

DESIGNED BY: Pete Williamson

DRAWN BY: James Williamson

CHECKED BY: Jack Hardaway

RED RIVER WATERSHED — SALINE RIVER, ARK

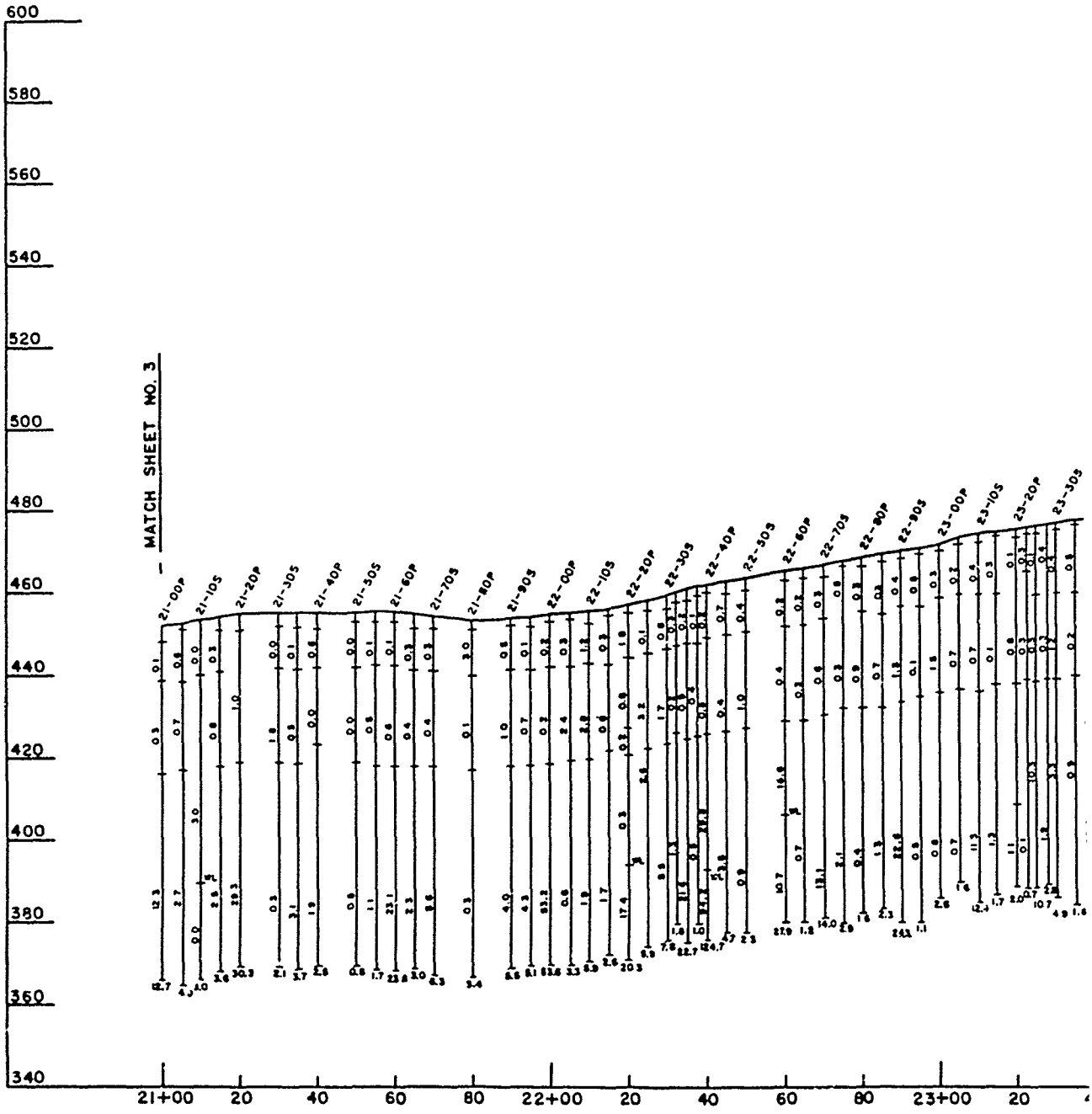
DIERKS DAM FOUNDATION REPORT

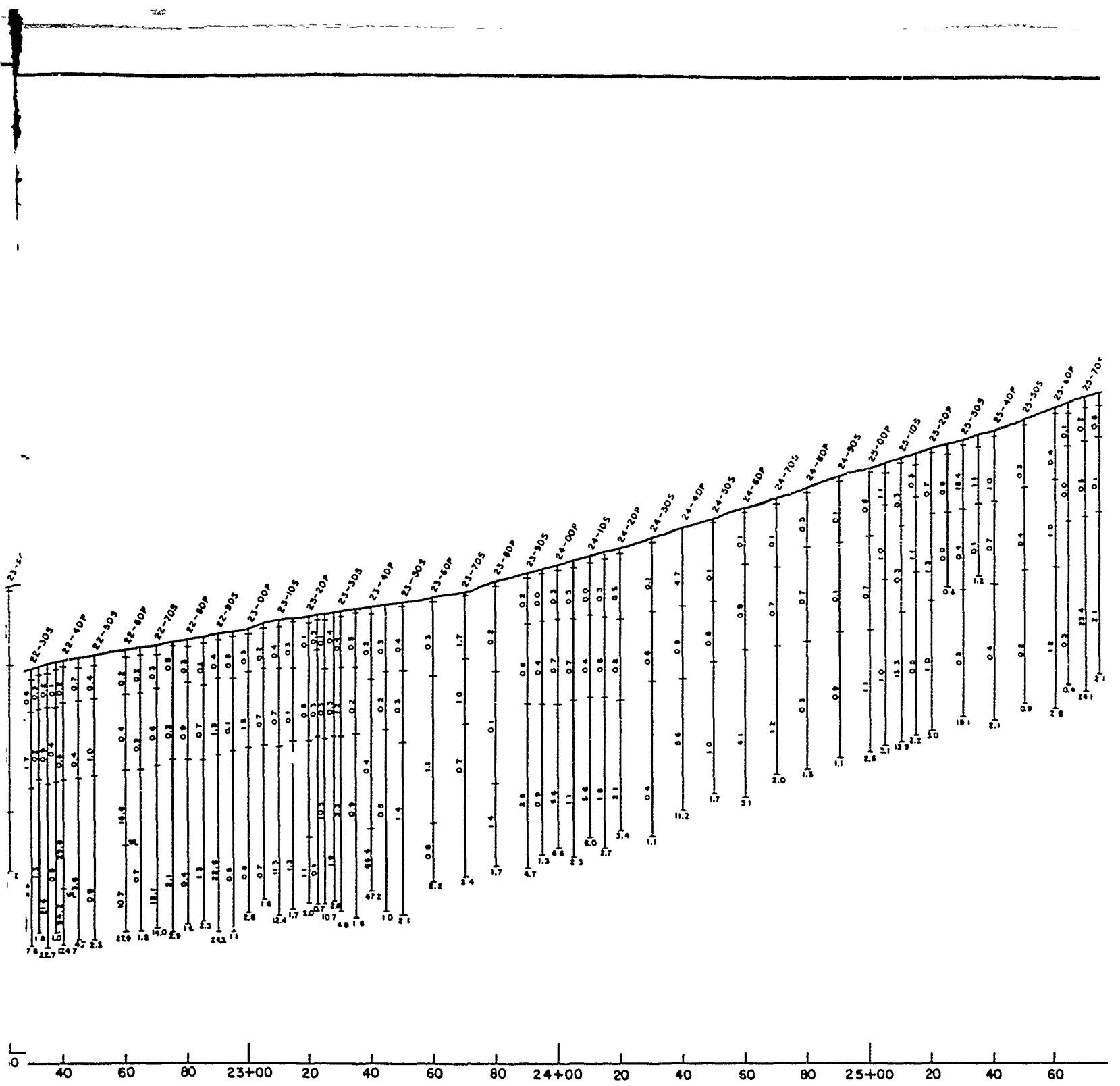
PART I FOUNDATION EMB. GROUTING

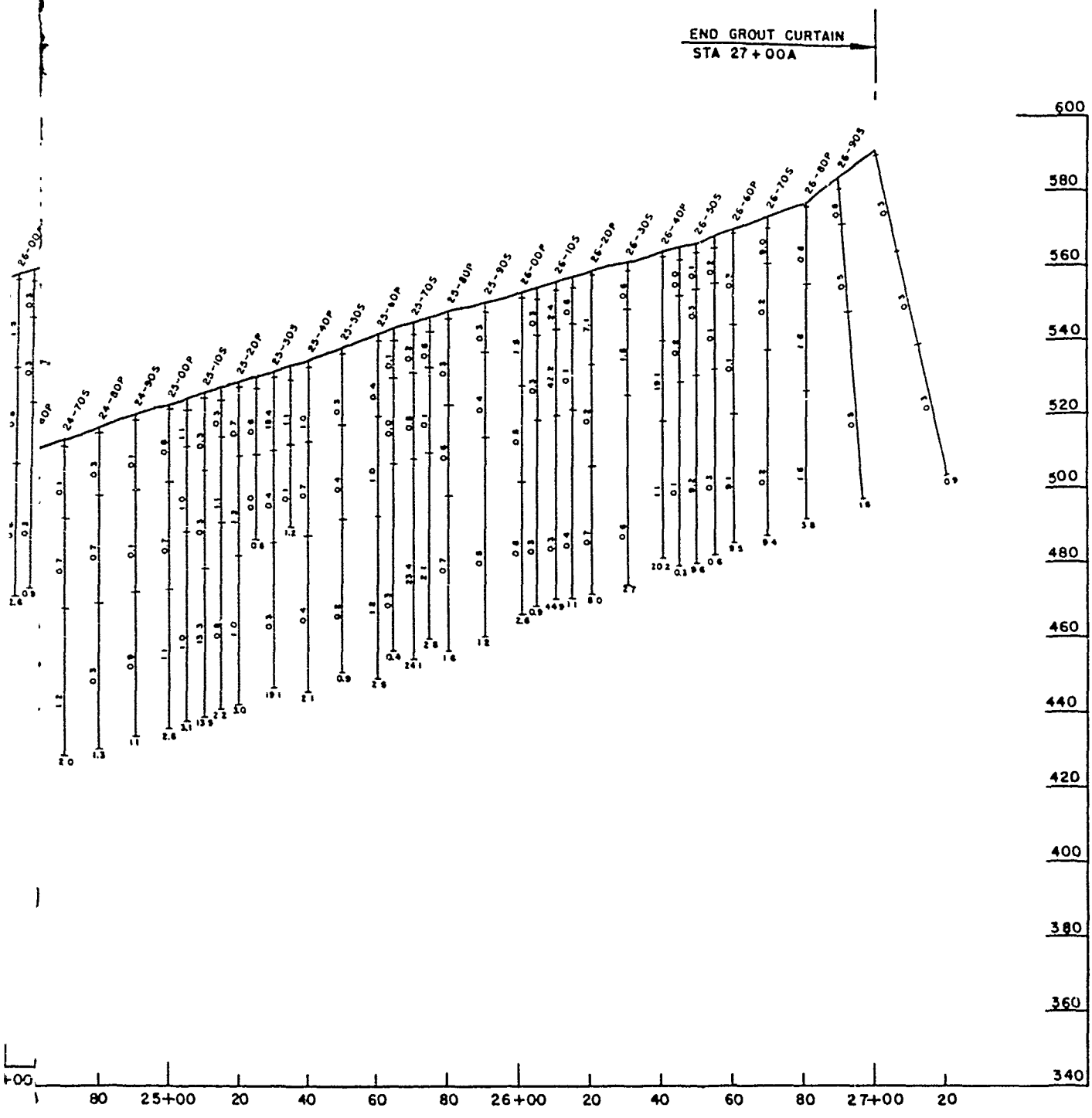
GROUTING PROFILE STA 14+00 TO 21+00

SUBMITTED: GEOLOGIST — DATE: 5 Dec 1973

APPROVED: RESIDENT ENG — DATE


600
580
560
540
520
500
480
460
440
420
400
380
360
340
MATCH SHEET NO. 3
21-00P
21-10S
21-20P
21-30S
21-40P
21-50S
21-60P
21-70S
21-80P
21-90S
22-00P
22-10S
22-20P
22-30S
22-40P
22-50S
22-60P
22-70S
22-80P
22-90S
23-00P
23-10S
23-20P
23-30S
21+00
20
40
60
80
22+00
20
40
60
80
23+00
20


22-30S
22-40P
22-50S
22-60P
22-70S
22-80P
22-90S
23-00P
23-10S
23-20P
23-30S
23-40P
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23-70S
23-80P
23-90S
24-00P
24-10S
24-20P
24-30S
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24-50S
24-60P
24-70S
24-80P
24-90S
25-00P
25-10S
25-20P
25-30S
25-40P
25-50S
25-60P
25-70S
40
60
80
23+00
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60
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24+00
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40
60
80
25+00
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40
60



DEPARTMENT OF THE ARMY
TULSA DISTRICT CORPS OF ENGINEERS
TULSA, OKLAHOMA

DESIGNED BY: James Williamson
DRAWN BY: Pete Williamson
CHECKED BY: Jack Harding

RED RIVER WATERSHED — SALINE RIVER, ARK

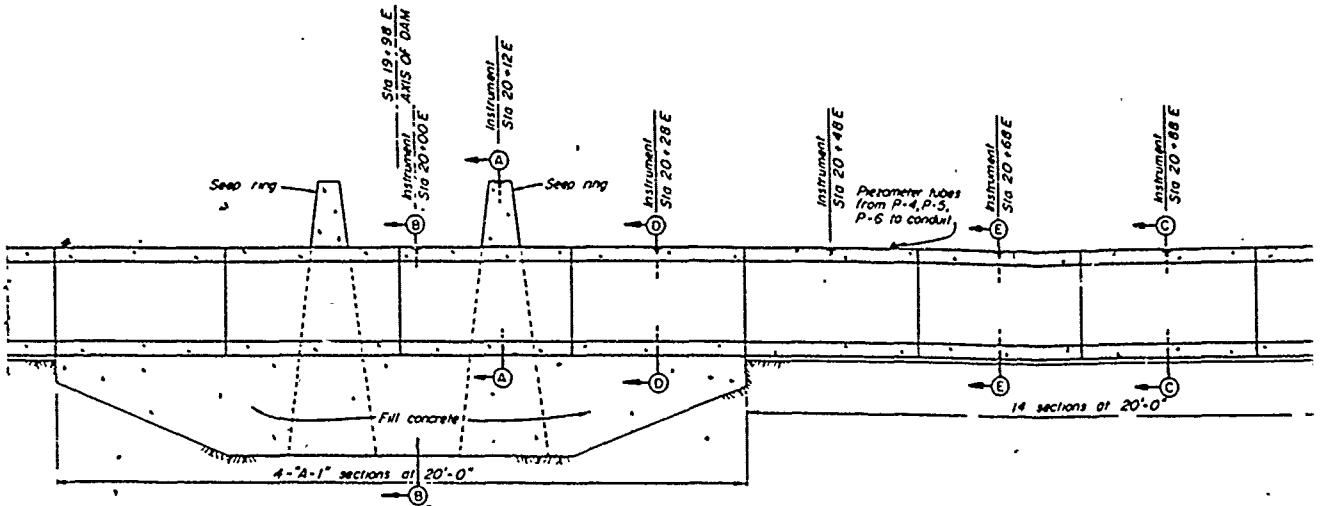
DIERKS DAM FOUNDATION REPORT

PART I FOUNDATION EMB. GROUTING

GROUTING PROFILE STA. 21+00 TO 27+00

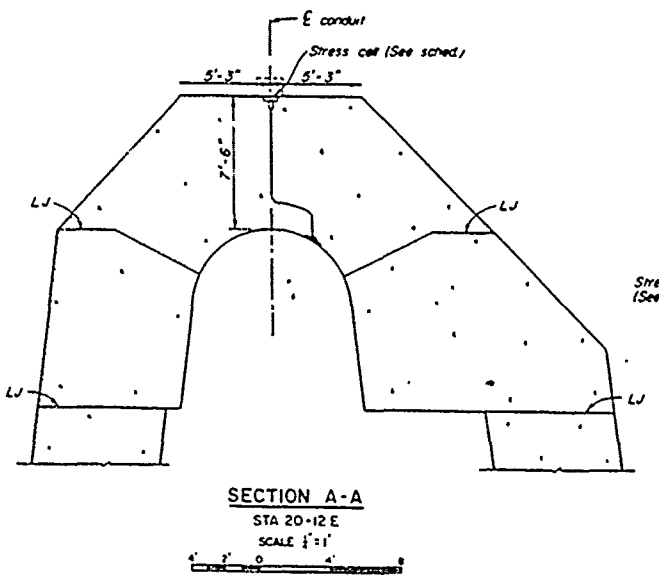
SUBMITTED: GEOLOGIST — DATE: 5 Dec, 1973

APPROVED: RESIDENT ENG. — DATE



SECTION ALONG ℄ OF CONDUIT

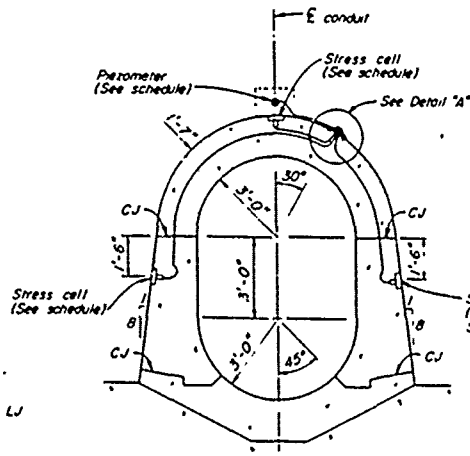
SCALE 1" = 1'



SECTION A-A

STA 20+12 E

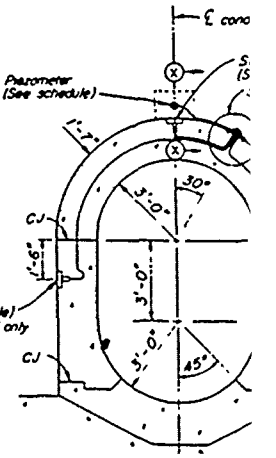
SCALE 1" = 1'



SECTION D-D

TYPICAL STATION 20+28E

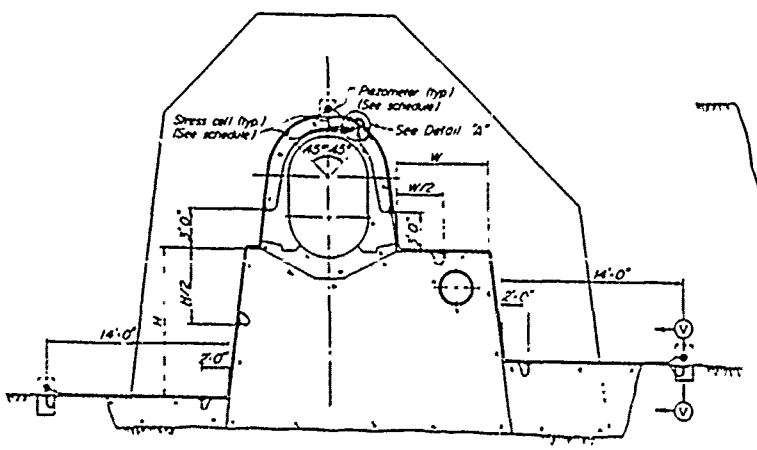
SCALE 1" = 1'



SECTION C-C

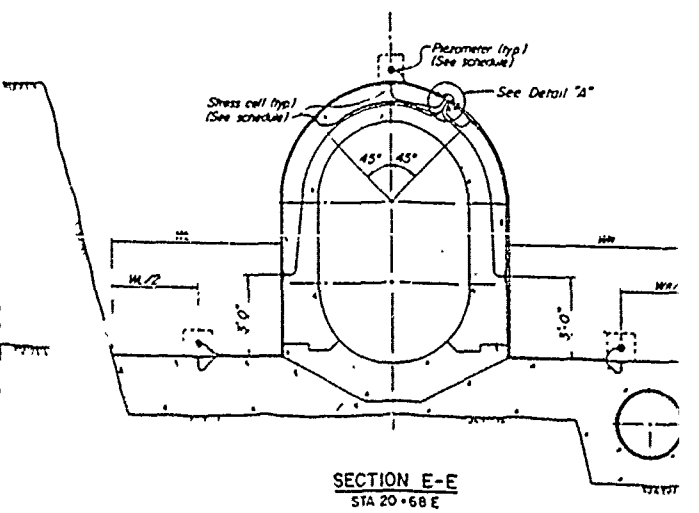
TYPICAL STATIONS 20+48E AND

SCALE 1" = 1'



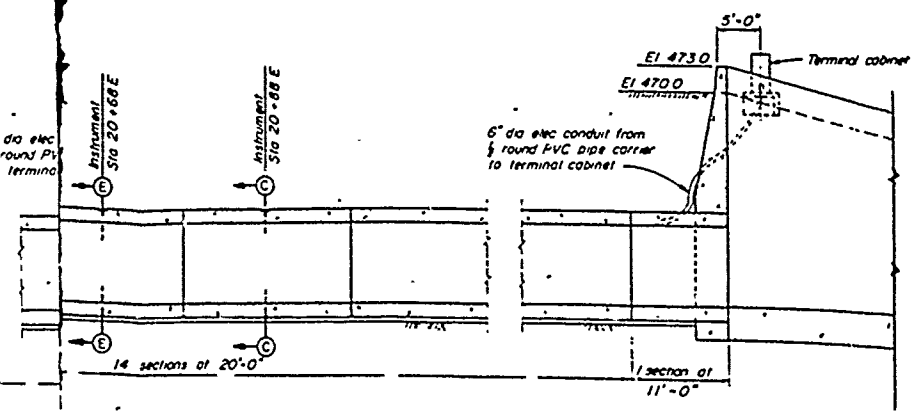
SECTION B-B

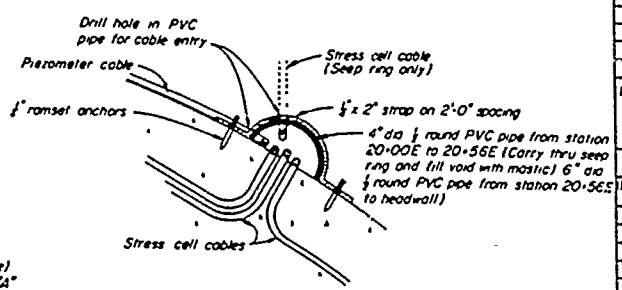
STA 20+00E



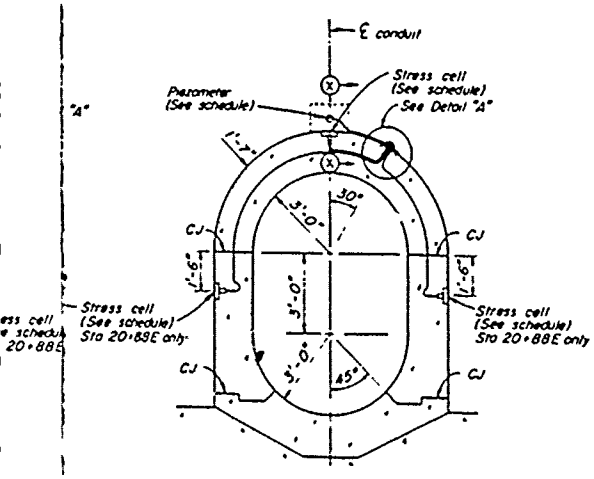
SECTION E-E

STA 20+68 E

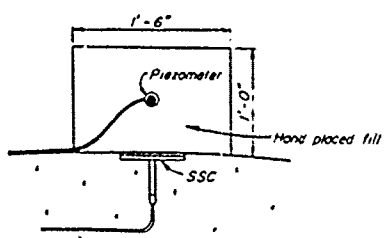




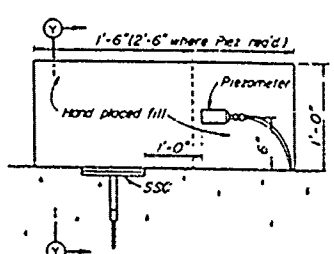
DETAIL "A"
SCALE ½" = 1'



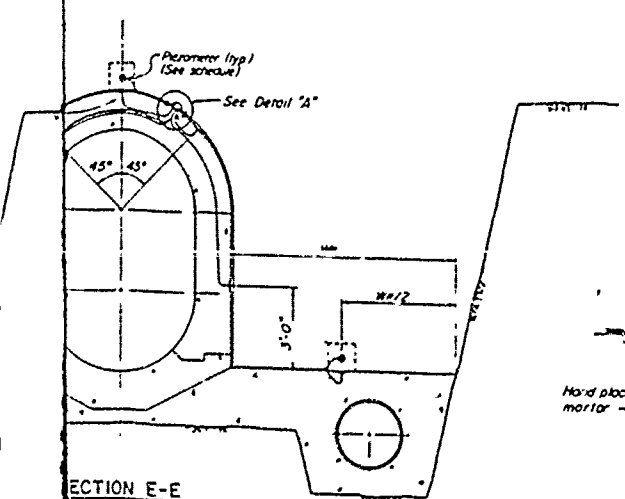
SECTION C-C
TYPICAL STATIONS 20+48E AND STA 20+88E
SCALE ½" = 1'



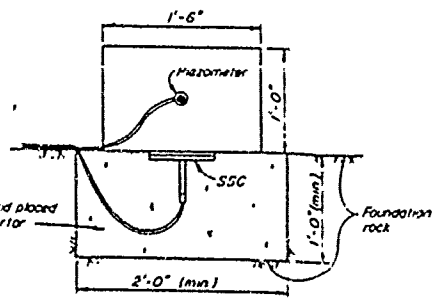
SECTION Y-Y
NO SCALE



SECTION X-X
NO SCALE



SECTION E-E
STA 20+68E



SECTION U-U
NO SCALE

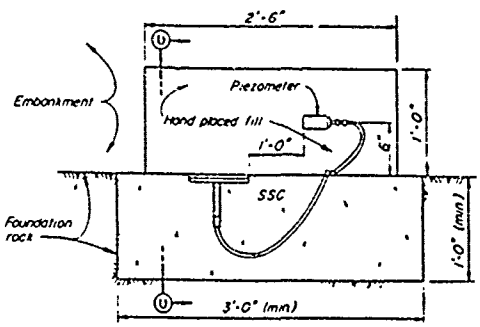
INSTRUMENT SCHEDULE			
SOIL PRESSURE CELLS			
INSTRUMENT NO	STATION	LOCATION	RANGE, PSI COMPRESSION	LENGTH CABLE REQUIRED
S-1	20+00E	Top of conduit, ℄	200	390'
S-2	"	Top of conduit, 45° Lt Rt	200	400'
S-3	"	Top of conduit, 45° Lt Lt	200	390'
S-4	"	Side of conduit, Rt	100	400'
S-5	"	Side of conduit, Lt	100	395'
S-6	"	Top of conduit base, Lt	200	400
S-7	"	Side of conduit base Rt	100	410'
S-8	"	Fill concrete, Rt	200	420'
S-9	"	Fill concrete, Lt	200	415
S-10	"	Rock, foundation Rt	200	430'
S-11	"	Rock, foundation Lt	200	430'
S-12	20+12E	Top of seep ring, ℄	200	385'
S-13	20+28E	Top of conduit, ℄	200	360'
S-14	"	Side of conduit, Rt	100	370'
S-15	"	Side of conduit, Lt	100	360'
S-16	20+48E	Top of conduit ℄	200	310'
S-17	20+68E	Top of conduit, ℄	200	315'
S-18	"	Top of conduit 45° Rt	200	325'
S-19	"	Top of conduit, 45° Lt Lt	200	315'
S-20	"	Side of conduit, Rt	100	325'
S-21	"	Side of conduit Lt	100	320'
S-22	"	Fill concrete, Rt	200	355'
S-23	"	Fill concrete, Lt	200	330'
S-24	20+88E	Top of conduit, ℄	200	295'
S-25	"	Side of conduit, Rt	100	305'
S-26	"	Side of conduit, Lt	100	300'

NOTES: 1 Soil pressure cells shall be Carlson type soil stress cells
2 Terminal ends of cables shall be permanently identified to show stress cell to which attached

PIEZOMETERS			
INSTRUMENT NO	STATION	LOCATION	LENGTH CABLE ATTACHED
P-4	13+30A	Main embankment, filter "A", El 442.0 :	1100'
P-5	17+30A	Main embankment filter "A", El 433.0 :	650'
P-6	21+42A	Main embankment filter "A", El 455.0 :	485'
P-7	20+00E	Top of conduit, ℄	390'
P-8	"	Top of rock, foundation Rt	430'
P-9	"	Top of rock, foundation Lt	430'
P-10	20+28E	Top of conduit, ℄	360'
P-11	20+68E	Top of conduit, ℄	315'
P-12	"	Fill concrete, Rt	355'
P-13	"	Fill concrete, Lt	330'
P-14	20+88E	Top of conduit, ℄	295'

NOTES 1 Piezometers shall be nitrogen gas operated pore pressure transducers (Slope Indicator Co., No 51402) and shall be furnished by the government with full length cable attached
2 See contract Dwgs #13/1 and 13/2 for piezometer installations in right embankment
3 Terminal ends of cables shall be permanently identified to show transducer to which attached

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT



SECTION V-V
NO SCALE

KEY	DATE	CHANGE	REVISION INDICATED BY (△)	APPR

U. S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

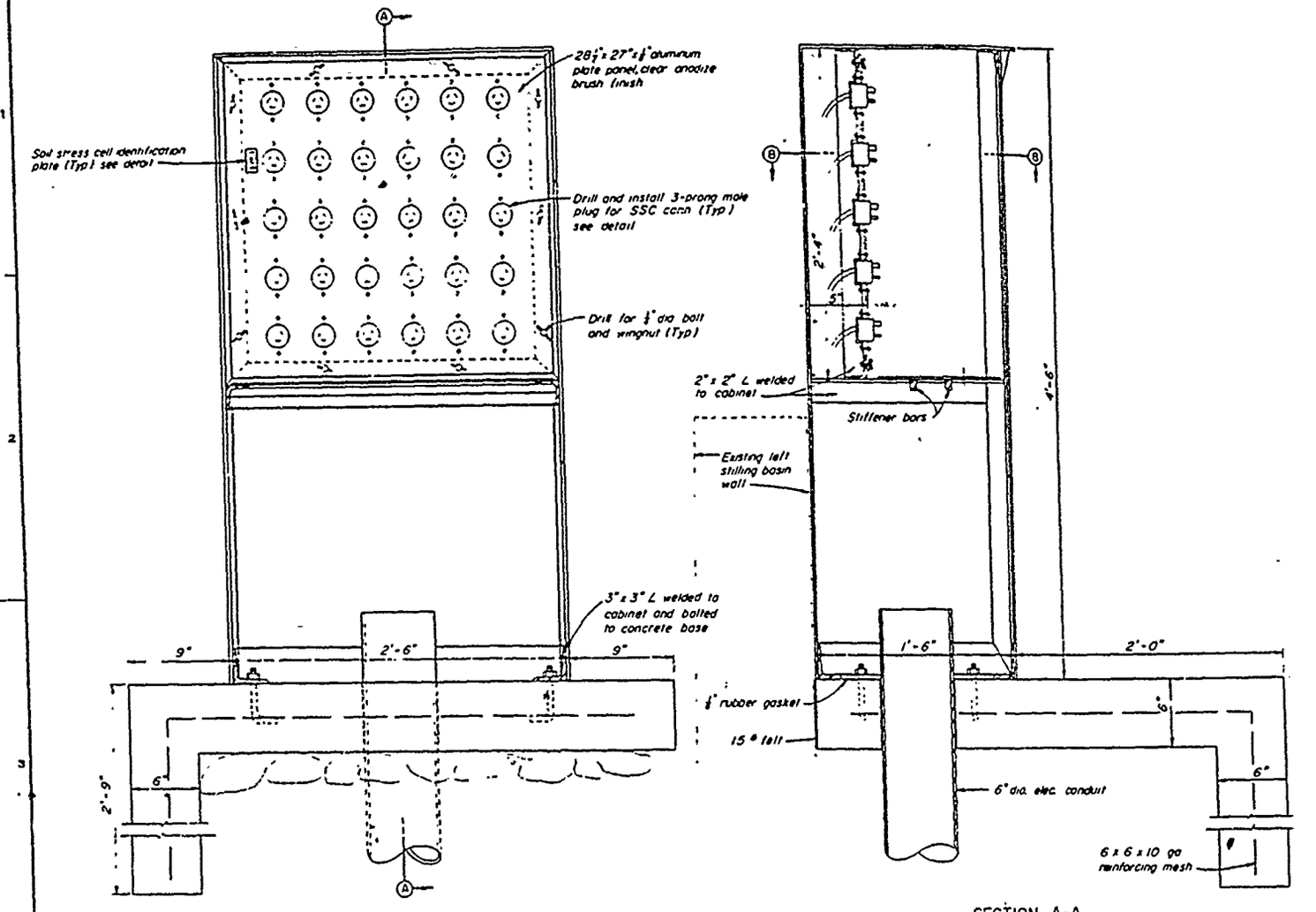
RED RIVER WATERSHED — BAYOU RIVER, ARKANSAS

DESIGNED BY: Carl D. Sims
DRAWN BY: Arnold Wilmott
CHECKED BY: Carl D. Sims

DIERKS DAM
EMB., OUTLET WORKS, SPILLWAY & ACCESS RDS.
ENGINEERING MEASUREMENT DEVICES
CONDUIT
SECTIONS AND DETAIL

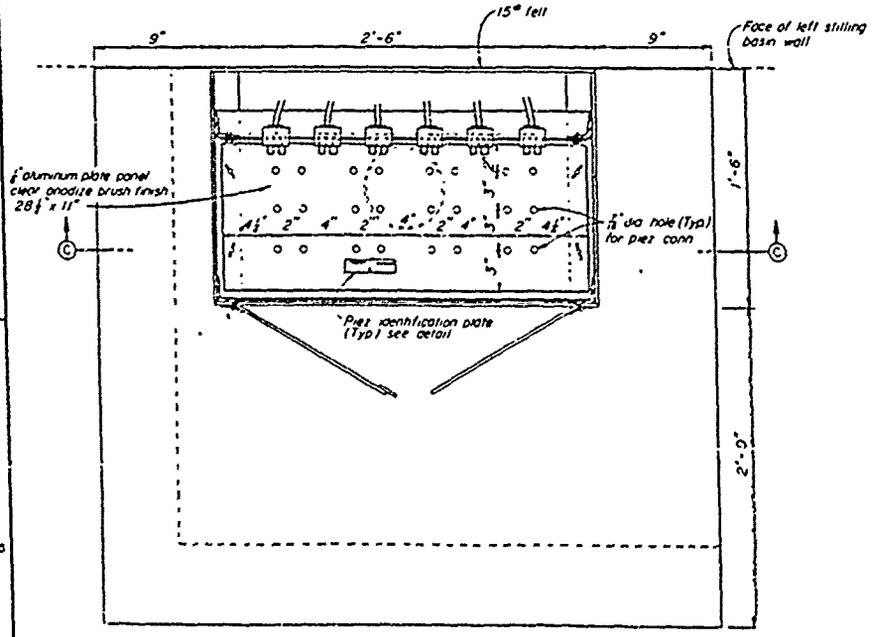
SUBMITTED: A. D. Brown for
CHIEF, PDNS & MATLS BR
DATE FEB. 1971

INVITATION NO DACW56- -B-00
SCALE AS SHOWN
DRAWING NUMBER 1960-C3-13/4

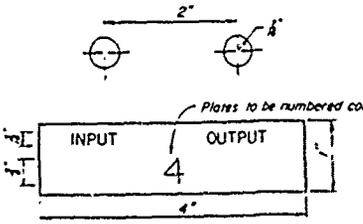


SECTION C-C
SCALE ½" = 1"

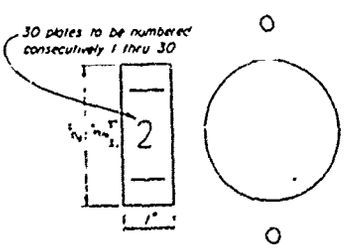
SECTION A-A
SCALE ½" = 1"



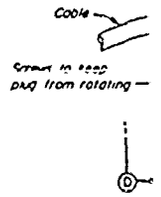
SECTION B-B
SCALE ½" = 1"

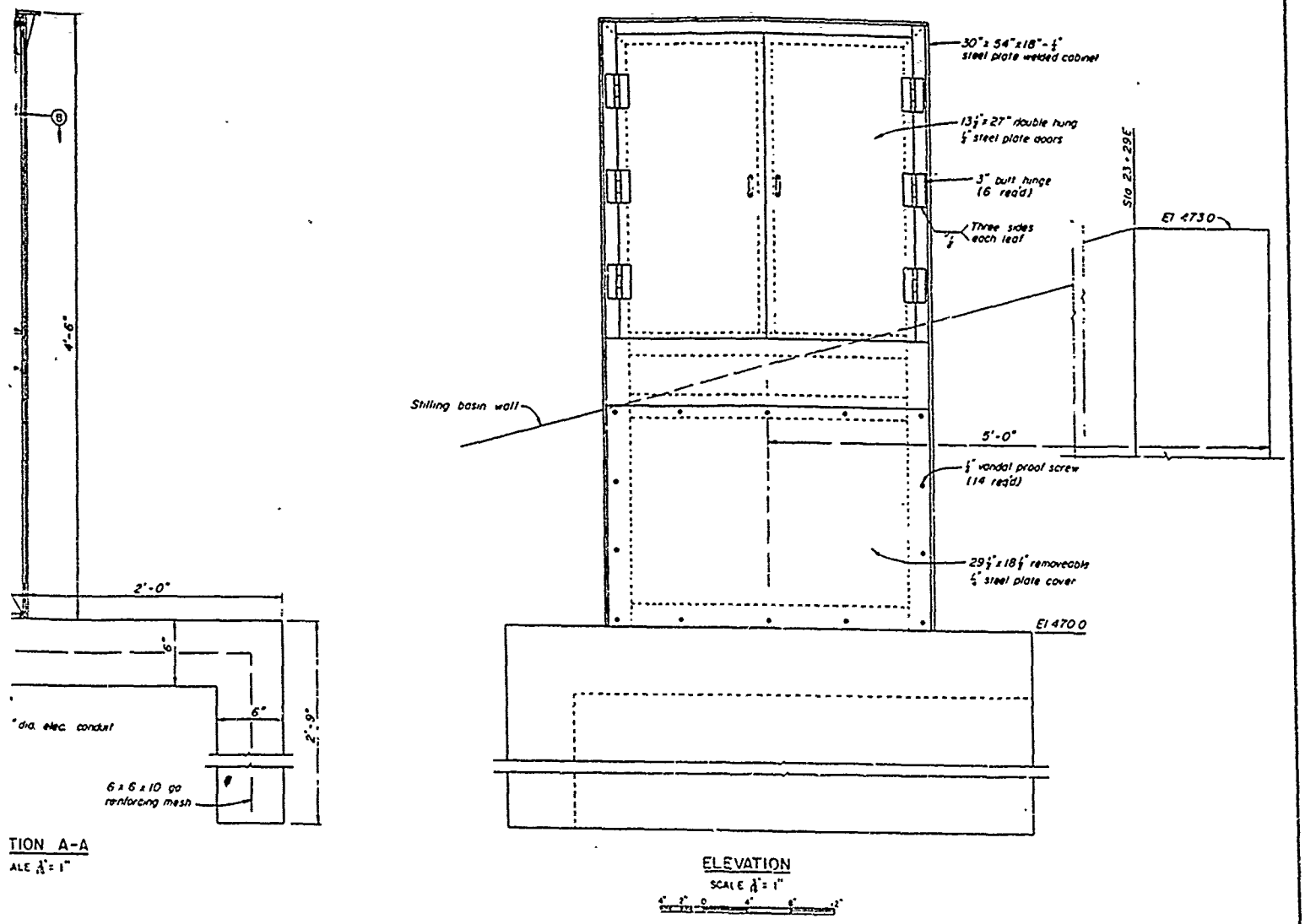


PIEZOMETER IDENTIFICATION PLATE
(MATERIAL TO BE BLACK BAKELITE W/WHITE LETTERS)
SCALE 1" = 1"



STRESS CELL IDENTIFICATION PLATE
(BLACK BAKELITE W/WHITE LETTERS)
SCALE 1" = 1"



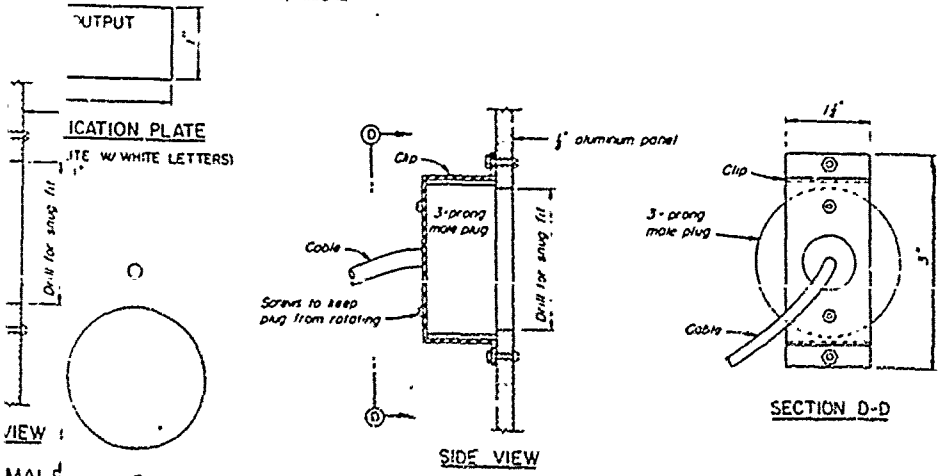


TION A-A
ALE ½" = 1"

ELEVATION
SCALE ½" = 1"

Plates to be numbered consecutive, 1 thru 12

NOTES
1. Provide a locking device for the cabinet doors as specified
2. See specifications for painting requirements
3. Temporary facilities will be provided so measurements can be made by the government using portable read-out equipment



MALE PLUG CLIP DETAIL
SCALE 1" = 1"

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

KEY	DATE	CHANGE	REVISION INDICATED BY Δ	APPD

U. S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

DESIGNED BY — RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

DIERKS DAM
EMB., OUTLET WORKS, SPILLWAY & ACCESS RDS
ENGINEERING MEASUREMENT DEVICES
EMBANKMENT
TERMINAL CABINET - SECTIONS, ELEVATION & DETAILS

DRAWN BY: David Whitworth
CHECKED BY:
SUBMITTED:
CHIEF, ENGR & WATER BR
DATE FEB 1971

INVITATION NO DACW56- -B 00
SCALE AS SHOWN
DRAWING NUMBER 1960-C3-13/5

REQUIRED EXCAVATIONS

	MAIN EMBANKMENT FOUNDATION	RIGHT EMBANKMENT FOUNDATION	SPILLWAY	RIDGE NO OF SPILLWAY	LEFT ABUTMENT ACCESS ROAD	RT ABUTMENT ACCESS ROAD	STILLING BASIN ACCESS ROAD	SPILLWAY AND DAM SERVICE ROAD	TOTAL EXCAVATION	BALANCE FACTOR	TOT NEAT
STRIPPING	36,000	34,000	28,000	12,000	1,800	3,200	3,400	2,000	120,400	WASTE	
UNCLASSIFIED FDN EXCAV. (OVERBURDEN)	420,000	NONE	NONE	NONE	NONE	NONE	NONE	NONE	420,000	EXCESS 48,000 → 0 85	26
UNCLASSIFIED ROW EXCAV. (OVERBURDEN & ROCK)	NONE	NONE	NONE	NONE	42,000	22,500	15,000	4,500	84,000	63,000 → 0 90	75
ROCK, CLASS IV (1)	26,000	8,000	570,000	86,000	NONE	NONE	NONE	NONE	690,000	EXCESS 133,000 → 345,000 → 1 00	21
ROCK, CLASS I	NONE	NONE	281,000	49,000	NONE	NONE	NONE	NONE	330,000	1 10	36
ROCK, CLASS II	NONE	NONE	563,000	49,000	NONE	NONE	NONE	NONE	612,000	1 10	67
ROCK, CLASS III	NONE	NONE	356,000	49,000	NONE	NONE	NONE	NONE	405,000	1 10	8
TOTAL	482,000	42,000	1,798,000	245,000	43,800	25,800	18,400	6,500	2,671,400		

(1) Consists of overburden, badly weathered rock, shale and undifferentiated rock of classes II and III. Fifty percent of total quantity assumed to be suitable for random rock fill

SAND AND GRAVEL FOR PROCESSING 82,200

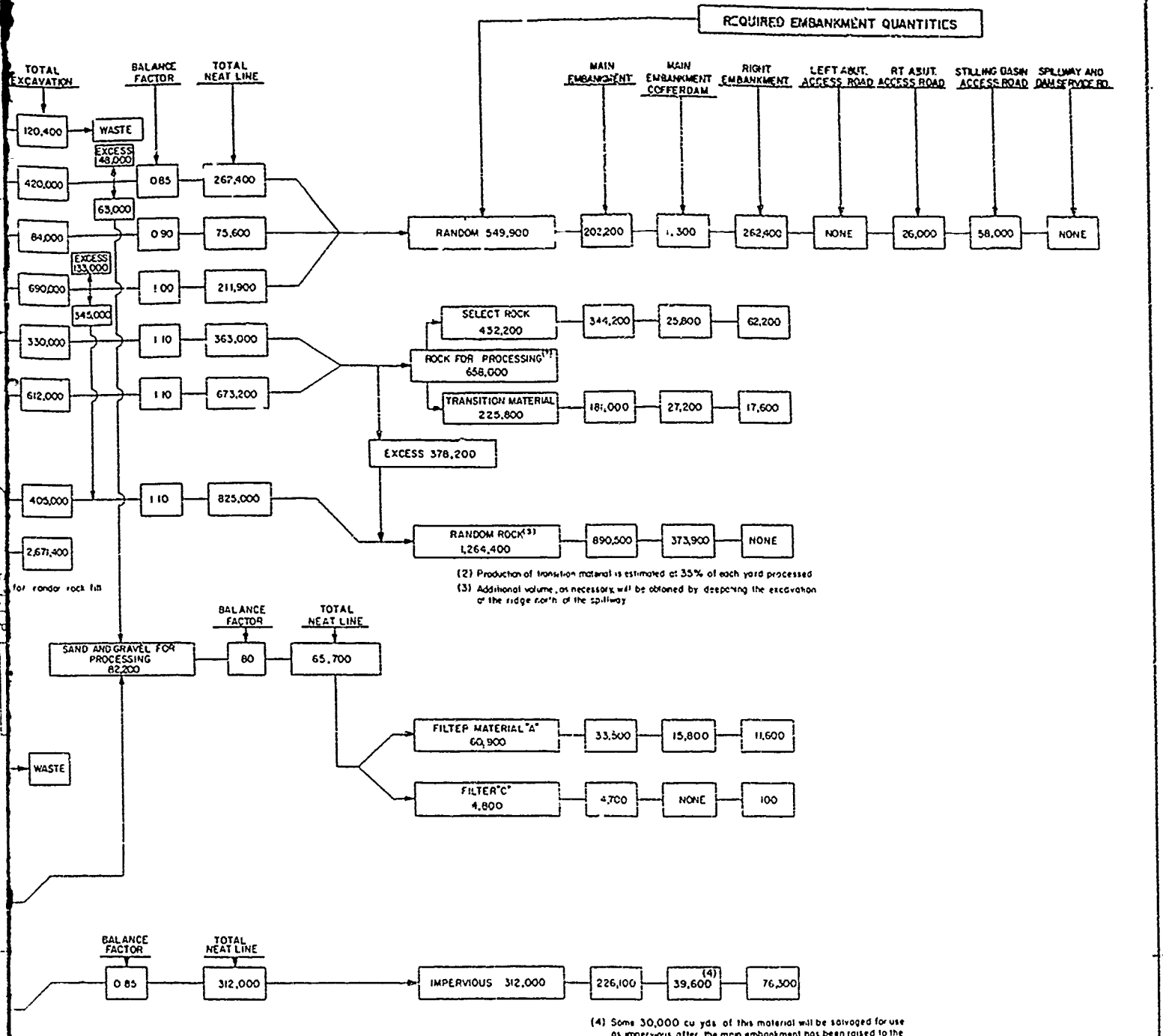
BORROW MATERIALS

	AREA D_1	AREA D_2	AREA E	AREA C	EXCAVATION	
STRIPPING	10,000	25,000	25,000	25,000	60,000	WASTE
SAND & GRAVEL	80,000	NONE	NONE	NONE	RESERVE 60,800; 19,200	
IMPERVIOUS	NONE	125,000	100,000	500,000+	RESERVE 358,000+; 367,000	BALANCE FACTOR 0 85

MATERIALS TO BE FURNISHED (5) BY THE CONTRACTOR

	TOTAL	LEFT ABUTMENT ACCESS ROAD	RT ABUTMENT ACCESS ROAD
TRAFFIC BOUND SURFACE COURSE	1540	NONE	1540
STAB BASE COURSE	2680	750	NONE
SUBBASE	3230	1310	430

(5) These materials may be obtained from the sand and gravel sources for filter materials provided ample quantities are available.


REQUIRED EMBANKMENT QUANTITIES
TOTAL EXCAVATION
BALANCE FACTOR
TOTAL NEAT LINE
MAIN EMBANKMENT
MAIN EMBANKMENT COFFERDAM
RIGHT EMBANKMENT
LEFT ABUT. ACCESS ROAD
RT ABUT. ACCESS ROAD
STILLING BASIN ACCESS ROAD
SPILLWAY AND DAM SERVICE RD.
120,400
WASTE
EXCESS 48,000
420,000
0 85
267,400
63,000
84,000
0 90
75,600
RANDOM 549,900
202,200
1,300
262,400
NONE
26,000
58,000
NONE
EXCESS 133,000
690,000
1 00
211,900
345,000
330,000
1 10
363,000
SELECT ROCK 432,200
344,200
25,800
62,200
ROCK FOR PROCESSING[2] 658,000
612,000
1 10
673,200
TRANSITION MATERIAL 225,800
181,000
27,200
17,600
EXCESS 378,200
405,000
1 10
825,000
RANDOM ROCK[3] 1,264,400
890,500
373,900
NONE
2,671,400
(2) Production of transition material is estimated at 35% of each yard processed
(3) Additional volume, as necessary, will be obtained by deepening the excavation of the ridge north of the spillway
BALANCE FACTOR
TOTAL NEAT LINE
SAND AND GRAVEL FOR PROCESSING 82,200
80
65,700
FILTER MATERIAL "A" 60,900
33,500
15,800
11,600
WASTE
FILTER "C" 4,800
4,700
NONE
100
BALANCE FACTOR
TOTAL NEAT LINE
0 85
312,000
IMPERVIOUS 312,000
226,100
39,600[4]
76,300
(4) Some 30,000 cu yds of this material will be salvaged for use as impervious after the main embankment has been raised to the elevation of the cofferdam
ALS TO BE FURNISHED[3] THE CONTRACTOR
LEFT ABUTMENT ACCESS ROAD
RT ABUTMENT ACCESS ROAD
STILLING BASIN ACCESS ROAD
SPILLWAY AND DAM SERVICE ROAD
NONE
1540
NONE
NONE
750
NONE
1930
NONE
430
1490
NONE
for filter materials
NOTE
All quantities expressed in cubic yards
U S ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA
RED RIVER WATERSHED
SALINE RIVER OKLAHOMA
DESIGNED
DRAWN
TRACED
SUBMITTED BY
CHIEF, SOILS MECH. SEC.
RECOMMENDED
APPROVED
CHIEF, ENGR. DIV.
FOR THE DISTRICT ENGINEER
DATE
OCT 1968
SCALE AS SHOWN
TO ACCOMPANY SUPPLEMENT NO. 2
DRAWING NO
1960-DM8-97/1
DIERKS RESERVOIR
MAIN & RIGHT EMBANKMENT
MATERIALS USAGE CHART
CONTRACT

REQUIRED EXCAVATION (1)

	MAIN EMBANKMENT FOUNDATION	SPILLWAY	RIDGE NORTH OF SPILLWAY	BORROW AREA "E"	TOTAL EXCAVATION	
UNCLASSIFIED EXCAVATION	100,000 (2)	NONE	NONE	NONE	100,000	
ROCK CLASS I AND II (3)	NONE	508,000	20,000	49,000	577,000	ROCK FOR PROCESSING 339,800
						237,200
MATERIAL TO BE PROCESSED (5)	NONE	387,500	NONE	NONE	387,500	+3" MTL. 116,300 (6)
						-3" MTL. 271,200
TOTAL	100,000	895,500	20,000	49,000	1,064,500	

(1) EXCAVATION AND COMPACTED QUANTITIES ARE THOSE REMAINING AS OF AUGUST 1972 FOR COMPLETION OF THE MARCH 1972 REVISED EMBANKMENT SECTION.

(2) CONSISTS OF APPROXIMATELY 50,000 C.Y. OF STOCKPILED MATERIAL PLUS APPROXIMATELY 50,000 C.Y. OF MATERIAL REMAINING IN THE FIRST STAGE COFFERDAM.

(3) ASSUMED SUITABLE FOR RANDOM ROCKFILL (QUARRY RUN) OR SUITABLE TO BE PROCESSED FOR SELECT ROCKFILL.

(4) PRODUCTION OF SELECT ROCKFILL ESTIMATED AT APPROXIMATELY 50 PERCENT OF EACH YARD PROCESSED.

(5) CONSISTS OF MATERIAL UNSUITABLE FOR PROCESSED SELECT ROCKFILL OR UNSUITABLE FOR QUARRY RUN RANDOM ROCKFILL OR RANDOM FILL.

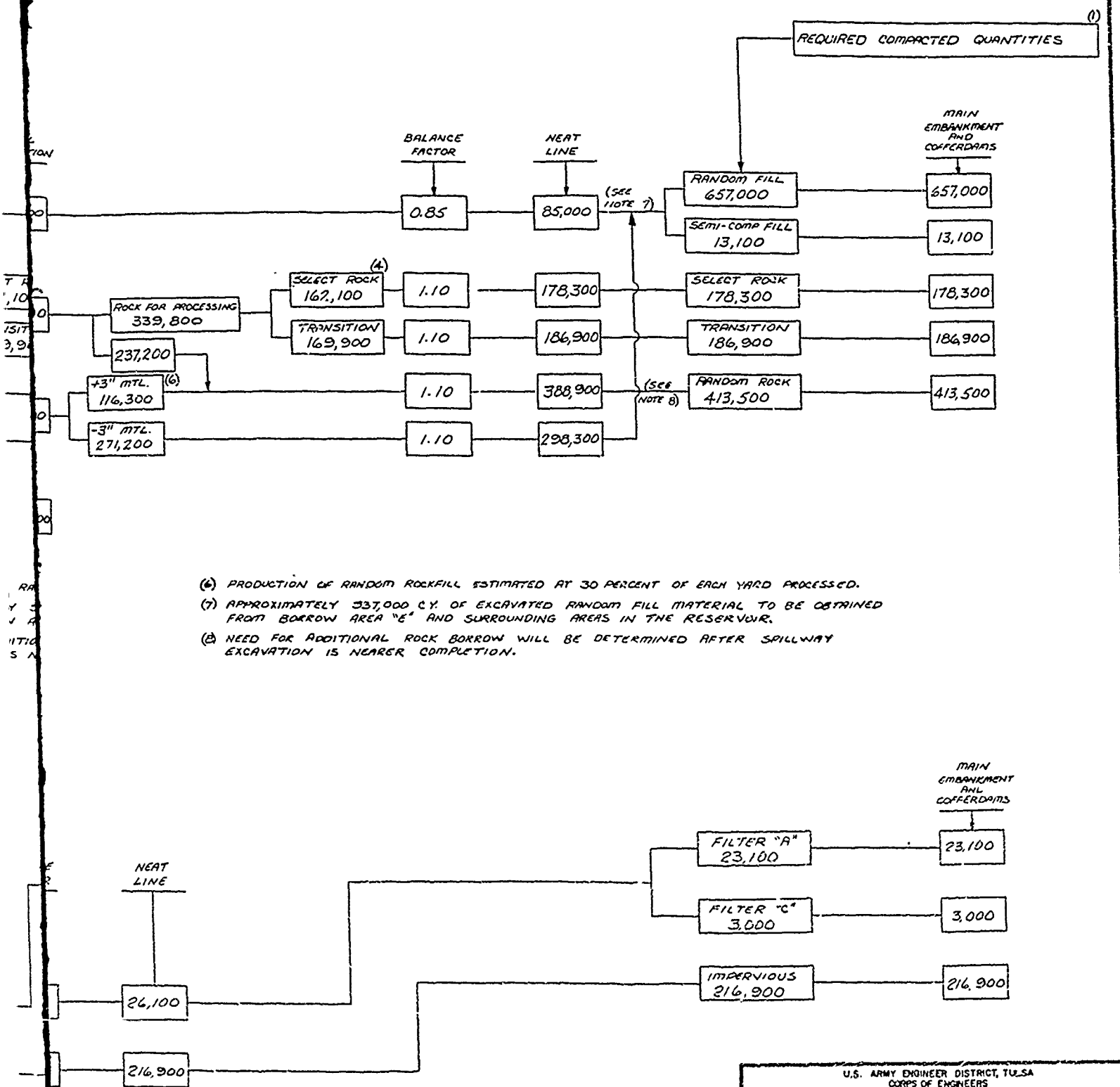
(6) PRC

(7) APP FRC

(8) NEE EXC

BORROW EXCAVATION (1)

	STOCKPILE OR AREA D	AREA E	AREA C	TOTAL EXCAVATION		BALANCE FACTOR	NEAT LINE
STRIPPING	NONE	NONE	43,000	43,000	WASTE		
SAND AND GRAVEL	32,600	NONE	NONE	32,600		0.80	26,100
IMPERVIOUS	NONE	255,200	500,000	255,200		0.85	216,900
			RESERVE				



U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

DESIGNED Dan'l Wright
DRAWN K Leland
CHECKED Dan'l Wright
SUBMITTED A B Brown Jr
CHIEF, WORKS MECH SEC II
DATE MARCH 1972

DIERKS RESERVOIR
EMBANKMENT AND SPILLWAY MATERIALS USAGE CHART
AUGUST 1972

SCALE AS SHOWN | SUPPLEMENT #2
DRAWING NO 1960-DM8-97/18