

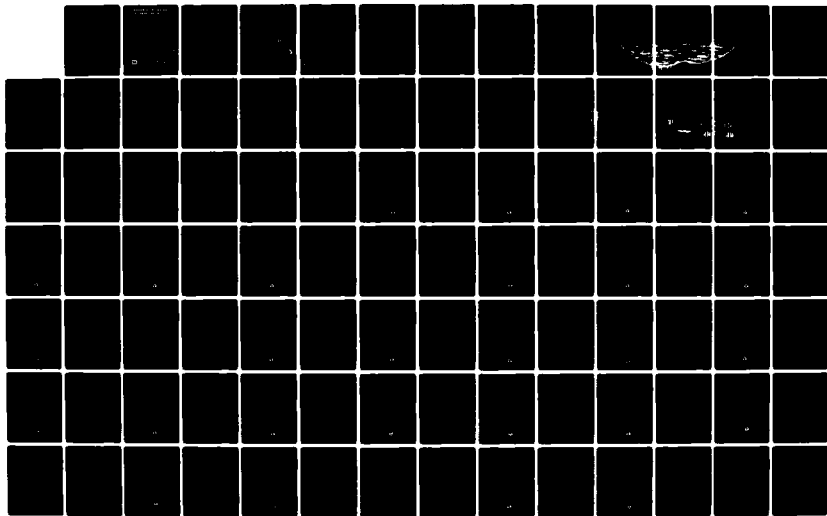
AD-A123 609

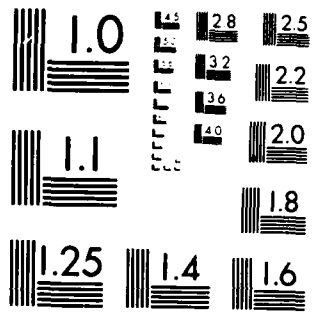
EMBANKMENT CRITERIA AND PERFORMANCE REPORT MISSOURI
RIVER FORT PECK LAKE MONTANA VOLUME III DRAWINGS(U)
ARMY ENGINEER DISTRICT OMAHA NEBR SEP 82

1/2

UNCLASSIFIED

F/G 13/13 NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

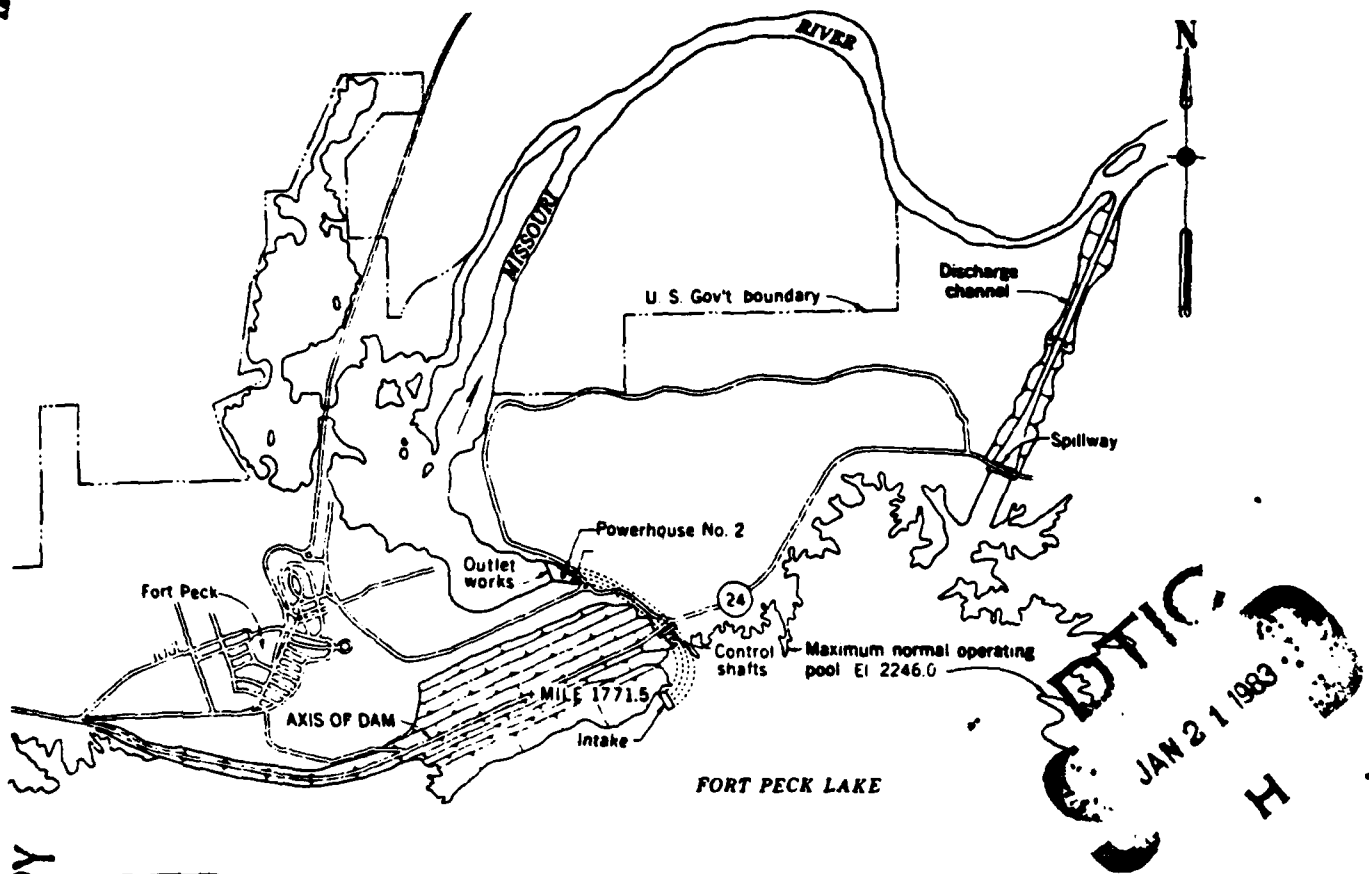
EMBANKMENT CRITERIA AND PERFORMANCE REPORT

5

SEPTEMBER 1982

ADA 123609

MISSOURI RIVER FORT PECK LAKE, MONTANA



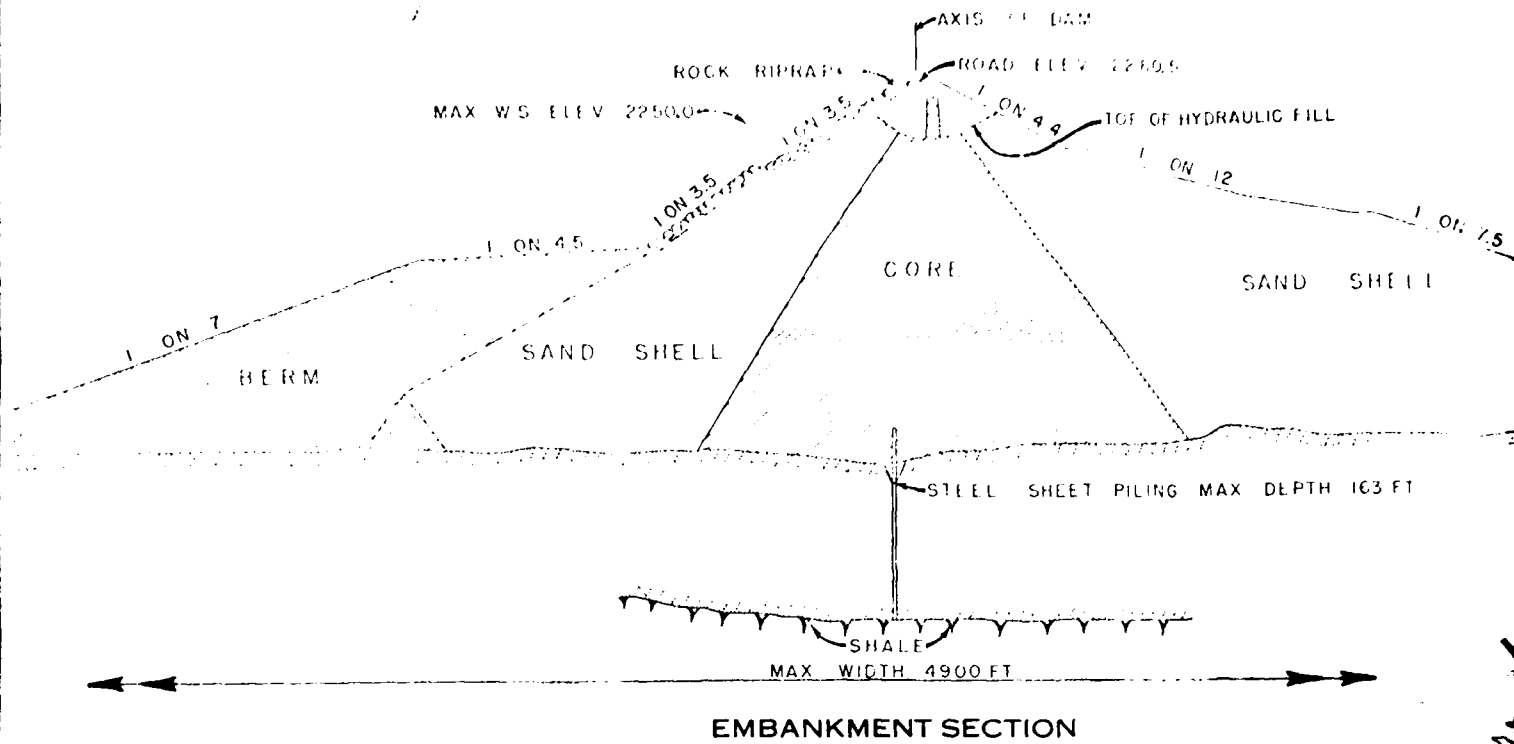
DTIC COPY



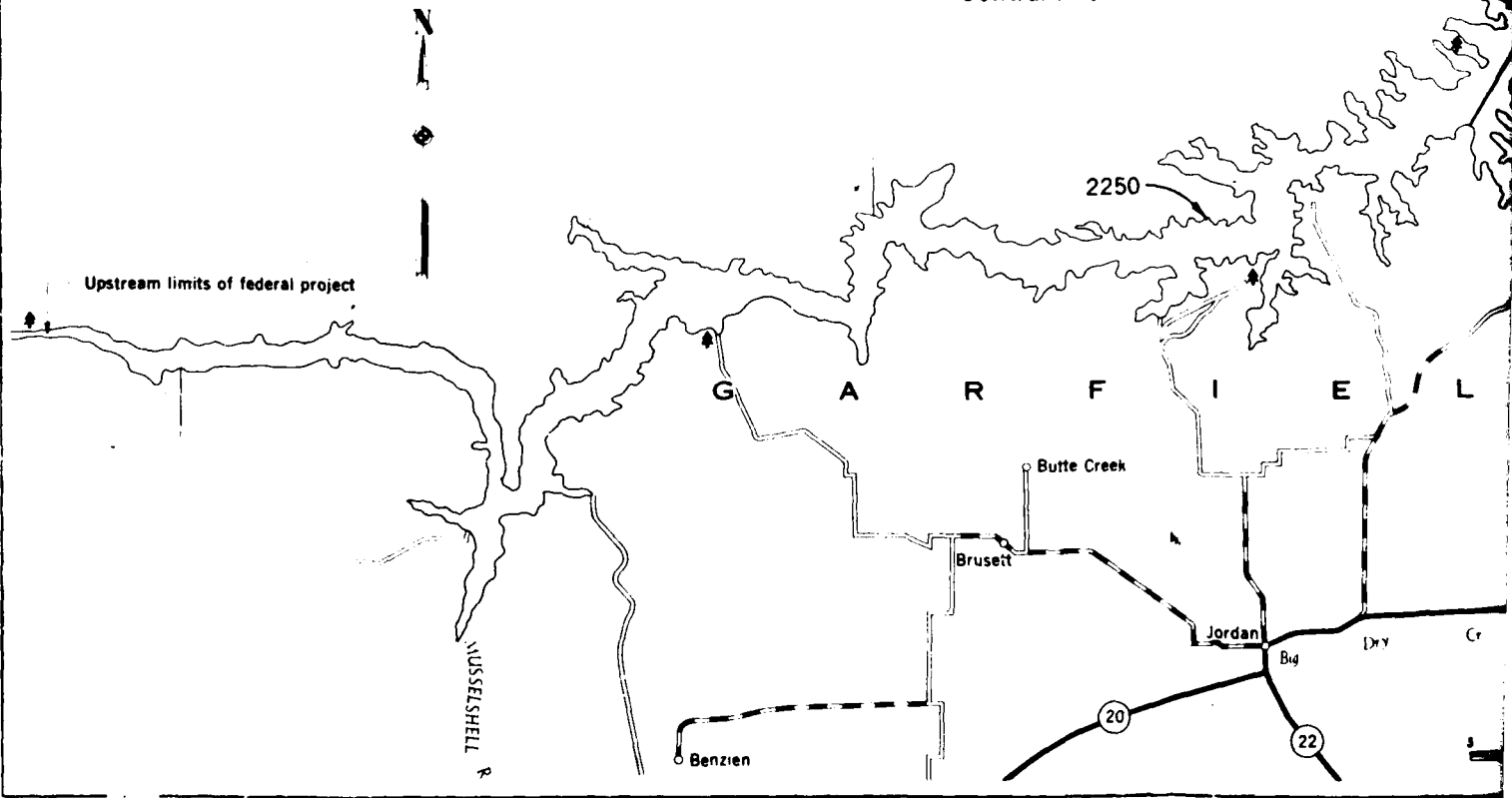
US Army Corps
of Engineers
Omaha District

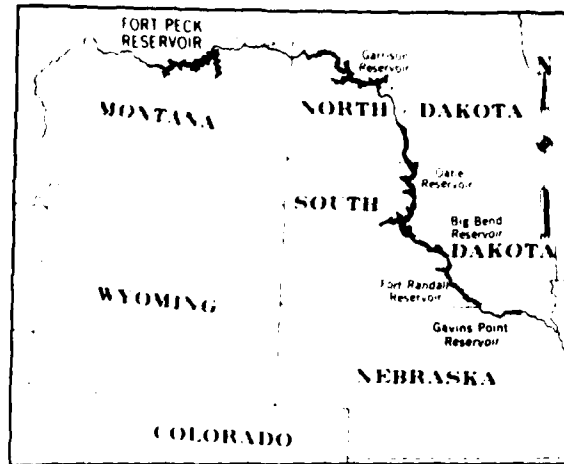
VOLUME III
DRAWINGS

DISTRIBUTION STATEMENT A
Approved for public release;
Distribution Unlimited

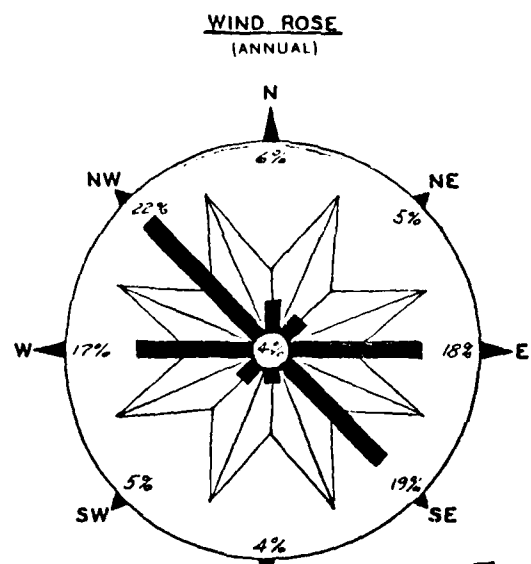
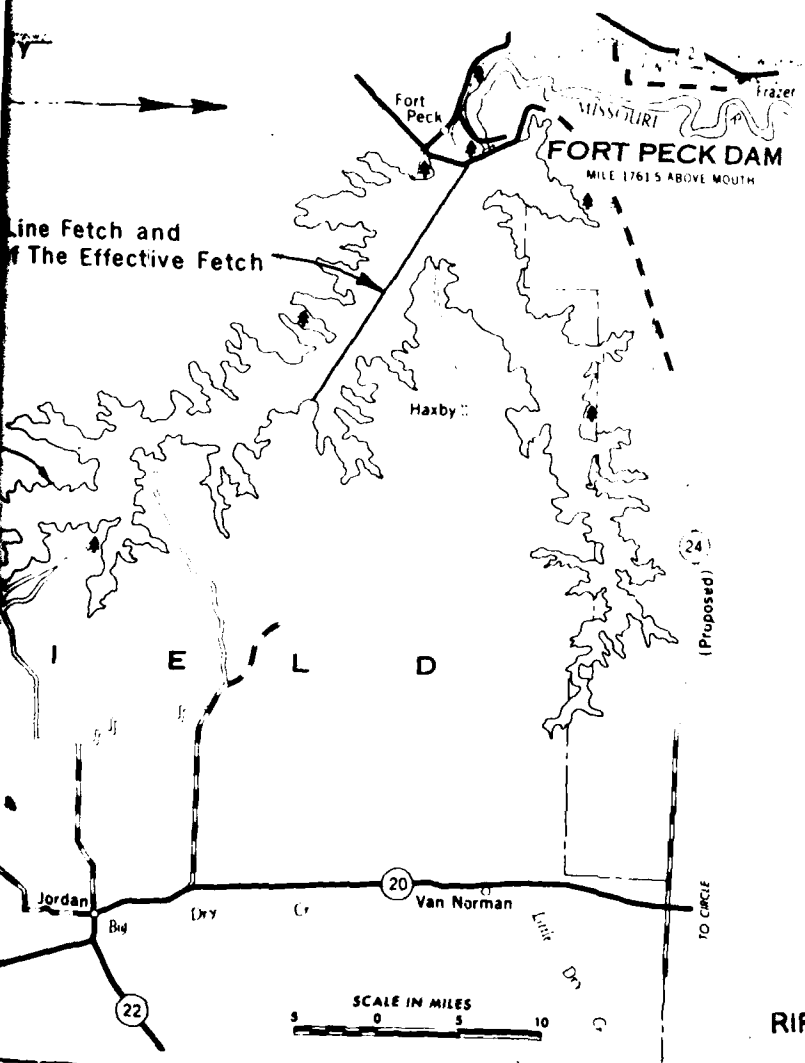
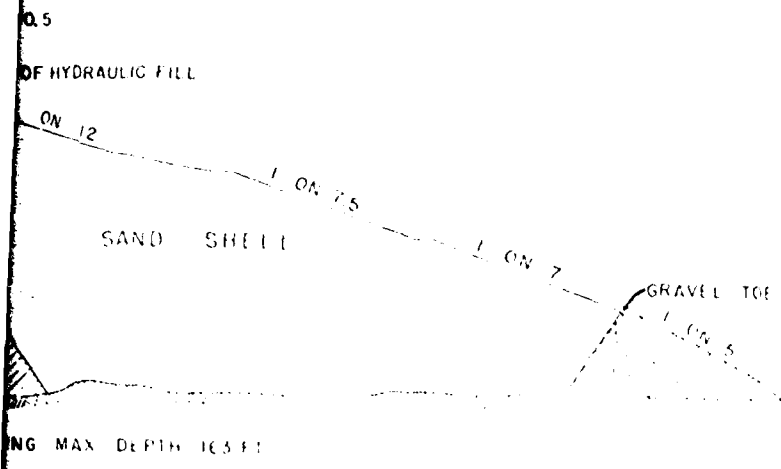


Straight Line Fetch and Central Radial of The Effective Fetch





LOCATION MAP



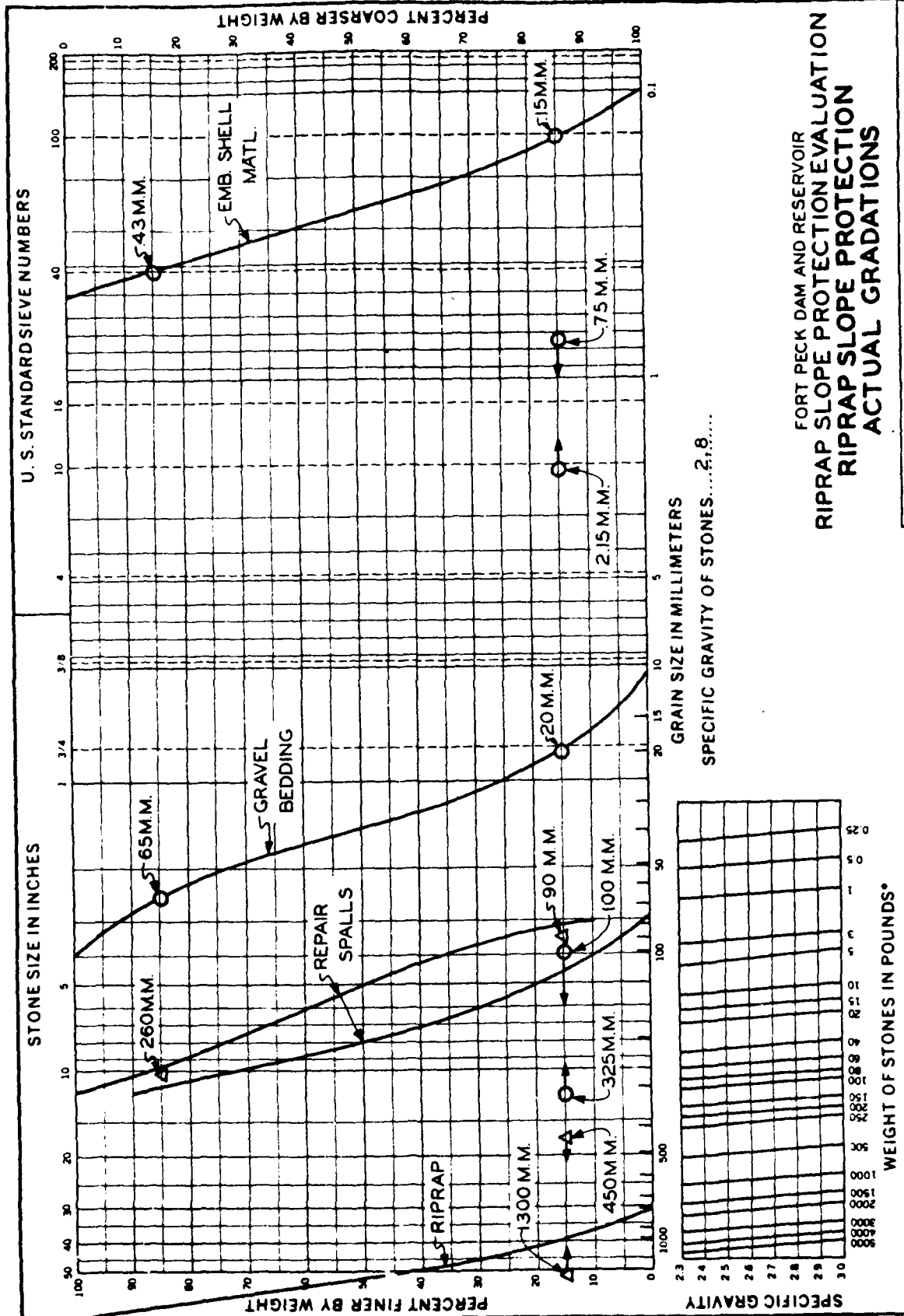
NOTE: VALUES SHOWN AT END OF EACH BAR INDICATE THE PERCENT OF TIME THAT WIND IS FROM GIVEN DIRECTION.

DTIC
 JAN 21 1983
 H

**FORT PECK DAM AND RESERVOIR
 RIPRAP SLOPE PROTECTION EVALUATION
 GENERAL DATA**

2

DISTRIBUTION STATEMENT A
 Approved for public release
 Distribution Unlimited



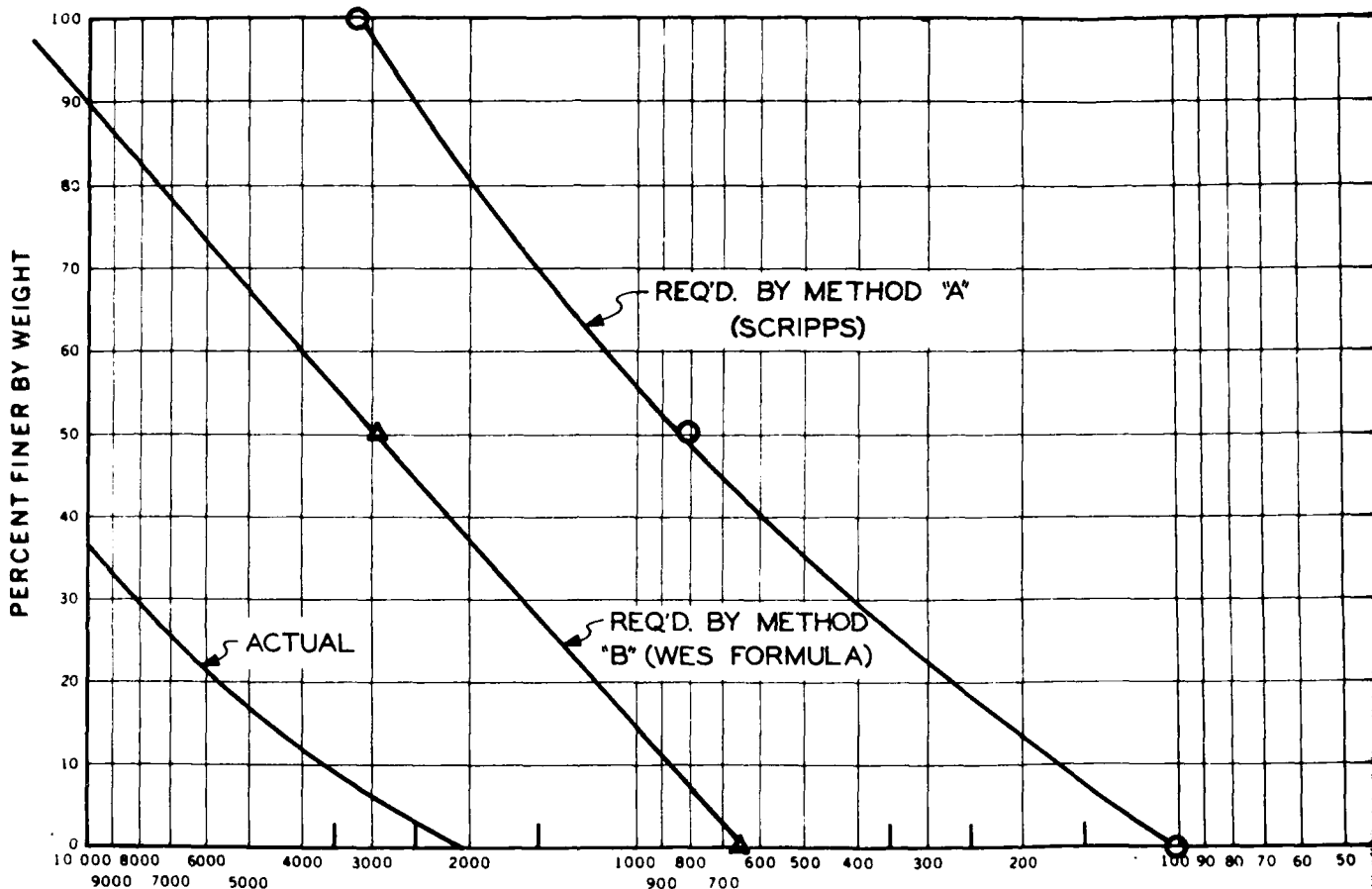
GRADATION CURVES

FORT PECK DAM AND RESERVOIR
RIPRAP SLOPE PROTECTION EVALUATION
RIPRAP SLOPE PROTECTION
ACTUAL GRADATIONS

* ASSUMING STONE SHAPE MIDWAY BETWEEN A SPHERE & CUBE

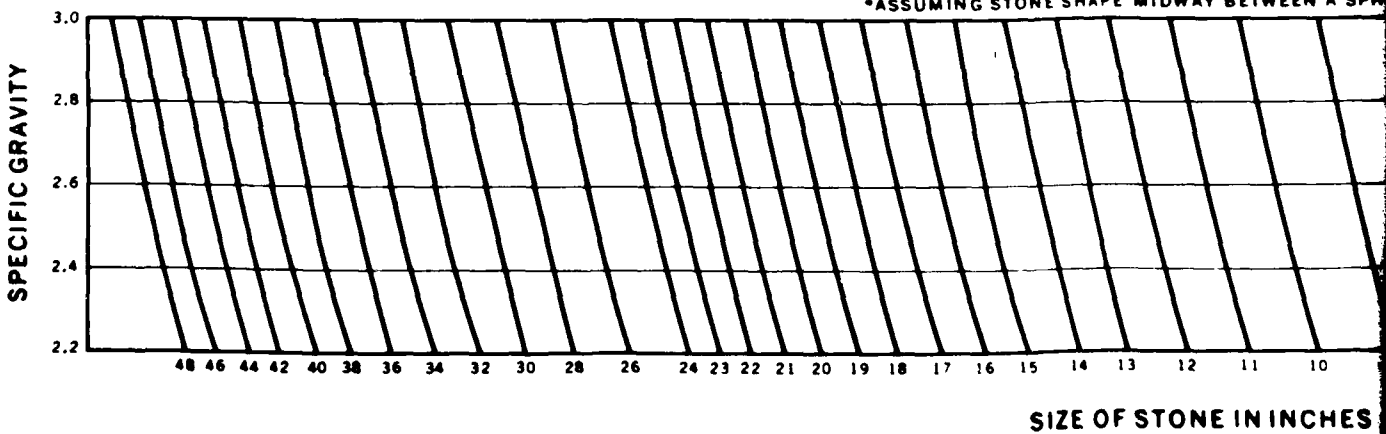
PROJECT FORT PECK DAM

RIPRAP GRADATION CURVES
AREA EMBANKMENT



WEIGHT OF STONES IN POUND
SPECIFIC GRAVITY OF ROCK... 2.2

*ASSUMING STONE SHAPE MIDWAY BETWEEN A SPH

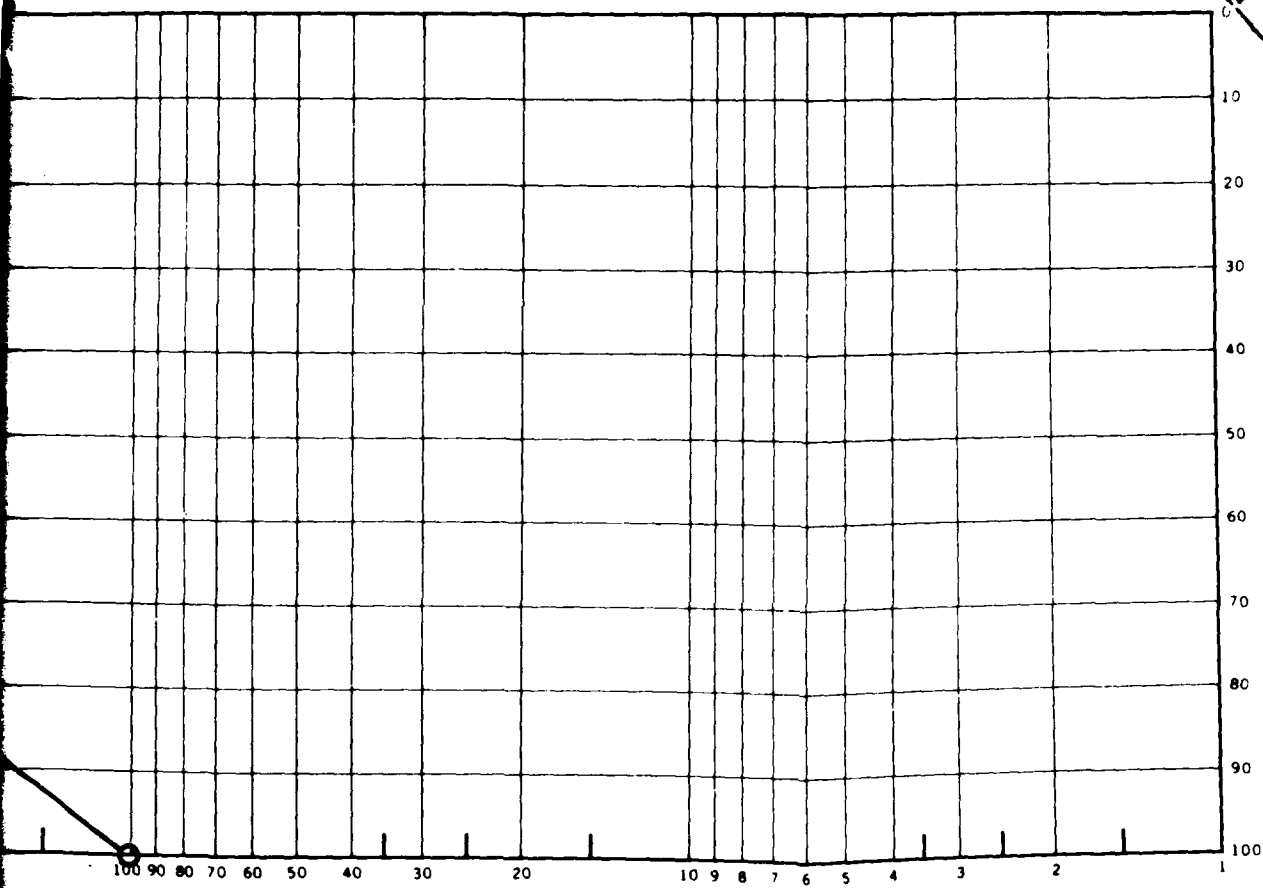


SIZE OF STONE IN INCHES

Accession of
 NIS 0111
 DTIC 7.1
 Unannounced
 Justification for
 Distribution/
 Availability Codes
 Avail and/or
 Special
 Dist
 A

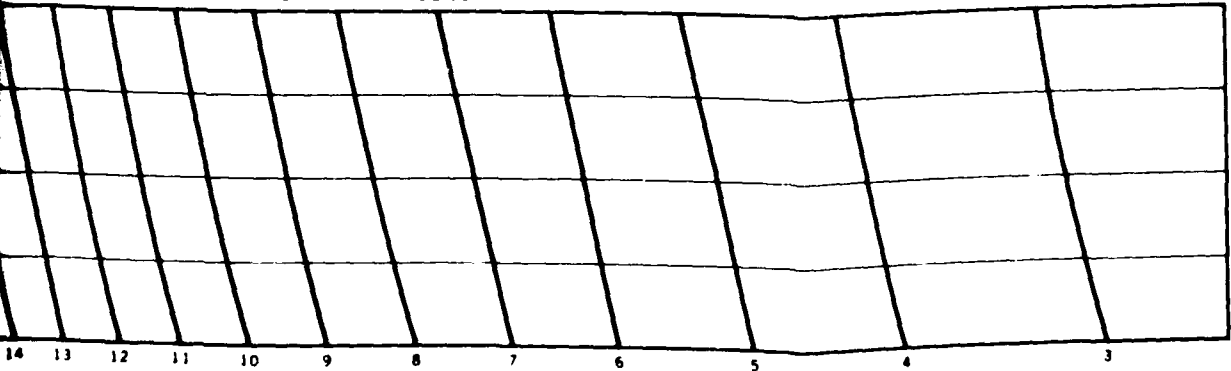
AP GRADATION CURVES
 EMBANKMENT

DATE.....



SIZE OF STONES IN POUNDS *
 SPECIFIC GRAVITY OF ROCK... 2.8.....

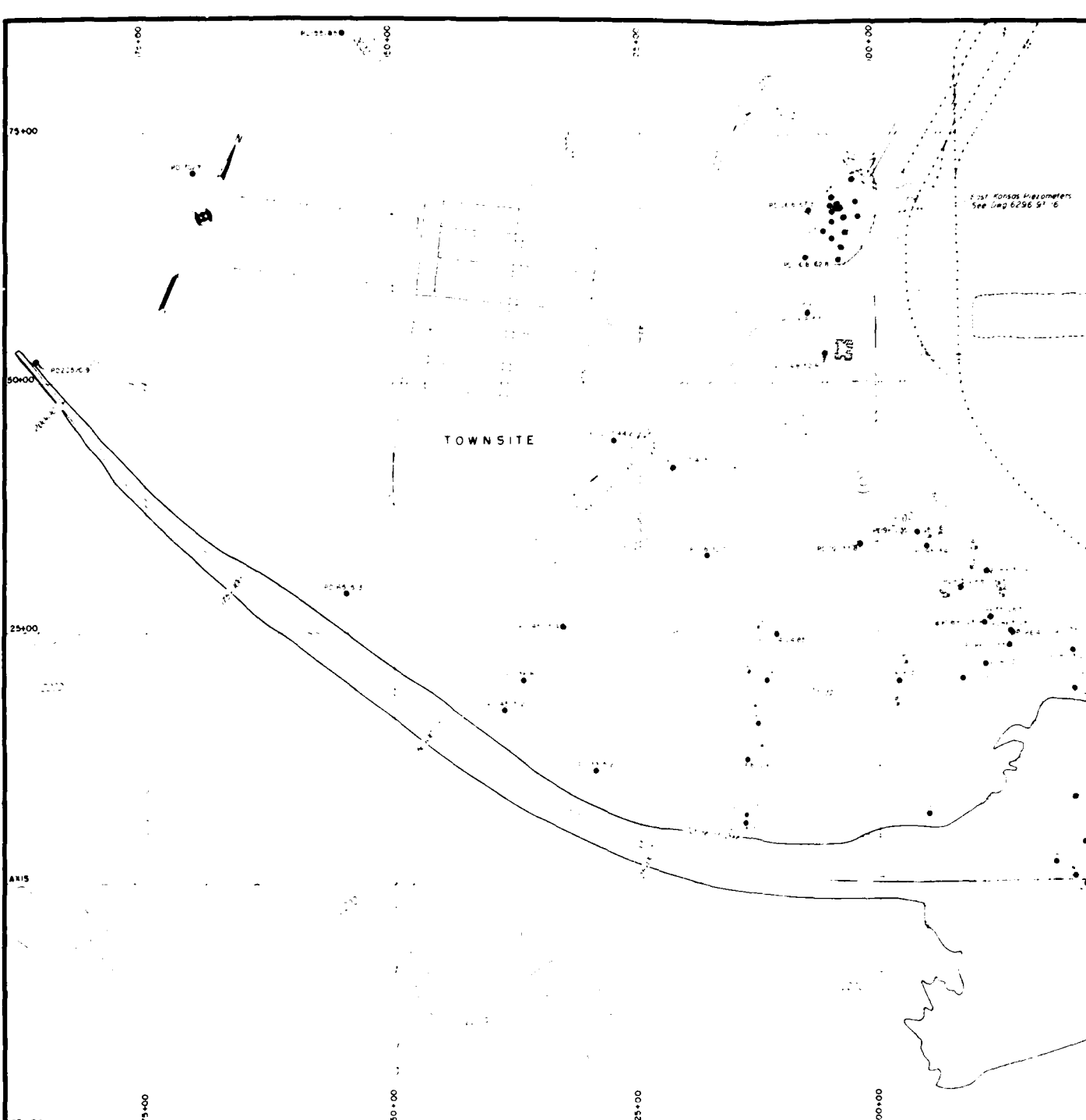
SHAPE MIDWAY BETWEEN A SPHERE AND CUBE



SIZE OF STONE IN INCHES

2

FORT PECK DAM AND RESERVOIR
 RIPRAP SLOPE PROTECTION EVALUATION
 RIPRAP STONE
 ACTUAL VS REQUIRED GRADATIONS

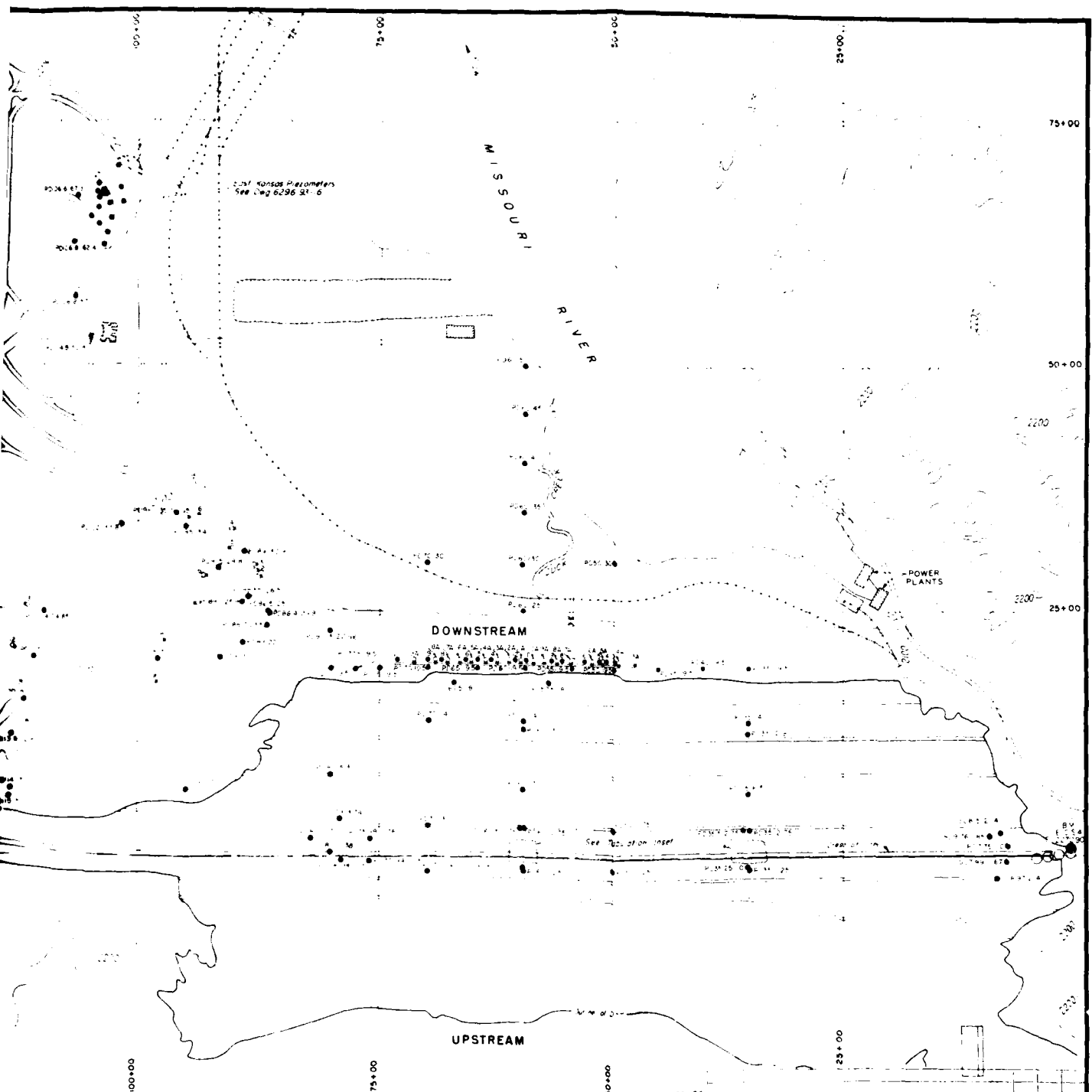


East Kansas Meters
See map 6256 51-6

CORE PILOMETER TABULATION

STA 35+00	STA 35+00 (cont)
PD35/1	PD35/2
PD35/10	PD35/23
PD35/07	PD35/265
PD35/06	
PD35/01	STA 60+00
PD35/04	PD60/035
PD35/038	PD60/038 #1
PD35/028 #2	PD60/038 #2
PD35/038 #3	PD60/038 #3
PD35/035	PD60/035
PD35/055	PD60/055
PD35/060	PD60/06
PD35/08	
PD35/085	
PD35/11	
PD35/14	
PD35/15	
PD35/17	
PD35/185	

P. 111
S. A. E. 111



PIEZOMETER TABULATION

STA 35+00 (cont.)
PD 35/2
PD 35/2.3
PD 35/2.65
STA 80+00
PD 80/0.35
PD 80/0.38 #1
PD 80/0.38 #2
PD 80/0.38 #3
PD 80/0.35
PD 80/0.6

PLAN
SCALE 1" = 500'

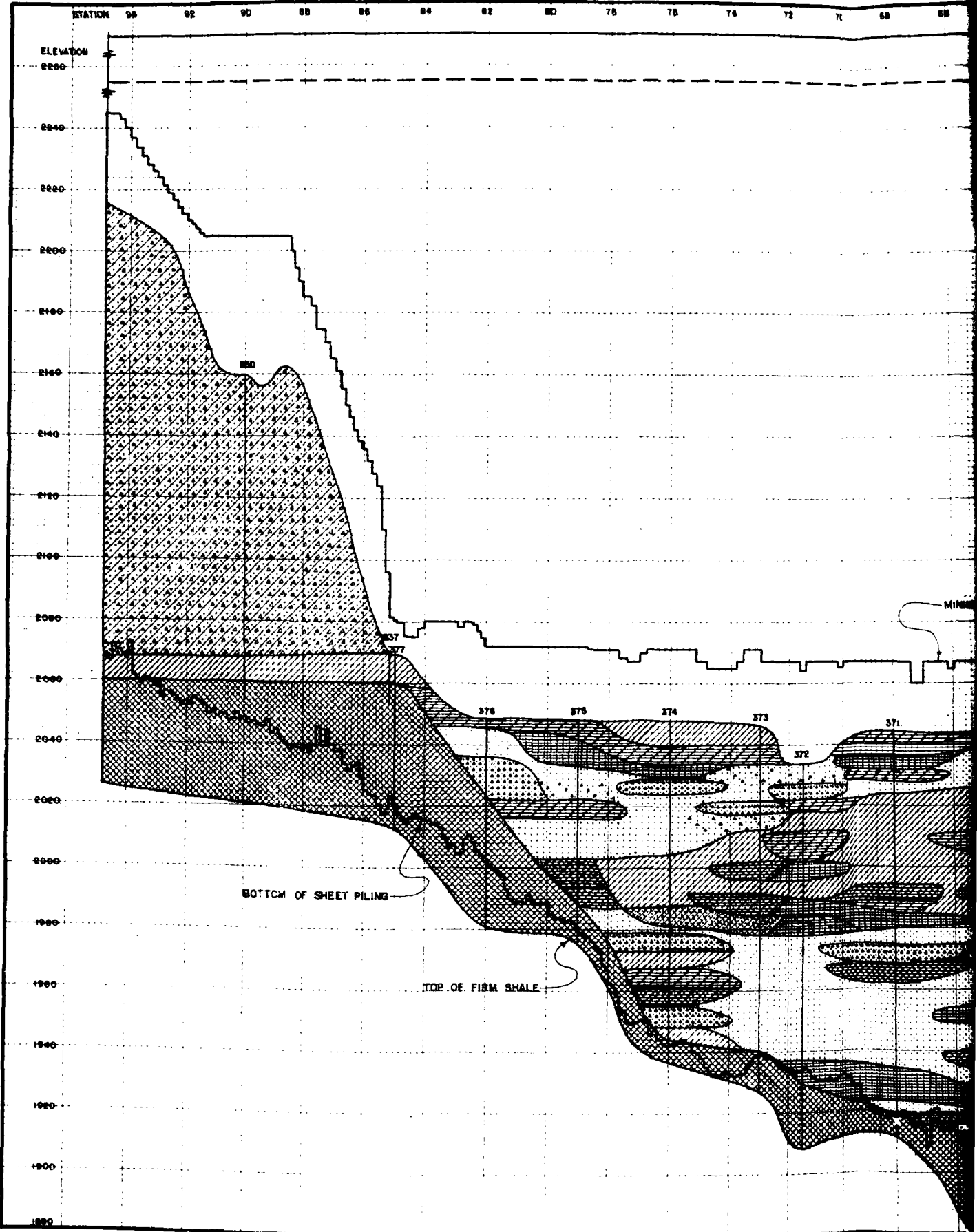
LEGEND
● - Piezometer
Q - Pressure Relief Well

NOTE
Piezometer Explanation
PD 35/1.1
● - Station 15+00 Downstream from E
- Station 15+00 Downstream

DATE	BY	CHKD	APP'D
CORPS OF ENGINEERS, U. S. ARMY OFFICE OF THE DISTRICT ENGINEER GARRISON DISTRICT GARRISON, MO.			
MISSOURI RIVER FORT PECK DAM LOCATION OF PIEZOMETERS AND RELIEF WELLS MAIN DAM AND LEFT ABUTMENT			
APPROVED	APPROVAL RECOMMENDED	AUGUST 1957	
CHIEF ENGINEERING DIVISION	SCALE AS SHOWN	DRAWING NUMBER	
		6296.92-1-69	

2

WAR DEPARTMENT



68 64 62 60 58 56 54 52 50 48 46 44 42 40 38 36 34 32

TOP OF DAM

TOP OF CORE

MINIMUM TOP ELEVATION OF SHEET PILING

370

367

366

365

364

363

362

361

360

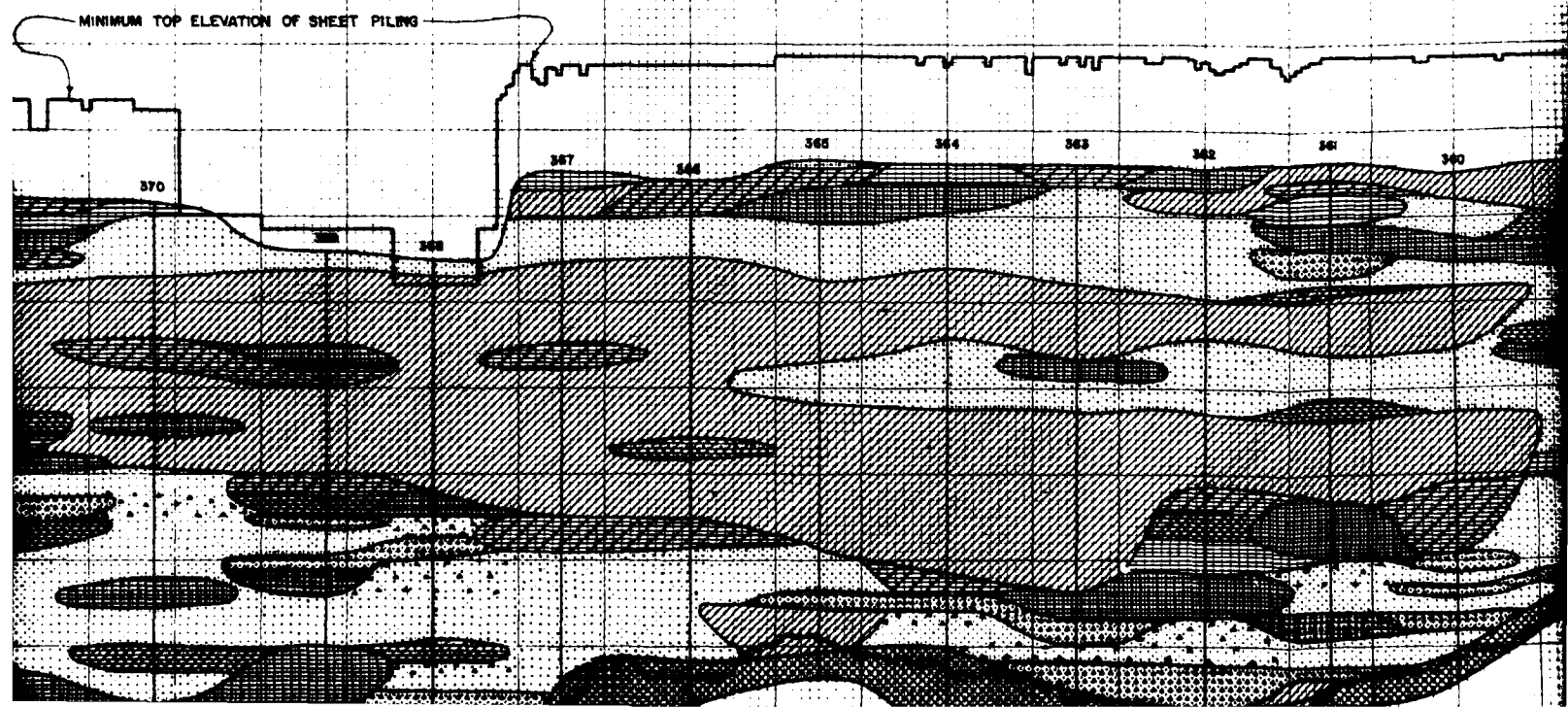
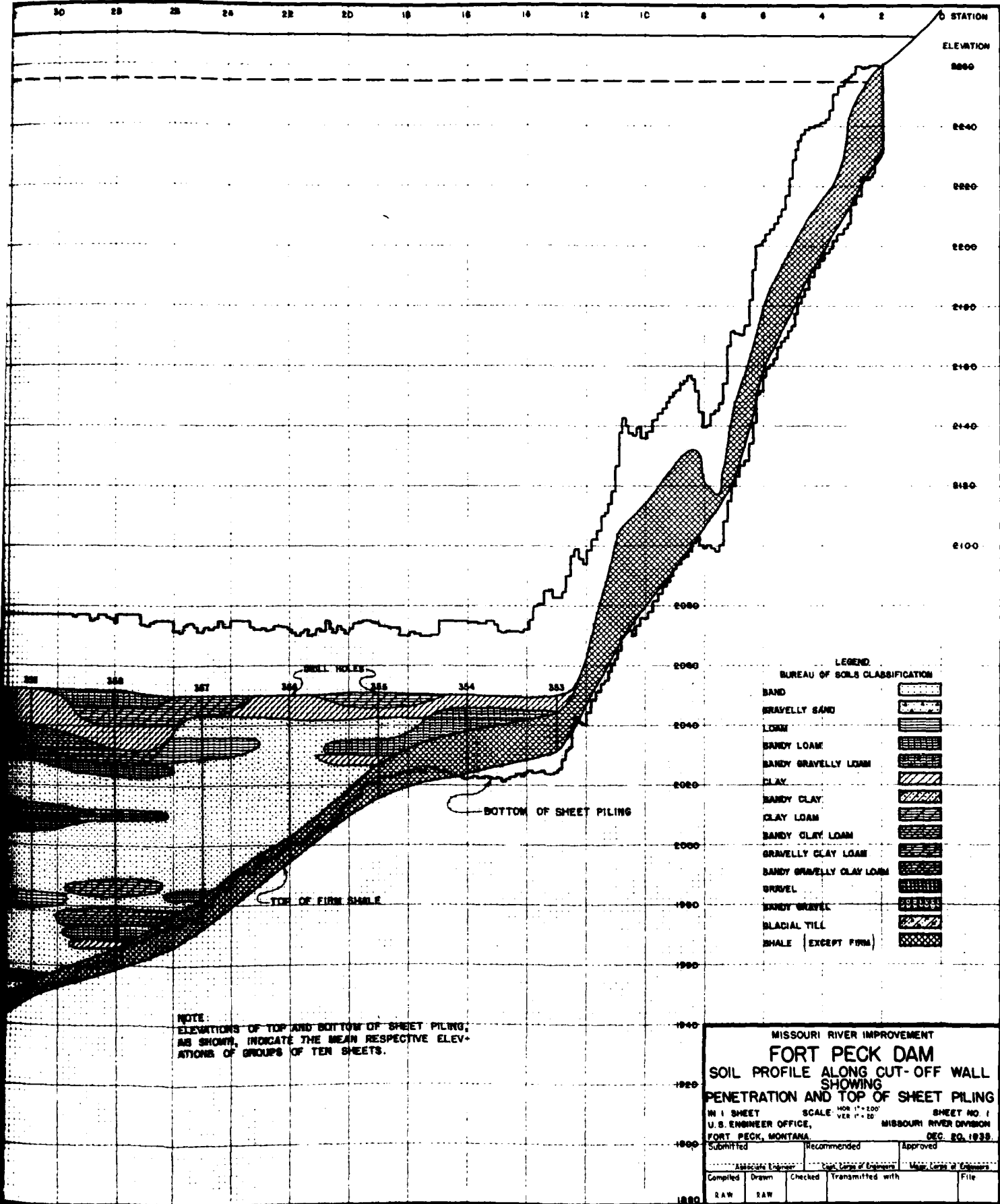


Figure 5

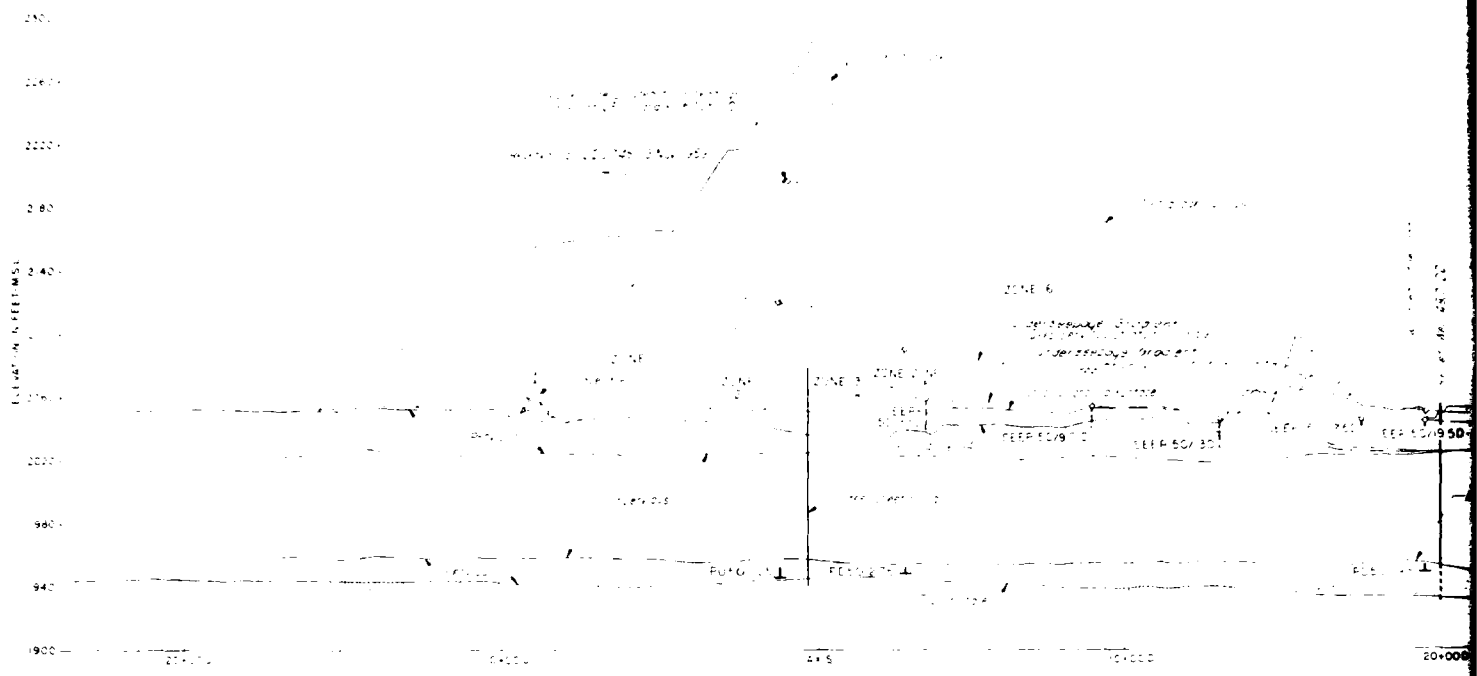
CORPS OF ENGINEERS, U. S. ARMY



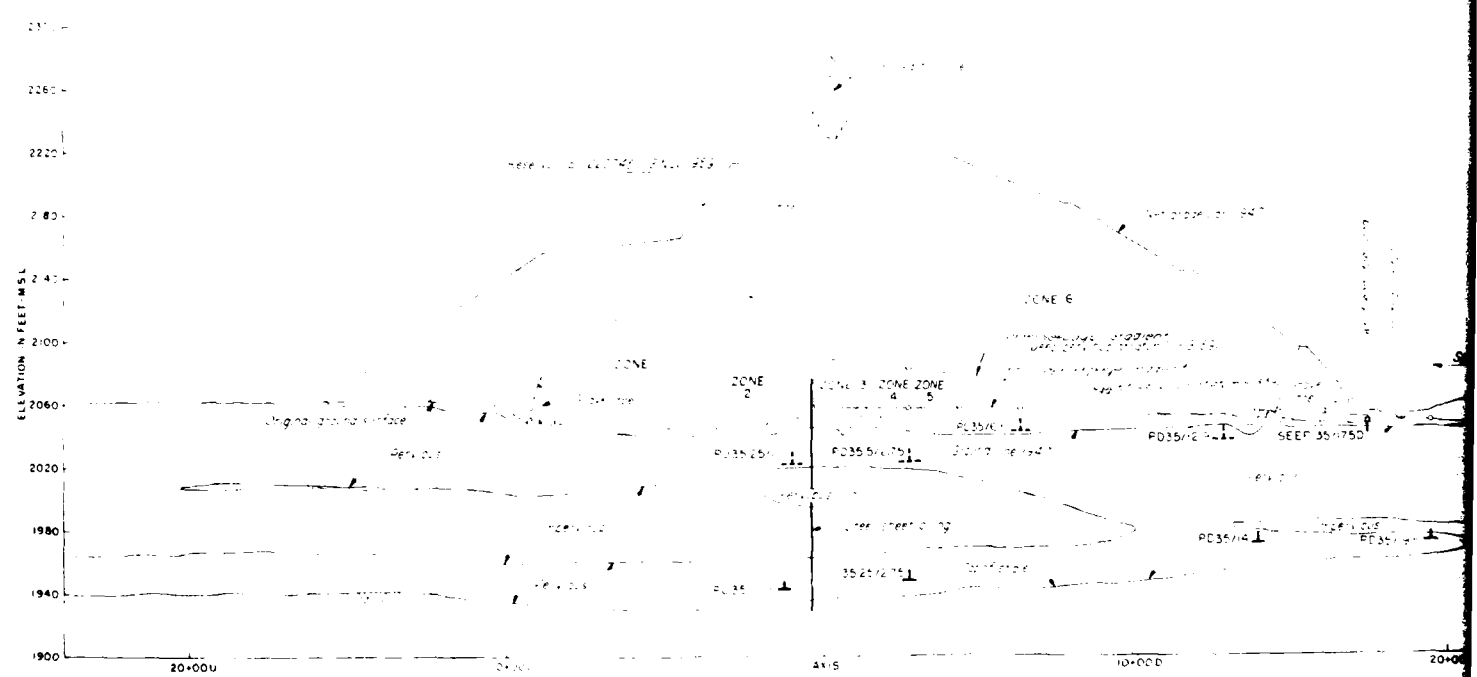
NOTE:
ELEVATIONS OF TOP AND BOTTOM OF SHEET PILING,
AS SHOWN, INDICATE THE MEAN RESPECTIVE ELEV-
ATIONS OF GROUPS OF TEN SHEETS.

MISSOURI RIVER IMPROVEMENT
FORT PECK DAM
 SOIL PROFILE ALONG CUT-OFF WALL
 SHOWING
 PENETRATION AND TOP OF SHEET PILING
 NO. 1 SHEET SCALE: HORIZ. 1" = 200' SHEET NO. 1
 U. S. ENGINEER OFFICE, VER. 1" = 20' MISSOURI RIVER DIVISION
 FORT PECK, MONTANA. DEC. 20, 1933.

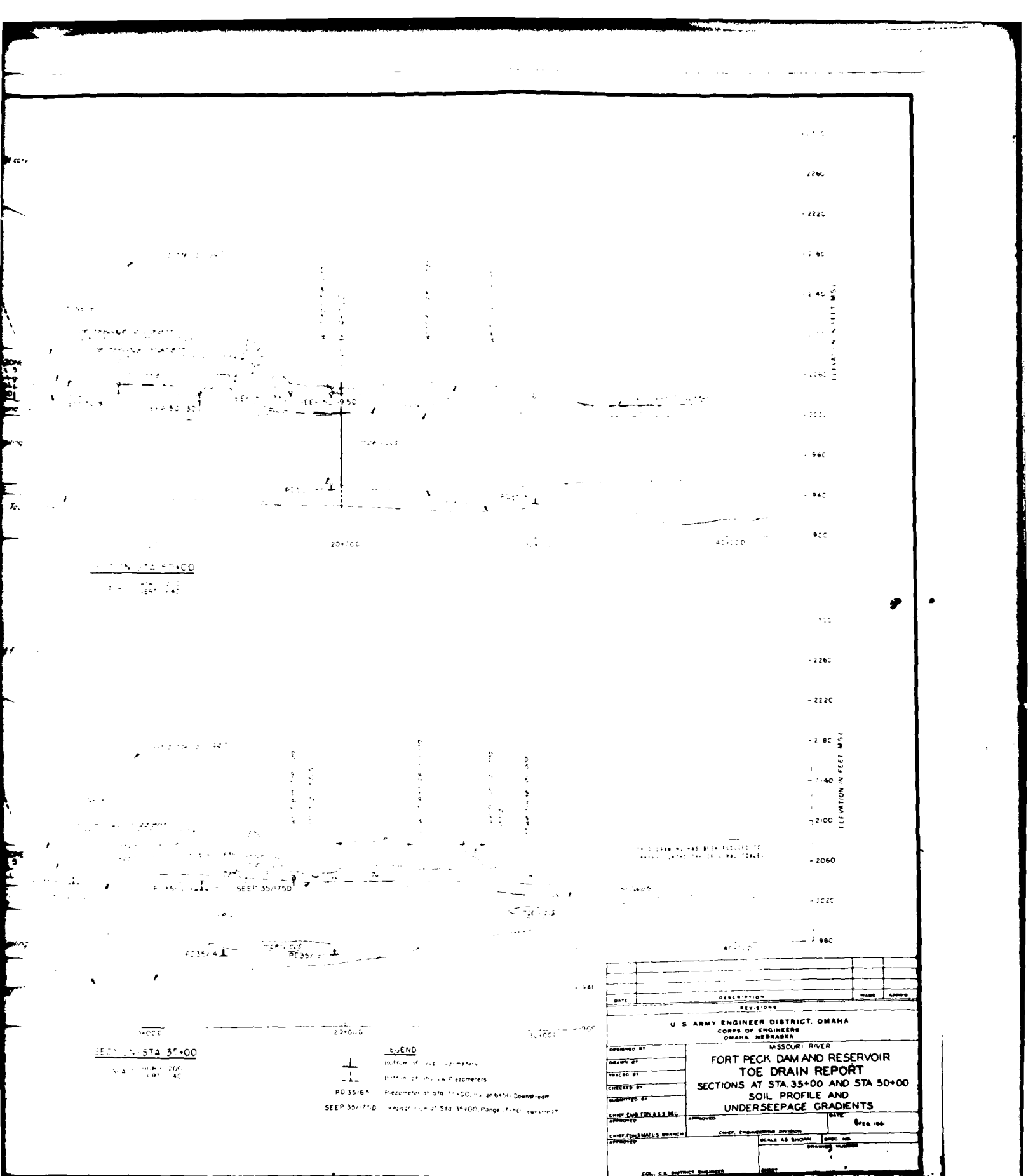
Submitted	Recommended	Approved
Associate Engineer	Capt. Corps of Engineers	Major, Corps of Engineers
Compiled	Drawn	Checked
RAW	RAW	RAW
Transmitted with		File



SECTION-STA 50+00
 SCALE: HORIZ. 1"=200'
 VERT. 1"=40'



SECTION-STA 35+00
 SCALE: HORIZ. 1"=200'
 VERT. 1"=40'



SECTION A-A STA 40+00
 SEE PLAN SHEET 7-2

SECTION B-B STA 35+00
 SEE PLAN SHEET 7-2

LEGEND
 ———— Bottom of Piezometer
 ———— Bottom of Piezometer
 PD 35/6A Piezometer at Sta 35+00, toe bank Downstream
 SEEP 35/75D Piezometer at Sta 35+00, Range 7500, Centerline

DATE	DESCRIPTION	MADE	APPROV
REVISIONS			
U S ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY	MISSOURI RIVER		
DRAWN BY	FORT PECK DAM AND RESERVOIR TOE DRAIN REPORT SECTIONS AT STA 35+00 AND STA 50+00 SOIL PROFILE AND UNDERSEEPAGE GRADIENTS		
CHECKED BY			
SUBMITTED BY			
DATE FOR RELEASE REC.			
CHEF OF DISTRICT'S BRANCH	CHEF ENGINEERING DIVISION	SCALE AS SHOWN	SPEC. NO.
DRAWING NUMBER		DRAWING NUMBER	

ELEVATION IN FEET - MSL

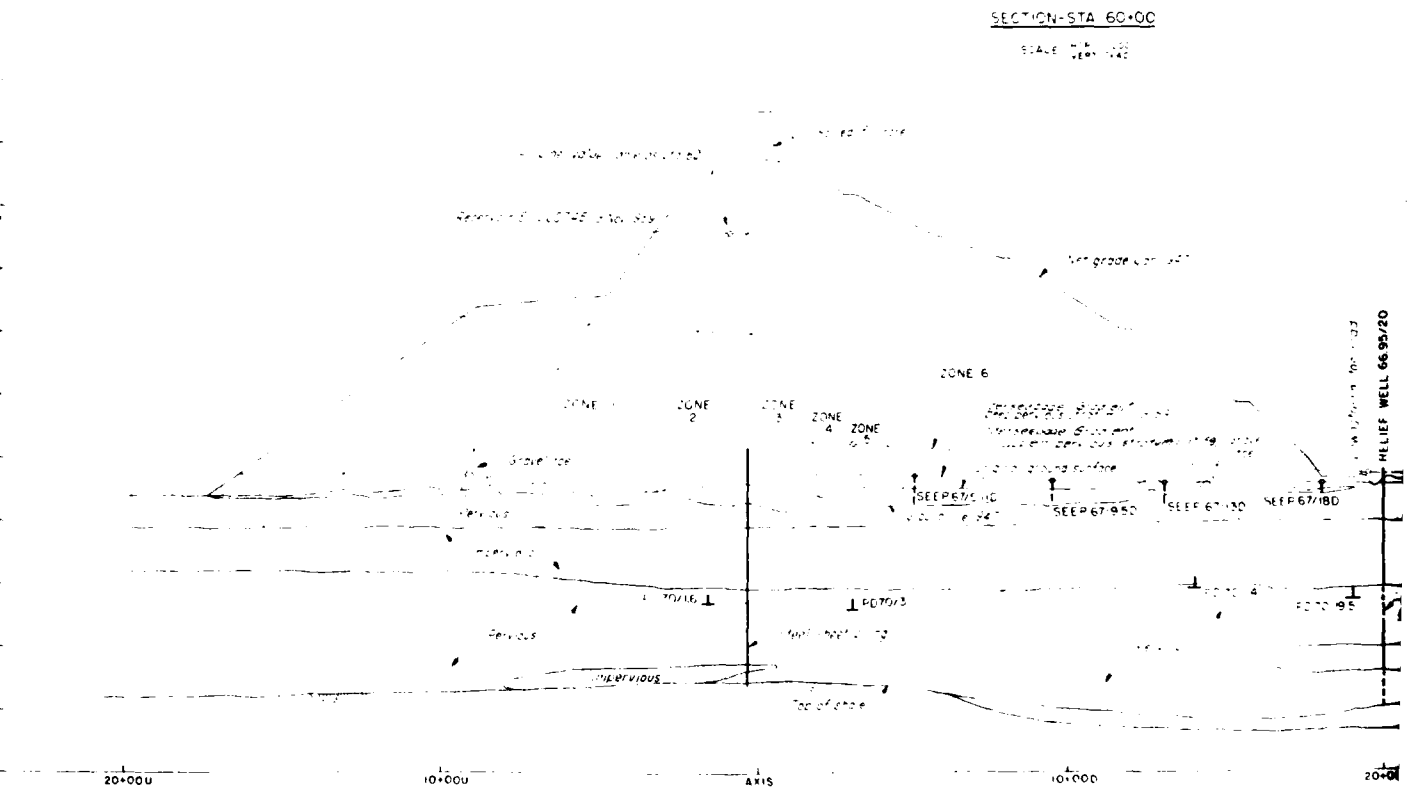
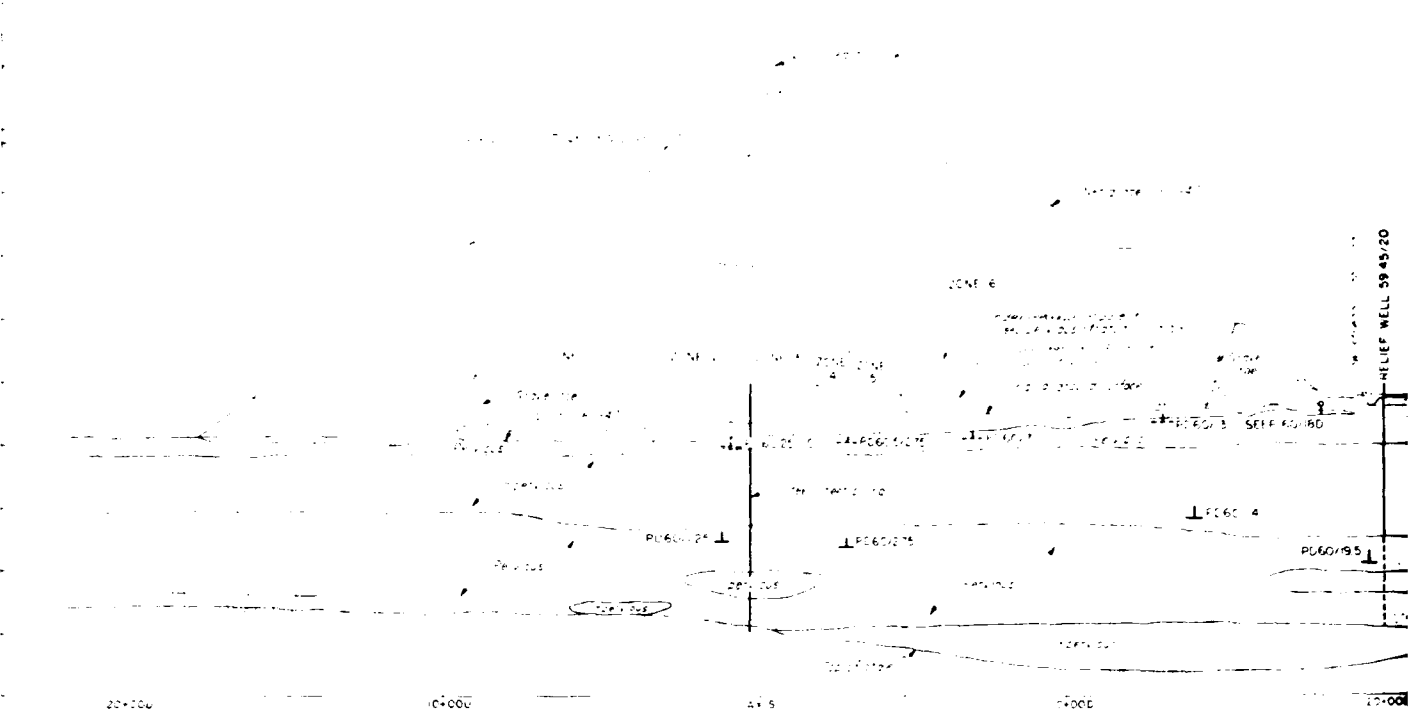
2300
2260
2220
2180
2140
2100
2060
2020
1980
1940
1900
1860

20+00 10+00 AXIS 10+00 20+00

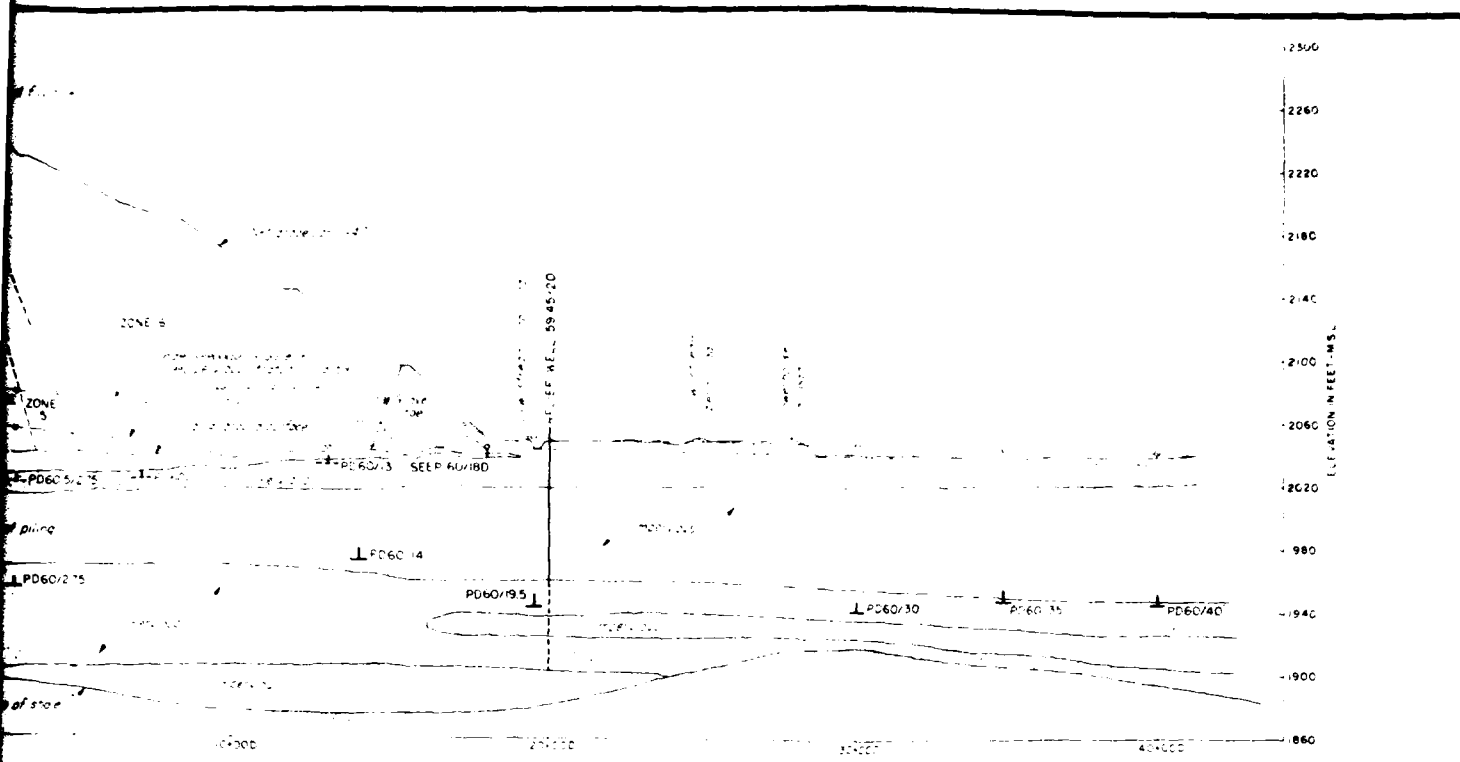
2300
2260
2220
2180
2140
2100
2060
2020
1980
1940
1900
1860

ELEVATION IN FEET - MSL

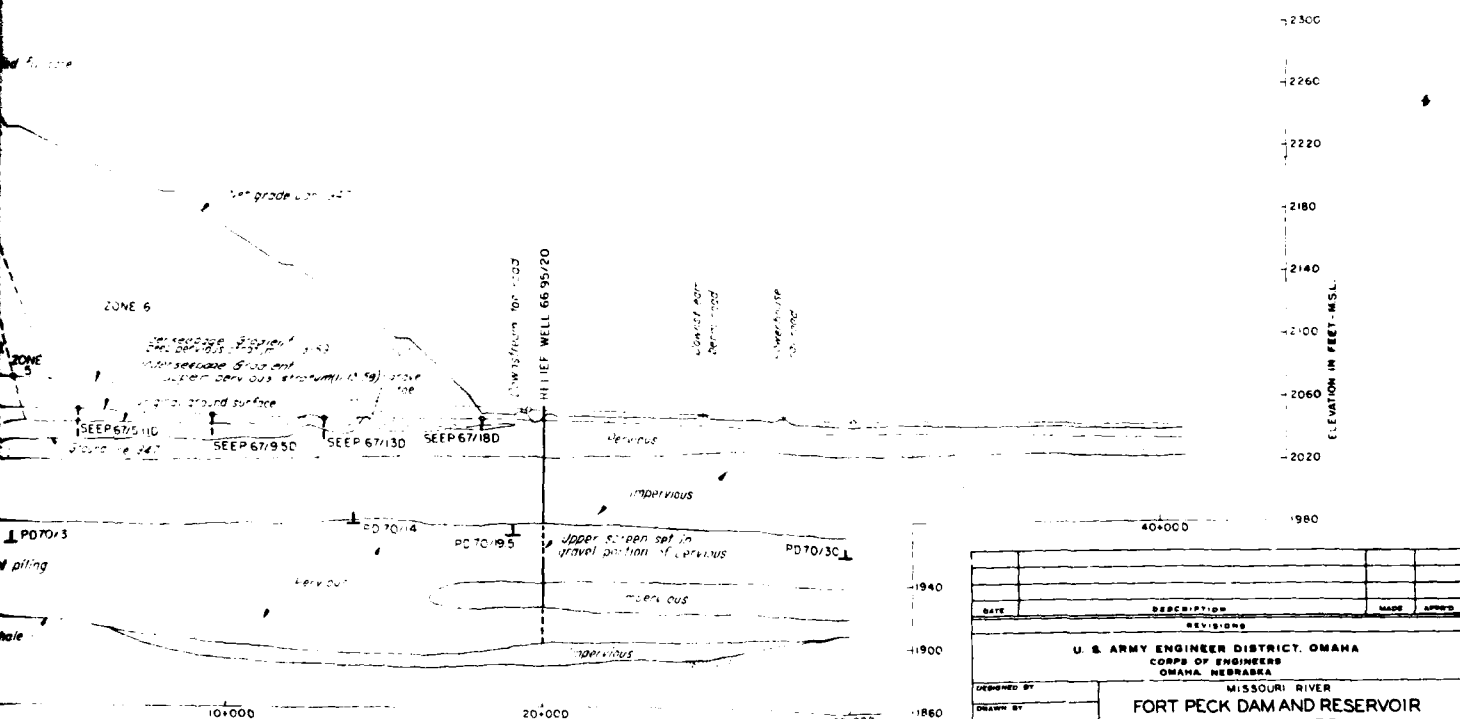
20+00 10+00 AXIS 10+00 20+00



RELIEF WELL 59 45/20
RELIEF WELL 56 95/20
RELIEF WELL 56 97/20
RELIEF WELL 56 98/20



SECTION - STA. 60+00
SCALE 1/4\"/>



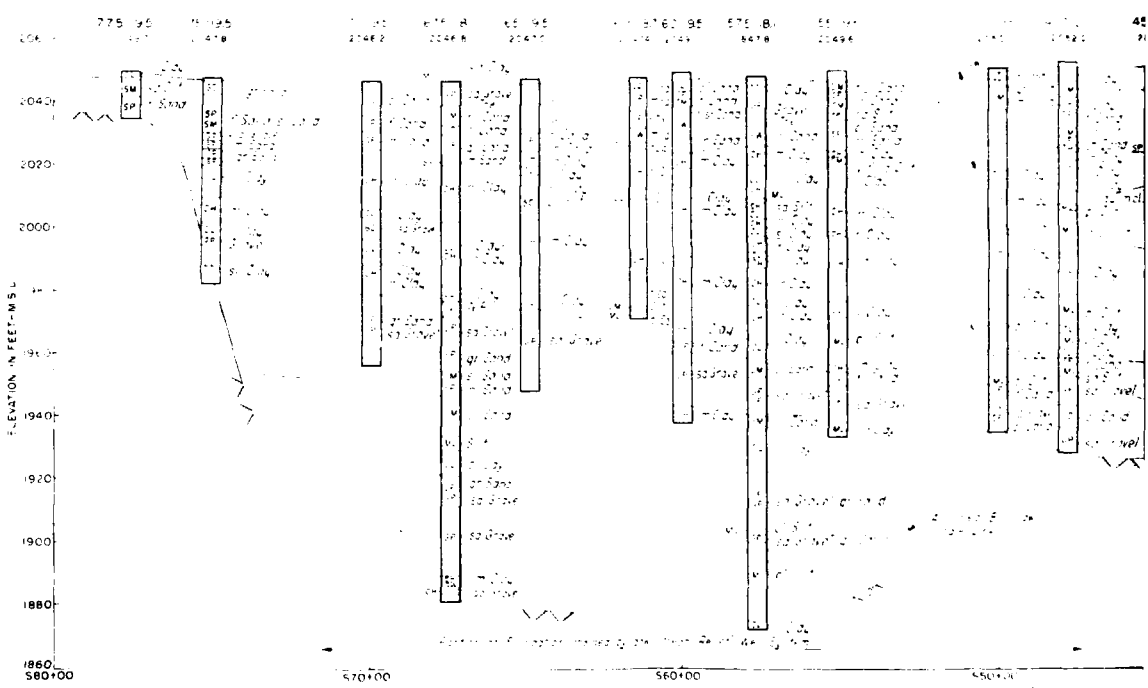
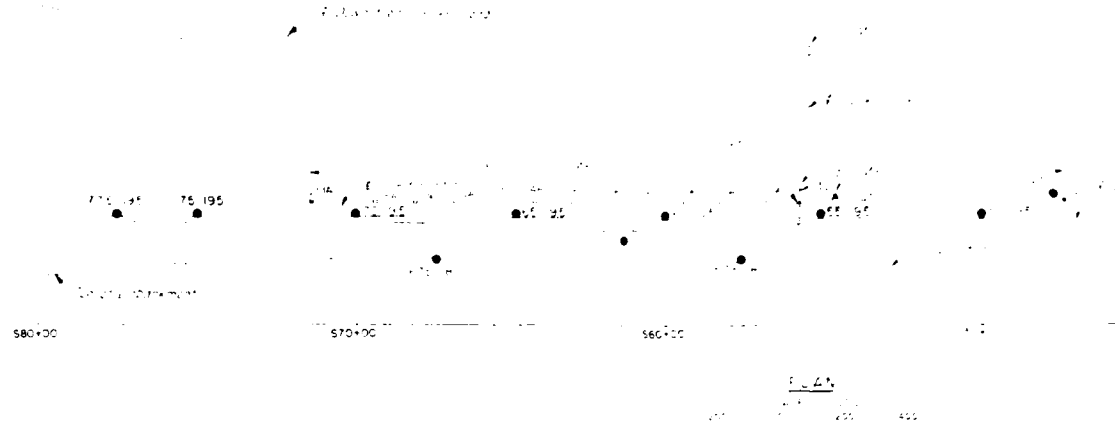
SECTION - STA. 67+00
SCALE 1/4\"/>

LEGEND
 1 Bottom of Deep Piezometers
 1 Bottom of Shallow Piezometers
 PD70/3 - Piezometer at Sta 70+00, Range 3+00 Downstream
 SEEP 67/130 - Seepage Pipe at Sta 67+00, Range 3+00 Downstream

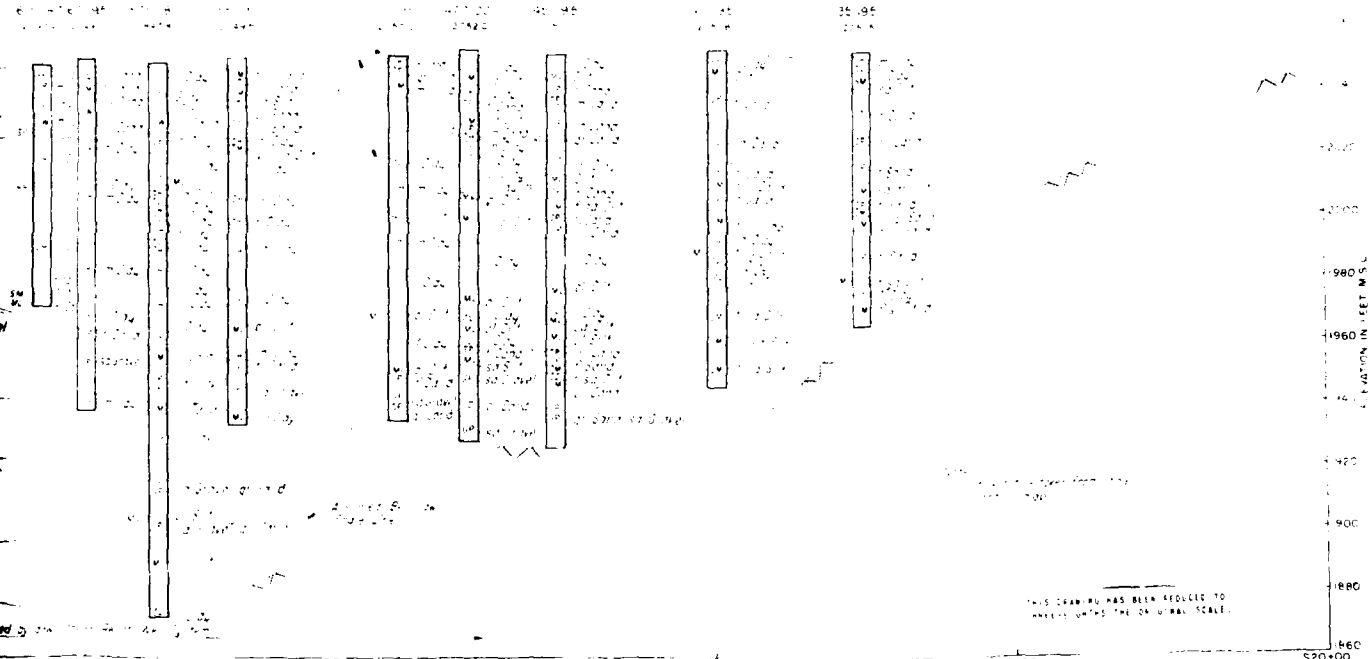
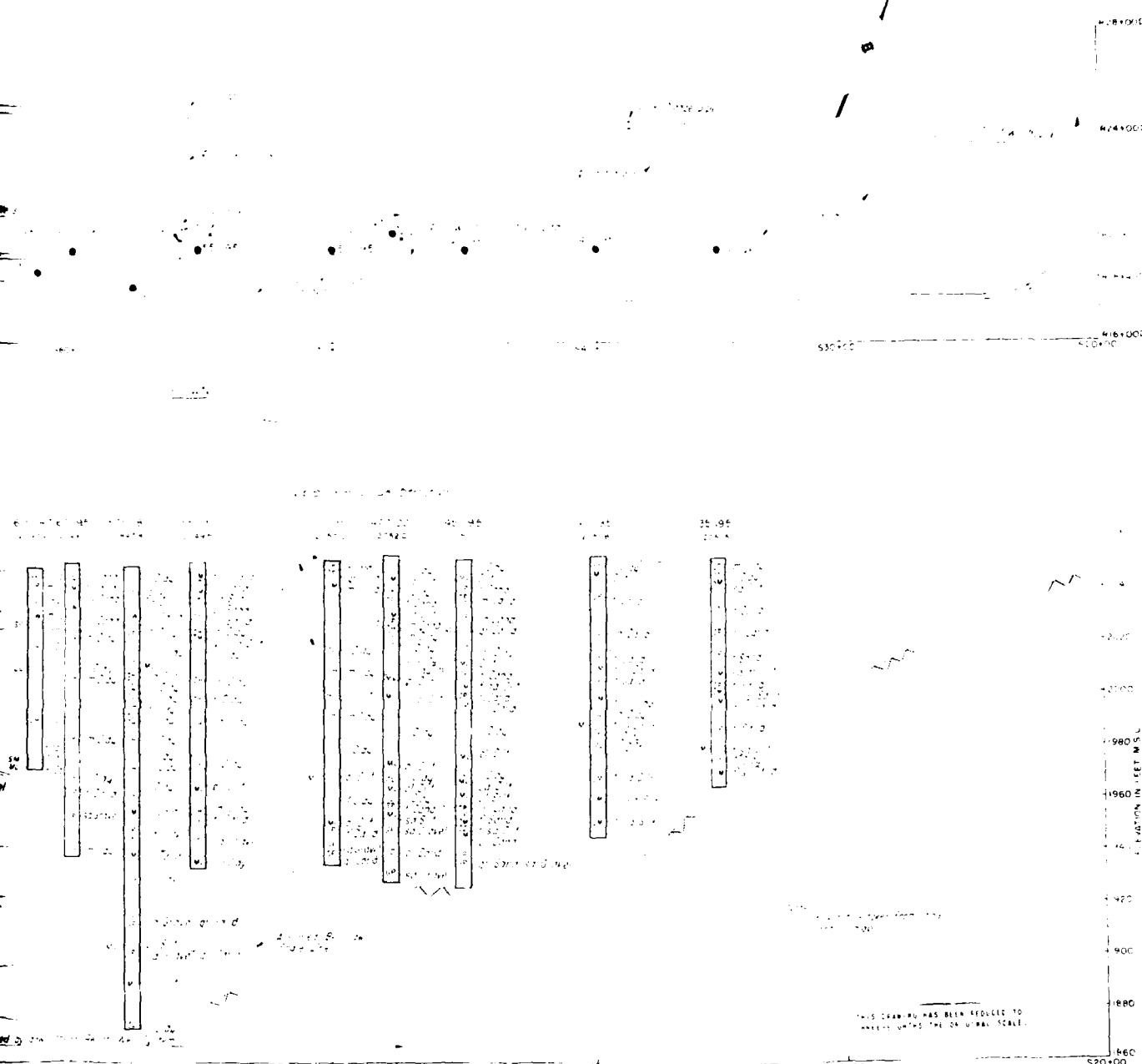
THIS DRAWING HAS BEEN REDUCED TO THREE-FIFTHS THE ORIGINAL SCALE.

DATE	DESCRIPTION	MADE	APPROV
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
MISSOURI RIVER			
FORT PECK DAM AND RESERVOIR TOE DRAIN REPORT			
SECTIONS AT STA 60+00 AND STA 67+00 SOIL PROFILE AND UNDERSEEPAGE GRADIENTS			
DESIGNED BY	CHIEF EMB. DIV. AREA 3		
DRAWN BY	CHIEF ENGINEERING DIVISION		
CHECKED BY	SCALE AS SHOWN		
SUBMITTED BY	SHEET NO.		
CHIEF EMB. DIV. AREA 3	APPROVED	FEB 1961	
CHIEF EMB. DIV. AREA 3	APPROVED	DRAWING NUMBER	
COL. G. A. DISTRICT ENGINEER			

144700
 144750
 144800
 144850
 144900
 144950
 145000



SOIL PROFILE - APPROXIMATELY 1900'
 SCALE: 1" = 120'
 HORIZ. = 1" = 200'

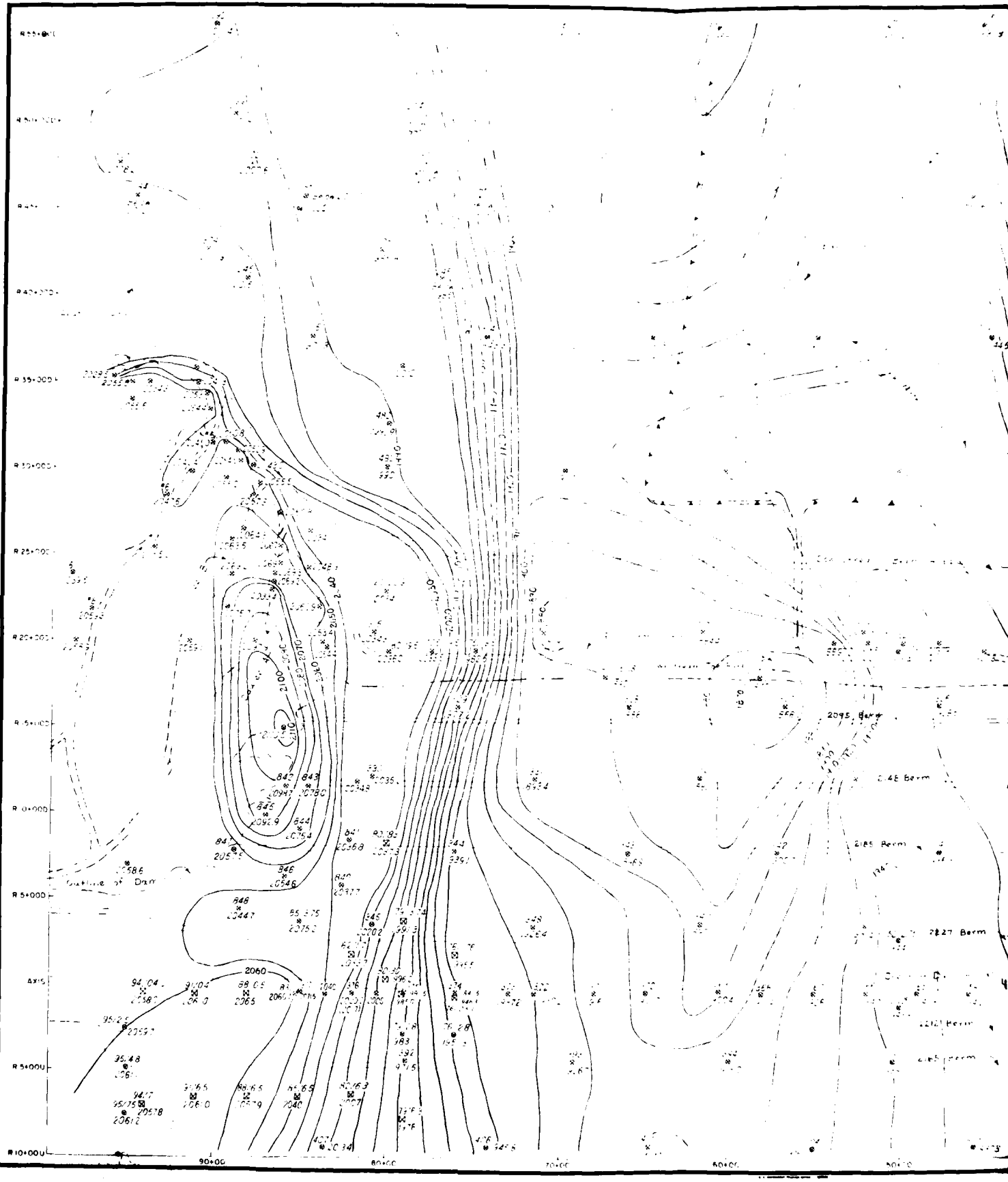


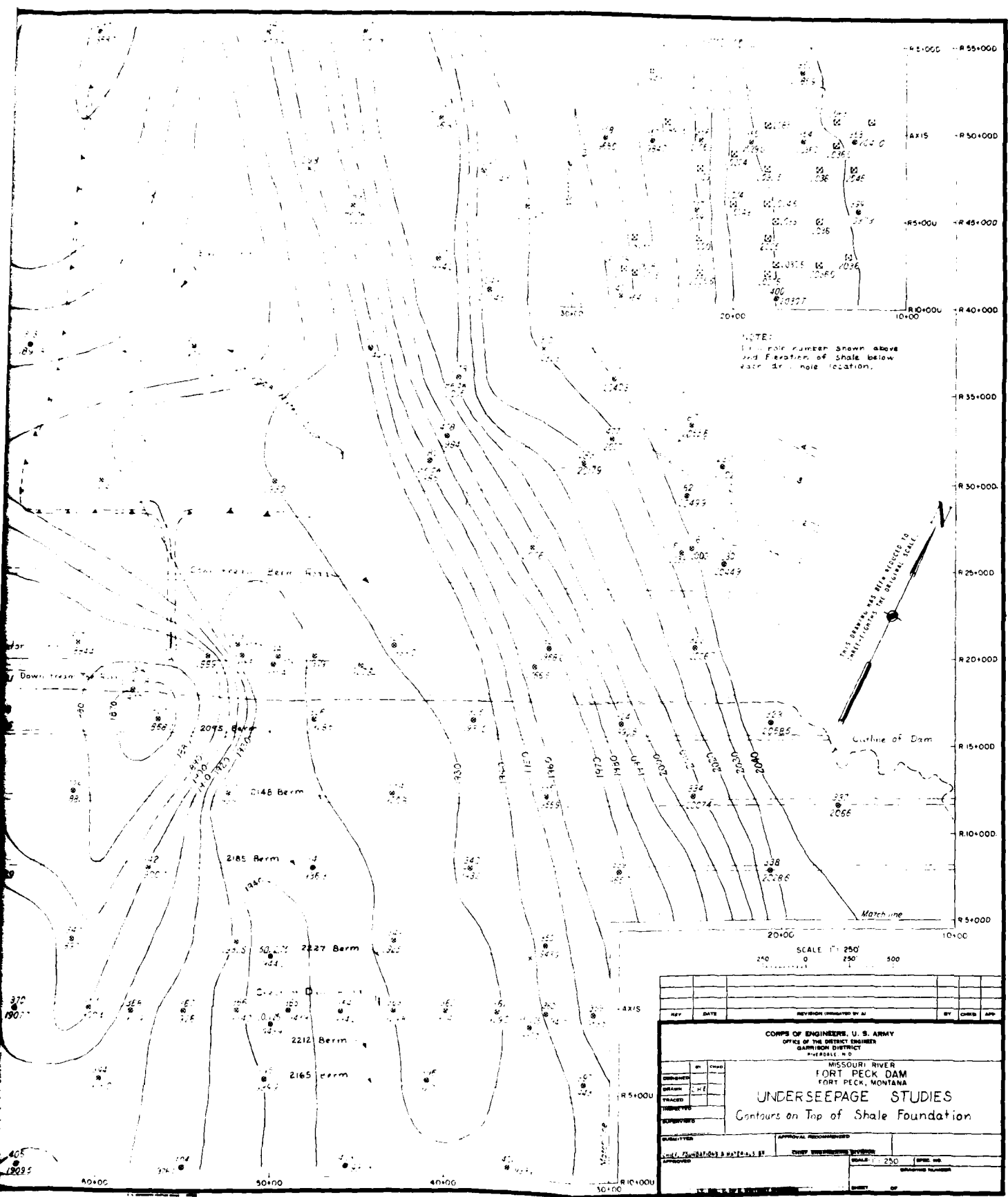
SOL PROFILE - APPROXIMATELY 1900' DS
 SCALE VERT 1:20
 SCALE HORIZ 1:200

THIS DRAWING HAS BEEN REDUCED TO
 FIT ON THIS SHEET ON A SMALL SCALE.

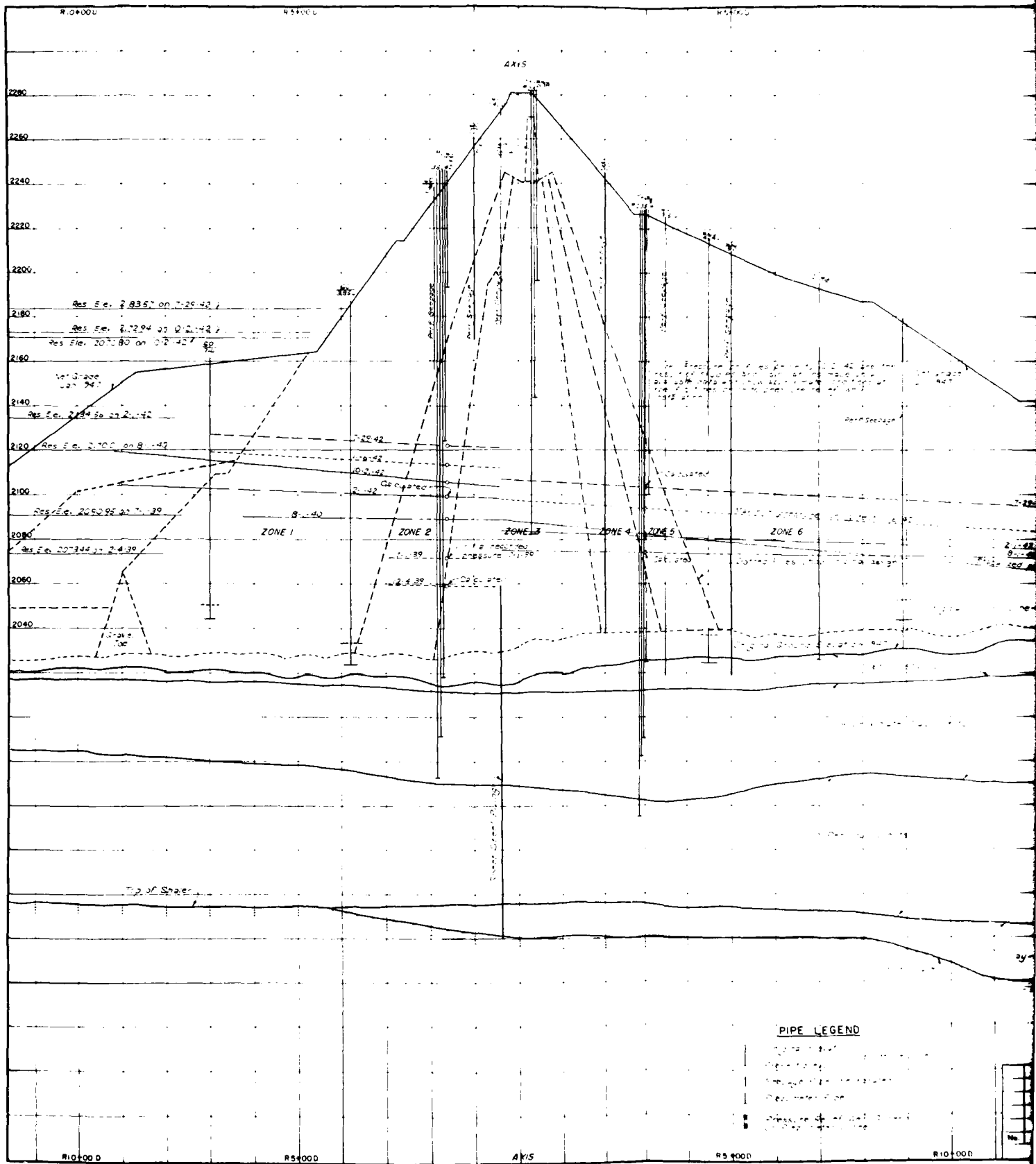
DATE	DESCRIPTION	MADE	APPROVED
DIVISION U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY DRAWN BY TRACED BY CHECKED BY SUBMITTED BY		MISSOURI RIVER FORT PECK DAM AND RESERVOIR TOE DRAIN REPORT SOL PROFILE R 19+00 D	
CHIEF ENGR. FDN. & B. SECT. APPROVED	APPROVED	CHIEF ENGINEERING DIVISION	DATE FEB 1964
CHIEF FDN. & B. BRANCH APPROVED	APPROVED	SCALE AS SHOWN SHEET NO.	DRAWING NUMBER
COL. C.E. DISTRICT ENGINEER			

2



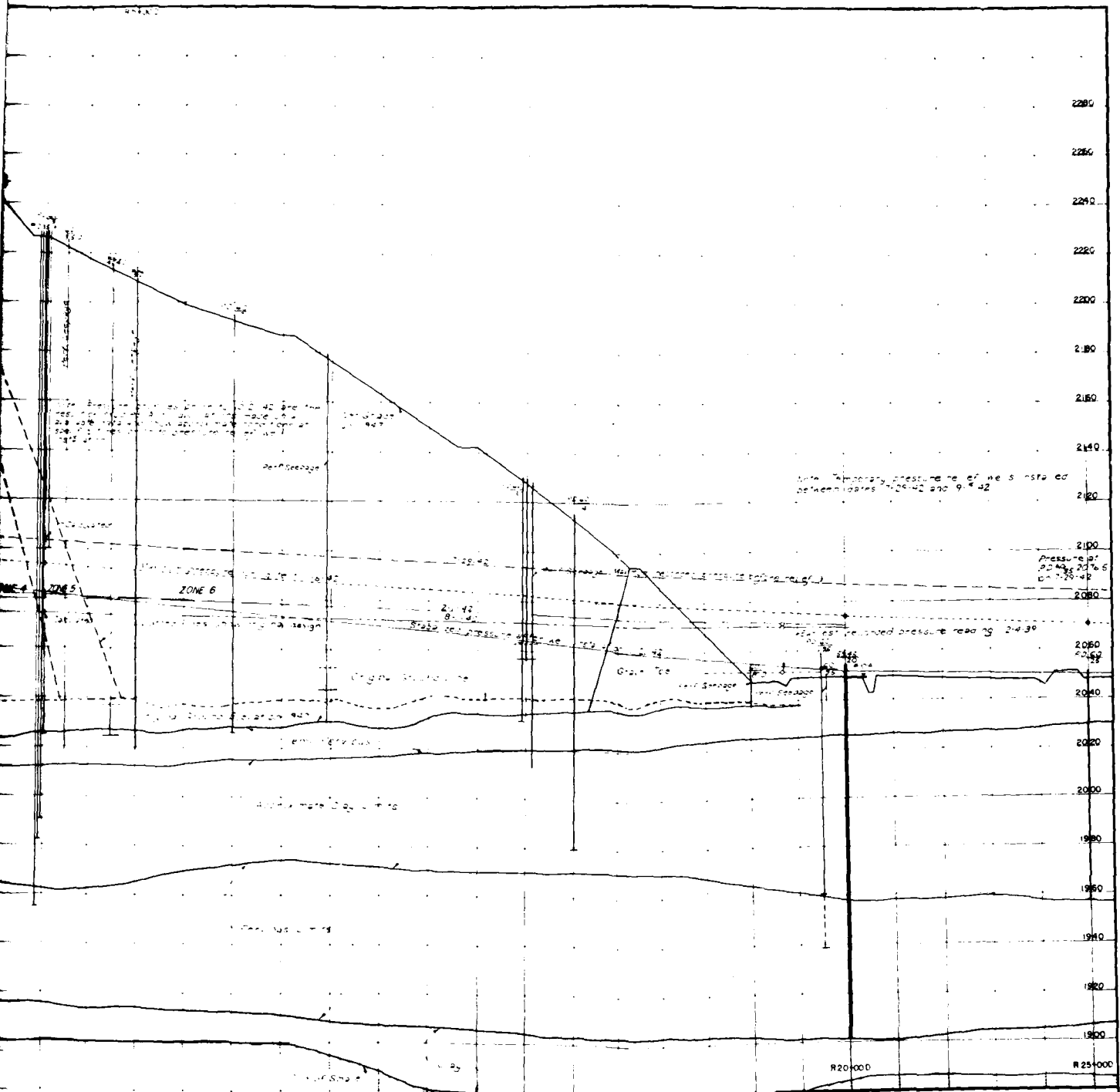


REV	DATE	REVISION (INITIALED BY)	BY	CHKD	APP
CORPS OF ENGINEERS, U. S. ARMY OFFICE OF THE DISTRICT ENGINEER GARRISON DISTRICT FORT SULLIVAN, M. O. MISSOURI RIVER FORT PECK DAM FORT PECK, MONTANA UNDER SEEPAGE STUDIES Contours on Top of Shale Foundation					
DESIGNED BY		APPROVAL AUTHORITY		SCALE: 1" = 250'	
CHECKED BY		DATE		SHEET NO.	
DRAWN BY		PROJECT NO.		DRAWING NO.	
IN CHARGE		APPROVED		DATE	



PIPE LEGEND

- Cased
- - - Perforated
- Cased
- Cased
- Cased
- Cased



PIPE LEGEND

- 12" dia. pipe
- 18" dia. pipe
- 24" dia. pipe
- 30" dia. pipe
- 36" dia. pipe
- 42" dia. pipe
- 48" dia. pipe
- 54" dia. pipe
- 60" dia. pipe
- 66" dia. pipe
- 72" dia. pipe
- 78" dia. pipe
- 84" dia. pipe
- 90" dia. pipe
- 96" dia. pipe
- 102" dia. pipe
- 108" dia. pipe
- 114" dia. pipe
- 120" dia. pipe
- 126" dia. pipe
- 132" dia. pipe
- 138" dia. pipe
- 144" dia. pipe
- 150" dia. pipe
- 156" dia. pipe
- 162" dia. pipe
- 168" dia. pipe
- 174" dia. pipe
- 180" dia. pipe
- 186" dia. pipe
- 192" dia. pipe
- 198" dia. pipe
- 204" dia. pipe
- 210" dia. pipe
- 216" dia. pipe
- 222" dia. pipe
- 228" dia. pipe
- 234" dia. pipe
- 240" dia. pipe
- 246" dia. pipe
- 252" dia. pipe
- 258" dia. pipe
- 264" dia. pipe
- 270" dia. pipe
- 276" dia. pipe
- 282" dia. pipe
- 288" dia. pipe
- 294" dia. pipe
- 300" dia. pipe

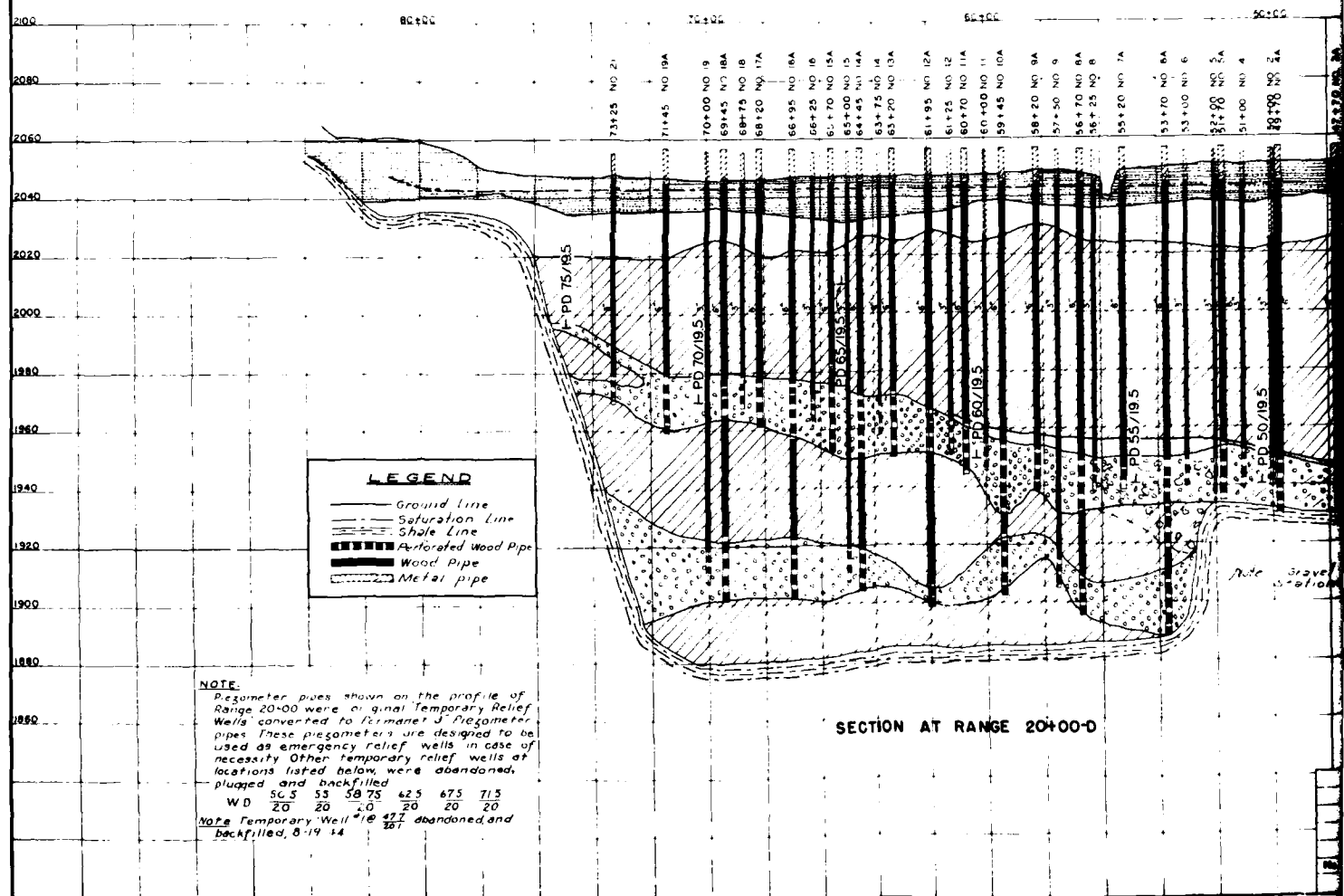
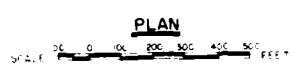
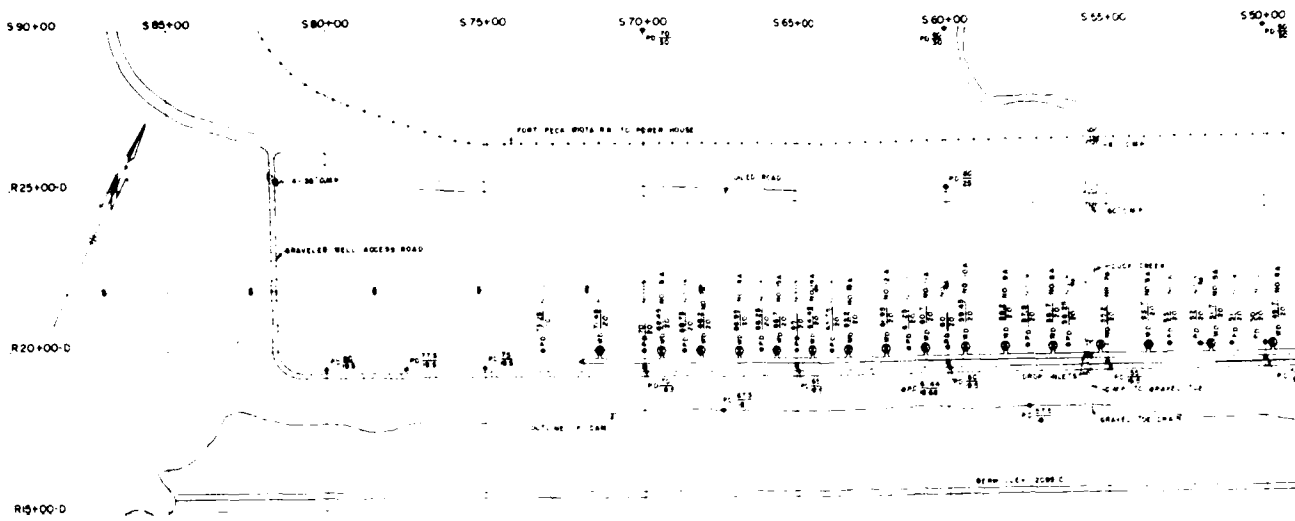
No.	Description	Date	App'd

MISSOURI RIVER IMPROVEMENT
FORT PECK DAM
 SUMMARY OF HYDROSTATIC PRESSURE
 BENEATH CLAY STRATUM
 1939 TO 1942 INCL.
 STATION 60+00

NO. SHEETS: _____ SHEET NO. _____
 FORT PECK DISTRICT, FORT PECK, MONTANA
 Submitted: _____ Approved: _____
 HEAD FIELD DISTRICT ENGINEER: _____ CHIEF ENGINEERING DIVISION: _____
 DRAWN BY: _____ TRANSMITTED WITH LETTERS: _____
 CHECKED BY: _____ DATE: _____

6296.97 -1-11

2



LEGEND

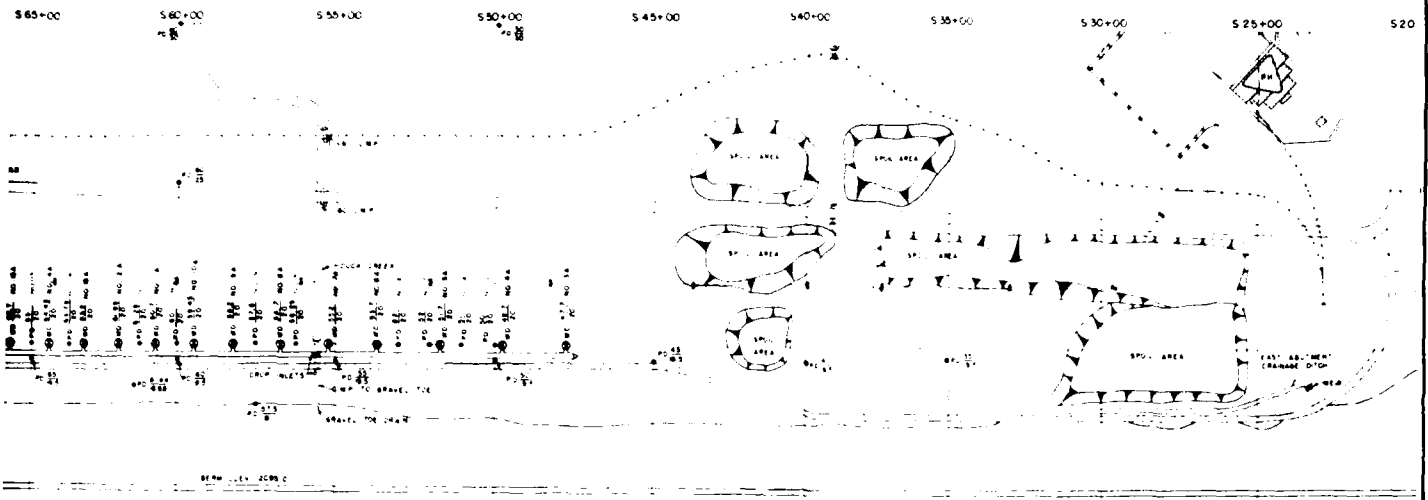
- Ground Line
- - - Saturation Line
- Shale Line
- ▨ Perforated Wood Pipe
- ▩ Wood Pipe
- ▧ Metal Pipe

NOTE:
 Piezometer pipes shown on the profile of Range 20-00 were original Temporary Relief Wells converted to Permanent Piezometer pipes. These piezometers are designed to be used as emergency relief wells in case of necessity. Other temporary relief wells at locations listed below, were abandoned, plugged and backfilled.

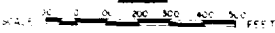
WD	50.5	53	58	75	62.5	67.5	71.5
	20	20	20	20	20	20	20

Note: Temporary Well #10 at 41.7 abandoned and backfilled, 8-19-34

SECTION AT RANGE 20+00-D

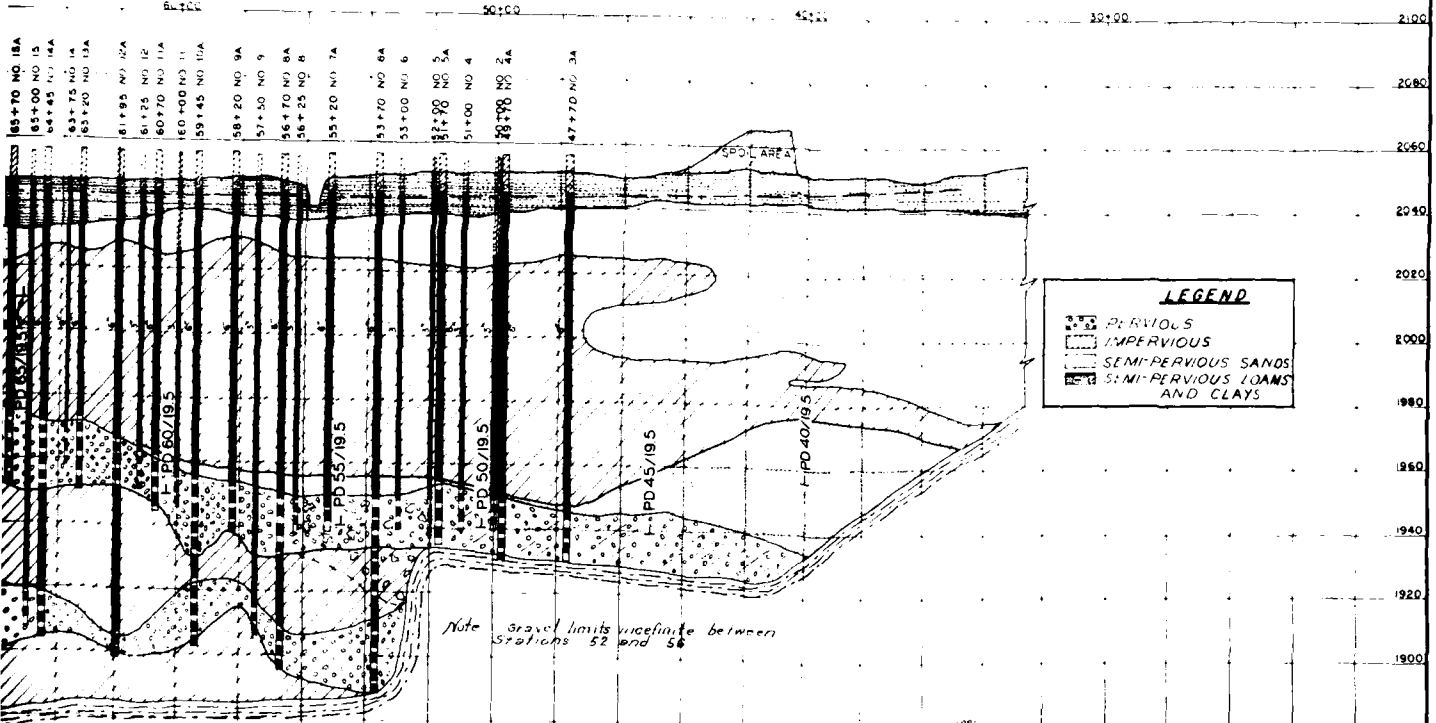


PLAN



LEGEND

- Permanent Pressure Relief Well
- Piezometer Pipe Installation



LEGEND

- PERMEABLE
- IMPERMEABLE
- SEMI-PERMEABLE SANDS
- SEMI-PERMEABLE LOAMS AND CLAYS

SECTION AT RANGE 20+00-D

MISSOURI RIVER IMPROVEMENT
FORT PECK DAM
 PERMANENT WELL RELIEF SYSTEM
 AND
 PERMANENT PIEZOMETER INSTALLATIONS
 ALONG RANGE 20+00-D

IN SHEETS SCALE AS SHOWN SHEET NO.

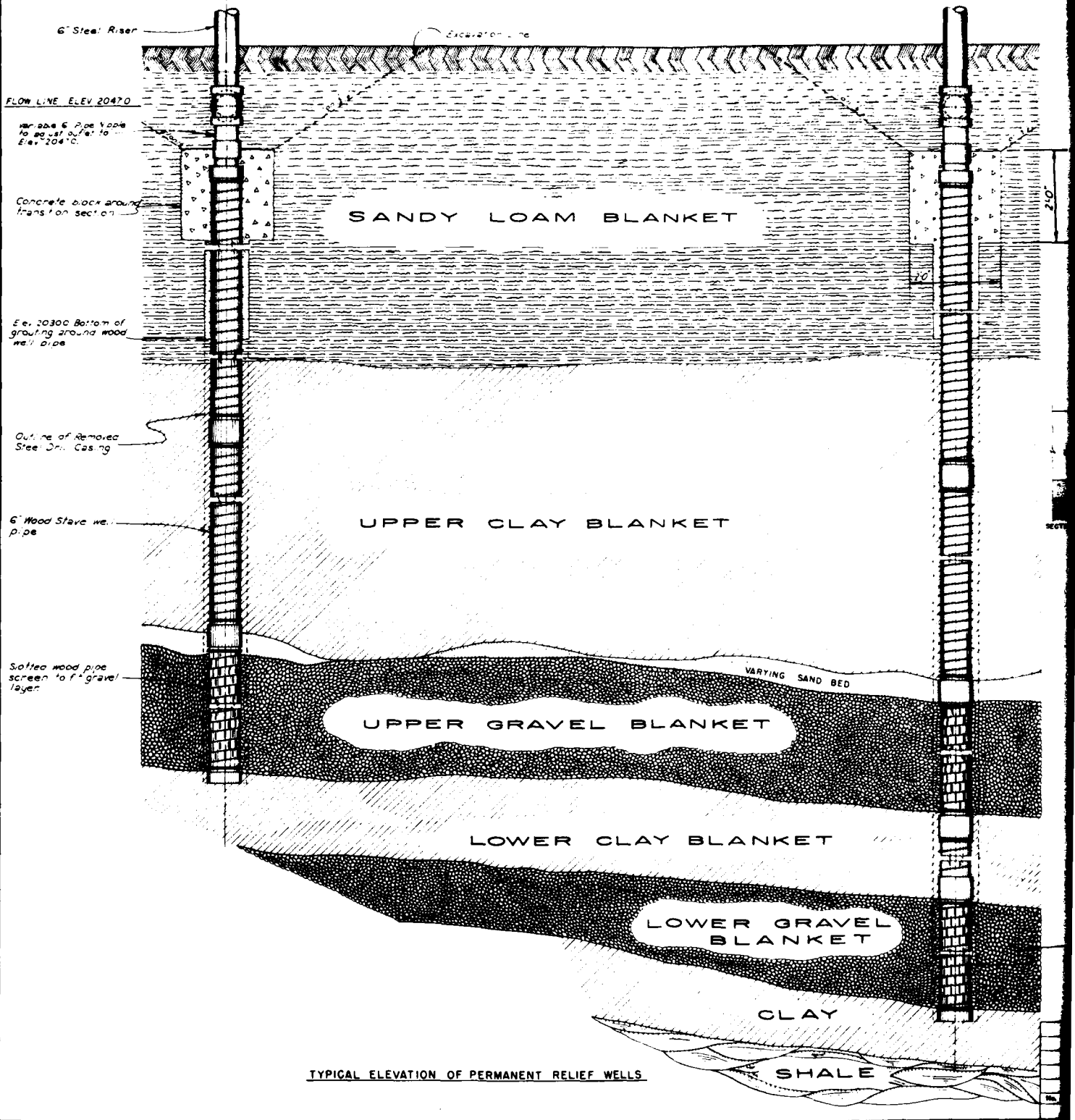
Submitted	Approval Recommended	Approved
ENGINEER	CIVIL ENGINEER	NO. CORPS OF ENGINEERS
Drawn: J.W.	Checked: P.F.G.	File No. 6296.93A-6A

No.	Description	Date	App'd
	REVISIONS		

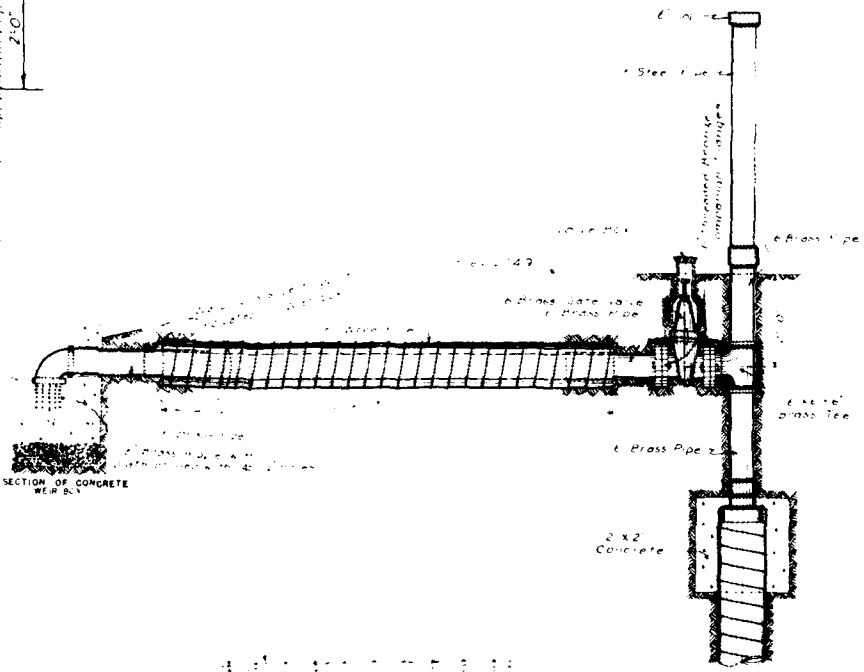
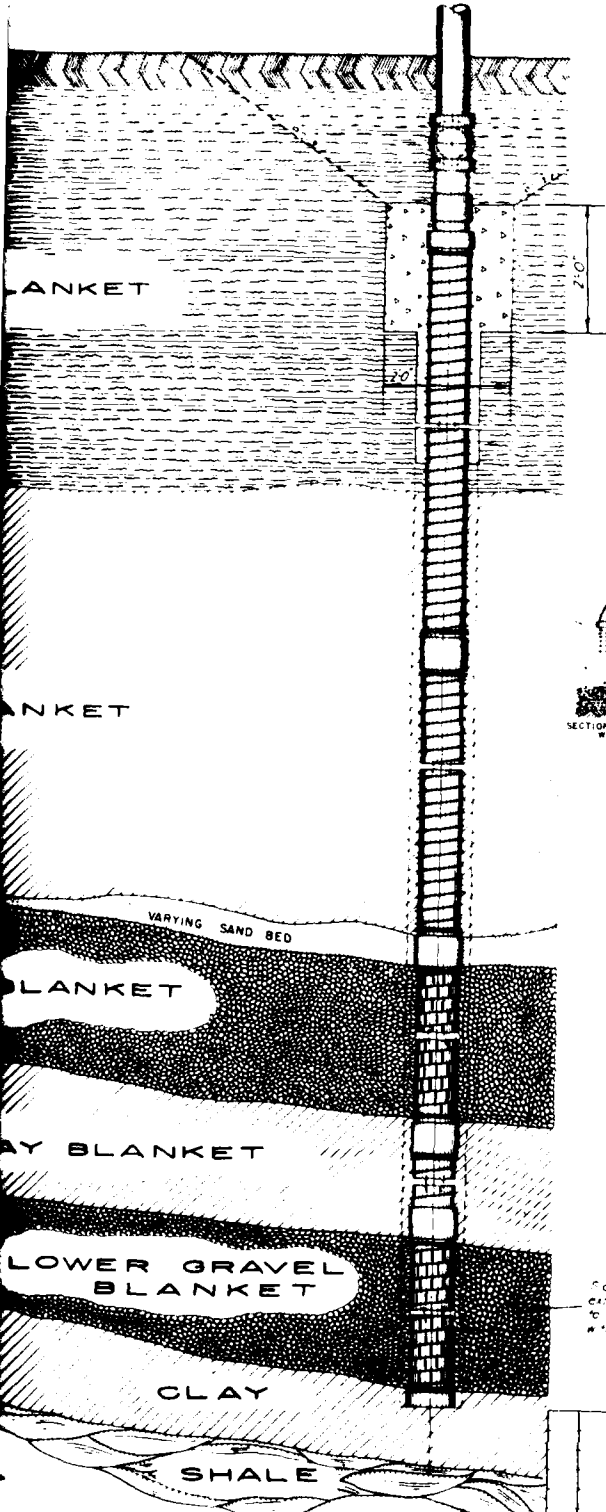
2

TYPICAL WELL INSTALLATION
TAPPING UPPER GRAVEL BLANKET ONLY.

TYPICAL WELL INSTALLATION
TAPPING BOTH UPPER AND LOWER
GRAVEL BLANKETS



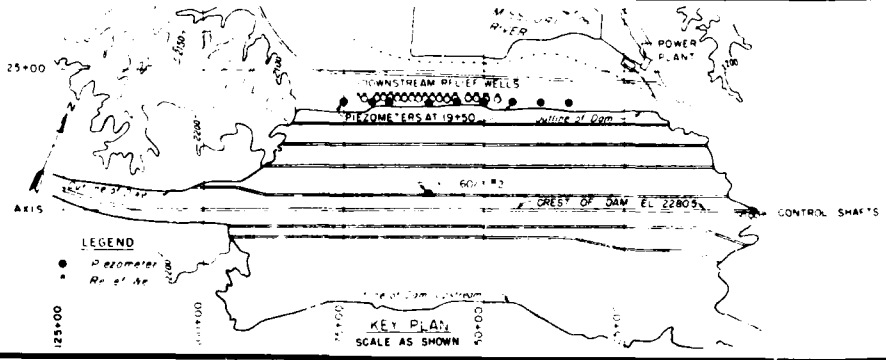
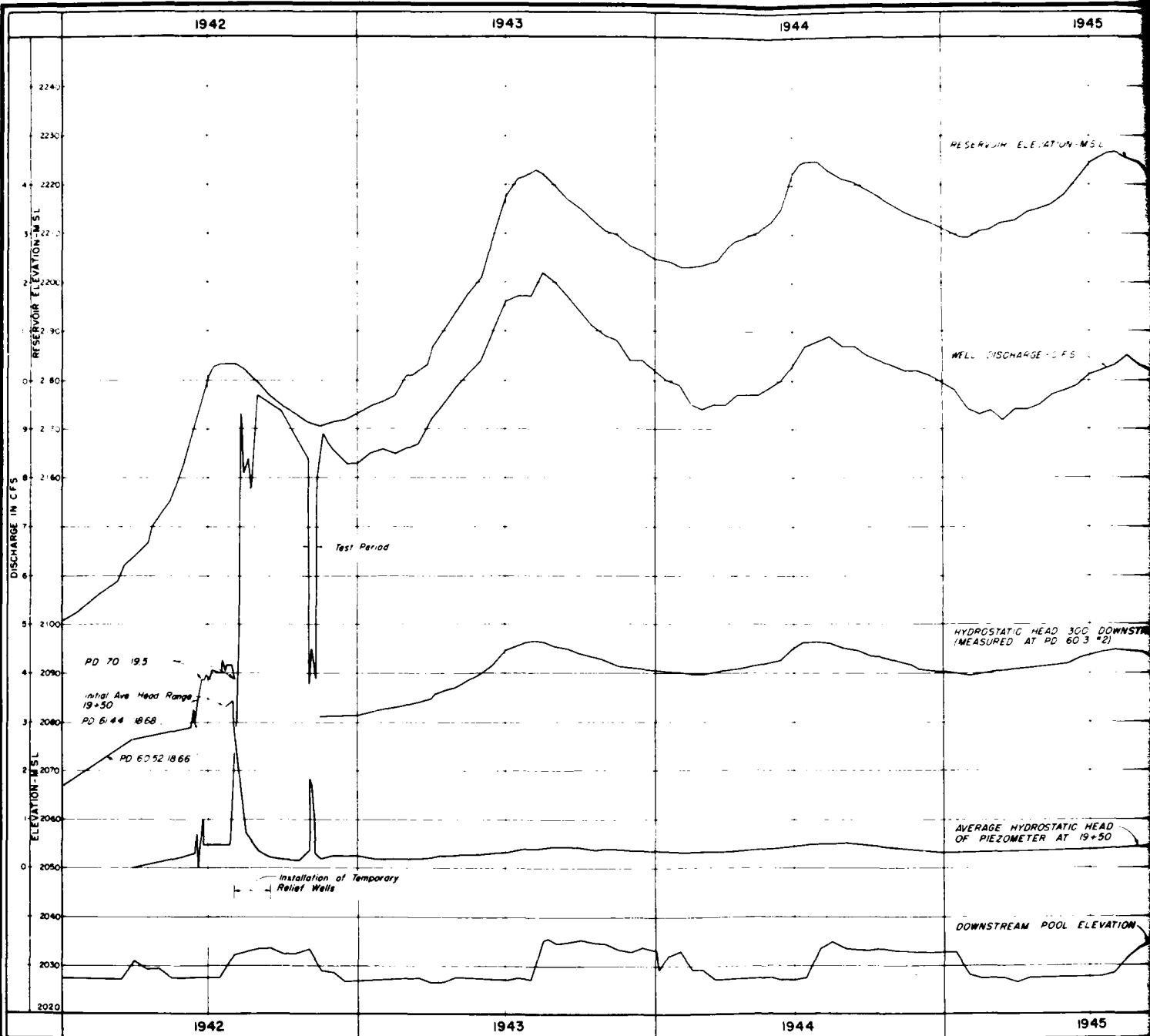
TYPICAL WELL INSTALLATION
TAPPING BOTH UPPER AND LOWER
GRAVEL BLANKETS

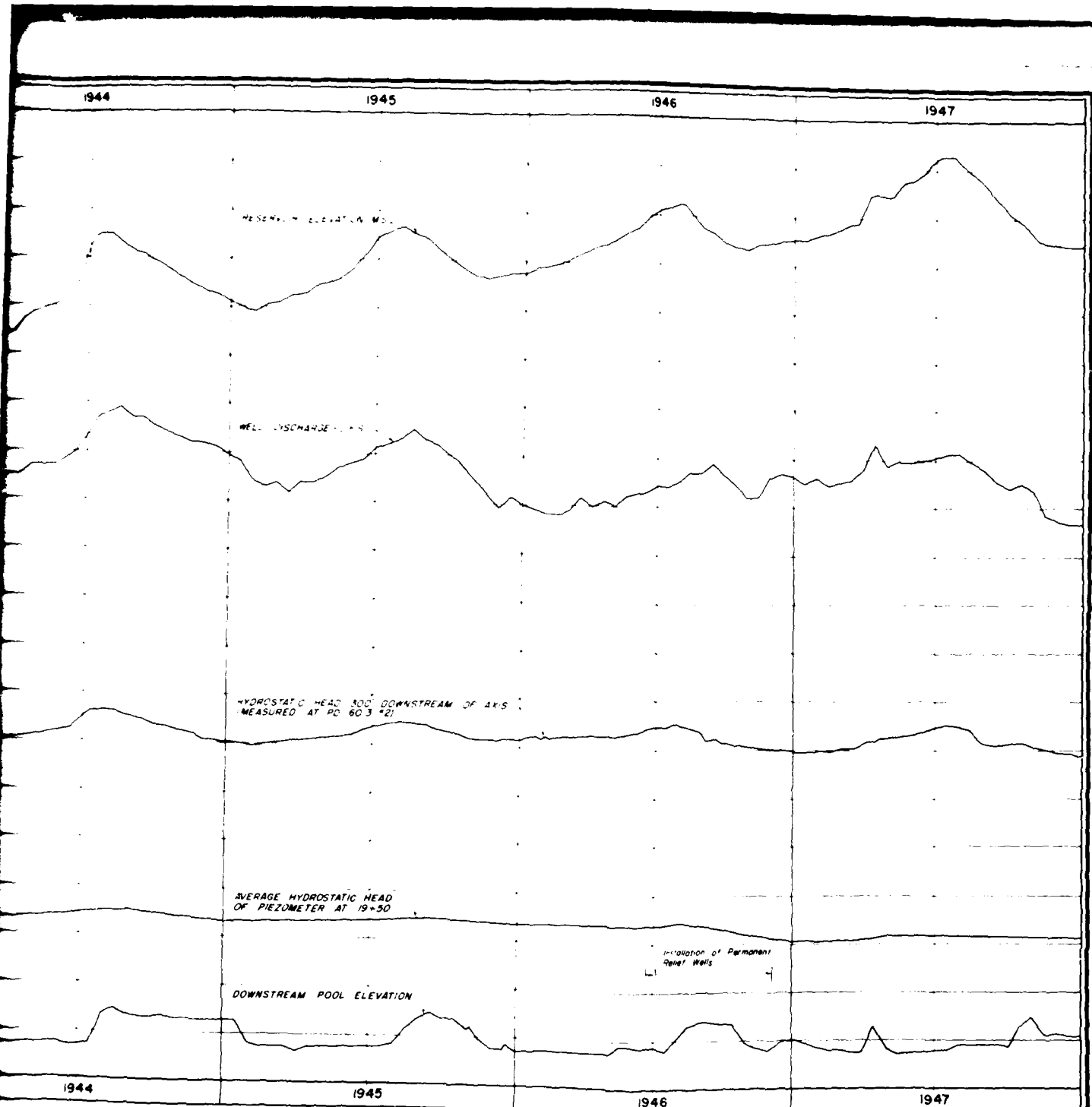


TYPICAL RELIEF WELL DISCHARGE FEATURES

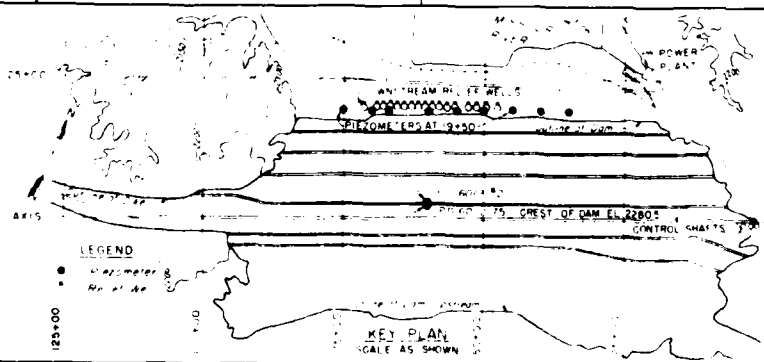
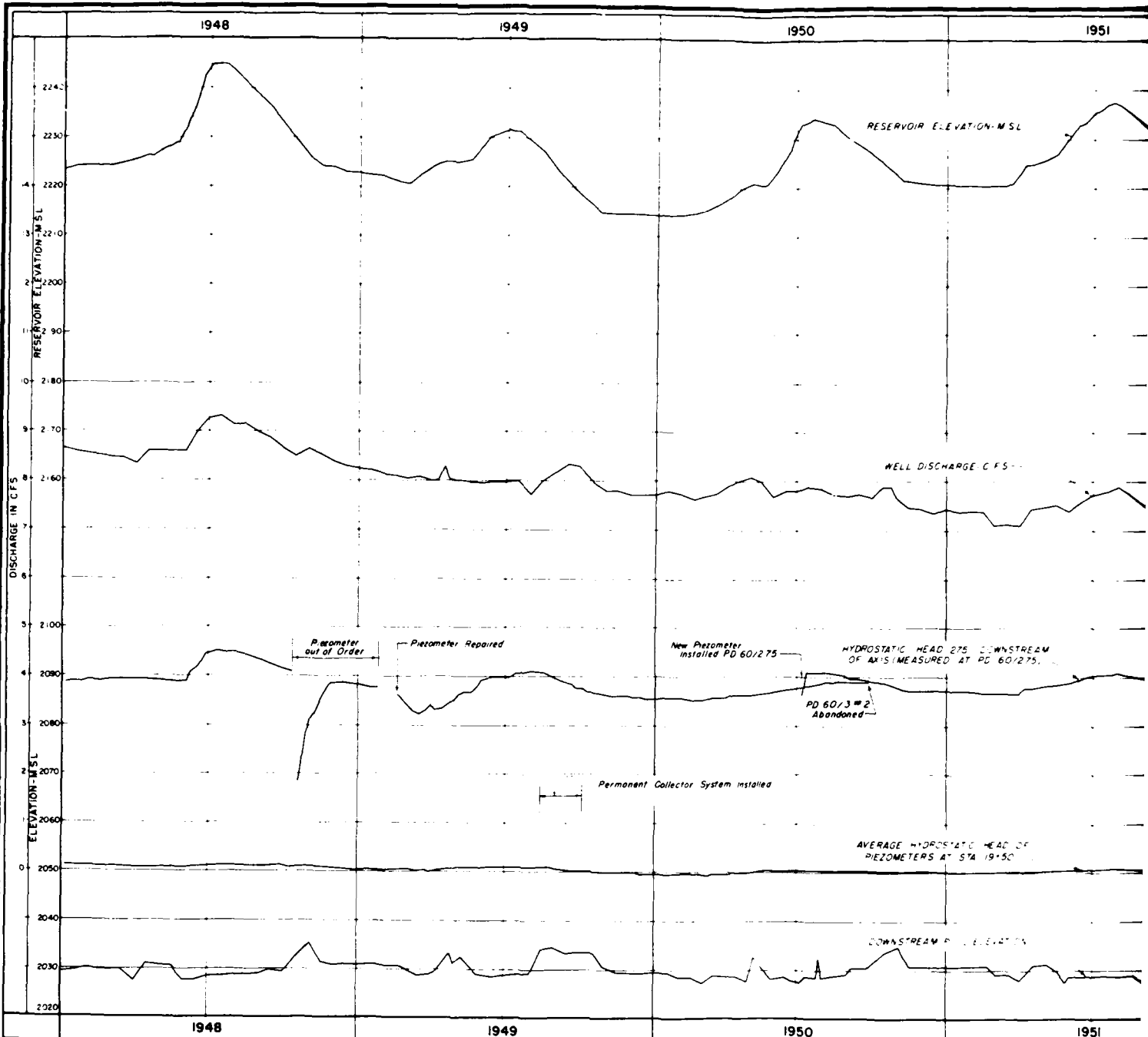
Notes of B₁ Plug Section may extend below Gravel in order to fit a other screen sections with gravel limits

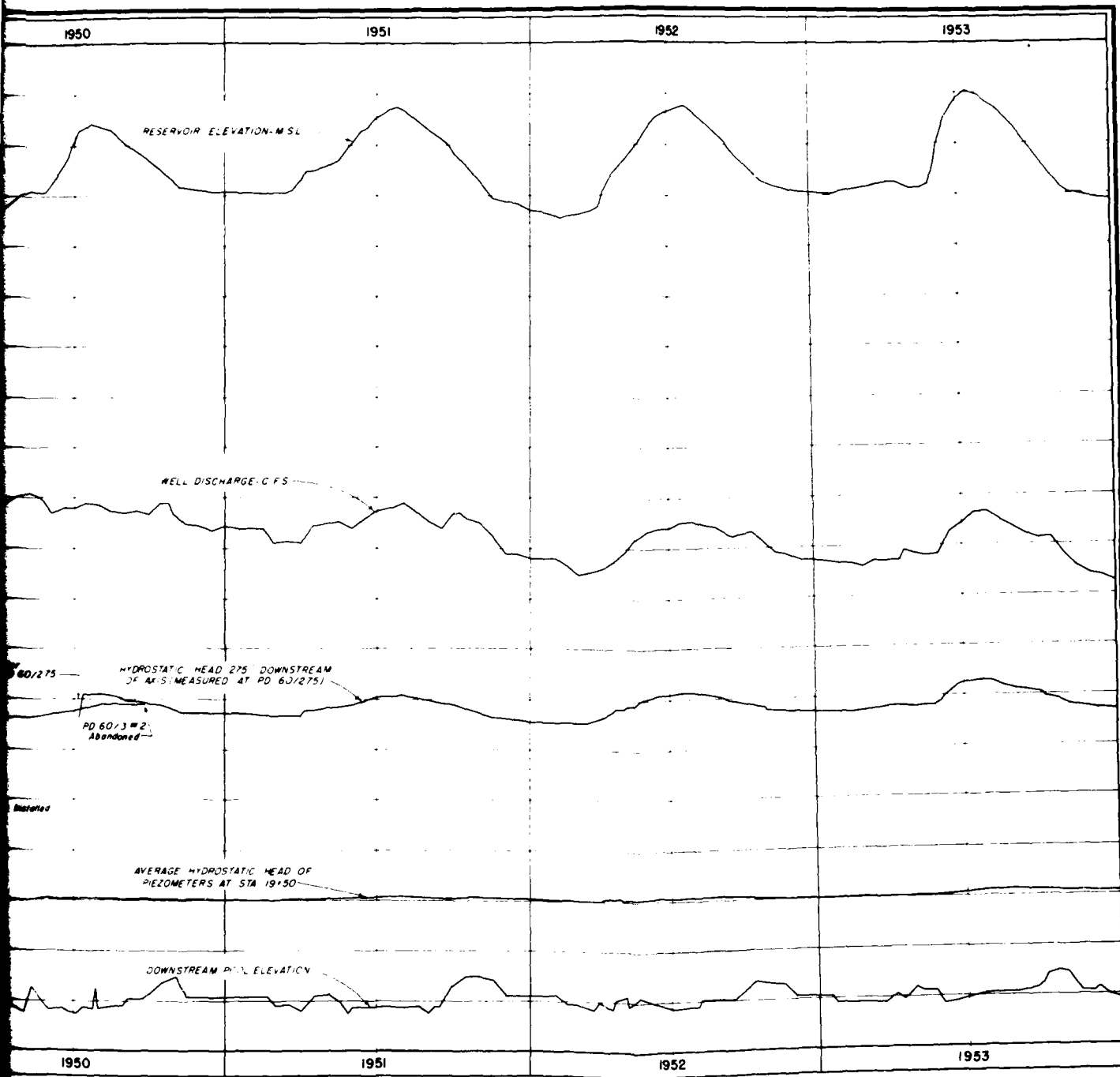
MISSOURI RIVER IMPROVEMENT			
FORT PECK DAM			
PERMANENT WELL RELIEF SYSTEM			
TYPICAL WELL INSTALLATIONS			
IN SHEETS	NO SCALE	SHEET NO	
U. S. ENGINEER OFFICE, FORT PECK, MONTANA			MAY 22, 1951
Design	Approved	Checked	Drawn
Drawn: G.H.H.	Approved: [Signature]	Checked: [Signature]	Drawn: [Signature]
Project No. 6296.97-1-74			File No.



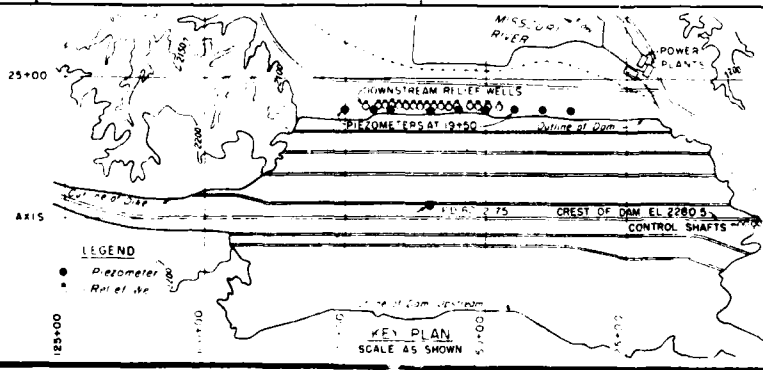
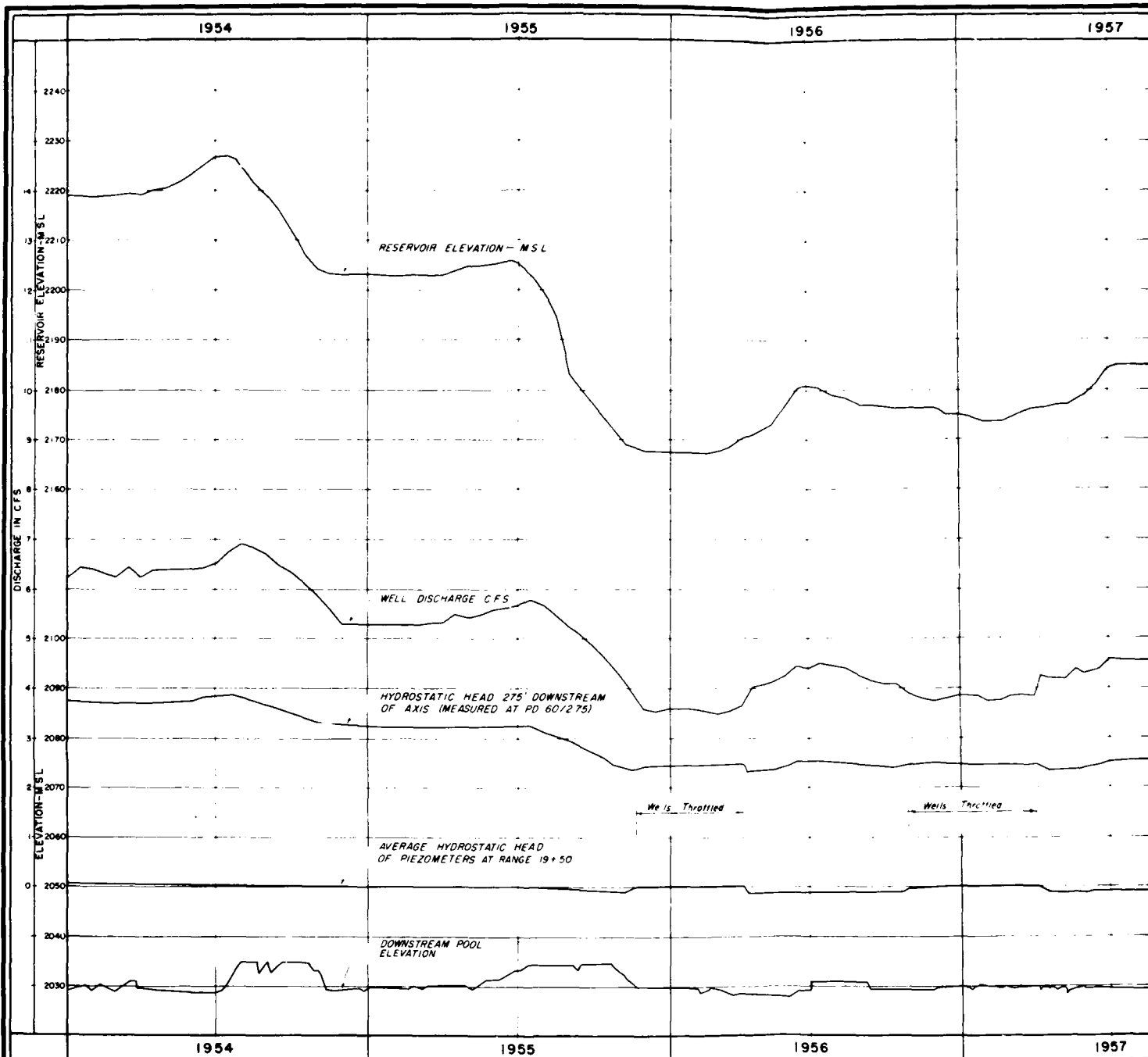


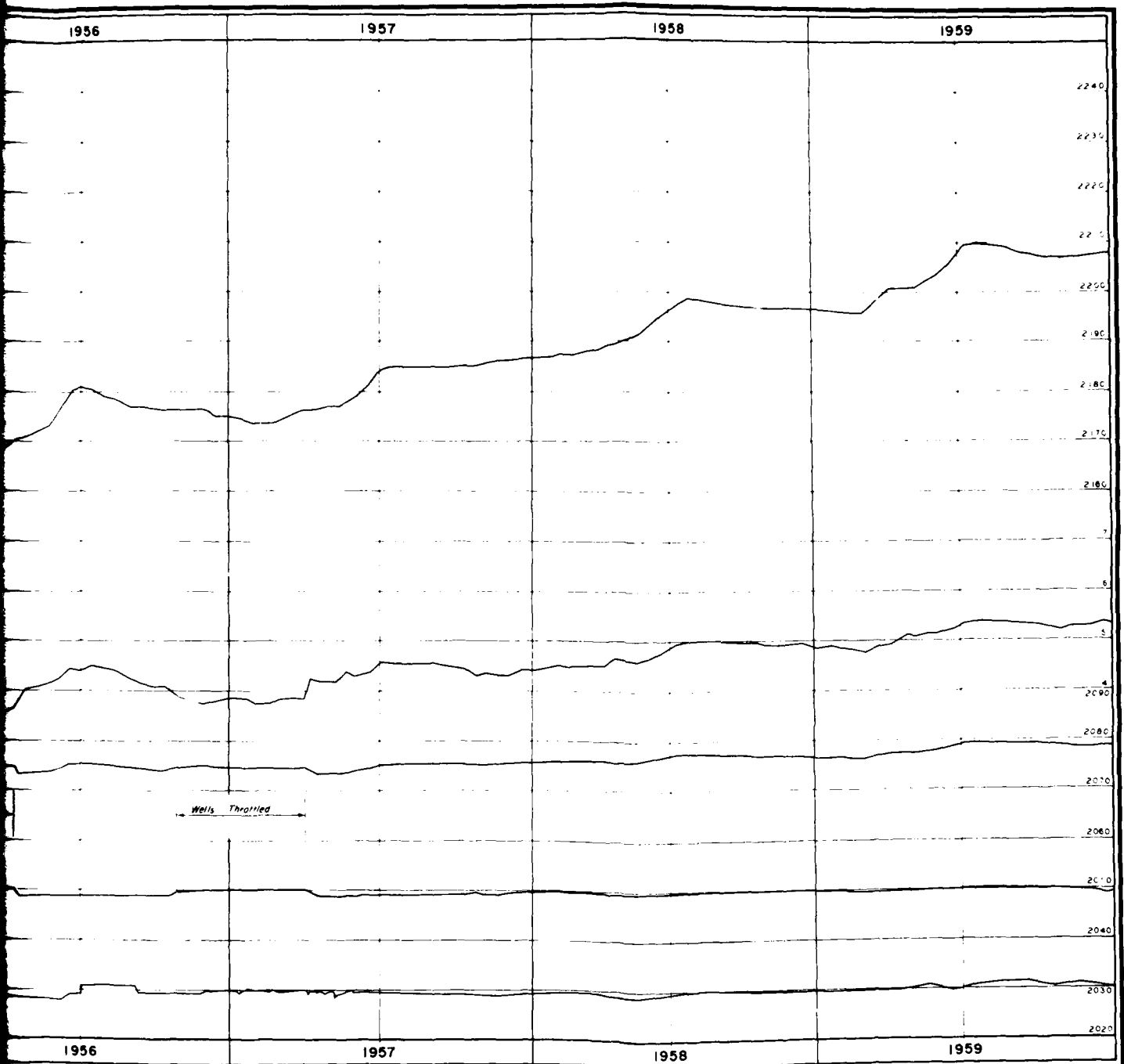
REV.	DATE	REVISION INDICATED BY	BY	CHKD	APP.
CORPS OF ENGINEERS, U. S. ARMY OFFICE OF THE DISTRICT ENGINEER GARRISON DISTRICT ST. LOUIS, MO. MISSOURI RIVER FORT PECK DAM SUMMARY OF HYDRAULIC DATA DOWNSTREAM PRESSURE RELIEF WELL SYSTEM 1942-1947 JUNE 1957 6296 97-1-101					



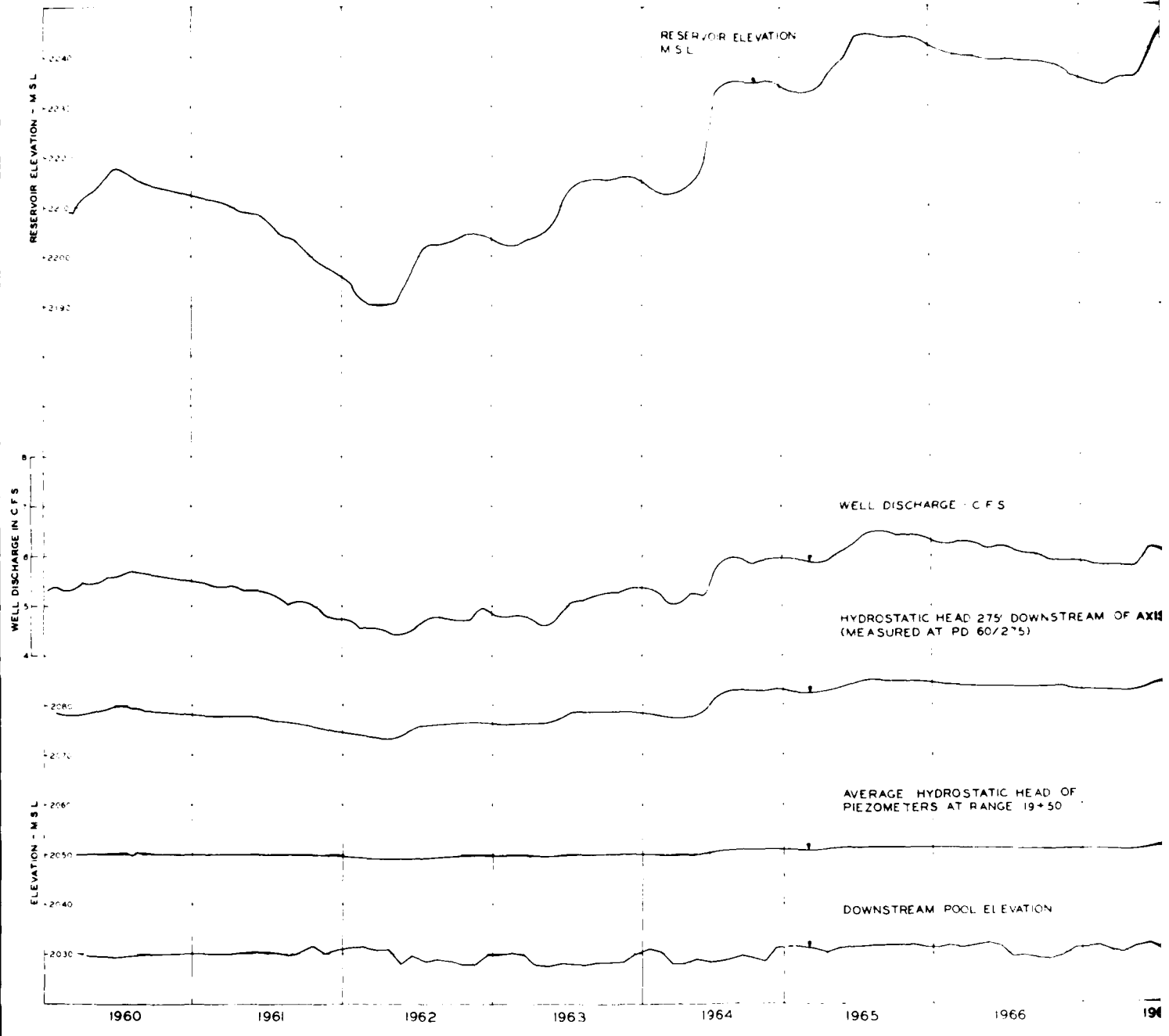


REV.	DATE	REVISION MADE BY	BY	CHKD.	APP.
CORPS OF ENGINEERS, U. S. ARMY OFFICE OF THE DISTRICT ENGINEER GARRISON DISTRICT BERKELEY, CALIF.					
MISSOURI RIVER FORT PECK DAM SUMMARY OF HYDRAULIC DATA DOWNSTREAM PRESSURE RELIEF WELL SYSTEM 1948-1953					
DESIGNED BY	CHECKED BY	APPROVAL RECOMMENDED	JUNE 1957		
DATE	DATE	CHEF, ENGINEERING DIVISION	SCALE AS SHOWN (SEE P. 10)		
DATE	DATE	DATE	DRAWING NUMBER		
SITE, FOUNDATIONS & MATERIALS		DATE	6296 97-1 102		
DATE		DATE	SHEET 2		





REV.	DATE	REVISION (CHECKED BY)	BY	DATE
CORPS OF ENGINEERS, U. S. ARMY OFFICE OF THE DISTRICT ENGINEER GARRISON DISTRICT ST. LOUIS, MO. MISSOURI RIVER FORT PECK DAM SUMMARY OF HYDRAULIC DATA DOWNSTREAM PRESSURE RELIEF WELL SYSTEM 1954-1959				
DESIGNED BY		APPROVAL RECOMMENDED	JUNE 1957	
DRAWN BY		CORPS ENGINEERING DIVISION	SCALE AS SHOWN (SPEC. NO.)	
CHECKED BY			DRAWING NUMBER	
			8296 97-1-103	



FORT PECK DAM AND RESERVOIR

RESERVOIR ELEVATION

2240
2230
2220
2210
2200
2190

WELL DISCHARGE - C.F.S

HYDROSTATIC HEAD 275' DOWNSTREAM OF AXIS
(MEASURED AT PD 60/275)

AVERAGE HYDROSTATIC HEAD OF
PIEZOMETERS AT RANGE 19+50

DOWNSTREAM POOL ELEVATION

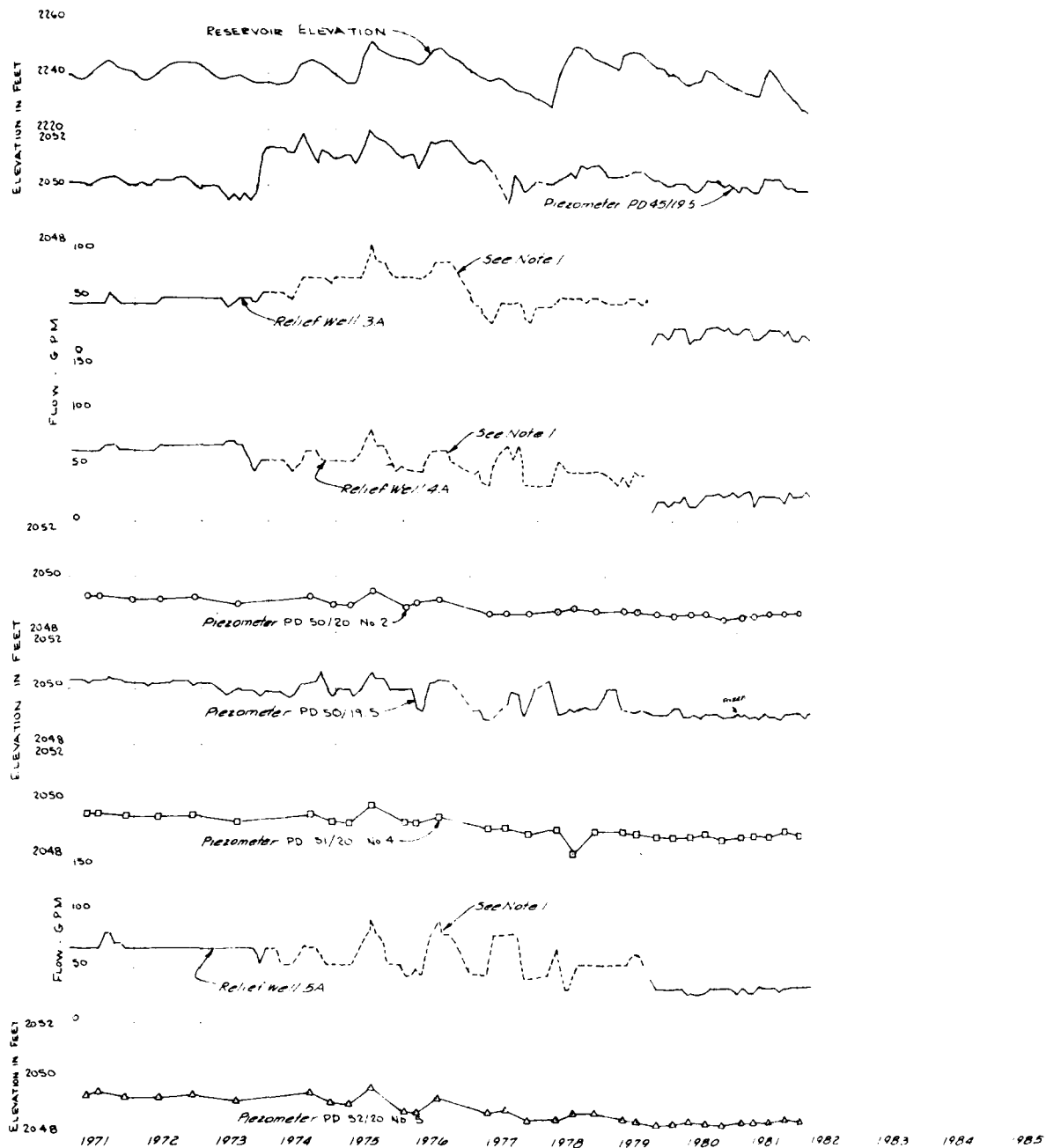
NO RECORD

1964 1965 1966 1967 1968 1969 1970 1971

DATE	DESCRIPTION	MADE	APPROVED
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY		MISSOURI RIVER	
DRAWN BY		FORT PECK LAKE, MONTANA SUMMARY OF HYDRAULIC DATA DOWNSTREAM PRESSURE RELIEF WELL SYSTEM 1960-1971	
CHECKED BY			
SUBMITTED BY		DATE	
APPROVED		DATE	
APPROVED		DATE	
APPROVED		DATE	



THIS PLAN ACCOMPANIES CONTRACT NO. _____
MODIFICATION NO. _____



Notes
 1 Relief Well Weirs not recalibrated between October 1973 and August 1979. The flow readings during this period are therefore not considered accurate. The Well was recalibrated in August 1979.

1982 1983 1984 1985

THIS DRAWING HAS BEEN REDUCED TO
FIT WITHIN THE ORIGINAL SCALE.

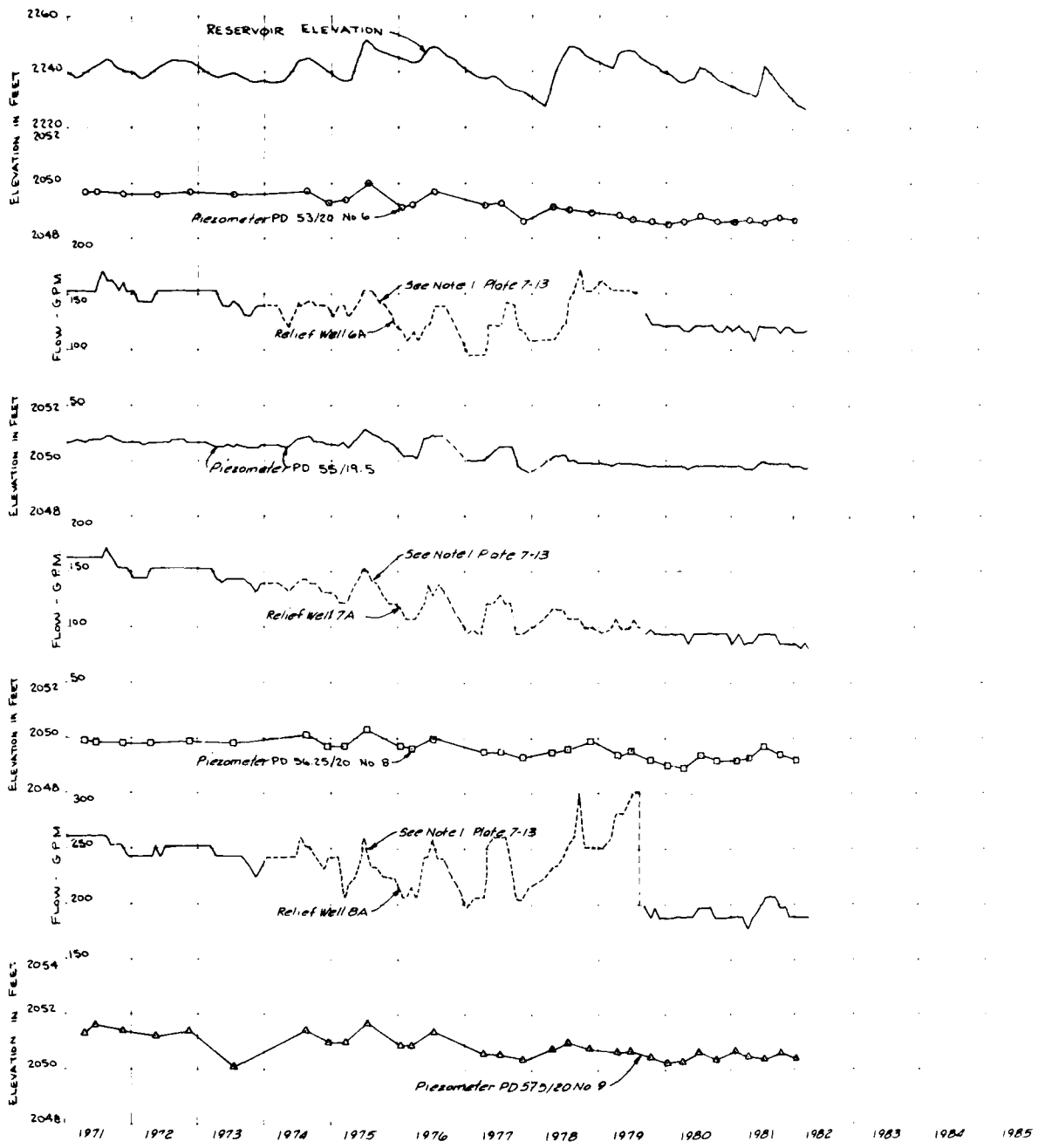
DATE	DESCRIPTION	MADE	APPROV.
Revisions			

U. S. ARMY ENGINEER DISTRICT, OMAHA
CORPS OF ENGINEERS
OMAHA, NEBRASKA

DESIGNED BY:		MISSOURI RIVER	
DRAWN BY:		FORT PECK LAKE MONTANA	
CHECKED BY:		SUMMARY OF HYDRAULIC DATA FOR	
QUANTITIES BY:		DOWNSTREAM PRESSURE RELIEF WELL SYSTEM, 1971 - 1982	
UNIT	SECTION	1STA. 45+00 - 52+00	
RECORDED:	APPROVED:	DATE:	
SHEET	SCALE	SHEET ENGINEERING OFFICE	
APPROVED:		SCALE AS SHOWN	SHEET NO.
DR. S. E. DISTRICT ENGINEER		DRAWING NUMBER	



THIS PLAN ACCOMPANIES CONTRACT NO.
MODIFICATION NO.



1982 1983 1984 1985

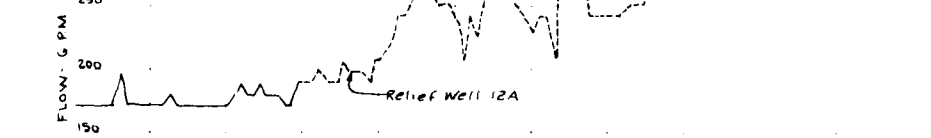
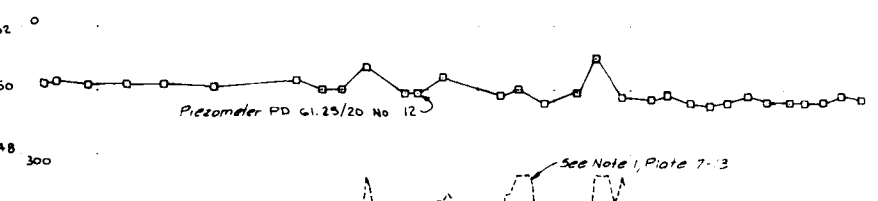
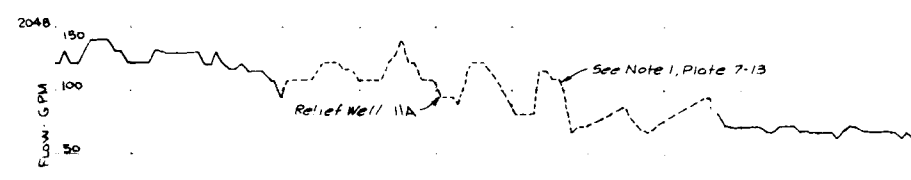
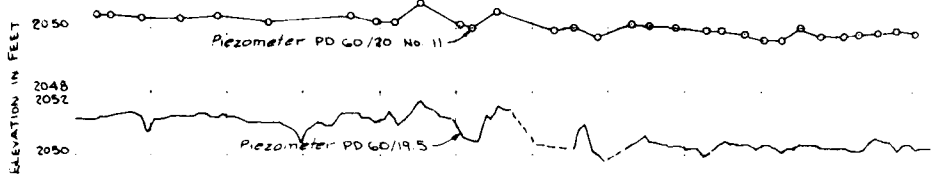
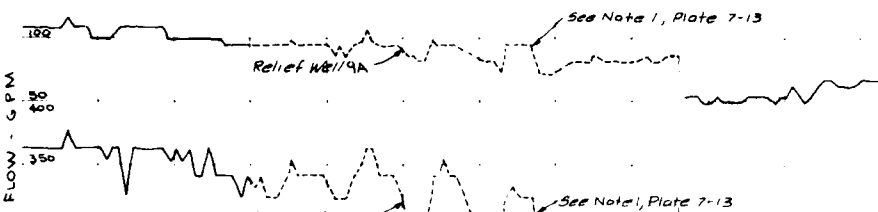
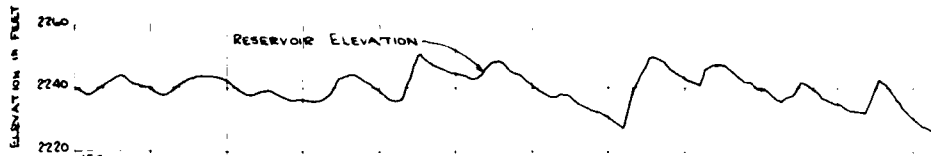
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THREE-FIFTHS THE ORIGINAL SCALE.



THIS PLAN ACCOMPANIES CONTRACT NO.
MODIFICATION NO.

DATE	DESCRIPTION	MADE	APPROV.
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DRAWN BY:	MISSOURI RIVER		
CHECKED BY:	FORT PECK LAKE MONTANA		
QUANTITY BY:	SUMMARY OF HYDRAULIC DATA FOR		
	DOWNSTREAM PRESSURE RELIEF WELL SYSTEM, 1971 - 1982		
	(STA. 52+00 - 58+00)		
DATE:	APPROVED:	DATE:	
SCALE AS SHOWN	SHEET NO.		
	SHEET		

2



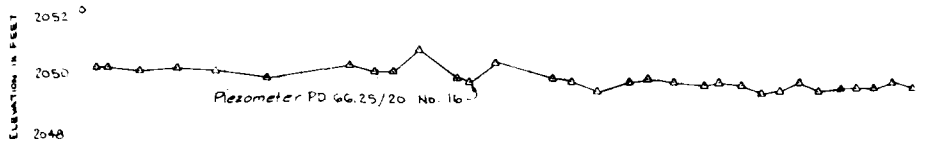
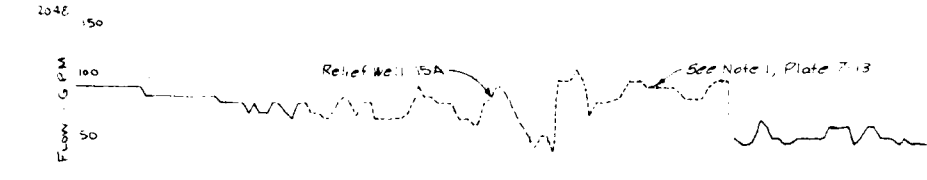
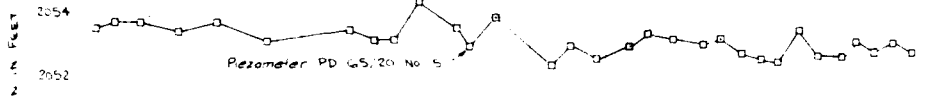
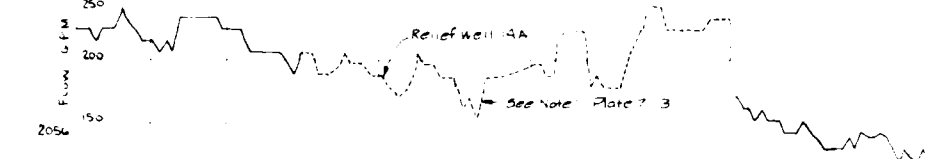
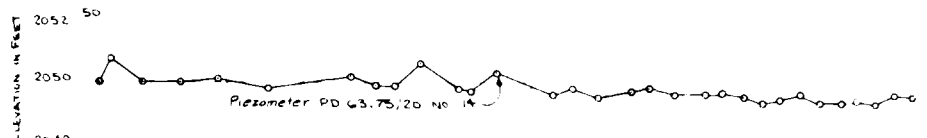
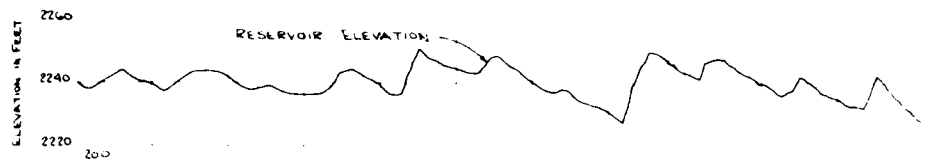
1982 1983 1984 1985

THIS DRAWING HAS BEEN REDUCED TO
THIRTIETH (30%) OF ORIGINAL SCALE.



THIS PLAN ACCOMPANIES CONTRACT NO.
MODIFICATION NO.

DATE		DESCRIPTION		MADE	APPROVED
REVISIONS					
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA					
DESIGNED BY:	MISSOURI RIVER FORT PECK LAKE MONTANA SUMMARY OF HYDRAULIC DATA FOR DOWNSTREAM PRESSURE RELIEF WELL SYSTEM, 1971 - 1982 (STA. 57+00 - 62+00)				
DRAWN BY:					
CHECKED BY:					
SUBMITTED BY:					
DATE:	BY:	DATE:	APPROVED:		
DATE:	BY:	DATE:	APPROVED:		
SCALE: AS SHOWN		SHEET NO.			
SCALE: AS SHOWN		SHEET NO.			



1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985

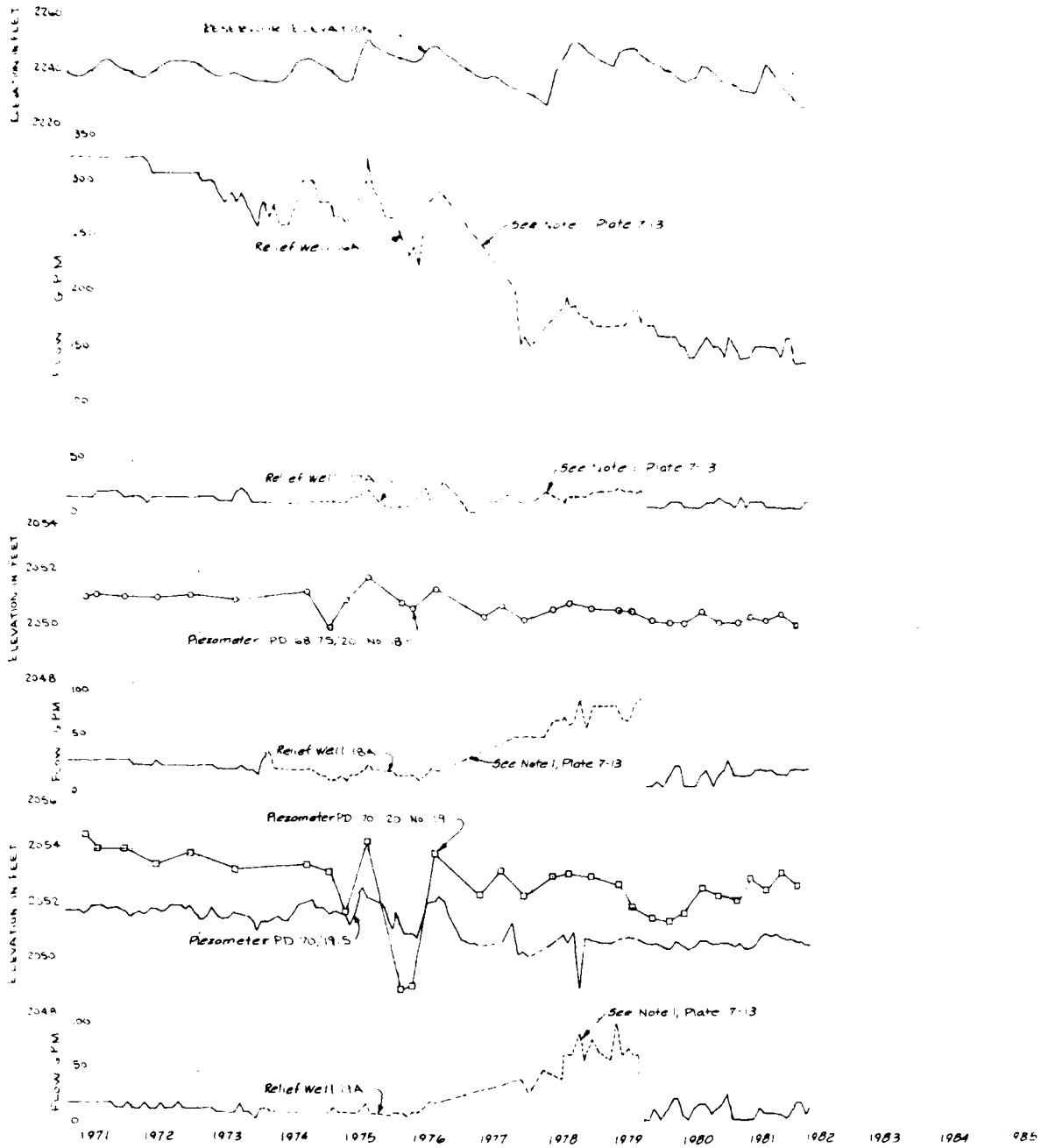
1972 1974 1984 1985

THIS PLAN IS THE PROPERTY OF THE U.S. ARMY ENGINEER DISTRICT, OMAHA, NEBRASKA. IT IS TO BE KEPT IN THE OFFICE OF THE DISTRICT ENGINEER AND NOT TO BE LOANED, REPRODUCED, COPIED, OR IN ANY MANNER DISSEMINATED OUTSIDE THE OFFICE OF THE DISTRICT ENGINEER.

DATE	DESCRIPTION	MADE	APPROVED
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY	MISSOURI RIVER		
DRAWN BY	FORT PECK LAKE MONTANA		
CHECKED BY	SUMMARY OF HYDRAULIC DATA FOR		
SUBMITTED BY	DOWNSTREAM PRESSURE RELIEF WELL SYSTEM, 1971 - 1982		
SHEET	SECTION	(STA. 62+00 - 66+00)	
RECOMMEND	APPROVED	DATE	
SHEET	BRANCH	CHIEF ENGINEERING DIVISION	SHEET NO.
APPROVED	SCALE AS SHOWN		SHEET NO.
DR. S. L. DISTRICT ENGINEER		SHEET NUMBER	



THIS PLAN ACCOMPANIES CONTRACT NO. _____
MODIFICATION NO. _____



1

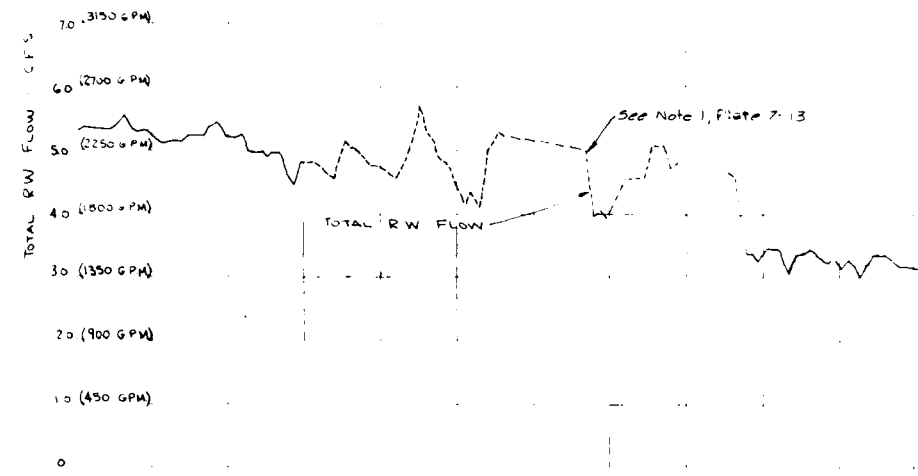
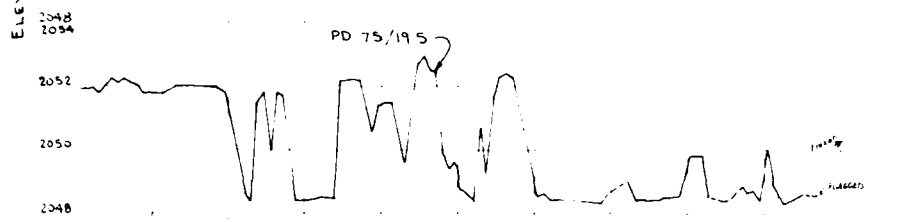
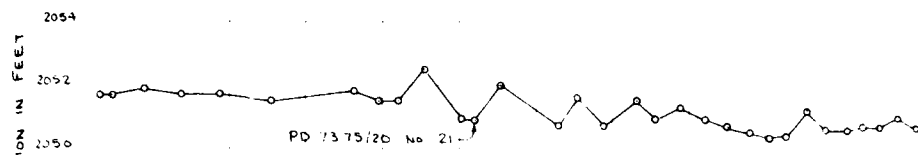
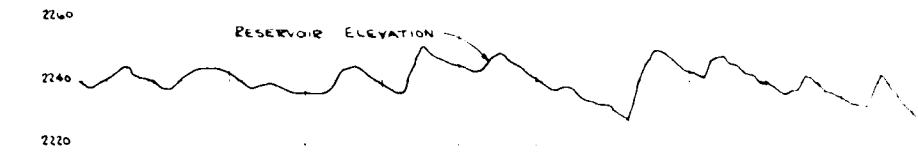
1981 1982 1983 1984 1985

STATE OF NEBRASKA
 DEPARTMENT OF TRANSPORTATION

DATE	DESCRIPTION	MADE	APPROV
REVISIONS			
11 B. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY:	MISSOURI RIVER FORT PECK LAKE MONTANA SUMMARY OF HYDRAULIC DATA FOR DOWNSTREAM PRESSURE RELIEF WELL SYSTEM, 1971 - 1982 (STA. 66+00 - 72+00)		
DRAWN BY:	SECTION	DATE	
CHECKED BY:	DATE	DATE	
APPROVED:	DATE	DATE	
APPROVED:		SCALE AS SHOWN	SHEET NO.
DR. S. L. BENTLEY ENGINEER		DATE	SHEET NUMBER



THIS PLAN ACCOMPANIES CONTRACT NO. _____
 MODIFICATION NO. _____



1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985

1982 1983 1984 1985

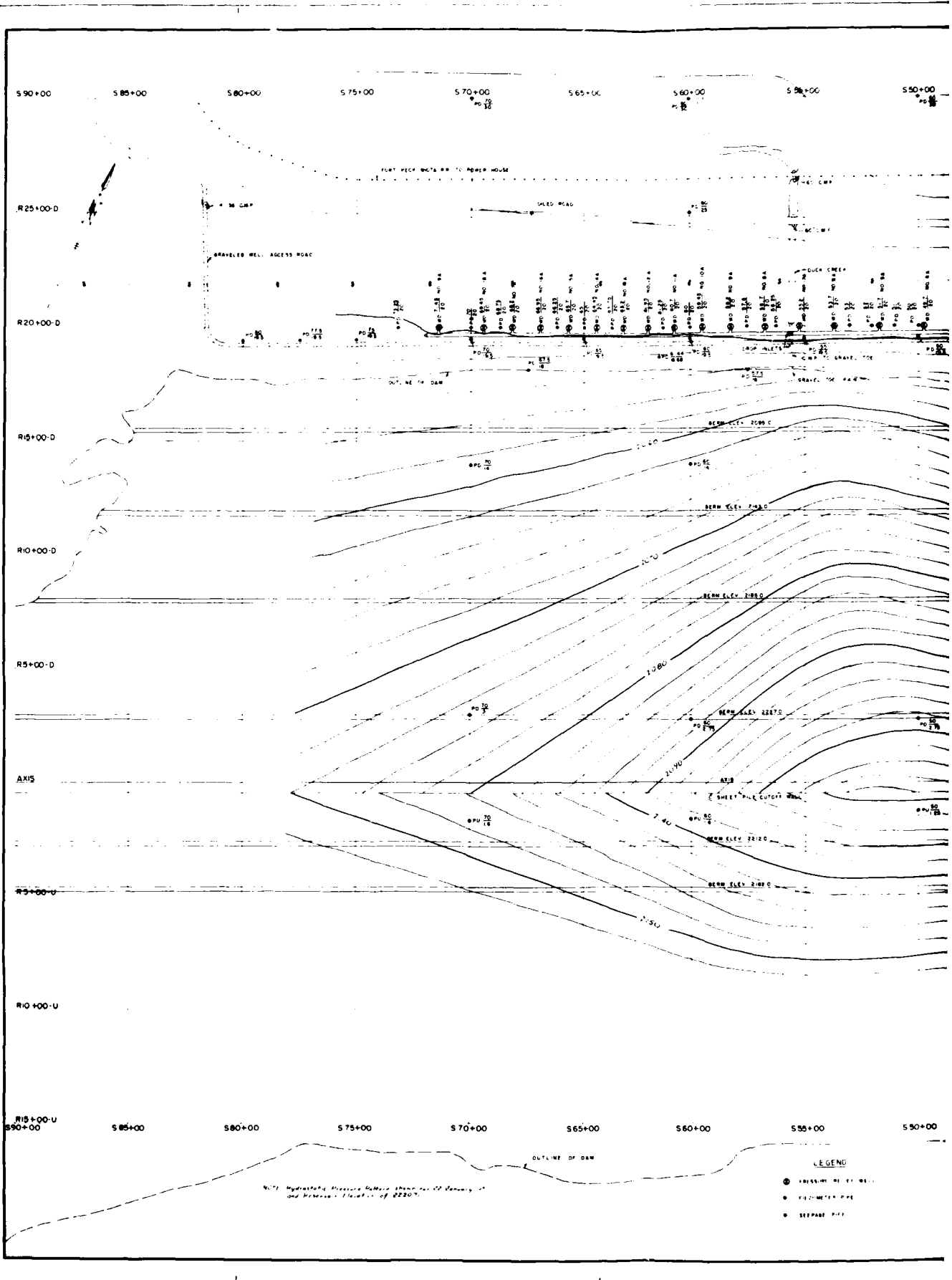
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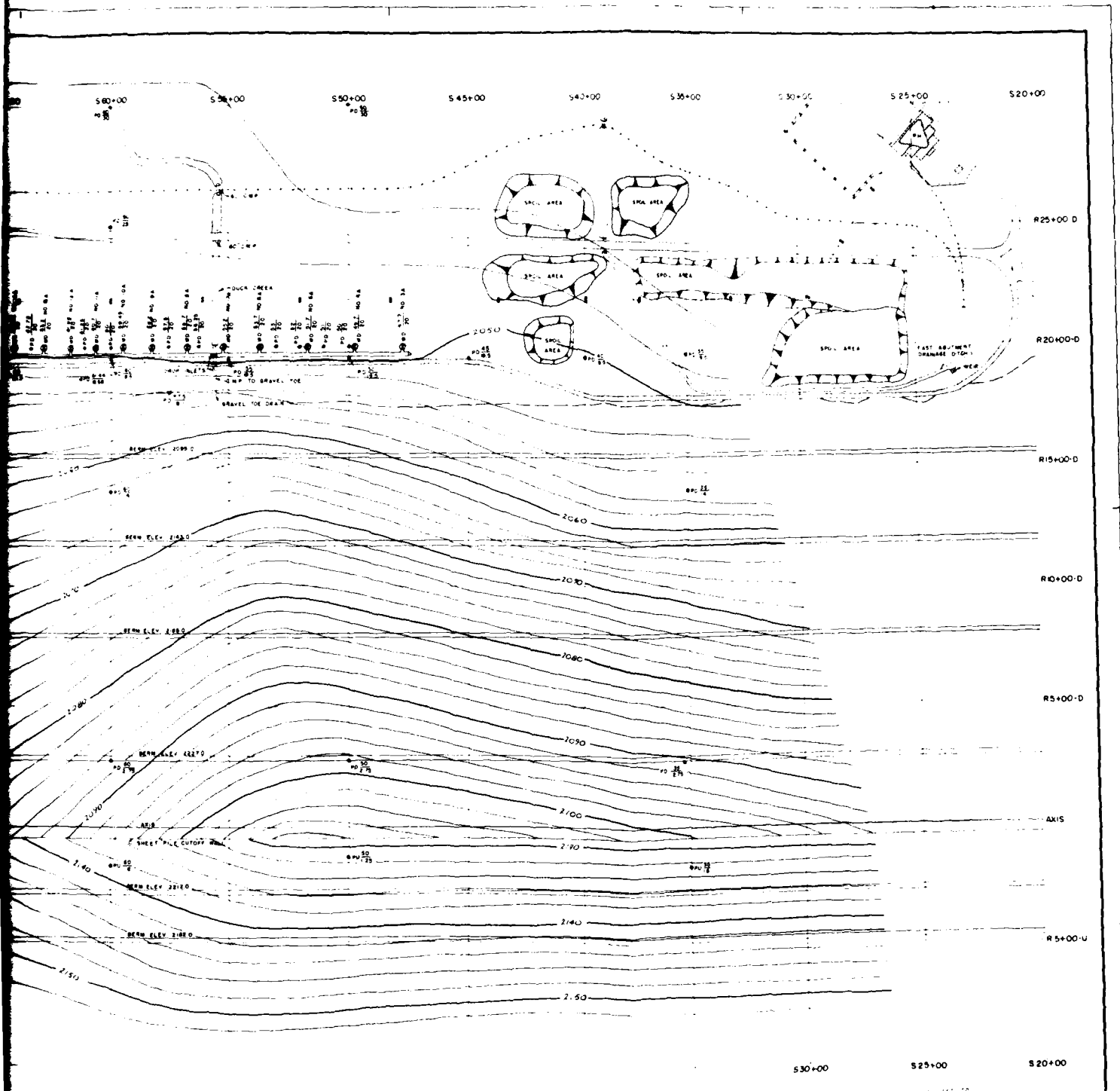
DATE	DESCRIPTION	MADE	APPROV.
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY:	MISSOURI RIVER FORT PECK LAKE MONTANA SUMMARY OF HYDRAULIC DATA FOR DOWNSTREAM PRESSURE RELIEF WELL SYSTEM, 1971 - 1982 (STA. 72+00 - 74+00)		
DRAWN BY:			
CHECKED BY:			
APPROVED BY:			
DATE:			
DATE:	SECTION:	DATE:	DATE:
DATE:	SCALE:	DATE:	DATE:
DATE:	SCALE:	DATE:	DATE:
DATE:	SCALE:	DATE:	DATE:

THIS PLAN ACCOMPANIES CONTRACT NO. _____
MODIFICATION NO. _____

2



1



LEGEND

- PRESSURE POINT BEHIND
- PRESSURE POINT
- SEEPAGE

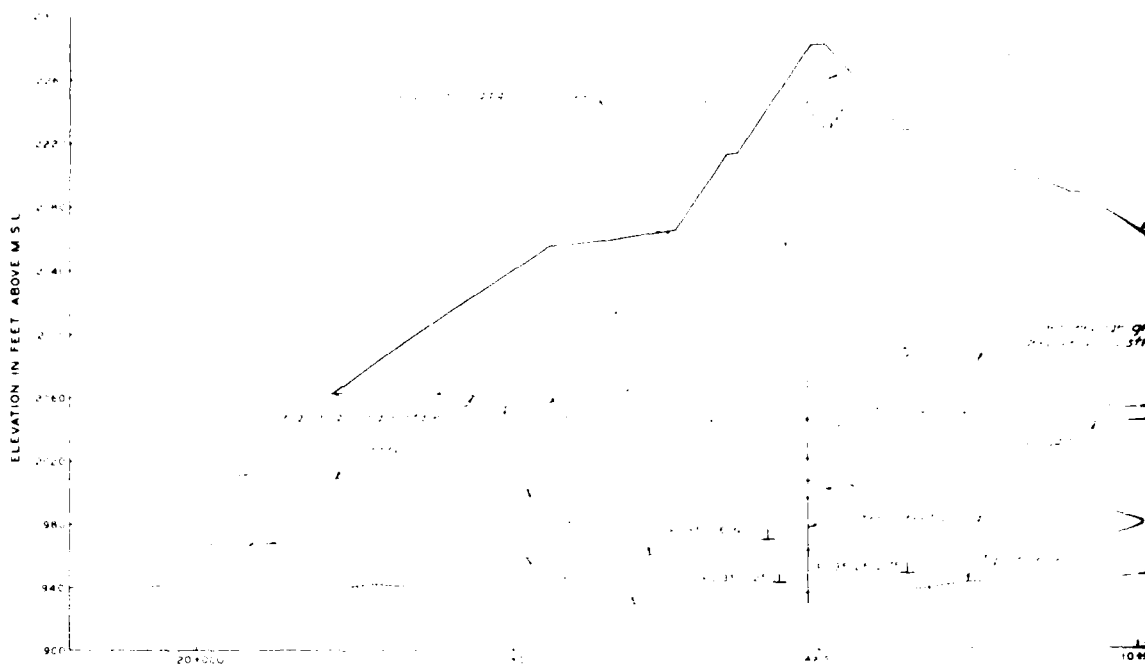
NO.	DESCRIPTION	DATE	APP'D.
REVISIONS			

MISSOURI RIVER IMPROVEMENT
FORT PECK DAM
 HYDROSTATIC PRESSURE PATTERN
 IN GRAVEL STRATA BENEATH
 CLAY STRATUM
 1-22-51

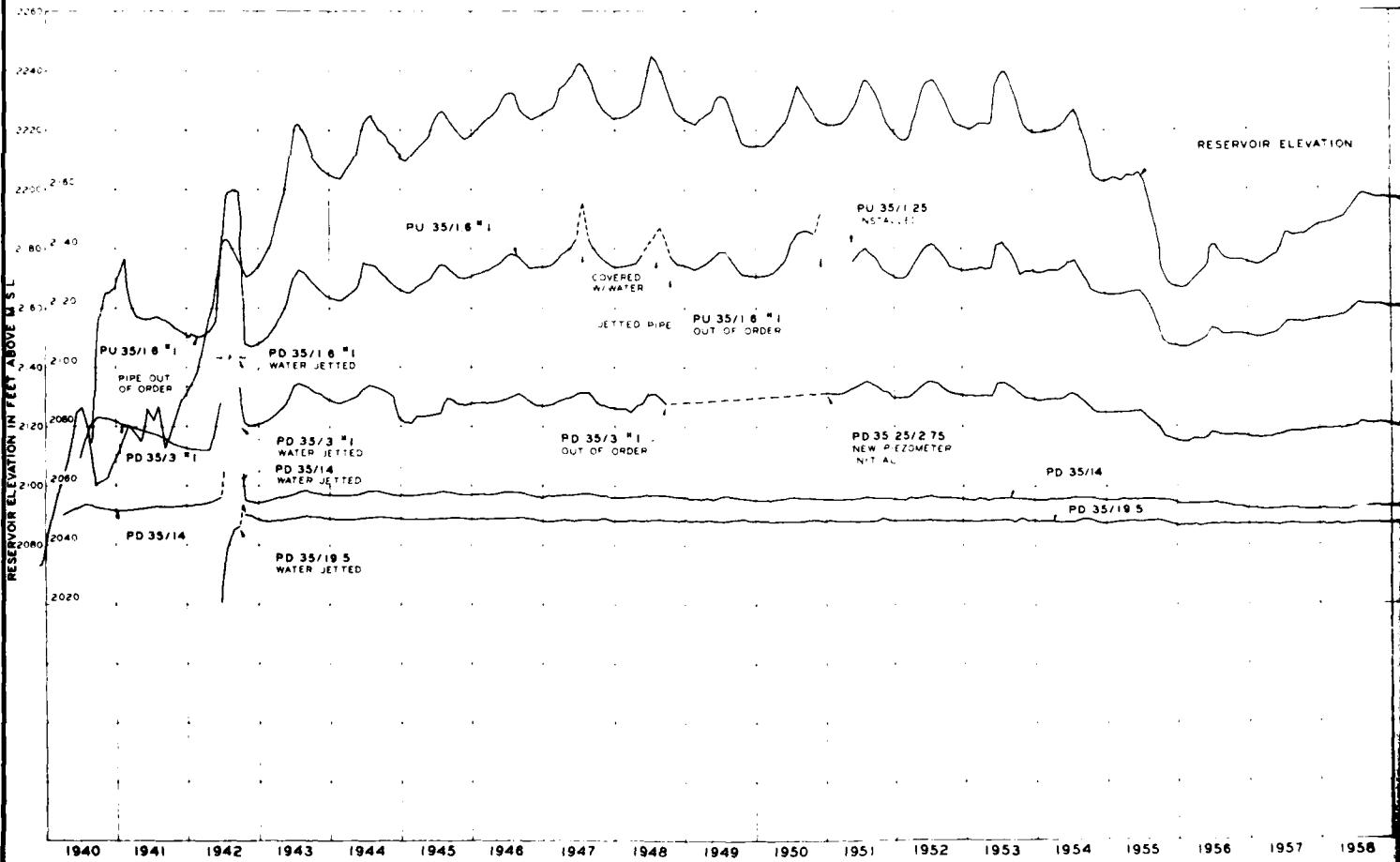
IN SHEETS _____ SHEET NO. _____

FORT PECK DISTRICT, FORT PECK, MONTANA
 SUBMITTED _____ APPROVAL RECOMMENDED _____ APPROVED _____

HEAD DESIGN BRANCH _____ CHIEF ENGINEERING DIVISION _____ COL. CHIEF OF ENGINEERS _____
 TRANSMITTED WITH LETTERS _____ FILE NO. _____
 DRAWN BY J.E.H. _____ **6296.97-1-55**
 CHECKED BY C.J. _____ DATES _____



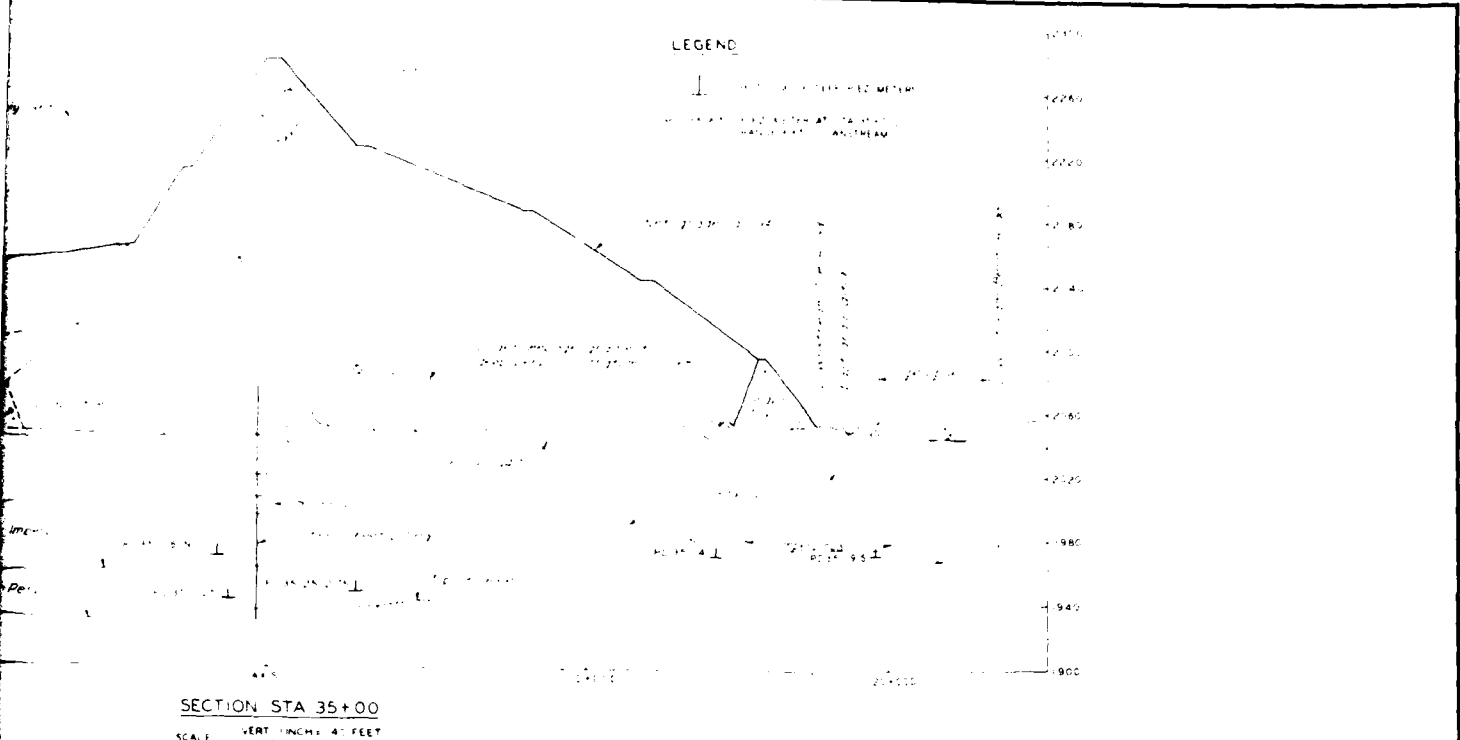
SECTION STA 35+00
 VERT. INCH = 4' FEET
 SCALE HORIZ. INCH = 200 FEET



FORT PECK DAM AND RESER

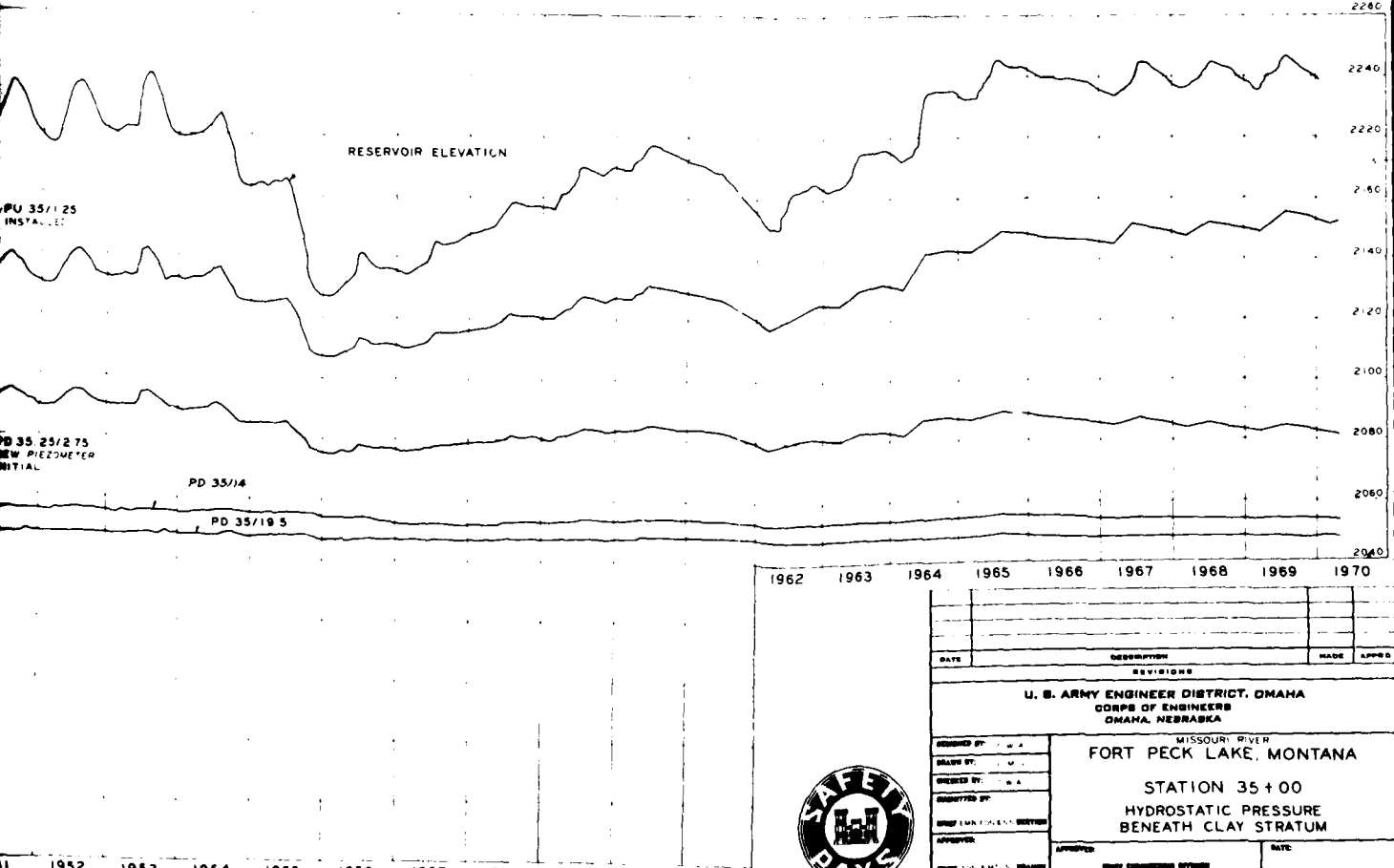
LEGEND

1. ... METER
 2. ... ANTIHEAV



SECTION STA 35+00

SCALE VERT. INCHES = 4 FEET
 HORIZ. INCHES = 200 FEET

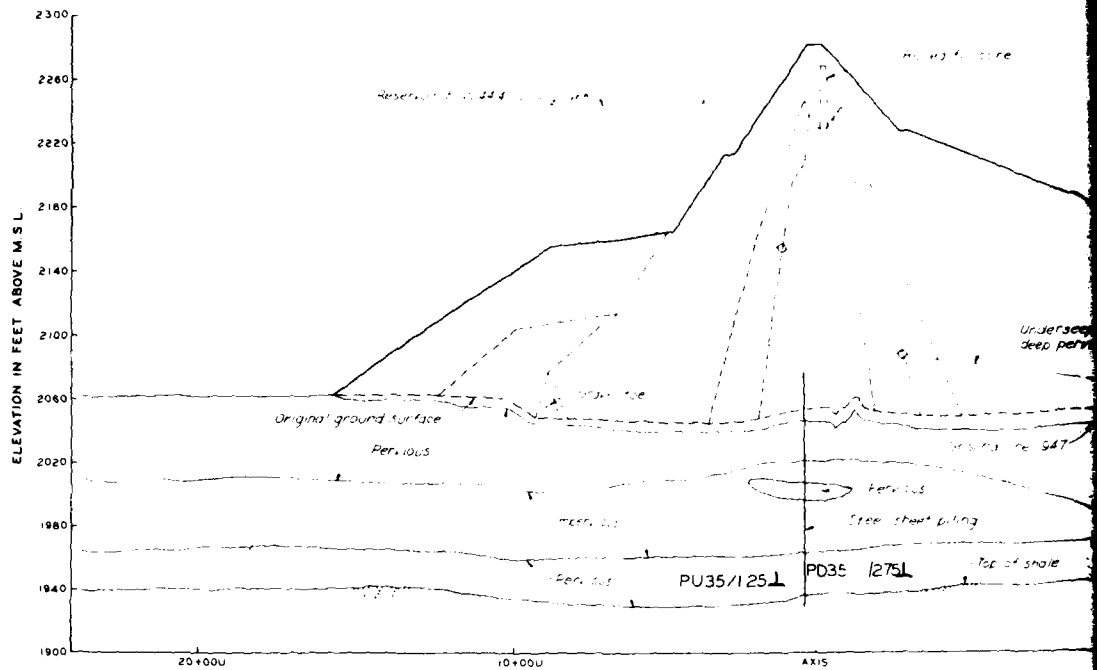


1962	1963	1964	1965	1966	1967	1968	1969	1970
DATE		DESCRIPTION		MADE	APPROD			
REVISIONS								
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA								
DESIGNED BY: W. A.			MISSOURI RIVER FORT PECK LAKE, MONTANA					
DRAWN BY: W. A.			STATION 35+00					
CHECKED BY: W. A.			HYDROSTATIC PRESSURE					
GROUP ENGINEER DISTRICT			BENEATH CLAY STRATUM					
APPROVED:			APPROVED:			DATE:		
GROUP ENGINEER DISTRICT			GROUP ENGINEER DISTRICT			DATE AS SHOWN		
APPROVED:			APPROVED:			SHEET NO.		
SIL. S. L. DISTRICT ENGINEER			SHEET			SHEET NUMBER		

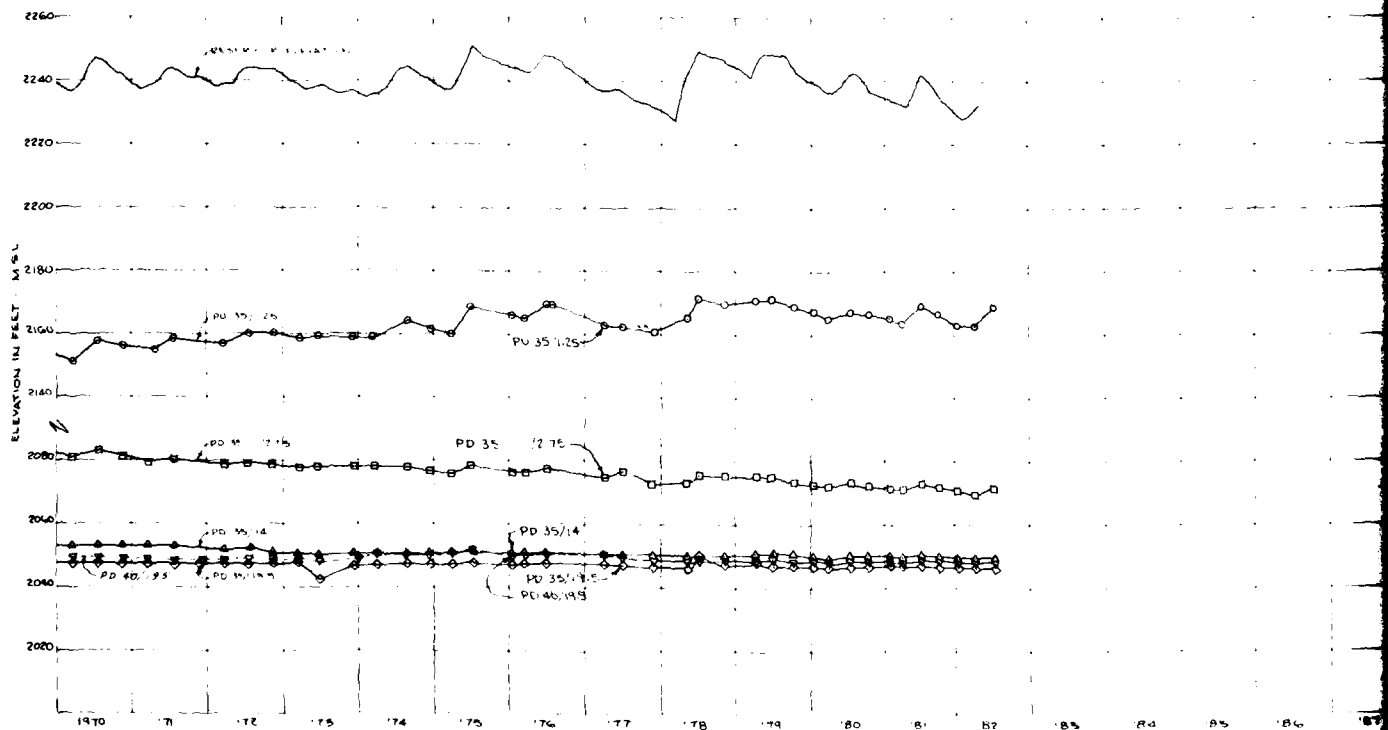


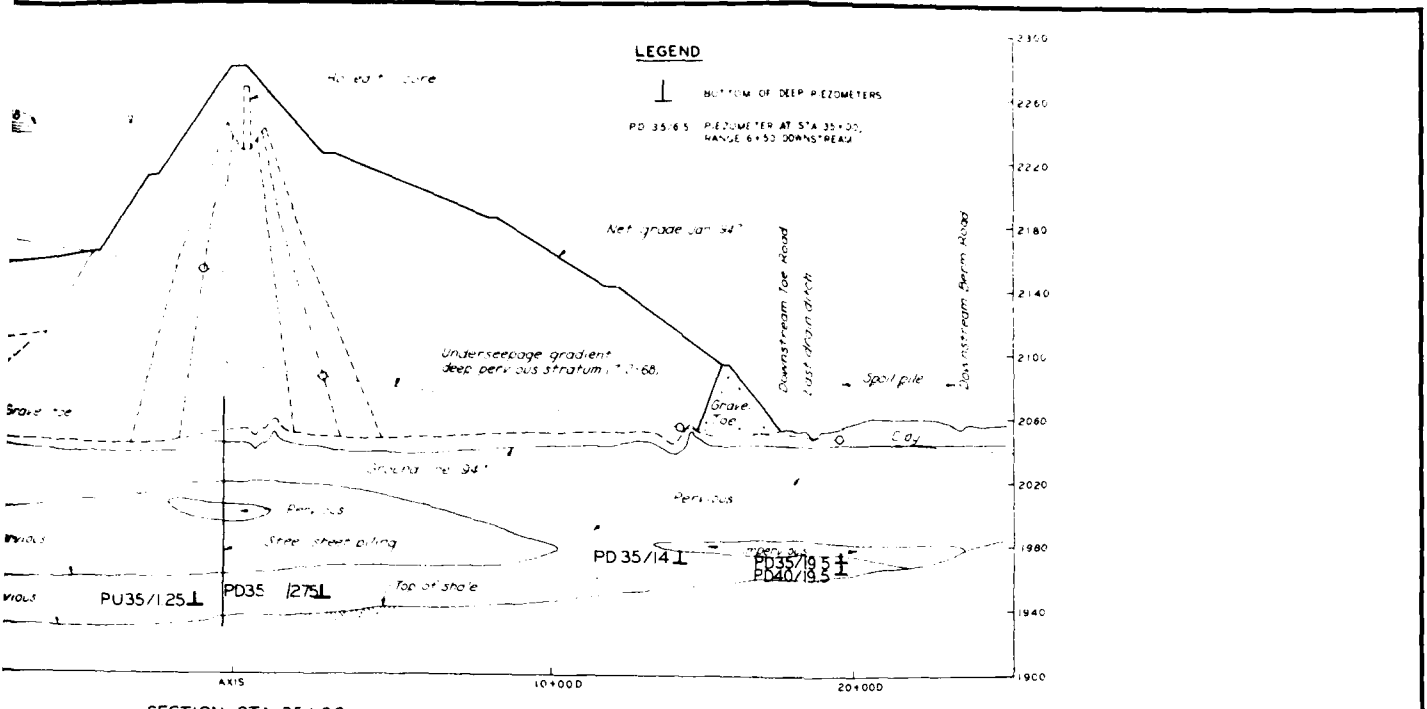
THIS PLAN ACCOMPANIES CONTRACT NO. _____
 MODIFICATION NO. _____

2

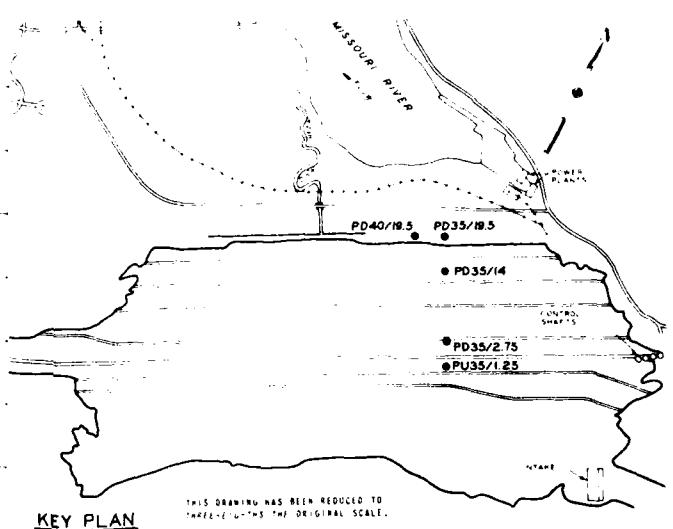
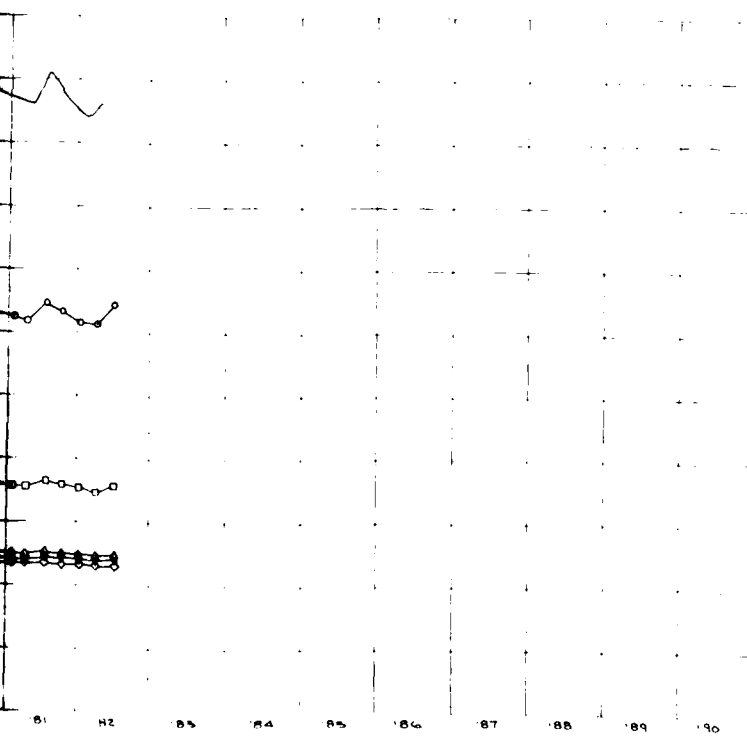


SECTION STA 35+00
 SCALE VERT. 1" = 40 FEET
 HORIZ. 1" = 200 FEET





SECTION STA 35+00
 SCALE VERT 1 INCH = 40 FEET
 HORIZ 1 INCH = 200 FEET



KEY PLAN

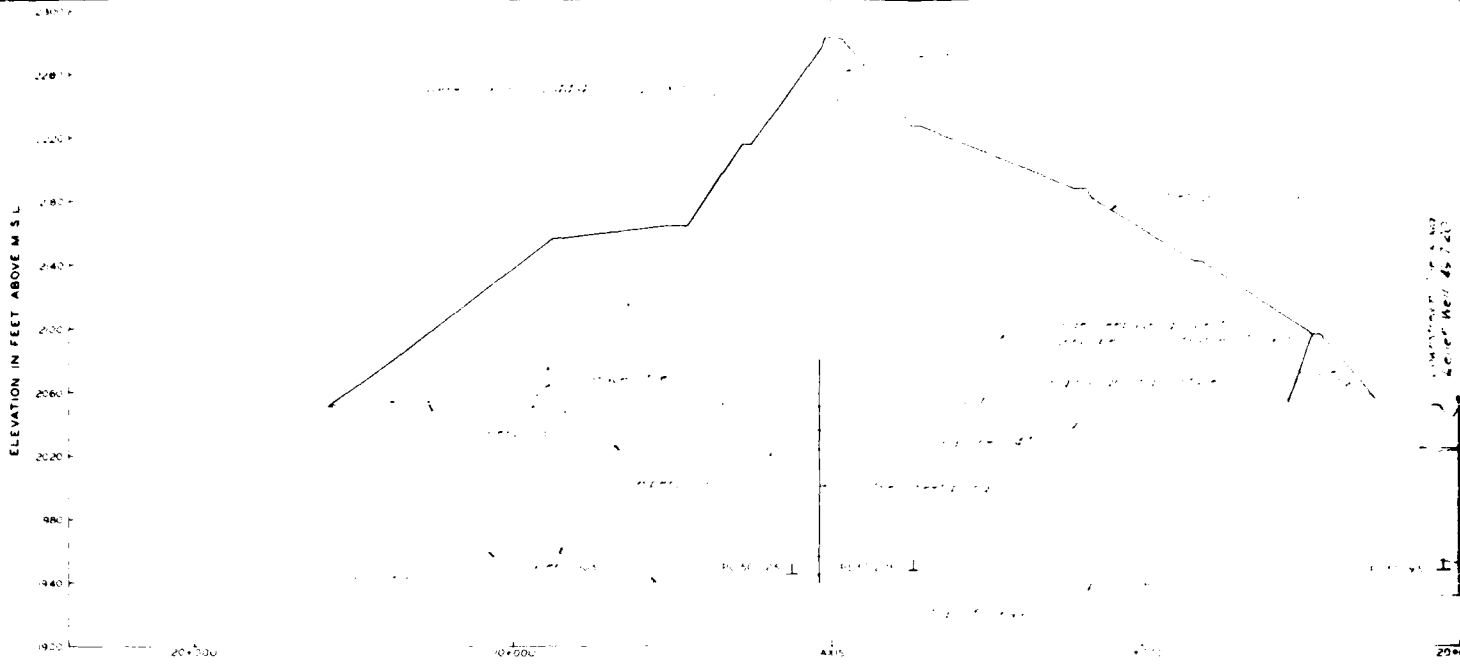
THIS DRAWING HAS BEEN REDUCED TO THREE-FIFTHS THE ORIGINAL SCALE.

DATE	DESCRIPTION	MADE	APPROVED
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA			
CORPS OF ENGINEERS			
OMAHA, NEBRASKA			
MISSOURI RIVER			
FORT PECK LAKE, MONTANA			
STATION 35 + 00			
HYDROSTATIC PRESSURE			
BENEATH CLAY STRATUM			
DESIGNED BY:	CHECKED BY:	DATE:	
DRAWN BY:	APPROVED BY:	DATE:	
SCALE:	PROJECT:	DATE:	
APPROVED:	DATE:	SCALE AS SHOWN:	SHEET NO.:
U. S. ARMY ENGINEER DISTRICT, OMAHA		SHEET	

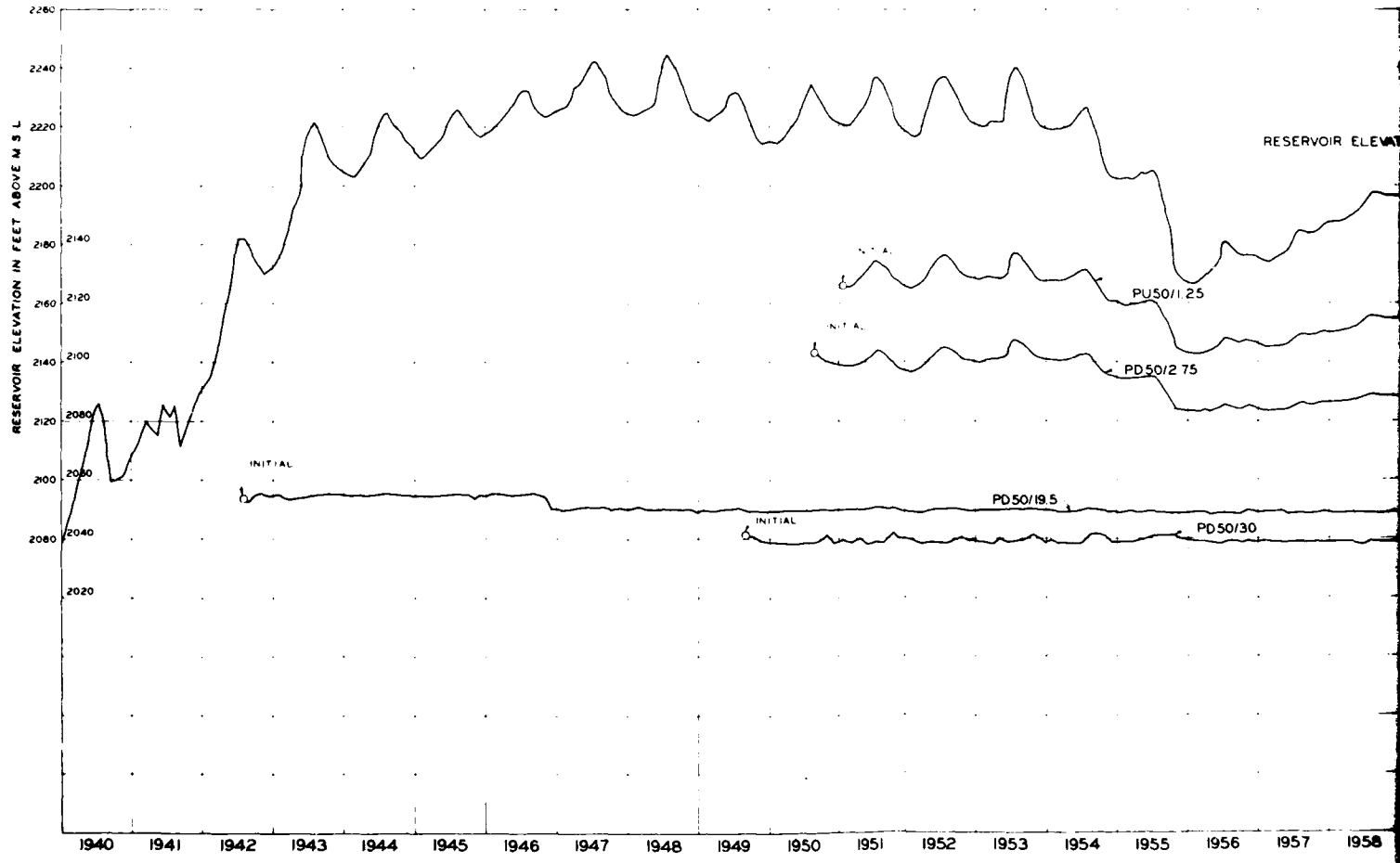


THIS PLAN ACCOMPANIES CONTRACT NO. _____
 MODIFICATION NO. _____

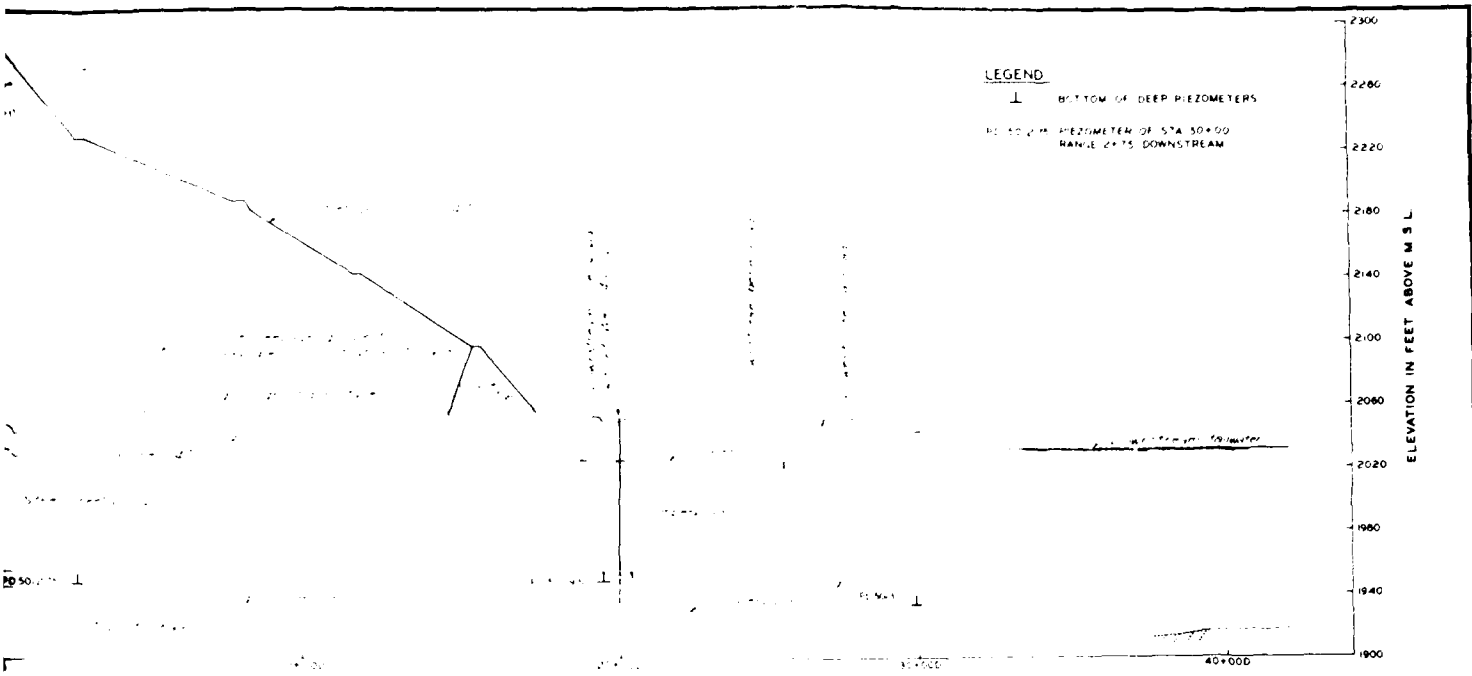
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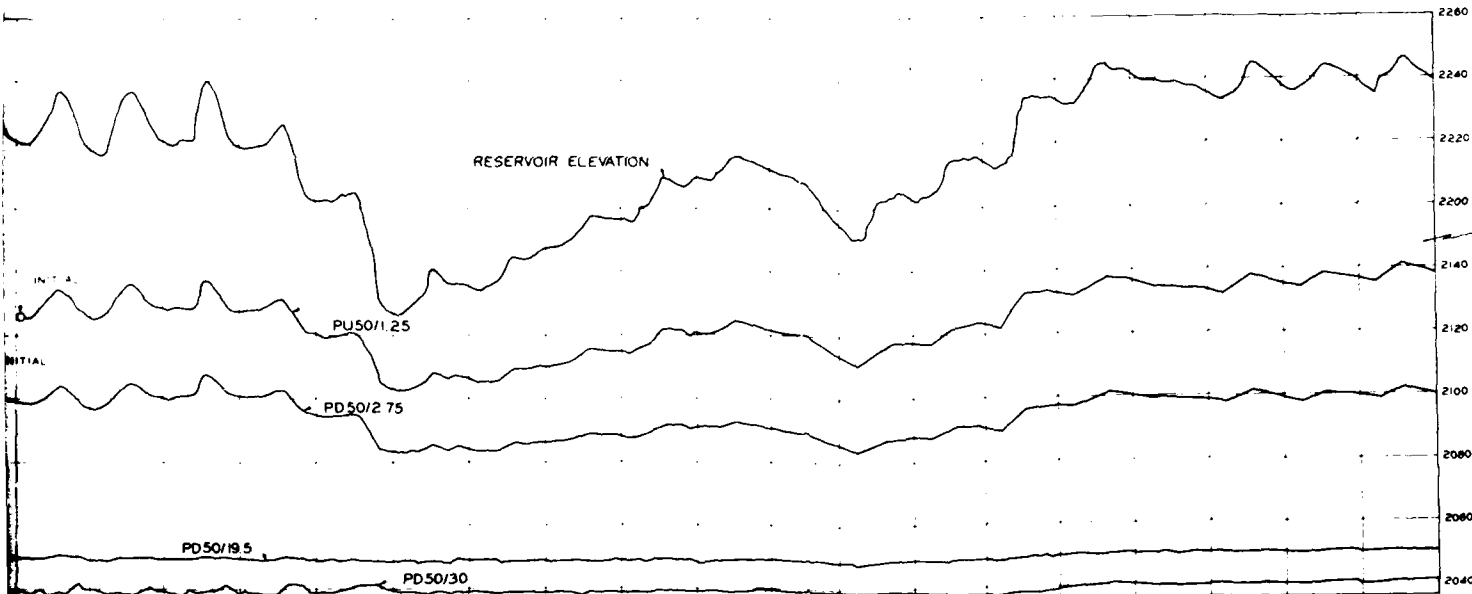
SECTION STA 50+00
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FORT PECK DAM AND RESERVOIR

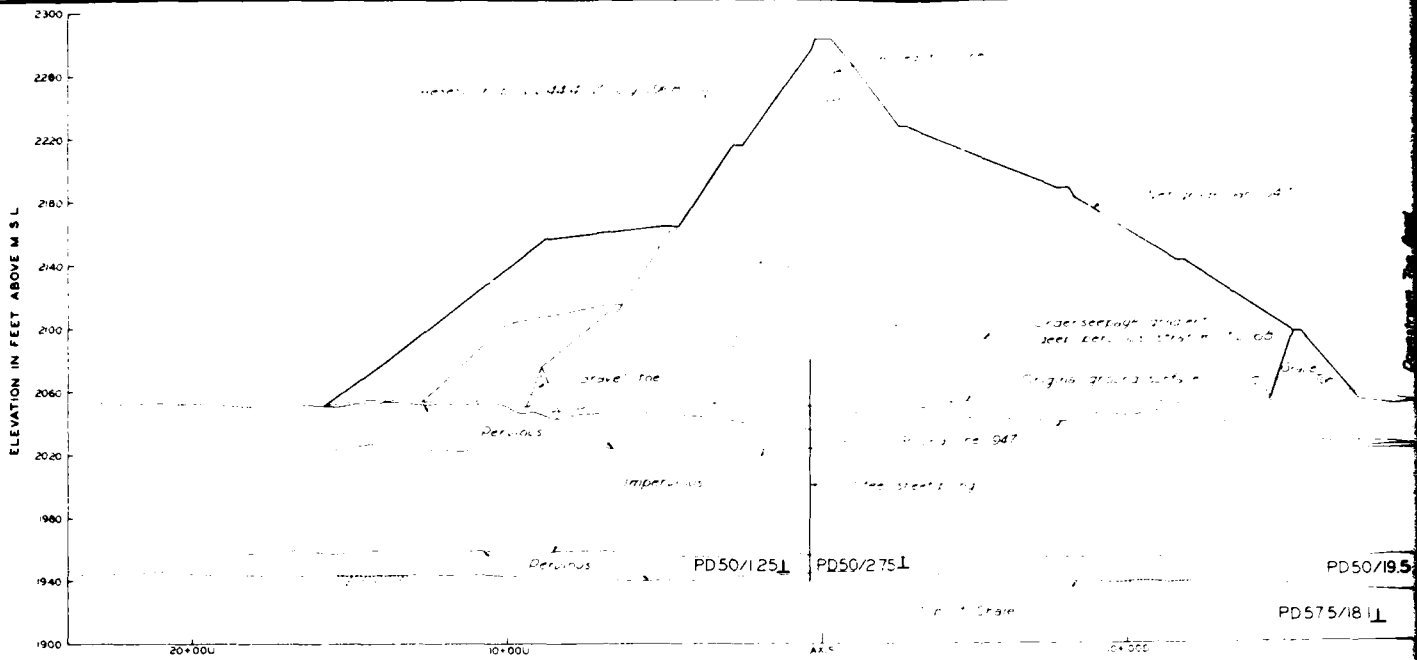


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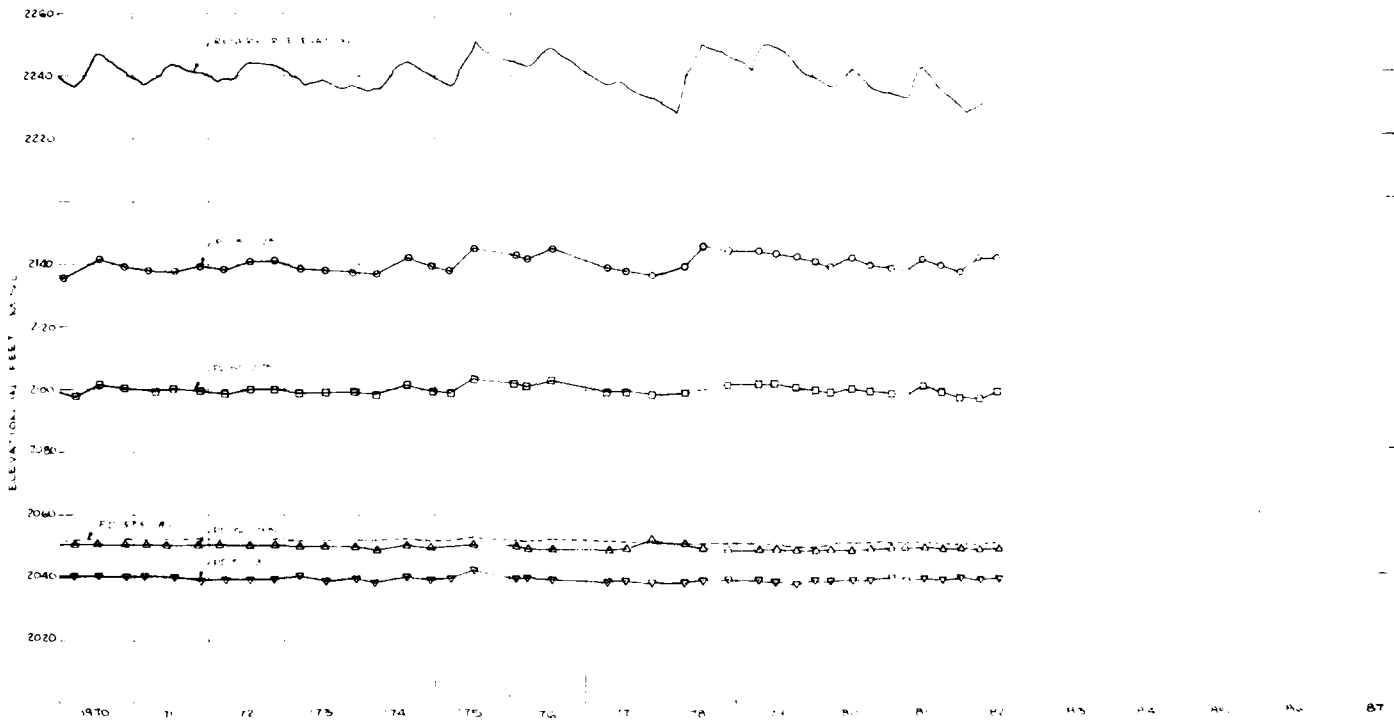


1962	1963	1964	1965	1966	1967	1968	1969																
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DATE	DESCRIPTION	MADE	APPROV.																				
REVISIONS																							
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA																							
MISSOURI RIVER FORT PECK LAKE, MONTANA STATION 50+00 HYDROSTATIC PRESSURE BENEATH CLAY STRATUM				APPROVED: _____ DATE: _____ SPECIAL AGENT IN CHARGE																			
DESIGNED BY: _____ DRAWN BY: _____ CHECKED BY: _____ CHECKED BY: _____ APPROVED: _____				DATE: _____ SCALE AS SHOWN _____ SHEET NO. _____																			

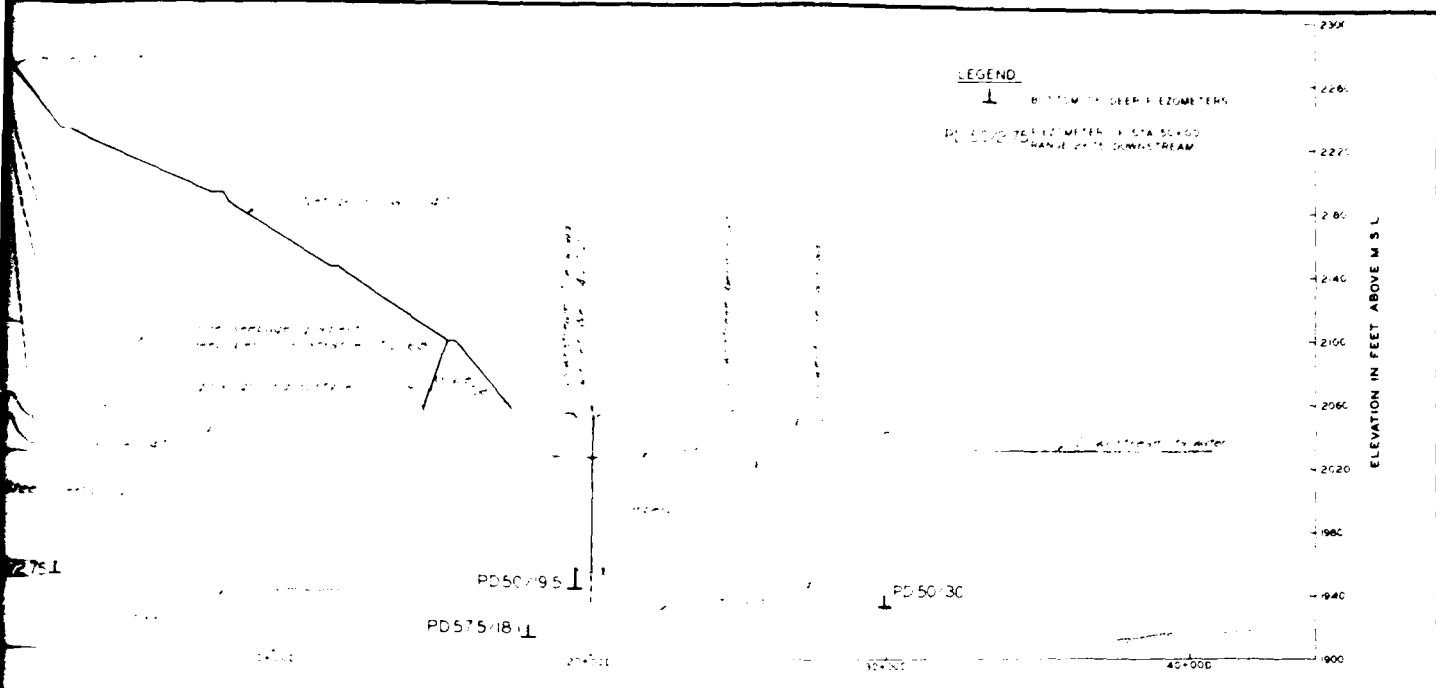




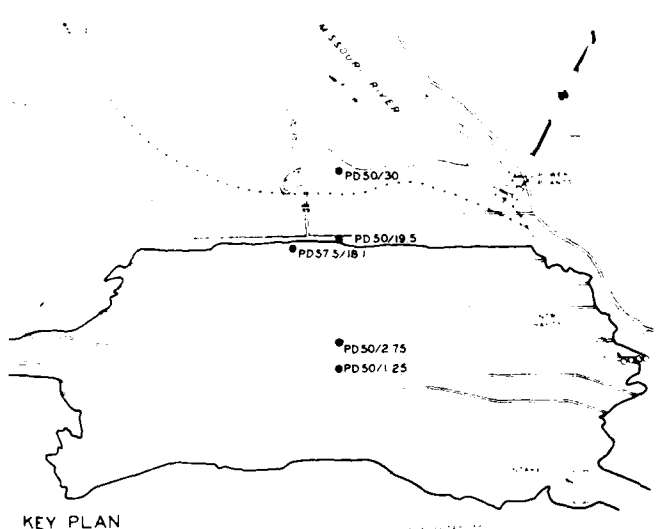
SECTION STA 50+00
SCALE VERT. INCHES 40 FEET
HORIZ. INCHES 200 FEET



1



SECTION STA 50+00
 VERT. SCALE: 1"=40 FEET
 HORIZ. SCALE: 1"=200 FEET

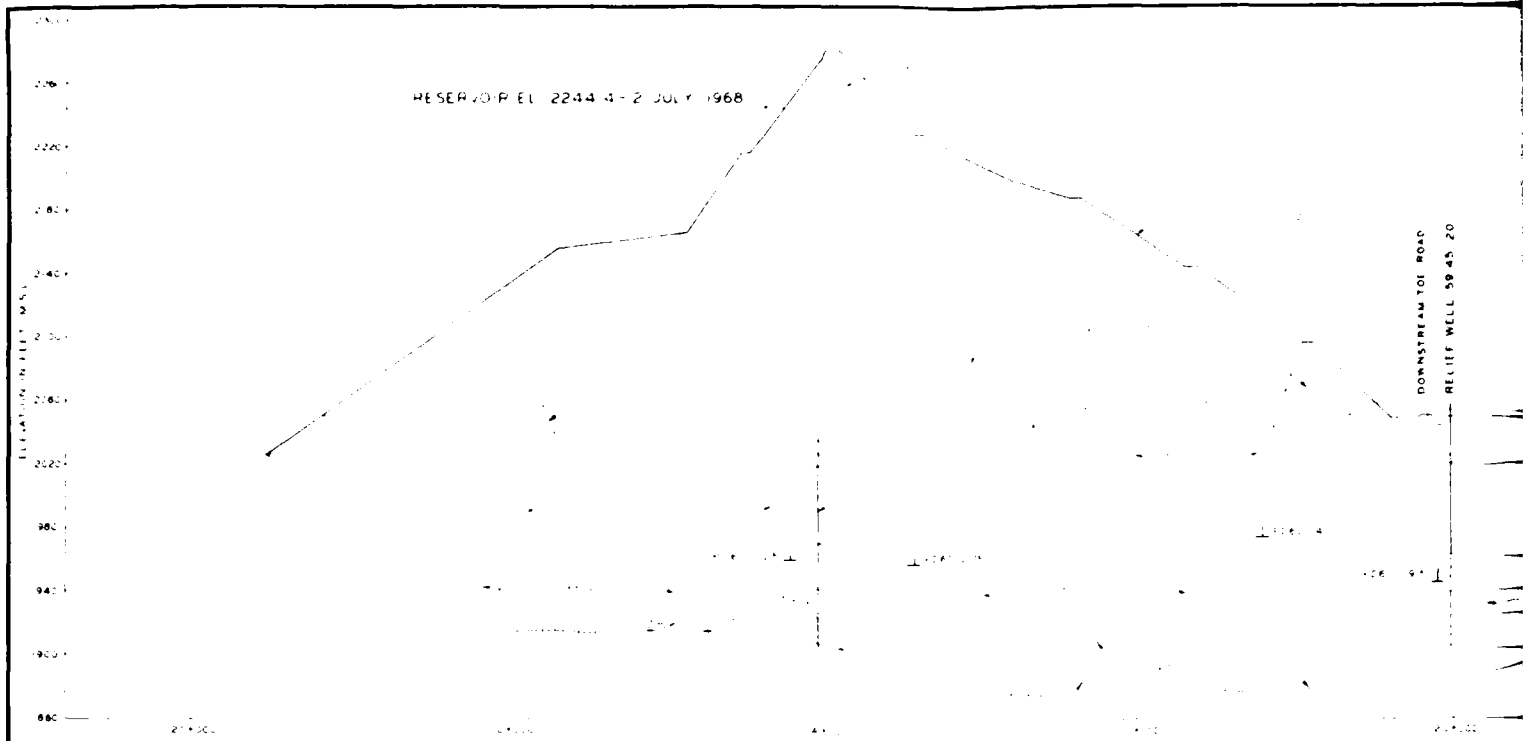


KEY PLAN

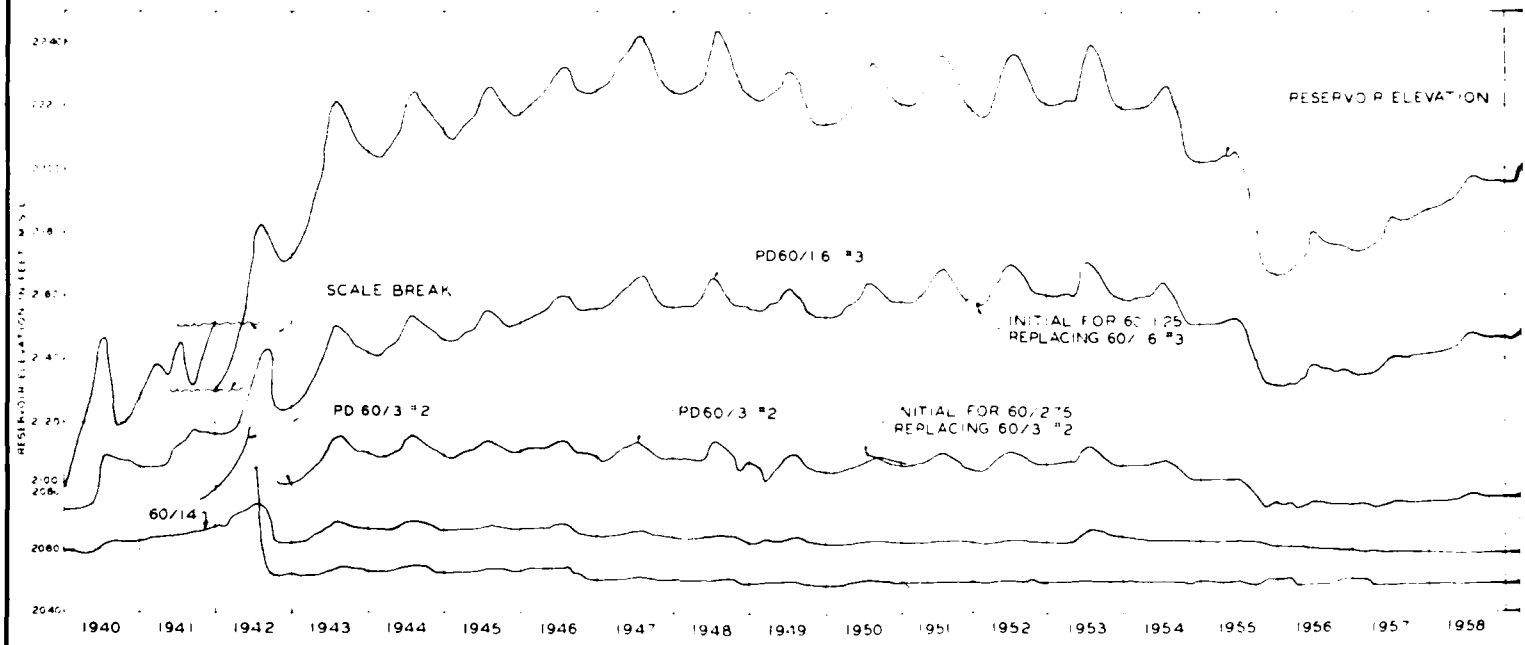
DATE	DESCRIPTION	MADE	APPROVED
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
MEMBER BY:		MISSOURI RIVER	
DRAWN BY:		FORT PECK LAKE, MONTANA	
CHECKED BY:		STATION 50+00	
SUBMITTED BY:		HYDROSTATIC PRESSURE	
SHEET:		BENEATH CLAY STRATUM	
APPROVED:	DATE:	BY:	DATE:
BY:	DATE:	BY:	DATE:
APPROVED:	DATE:	BY:	DATE:
COL. E. E. BARTNEY, ENGINEER		SHEET	

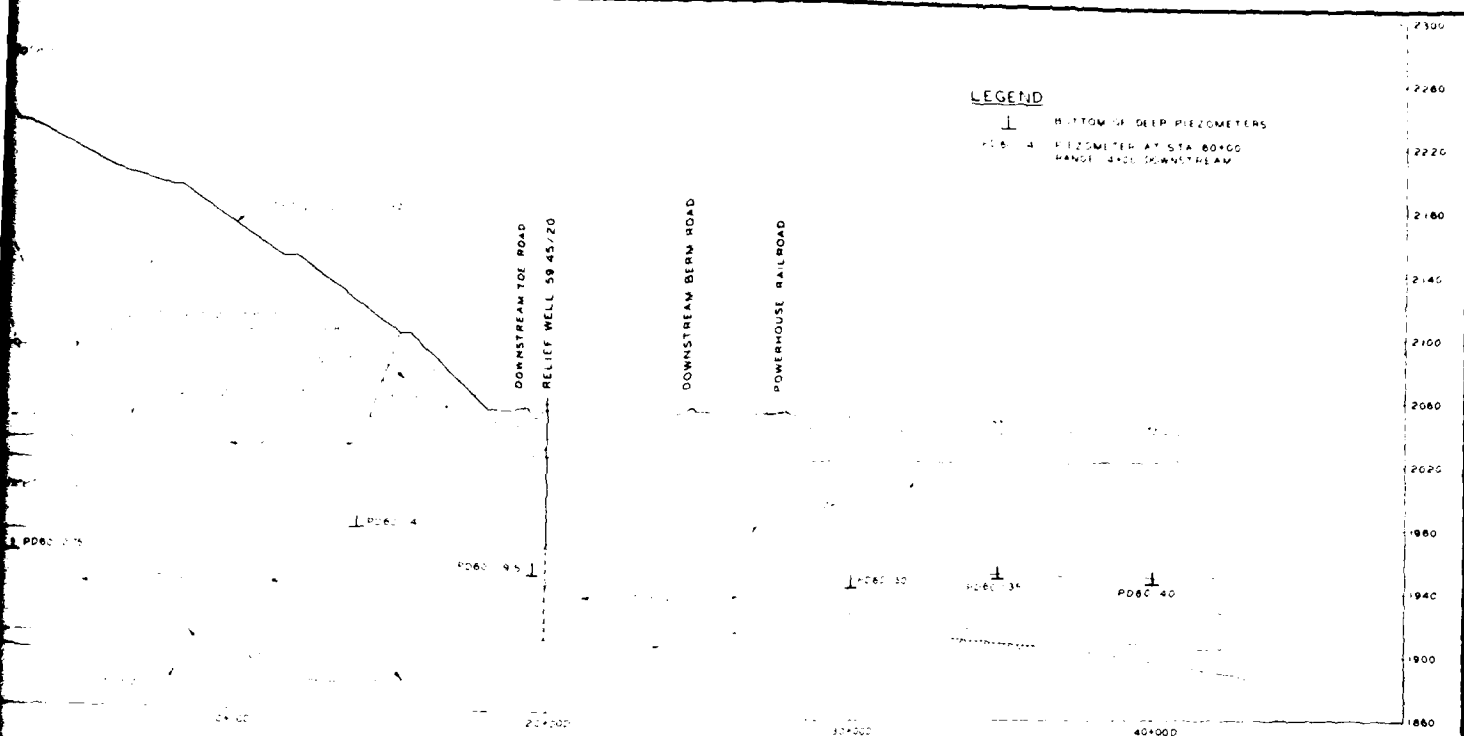


THIS PLAN ACCOMPANIES CONTRACT NO. _____
 MODIFICATION NO. _____

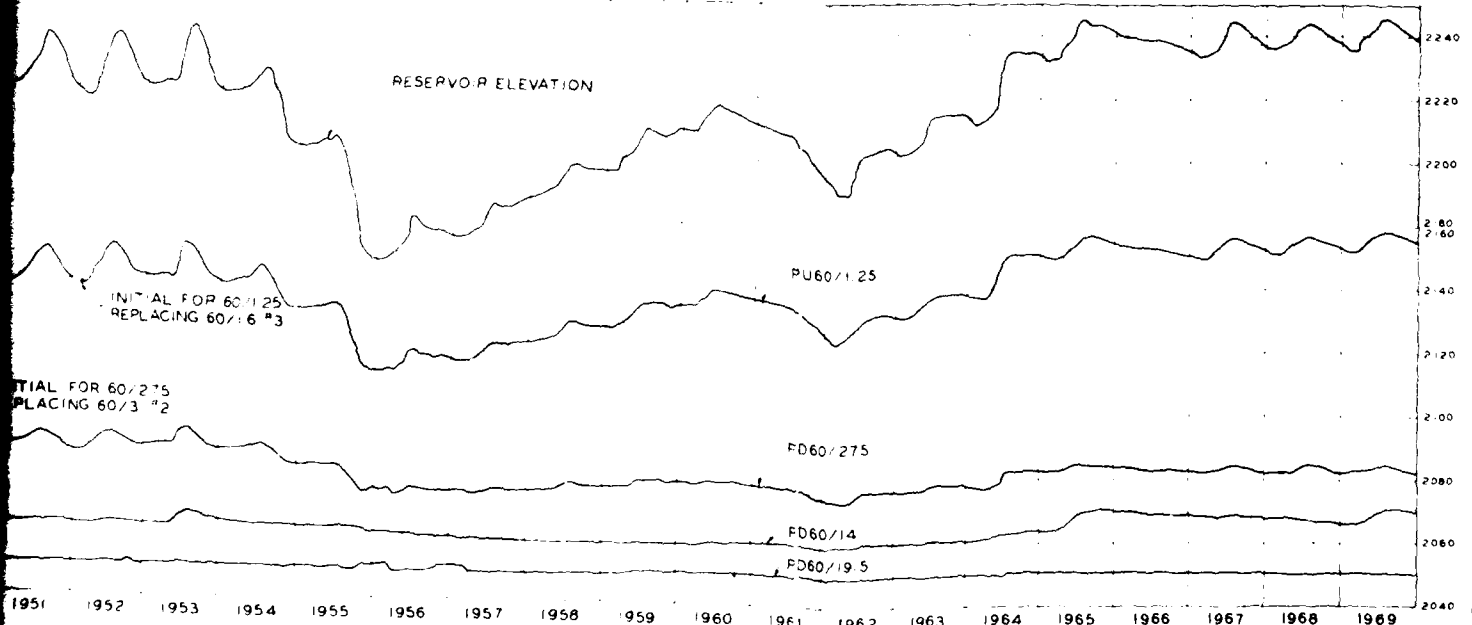


SECTION - STA 60+00
 SCALE VERT. 1" = 4' FEET
 HORZ. 1" = 20' FEET





SECTION-STA 60+00
 SCALE VERT. 1" = 4' FEET
 H. 1" = 20' FEET

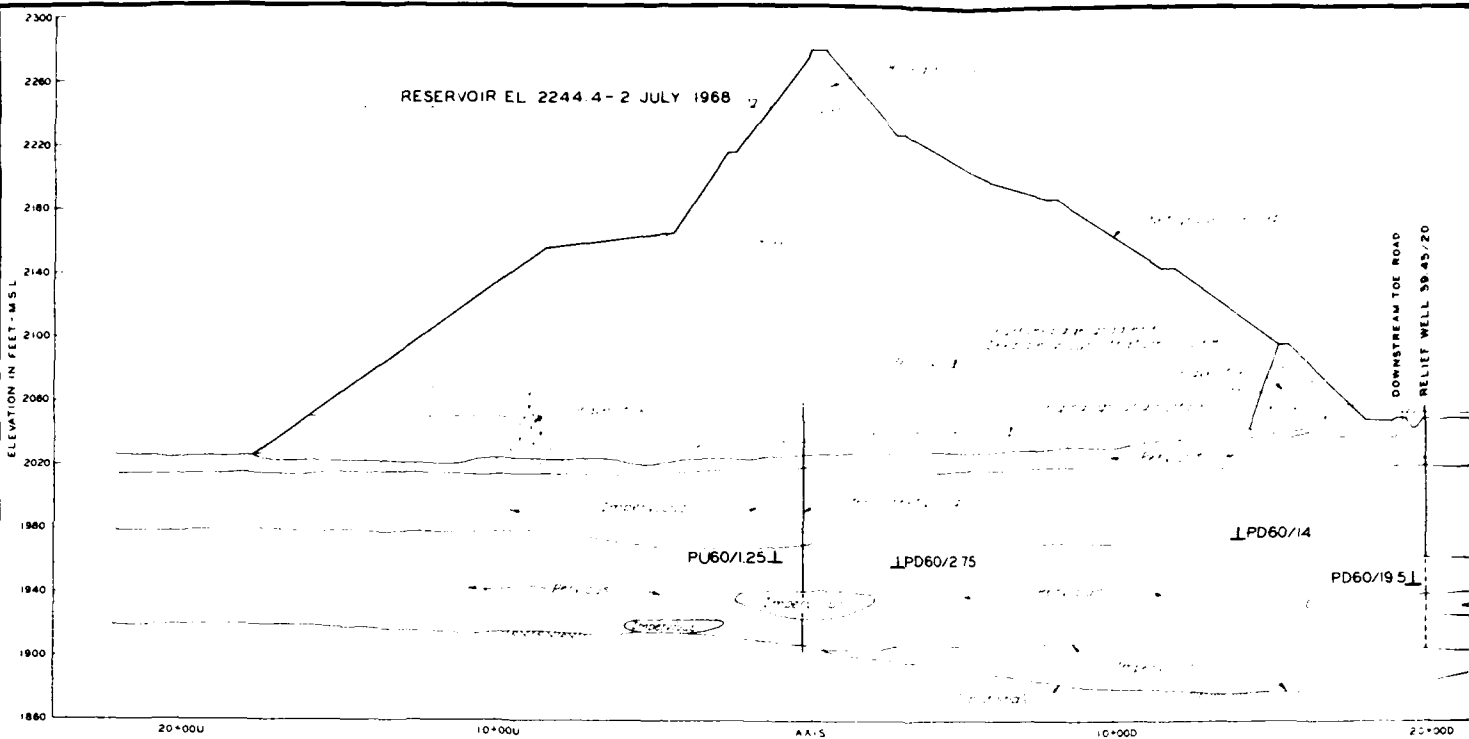


DATE	DESCRIPTION	MADE	APPROV
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
MISSOURI RIVER FORT PECK LAKE, MONTANA			
STATION 60+00 HYDROSTATIC PRESSURE BENEATH CLAY STRATUM			
DESIGNED BY	APPROVED	DATE	
CHECKED BY	ONLY ENGINEERING PERSONNEL APPROVED		DATE
APPROVED	SCALE AS SHOWN SHEET NO.		RELAY NUMBER

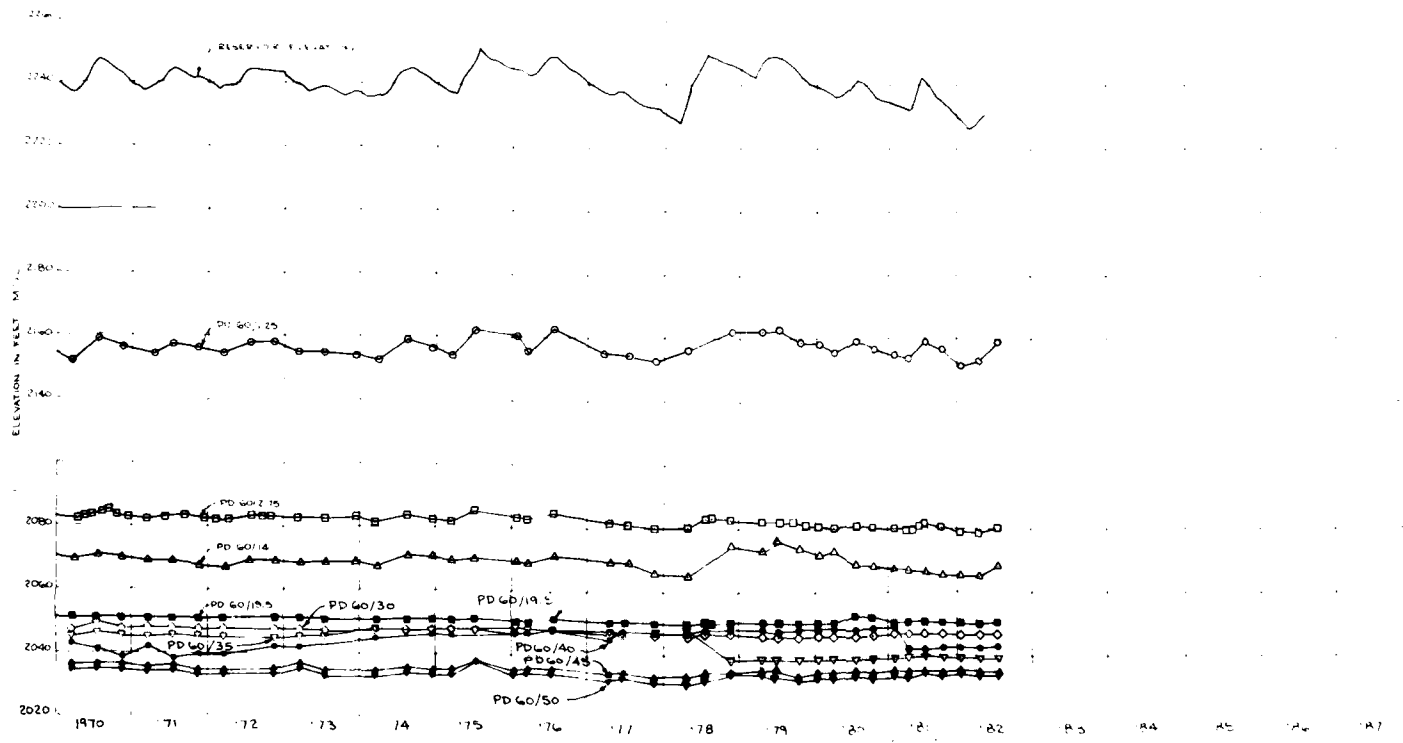


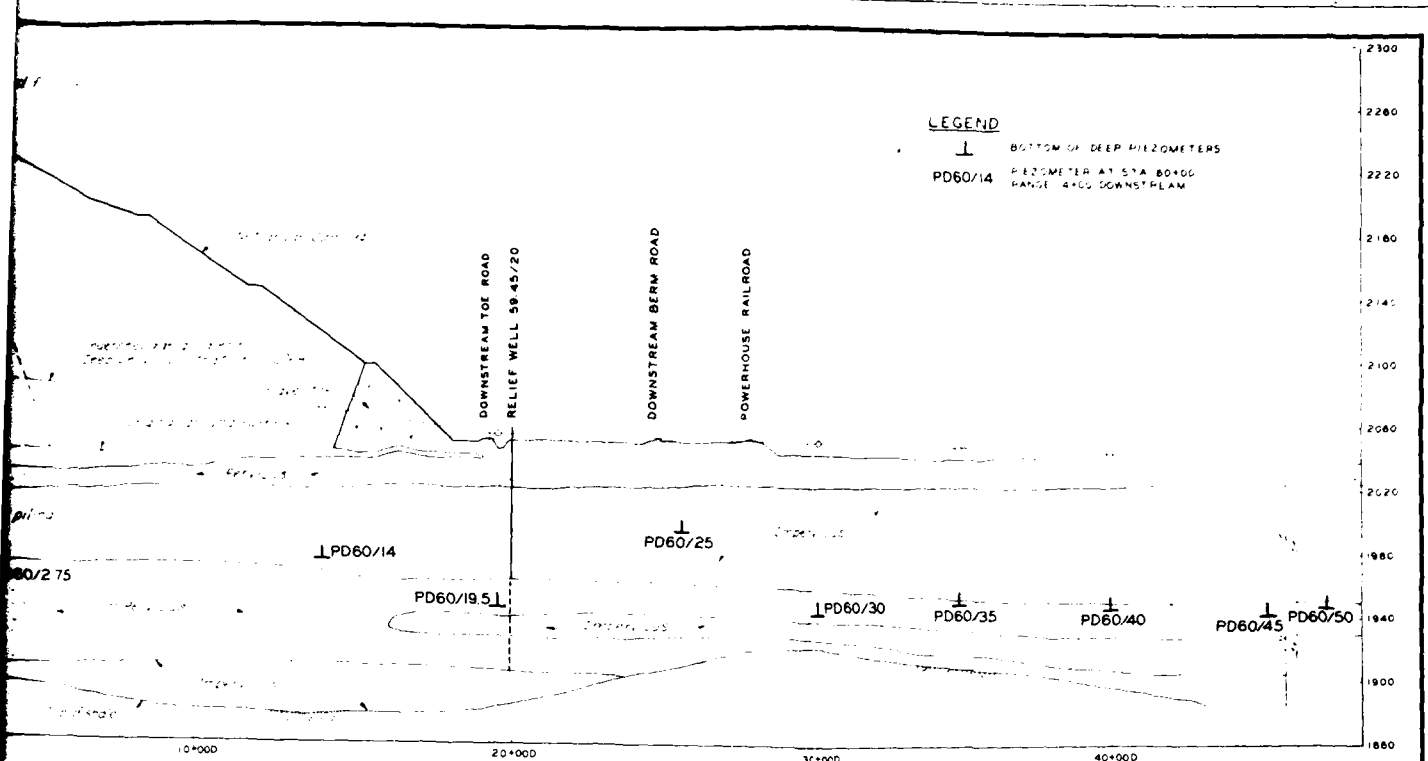
2

THIS PLAN ACCOMPANIES CONTRACT NO. _____
 MODIFICATION NO. _____

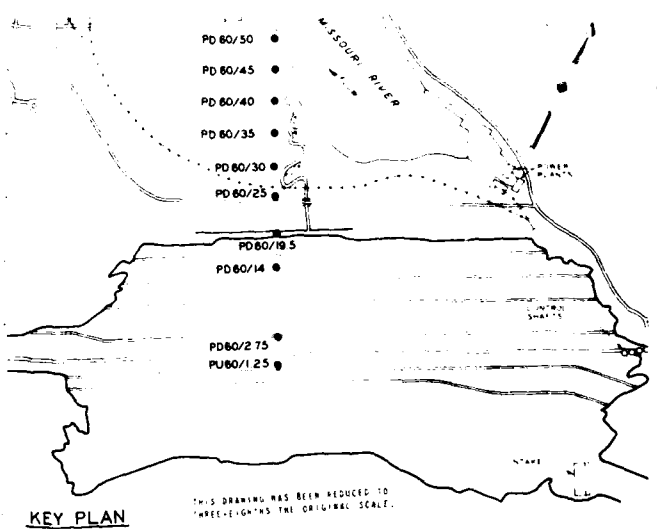
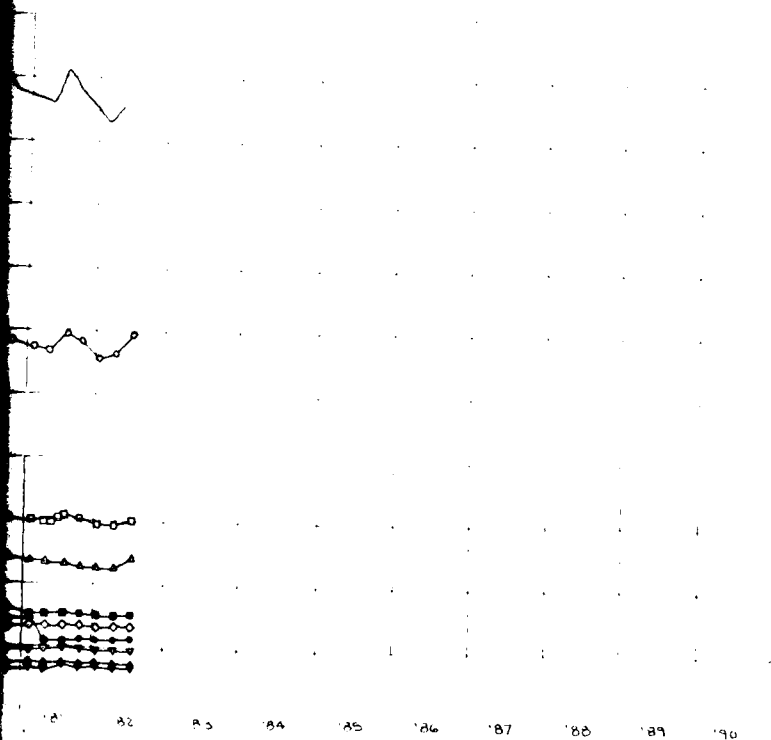


SECTION - STA 60+00
SCALE VERT. 1 INCH = 40 FEET
HORIZ. 1 INCH = 200 FEET





SECTION-STA 60+00
 SCALE VERT. 1 INCH = 40 FEET
 HORIZ. 1 INCH = 200 FEET

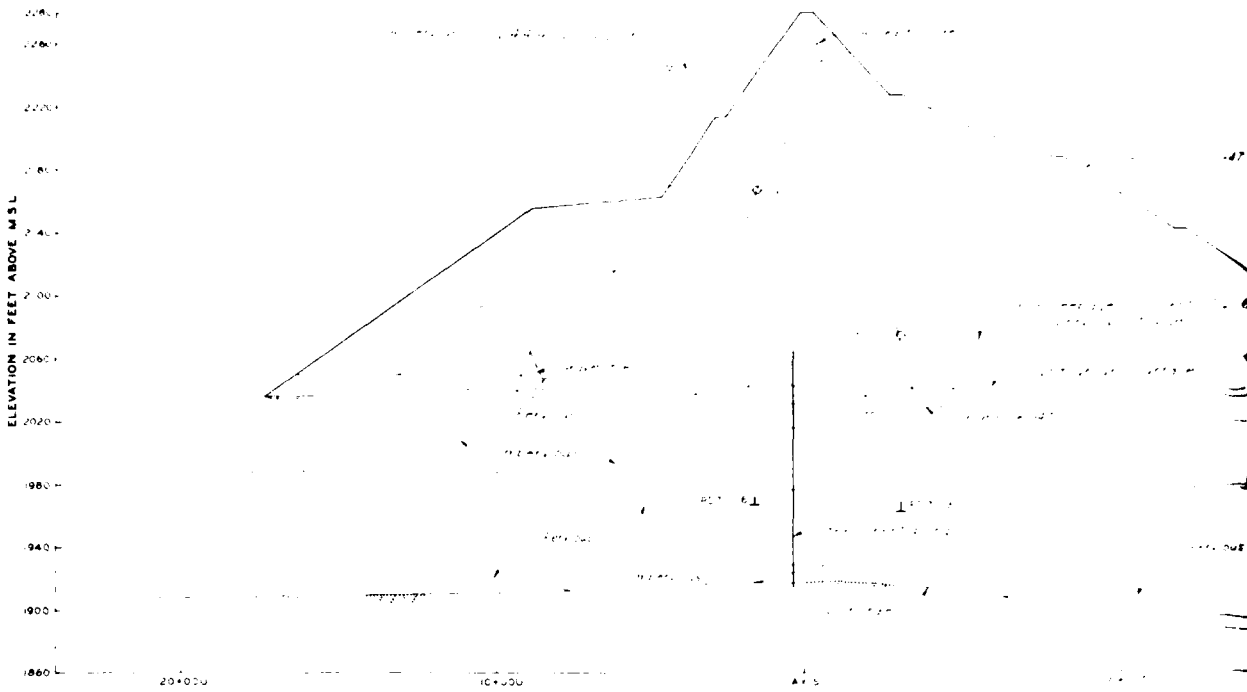


THIS DRAWING HAS BEEN REDUCED TO THREE-EIGHTHS THE ORIGINAL SCALE.

DATE	DESCRIPTION	MADE	APPROV.
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
OWNER BY:		MISSOURI RIVER FORT PECK LAKE, MONTANA	
DESIGNED BY:		STATION 60+00 HYDROSTATIC PRESSURE BENEATH CLAY STRATUM	
DATE	REVISION	APPROVER	DATE
DATE	REVISION	APPROVER	DATE
DATE	REVISION	APPROVER	DATE

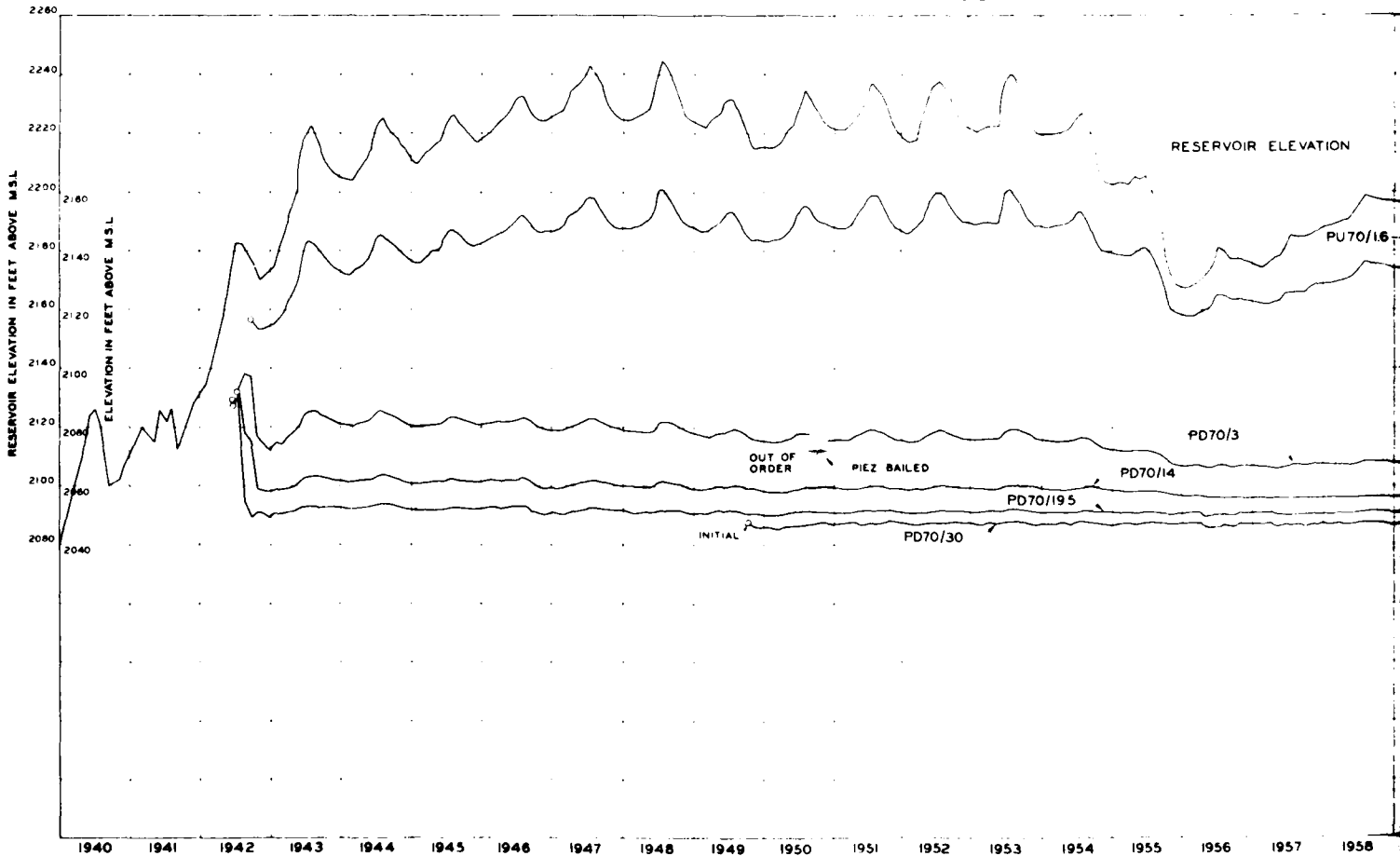


THIS PLAN ACCOMPANIES CONTRACT NO. _____
 MODIFICATION NO. _____



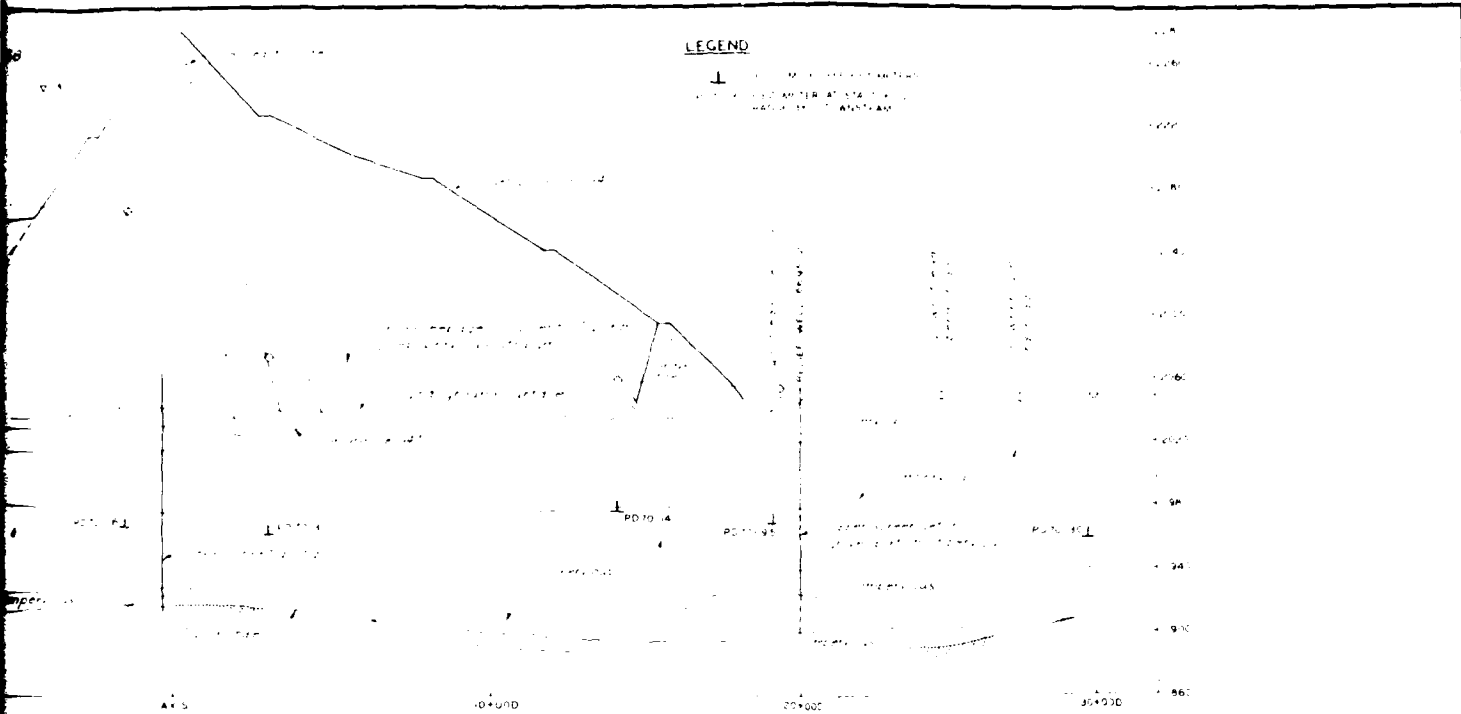
SECTION STA 70+00

SCALE VERT 1 INCH = 40 FEET
HORIZ 1 INCH = 200 FEET



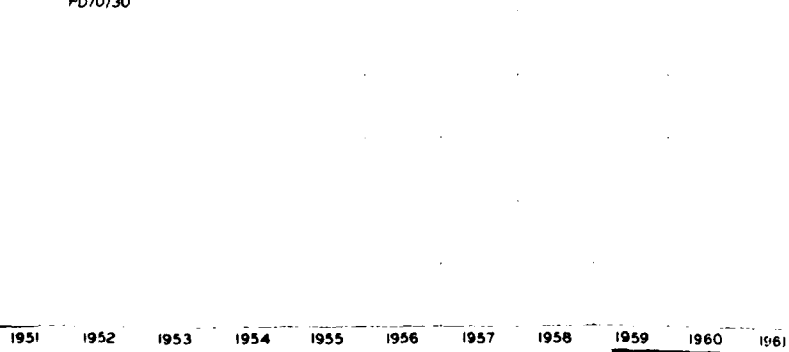
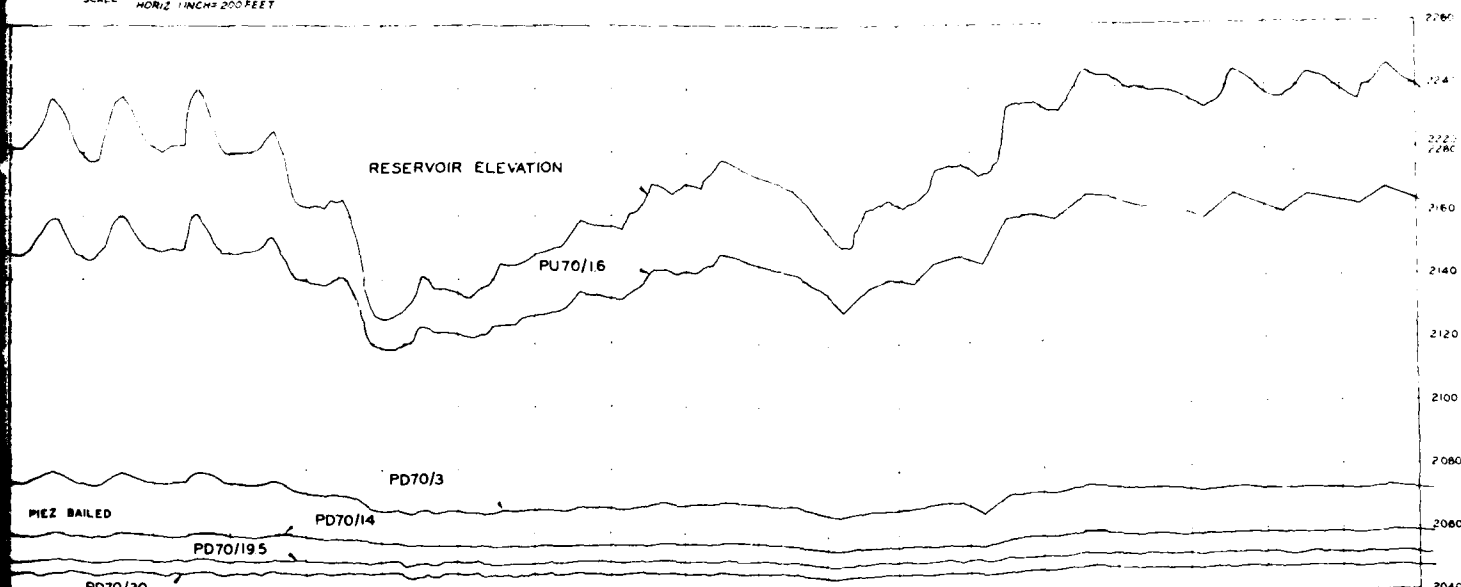
LEGEND

↓ WATER TABLE AT STATION 70+00
 WATER TABLE AT STATION 70+00



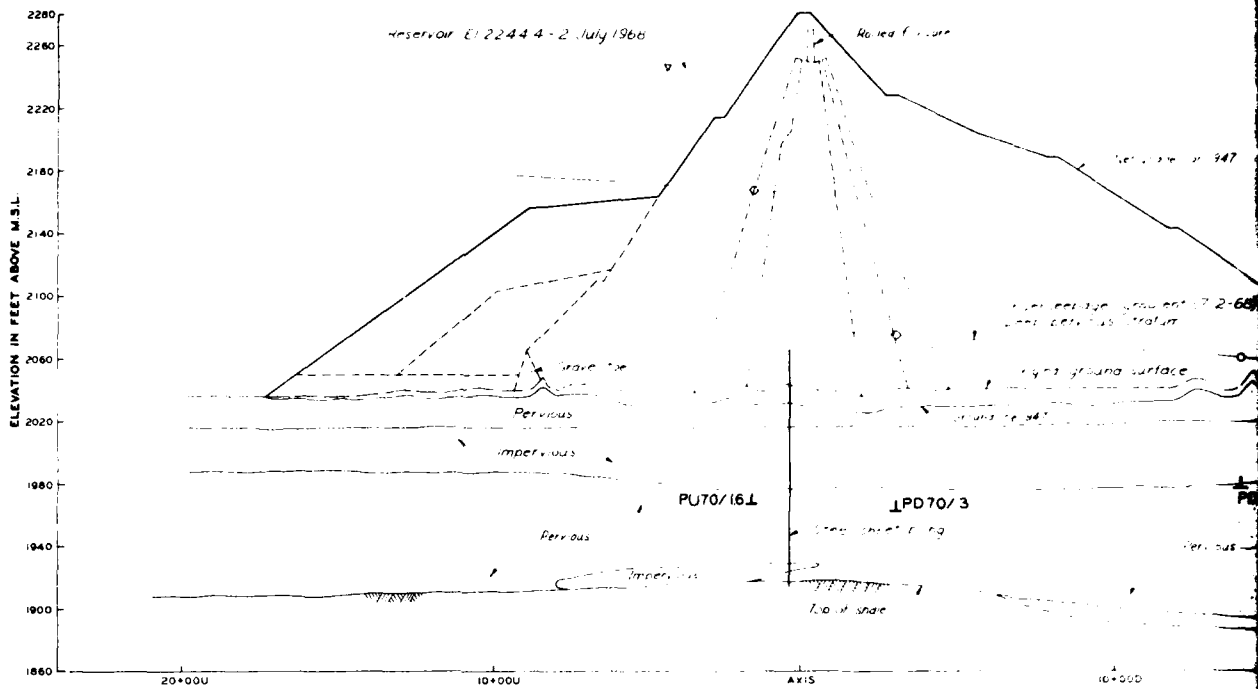
SECTION STA 70+00

SCALE VERT. 1 INCH = 40 FEET
 HORIZ. 1 INCH = 200 FEET



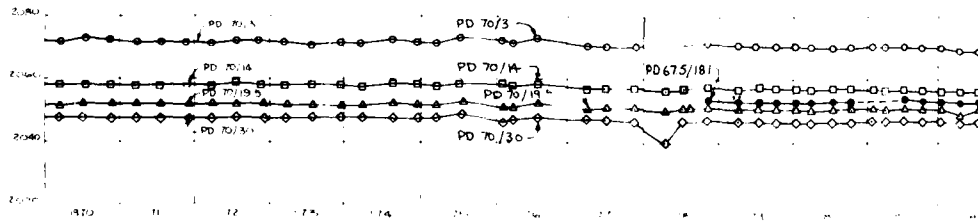
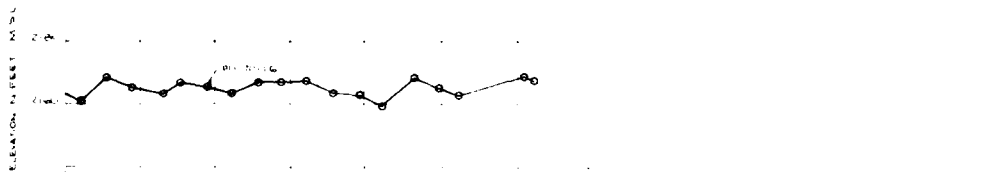
1962	1963	1964	1965	1966	1967	1968	1969
DATE		DESCRIPTION		MADE	APPROVED		
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA							
DESIGNED BY: A.A.		MASSON, DICKER FORT PECK LAKE, MONTANA STATION 70+00 HYDROSTATIC PRESSURE BENEATH CLAY STRATUM					
DRAWN BY: H.H.		CHECKED BY: A.A.		APPROVED:		DATE:	
ENGINEER BY: A.A.		SUPERVISOR: A.A.		APPROVED:		DATE:	
APPROVED:		APPROVED:		APPROVED:		DATE:	
APPROVED:		APPROVED:		APPROVED:		DATE:	

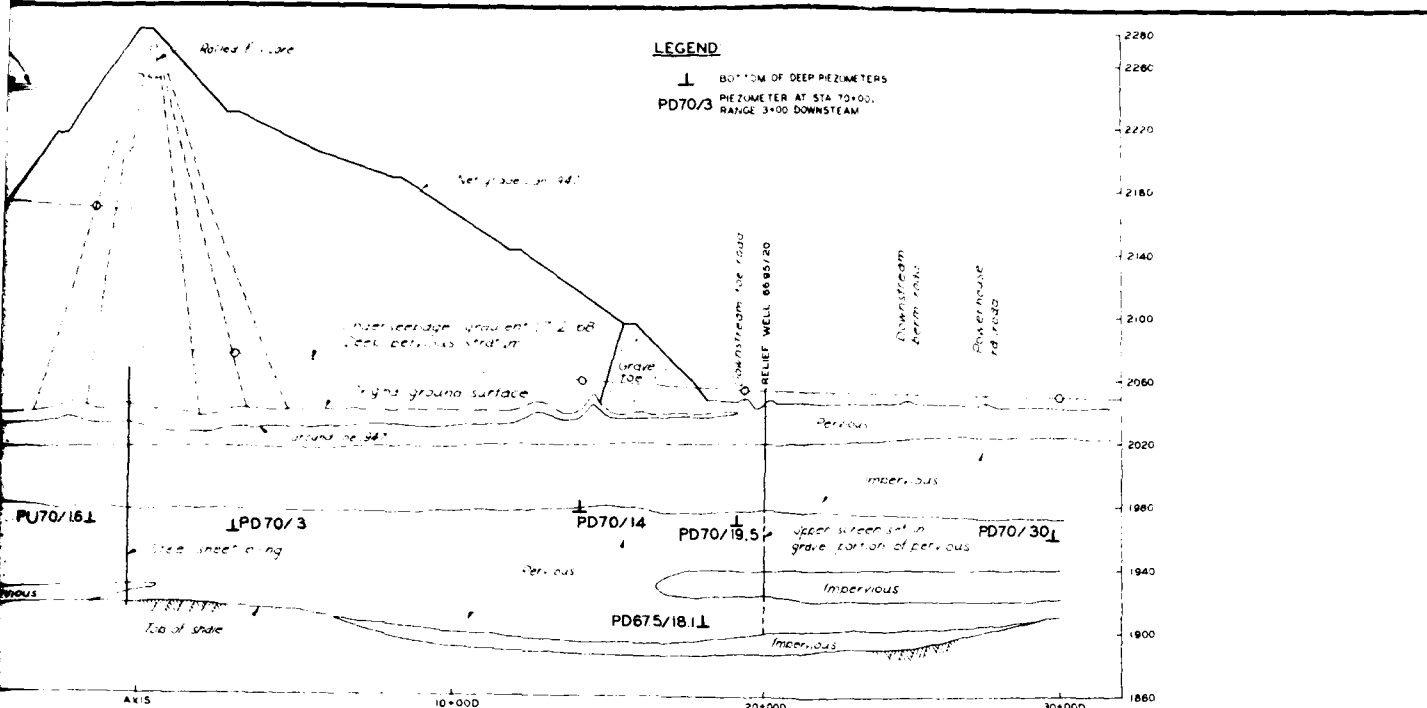




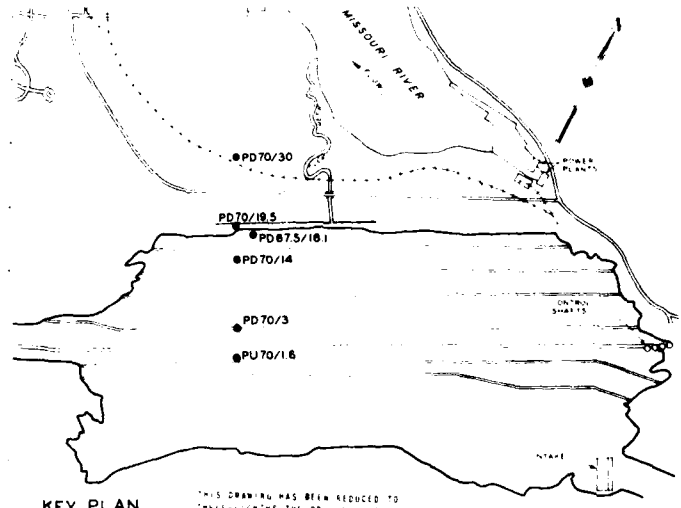
SECTION STA. 70+00

SCALE VERT 1 INCH = 40 FEET
 HORIZ 1 INCH = 200 FEET





SECTION STA. 70+00
 SCALE VERT 1 INCH = 40 FEET
 HORIZ 1 INCH = 200 FEET

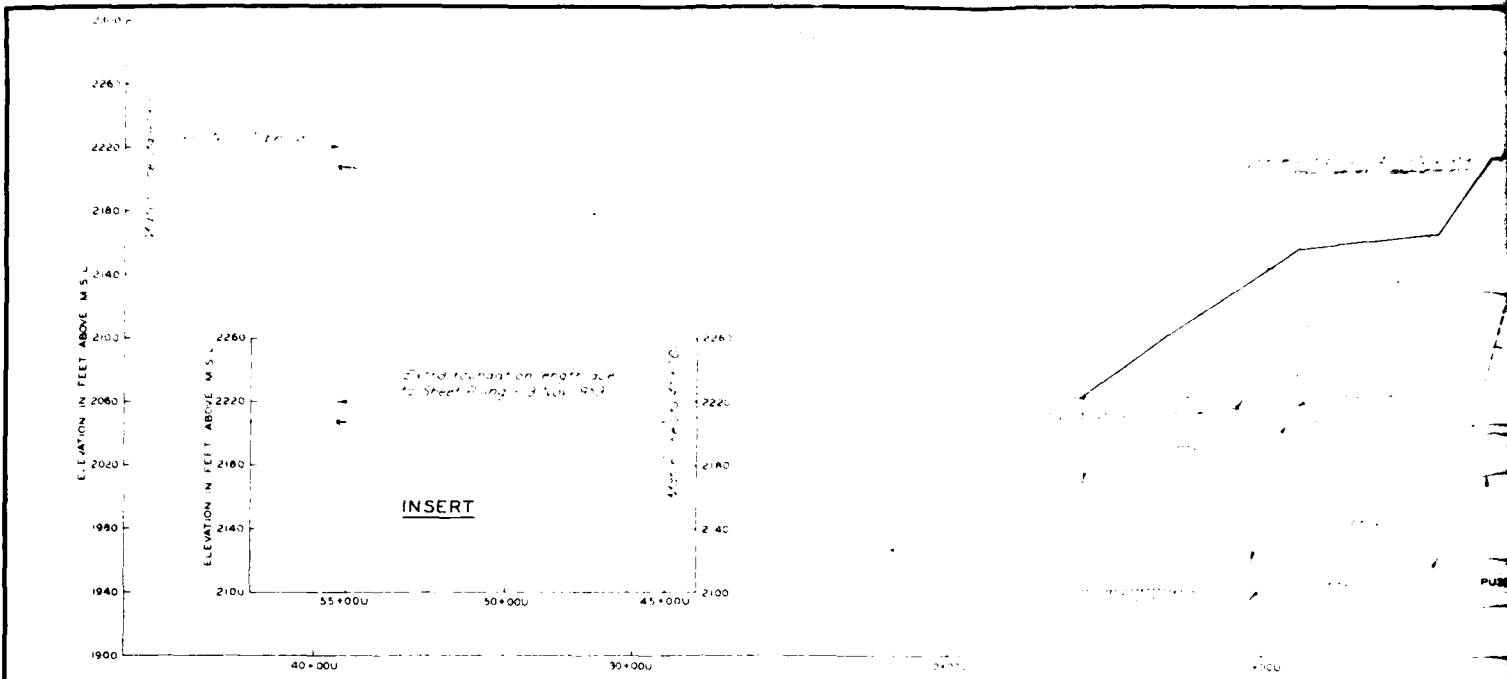


KEY PLAN

REVISIONS		DATE	DESCRIPTION	MADE	APPROV
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA					
DESIGNED BY: DRAWN BY: CHECKED BY: SUBMITTED BY:		MISSOURI RIVER FORT PECK LAKE, MONTANA STATION 70+00 HYDROSTATIC PRESSURE BENEATH CLAY STRATUM			
DATE: SHEET NO.:	SHEETS: OF:	APPROVED:	DATE:	SCALE AS SHOWN:	SHEET NO.:
APPROVED:	DRAWN:	CHECKED:	DATE:	SHEETS:	OF:
U. S. ARMY ENGINEER DISTRICT, OMAHA CIVIL ENGINEER			CHECKED:		

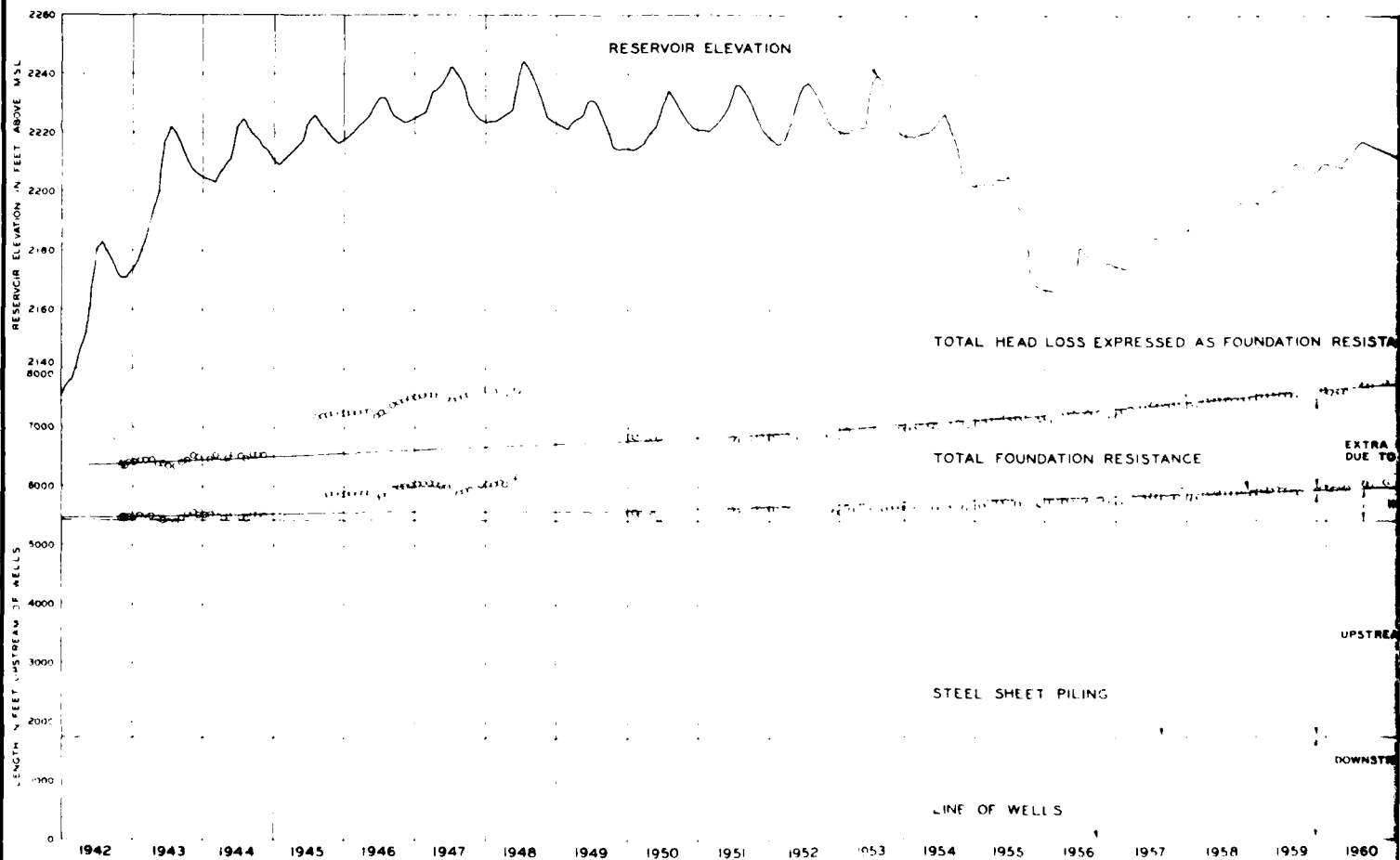


THIS PLAN ACCOMPANIES CONTRACT NO. _____
 MODIFICATION NO. _____

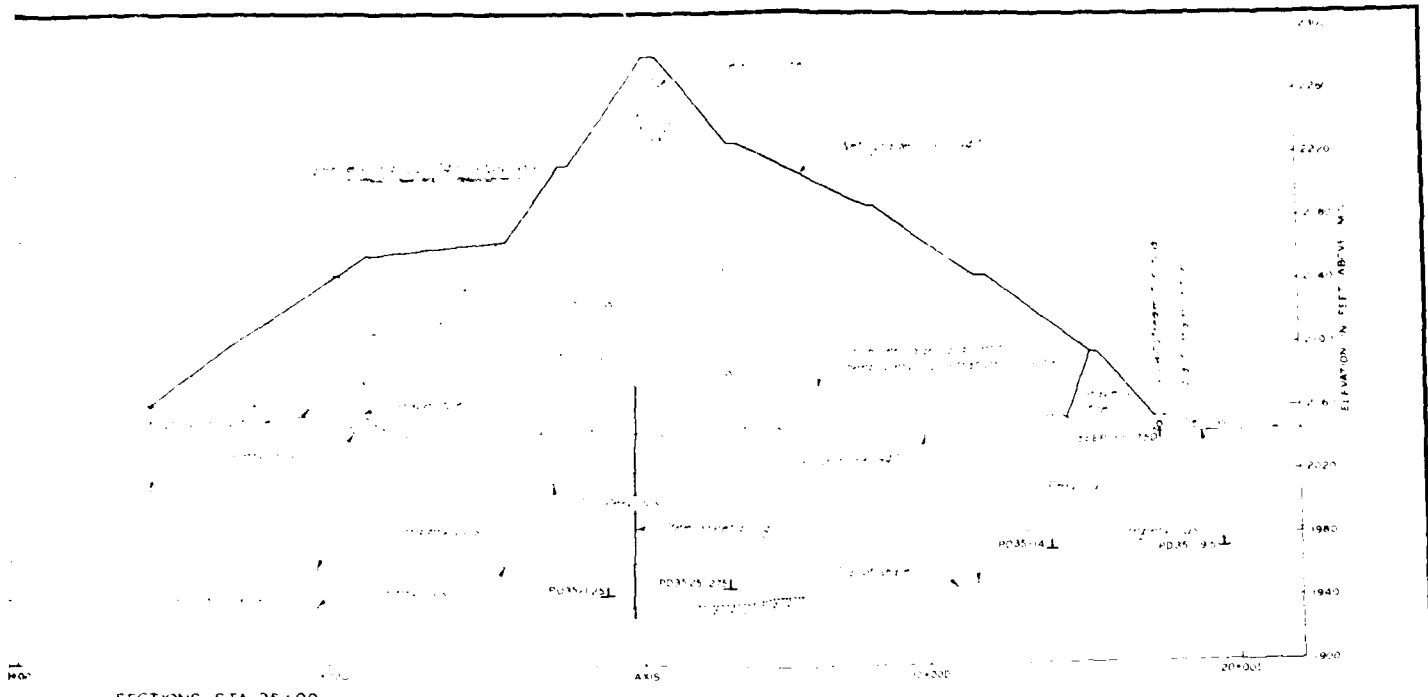


SECTIONS - STA 35+00

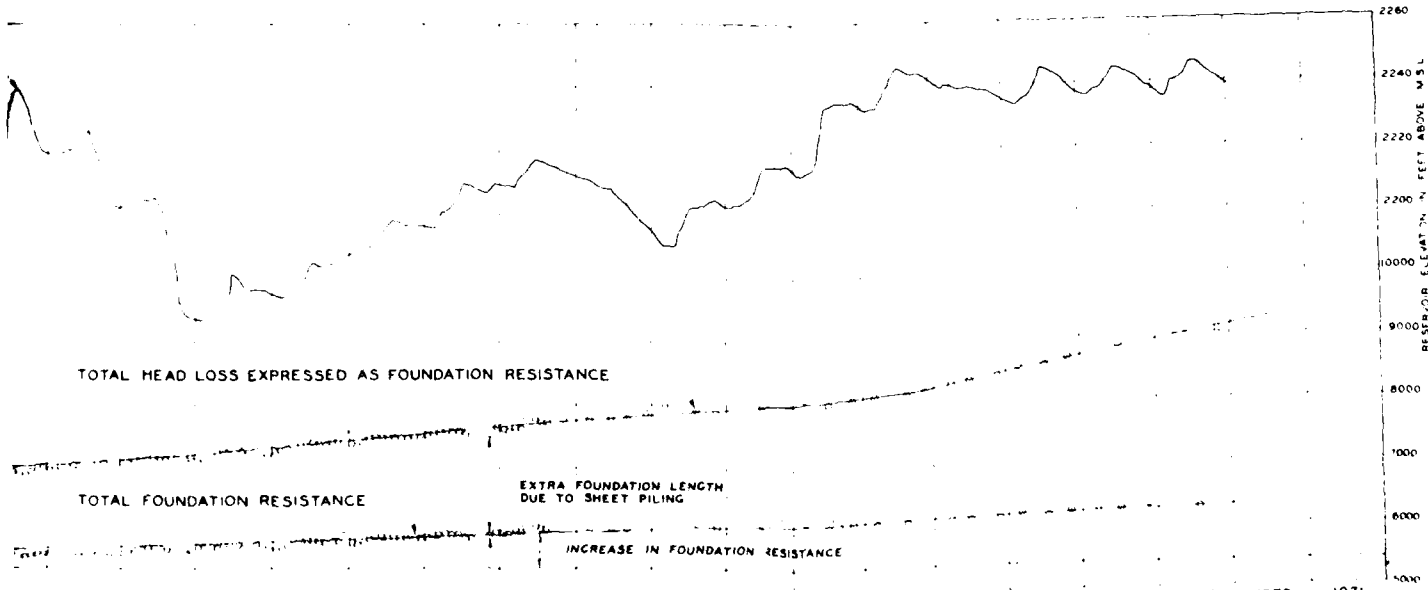
SCALE VERT. INCH = 40 FEET
HORIZ. INCH = 200 FEET



FORT PECK DAM AND RESERVOIR



SECTIONS - STA 35+00



DATE	DESCRIPTION	MADE	APPROV
1964			
1965			
1966			
1967			
1968			
1969			
1970			
1971			

U. S. ARMY ENGINEER DISTRICT, OMAHA
CORPS OF ENGINEERS
OMAHA, NEBRASKA

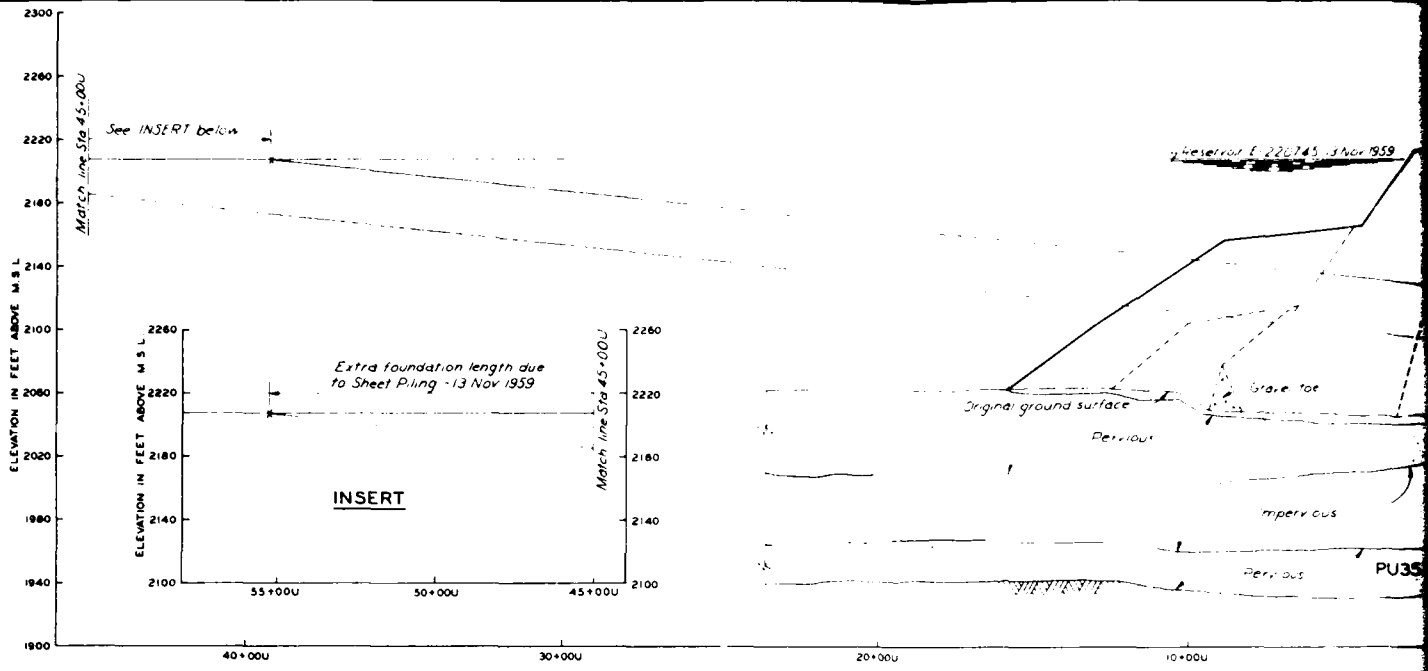
FOR PECK LAKE, MONTANA
UNDERSEEPAGE STUDIES
STATION 35+00
ANALYSIS OF SEEPAGE PERFORMANCE

DESIGNED BY		APPROVED	DATE
DRAWN BY			
CHECKED BY			
PERMITTED BY			
SUPV. BY			
APPV. BY			
DATE			

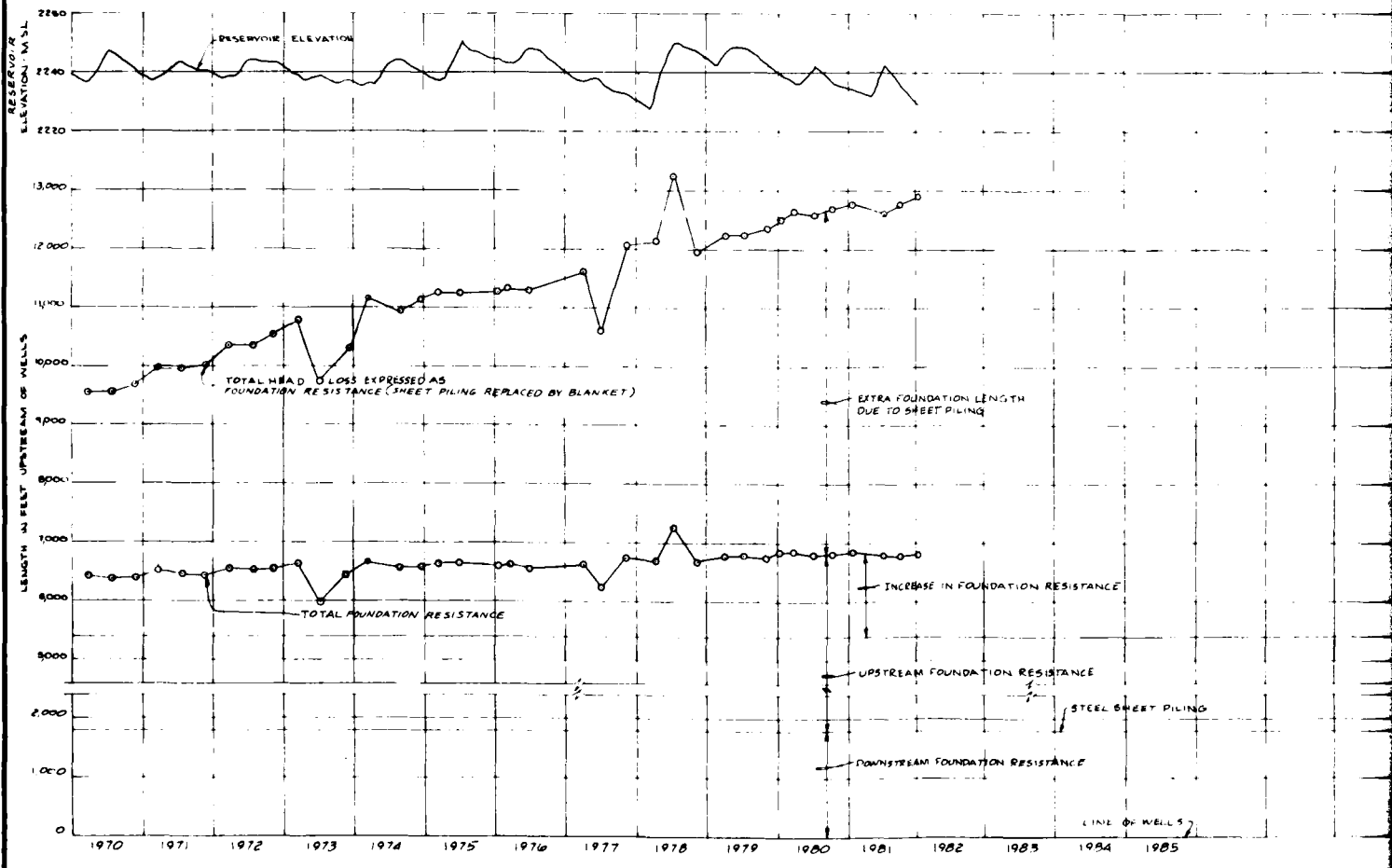
SCALE AS SHOWN SHEET NO. DRAWING NUMBER

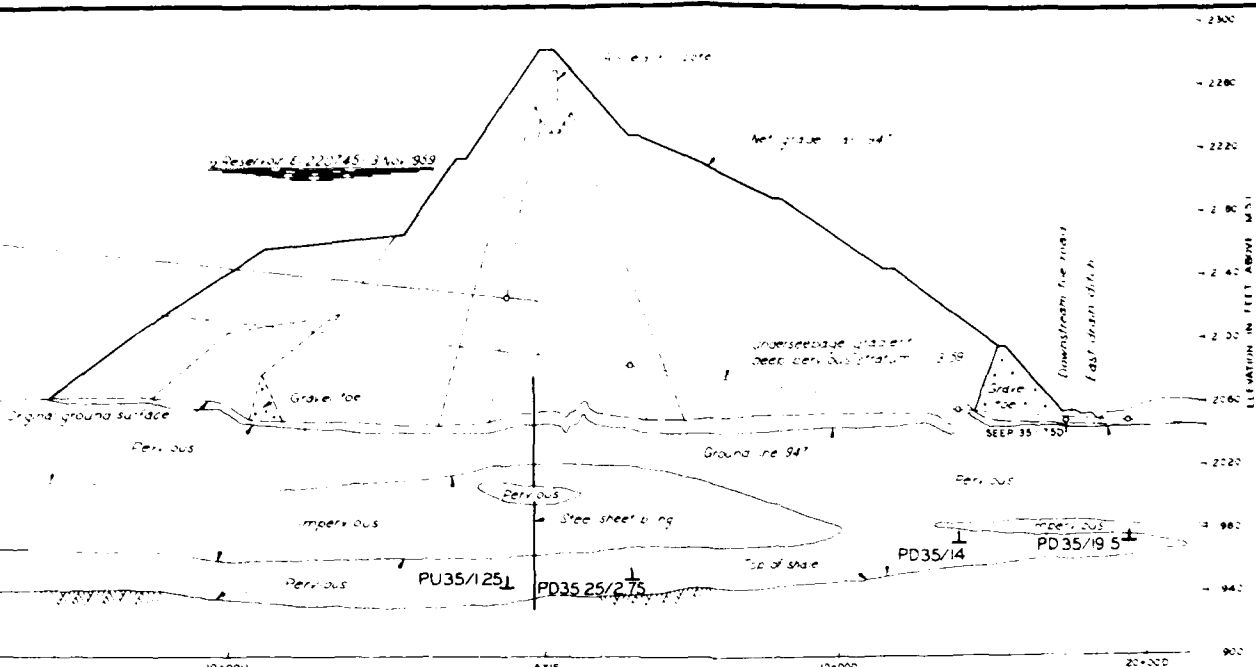


THIS PLAN ACCOMPANIES CONTRACT NO. _____
MODIFICATION NO. _____



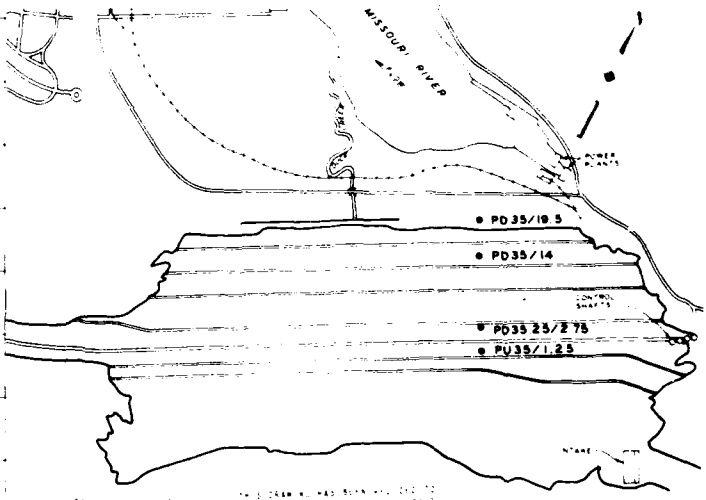
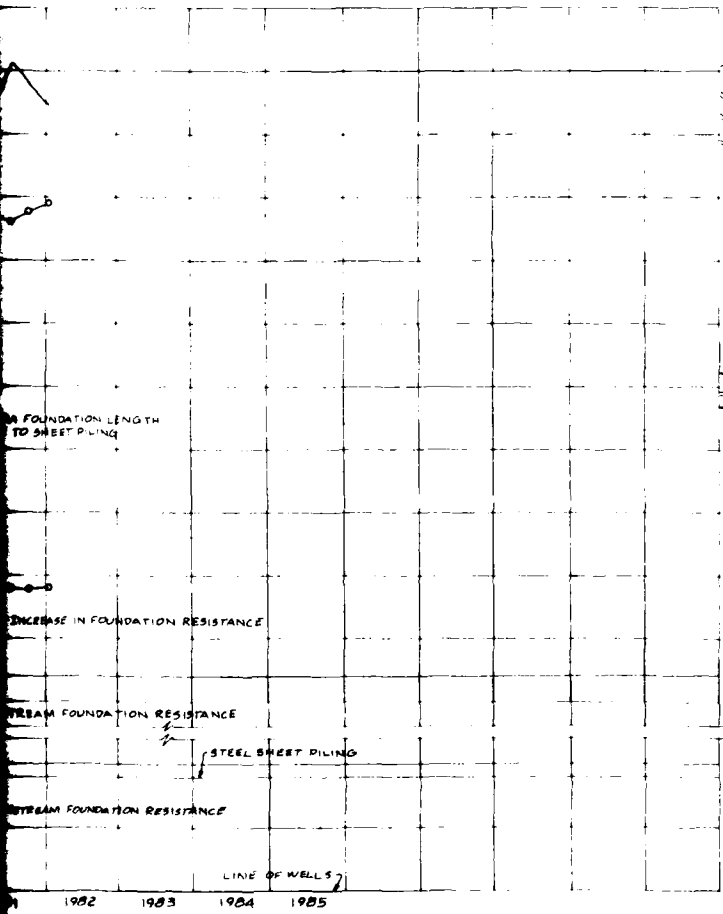
SECTIONS-STA. 35+00
 SCALE VERT. INCH= 40 FEET
 HORIZ. INCH= 200 FEET





SECTIONS - STA. 35+00

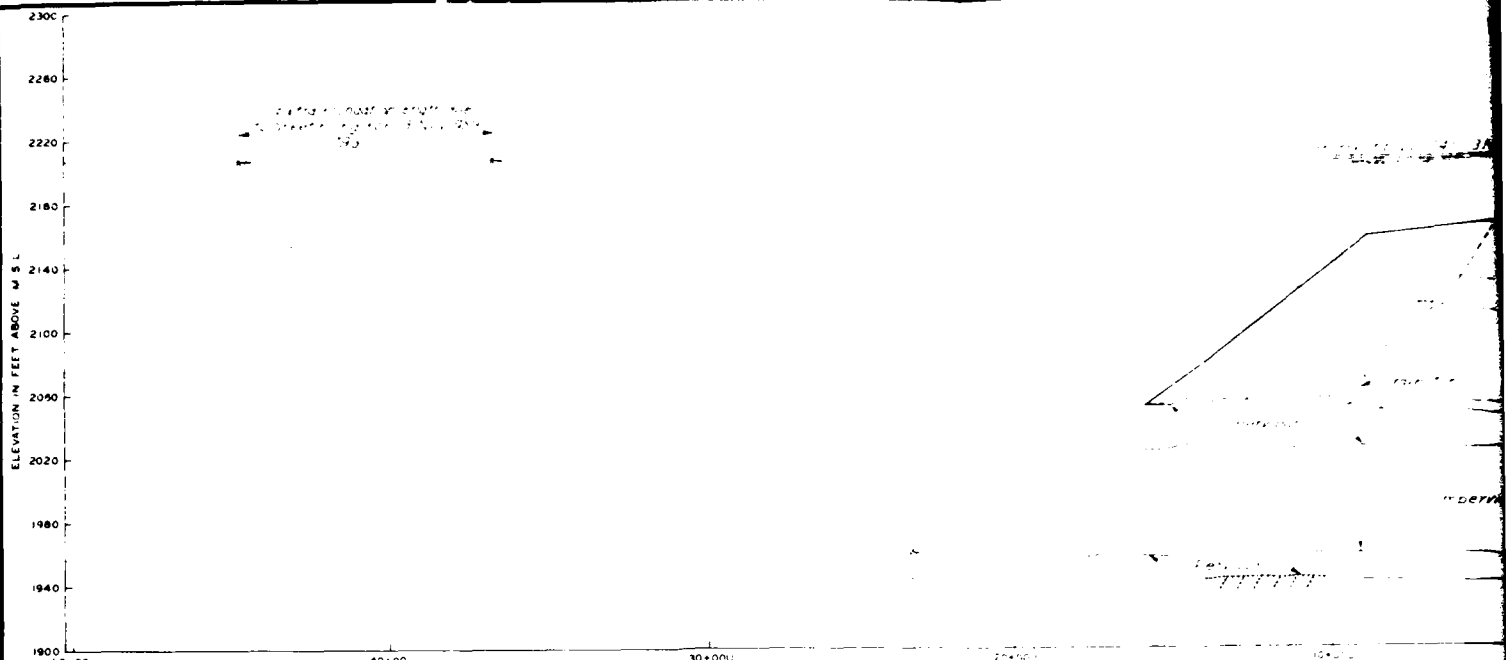
SCALE VERT INCH = 40 FEET
 HORIZ INCH = 200 FEET



KEY PLAN

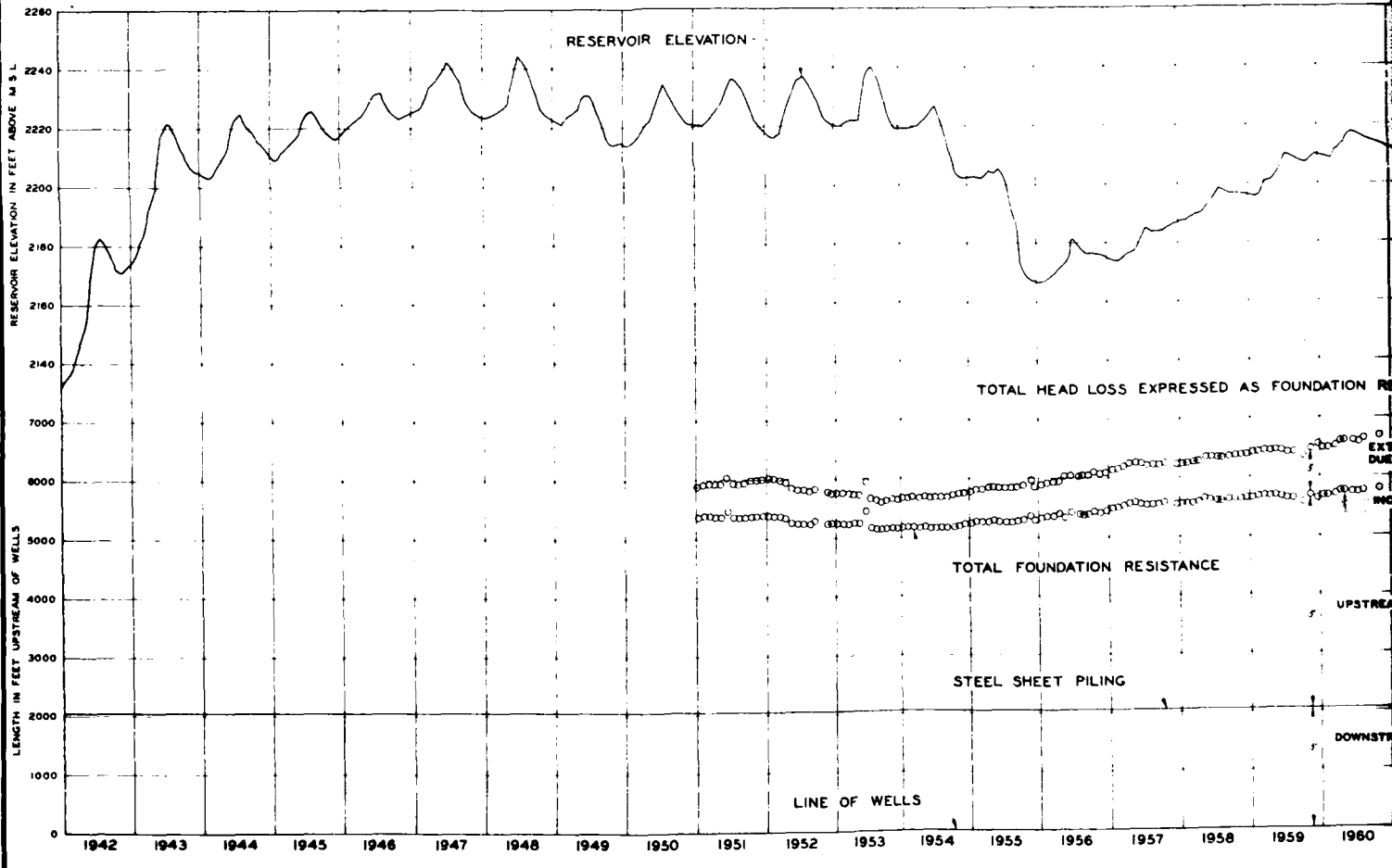
DATE	DESCRIPTION	MADE	APPROV
	REVISIONS		
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY: DRAWN BY: CHECKED BY: QUANTITY BY: DATE:		MISSOURI RIVER FORT PECK LAKE, MONTANA UNDERSEEPAGE STUDIES STATION 35+00 ANALYSIS OF SEEPAGE PERFORMANCE BENEATH CLAY STRATUM	
APPROVED:	DATE:	APPROVED:	DATE:
BY: [Signature]	DATE: [Date]	BY: [Signature]	DATE: [Date]
THIS PLAN ACCOMPANIES CONTRACT NO. _____ MODIFICATION NO. _____		MISSOURI RIVER FORT PECK LAKE, MONTANA UNDERSEEPAGE STUDIES STATION 35+00 ANALYSIS OF SEEPAGE PERFORMANCE BENEATH CLAY STRATUM PLATE 7-30	





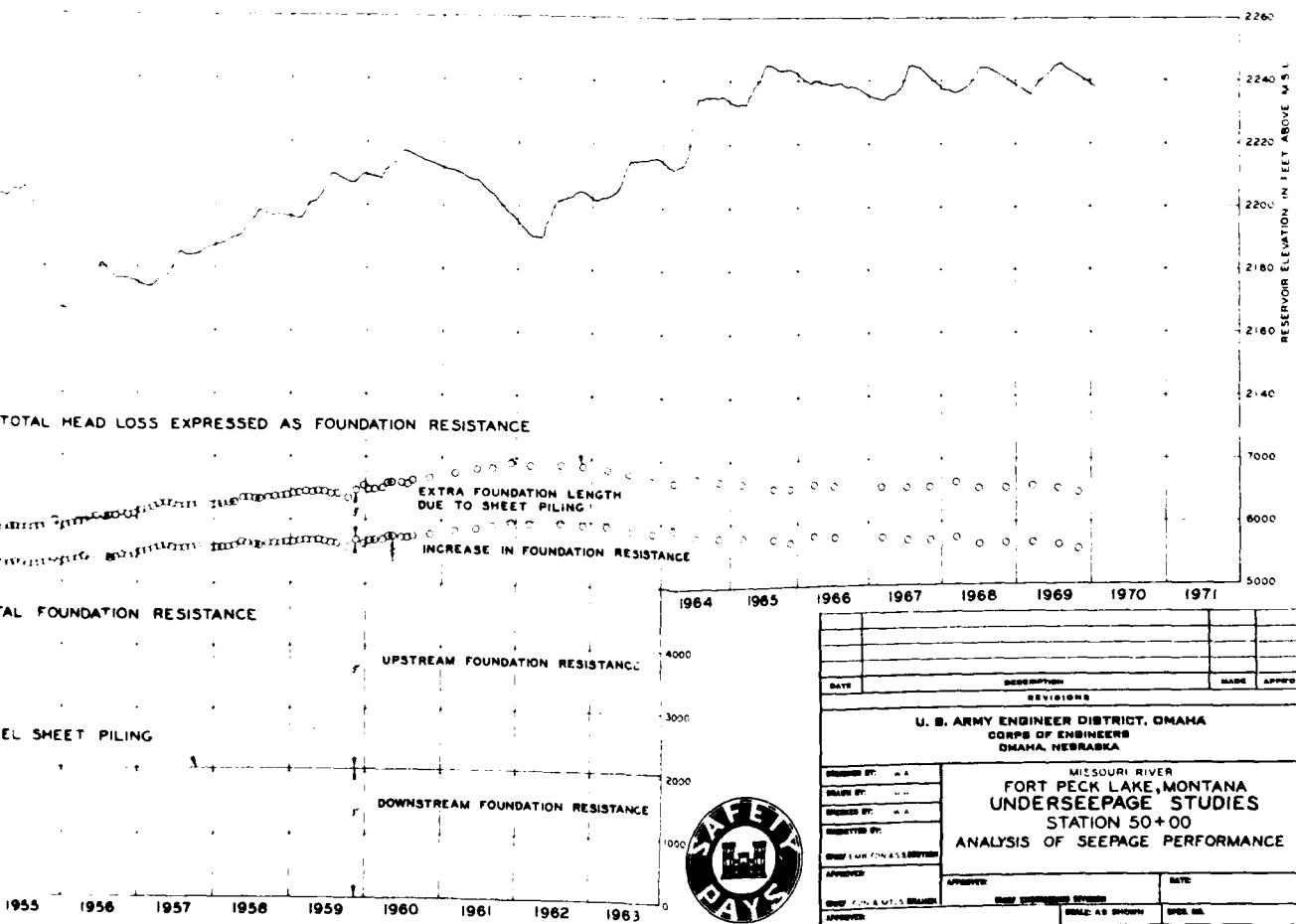
SECTION - STA 50+00

SCALE VERT. INCH=40 FEET
HORIZ. INCH=200 FEET



FORT PECK DAM AND RESERVOIR

SECTION STA 50+00
 DATE: 11/21/67
 SCALE: 1" = 200 FEET

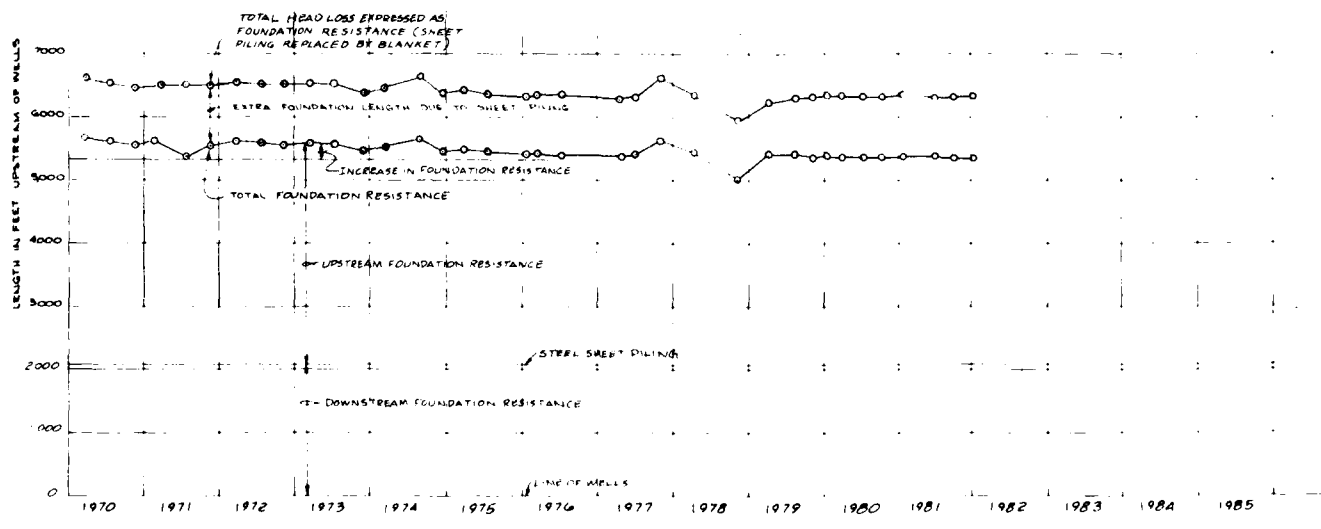
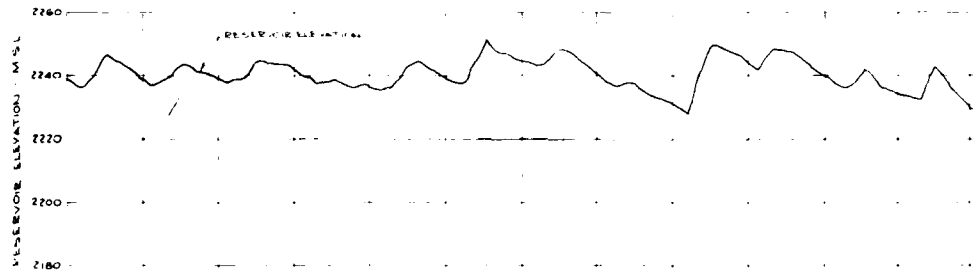
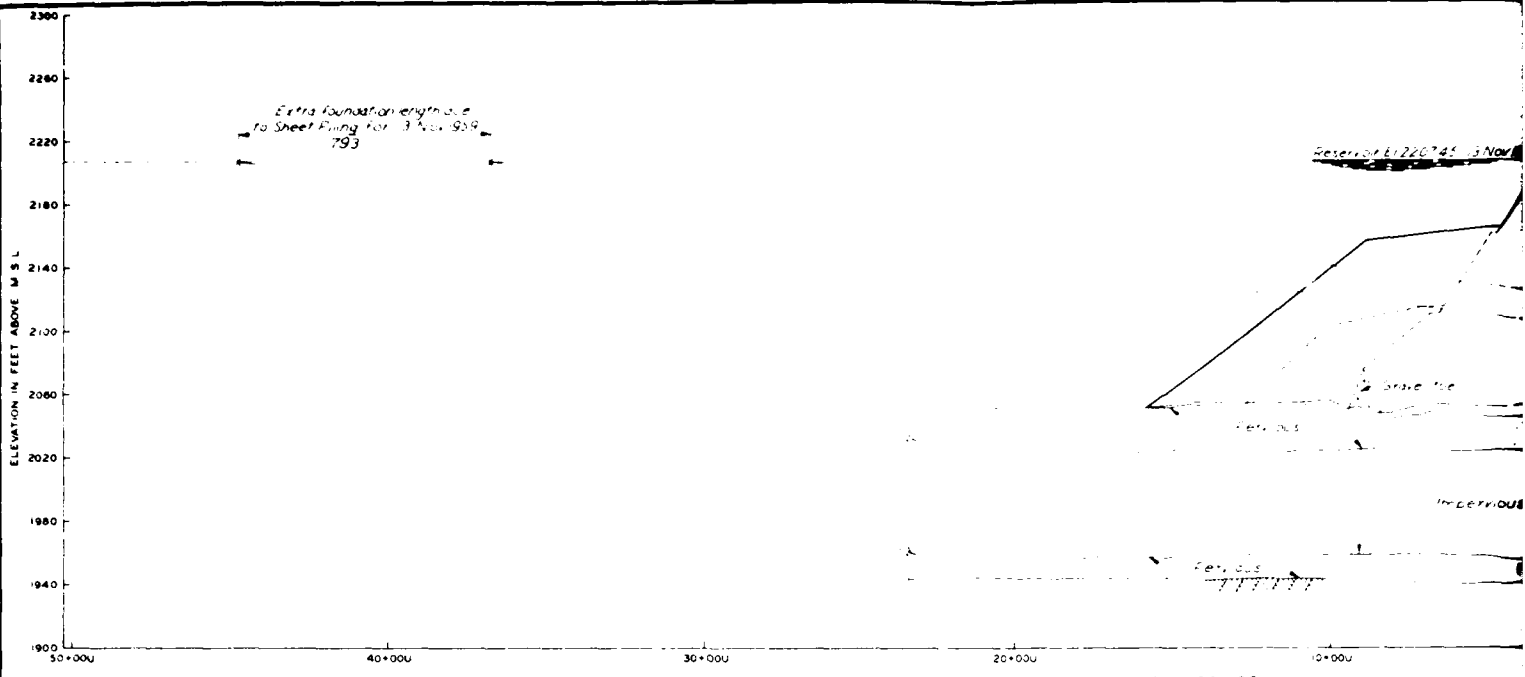


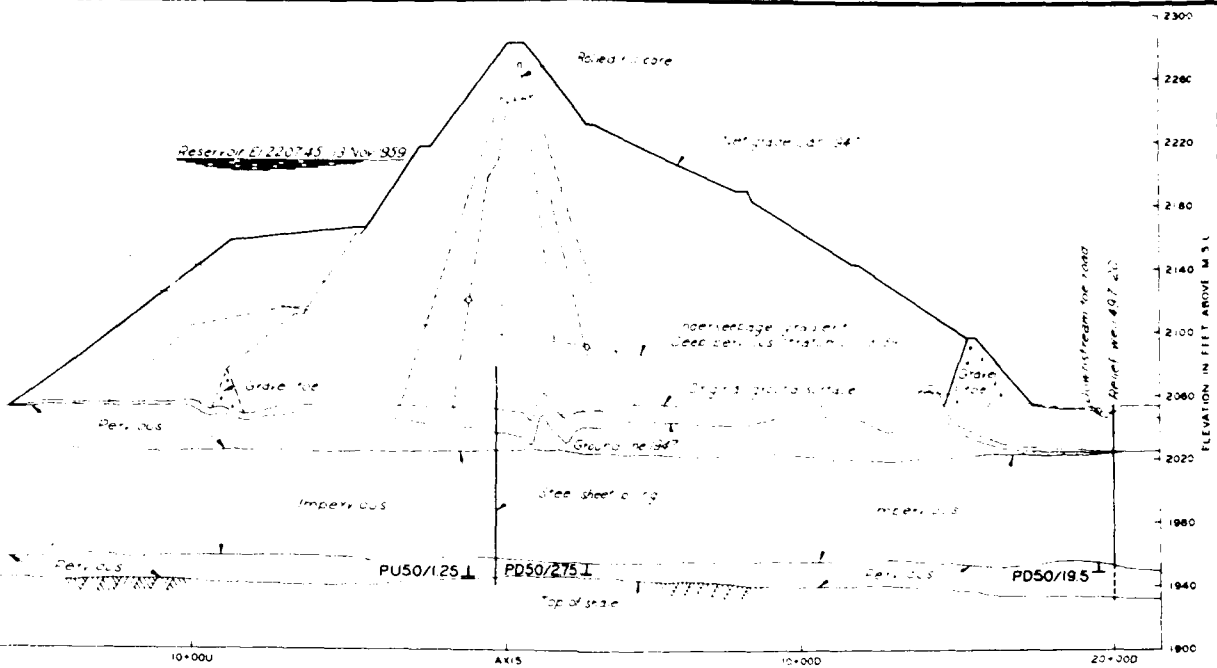
DATE	DESCRIPTION	MADE	APPROV
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY: A.A.		MISSOURI RIVER FORT PECK LAKE, MONTANA UNDERSEEPAGE STUDIES STATION 50+00 ANALYSIS OF SEEPAGE PERFORMANCE	
DRAWN BY: A.A.	ENGINEER BY: A.A.	PROJECTED BY:	APPROVED:
CHECKED BY: A.A.	APPROVED:	DATE:	
APPROVED:	APPROVED:	SCALE AS SHOWN:	SHEET NO.



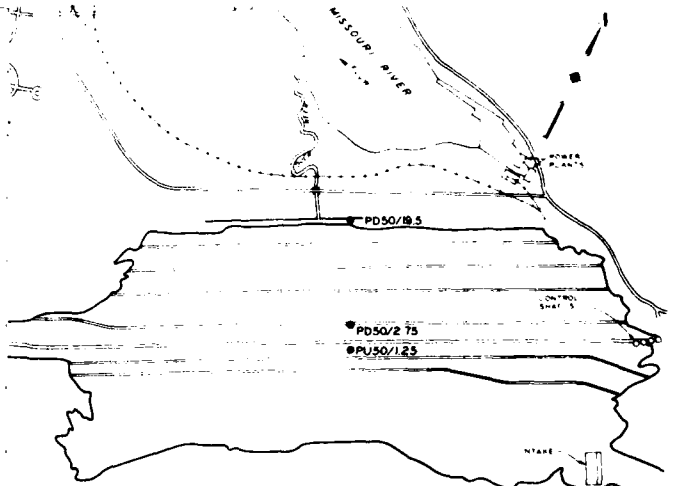
THIS PLAN ACCOMPANIES CONTRACT NO. _____
 MODIFICATION NO. _____

2





SECTION - STA. 50+00
 SCALE VERT 1 INCH = 40 FEET
 HORIZ 1 INCH = 200 FEET



KEY PLAN

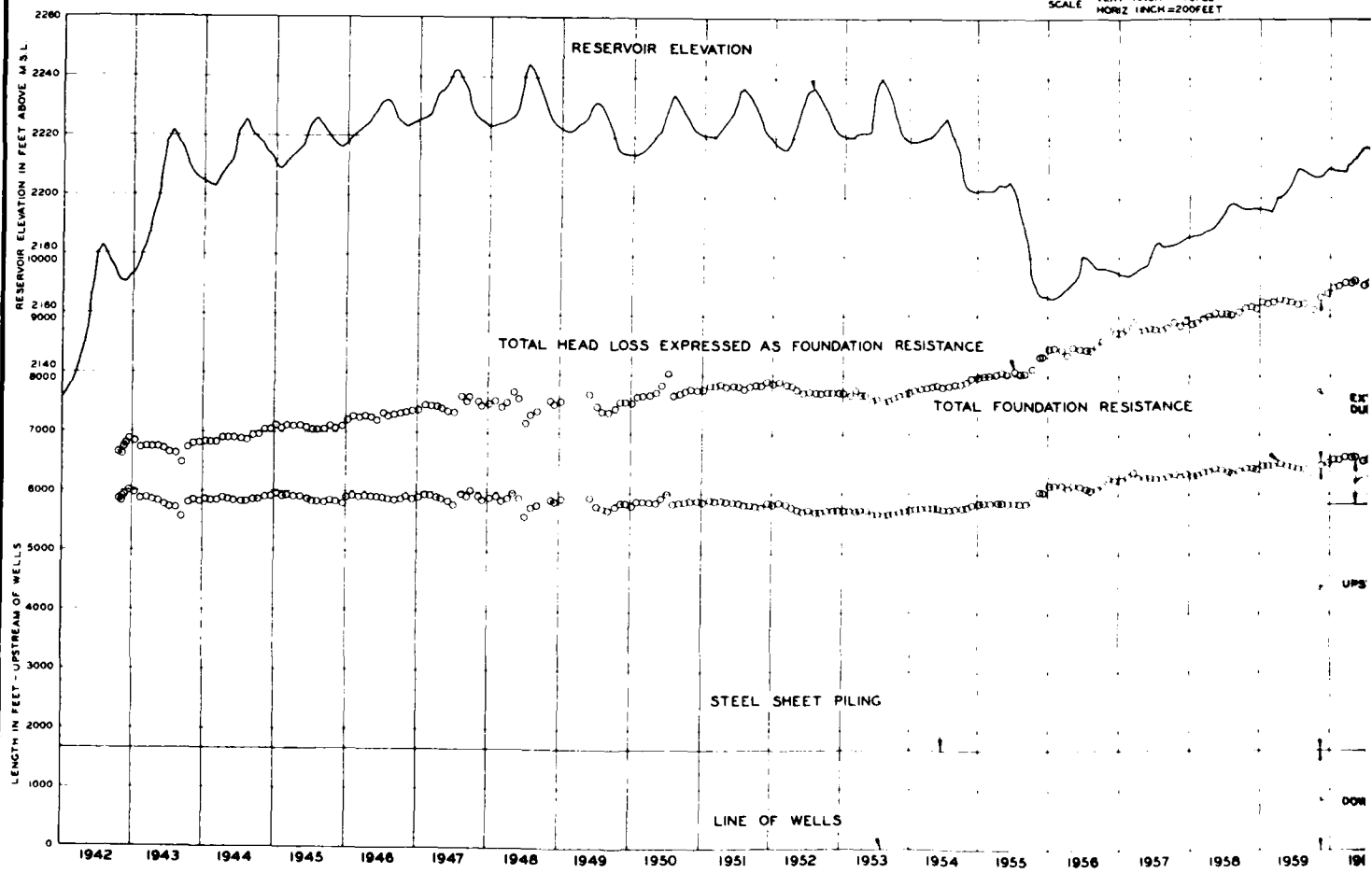
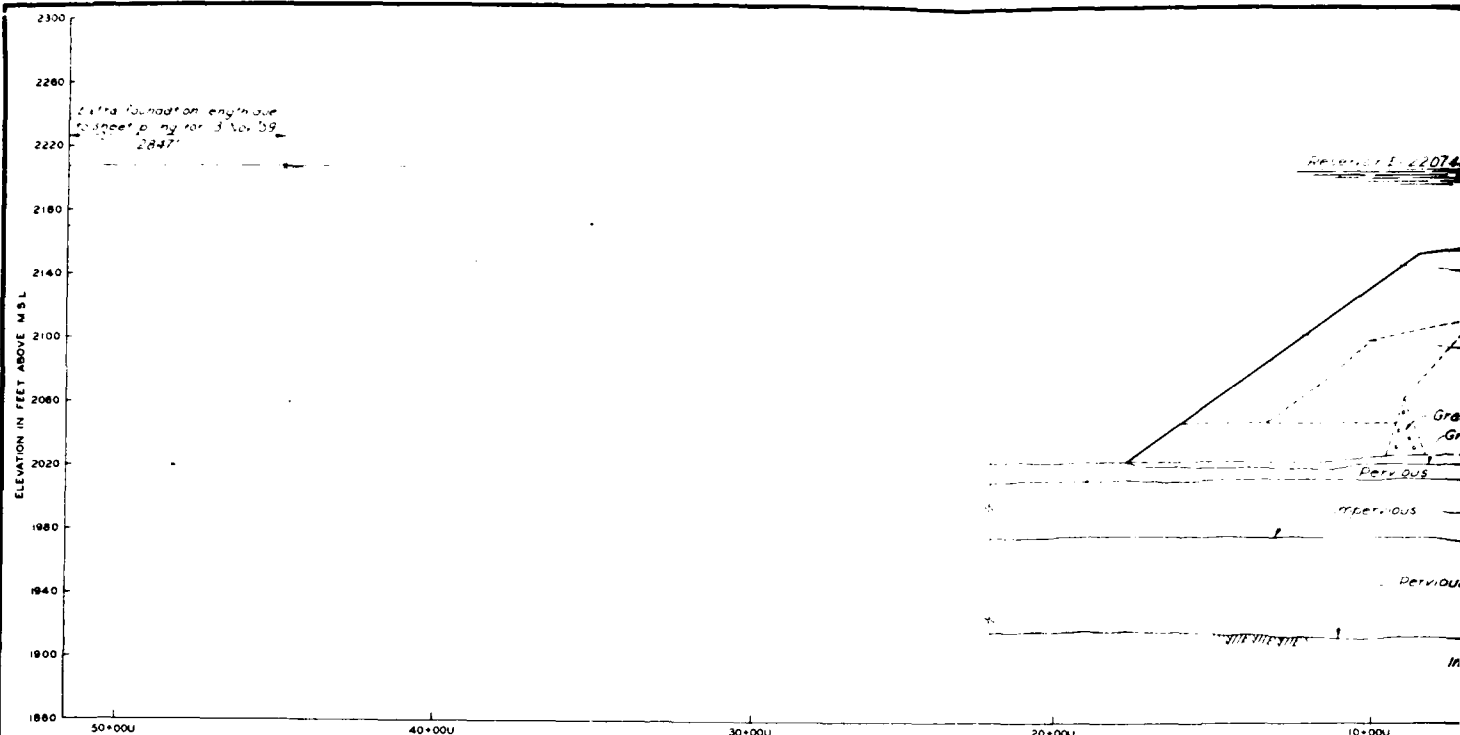
THIS PLAN HAS BEEN REDUCED TO
 HALF OF THE ORIGINAL SCALE

1981 1982 1983 1984 1985

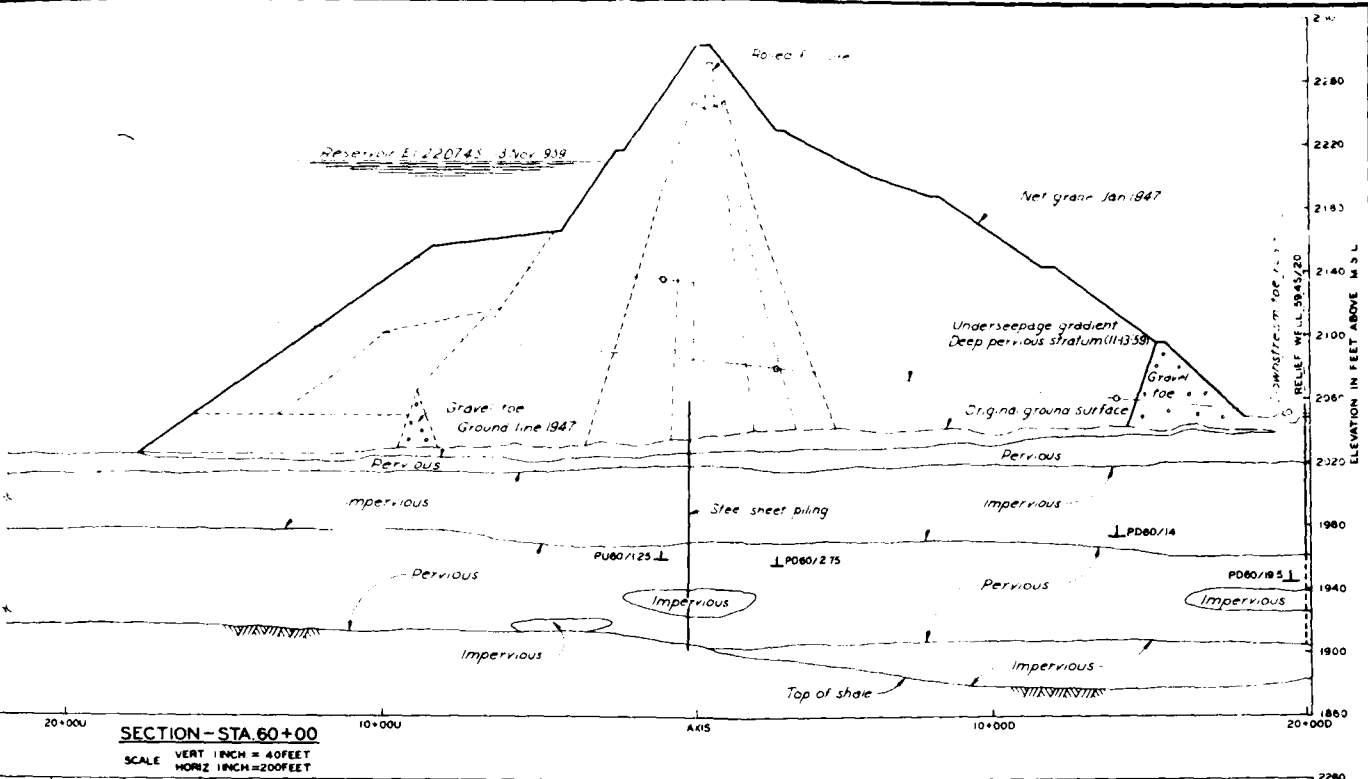


THIS PLAN ACCOMPANIES CONTRACT NO. _____
 MODIFICATION NO. _____

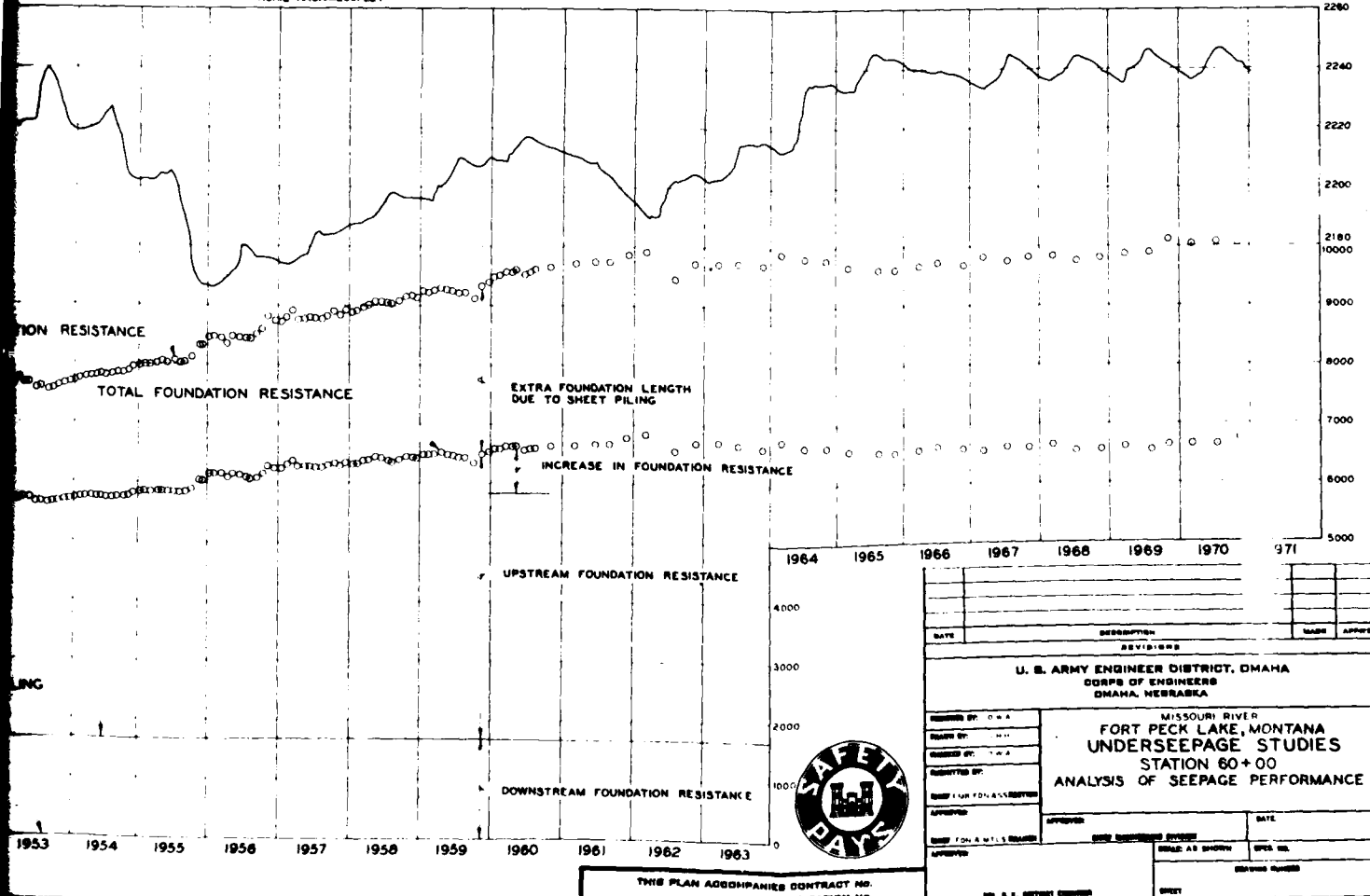
DATE	DESCRIPTION	MADE	APPROV
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY:	MISSOURI RIVER FORT PECK LAKE, MONTANA UNDERSEEPAGE STUDIES STATION 50+00 ANALYSIS OF SEEPAGE PERFORMANCE BENEATH CLAY STRATUM		
DRAWN BY:			
CHECKED BY:			
APPROVED BY:			
DATE:			
SCALE AS SHOWN:	DATE:	DRAWN NUMBER:	
SHEET NUMBER:		SHEET:	



FORT PECK DAM AND RESE



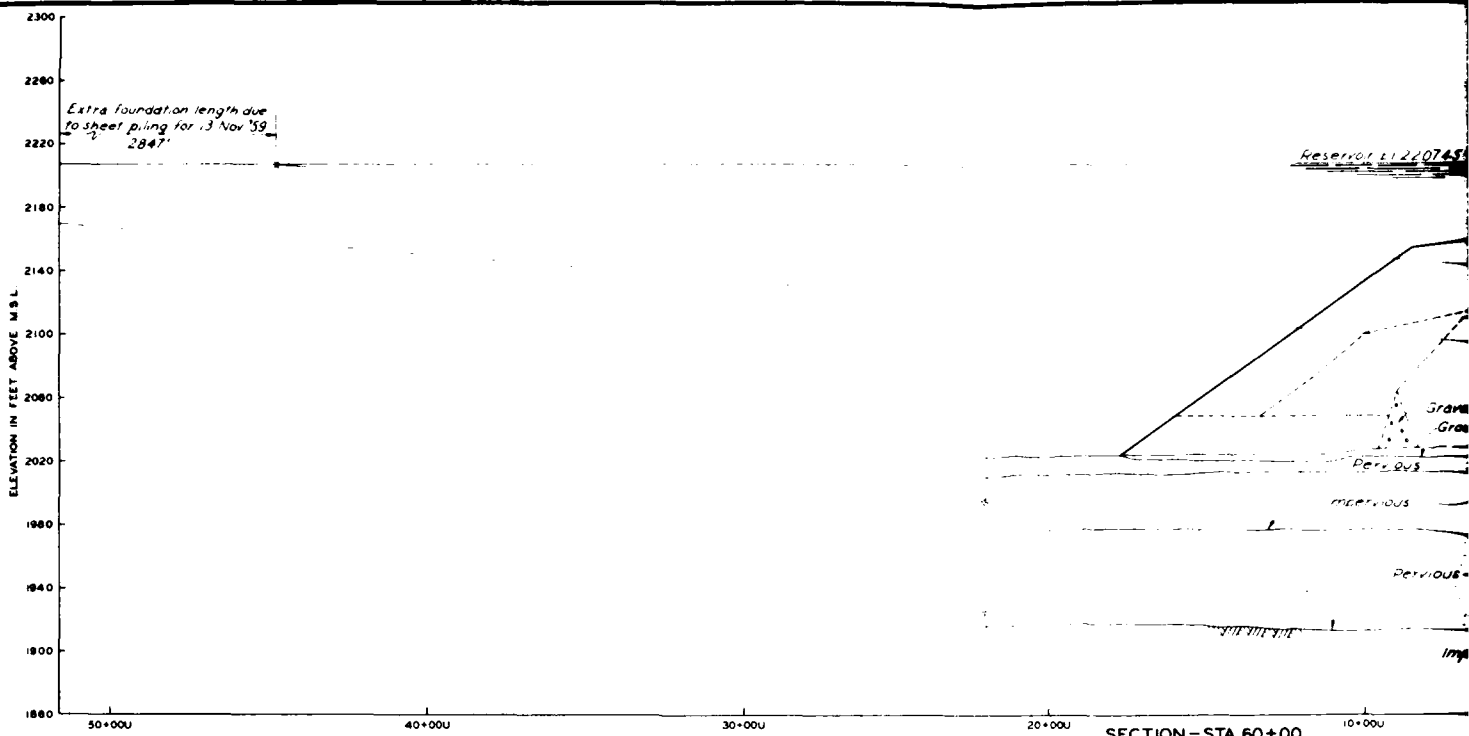
SECTION - STA. 60+00
 VERT. INCH = 40 FEET
 SCALE
 HORIZ. INCH = 200 FEET



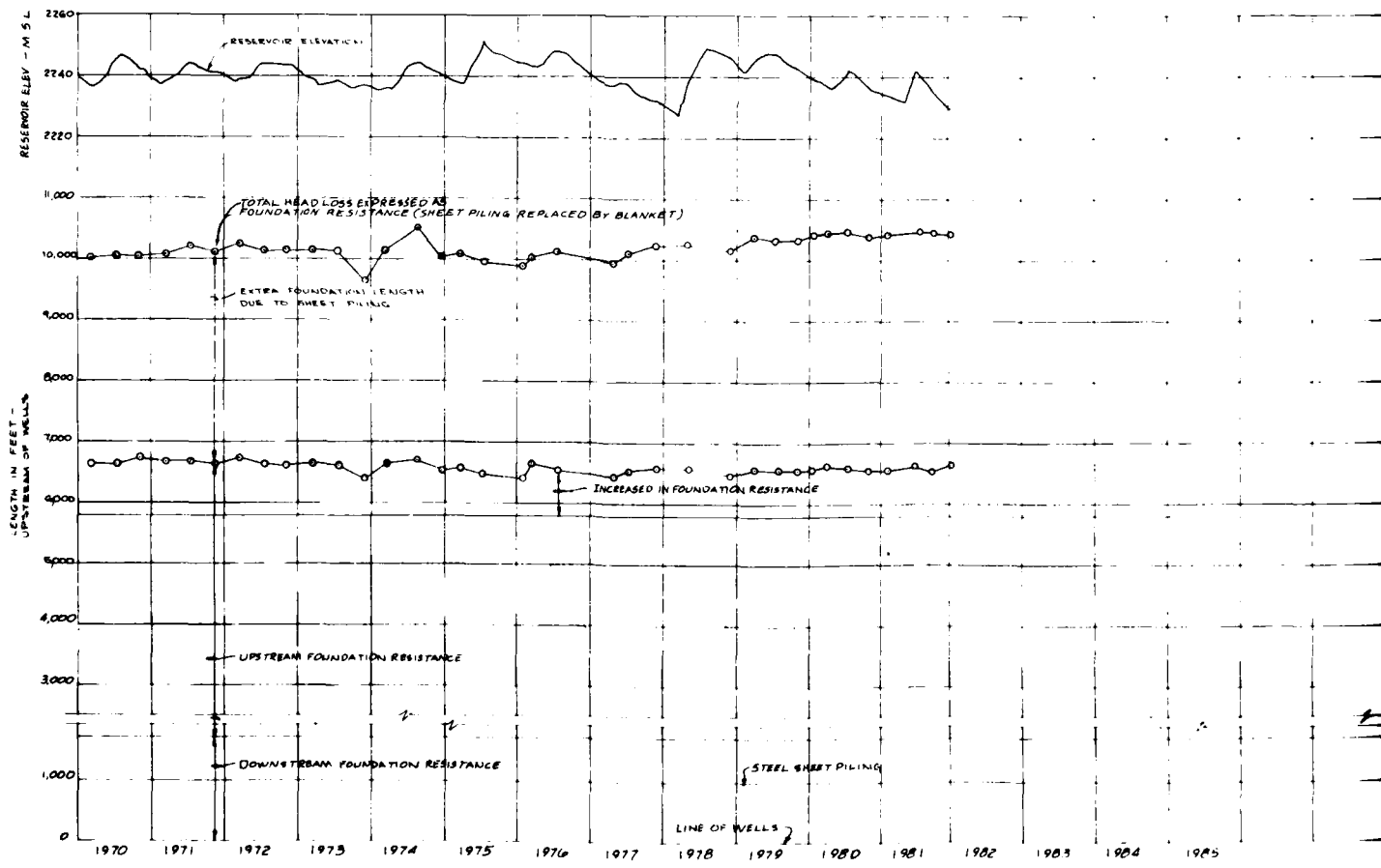
1964	1965	1966	1967	1968	1969	1970	1971
DATE		DESCRIPTION		MADE	APPROV.		
REVISIONS							
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA							
DESIGNED BY: O.W.A.		MISSOURI RIVER					
DRAWN BY: J.H.H.		FORT PECK LAKE, MONTANA					
CHECKED BY: T.W.S.		UNDERSEepage STUDIES					
SUPERVISOR: J.F.D.		STATION 60+00					
APPROVED:		ANALYSIS OF SEEPAGE PERFORMANCE					
SUPERVISOR'S SIGNATURE:		DATE:					
APPROVED:		SCALE AS SHOWN:		SHEET NO.			
		SHEET:		TOTAL SHEETS:			

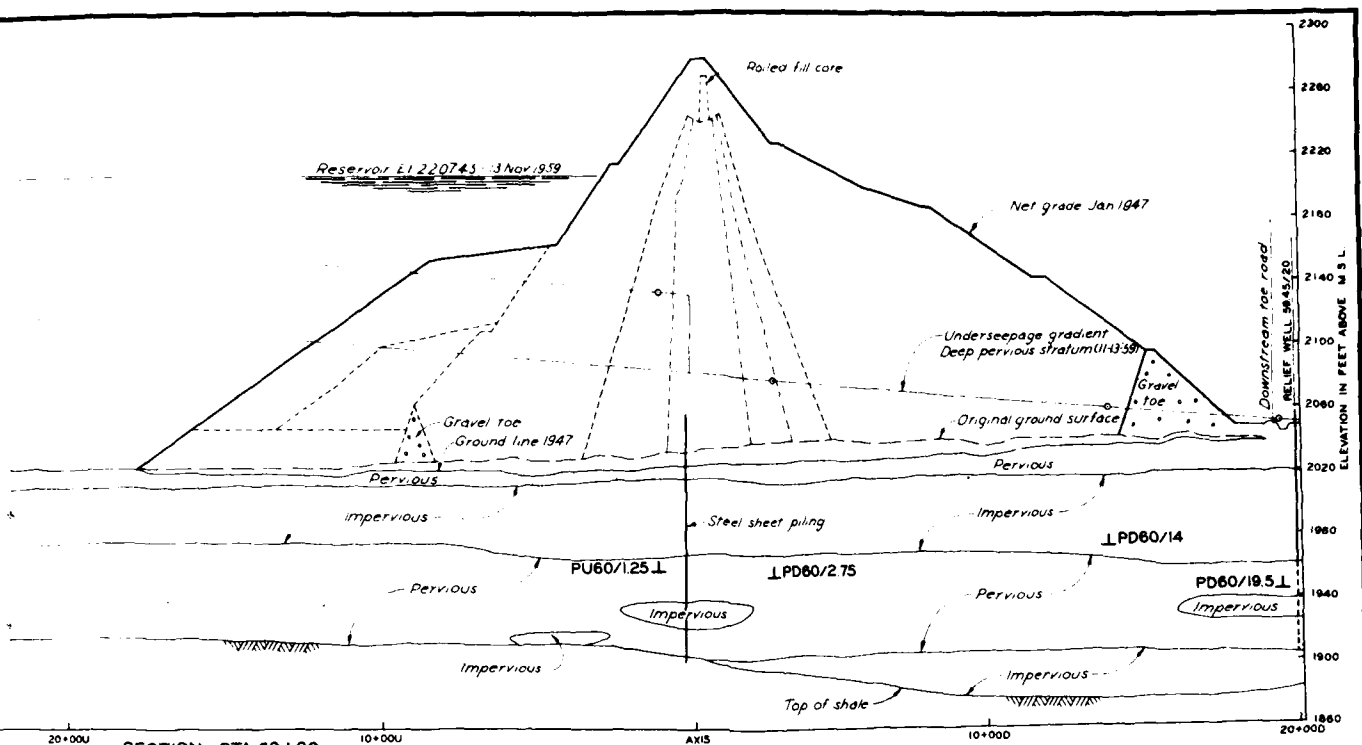


THIS PLAN ACCOMPANIES CONTRACT NO. _____
 MODIFICATION NO. _____

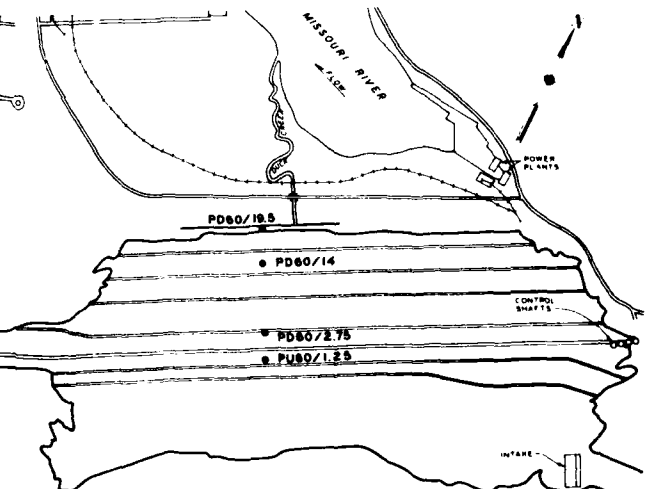
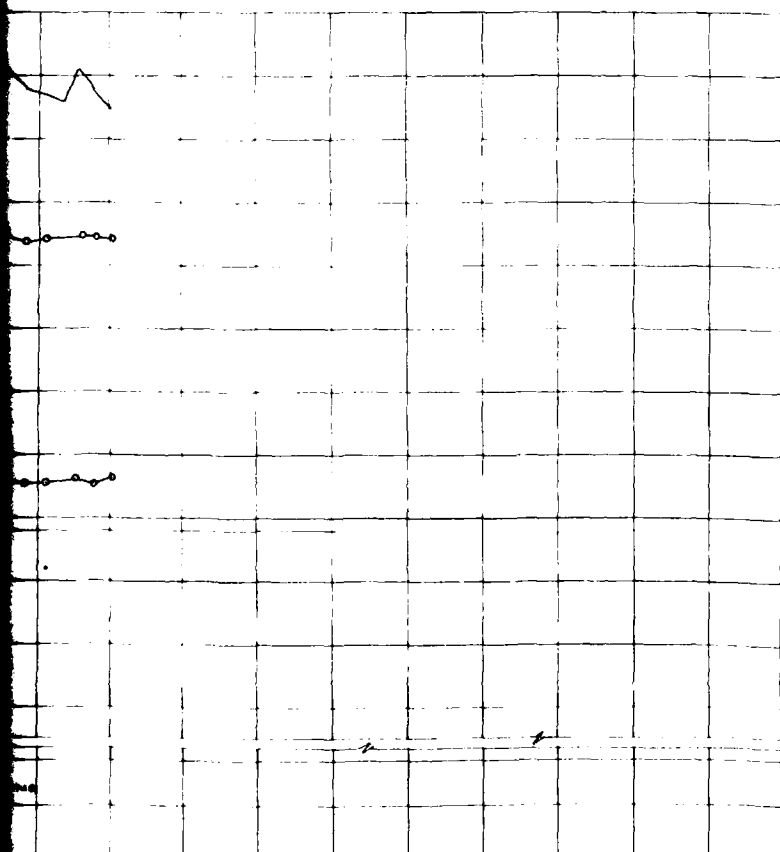


SECTION - STA. 60+00
 VERT 1/8" = 40 FEET
 SCALE HORIZ 1" = 200 FEET





SECTION - STA. 60+00
 VERT. INCH. = 40 FEET
 SCALE. HORIZ. INCH. = 200 FEET



KEY PLAN

THIS DRAWING HAS BEEN REDUCED TO THREE-EIGHTHS THE ORIGINAL SCALE.

DATE	DESCRIPTION	MADE	APPROV.
REVISIONS			

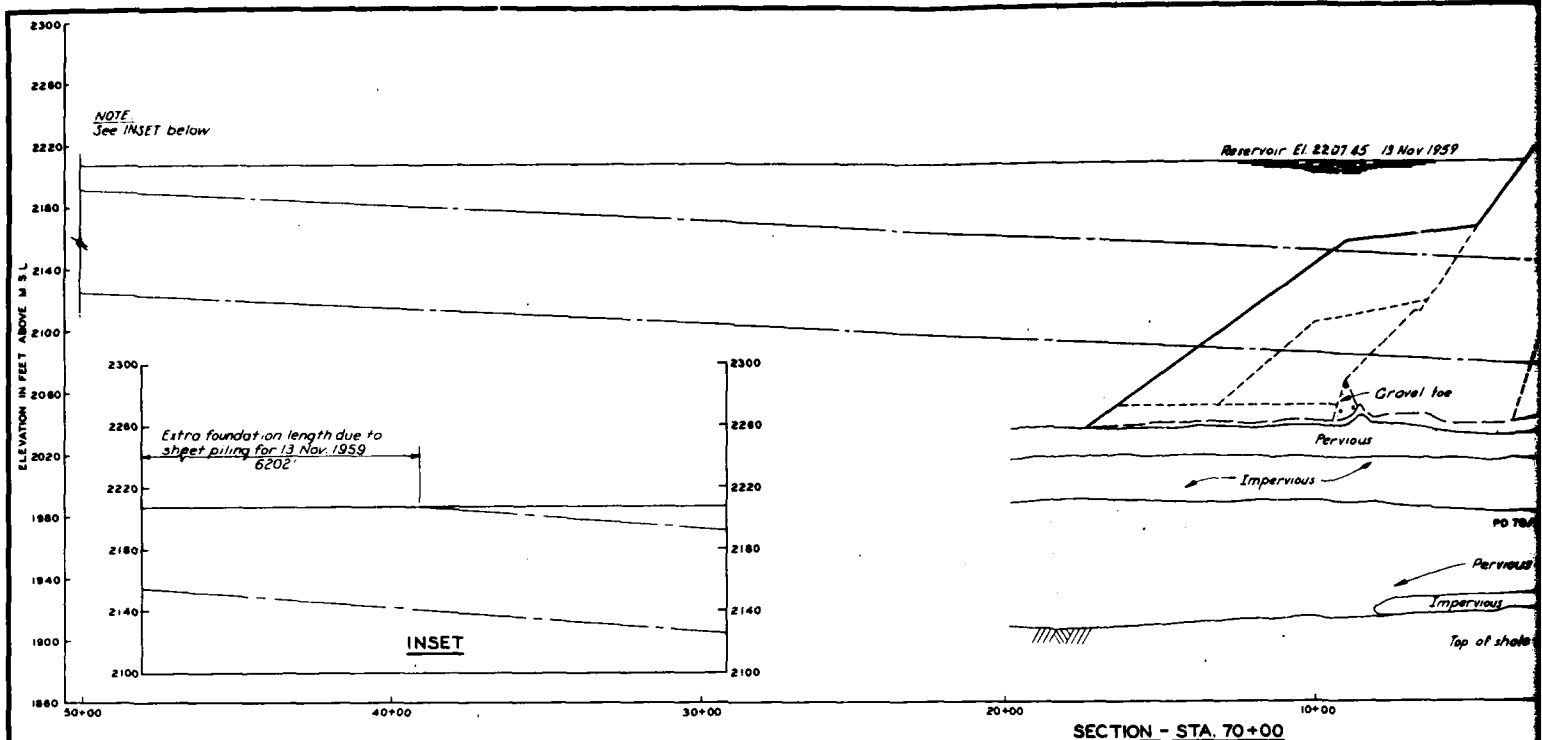
U. S. ARMY ENGINEER DISTRICT, OMAHA
 CORPS OF ENGINEERS
 OMAHA, NEBRASKA

MISSOURI RIVER
FORT PECK LAKE, MONTANA
UNDERSEEPAGE STUDIES
STATION 60+00
ANALYSIS OF SEEPAGE PERFORMANCE
BENEATH CLAY STRATUM

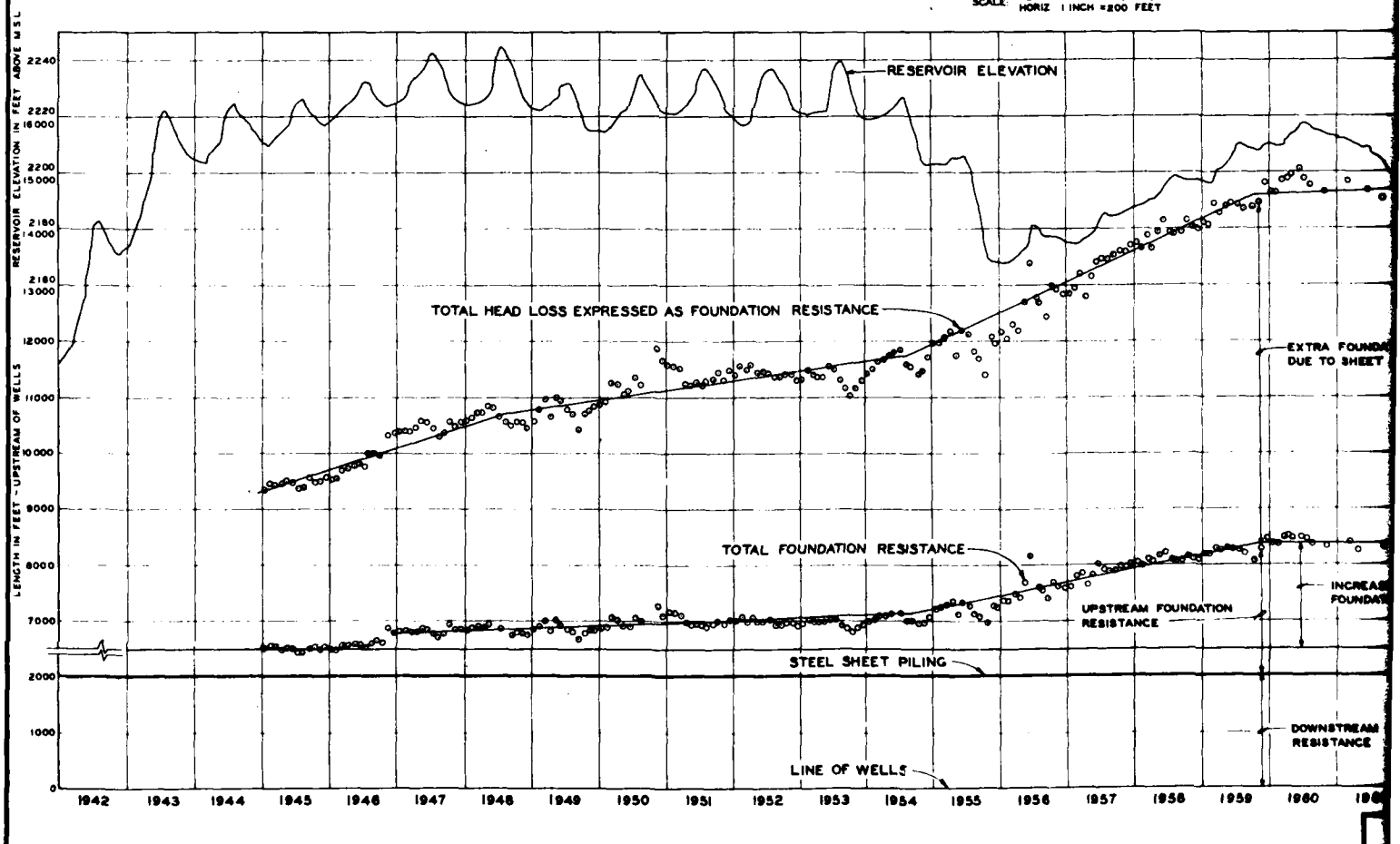


DESIGNED BY:		DATE:	
CHECKED BY:		APPROVED:	
APPROVED BY:		DATE:	

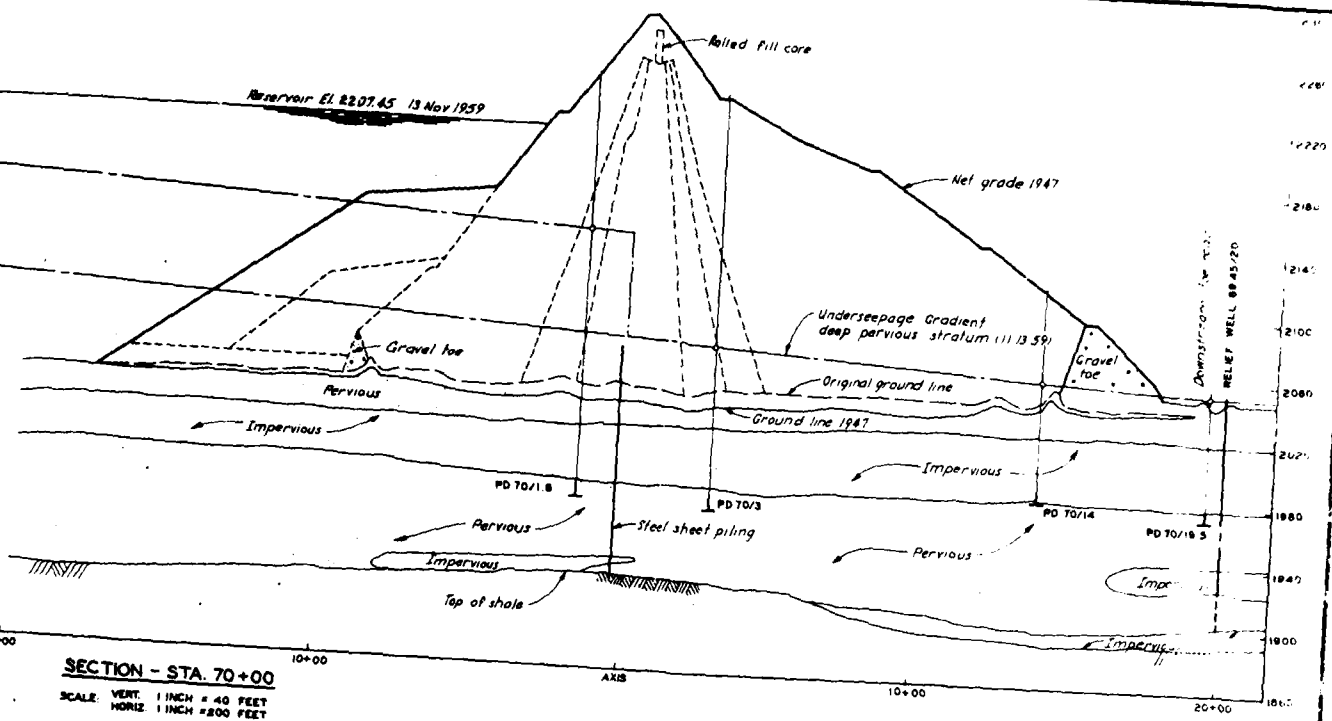
TWO PLAN ACCOMPANIES CONTRACT NO. MODIFICATION NO.



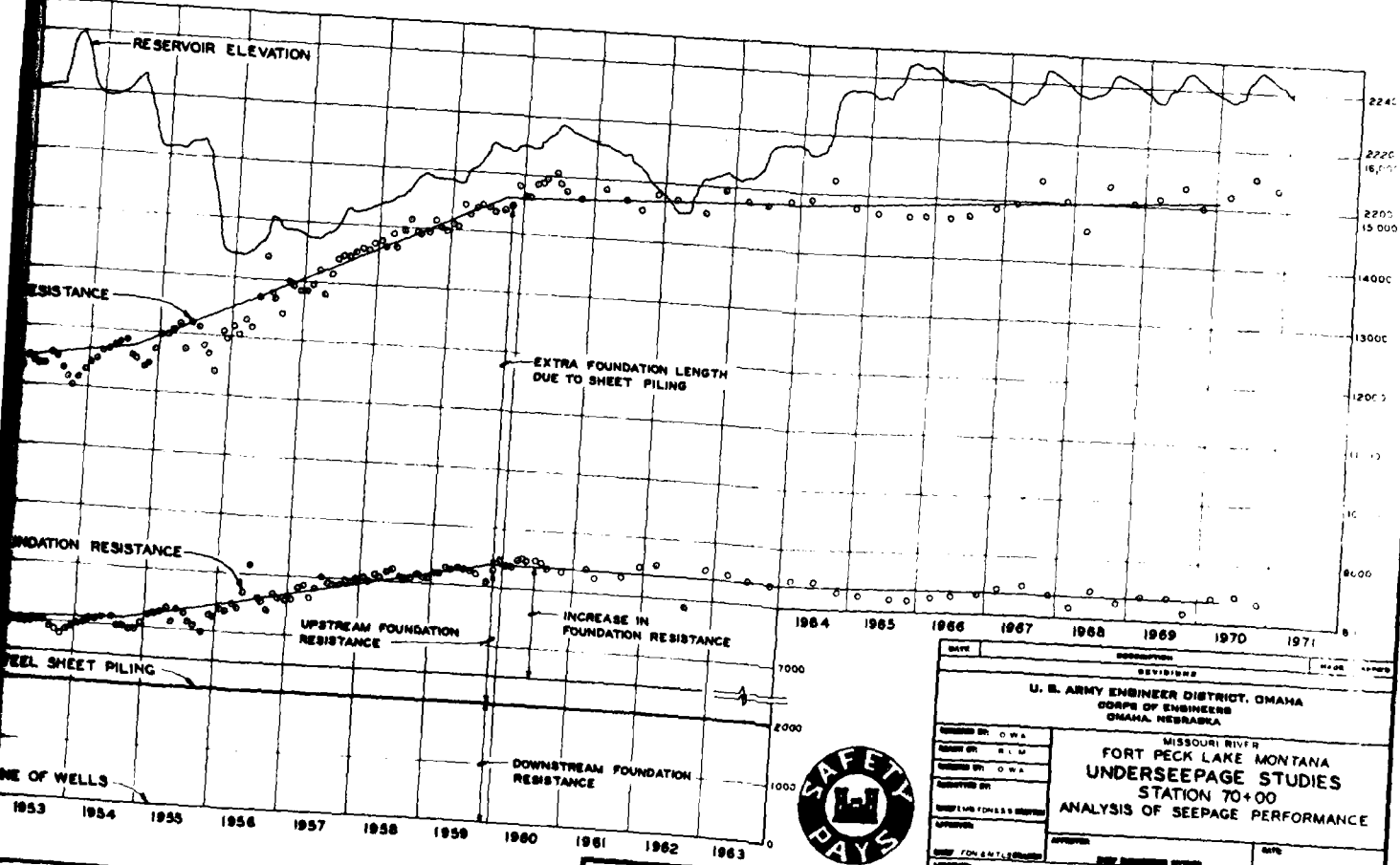
SECTION - STA. 70+00
SCALE: VERT. 1 INCH = 40 FEET
HORIZ. 1 INCH = 200 FEET



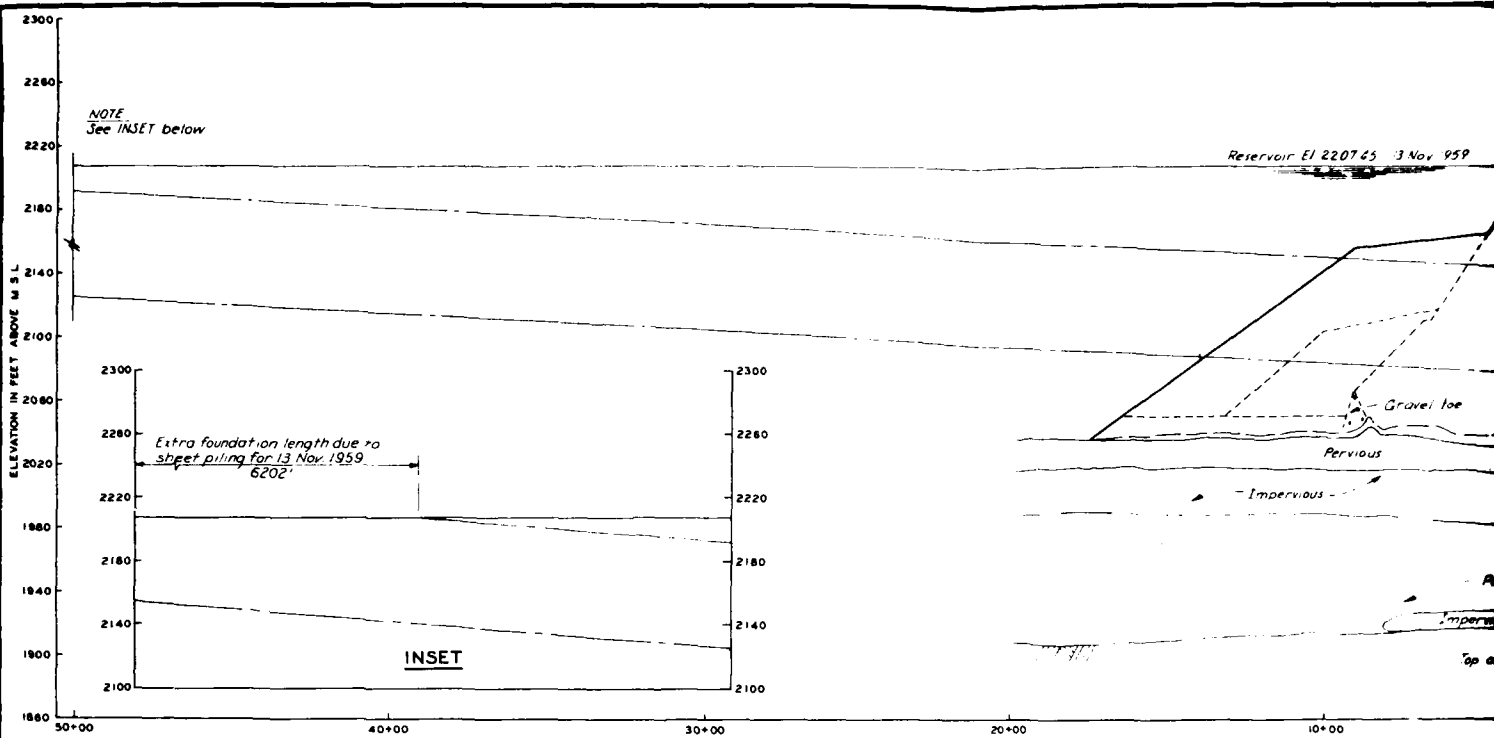
FORT PECK DAM AND RESERVOIR



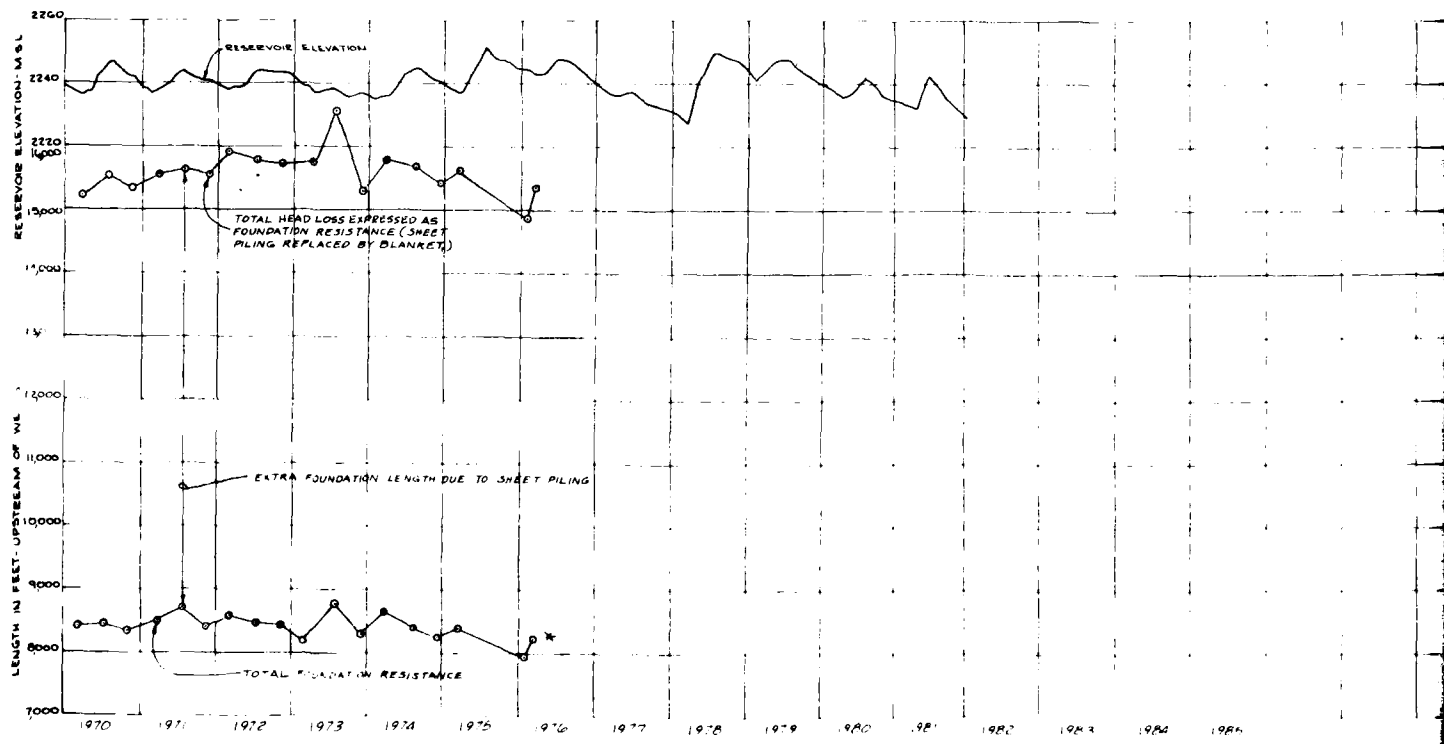
SECTION - STA. 70+00
 SCALE: VERT. 1 INCH = 40 FEET
 HORIZ. 1 INCH = 200 FEET



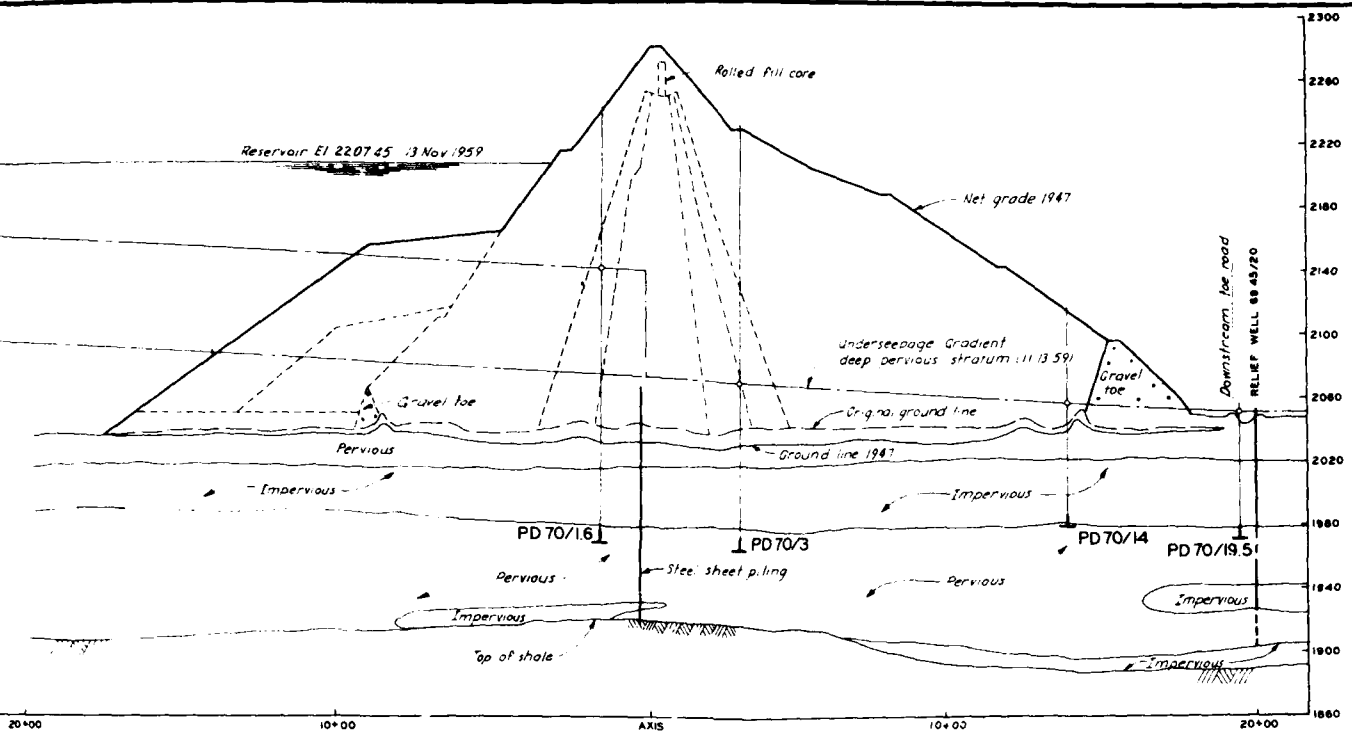
DATE	DESCRIPTION	MADE	APPROVED
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
MISSOURI RIVER FORT PECK LAKE MONTANA UNDERSEEPAGE STUDIES STATION 70+00 ANALYSIS OF SEEPAGE PERFORMANCE			
DESIGNED BY: O.W.A.	DESIGNED BY: O.W.A.	APPROVED:	DATE:
DRAWN BY: H.L.M.	DRAWN BY: H.L.M.	DATE:	DATE:
CHECKED BY: O.W.A.	CHECKED BY: O.W.A.	DATE:	DATE:
APPROVED:	APPROVED:	DATE:	DATE:
DATE:	DATE:	DATE:	DATE:



SECTION - STA. 70+00
SCALE VERT 1 INCH = 40 FEET
HORIZ 1 INCH = 200 FEET

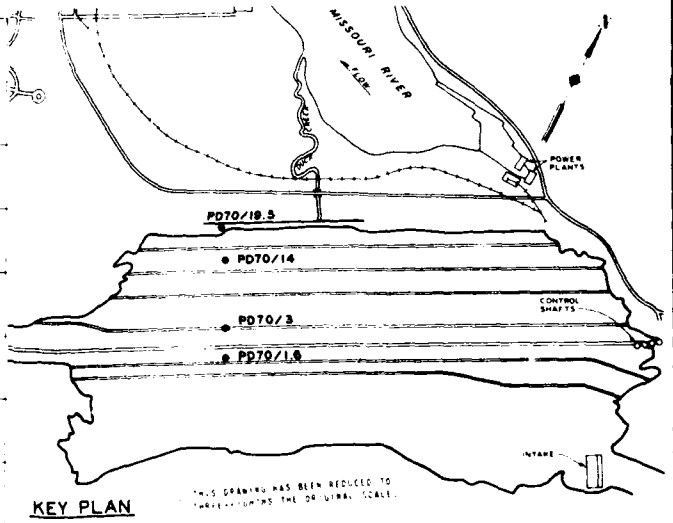


P11 70/14 under water since 1976



SECTION - STA. 70+00

SCALE VERT 1 INCH = 40 FEET
 HORIZ 1 INCH = 200 FEET

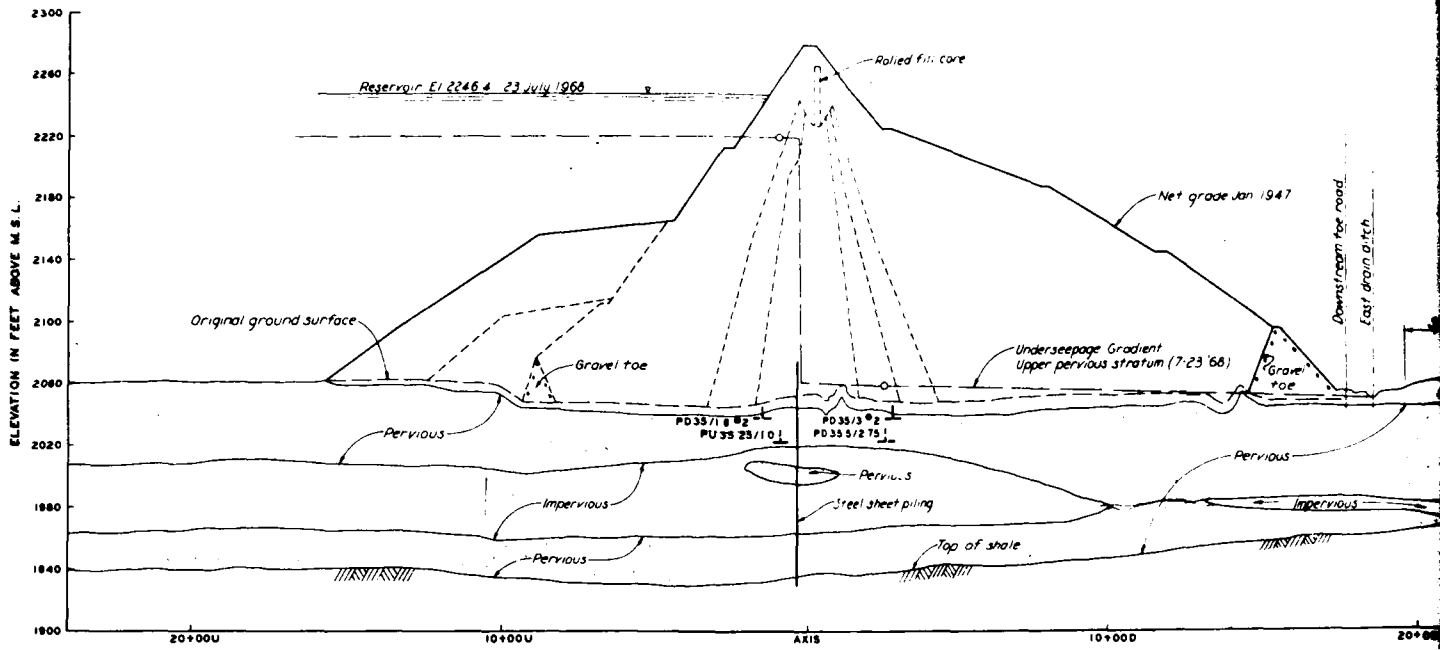


KEY PLAN

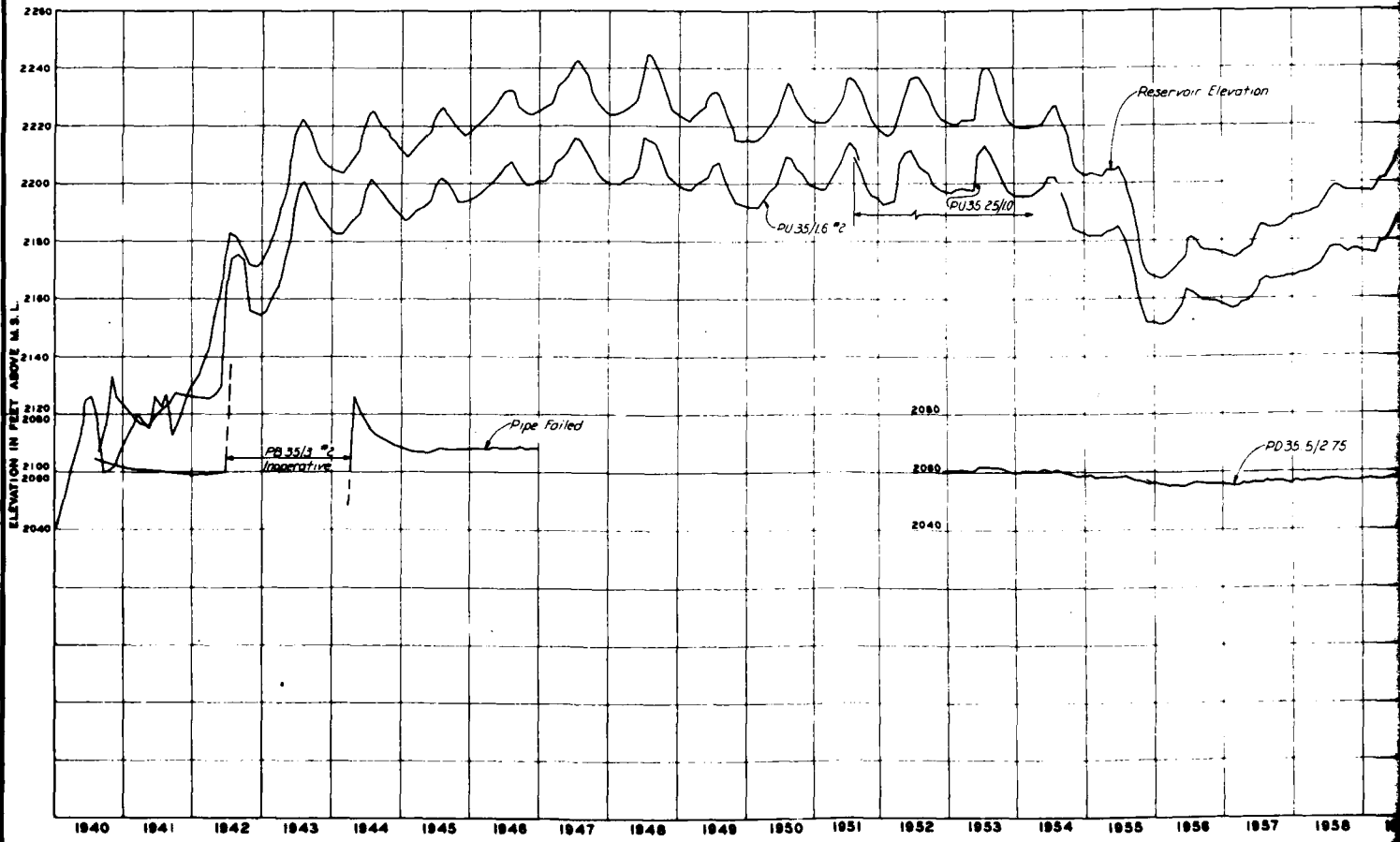
DATE	DESCRIPTION	MADE	APPROV
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY:	MISSOURI RIVER FORT PECK LAKE, MONTANA UNDERSEEPAGE STUDIES STATION 70+00 ANALYSIS OF SEEPAGE PERFORMANCE BENEATH CLAY STRATUM		
DRAWN BY:	DATE:	APPROVED:	DATE:
CHECKED BY:	DATE:	APPROVED:	DATE:
APPROVED:	DATE:	APPROVED:	DATE:

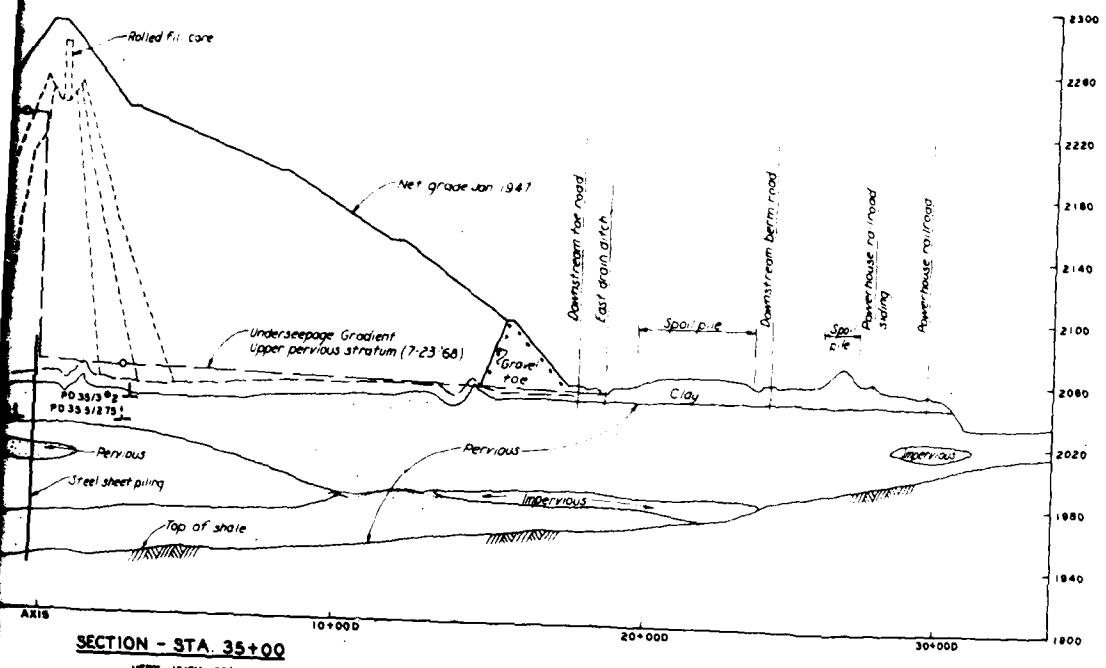


THIS PLAN ACCOMPANIES CONTRACT NO. _____

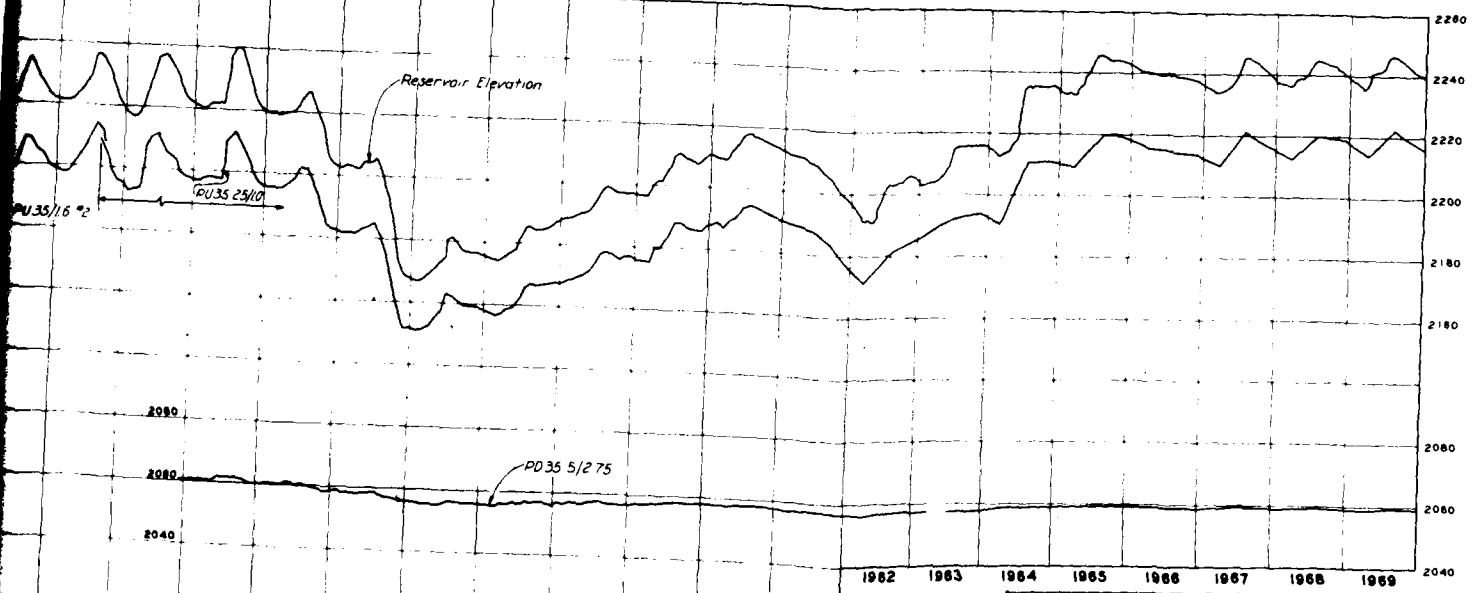


SECTION - STA. 35+00
 SCALE: VERT. 1 INCH = 200 FEET
 HORIZ. 1 INCH = 40 FEET



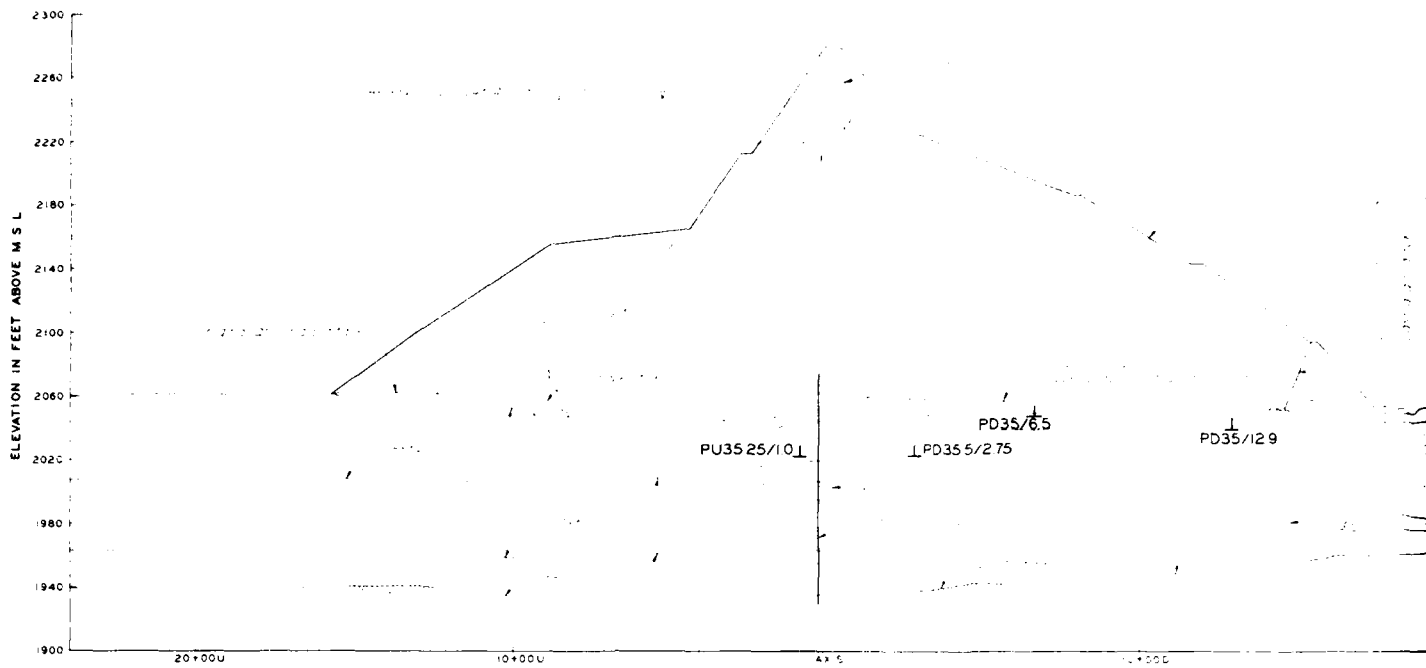


SECTION - STA. 35+00
 SCALE: VERT. 1 INCH = 200 FEET
 HORIZ. 1 INCH = 40 FEET



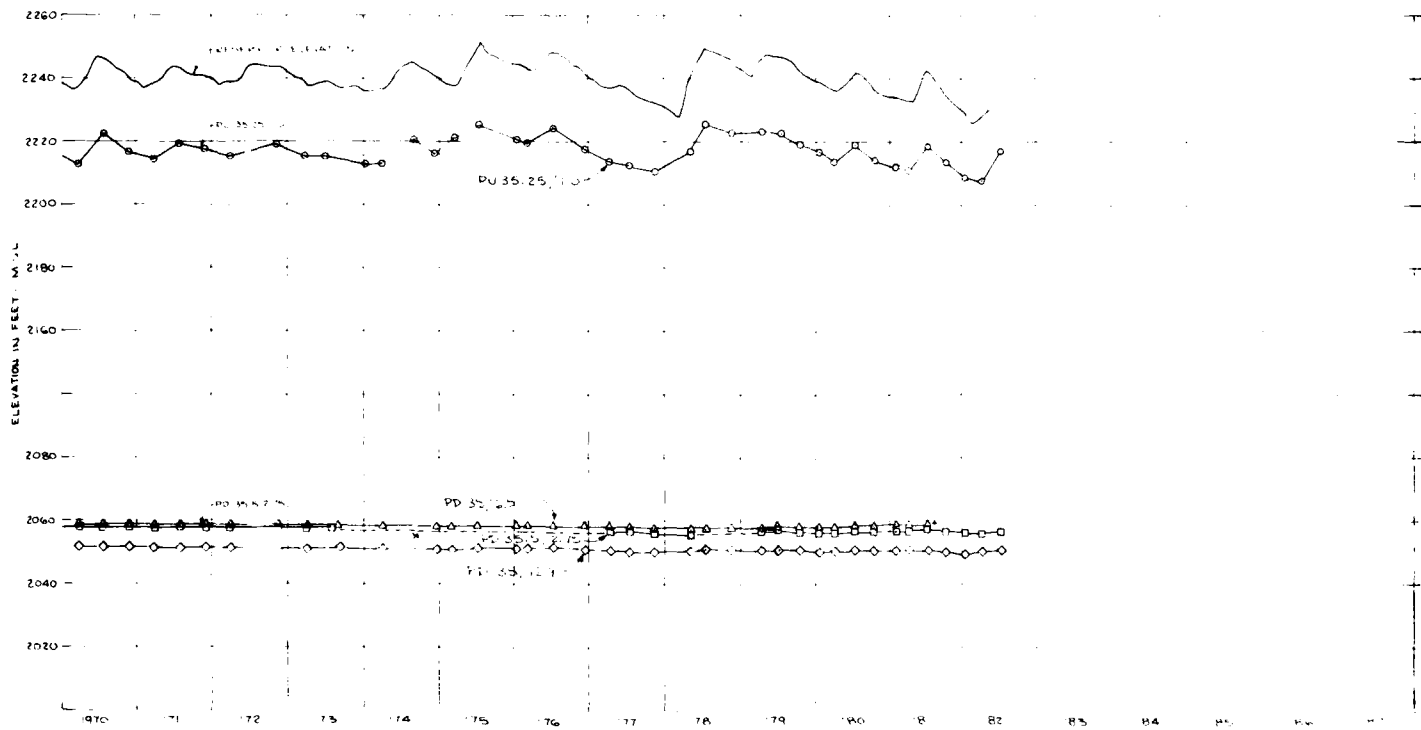
DATE	REVISIONS	MADE	APPROV
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
MISSOURI RIVER FORT PECK LAKE, MONTANA UNDERSEPAGE STUDIES STATION 35+00 STUDY OF HEAD LOSS THROUGH SHEET PILING ABOVE CLAY STRATUM			
DESIGNED BY	CHECKED BY	DATE	
DRAWN BY	APPROVED BY		
SCALE FOR ASSEMBLY	SCALE FOR CONSTRUCTION		
APPROVED	SCALE AS SHOWN	DATE	
DESIGNED BY	SCALE AS SHOWN	DATE	
DRAWN BY	SCALE AS SHOWN	DATE	





SECTION - STA 35+00

VERT. INCH = 200 FEET
SCALE
HORIZ. INCH = 40 FEET



LEGEND

⊥ 5 FEET OR DEEPER

PD35/65 5 FEET METER AT STATION RANGE
FROM DAMSTREAM

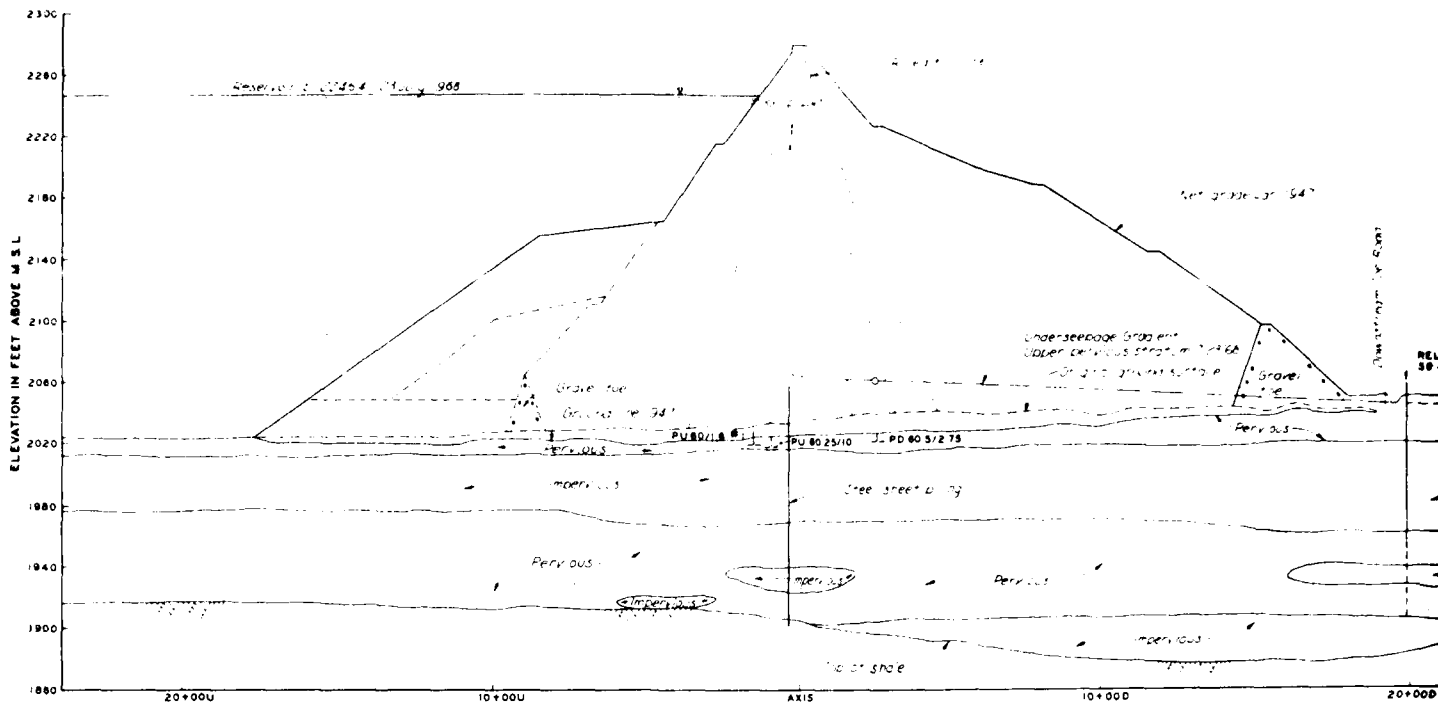


KEY PLAN

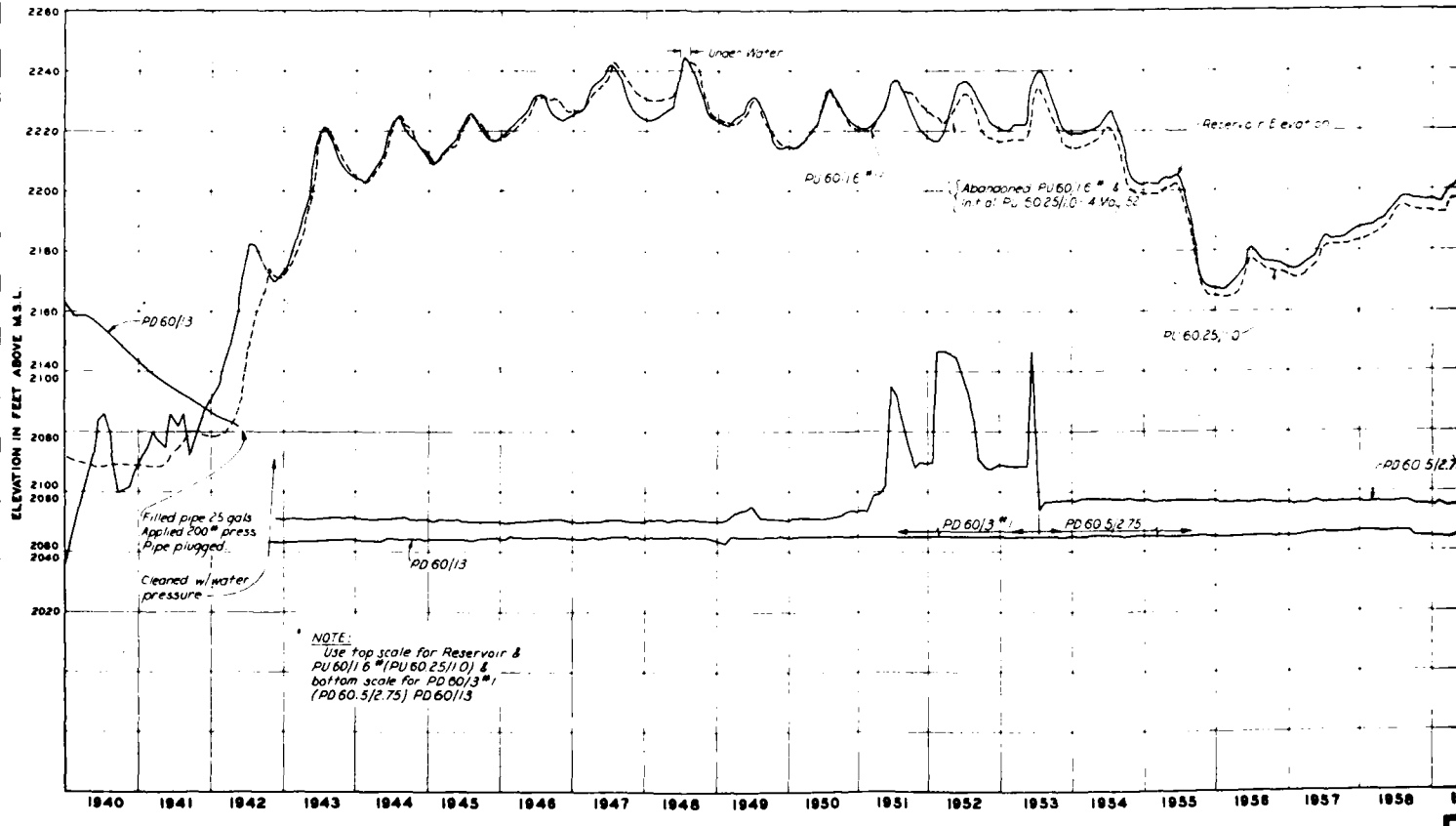
DATE	DESCRIPTION	MADE	APPROD
REV. 8-10-66			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY	MISSOURI RIVER FORT PECK LAKE, MONTANA UNDERSEEPAGE STUDIES STATION 35+00		
DRAWN BY	STUDY OF HEAD LOSS THROUGH SHEET PILING ABOVE CLAY STRATUM		
CHECKED BY	DATE	APPROVED	DATE
APPROVED BY	DATE	APPROVED	DATE
SCALE AS SHOWN	SCALE AS SHOWN	SCALE AS SHOWN	SCALE AS SHOWN

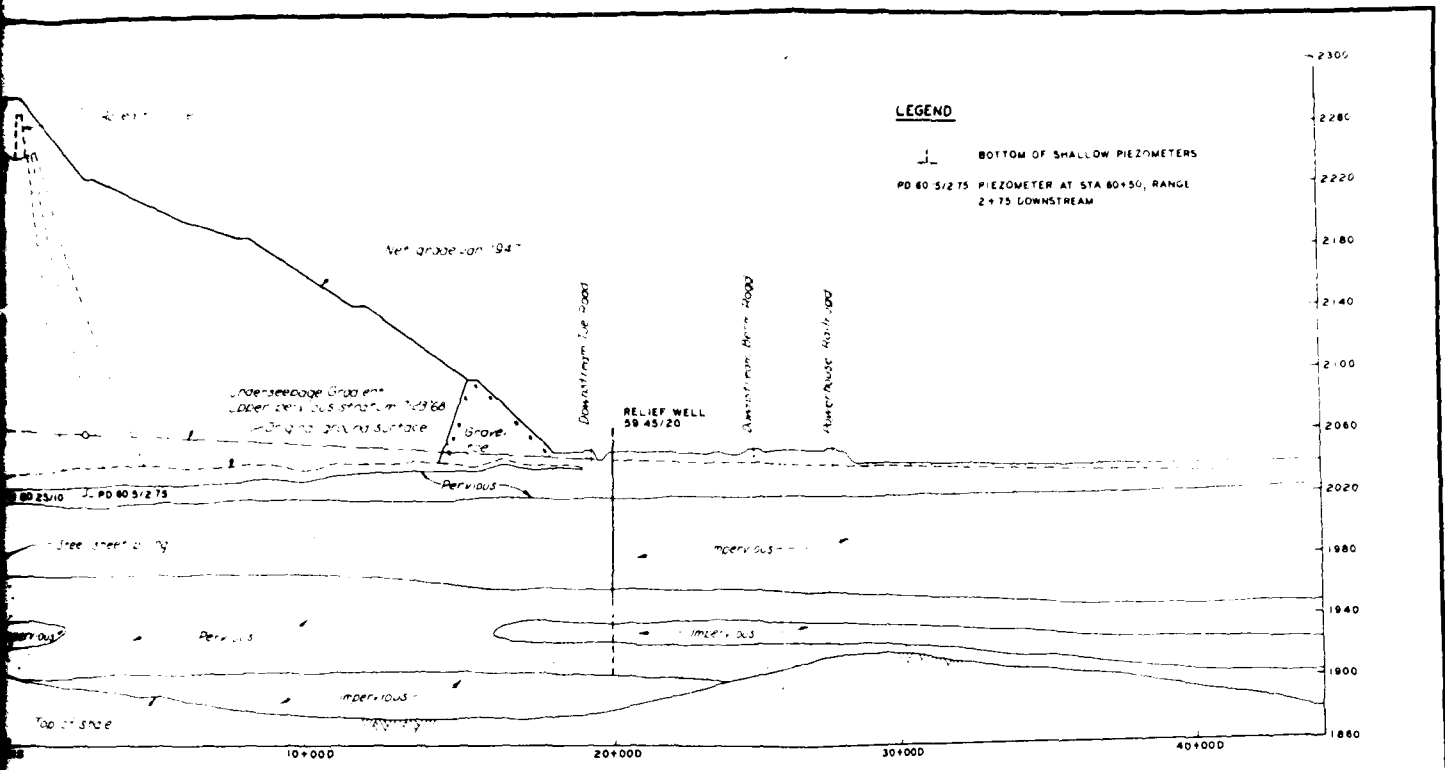


THIS PLAN ACCOMPANIES DOWNTOWN NO. _____
MODIFICATION NO. _____

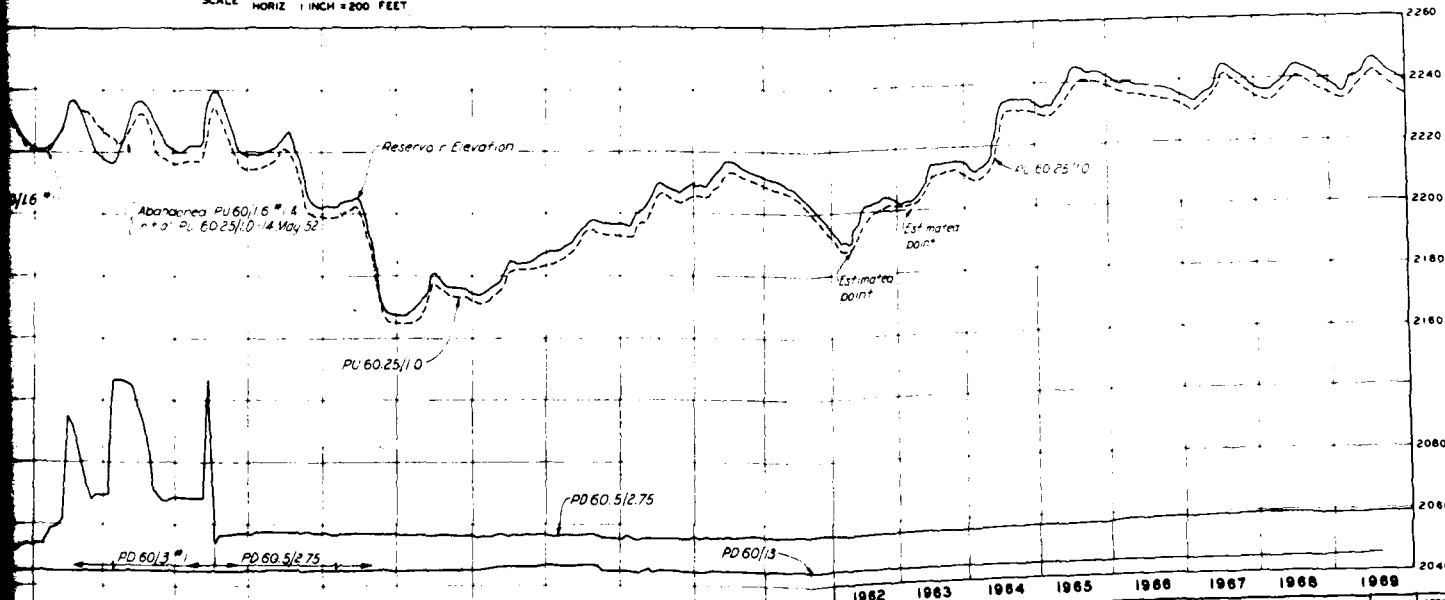


SECTION - STA. 60+00
 VERT. 1 INCH = 40 FEET
 SCALE HORIZ. 1 INCH = 200 FEET

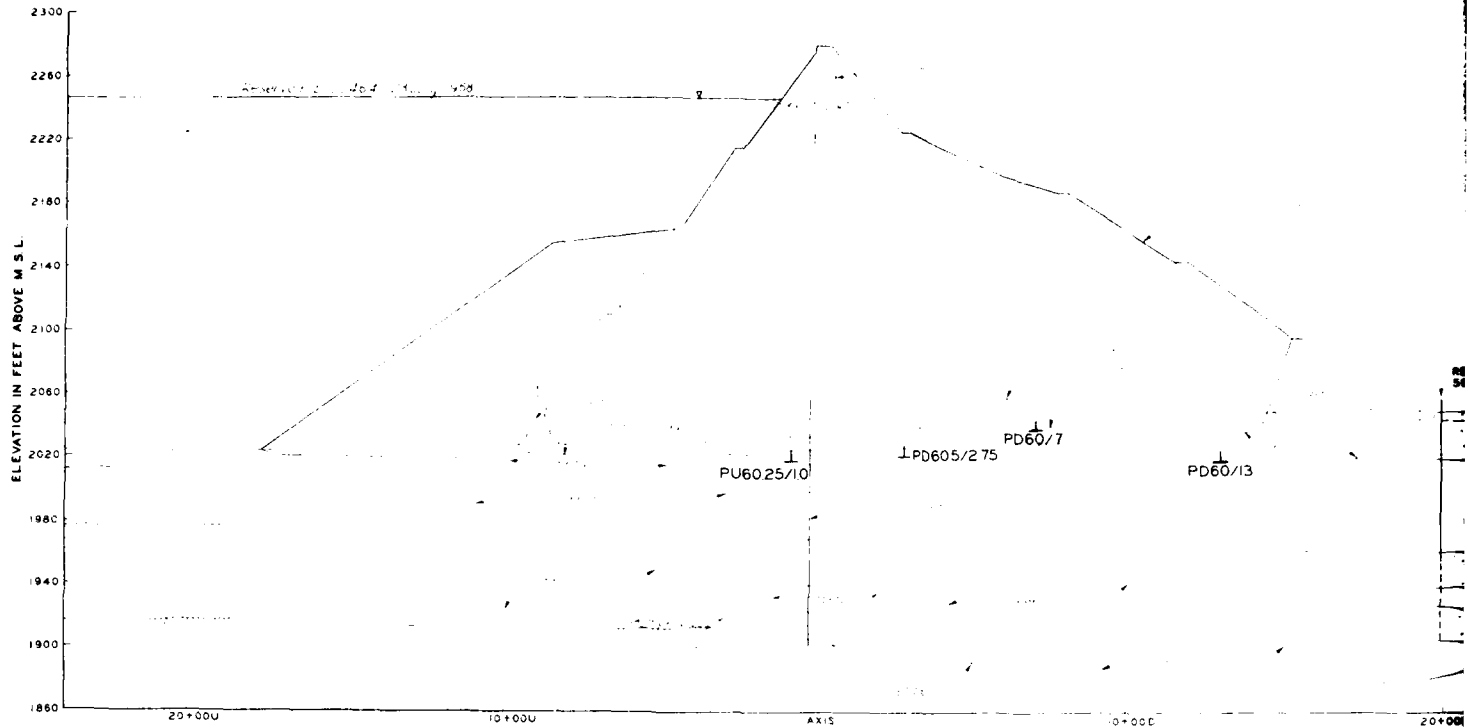




SECTION - STA. 60+00
 SCALE VERT. 1 INCH = 40 FEET
 HORIZ. 1 INCH = 200 FEET

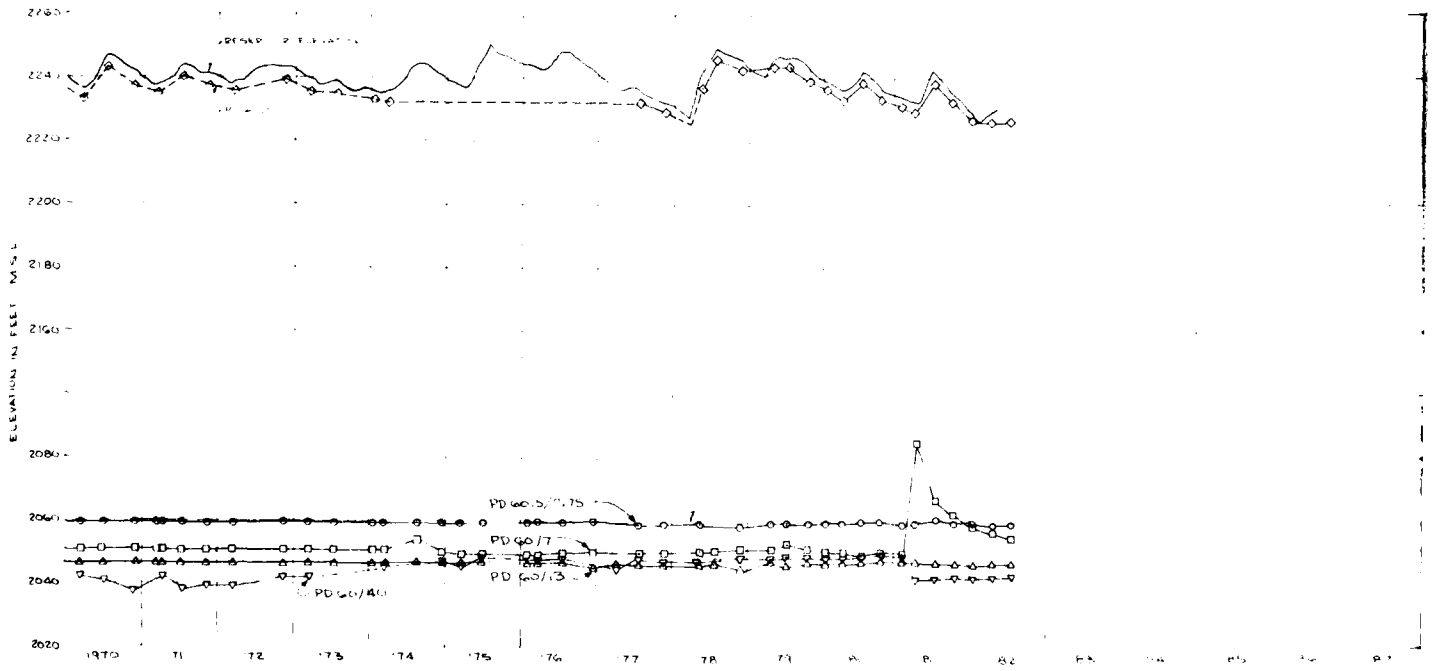


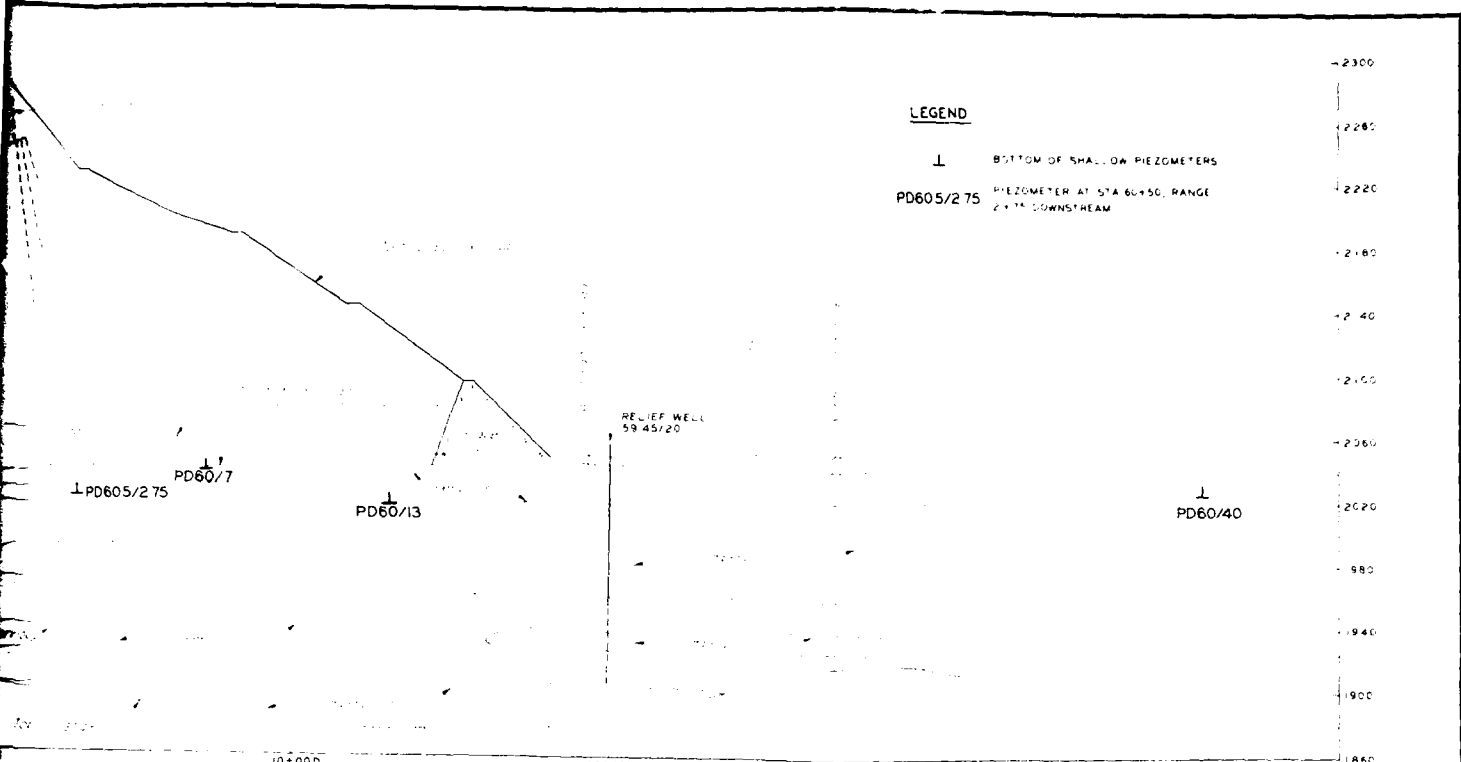
DATE	REVISION	NAME	APPROV
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
MISSOURI RIVER FORT PECK LAKE, MONTANA UNDERSEEPAGE STUDIES STATION 60+00 STUDY OF HEAD LOSS THROUGH SHEET PILING ABOVE CLAY STRATUM			
DESIGNED BY	APPROVED	DATE	
DRAWN BY L M C			
CHECKED BY			
APPROVED FOR ASSESSMENT			
APPROVED			
DESIGNED BY			
APPROVED			
DESIGNED BY			
APPROVED			



SECTION - STA 60+00

SCALE VERT. 1 INCH = 40 FEET
HORIZ. 1 INCH = 200 FEET



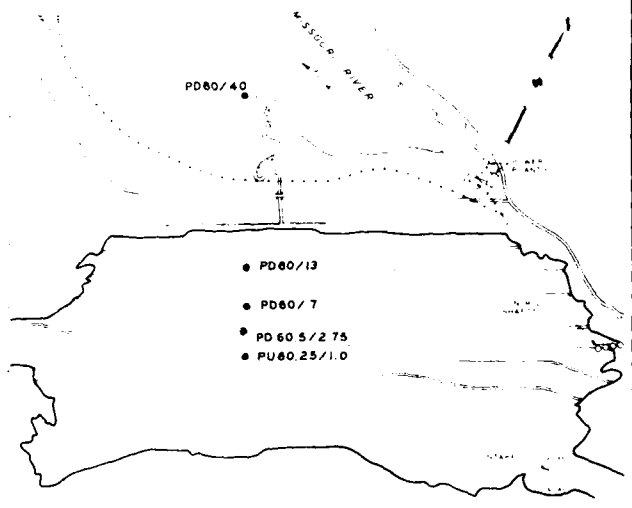


LEGEND

- ⊥ BOTTOM OF SHALLOW PIEZOMETERS
- ⊥ PIEZOMETER AT STA 60+50, RANGE 2+75 DOWNSTREAM

SECTION - STA 60+00

SCALE VERT 1 INCH = 40 FEET
 HORIZ 1 INCH = 200 FEET



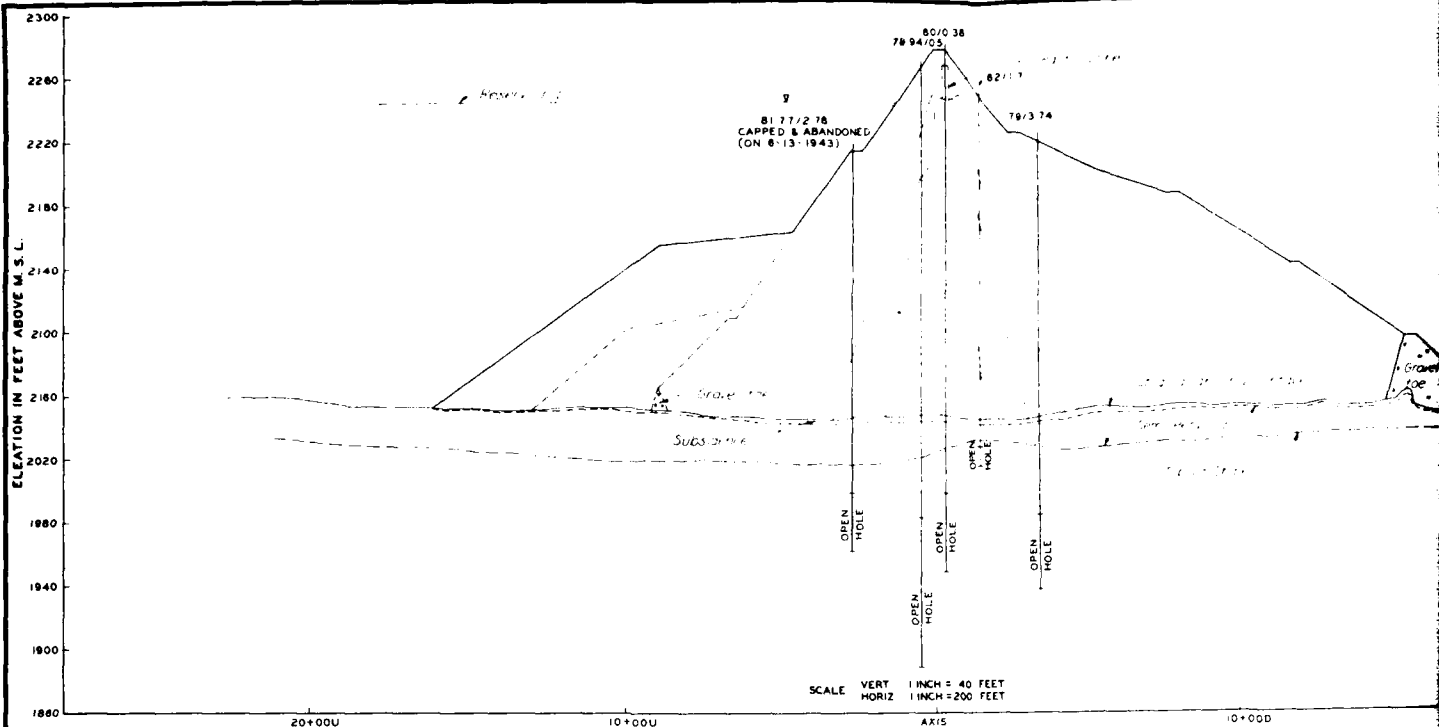
BK1 A B2 B3 B4 B5 B6 B7 B8 B9 10

THIS DRAWING HAS BEEN REDUCED TO
 FIT THE LIMITS OF THIS SCALE.

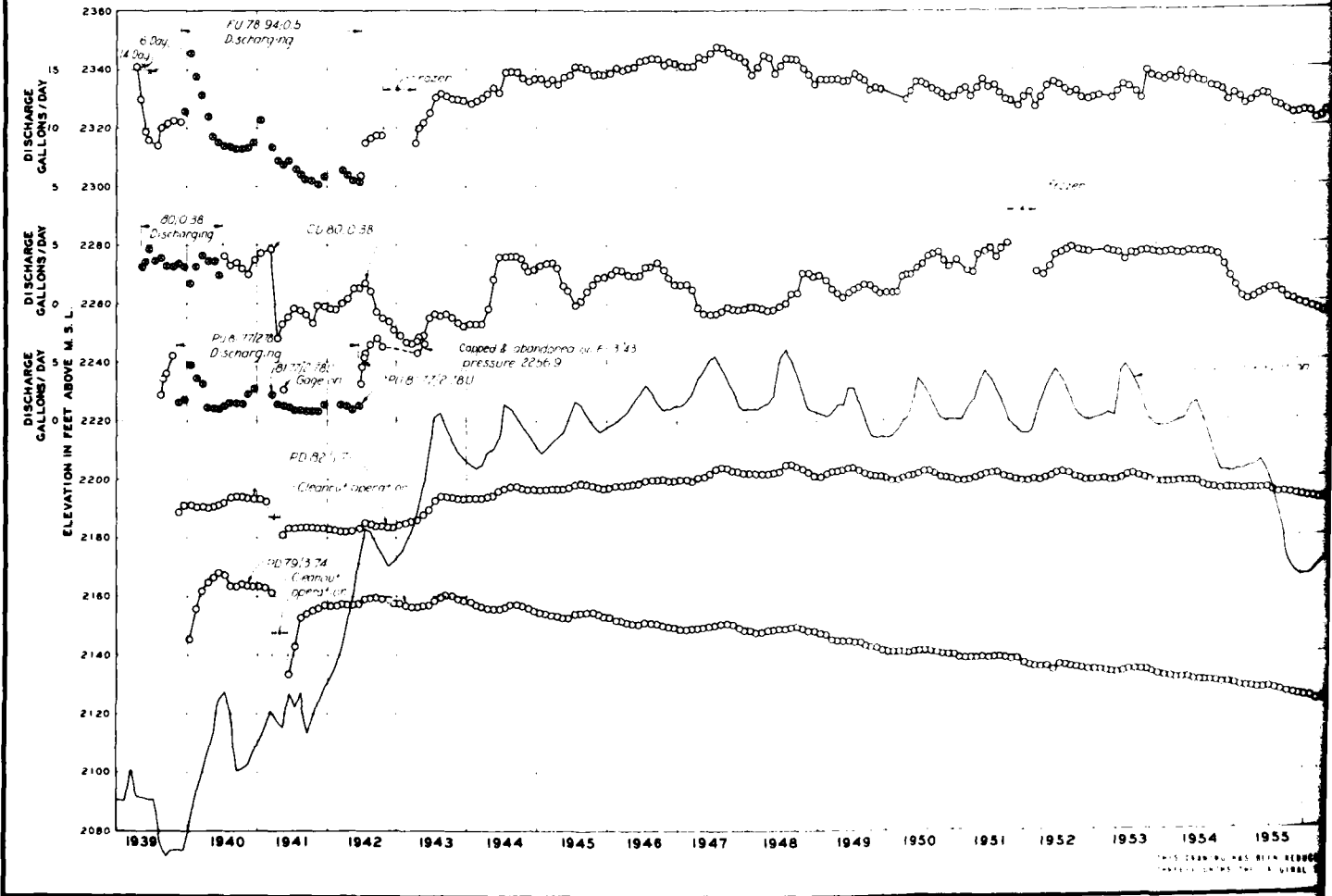


THIS PLAN ACCOMPANIES CONTRACT NO. _____
 MODIFICATION NO. _____

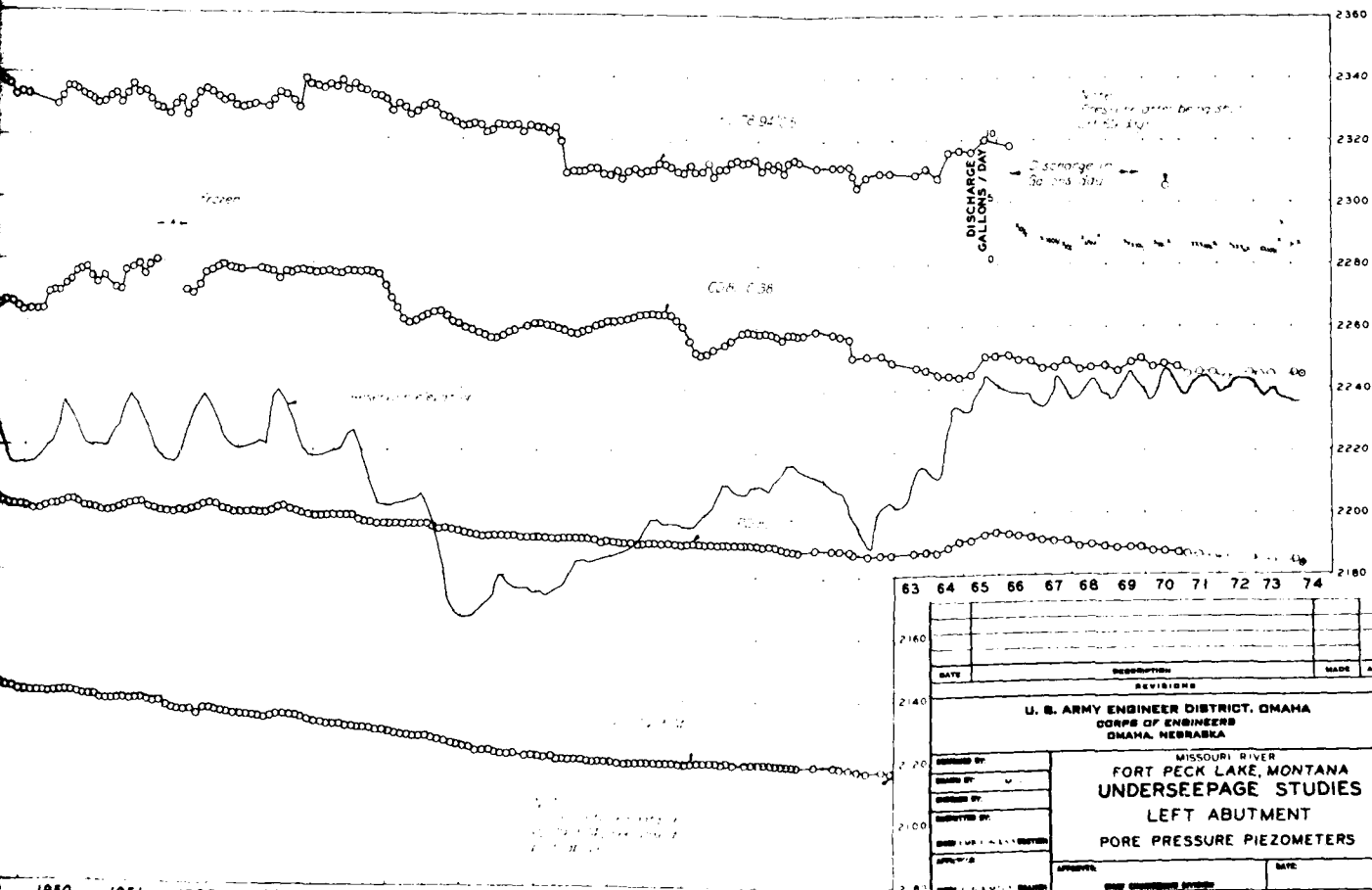
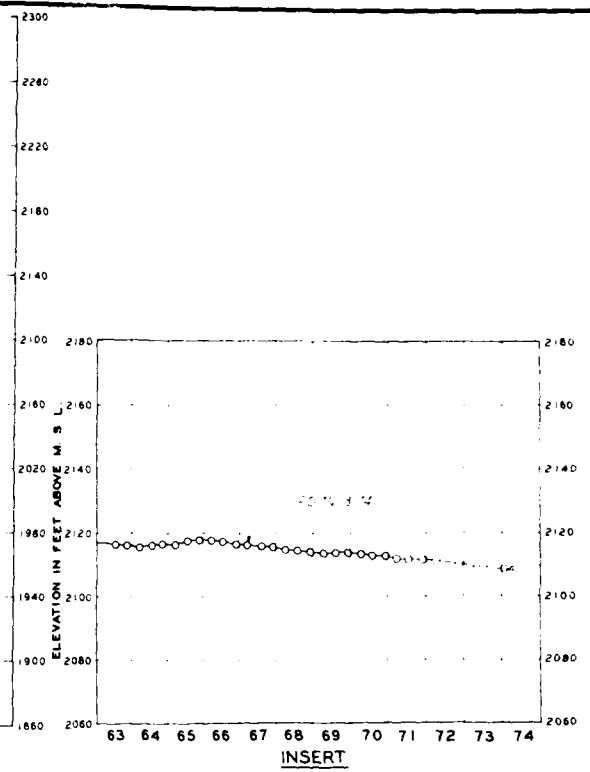
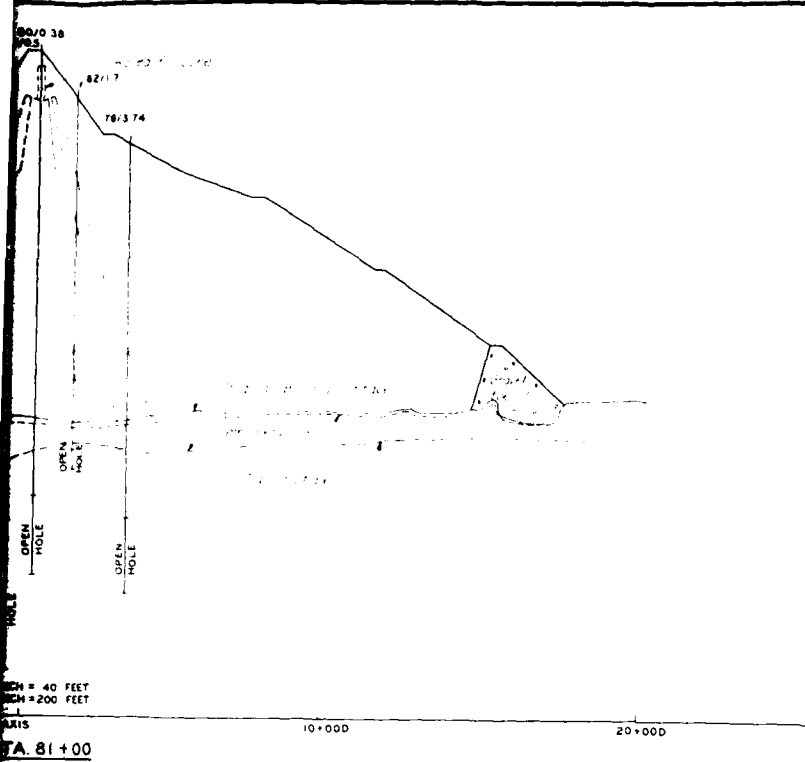
DATE	DESCRIPTION	MADE	APPRO
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY:	MISSOURI RIVER FORT PECK LAKE, MONTANA UNDERSEEPAGE STUDIES STATION 60+00 STUDY OF HEAD LOSS THROUGH SHEET PILING ABOVE CLAY STRATUM		
DRAWN BY:			
CHECKED BY:			
DESIGNED BY:			
DATE:			
ENGINEER	SECTION	APPROVED:	DATE:
ENGINEER	SECTION	ENGINEERING DIVISION	
APPROVED:	SCALE AS SHOWN	SHEET NO.	
COL. C. E. BRYANT, CHIEF		SHEET	



SECTION - STA 81+00



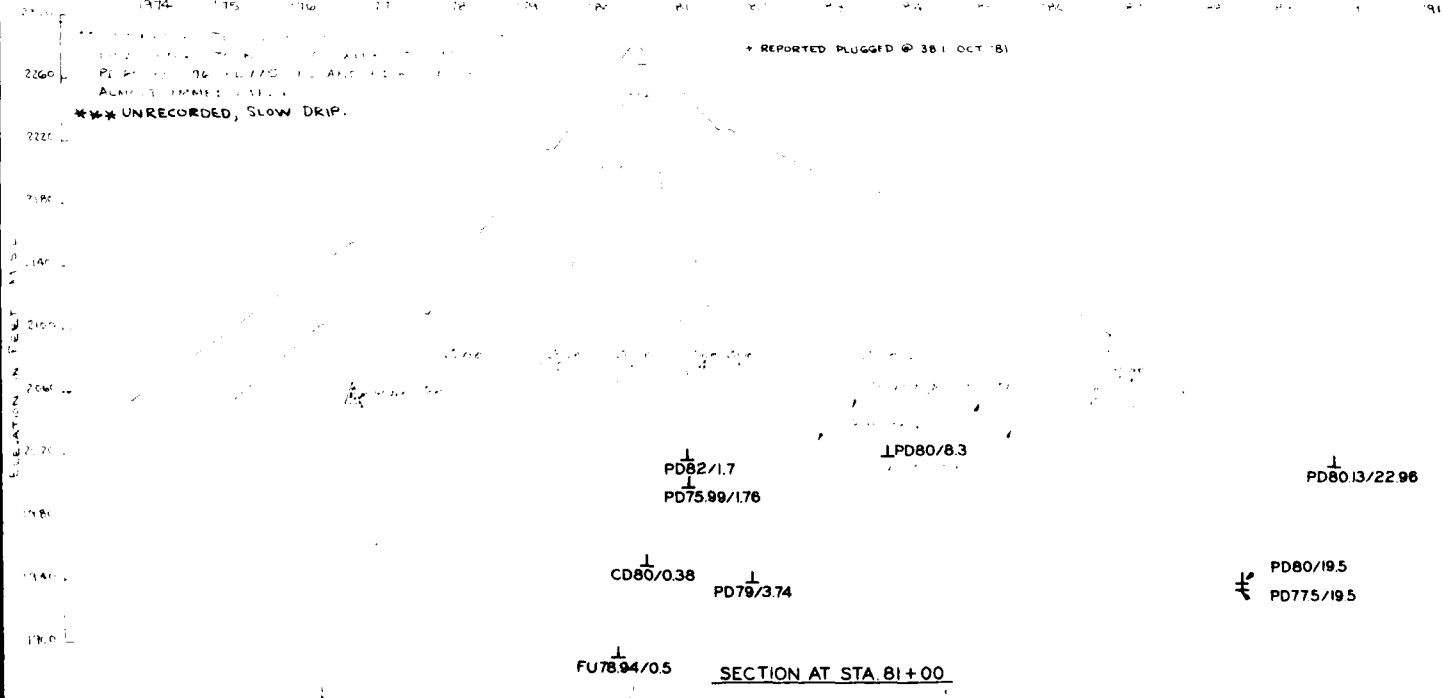
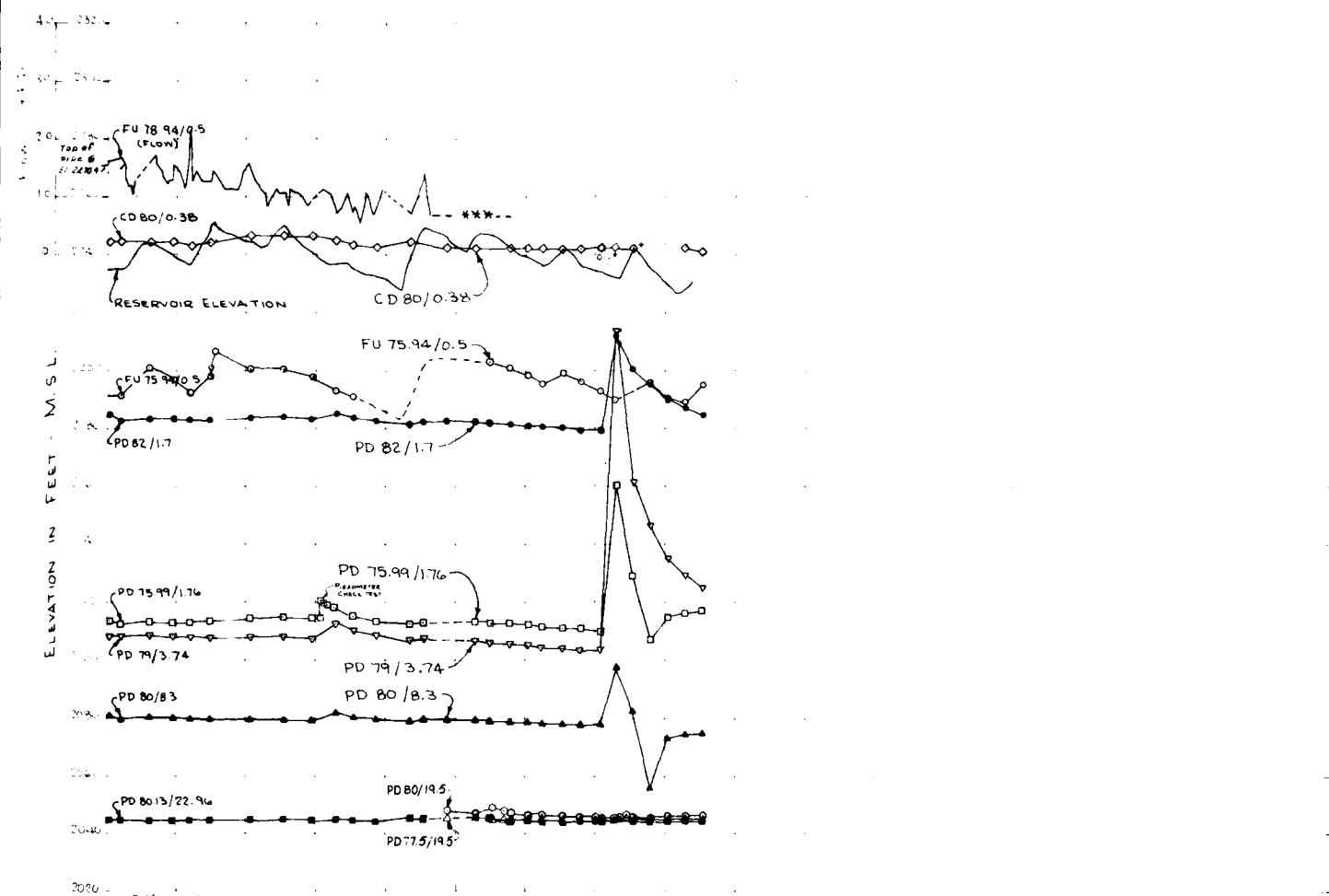
THIS DRAWING WAS MADE BY THE BUREAU OF RECONSTRUCTION AND DEVELOPMENT, U. S. ARMY



DATE	DESCRIPTION	MADE	APPROVED
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY: DRAWN BY: CHECKED BY: APPROVED BY:		MISSOURI RIVER FORT PECK LAKE, MONTANA UNDERSEPAGE STUDIES LEFT ABUTMENT PORE PRESSURE PIEZOMETERS	
DATE	DATE	DATE	DATE
SCALE AS SHOWN	SCALE AS SHOWN	SCALE AS SHOWN	SCALE AS SHOWN

THIS PLAN ACCOMPANIES CONTRACT NO. _____
 MODIFICATION NO. _____

2

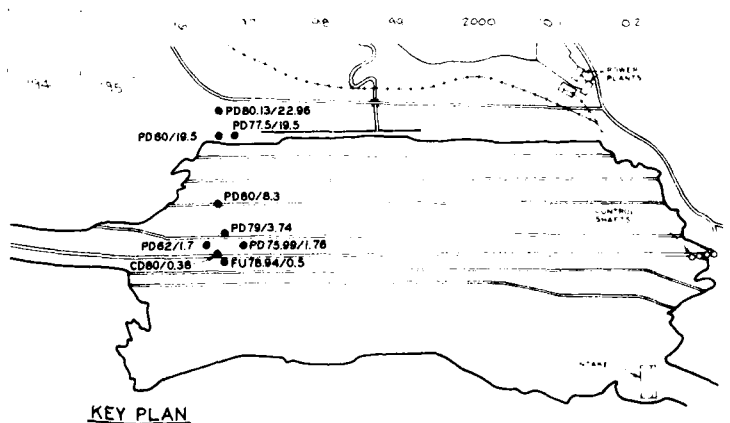


* REPORTED PLUGGED @ 381 OCT '81
 *** UNRECORDED, SLOW DRIP.

† PD 82/1.7 † PD 80/8.3 † PD 80/13/22.96
 † PD 75.99/1.76 † PD 80/19.5 † PD 80/19.5
 † CD 80/0.38 † PD 79/3.74 † PD 77.5/19.5
 † FU 75.94/0.5

SECTION AT STA 81+00

1935 1936 1937 1938 1939 1940 1941 1942 1943 1944 1945
 OCT '81



KEY PLAN

PD80.13/22.96

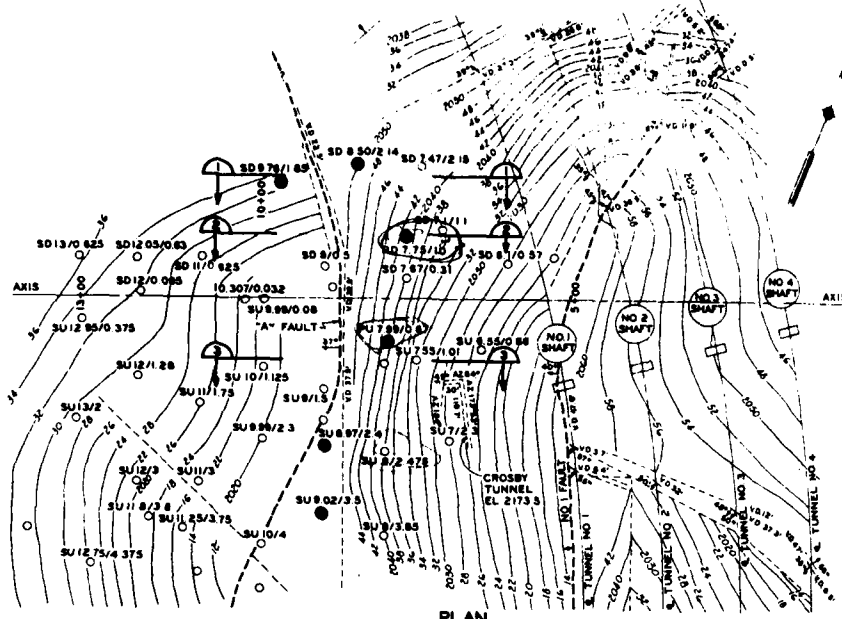
PD80/19.5
 PD77.5/19.5

THIS DRAWING HAS BEEN REDUCED TO
 THREE-EIGHTHS THE ORIGINAL SCALE.



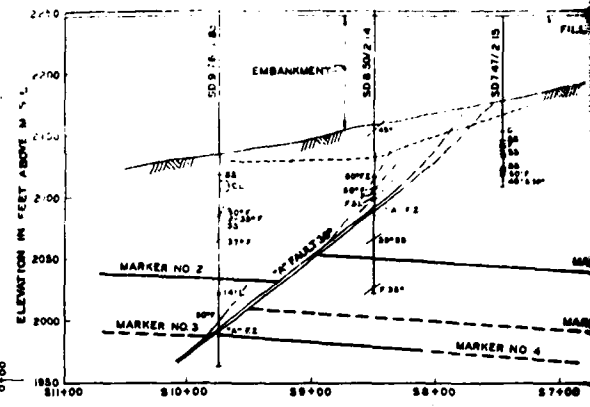
THIS PLAN ACCOMPANIES CONTRACT NO.
 MODIFICATION NO.

DATE	DESCRIPTION	MADE	APPROV
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY:	MONSIEUR W. J. JAY		
DRAWN BY:	FORT PECK LAKE MONTANA		
CHECKED BY:	LEFT ABUTMENT		
SUBMITTED BY:	PORE PRESSURE PIEZOMETERS FOUNDATION SHALE		
NAME	SECTION	APPROVED	DATE
		DAVE ENGINEERING DIVISION	
CHECKED	DRAWN	SCALE AS SHOWN	SHEET NO.
			DRAWING NUMBER
APPROVED	SIL. S. E. BRITNEY ENGINEER		SHEET

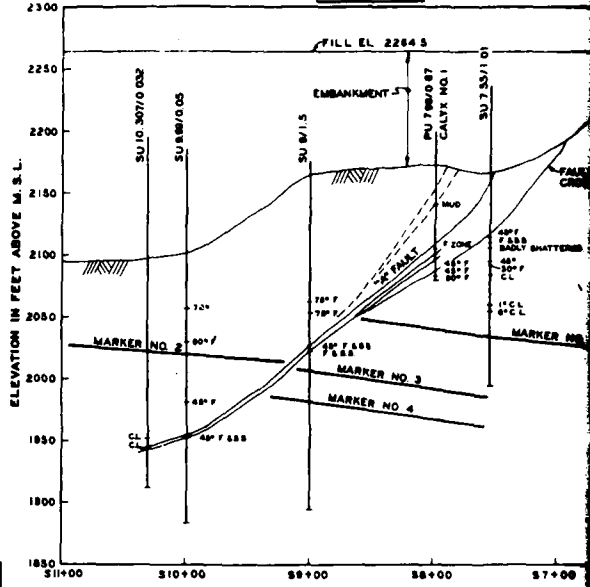


PLAN
SCALE: 1 INCH = 100 FEET

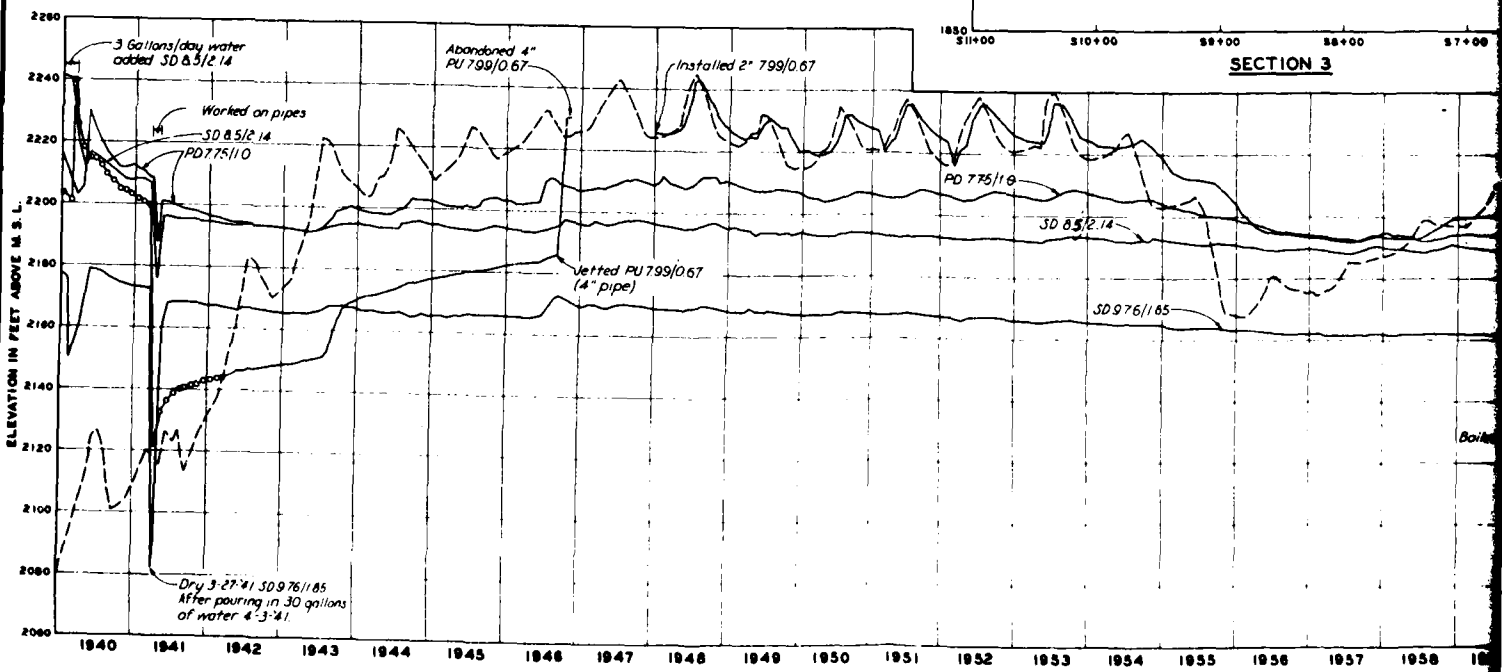
- LEGEND:**
- T STRIKE AND DIP
 - VD VERTICAL DISPLACEMENT
 - SD SLIDE AREA BORINGS DOWNSTREAM
 - SU SLIDE AREA BORINGS UPSTREAM
 - - - FAULT
 - SPECIAL BORINGS FOR "A" FAULT OBSERVATION
 - EXPLORATORY BORINGS

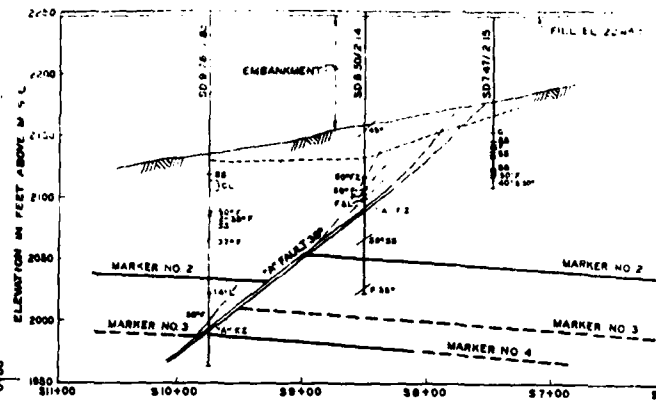


SECTION 1

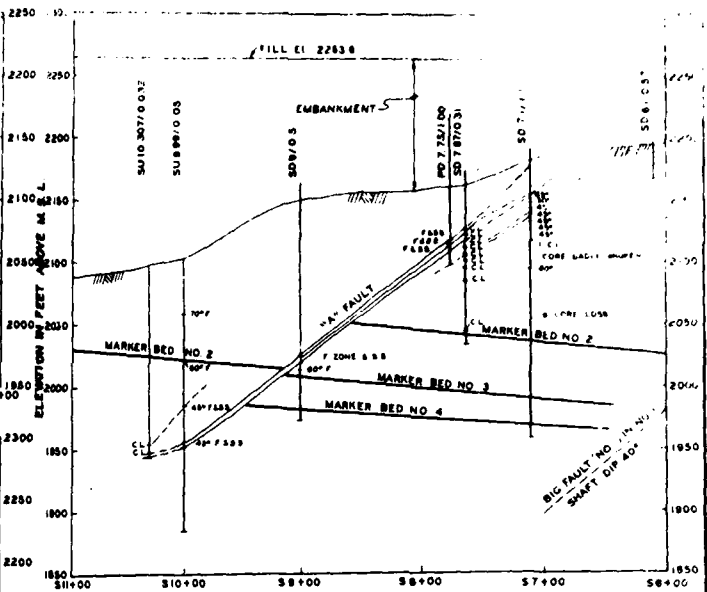


SECTION 3

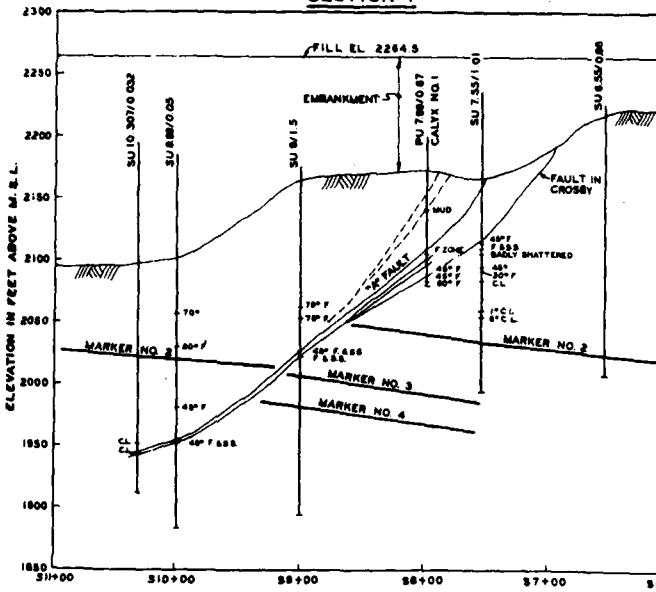




SECTION 1

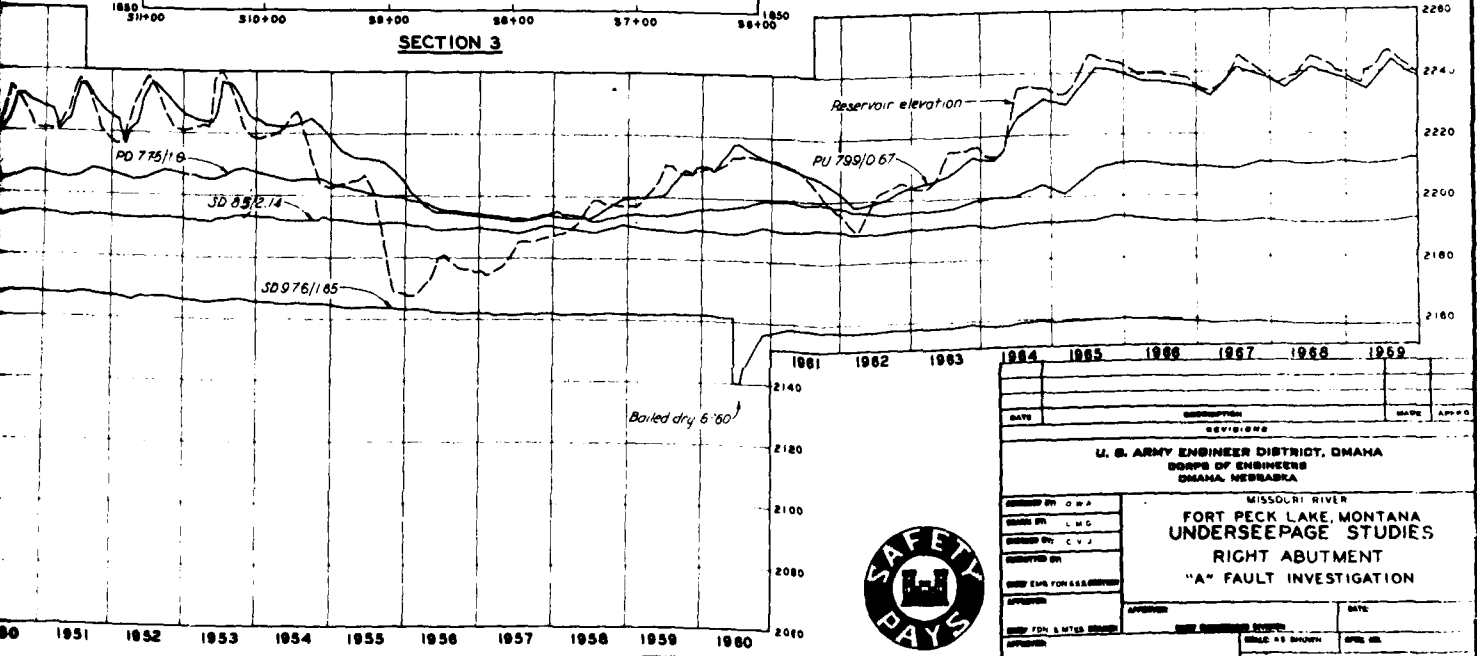


SECTION 2



SECTION 3

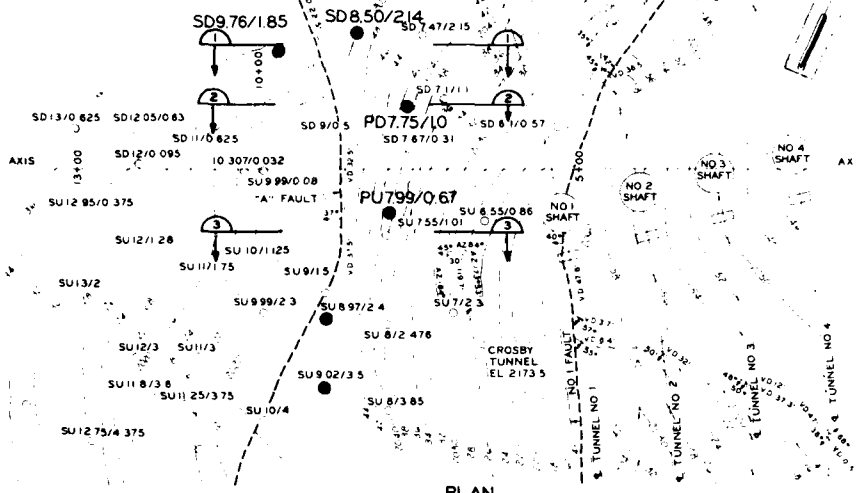
- LEGEND:**
- S.S. SLICKENSIDES
 - C.L. CORE LOSS
 - SH. SHATTERED
 - 45° F. FAULT PLANE
 - H.W. HANGING WALL
 - F & SS FAULT PLANE WITH SLICKENSIDES
 - MARKER NO. MARKER BEDS OF BENTONITE



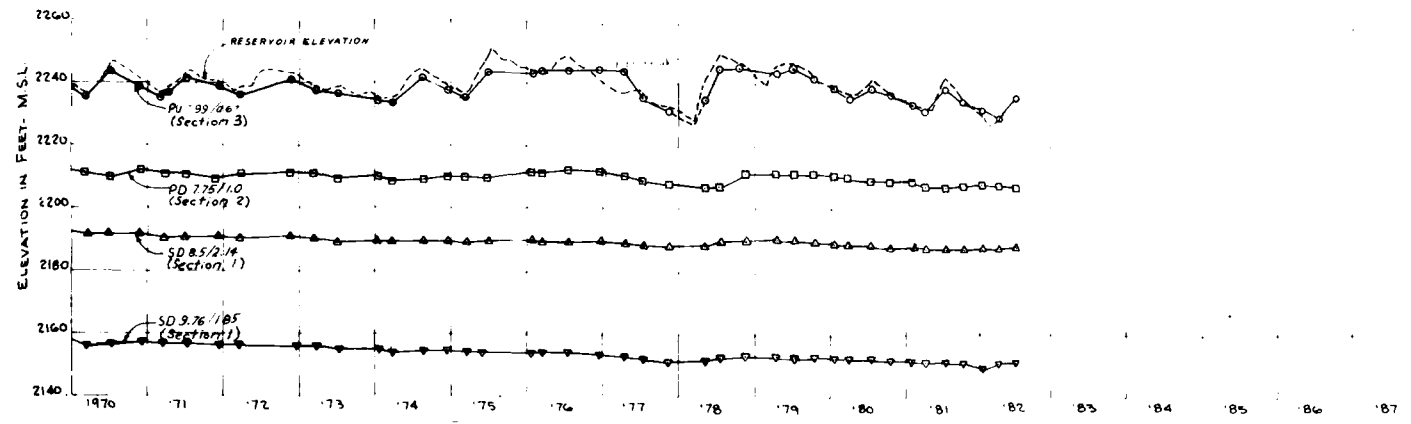
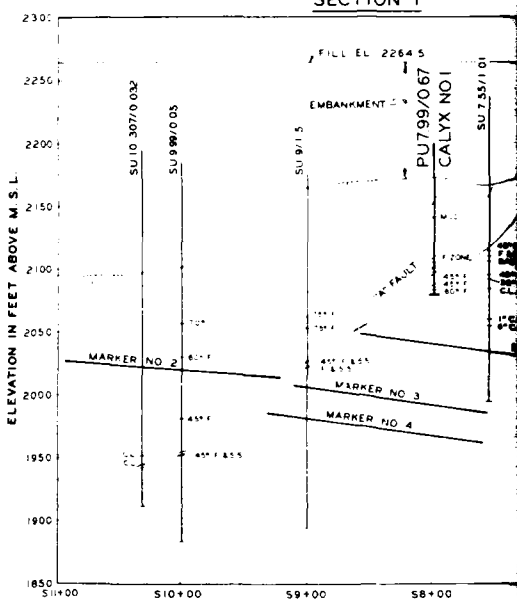
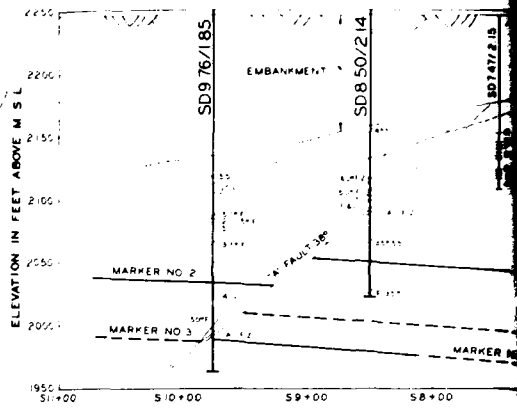
THIS PLAN ACCORDS WITH CONTRACT NO. MODIFICATION NO.

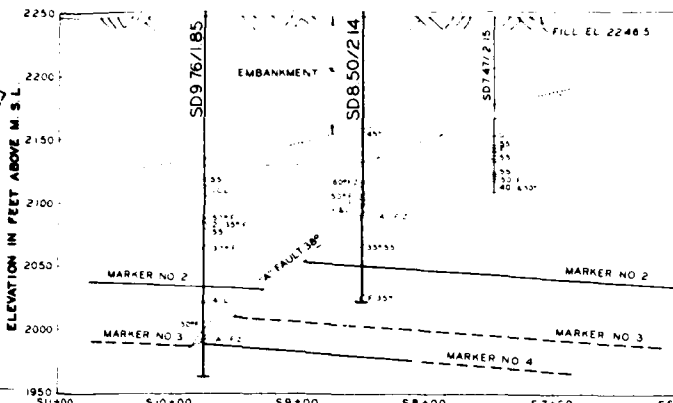


DATE	REVISIONS
U. S. ARMY ENGINEER DISTRICT, OMAHA GROUP OF ENGINEERS OMAHA, NEBRASKA	
MISSOURI RIVER FORT PECK LAKE, MONTANA UNDERSEPAGE STUDIES RIGHT ABUTMENT "A" FAULT INVESTIGATION	
DESIGNED BY: OWA	APPROVED: _____ DATE: _____
DRAWN BY: LMG	CHECKED BY: _____ DATE: _____
CHECKED BY: CVJ	DATE: _____
REVIEWED BY: _____	DATE: _____
DATE FOR ASSIGNED: _____	DATE: _____
DATE FOR LIMITS: _____	DATE: _____

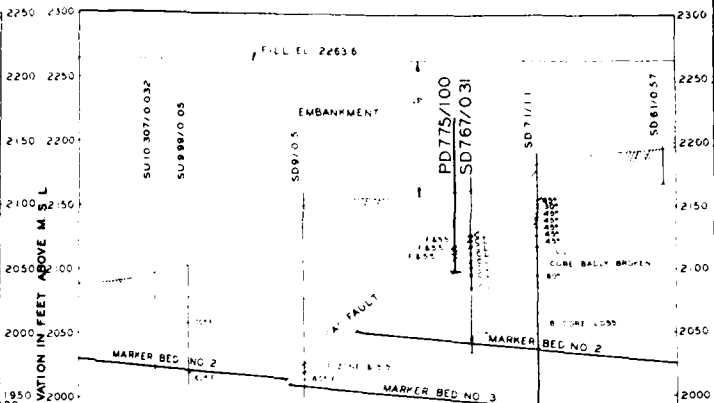


- LEGEND:**
- ↑ STRIKE AND DIP
 - VD VERTICAL DISPLACEMENT
 - SD SLIDE AREA BORINGS DOWNSTREAM
 - SU SLIDE AREA BORINGS UPSTREAM
 - - - FAULT
 - SPECIAL BORINGS FOR "A" FAULT OBSERVATION
 - EXPLORATORY BORINGS

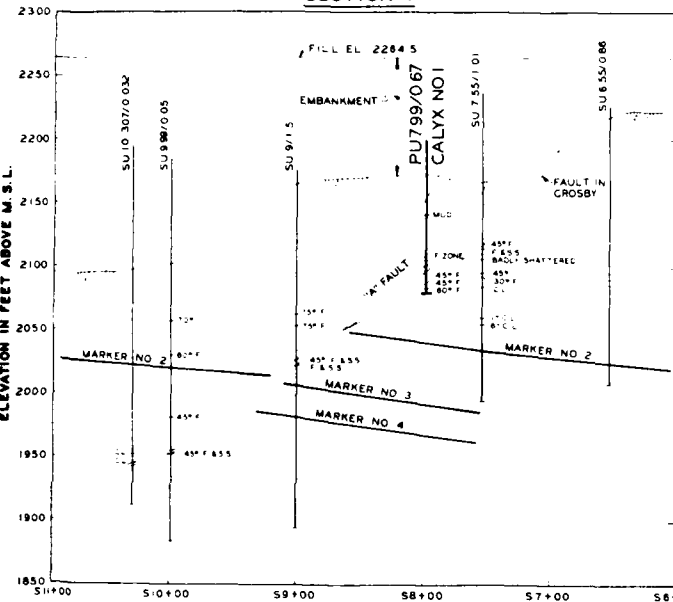




SECTION 1



SECTION 2



SECTION 3

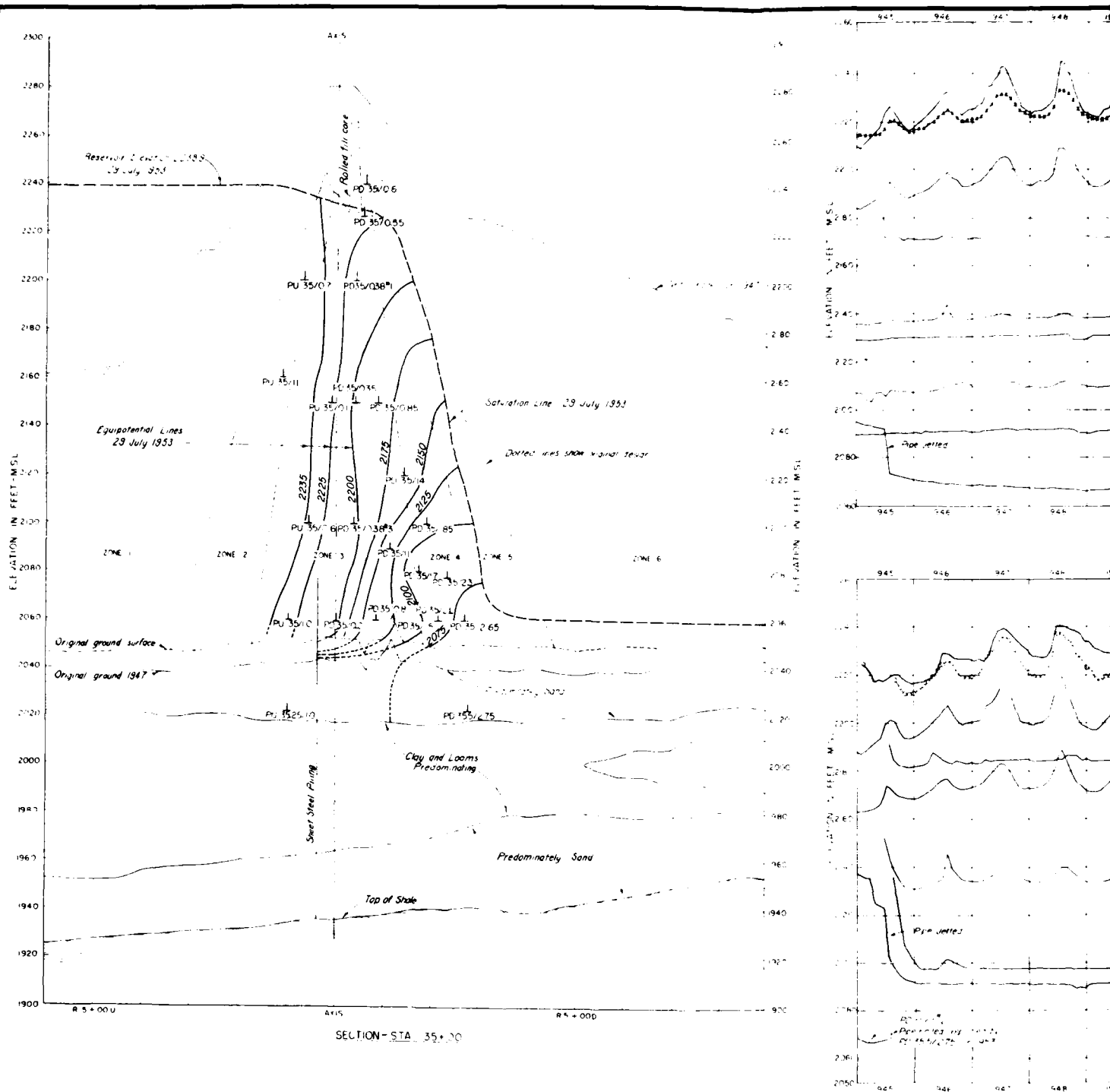
- LEGEND**
- SS SLICKENSIDES
 - CL CORE LOSS
 - SH SHATTERED
 - 45°F FAULT PLANE
 - H W HANGING WALL
 - F & SS FAULT PLANE WITH SLICKENSIDES
 - MARKER NO MARKER BEDS OF BENTONITE

81 82 83 84 85 86 87 88 89 90 91 92 93

U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA	
MISSOURI RIVER FORT PECK LAKE, MONTANA UNDERSEepage STUDIES RIGHT ABUTMENT PIEZOMETERS "A" FAULT INVESTIGATION	
DESIGNED BY: DRAWN BY: CHECKED BY: SUBMITTED BY: DATE:	APPROVED: DATE:
DIVISION: OFFICE:	SCALE AS SHOWN SHEET NO.

THIS DRAWING HAS BEEN REDUCED TO
THREE-FIFTHS THE ORIGINAL SCALE.

2



LEGEND
 ⊥ - Bottom of Piezometer

NOTES
 Data shown is for Piezometer
 Observations for 29 July 1953
 See Dwg 6236 97-1-100 for
 conditions on 3 June 1957 when
 the Reservoir was at 21 27 15

AD-A123 609

EMBANKMENT CRITERIA AND PERFORMANCE REPORT MISSOURI
RIVER FORT PECK LAKE MONTANA VOLUME III DRAWINGS(U)
ARMY ENGINEER DISTRICT OMAHA NEBR SEP 82

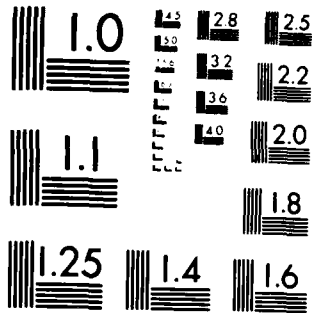
2/2

UNCLASSIFIED

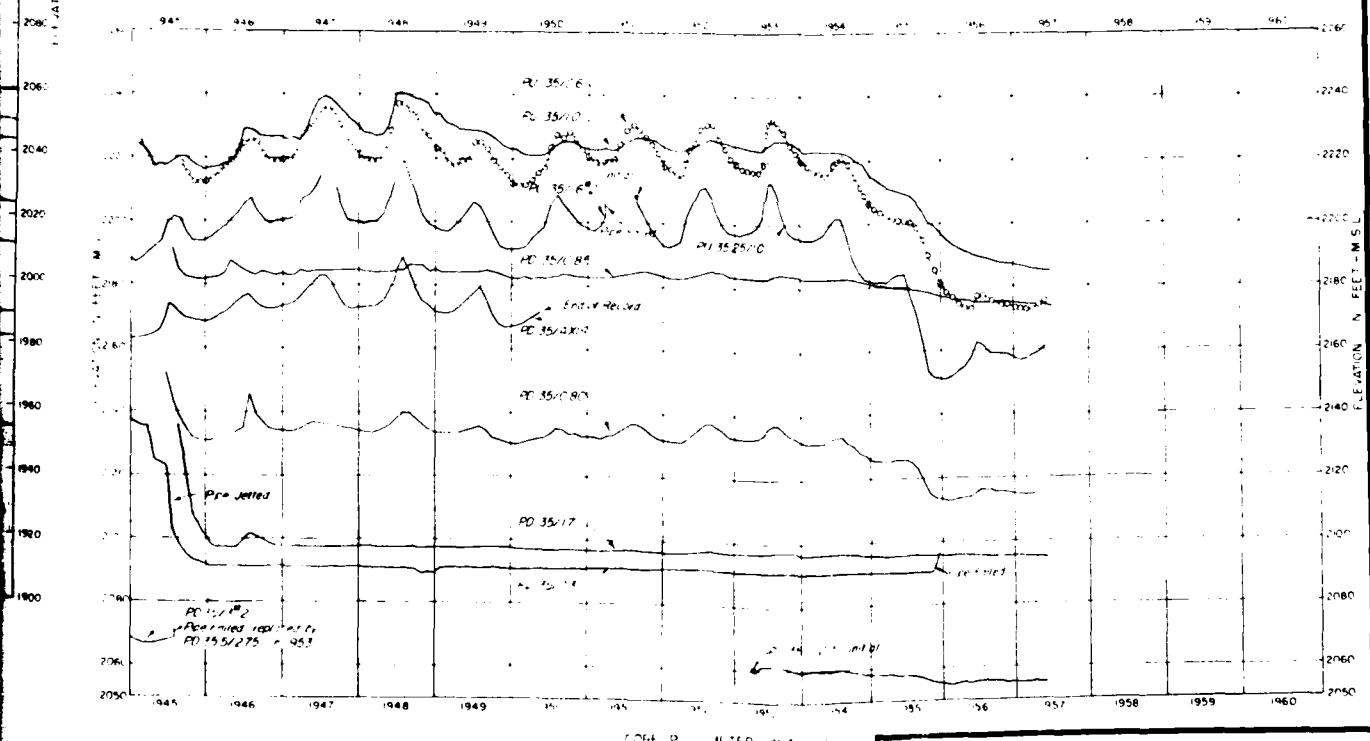
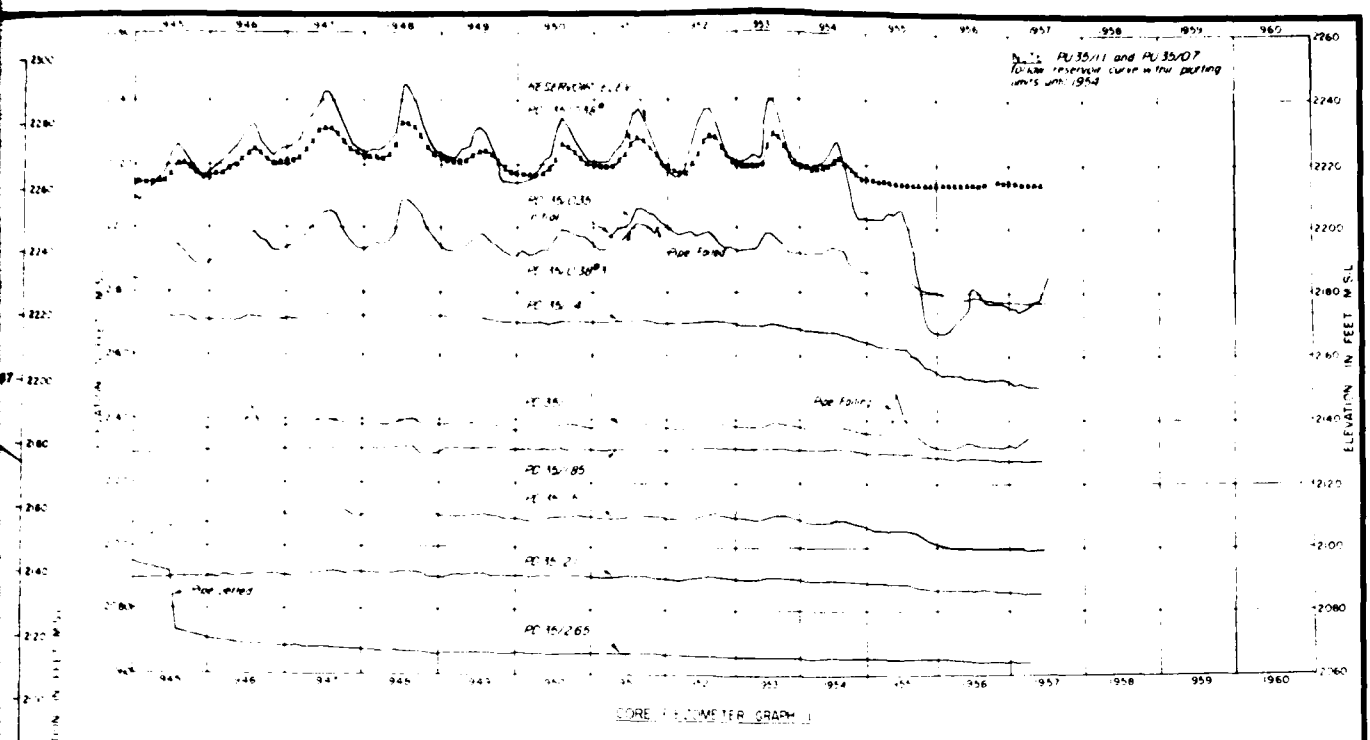
F/G 13/13

NL

END
DATE
FILMED
8-83
DTIC

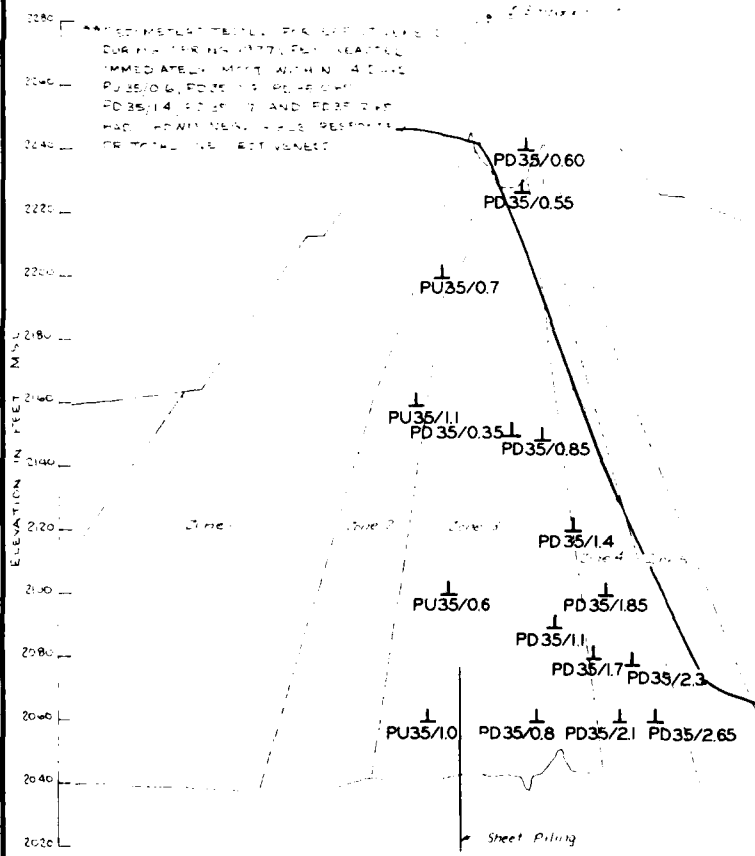
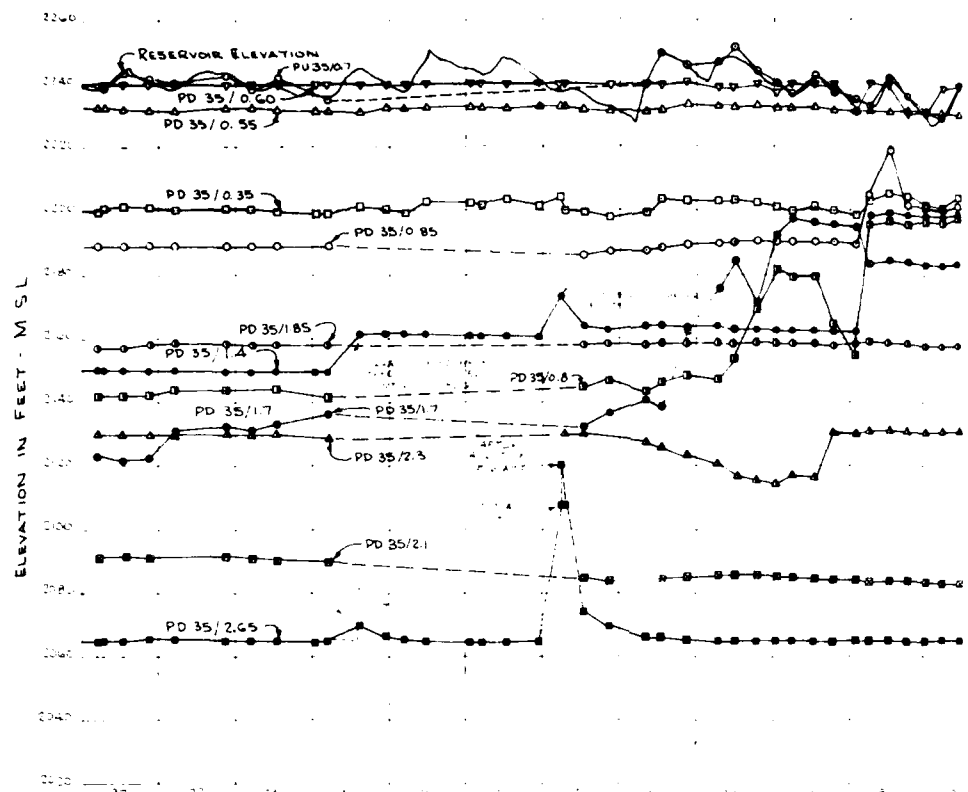


MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A



CORPS OF ENGINEERS, U. S. ARMY
 DISTRICT ENGINEER
 HARRISON DISTRICT
 MISSOURI RIVER
 FORT PECK DAM
 EQUIPOTENTIAL LINES FOR IMPERVIOUS CORE
 AND PIEZOMETER GRAPHS
 STA 35+00
 29 JULY 1953

DATE: JUNE 1957
 DRAWN BY: AS SHOWN IN SPEC. NO. 6296 97-1-99



RESERVOIR ELEVATION
 PU 35/0.7
 PD 35/0.60
 PD 35/0.55

ELEVATION IN FEET - M.S.L.

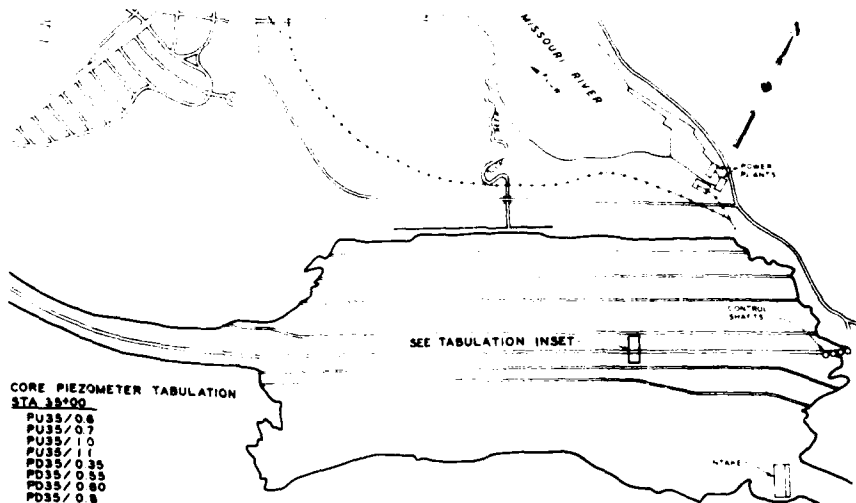
PD 35/0.35
 PD 35/0.85
 PD 35/1.85
 PD 35/1.4
 PD 35/1.7
 PD 35/2.3
 PD 35/2.1
 PD 35/2.65

RESERVOIR ELEVATION TESTED FOR SEEPAGE
 DURING PERIOD 1977. TEST RESULTS
 IMMEDIATELY MET WITHIN 4 DAYS
 PU 35/0.6, PD 35/1.1, PD 35/1.4,
 PD 35/1.7 AND PD 35/2.1
 HAD ADMITTING TO RESERVOIR
 OR TO THE SEEPAGE VENT

PD 35/0.60
 PD 35/0.55
 PU 35/0.7
 PU 35/1.1
 PD 35/0.35
 PD 35/0.85
 PD 35/1.4
 PU 35/0.6
 PD 35/1.85
 PD 35/1.1
 PD 35/1.7
 PD 35/2.3
 PU 35/1.0
 PD 35/0.8
 PD 35/2.1
 PD 35/2.65

July 79 Crest line developed from
 seepage pipe instrumentation.
 See Plate B 431

Sheet Piling



- CORE PIEZOMETER TABULATION**
SIA 35+00
- PU35/06
 - PU35/07
 - PU35/10
 - PU35/11
 - PD35/035
 - PD35/055
 - PD35/080
 - PD35/09
 - PD35/085
 - PD35/11
 - PD35/14
 - PD35/17
 - PD35/185
 - PD35/21
 - PD35/23
 - PD35/285

KEY PLAN

THIS DRAWING HAS BEEN REDUCED TO THREE-EIGHTHS THE ORIGINAL SCALE.

Photostatic developed from pipe instrumentation Plate B-431



THIS PLAN ACCOMPANIES CONTRACT NO. MODIFICATION NO.

DATE	DESCRIPTION	MADE	APPROD

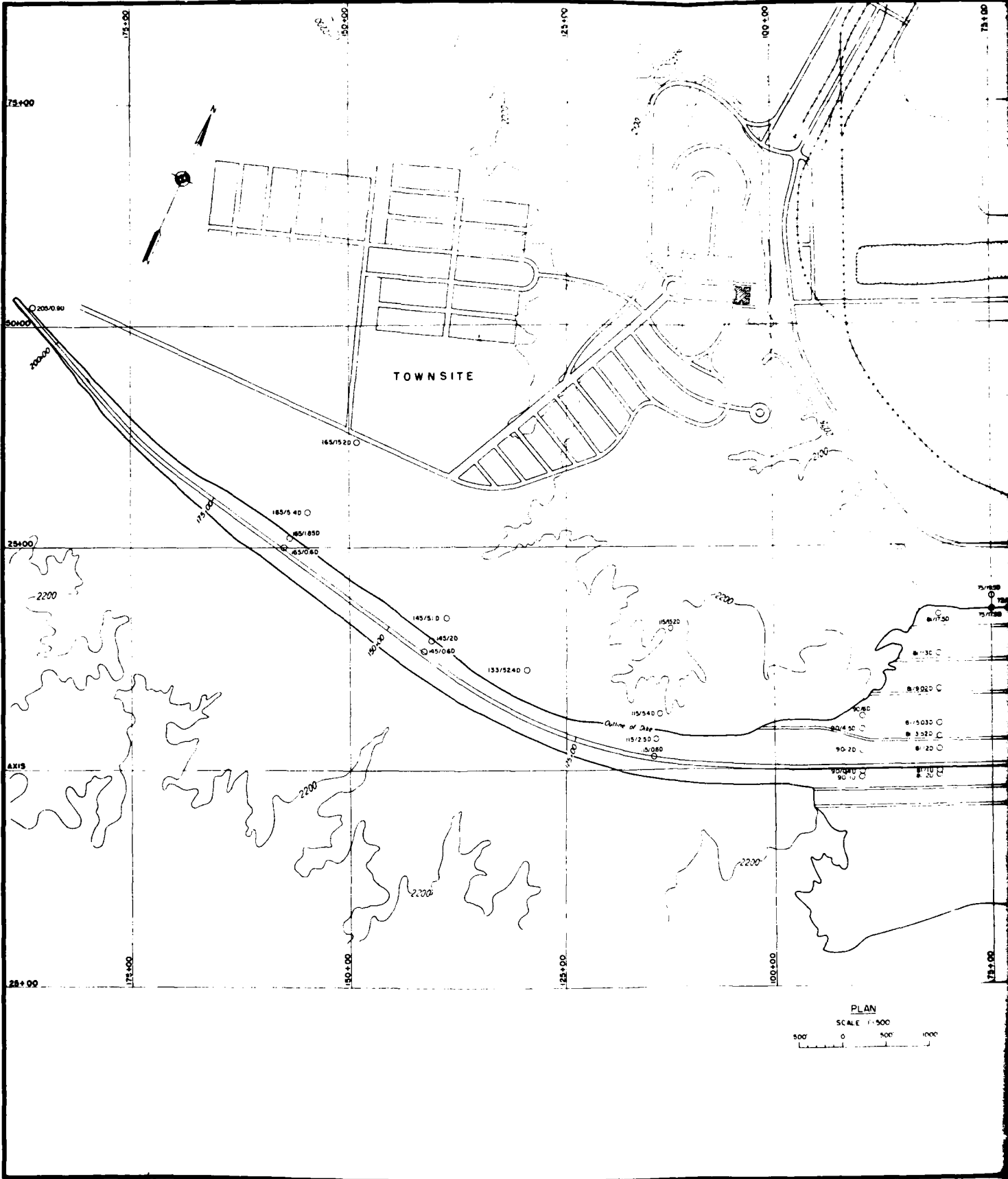
U. S. ARMY ENGINEER DISTRICT, OMAHA
CORPS OF ENGINEERS
OMAHA, NEBRASKA

MISSOURI RIVER
FORT PECK LAKE, MONTANA

EMBANKMENT PIEZOMETERS
STATION 35+00

DESIGNED BY: _____
 DRAWN BY: _____
 CHECKED BY: _____
 SUBMITTED BY: _____
 DATE: _____

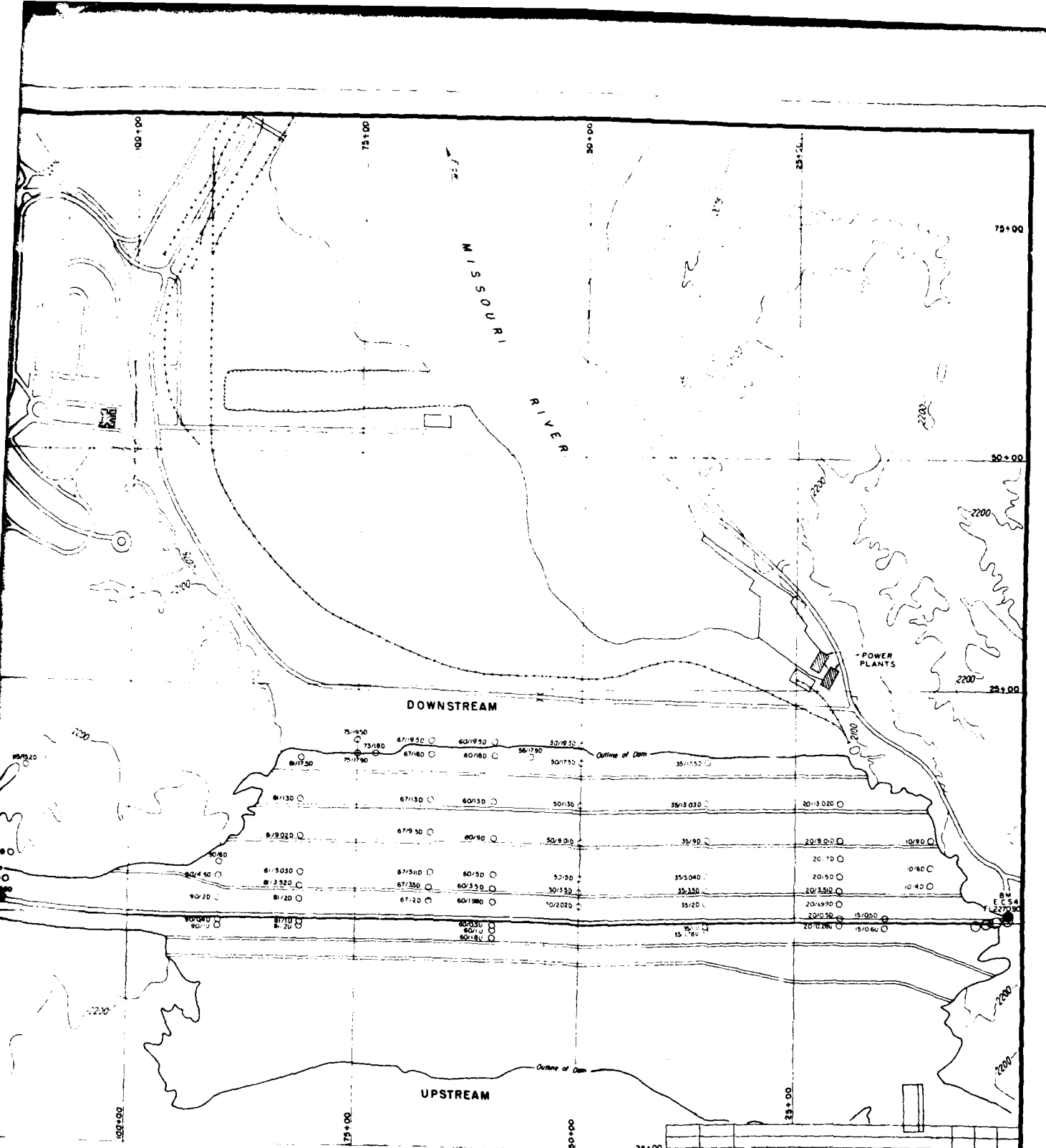
APPROVED: _____
 DATE: _____
 SCALE AS SHOWN _____
 SHEET NO. _____



PLAN

SCALE 1" = 500'

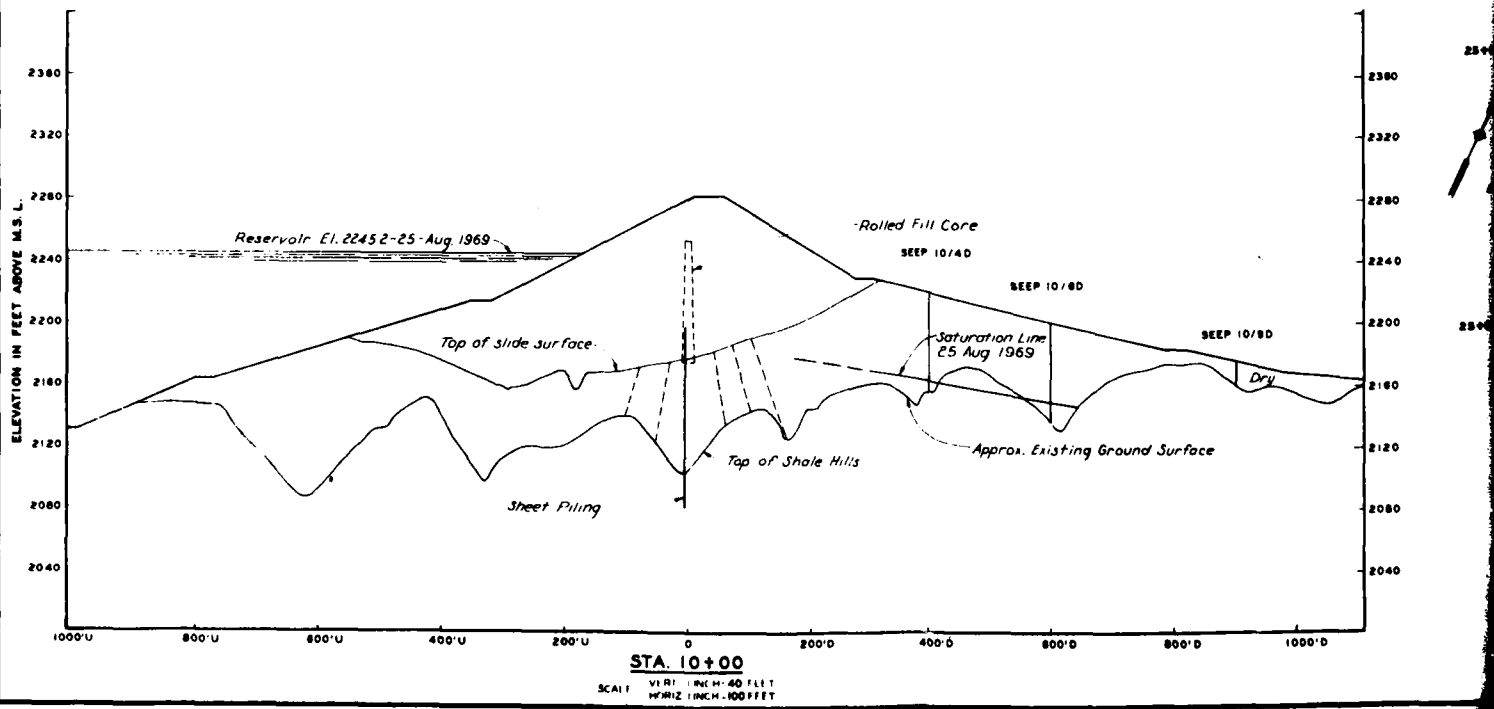
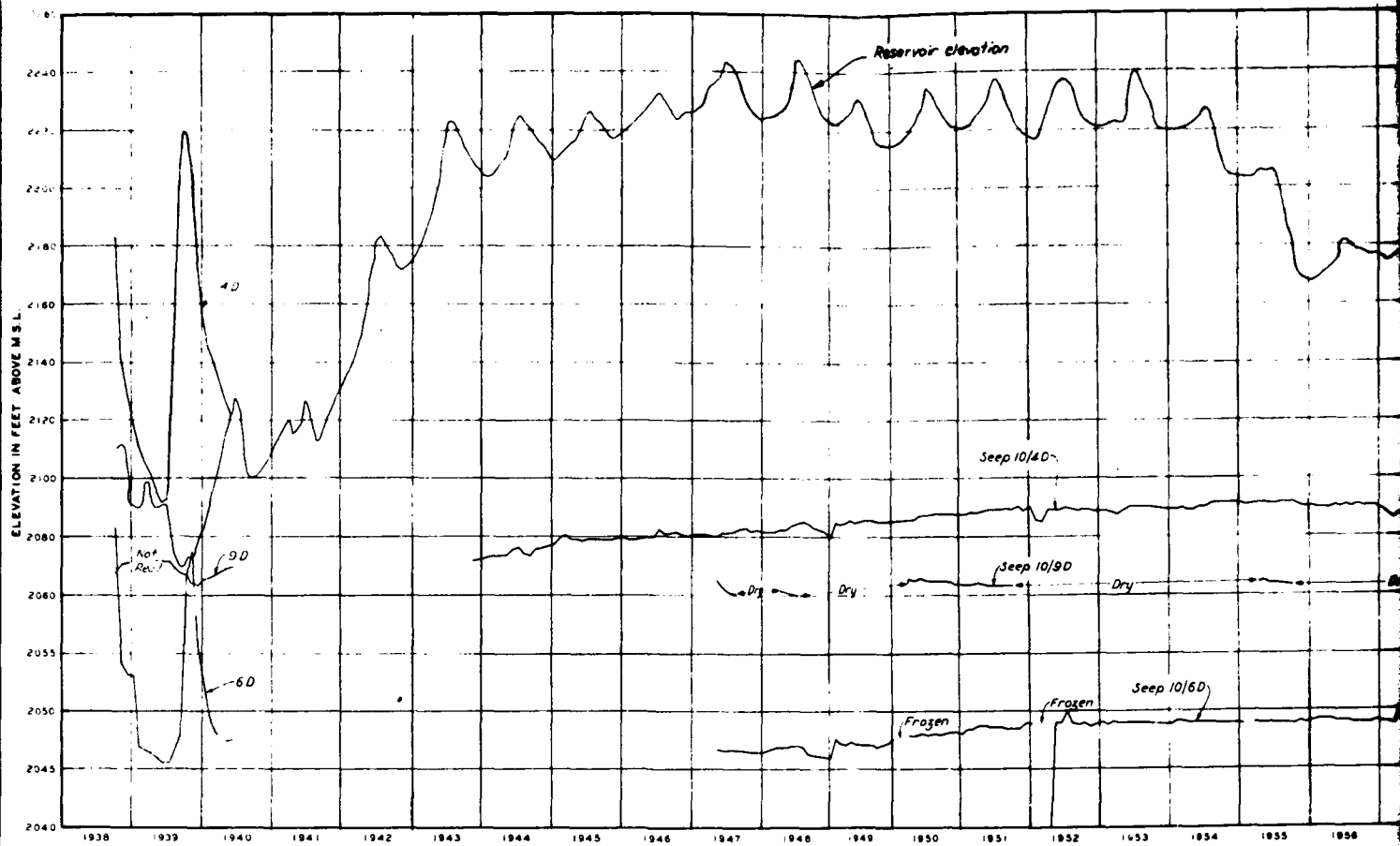
500' 0 500' 1000'



PLAN
SCALE 1:500
0 500 1000

THIS DRAWING HAS BEEN REDUCED TO
THREE-FIFTHS THE ORIGINAL SCALE

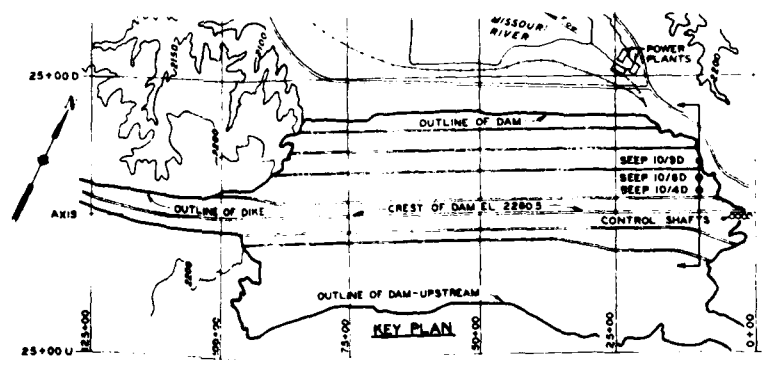
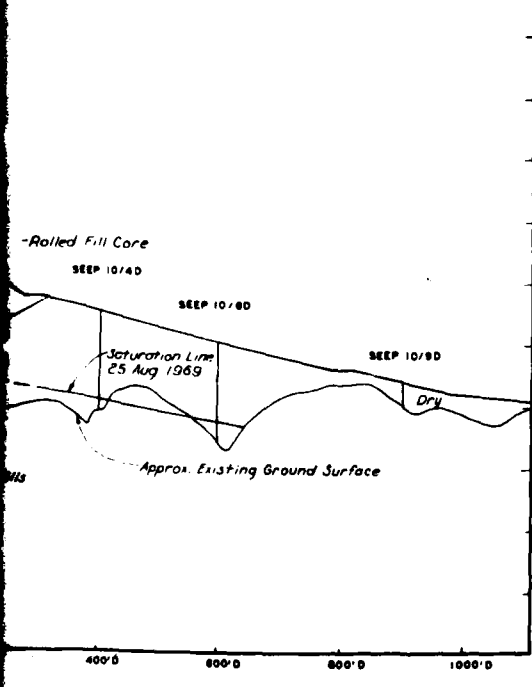
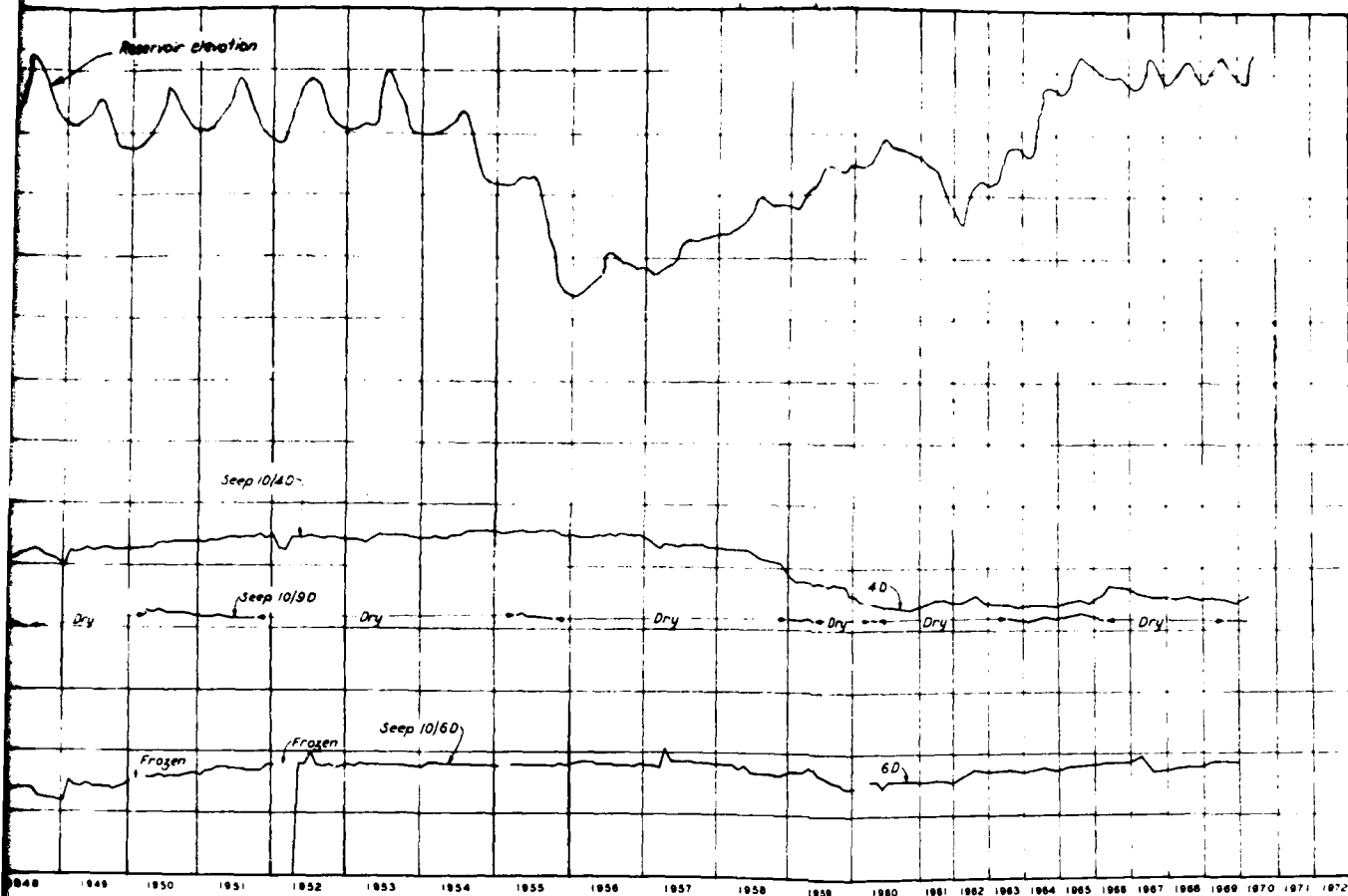
NO.	DATE	REVISIONS APPROVED BY	BY	CHKD	APPD
CORPS OF ENGINEERS, U. S. ARMY OFFICE OF THE DISTRICT ENGINEER GARDEN CITY DISTRICT RIVERBANK, S. D.					
MISSOURI RIVER FORT PECK DAM LOCATION OF ST PAGE PIPES					
DESIGNED BY		APPROVED BY		AUGUST 1937	
CHECKED BY				AS SHOWN	
				6296 92-70	



STA. 10+00

SCALE: VERT. 1 INCH = 40 FEET
HORIZ. 1 INCH = 100 FEET

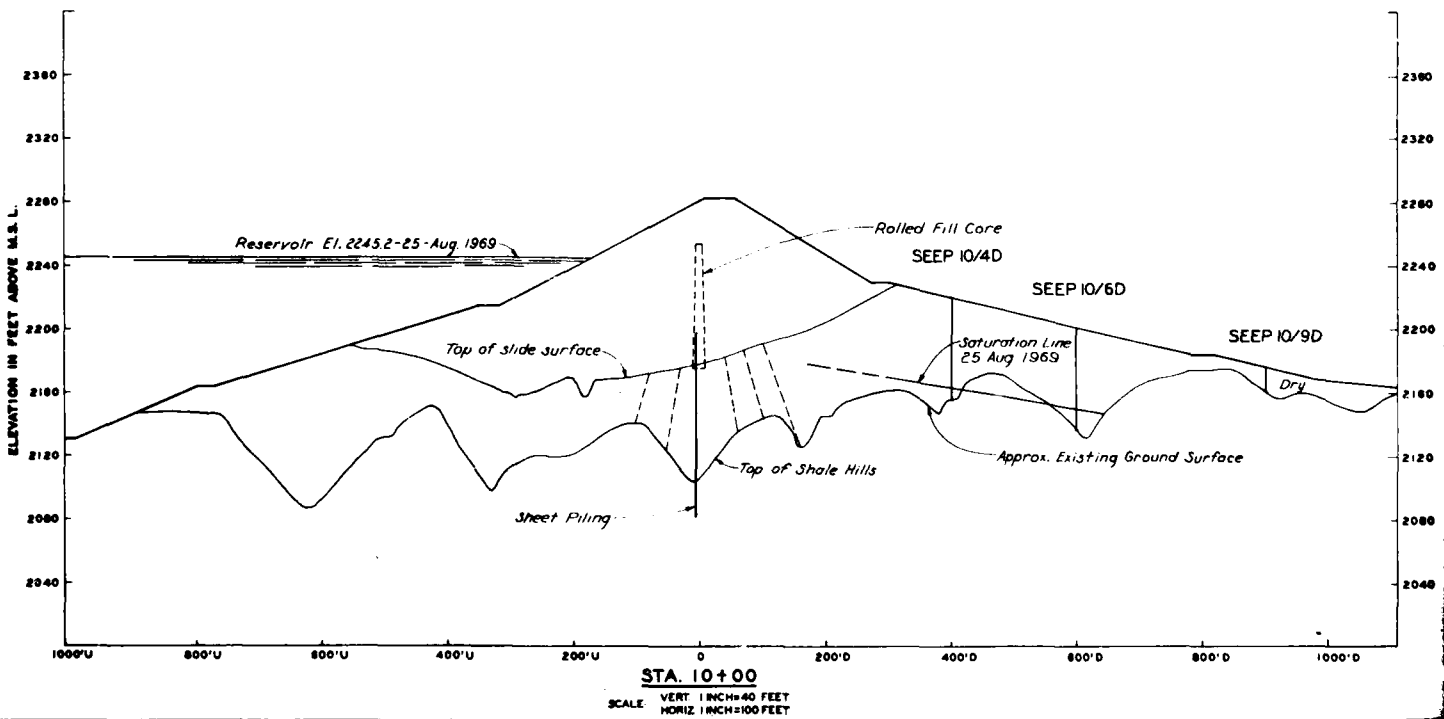
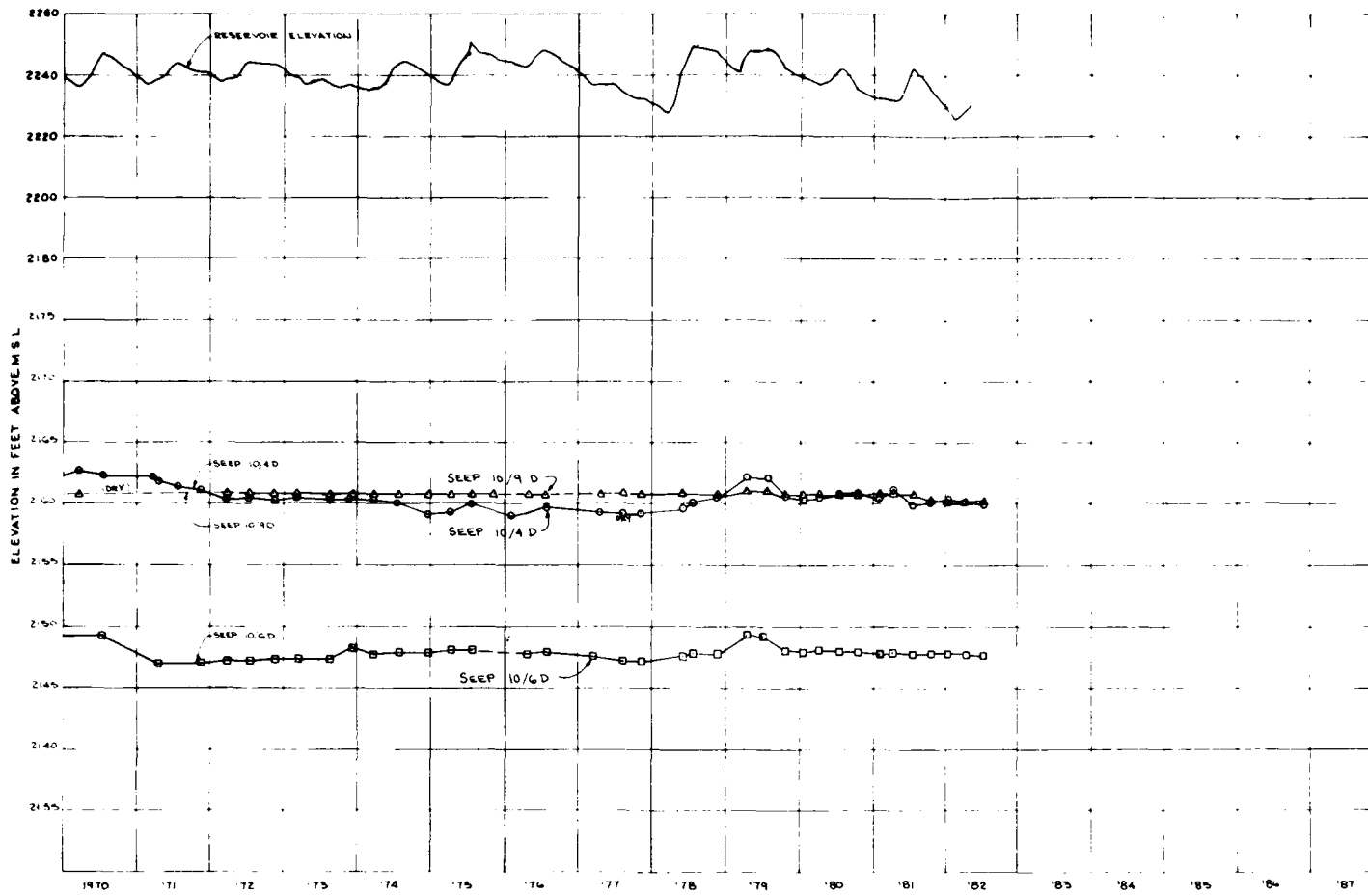
FORT PECK DAM AND RESERVOIR

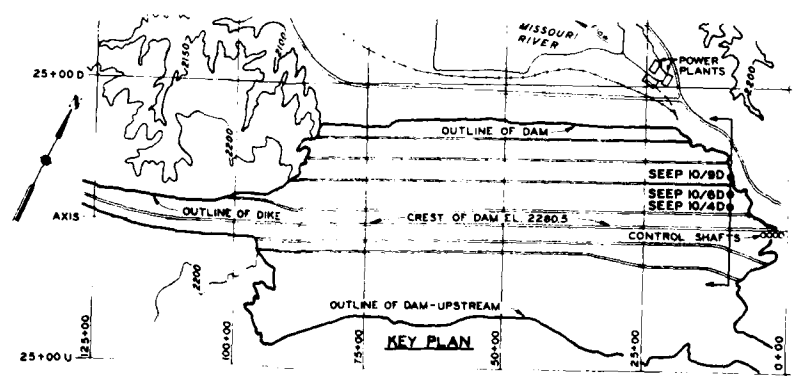
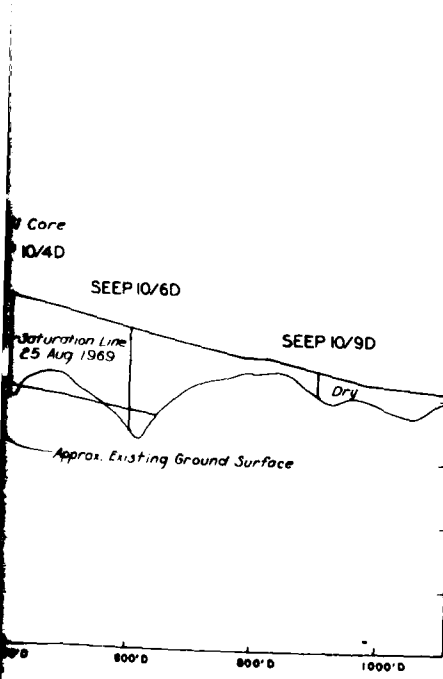
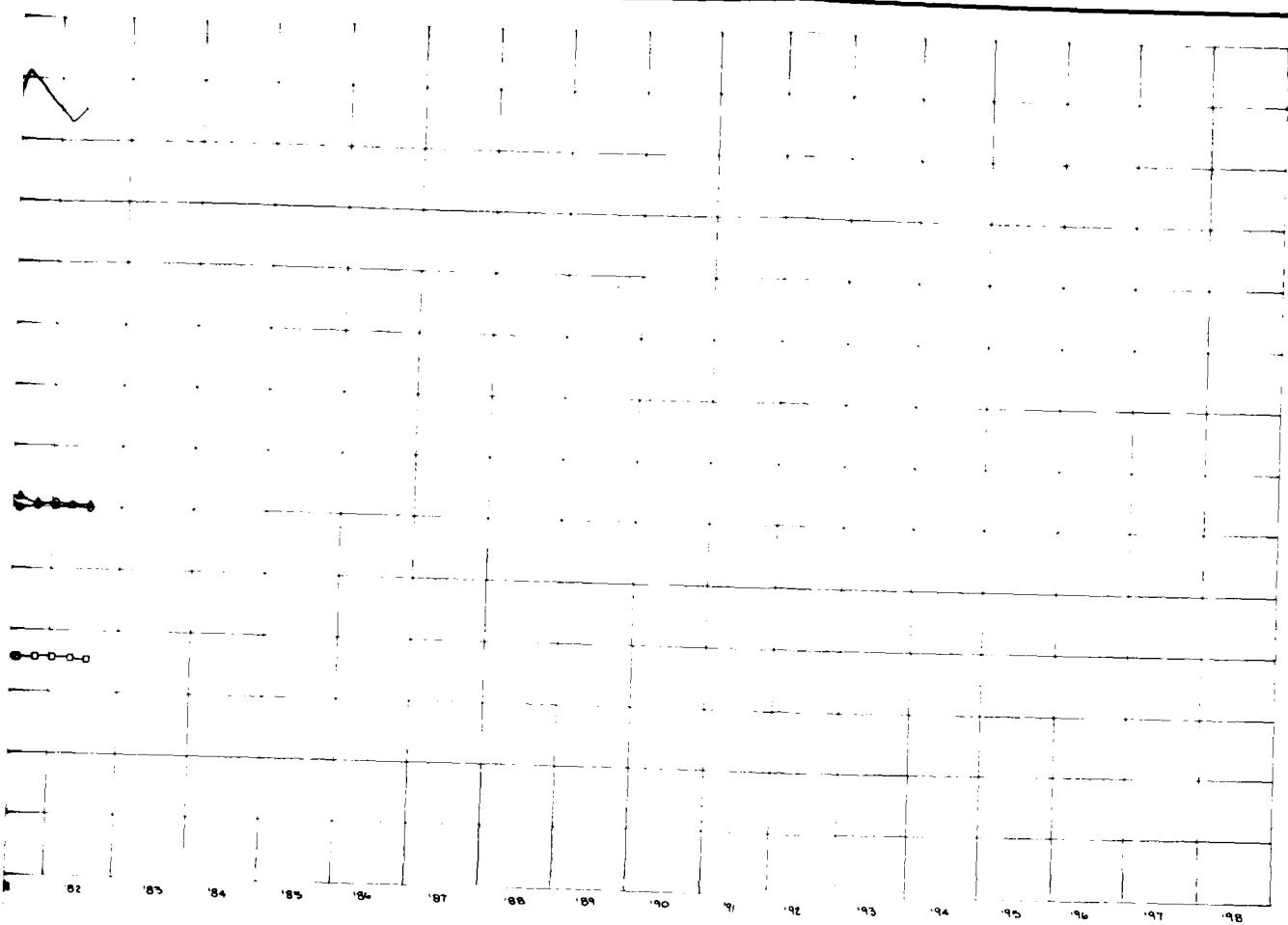


DATE	DESCRIPTION	MADE	APPROV
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY:		MISSOURI RIVER	
DRAWN BY: L. M. G.		FORT PECK LAKE, MONTANA	
CHECKED BY:		SATURATION LINE OBSERVATIONS	
SUPERVISOR:		STA. 10+00	
APPROVED:	DATE:	FILE AS SHOWN:	DATE:
DESIGNED BY:	DATE:	FILE AS SHOWN:	DATE:
DESIGNED BY:	DATE:	FILE AS SHOWN:	DATE:



2





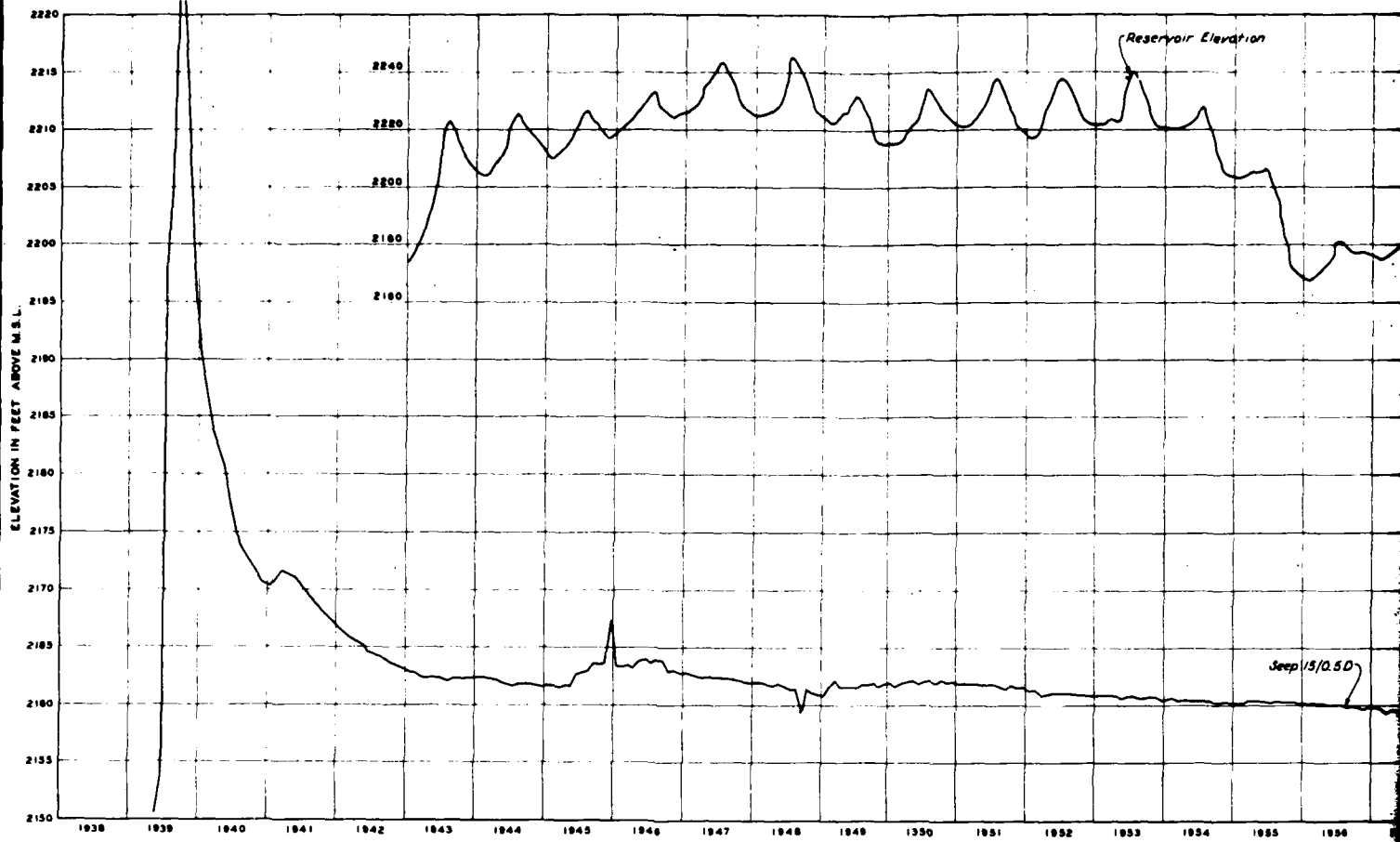
THIS DRAWING HAS BEEN REDUCED TO
THREE-EIGHTHS THE ORIGINAL SCALE.



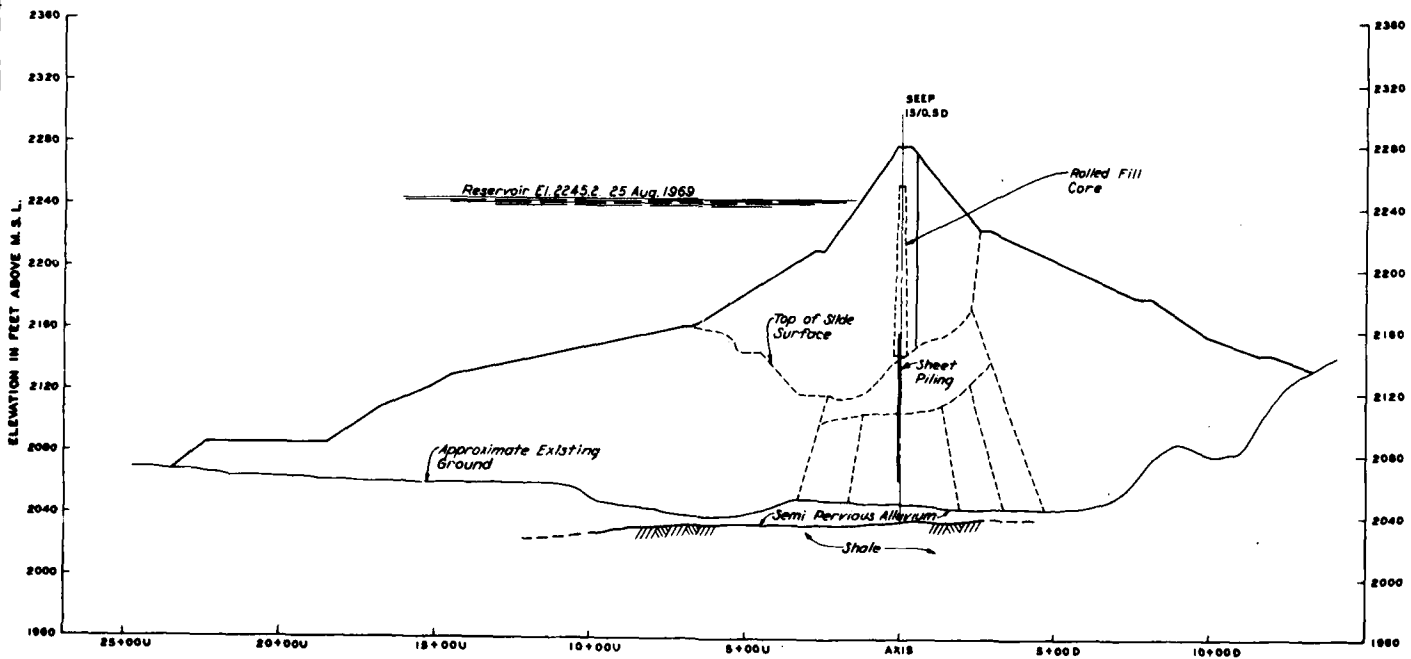
THIS PLAN ACCOMPANIES CONTRACT NO. _____
MODIFICATION NO. _____

DATE	DESCRIPTION	MADE	APPROVED
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY:		MISSOURI RIVER	
DRAWN BY: L. M. G.		FORT PECK LAKE, MONTANA	
CHECKED BY:		SATURATION LINE OBSERVATIONS	
BY: EMB FORTS DISTRICT		STA. 10+00	
APPROVED:	APPROVED:	DATE:	
BY: FORTS DISTRICT	BY: MISSOURI RIVER		
APPROVED:	APPROVED:	DATE:	
BY: FORTS DISTRICT	BY: MISSOURI RIVER		
COL. L. L. GUTBERY ENGINEER		ENGINEER	

2

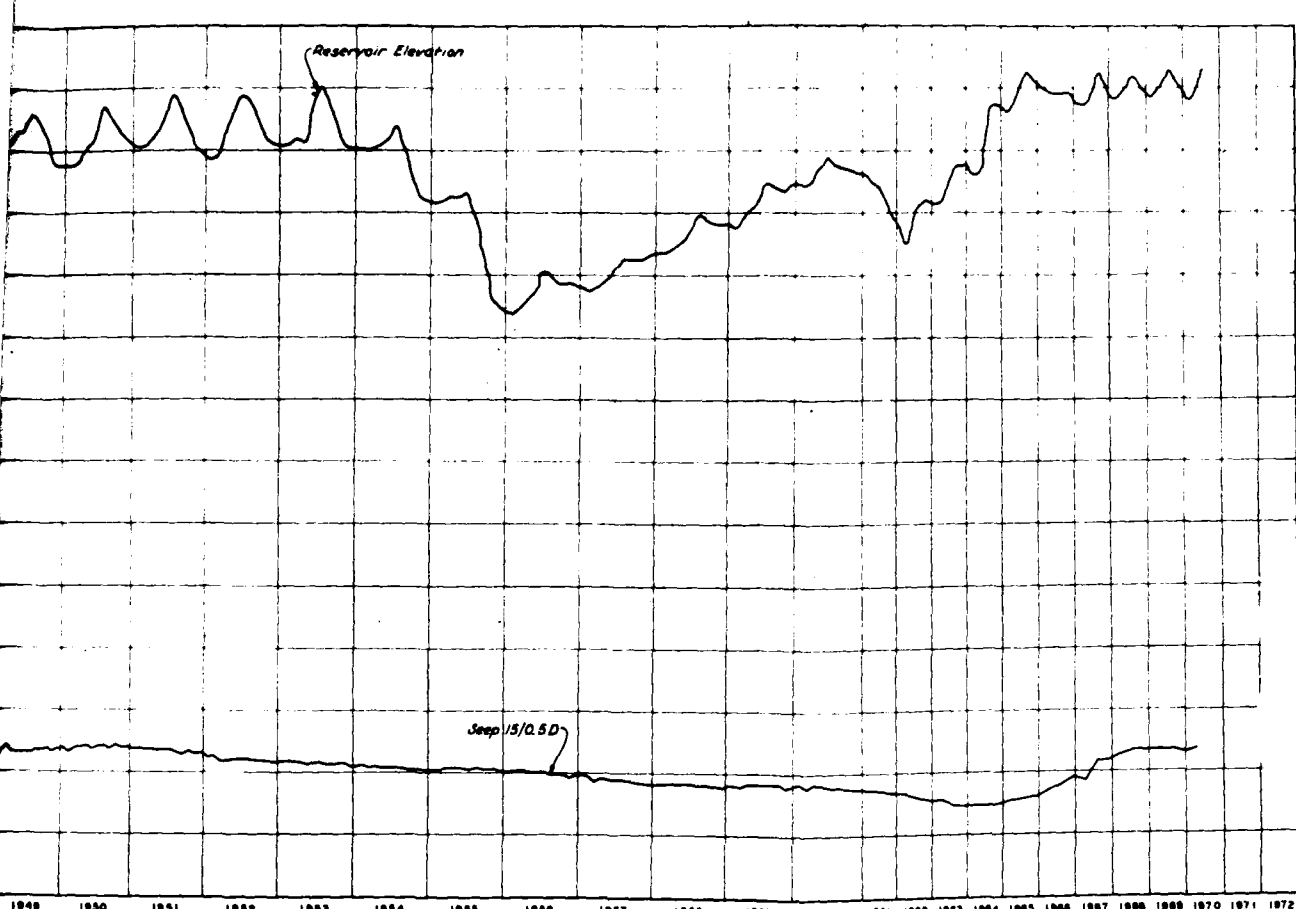


STA. 15+00

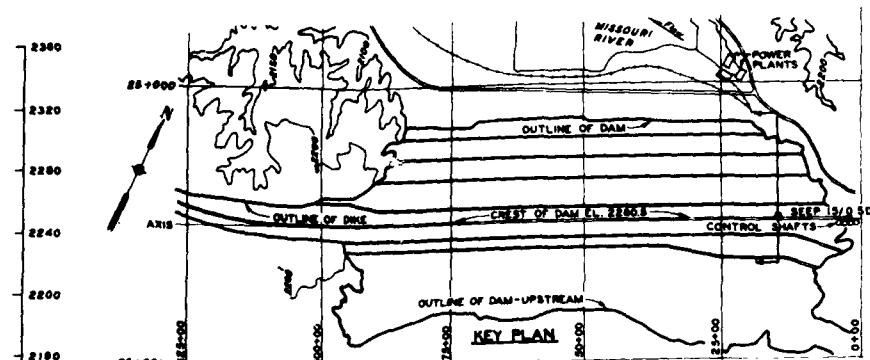
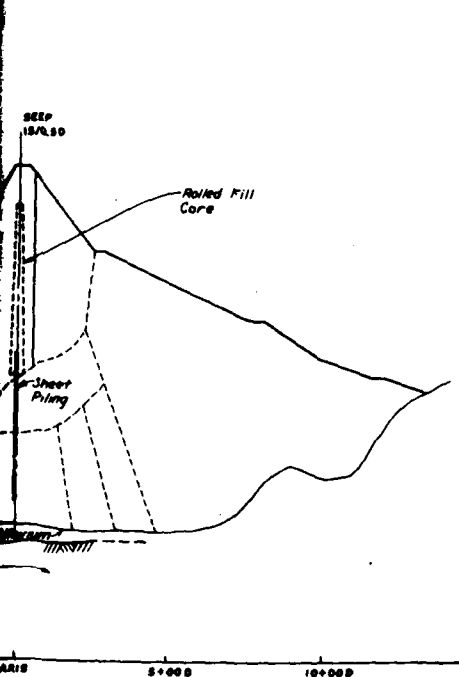


STA. 15+00
 SCALE: VERT. 1 INCH = 40 FEET
 HORIZ. 1 INCH = 200 FEET

FORT PECK DAM AND RESERVOIR

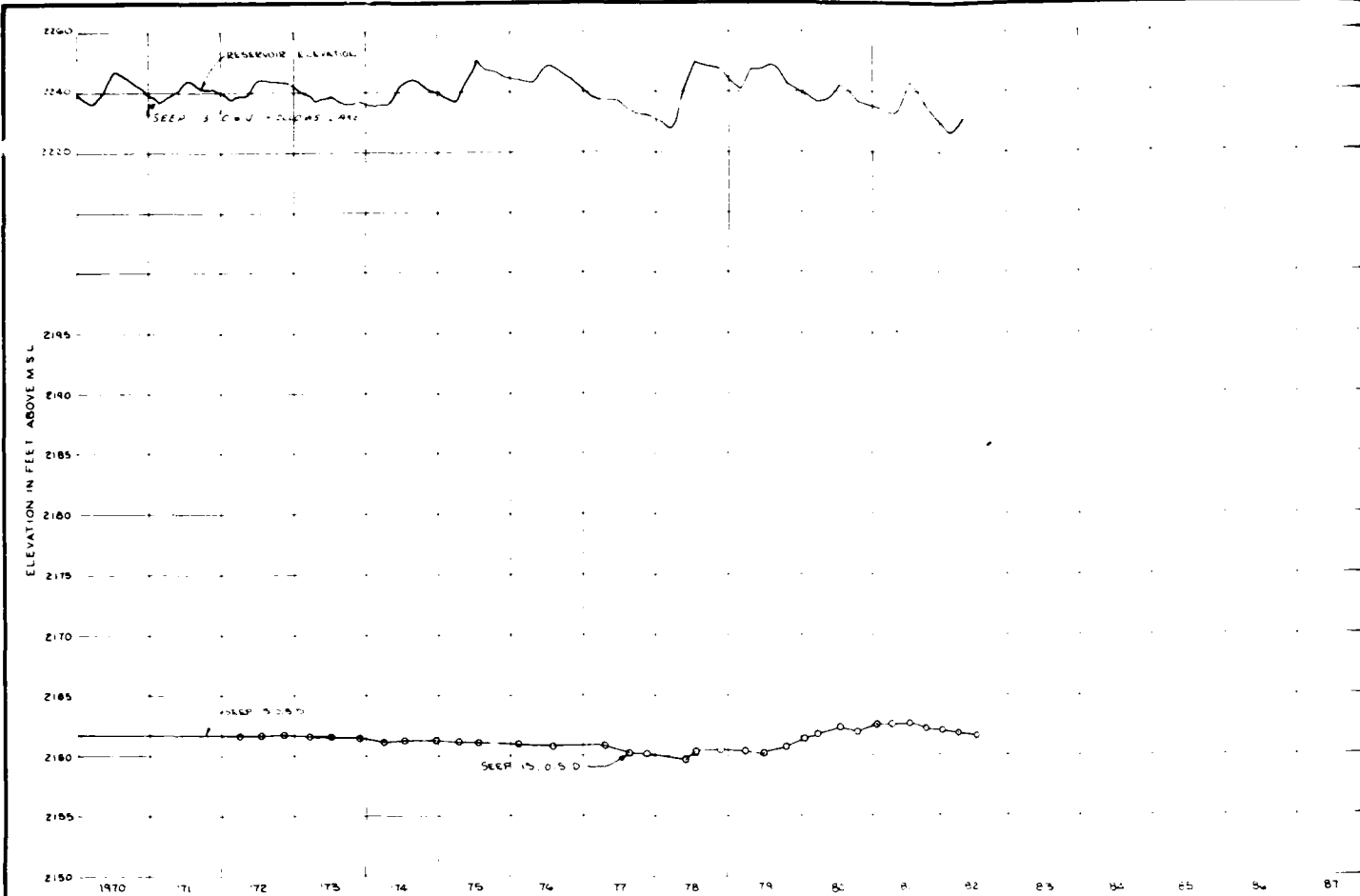


STA. 15+00

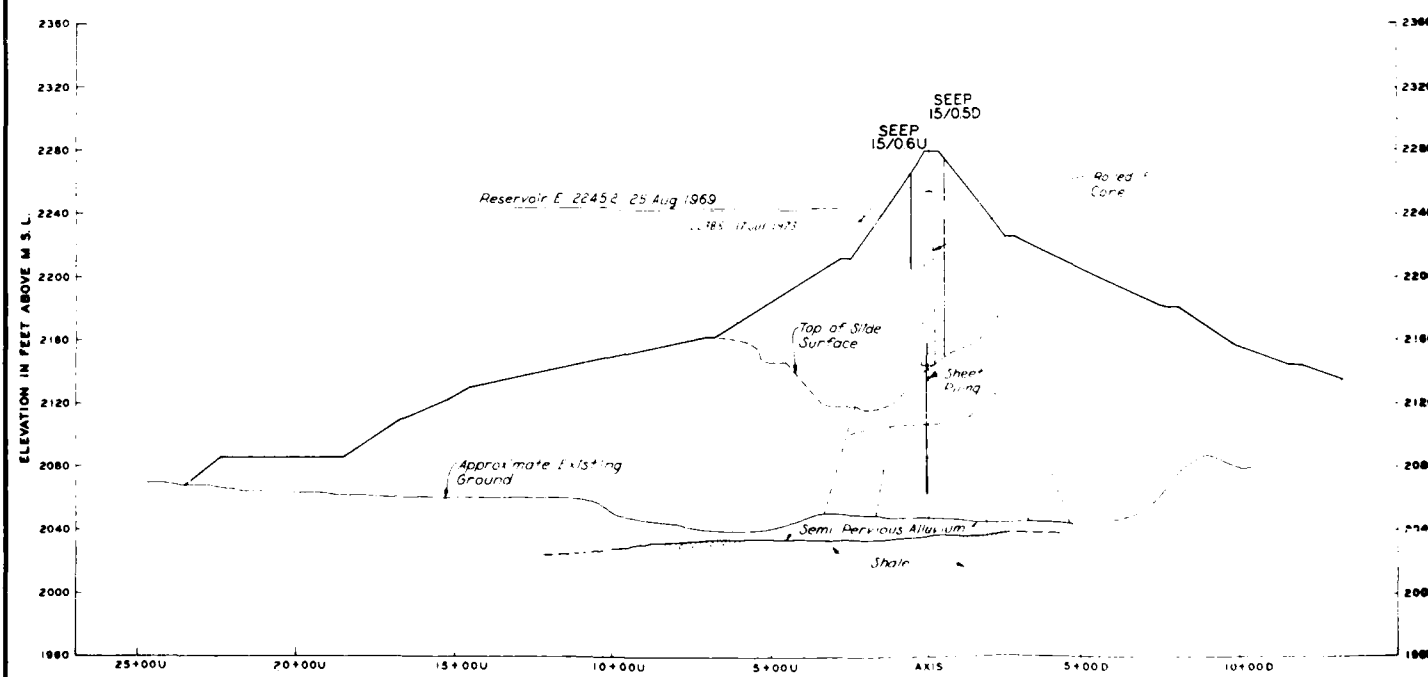


DATE	REVISIONS	MADE	APPROVED
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
MISSOURI RIVER FORT PECK LAKE, MONTANA SATURATION LINE OBSERVATIONS STA. 15+00			
DESIGNED BY	CHECKED BY	APPROVED BY	DATE
DRAWN BY	REVISIONS		
CHECKED BY			
APPROVED BY			
DATE			





STA 15+00

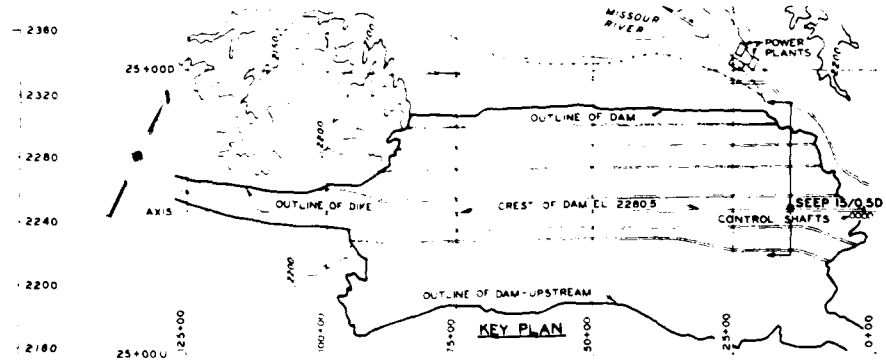


STA 15+00

SCALE: VERT 1 INCH = 40 FEET
 HORIZ 1 INCH = 200 FEET

82 83 84 85 86 87 88 89 90 92 93 94 95 96 97 98

STA 15+00

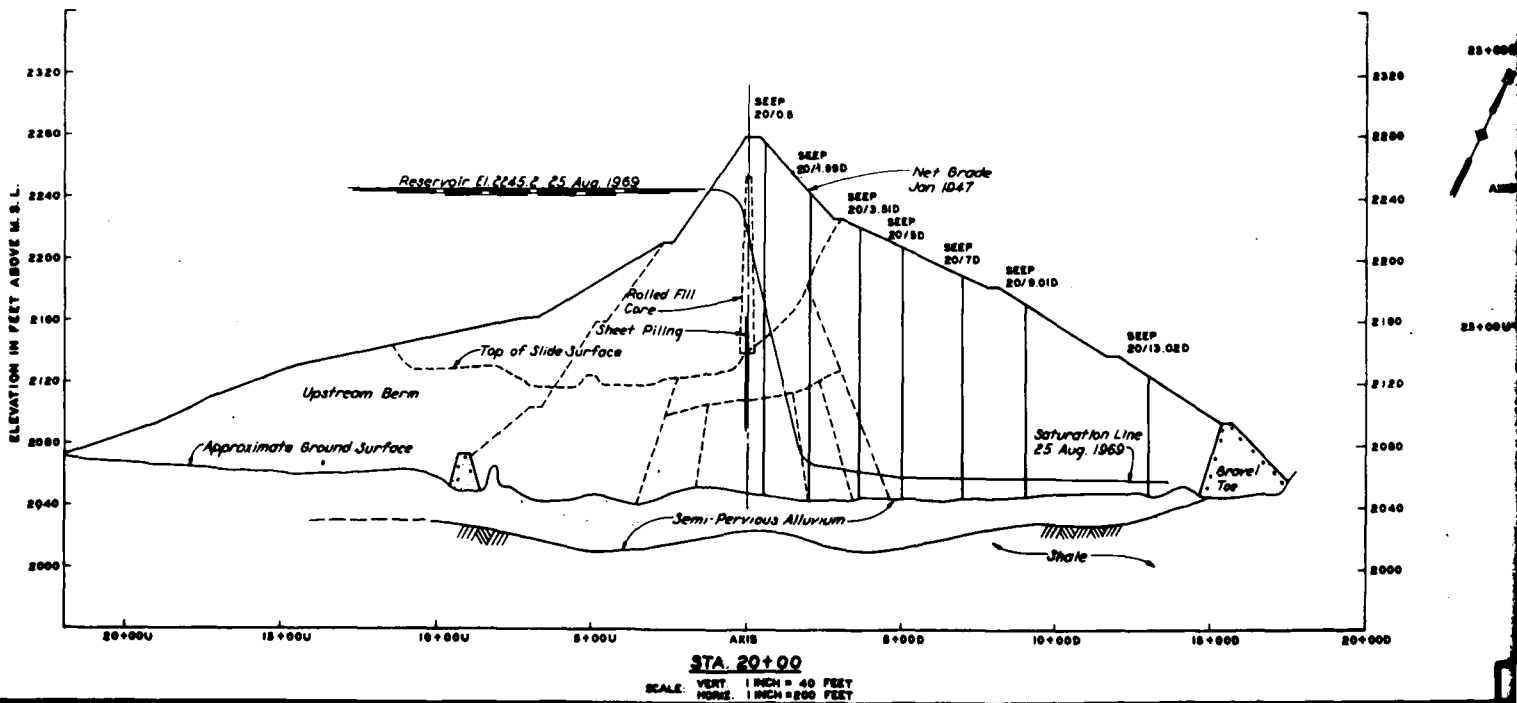
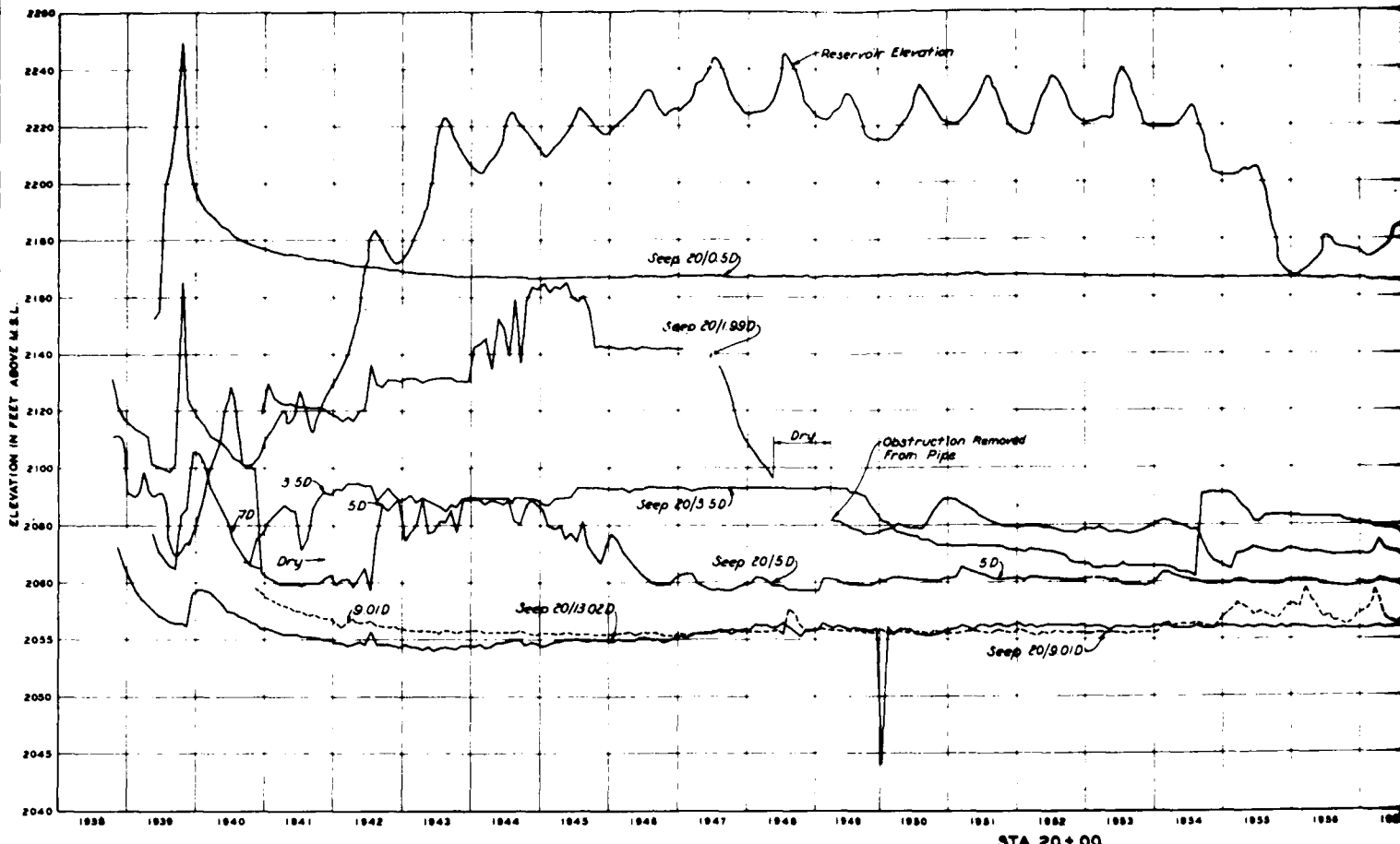


DATE	DESCRIPTION	MADE	APPROVED
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
FORMED BY:		MISSOURI RIVER	
DRAWN BY: L. M. C.		FORT PECK LAKE, MONTANA	
CHECKED BY:		SATURATION LINE OBSERVATIONS	
APPROVED BY:		STA. 15+00	
DESIGNED FOR: U.S.A. DISTRICT	APPROVED:	DATE:	
DESIGNED FOR: U.S.A. DISTRICT	DESIGNED BY:	SCALE AS SHOWN	SHEET NO.
APPROVED:	DESIGNED BY:	DATE:	

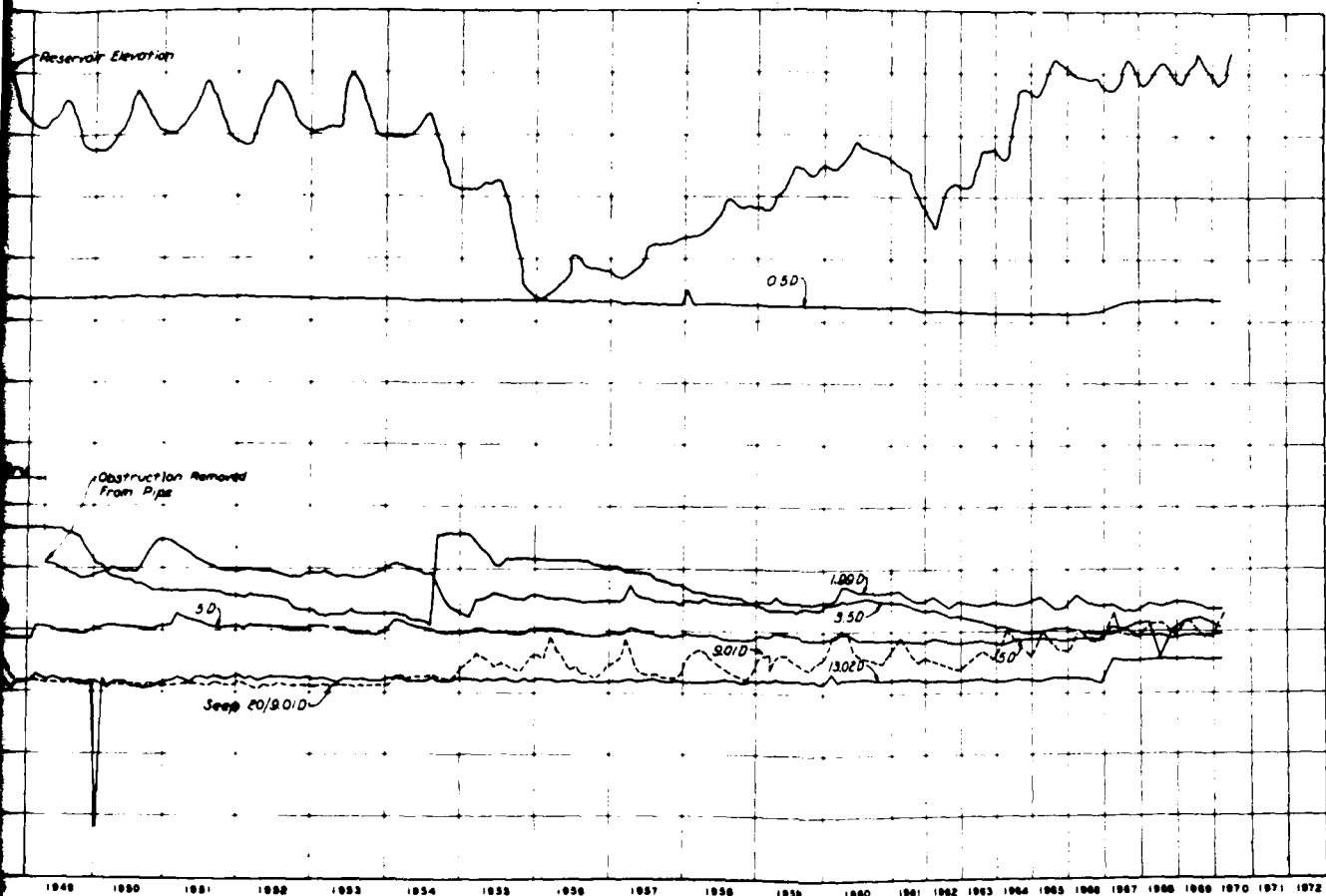


THIS DRAWING HAS BEEN REDUCED TO THREE-EIGHTHS THE ORIGINAL SCALE.

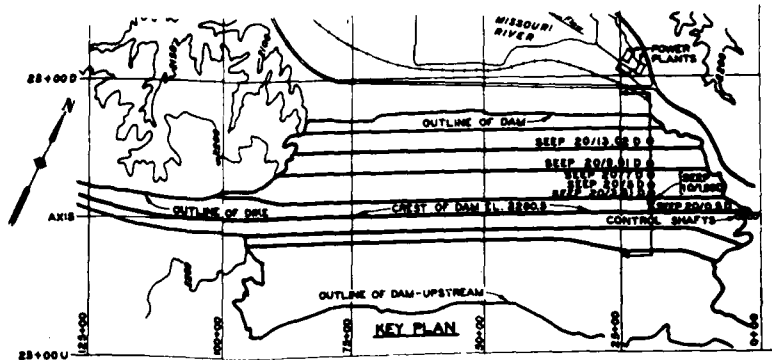
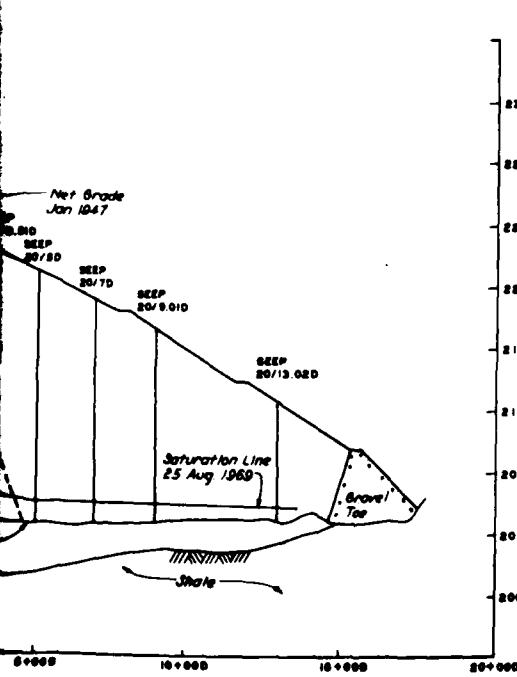
THIS PLAN ACCOMPANIES CONTRACT NO. MODIFICATION NO.



FORT PECK DAM AND RESERVOIR

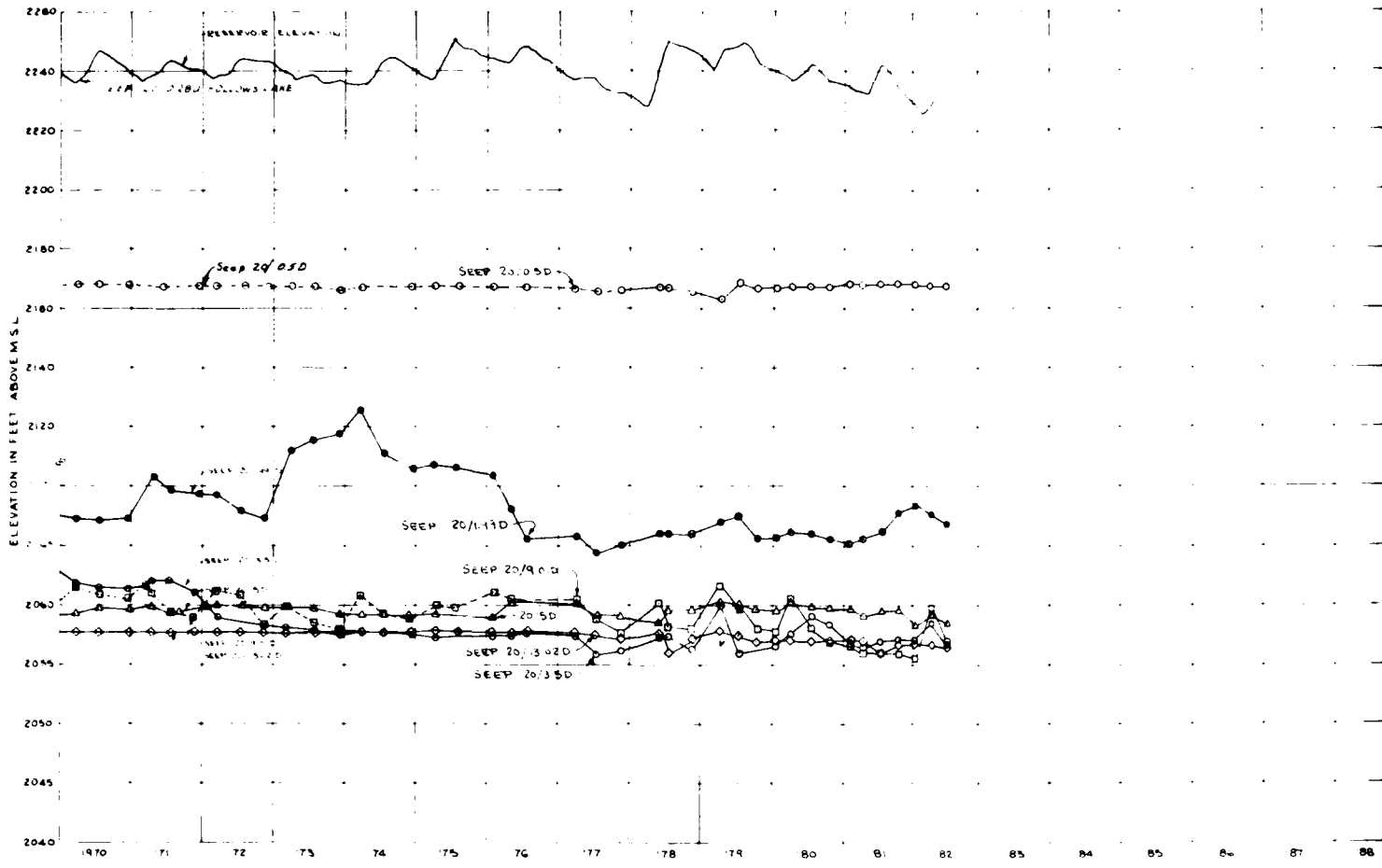


STA 20+00

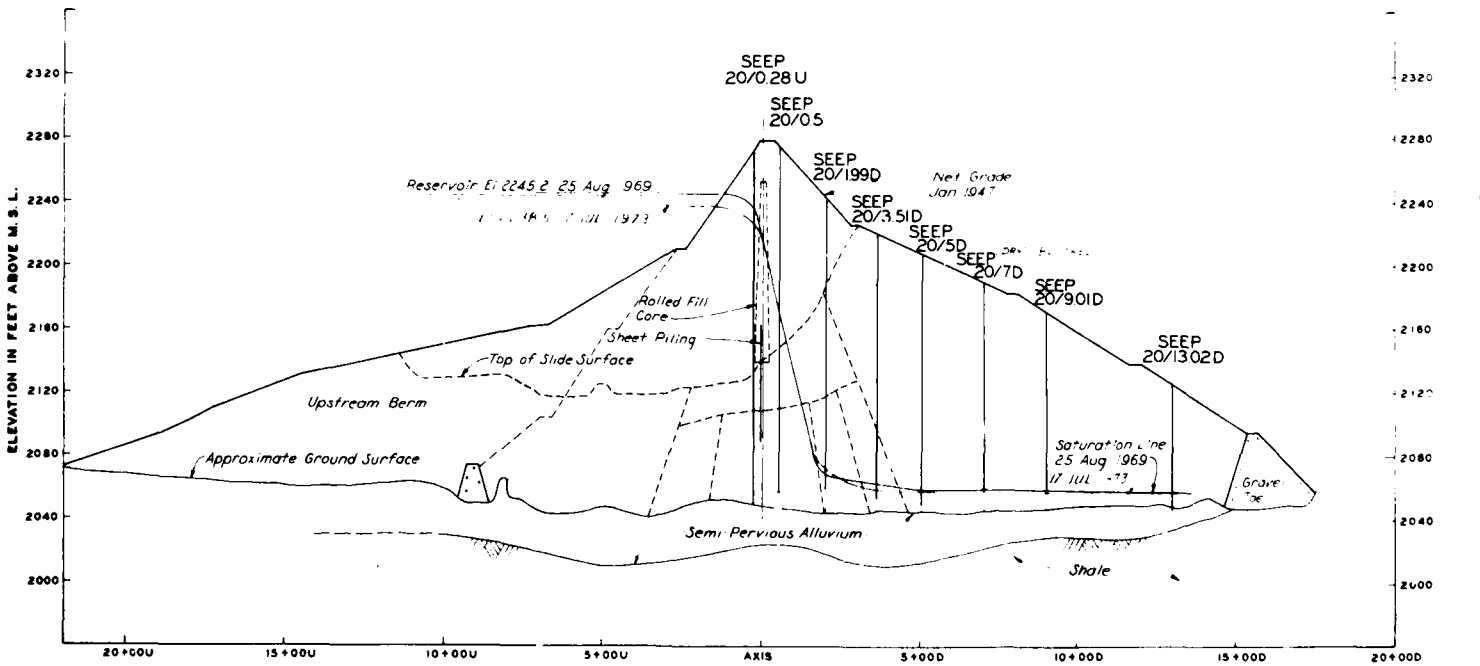


DATE	REVISION	NAME	APPV
DIVISION			
U. S. ARMY ENGINEER DISTRICT, OMAHA			
CORPS OF ENGINEERS			
OMAHA, NEBRASKA			
MISSOURI RIVER			
FORT PECK LAKE, MONTANA			
SATURATION LINE OBSERVATIONS			
STA. 20+00			
DESIGNED BY: C.W.A.	CHECKED BY: L.M.S.	APPROVED BY:	DATE:
DESIGNED BY: C.W.A.	APPROVED BY:	DATE:	DATE:
DESIGNED BY: C.W.A.	APPROVED BY:	DATE:	DATE:
DESIGNED BY: C.W.A.	APPROVED BY:	DATE:	DATE:



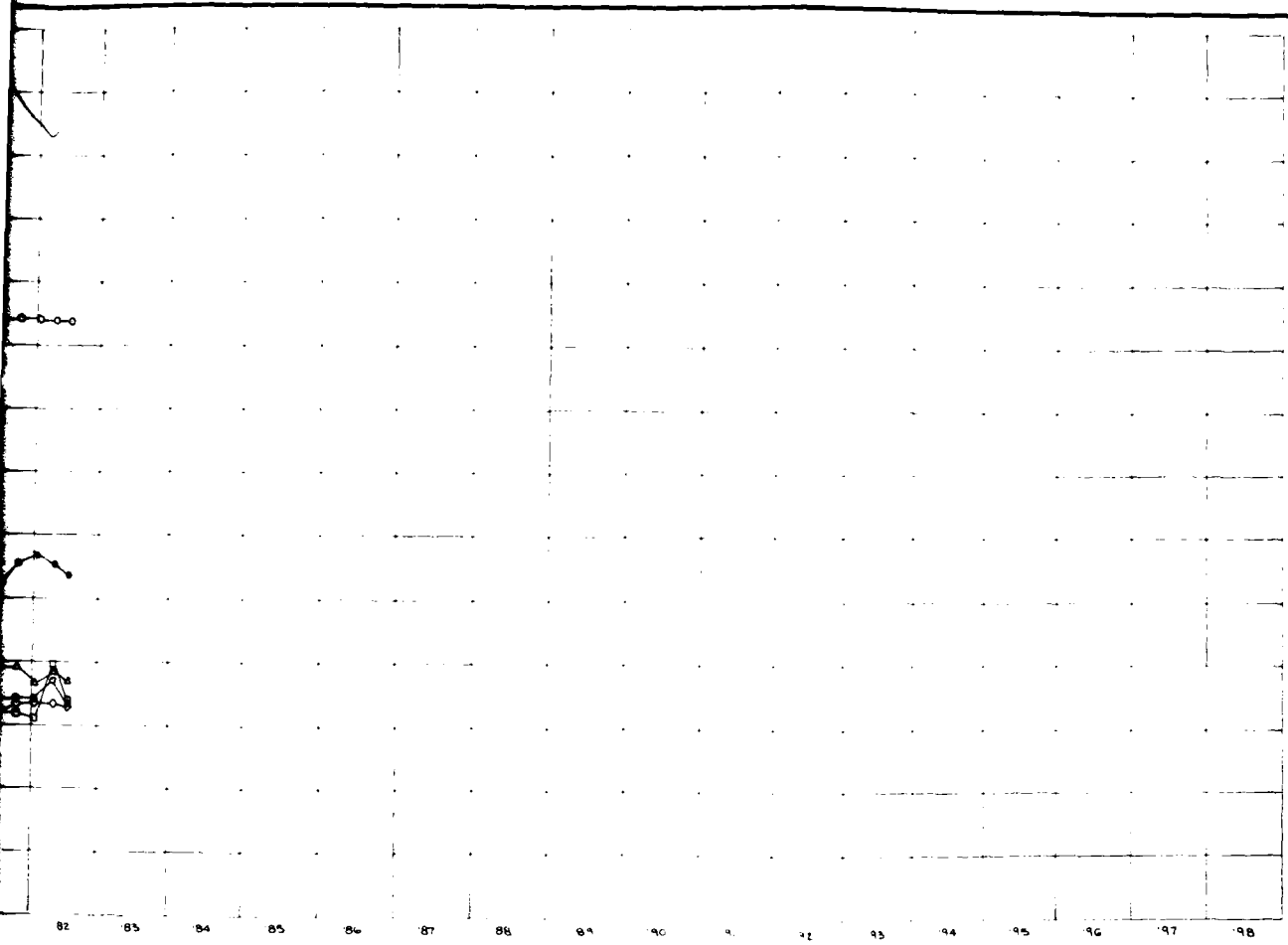


STA 20+00

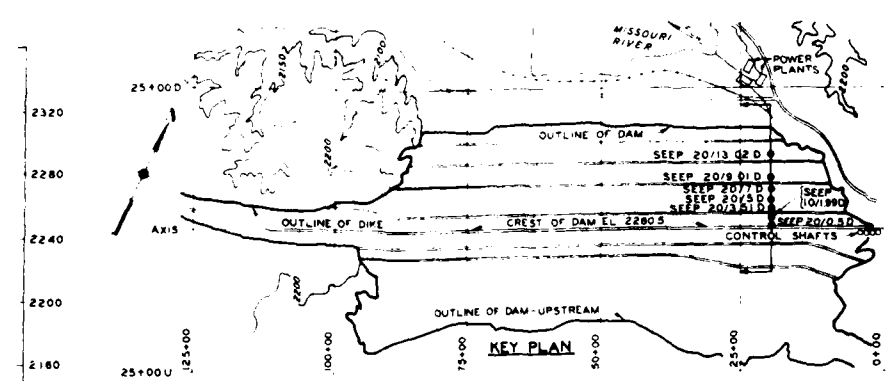
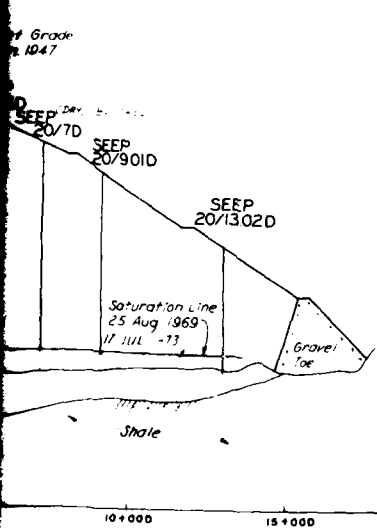


STA 20+00

SCALE VERT 1 INCH = 40 FEET
HORIZ 1 INCH = 200 FEET



STA 20+00

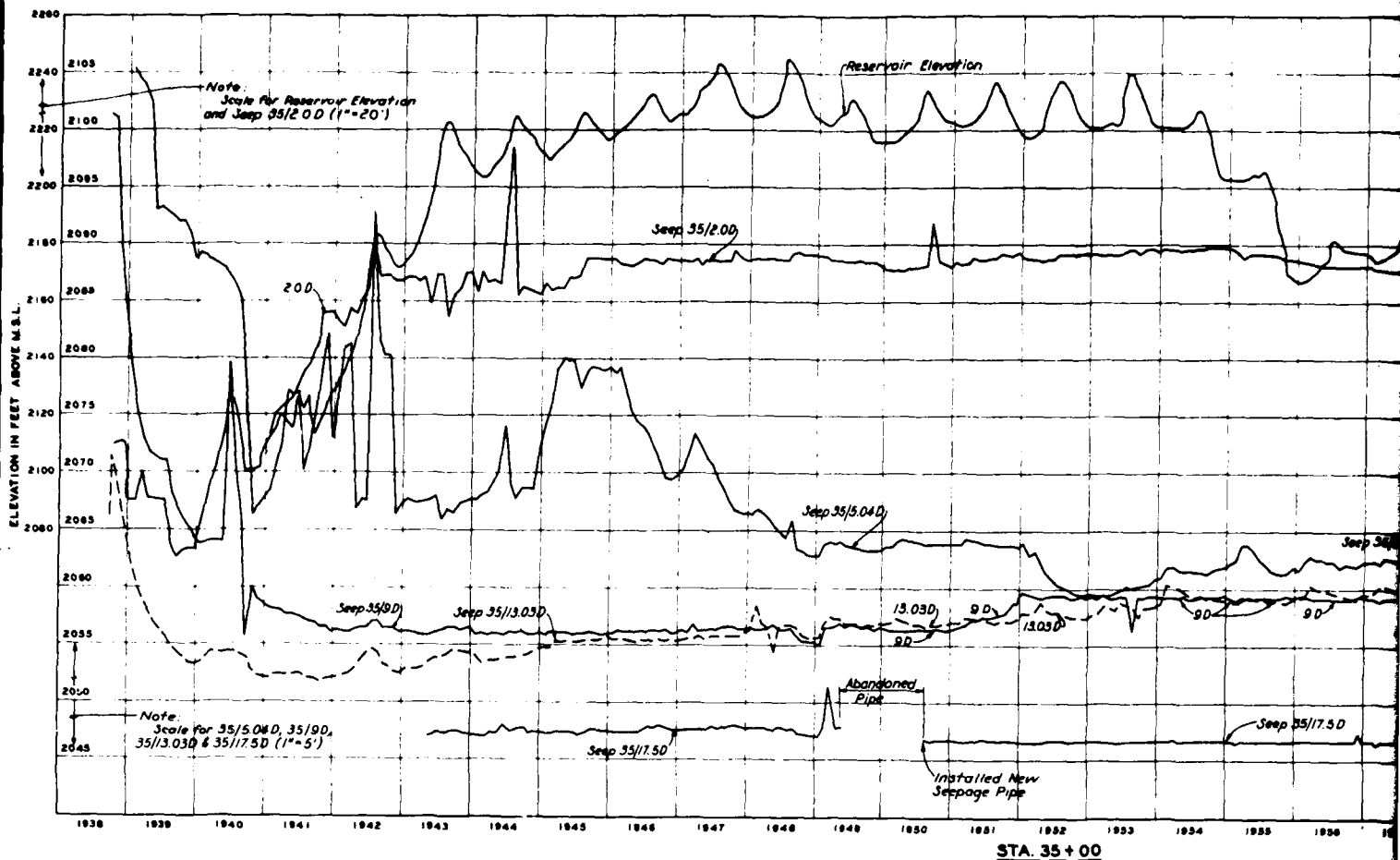


THIS DRAWING HAS BEEN REDUCED TO THREE-EIGHTHS THE ORIGINAL SCALE.

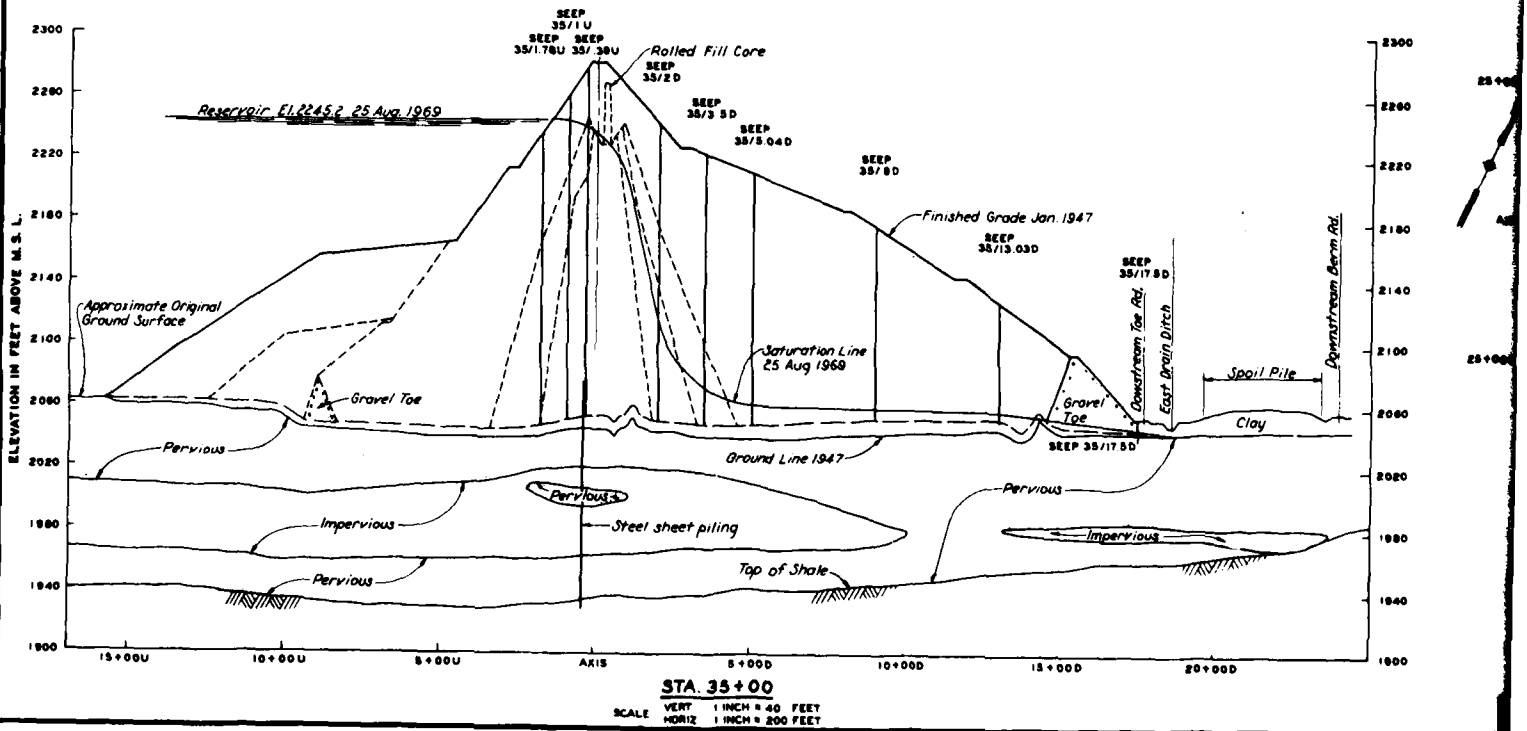


THIS PLAN ACCOMPANIES CONTRACT NO. MODIFICATION NO.

DATE	DESCRIPTION	MADE	APPROV.
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY: OWA CHECKED BY: L.M.G. SUBMITTED BY: OWA		MISSOURI RIVER FORT PECK LAKE, MONTANA SATURATION LINE OBSERVATIONS STA. 20+00	
APPROVED: (Signature)	APPROVED: (Signature)	DATE	
(Signature)	(Signature)	(Signature)	(Signature)

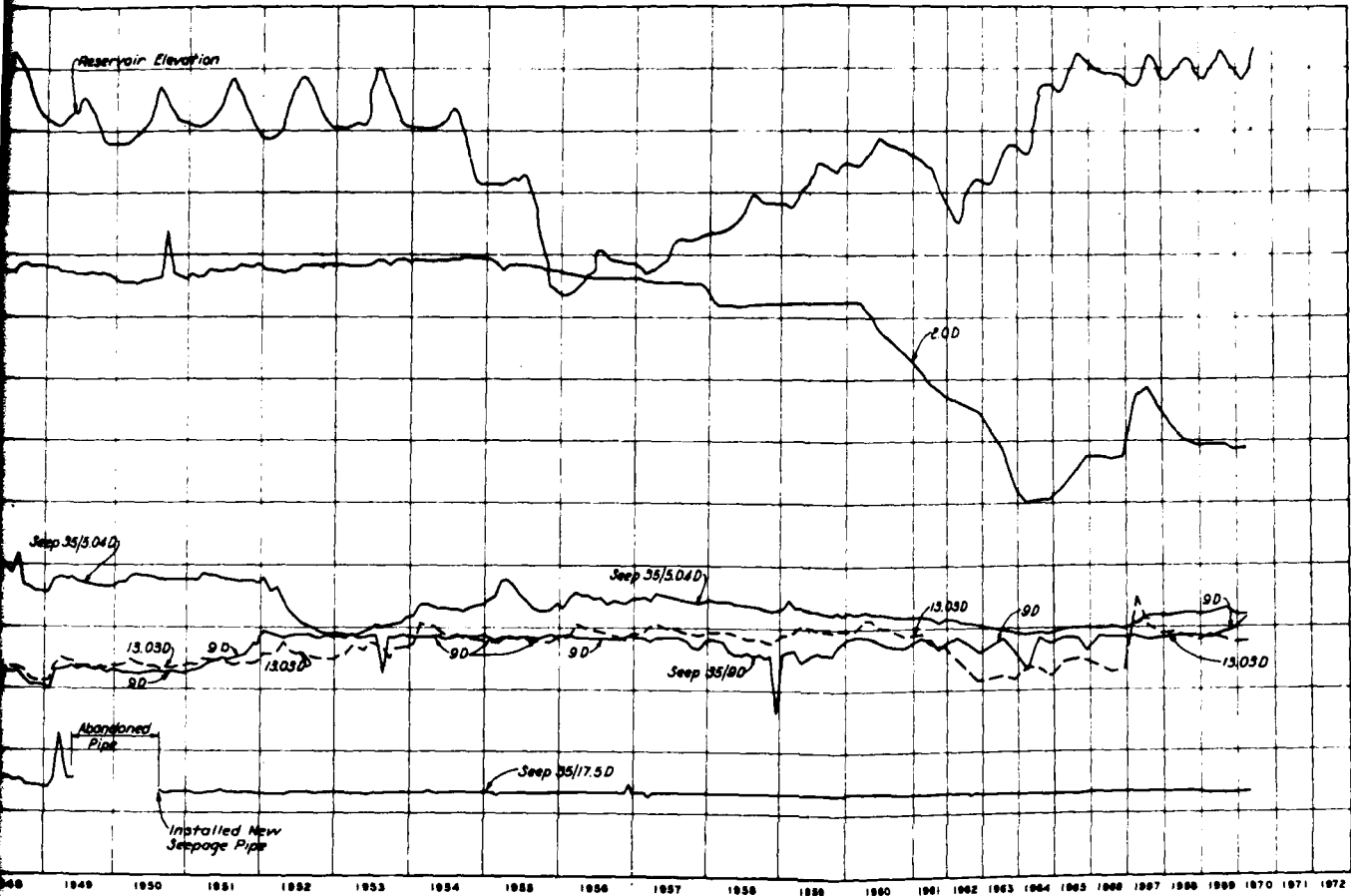


STA. 35+00

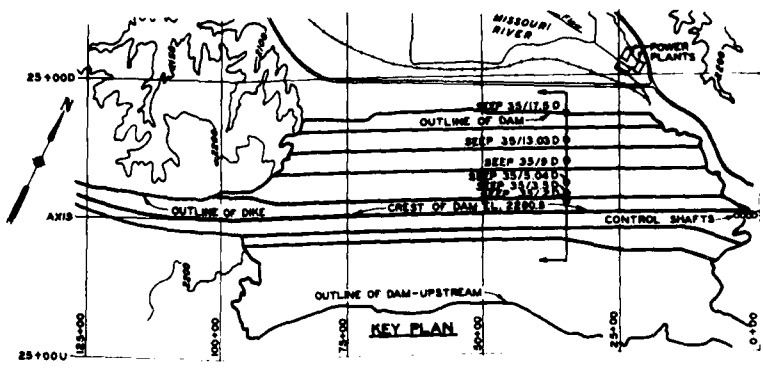
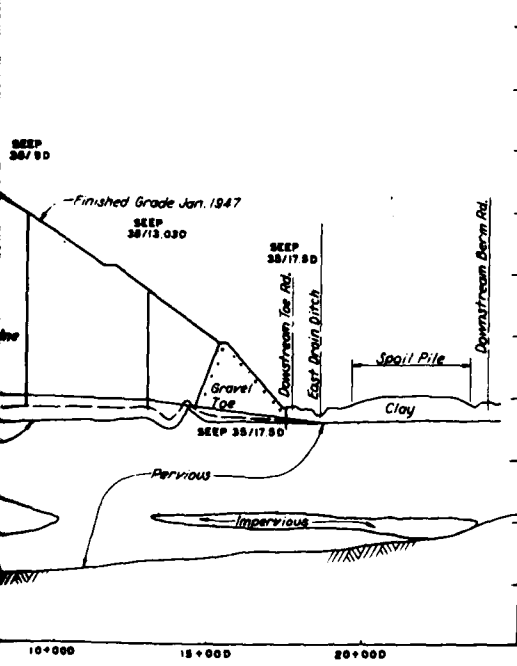


STA. 35+00

FORT PECK DAM AND RESERVOIR



STA. 35+00

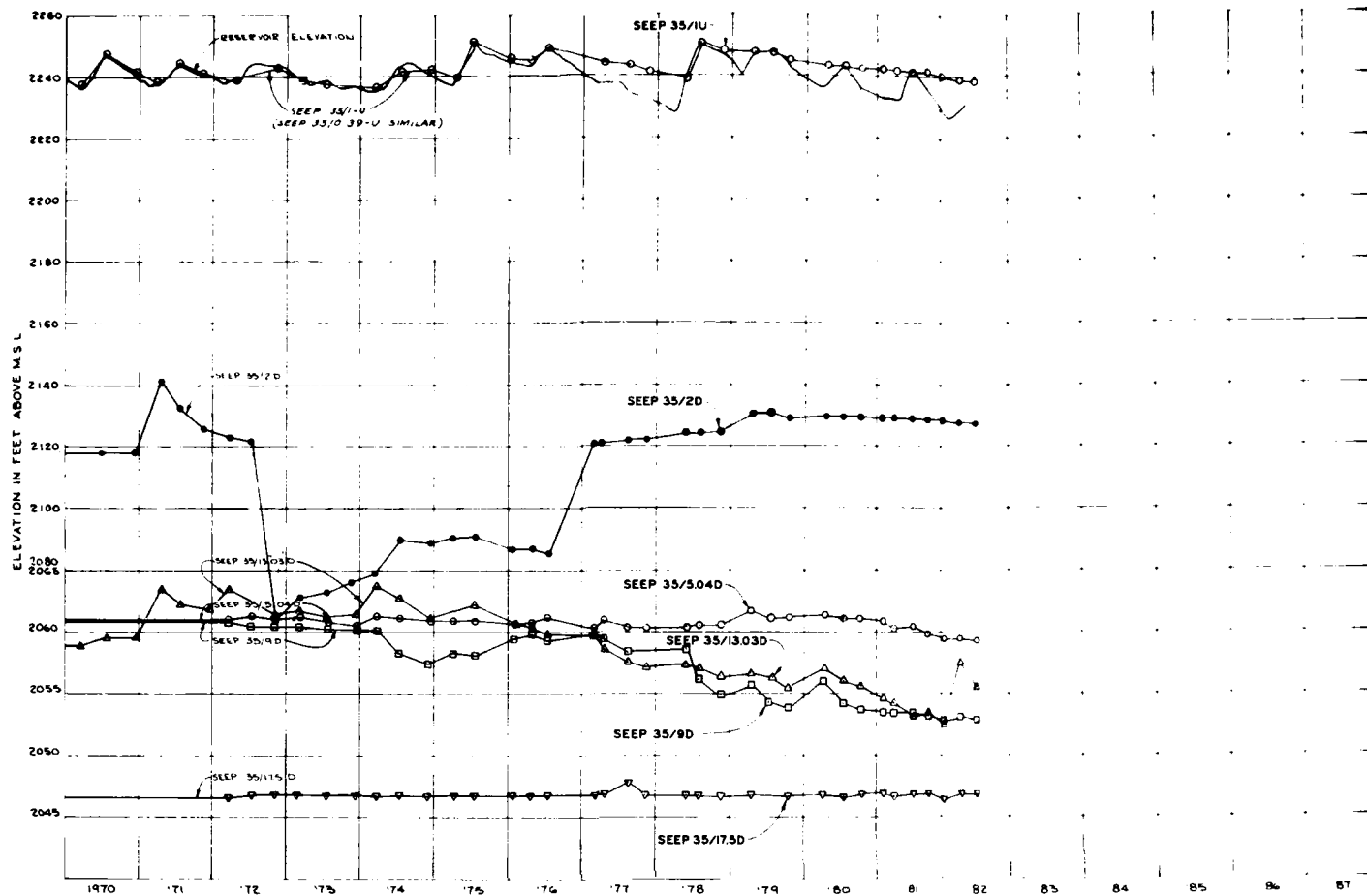


LEGEND:
SEEP SEEPAGE PIPE (PERFORMED)

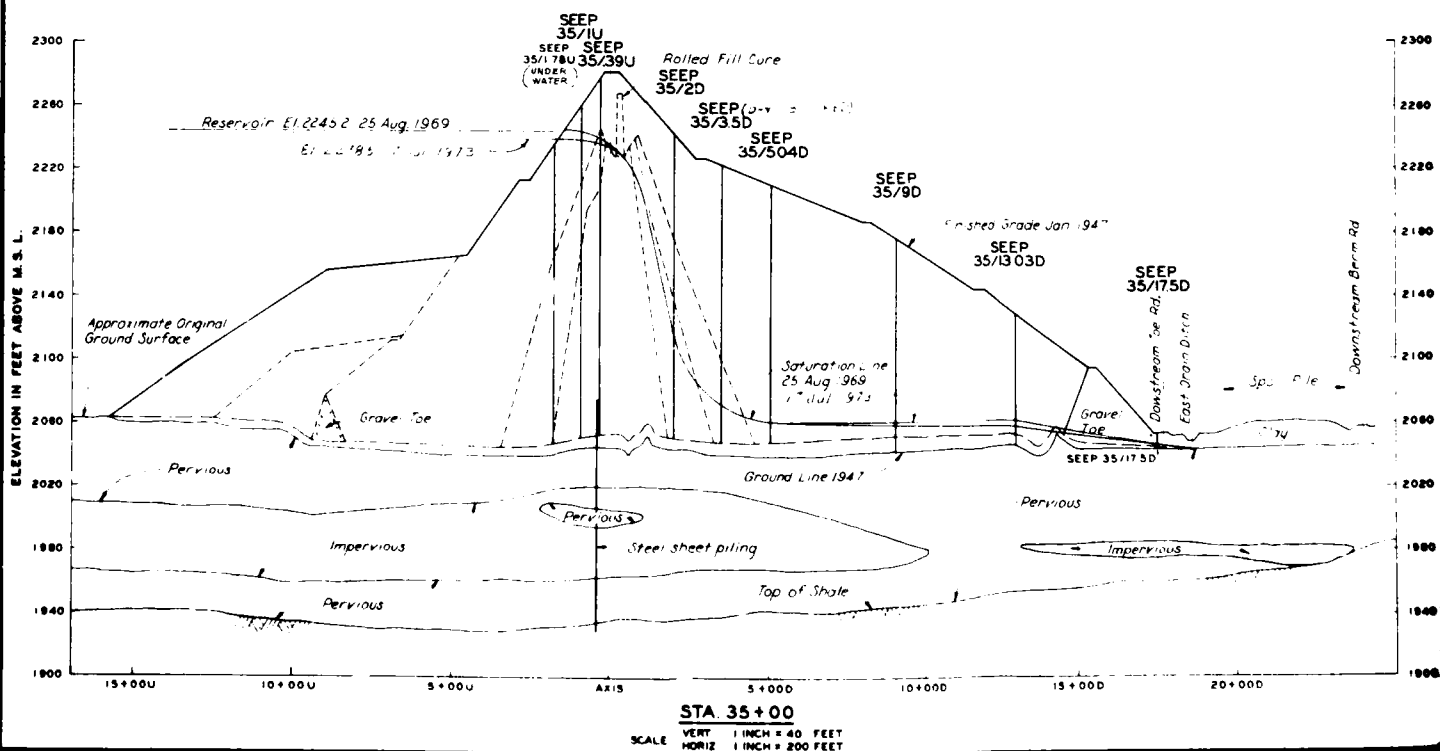


DATE	DESIGNATION	SCALE	APPROVED
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY		MISSOURI RIVER	
DRAWN BY		FORT PECK LAKE, MONTANA	
CHECKED BY		SATURATION LINE OBSERVATIONS	
SEEP DATA PHASES		STA. 35+00	
APPROVED	APPROVED	DATE	DATE
SEEP DATA PHASES	SEEP DATA PHASES	SCALE AS SHOWN	SCALE
APPROVED	APPROVED	DESIGNED BY	DATE

THIS PLAN ACCOMPANIES CONTRACT NO. MODIFICATION NO.

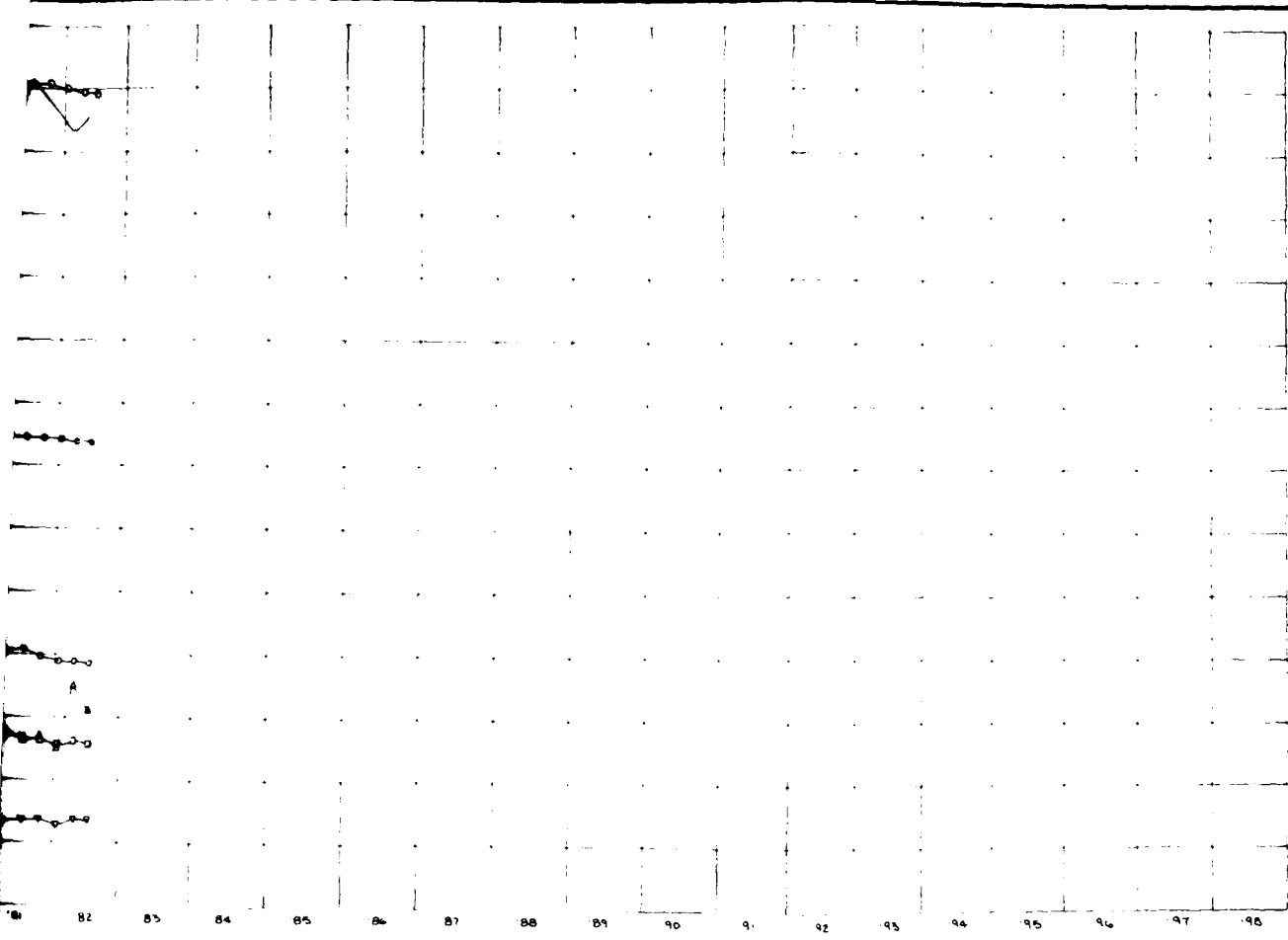


STA. 35+00

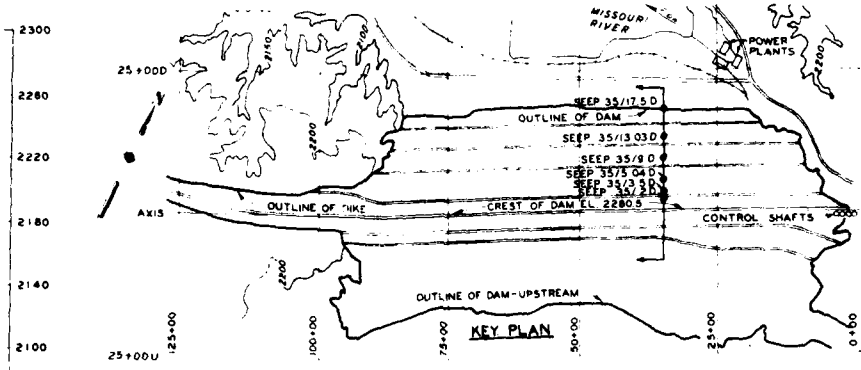
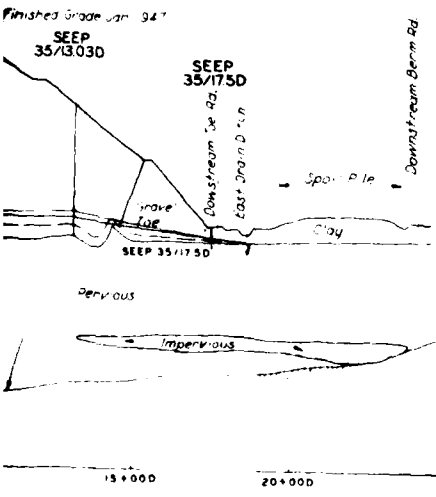


STA. 35+00

VERT 1 INCH = 40 FEET
SCALE
HORIZ 1 INCH = 200 FEET



STA 35+00



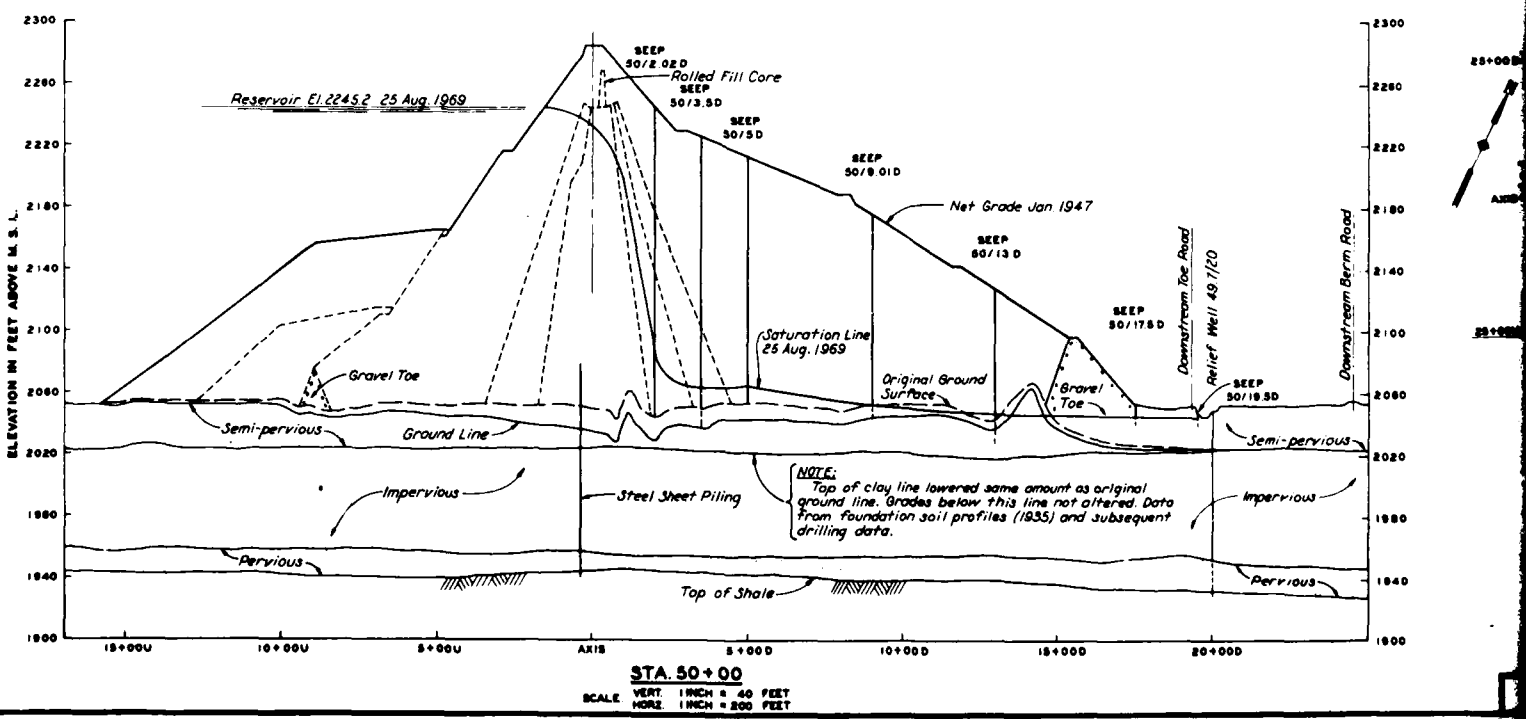
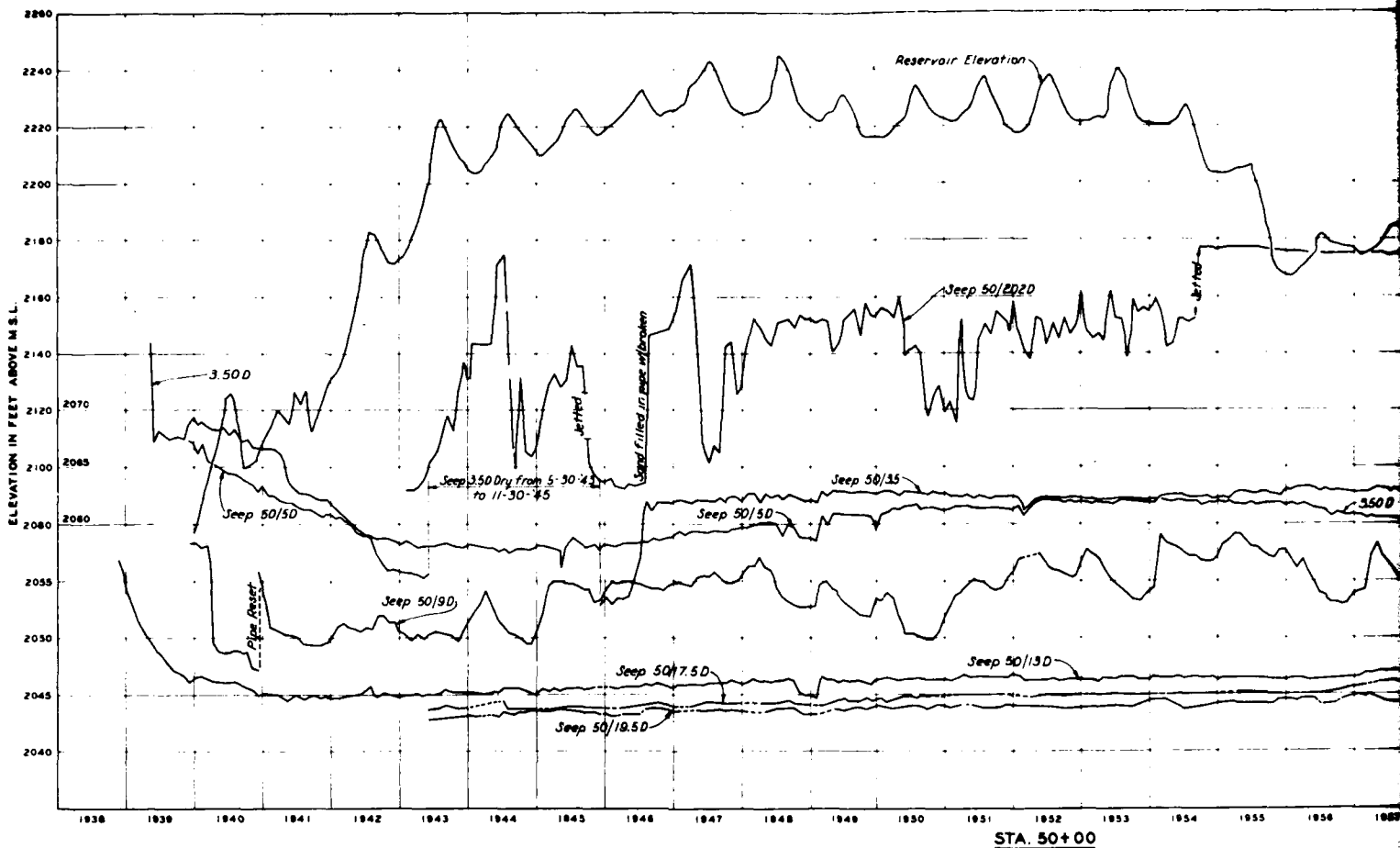
LEGEND
SEEP SEEPAGE PIPE (PERFORATED)



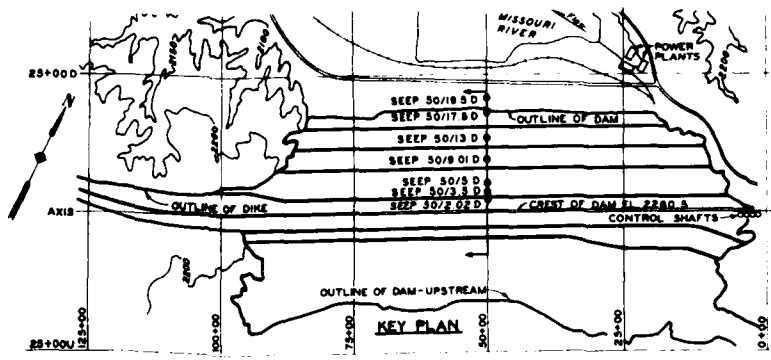
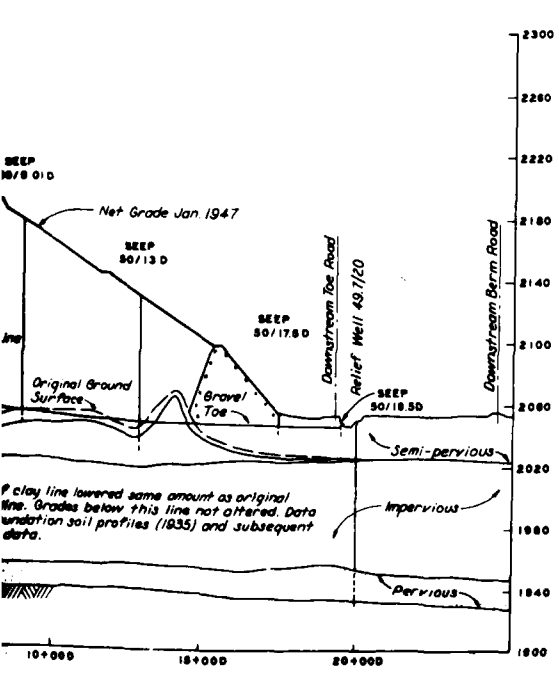
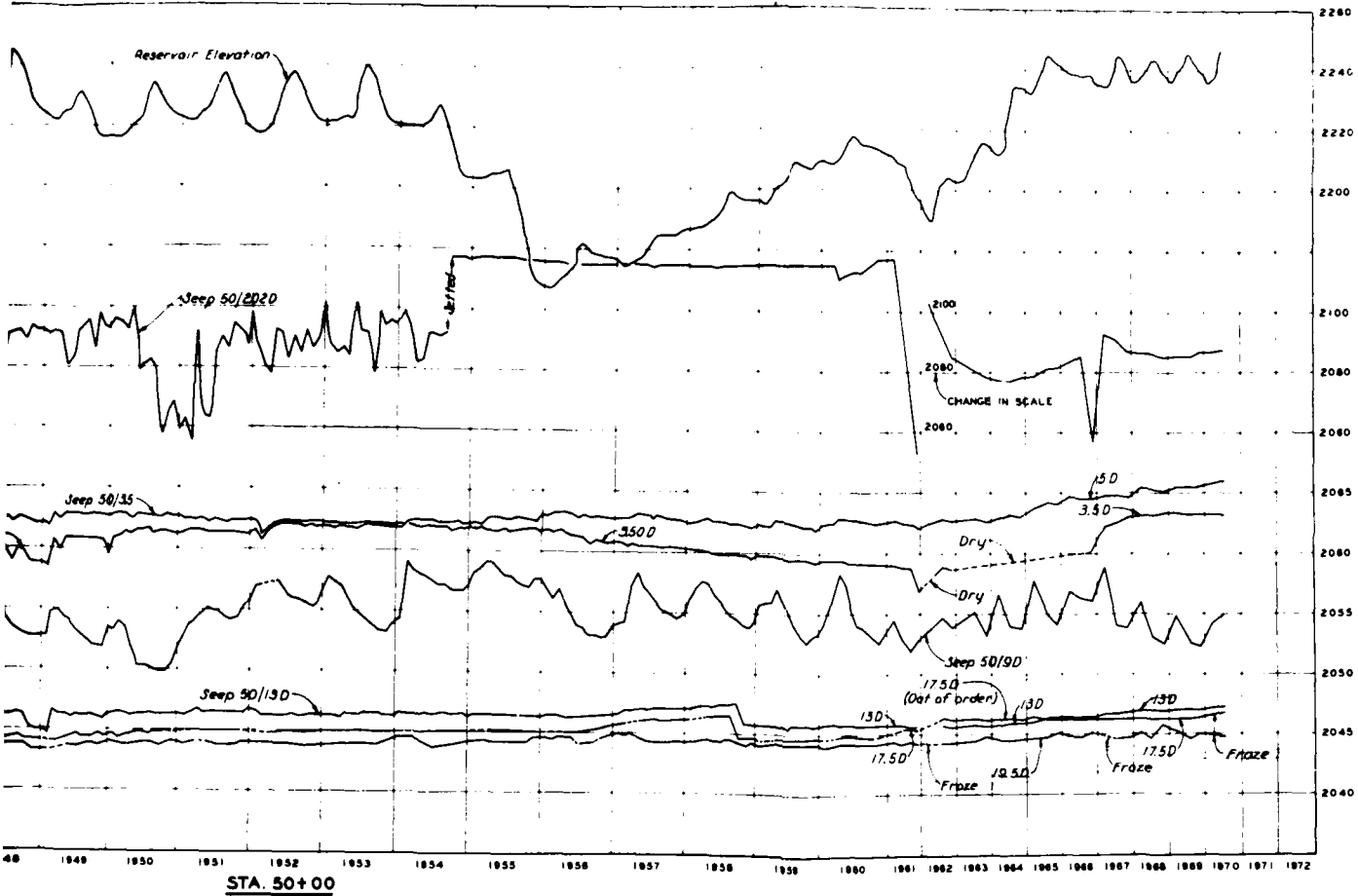
THIS PLAN ACCOMPANIES CONTRACT NO. MODIFICATION NO.

DATE	DESCRIPTION	MADE	APPROD
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DRAWN BY: _____		MISSOURI RIVER FORT PECK LAKE, MONTANA	
CHECKED BY: _____		SATURATION LINE OBSERVATIONS STA 35+00	
DESIGNED BY: _____		APPROVED: _____	DATE: _____
SEAL (FOR ASST. ENGINEER)		SEAL (FOR ENGINEER)	SEAL (FOR DISTRICT)
APPROVED: _____		SEAL (FOR DISTRICT)	SEAL (FOR DISTRICT)
SIL. & E. DISTRICT ENGINEER		DISTRICT ENGINEER	

2



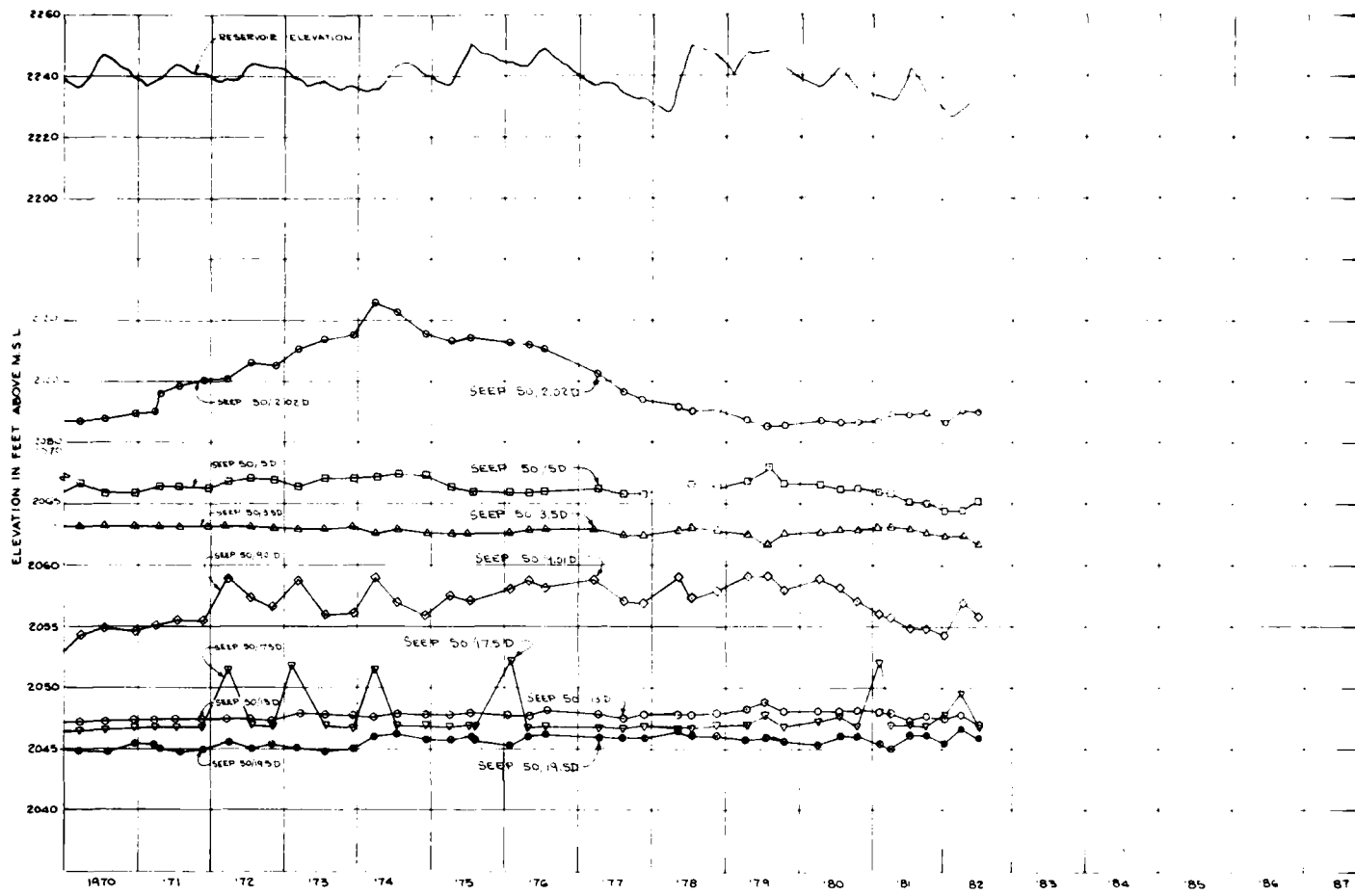
FORT PECK DAM AND RESERVOIR



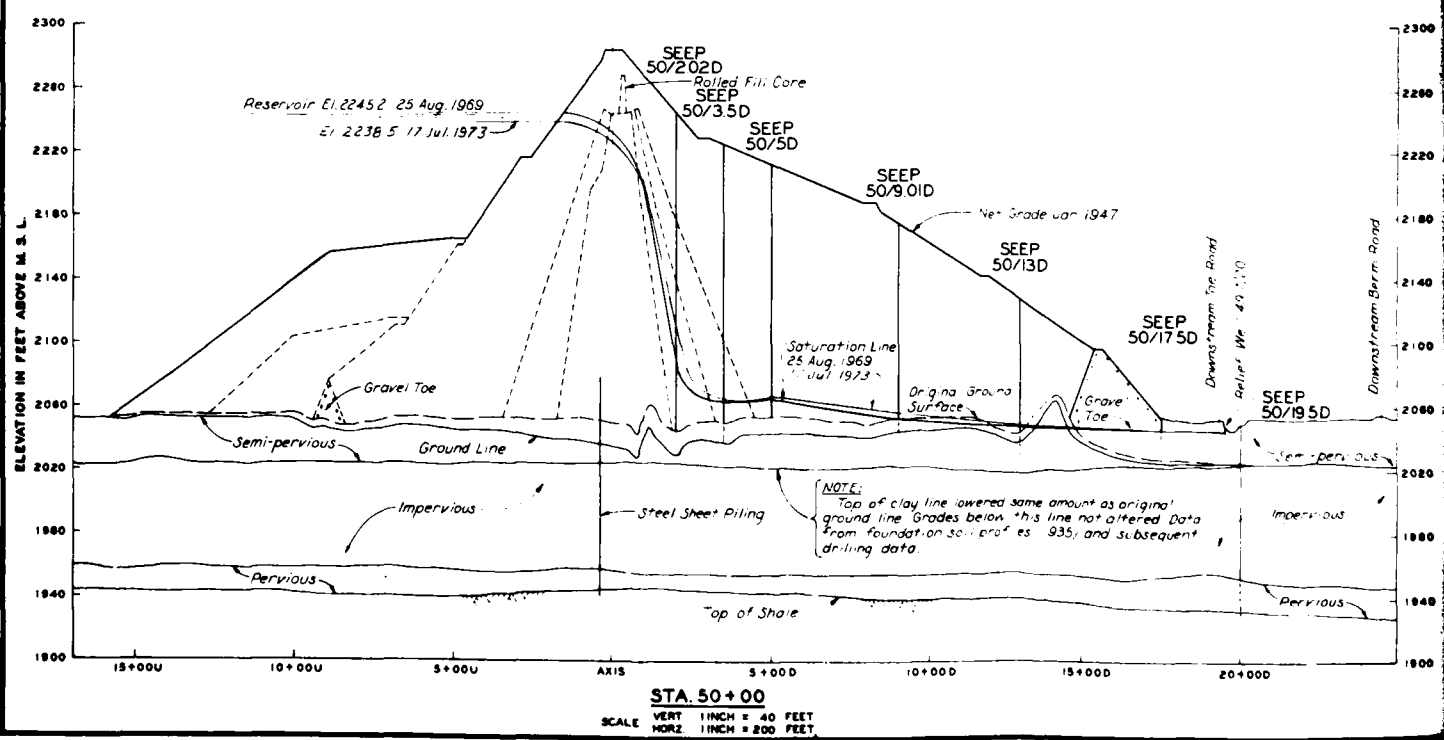
LEGEND:
SEEP SEEPAGE PIPE (PERFORATED)



DATE	DESCRIPTION	MADE	APPROV.
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
MISSOURI RIVER FORT PECK LAKE, MONTANA			
SATURATION LINE OBSERVATIONS STA. 50+00			
DESIGNED BY	CHECKED BY	APPROVED	DATE
DRAWN BY	REVISIONS		
SCALE	DATE		
BY	DATE		
BY	DATE		
BY	DATE		

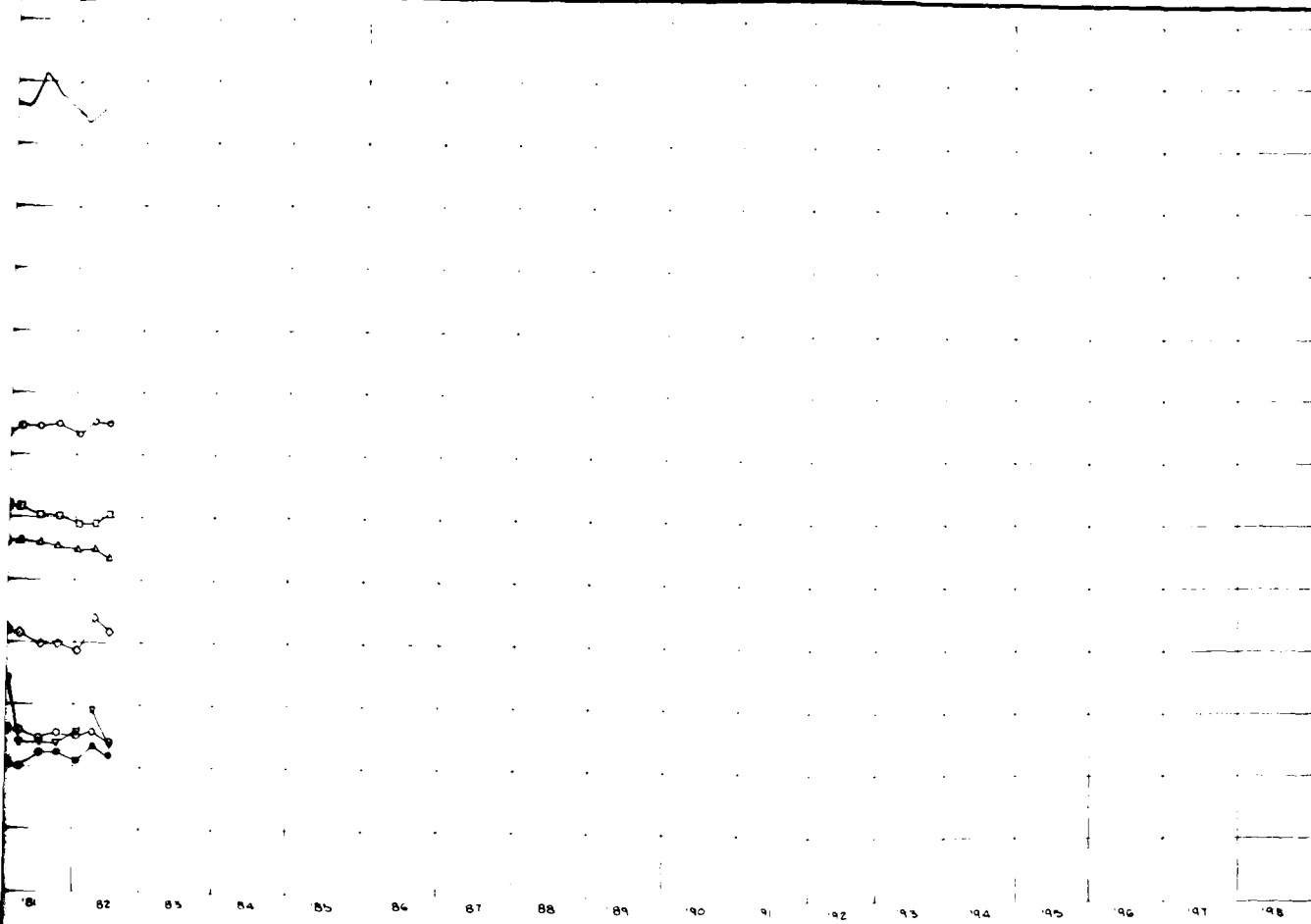


STA. 50+00

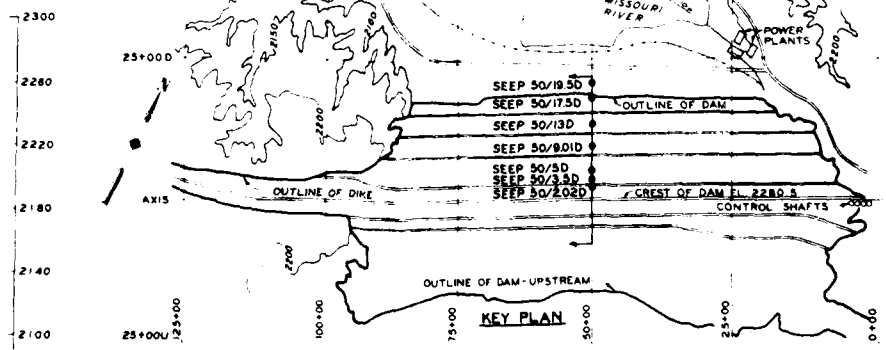
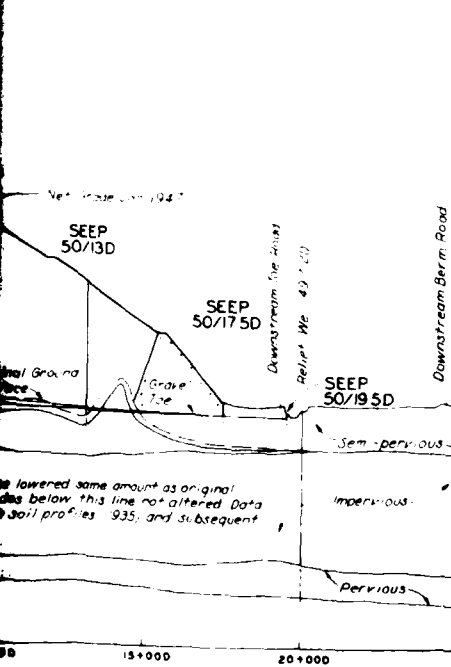


STA. 50+00

VERT. 1 INCH = 40 FEET
SCALE
HORIZ. 1 INCH = 200 FEET



STA. 50+00



LEGEND:

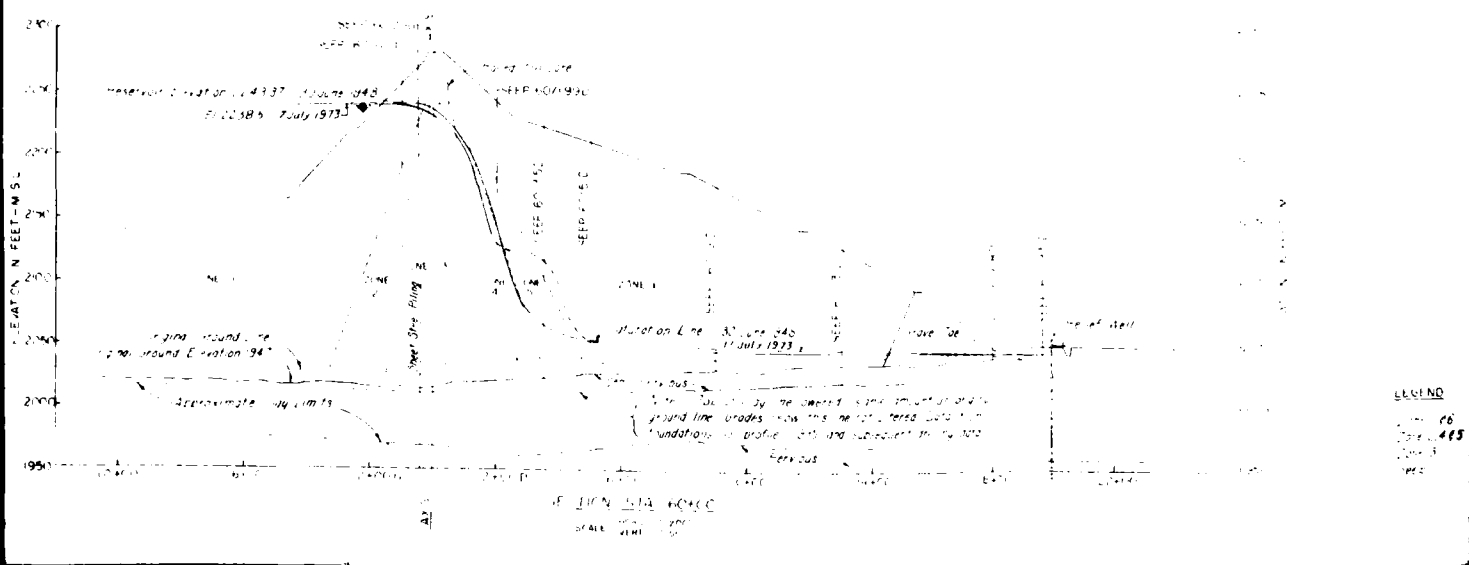
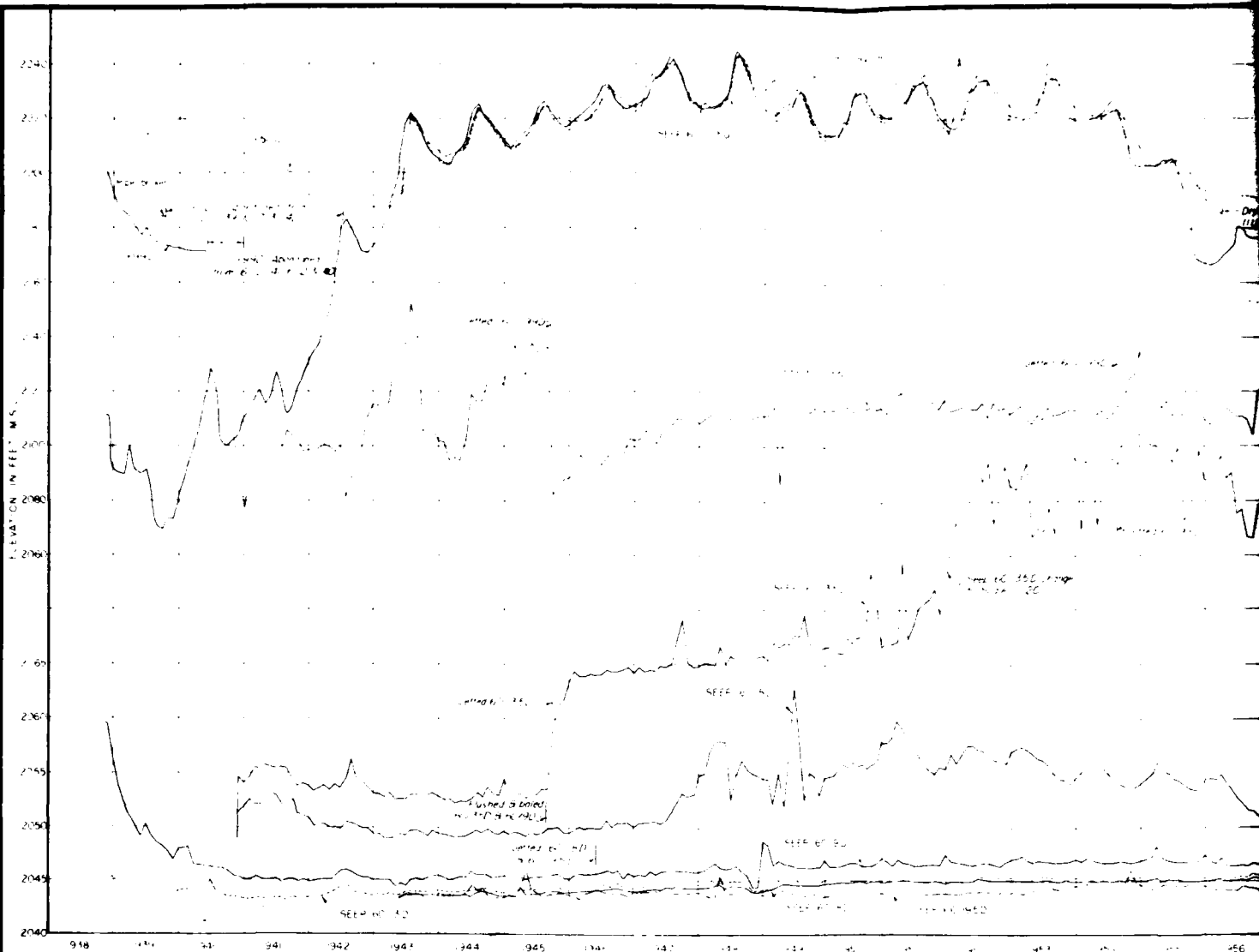
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THIS DRAWING HAS BEEN REDUCED TO THREE-FOURTHS (3/4) OF ORIGINAL SCALE.

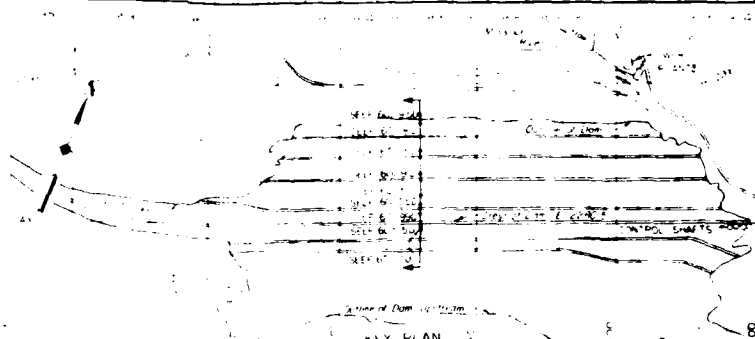
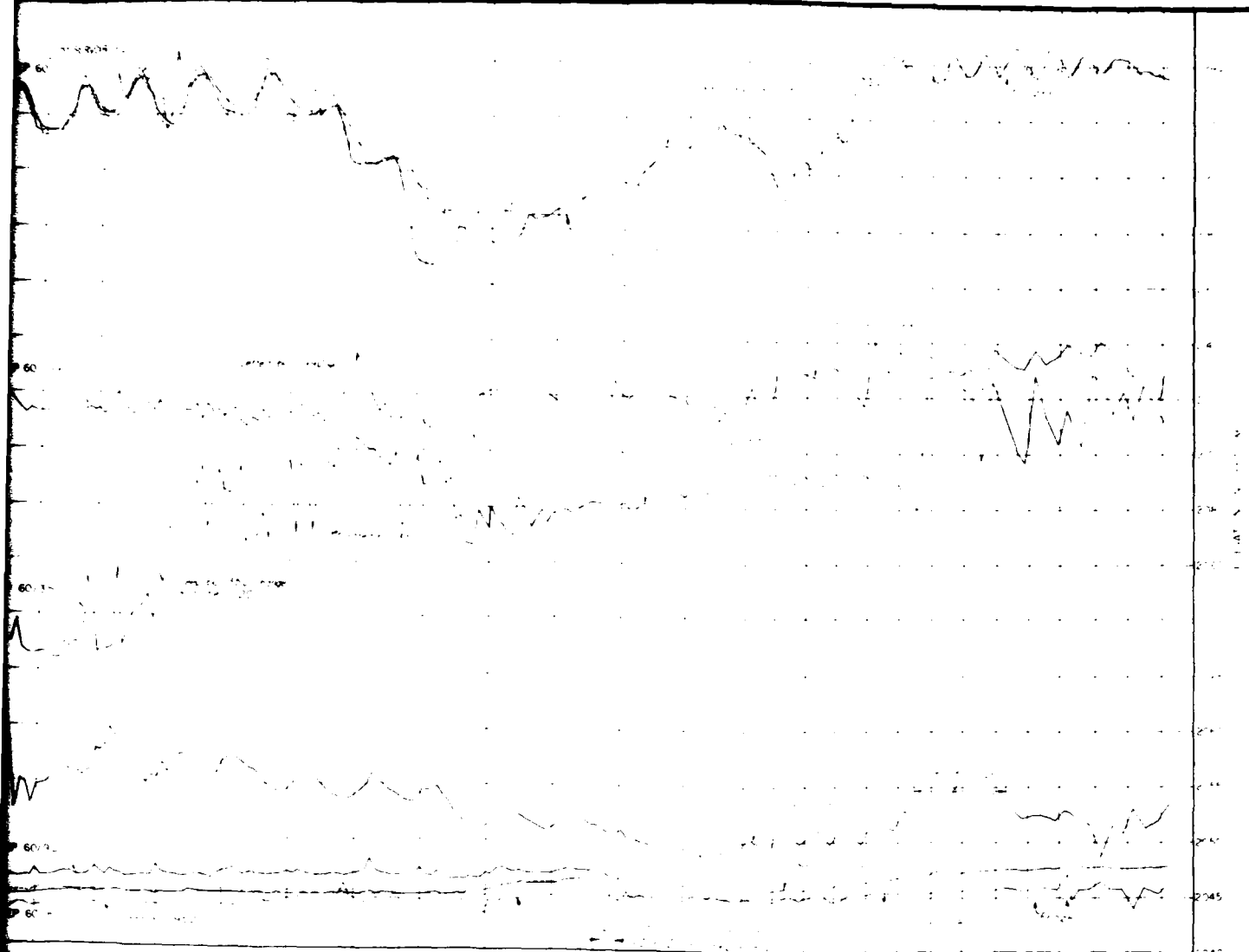


THIS PLAN ACCOMPANIES CONTRACT NO. MODIFICATION NO.

DATE	DESCRIPTION	MADE	APPROVED
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
MISSOURI RIVER FORT PECK LAKE, MONTANA SATURATION LINE OBSERVATIONS STA. 50+00			
DESIGNED BY:	DRAWN BY: L.M.G.		
CHECKED BY:	APPROVED BY:		
APP'D FOR ASST. DISTRICT	APP'D FOR DISTRICT ENGINEER	DATE	
APP'D FOR STATE ENGINEER	APP'D FOR CHIEF OF DISTRICT	DATE	
APP'D FOR DISTRICT	APP'D FOR DISTRICT	DATE	



LEGEND
 1. 06
 2. 485
 3. 1000
 4. 1000



KEY PLAN

CORPS OF ENGINEERS, U. S. ARMY
OFFICE OF THE DISTRICT ENGINEER
GARMINER DISTRICT
SALT LAKE CITY, UTAH

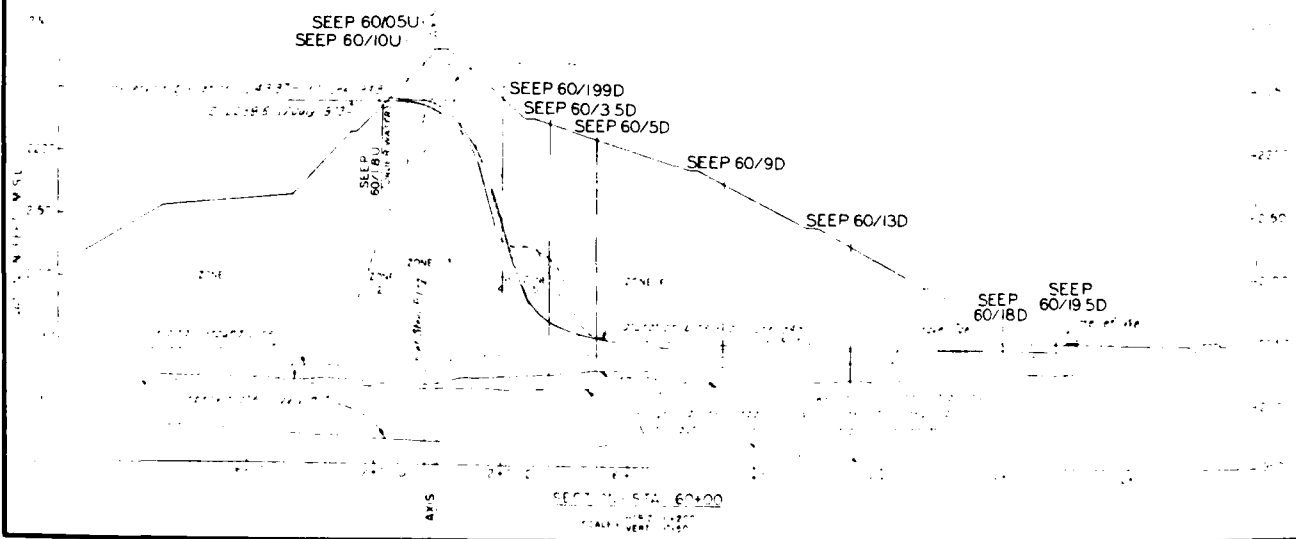
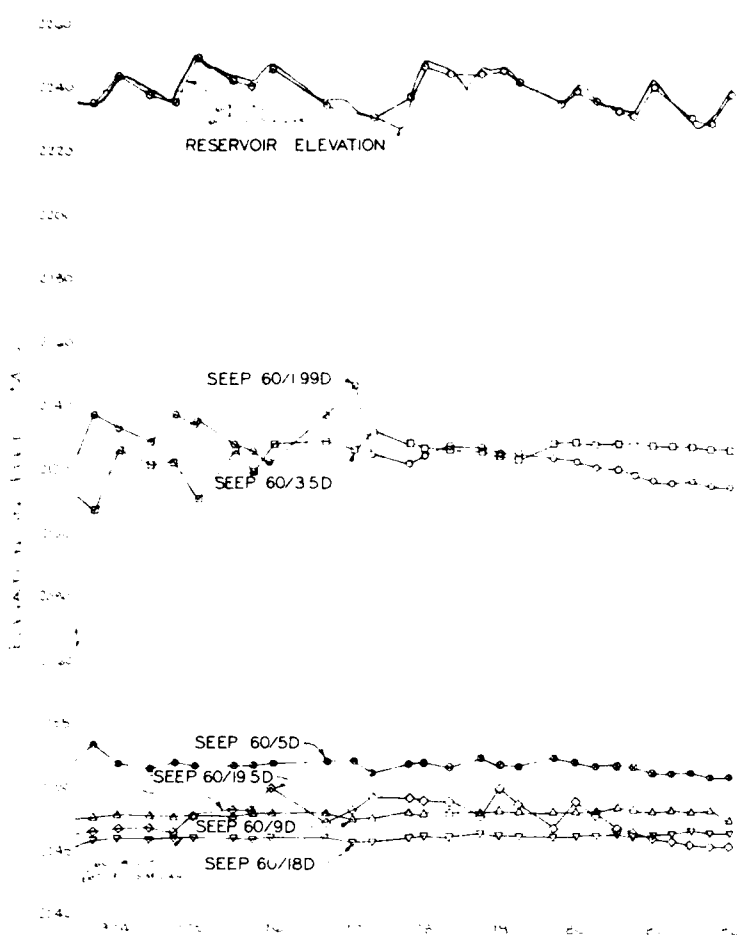
MOUNTAIN VIEW
FORT PECK DAM
OBSERVATION LINE OBSERVATIONS
STA 60+00

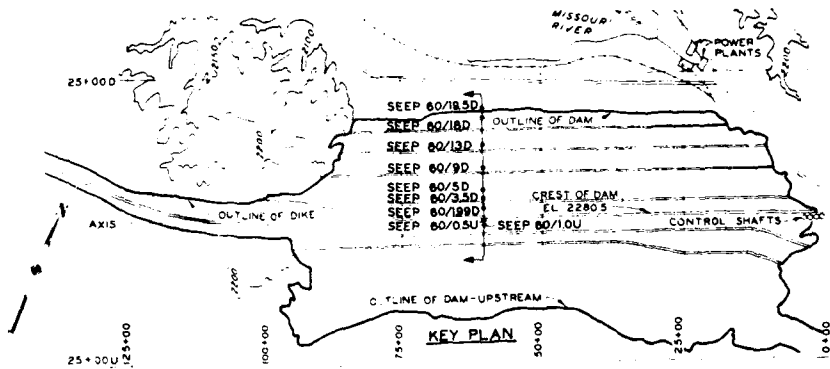
DESIGNED BY	CHECKED BY	DATE
DRAWN BY	4	8-2
PLACED BY		
REVISIONS		
APPROVED BY	APPROVAL SIGNATURE	AUGUST 1957
62469-1-72		7-64

LEGEND

June 25 1957
 June 2, 1955
 June 3
 1950

THIS DRAWING HAS BEEN REDUCED TO
 THESE DIMENSIONS FROM THE ORIGINAL SCALE





-2.1
 -2.25
 -2.50
 -2.75
 -3.00
 -3.25
 -3.50

SEEP 60/18D
 SEEP 60/19.5D

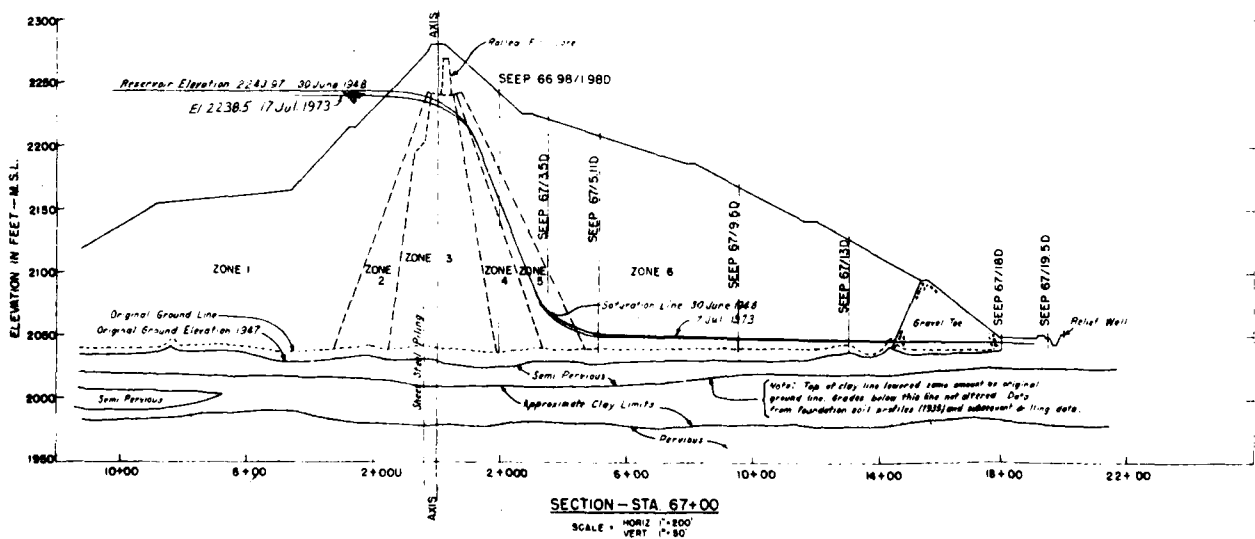
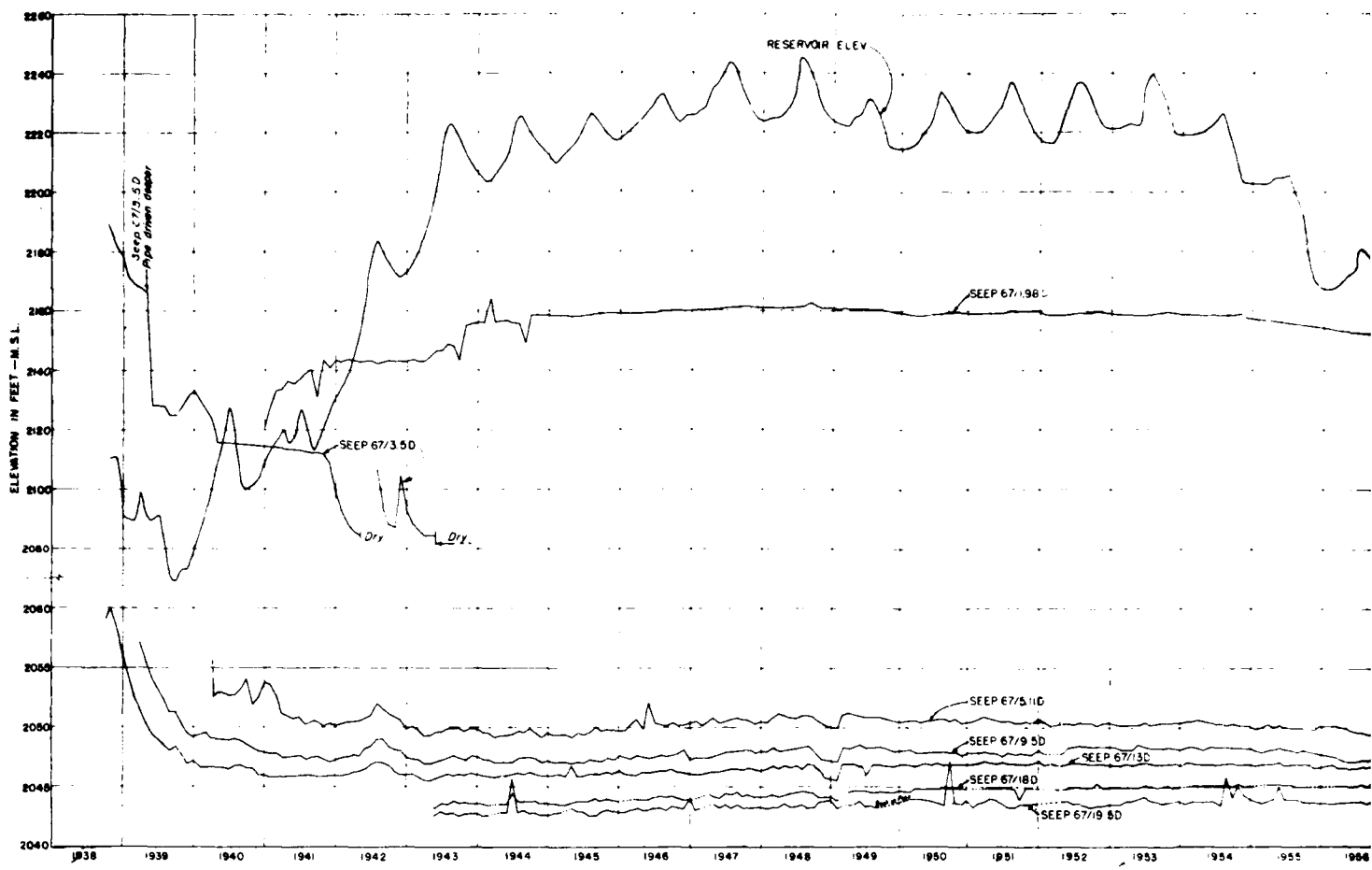
THIS DRAWING HAS BEEN REEVALUATED
 AND FOUND TO BE CORRECT AS SHOWN



THIS PLAN ACCOMPANIES CONTRACT NO. _____
 MODIFICATION NO. _____

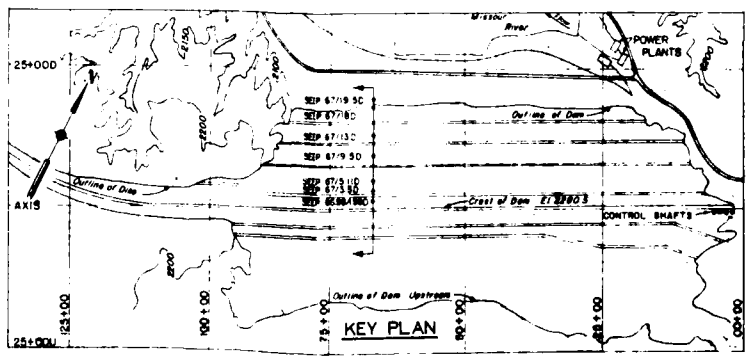
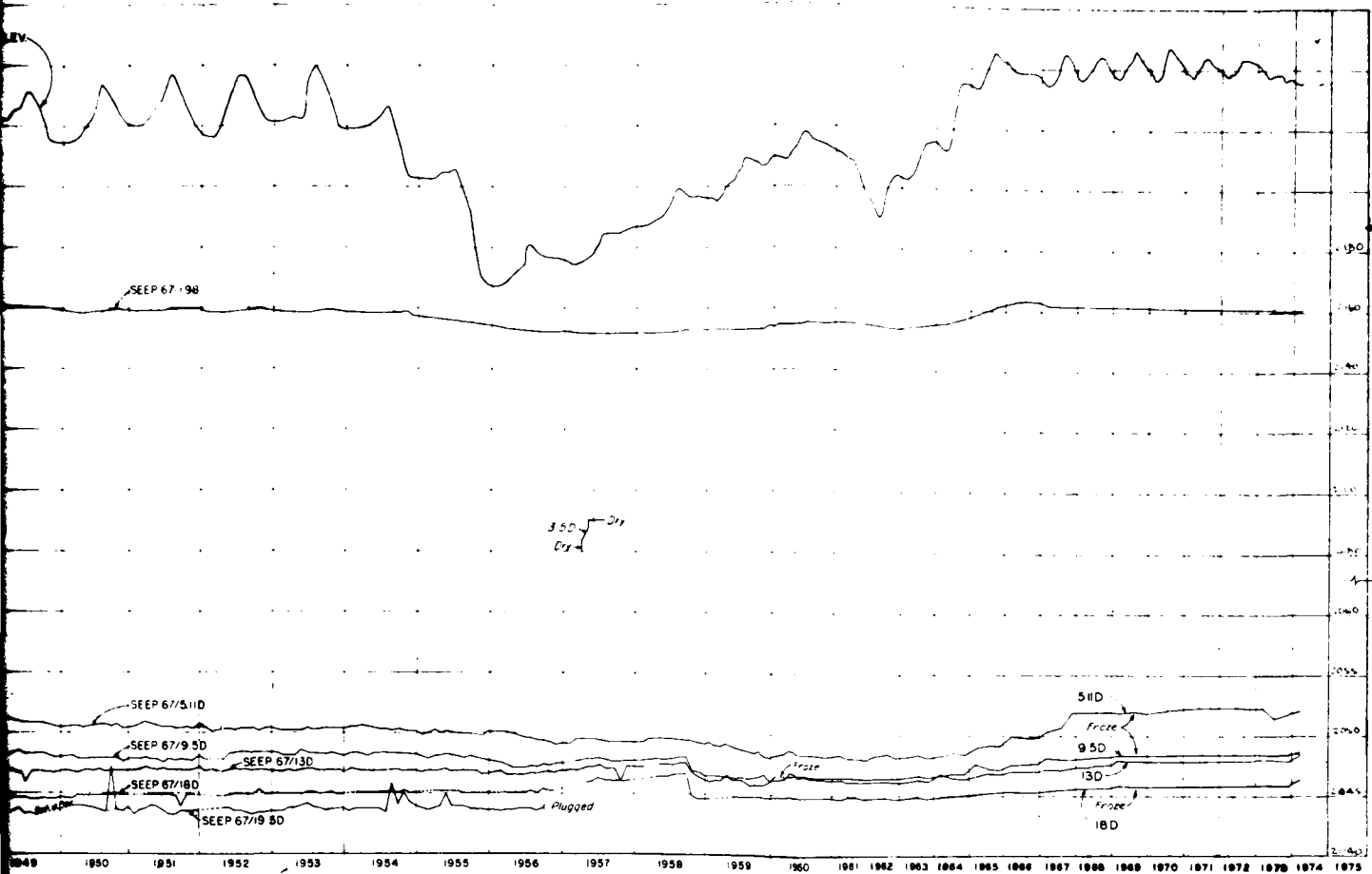
DATE	DESCRIPTION	MADE	APPROV.
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY:	FORT PECK LAKE, MONTANA SATURATION LINE OBSERVATIONS STATION 60+00		
DRAWN BY:			
CHECKED BY:			
SUBMITTED BY:			
ENGINEER:			
SECTION:	APPROVED:	DATE:	
BRANCH:	ENGINEERING DIVISION:		SHEET NO.:
APPROVER:	SCALE AS SHOWN:		DRAWING NUMBER:
DIST. & C. DISTRICT ENGINEER:		SHEET:	

2



SECTION - STA 67+00
 SCALE - HORIZ 1"=80'
 VERT 1"=30'

2540
 2535
 LEG
 SEI



1. Data assumed to original
 2. Data not altered. Data
 (month) and subsequent plotting date

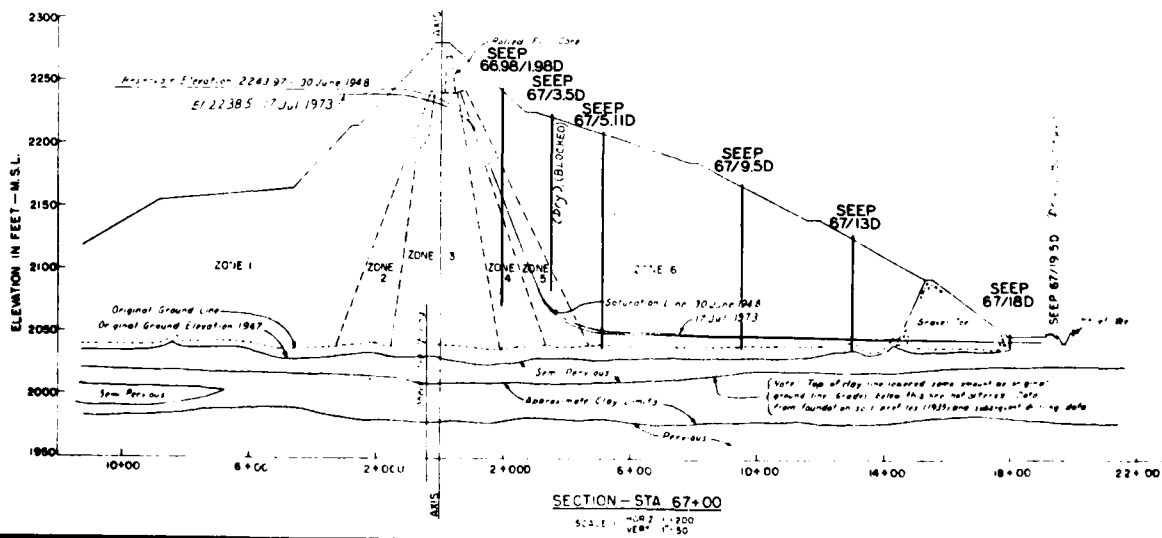
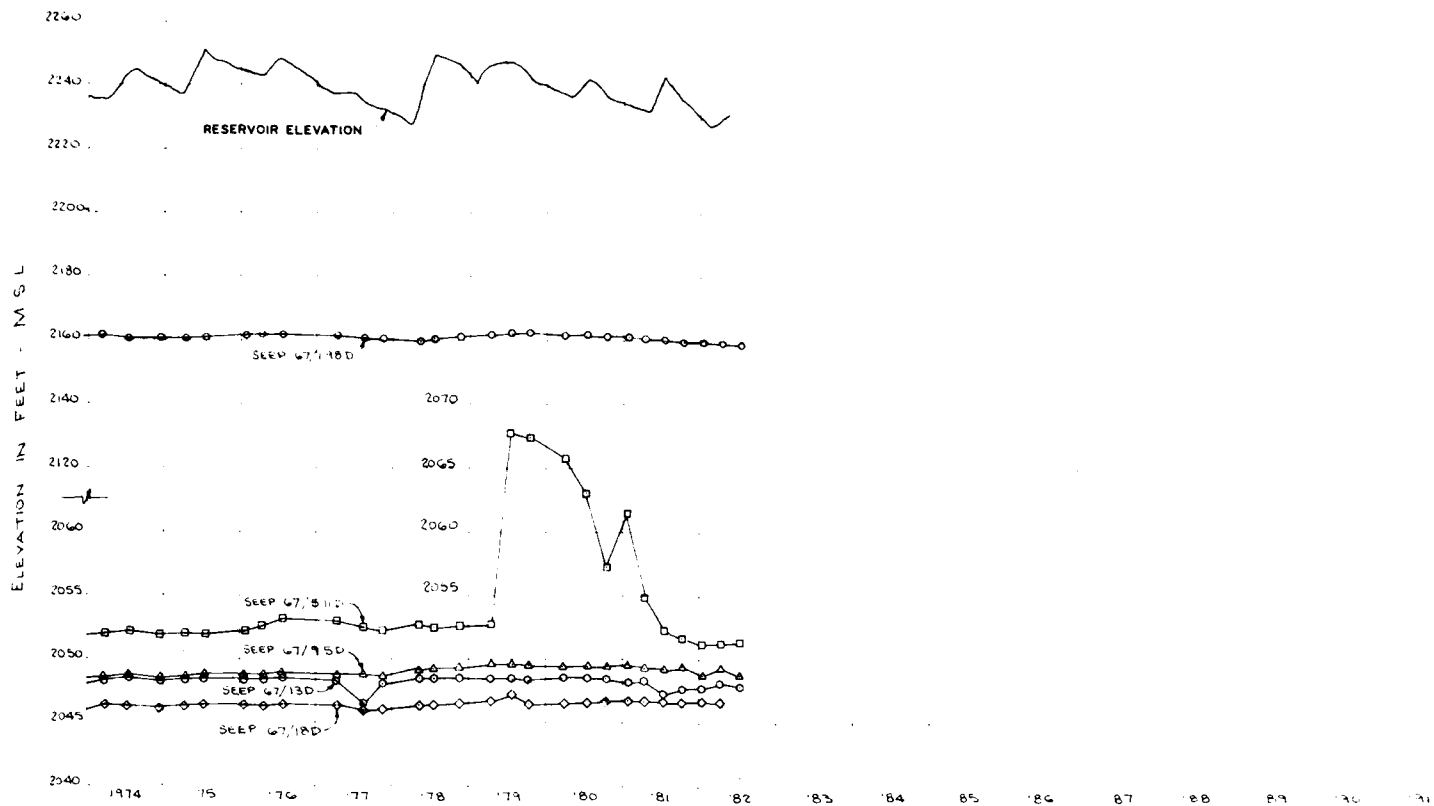
LEGEND:
 SEEP SEEPAGE PIPE (PERFORATED)

THIS DRAWING HAS BEEN REFERRED TO
 THROUGHOUT THE GENERAL STATE

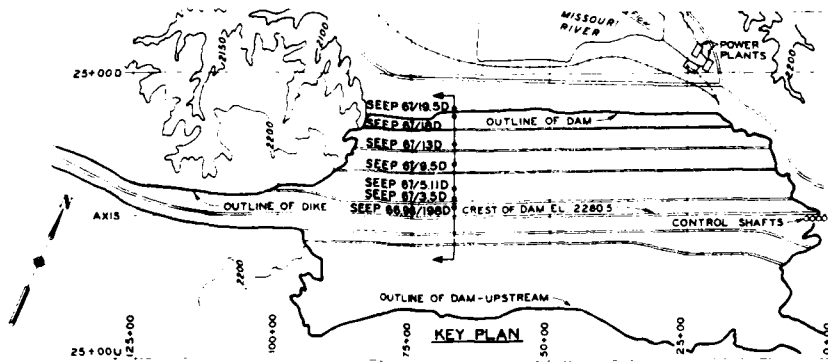


THIS PLAN ACCOMPANIES CONTRACT NO. _____
 MODIFICATION NO. _____

DATE	DESCRIPTION	MADE	APPROVED
	REVISIONS		
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY: DRAWN BY: L.M.G. CHECKED BY: SUBMITTED BY: CHIEF ENGINEER'S OFFICE		MISSOURI RIVER FORT PECK LAKE, MONTANA SATURATION LINE OBSERVATIONS STA. 67+00	
APPROVED:	DATE:	SCALE AS SHOWN	SHEET NO.
CHIEF ENGINEER'S OFFICE			
APPROVED:	DATE:	DESIGNED BY:	DRAWN BY:
CHIEF ENGINEER'S OFFICE			



85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 2000 01 02



SEEP 67/180
SEEP 67/130
SEEP 67/95.0
SEEP 67/5.11D
SEEP 67/3.5D
SEEP 68.87/190D

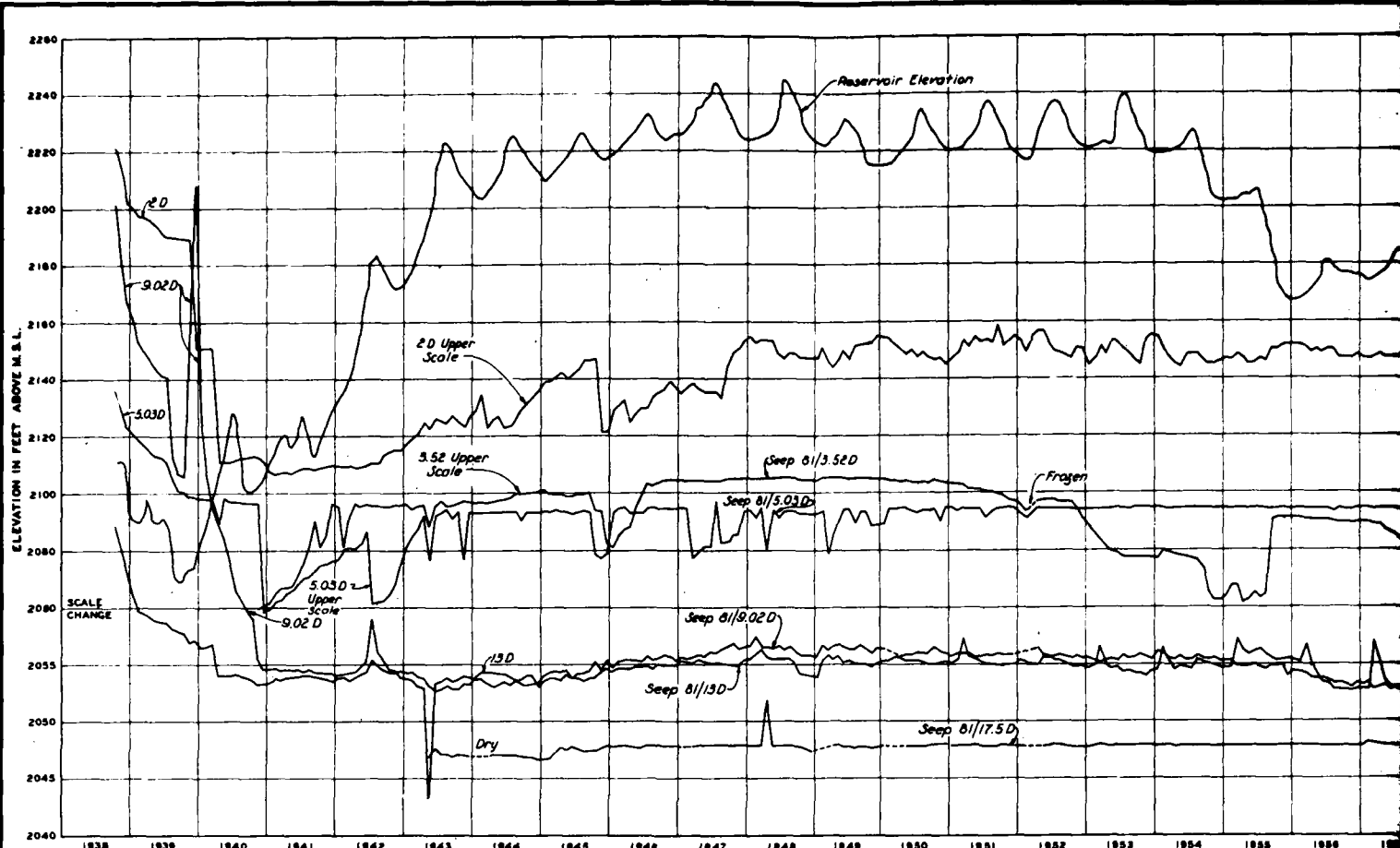
THIS DRAWING HAS BEEN REDUCED TO
FIT THE SPACE OF THE SHEET AT THE SCALE



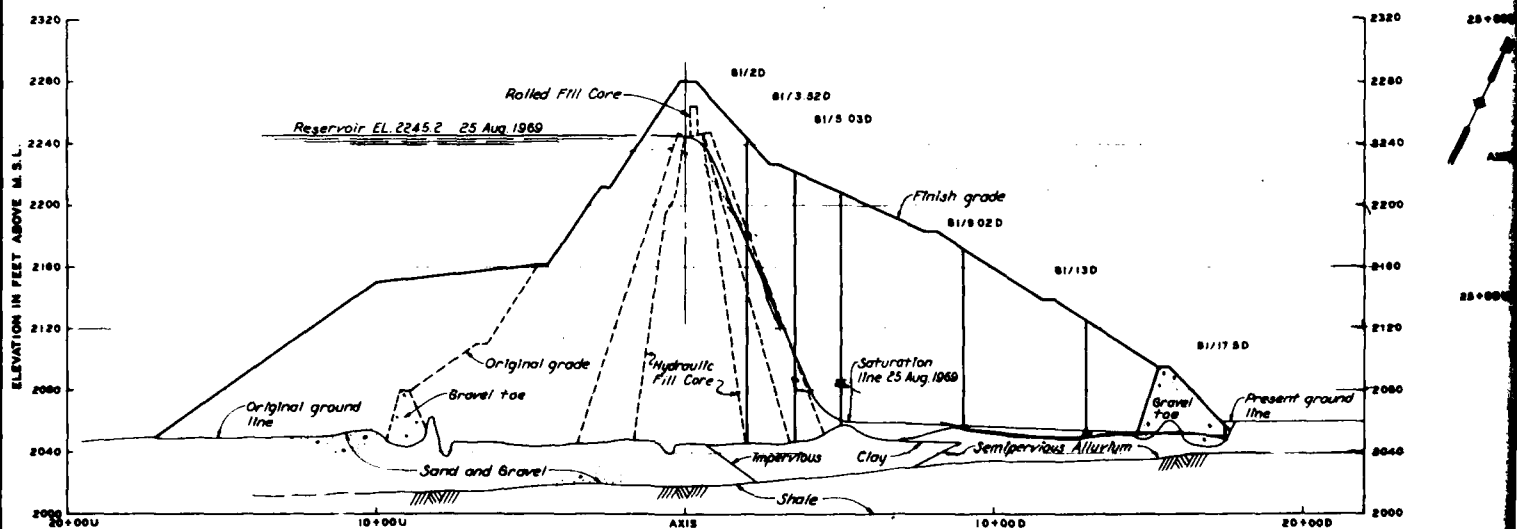
THIS PLAN ACCOMPANIES CONTRACT No. _____
MODIFICATION No. _____

DATE	DESCRIPTION	MADE	APPROV
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY	FORT PECK LAKE, MONTANA		
CHECKED BY	SATURATION LINE OBSERVATIONS		
SUBMITTED BY	STATION 67+00		
DATE			
APPROVED			

2

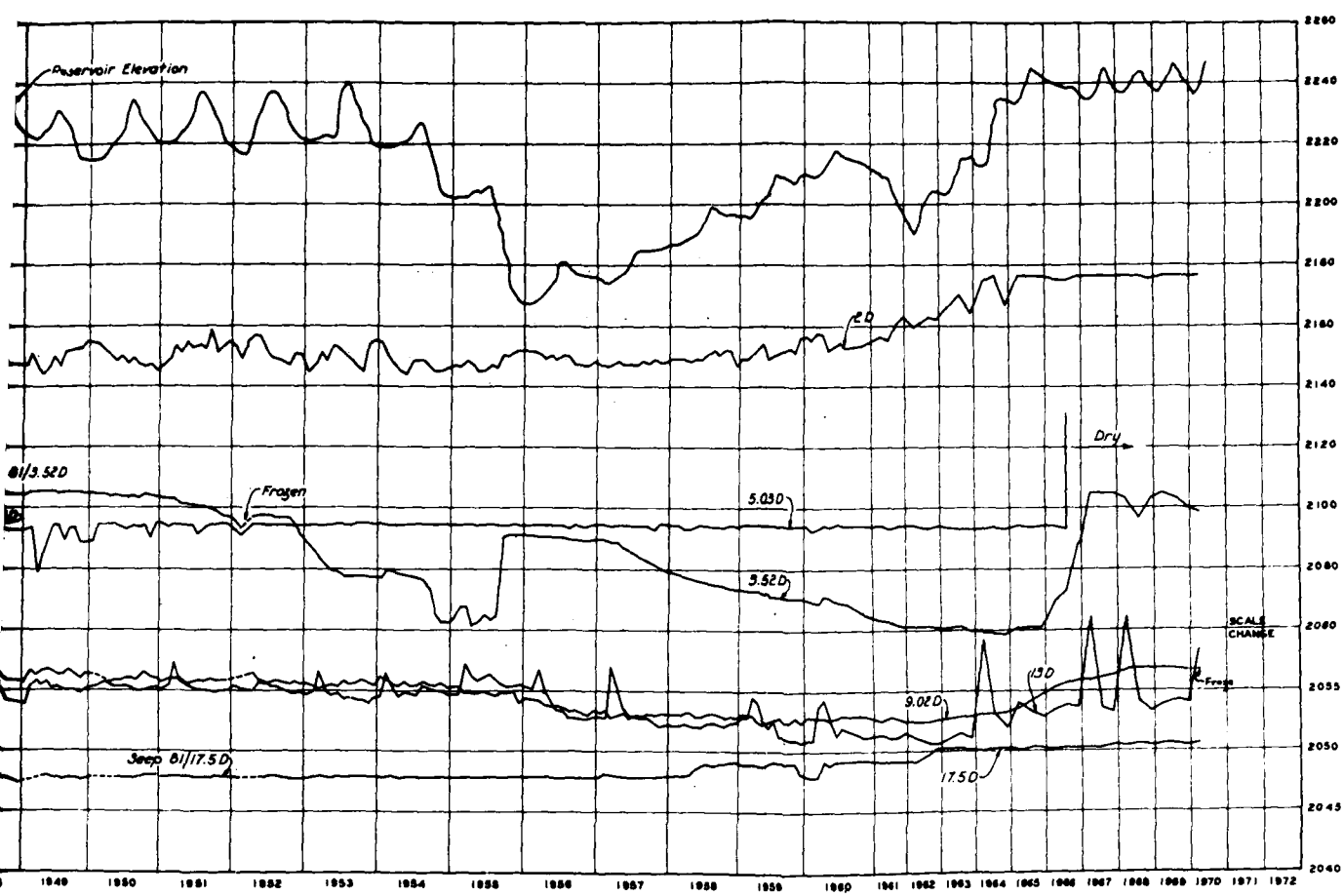


STA. 81+00

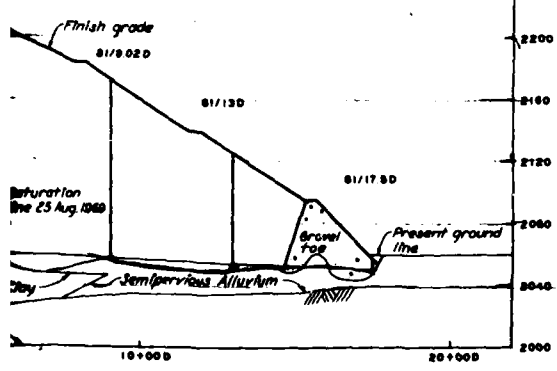
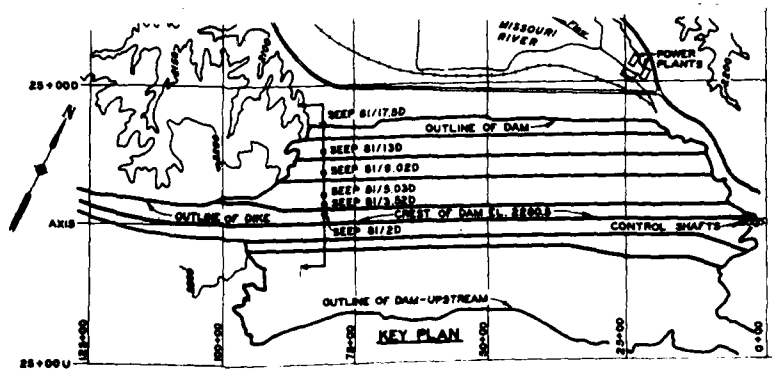


STA. 81+00

SCALE: VERT. 1 INCH = 40 FEET
HORIZ. 1 INCH = 200 FEET

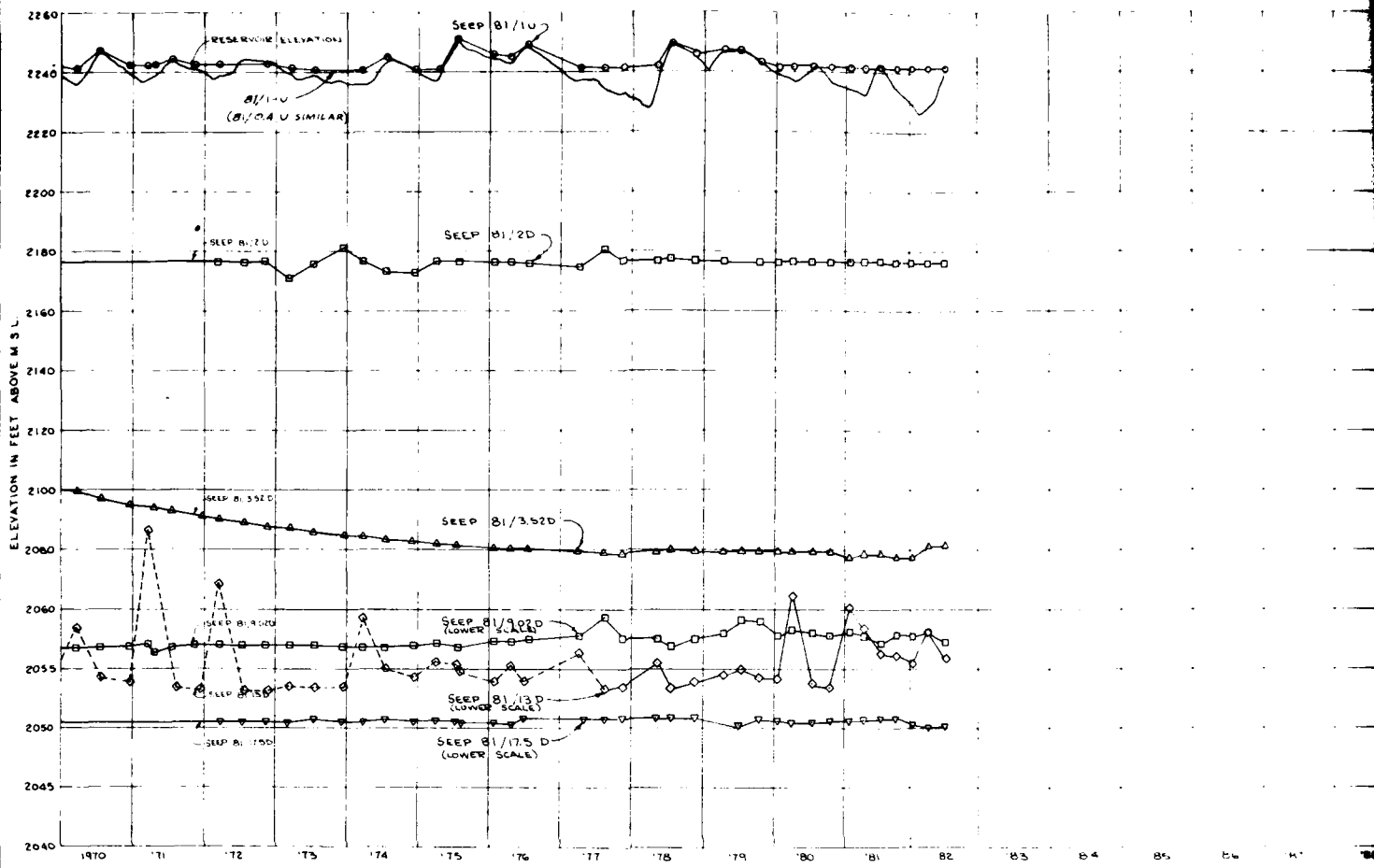


STA. 81+00

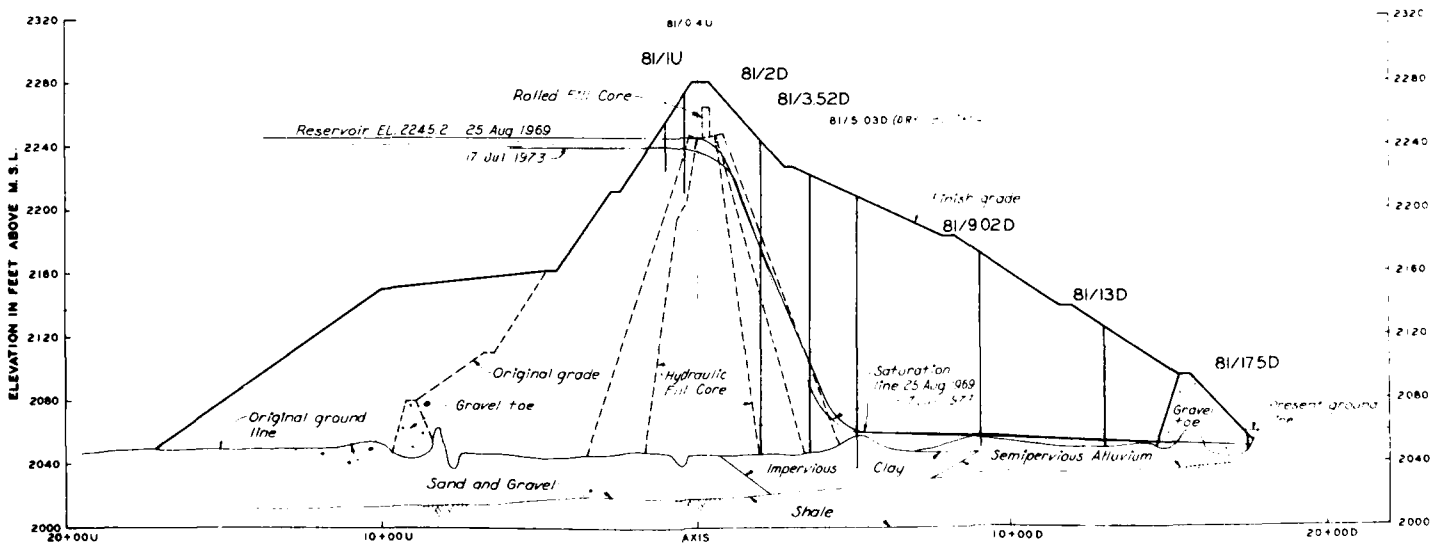


REVISIONS		DATE	BY	REASON
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA				
MISSOURI RIVER FORT PECK LAKE, MONTANA				
SATURATION LINE OBSERVATIONS STA. 81+00				
DESIGNED BY				
CHECKED BY	L. M. R.			



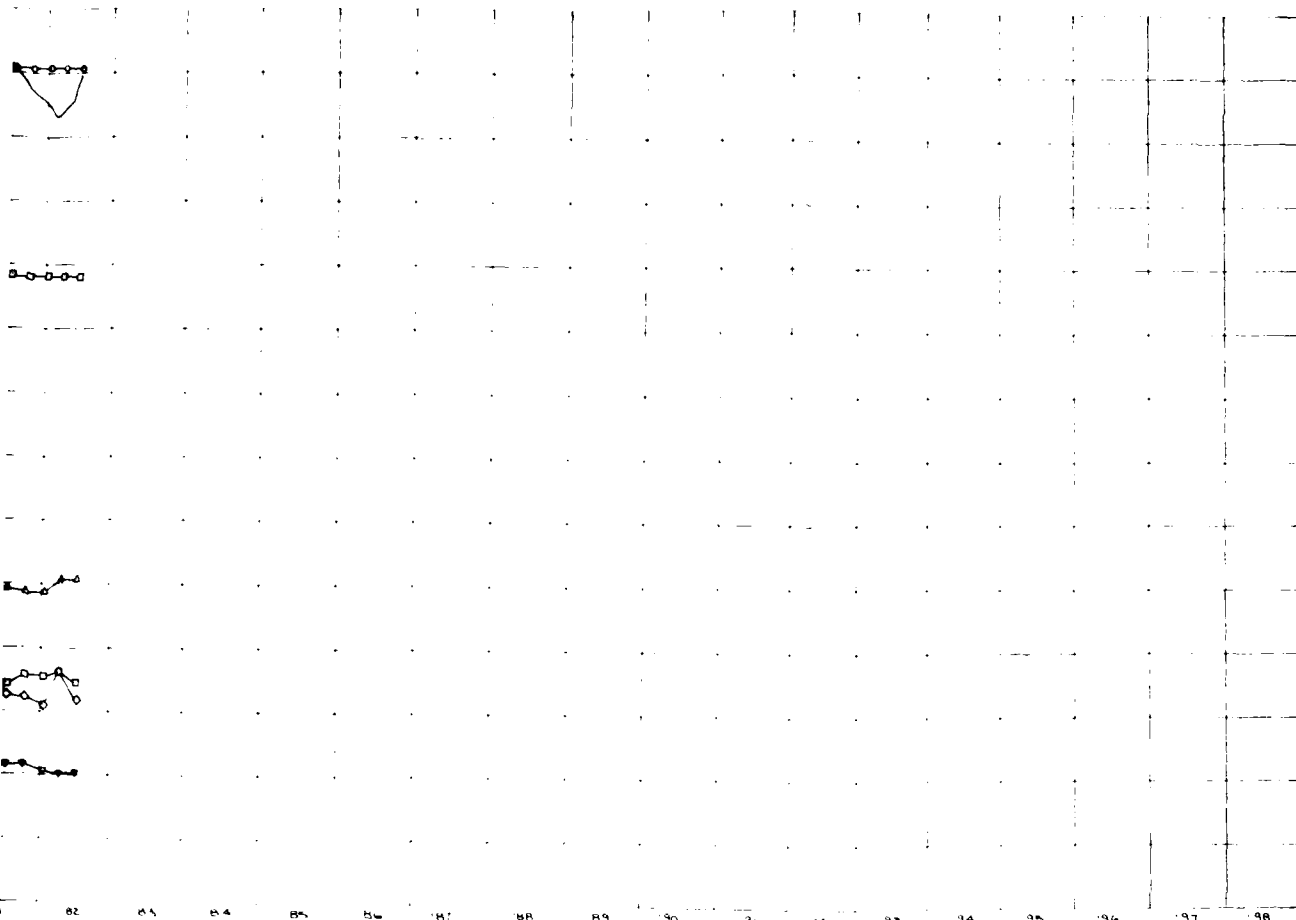


STA 81+00

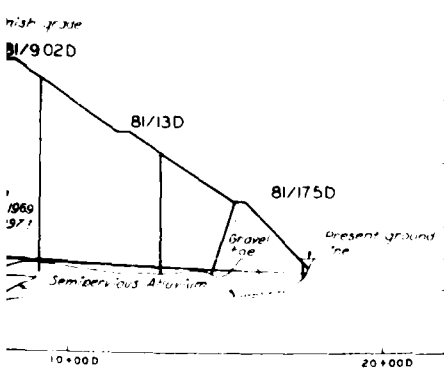
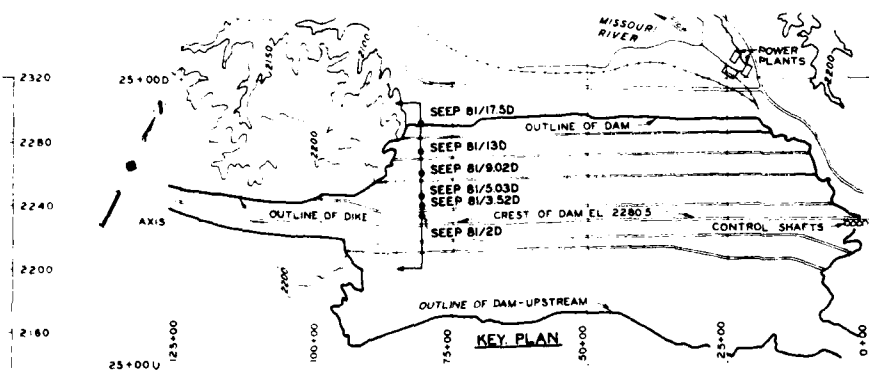


STA 81+00

SCALE VERT INCH=40 FEET
HORIZ INCH=200 FEET



STA 81+00



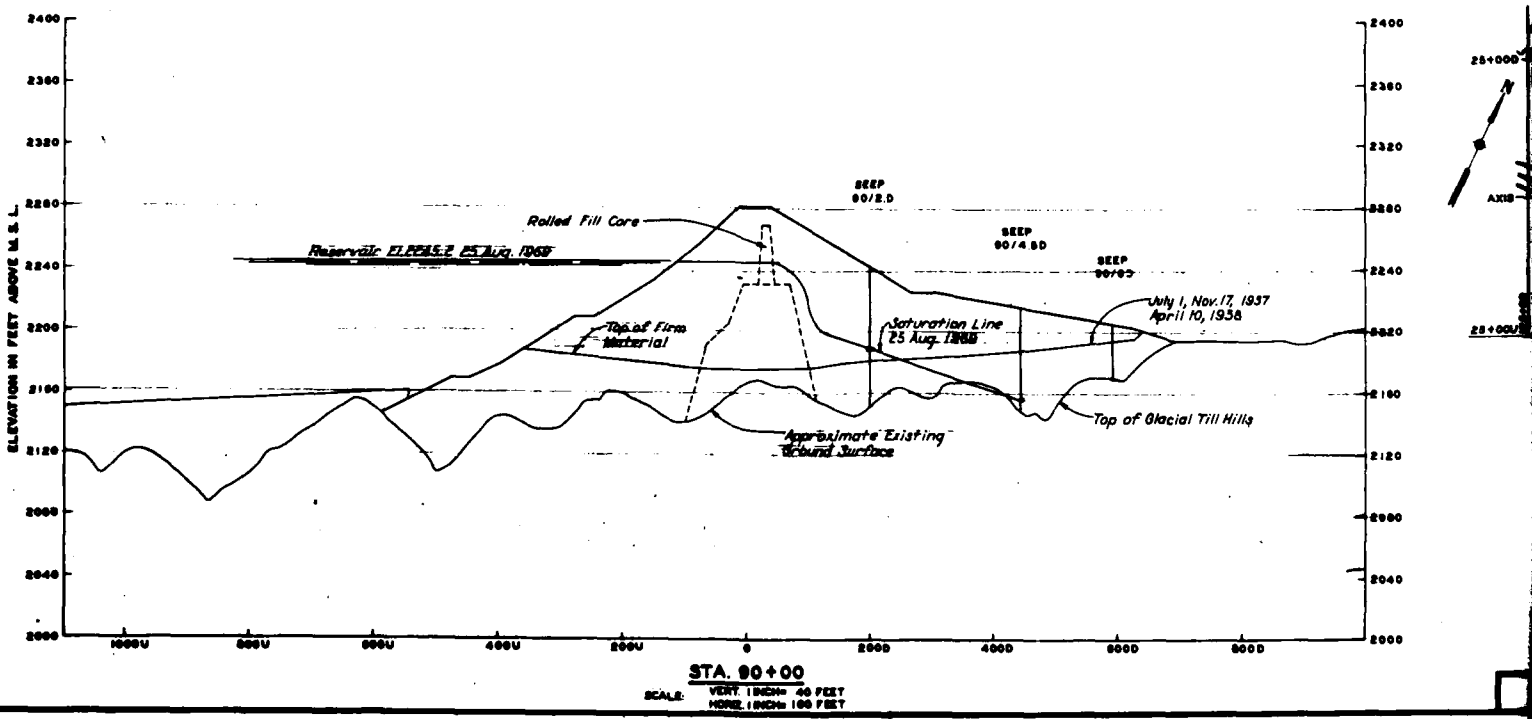
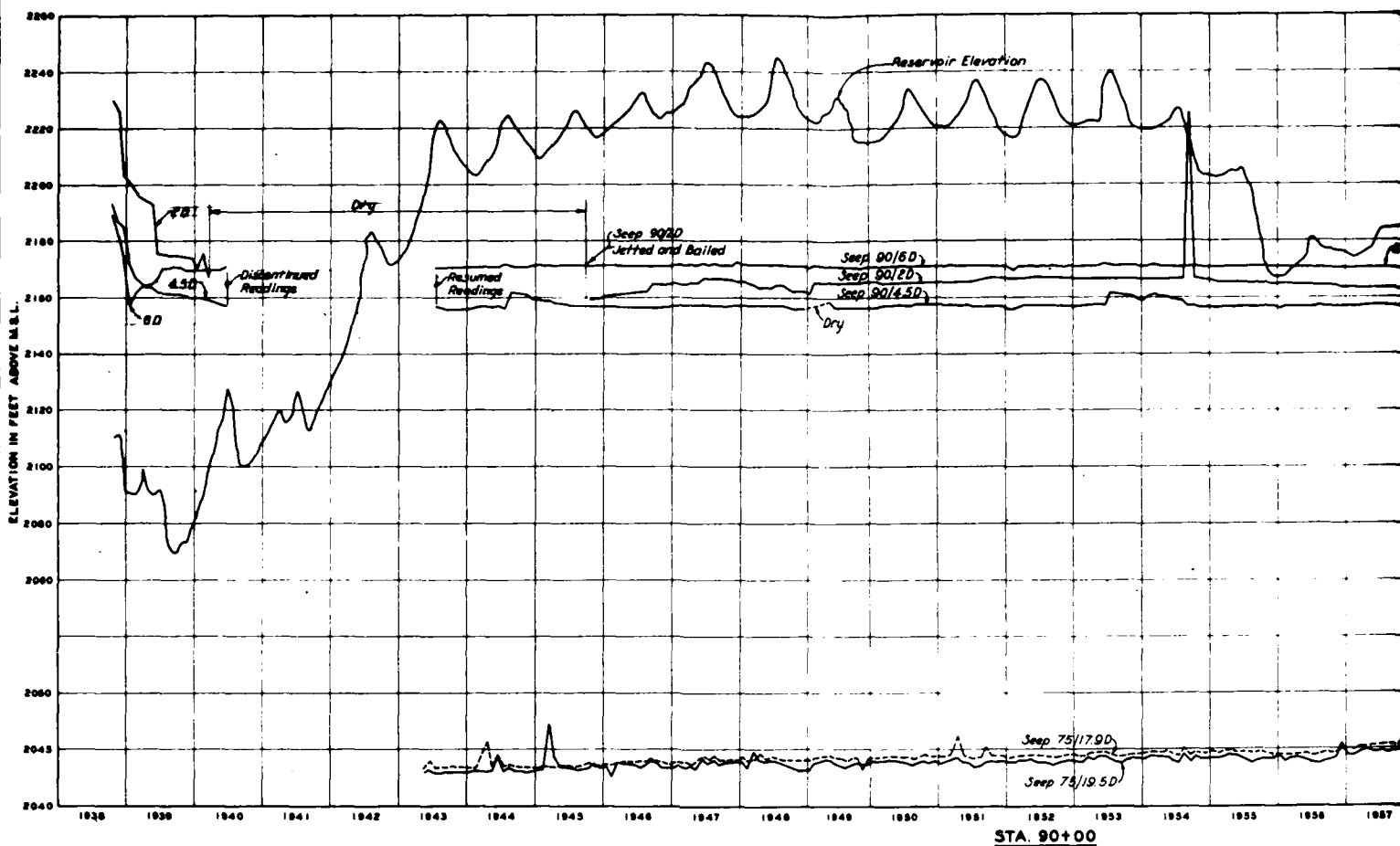
THIS DRAWING HAS BEEN REDUCED TO
 SCALE FROM THE ORIGINAL SCALE.



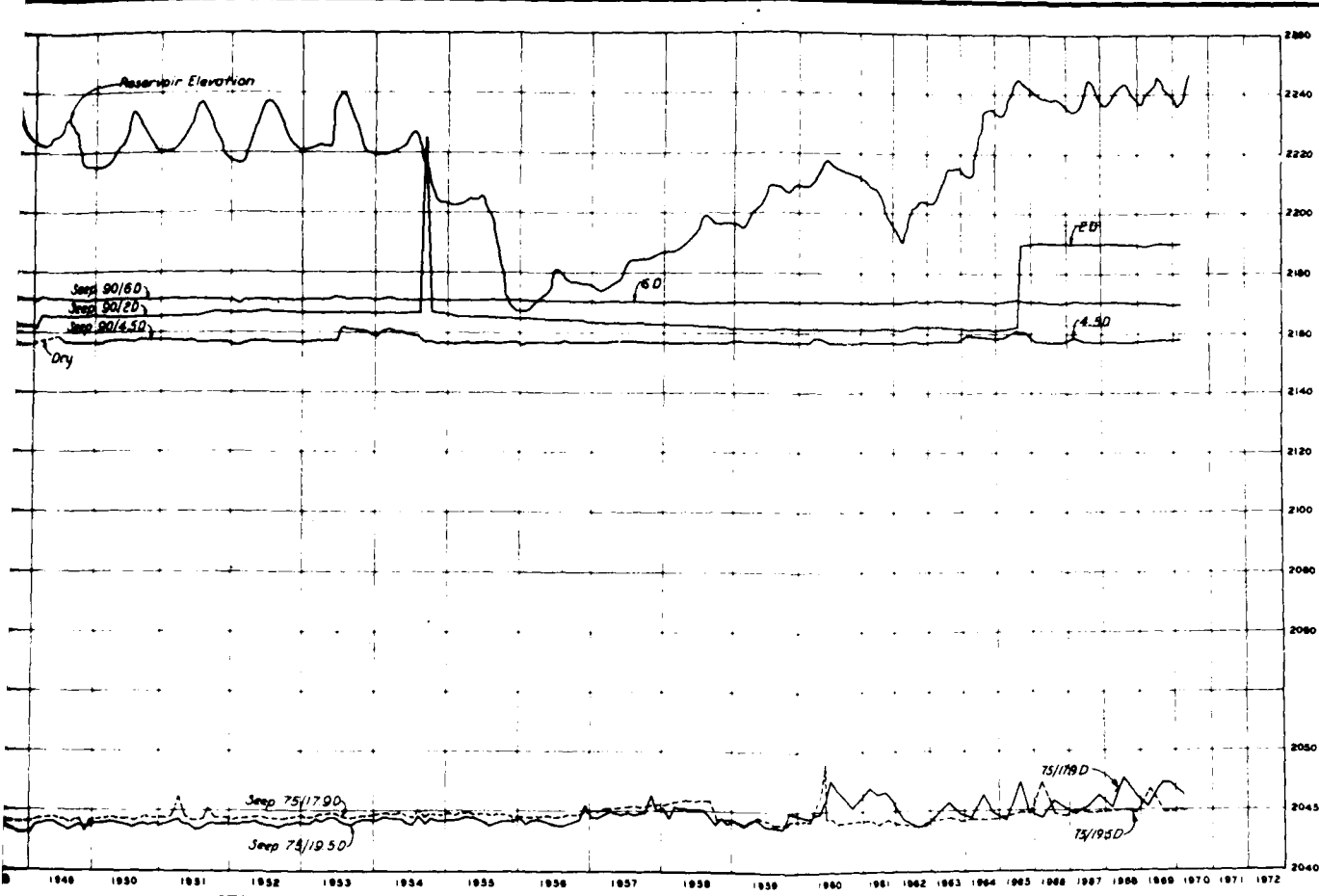
THIS PLAN ACCOMPANIES CONTRACT NO. _____
 MODIFICATION NO. _____

DATE	DESCRIPTION	MADE	APPROV
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY:		MISSOURI RIVER	
DRAWN BY: L. M. G.		FORT PECK LAKE, MONTANA	
CHECKED BY:		SATURATION LINE OBSERVATIONS	
SUBMITTED BY:		STA. 81 + 00	
APPROVED:	APPROVED:	DATE:	
CHIEF ENGINEER'S SIGNATURE	CHIEF ENGINEER'S SIGNATURE	SCALE AS SHOWN	SHEET NO.
APPROVED:	APPROVED:	DESIGNED BY:	
CHIEF ENGINEER'S SIGNATURE		CHIEF ENGINEER'S SIGNATURE	

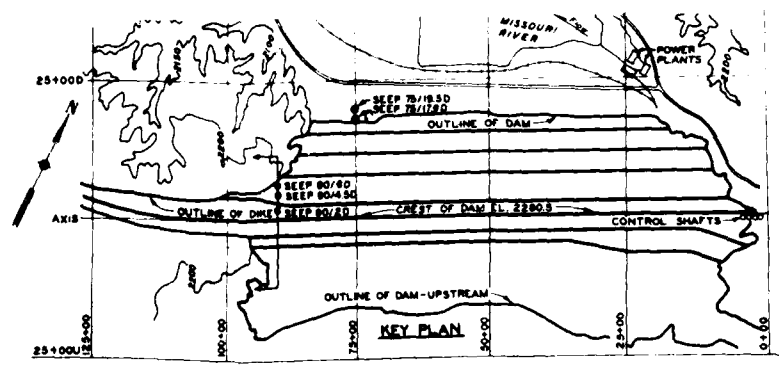
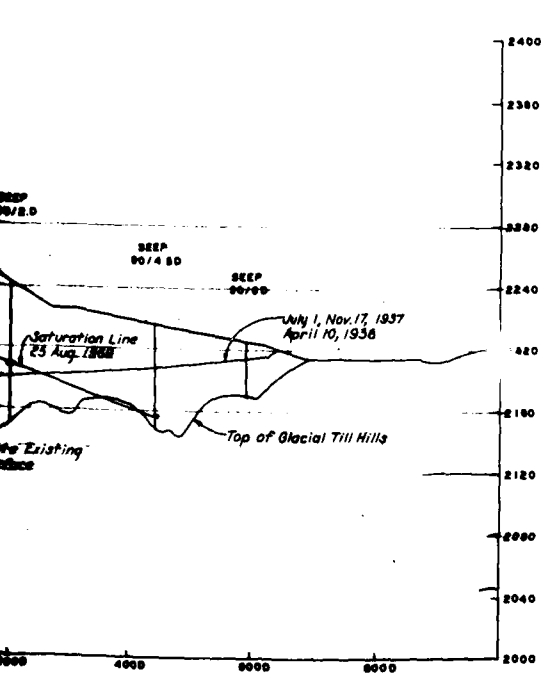
2



FORT PECK DAM AND RESERVOIR

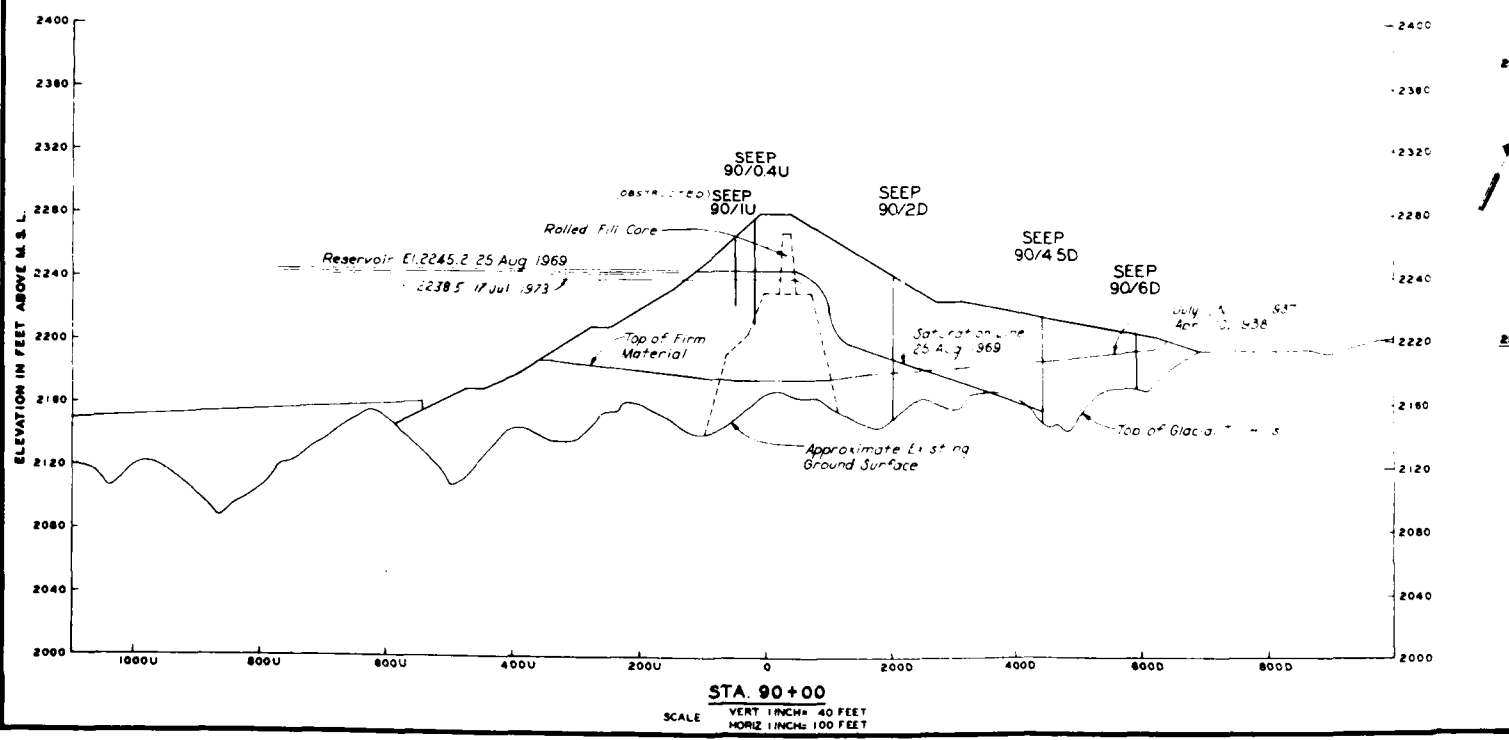
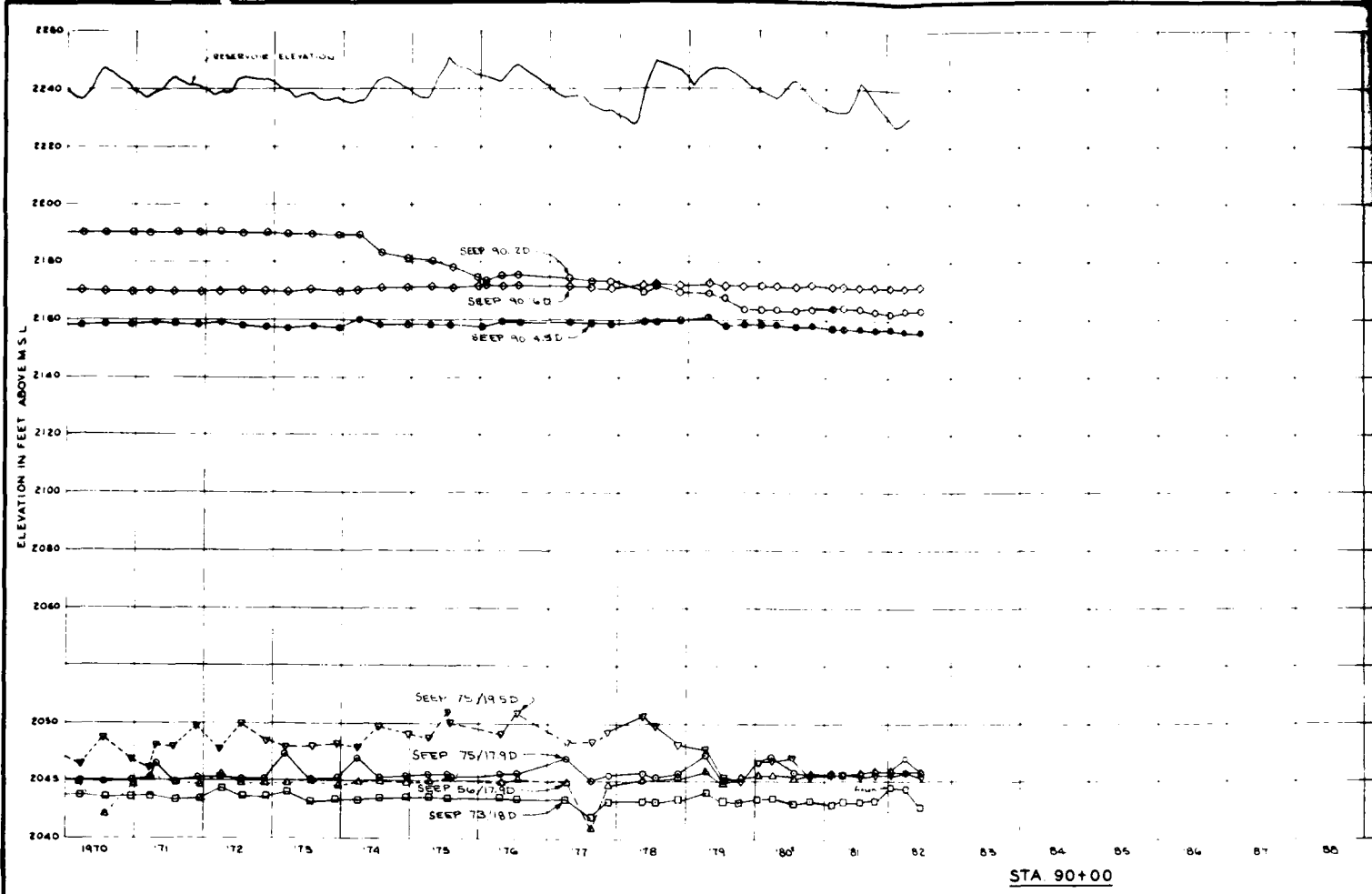


STA. 90+00



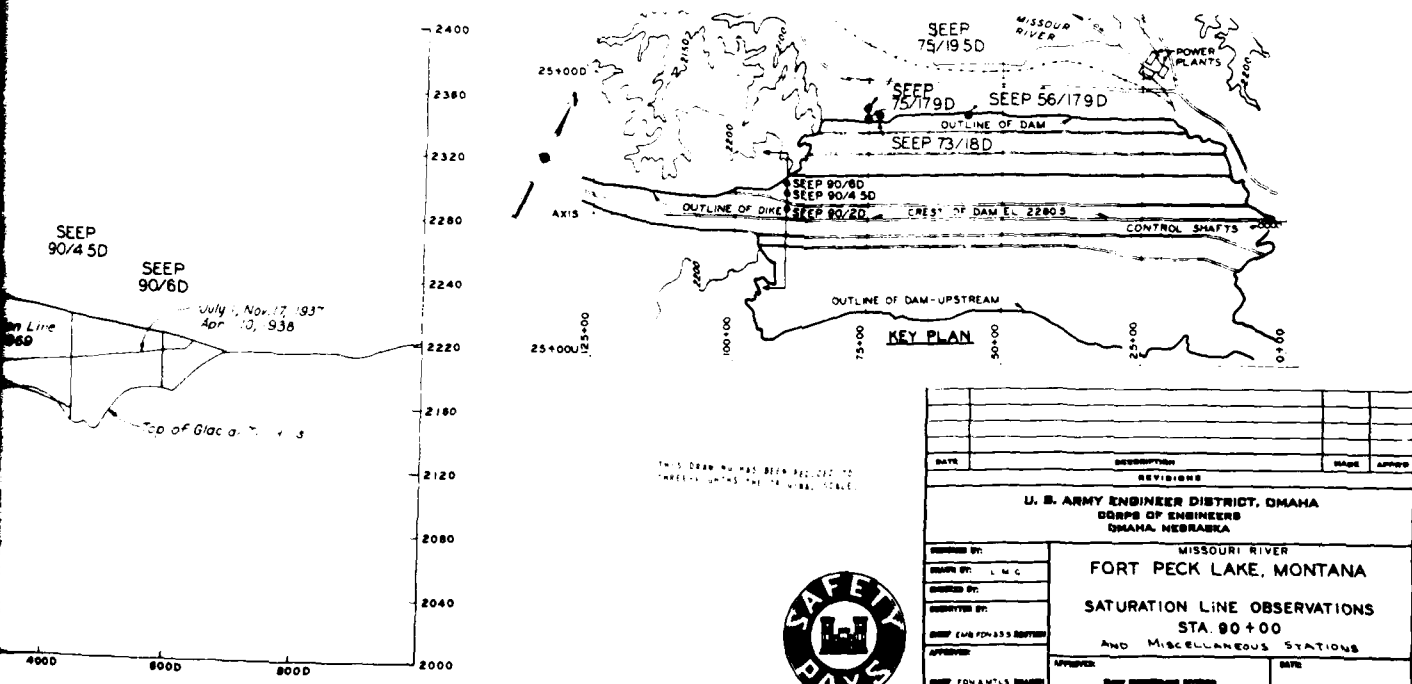
DATE	REVISIONS	MADE	APPROVED
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
MISSOURI RIVER FORT PECK LAKE, MONTANA SATURATION LINE OBSERVATIONS STA. 90+00			
DESIGNED BY	APPROVED	DATE	
DRAWN BY: L. M. C.			
CHECKED BY			
REVIEWED BY			
SEEP DATA SHEET NO.			
DATE FOR LATEST SHEET			
APPROVED			
THIS PLAN ACCOMPANIES CONTRACT NO.		NO. U. S. ENGINEER DISTRICT	
MODIFICATION NO.		DATE	





82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98

STA 90+00



SEEP 90/4 5D
SEEP 90/6D
July 1, Nov. 17, 1937
Apr. 10, 1938
Top of Glacier

THIS DRAWING HAS BEEN PREPARED TO
MATCH THE VERTICAL SCALE



THIS PLAN ACCOMPANIES CONTRACT NO. _____
MODIFICATION NO. _____

DATE	DESCRIPTION	NAME	APPROV

REVISIONS

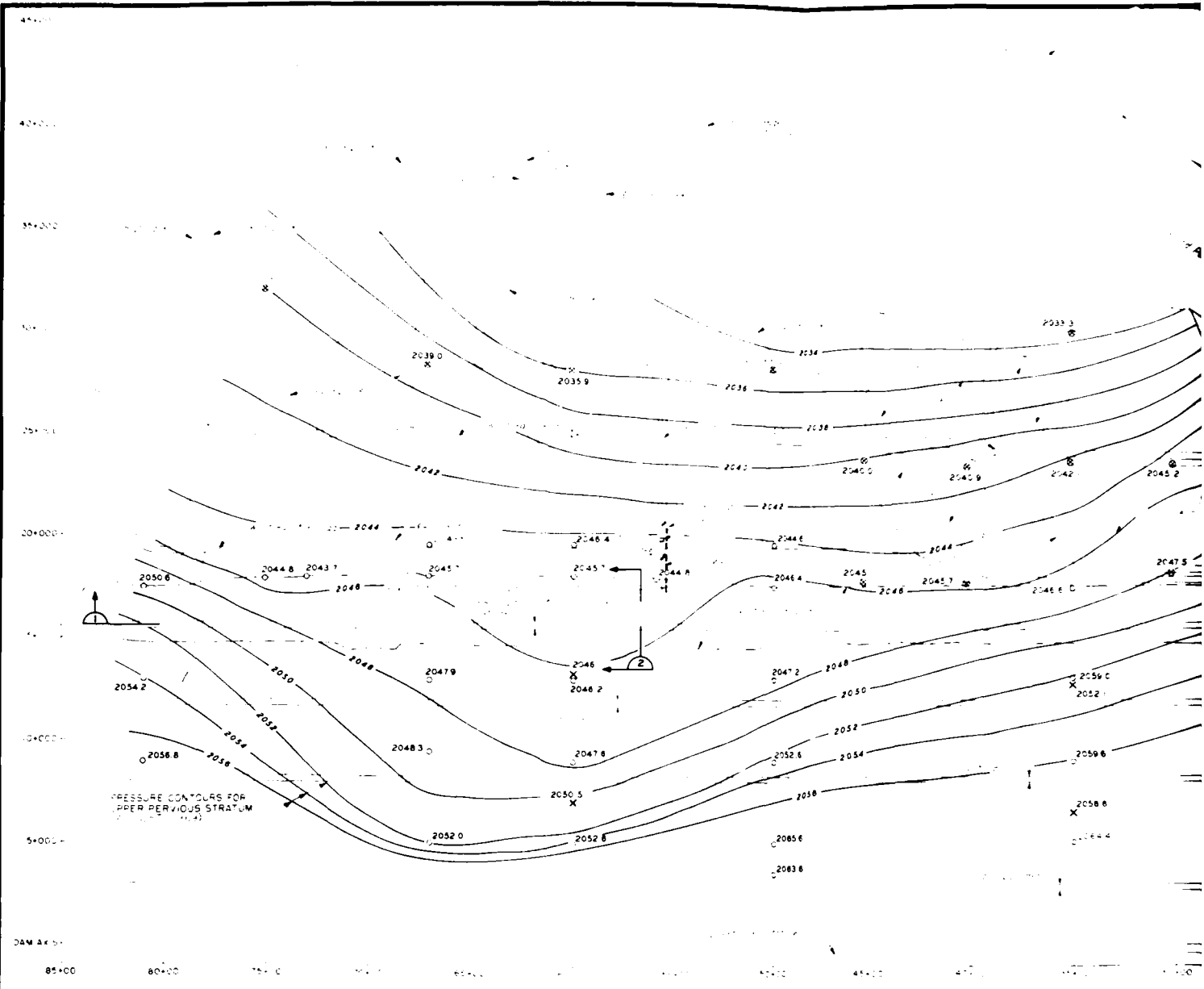
U. S. ARMY ENGINEER DISTRICT, OMAHA
CORPS OF ENGINEERS
OMAHA, NEBRASKA

MISSOURI RIVER
FORT PECK LAKE, MONTANA
SATURATION LINE OBSERVATIONS
STA. 90+00
AND MISCELLANEOUS STATIONS

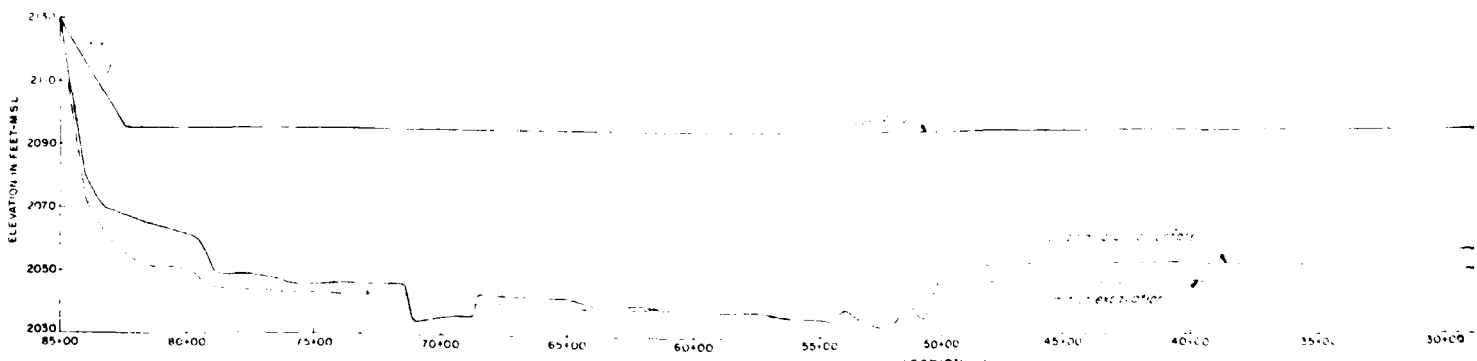
DESIGNED BY:	APPROVED:	DATE:
DRAWN BY: L. M. C.		
CHECKED BY:		
REVIEWED BY:		
SEAL AND SIGNATURE		

U. S. & L. OFFICE NUMBER

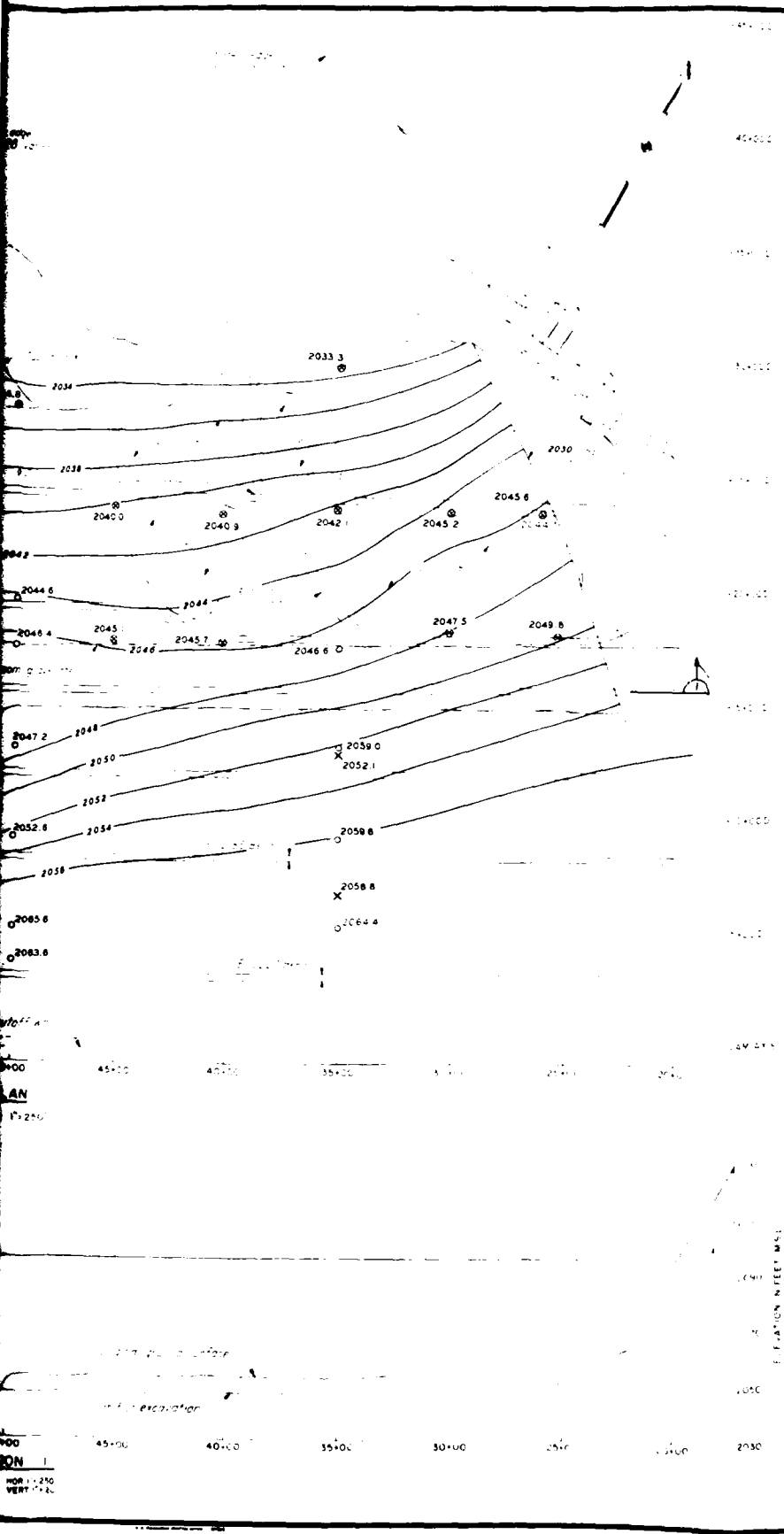
2



PRESSURE CONTOURS FOR
UPPER PERVIOUS STRATUM



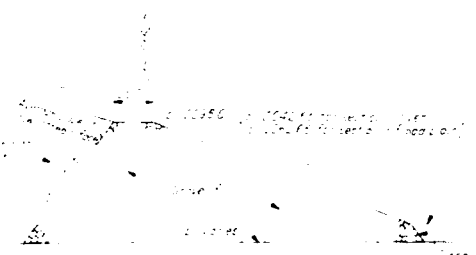
SECTION 1
SCALE 1" = 100'



DATE: 20 August 1969 with the stream bed above E10045.

LEGEND

- X - gravel toe
- O - pressure
- ⊗ - pressure

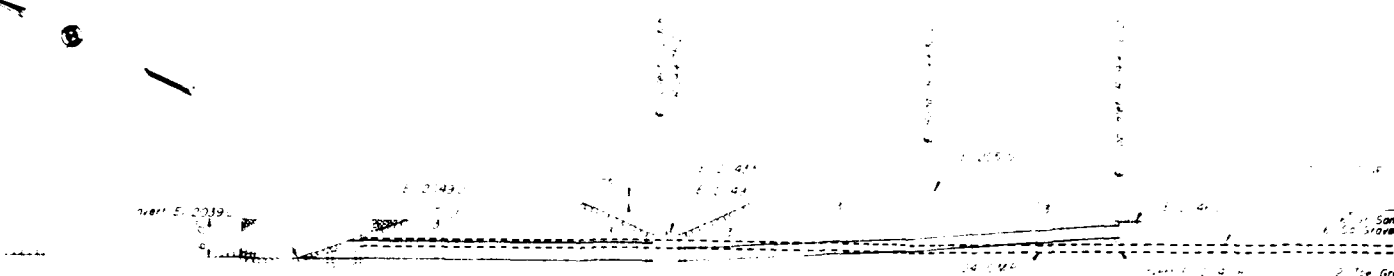


SECTION D
TYPICAL SECTION OF GRAVEL TOE
SCALE: HORIZ. 1" = 100'
VERT. 1" = 20'

THIS DRAWING HAS BEEN REDUCED TO
FIT THE ORIGINAL SCALE

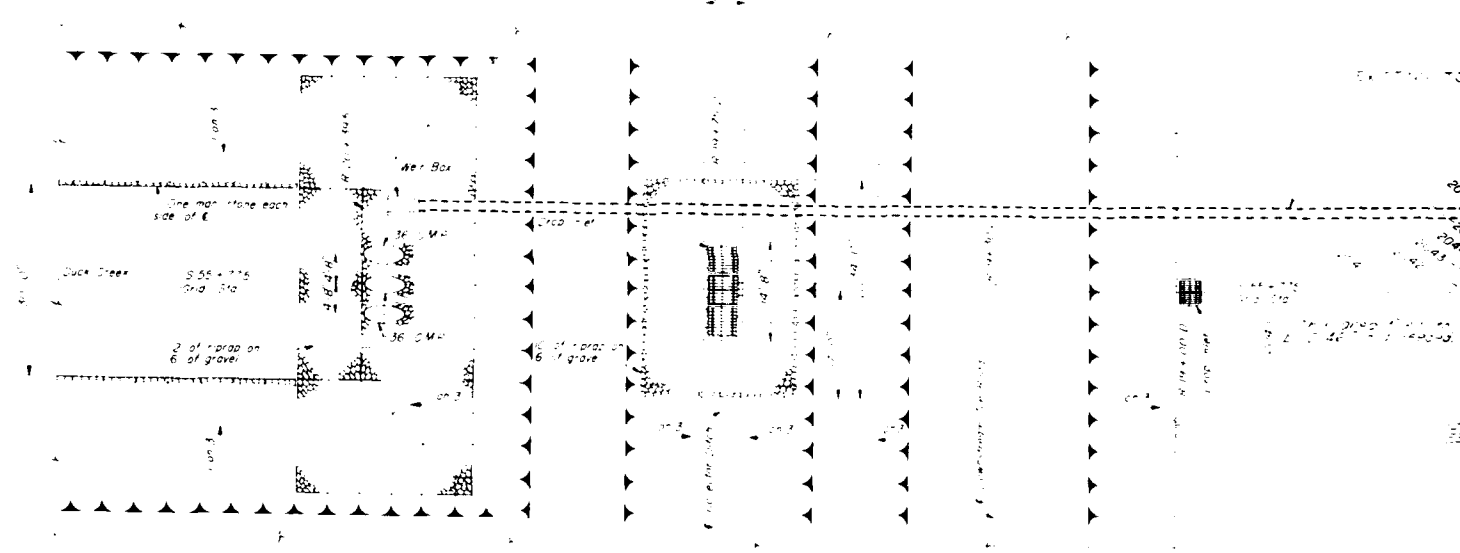
DATE	DESCRIPTION	MADE	APPROD
REVISIONS			
U S ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
MISSOURI RIVER FORT PECK DAM AND RESERVOIR			
PRESSURE CONTOURS FOR UPPER PERVIOUS STRATUM AND GRAVEL TOE PROFILE AND SECTION			
DESIGNED BY		DATE	FEB 1961
DRAWN BY		SCALE AS SHOWN	SPEC. NO.
CHECKED BY		DRAWING NUMBER	
APPROVED BY			
CHIEF ENG. DISTRICT			
CHIEF FOR. BRANCH			
APPROVED			
COL. G. A. DISTRICT ENGINEER		ENGINEER	

2

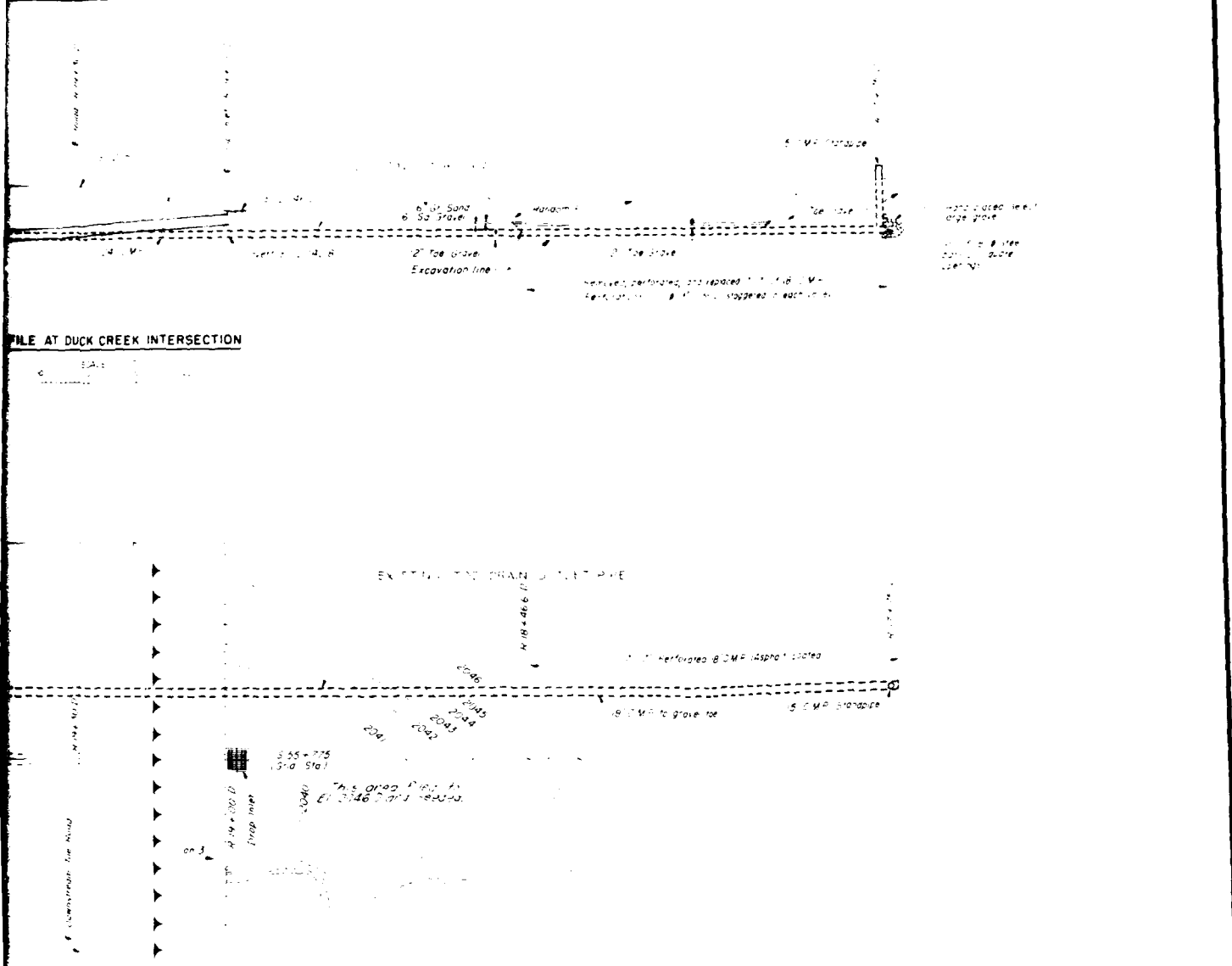


Note: Under no circumstances shall the depth of excavation be less than 2'.

PROFILE AT DUCK CREEK INTERSECTION



PLAN AT DUCK CREEK INTERSECTION



PILE AT DUCK CREEK INTERSECTION

CREEK INTERSECTION

SCALE

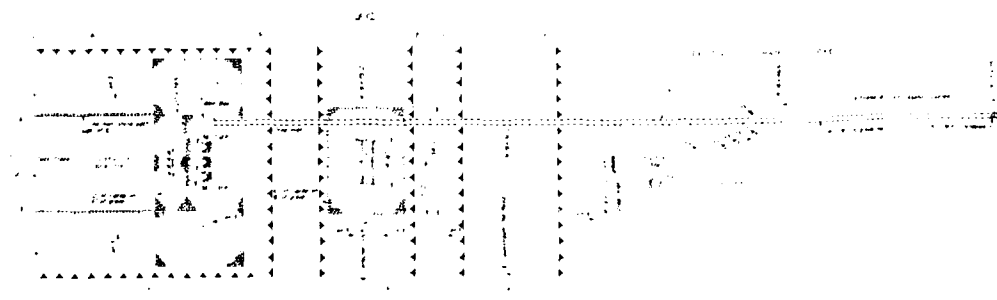
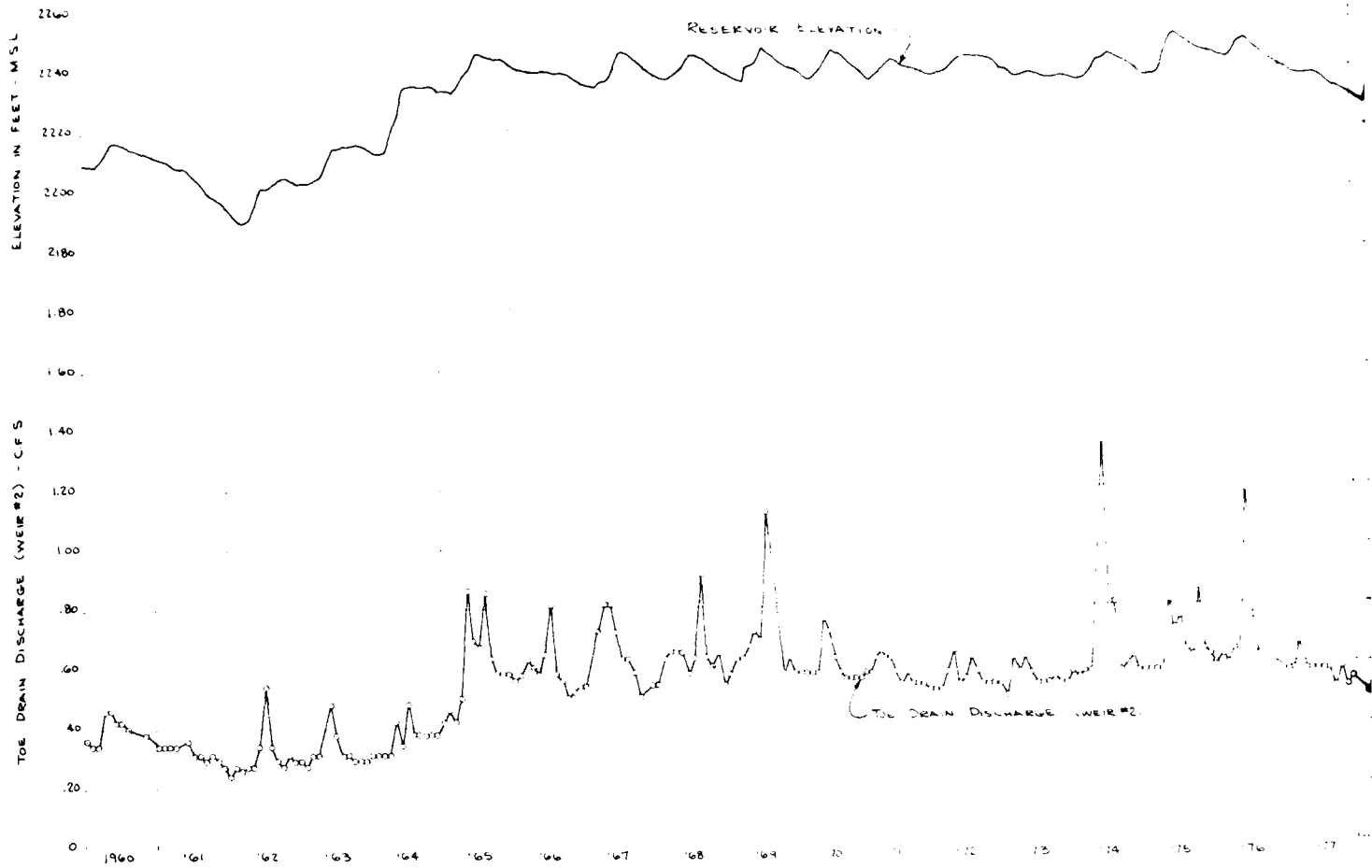
NOTE

- 1. See original contract drawing No R296 930-11
- 2. General notes on drawings for toe drain outlet pipe is shown on Plate 1

THIS DRAWING HAS BEEN REDUCED TO
 1/4" = 1' SCALE FOR REPRODUCTION

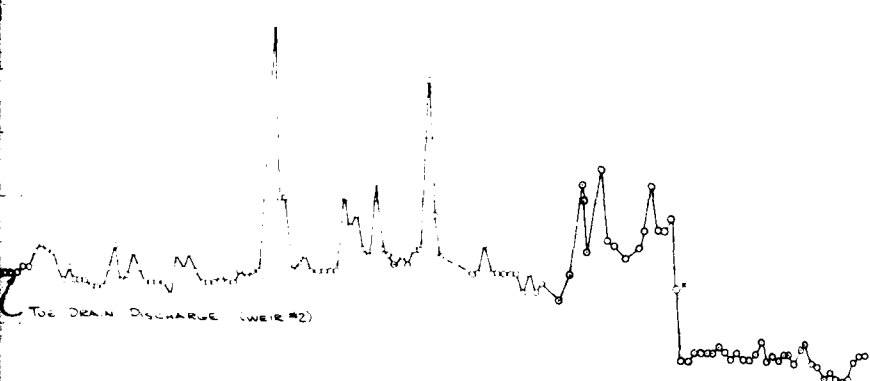
REVISIONS		DATE	DESCRIPTION	MADE	APPROVED
U S ARMY ENGINEER DISTRICT OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA MISSOURI RIVER					
DESIGNED BY: _____ DRAWN BY: _____ CHECKED BY: _____ SUBMITTED BY: _____ CHIEF EMB PDM A&B SEC APPROVED: _____ CHIEF PDM BATTLE'S BRANCH APPROVED: _____		FORT PECK DAM AND RESERVOIR TOE DRAIN REPORT DETAILS OF EXISTING TOE DRAIN OUTLET PIPE AFTER REPAIRS OF SEPTEMBER 1956 APPROVED: _____ DATE: FEB 1957 CHIEF ENGINEERING DIVISION SCALE AS SHOWN SPEC NO. _____ DRAWING NUMBER _____			

7



PLAN AT DUCK CREEK INTERSECTION

* We
ber
Ret



TOE DRAIN DISCHARGE (WEIR #2)

1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988

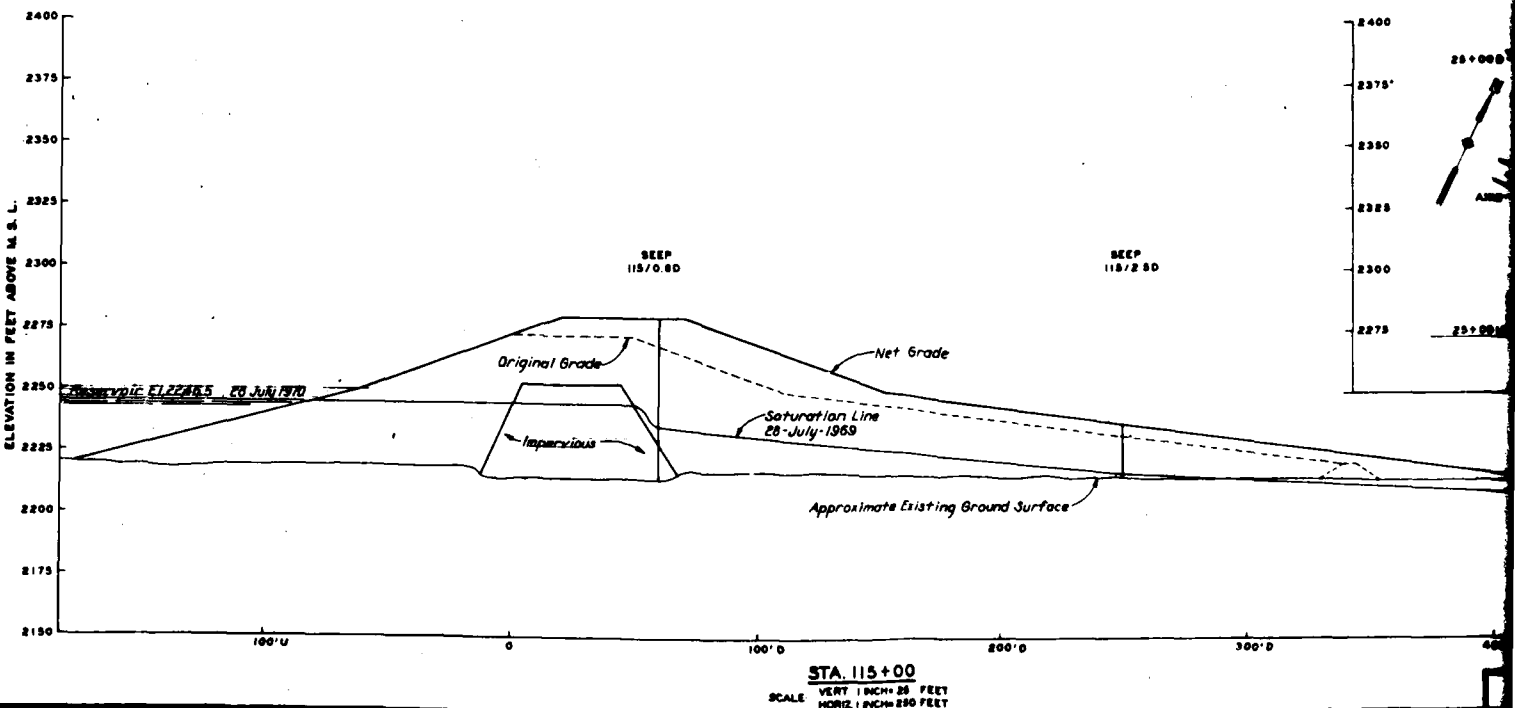
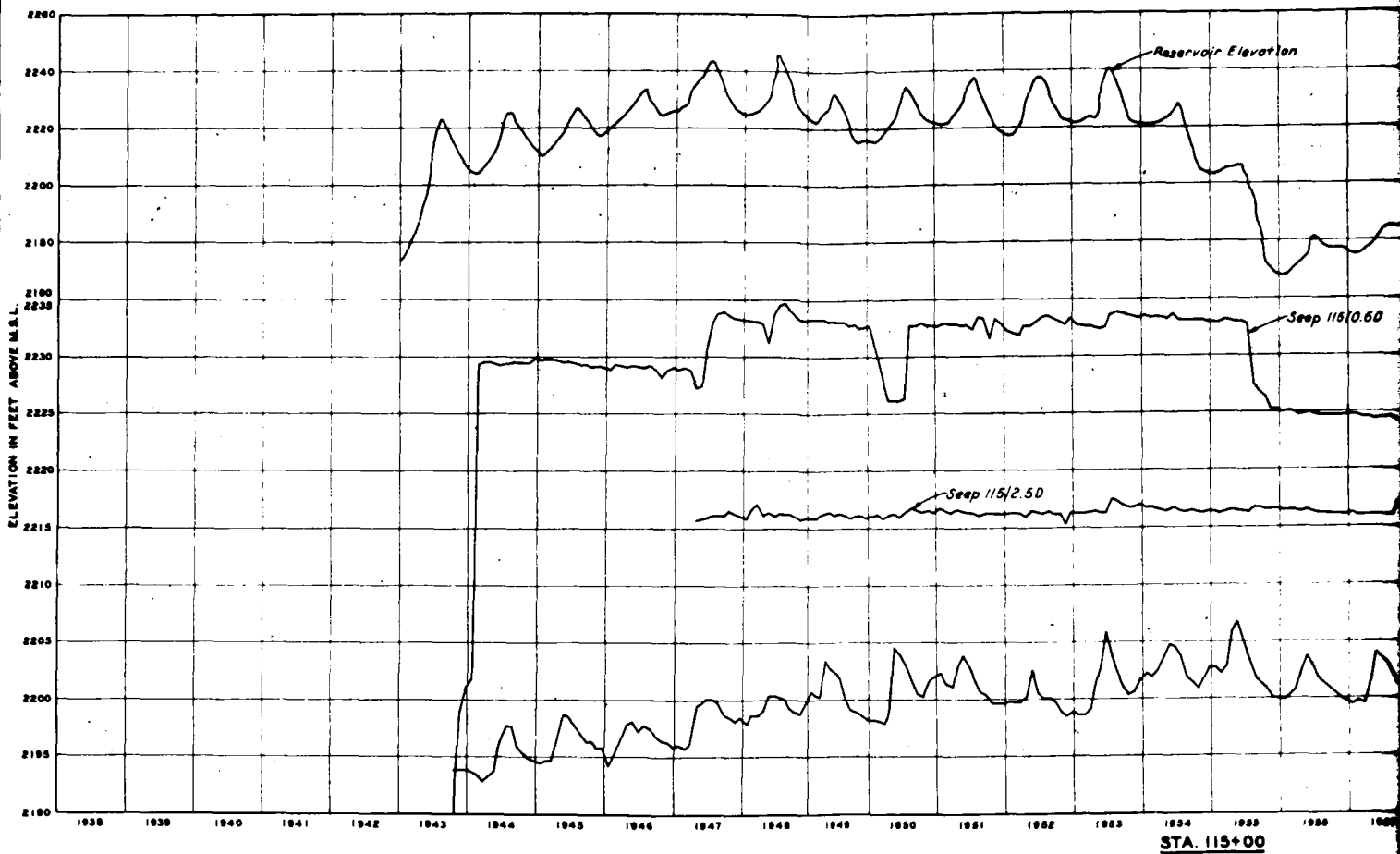
*Weir for defective gate due to
 damage caused by vibration
 Re-calibrated Fall 1979

THIS DRAWING HAS BEEN REDUCED TO
 THREE-FIFTHS THE ORIGINAL SCALE.

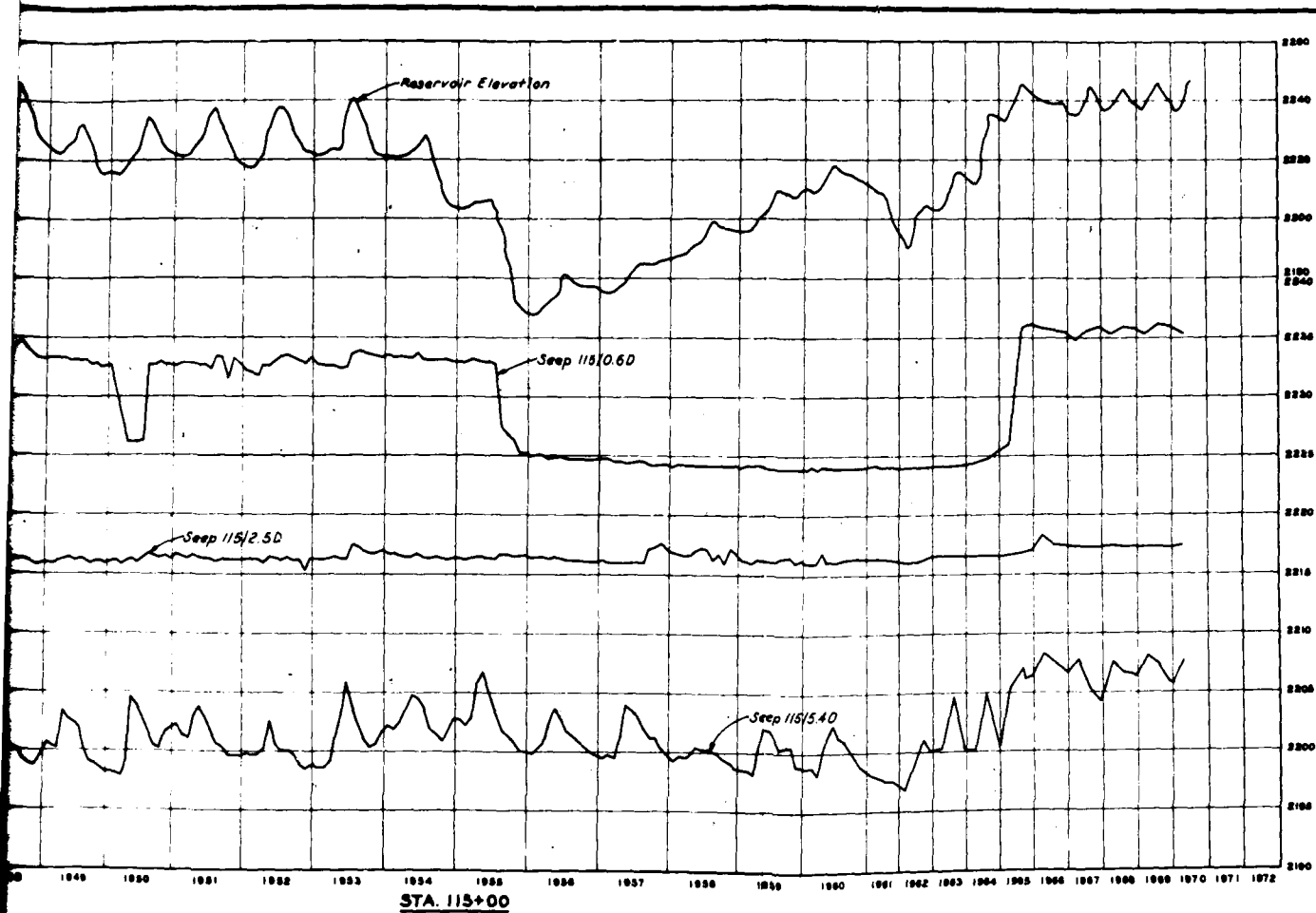
DATE	DESCRIPTION	MADE	APPROVED
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY:		MISSOURI RIVER FORT PECK DAM	
DRAWN BY:			
CHECKED BY:		TOE DRAIN DISCHARGE (SINCE 1960)	
SUBMITTED BY:			
ENGINEER	SECTION	APPROVED	DATE
ENGINEER	SECTION	CHIEF ENGINEERING DIVISION	DATE
APPROVED		SCALE AS SHOWN	SHEET NO.
SHEET		DRAWING NUMBER	



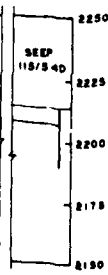
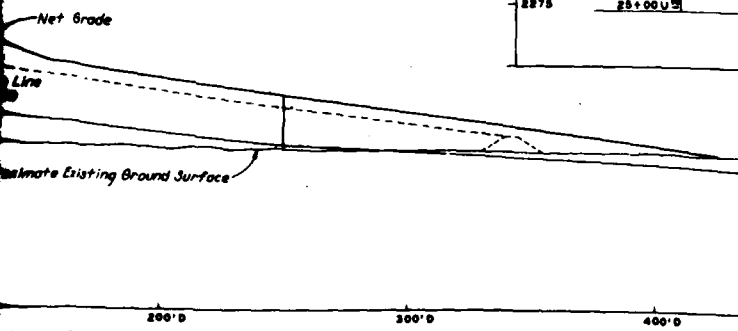
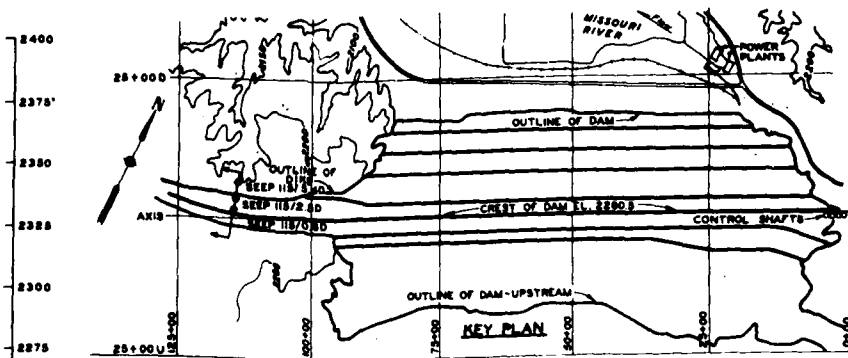
THIS PLAN ACCOMPANIES CONTRACT NO.
 MODIFICATION NO.



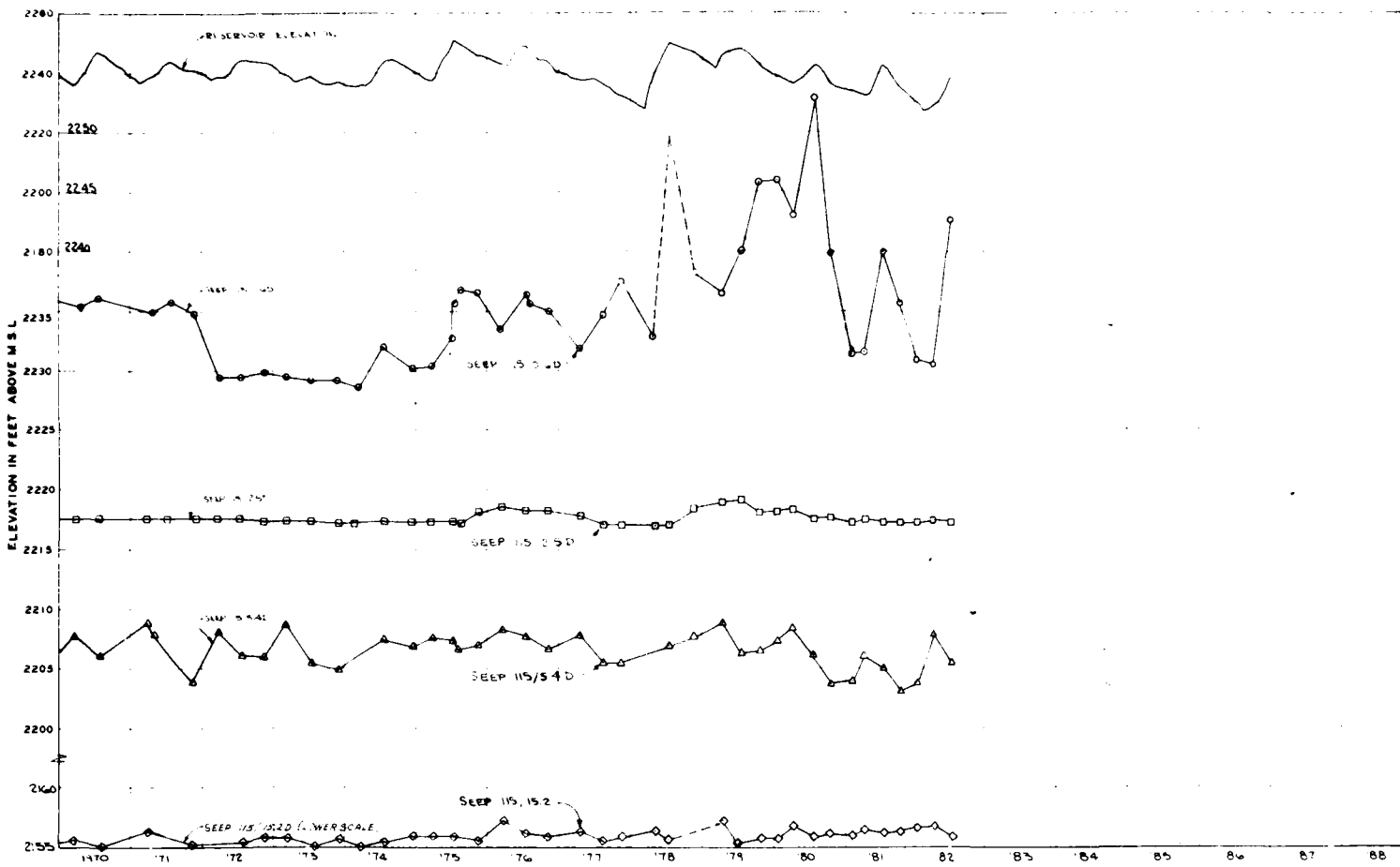
FORT PECK DAM AND RESERVOIR



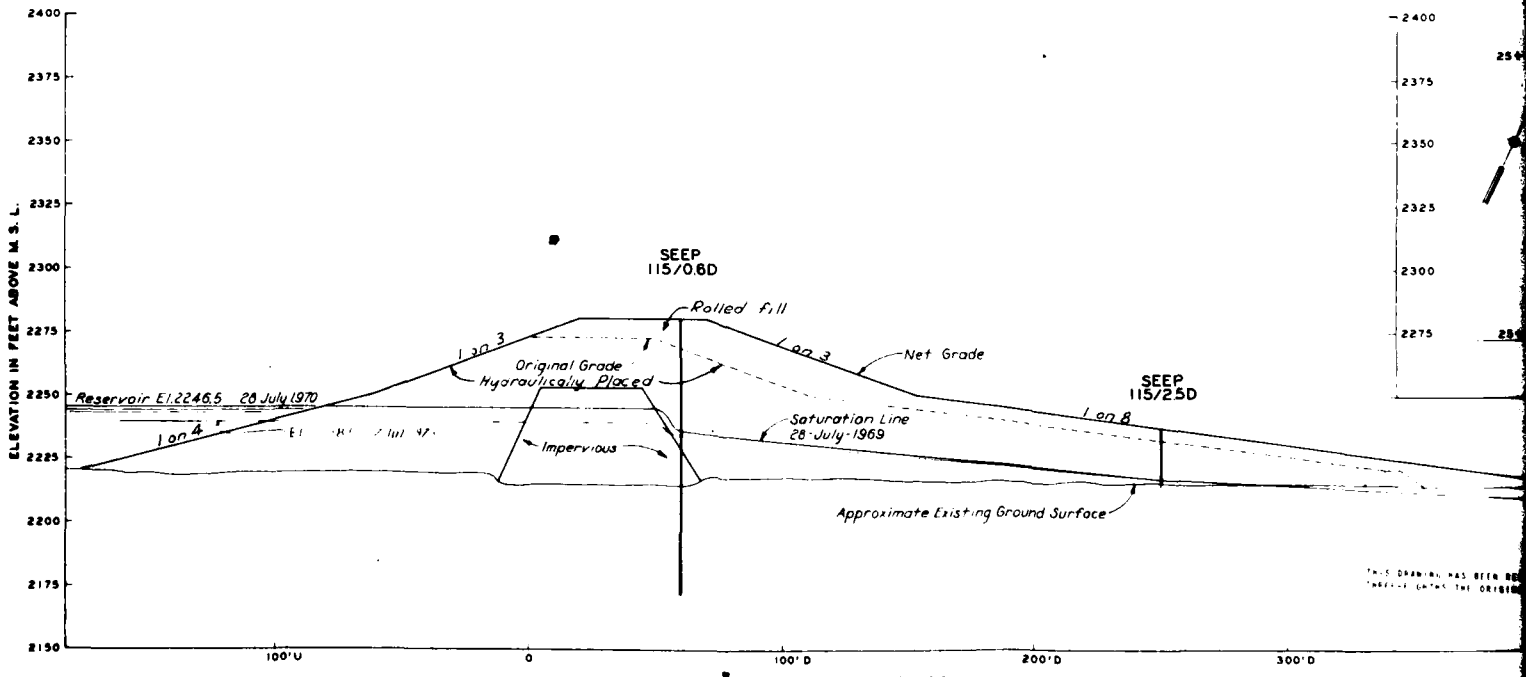
STA. 115+00



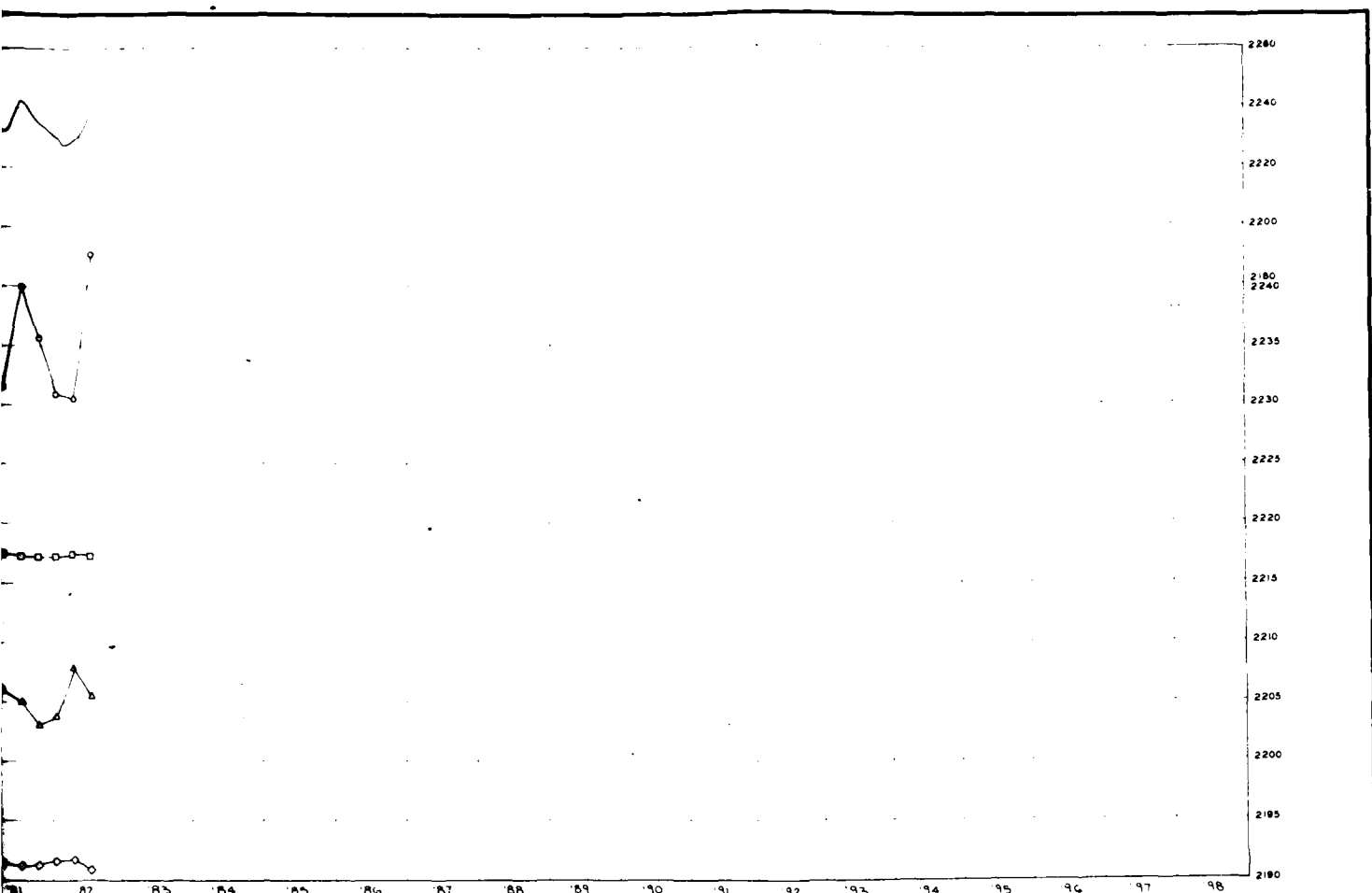
DATE	DESCRIPTION	MADE	APPROV
	REVISION		
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
MISSOURI RIVER FORT PECK LAKE, MONTANA SATURATION LINE OBSERVATIONS STA. 115 + 00			
DESIGNED BY	APPROVED BY	DATE	
DRAWN BY L. M. C.			
CHECKED BY			
SEEP DATA SHEET NUMBER			
APPROVED			
SEEP DATA SHEET NUMBER			
	FIELD AS SHOWN	WELL NO.	
		CHASING NUMBER	



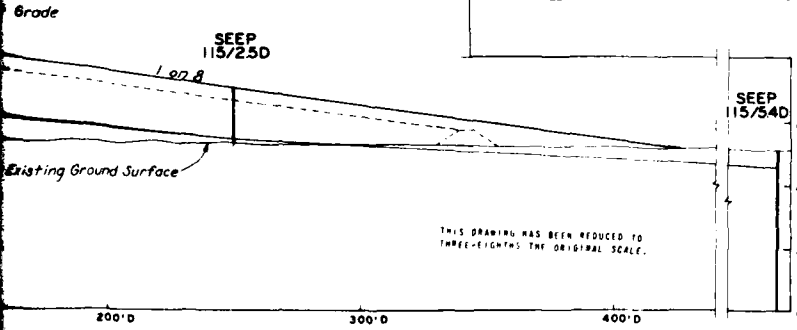
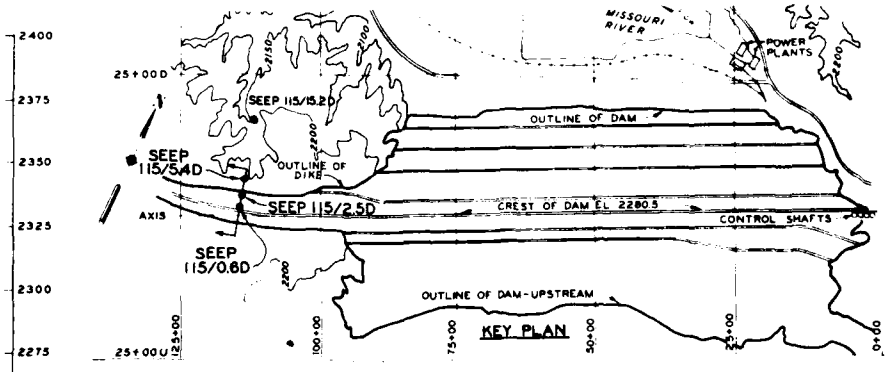
STA. 115+00



THIS DRAWING HAS BEEN RE-
PRODUCED FROM THE ORIGINAL



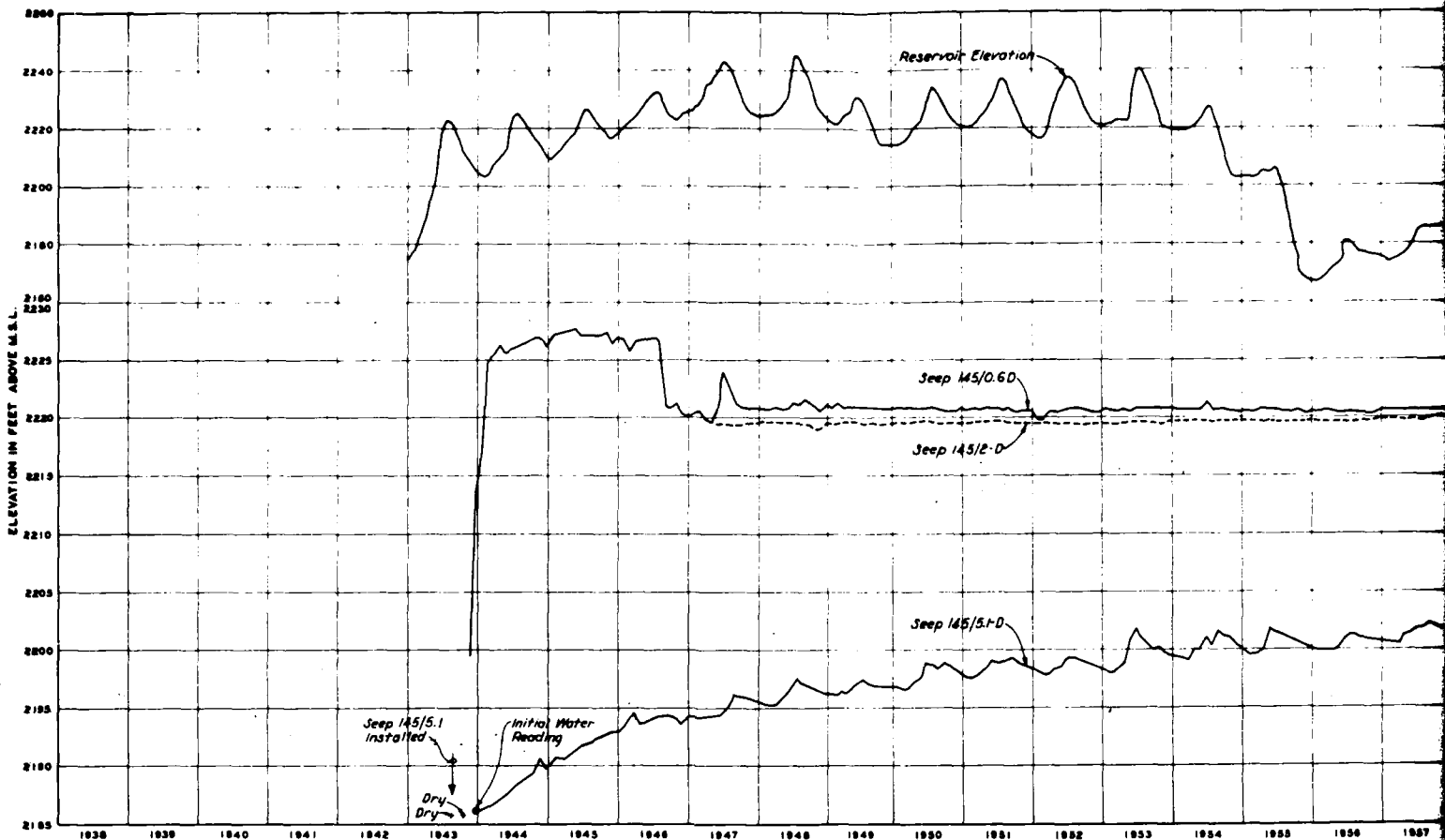
STA. 115+00



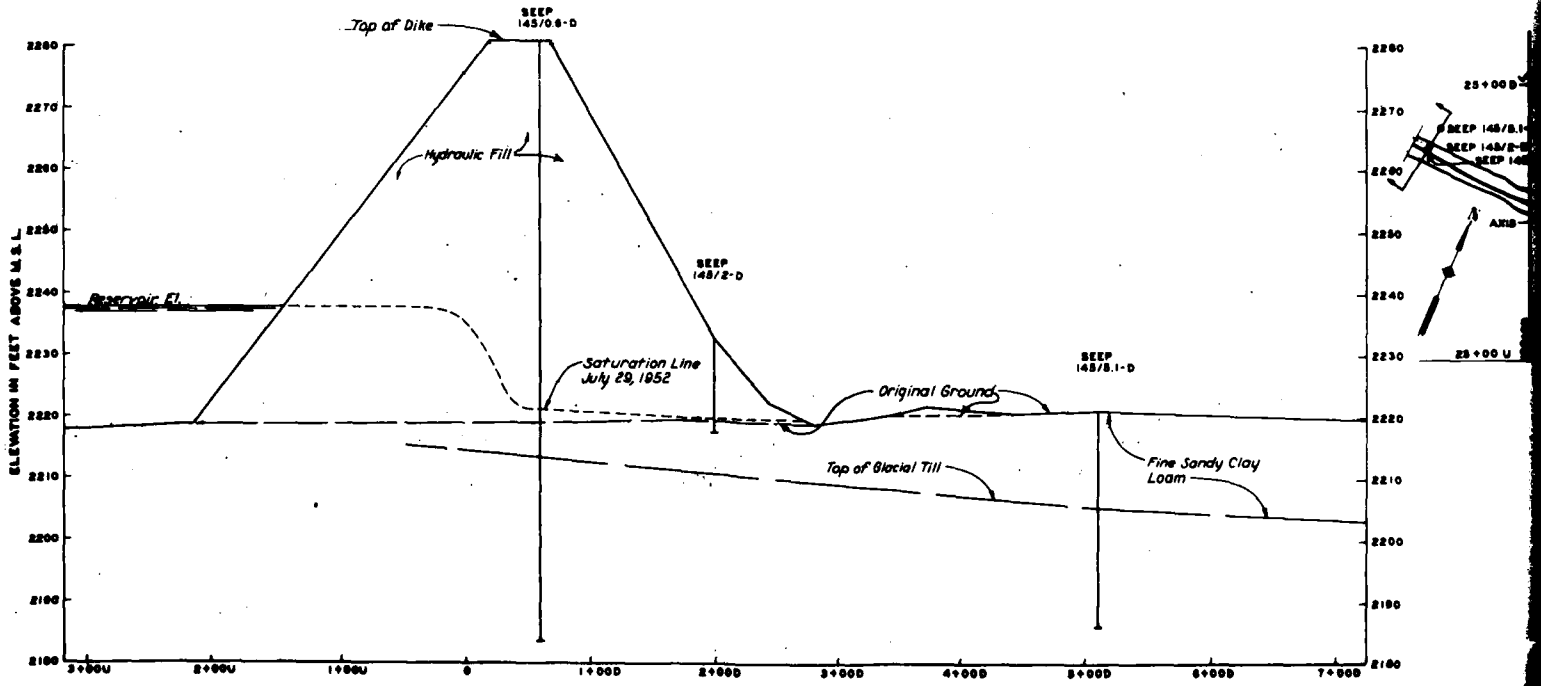
DATE	DESCRIPTION	MADE	APPROD
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
MISSOURI RIVER FORT PECK LAKE, MONTANA SATURATION LINE OBSERVATIONS STA. 115 + 00			
DESIGNED BY:	APPROVED:		
DRAWN BY: L. M. G.	DATE:		
CHECKED BY:	FIELD AS SHOWN		
SEEP EMB (DN&S) REVIEW:	SHEET NO.		
SEEP FDN & MTL'S REVIEW:	TOTAL SHEETS		
APPROVED:	PROJECT NUMBER		
U. S. & L. SURVEY ENGINEER			

THIS PLAN ACCOMPANIES CONTRACT NO. _____
MODIFICATION NO. _____

2



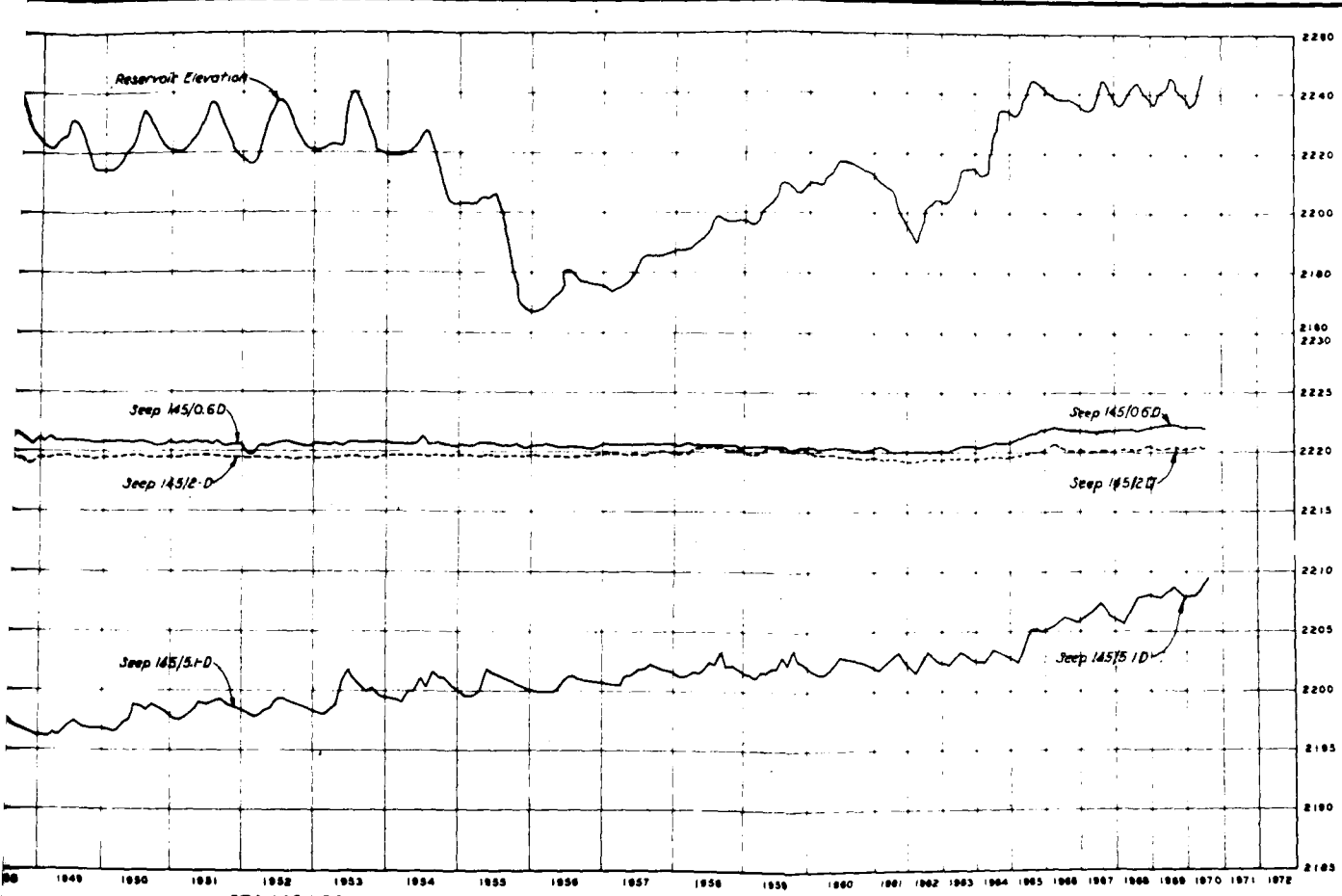
STA. 145+00



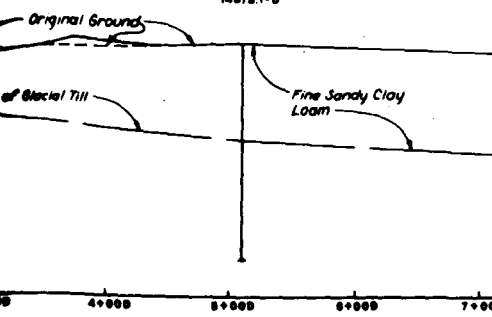
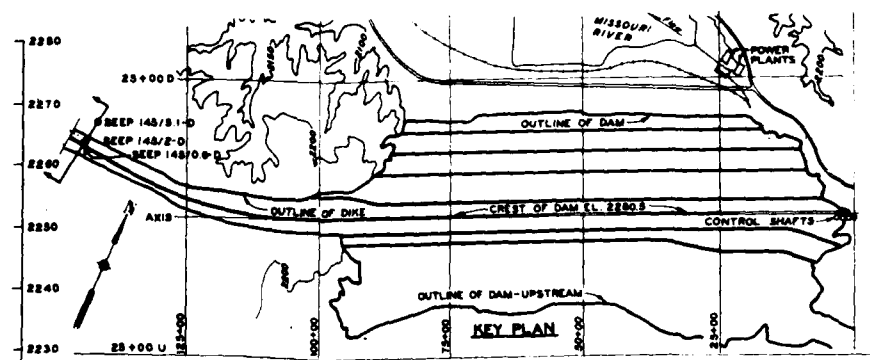
STA. 145+00

SCALE: VERT. 1 INCH = 10 FEET
HORIZ. 1 INCH = 50 FEET

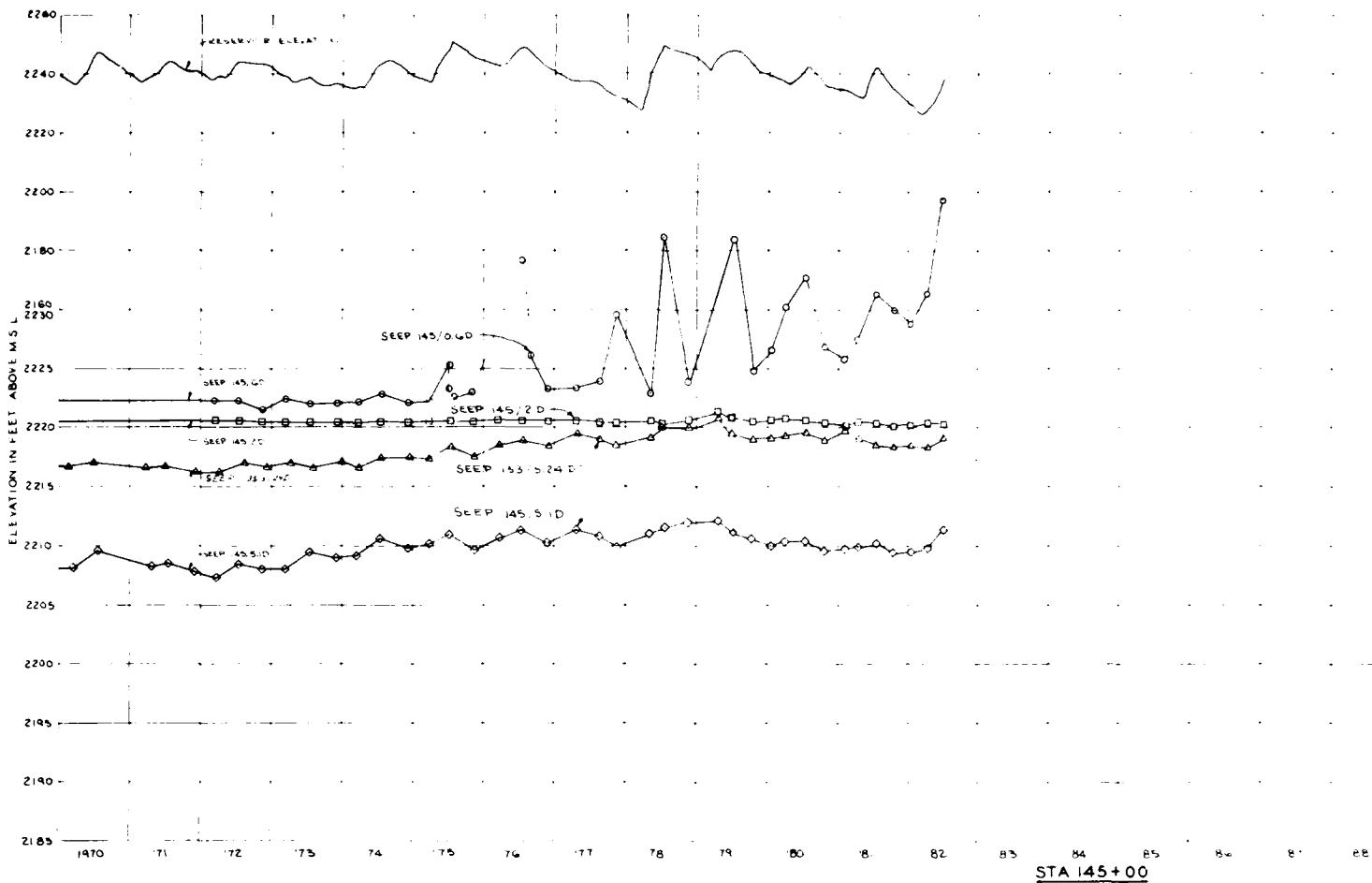
FORT PECK DAM AND RESERVOIR



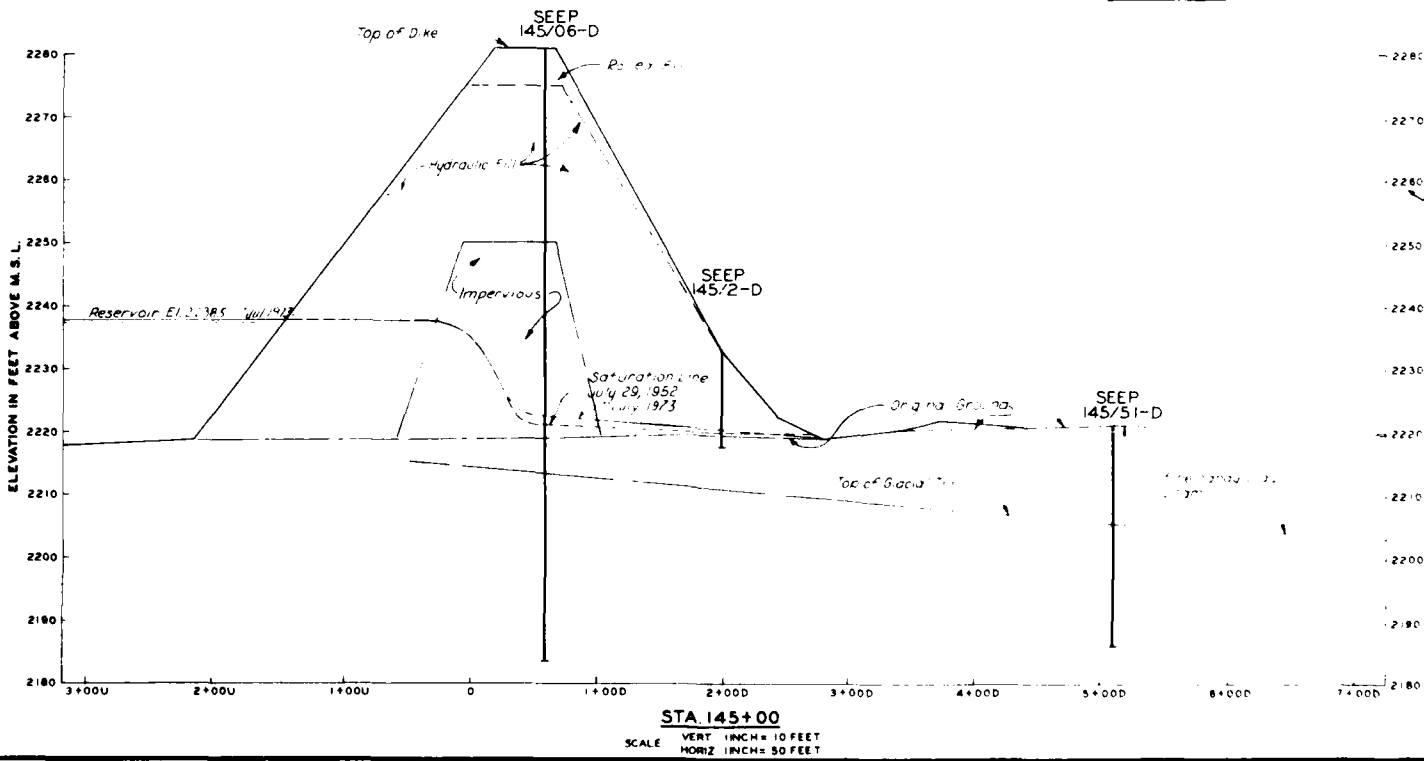
STA. 145+00



DATE		REVISIONS	DATE	APPROV
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA				
DESIGNED BY: GWA		MISSOURI RIVER FORT PECK LAKE, MONTANA		
CHECKED BY: LMG		SATURATION LINE OBSERVATIONS STA. 145+00		
DRAWN BY: GWA		APPROVED:		
REVIEWED BY:		DATE:		
BY: F. H. L. (S. S. S. S. S.)		SCALE AS SHOWN:		
DATE:		SHEET NO.:		
PROJECT:		CONTRACT NO.:		

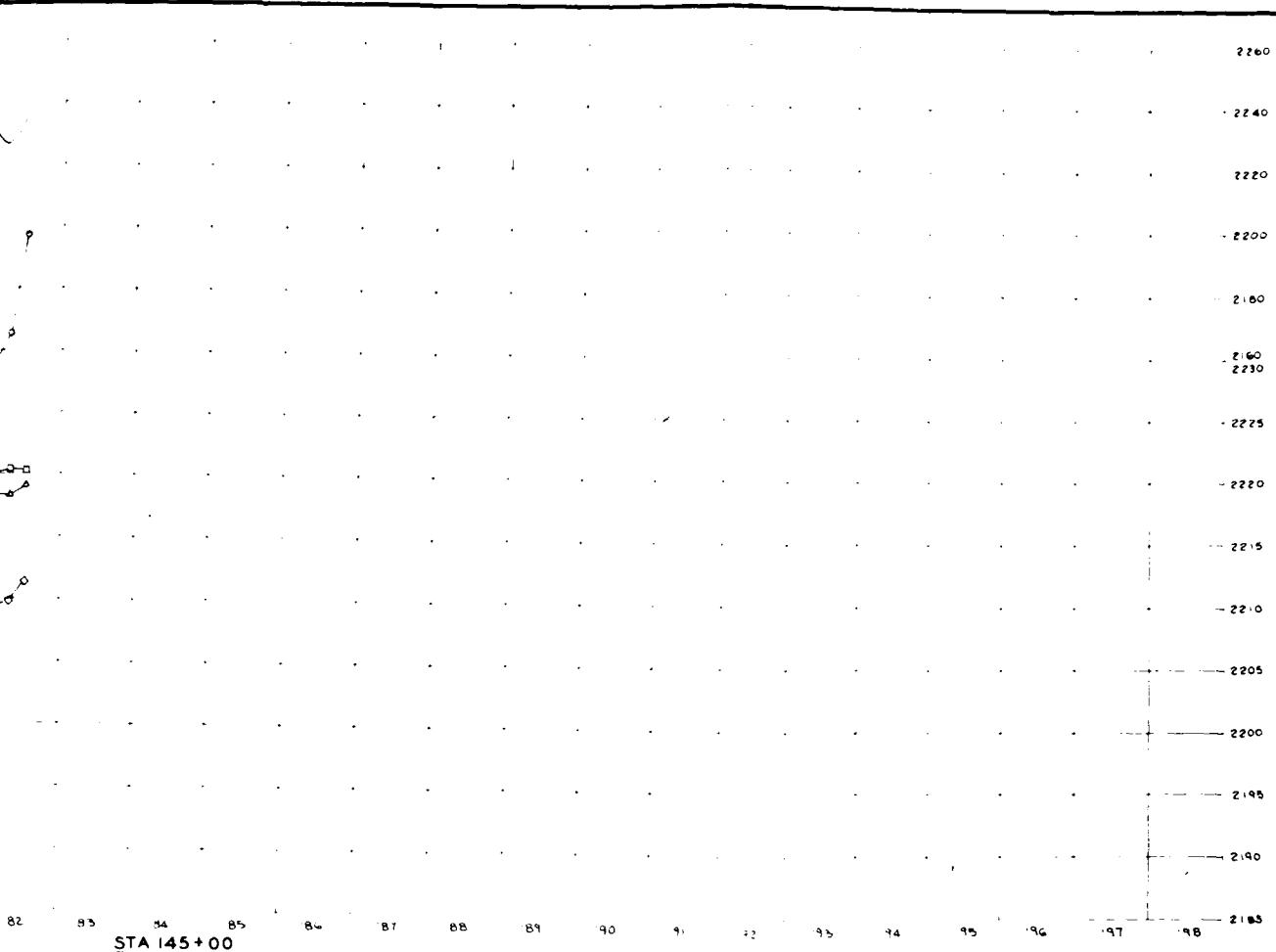


STA 145+00

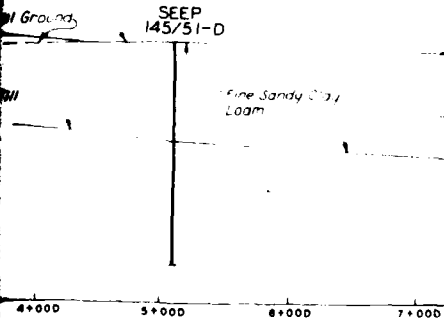
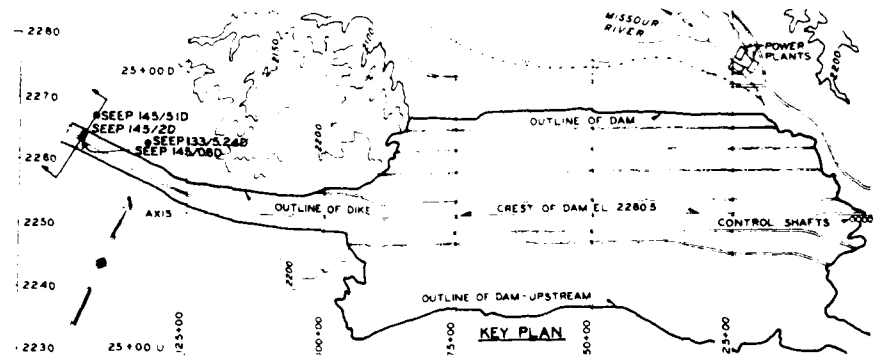


STA 145+00

SCALE VERT. 1 INCH = 10 FEET
HORIZ. 1 INCH = 50 FEET



STA 145+00

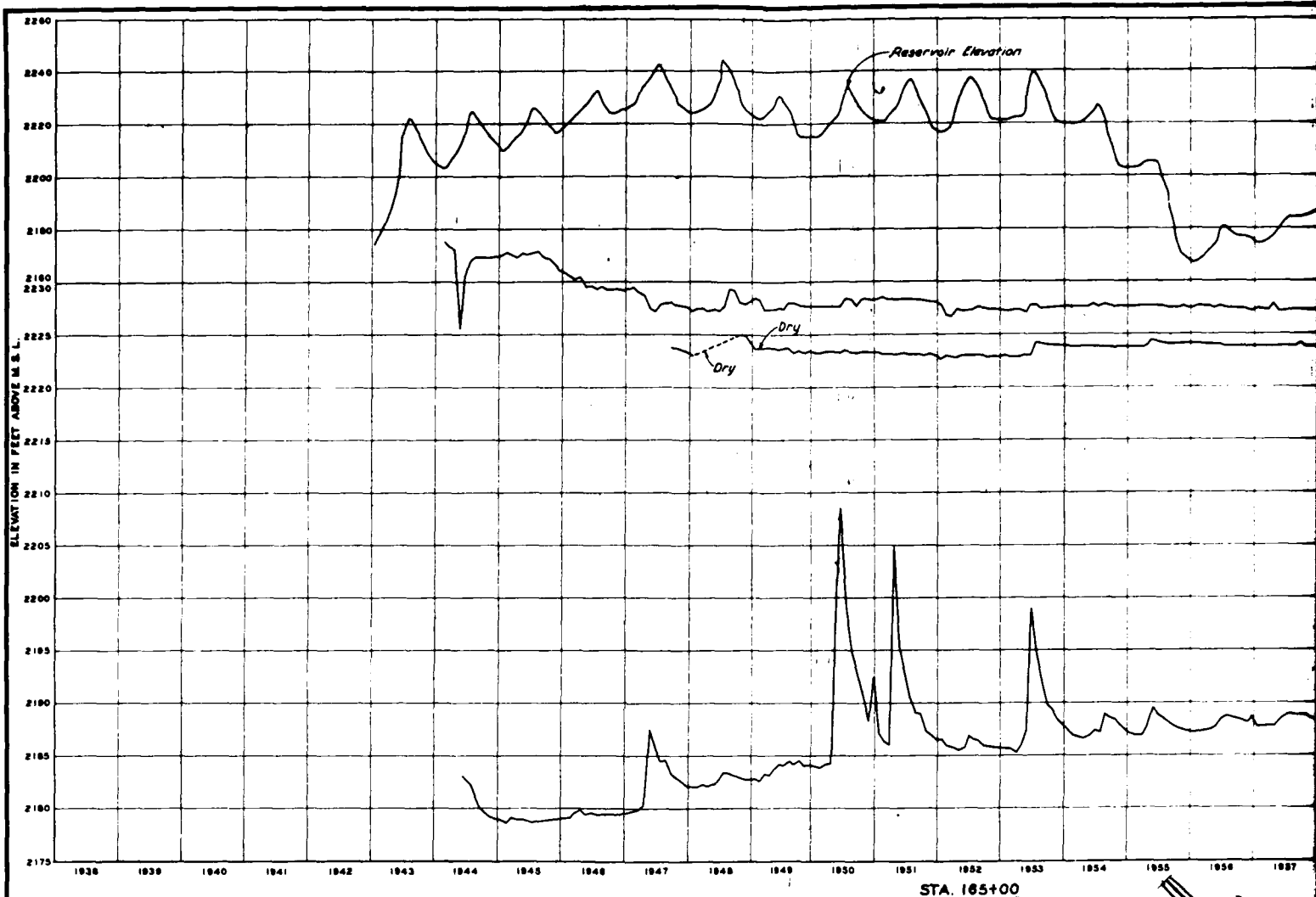


DATE	DESCRIPTION	MADE	APPROV
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
MISSOURI RIVER FORT PECK LAKE, MONTANA			
SATURATION LINE OBSERVATIONS STA. 145+00			
DESIGNED BY: C. W. A.	DRAWN BY: C. W. A.		
CHECKED BY:	APPROVED BY:		
BY: EMB/ST/15/ST/15	APPROVED:	DATE:	
BY: EMB/ST/15/ST/15	APPROVED:	DATE:	
BY: EMB/ST/15/ST/15	APPROVED:	DATE:	
BY: EMB/ST/15/ST/15	APPROVED:	DATE:	

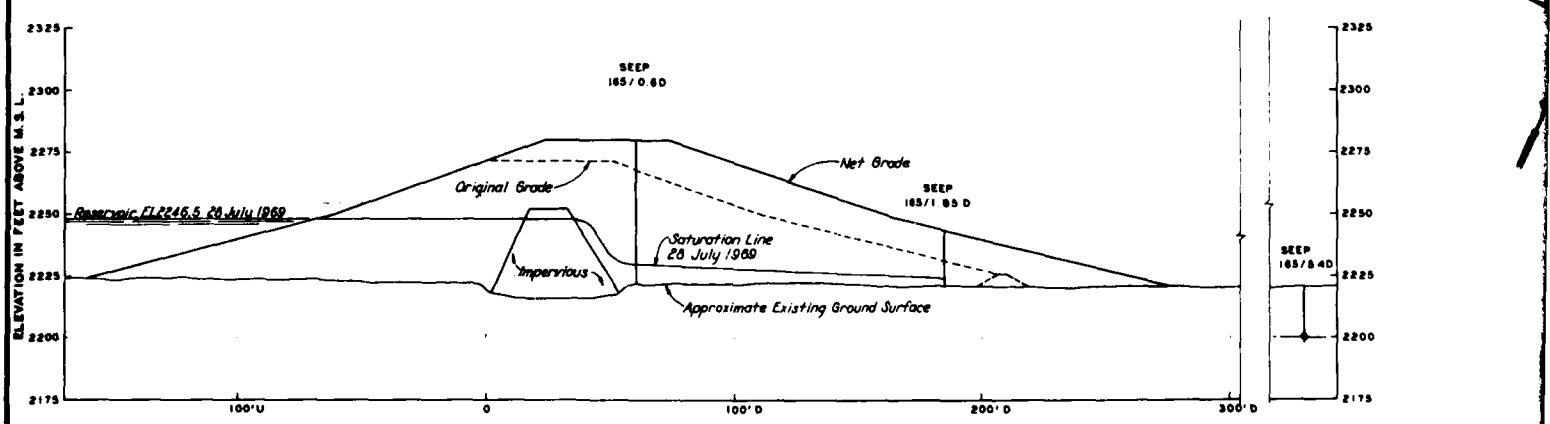


THIS PLAN ACCOMPANIES CONTRACT NO. _____
MODIFICATION NO. _____

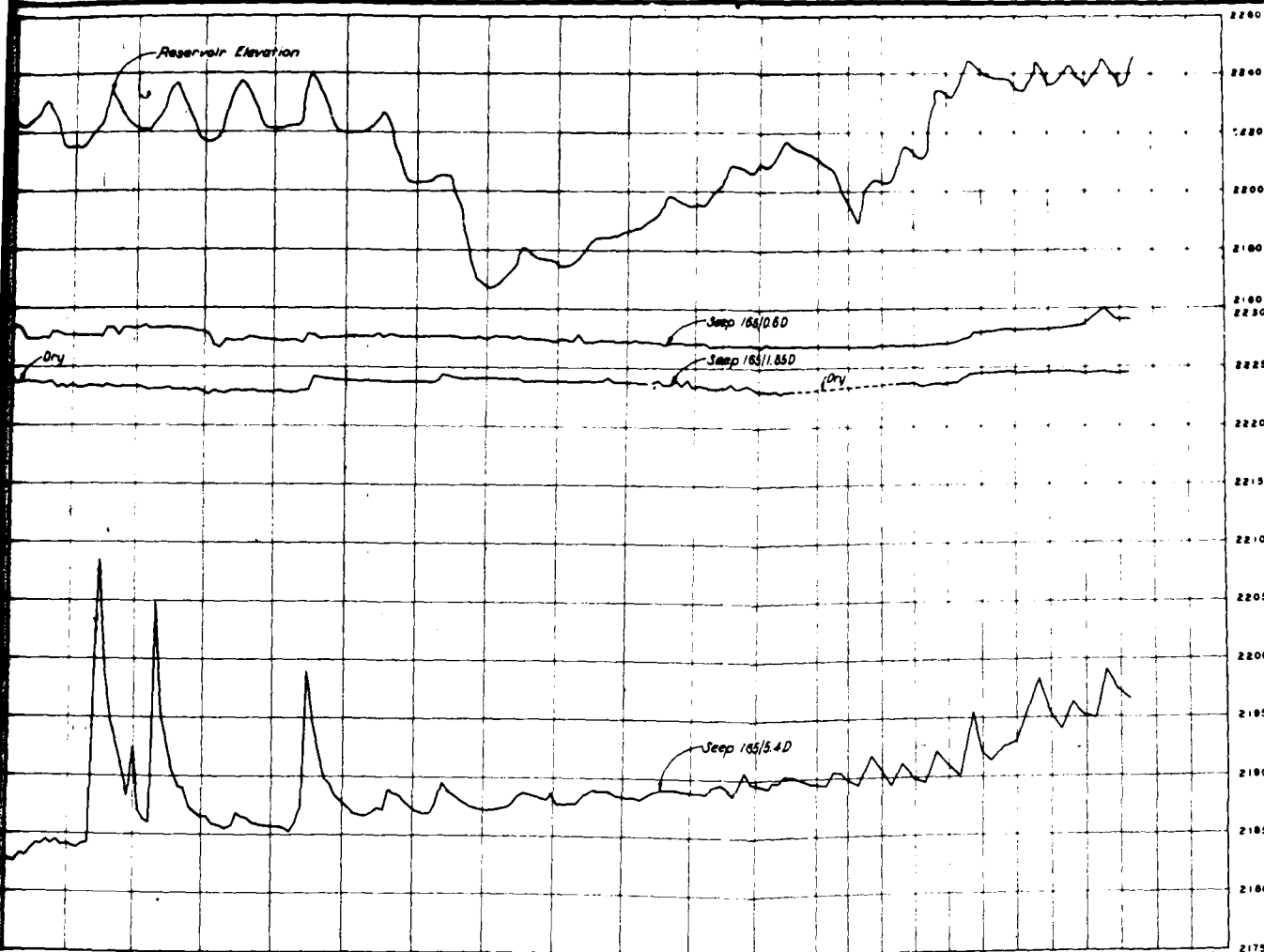
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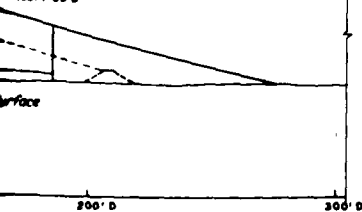
STA. 165+00



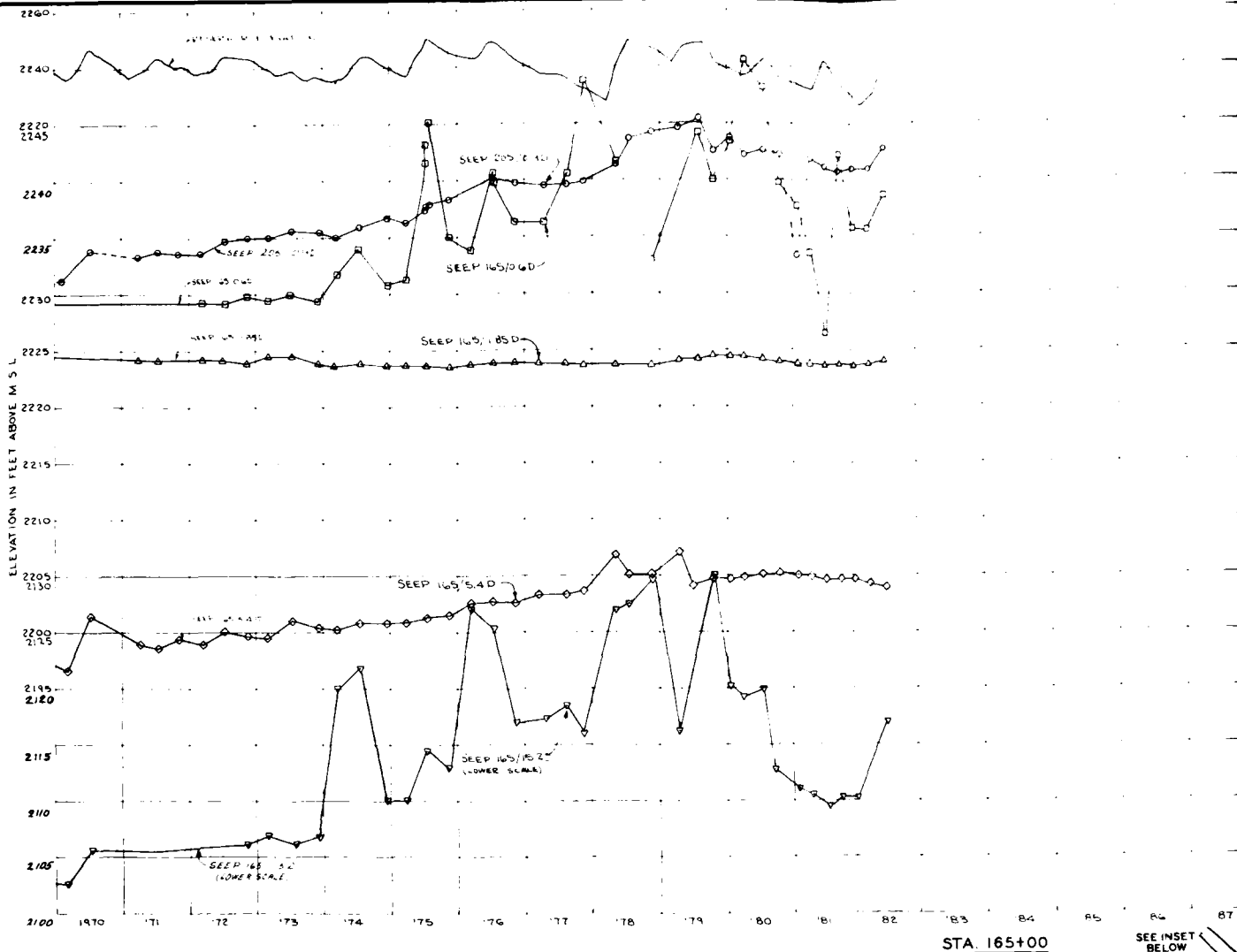
STA. 165+00
SCALE: VERT. 1 INCH = 25 FEET
HORIZ. 1 INCH = 25 FEET



STA. 165+00

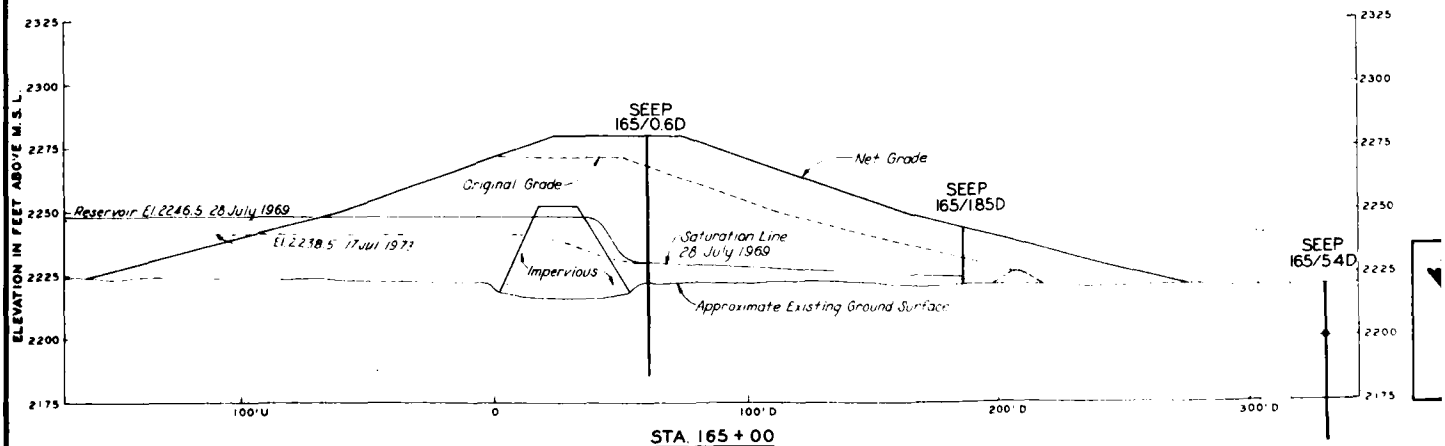


DATE	REVISIONS	MADE	APPROV
U. S. ARMY ENGINEER DISTRICT, OMAHA GROUP OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY: R. J. M. DRAWN BY: L. M. C. CHECKED BY: D. W. A. PROJECT NO.: SHEET NO.:		MISSOURI RIVER FORT PECK LAKE, MONTANA SATURATION LINE OBSERVATIONS STA. 165+00	
APPROVED:	DATE:	SCALE AS SHOWN:	SHEET NO.:
DESIGNED BY:	DATE:	SCALE AS SHOWN:	SHEET NO.:



STA. 165+00

SEE INSET BELOW



STA. 165+00

SCALE: VERT 1 INCH = 25 FEET
HORIZ 1 INCH = 25 FEET

THIS DRAWING HAS BEEN REEVALUATED AND REDESIGNED TO REPRESENT THE ORIGINAL

2260

2240

2220

2200

2180

2160

2150

2225

2220

2215

2210

2205

2200

2195

2190

2185

2180

STA. 165+00

SEE INSET BELOW

SEEP 165/15.2D

SEEP 165/5.4D
SEEP 165/18.5D
SEEP 165/0.0D

25+00D

MISSOURI RIVER

POWER PLANTS

OUTLINE OF DAM

AXIS

CREST OF DAM EL. 2280.5

CONTROL SHAFTS

OUTLINE OF DAM-UPSTREAM

KEY PLAN

SEEP 165/18.5D

SEEP 165/5.4D

SEEP 205/0.0D

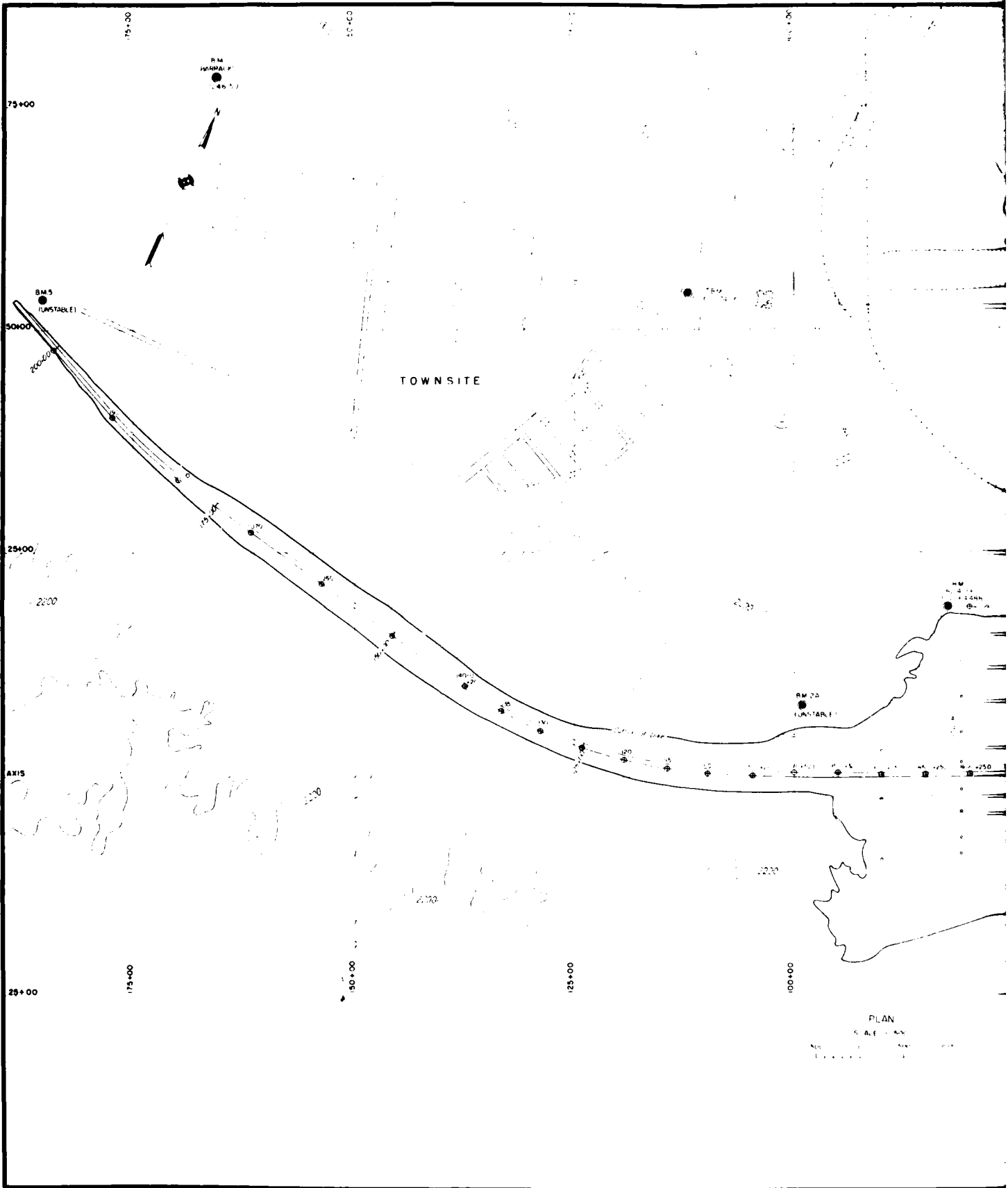
INSET



THIS DRAWING HAS BEEN REDUCED TO THREE-EIGHTHS THE ORIGINAL SCALE.

THIS PLAN ACCOMPANIES CONTRACT NO. MODIFICATION NO.

DATE	DESCRIPTION	MADE	APPROVED
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
MISSOURI RIVER FORT PECK LAKE, MONTANA			
SATURATION LINE OBSERVATIONS STA 165+00			
DESIGNED BY: C. M. T.	APPROVED:	DATE:	
DRAWN BY: L. M. C.	SEAL AS SHOWN:	SPEC. NO.:	
CHECKED BY: T. A. A.	ENGINEER:	DATE:	
REVIEWED BY:	APPROVED:	DATE:	
SEEP (NO. ON MASS SECTION)	APPROVED:	DATE:	
SEEP CONTRACT'S NAME:	APPROVED:	DATE:	
SEEP:	APPROVED:	DATE:	
SEEP (NO. ON MASS SECTION)	APPROVED:	DATE:	



75+00 75+00

BM 5
UNSTABLE

TOWNSITE

BM 5
UNSTABLE

50+00

25+00

AXIS

20+00

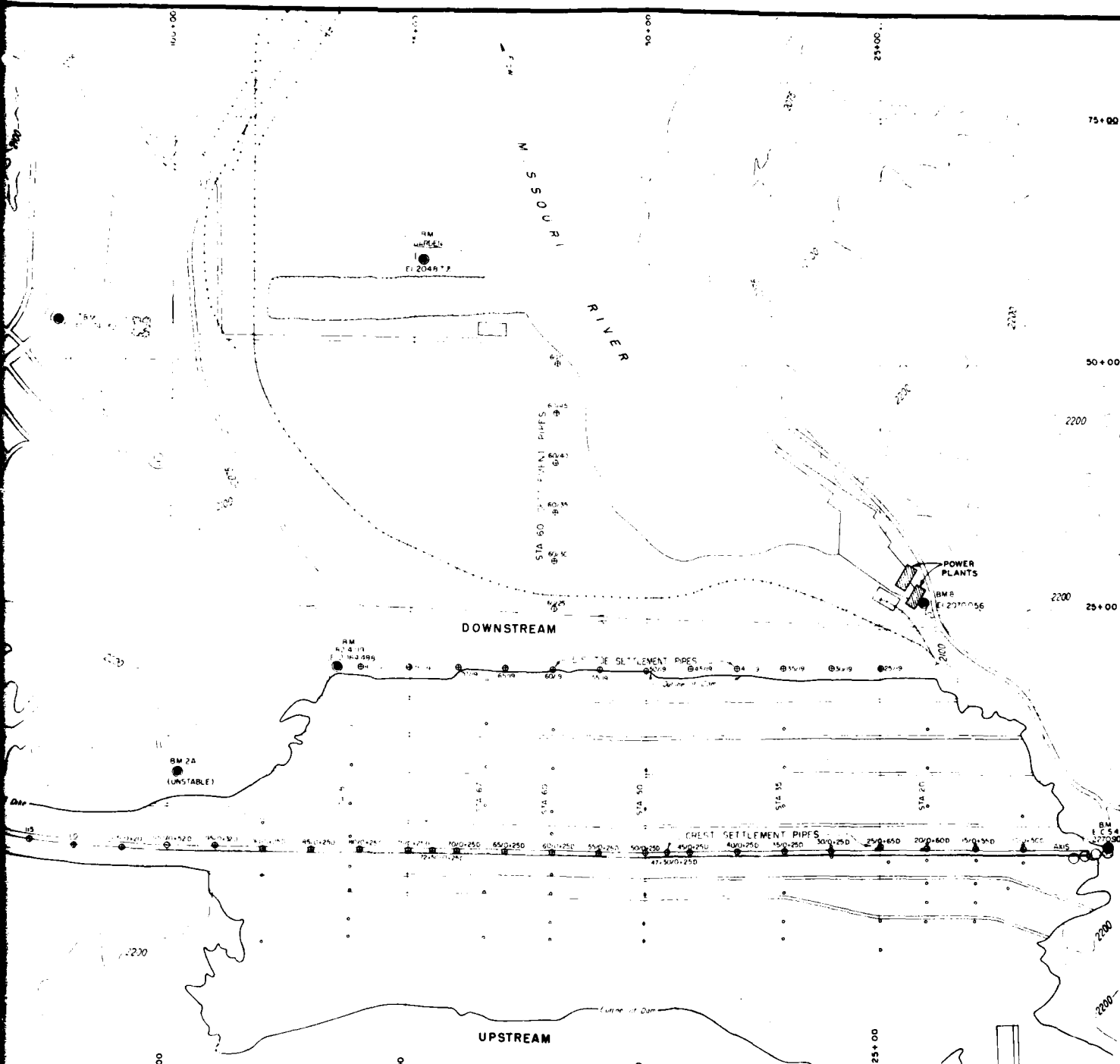
175+00

150+00

125+00

100+00

PLAN
SCALE 1:500



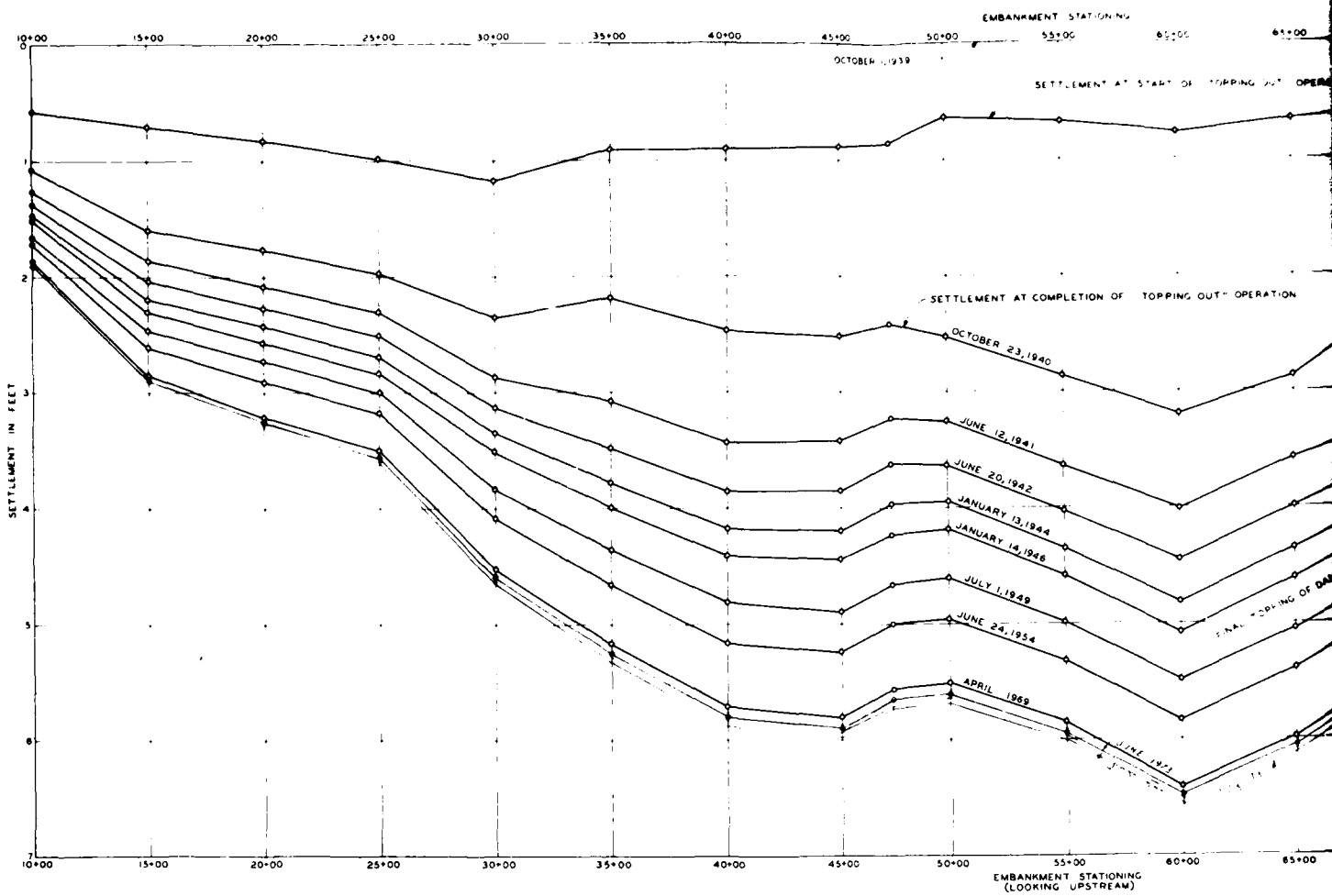
PLAN
SCALE 1/500

- LEGEND**
- Bench Mark
 - Settlement Pipe
 - Subsidence Pipe

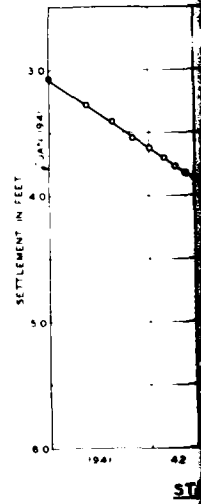
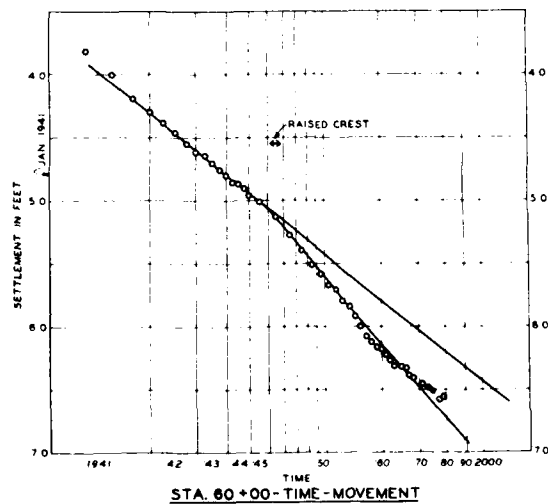
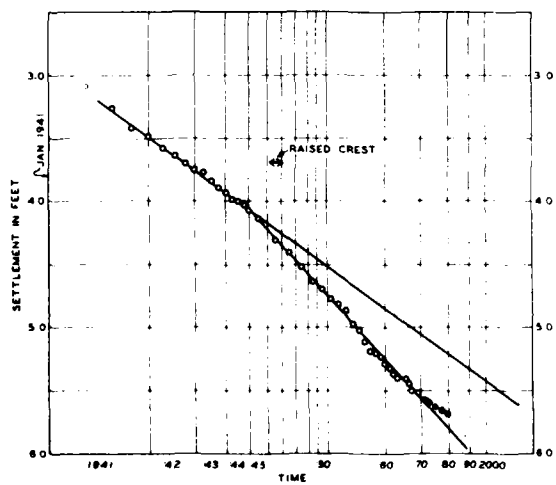
THIS DRAWING HAS BEEN REDUCED TO
THREE-EIGHTHS THE ORIGINAL SCALE

2

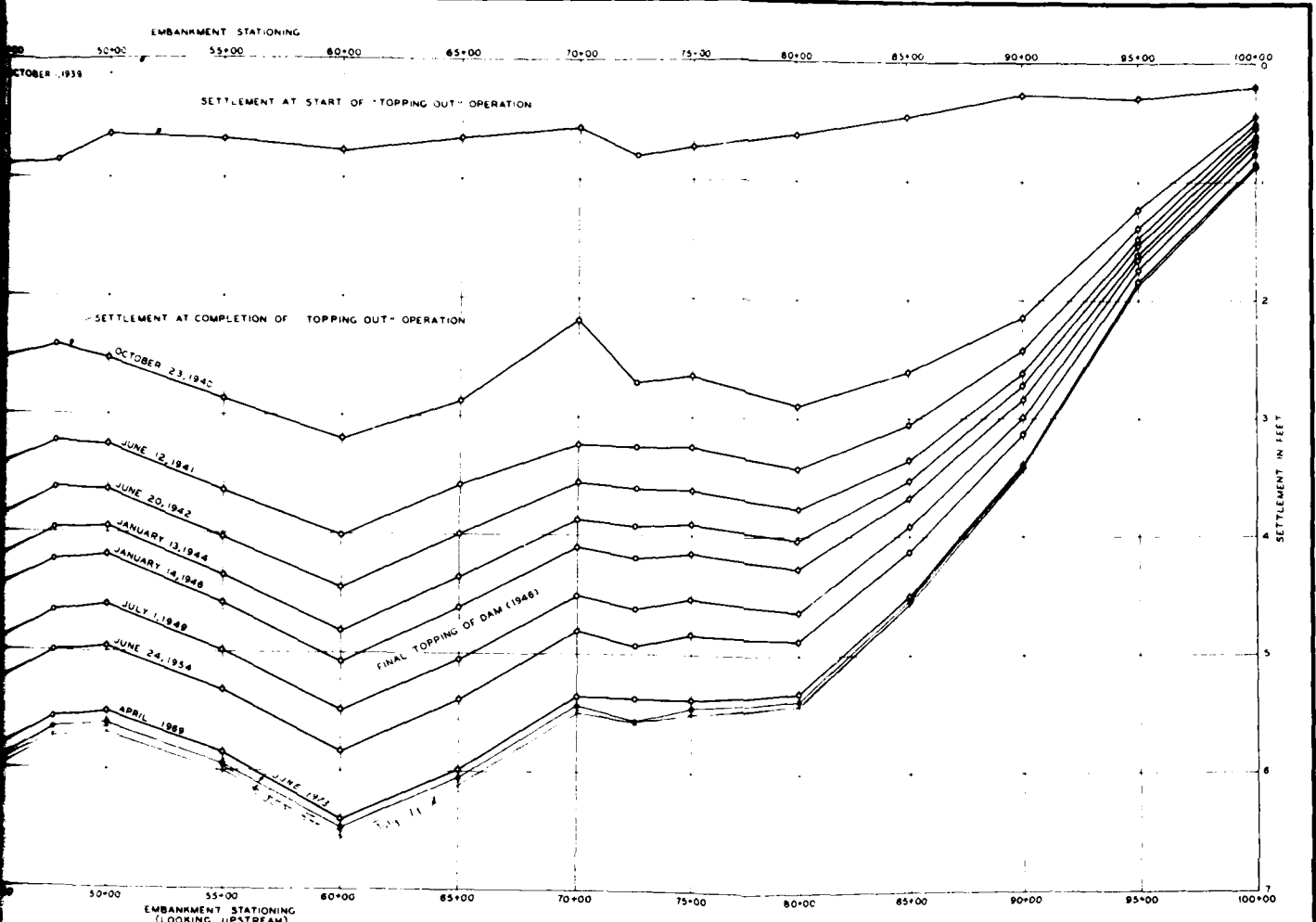
REV	DATE	REVISIONS INITIALED BY	BY	CHKD	APP
CORPS OF ENGINEERS, U. S. ARMY OFFICE OF THE DISTRICT ENGINEER COLUMBIA DISTRICT RIVERSIDE, N. C.					
MISSOURI RIVER FORT PECK DAM LOCATION OF BENCHMARKS AND SETTLEMENT AND SUBSIDENCE PIPES					
DESIGNED BY					
DRAWN BY					
TRACED BY					
CHECKED BY					
APPROVED BY					
DATE	JUNE 1947		SCALE	AS SHOWN	SHEET NO.



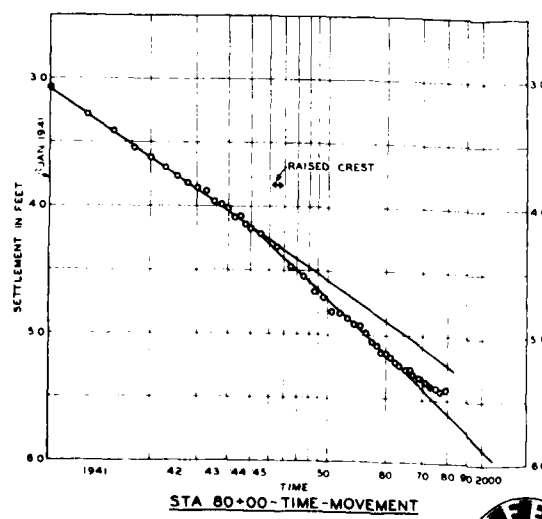
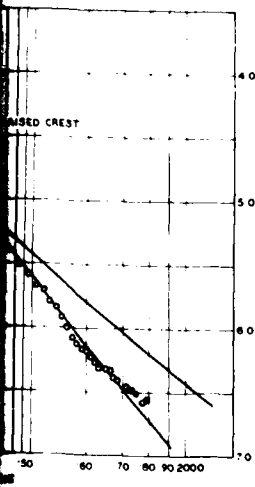
RECORD OF CREST SETTLEMENT SINCE SEPTEMBER 1939



ST



RECORD OF CREST SETTLEMENT SINCE SEPTEMBER 1939

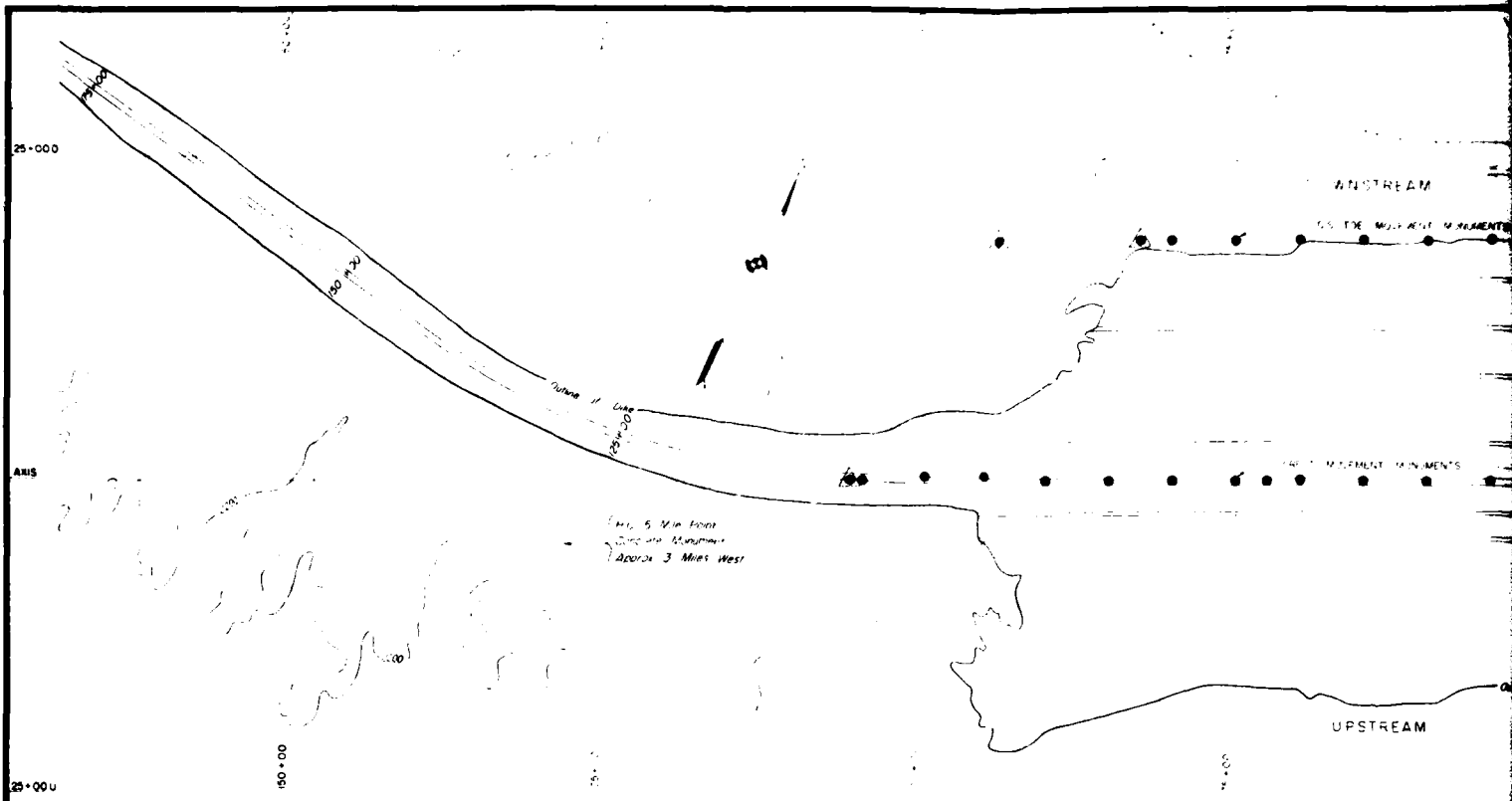


THIS DRAWING HAS BEEN REDUCED TO THREE-EIGHTHS THE ORIGINAL SCALE.

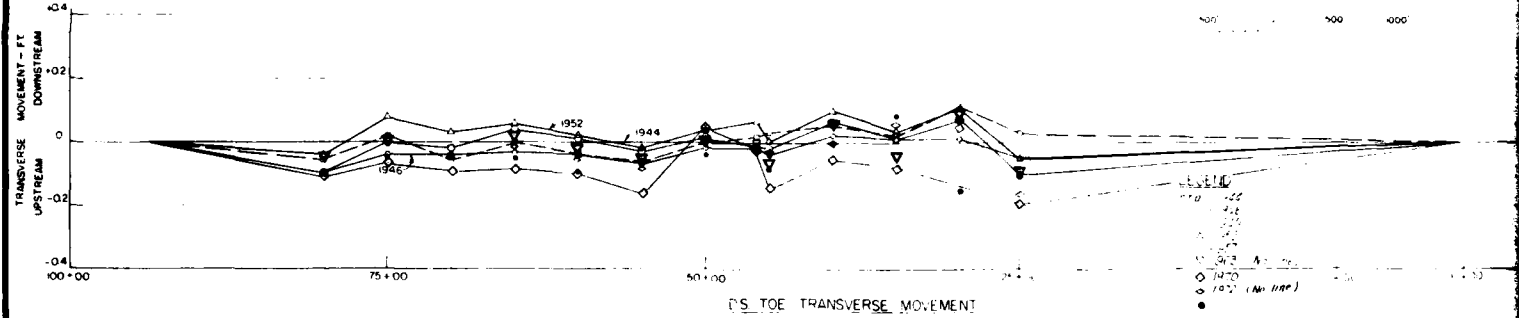
DATE	DESCRIPTION	MADE	APPROV
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY: C.V.J.	MISSOURI RIVER FORT PECK DAM AND RESERVOIR		
DRAWN BY: C.W.D.			
TRACED BY:			
CHECKED BY: D.W.A.			
ENGINEERED BY: W.M.P. FOR ASSOCIATION			
APPROVED: W.M.P. FOR ASSOCIATION	APPROVED: W.M.P. FOR ASSOCIATION	DATE: SEP 1969	
APPROVED:	SCALE:	SHEET NO.:	
		ENGINE NUMBER:	
U. S. ARMY DISTRICT ENGINEER			



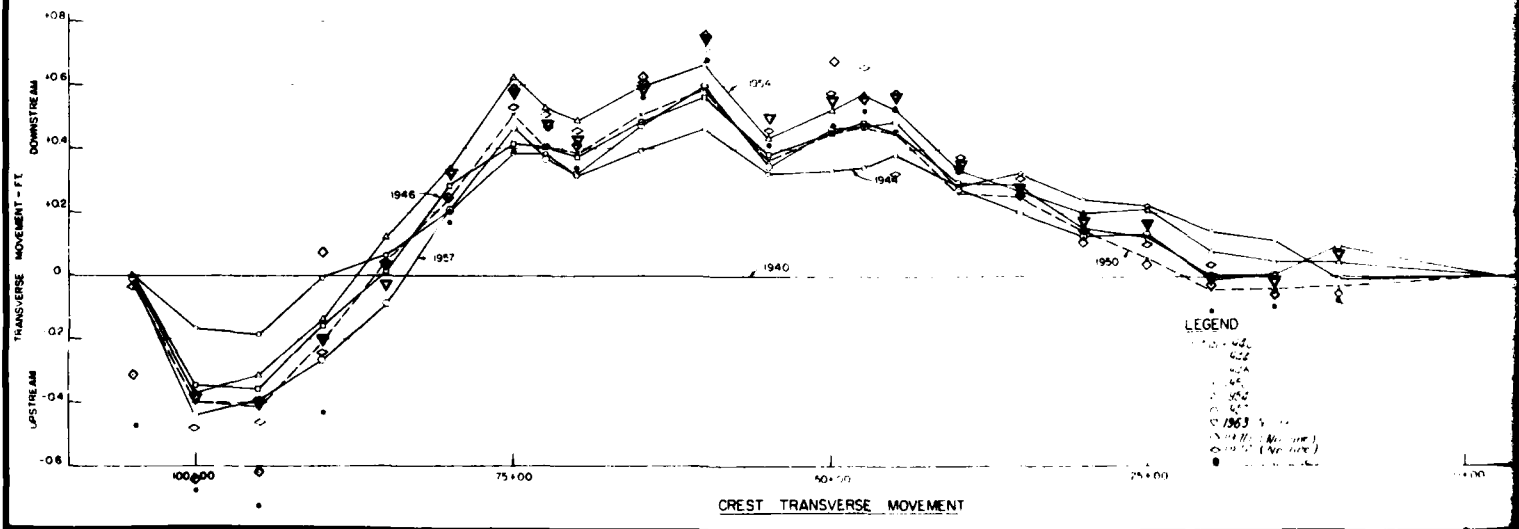
THIS PLAN ACCOMPANIES CONTRACT NO. MODIFICATION NO.



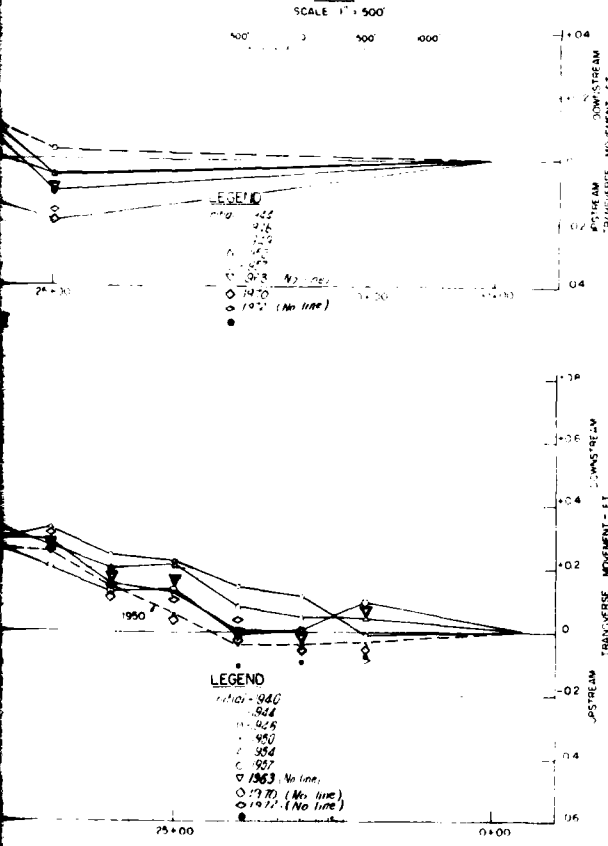
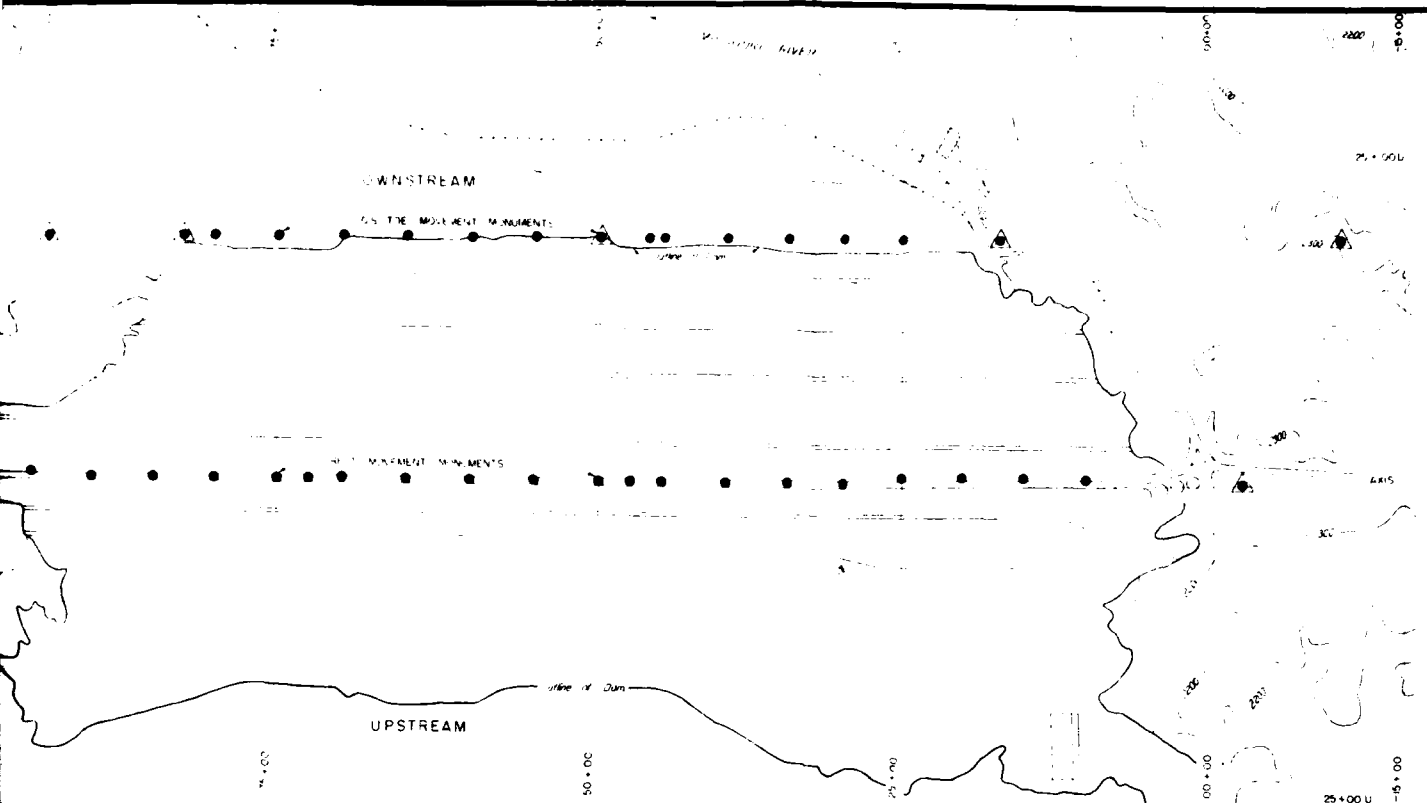
PLAN
SCALE 1" = 500'



LEGEND
 1946
 1952
 1944
 1940
 1948
 1950



LEGEND
 1946
 1957
 1940
 1948
 1950



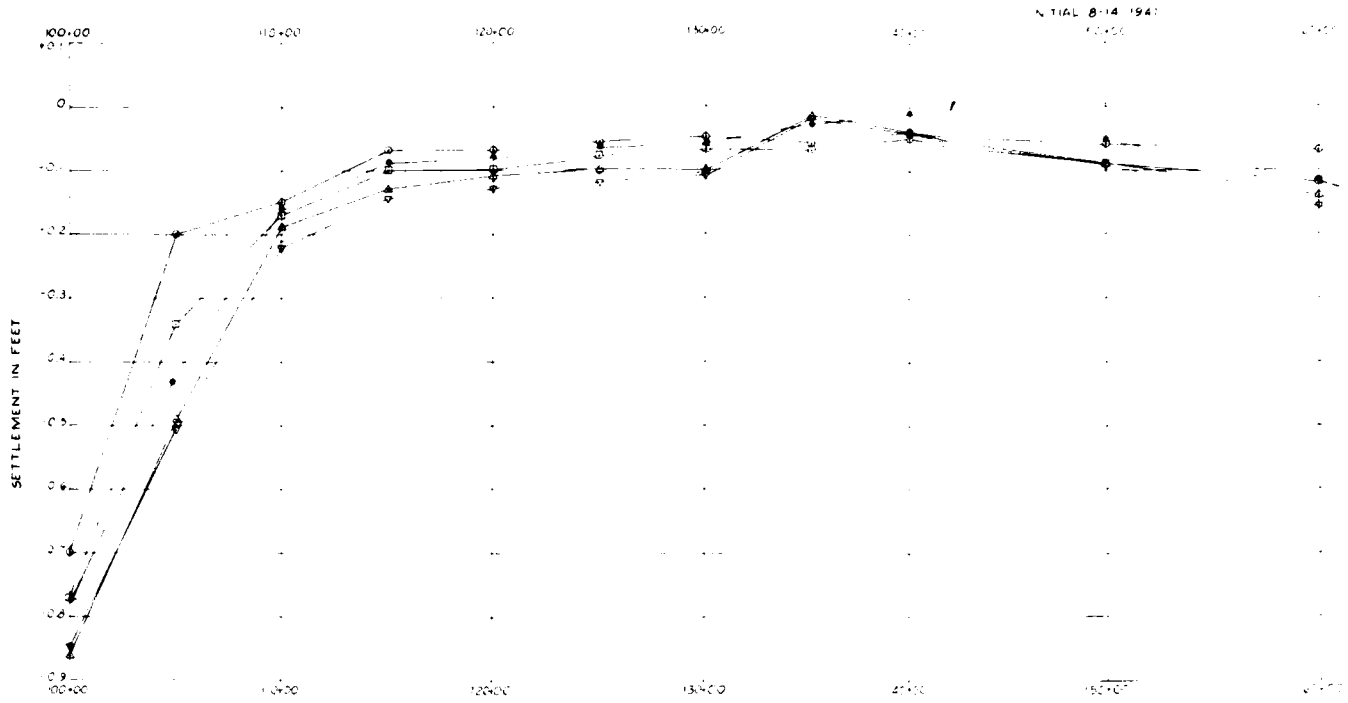
TABULATED LOCATIONS OF TOE MOVEMENT MONUMENTS			TABULATED LOCATIONS OF CREST MOVEMENT MONUMENTS		
NO	STATION	RANGE	NO	STATION	RANGE
H.C. 93218D	9+35.286	8+00.000	7+30.4x8	7+30.4x8	7+30.4x8
H.C. 63818D	10+32.632	10+00.000	60035D	10+32.632	10+32.632
23719D	25+01.148	10+00.000	10018D	10+32.632	10+32.632
33719D	20+09.521	10+00.000	20069D	20+09.521	10+00.000
3519D	35+00.000	10+00.000	35069D	35+00.000	10+00.000
4019D	39+39.789	10+00.000	40069D	39+39.789	10+00.000
4319D	45+00.000	10+00.000	43069D	45+00.000	10+00.000
4919D	45+00.000	10+00.000	49069D	45+00.000	10+00.000
5019D	50+00.000	10+00.000	50069D	50+00.000	10+00.000
H.C. 5019D	50+00.000	10+00.000	55069D	55+00.000	10+00.000
5519D	55+00.000	10+00.000	60069D	60+00.000	10+00.000
6019D	60+00.000	10+00.000	65069D	65+00.000	10+00.000
6519D	65+00.000	10+00.000	70069D	70+00.000	10+00.000
7019D	70+00.000	10+00.000	75069D	75+00.000	10+00.000
7519D	75+00.000	10+00.000	80069D	80+00.000	10+00.000
8019D	80+00.000	10+00.000	85069D	85+00.000	10+00.000
8519D	85+00.000	10+00.000	90069D	90+00.000	10+00.000
H.C. 93718D	93+74.176	10+00.000	95069D	95+00.000	10+00.000
			100032D	100+00.000	10+00.000
			103024D	103+96.663	10+37.000
			H.C. 037023D	103+94.795	10+29.000

Note Locations as of May 1957

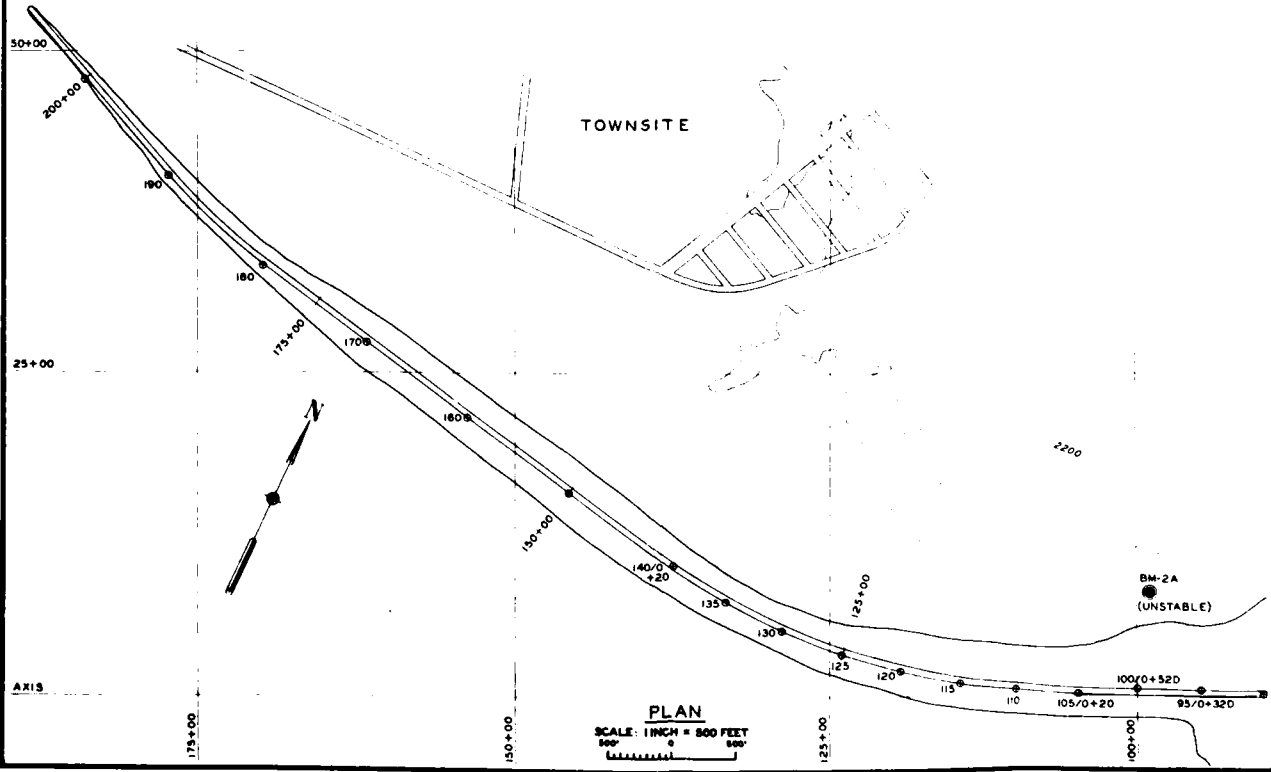
REVISED BY	DATE	REVISION INDICATED BY	BY	CHKD	APP.
CORPS OF ENGINEERS, U. S. ARMY OFFICE OF THE DISTRICT ENGINEER SANSBOURN DISTRICT AVONDALE, MO.					
MISSOURI RIVER FORT PECK DAM					
HORIZONTAL MOVEMENT CONTROL PLAN - GRAPHS - TABULATION					
DESIGNED BY	CHKD	APPROVAL		DATE	
DRAWN BY	CHKD	DATE		DATE	
TRACED BY	CHKD	DATE		DATE	
REVISIONS					
APPROVED	JUNE 1957				
PROJECT NO.	620693C-33				

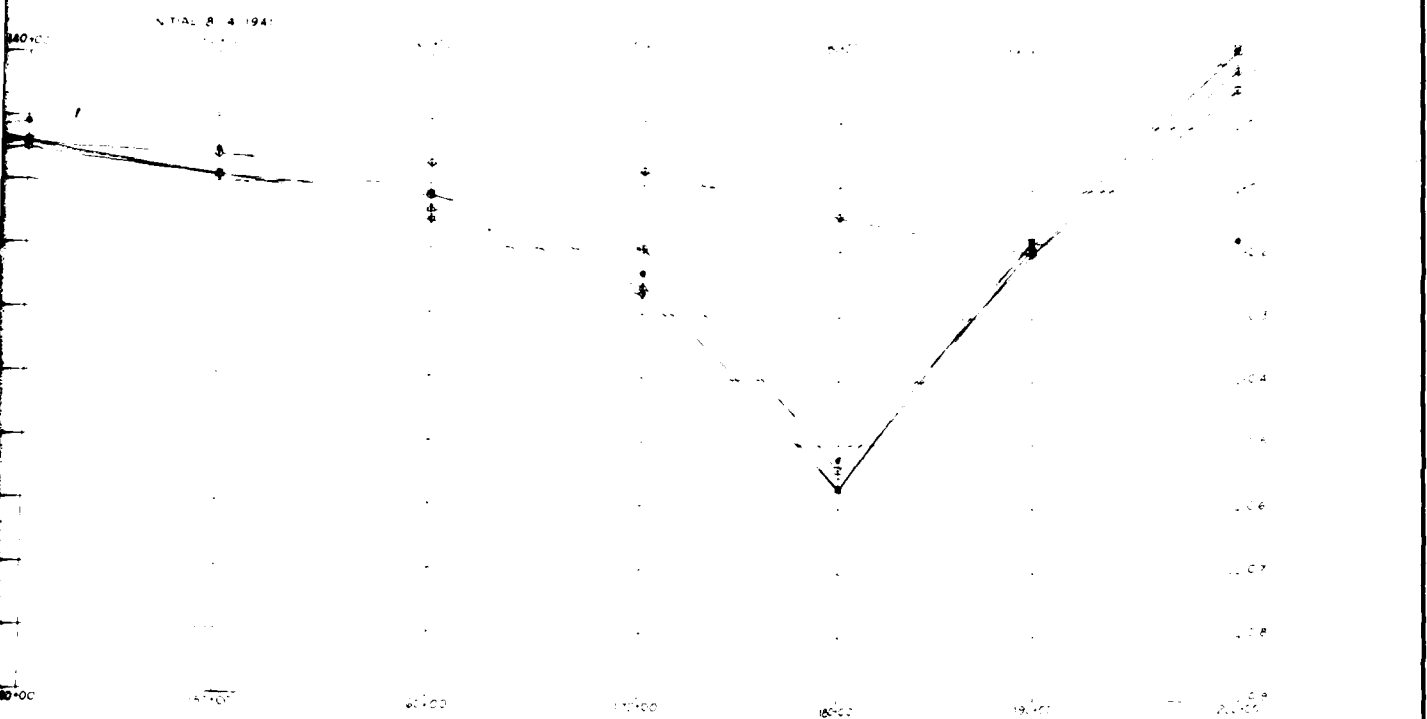
THIS DRAWING HAS BEEN REDUCED TO THREE-EIGHTHS THE ORIGINAL SCALE.

2



RECORD OF DIKE SETTLEMENT



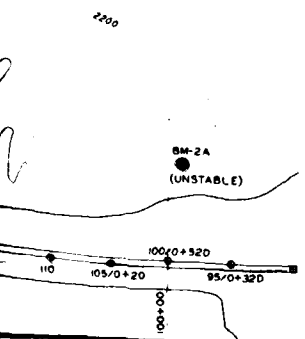


RECORD OF DIKE SETTLEMENT

LEGEND

INITIAL	AUG 14 1941
○	1948
□	1960
△	JUNE 1973
▽	JULY 1975
•	JULY 1979

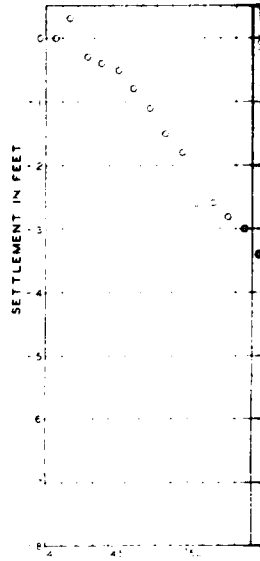
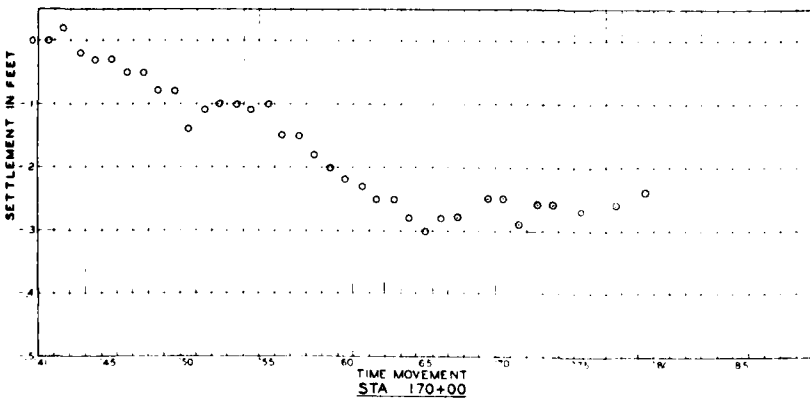
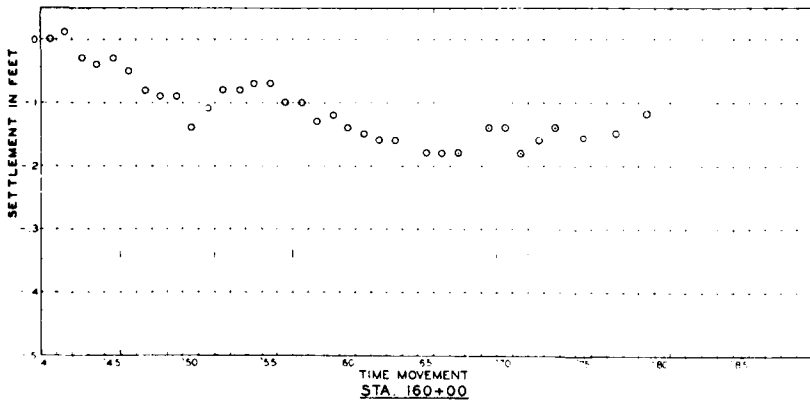
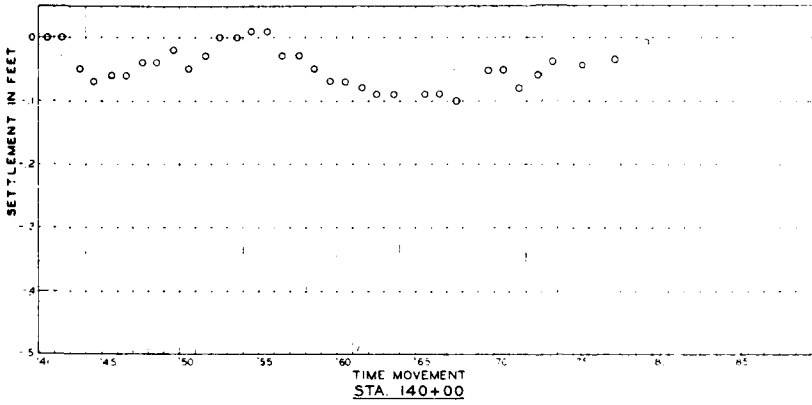
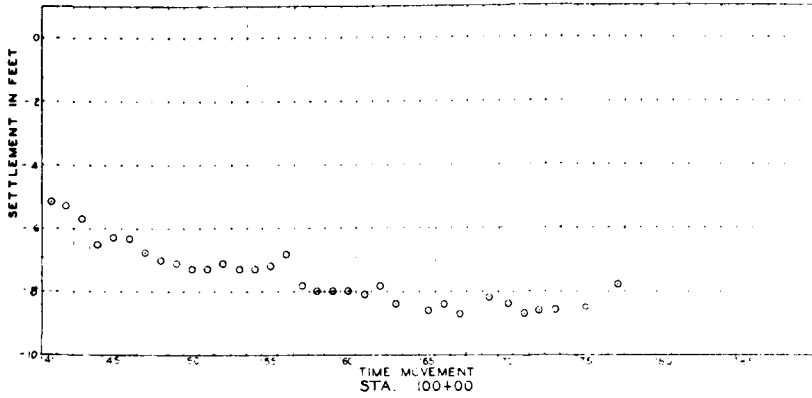
THIS DRAWING HAS BEEN REDUCED TO 1/4" = 10' FROM THE ORIGINAL SCALE.



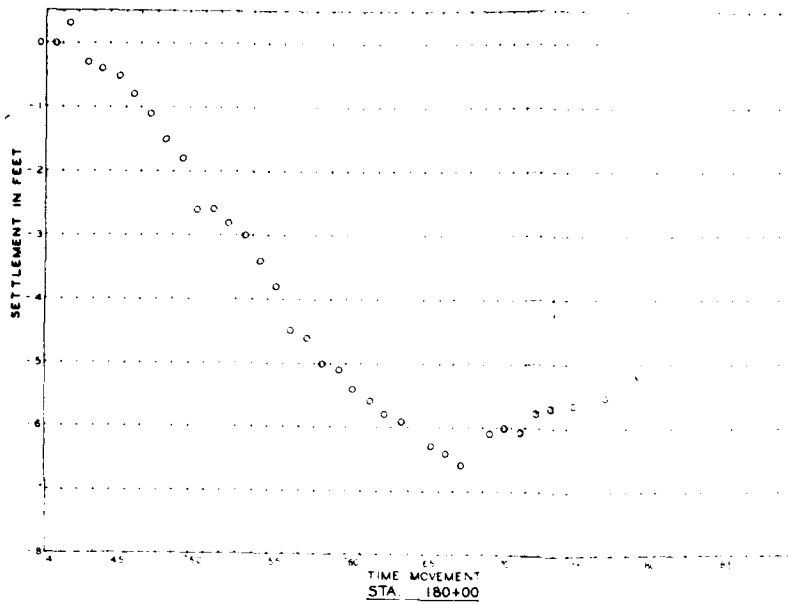
DATE		DESCRIPTION		MADE	APPROV
REVISIONS					
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA					
DESIGNED BY	MISSOURI RIVER				
DRAWN BY	FORT PECK LAKE MONTANA				
CHECKED BY	CREST OF DIKE				
SUBMITTED BY	RECORD OF SETTLEMENT SINCE				
DIST	SECTION	APPROVED		DATE	
DESIGNED		DISTRICT ENGINEER			
DIST	SECTION	SCALE AS SHOWN	SHEET NO	DRAWING NUMBER	
APPROVED:					
SA. E. L. DISTRICT ENGINEER					



THIS PLAN ACCOMPANIES CONTRACT NO. _____
MODIFICATION NO. _____



1



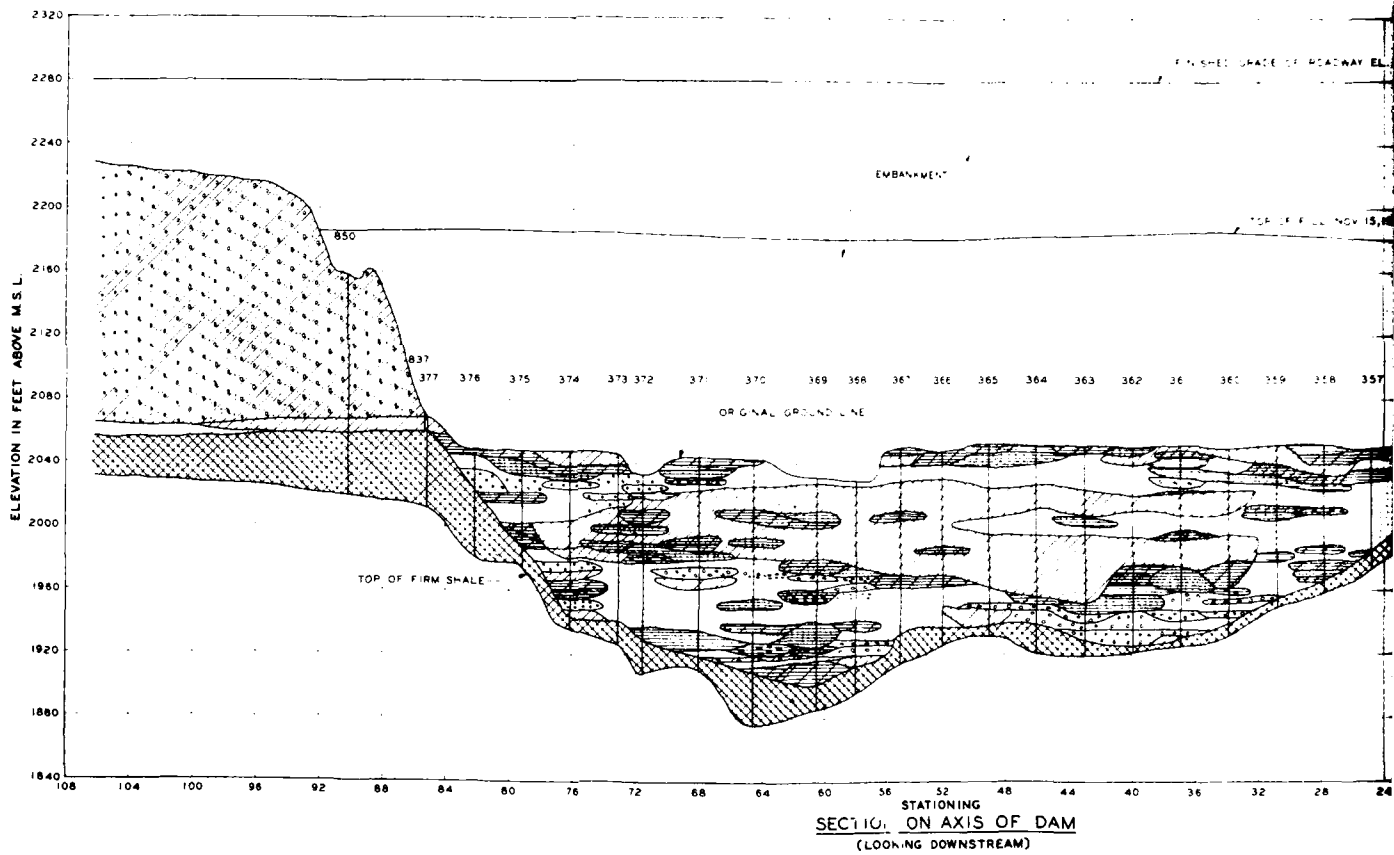
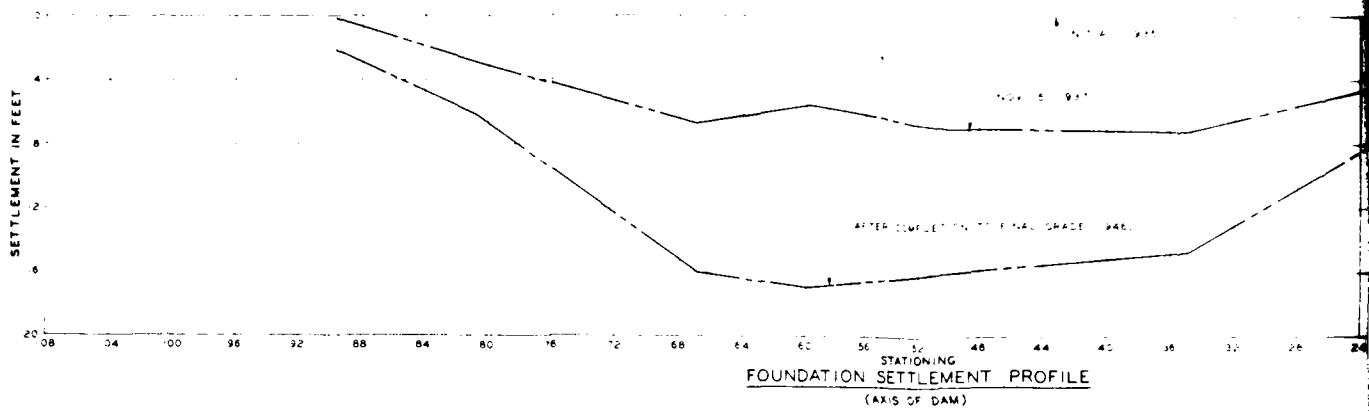
TIME MOVEMENT
STA 180+00

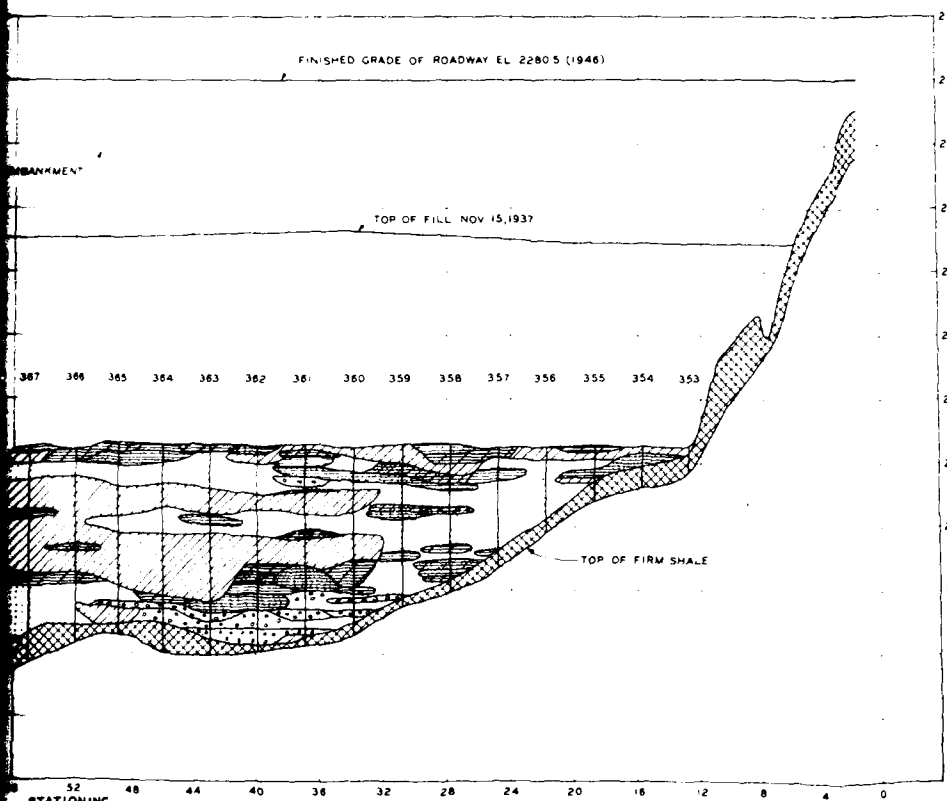
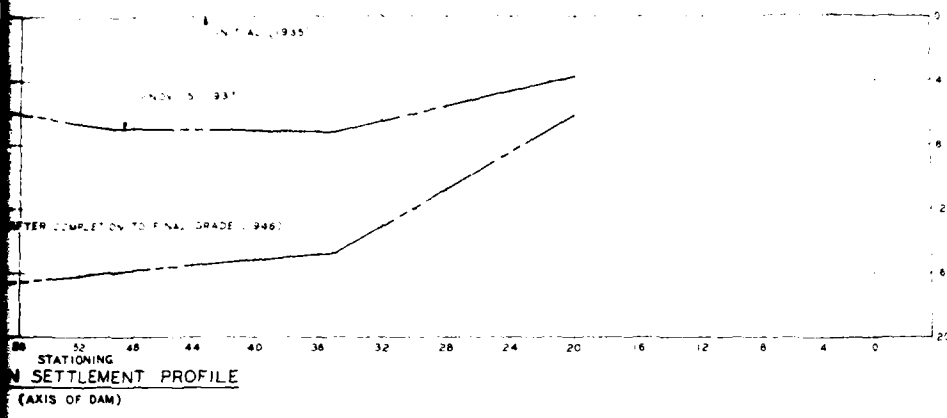
THIS DRAWING HAS BEEN REDUCED TO
THREE-FIFTHS THE ORIGINAL SCALE.

DATE	DESCRIPTION	MADE	APPROVED
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY:	MISSOURI RIVER FORT PECK LAKE MONTANA		
DRAWN BY:	CREST OF DIKE		
CHECKED BY:	RECORD OF SETTLEMENT SINCE		
SUBMITTED BY:	AUGUST 1941		
CHIEF	SECTION	(Selected Station)	
ENGINEER	APPROVED	CHIEF ENGINEERING DIVISION	DATE
CHIEF	BRANCH	SCALE AS SHOWN	SPEC NO.
APPROVER:	SHEET		SEALING NUMBER
ENL. & E. DISTRICT ENGINEER			



THIS PLAN ACCOMPANIES CONTRACT NO. _____
MODIFICATION NO. _____





LEGEND

[Symbol]	SAND
[Symbol]	GRAVELLY SAND
[Symbol]	LOAM
[Symbol]	SANDY LOAM
[Symbol]	SANDY GRAVELLY LOAM
[Symbol]	CLAY
[Symbol]	SANDY CLAY
[Symbol]	CLAY LOAM
[Symbol]	SANDY CLAY LOAM
[Symbol]	GRAVELLY CLAY LOAM
[Symbol]	SANDY GRAVELLY CLAY LOAM
[Symbol]	GRAVEL
[Symbol]	SANDY GRAVEL
[Symbol]	GLACIAL TILL
[Symbol]	SHALE (EXCEPT FIRM)

BUREAU OF SOILS CLASSIFICATION

NOTE

1. PROFILE DATA TAKEN FROM DWG NO 5286 91-1-10 (FEB 1944)

2. EACH SUBSIDIANCE PIPE IS AN EXTENSION OF A 2" PIPE WELDED TO AN 18" PLATE, IN TURN BOLTED TO A WOOD PLATFORM MEASURING 8' SQUARE. NO PROTECTIVE PIPE WAS PROVIDED; THEREFORE, STRAIN DUE TO SKIN FRICTION IS REALIZED

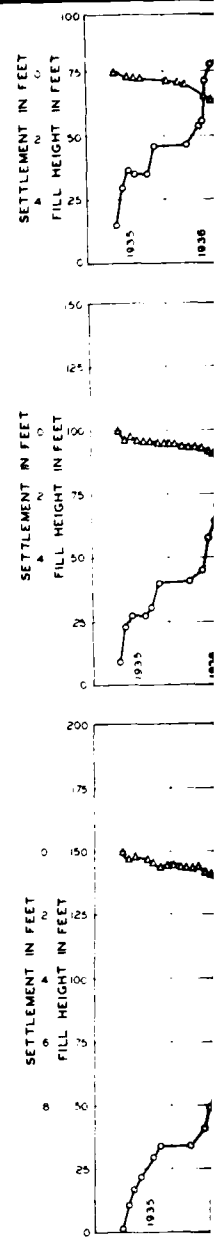
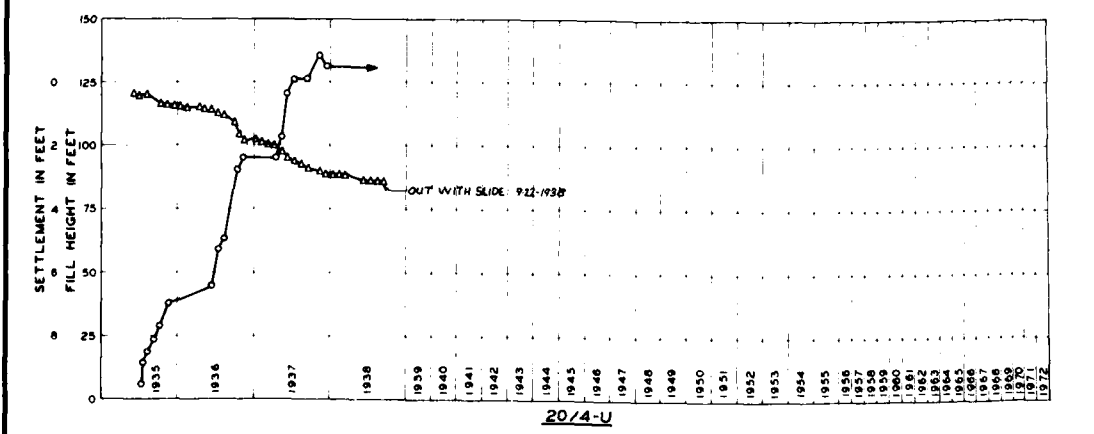
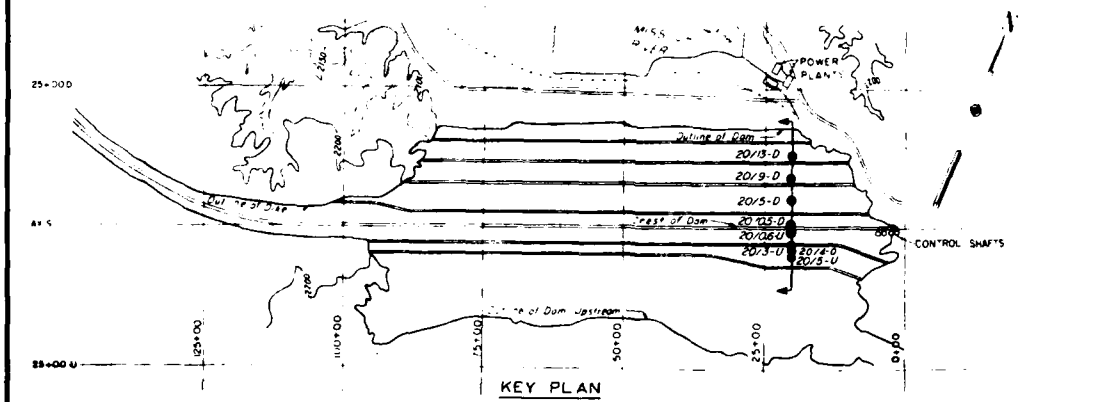
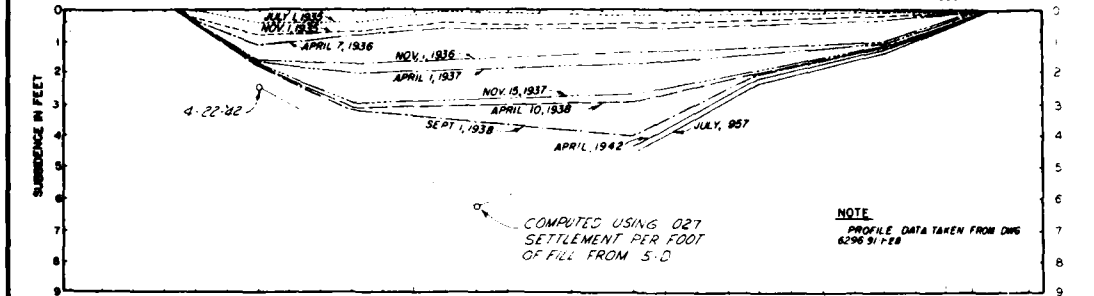
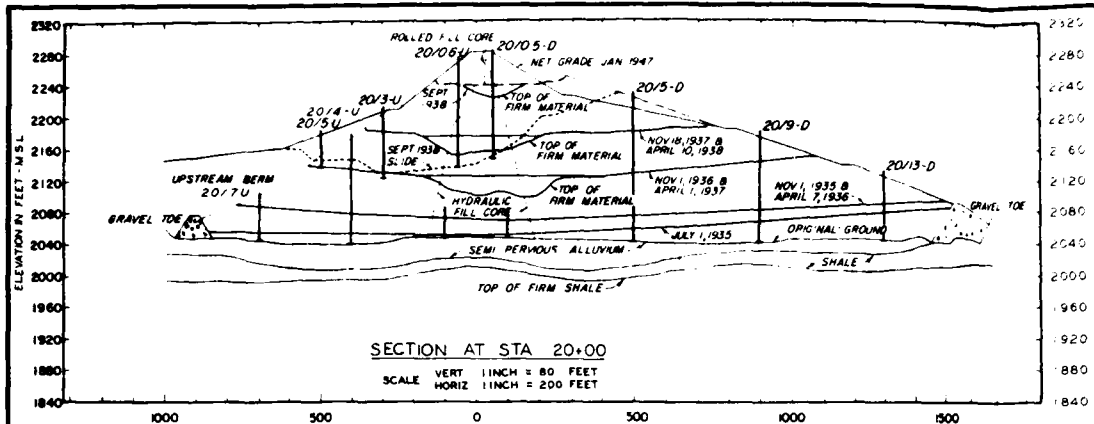
DATE	DESCRIPTION	MADE	APPROVED
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
MISSOURI RIVER FORT PECK LAKE, MONTANA			
SUMMARY OF FOUNDATION SETTLEMENT AND FOUNDATION PROFILE (SUBSIDIANCE PIPES)			
DESIGNED BY: C. H. A.	CHECKED BY: L. M. G.	APPROVED BY: C. H. A.	DATE: _____
DRAWN BY: C. H. A.	SCALE: AS SHOWN	DATE: _____	DATE: _____
APPROVED BY: _____	SCALE: AS SHOWN	DATE: _____	DATE: _____

THIS DRAWING HAS BEEN RECHECKED TO
CORRECT ERRORS THAT MAY BE FOUND ON SCALE

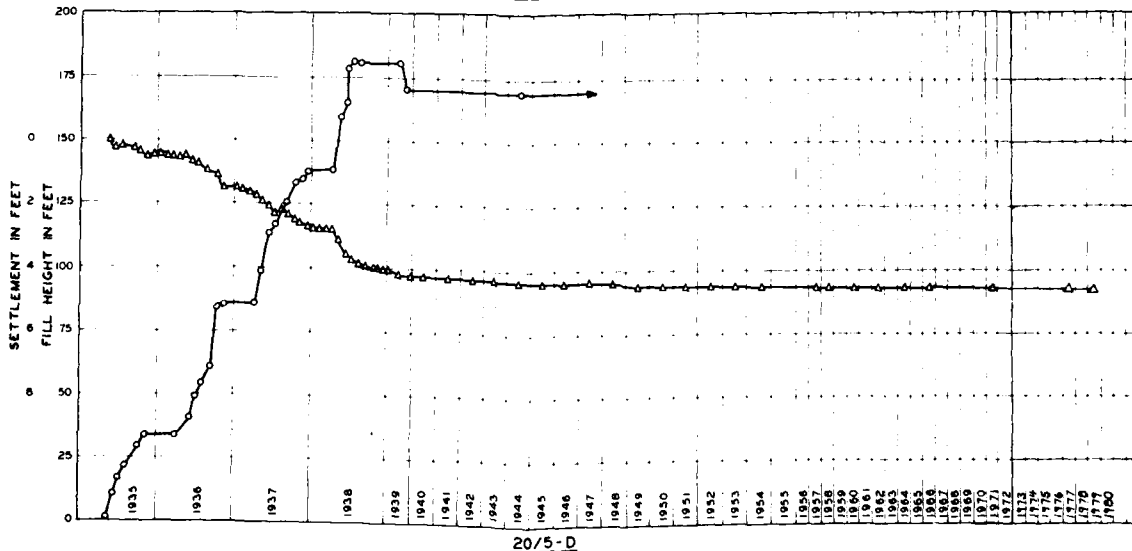
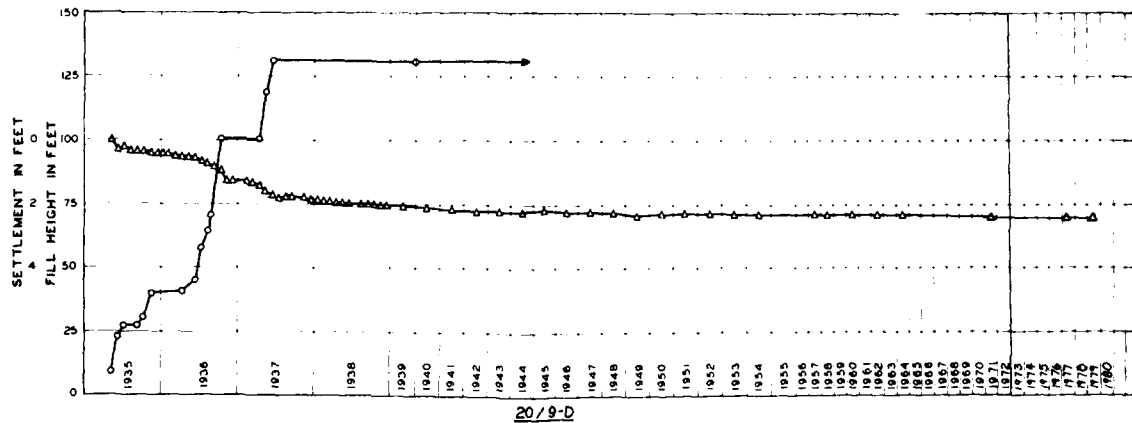
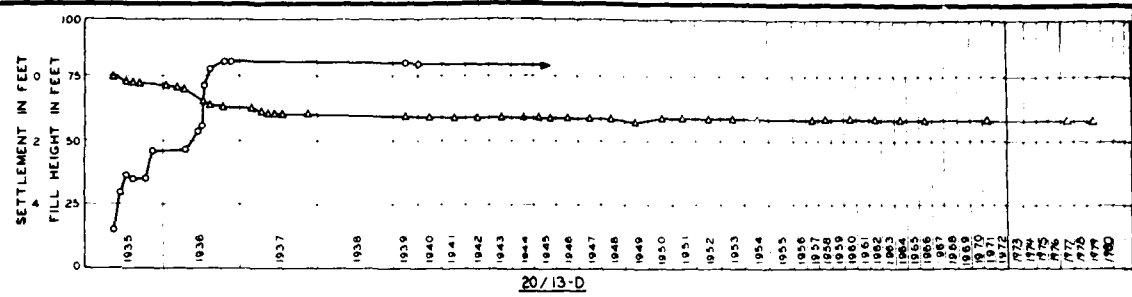
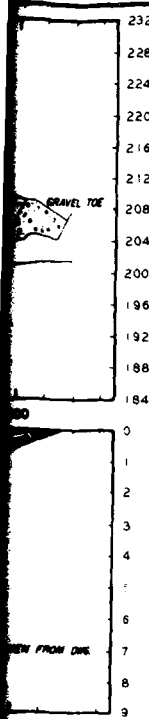
2

SCALE VERT 1 INCH = 40 FEET
HORIZ 1 INCH = 400 FEET

THIS PLAN ACCOMPANIES CONTRACT NO. _____
MODIFICATION NO. _____



LEGEND
 ○ ——— ○
 □ ——— □



1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

LEGEND
 ○ — FILL HEIGHT IN FEET
 △ — SETTLEMENT IN FEET

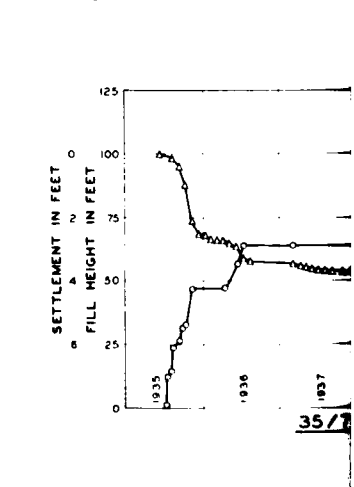
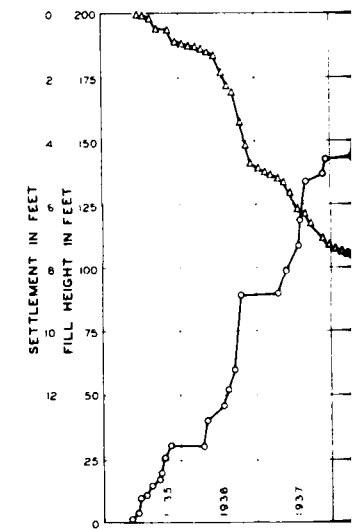
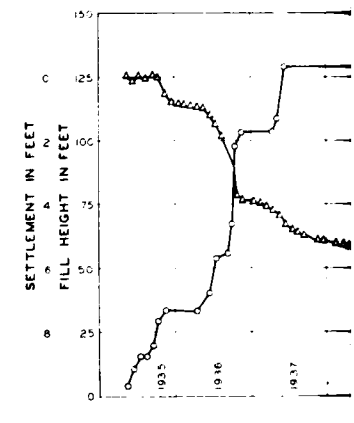
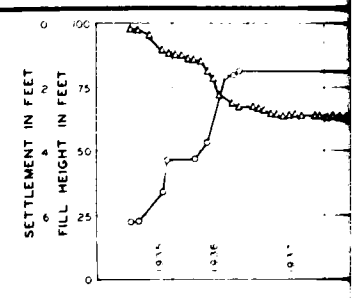
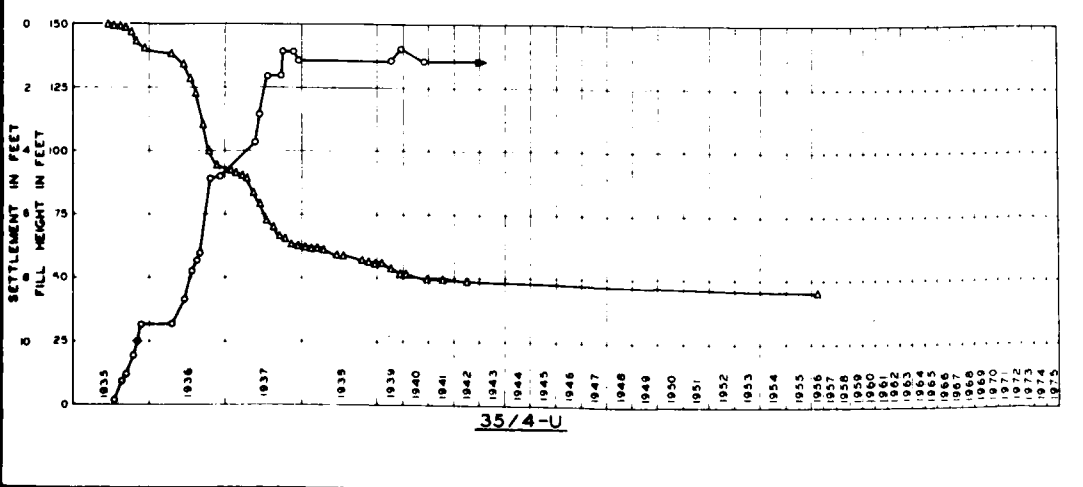
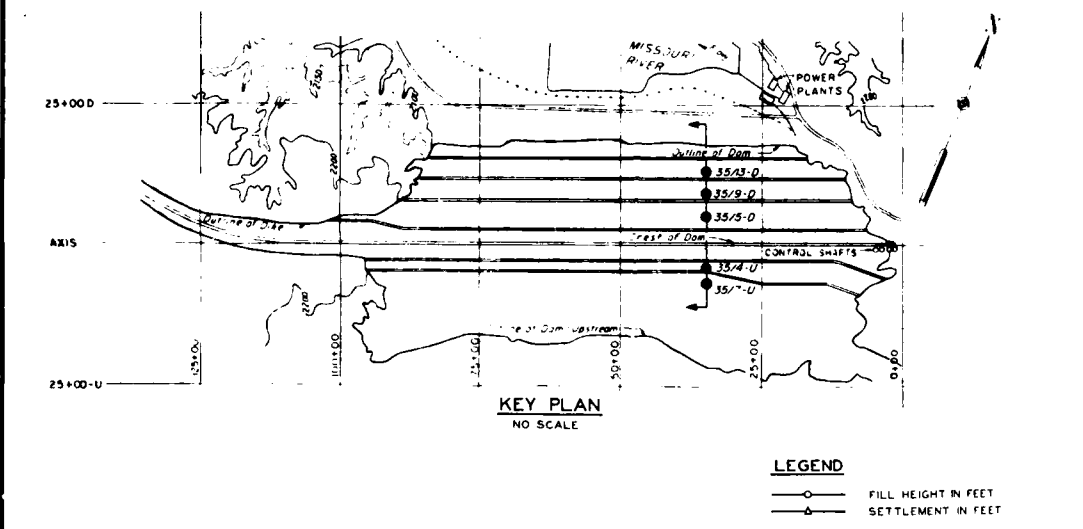
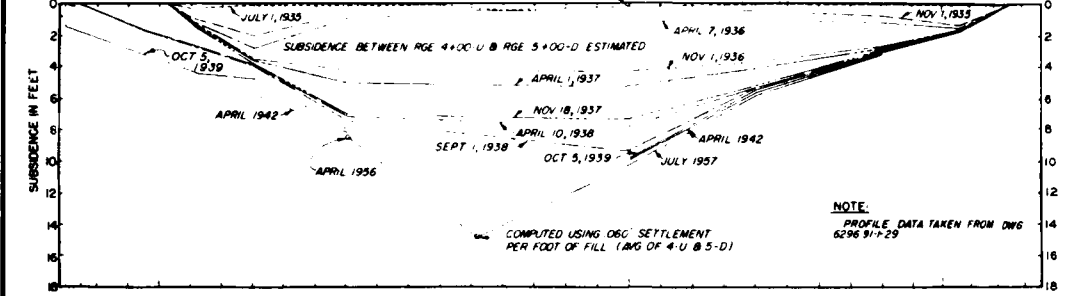
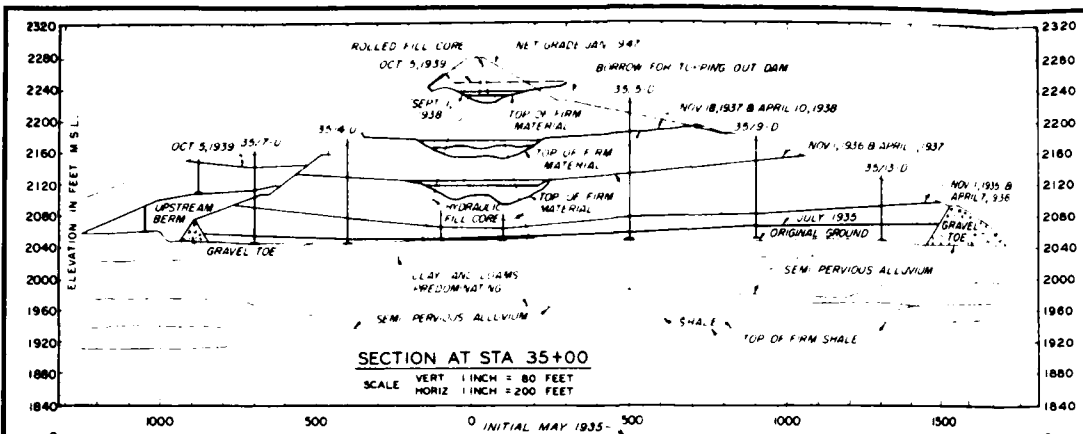
2



THIS PLAN ACCOMPANIES CONTRACT NO. _____
 MODIFICATION NO. _____

THIS DRAWING HAS BEEN REDUCED TO
 THREE-EIGHTHS THE ORIGINAL SCALE.

DATE	DESCRIPTION	MADE	APPROV
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA			
CORPS OF ENGINEERS			
OMAHA, NEBRASKA			
DESIGNED BY: O. W. A.		MISSOURI RIVER	
DRAWN BY: P. F. A.		FORT PECK LAKE, MONTANA	
CHECKED BY: O. W. A.		SUMMARY OF FOUNDATION SETTLEMENT	
APPROVED BY: _____		STATION 20+00	
APPROVED:	DATE:	APPROVED:	DATE:
APPROVED:	DATE:	APPROVED:	DATE:

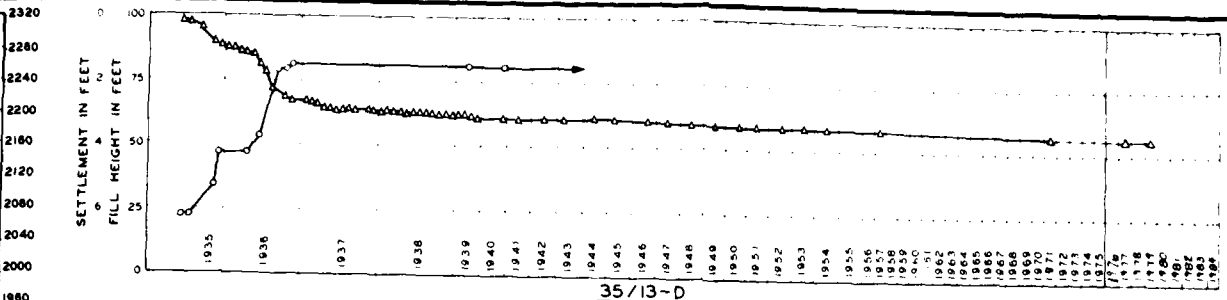


NOV. 1, 1916 B
APRIL 7, 1916

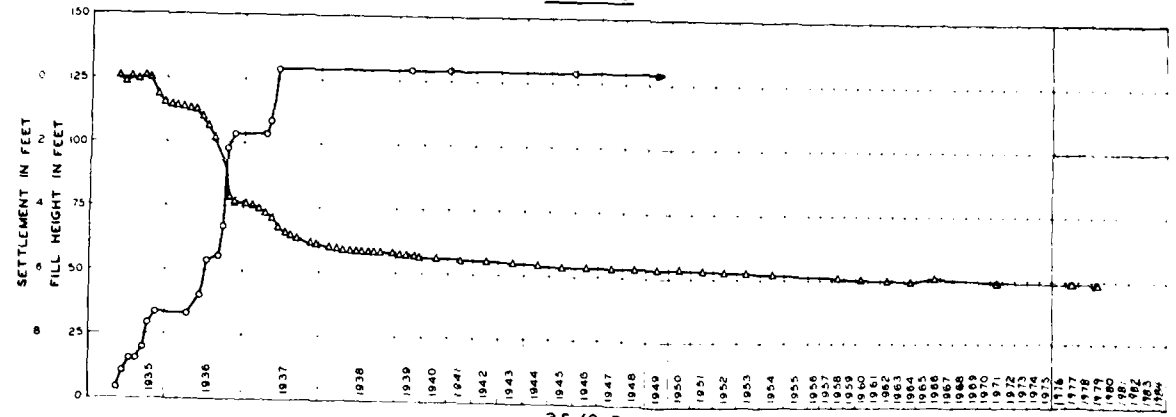
FROM ONE

FEET
IN FEET

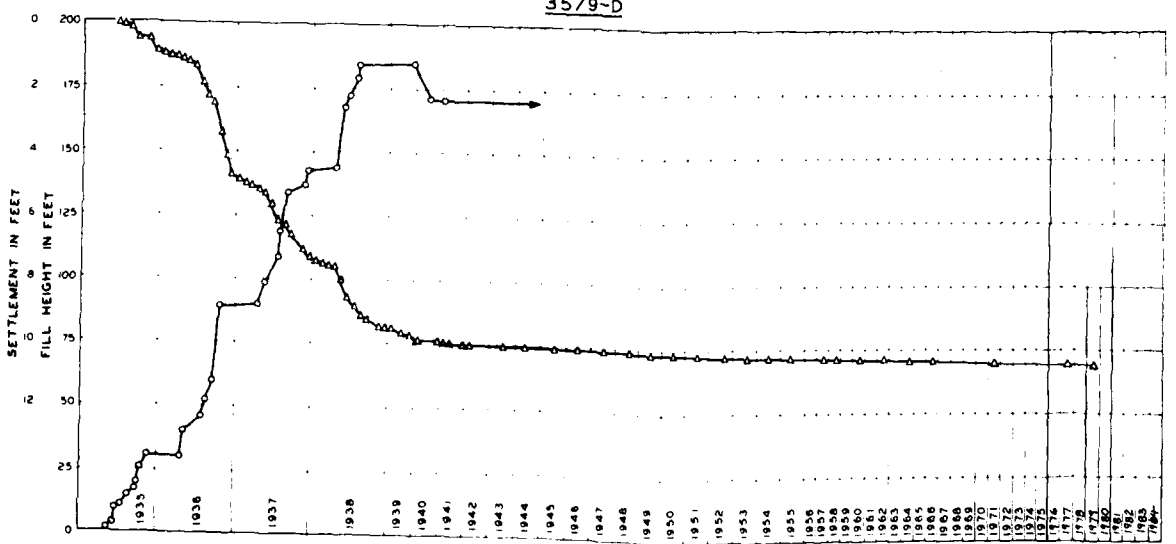
1870
1875
1880
1885
1890
1895
1900
1905
1910
1915
1920



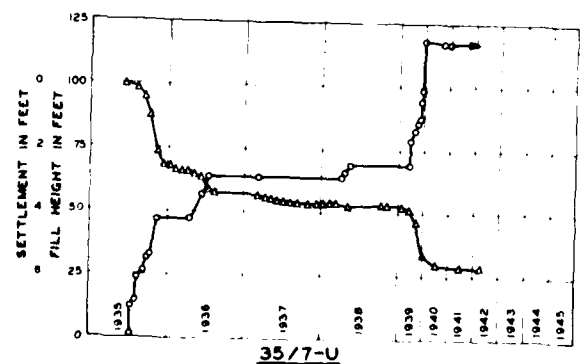
35/13-D



35/9-D



35/5-D



35/7-U

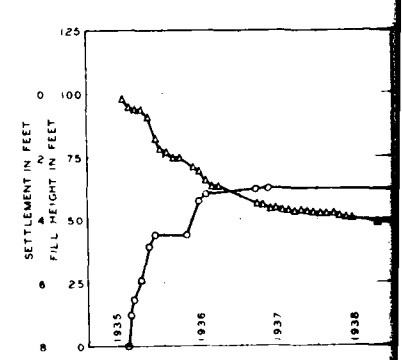
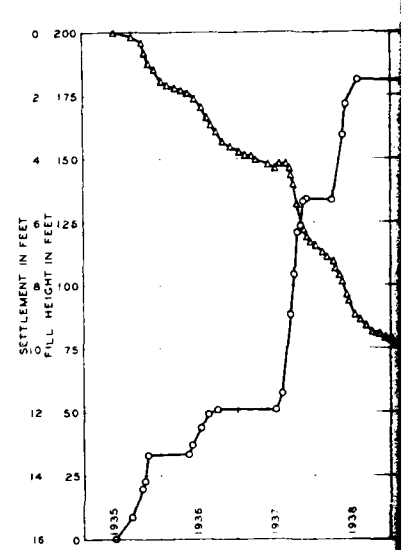
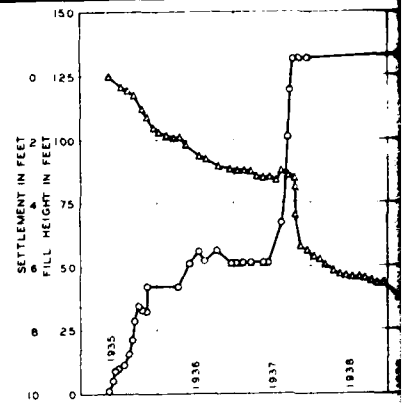
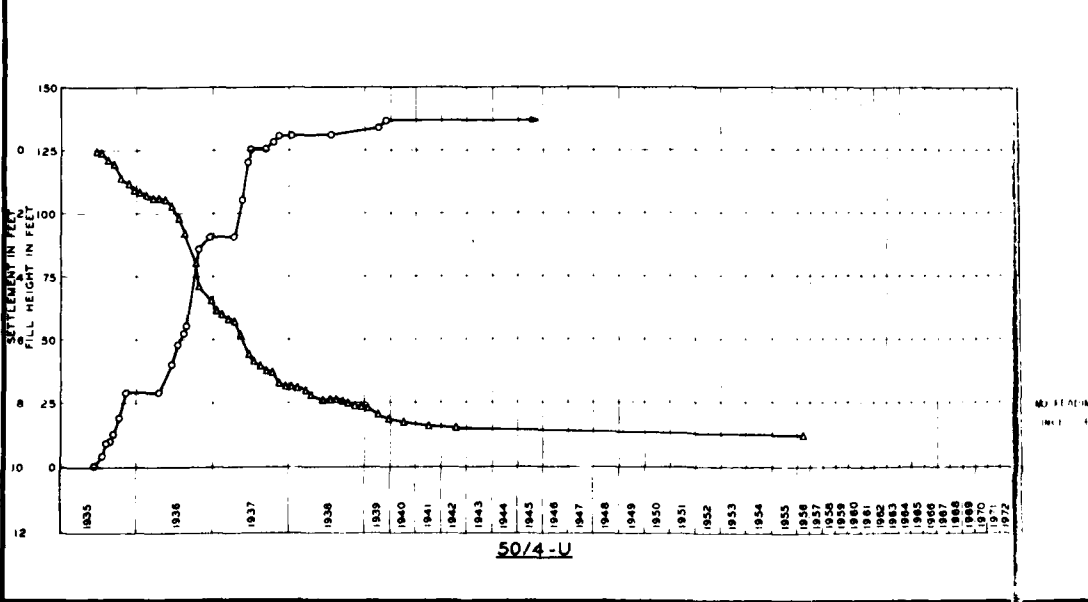
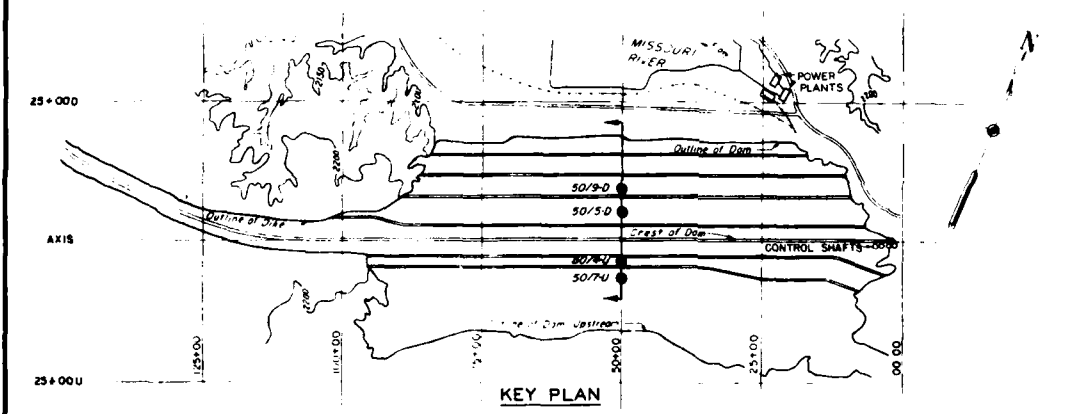
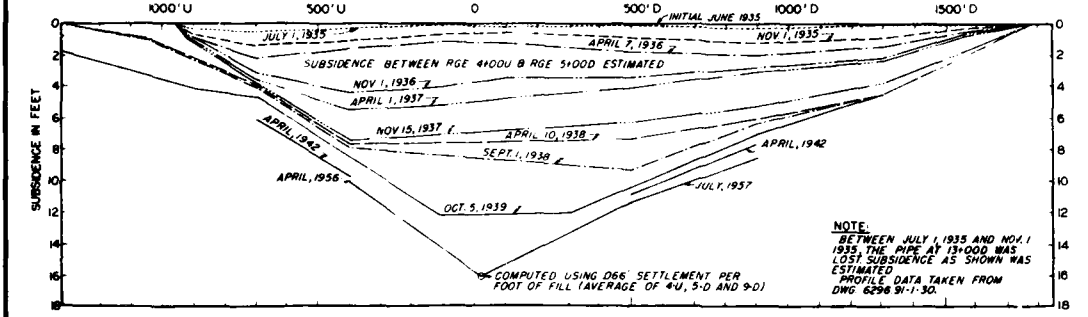
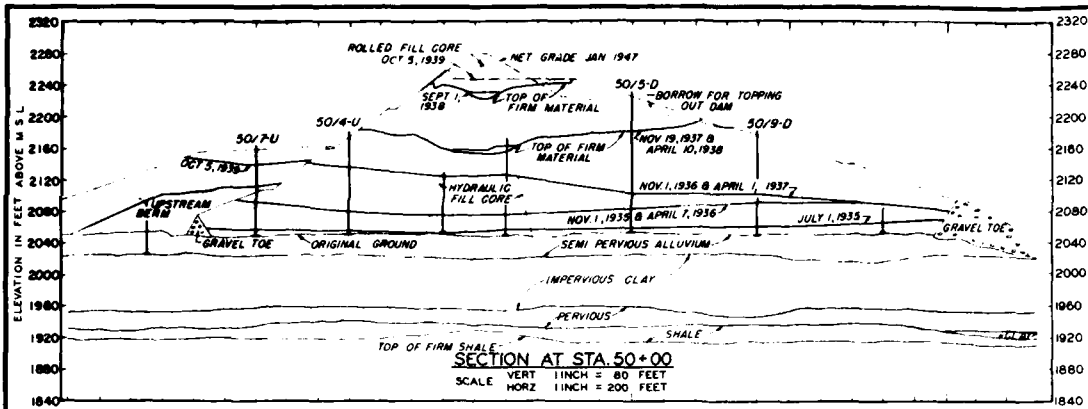
THIS DRAWING HAS BEEN REDUCED TO
THREE-FIFTHS THE ORIGINAL SCALE.



THIS PLAN ACCOMPANIES CONTRACT NO. _____
MODIFICATION NO. _____

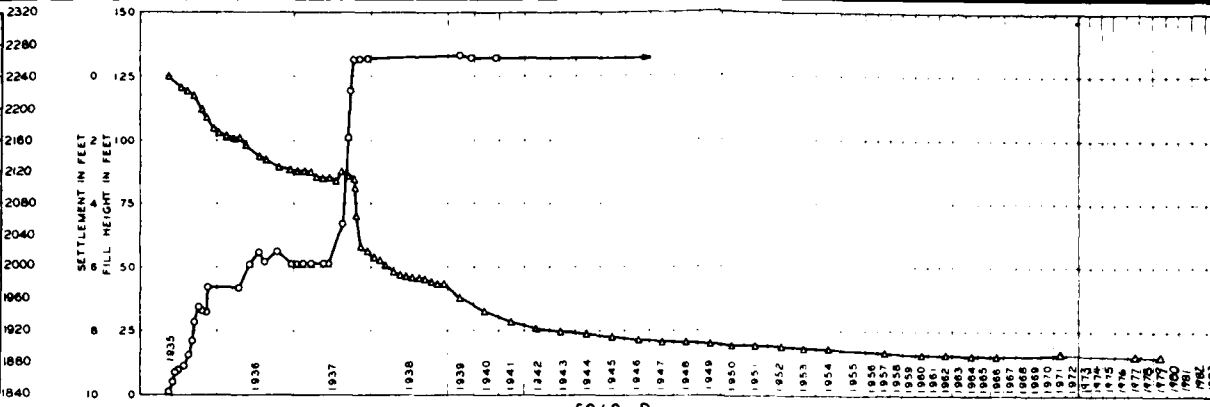
DATE	REVISIONS	MADE	APPROV
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DRAWING BY: W. J. M. CHECKED BY: H. S. DESIGNED BY: C. W. A. QUANTITY BY:		MISSOURI RIVER FORT PECK LAKE, MONTANA	
SUMMARY OF FOUNDATION SETTLEMENT STATION 35+00			
APPROVED:	APPROVED:	DATE:	BY:
CHIEF OF DISTRICT:	CHIEF ENGINEER:	DATE AS SHOWN:	BY:
CHIEF OF DIVISION:	CHIEF OF SECTION:	DATE:	BY:

2

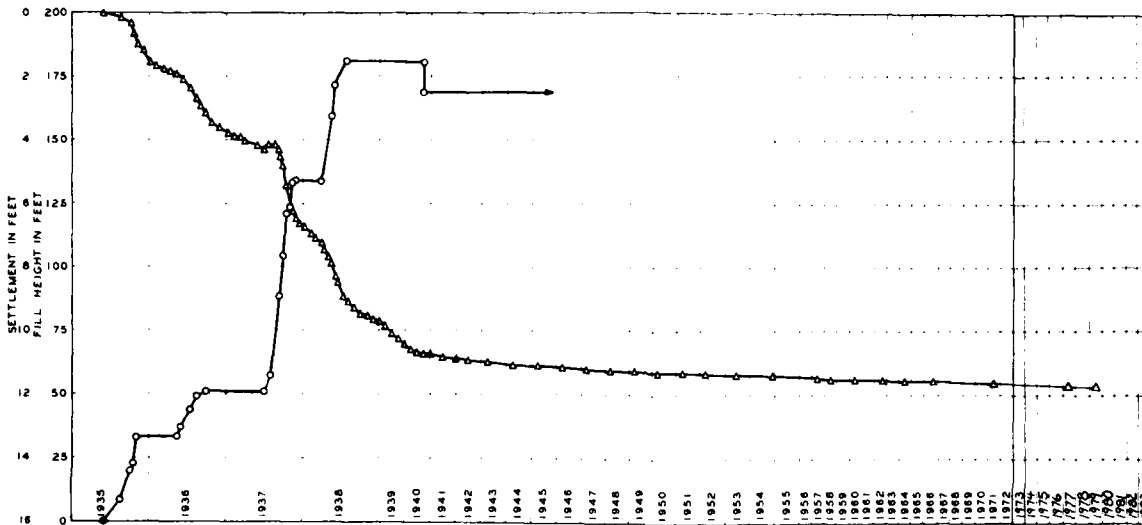


LEGEND:
 ○ FILL HEIGHT IN FEET
 △ SETTLEMENT IN FEET

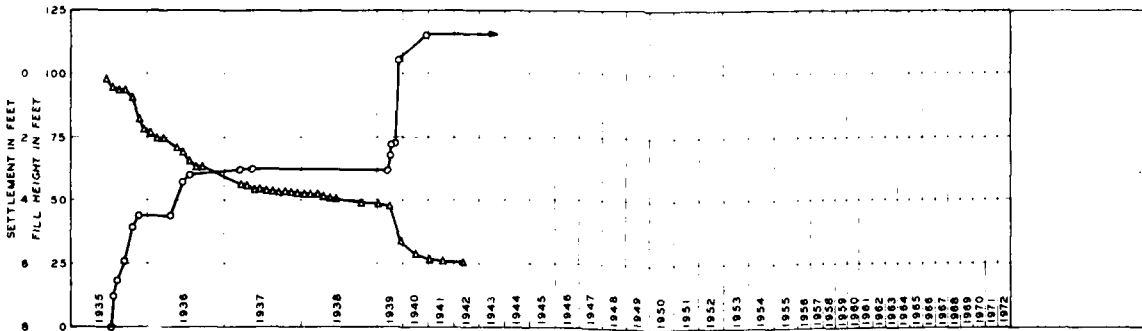
50/4-U



50/9-D



50/5-D



50/7-U

THIS DRAWING HAS BEEN REDUCED TO THREE-EIGHTHS THE ORIGINAL SCALE

LEGEND:

- — FILL HEIGHT IN FEET
- △ — SETTLEMENT IN FEET

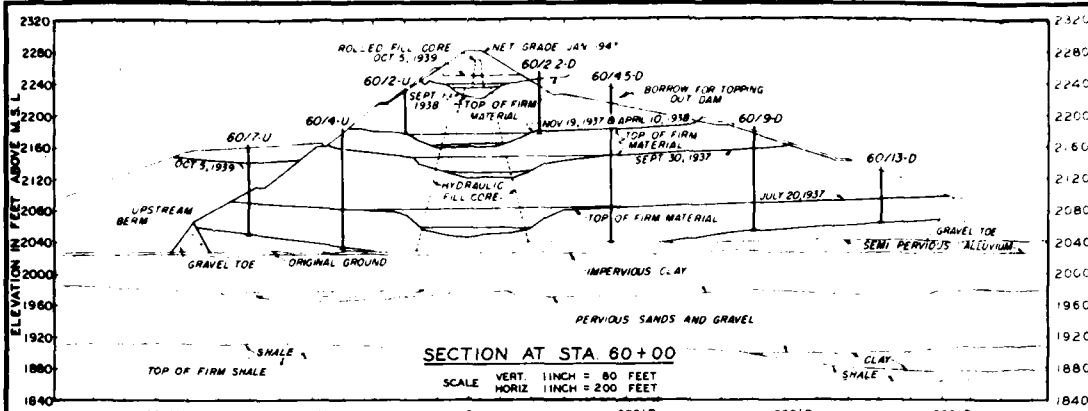
NO READING
1967 156



THIS PLAN ACCOMPANIES CONTRACT NO. _____
MODIFICATION NO. _____

DATE	DESCRIPTION	MADE	APPROV
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
MISSOURI RIVER FORT PECK LAKE, MONTANA			
SUMMARY OF FOUNDATION SETTLEMENT STATION 50+00			
DESIGNED BY: A. J. M.	DRAWN BY: L. M. C.		
CHECKED BY: O. W. A.	APPROVED BY: _____		
CHIEF ENGINEER DISTRICT	CHIEF ENGINEER DISTRICT	DATE:	
APPROVED:	CHIEF ENGINEER DISTRICT	DATE:	
CHIEF ENGINEER DISTRICT	CHIEF ENGINEER DISTRICT	DATE:	
CHIEF ENGINEER DISTRICT	CHIEF ENGINEER DISTRICT	DATE:	

2

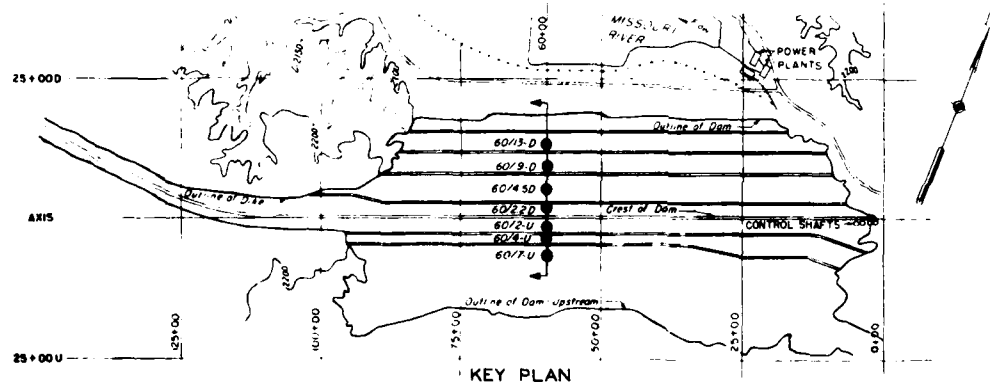
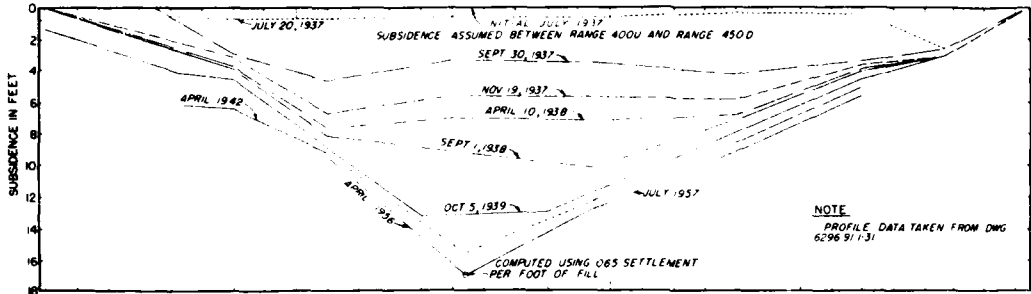


SECTION AT STA 60+00

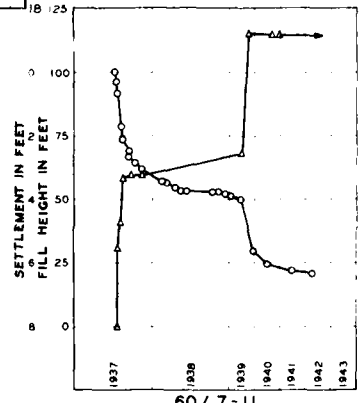
SCALE VERT. 1 INCH = 80 FEET
HORIZ. 1 INCH = 200 FEET

LEGEND

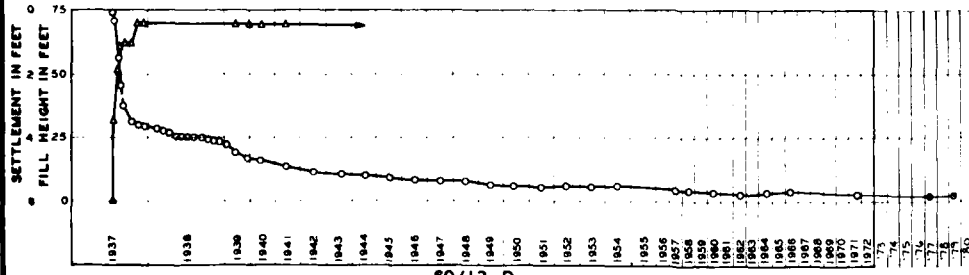
- FILL HEIGHT IN FEET
- SETTLEMENT IN FEET



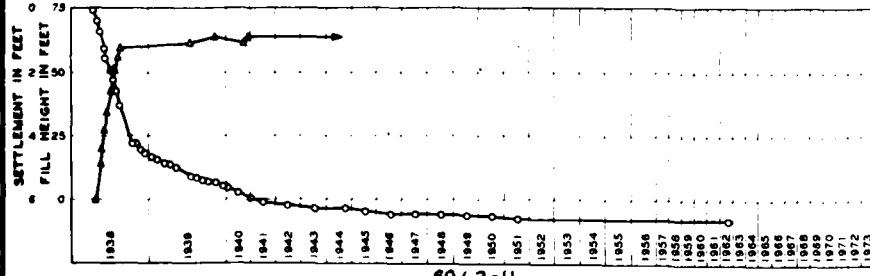
KEY PLAN



60/7-U

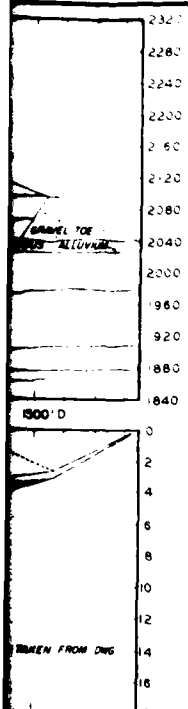


60/13-D

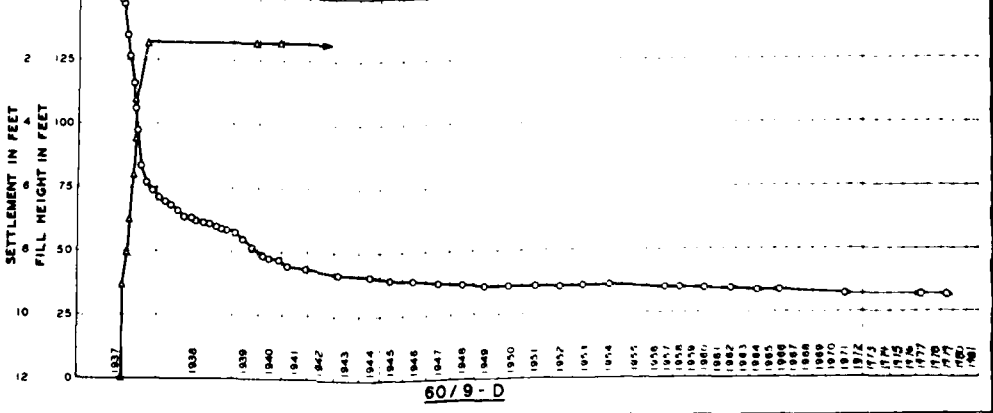
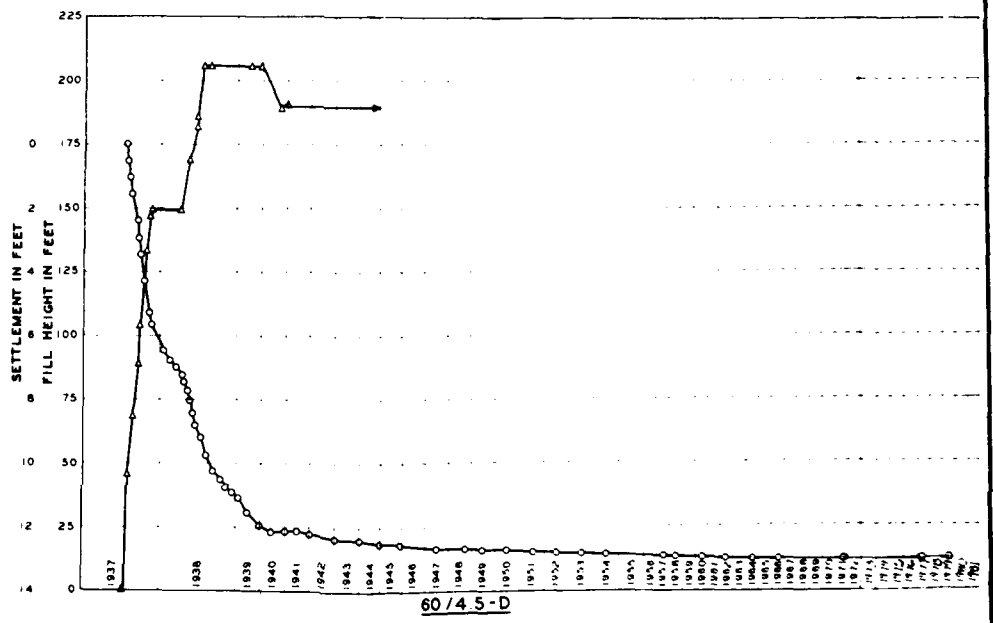
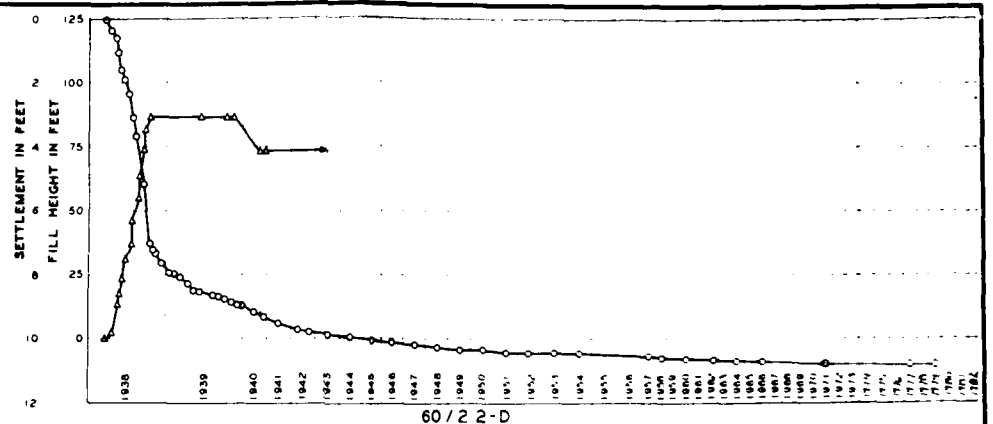
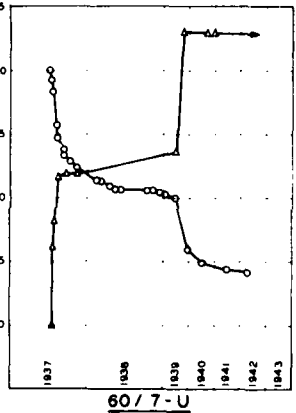


60/2-U

SETTLEMENT IN FEET
 FILL HEIGHT IN FEET
 225
200
175
150
125
100
75
50
25
0
 225
200
175
150
125
100
75
50
25
0
 225
200
175
150
125
100
75
50
25
0
 225
200
175
150
125
100
75
50
25
0



LEGEND
 —○— FILL HEIGHT IN FEET
 —○— SETTLEMENT IN FEET




2

THIS DRAWING HAS BEEN REDUCED TO THREE-EIGHTHS THE ORIGINAL SCALE.

THIS PLAN ACCOMPANIES CONTRACT NO. _____

MODIFICATION NO. _____

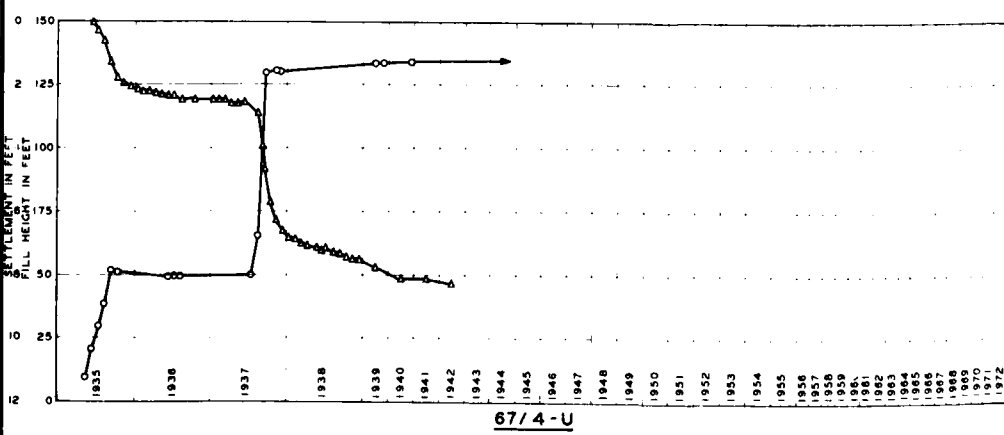
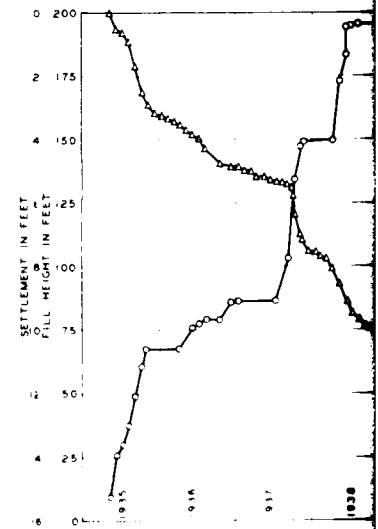
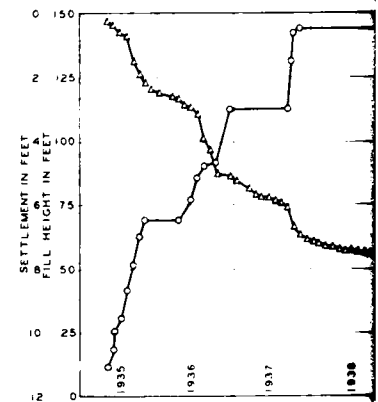
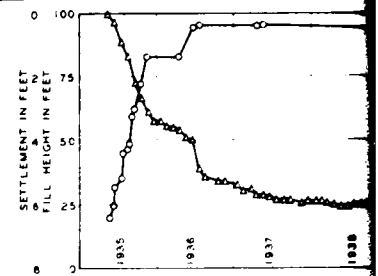
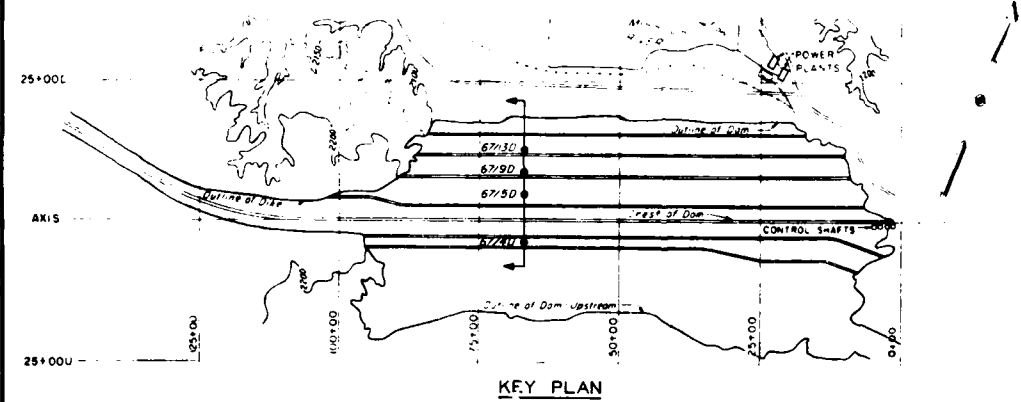
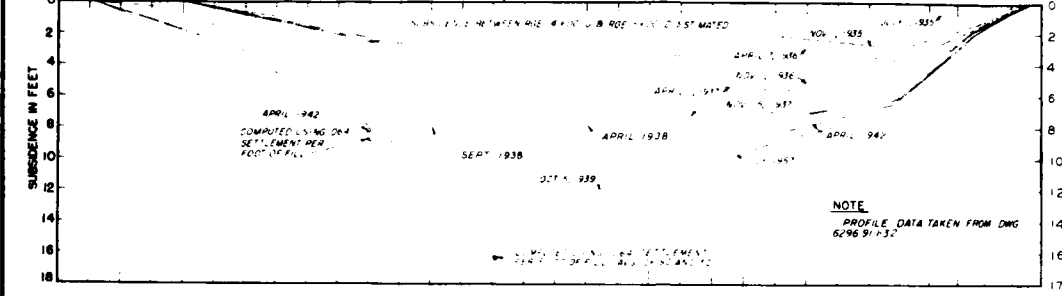
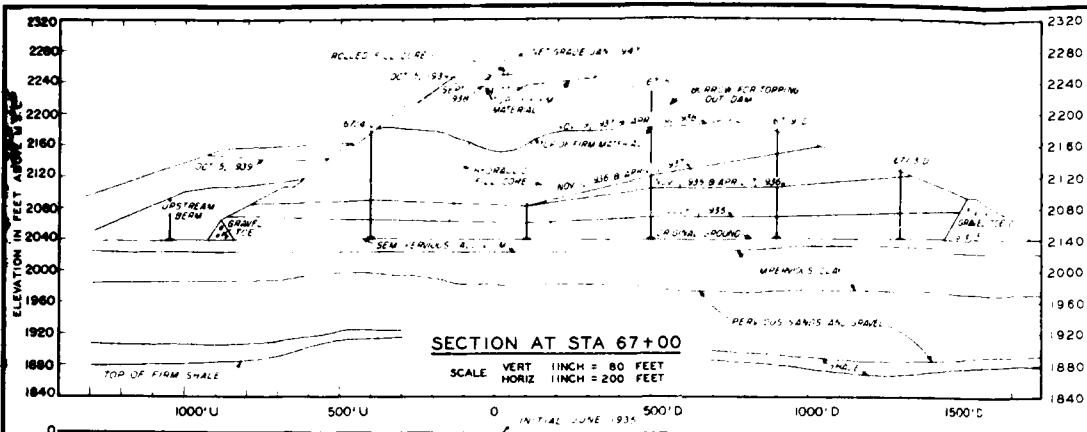


U. S. ARMY ENGINEER DISTRICT, OMAHA
CORPS OF ENGINEERS
OMAHA, NEBRASKA

MISSOURI RIVER
FORT PECK LAKE, MONTANA

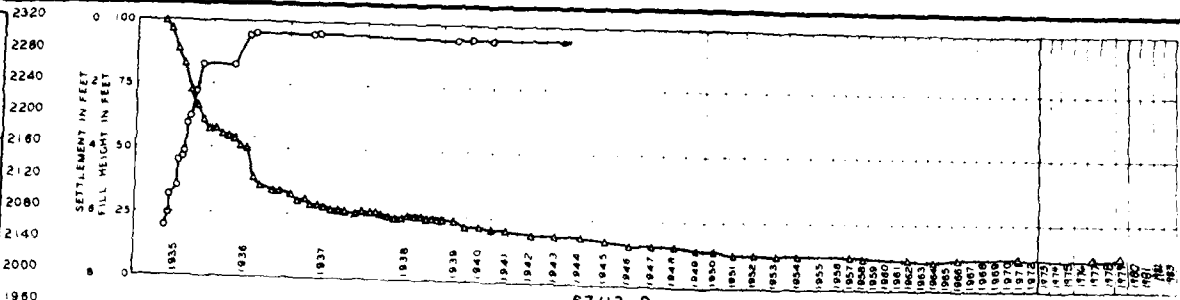
SUMMARY OF FOUNDATION SETTLEMENT
STATION 80+00

DESIGNED BY: _____	CHECKED BY: _____
DRAWN BY: _____	APPROVED: _____
DATE: _____	DATE: _____

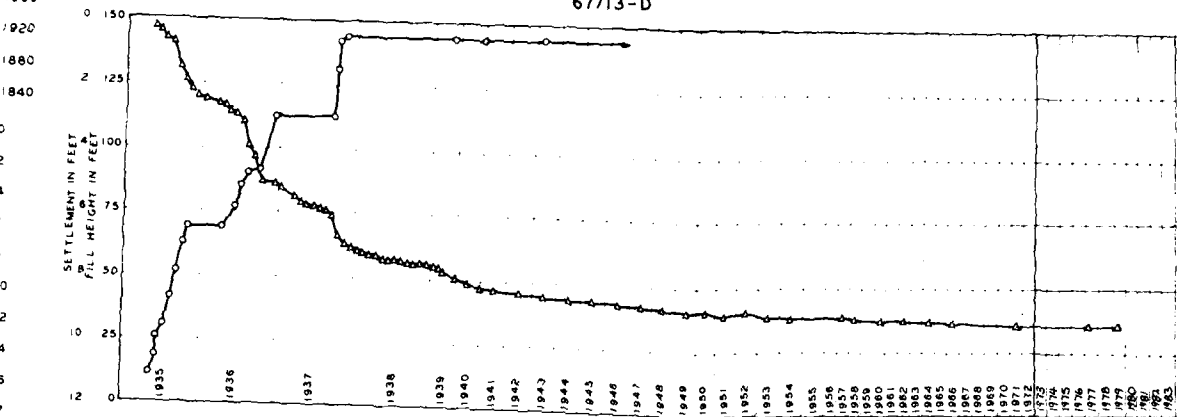


LEGEND

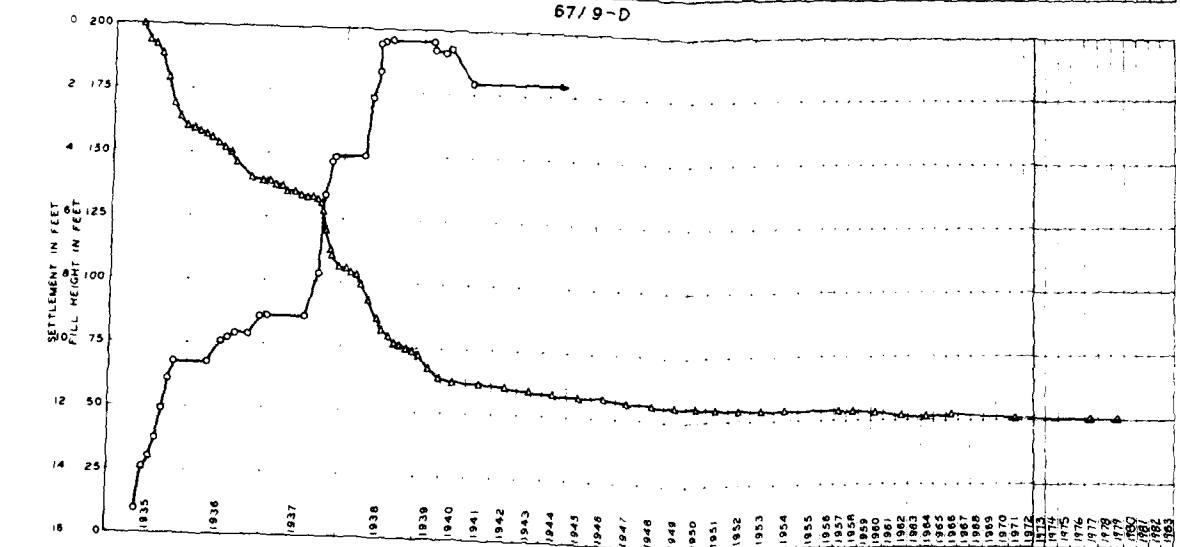
- FILL HEIGHT IN FEET
- SETTLEMENT IN FEET



67/13-D



67/9-D



67/5-D

LEGEND:
 ○ — FILL HEIGHT IN FEET
 —●— SETTLEMENT IN FEET

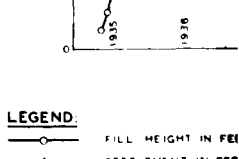
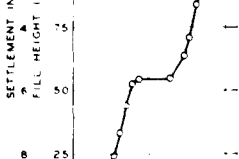
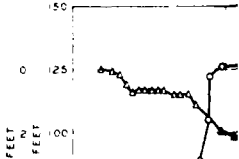
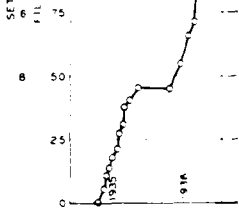
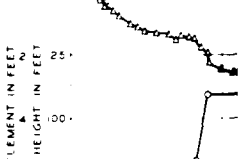
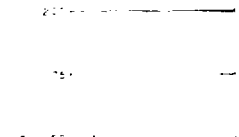
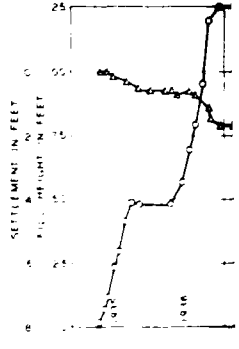
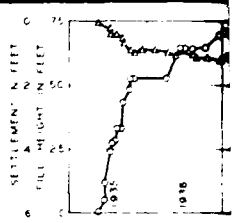
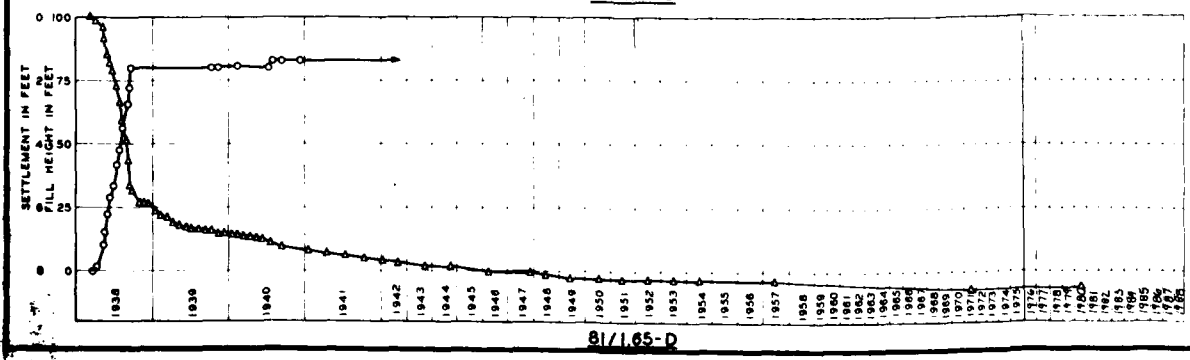
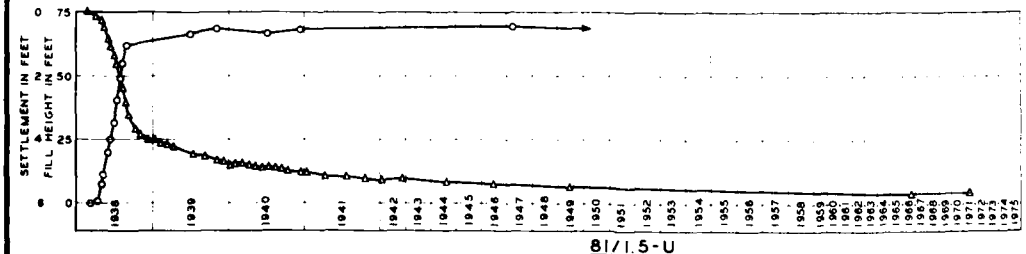
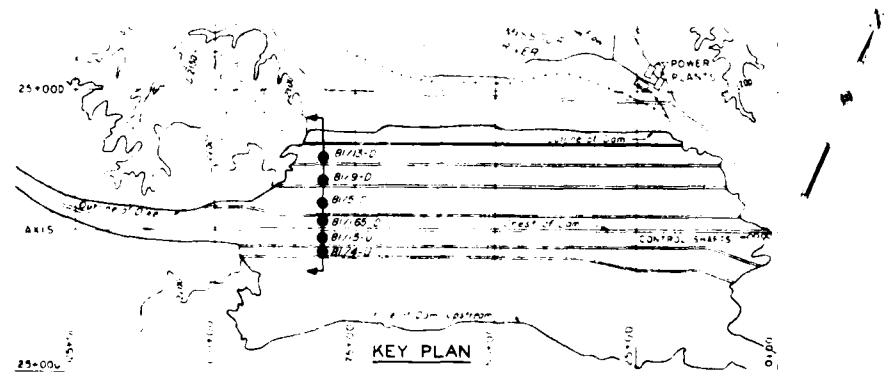
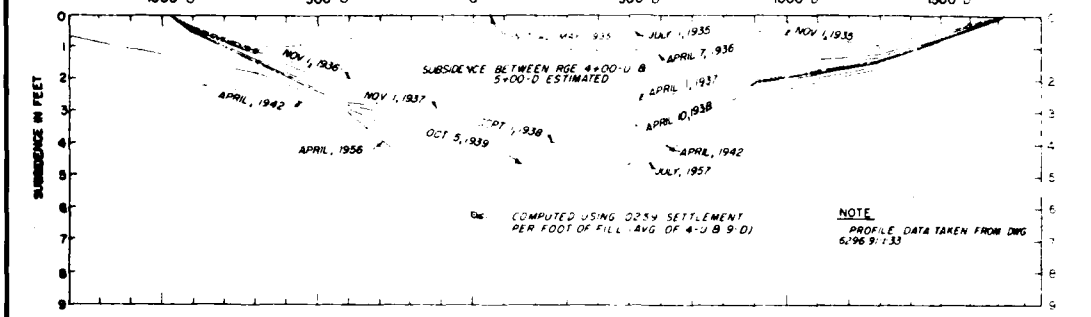
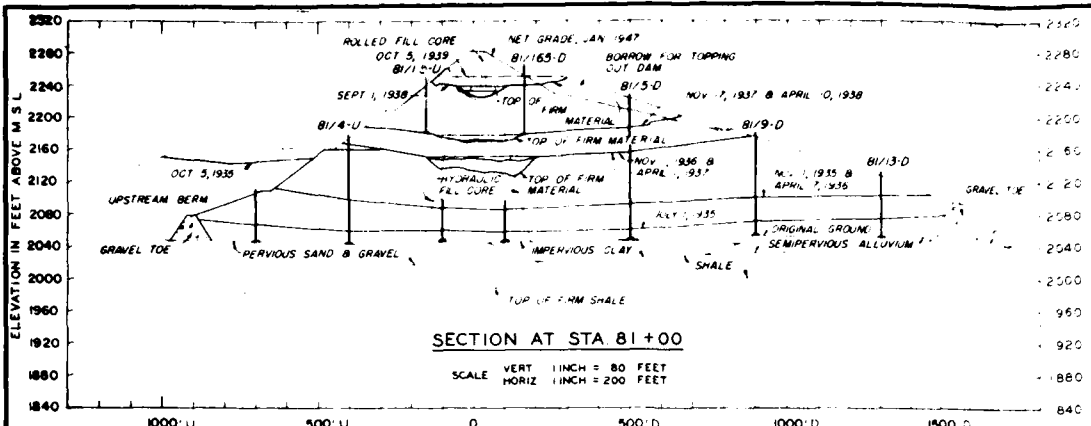
THIS DRAWING HAS BEEN REDUCED TO THREE-FOURTHS THE ORIGINAL SCALE.

1935
1936
1937
1938
1939
1940
1941
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1943
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1946
1947
1948
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1952
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1956
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1973

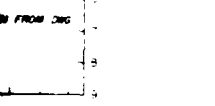
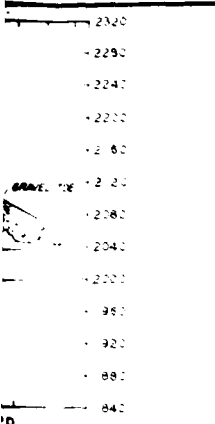


THIS PLAN ACCOMPANIES CONTRACT NO. MODIFICATION NO.

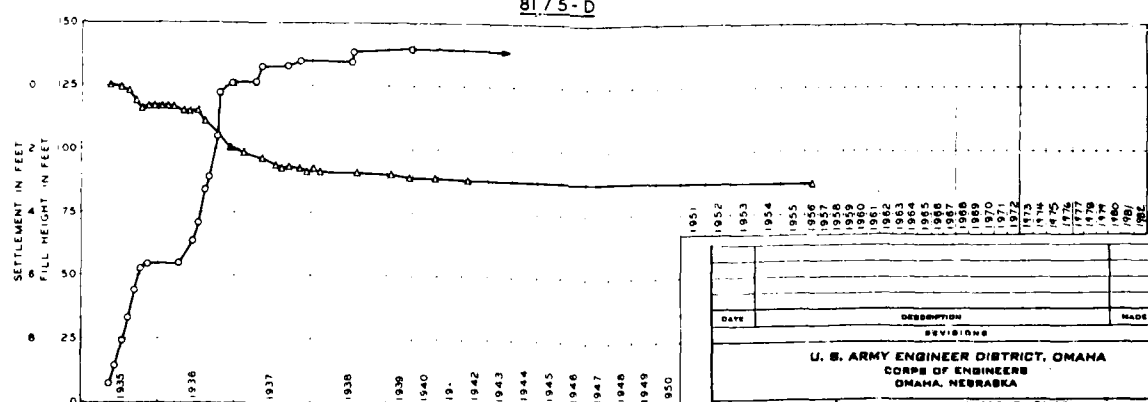
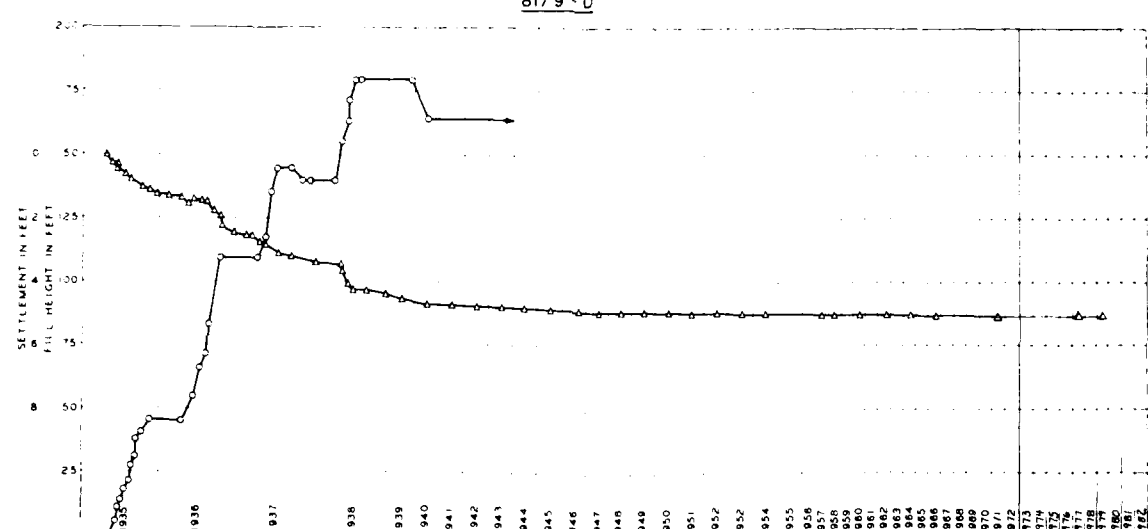
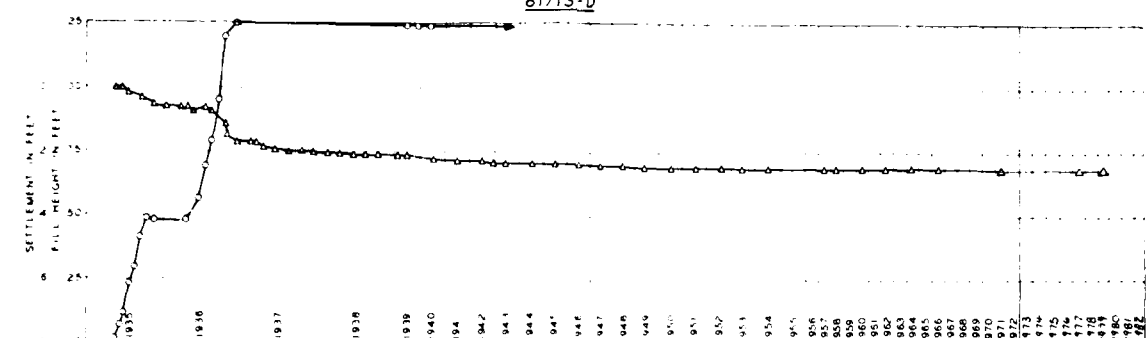
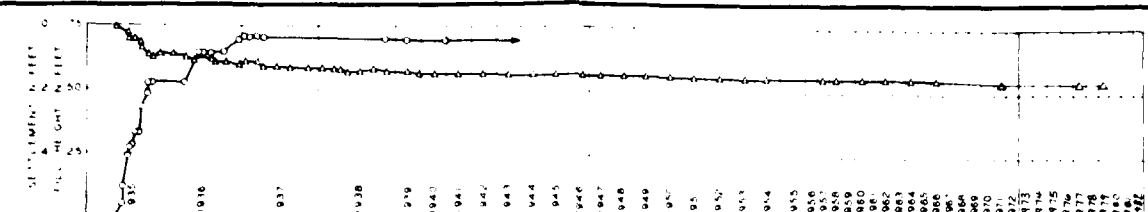
DATE	DESCRIPTION	MADE	APPROV
REVISIONS			
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
MISSOURI RIVER FORT PECK LAKE, MONTANA		SUMMARY OF FOUNDATION SETTLEMENT STATION 87+00	
DESIGNED BY: H. J. W.	MADE BY: L. M. C.	APPROVED: _____ DATE: _____	
DRAWN BY: O. W. A.	IDENTIFIED BY:		
CHECKED BY: F. W. S. BENTLEY	APPROVED: _____	DATE: _____	SCALE: AS SHOWN
APPROVED: _____	DATE: _____	SCALE: AS SHOWN	DRAWING NUMBER
U. S. ARMY ENGINEER DISTRICT		OMAHA	



LEGEND:
 ○ FILL HEIGHT IN FEET
 △ SETTLEMENT IN FEET



Year	Settlement (Feet)	Fill Height (Feet)
1935	0	0
1936	10	50
1937	20	60
1938	30	70
1939	35	75
1940	38	75
1941	40	75
1942	42	75
1943	43	75
1944	44	75
1945	45	75
1946	46	75
1947	47	75
1948	48	75
1949	49	75
1950	50	75
1951	51	75
1952	52	75
1953	53	75
1954	54	75
1955	55	75
1956	56	75
1957	57	75
1958	58	75
1959	59	75
1960	60	75
1961	61	75
1962	62	75
1963	63	75
1964	64	75
1965	65	75
1966	66	75
1967	67	75
1968	68	75
1969	69	75
1970	70	75
1971	71	75
1972	72	75
1973	73	75
1974	74	75
1975	75	75
1976	76	75
1977	77	75
1978	78	75
1979	79	75
1980	80	75
1981	81	75
1982	82	75



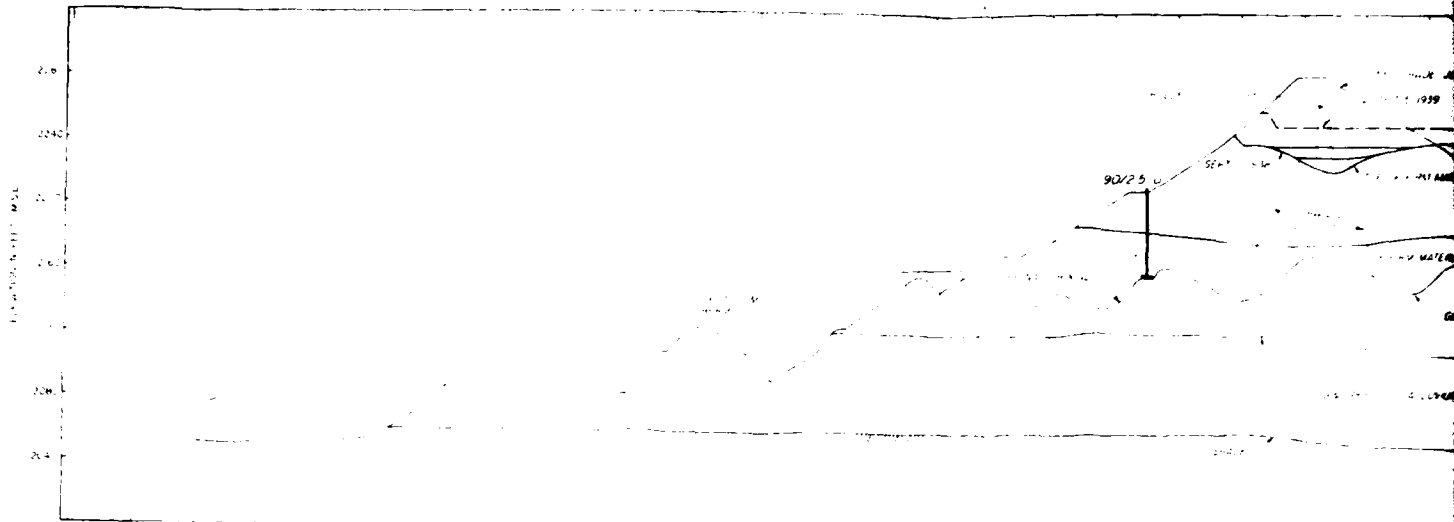
LEGEND
 ○ FILL HEIGHT IN FEET
 △ SETTLEMENT IN FEET

THIS DRAWING HAS BEEN RECHECKED TO VERIFY AGAIN THE ORIGINAL SCALE.

THIS PLAN ACCOMPANIES CONTRACT NO. MODIFICATION NO.

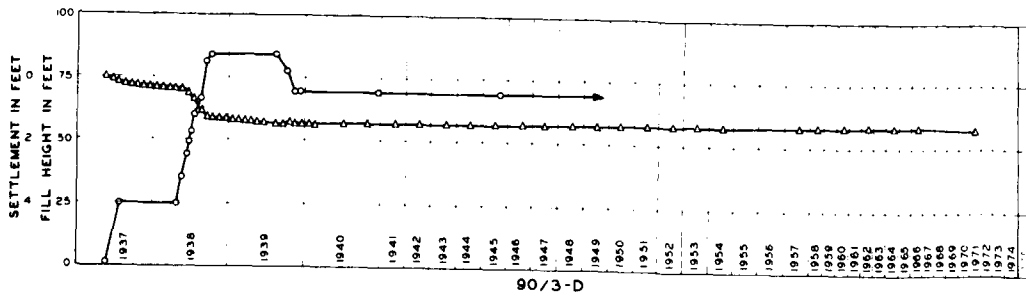
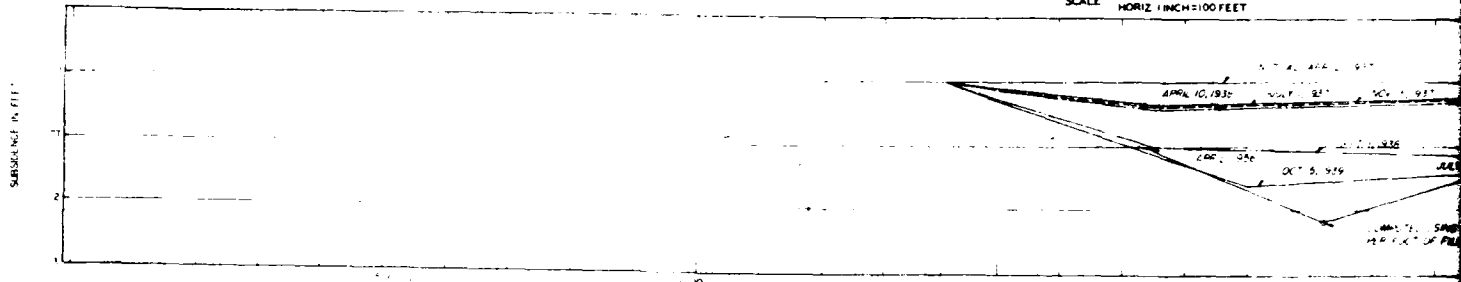


DESIGNED BY: R. M. LY	DATE:	DESCRIPTION:	MADE:	APPROV:
DRAWN BY: L. M. C.		REVISIONS:		
ENGINEER BY: C. W. A.		U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA		
CHIEF LAB (ONLINE) SECTION:		MISSOURI RIVER FORT PECK LAKE, MONTANA		
APPROVED:		SUMMARY OF FOUNDATION SETTLEMENT STATION 81+00		
CHIEF CONTRACTOR'S SIGNATURE:		APPROVED:	DATE:	
APPROVED:		CHIEF ENGINEERING DIVISION:	MADE AS SHOWN:	SPCL. ILL.
				ISSUED NUMBER:
		COL. S. T. SHRYVER ENGINEER:		DIET:

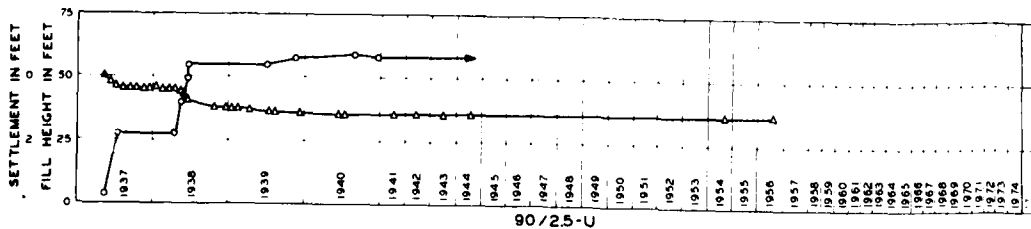


SECTION AT STA 90+00

SCALE VERT. 1 INCH = 40 FEET
HORIZ. 1 INCH = 100 FEET



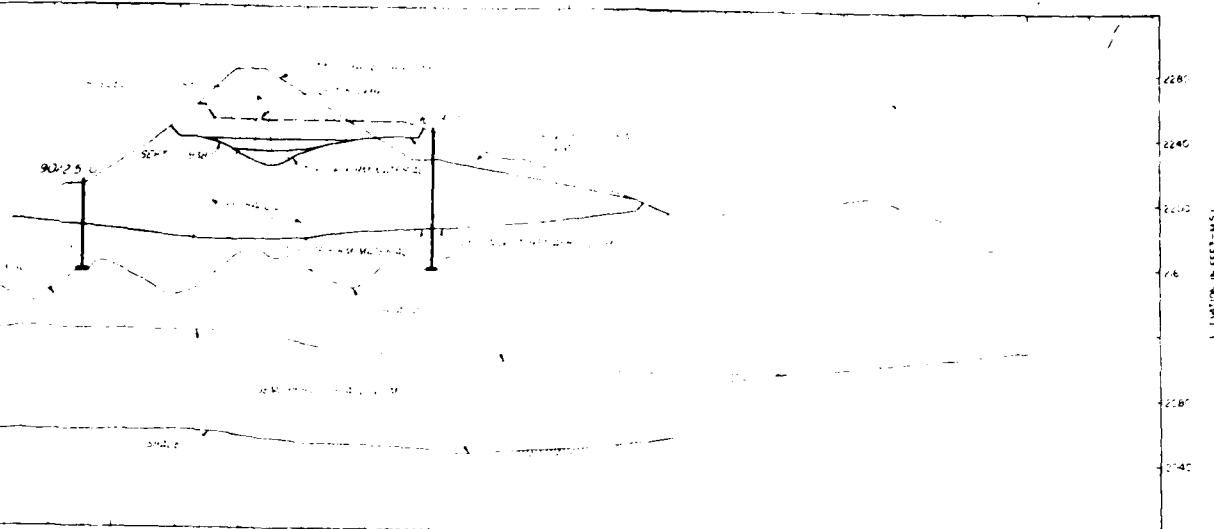
90/3-D



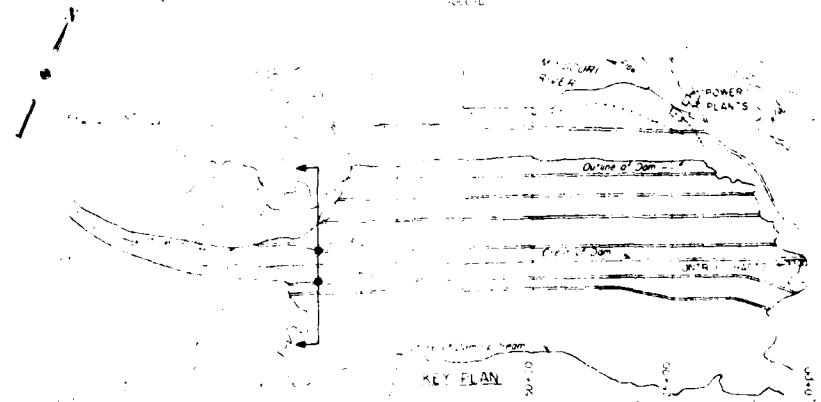
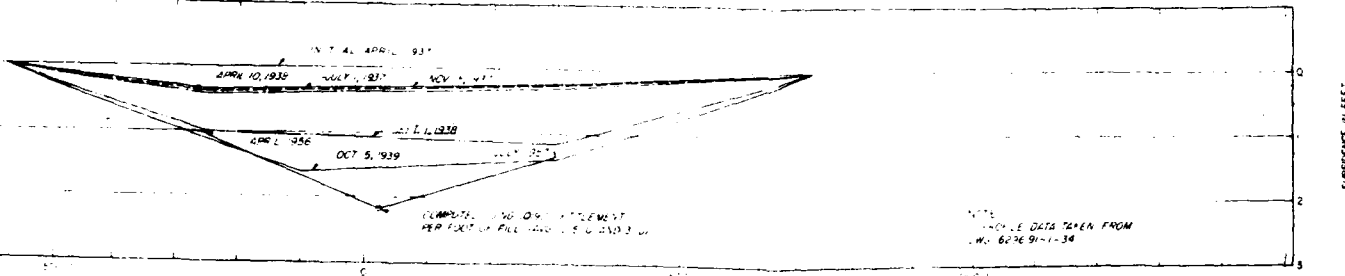
90/25-U

LEGEND

—○— SETTLEMENT IN FEET
- - -□- - - FILL HEIGHT IN FEET



SECTION AT STA 90+00
 SCALE VERT 1 INCH=40 FEET
 HORIZ 1 INCH=100 FEET



1874
1875
1876
1877
1878
1879
1880
1881
1882
1883
1884
1885
1886
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1890
1891
1892
1893
1894
1895
1896
1897
1898
1899
1900

LEGEND
 —○— SETTLEMENT IN FEET
 —△— FILL HEIGHT IN FEET

THIS DRAWING HAS BEEN FILED IN THE
 OFFICE OF THE DISTRICT ENGINEER
 AT OMAHA, NEBRASKA, THIS 12th DAY OF APRIL 1939



THIS PLAN ACCOMPANIES CONTRACT NO. _____
 MODIFICATION NO. _____

DATE	DESCRIPTION	MADE	APPROV
	REVISIONS		
U. S. ARMY ENGINEER DISTRICT, OMAHA CORPS OF ENGINEERS OMAHA, NEBRASKA			
DESIGNED BY: _____ DRAWN BY: _____ CHECKED BY: _____ SUBMITTED BY: _____		MISSOURI RIVER FORT PECK LAKE, MONTANA	
SUMMARY OF FOUNDATION SETTLEMENT STATION 90+00			
CHECKED FOR FOUNDATION SECTION APPROVED: _____ DIST. FOR L.W. & M. SECTION APPROVED: _____	APPROVED: _____ DIST. ENGINEERING DIVISION APPROVED: _____	DATE: _____	SCALE AS SHOWN SHEET NO. _____

LMED
-83