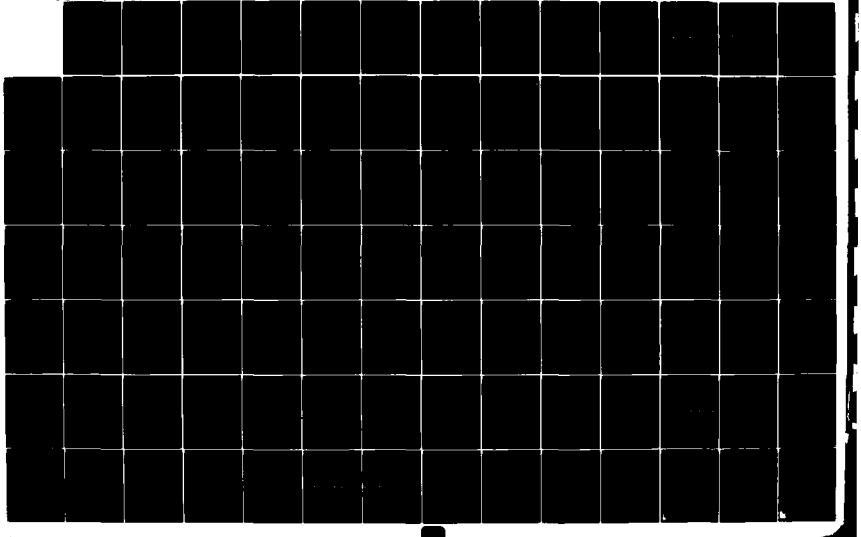
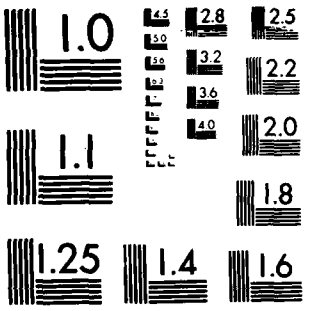
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Osage River
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Harry S. Truman Dam & Reservoir

Operation and Maintenance Manual

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Appendix VII
Volume Two

Construction Foundation Report

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Kansas City District

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

The purpose of this report is to provide a record of foundation conditions encountered during construction and methods used to adapt to these conditions during construction. This information is a part of the permanent collection of project engineering data required by Appendix A to ER 1110-1-1801, dated Dec 81. This report deals with construction of the main embankment, the Sterett Creek Dike and the Spillway-Powerhouse.

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OPERATION AND MAINTENANCE MANUAL
HARRY S. TRUMAN DAM AND RESERVOIR
OSAGE RIVER, MISSOURI

APPENDIX VII
CONSTRUCTION FOUNDATION REPORT
VOLUME II

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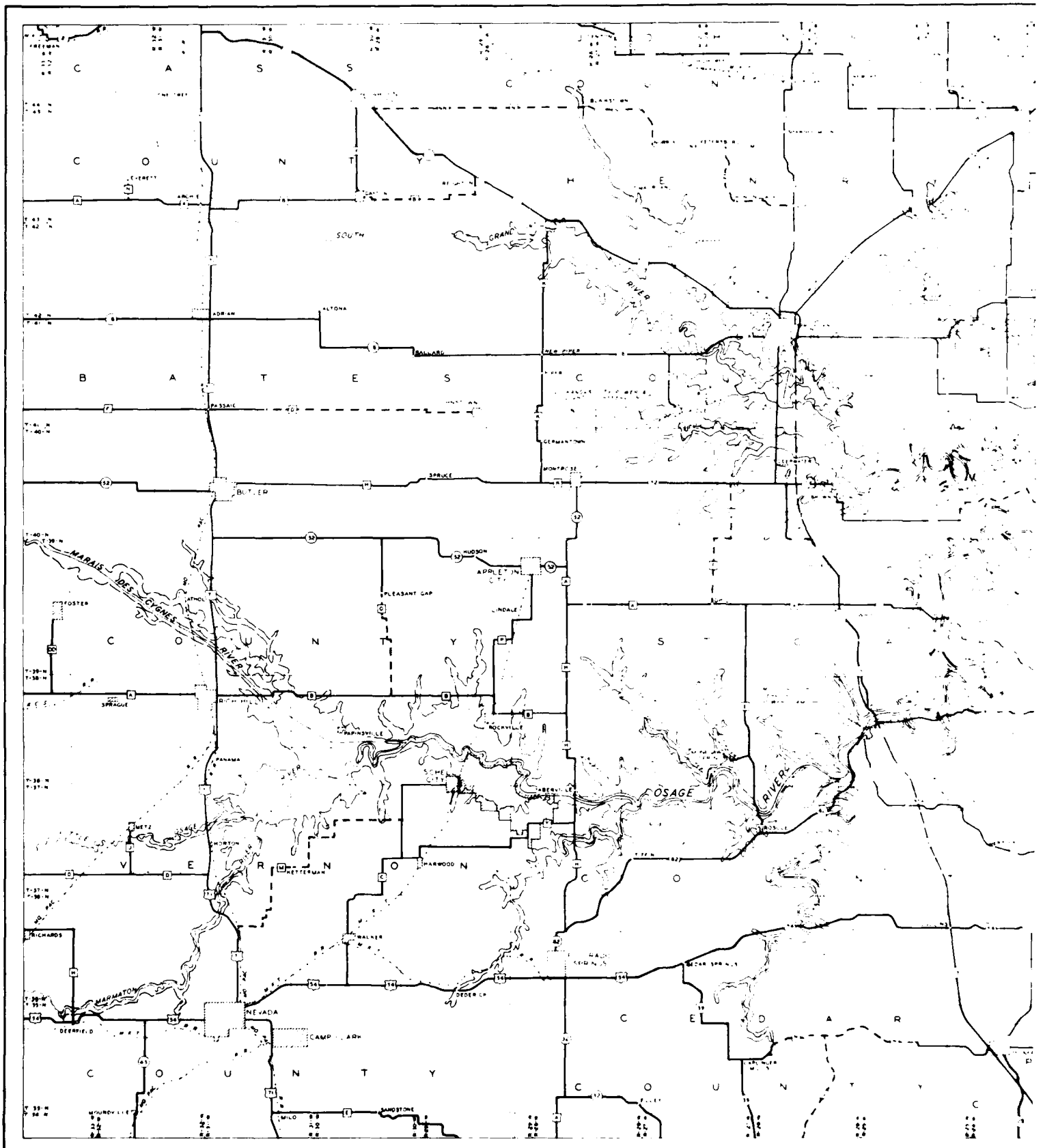
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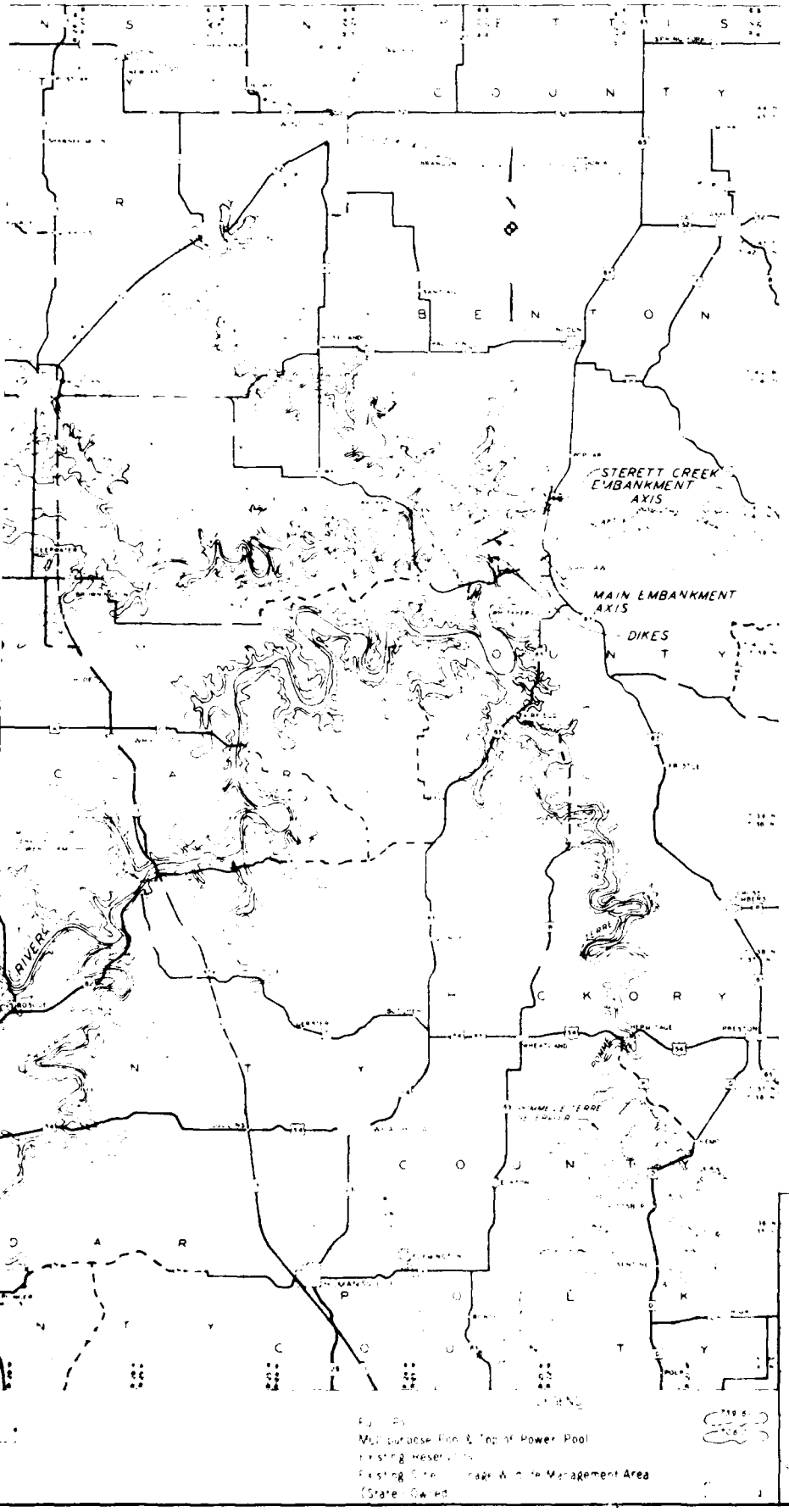
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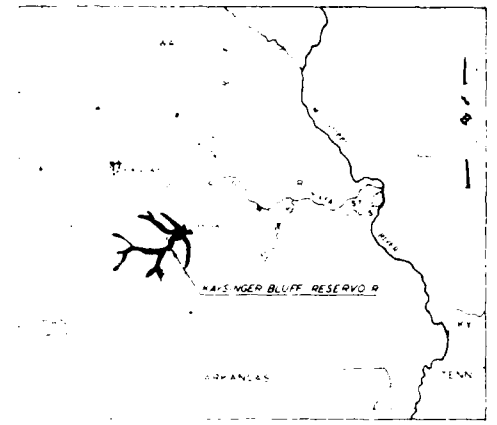
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STAGE I CONSTRUCTION


CASS COUNTY
SOUTH GRAND RIVER
BATES COUNTY
HENRY COUNTY
ADRIAN
ALTONA
BALLARD
PASSAIC
BUTLER
SPRUCE
HUDSON
APPLETON CITY
PLEASANT GAP
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FOSTER
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MARAIS DES CYGNES RIVER
PANAMA
SCHELL CITY
OSAGE RIVER
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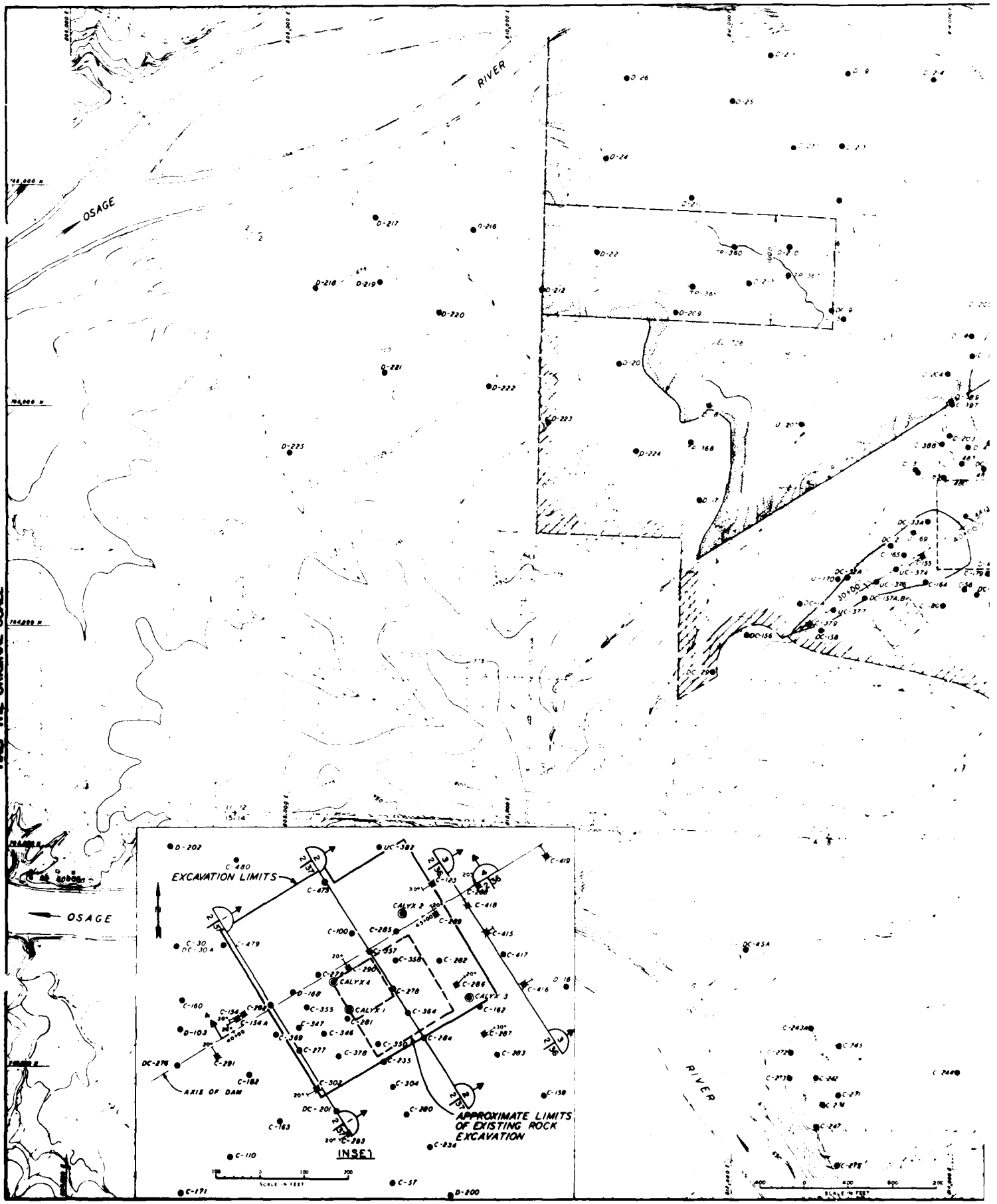
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CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

CONSTRUCTION FOUNDATION REPORT

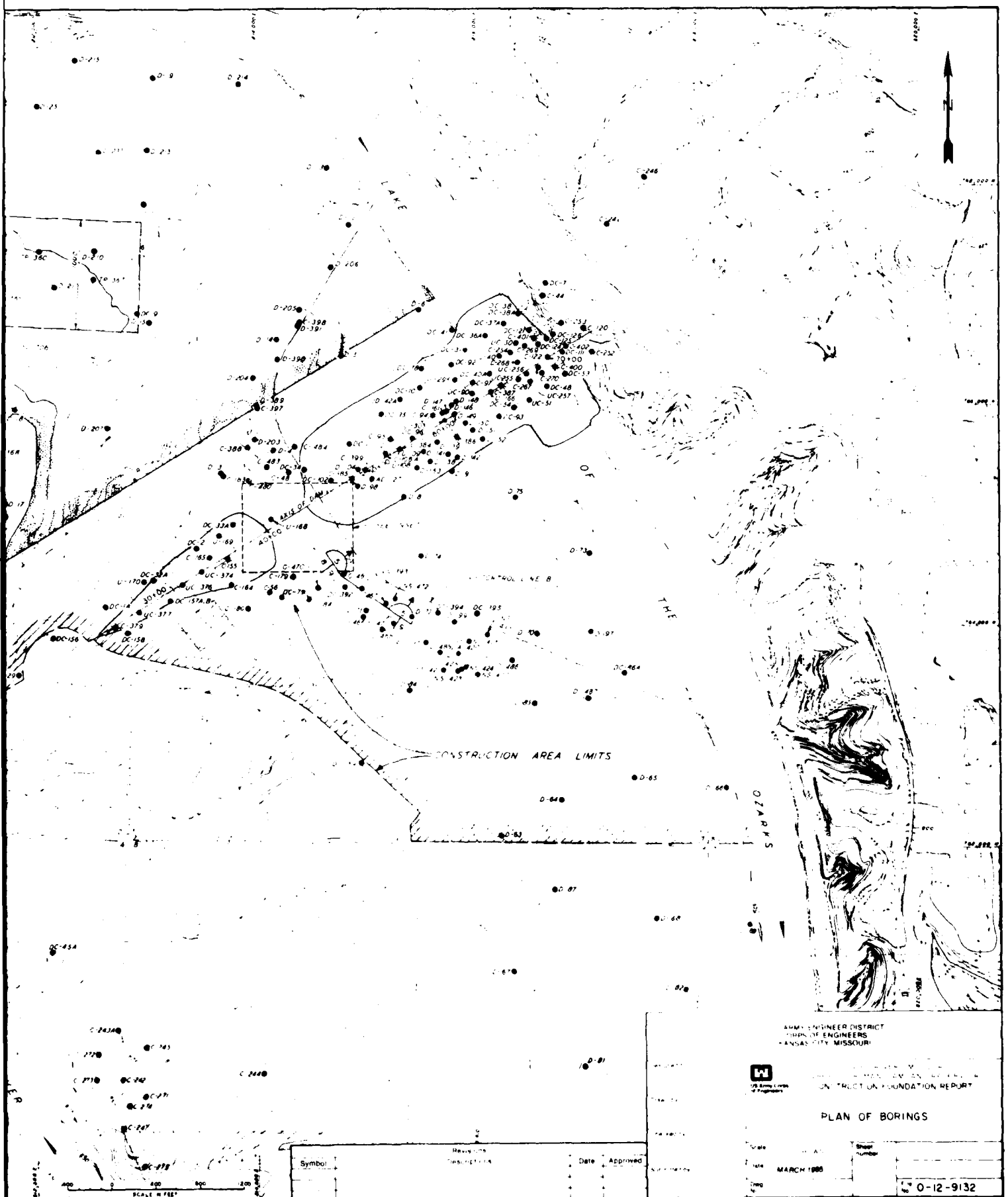
LOCATION AND VICINITY

Sheet Number	
MARCH 1985	
	0-12-9131

PLATE NO. 1



HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE



ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

ON TRACTOR FOUNDATION REPORT

PLAN OF BORINGS

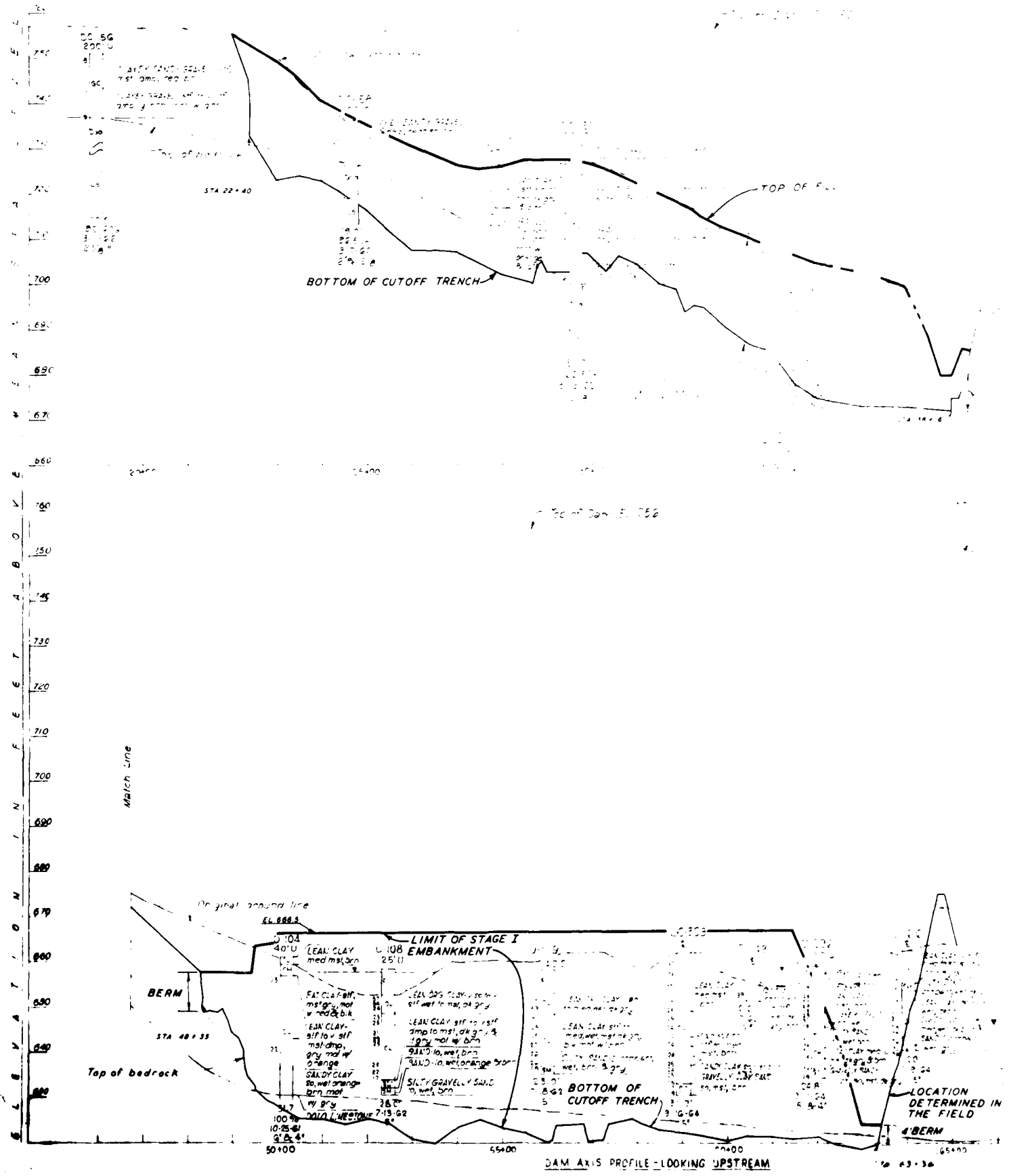
MARCH 1966

Symbol | Revisions | Date | Approved

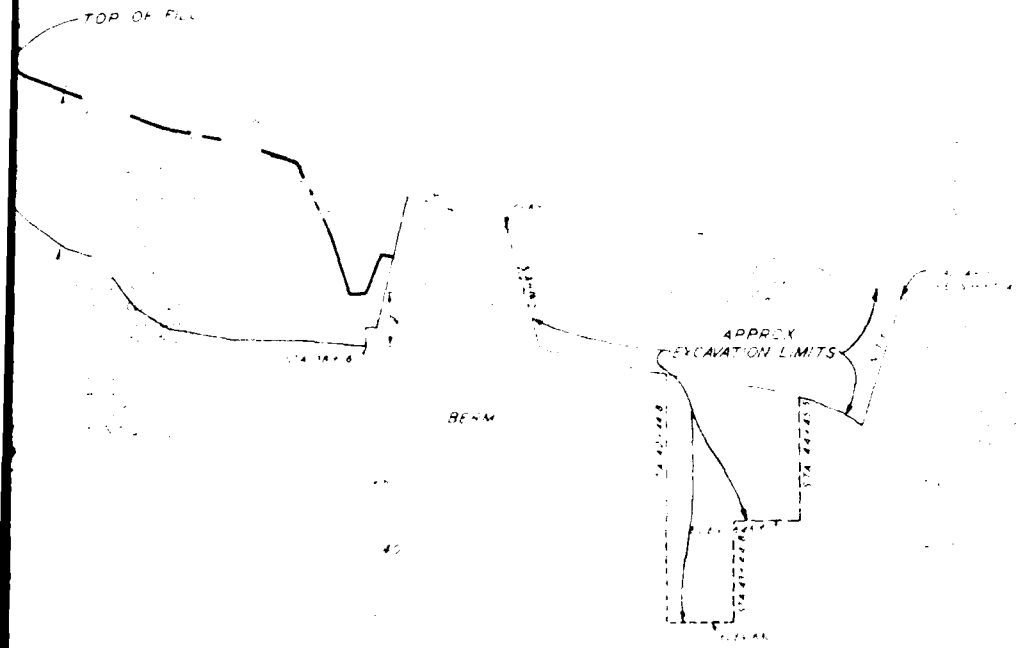
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No. 0-12-9132

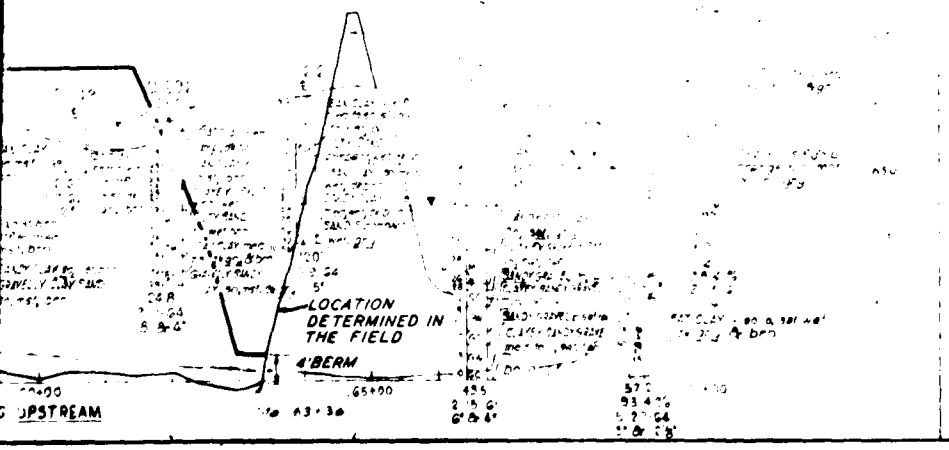
PLATE NO. 2



DAM AXIS PROFILE - LOOKING UPSTREAM



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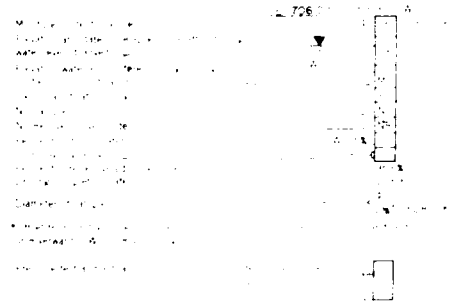
Date Approved

INSTRUCTION FOUNDATION REPORT

DAM AXIS
ON OVERBURDEN PROFILE

0-12-9133

PLATE NO 3

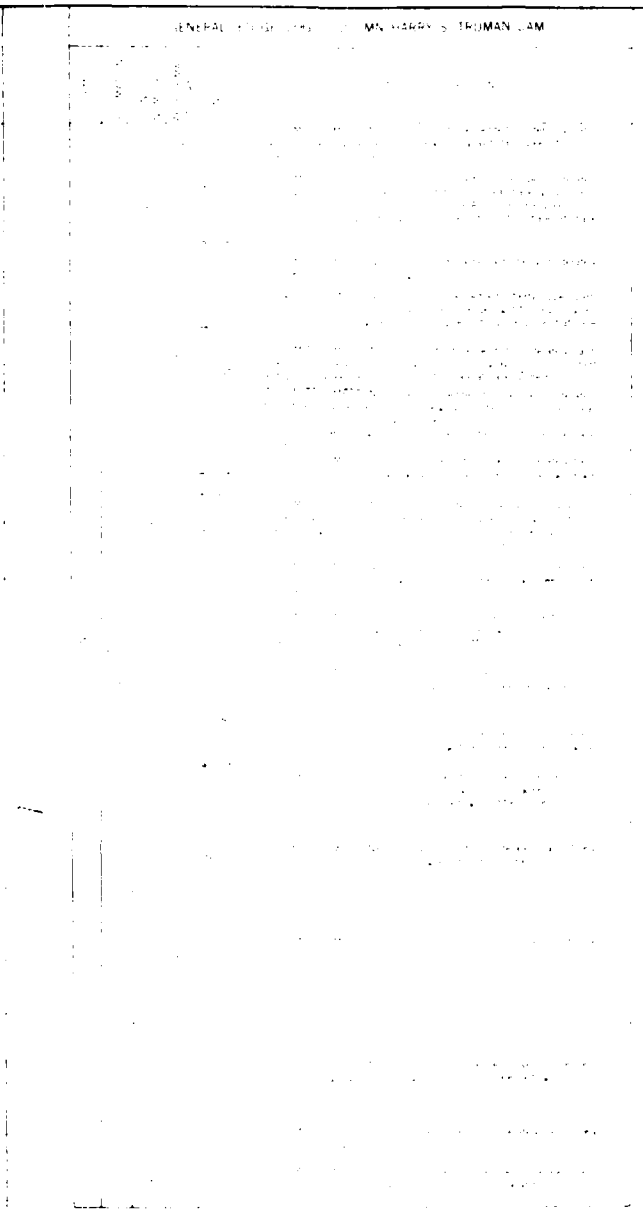


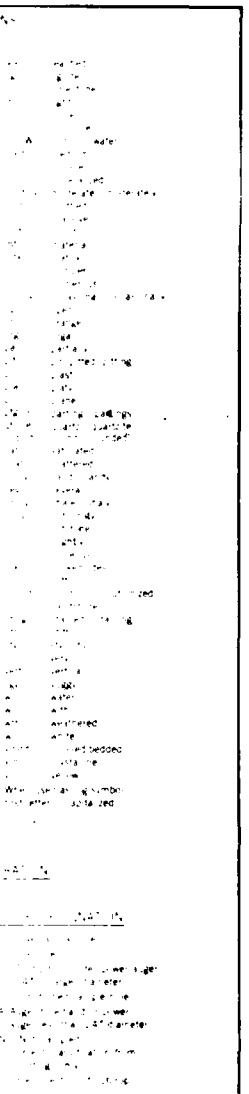
GENERALIZED GEOLOGIC COLUMN HARRY S. TRUMAN DAM

GW
GM
SW
SP
SM
SC

MK HARRY S. TRUMAN DAM

MK HARRY S. TRUMAN DAM





...es present throughout ... formation, were not included

...noted on boring logs, is defined ... and dolomite limestone fragments

...where noted of boring logs, ...ments of chert and dolomite limestone

Revisions		
Descriptions	Date	Approved

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...
CONSTRUCTION FOUNDATION REPORT

GEOLOGIC COLUMN AND LEGEND

MARCH 1985

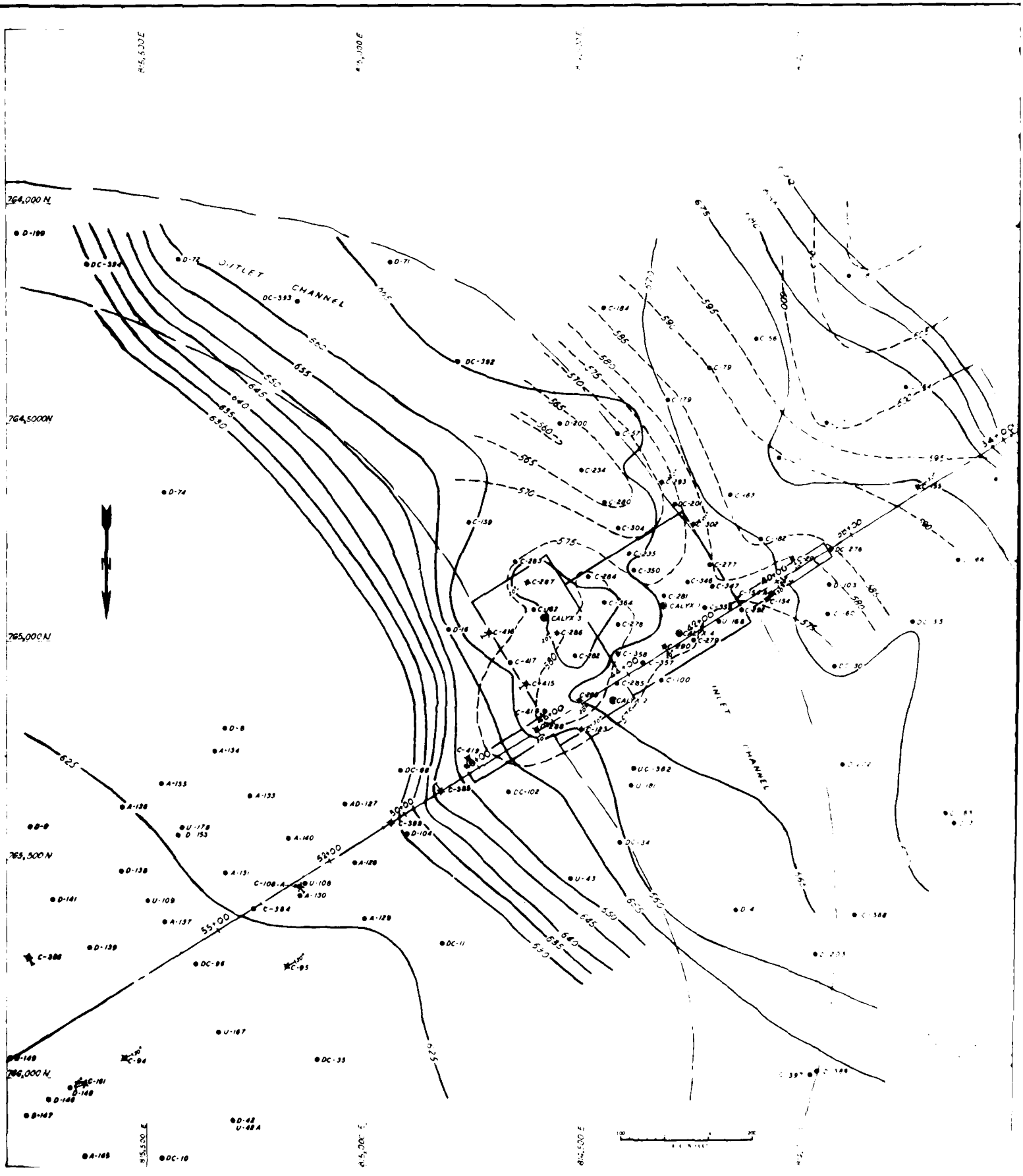
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PLATE NO. 4

CORPS OF ENGINEERS



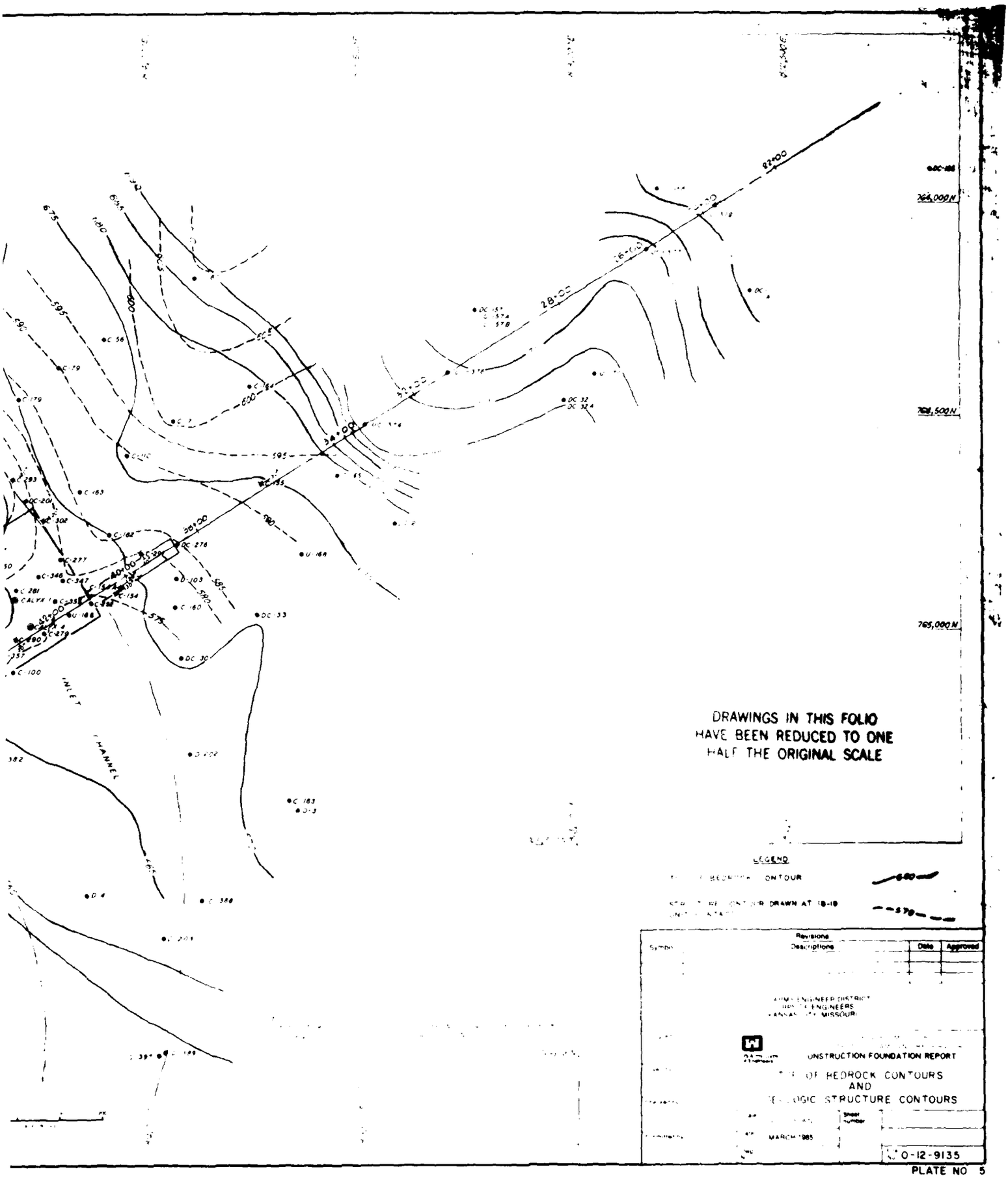
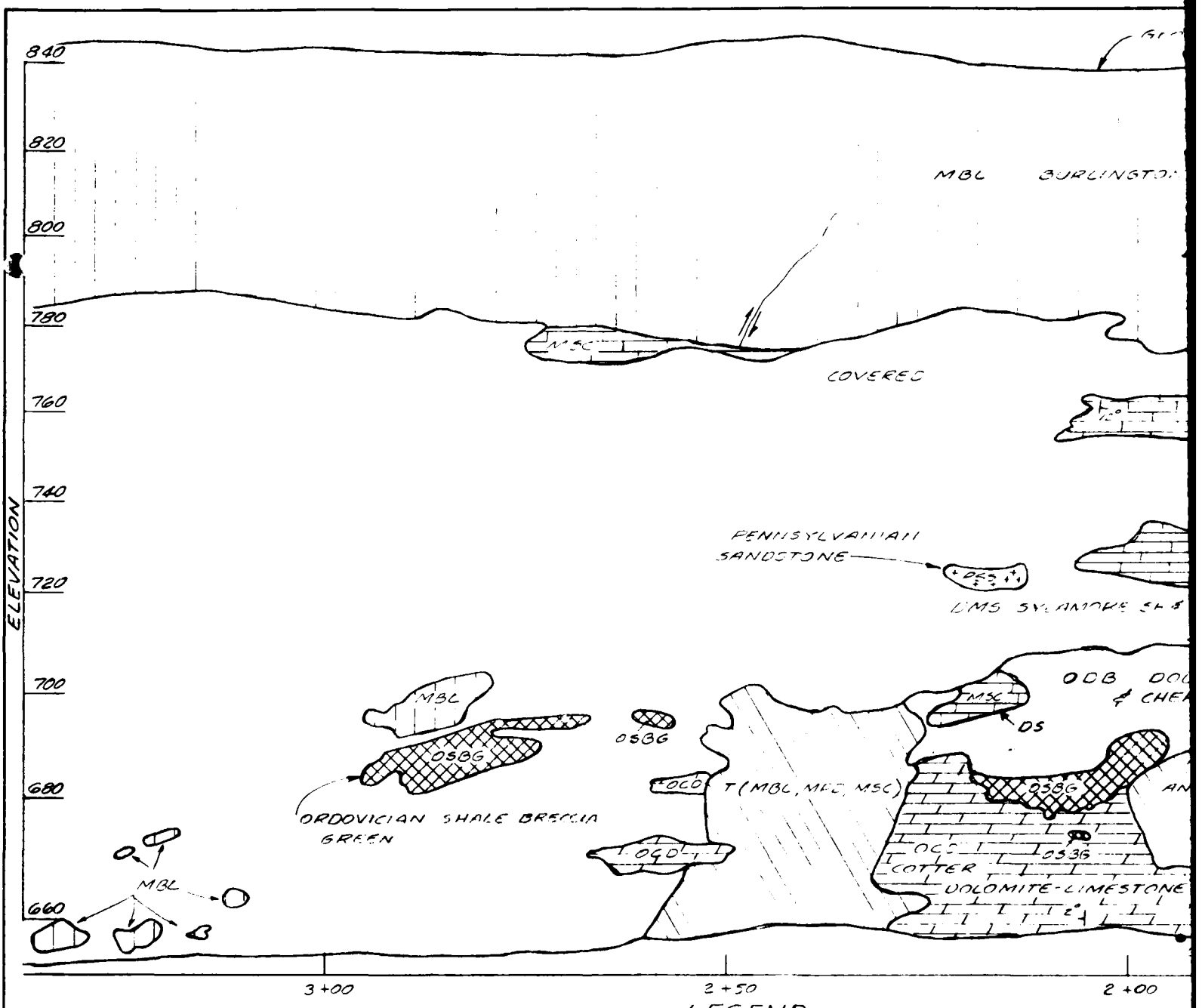

765,000N
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LEGEND
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HALF THE ORIGINAL SCALE
Revisions
Symbol
Description
Date
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CONSTRUCTION FOUNDATION REPORT
TOP OF BEDROCK CONTOURS
AND
GEOLOGIC STRUCTURE CONTOURS
MARCH 1985
0-12-9135

PLATE NO 5



LEGEND

QUATERNARY
UNCONFORMITY
T(MBL) Talus (Rock Unit)

PENNSYLVANIAN
PSH Penn. Shale
PSS Penn. Sandstone
UNCONFORMITY

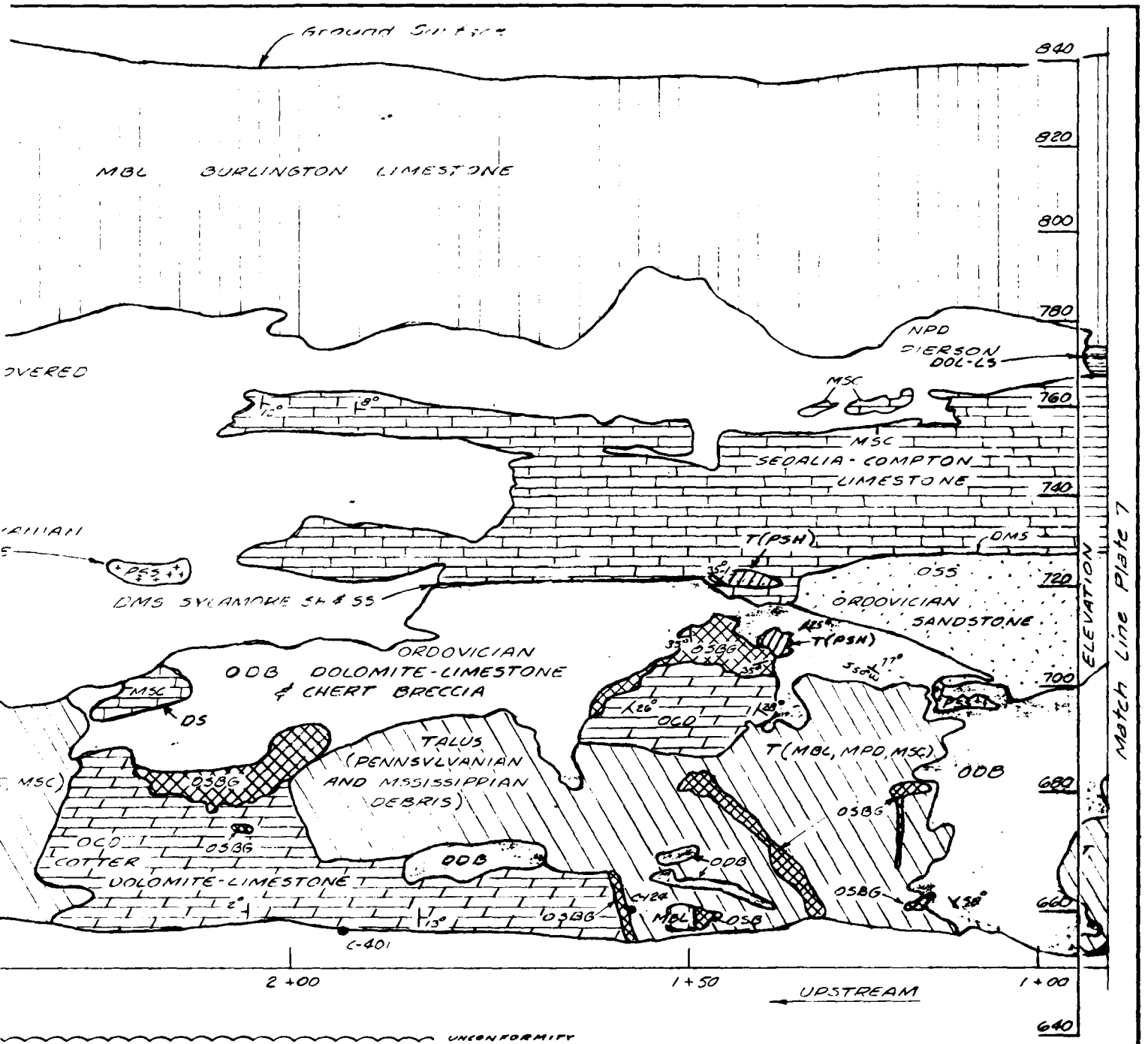
MISSISSIPPIAN
MBL Miss. Burlington ls.
MFD Miss. Pierson Dol-ls.
MNS Miss. Northview Shale
MSC Miss. Sedalia-Compton ls.
UNCONFORMITY

DEVONIAN-MISS
UMS Dev.-Miss. Sylamore Sh. & Ss.
UNCONFORMITY

ORDOVICIAN
OSS Ord. Sand
OOB Ord. Dol-Ls
OSBG Ord. Shale
OSB Ord. Sand
OCS Ord. Clayey
OCD Ord. Cotter

GEOLOGIC MAP LEFT ABUTMENT

based on Photographs Elevation & stations approx



UNCONFORMITY

OSS Ord Sandstone

UNCONFORMITY

OOB Ord. Dol-Ls & Chert Breccia

OSBG Ord. Shale Breccia Green

OSB Ord. Sandy Shale Breccia

OCS Ord. Clayey Sand

OCO Ord. Cotter Dolomite-Limestone

Symbol	Revisions Description	Date	Approved

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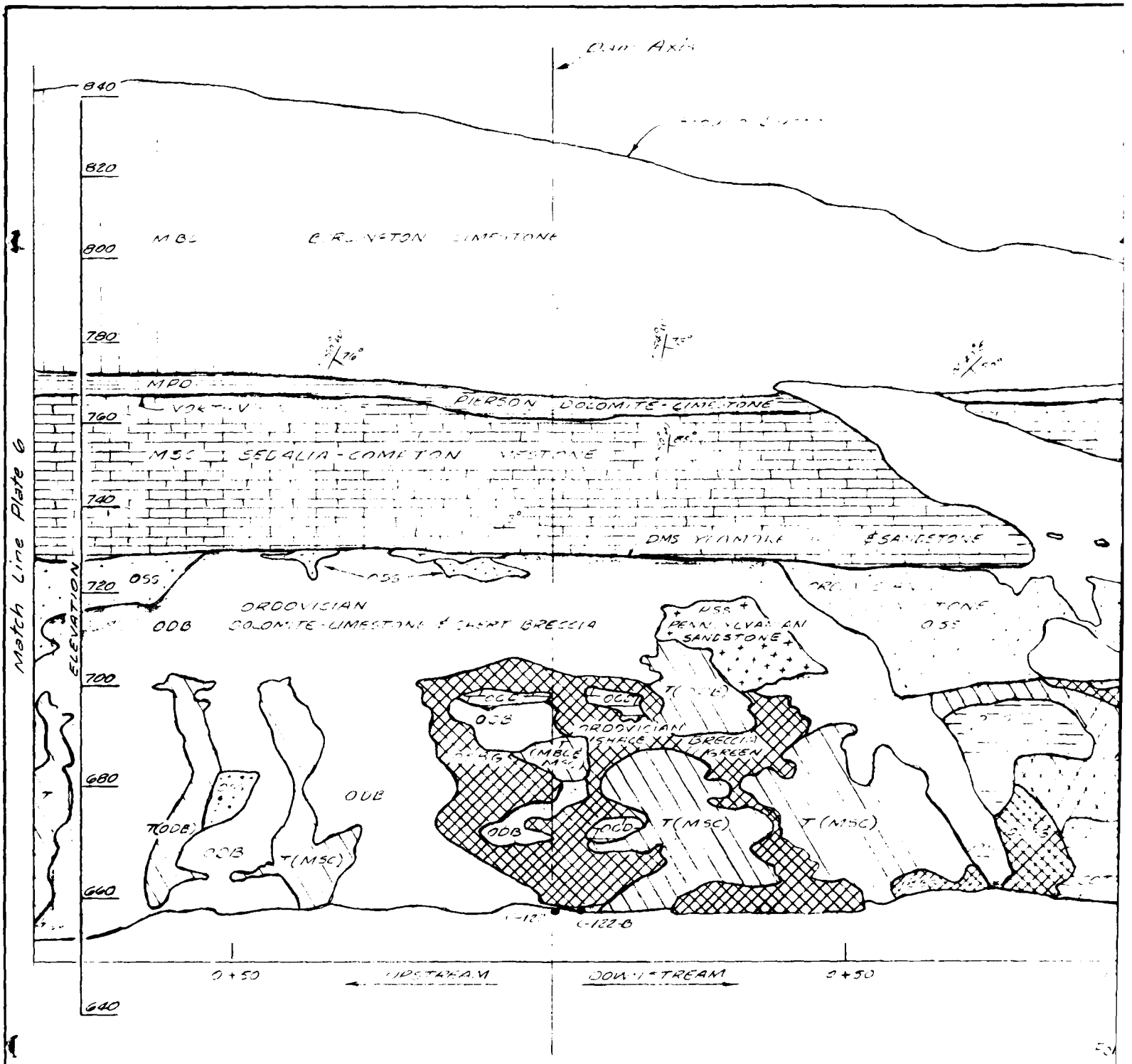
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

GEOLOGIC MAP LEFT ABUTMENT, UPSTREAM

As shown
MARCH 1955

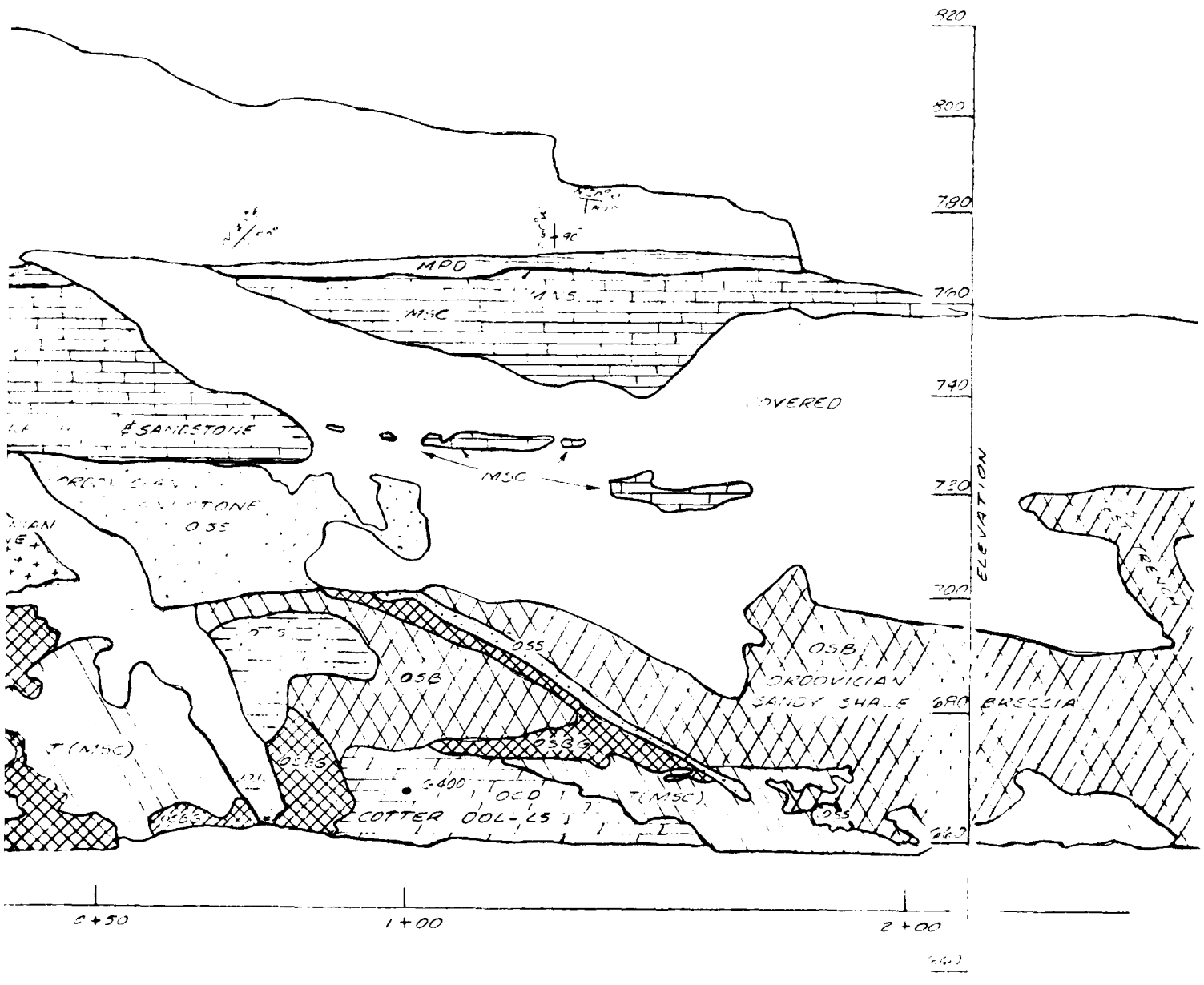
BUTMENT
Elevation & stations approximate

PLATE NO. 6



GEOLOGIC MAP LEFT ABUTMENT

based on photographs elevation & stations approximate



For legend see plate 6

T ABUTMENT

ruction & stations approximate

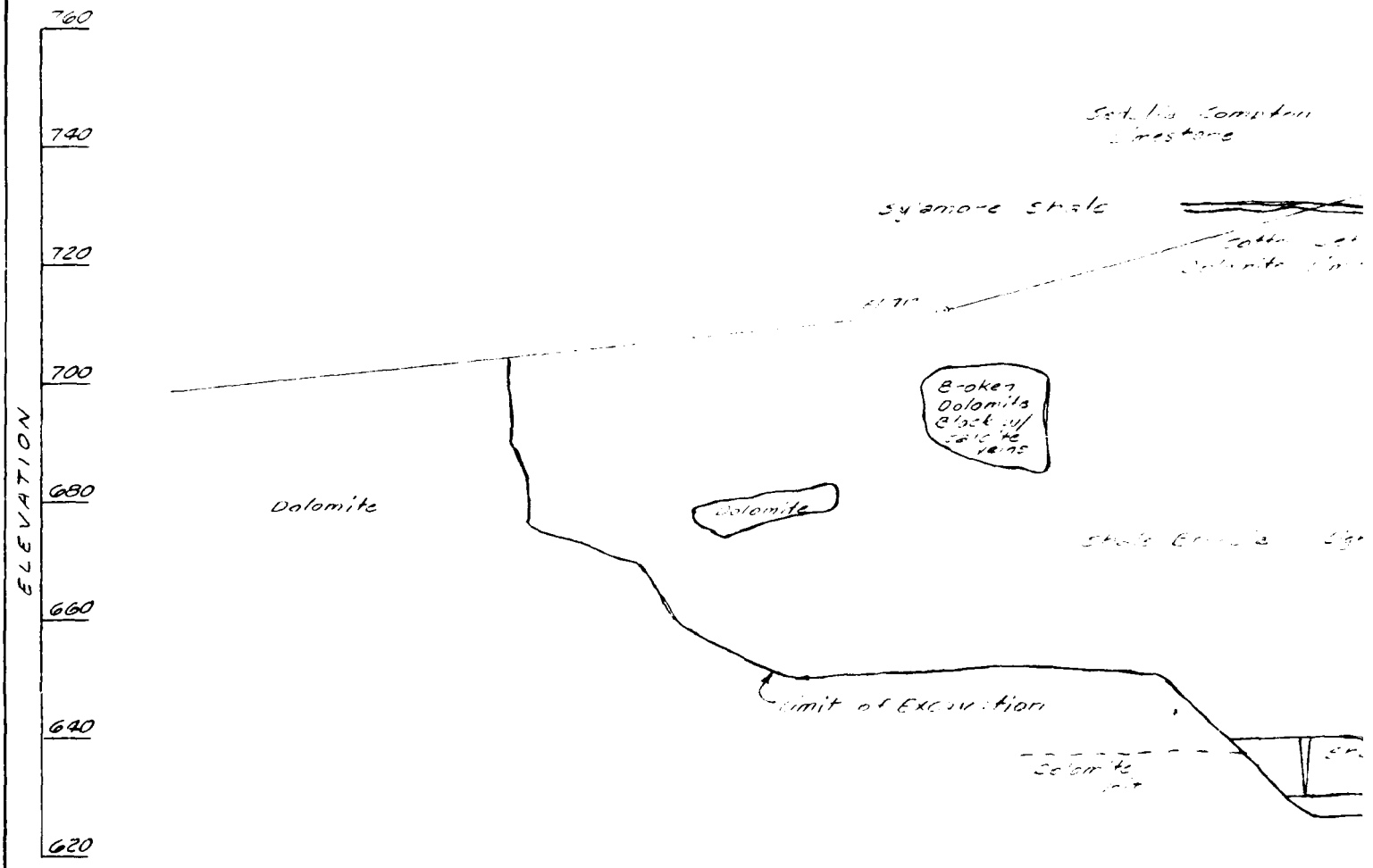
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OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

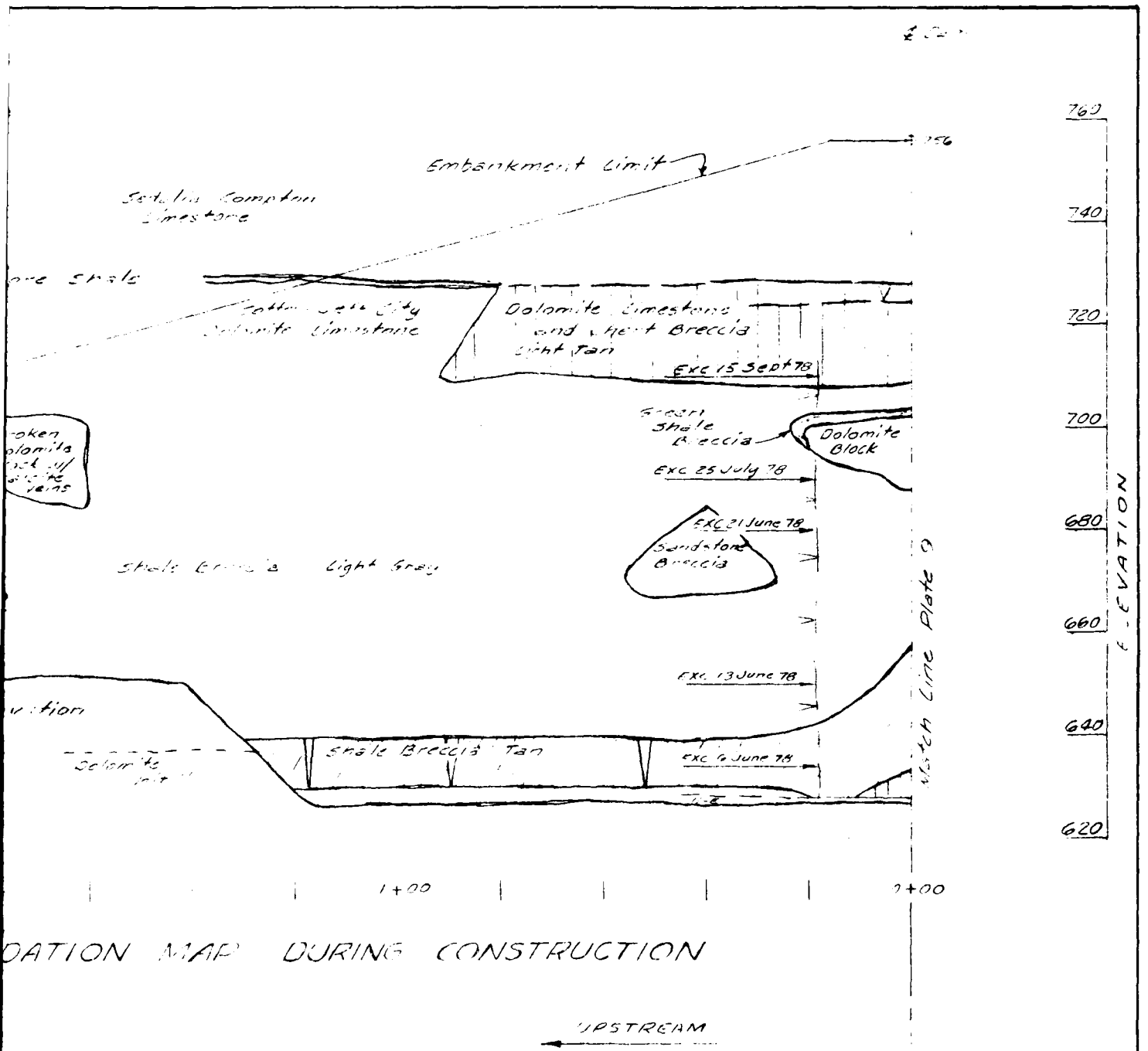
GEOLOGIC MAP LEFT
ABUTMENT, DOWNSTREAM

Scale AS SHOWN
Date MARCH 1966
File No. 0-12-9137

PLATE NO. 7



LEFT ABUTMENT FOUNDATION MAP DUR



DATION MAP DURING CONSTRUCTION

0 20
SCALE IN FEET

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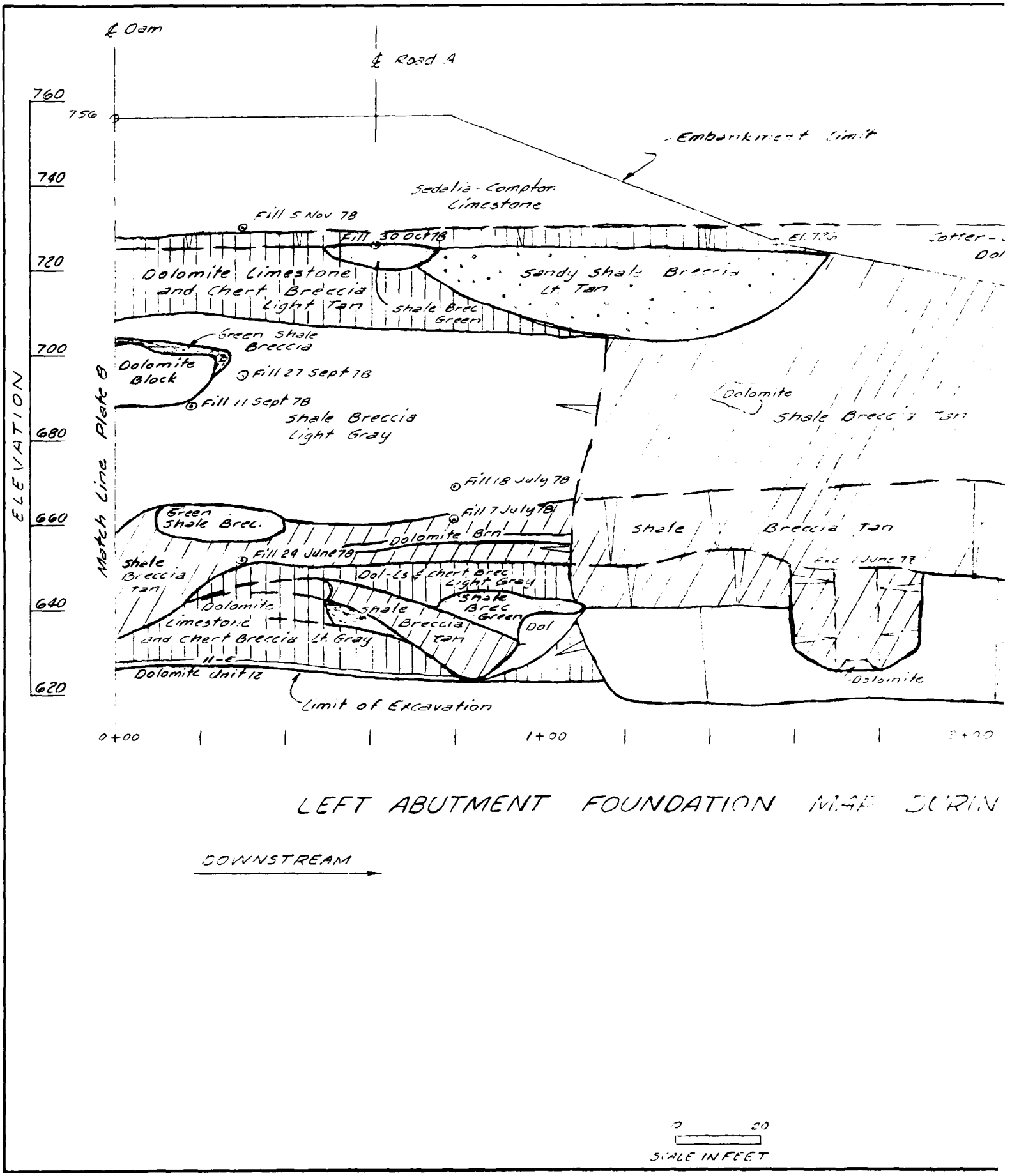
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HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

LEFT ABUTMENT FOUNDATION MAP, UPSTREAM DURING

Scale: AS SHOWN
Date: MARCH 1980
Sheet number:
File No. 0-12-913

PLATE NO. 6

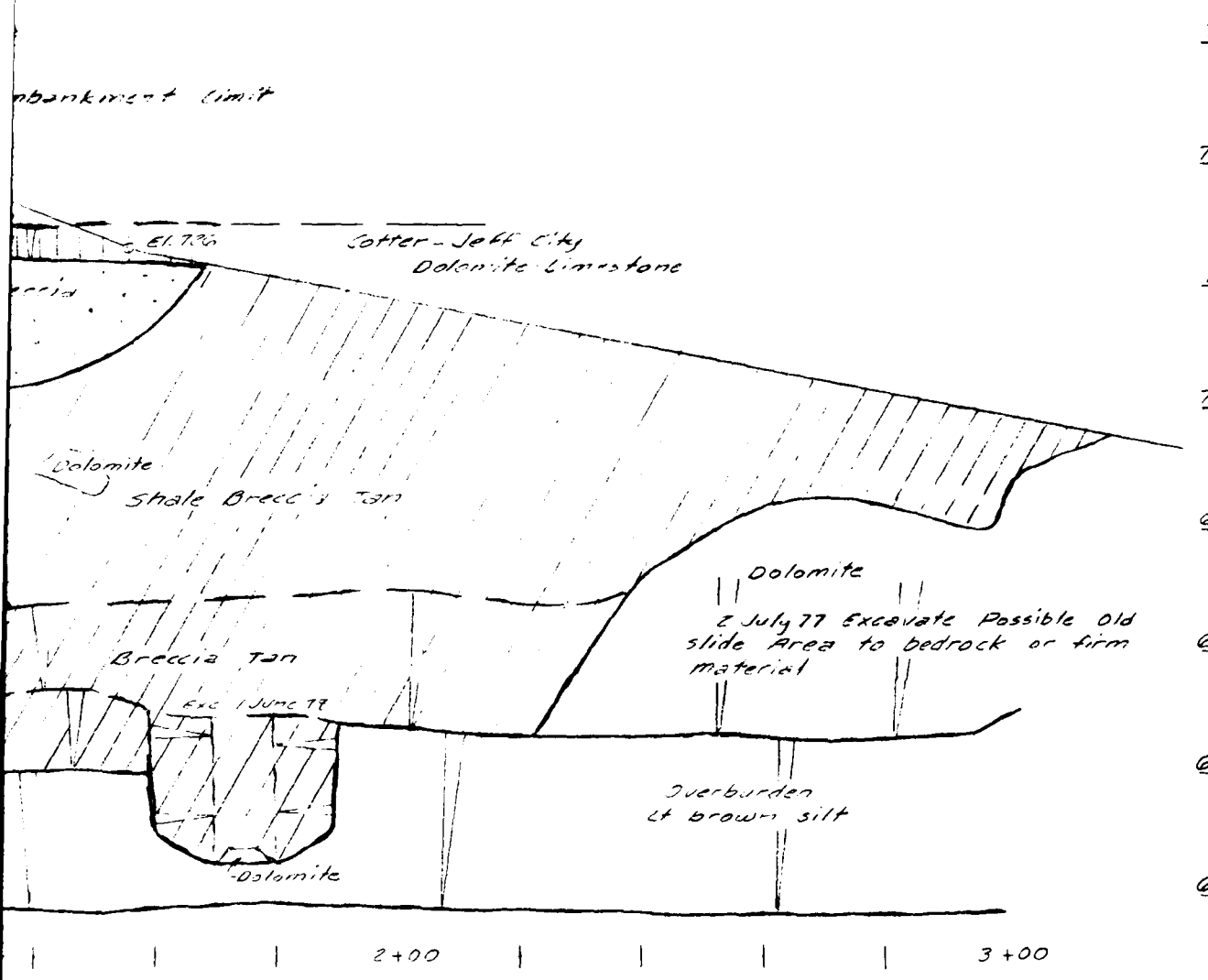


LEFT ABUTMENT FOUNDATION MAP DURIN

DOWNSTREAM →

0 20

SCALE IN FEET



ATION MAP DURING CONSTRUCTION

Revisions			
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CONSTRUCTION FOUNDATION REPORT

LEFT ABUTMENT FOUNDATION MAP
DOWNSTREAM DURING CONST.

Scale

Sheet number

Date: MARCH 1986

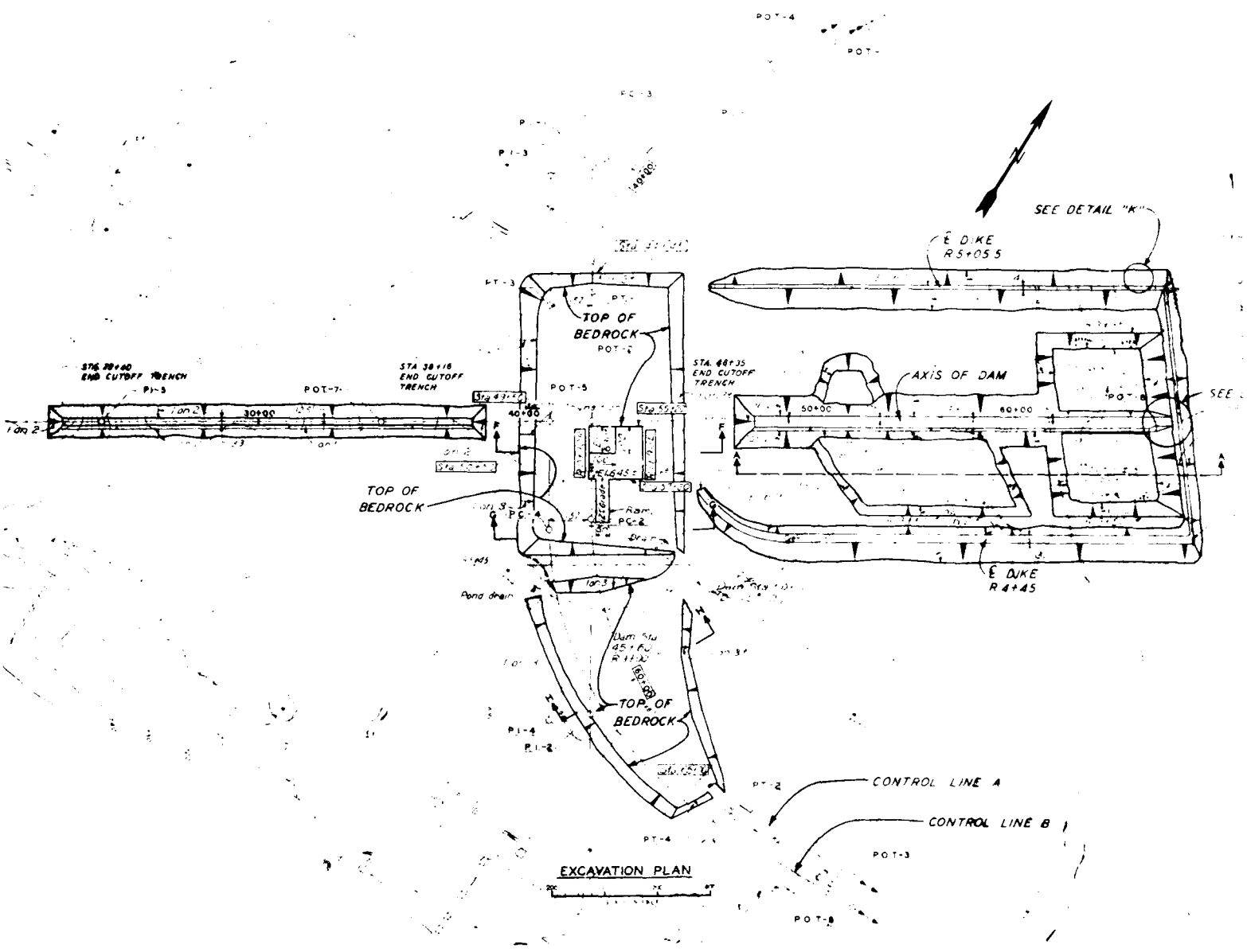
Dwg. No.

File No. 0-12-9139

PLATE NO. 9

20
IN FEET

CORPS OF ENGINEERS



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A

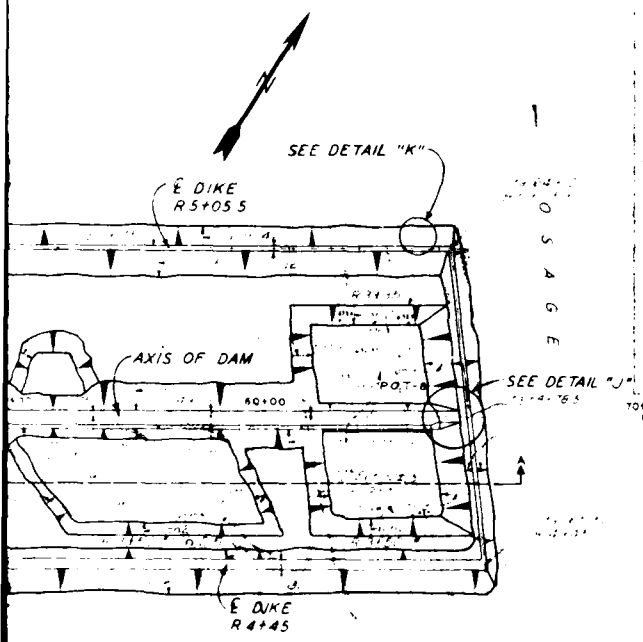
ALINEMENT DATA SCHEDULE

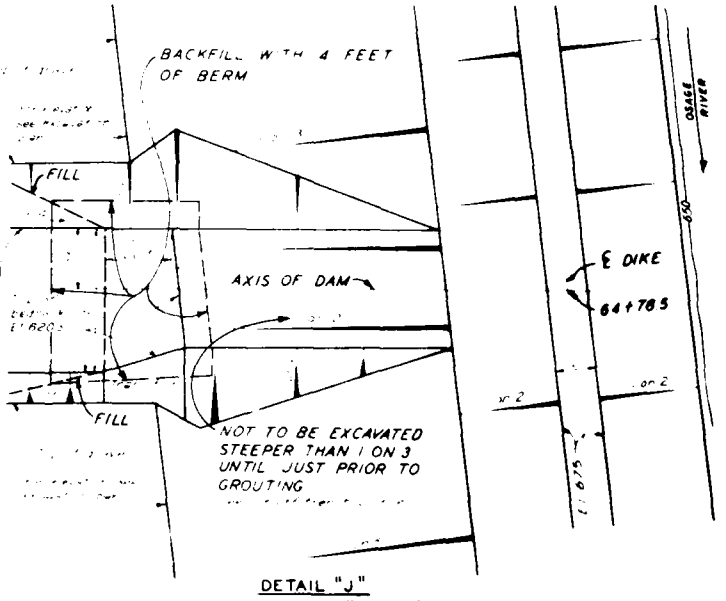
CONTROL LINE A

ATTITUDE	DEPARTURE	AZIMUTH	STATION	STATION	RECTATION BY STATION	B	C	D	T	R	L	E

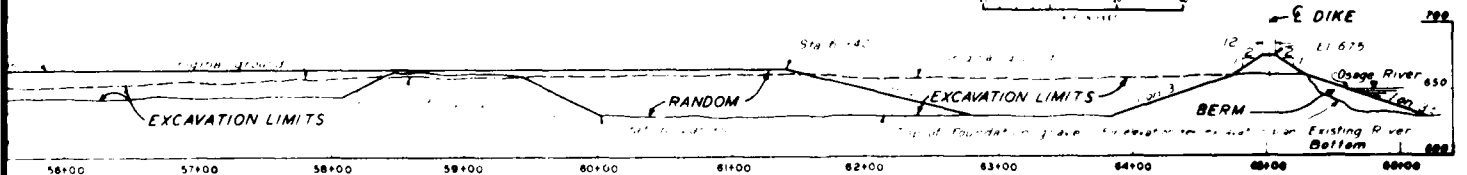
CONTROL LINE B

DAM CENTERLINE





DETAIL "J"



SECTION A-A

LEGEND

STA 40+00 · R1+00 = OUTLET WORKS CONTROL LINE A STATION OR RANGE
STA 50+00 · R2+00 = EMBANKMENT STATION OR RANGE

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Revisions			
Symbol	Descriptions	Date	Approved

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KANSAS CITY, MISSOURI

US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

EXCAVATION PLAN AND DETAILS

Scale
Date MARCH 1986
Drawing No.

Sheet Number

Contract No. DACW41-86-C-0140

PLATE NO 10

LITHOLOGIC DESCRIPTIONS

UPPER CUTOFF TRENCH STA 22+30 to 38+00

Symbol	Lithologic Description	Symbol
D-1	2.8' thick - Dolomite, light gray brown, very thin bedded with pyrolusite precipitate on bedding surfaces. Unit is hard and moderately weathered with brown stain along scattered discontinuous vertical fractures.	DB-1
D-2	Dolomite - 3.5' thick - light gray-brown with lamellar shales interspersed throughout upper third of unit. Unit contains deformed undulating beds, very thin bedded, badly fractured with hairline black stained (pyrolusite) fractures vertically oriented. Unit is lightly weathered and moderately hard.	
D-3	Dolomite - 5.0' thick - light gray, very thin to thin bedded, flaggy, microcrystalline, lightly weathered, hard and breaks with conchoidal fracture. Exposed bedding surfaces exhibit reniform surface of ripple mark nature. Potholes and caves found to be most common in this unit.	DB-2
D-4	Dolomite - brown-gray, gnarly, massive, tripolitic, with scattered intruded shale breccia. No apparent bedding distinguishable. Black and white chert fragments scattered throughout. Mass constitutes a random orientation of fragments and blocks, lightly weathered, hard.	DB-3
D-5	Dolomite - gray, hard, intensely fractured and tightly consolidated. Fragment size 1 to 3". Black stained fracture faces are common.	DB-4
D-6	Dolomite, tripolitic, brown-gray, massive, hackly, hard, with an intense high angle fracture pattern, badly distorted, unweathered to moderately weathered. Unit is overlain by dolomite blocks in random orientation in a shale matrix.	DB-5
D-7	Dolomite, gray, lightly weathered, with scattered high angle fractures, microcrystalline, and thin bedded (bedding 6 - 12")	
D-8	Dolomite, pink, very thin bedded (bedding 2 - 3") moderately weathered, badly fractured with random orientation of high angle fractures.	
D-9	Dolomite, gray and brown-gray, very thin bedded (beds 2 - 6") with lamellar interbedded dolomite shales, blue and white, and paper thin shale lamellae. Dolomite badly fractured with considerable tight high angle fractures. Pyrolusite dendrites common in fracture faces. Beds undulating, lightly weathered to unweathered,	DB-6
D-10	Dolomite, brown, hackly, massive, tripolitic, lightly to moderately weathered and with scattered black chert.	
D-11	Dolomite, gray, microcrystalline, hard, unweathered, lightly fractured, thin bedded, bedding 6 - 18", and deformed at scattered instances with shale intrusions, gently undulating.	
D-12	Dolomite, hard, gray, lightly weathered with staining along fracture faces, very thin bedded (beds 2 - 4") with definite ripple mark bedding contacts.	
D-13	Dolomite - 1.0' thick - brown-gray, with considerable black chert in pockets and seams, very thin bedded to thin bedded (beds 1 - 3").	
D-14	Dolomite, gray and brown gray, very thin bedded, beds 1/2 - 2", flaggy, unweathered, tight and hard.	
D-15	Dolomite, light brown-gray, hackly, beds 3 - 6".	
D-16	Dolomite, gray, very thin bedded (<2"), unfractured. Surface resembles shale.	

LITHOLOGIC DESCRIPTIONS

UPPER CUTOFF TRENCH **STA 22+30 to 38+00**

Symbol	Lithologic Description
DB-1	Dolomite Breccia - tightly consolidated pieces of red-brown, gray, and gray-brown dolomite in a blue-gray shale matrix. Dolomite is hard and competent. Shale is soft and unweathered. Chert is scattered throughout in random orientation. Fragments shapes are angular to subrounded and rounded and of varying sizes from 3/8" to 3 and 4 foot blocks. Overturned beds are strongly evident. The bottom of the dolomite breccia is 5 feet above the toe of slope and has lamellar bedding characteristics (Ll"). The beds dip N 50 W 26° NE at Sta 27+87 and become vertical at 27+90. The unit becomes badly fractured with considerable high angle fracture brown stained and radiating outward along the arc of the curve.
DB-2	Dolomite blocks in shale and sandstone matrix ray, hard and unweathered. Blue-gray shale contain - ϕ4 fragments of white shale scattered throughout. Slickensides are common. Dolomite blocks range in size from 0.5' to 4.0' resting in a random pattern.
DB-3	Dolomite, gnarly, deformed and broken into blocks with blue-gray shale and chert fragments scattered throughout. Units are competent but detached and locally situated without orientation.
DB-4	Dolomite blocks in shale and shale breccia, tight, unfractured, in a random pattern unweathered to li tly weathered.
DB-5	Dolomite blocks in black and blue shale and shale breccia, lamellar to very thin bedded, (containing flaggy characteristics). Blocks appear molded with subrounded edges and shale in the interstices often lapping over the edge of the dolomite like foliae. The dolomite is hard, gray and unweathered. Shale is moderately hard, black to blue-gray, lamellar to fissile and unweathered. Between Sta 34+60 and 35+00, scattered dolomite breccia and intensely fractured dolomite rehealed, with black chert concretions, cobble size, are scattered throughout. Unit is lightly to badly weathered but tightly consolidated.
DB-6	Dolomite Blocks - 1.0' thick - intensely fractured in mass of dolomite breccia, gray, massive, lightly to unweathered.

Revisions			
Symbol	Description	Date	Approved

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CORPS OF ENGINEERS
KANSAS CITY MISSOURI

OSAGE RIVER MISSOURI
HARRY S TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

LITHOLOGIC UNIT DESCRIPTION,
UPPER CUTOFF TRENCH
STA 22+30 TO STA 38+00 SH 1

Designed by
Drawn by
Checked by
Submitted by
Scale
Sheet number
Date MARCH 1988
Dwg no
File no 0-12-9141

PLATE NO 1

LITHOLOGIC DESCRIPTIONS

UPPER CUTOFF TRENCH STA 22+30 to 38+

Symbol	Lithologic Description	Symbol
DS-1	Dolomite with interbedded blue-gray, lamellar shale, brown, very thin bedded (less than 1") lightly to moderately weathered and brown stained, and hard. Gently undulating beds contained scattered chert and considerable high angle fractures with brown stain faces. Bedding surface exposures exhibit a knobbly surface resembling ripple marks.	SB-1
		SB-2
S-1	0.2' thick - Shale, gray-green, lamellar, with badly deformed beds and considerable dolomite fragments intruded into the shale mass, lightly to moderately weathered, moderately hard.	SB-3
S-2	Shale - 0.5' thick - gray-green, fissile, lightly weathered, moderately hard. Considerable number of chert concretions resembling suspect biostrome of possible permineralized pelecypods, brachiopods or both.	SB-4
S-3	Dolomitic Shale - 1.0' thick - gray-green, lamellar to fissile, lightly weathered, moderately hard, unfractured and containing scattered lamellar interbeds of dolomite, gray, moderately hard.	SB-5
S-4	Shale, white and blue-gray, vertically dipping with scattered red beds and chert fragments. The contact vicinity of Sta 28+10 is rust brown, soft. Suspect grout take zone is in this area.	SS-1
		SS-2
S-5	Shale, yellow-brown with chert scattered throughout. Only a trace of structure remaining as most of this unit has decomposed to soil.	SS-3
S-6	Shale, white, lamellar, soft, decomposed, with slickensides locally.	
S-7	Shale, white and green-gray, lamellar and interbedded in a random pattern, moderately weathered, soft, tight, and with scattered brown staining.	SS-4
S-8	Shale, red and gray mottled with sandstone gravels and lenses scattered throughout; rust-brown and gray-brown. Considerable slickensided surfaces portraying a gnarly surface, massive but badly fractured. Structure reflects shale lithified then collapsed. Subsequent reconsolidation and lithification developed. Local lamellar bedding is discontinuous and distorted.	SS-5
S-9	Shale, gray, lamellar, moderately soft, unweathered, unfractured but badly deformed by undulatory beds.	SS-6
		SS-7

LITHOLOGIC DESCRIPTIONS

UTOFF TRENCH STA 22+30 to 38+00

Symbol	Lithologic Description
SB-1	Shale Breccia - black-gray, unweathered, soft, unstable, with fine grained dolomite and chert fragments in subangular shapes (less than #4 screen) scattered throughout. A depression to a depth of 1.0' is formed by the presence of this unit.
SB-2	Shale and Shale Breccia - scattered rust stained sandstone in shale and shale breccia ranging from rust brown to white with red streaks, lamellar to very thin bedded but dipping in a random pattern from high angle to horizontal, soft to hard. Pockets of chert, red, black, and white are scattered throughout.
SB-3	Shale and Shale Breccia with interbeds of sandstone; soft, friable and rust-brown to red in random orientation. Shale, white to blue-gray, lamellar and badly deformed beds generally resting at high angles.
SB-4	Shale Breccia, brown, hackly, hard, moderately weathered with dolomite blocks subrounded 3 - 12" in size, scattered throughout as float.
SB-5	Shale breccia, black dolomite and chert fragments in black shale breccia, unweathered, locally pyritized, moderately hard.
SS-1	Sandstone, soft, friable, fine grained to silty, poorly sorted, white, rounded with varigated limonite, red and green scattered throughout. CL comprises the matrix.
SS-2	Sandstone, soft, friable, golden brown, with limonite - red streaks scattered in discontinuous near horizontal pattern.
SS-3	Sandstone, flesh pink with variegated red streaks scattered throughout. Unit is composed of moderately hard, well sorted, fine grained, rounded sand grains. Bedding is thin to medium (4" to 48") with strike and dip ranging between N 8 E 10 SE and N 18 E 11 SE.
SS-4	Sandstone, white and brown-white, thin bedded, with flat lying beds 3 - 12" thick, moderately hard and friable. Grains are uniformily graded and rounded.
SS-5	Interblend of topsoil, black, and sandstone decomposed to sand, red, gray and with shale and clay, yellow, green, and gray. Chert fragments are scattered throughout. GC class. On the contact between overburden and competent rock is found dolomite, (in float) very thin bedded, gray to yellow-gray, badly weathered and stained along the fractures, badly fractured and containing considerable chert.
SS-6	Sandstone, red and red-brown, badly weathered and decomposed to sand, fine grained, well sorted, rounded and subrounded.
SS-7	Sandstone - 1.5' thick - fine ground, silty, lamellar, brown, soft and friable.

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KANSAS CITY MISSOURI

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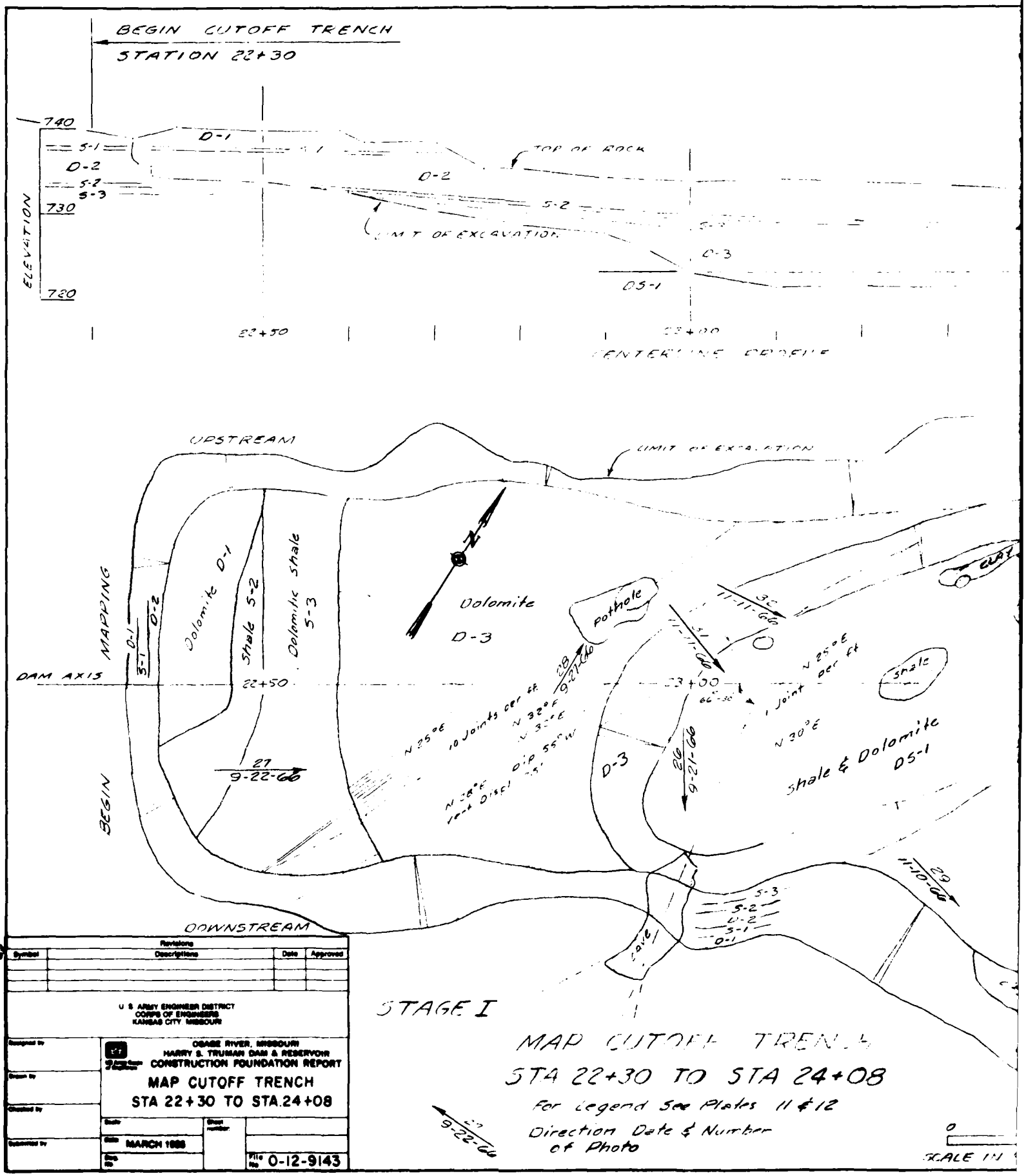
OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

LITHOLOGIC UNIT DESCRIPTION,
UPPER CUTOFF TRENCH
STA.22+30 TO STA.38+00 SH.2

Scale
Sheet number
Date MARCH 1986
Drwg No.
File No. 0-12-9142

Revisions			
Symbol	Descriptions	Date	Approved

PLATE NO. 12



Revisions			
Symbol	Descriptions	Date	Approved

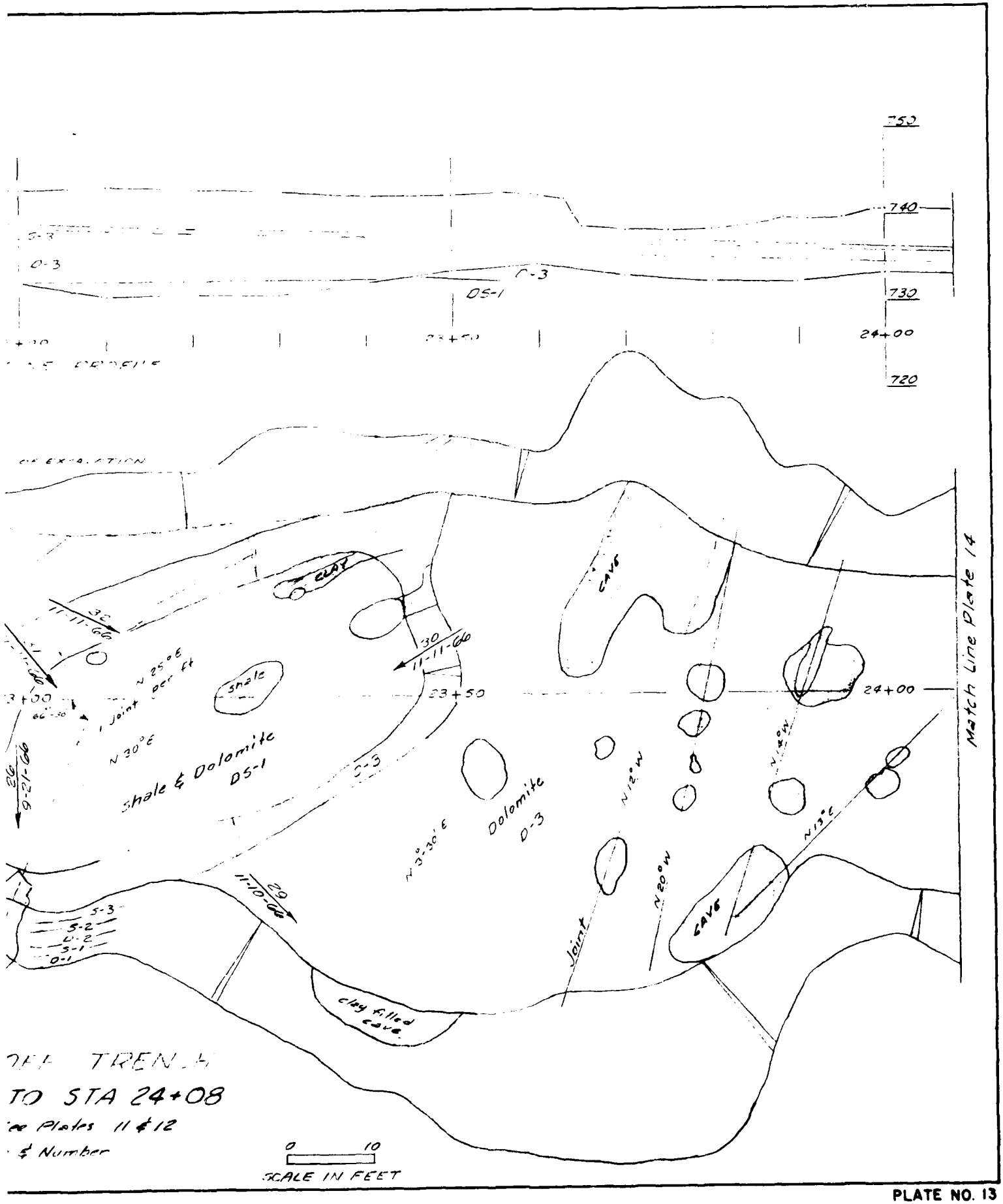
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CONSTRUCTION FOUNDATION REPORT

MAP CUTOFF TRENCH
STA 22+30 TO STA.24+08

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Sheet number
File No. 0-12-9143

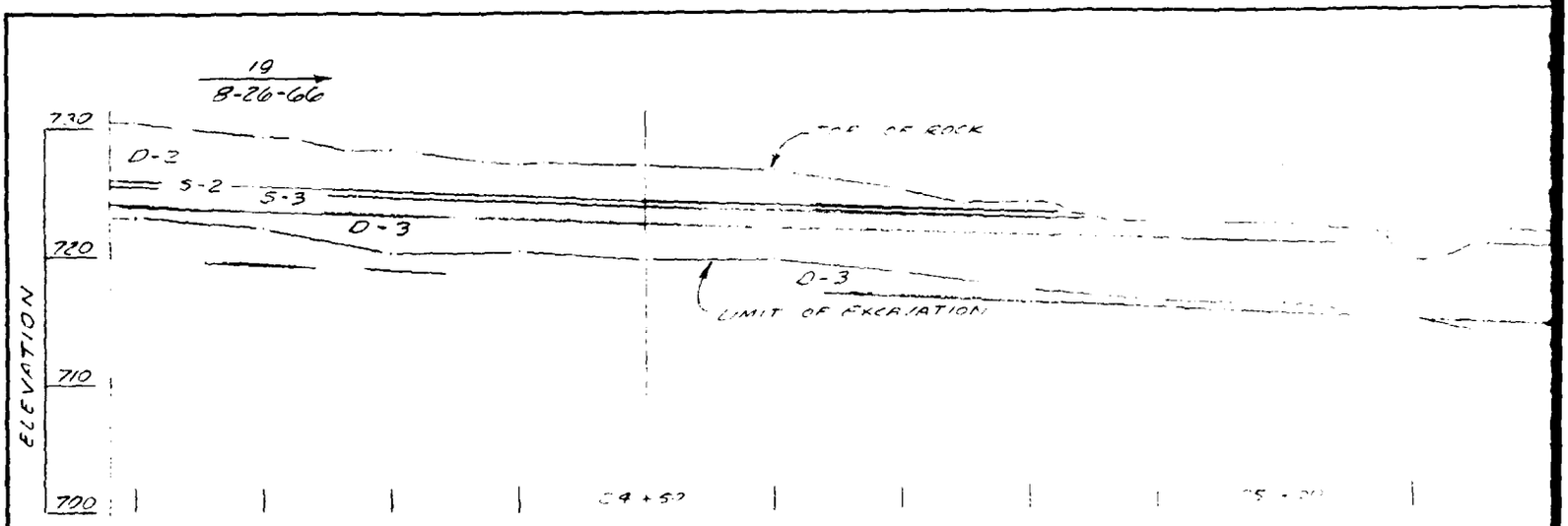


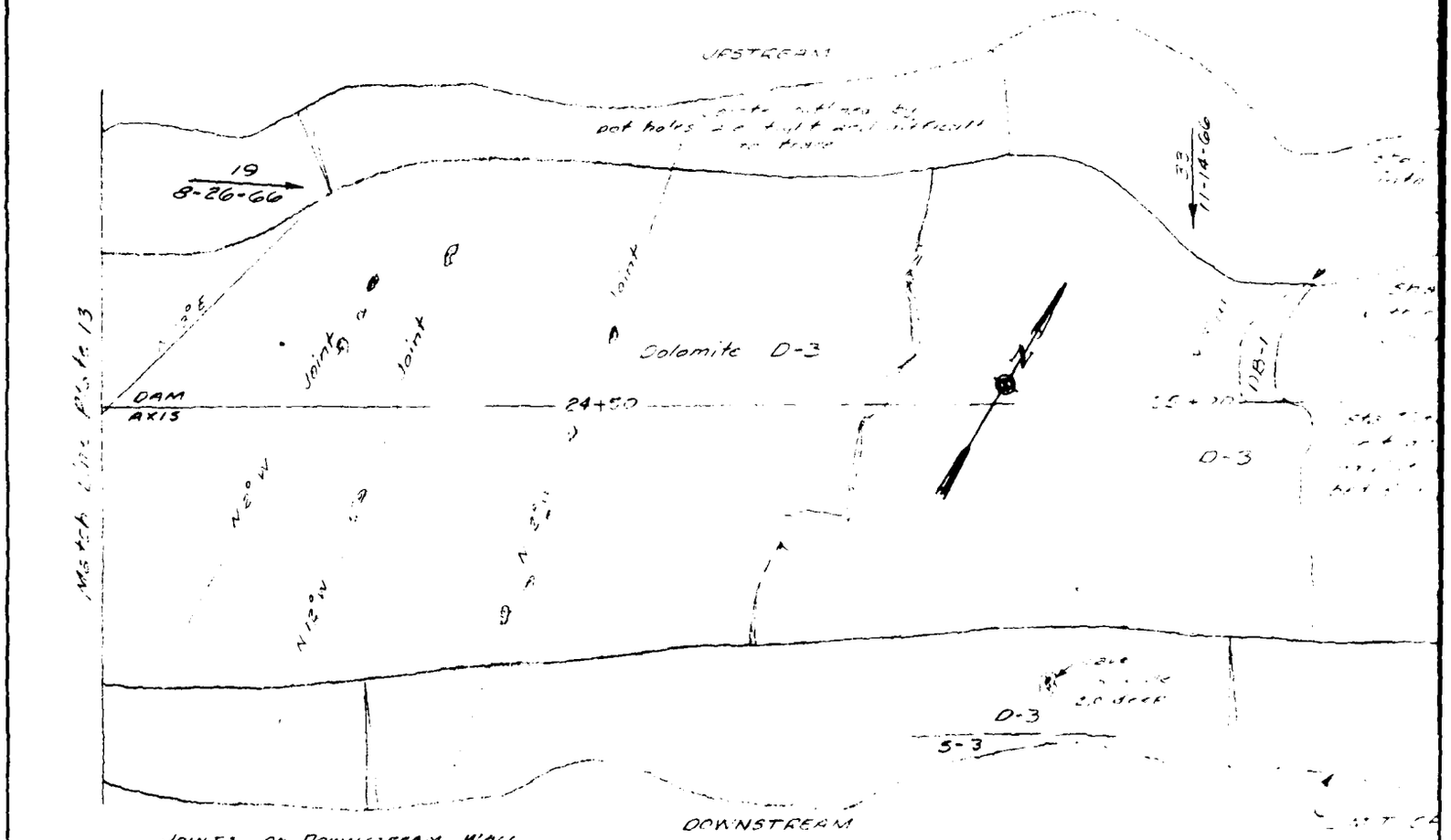
TO STA 24+08

see Plates 11 & 12

& Number

PLATE NO. 13





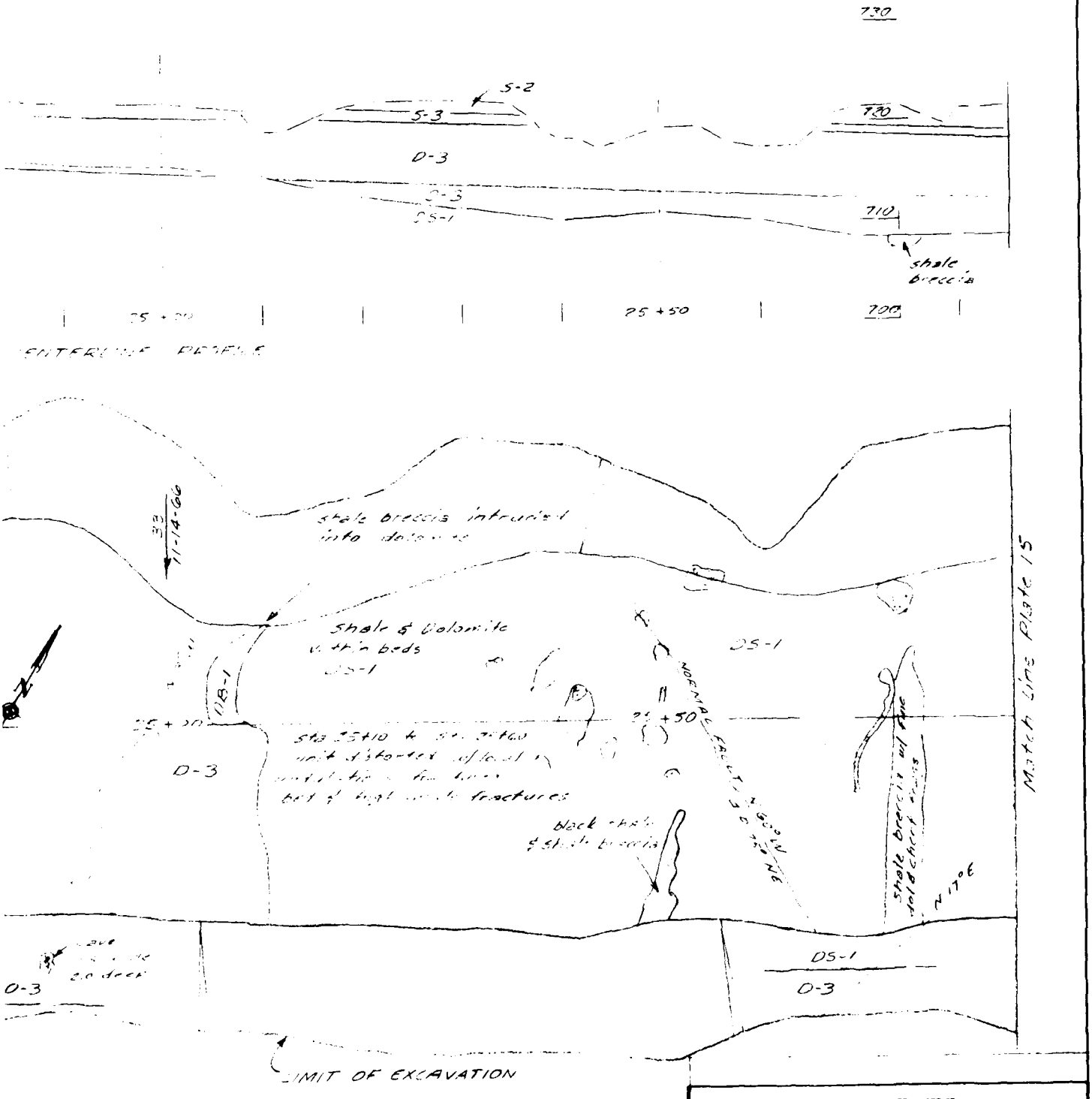
JOINTS ON DOWNSTREAM WALL

STATION	STRIKE	DIP
24+00	N 20° E	65° E
24+25	N 30° E	55° E
24+50	N - °W	7° NE
25+10	N 5° E	8° SE
25+80	N 7° W	Vert

STAGE I

For [illegible] see Plates 11 & 12

19
8-26-66 Direction Date & Number of Photo



MAP CUTOFF TRENCH

STA 24+08 TO STA 25+85

See Plates 11 & 12

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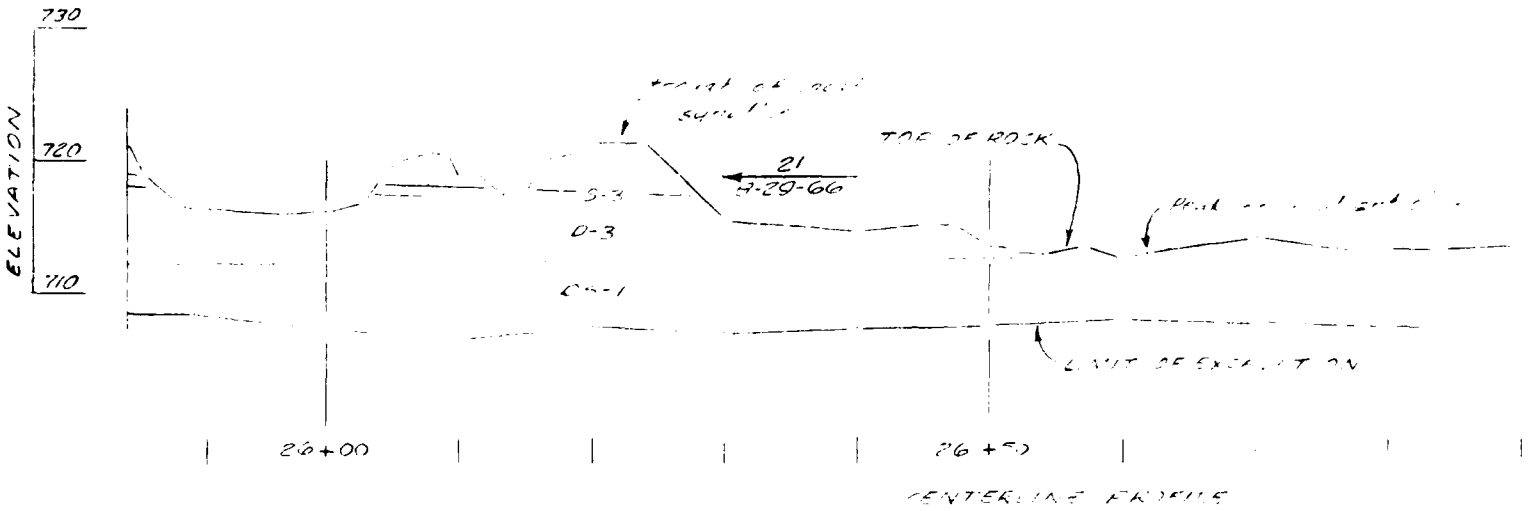
US Army Corps of Engineers

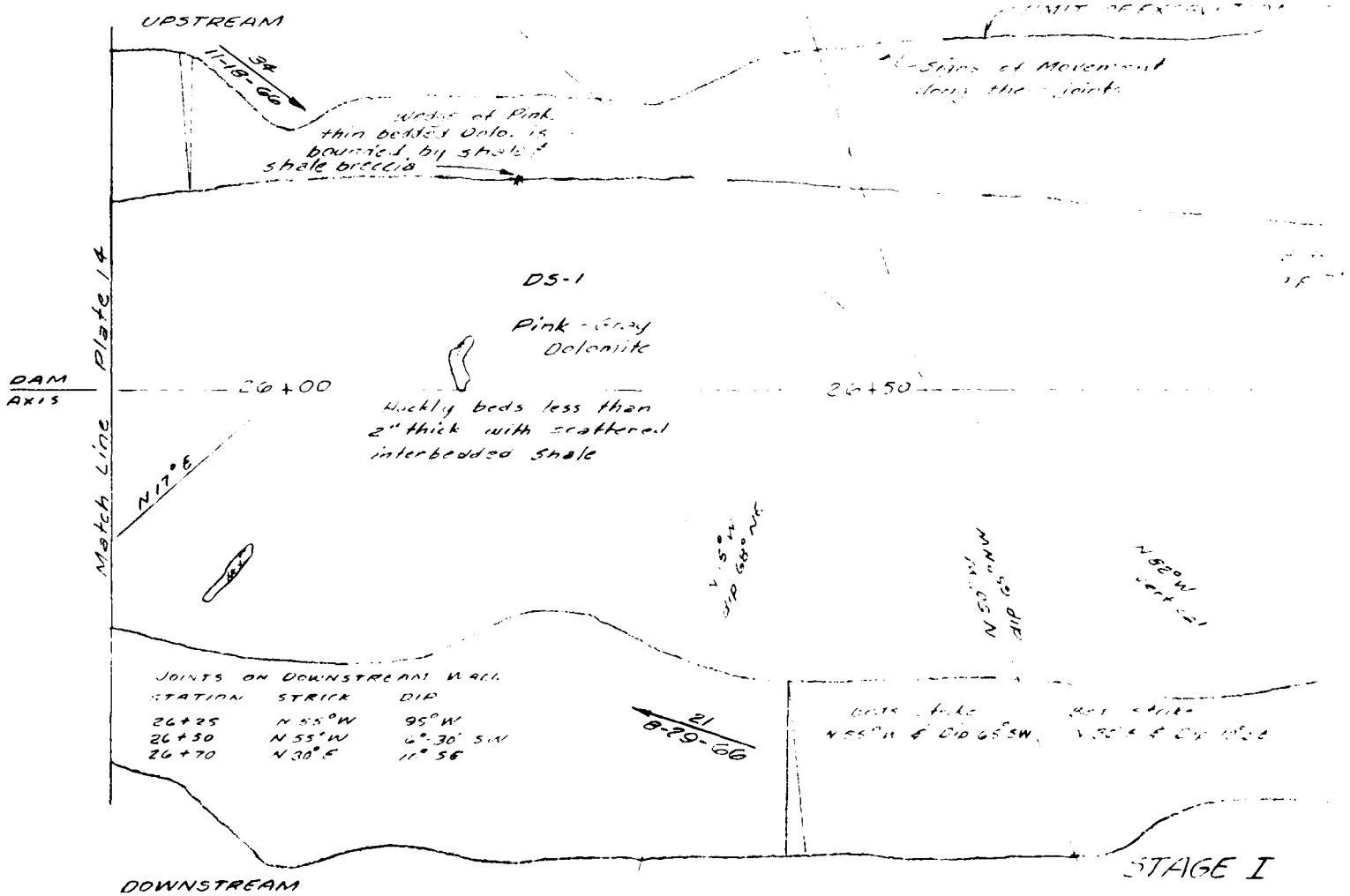
OSAGE RIVER, MISSOURI
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CONSTRUCTION FOUNDATION REPORT

MAP CUTOFF TRENCH
STA.24+08 TO STA.25+85

Scale
Date: MARCH 1966
Dwg No.
Sheet number
File No 0-12-9144

PLATE NO. 14

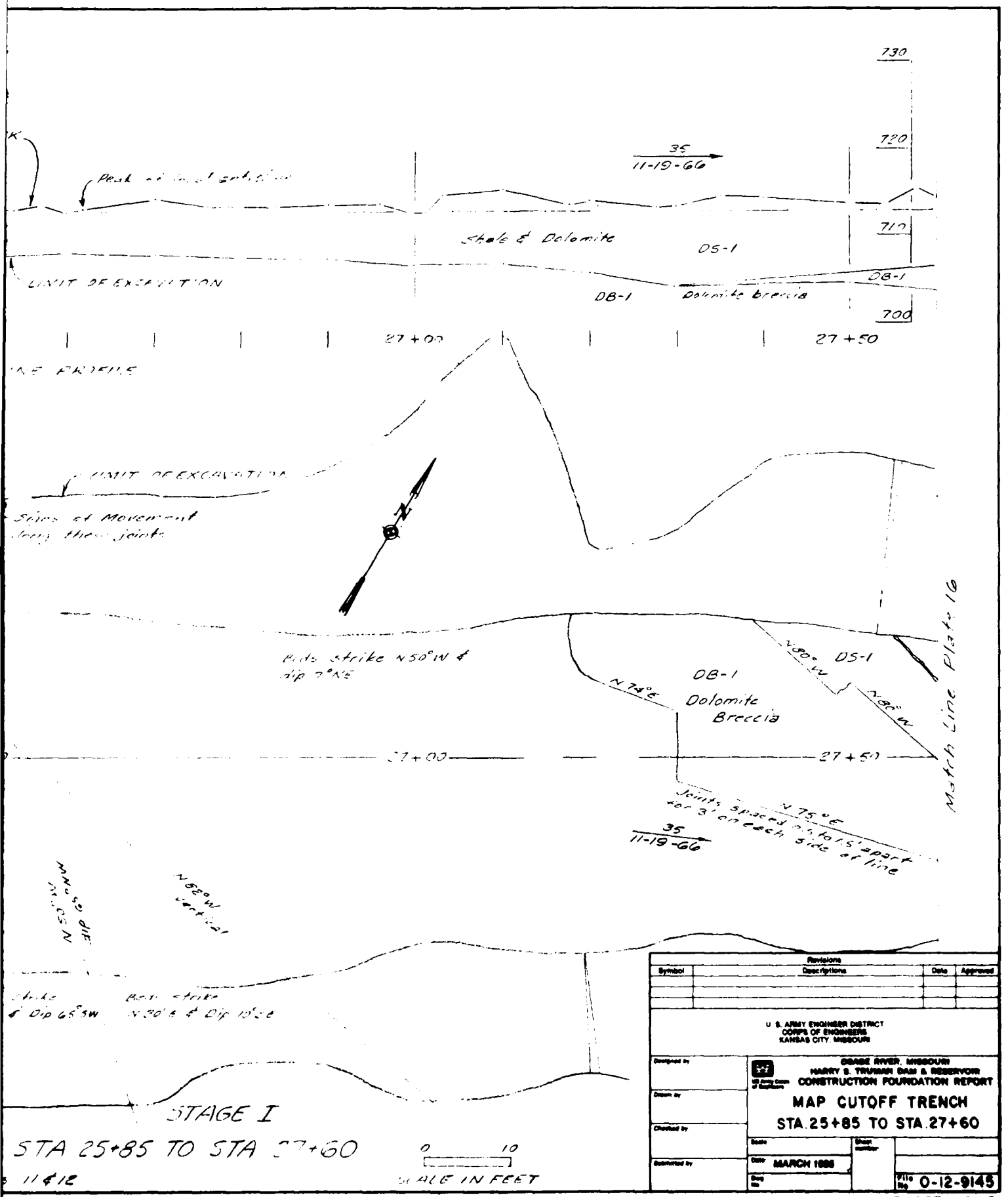




Direction, Date & Number of Photo

MAP CUTOFF TRENCH STA 25+55 TO STA

For Legend See Plates 11 & 12



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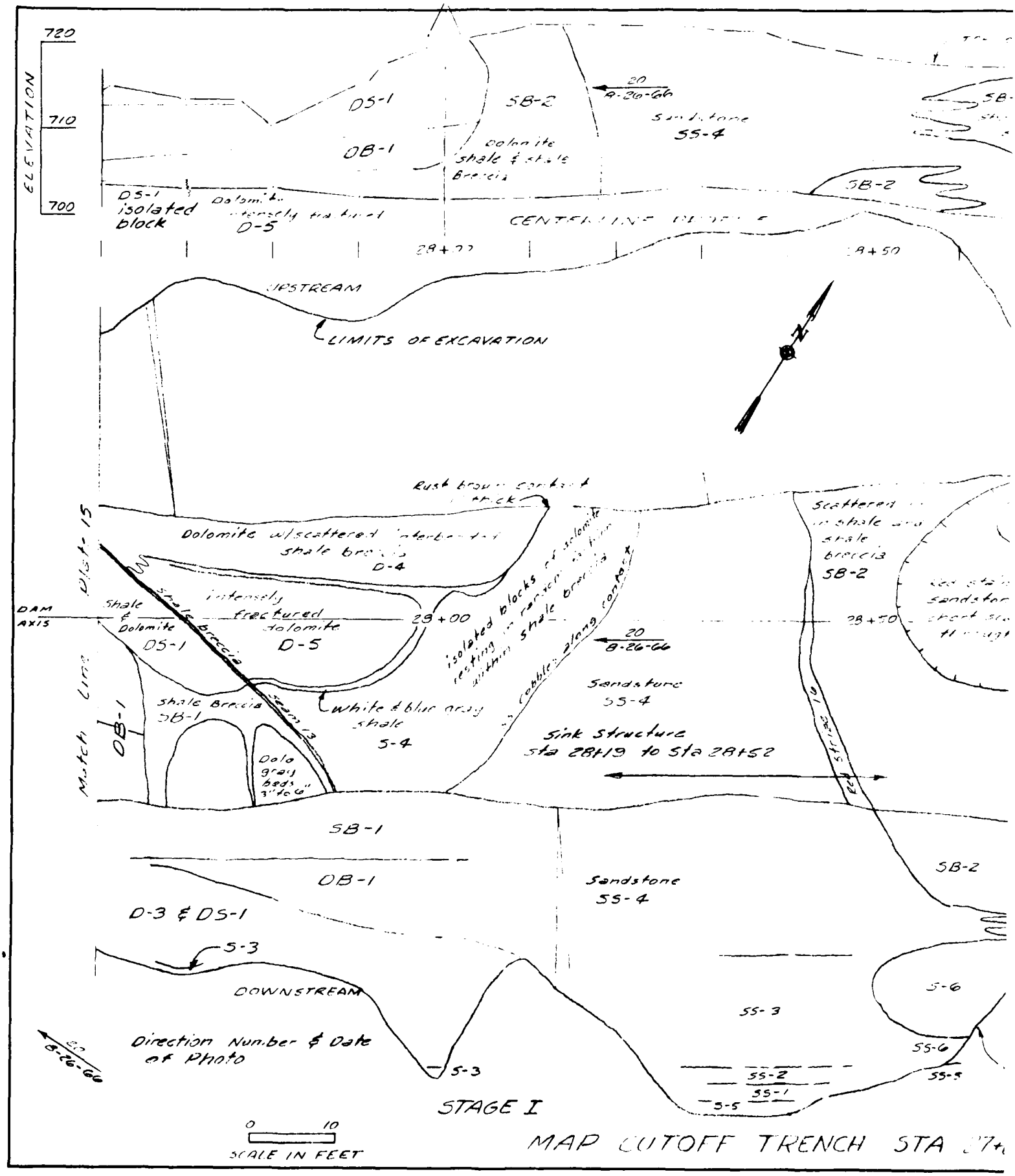
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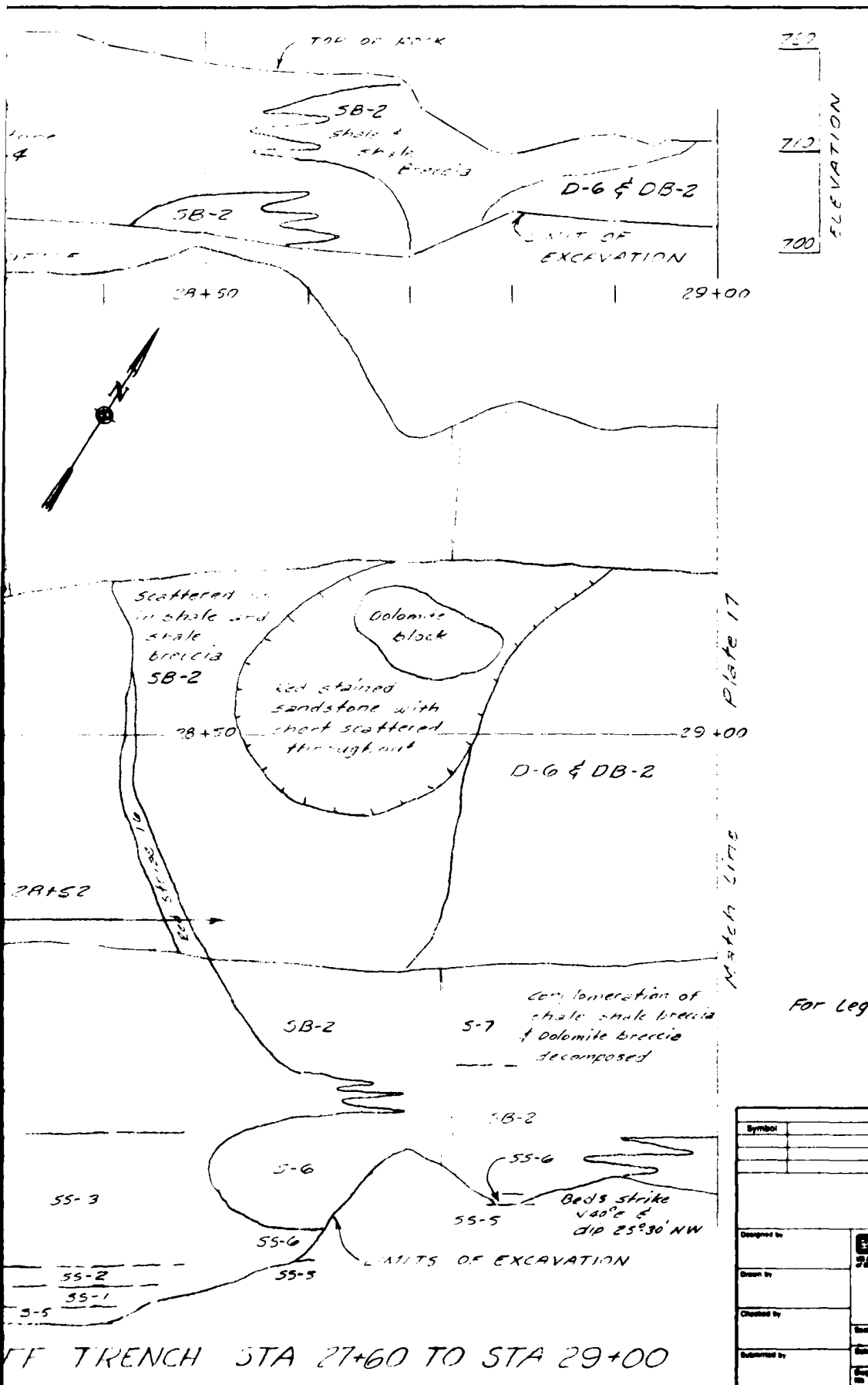
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MAP CUTOFF TRENCH
STA. 25+85 TO STA. 27+60

Scale
Date MARCH 1968
Sheet number
File No. 0-12-9145

PLATE NO. 15


720
710
700
ELEVATION
DS-1
SB-2
OB-1
20
A-20-66
Sandstone
SS-4
Dolomite
Shale & shale
Breccia
DS-1
isolated
block
Dolomite
intensely fractured
D-5
CENTERLINE
28+00
28+50
UPSTREAM
LIMITS OF EXCAVATION
Rust brown carbonaceous
shale
Dolomite w/scattered interbedded
shale breccia
D-4
Scattered
in shale and
shale
breccia
SB-2
DAM
AXIS
Shale
& Dolomite
DS-1
Shale Breccia
intensely
fractured
dolomite
D-5
28+00
28+50
isolated blocks of dolomite
resting in rock
within shale breccia
cobbles along
20
B-26-66
Sandstone
SS-4
Sink Structure
Sta 28+19 to Sta 28+52
Shale Breccia
SB-1
Seam 13
White & blue gray
shale
S-4
Dolo
gray
beds
3" to 6"
OB-1
Match Line
SB-1
OB-1
Sandstone
SS-4
SB-2
D-3 & DS-1
S-3
DOWNSTREAM
S-6
SS-3
Direction Number & Date
of Photo
S-3
SS-6
SS-2
SS-1
S-5
SS-5
STAGE I
0
10
SCALE IN FEET
MAP CUTOFF TRENCH STA



For Legend See Plates 11 & 12

TF TRENCH STA 27+60 TO STA 29+00

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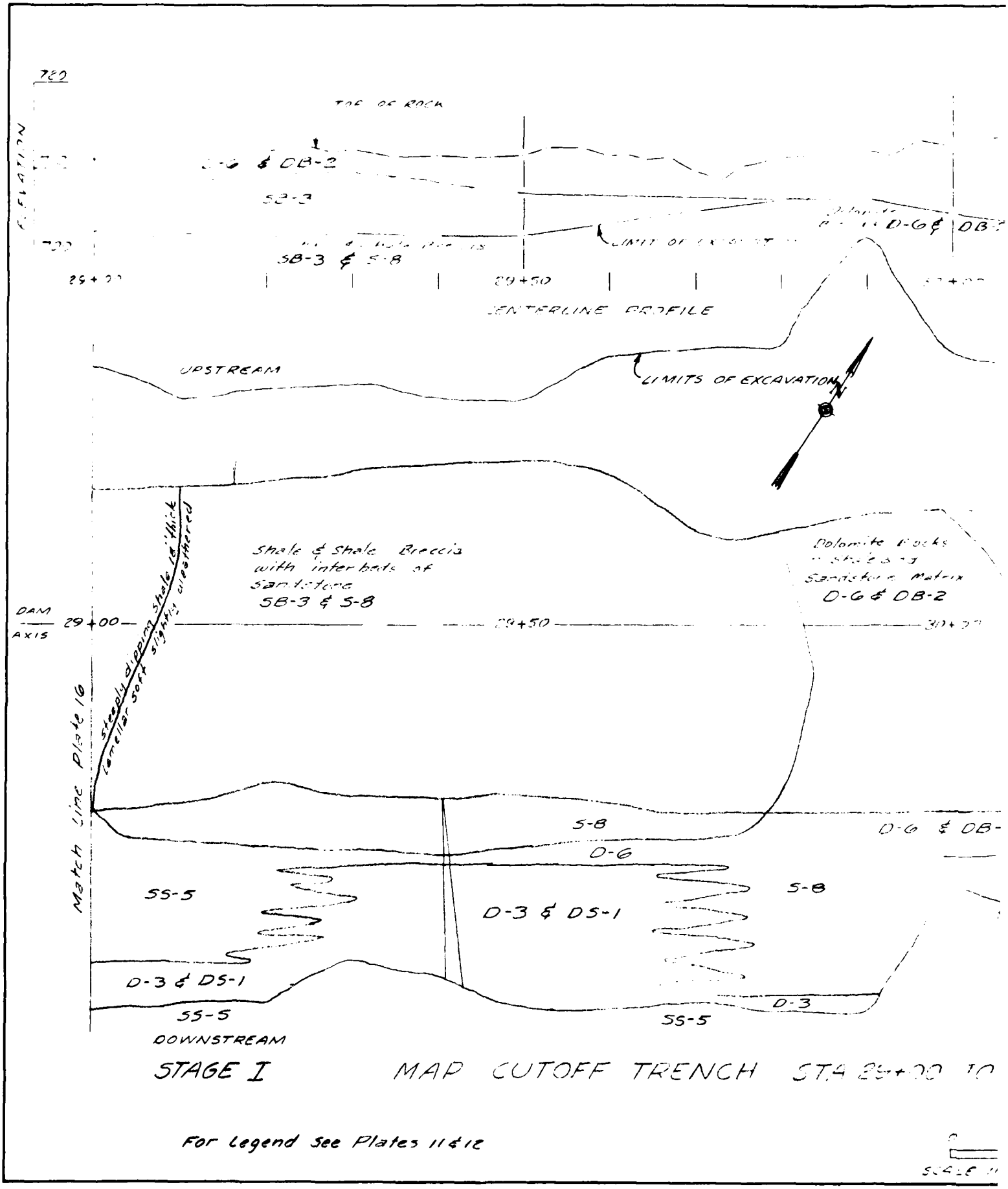
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MAP CUTOFF TRENCH
STA. 27+60 TO STA. 29+00

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Date: MARCH 1966
Sheet number
File No. 0-12-9146

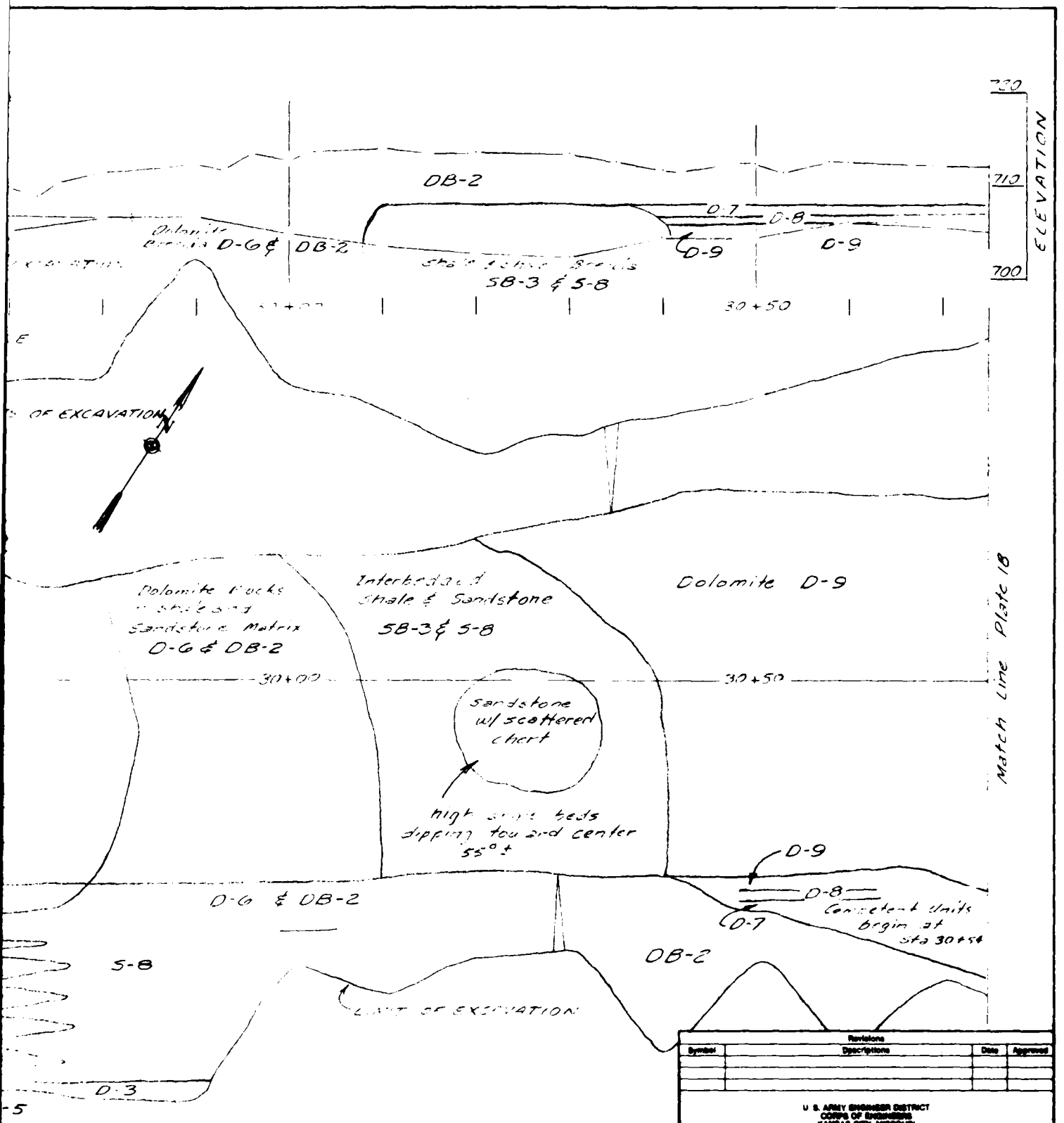
PLATE NO. 16



STAGE I MAP CUTOFF TRENCH STA 29+00 TO

For Legend see Plates 11 & 12

SCALE 1"



NCH STA 29+00 TO STA 30+75

0 10
SCALE IN FEET

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Symbol	Descriptions	Date	Approved

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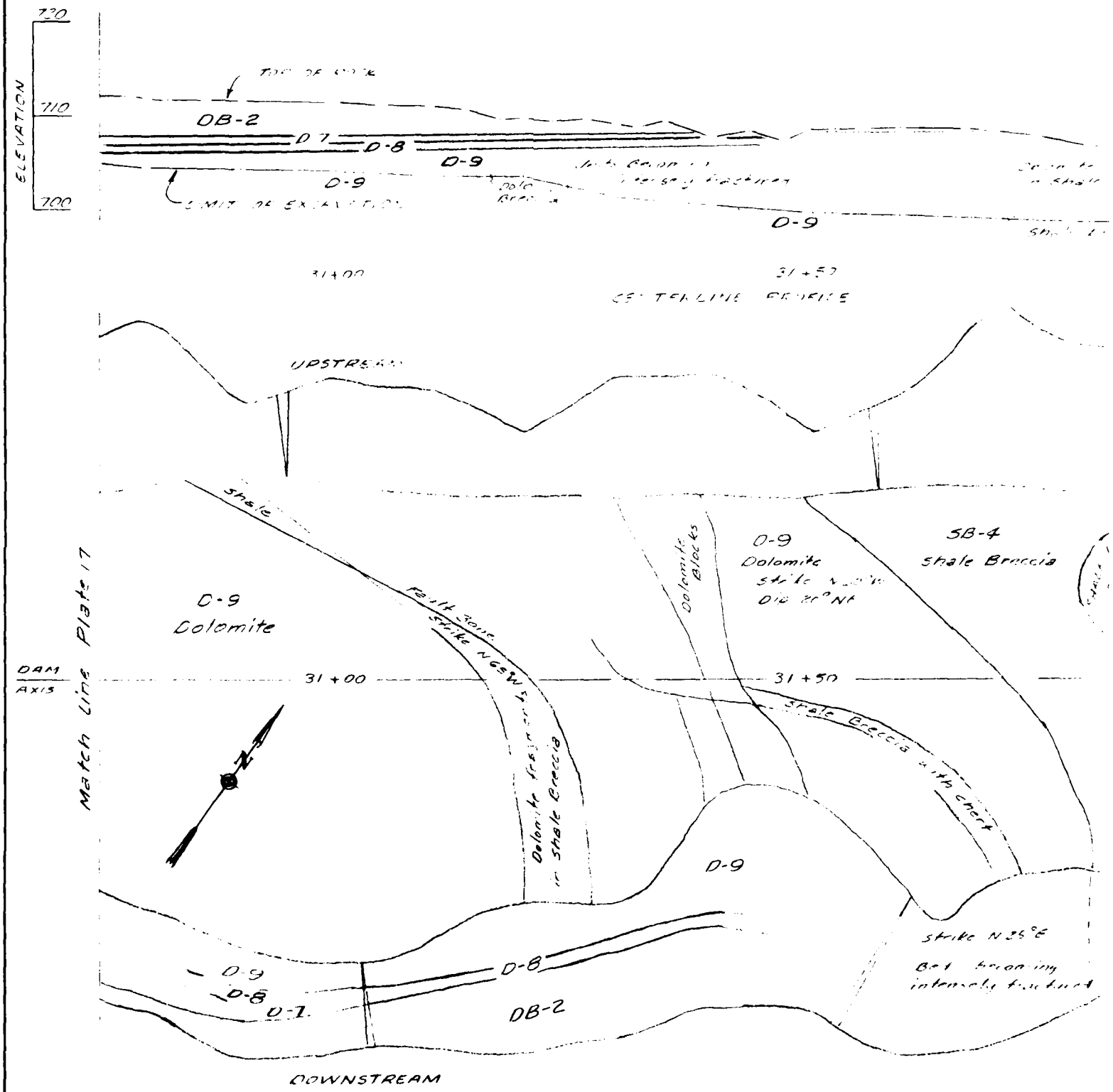
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MAP CUTOFF TRENCH
STA. 29+00 TO STA. 30+75

Scale
Date MARCH 1958
Sheet number
Drawing No.
FIN 0-12-9147

PLATE NO. 17



STAGE I

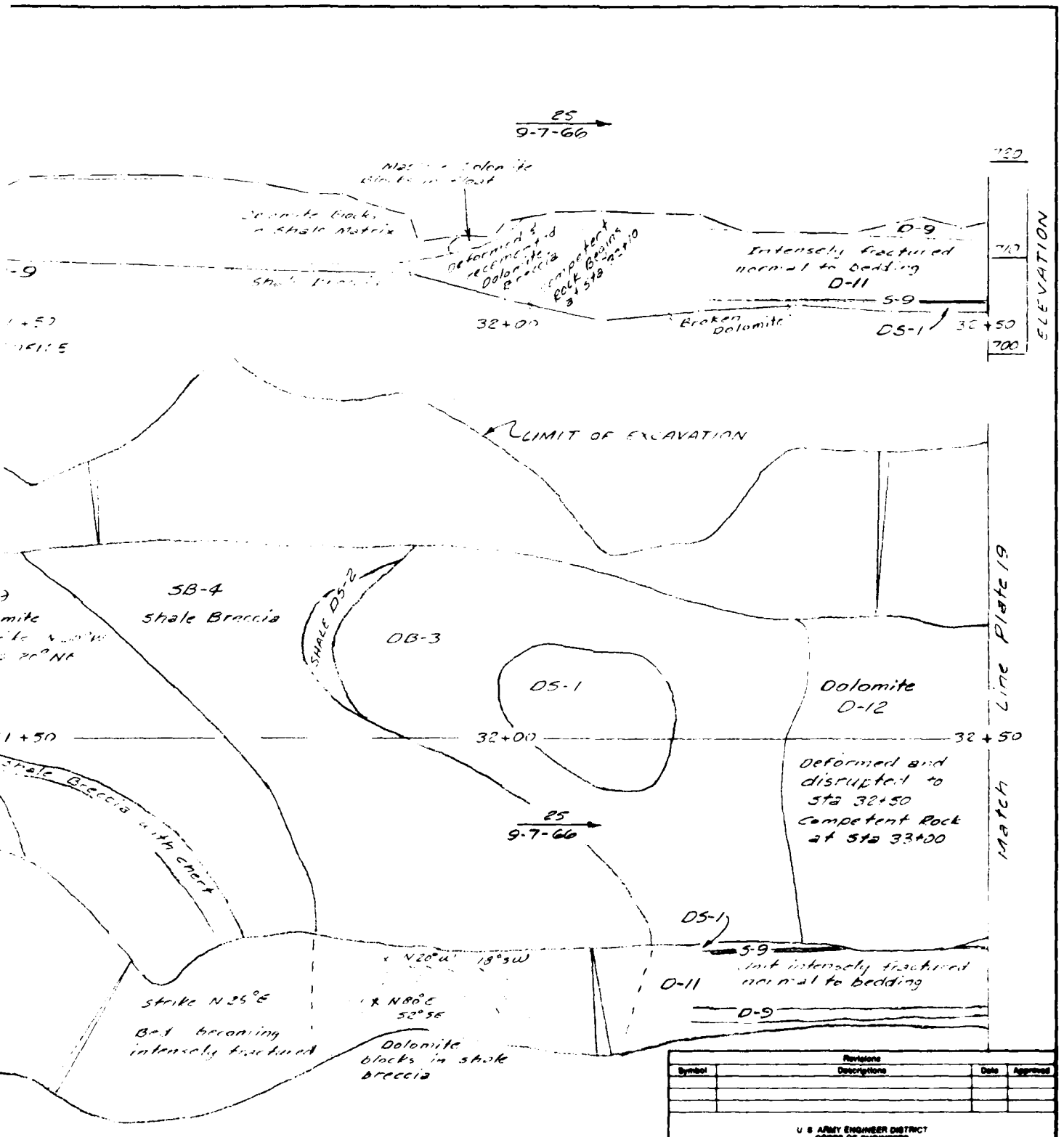
MAP CUTOFF TRENCH STA 30+75 TO

25
9-7-66
Direction Date & Number of Photo

For Legend See Plates 11 & 12

0

SCALE 1



STA 30+75 TO STA 32+50

0 10

SCALE IN FEET

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Symbol	Descriptions	Date	Approved

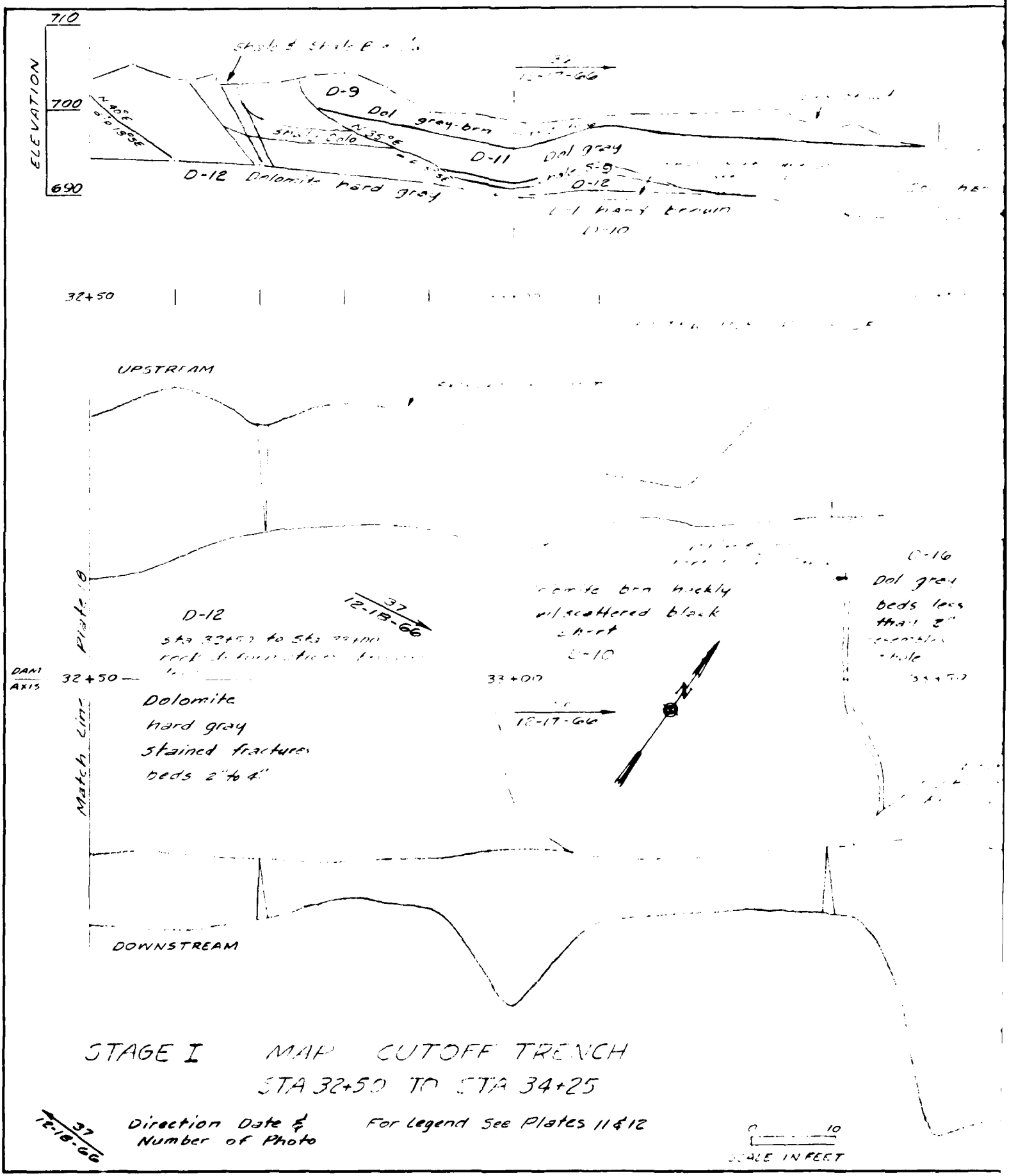
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MAP CUTOFF TRENCH
STA. 30+75 TO STA. 32+50

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Sheet number
File No. O-12-9148

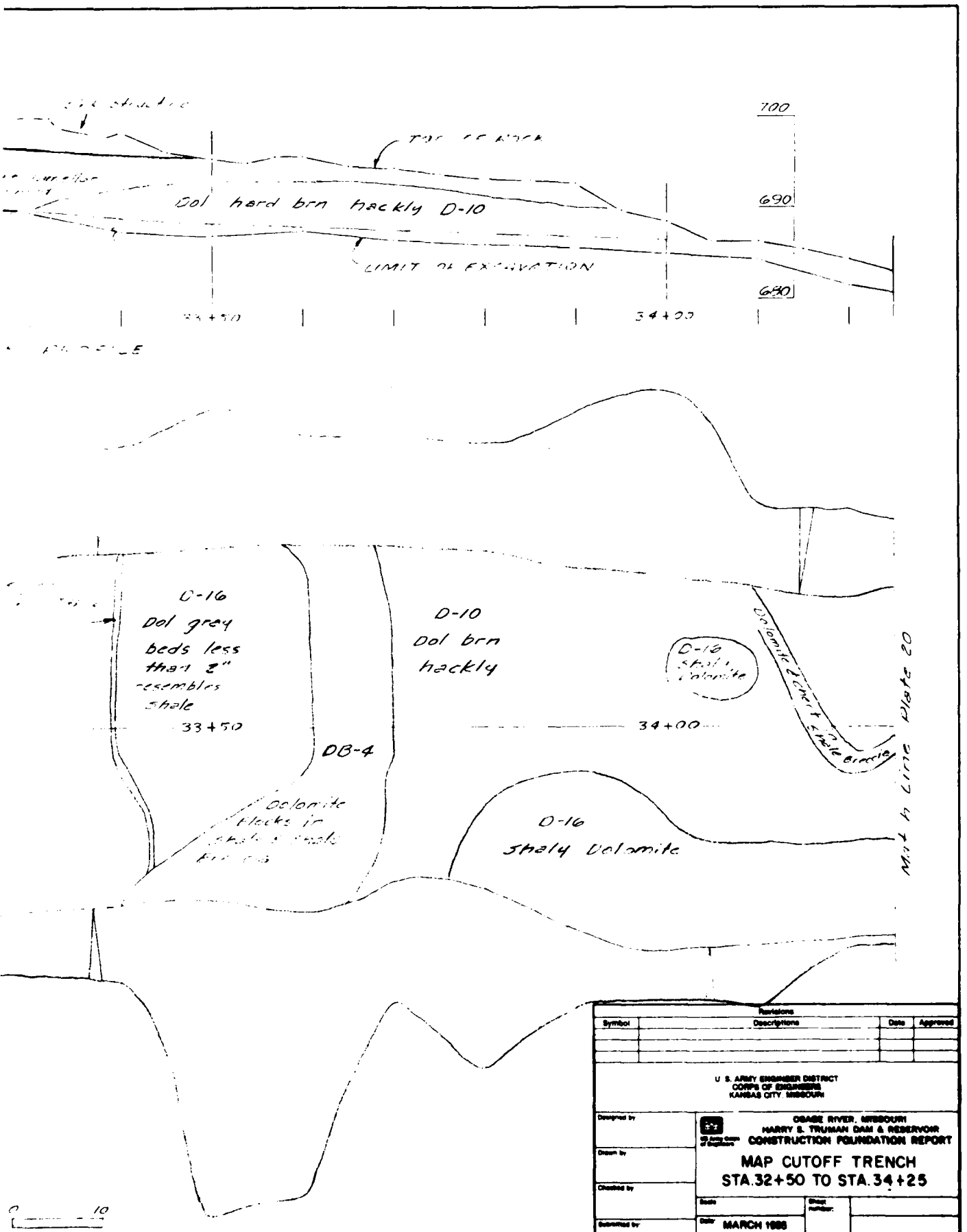
PLATE NO. 18



STAGE I MAP CUTOFF TRENCH
STA 32+50 TO STA 34+25

37
12-18-66
Direction Date & Number of Photo

For legend See Plates 11 & 12



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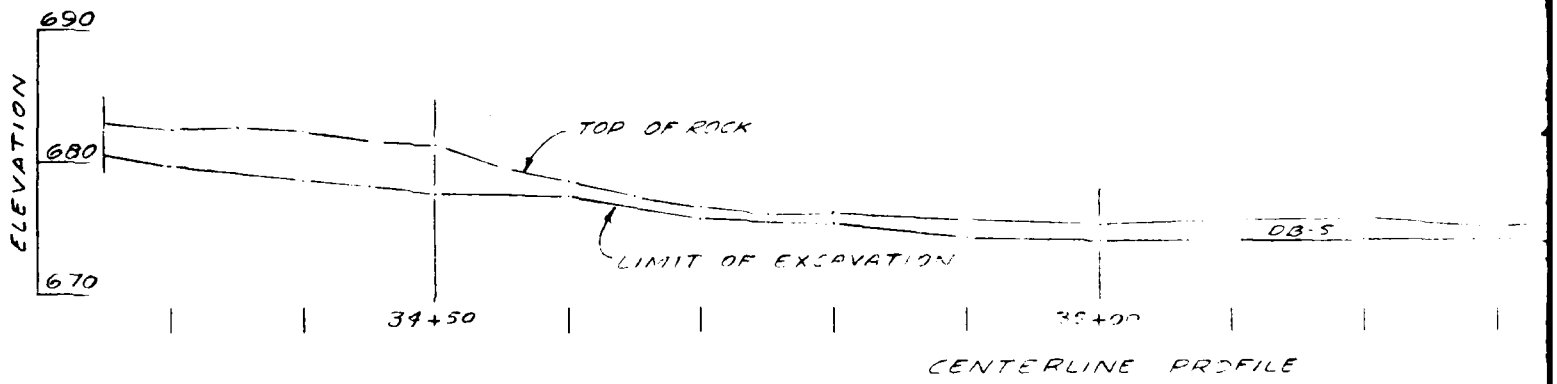
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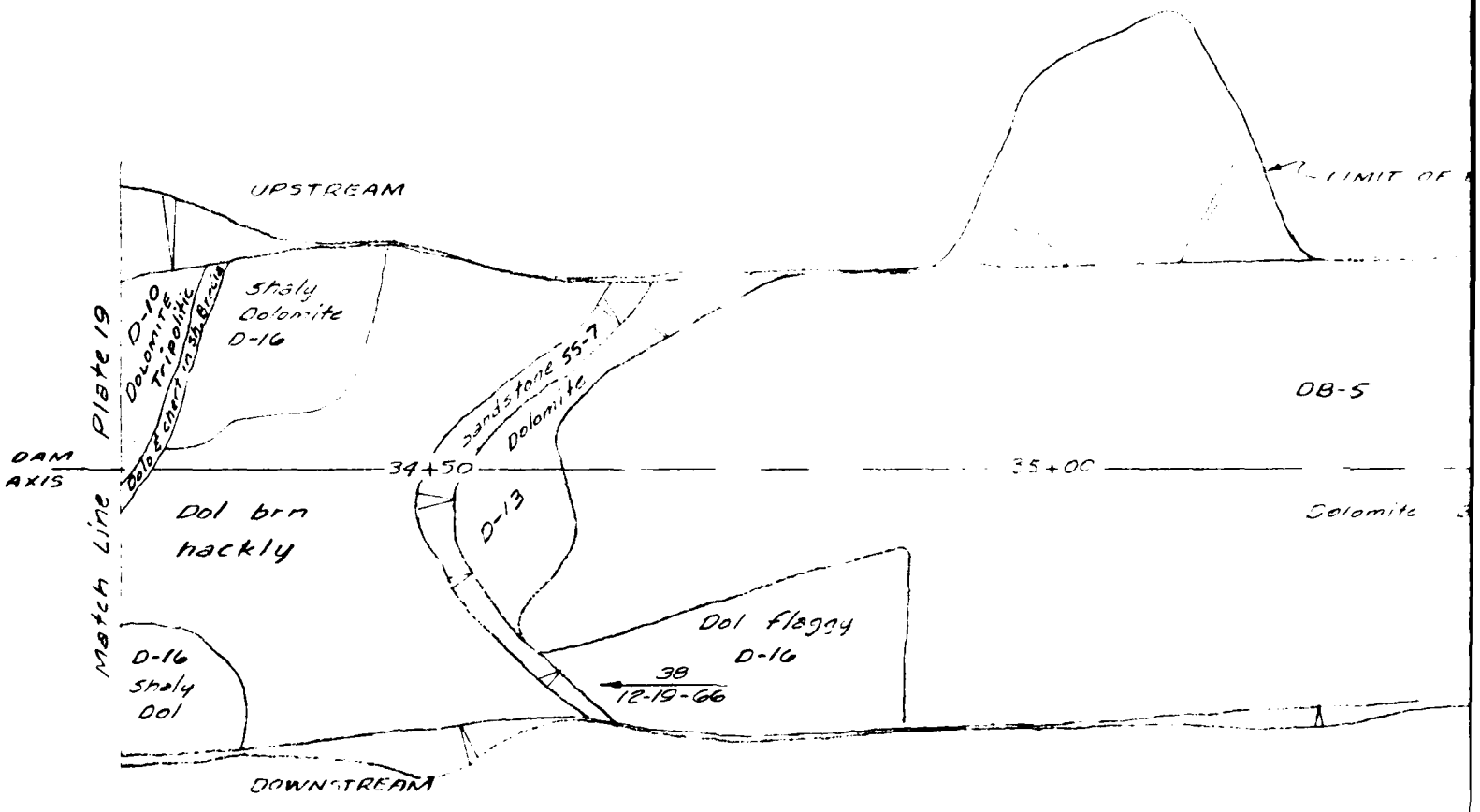
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CONSTRUCTION FOUNDATION REPORT

MAP CUTOFF TRENCH
STA. 32+50 TO STA. 34+25

Scale
Date: MARCH 1966
Drawing No.
Sheet number
File No. 0-12-9149

PLATE NO. 19

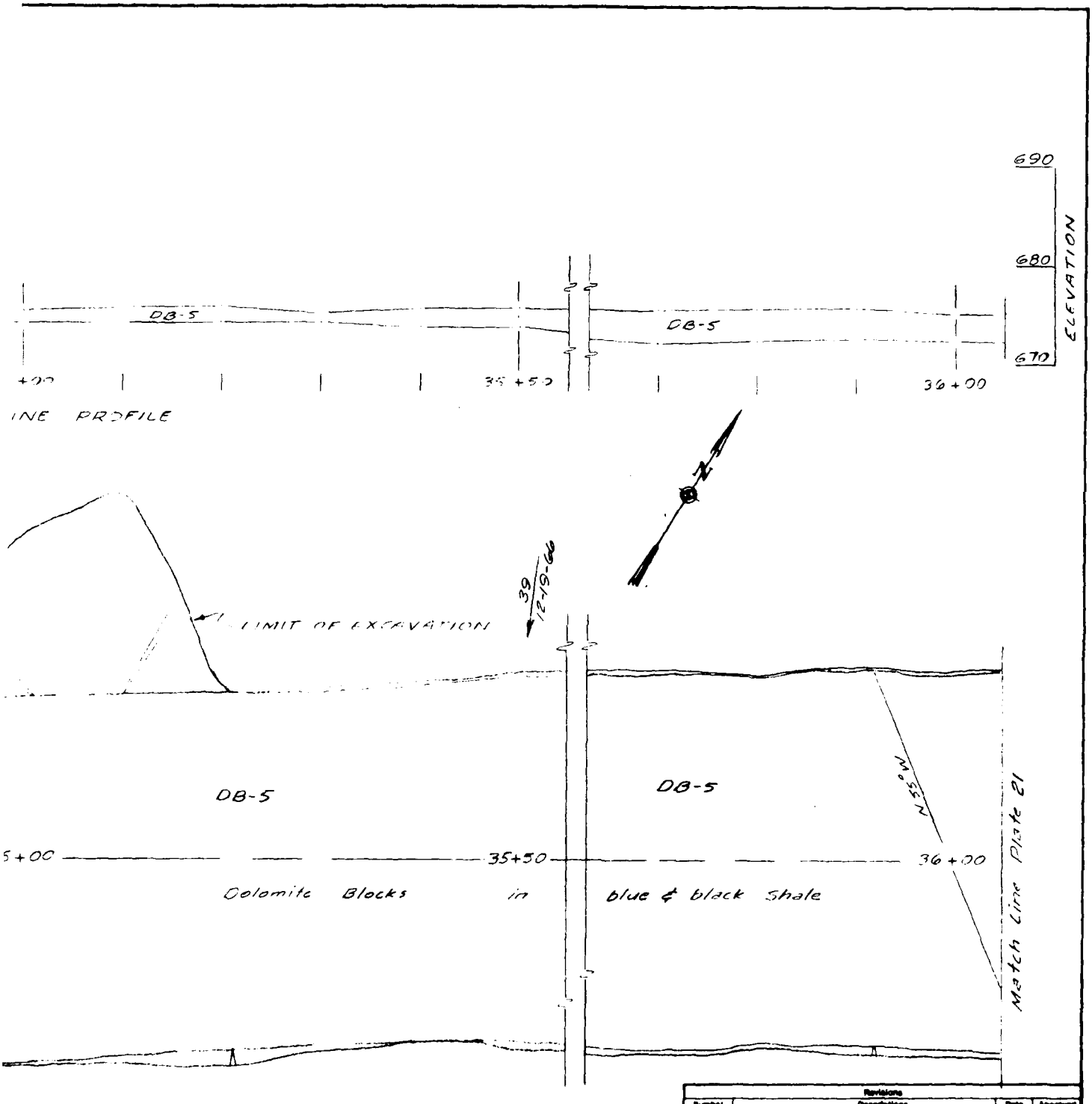




STAGE I MAP CUTOFF TRENCH STA 34-35 TO

38/12-19-66 Direction, Date & Number of Photo

For Legend See Plates 11 & 12



STA 34+25 TO STA 36+05

0 10
SCALE IN FEET

Revisions			
Symbol	Descriptions	Date	Approved

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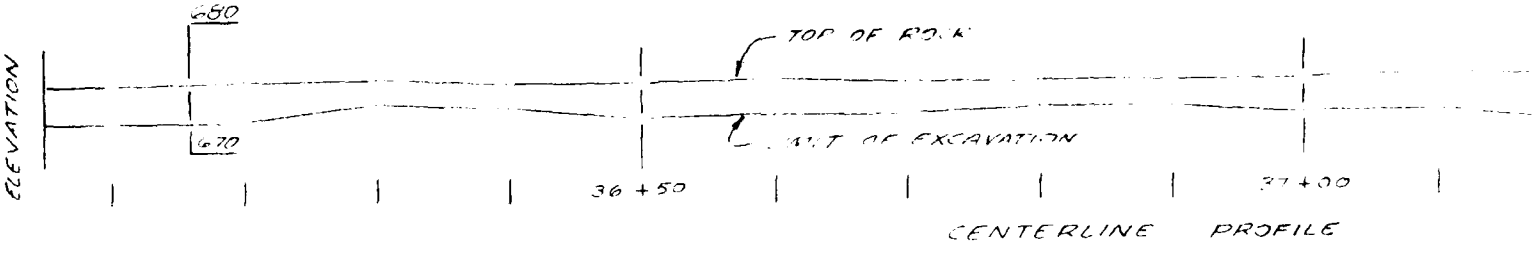
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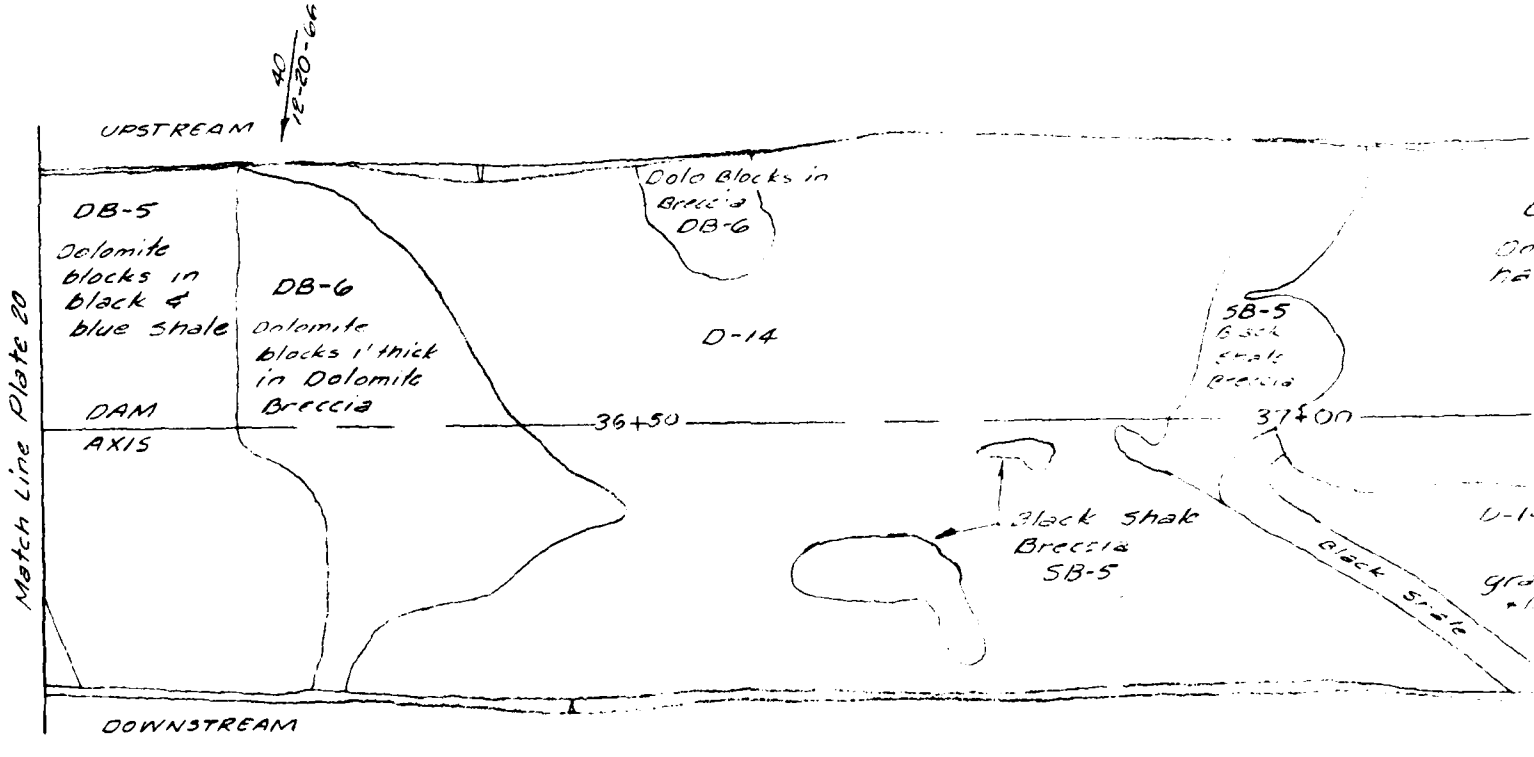
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MAP CUTOFF TRENCH
STA.34+25 TO STA.36+05

Scale
Date MARCH 1966
Sheet number
File No. 0-12-9150

PLATE NO. 20





STAGE I MAP CUTOFF TRENCH STA 36+25 TO ST

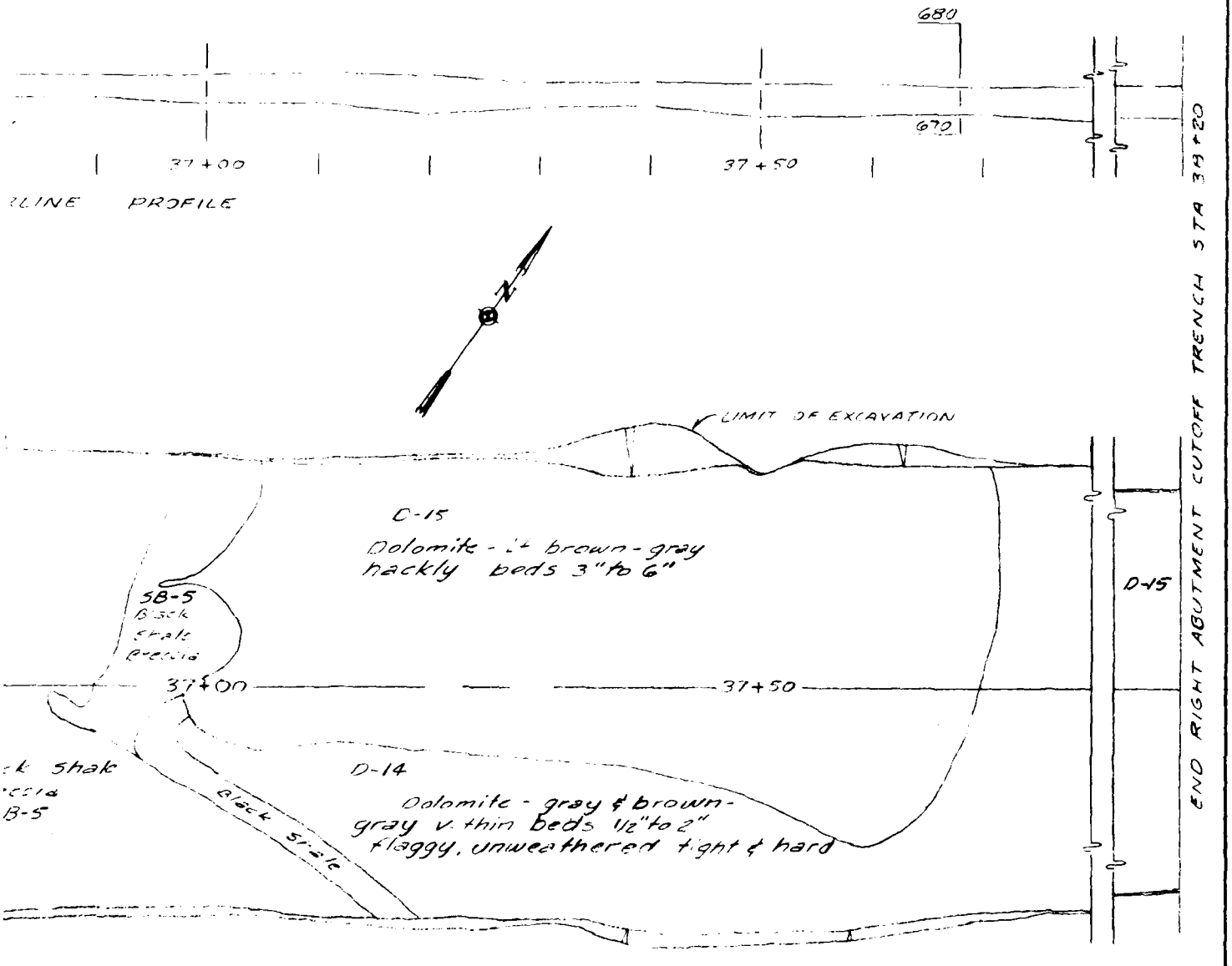
NOTE

From Sta 35+20 to Sta 48+30 see Spillway Excavation Plates 62 thru 71

40
12-20-66
Direction Date & Number of Photo

For Legend see Plates 11 & 12

0
SCALE IN FE



H STA 36+05 TO STA 38+20

30 to Sta 48+30 See Spillway - Foundations
Plates 62 thru 71

0 10
SCALE IN FEET

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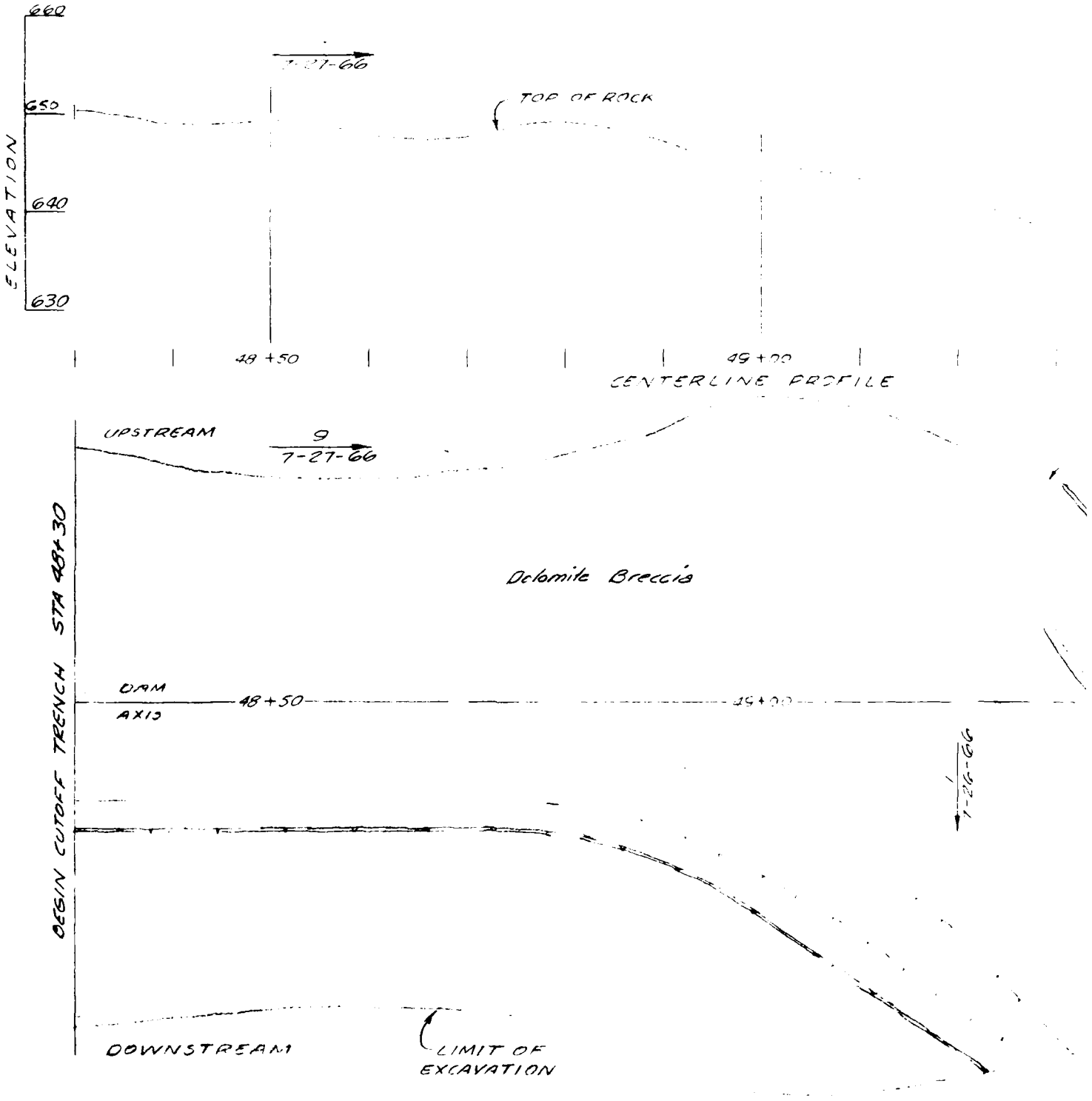
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MAP CUTOFF TRENCH STA. 36+05 TO STA. 38+20

Scale
Date MARCH 1966
Sheet number
File No. 0-12-9151

PLATE NO. 21



STAGE I MAP CUTOFF TRENCH STA 48+30

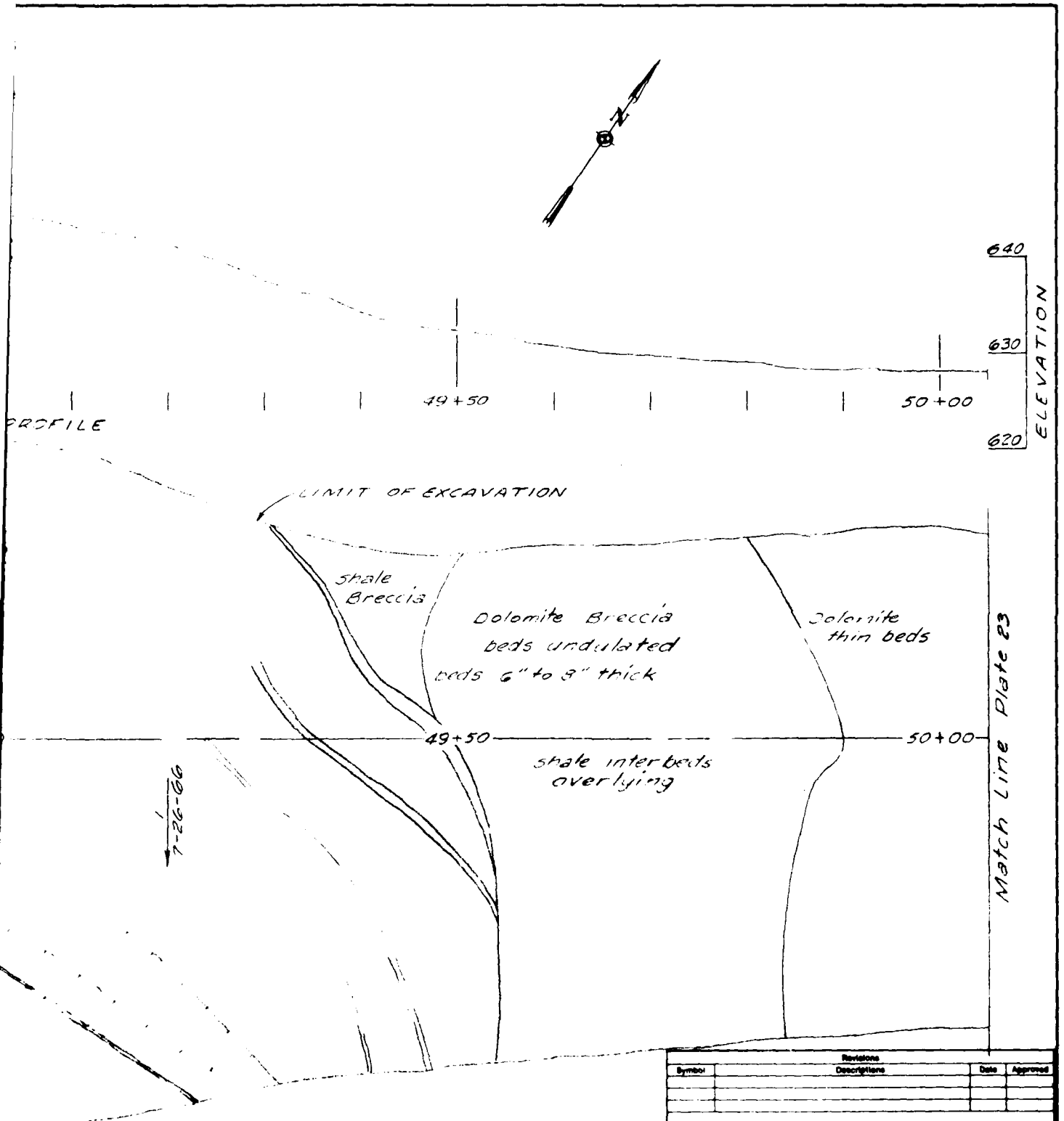
NOTE

Direction Date & Number of Photo

From Sta 38+20 to Sta 48+30 See Spillway Excavation Notes 62 thru 71

0

SCALE



ENCH STA 48+30 TO STA 50+05

48+30 See Spillway-Powerhouse

thru 71

0 10

SCALE IN FEET

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MAP CUTOFF TRENCH STA.48+30 TO STA.50+05

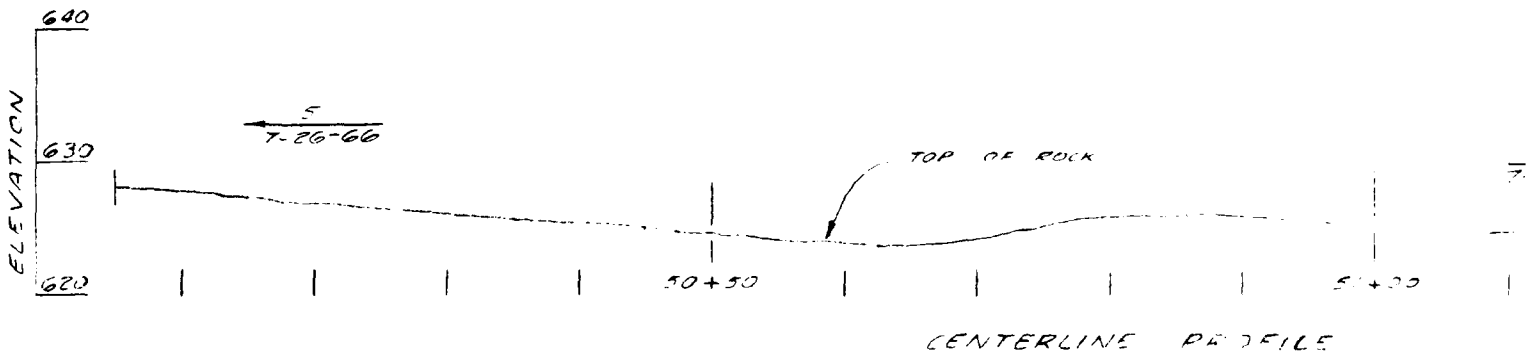
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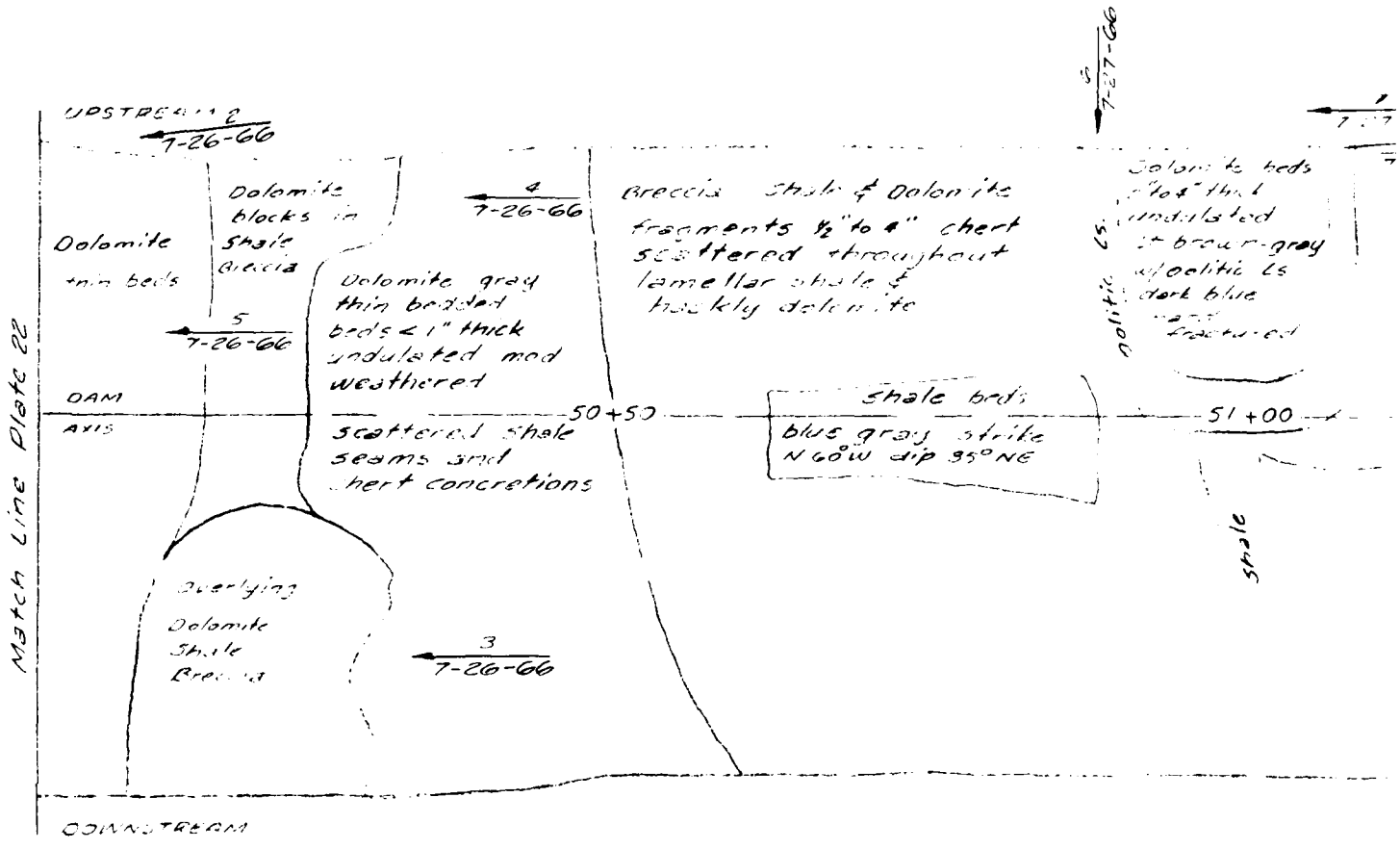
Sheet number

Date MARCH 1968

File No. 0-12-9182

PLATE NO. 22

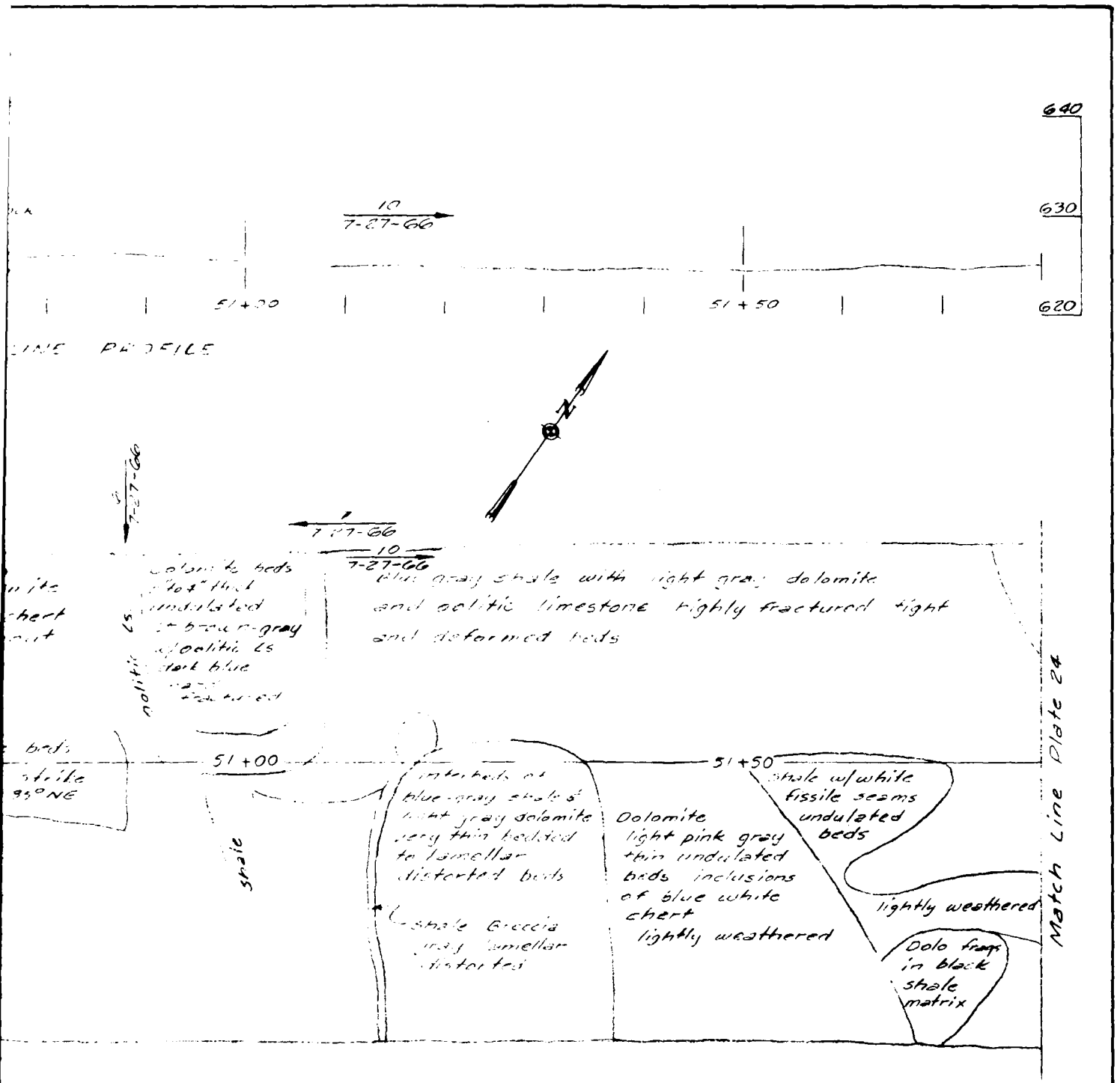




STAGE I MAP CUTOFF TRENCH STA 50+05 TO

5
7-26-66
Direction Number &
Date of Photo

SCALE IN



CH STA 50+05 TO STA 51+80

0 10
SCALE IN FEET

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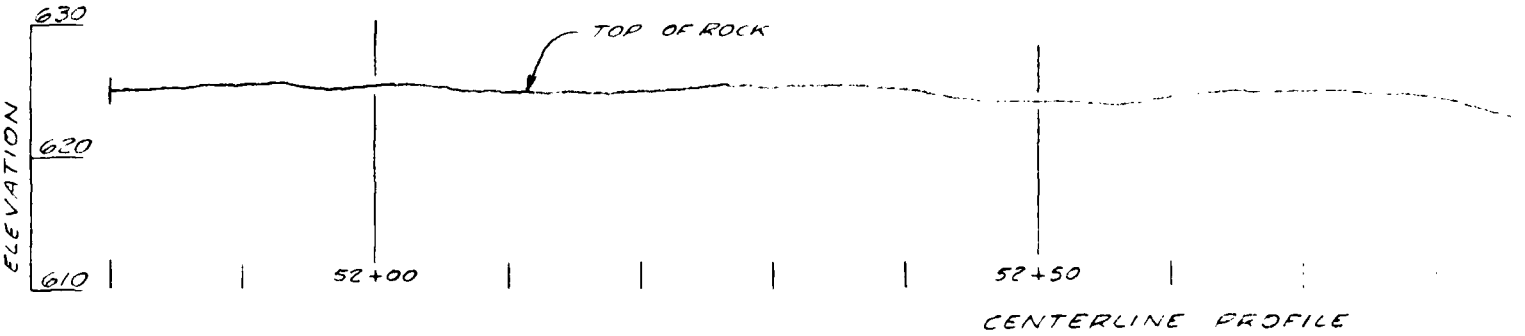
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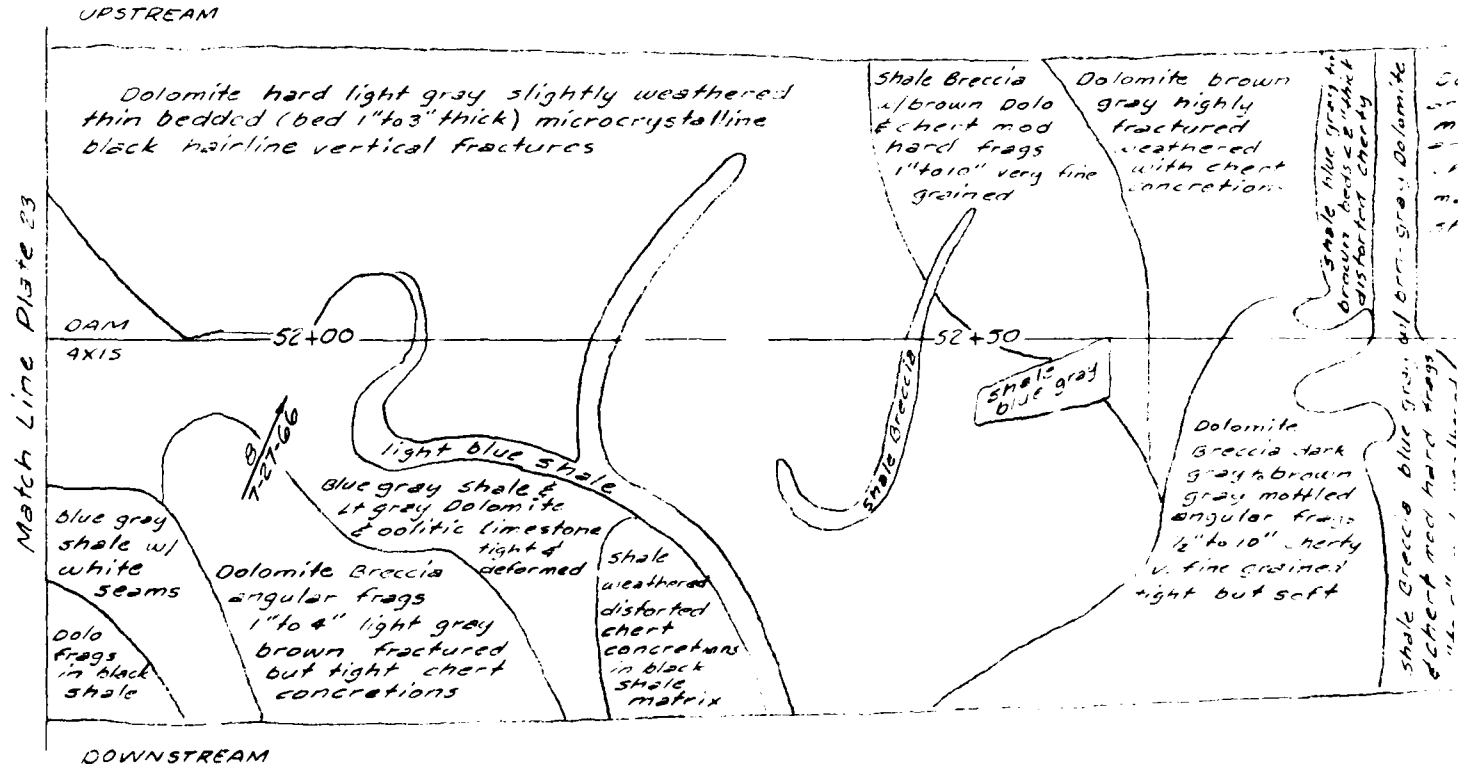
MAP CUTOFF TRENCH STA. 50+05 TO STA. 51+80

Scale
Date: MARCH 1966
Sheet number
Dwg No.
File No. 0-12-9163

PLATE NO. 23



CENTERLINE PROFILE

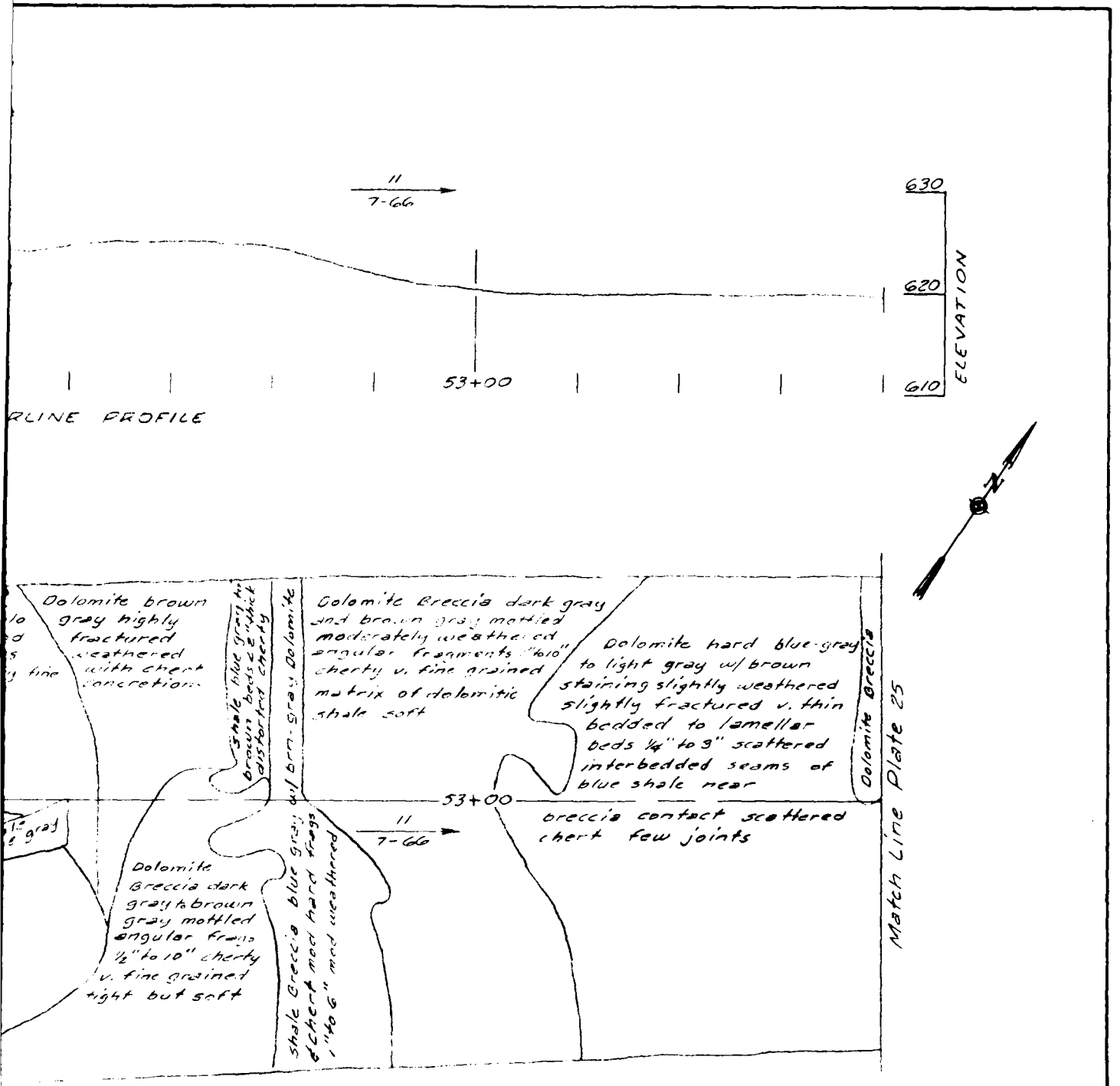


STAGE I MAP CUTOFF TRENCH STA 51+80 TO 5

8/7-27-66 Direction Number & Date of Photo

0

SCALE IN



TH STA 51+80 TO STA 53+40

0 10
SCALE IN FEET

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Symbol	Descriptions	Date	Approved

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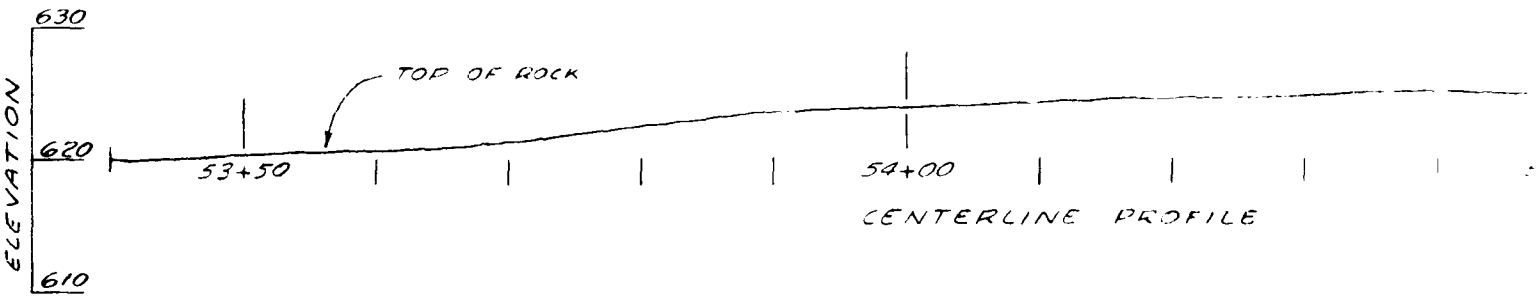
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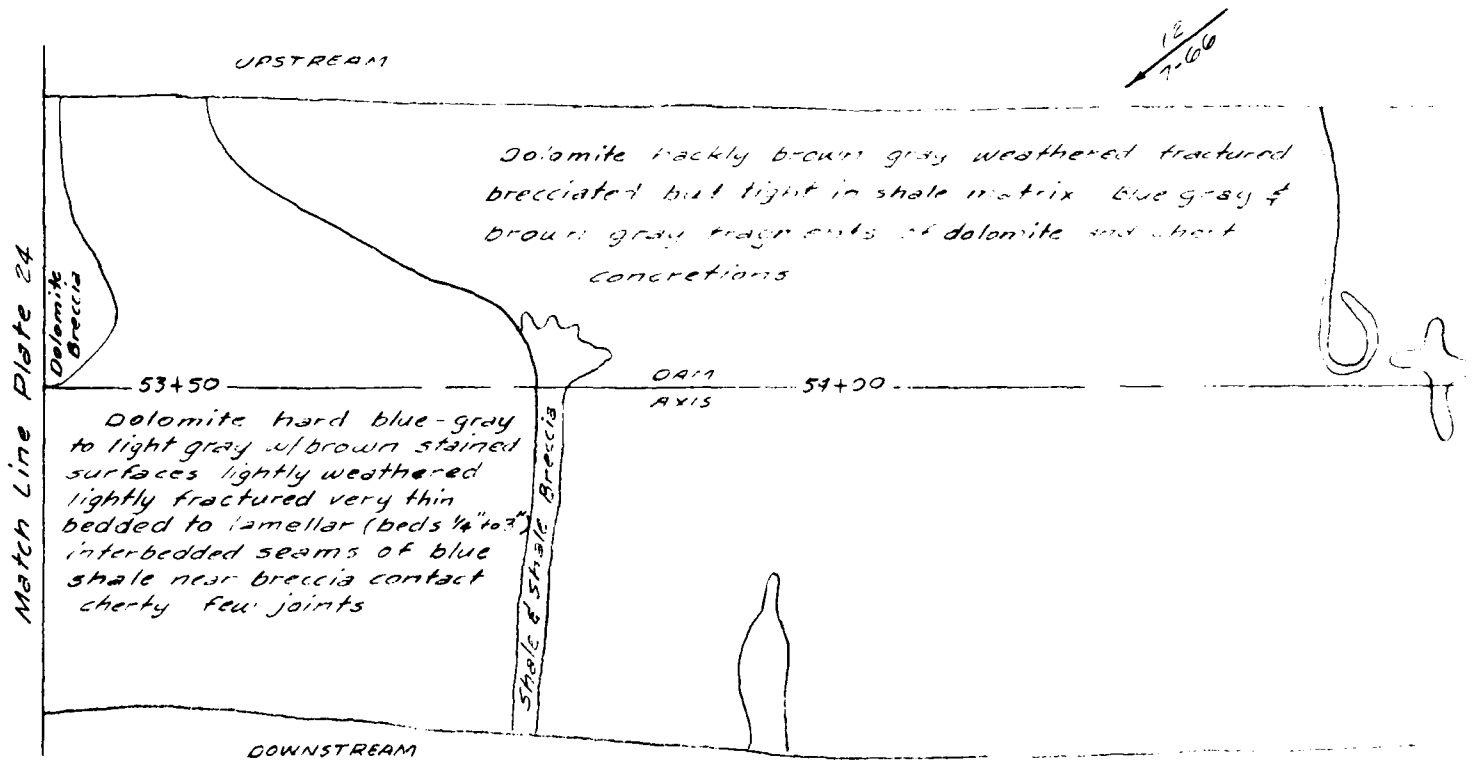
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MAP CUTOFF TRENCH STA. 51+80 TO STA. 53+40

Scale:
Date: MARCH 1968
Sheet number:
Drawing No.
File No. 0-12-9184

PLATE NO. 24

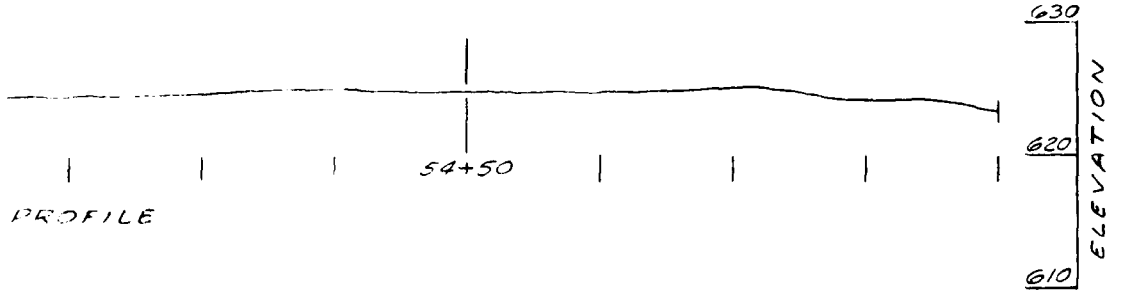




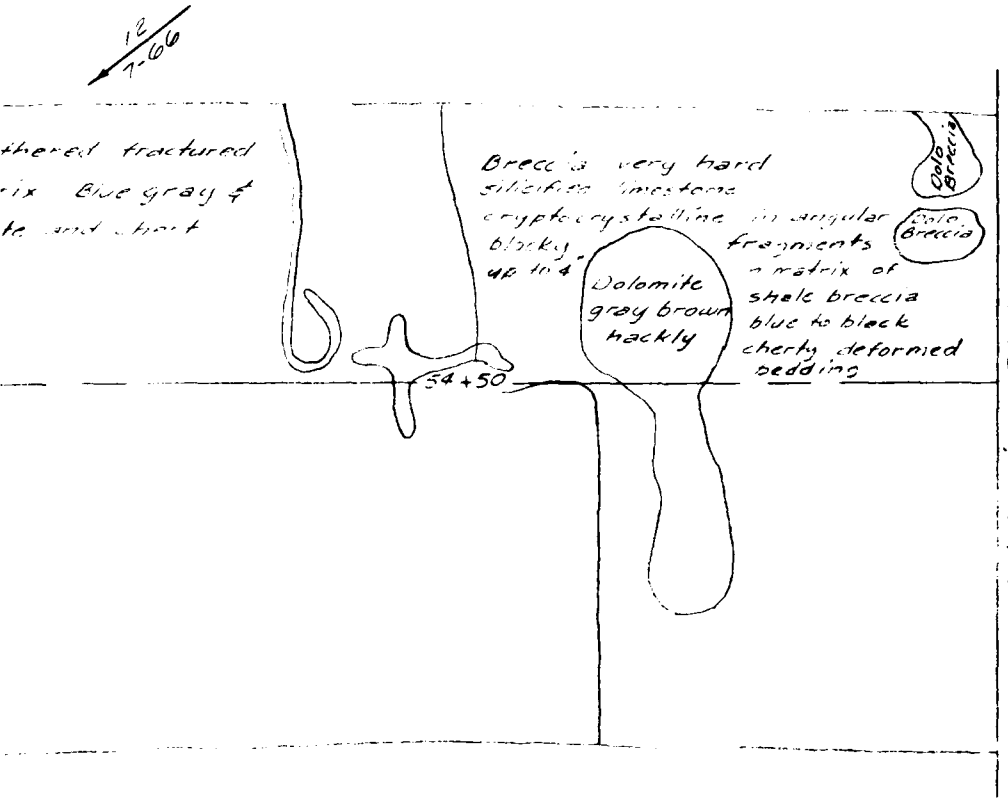
STAGE I MAP CUTOFF TRENCH STA 53+40 TO 5

12
7-66
Direction Number & Date of Photo

0
SCALE IN



PROFILE



STA 53+40 TO STA 54+90

0 10

SCALE IN FEET

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MAP CUTOFF TRENCH STA.53+40 TO STA.54+90

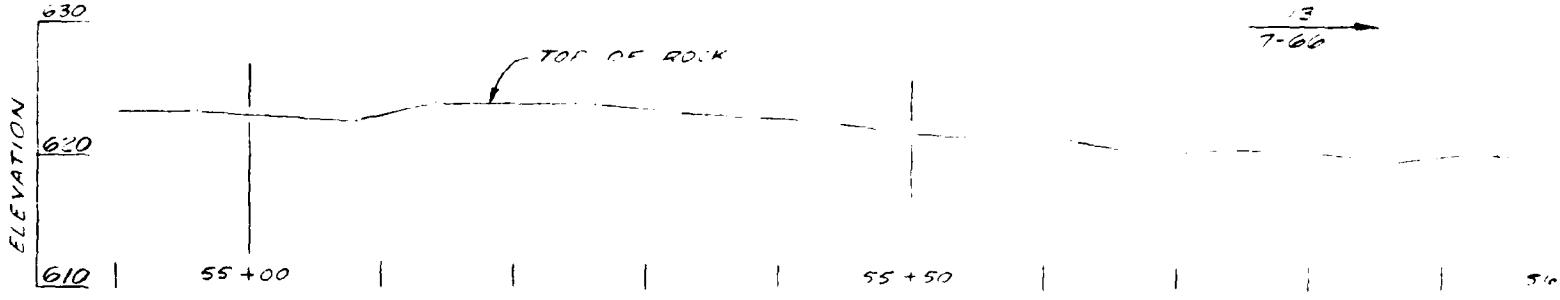
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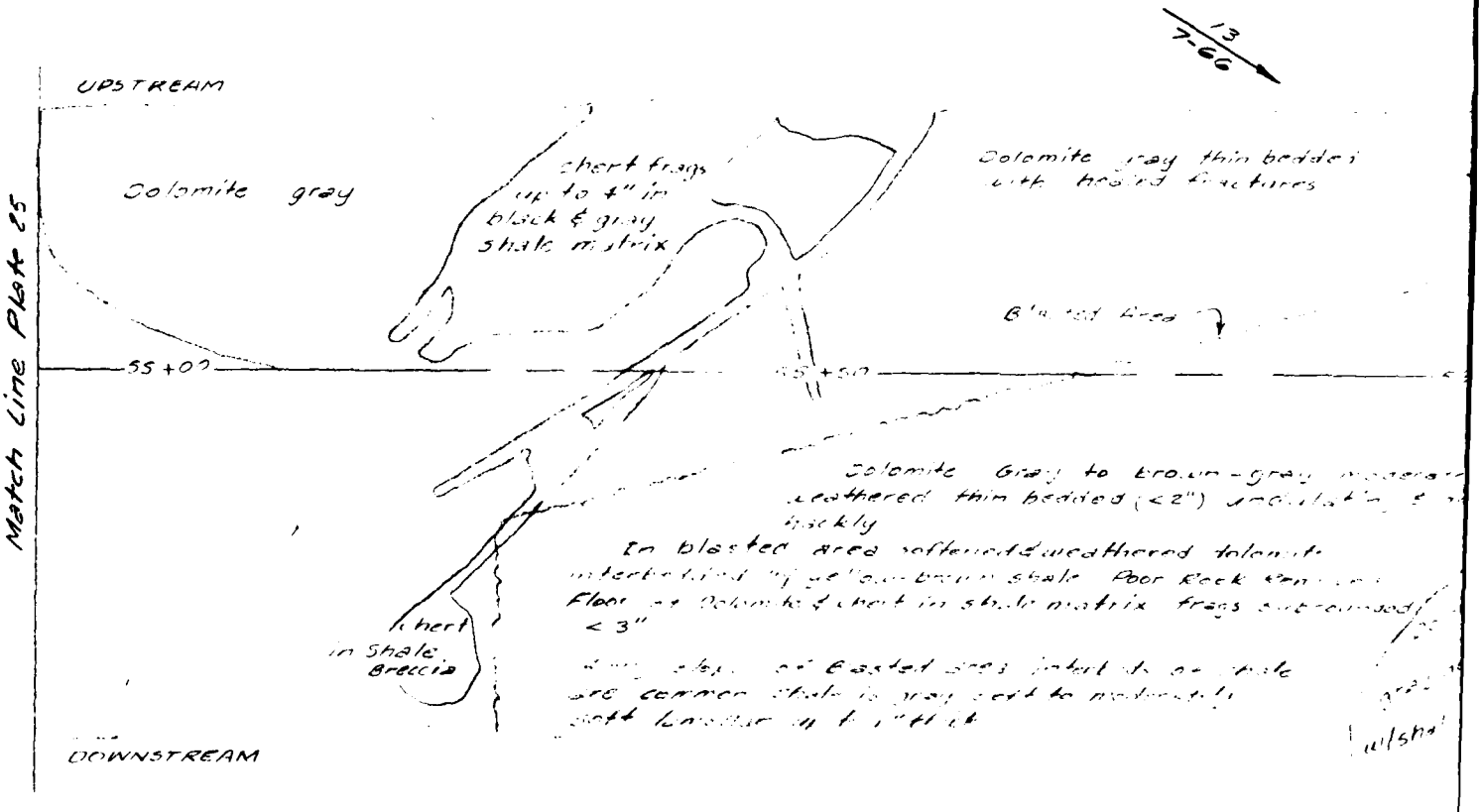
Date: MARCH 1968

Sheet number

Drawing No. 0-12-9155

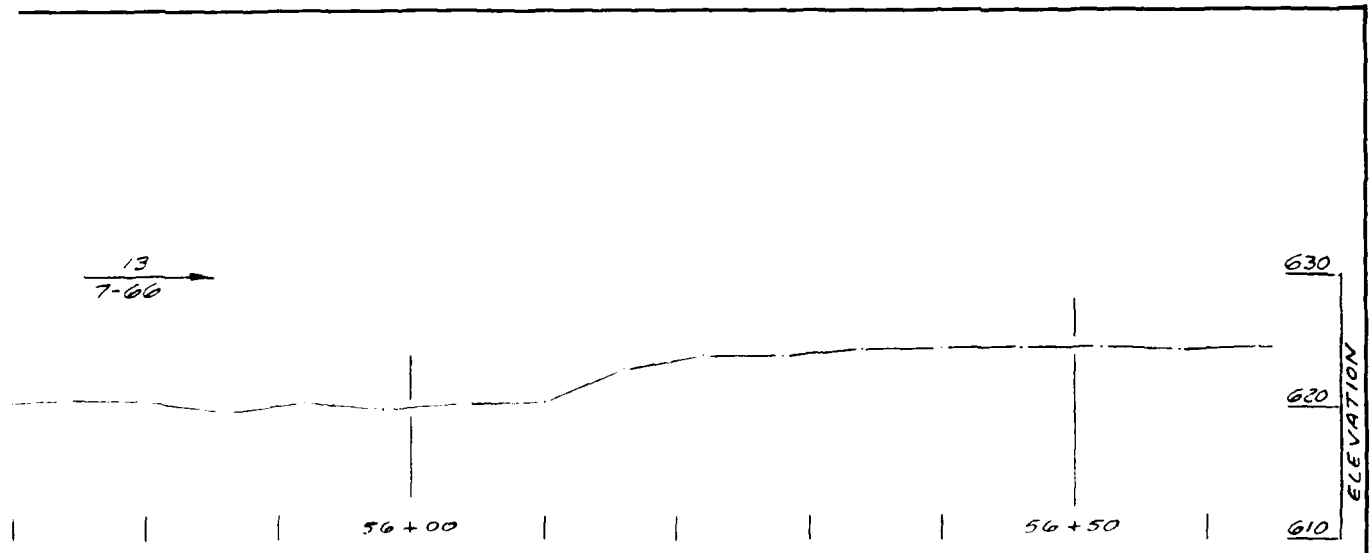
PLATE NO. 25



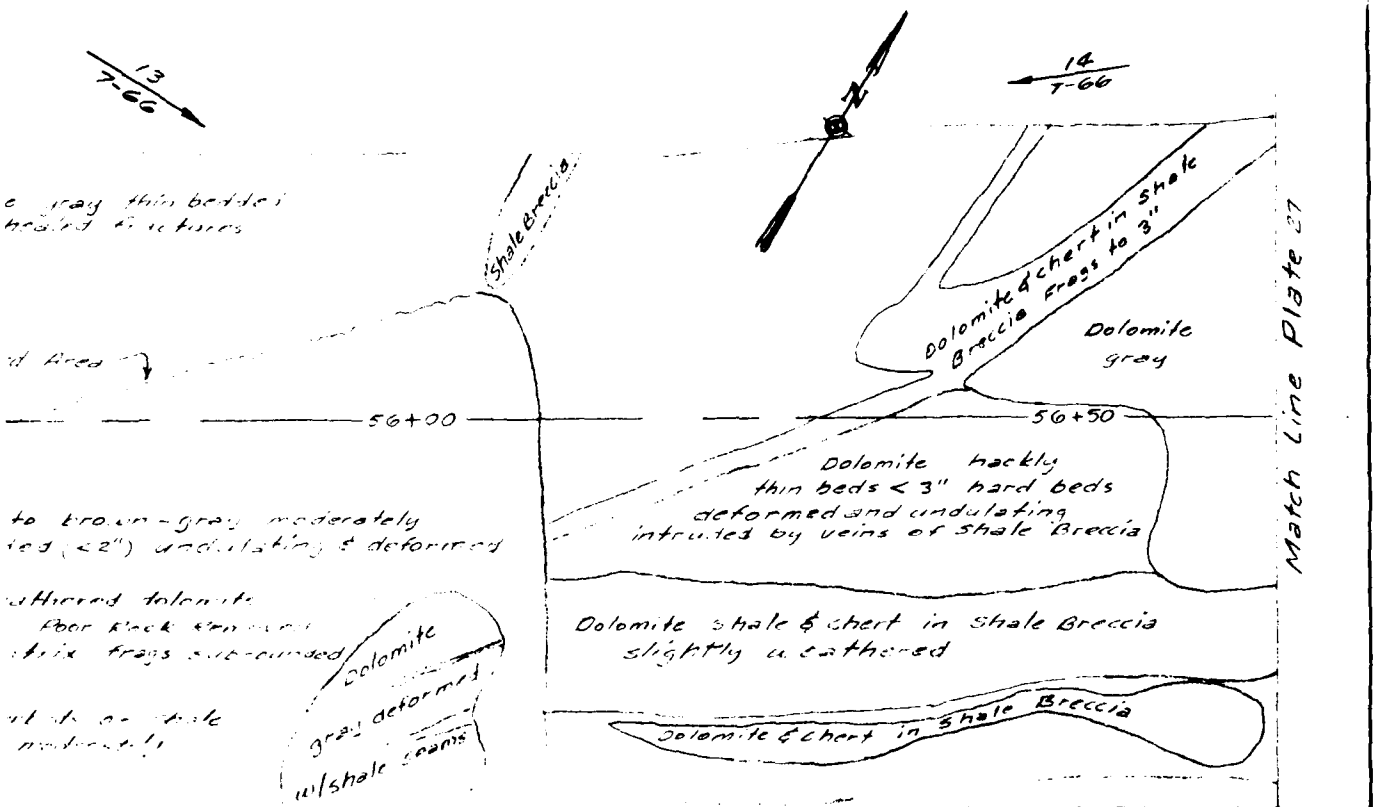


STAGE I MAP CUTOFF TRENCH STA 54+90 TO 5

13
7-66
Direction Date & Number of Photo



E PROFILE



TA 54+90 TO STA 56+65

0 10
SCALE IN FEET

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Checked by
Submitted by

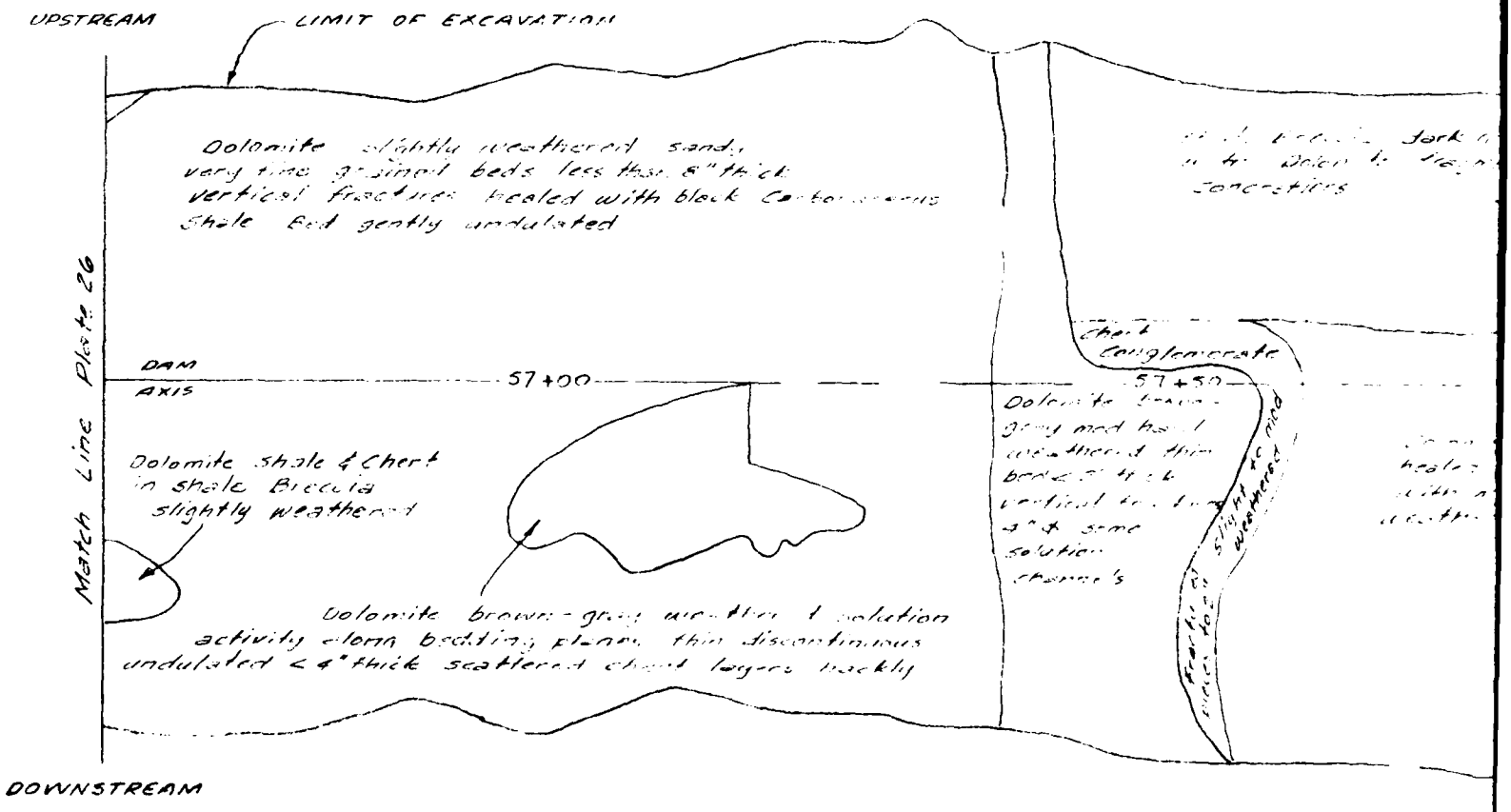
OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

MAP CUTOFF TRENCH
STA.54+90 TO STA.56+65

Scale
Date: MARCH 1968
Sheet number
File No. 0-12-9156

PLATE NO. 26

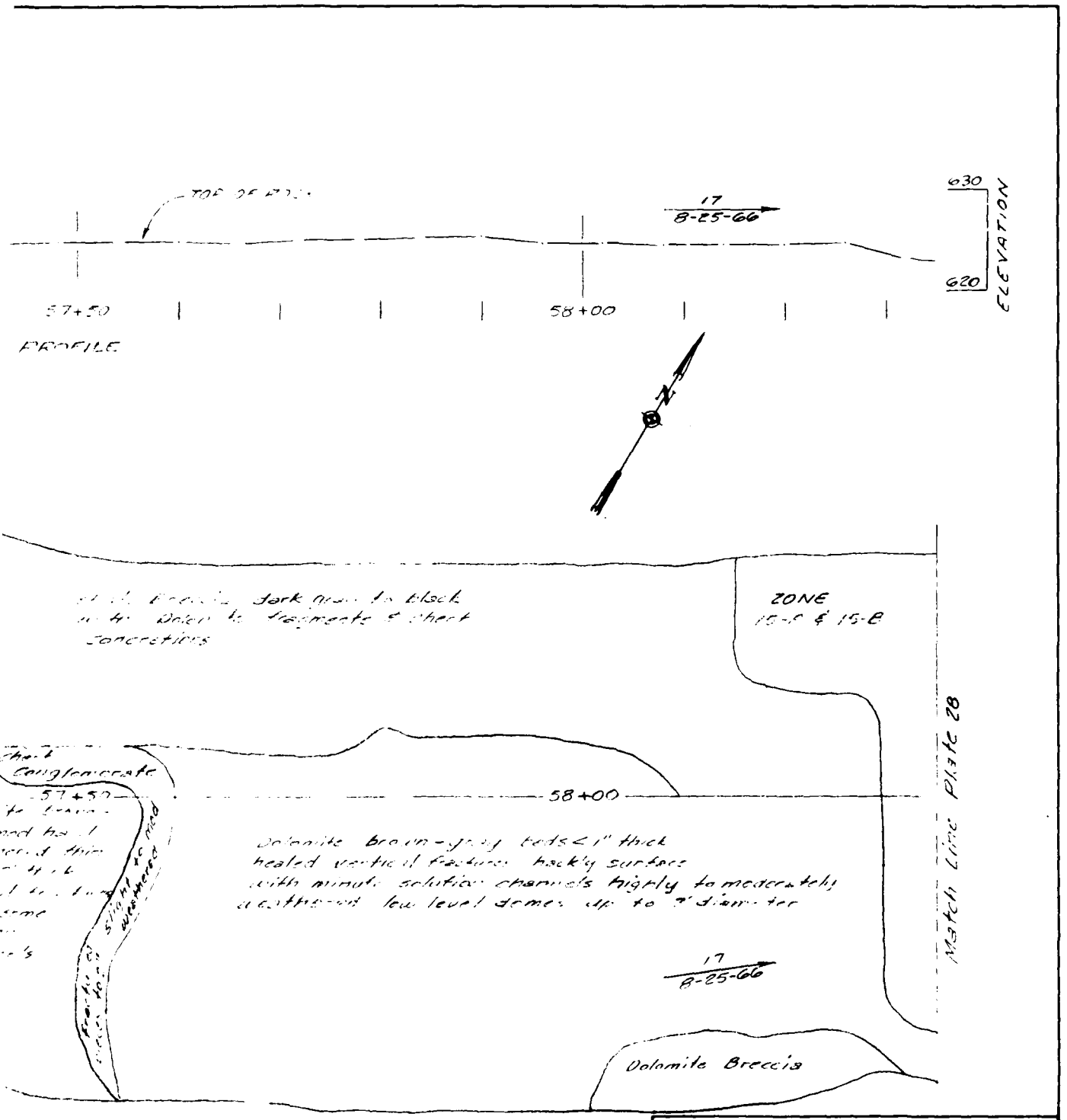




STAGE I MAP CUTOFF TRENCH STA 56+65 TO

For Detail Description of Sec & Plates 59, 60 & 61

17 R-25-60 Direction Number & Date of Photo



STA 56+65 TO STA 58+35

Detail Description of Geologic Units see Plate 4
& Plates 59, 60 & 61

SCALE IN FEET

Revisions			
Symbol	Description	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

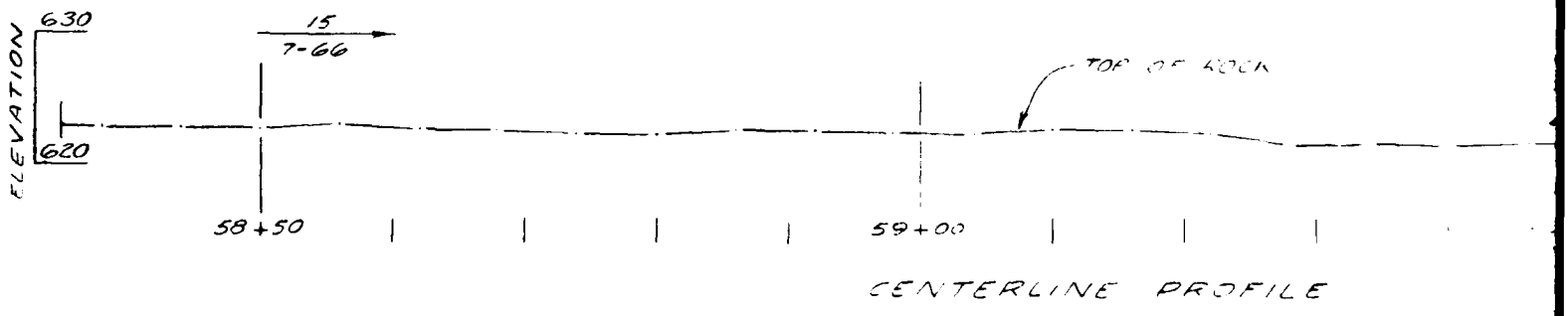
Designed by
Drawn by
Checked by
Submitted by

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

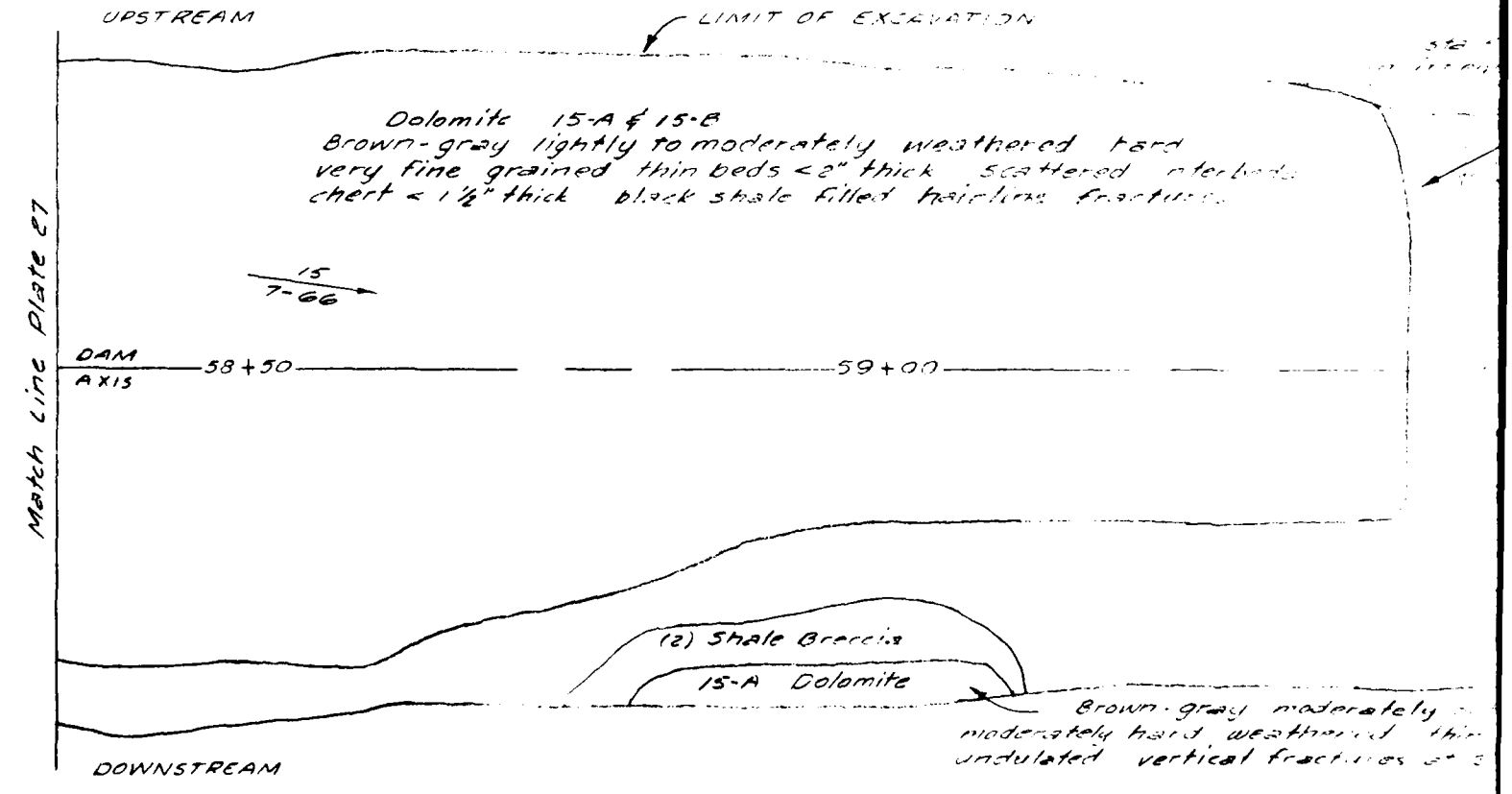
MAP CUTOFF TRENCH STA. 56+65 TO STA. 58+35

Scale
Date: MARCH 1966
Sheet number
Dwg. No.
File No. 0-12-9157

PLATE NO. 27



CENTERLINE PROFILE

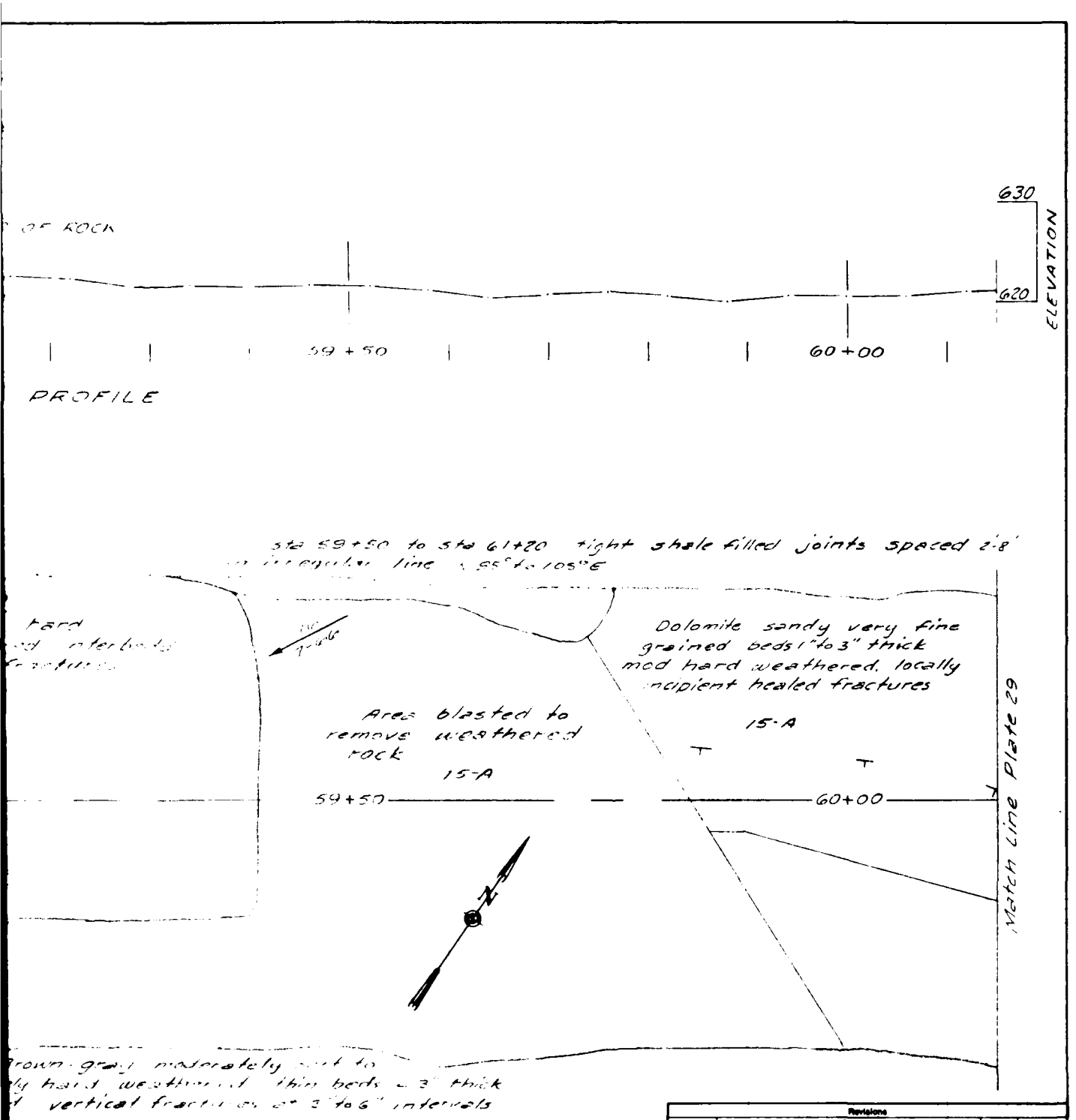


STAGE I MAP CUTOFF TRENCH STA 58+35 T

15 / 7-66 Direction Number & Date of Photo

For Legend See Plates 59, 60 & 61

SCALE IN



CH STA 58+35 TO STA 60+15

Revisions			
Symbol	Descriptions	Date	Approved

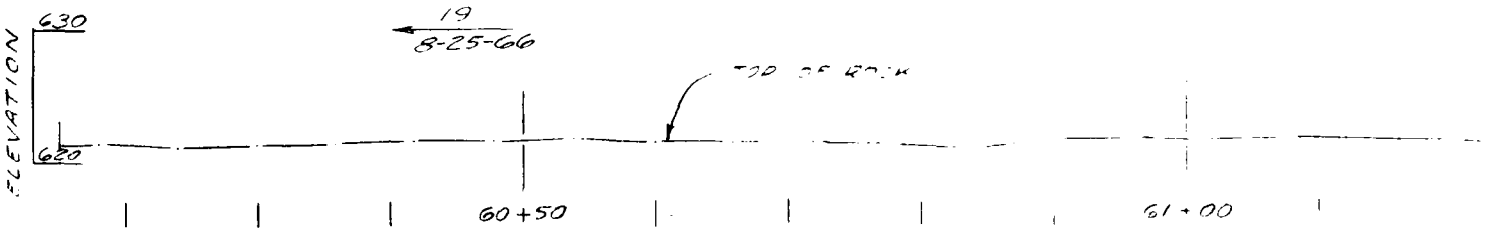
U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

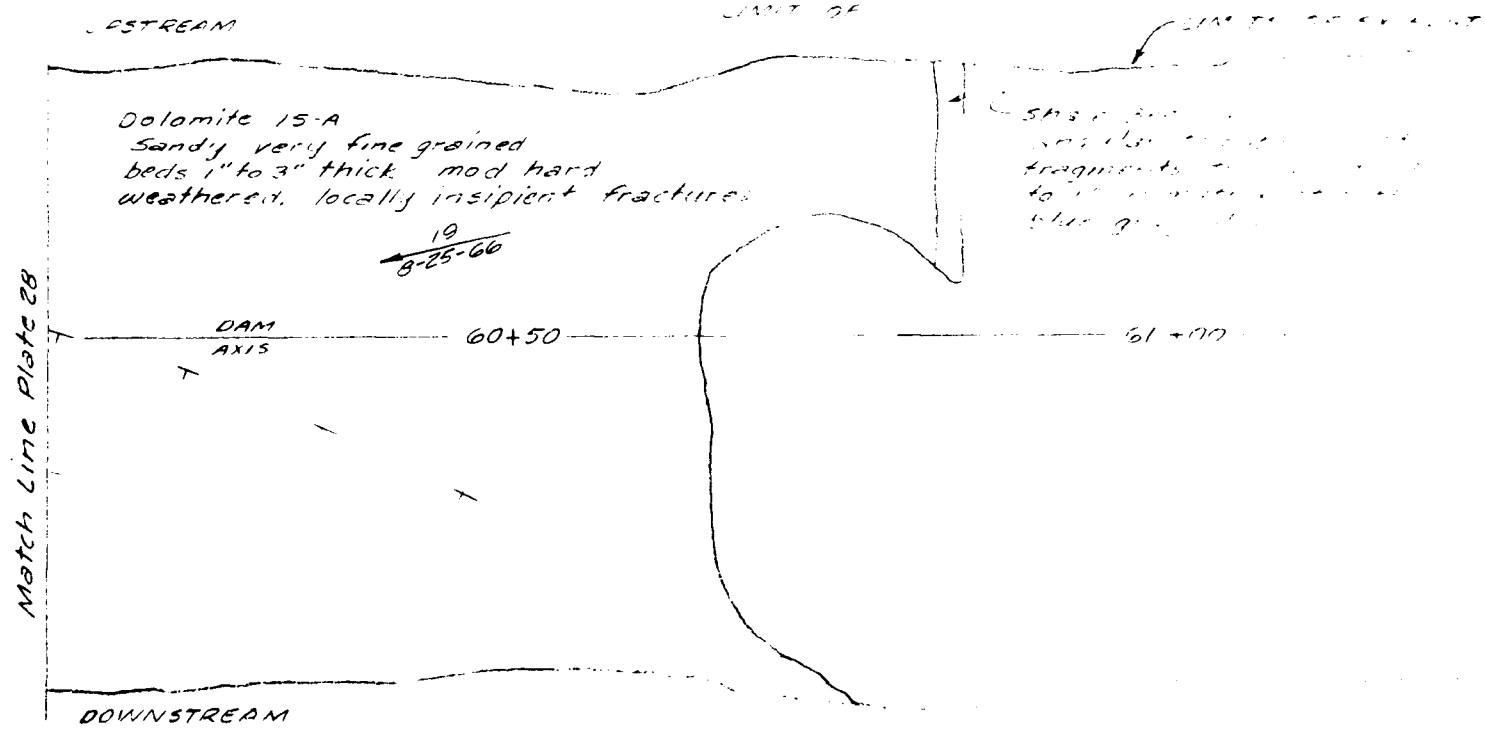
MAP CUTOFF TRENCH
STA. 58+35 TO STA. 60+15

Designed by
Drawn by
Checked by
Submitted by
Scale
Date MARCH 1958
Sheet number
File No. 0-12-9158

PLATE NO. 28



CENTERLINE PROFILE

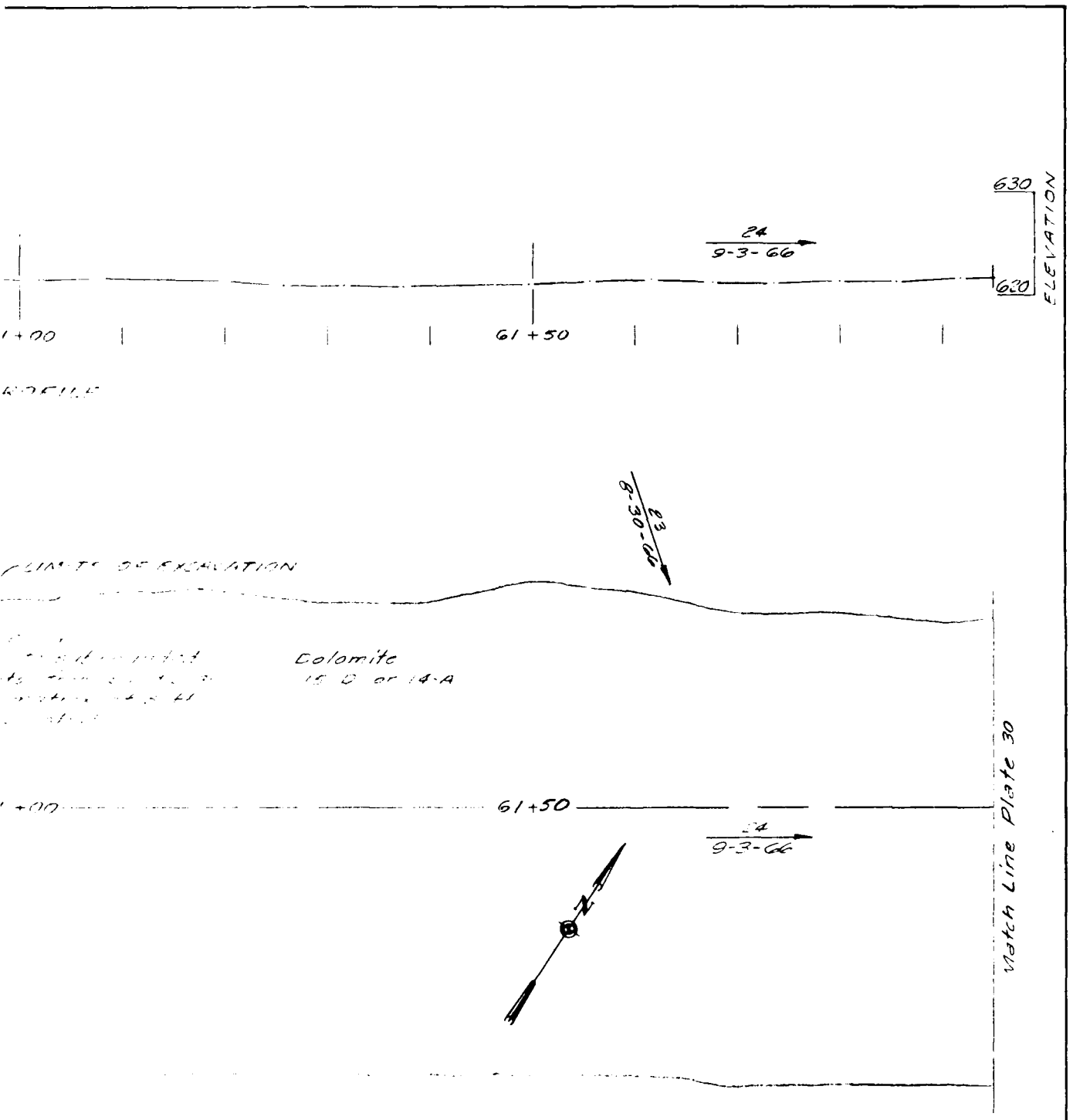


STAGE I MAP CUTOFF TRENCH

19
8-25-66 Direction Number & Date of Photo

For Legend see Plates 59, 60 & 61

IN FEET



STA. 60+15 TO STA 61+95

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

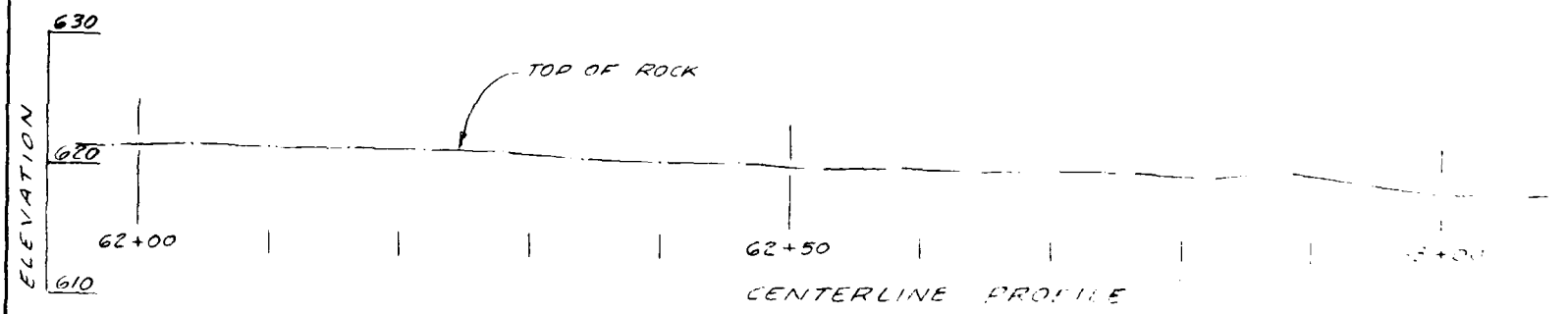
Designed by
Drawn by
Checked by
Submitted by

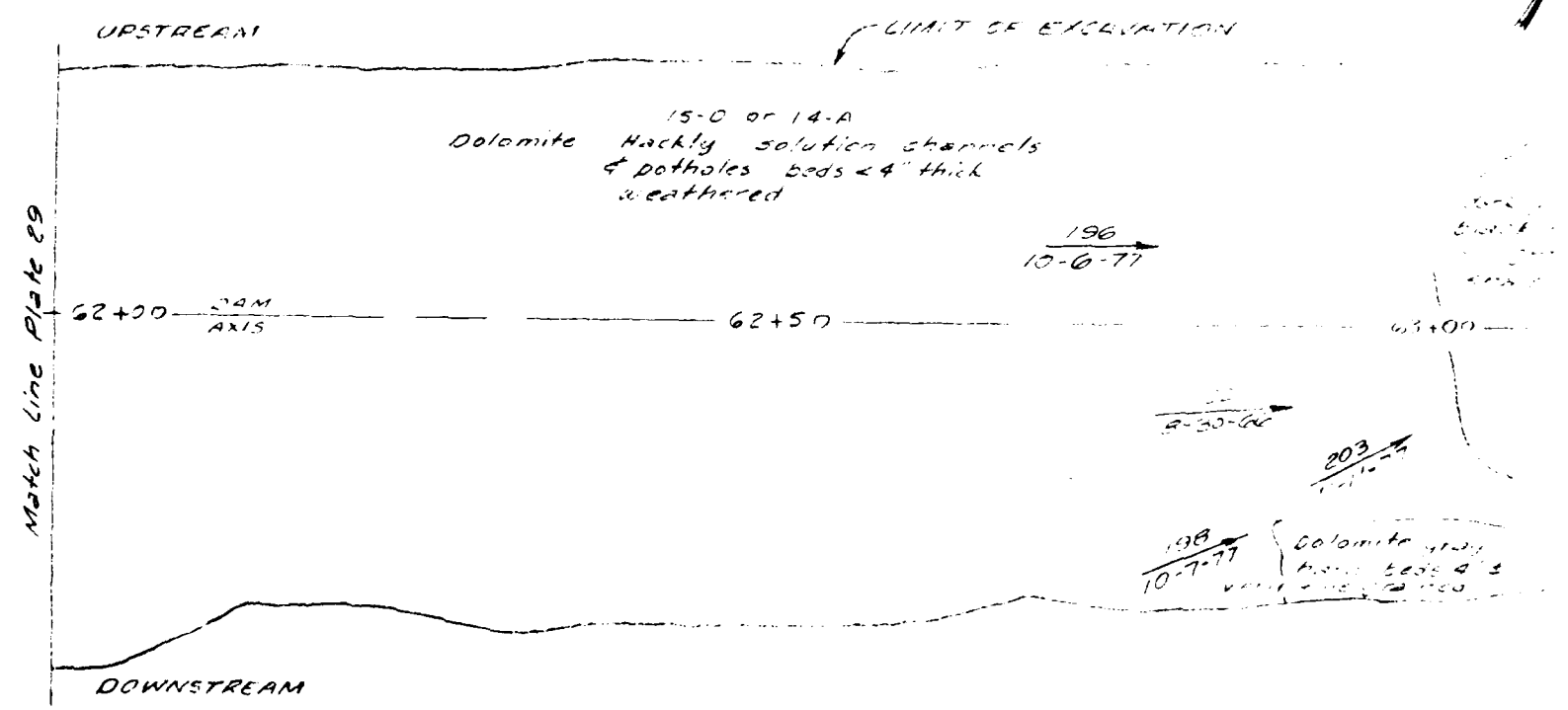
OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

MAP CUTOFF TRENCH STA.60+15 TO STA.61+95

Scale
Date MARCH 1966
Sheet number
Drawing No.
File No. 0-12-9159

PLATE NO. 29



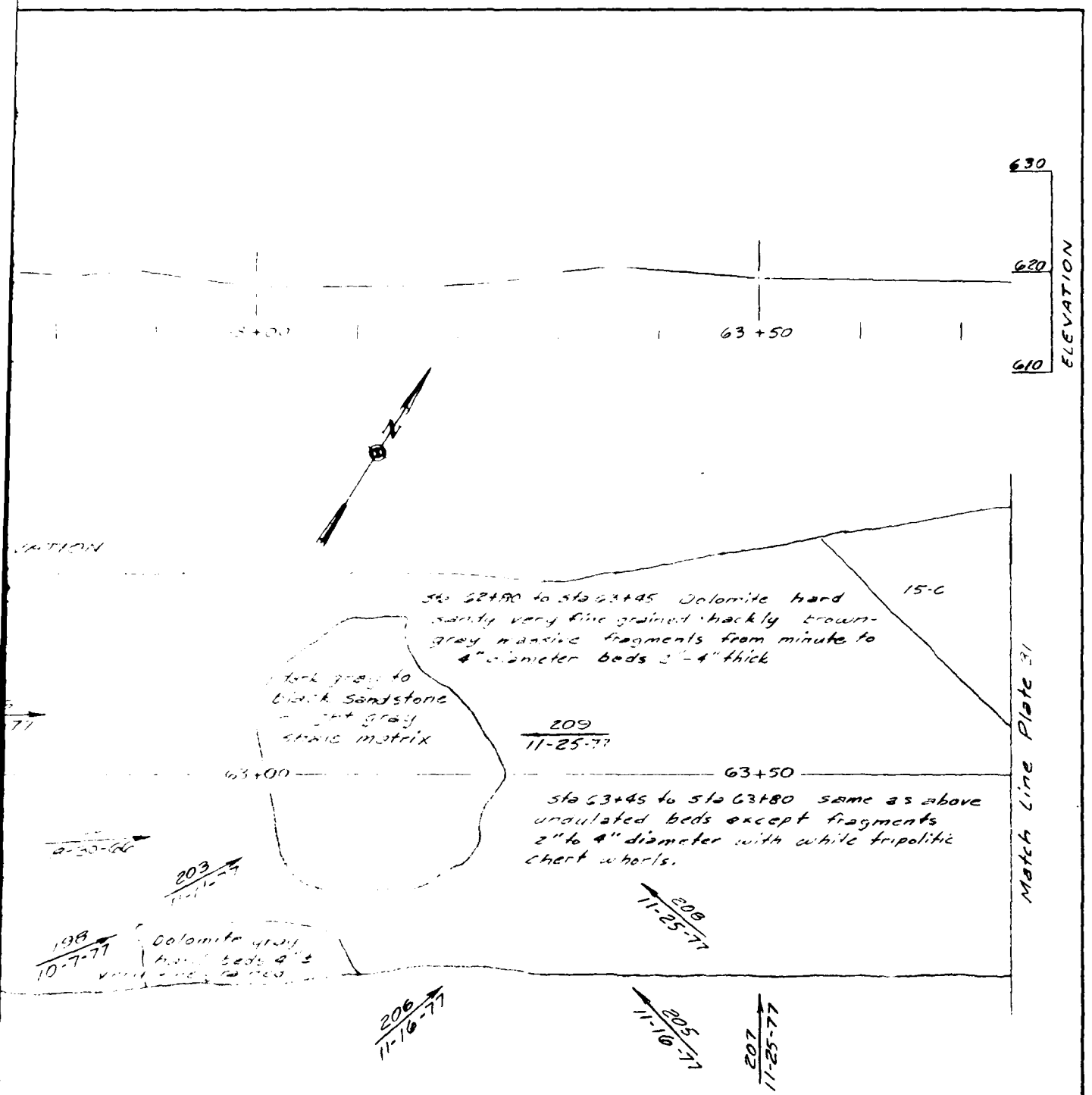


STAGE I MAP CUTOFF TRENCH STA 61+95 TO 63

22
8-30-66
Direction Number & Date of Photo

For Legend See Plates 59, 60 & 61

0 10
SCALE IN FEET



CH STA 61+95 TO STA 63+75

0 10

HIF IN FEET

Revisions			
Symbol	Description	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

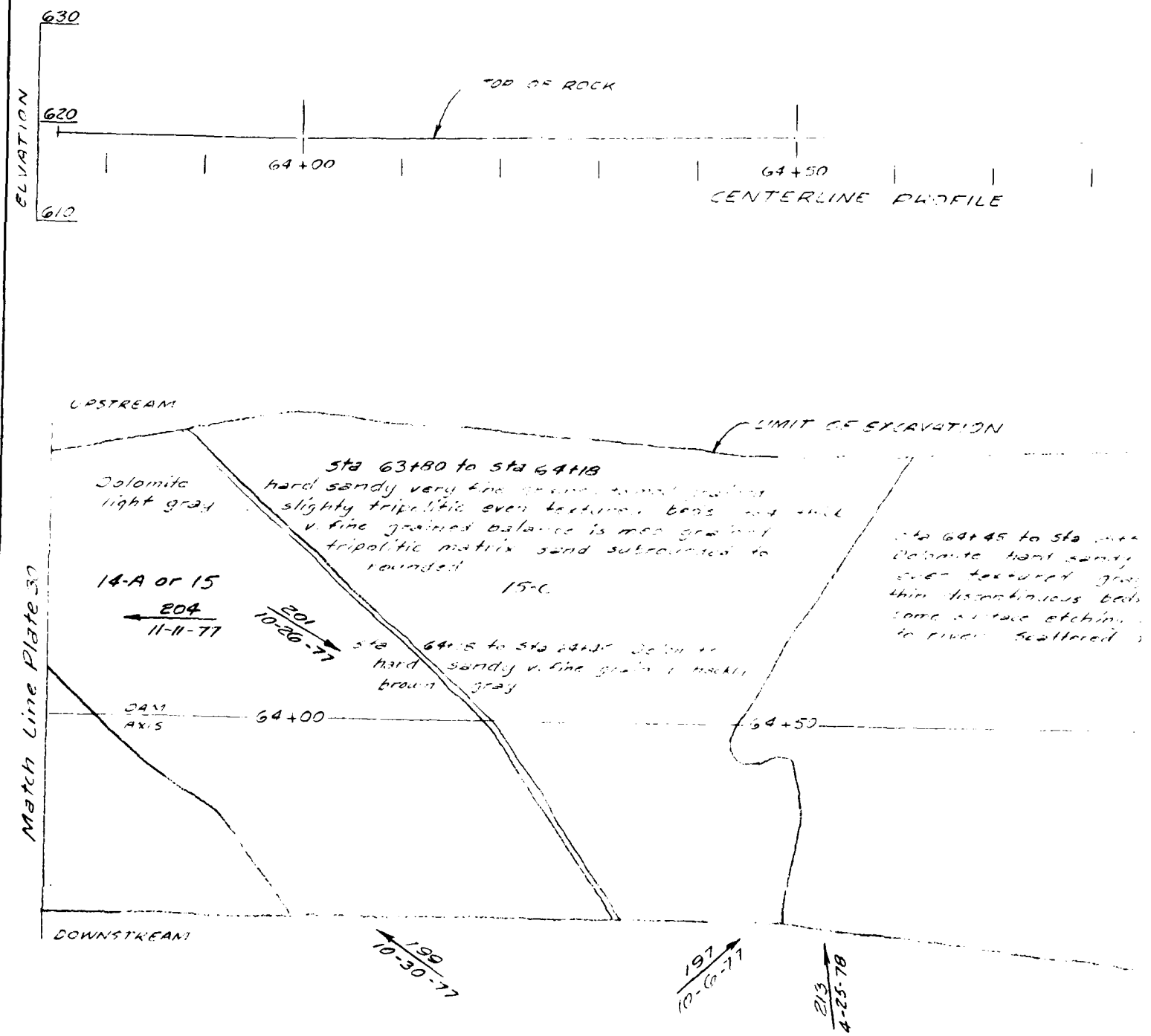
Designed by
Drawn by
Checked by
Submitted by

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HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

MAP CUTOFF TRENCH
STA.61+95 TO STA.63+75

Scale
Date: MARCH 1985
Sheet number
Dwg No.
FIN No. 0-12-9160

PLATE NO.30

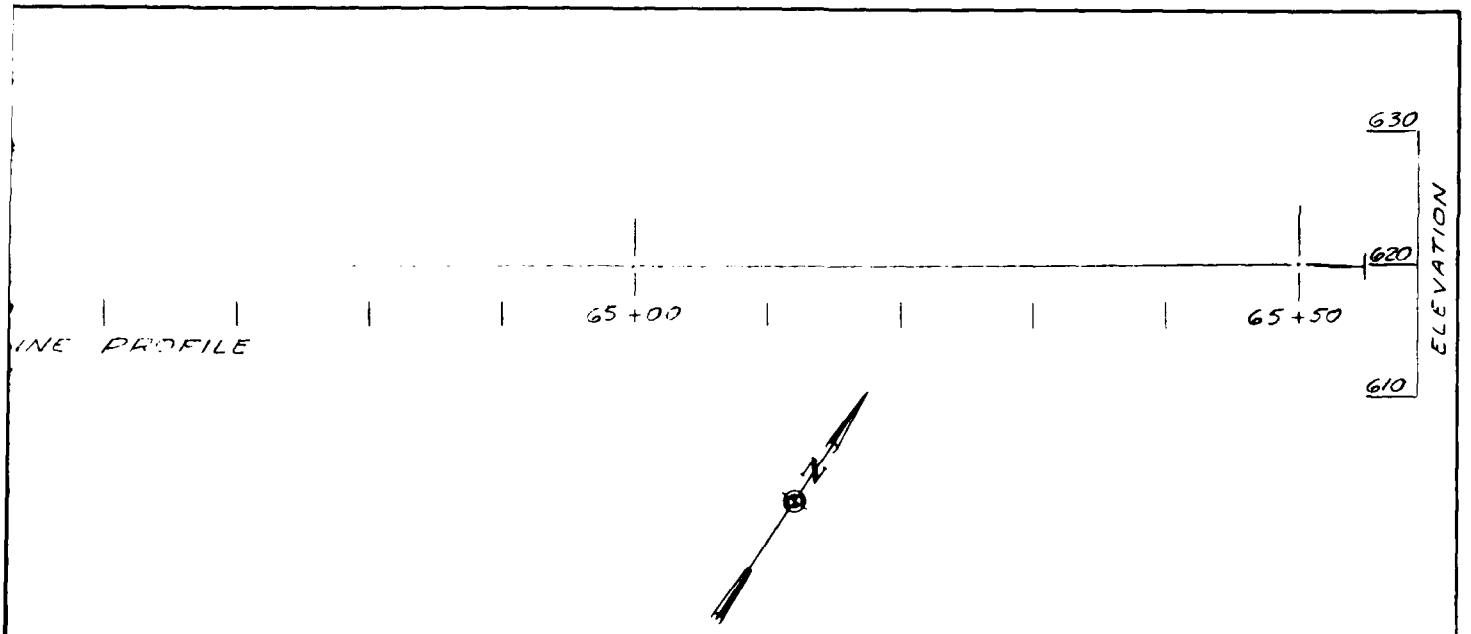


STAGE I MAP CUTOFF [illegible] STA 64+18 TO STA 64+45

201
10-26-77
Direction, Date & Number of Photo

For Legend See Plates 59, 60 & 61

0 10
SCALE IN FEET



OF EXCAVATION

Sta 64+45 to Sta 65+50
Dolomite hard sandy med grained
even textured gray to brown gray
thin discontinuous beds (1" to 4" thick) undulated
some surface etching and erosion parallel
to river scattered tripolitic joints

65+00 65+50

Match Line Plate 32

211
4-21-78

212
4-21-78

213
4-25-78

STA 63+75 TO STA 65+55

0 10
SCALE IN FEET

Revisions			
Symbol	Descriptions	Date	Approved

U S ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

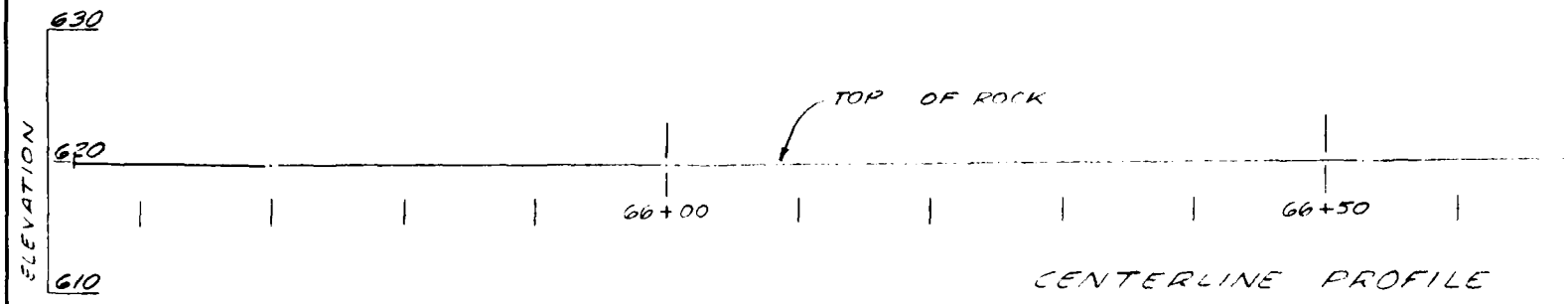
Designed by
Drawn by
Checked by
Submitted by

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

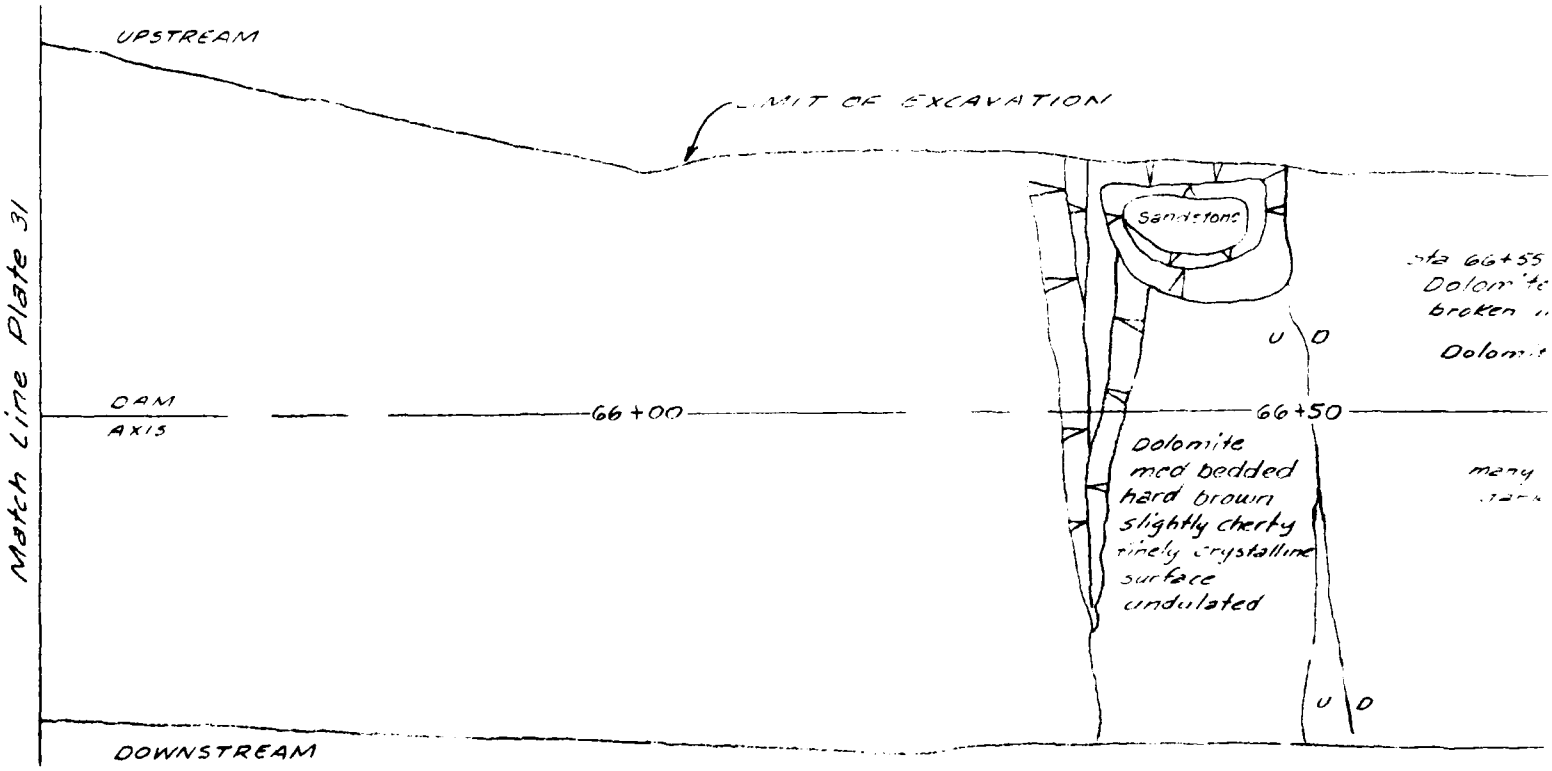
MAP CUTOFF TRENCH
STA. 63+75 TO STA. 65+55

Scale
Date: MARCH 1985
Sheet number
Drawing No.
File No. 0-12-9161

PLATE NO. 31



CENTERLINE PROFILE



STAGE I MAP CUTOFF TRENCH STA 65+55 TO STA

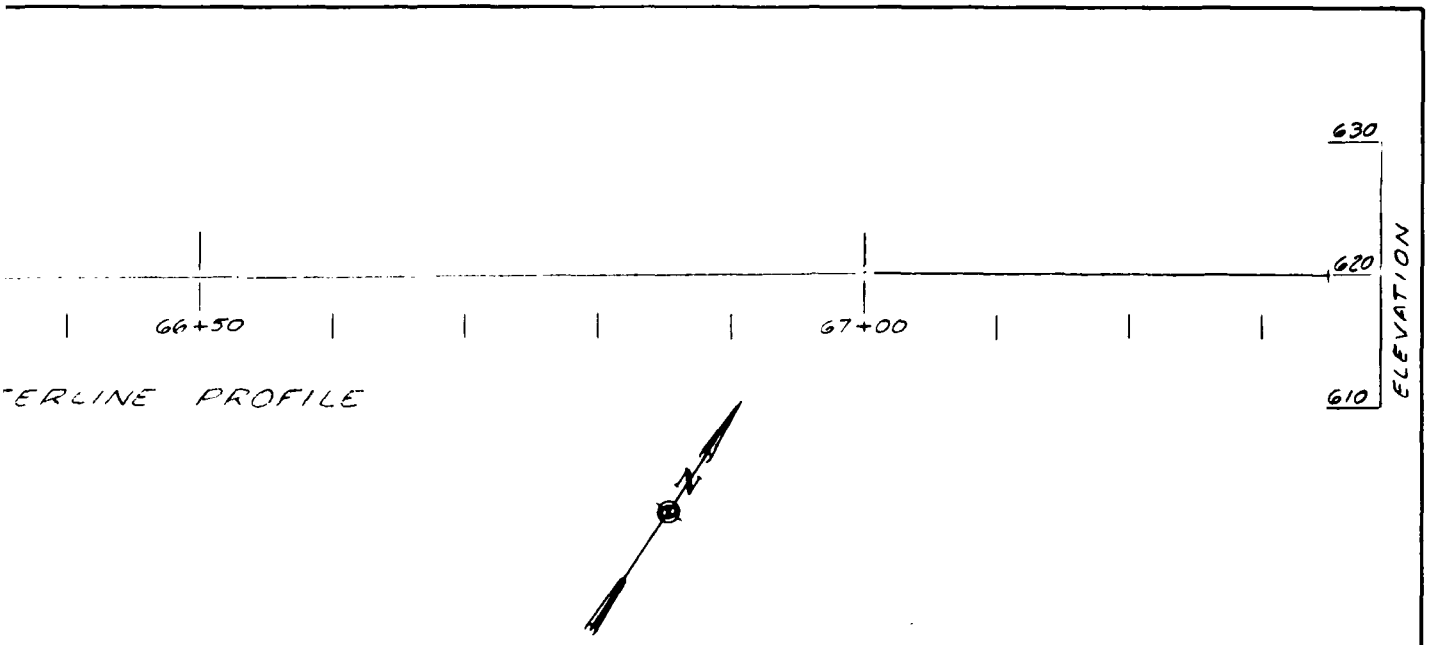
E13
8-25-78

Direction, Date & Number of Photo

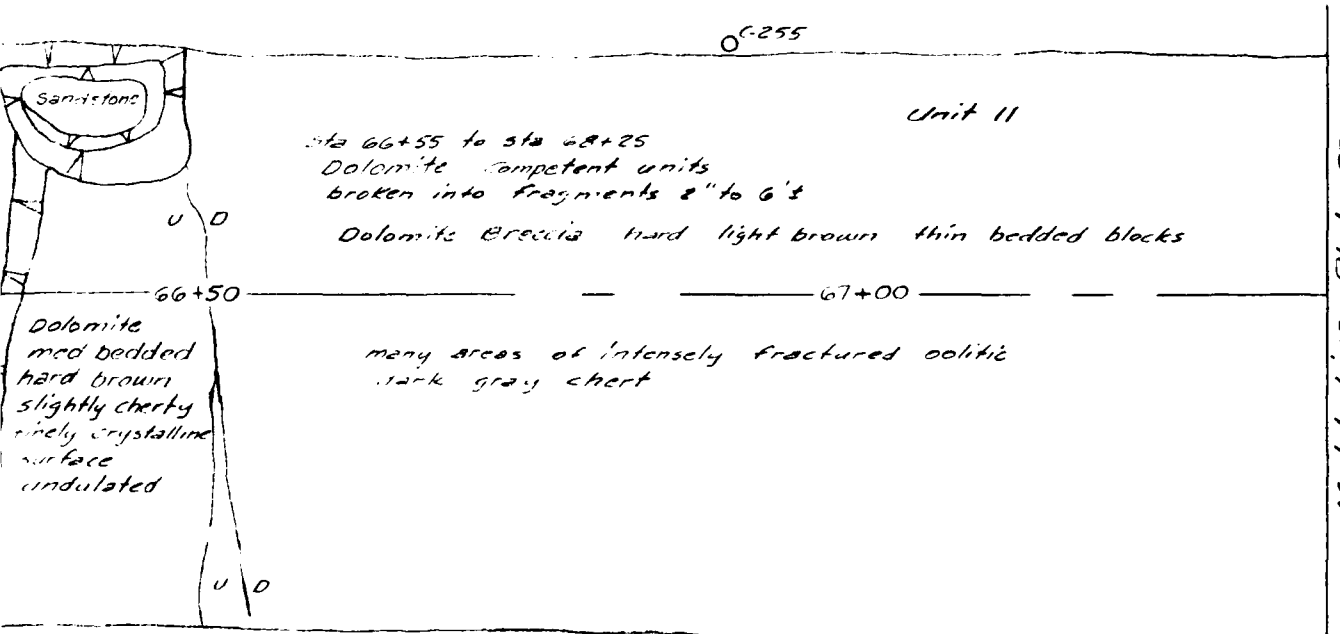
For Legend See Plates 59, 60 & 61

0 10

SCALE IN FE



TERLINE PROFILE



STA 65+55 TO STA 67+35

0 10
SCALE IN FEET

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

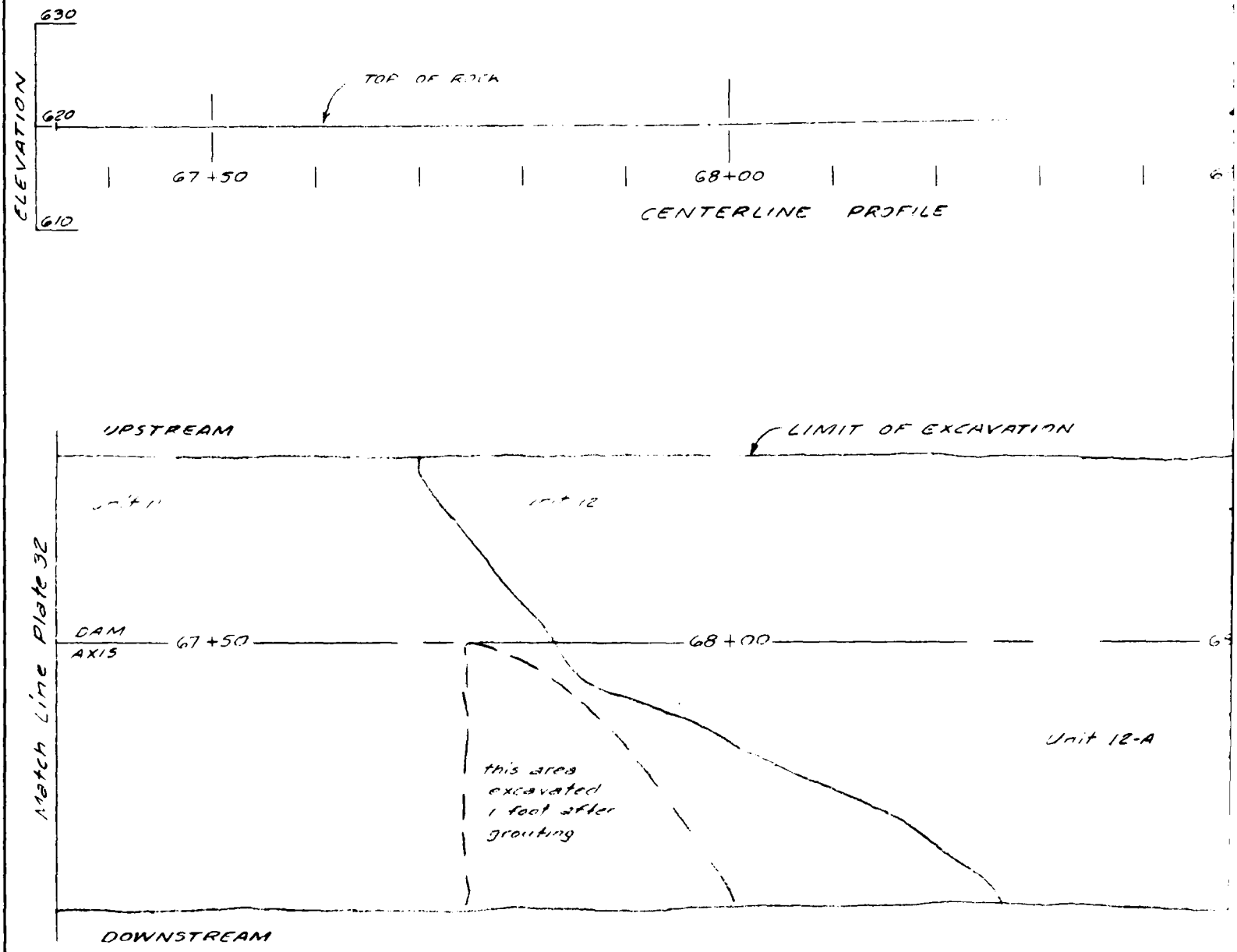
Designed by
Drawn by
Checked by
Submitted by

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HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

MAP CUTOFF TRENCH
STA.65+55 TO STA.67+35

Scale
Date MARCH 1956
Sheet number
Dwg. no.
File 0-12-9162

PLATE NO.32

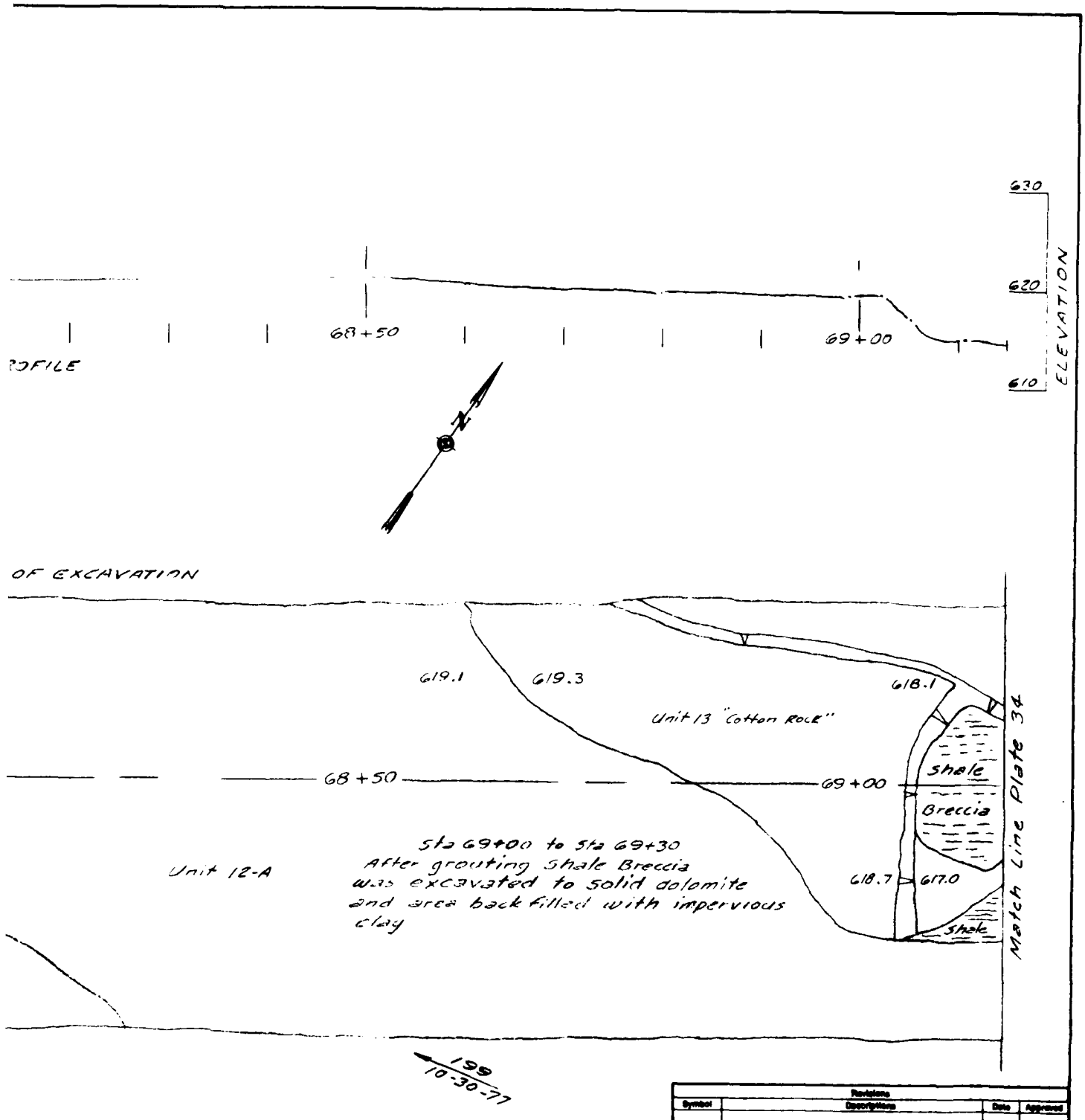


STAGE I MAP CUTOFF TRENCH STA 67+35 TO STA

-0-30-77 199 Direction, Date & Number of Photo

For Legend See Plates 59, 60 & 61

0 10
SCALE IN FEET



199
10-30-77

STA 67+35 TO STA 69+15

0 10
SCALE IN FEET

Revisions			
Symbol	Description	Date	Approved

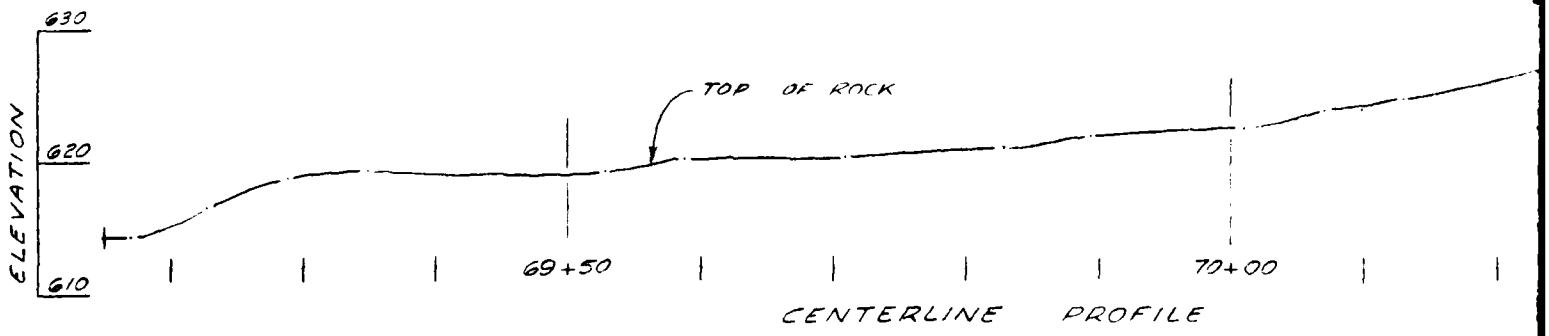
U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

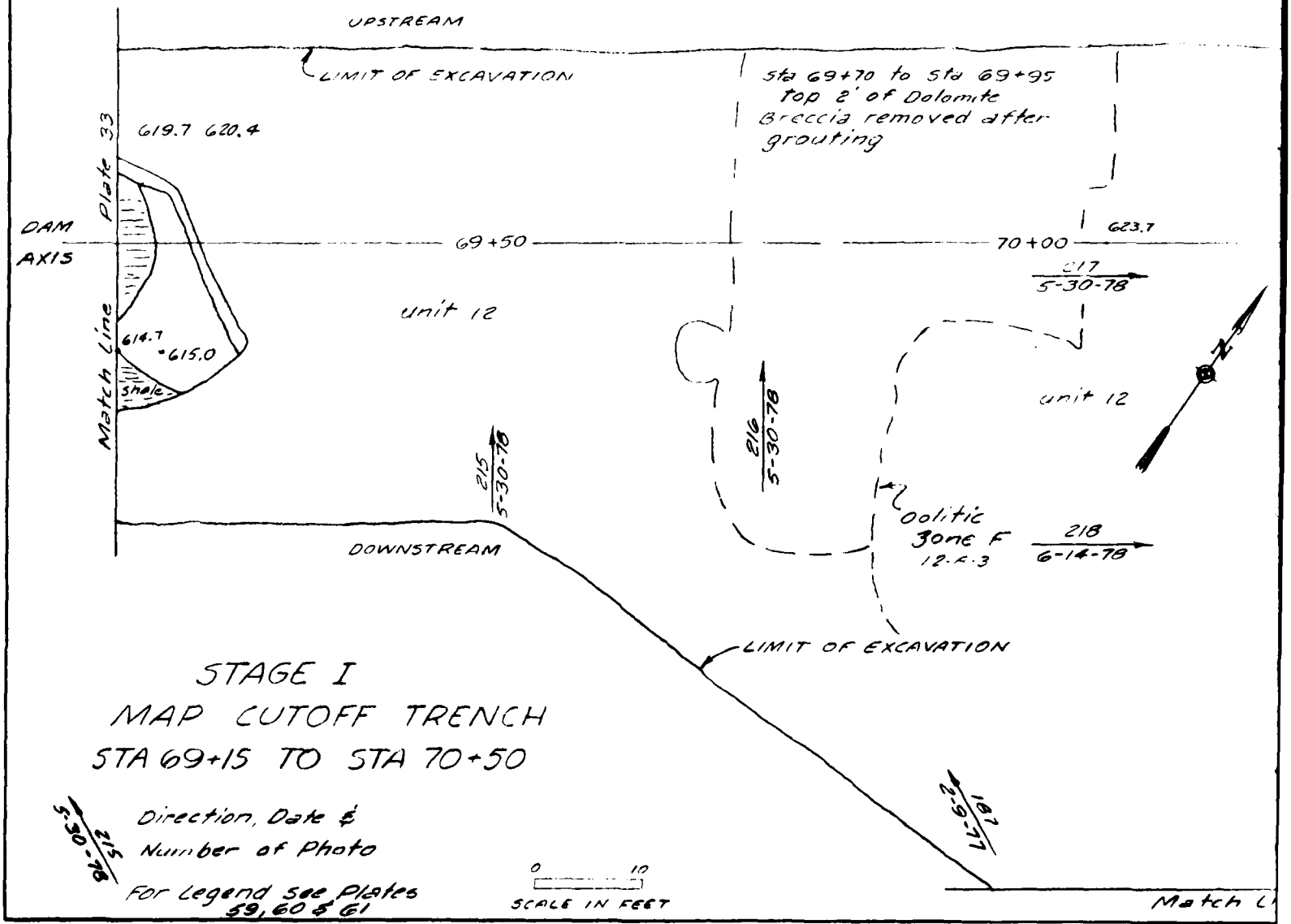
OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

MAP CUTOFF TRENCH
STA. 67+35 TO STA. 69+15

Designed by
Drawn by
Checked by
Submitted by
Scale
Date MARCH 1988
Dwg. No.
Sheet number
File No. 0-12-9163

PLATE NO. 33

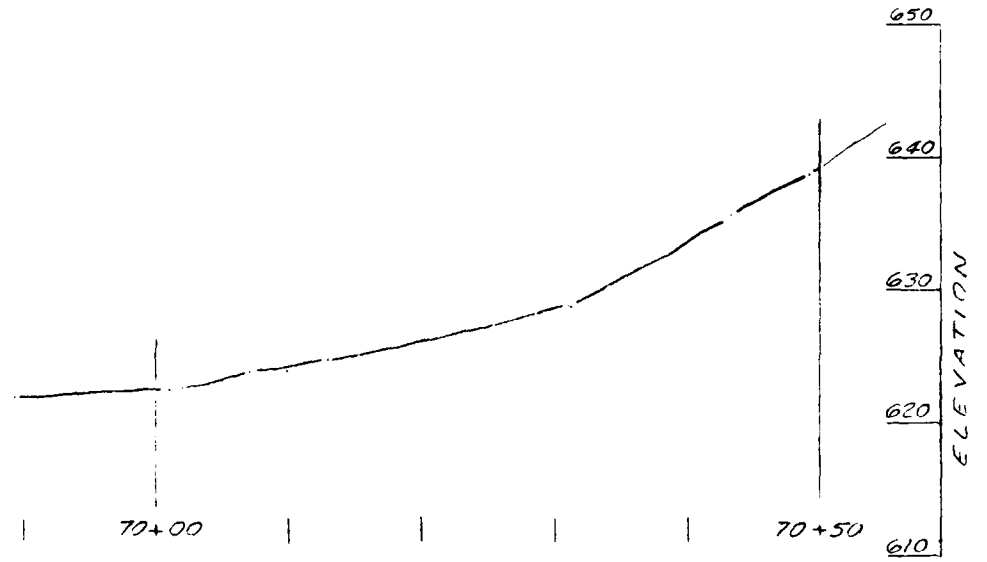




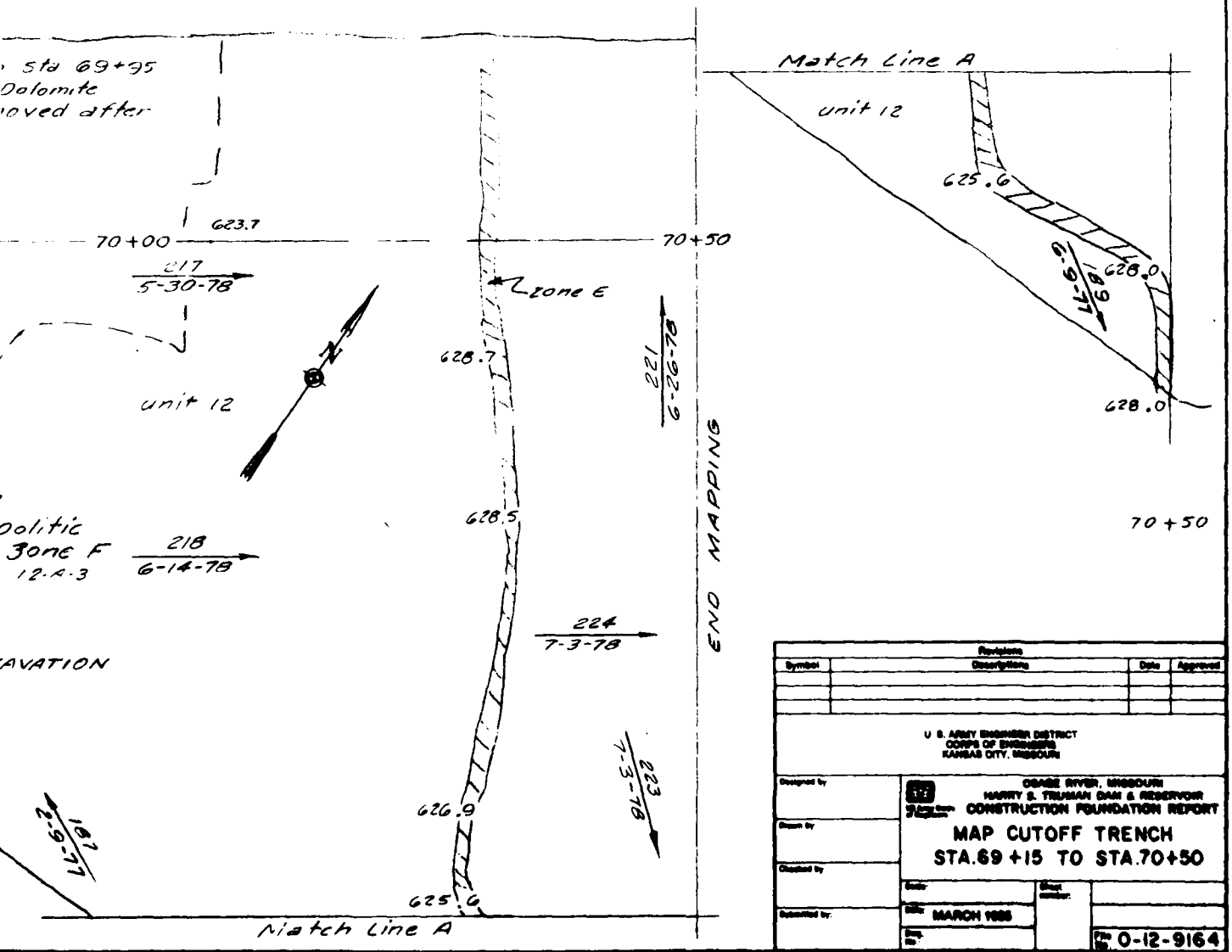
STAGE I
MAP CUTOFF TRENCH
STA 69+15 TO STA 70+50

215
5-30-78
Direction, Date &
Number of Photo

For Legend see Plates
59, 60 & 61



PROFILE



EXCAVATION

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

MAP CUTOFF TRENCH
STA.69+15 TO STA.70+50

Scale

Sheet number

Date: MARCH 1980

Drawing No.

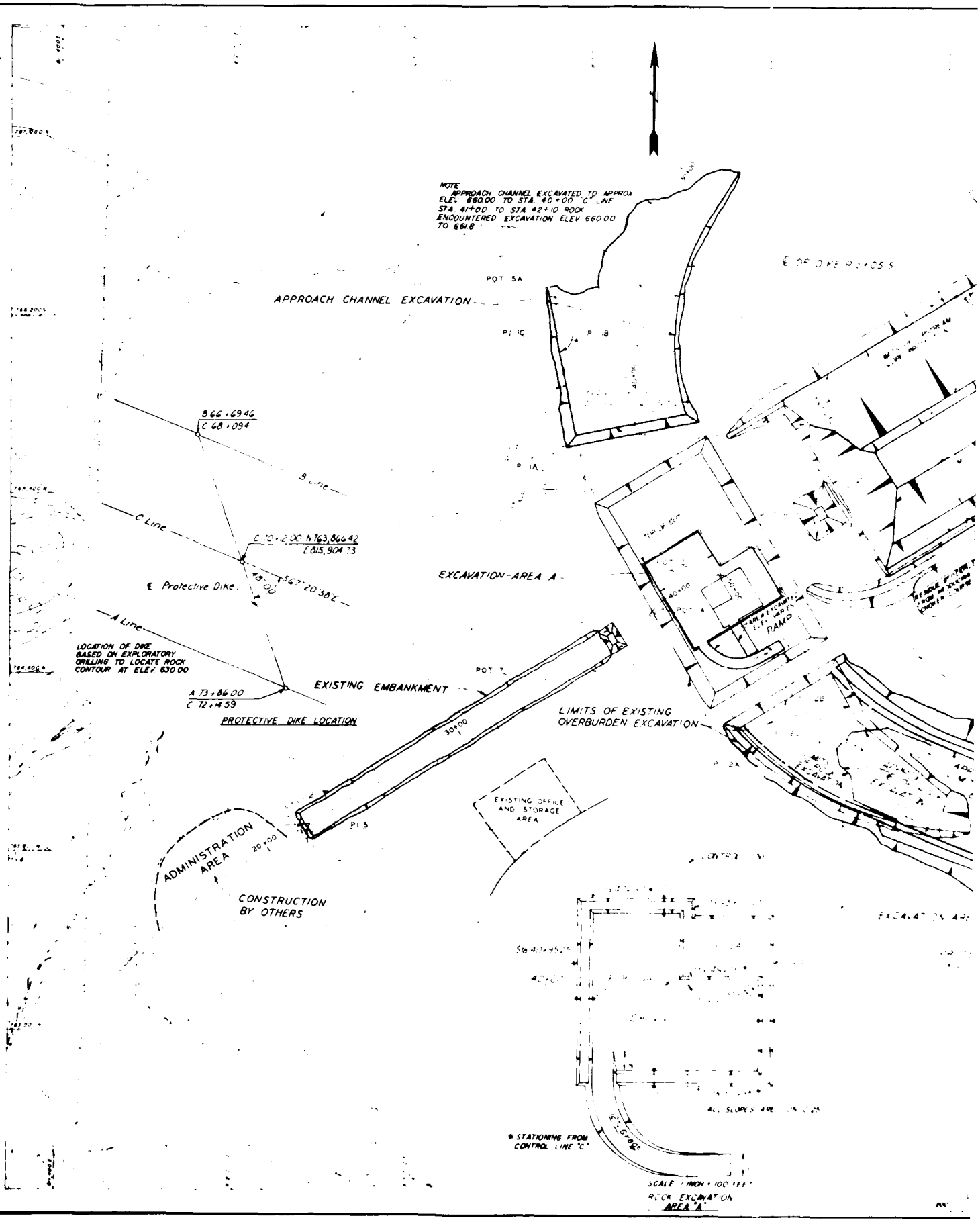
File No. 0-12-9164

PLATE NO.34

STAGE II CONSTRUCTION

UCTION

HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE



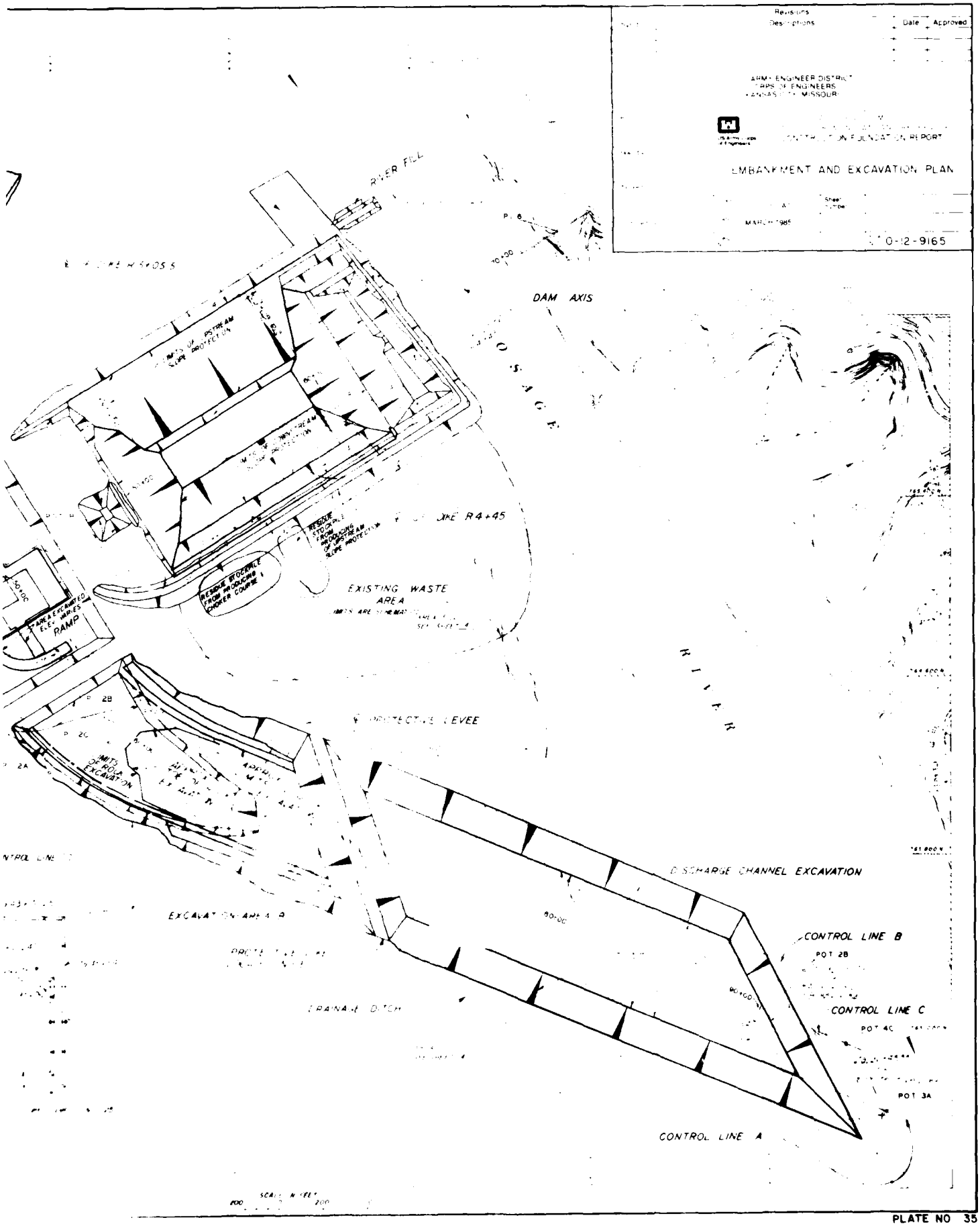
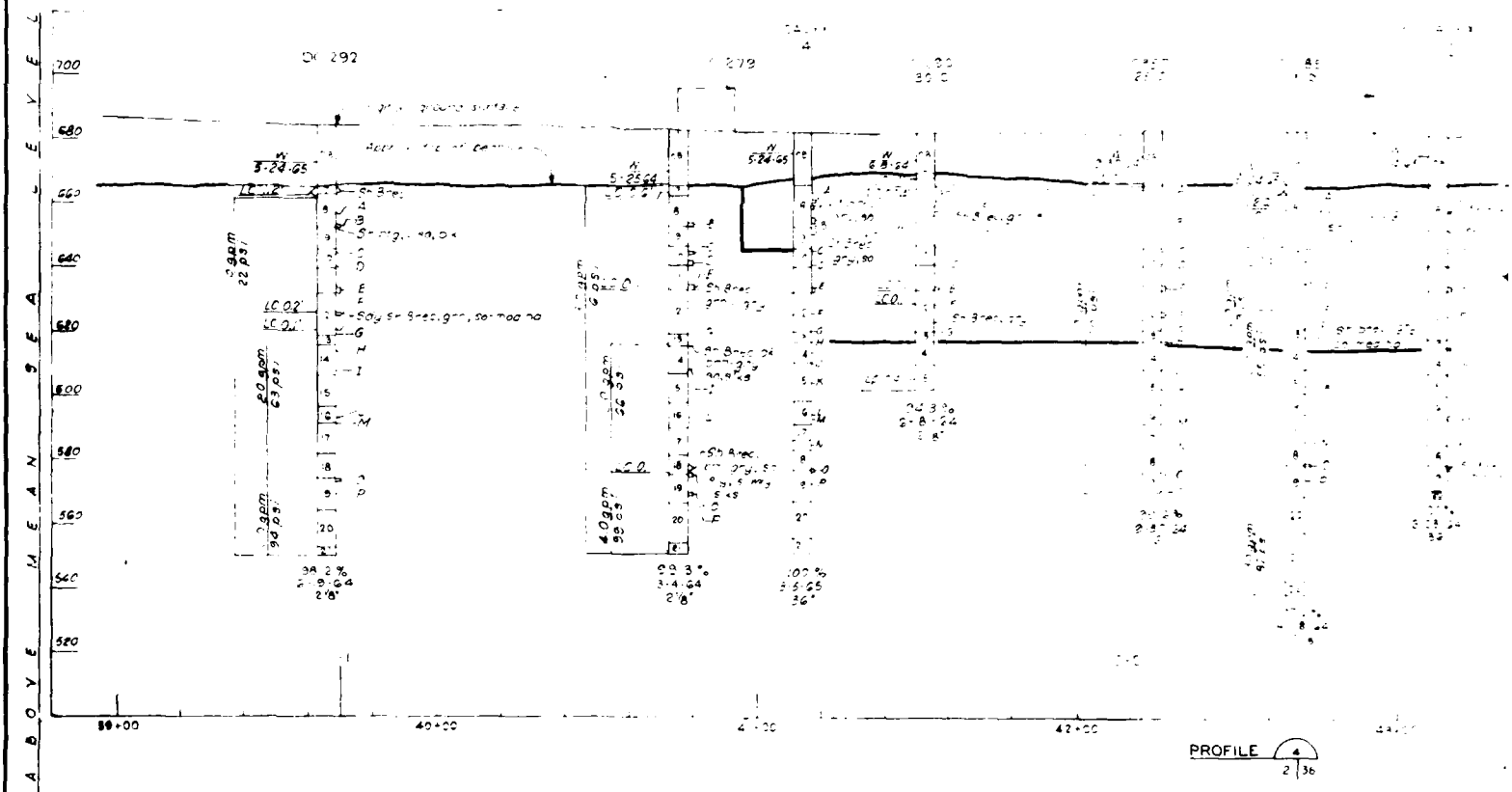
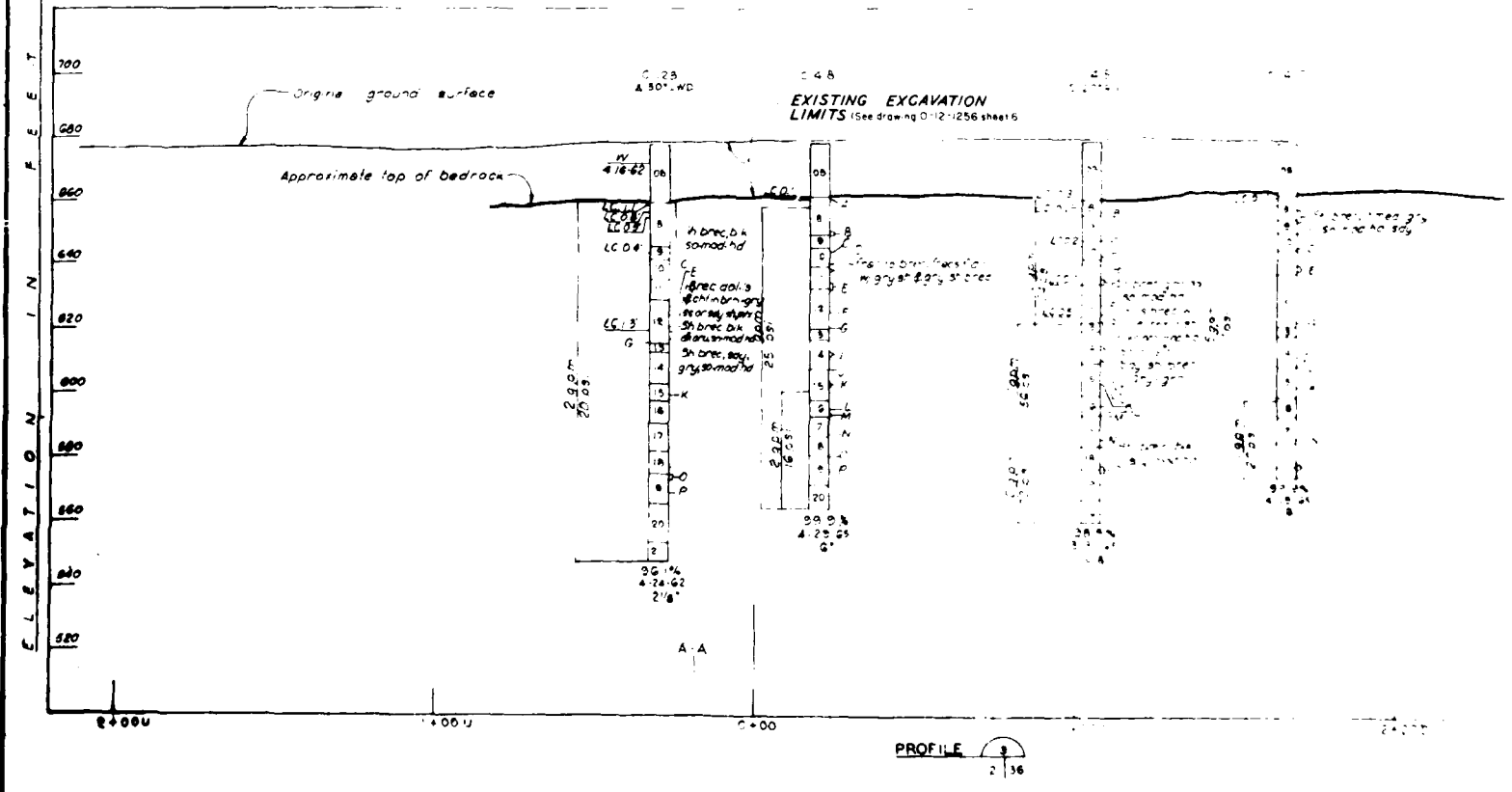
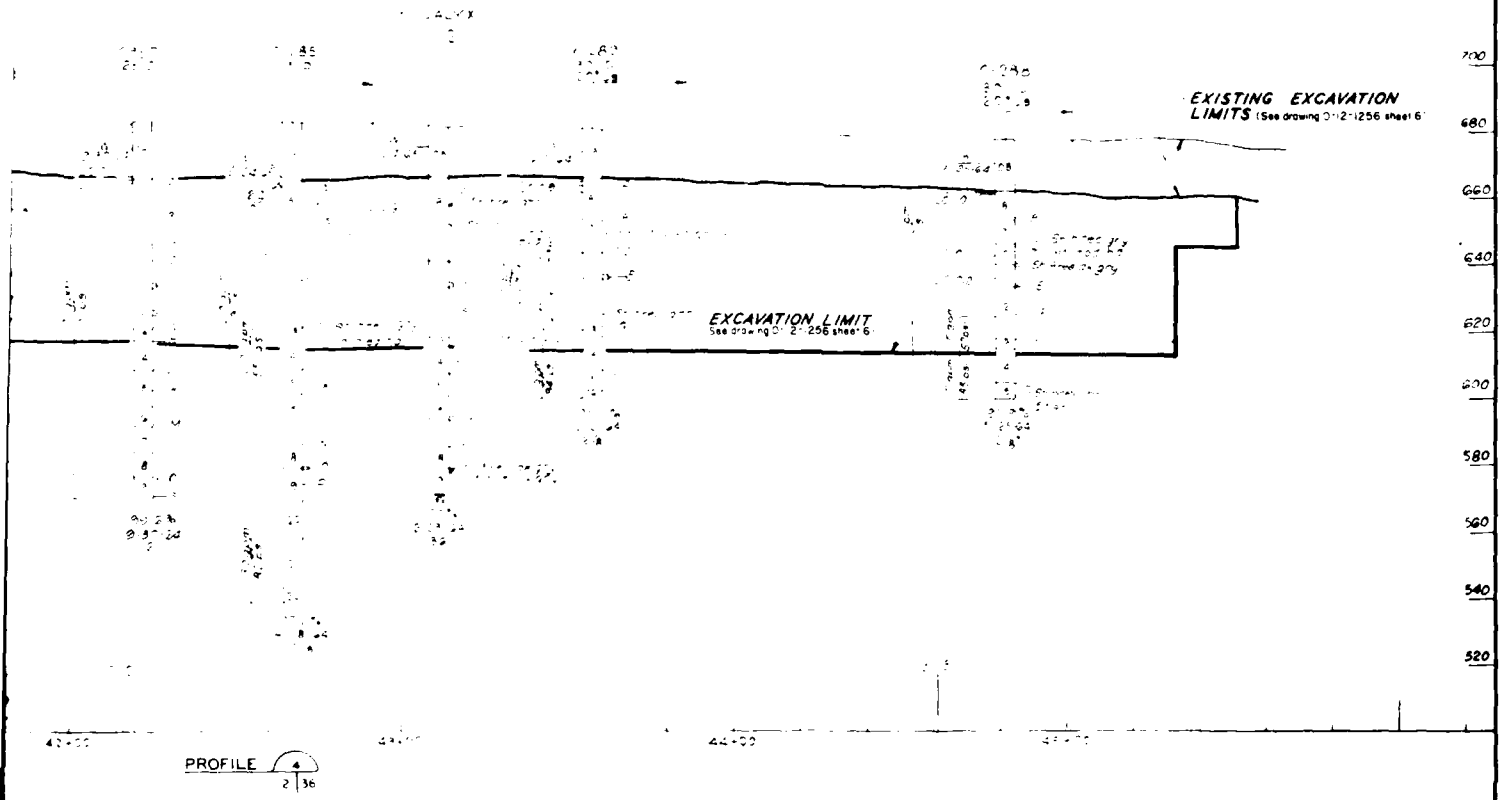

Revisions
Descriptions
Date
Approved
ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI
EMBANKMENT AND EXCAVATION PLAN
MARCH 1985
0-12-9165
RIVER FILL
DAM AXIS
EXISTING WASTE AREA
RAMP
PROTECTIVE LEVEE
LIMITS OF EXCAVATION
EXCAVATION AREA B
DISCHARGE CHANNEL EXCAVATION
CONTROL LINE B
POT 2B
CONTROL LINE C
POT 4C
POT 3A
CONTROL LINE A
DRAINAGE DITCH
SCALE IN FEET
100
200

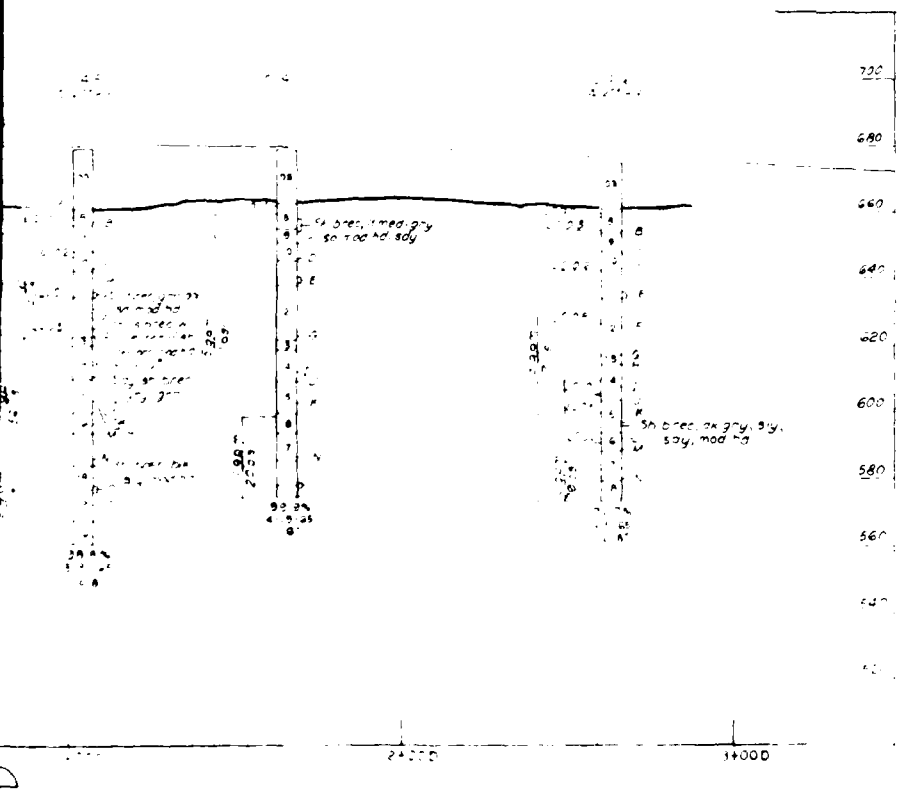
PLATE NO 35


ELEVATION IN FEET ABOVE MEAN SEA LEVEL
700
680
660
640
620
600
580
560
540
520
40+00
42+00
PROFILE 4
2 36


ELEVATION IN FEET ABOVE MEAN SEA LEVEL
700
680
660
640
620
600
580
560
540
520
Origina ground surface
Approximate top of bedrock
EXISTING EXCAVATION LIMITS (See drawing D-12-1256 sheet 6
A-A
0+00
PROFILE 3
2 36



PROFILE 4
2 36



SEE PLATE 2

SEE PLATE 4.

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

Symbol	Revisions Descriptions	Date	Approved

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

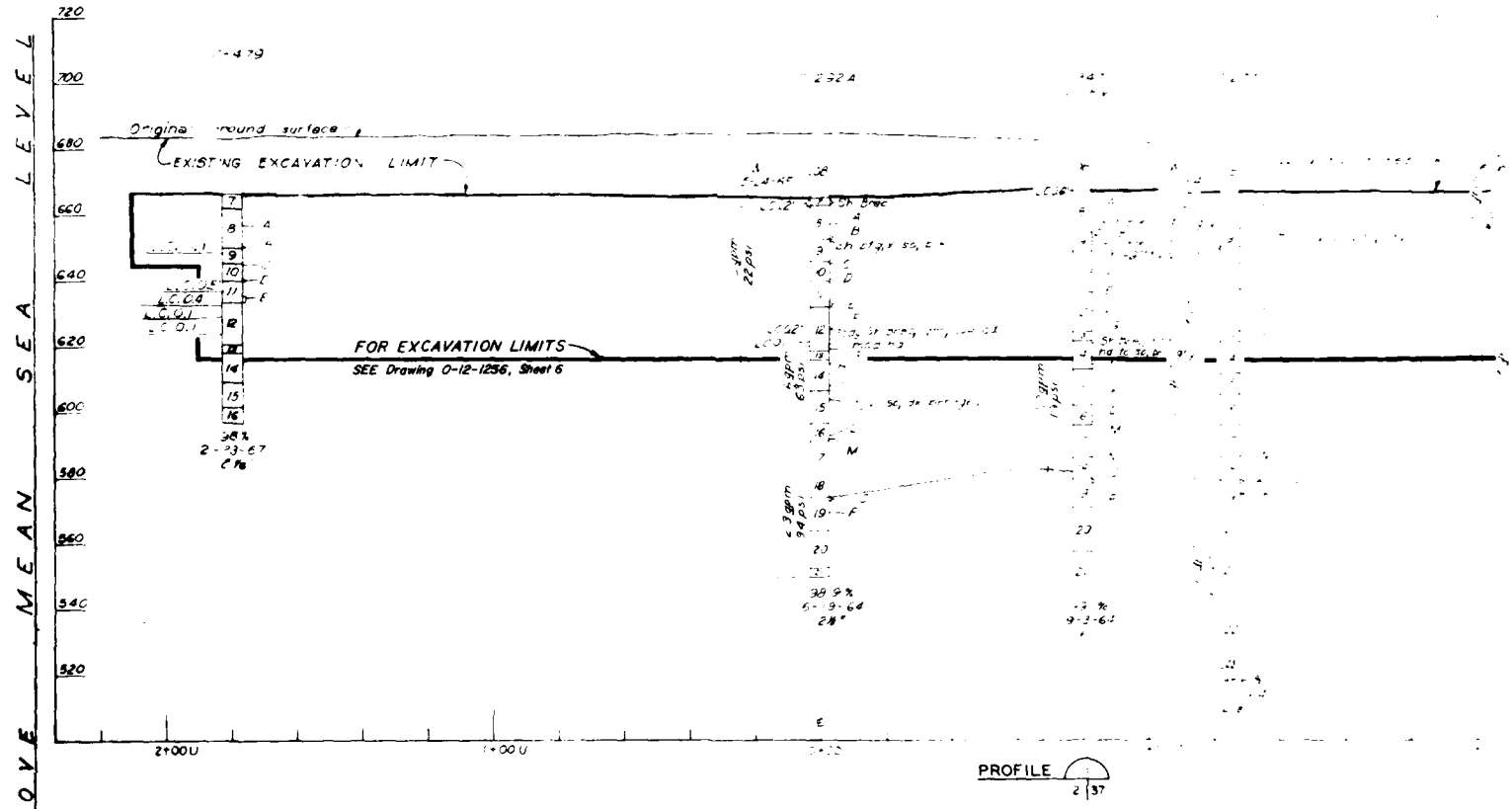
US Army Corps of Engineers

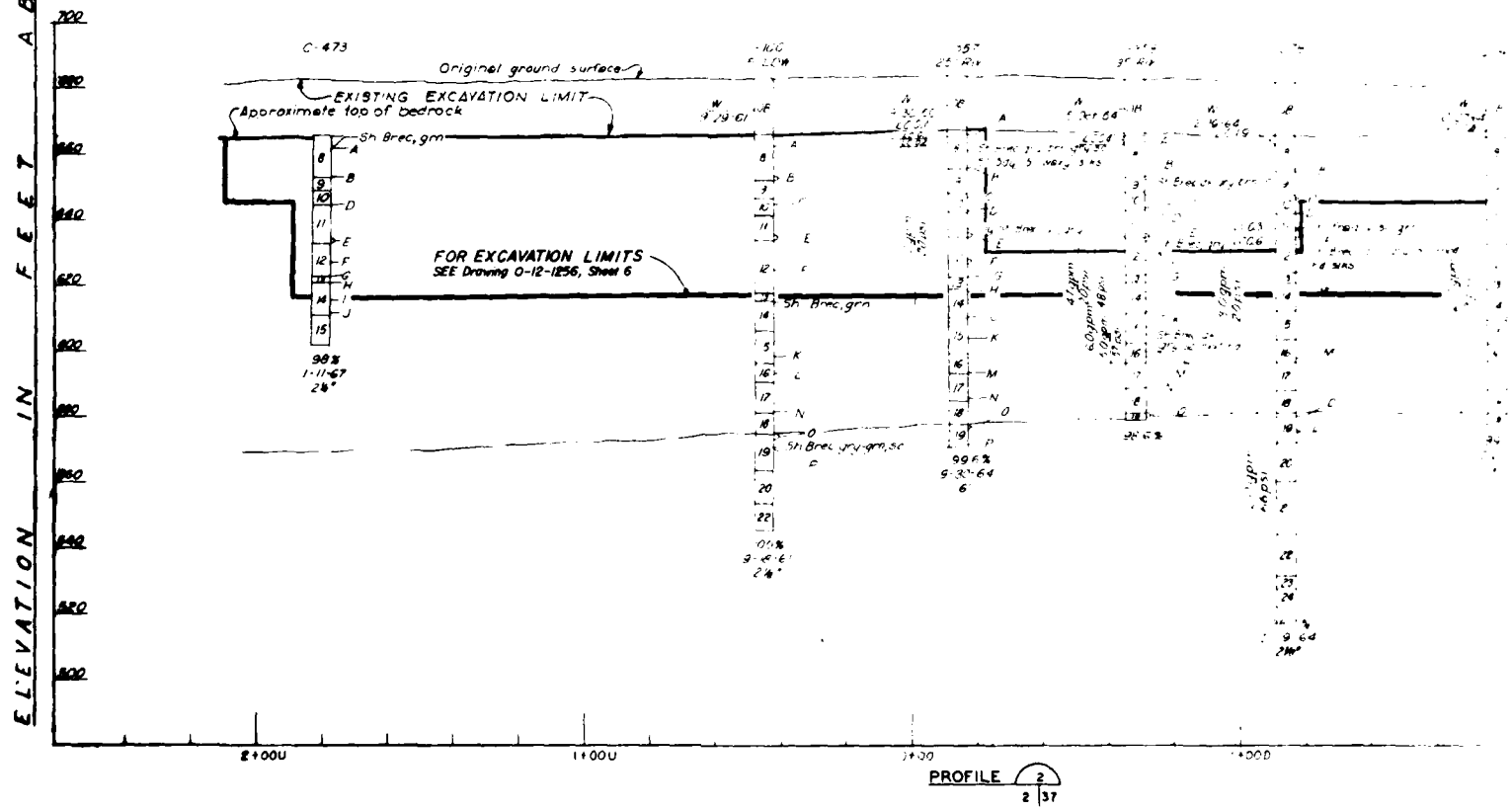
TRUMAN DAM AND RESERVOIR
CONSTRUCTION FOUNDATION REPORT

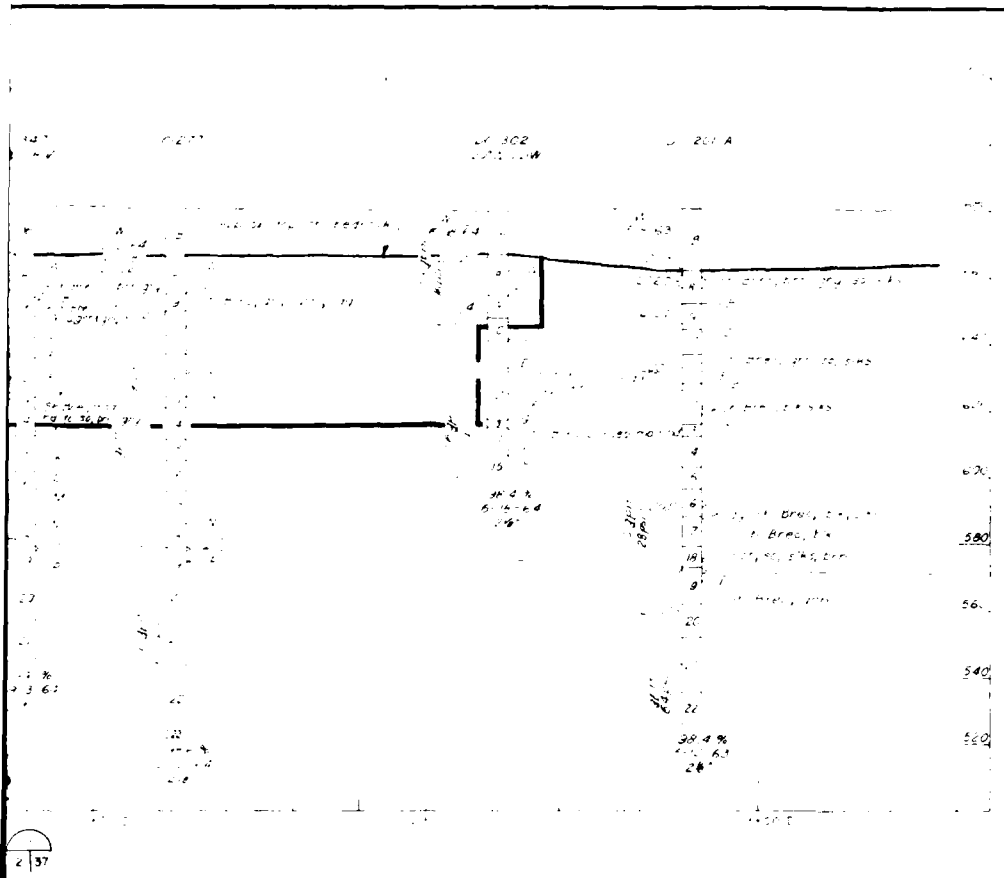
GEOLOGIC PROFILES
4-4 AND 3-3

Scale	AS SHOWN	Sheet number	
Date	MARCH 1965		
Drawing No.		File No.	0-12-9166

PLATE NO 36


ELEVATION IN FEET ABOVE MEAN SEA LEVEL
720
700
680
660
640
620
600
580
560
540
520
Original ground surface
EXISTING EXCAVATION LIMIT
FOR EXCAVATION LIMITS
SEE Drawing 0-12-1256, Sheet 6
2+00U
1+00U
PROFILE
2 37


ELEVATION IN FEET ABOVE MEAN SEA LEVEL
700
680
660
640
620
600
580
560
540
520
Original ground surface
EXISTING EXCAVATION LIMIT
Approximate top of bedrock
Sh Brec, gm
FOR EXCAVATION LIMITS
SEE Drawing 0-12-1256, Sheet 6
Sh Brec, grn
Sh Brec, gry-grn, sc
2+00U
1+00U
PROFILE
2
2 37



DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY MISSOURI

Designed by

Drawn by

Checked by

Submitted by

US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

GEOLOGIC PROFILES
I-1 AND 2-2

Scale AS SHOWN

Date MARCH 1985

Sheet number

Drwg No.

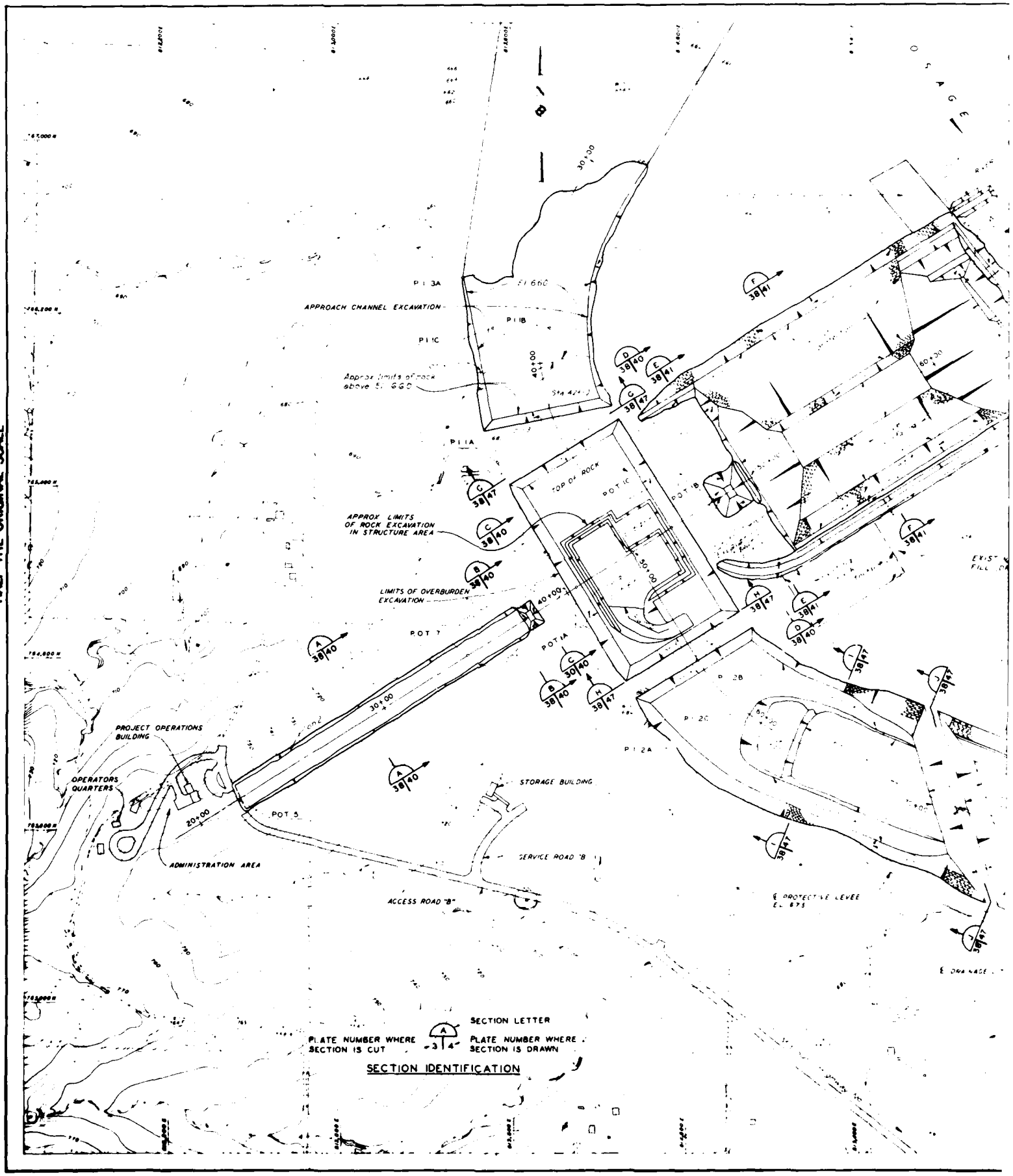
File No. 0-12-9167

PLATE NO. 37

STAGE III CONSTRUCTION

TRUCTION

HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE



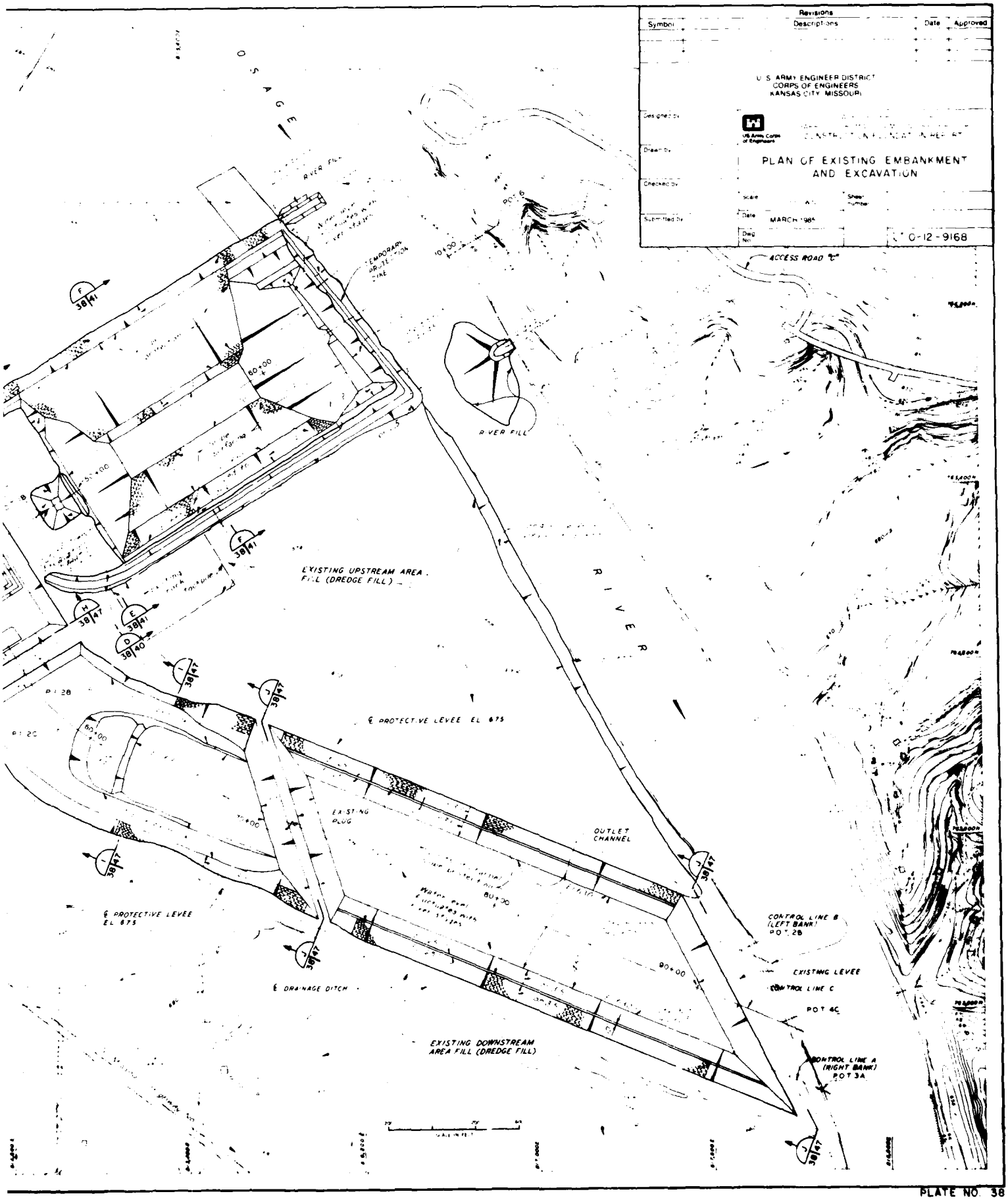
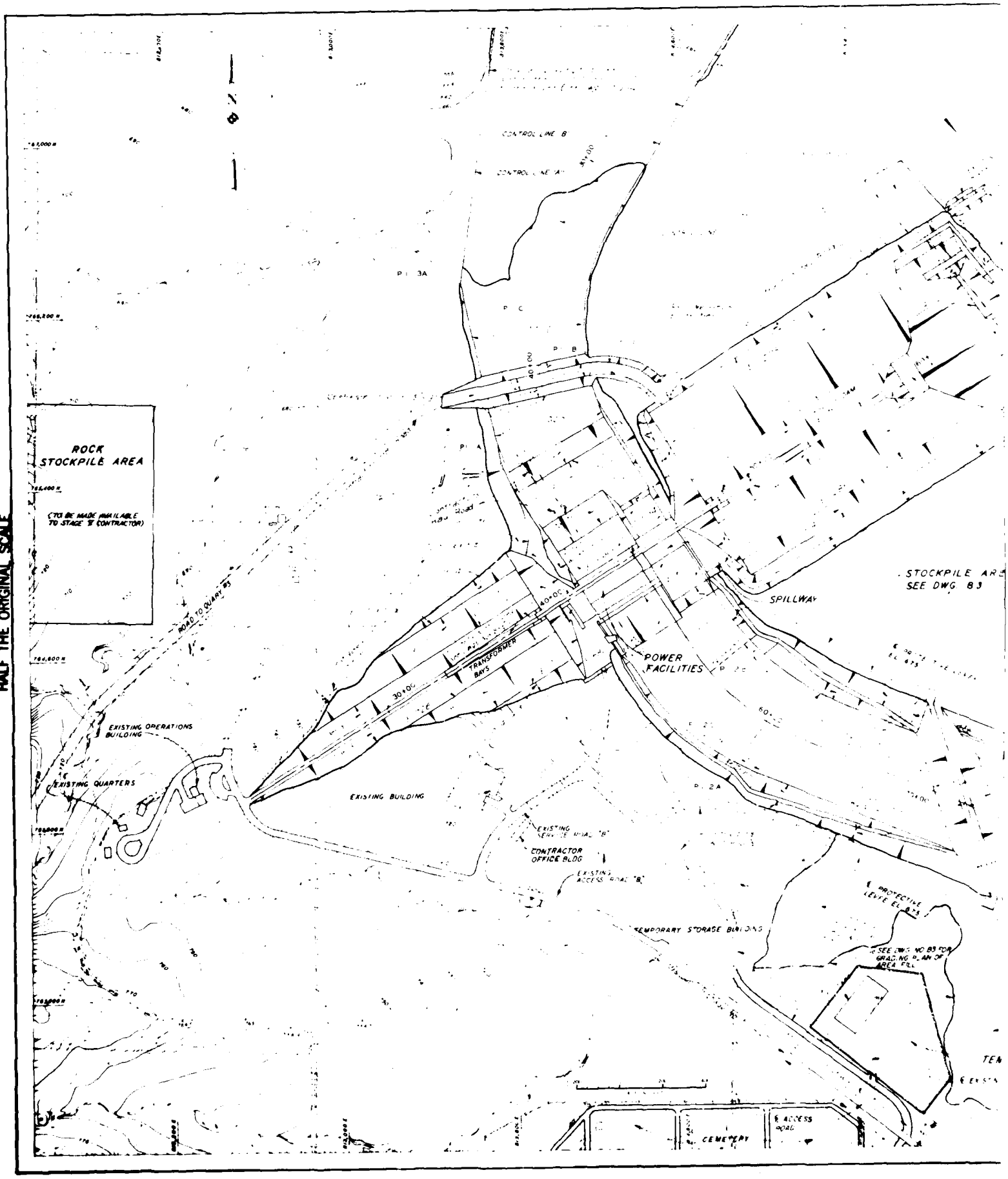
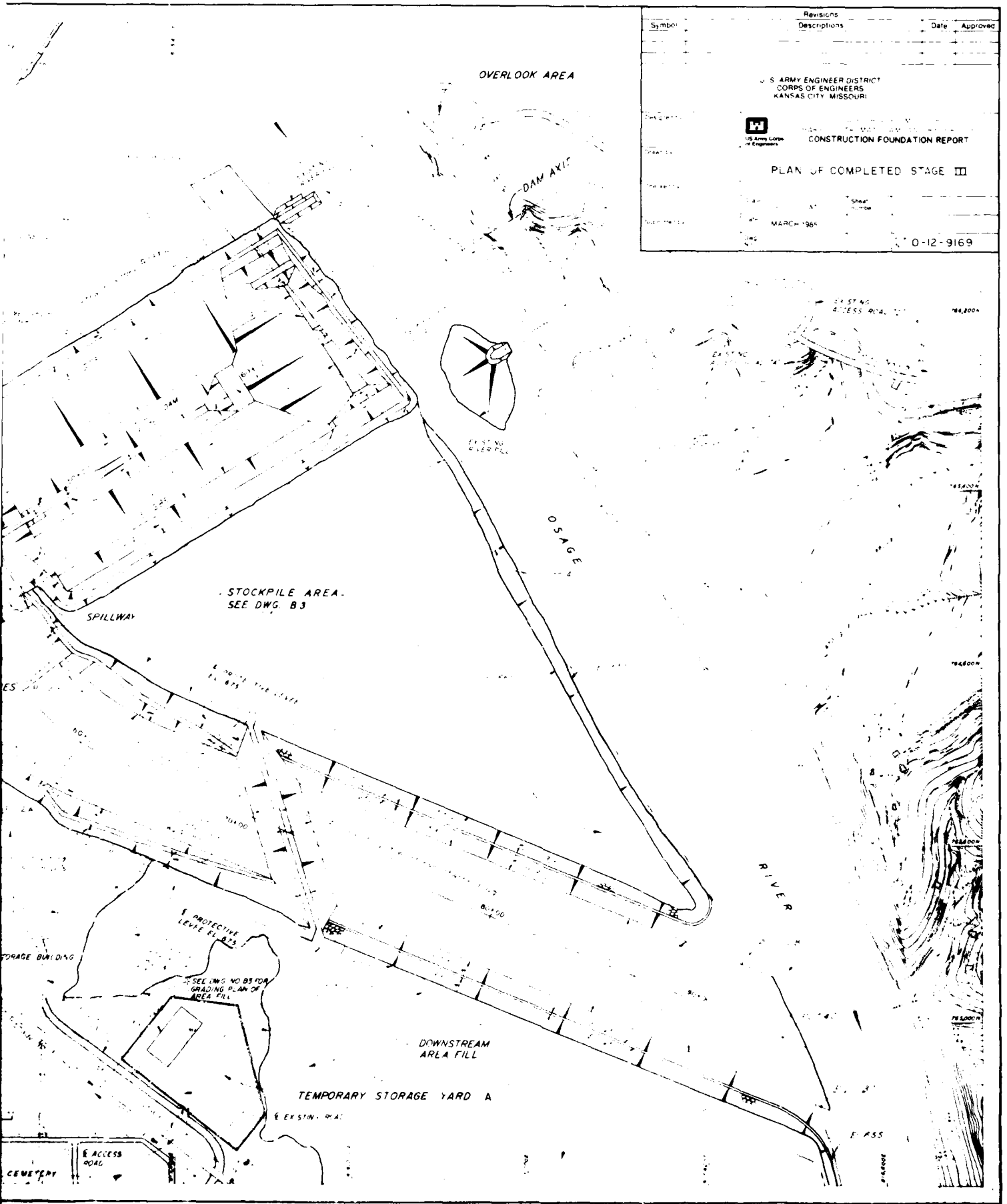

Revisions
Symbol
Description
Date
Approved
U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI
Designed by
Drawn by
Checked by
Submitted by
PLAN OF EXISTING EMBANKMENT
AND EXCAVATION
Scale
Sheet number
Date
MARCH 1984
Dwg No.
0-12-9168
ACCESS ROAD "C"
OSAGE RIVER
RIVER FILL
EXISTING UPSTREAM AREA FILL (DREDGE FILL)
RIVER
℄ PROTECTIVE LEVEE EL 675
EXISTING PLUG
OUTLET CHANNEL
℄ PROTECTIVE LEVEE EL 675
℄ DRAINAGE DITCH
EXISTING DOWNSTREAM AREA FILL (DREDGE FILL)
CONTROL LINE B (LEFT BANK) POT 2B
EXISTING LEVEE
CONTROL LINE C
POT 4C
CONTROL LINE A (RIGHT BANK) POT 3A
P.I. 2B
P.I. 2C
60+00
50+00
70+00
80+00
90+00
10+00

PLATE NO. 38



HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE



Revisions

Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

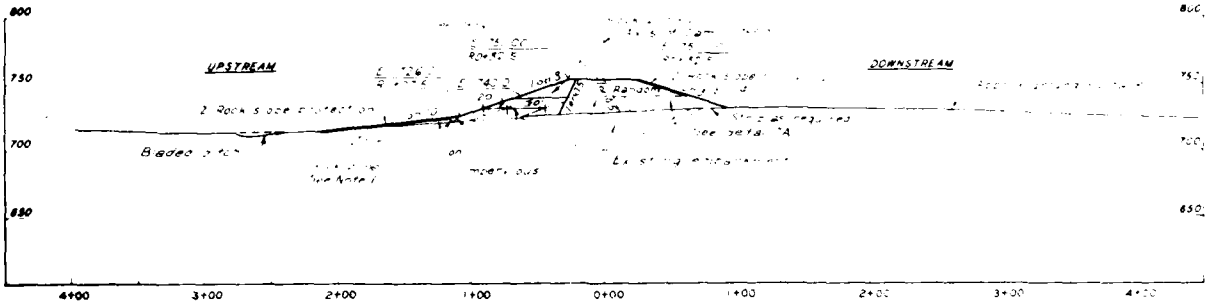
PLAN OF COMPLETED STAGE III

Sheet Number

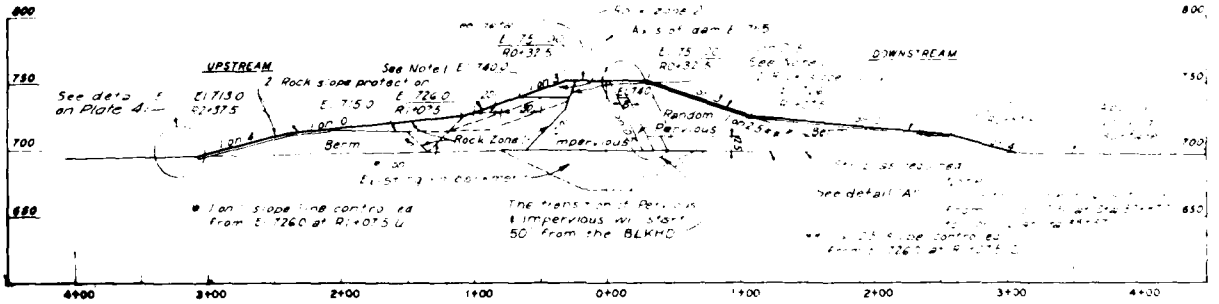
MARCH 1985

0-12-9169

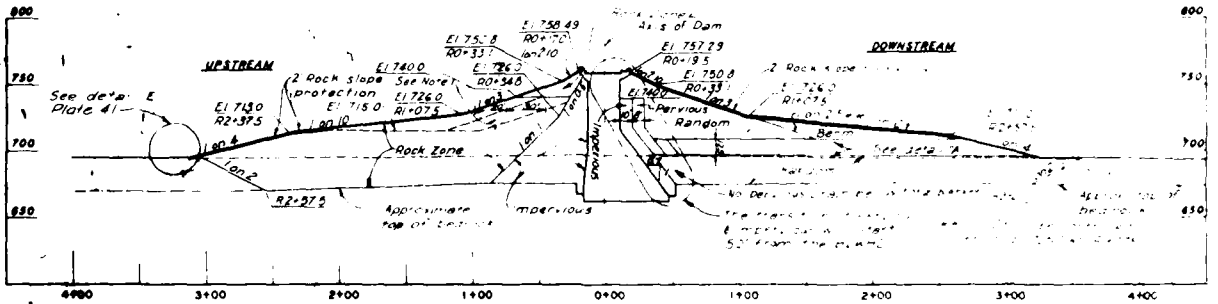
PLATE NO. 39



TYPICAL SECTION, RIGHT ABUTMENT
SECTION (A) AT STA. 29+00±
38|40

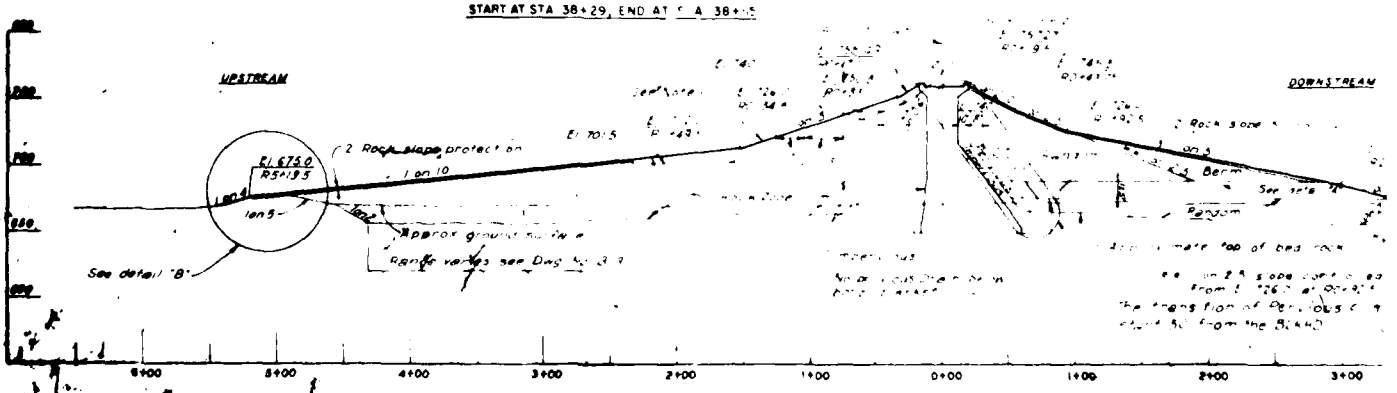


TYPICAL SECTION, RIGHT ABUTMENT
SECTION (B) AT STA. 37+00±
38|40

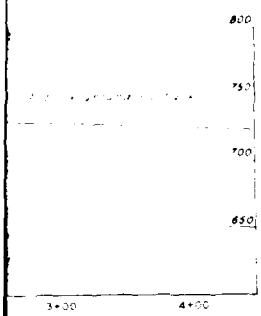


TYPICAL SECTION WEST BULKHEAD
SECTION (C) AT STA. 38+45±
38|40

START AT STA 38+29, END AT STA 38+55

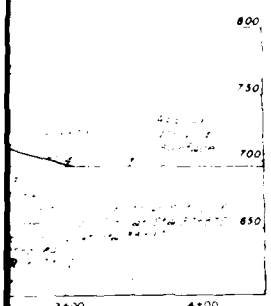


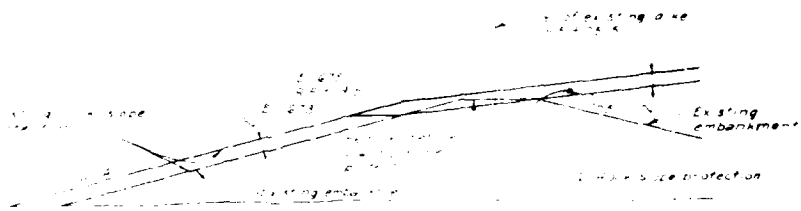
TYPICAL SECTION EAST BULKHEAD
SECTION (D) AT STA. 47+95±
38|40



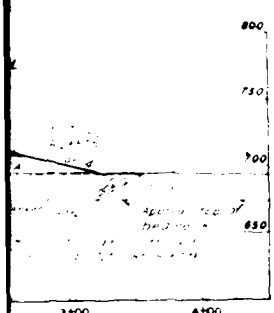


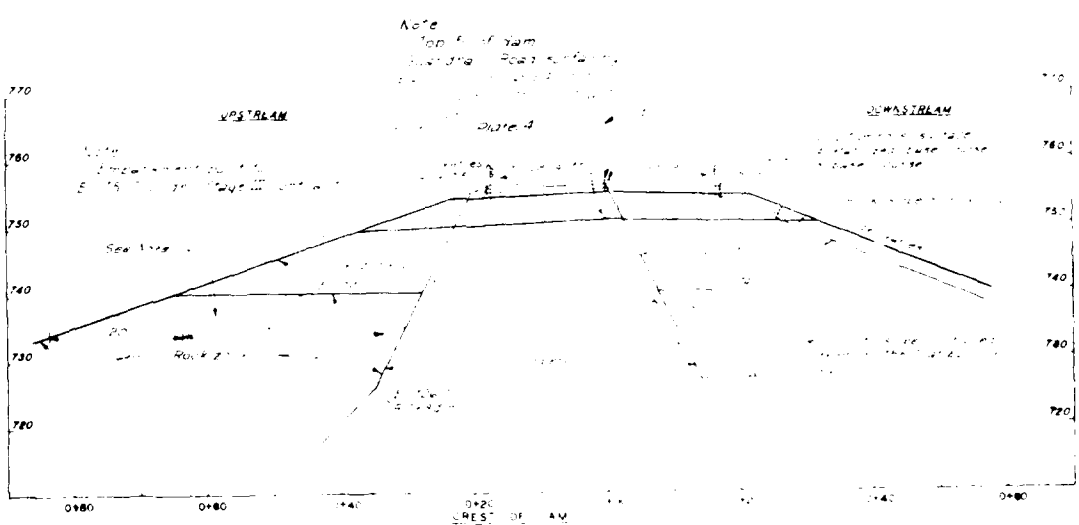
DETAIL A



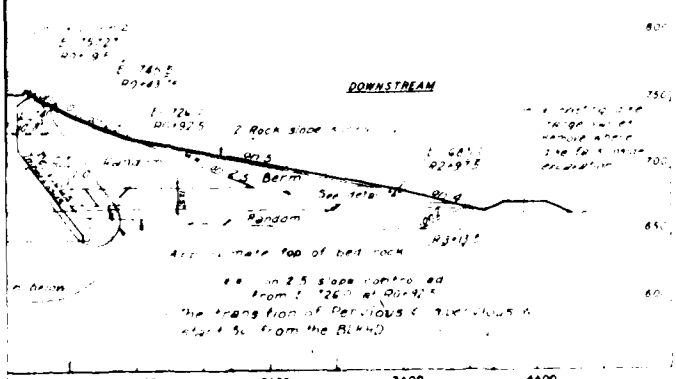


DETAIL B





DETAIL C



DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

Revisions

Symbol	Description	Date	Approved

ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

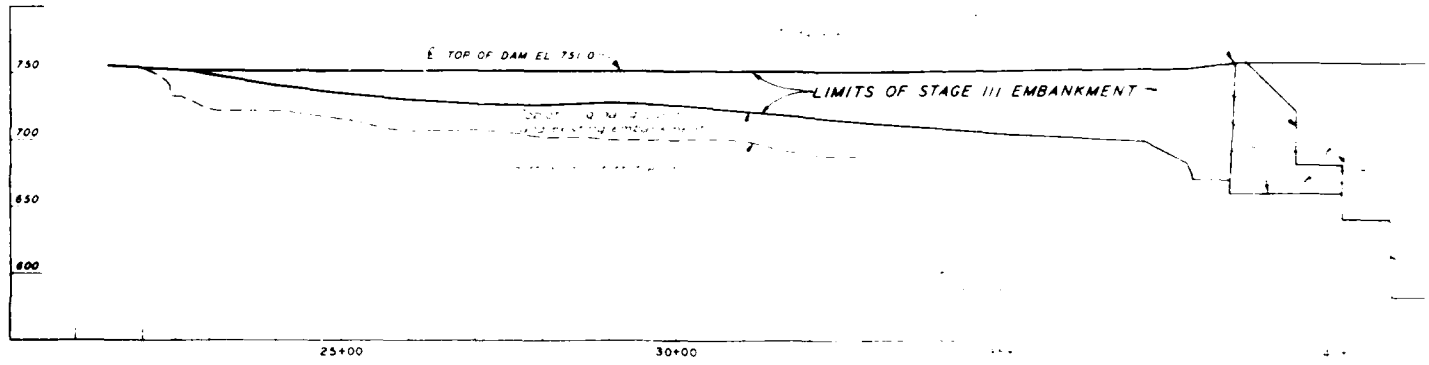
CONSTRUCTION FOUNDATION REPORT

TYPICAL EMBANKMENT SECTIONS

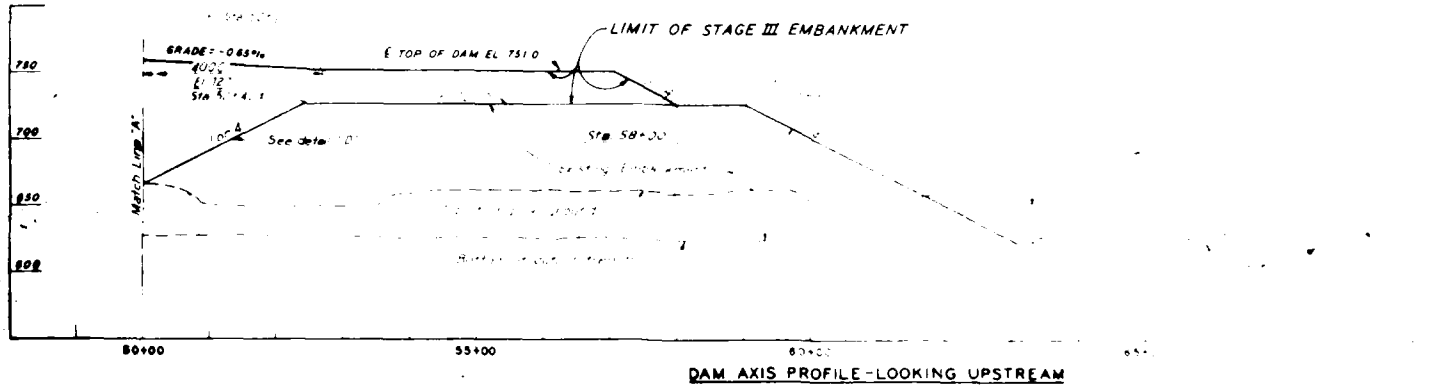
MARCH 19[illegible]

D 12-9170

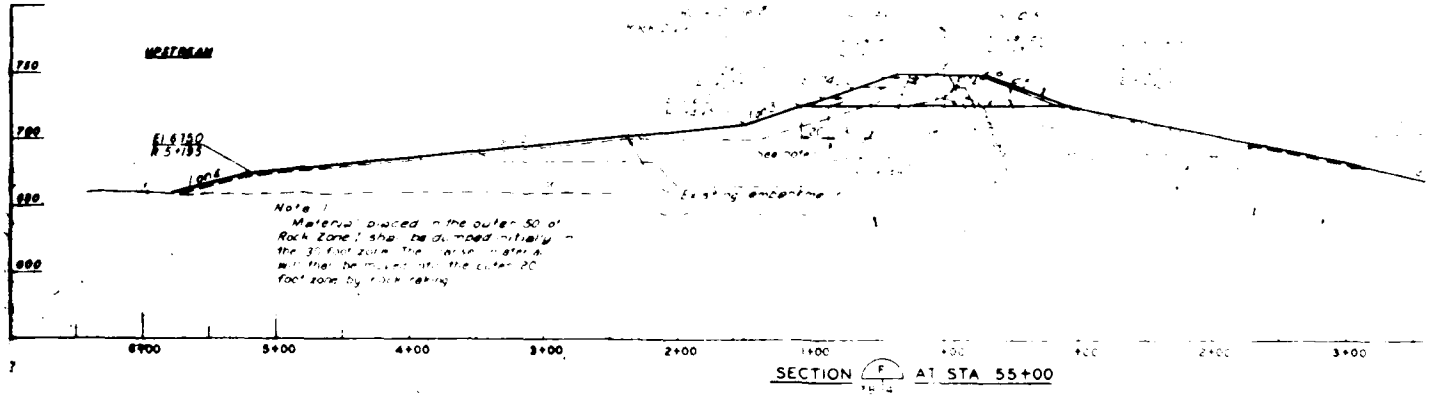
PLATE NO 40



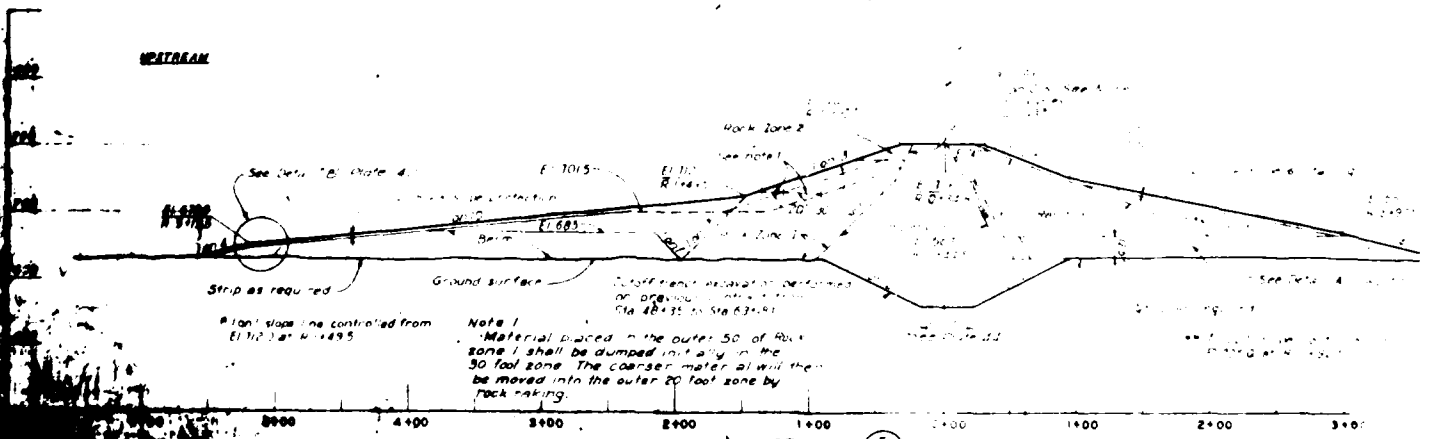
DAM AXIS PROFILE - LOOKING UPSTREAM



DAM AXIS PROFILE - LOOKING UPSTREAM



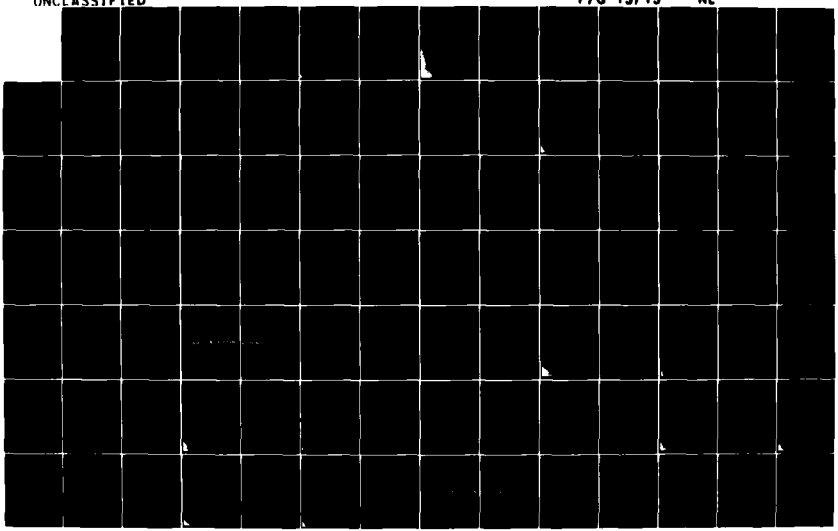
SECTION F AT STA 55+00

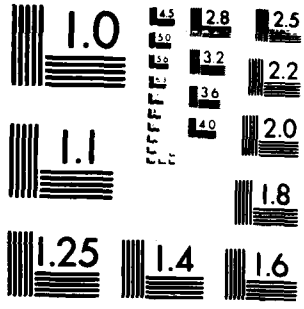


SECTION E AT STA 48+55

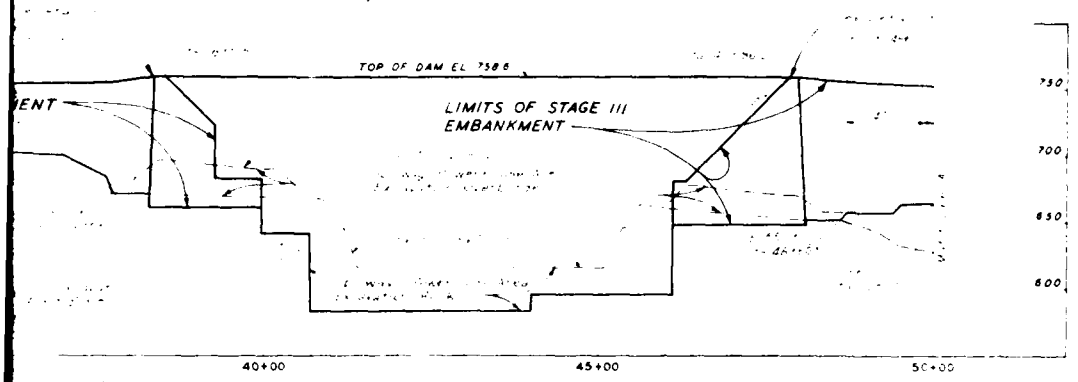
AD-A154 456 OSAGE RIVER BASIN OSAGE RIVER MISSOURI HARRY S TRUMAN DAM & RESERVOIR MU..(U) CORPS OF ENGINEERS KANSAS CITY MO KANSAS CITY DISTRICT R F GRIFFITH ET AL. 1984 2/4

UNCLASSIFIED F/G 13/13 NL

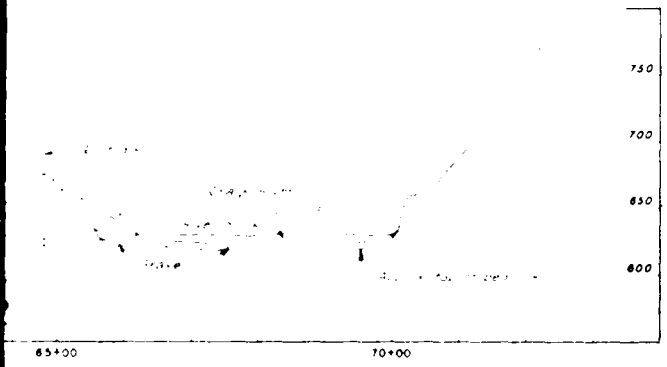


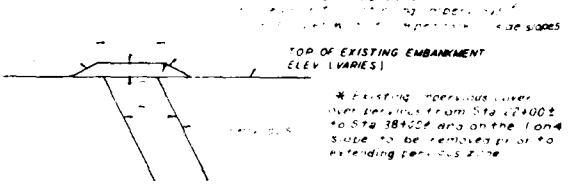


MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A

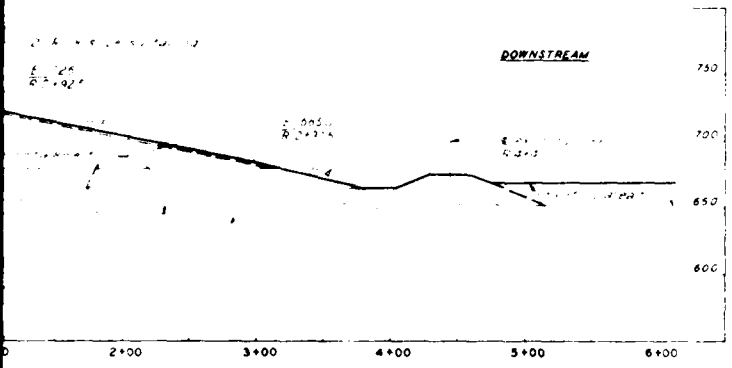


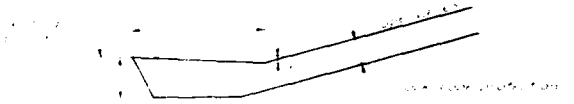
OKING UPSTREAM





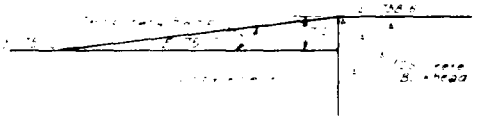
DETAIL "D"



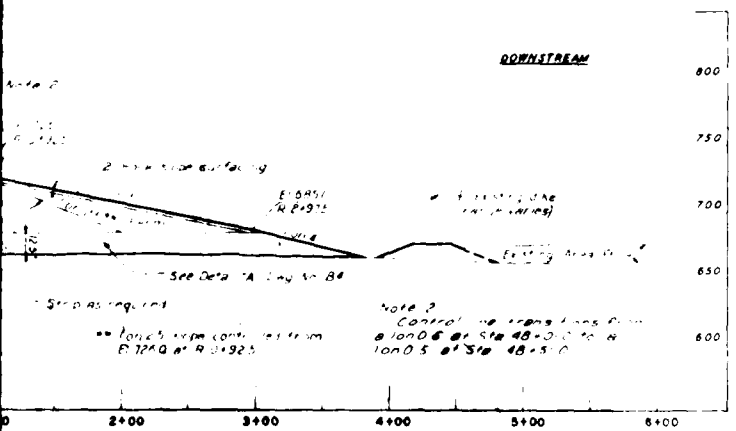


DETAIL "E"
TOE TRENCH DETAIL

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE



DETAIL "F"



Revisions			
Symbol	Descriptions	Date	Approved

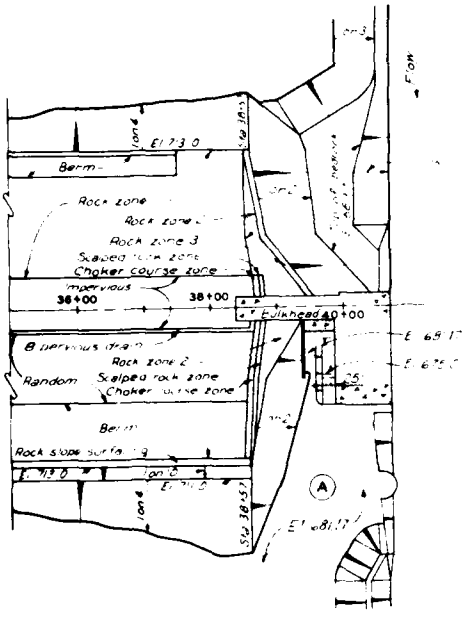
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

CONSTRUCTION FOUNDATION REPORT

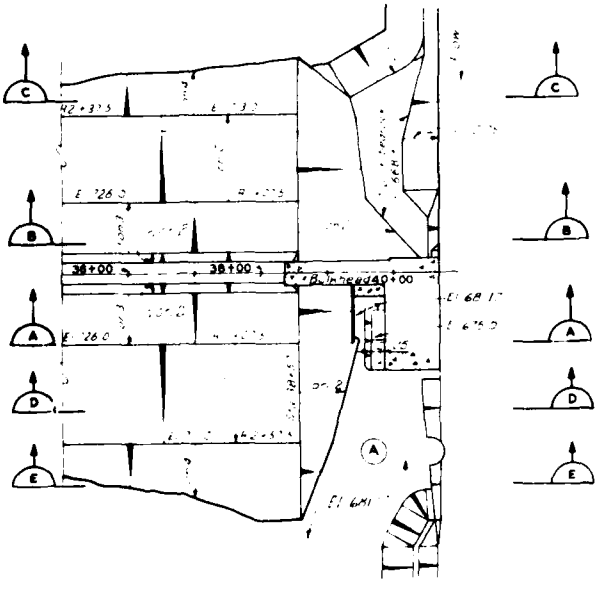
EMBANKMENT SECTIONS AND PROFILE

Scale: AS NOTED
Date: MARCH 1985
Sheet number
E 0-12-9171

PLATE NO. 41



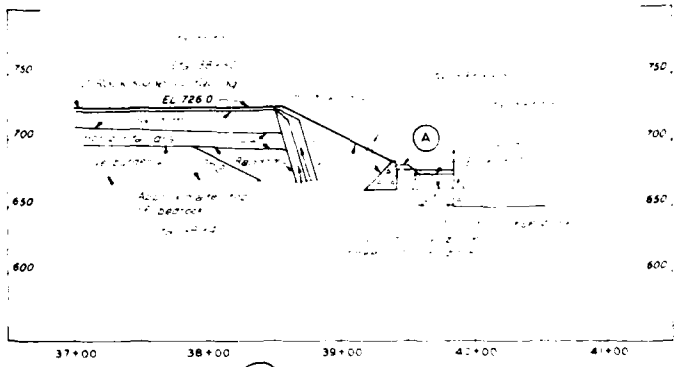
BULKHEAD - FILL TIE - IN
PLAN OF FILL AT EL 713.0



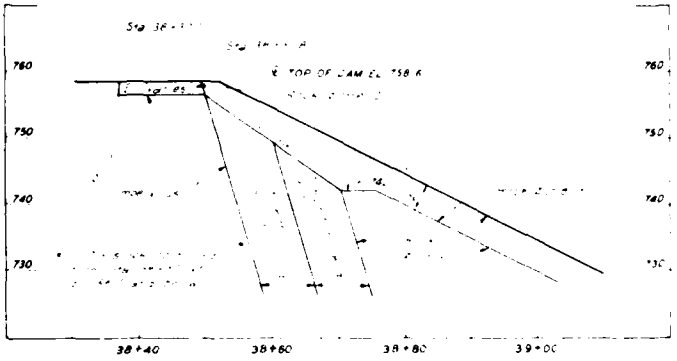
(A) BULKHEAD - FILL TIE - IN

DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

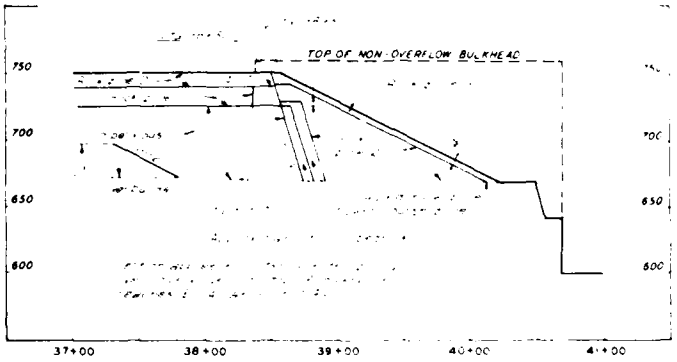
ELEVATION IN FEET ABOVE MEAN SEA LEVEL



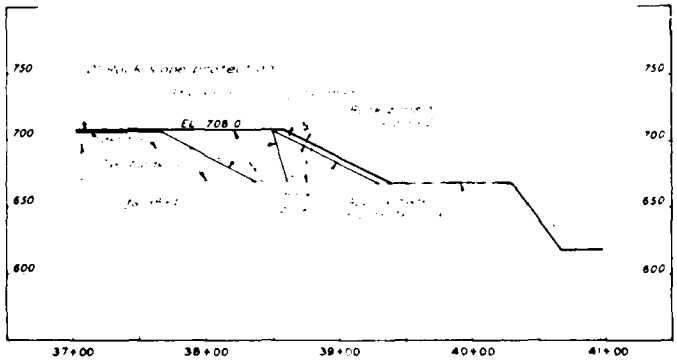
PROFILE (A) AT R 1+07.5 DOWNSTREAM



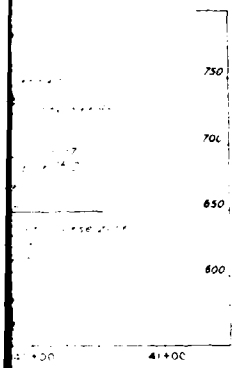
PROFILE - CREST DETAIL - BULKHEAD FILL TIE - IN
R 0+17.0 TO R 0+26.4 UPSTREAM



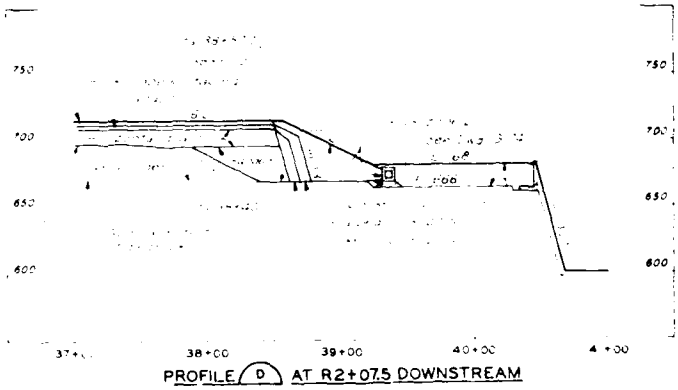
PROFILE (B) AT R 0+34.8 UPSTREAM



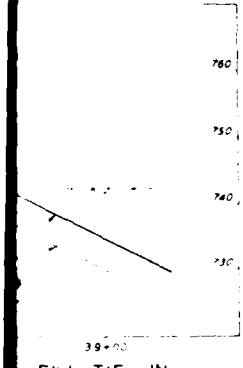
PROFILE (C) AT R 2+57.5 UPSTREAM



TREAM

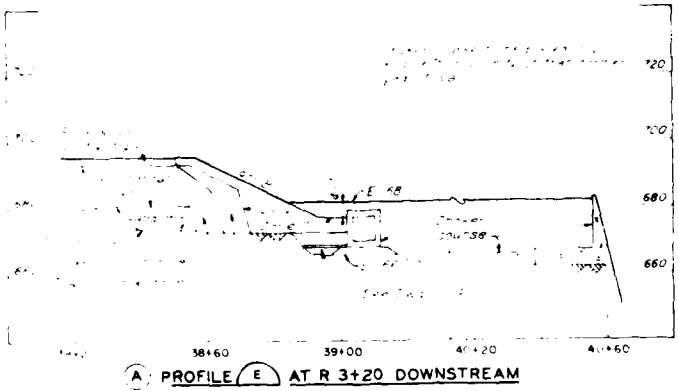


PROFILE (D) AT R2+07.5 DOWNSTREAM



FILL TIE - IN

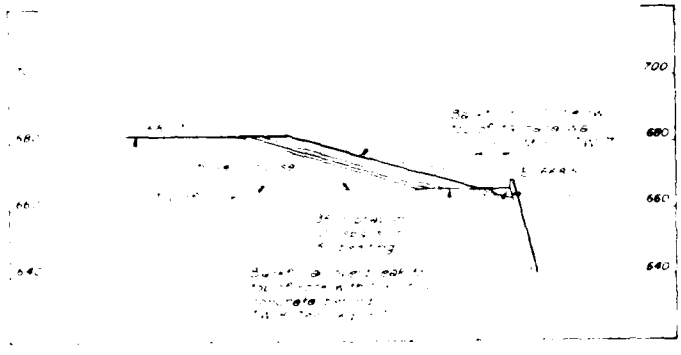
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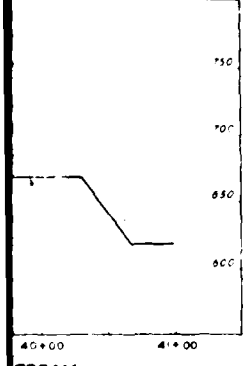
(A) PROFILE (E) AT R 3+20 DOWNSTREAM



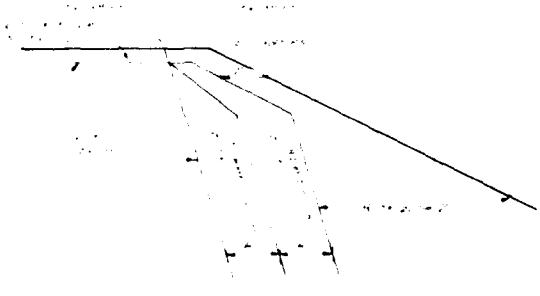
TREAM



(A) PROFILE NORMAL TO TAILRACE WINGWALL



TREAM



DOWNSTREAM ZONING DETAILS

bulkhead section from

detail from RO+12.0 to RO+17.0

downstream

Revisions			
Symbol	Descriptions	Date	Approved

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

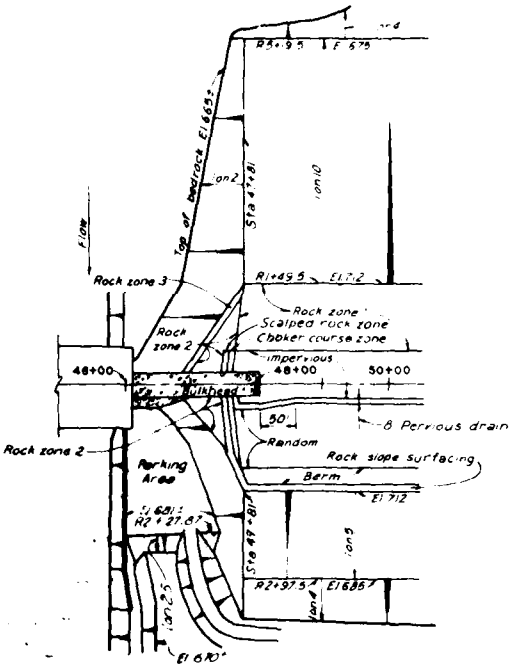
US Army Corps of Engineers

OSAGE RIVER, MISSOURI
[illegible] DAM AND RESERVOIR
CONSTRUCTION FOUNDATION REPORT

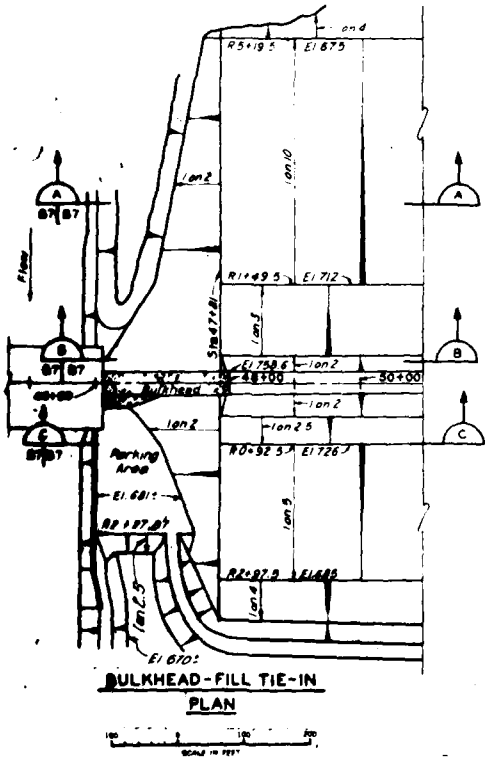
WEST NON-OVERFLOW BULKHEAD
FILL TIE-IN

Designed by			
Drawn by			
Checked by			
Submitted by			
Scale	[illegible]	Sheet number	
Date	MARCH 1985		
Drawing No.		File No.	O-12-9172

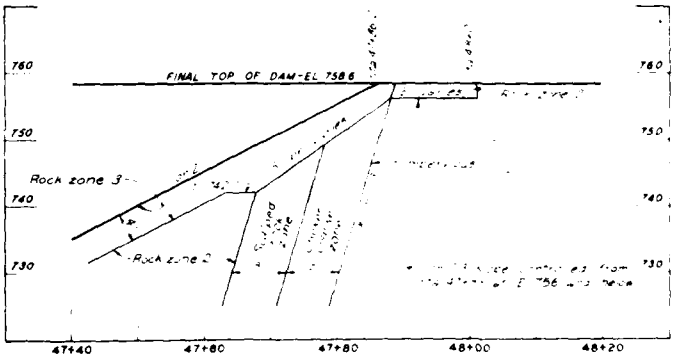
PLATE NO 42



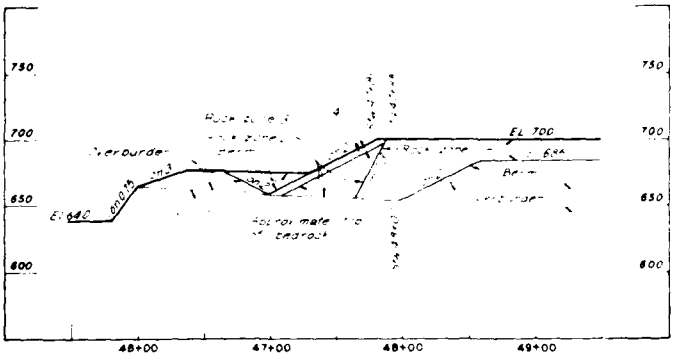
BULKHEAD-FILL TIE-IN
PLAN OF FILL AT EL. 712



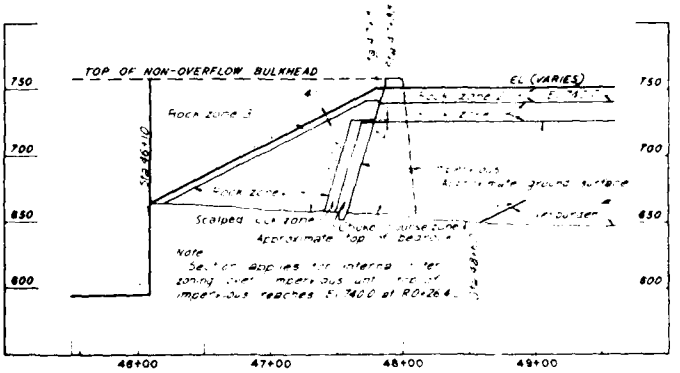
BULKHEAD-FILL TIE-IN
PLAN



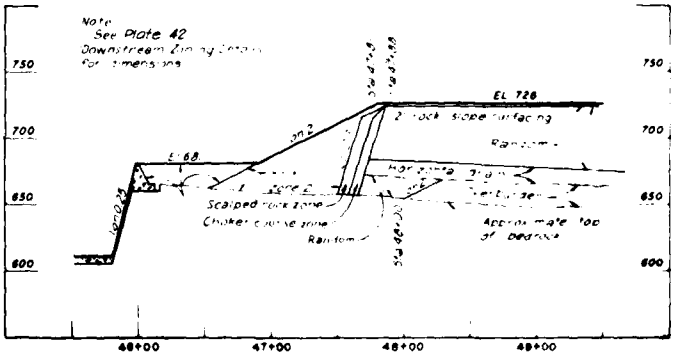
PROFILE - CREST DETAIL - BULKHEAD FILL TIE-IN
R0+17.0 TO R0+26.4 UPSTREAM



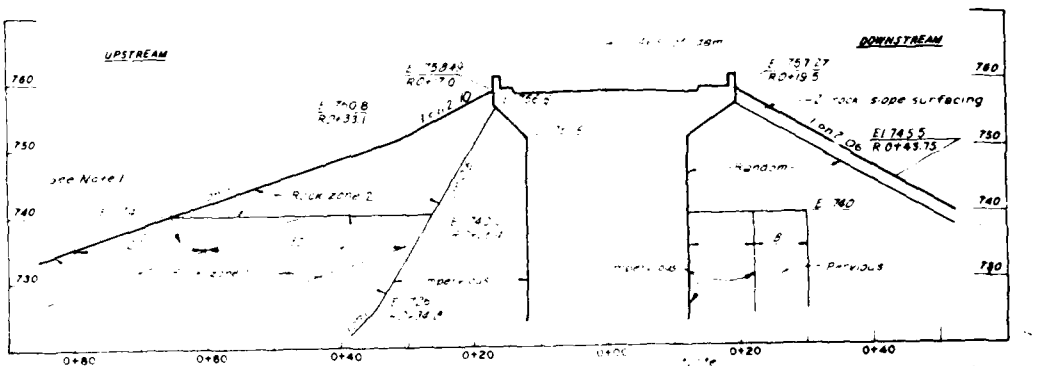
PROFILE (A) AT R2+69.5 UPSTREAM



PROFILE (B) AT R0+34.8 UPSTREAM

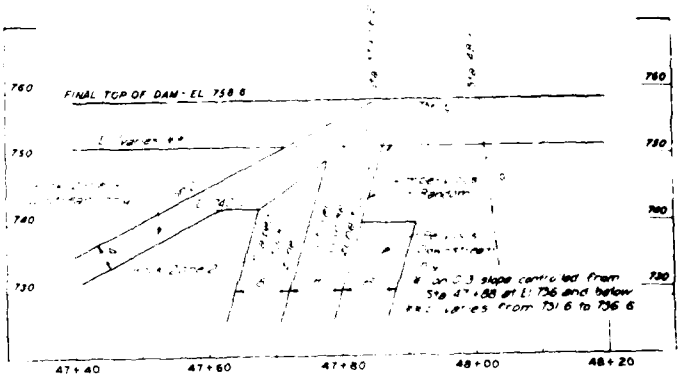


PROFILE (C) AT R0+92.5 DOWNSTREAM



SECTION AT BULKHEAD
*STA. 47+88.0 TO 48+01.0
**STA. 38+37.0 TO 38+50.0

Note: a placed in the outer 50' of ... shall be dumped initially in the ... foot zone. The coarser material will then be moved into the outer 20 foot zone by rock ... ing.
* Applicable U/S and D/S
** Applicable U/S but not D/S



PROFILE - CREST DETAIL - BULKHEAD FILL TIE-IN
R0+12.0 TO R0+17.0 UPSTREAM
R0+12.0 TO R0+19.5 DOWNSTREAM

Note: ... excavation plan, see Plate 44

DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

Symbol	Revisions Descriptions	Date	Approved

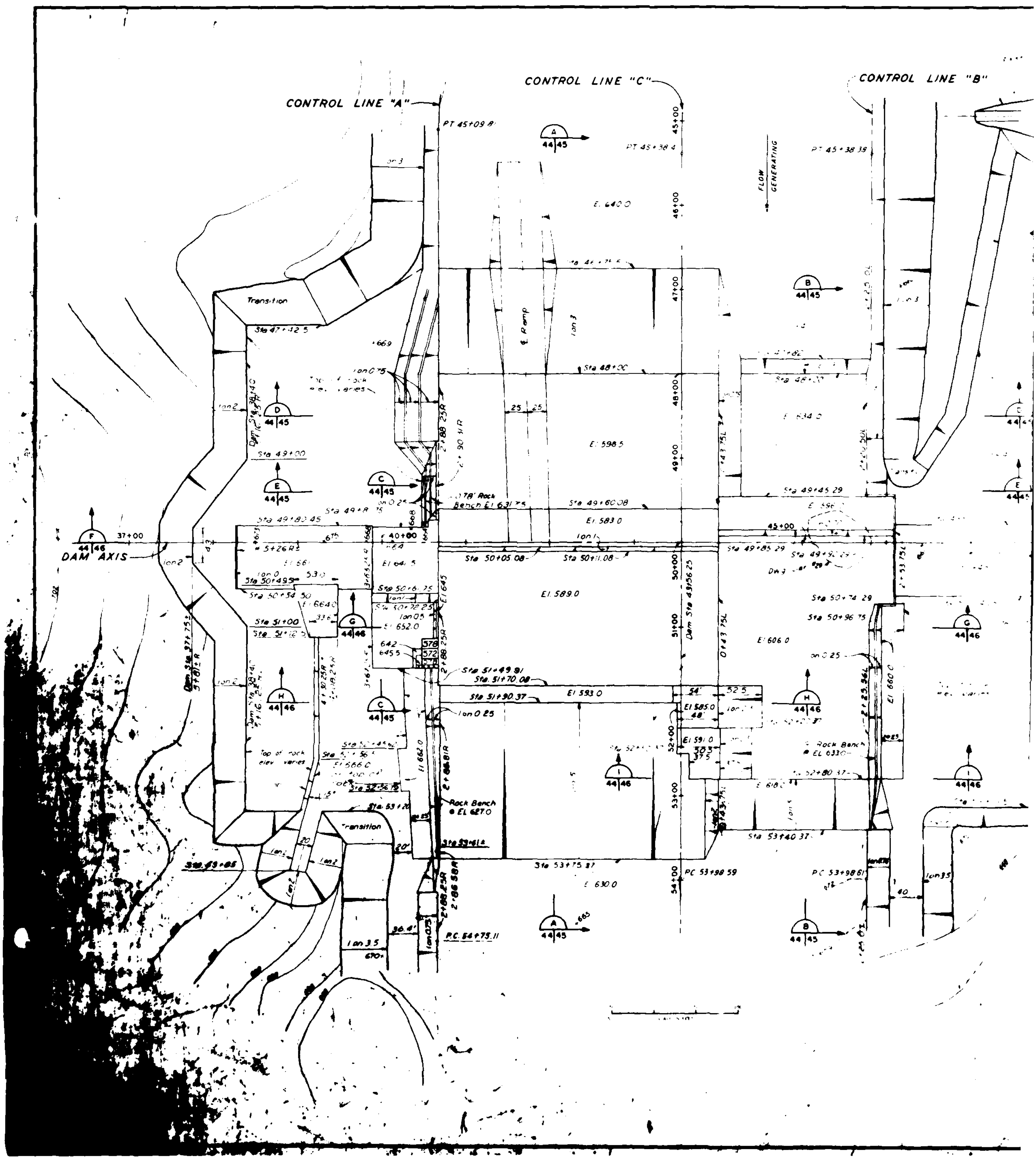
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

... RIVER, MISSOURI
... MAIN DAM AND RESERVOIR
CONSTRUCTION FOUNDATION REPORT

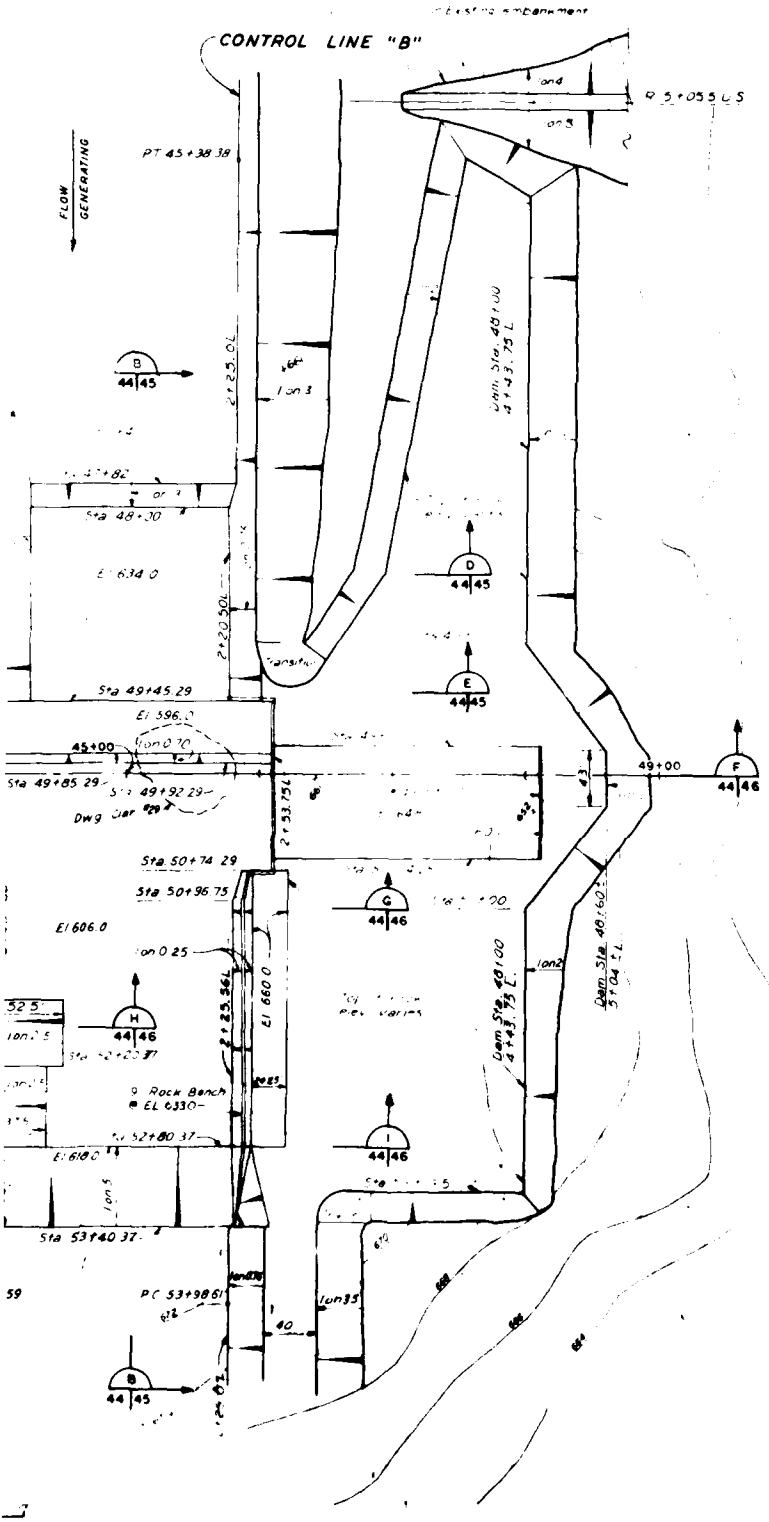
EAST NON-OVERFLOW BULKHEAD
FILL TIE-IN

Scale: AS SHOWN
Date: MARCH 1985
Drawing No.:
Sheet number:
File No. 0-12-9173

PLATE NO. 43



CONTROL LINE "A"
CONTROL LINE "C"
CONTROL LINE "B"
PT 45+09.8
PT 45+38.4
PT 45+38.39
FLOW
GENERATING
El 640.0
El 598.5
El 583.0
El 589.0
El 593.0
El 634.0
El 606.0
El 660.0
El 585.0
El 591.0
El 630.0
Transition
Sta 47+12.5
Sta 48+00
Sta 49+00
Sta 49+60.08
Sta 49+80.45
Sta 49+45.29
Sta 49+85.29
Sta 50+05.08
Sta 50+11.08
Sta 50+49.5
Sta 50+54.50
Sta 50+74.29
Sta 50+96.75
Sta 51+00
Sta 51+49.91
Sta 51+70.08
Sta 51+90.37
Sta 52+56.75
Sta 52+80.37
Sta 53+20
Sta 53+40.37
Sta 53+75.37
Sta 53+85
DAM AXIS
Dam Sta 49+56.25
Rock Bench El 627.0
Rock Bench El 633.0
Top of rock elev varies
PC 53+98.59
PC 53+98.61
P.C. 54+75.11
1 on 3.5
1 on 2
1 on 3
1 on 0.25
1 on 0.75
45+00
46+00
47+00
48+00
49+00
50+00
51+00
52+00
53+00
54+00
37+00



DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

Revisions			
Symbol	Descriptions	Date	Approved

U S ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY MISSOURI

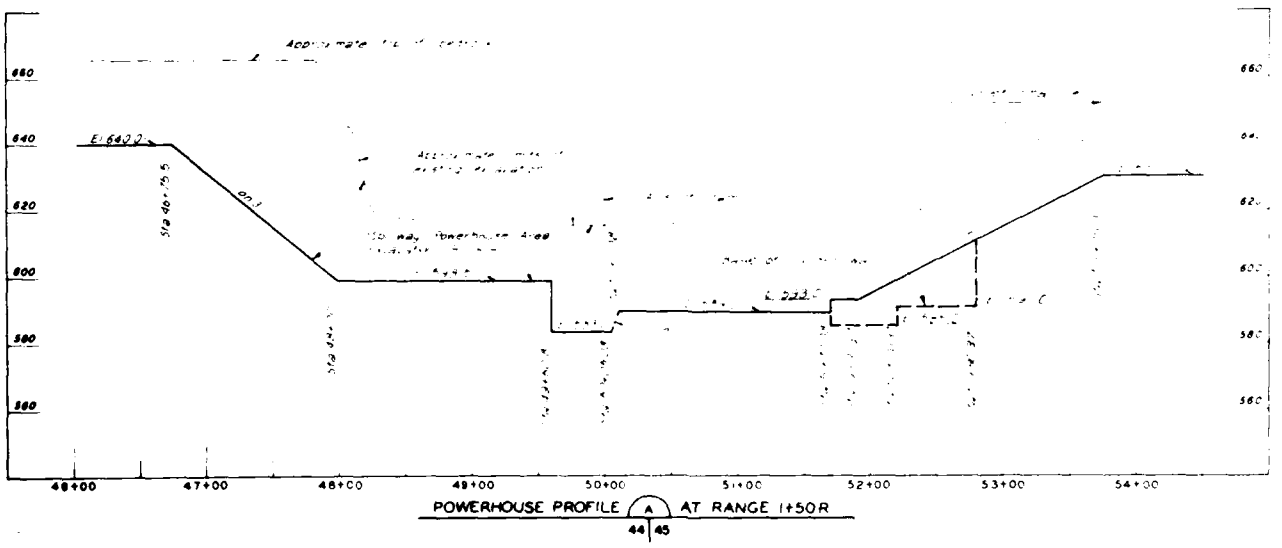
US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

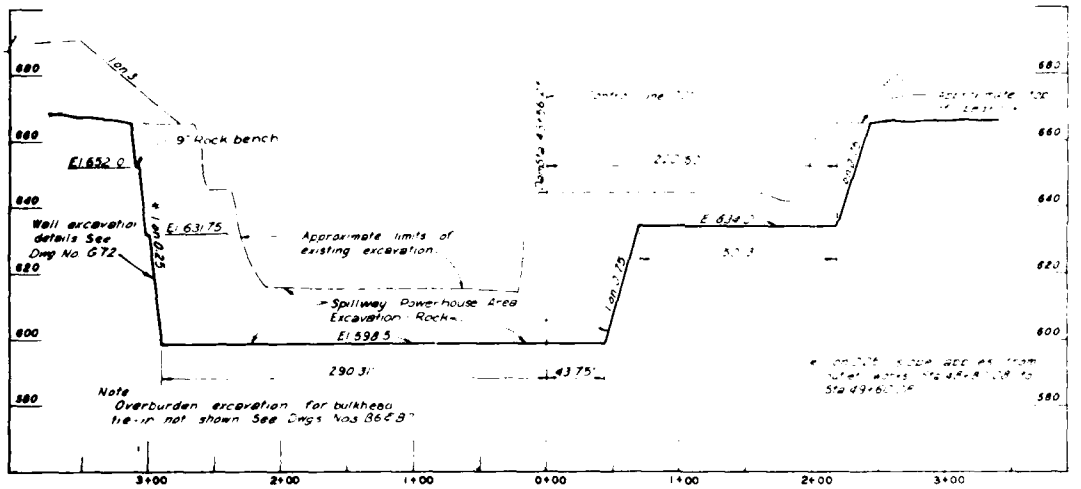
SPILLWAY - POWERHOUSE EXCAVATION PLAN

Designed by	Scale	Sheet number	
Drawn by	Date MARCH 1985		
Checked by	Dwg No		No 0-12-9174
Submitted by			

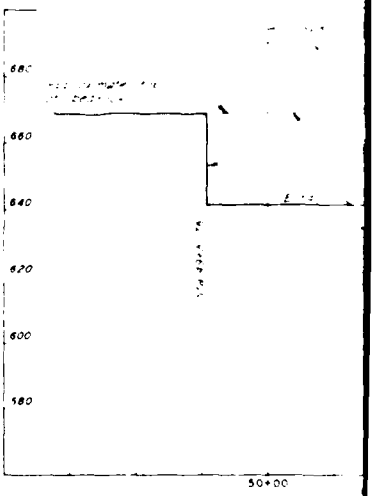
PLATE NO 44



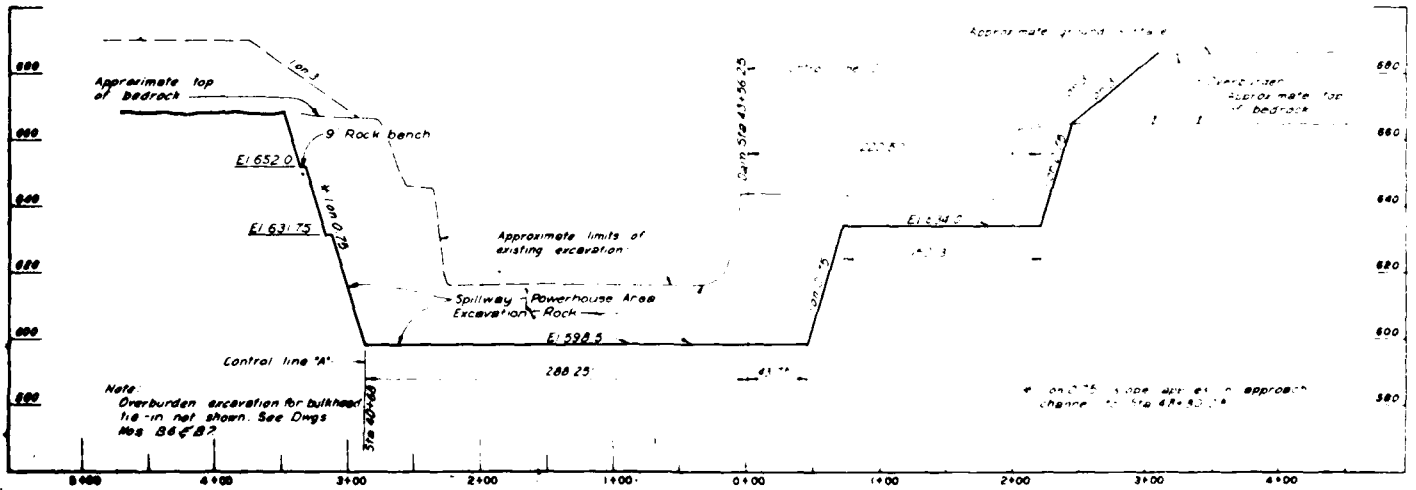
POWERHOUSE PROFILE (A) AT RANGE 1+50R
44|45



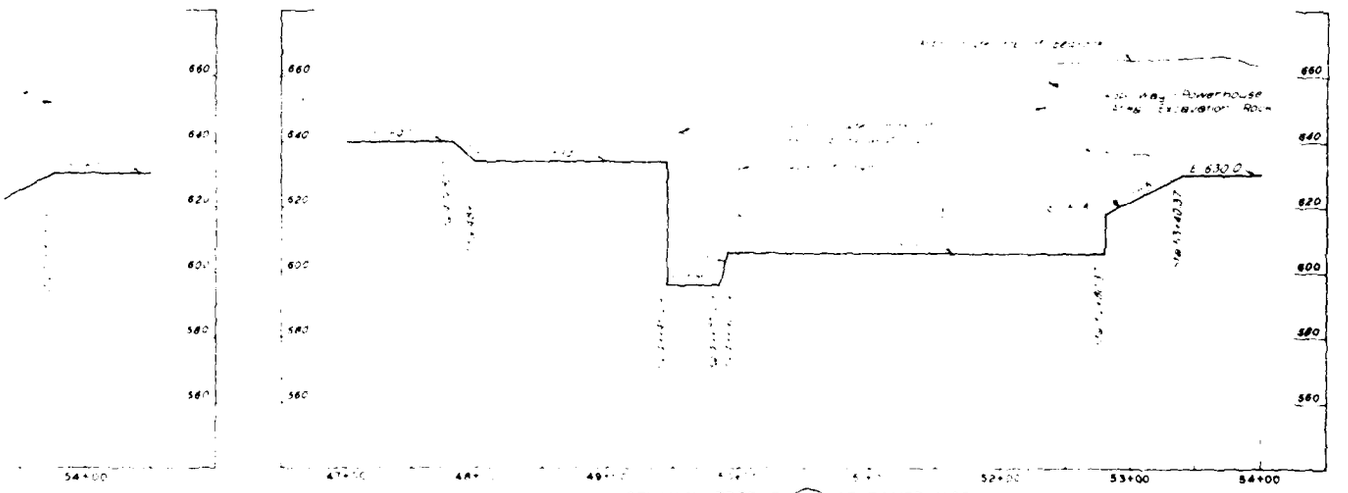
OUTLET WORKS SECTION (E) AT STA. 49+40
44|45



SERVICE BAY PROFILE

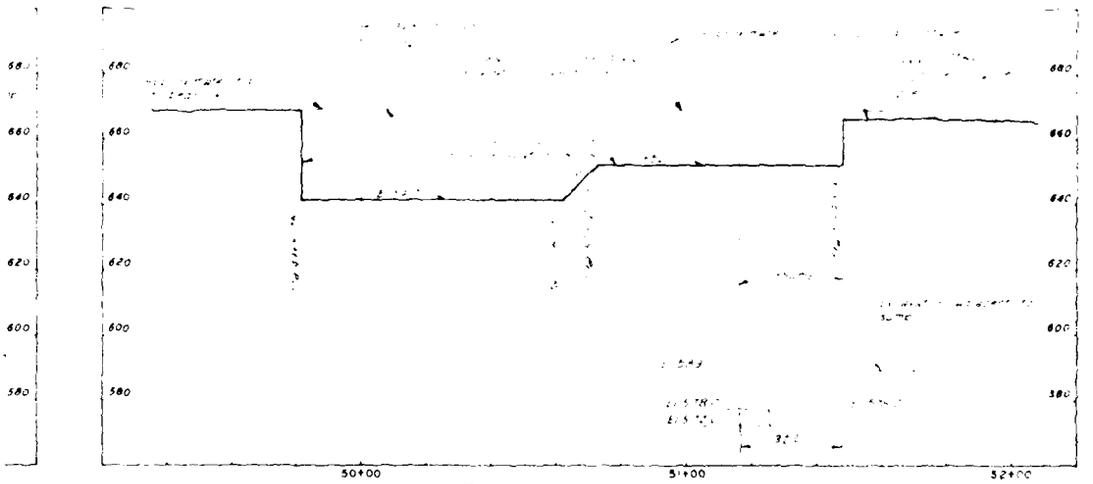


OUTLET WORKS SECTION (D) AT STA. 48+50
44|45



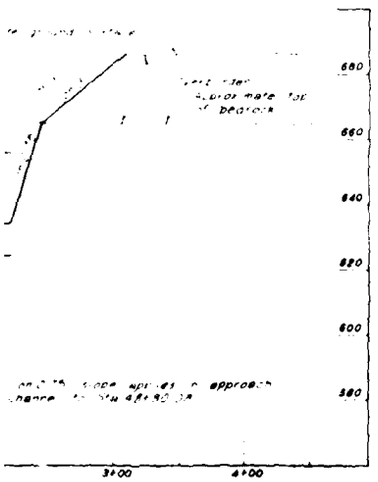
SPILLWAY PROFILE (B) AT RANGE 1+50L

44 45



SERVICE BAY PROFILE (C) AT RANGE 3+25R AND SUMP AT RANGE 2+88.25R

44|45



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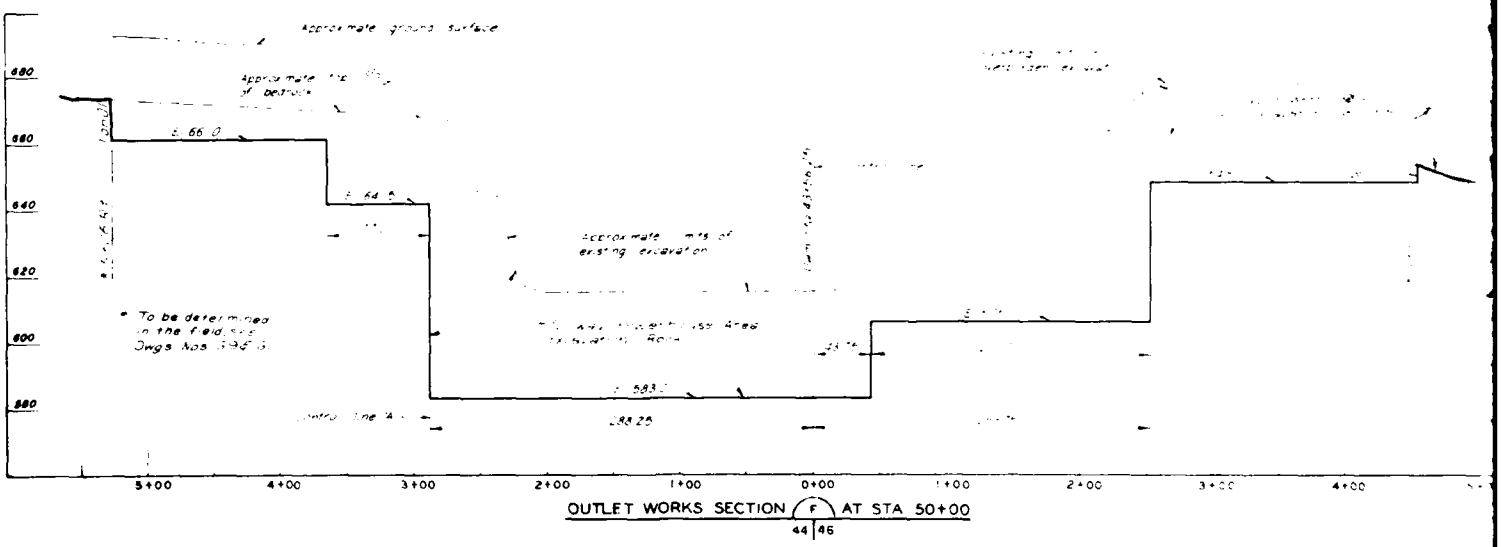
CONSTRUCTION FOUNDATION REPORT

SPILLWAY-POWERHOUSE EXCAVATION
SECTIONS AND PROFILES

Date: MARCH 1985

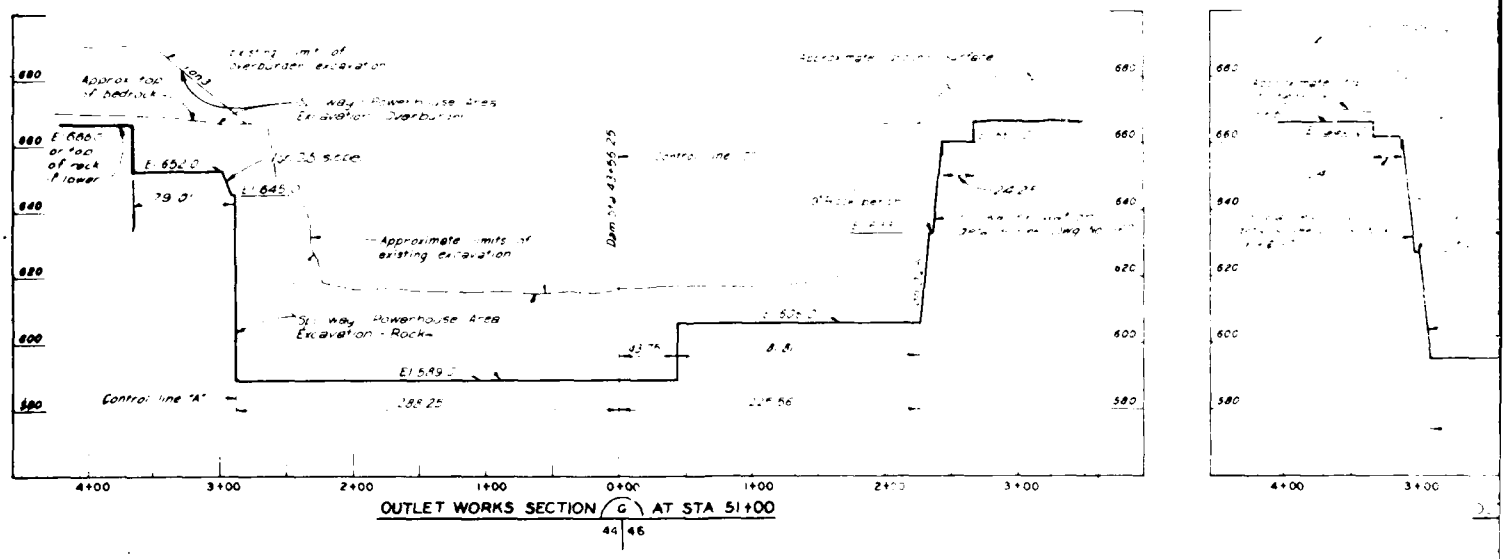
Sheet number: 0-12-9175

PLATE NO 45



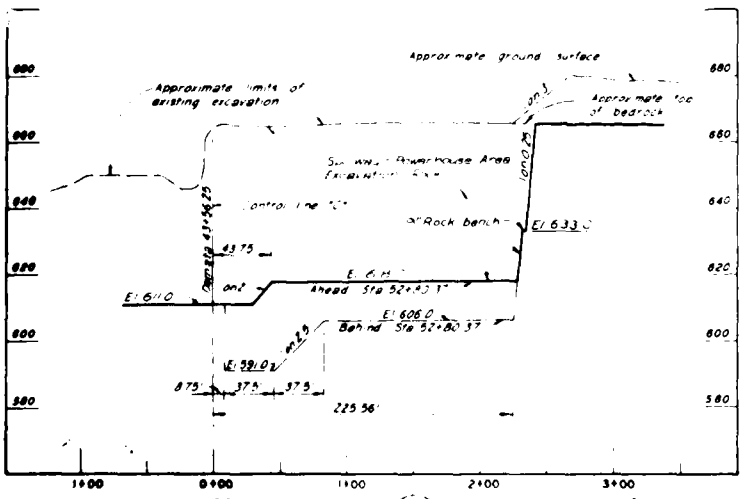
OUTLET WORKS SECTION (F) AT STA 50+00

44 | 46



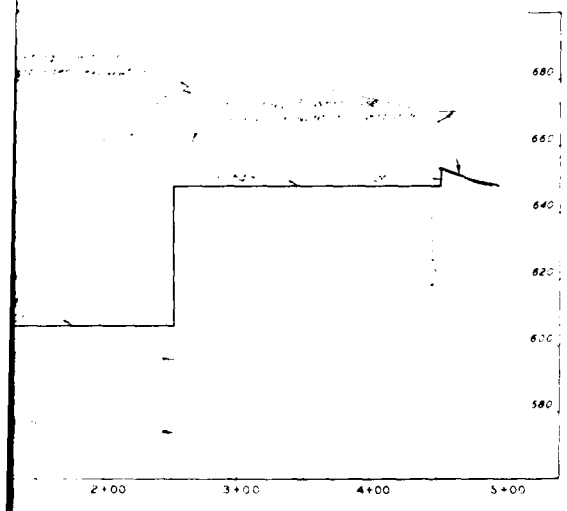
OUTLET WORKS SECTION (G) AT STA 51+00

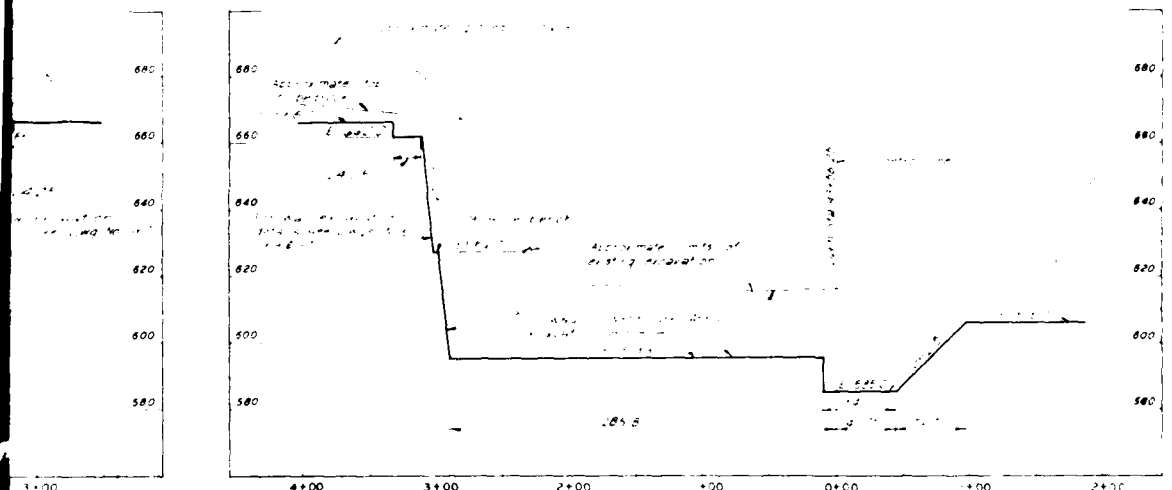
44 | 46



OUTLET WORKS SECTION (I) AT STA 52+80.37

44 | 46





OUTLET WORKS SECTION (H) AT STA 51+90.37

44 | 46

see Plate 44.
See Plates 42 & 45

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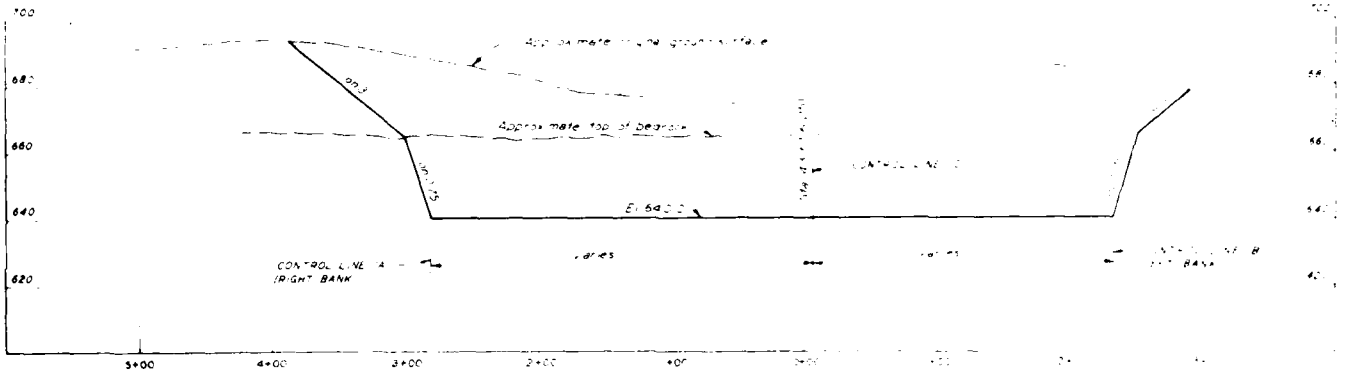
US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

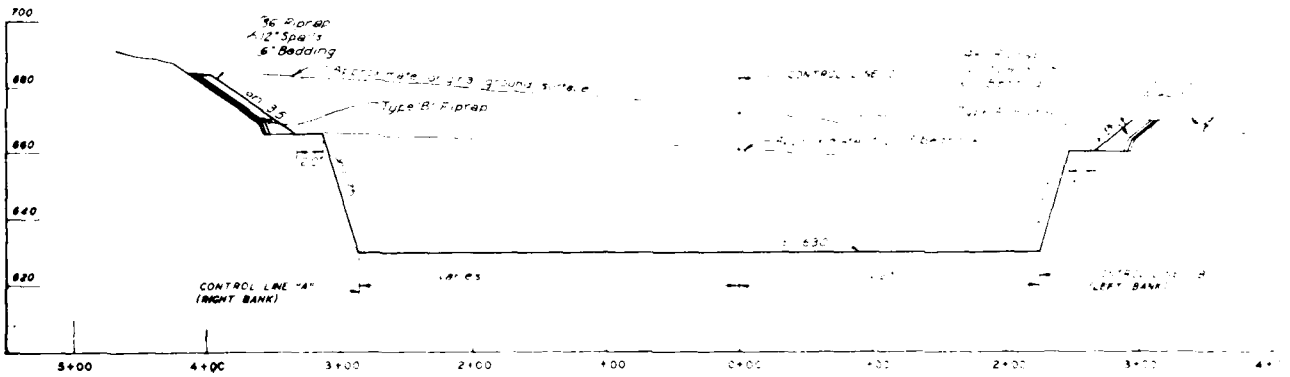
SPILLWAY - POWERHOUSE
EXCAVATION SECTIONS

Scale: AS NOTED
Sheet Number:
Date: MARCH 1985
Dwg No.: 0-12-9176

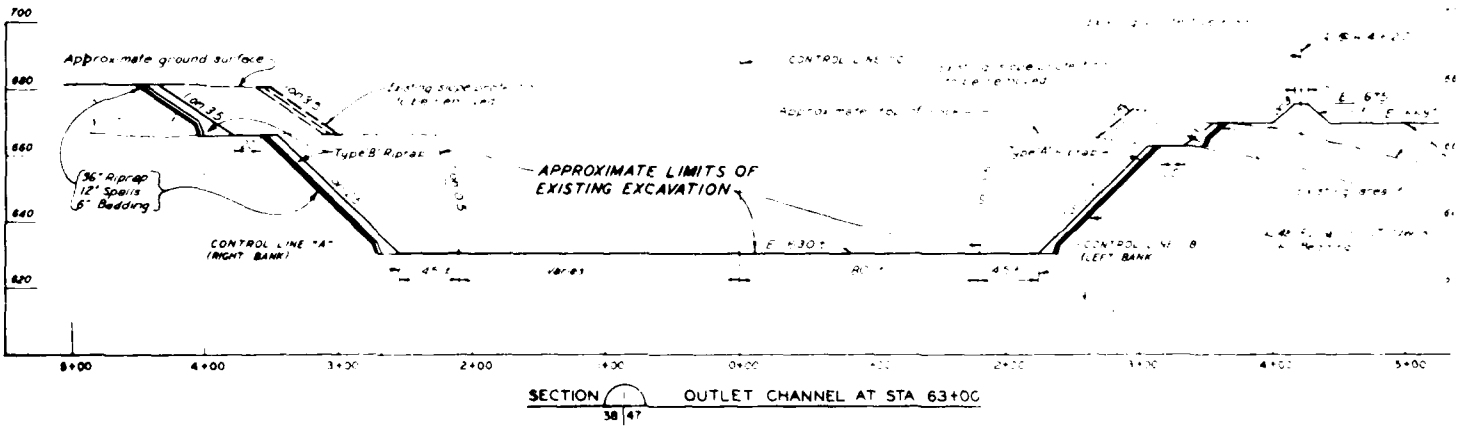
PLATE NO 46



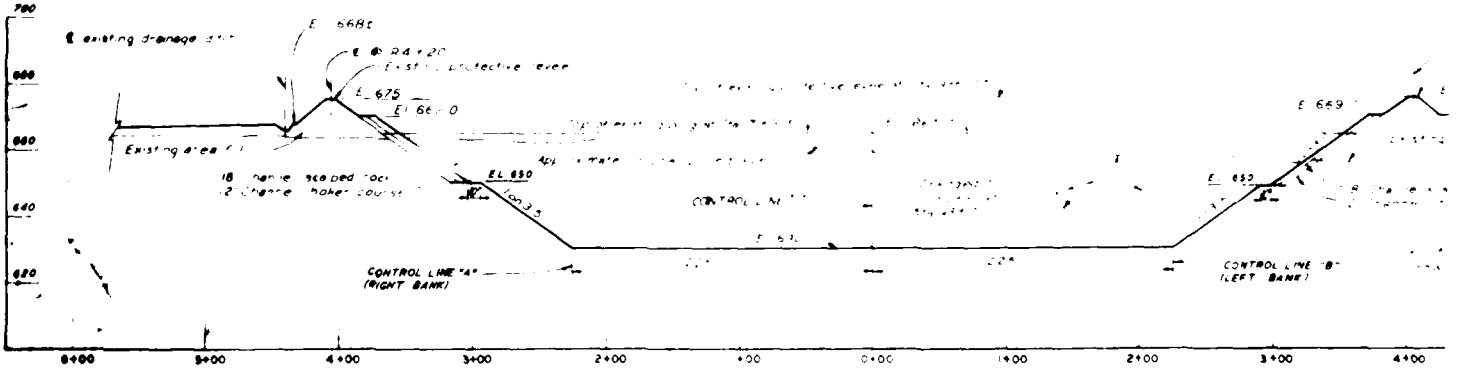
SECTION G 38|47 APPROACH CHANNEL AT STA 45+00



SECTION H 38|47 OUTLET CHANNEL AT STA 55+00

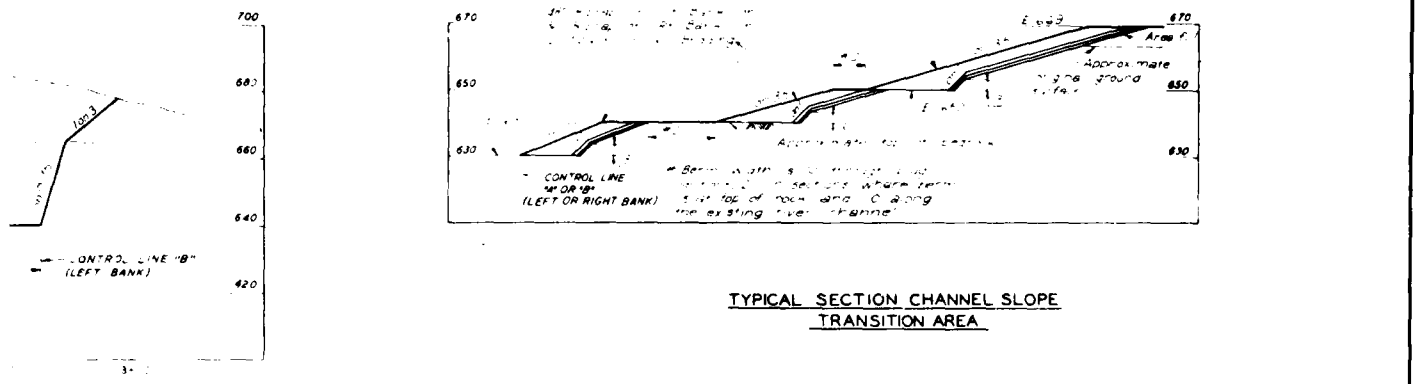


SECTION I 38|47 OUTLET CHANNEL AT STA 63+00

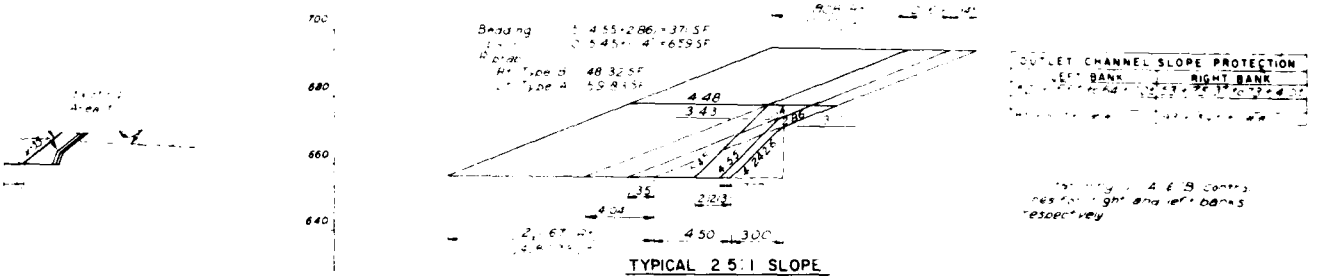


SECTION J 38|47 OUTLET CHANNEL

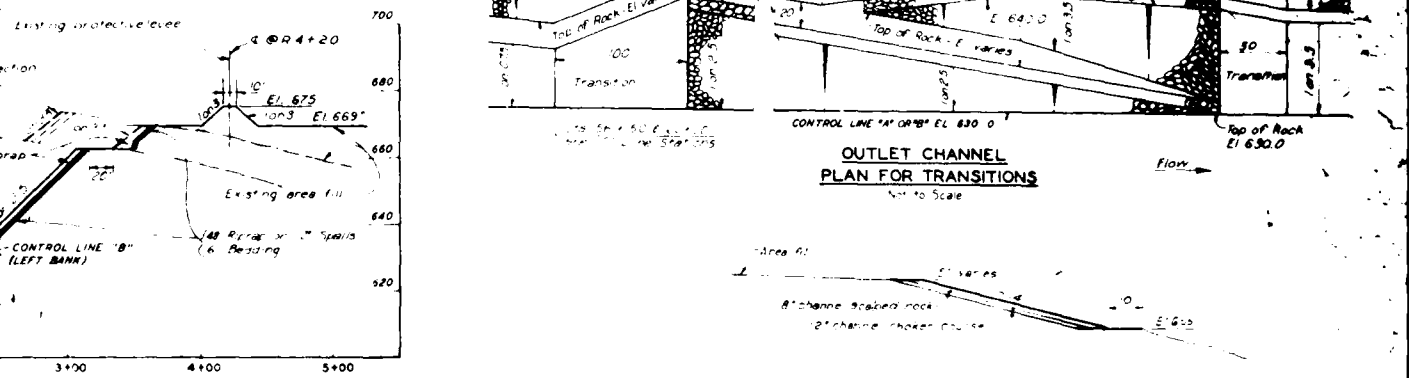
ELEVATION IN FEET ABOVE MEAN SEA LEVEL



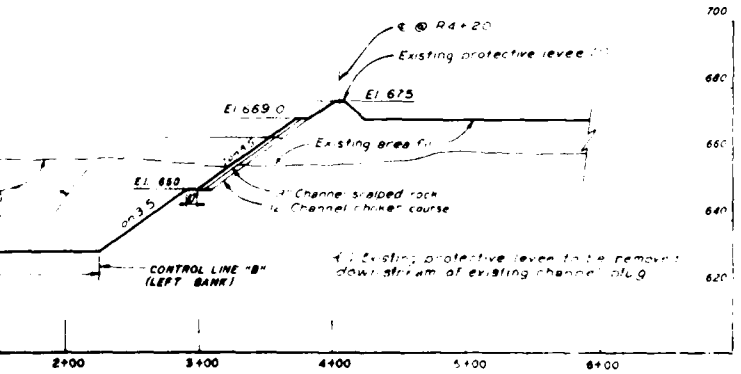
TYPICAL SECTION CHANNEL SLOPE
TRANSITION AREA



TYPICAL 2.5:1 SLOPE



OUTLET CHANNEL
PLAN FOR TRANSITIONS
Not to Scale



RIVER CHANNEL SLOPE PROTECTION

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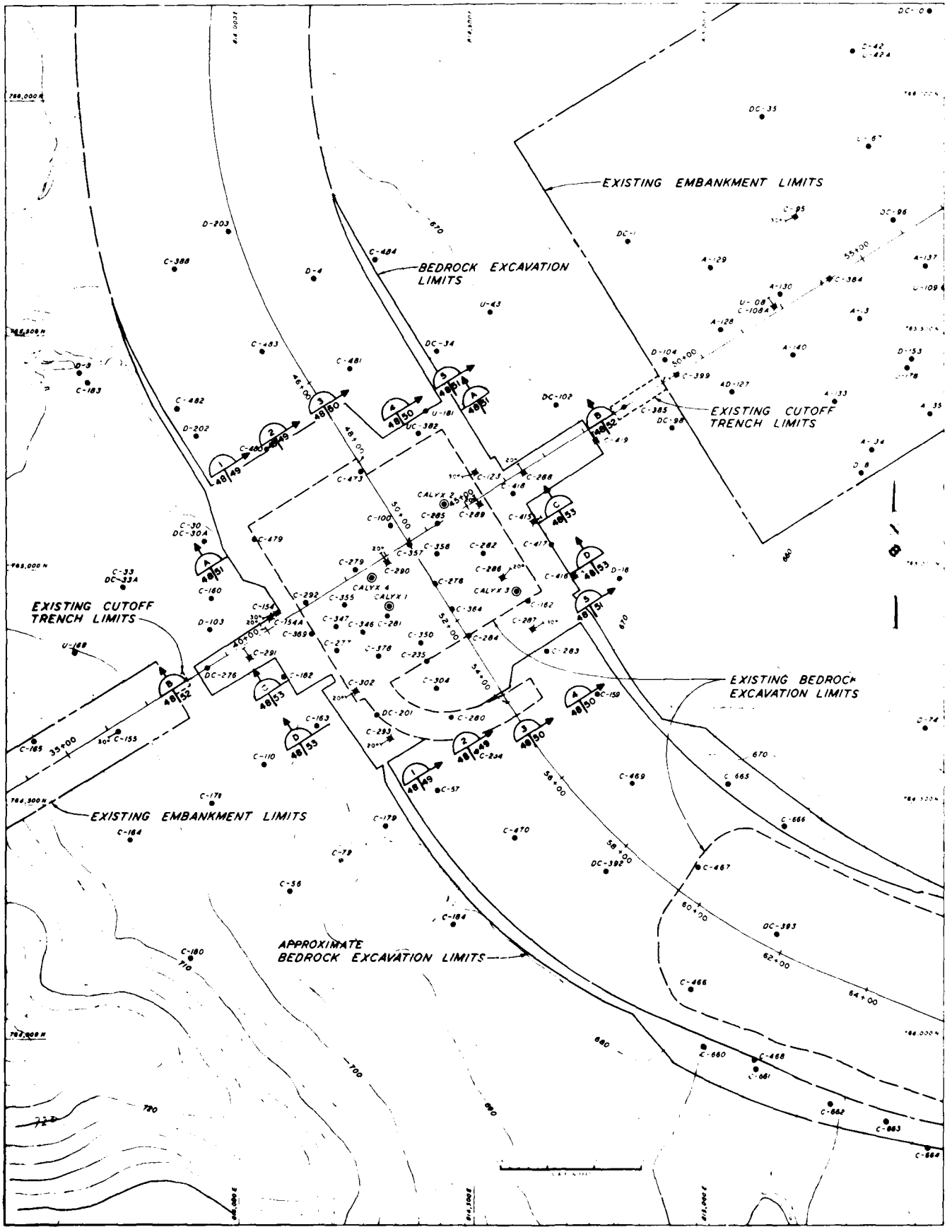
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CONSTRUCTION FOUNDATION REPORT

APPROACH AND OUTLET CHANNELS
EXCAVATION SECTIONS

Scale
Date MARCH 1985
Dwg No
Sheet number
File No 0-12-9177

PLATE NO 47



PLAN OF BORINGS - SPILLWAY & POWERHOUSE



NOTE - FOR LEGEND OF BORINGS SEE PLATE 4.

PLATE NUMBER WHERE SECTION IS CUT — SECTION LETTER — PLATE NUMBER WHERE SECTION IS DRAWN

SECTION IDENTIFICATION

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[illegible] MISSOURI
[illegible] HARRY S. TRUMAN DAM AND RESERVOIR
CONSTRUCTION FOUNDATION REPORT

PLANS OF EXPLORATIONS
SPILLWAY POWERHOUSE

Scale [illegible]

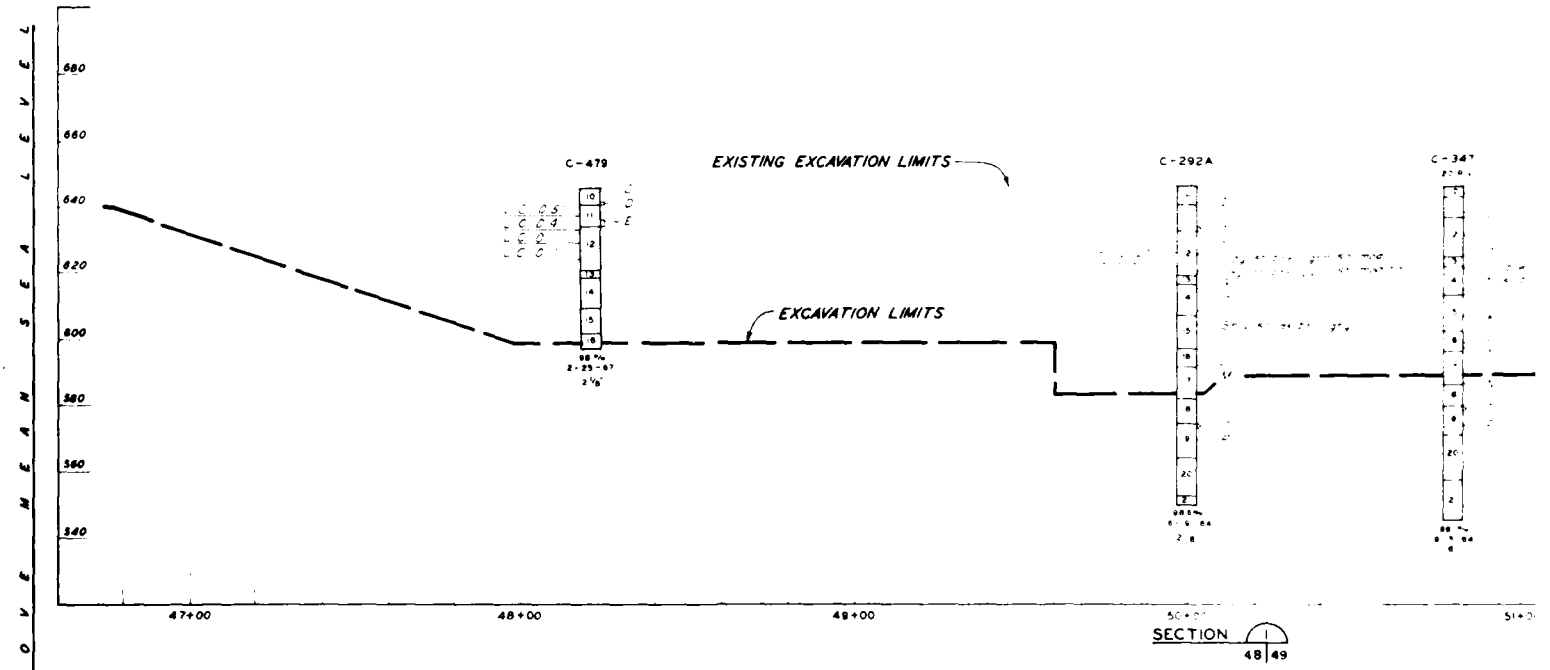
Date MARCH 1985

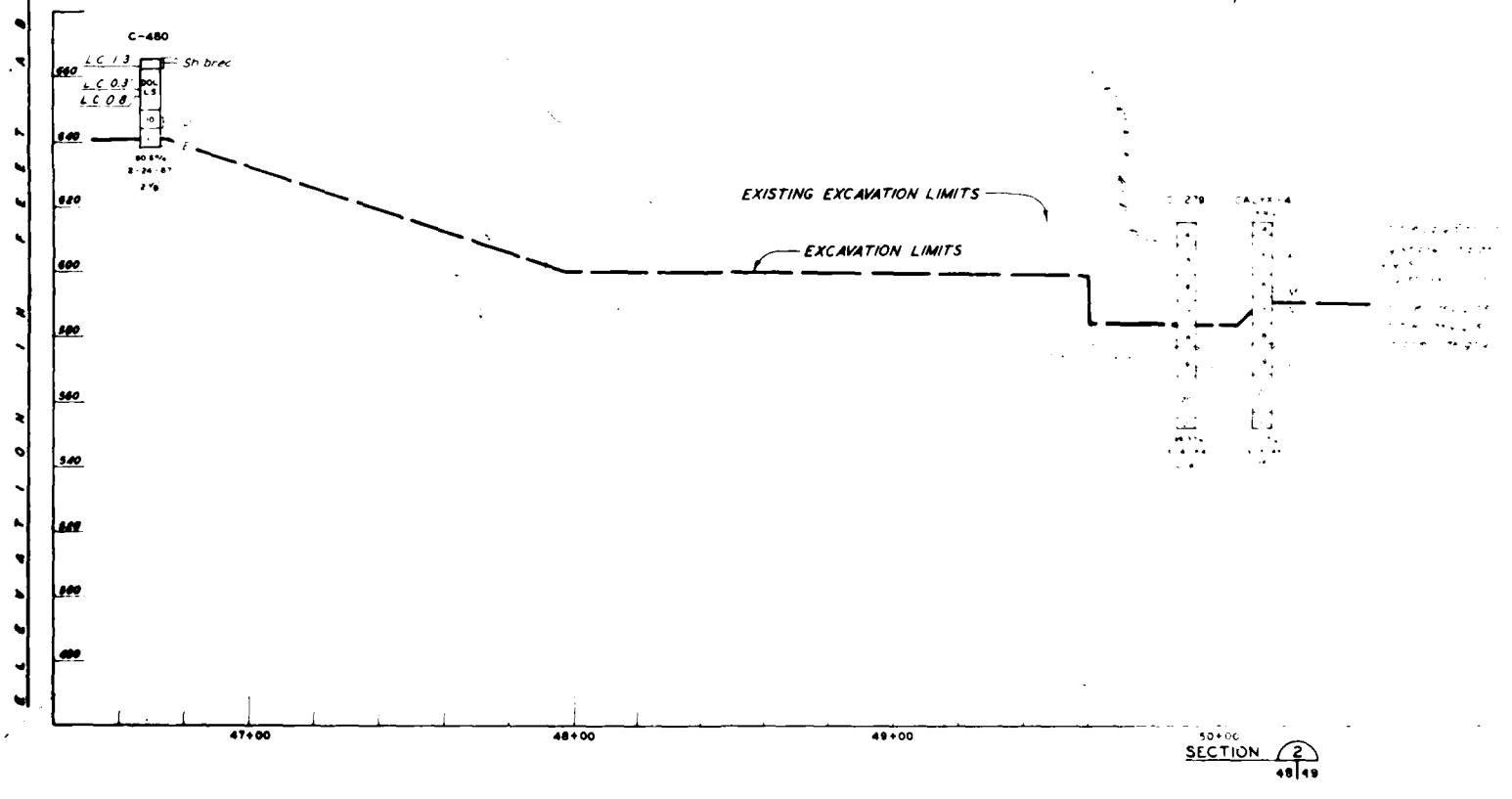
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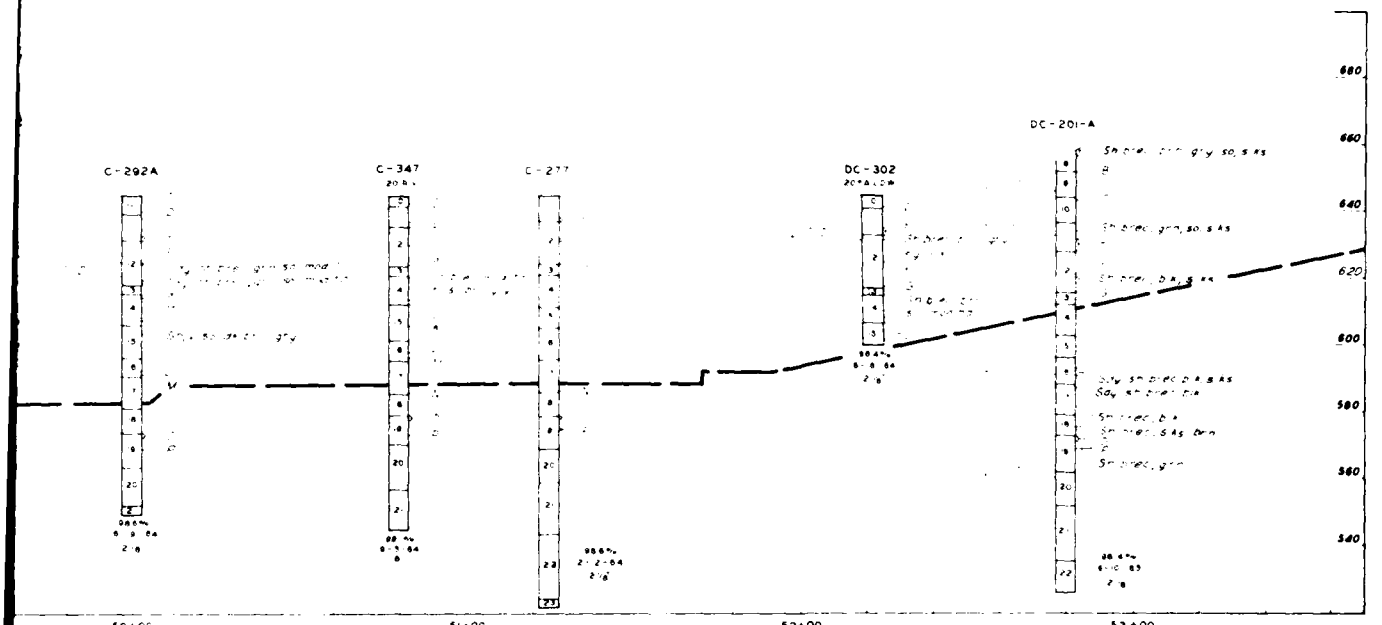
Drwg No

F.N. No 0-12-9178

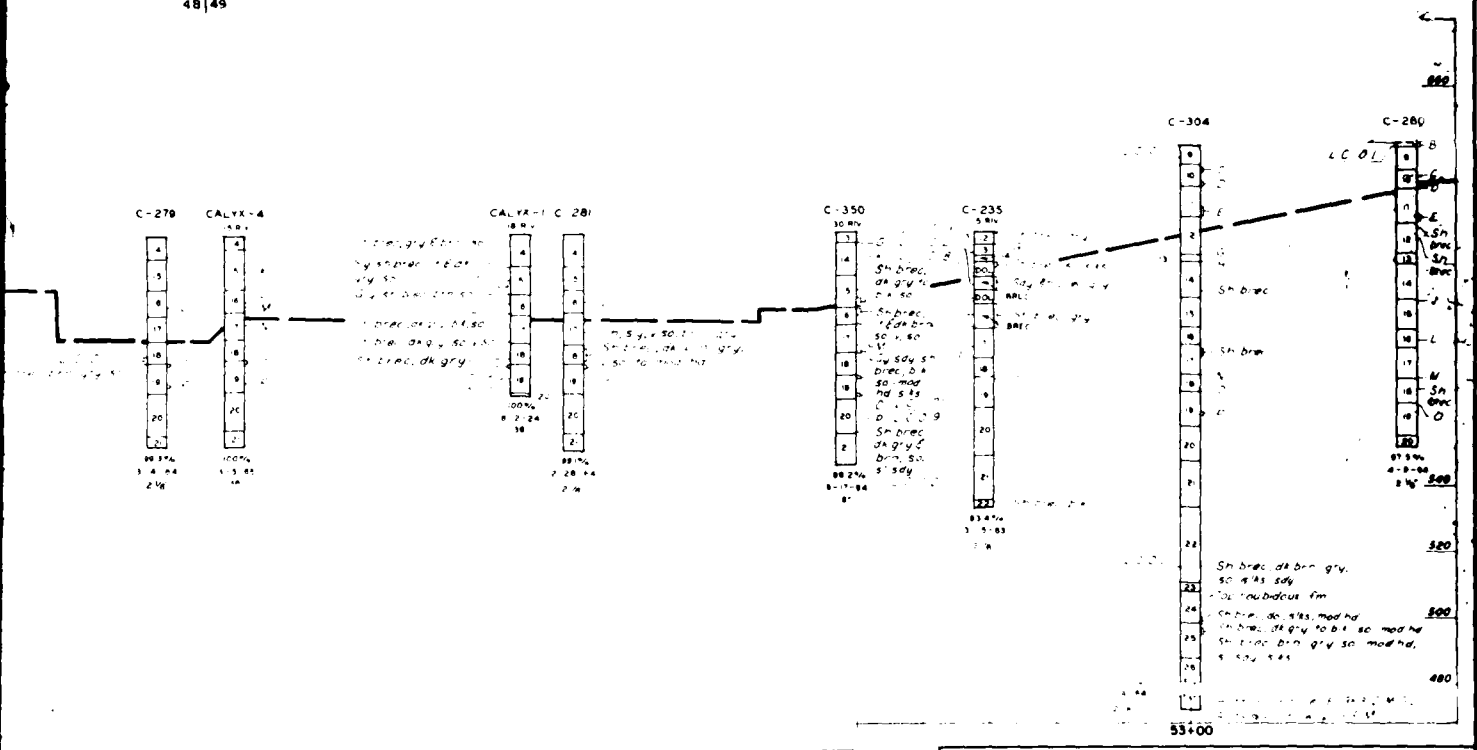
PLATE NO. 46


ELEVATION IN FEET ABOVE MEAN SEA LEVEL
680
660
640
620
600
580
560
540
C-479
EXISTING EXCAVATION LIMITS
EXCAVATION LIMITS
C-292A
C-347
47+00
48+00
49+00
SECTION 1
48 | 49


ELEVATION IN FEET ABOVE MEAN SEA LEVEL
680
660
640
620
600
580
560
540
C-480
LC 1.3
LC 0.3
LC 0.8
Sh brec
EXISTING EXCAVATION LIMITS
EXCAVATION LIMITS
47+00
48+00
49+00
SECTION 2
48 | 49



SECTION 1
48 | 49



SECTION 2
48 | 49

See Plate 4.

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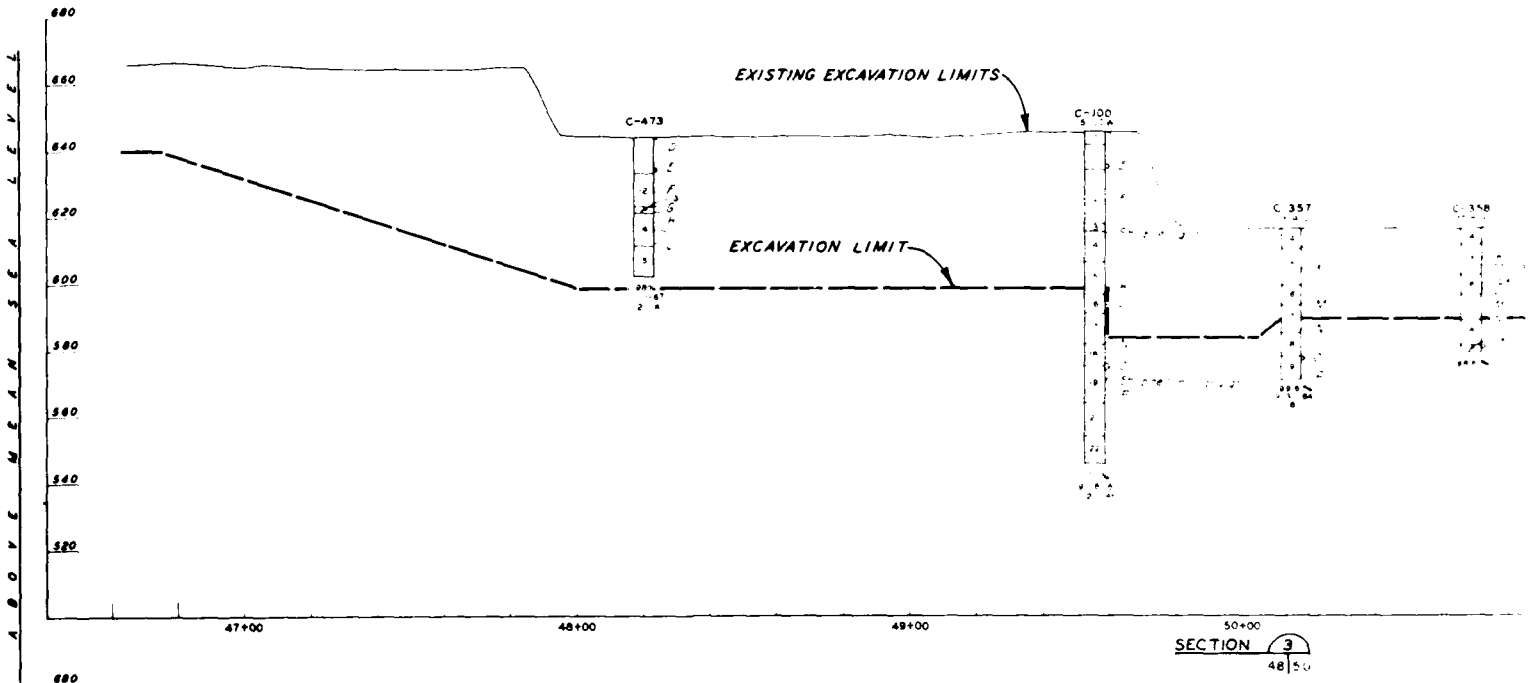
US Army Corps of Engineers

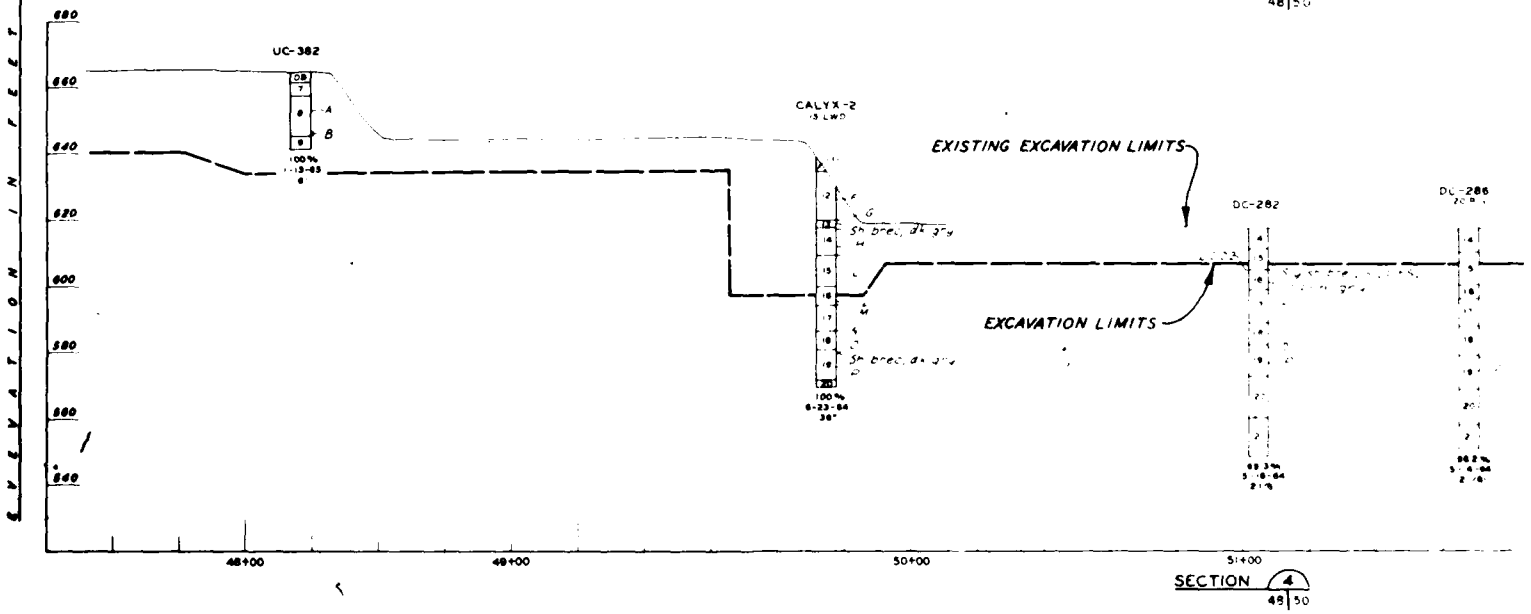
HARRY S. TRUMAN DAM AND RESERVOIR
CONSTRUCTION FOUNDATION REPORT

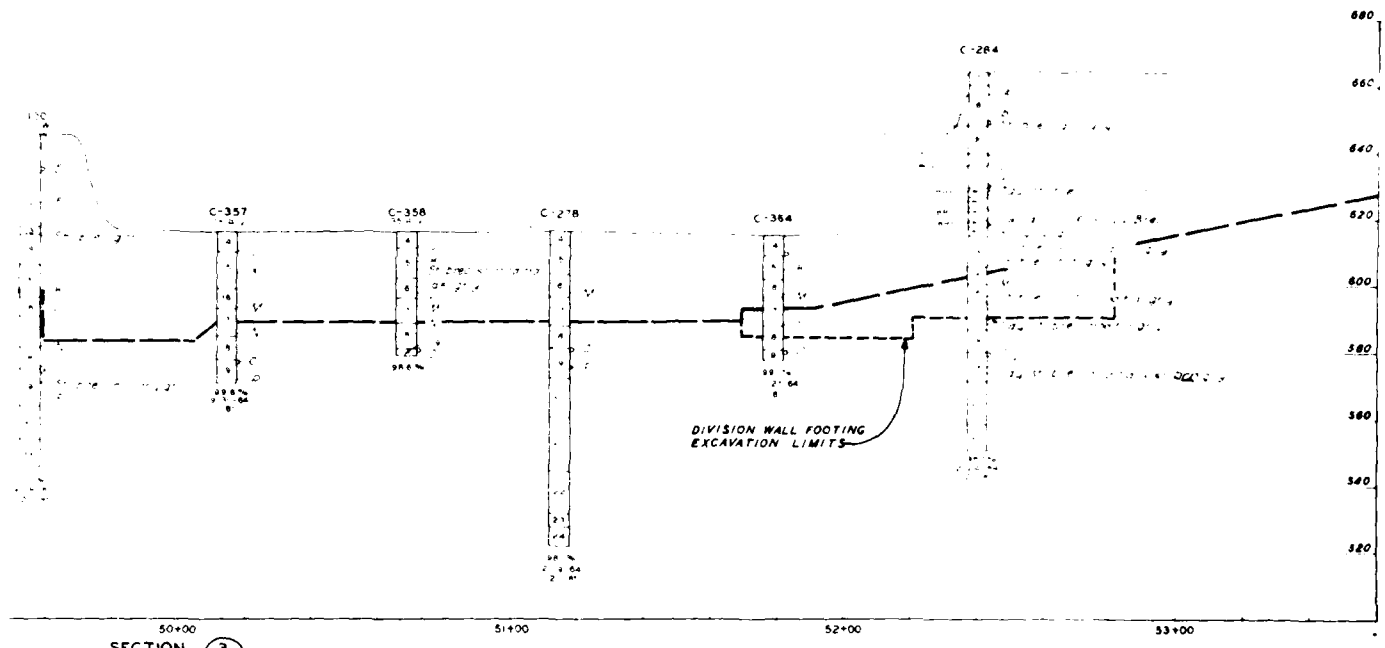
LOGS OF EXPLORATIONS
SPILLWAY - POWERHOUSE SECTIONS

Scale: AS SHOWN
Date: MARCH 1985
Drawing No.
Sheet number
File No. 0-12-9179

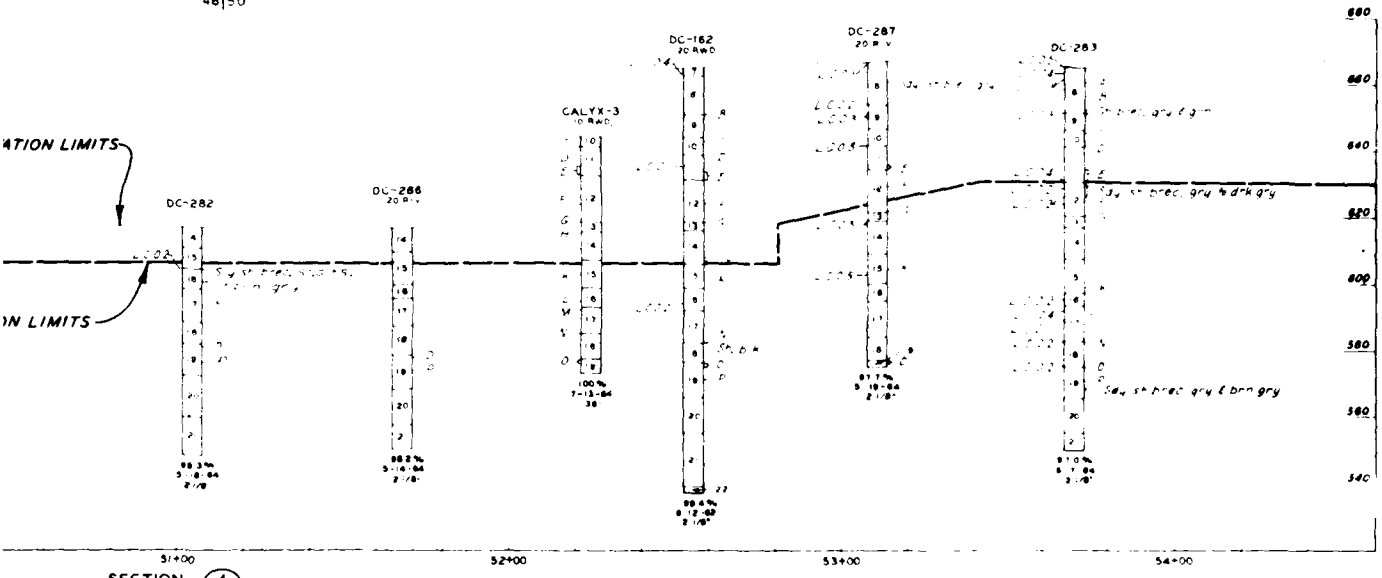
PLATE NO. 49


ELEVATION IN FEET ABOVE MEAN SEA LEVEL
680
660
640
620
600
580
560
540
520
EXISTING EXCAVATION LIMITS
EXCAVATION LIMIT
C-473
C-100
C-357
C-358
47+00
48+00
49+00
50+00
SECTION 3
48 | 50


ELEVATION IN FEET ABOVE MEAN SEA LEVEL
680
660
640
620
600
580
560
UC-382
CALYX-2
EXISTING EXCAVATION LIMITS
EXCAVATION LIMITS
DC-282
DC-286
48+00
49+00
50+00
51+00
SECTION 4
48 | 50



SECTION 3
48 | 50



SECTION 4
48 | 50

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see Plate 4

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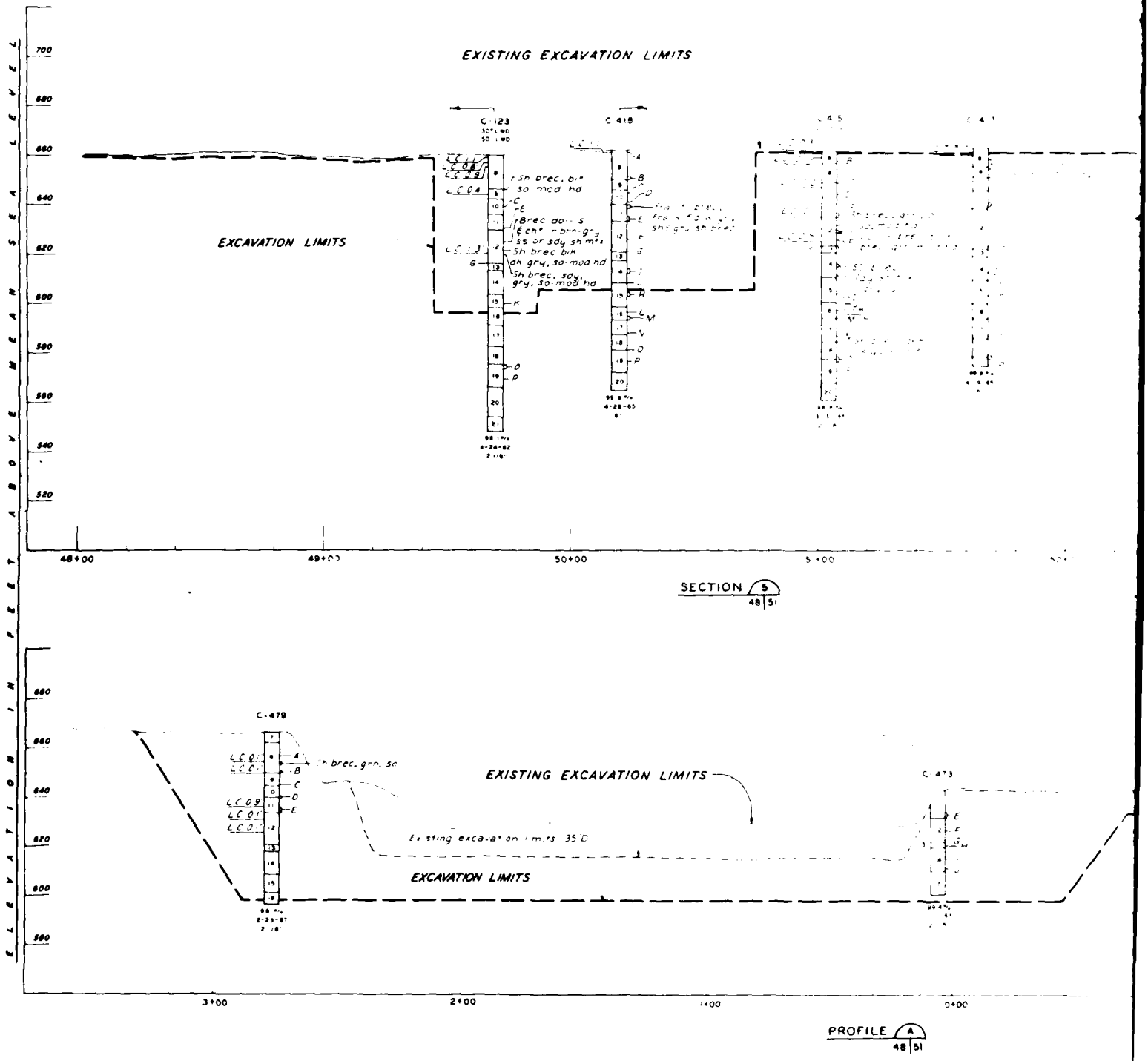
HARRY S. TRUMAN DAM AND RESERVOIR
CONSTRUCTION FOUNDATION REPORT

LOGS OF EXPLORATIONS
SPILLWAY - POWERHOUSE SECTIONS

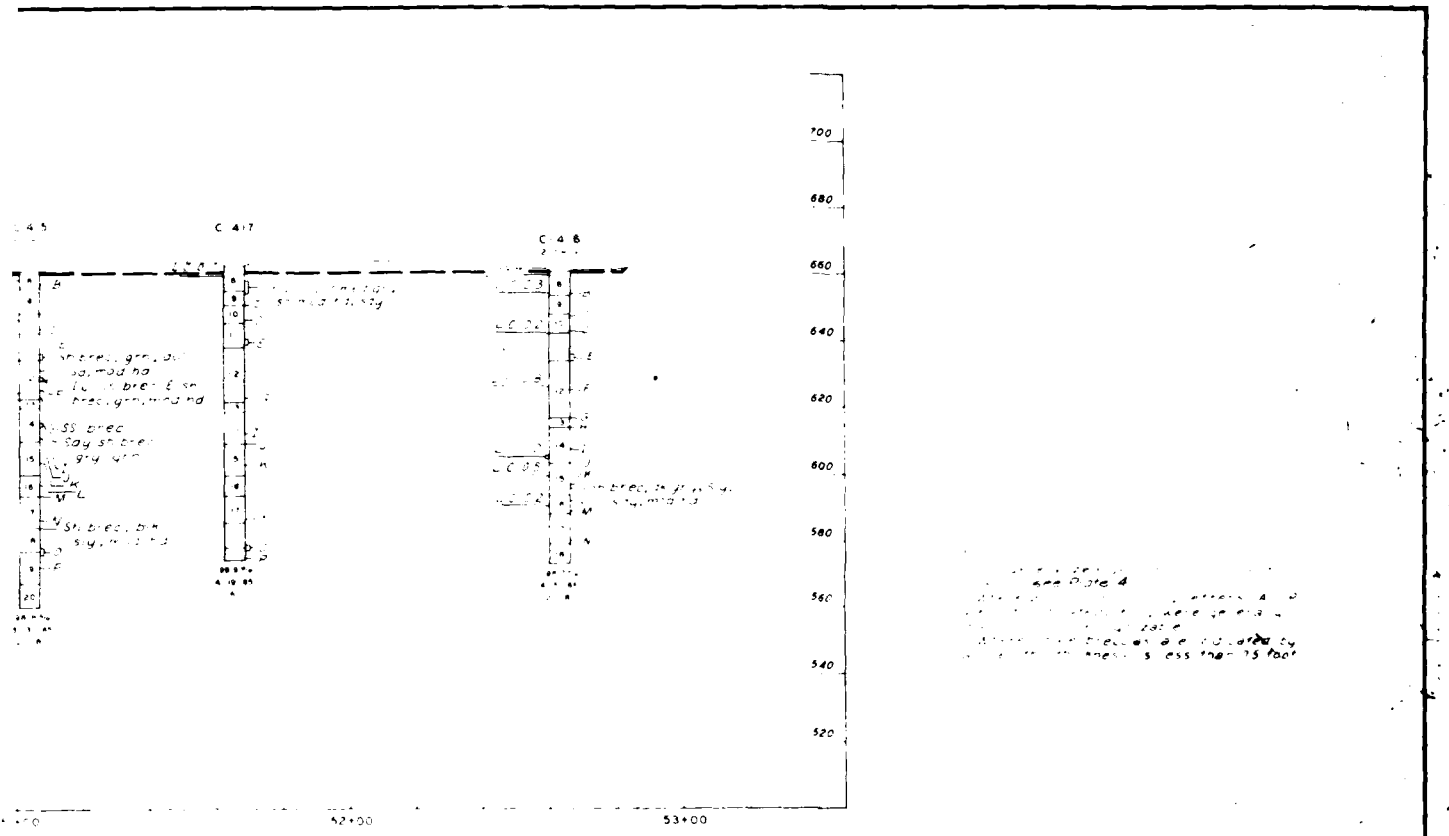
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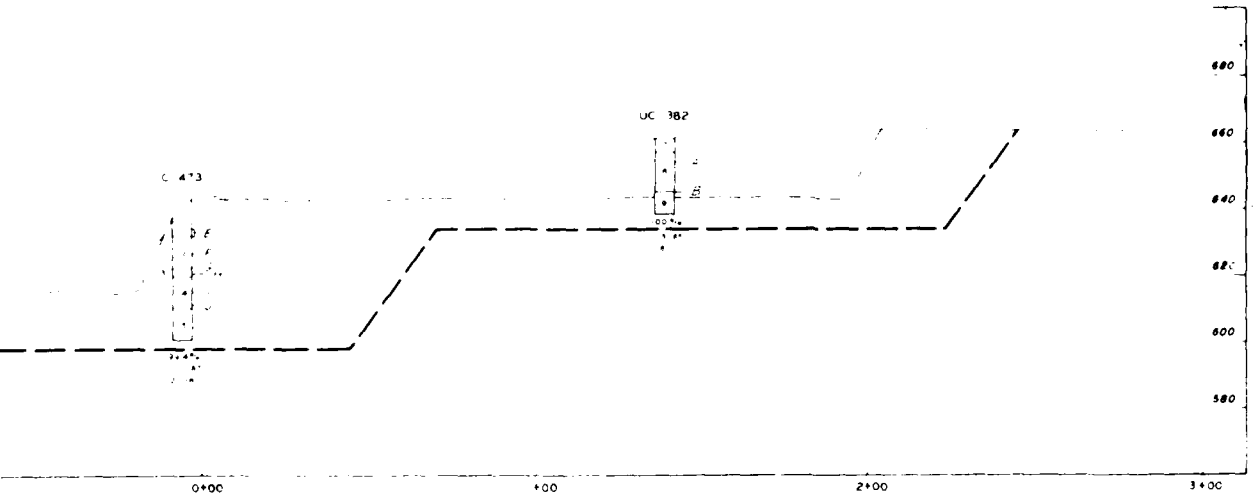
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Sheet number:
File No. 0-12-9180

PLATE NO 50


EXISTING EXCAVATION LIMITS
EXCAVATION LIMITS
C-123
C-418
ELEVATION IN FEET ABOVE MEAN SEA LEVEL
700
680
660
640
620
600
580
560
540
520
48+00
49+00
50+00
5+00
SECTION 5
48 51

C-479
C-473
EXISTING EXCAVATION LIMITS
Existing excavation limits 35 D
EXCAVATION LIMITS
ELEVATION IN FEET
680
660
640
620
600
580
3+00
2+00
1+00
0+00
PROFILE A
48 51





PROFILE A
48 | 51

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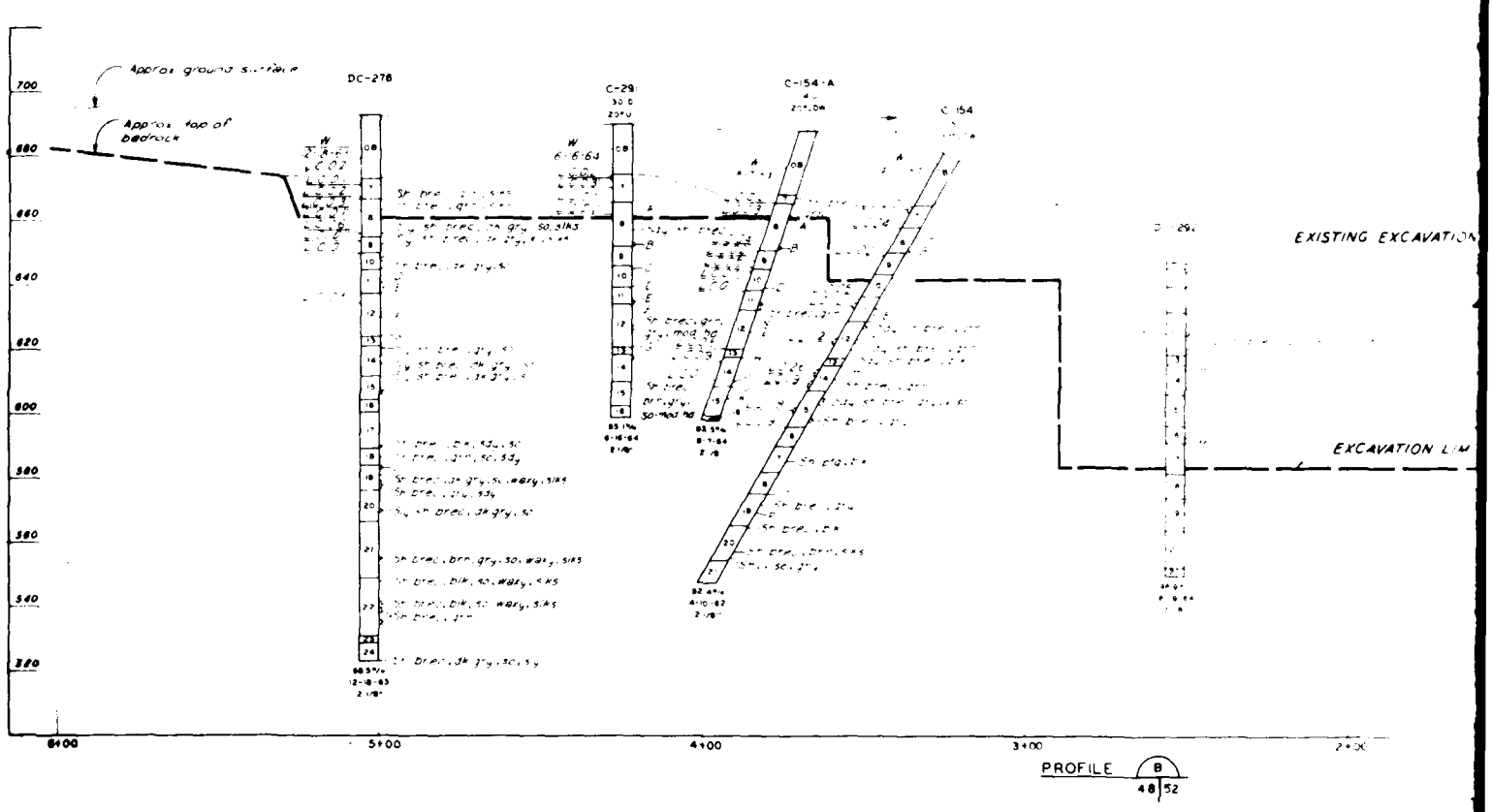
US Army Corps of Engineers

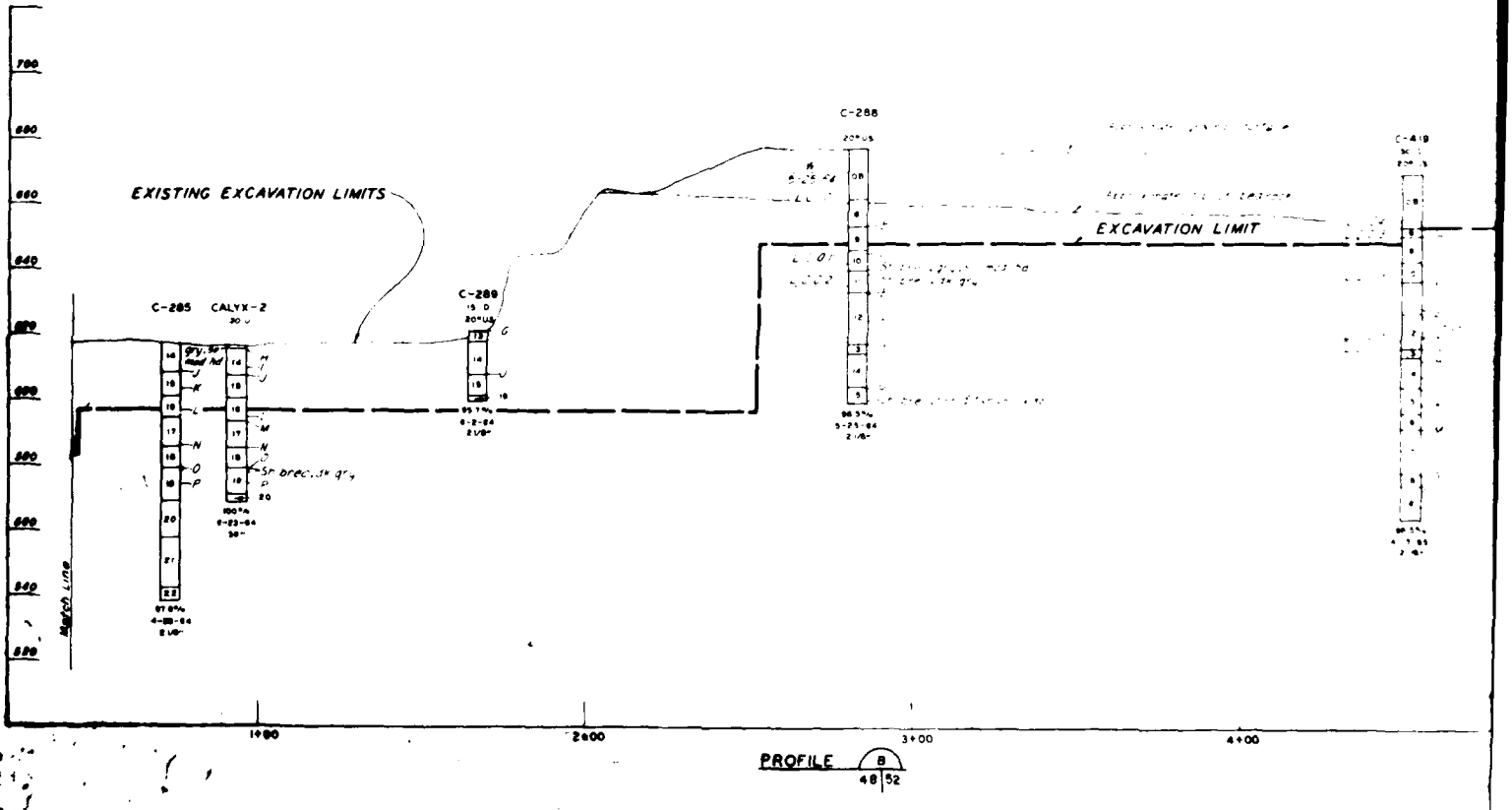
CONSTRUCTION FOUNDATION REPORT

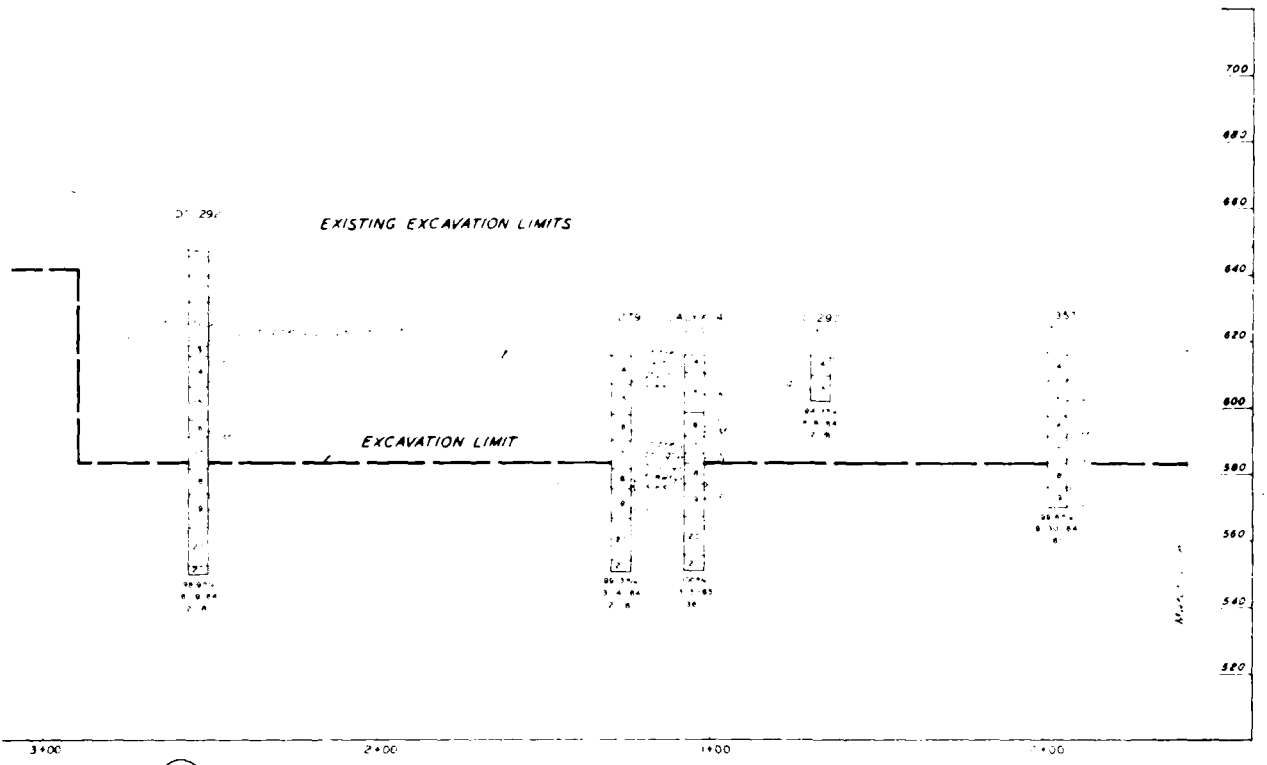
LOGS OF EXPLORATIONS
SPILLWAY POWERHOUSE
SECTION AND PROFILE

Scale: A
Date: MARCH 1985
Sheet number:
Drwg No.
File No. 0-12-9181

PLATE NO 51


ELEVATION IN FEET ABOVE MEAN SEA LEVEL
700
680
660
640
620
600
580
560
540
520
Approx ground surface
Approx top of bedrock
DC-276
C-29
C-154-A
C-154
EXISTING EXCAVATION
EXCAVATION LIM
5+00
4+00
3+00
PROFILE B
48 52


ELEVATION IN FEET ABOVE MEAN SEA LEVEL
700
680
660
640
620
600
580
560
540
520
EXISTING EXCAVATION LIMITS
C-285 CALYX-2
C-286
C-288
EXCAVATION LIMIT
Water Line
1+00
2+00
3+00
4+00
PROFILE B
48 52



PROFILE B
48 | 52

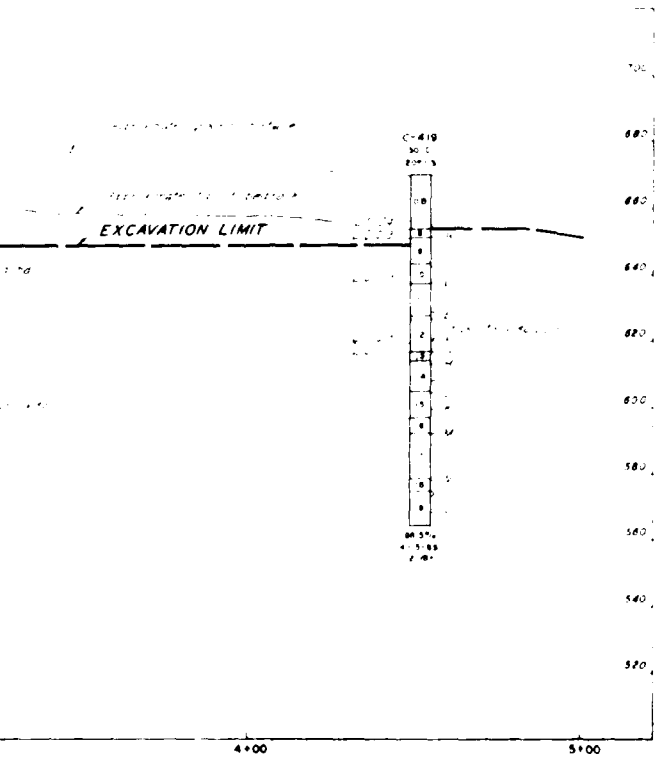


Plate 4

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KANSAS CITY, MISSOURI

US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

LOGS OF EXPLORATIONS
SPILLWAY - POWERHOUSE PROFILE

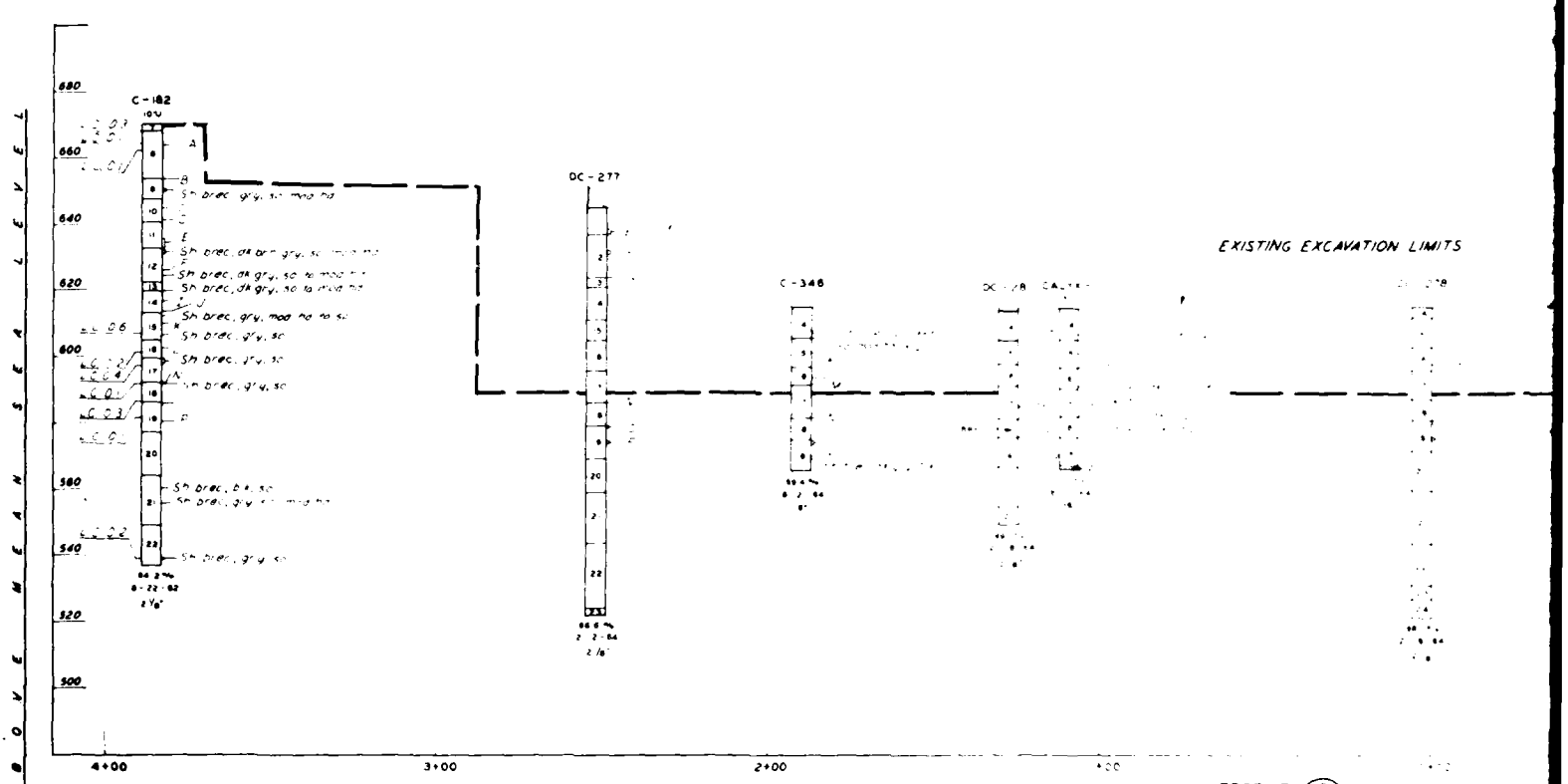
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Date: MARCH 1985

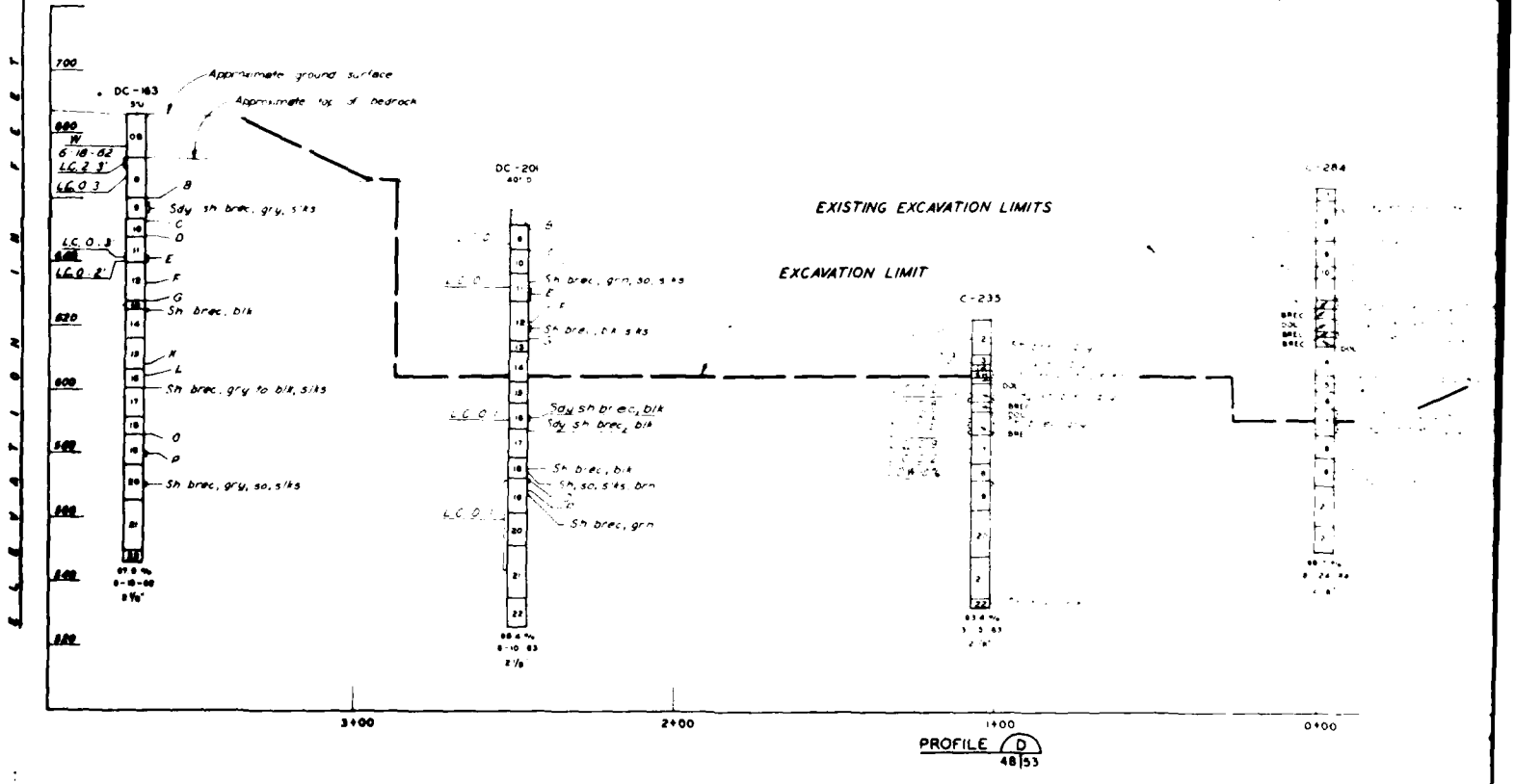
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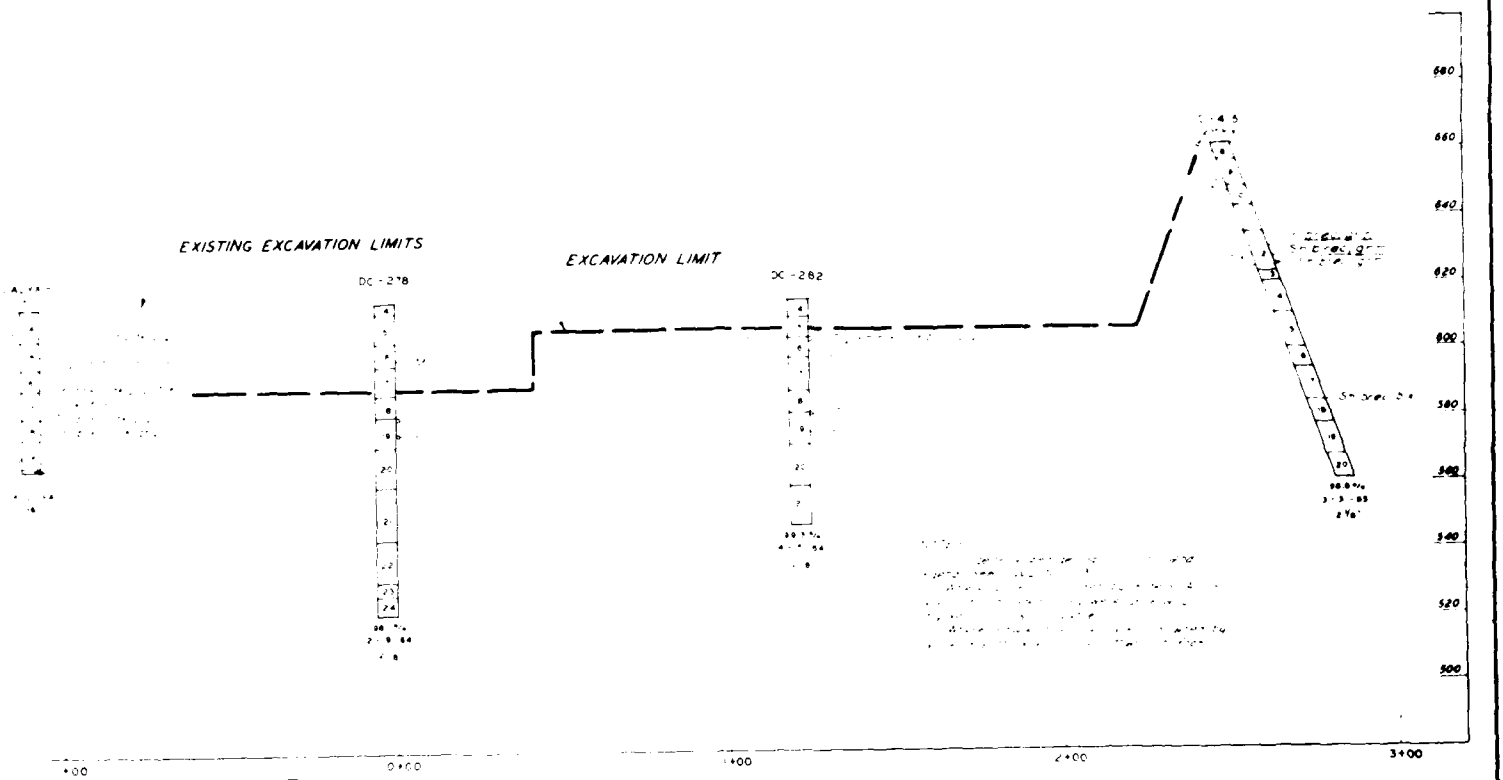
PLATE NO 52



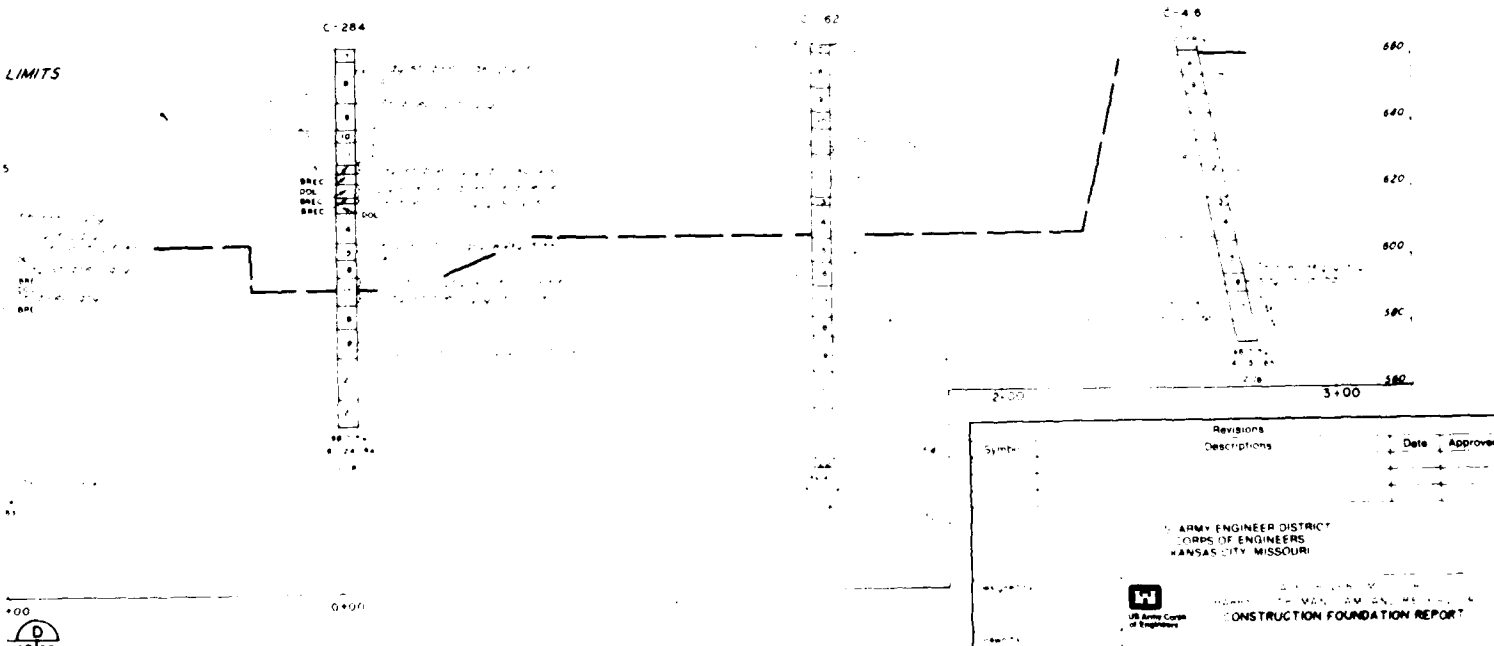
PROFILE C
48|53



PROFILE D
48|53



PROFILE C
48|53



D
48|53

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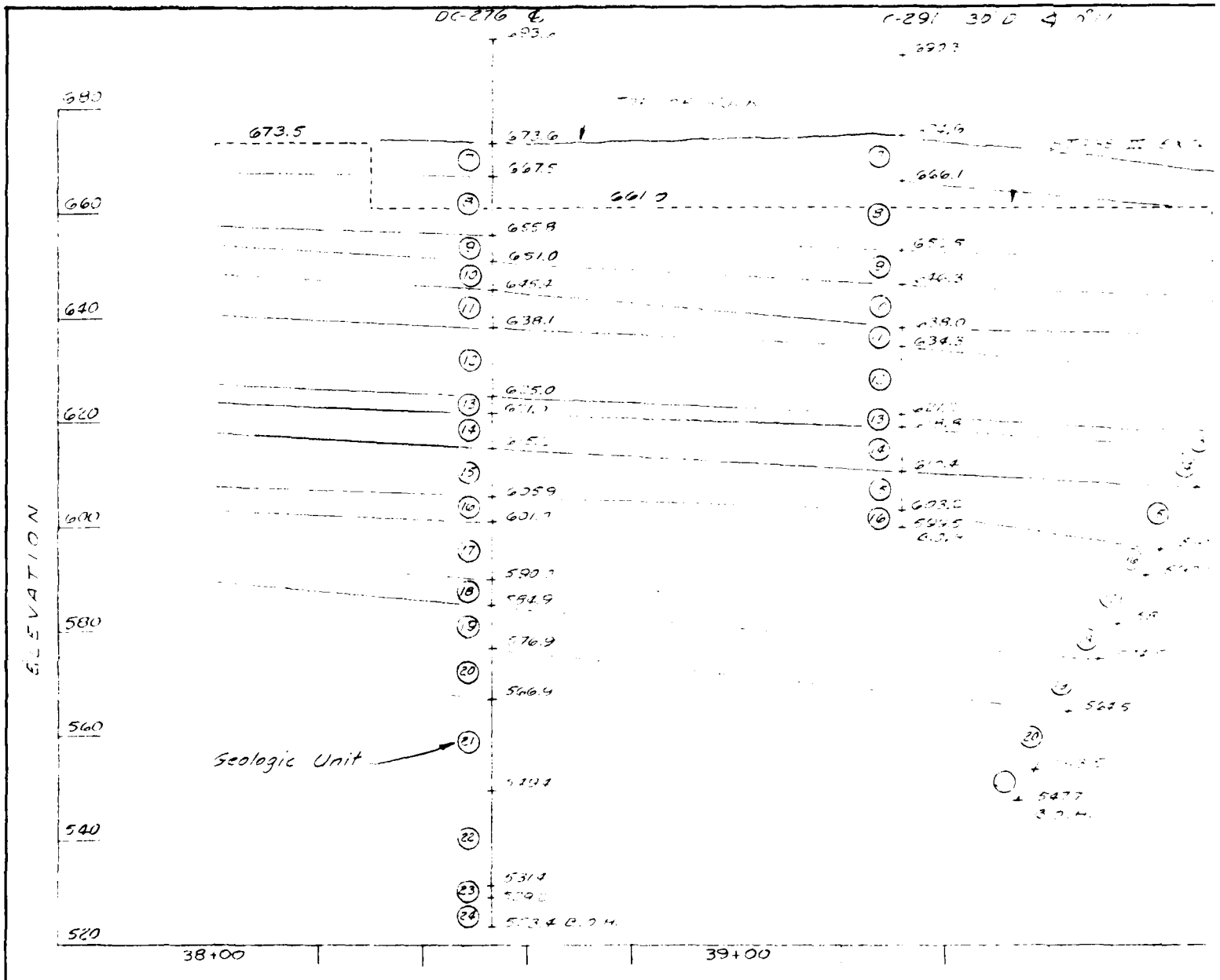
US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

LOGS OF EXPLORATIONS
SPILLWAY - POWERHOUSE PROFILES

Scale
Date MARCH 1985
Drawing No.
Sheet number
No. 0-12-9183

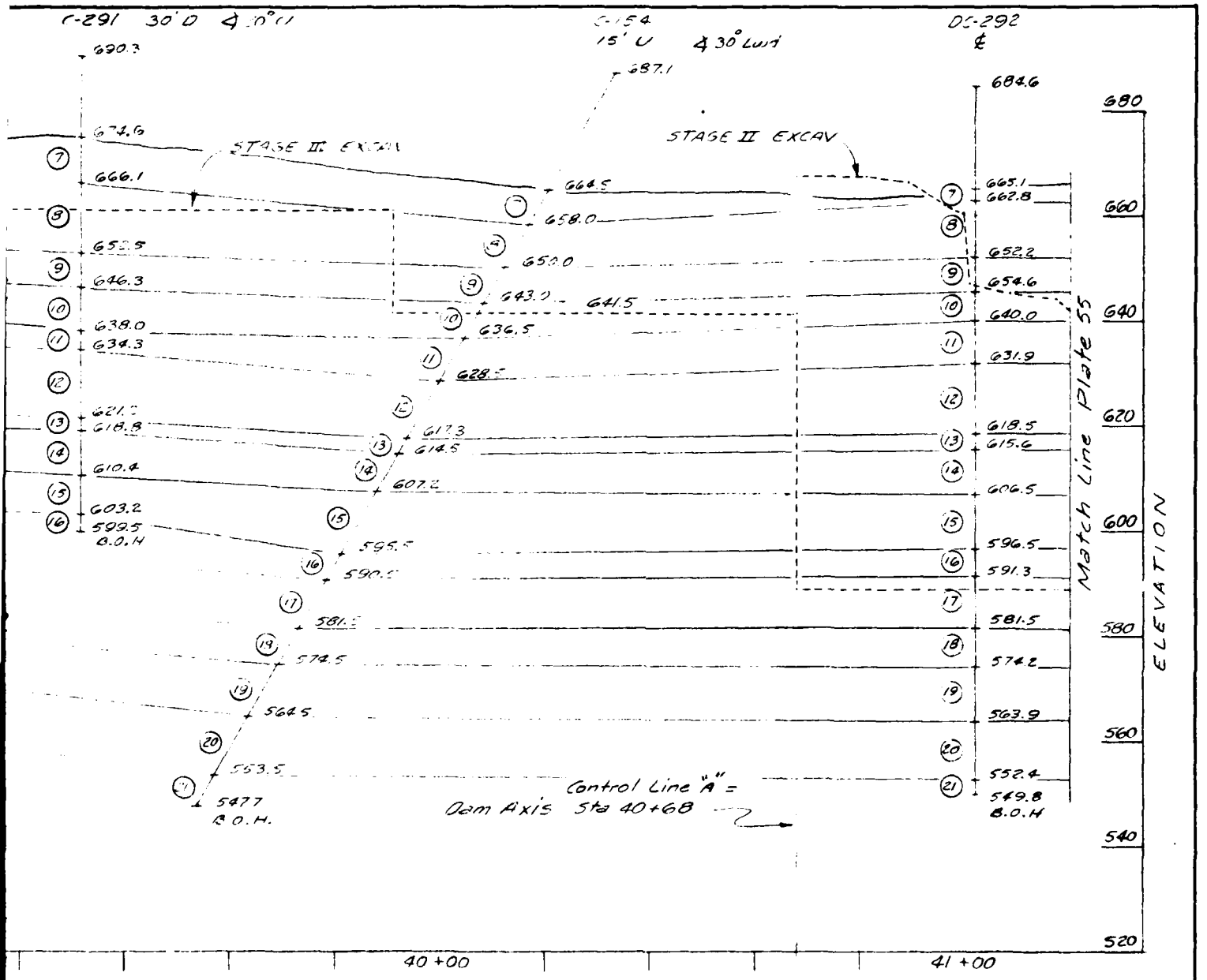
PLATE NO 53



LIMITS OF ROCK EXCAVATION - [illegible]
LOOKING UPSTREAM

For Legend See Plate 2

SCALE IN FEET



TION - PROFILE ALONG DAM AXIS
OOKING UPSTREAM

0 20
SCALE IN FEET

Revisions			
Symbol	Descriptions	Date	Approved

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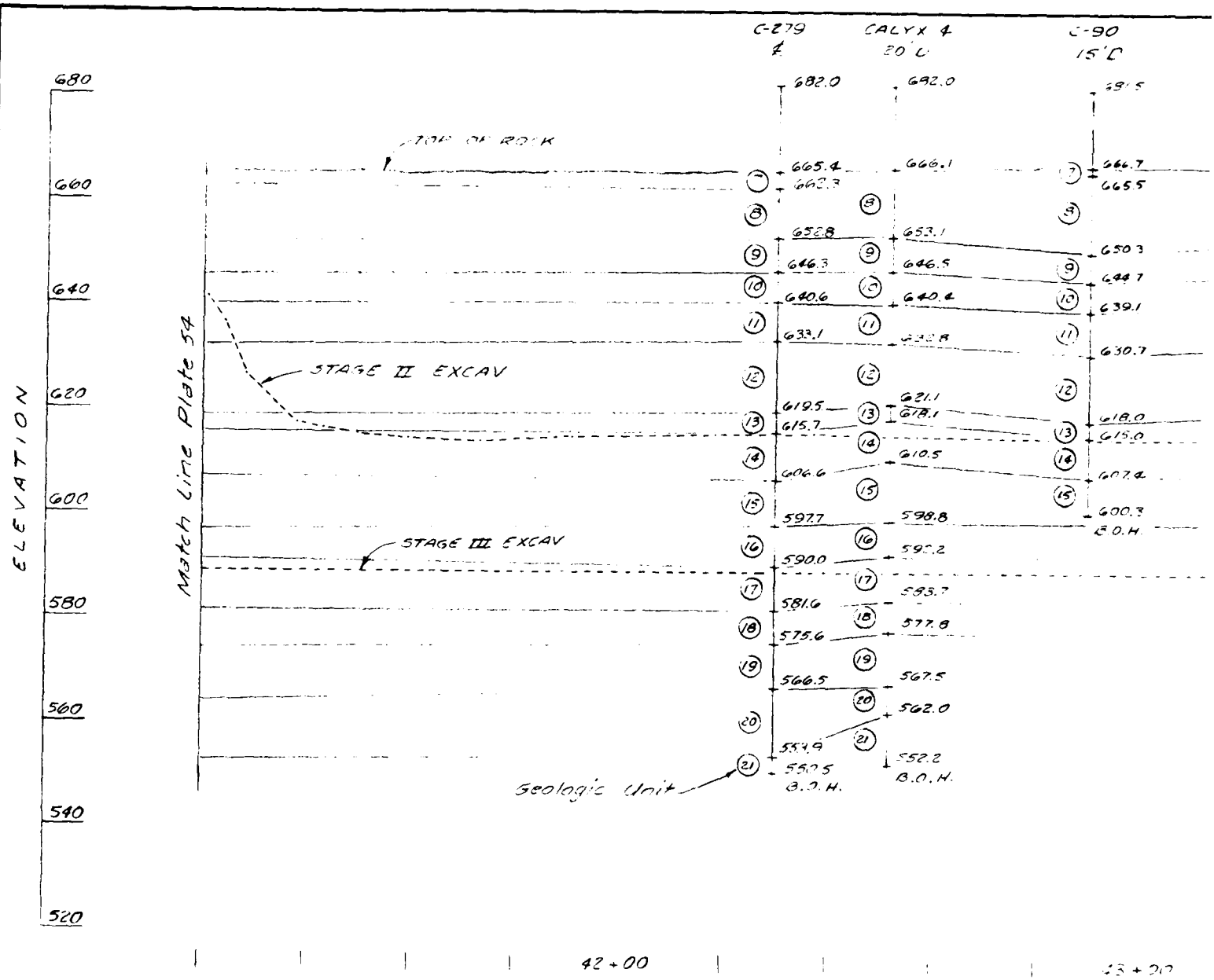
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CONSTRUCTION FOUNDATION REPORT

LIMITS OF ROCK EXCAVATION
PROFILE ALONG DAM AXIS

Scale: AS SHOWN
Date: MARCH 1956
Sheet number: —
File No. 0-12-9184

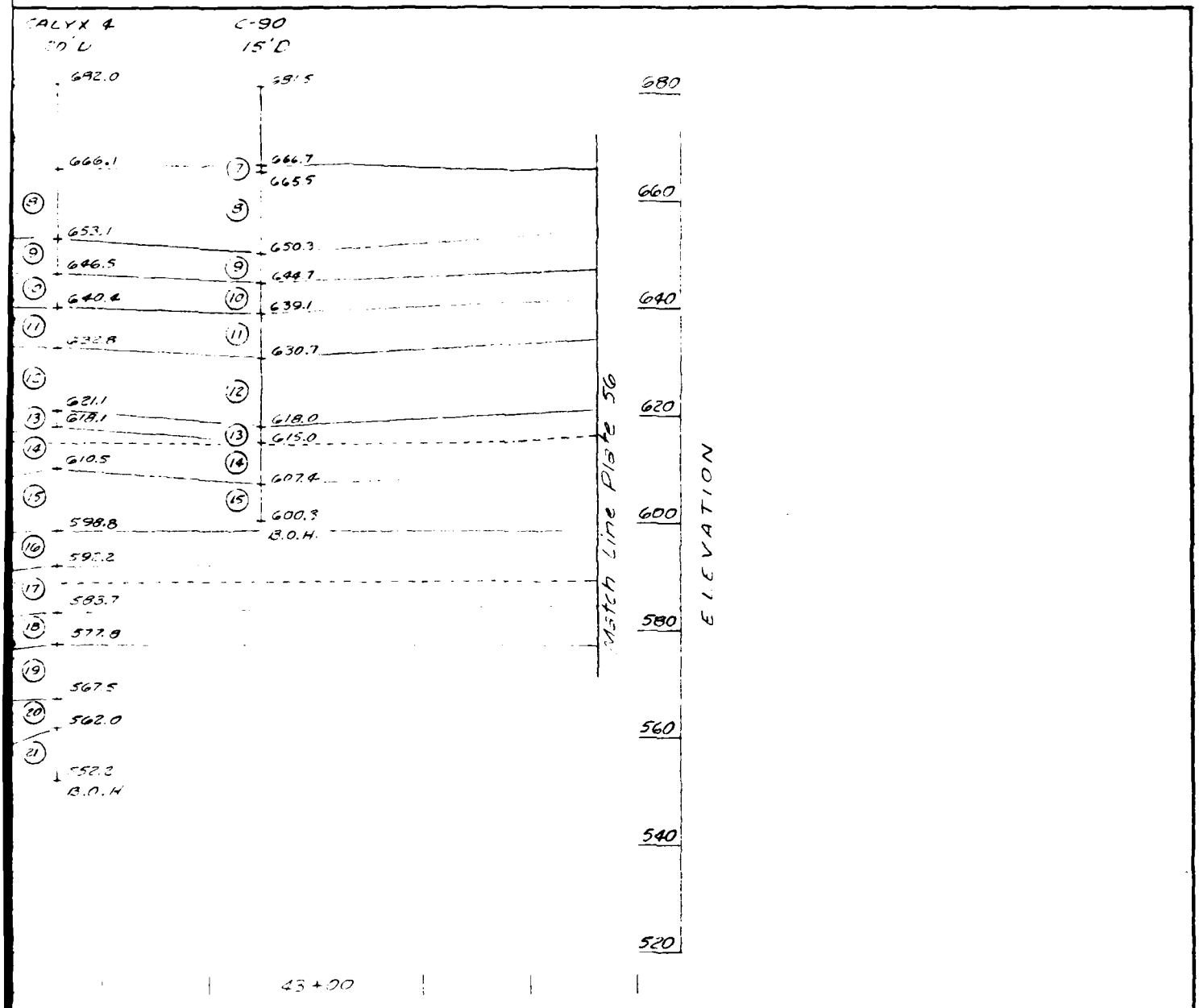
PLATE NO. 54



LIMITS OF ROCK EXCAVATION - PROFILE ALONG DAM AXIS
LOOKING UPSTREAM

For Legend See Plate 4

0 20
SCALE IN FEET



E ALONG DAM AXIS

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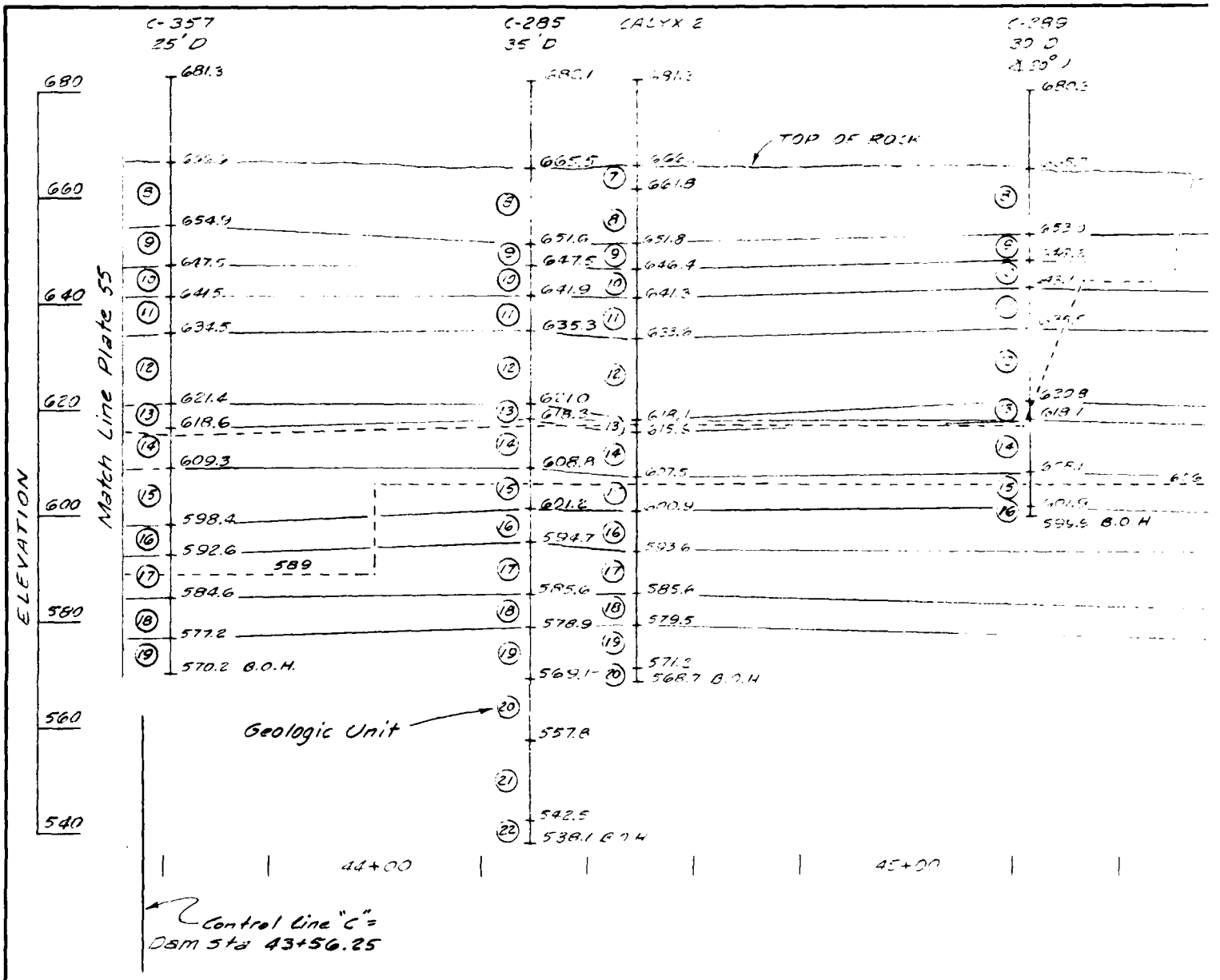
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LIMITS OF ROCK EXCAVATION
PROFILE ALONG DAM AXIS

Scale: AS SHOWN
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Sheet number:
Drawing No.: 0-12-985

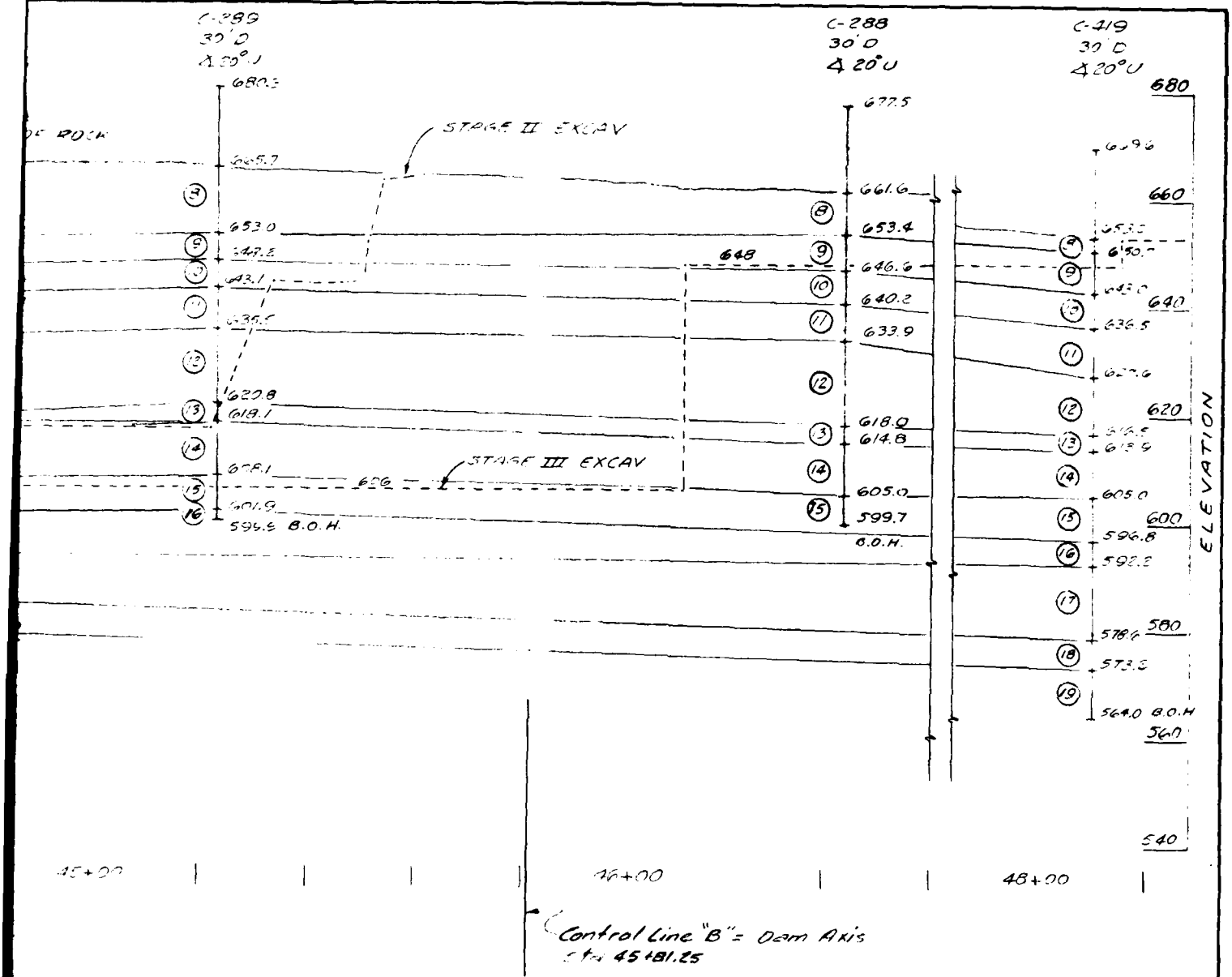
PLATE NO. 55



LIMITS OF ROCK EXCAVATION - PROFILE
LOOKING WESTERLY

For Legend See Plate 4

0 20
SCALE IN FEET



GVATION - PROFILE ALONG DAM AXIS

OKING UPSTREAM

0 20

SCALE IN FEET

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LIMITS OF ROCK EXCAVATION
PROFILE ALONG DAM AXIS

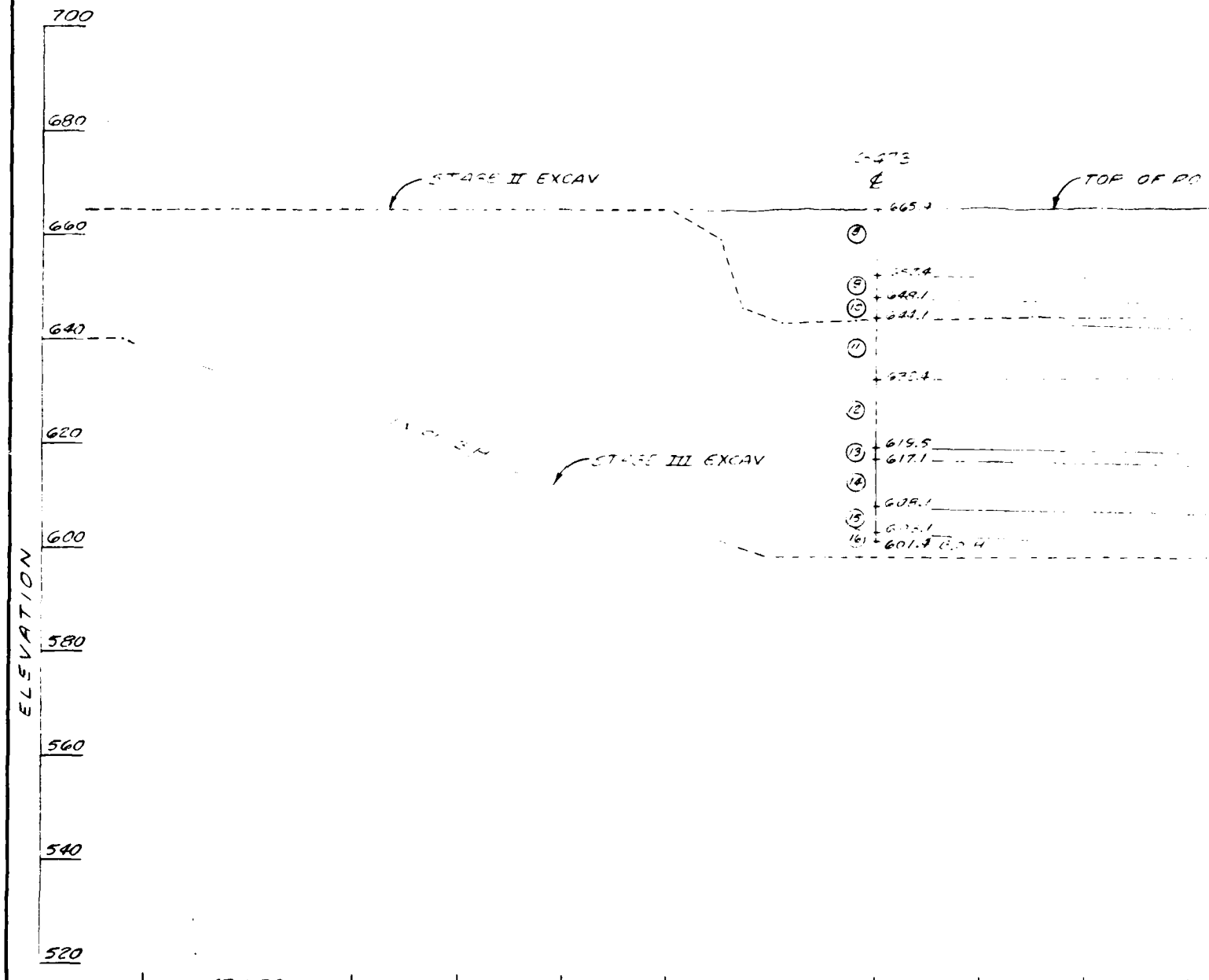
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PLATE NO. 56

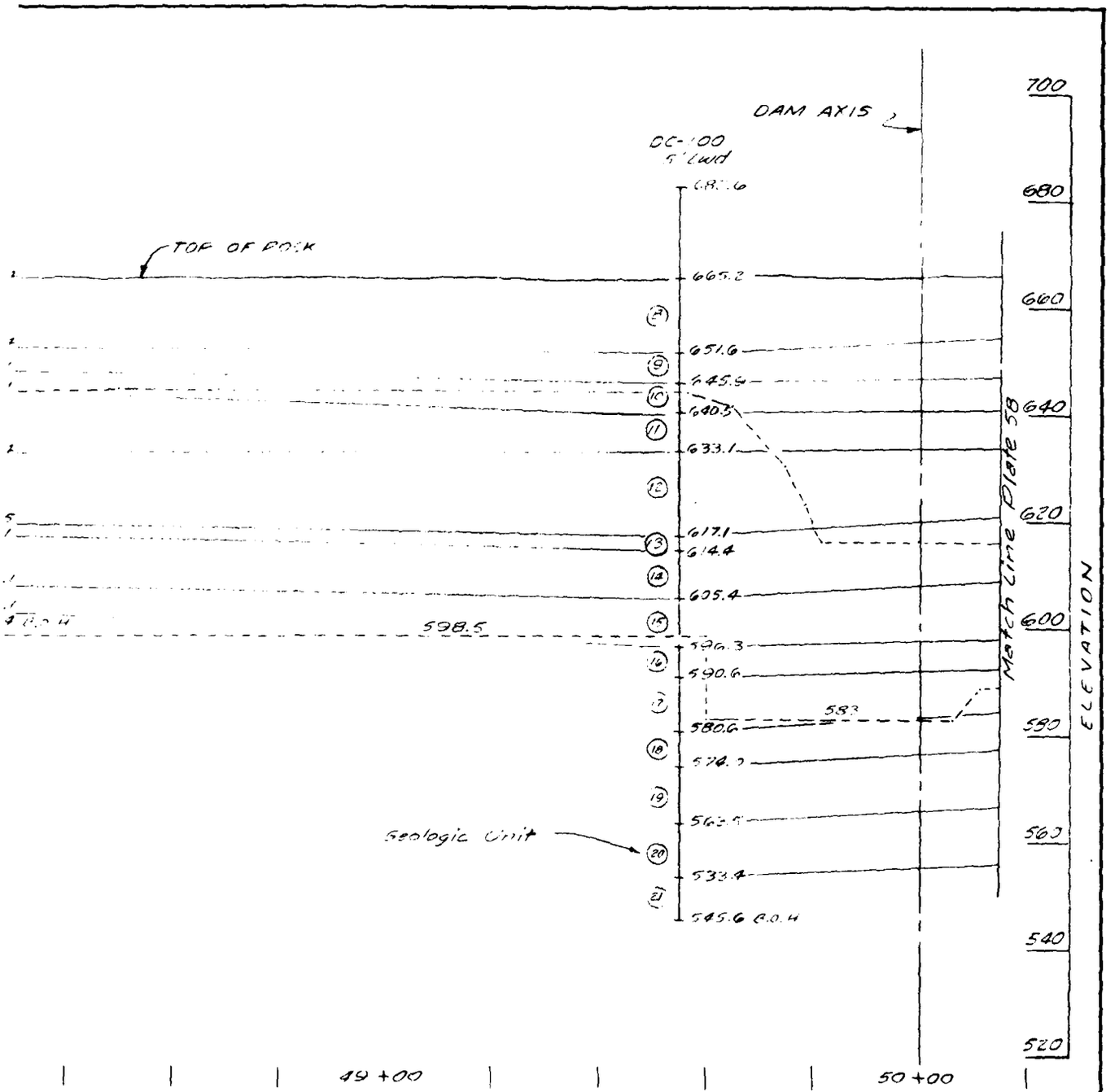


LIMITS OF ROCK EXCAVATION - PROFILE

Control Line "C" = Dam Station 43+50.00

For Legend See Plate 4

0 60
SCALE IN FEET



ON - PROFILE ALONG LINE "C"

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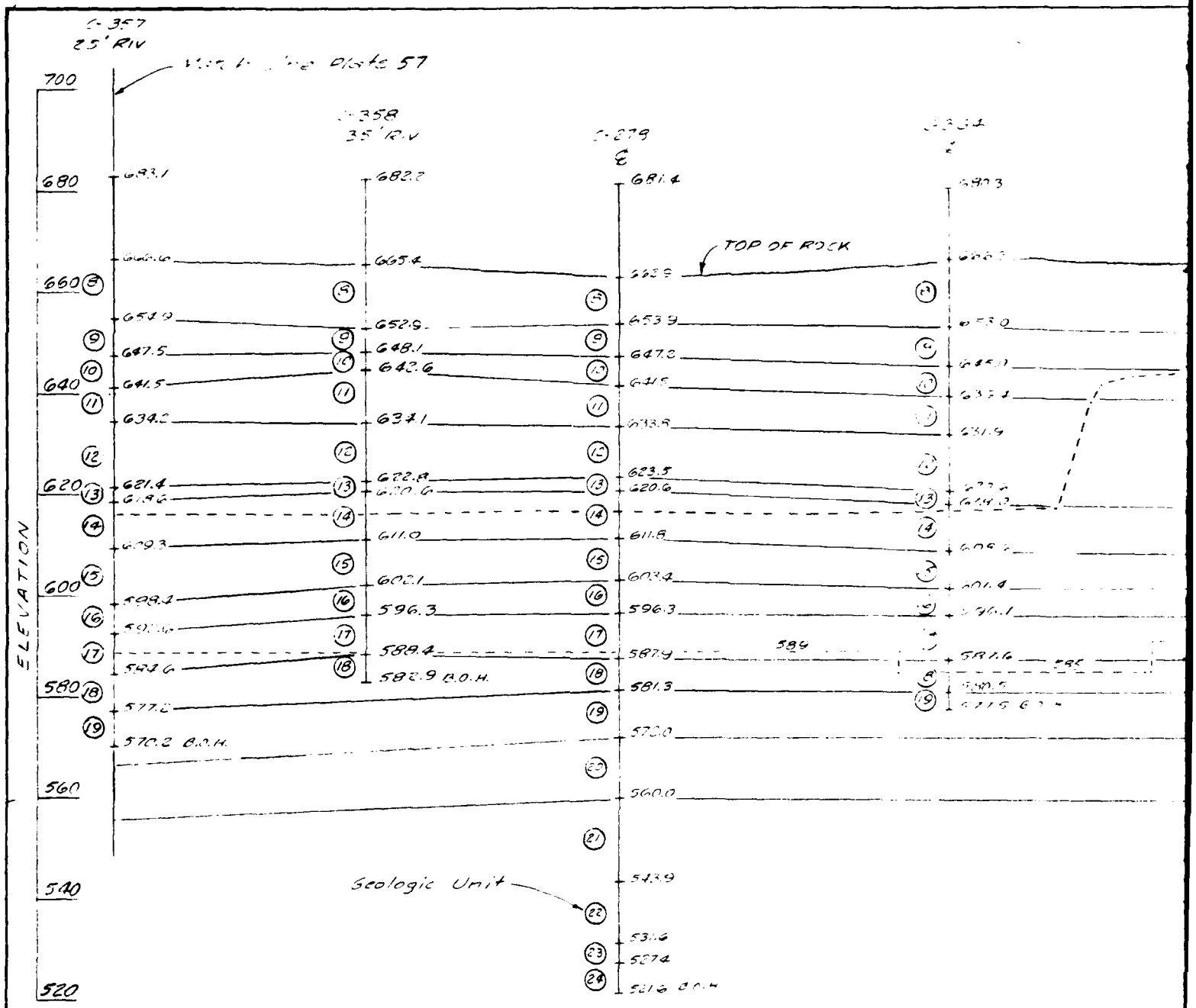
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LIMITS OF ROCK EXCAVATION
PROFILE ALONG LINE "C"

Scale: AS SHOWN
Date: MARCH 1958
Sheet number:
File No. 0-12-9187

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SCALE IN FEET

PLATE NO. 57

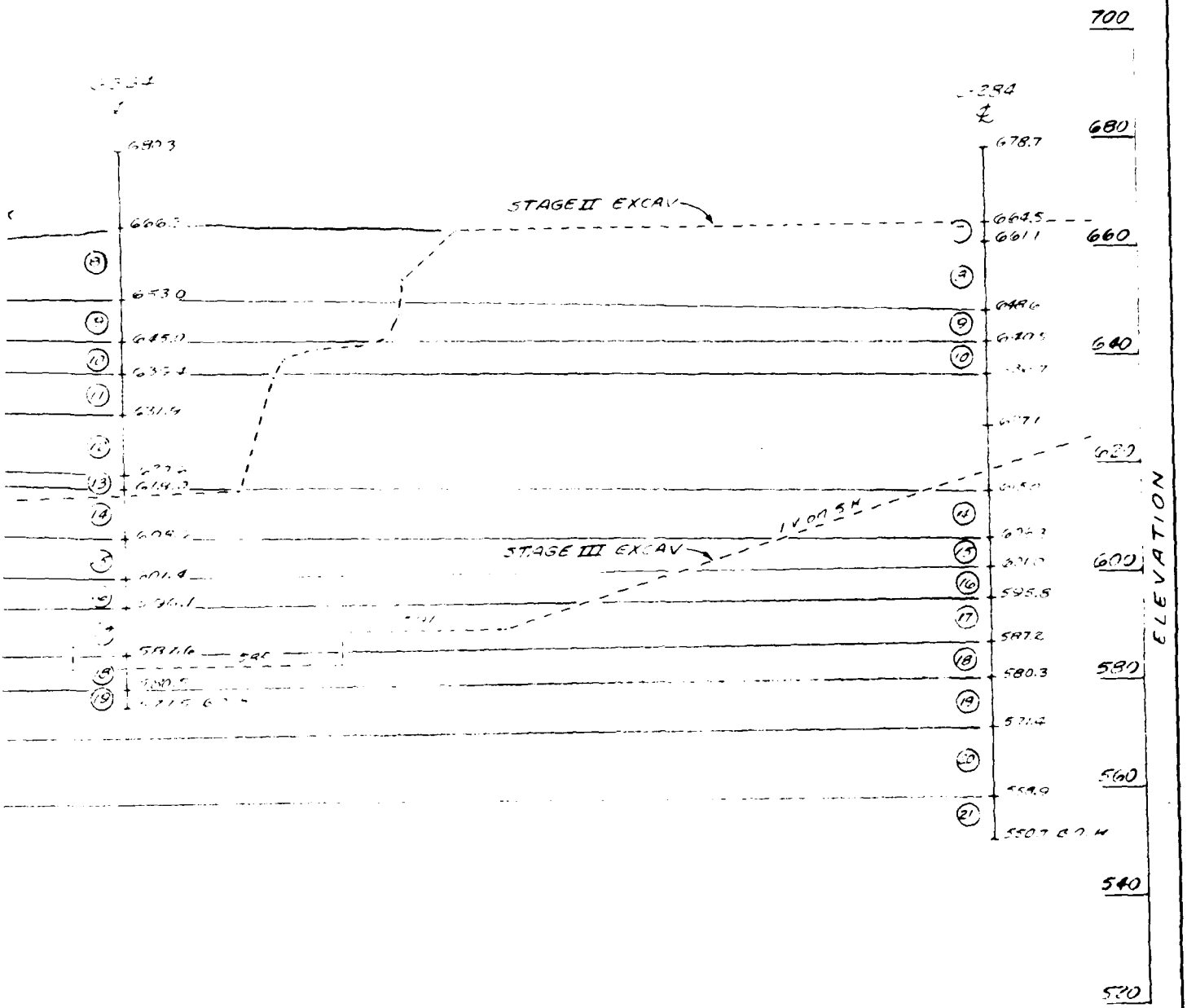


LIMITS OF ROCK EXCAVATION - SCHEME A

Control Line "℄" = Dam Station 42+56.35
Dam Axis is at Sta 50+00

For Legend see Plate 4

0 20
SCALE IN FEET



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LIMITS OF ROCK EXCAVATION PROFILE ALONG LINE "C"

Scale

Sheet number

Date: MARCH 1966

Dwg No.

File No. 0-12-9166

PLATE NO. 58

GEOLOGIC UNIT DESCRIPTIONS

To understand the map of the spillway powerhouse area, it may be interesting to note the method used to obtain the detail of the units, subunits, and their location. The vast exposure of the rock surfaces portrayed the big picture in viewing the units, and their trends, individually; and in relation to each other. Unit descriptions and their direction were obtained and traced along the unweathered presplit final rock surfaces. Accuracy in locating these units in respect to elevation and station was assured by the following method.

As the rock was being prepared (scaled, trimmed, and cleaned) there was opportunity to examine the rock and to map it by increments specifically pinpointed by the concrete pour layout drawings of the contract plans. As the rock was marked according to scheduled concrete pours, the foundation was also mapped. Essentially steel rebars, a part of the reinforced concrete design, were generally situated near the exposed rock surface on 12-inch centres to form a mat. The mat served as a grid over the rock providing control in which to map. Generally, stations, ranges, and elevations were a part of the pour layouts providing sufficient survey accuracy to map without the use of a survey party. Hence, no survey party was used. Finally, the "big picture" was thereby reproduced showing each rock unit, subunit, and boundary merely by fitting the rock map of each concrete pour together after concreting was completed.

GEOLOGIC UNIT DESCRIPTIONS

Unit 8

Description of Unit 8 is from the base (lowermost elevation upward). Unit 8 appears weathered with brown stain evident throughout.

8A

0.7 - 1.3' — Dolomite, shaly, lamellar to very thin bedded (up to ½"), gray, with blue-gray and black shale along beds. Unit is undulating generally and deformed locally.

8B, 8C

± 3' — Dolomite, gray, moderately hard

8C - Upper half - hackly and tripolitic.

8B - Lower half - very thin beds (1-3") locally indistinct and overridden by tripolitic dolomite, undulating, gnarly, with considerable healed high angl- fr ctures.

Top contact of ¼ - 1" b.ack chert locally indistinct.

8D, 8E

± 2' — Dolomite, gray, moderately hard

8E - Upper half - massive, medium grained (macroscopic) sandy, with scattered high angle fractures (no accurate fracture frequency determinable).

8D - Lower half - Very thin bedded, (beds uniformly 1 - 2") very fine grained (argillaceous), shaly contacts along beds, lightly fractured to unfractured, undulating.

8F, 8G

3 - 4' — Dolomite, gray, moderately hard

8G - Upper three-quarters - massive, tripolitic, hackly, and weathers brown.

8F - Lower one-quarter - red-brown-gray, very th' bedded (beds ¼") with locally indistinct separations, ..ying massive appearance. Unit is gnarly with intense random high angle fracture system; discontinuous.

Unit 9

Unit 10

Subunit A - 1.5' ±

Subunit 1 - 2.5' ±

Subunit 2 - 1.5' ± (top of Unit 10)

TAGE III CONSTRUCTION
uman Dam and Reservoir, Missouri
apping - Spillway Powerhouse Area

GEOLOGIC UNIT DESCRIPTIONS

Unit 9

Dolomite, moderately hard, brown-gray, massive appearing, (bedding exemplified by discontinuous chert bands along horizons 6-12" apart in lower 2/3 of this unit. Chert is 1-2" thick along discontinuous bands, blue, black, and white, locally disturbed and/or deformed. Dolomite is fine to medium grained, lightly to unfractured. Upper 1/3 of this unit is browner, without chert, locally hackly, locally vuggy, and containing random assortment of disoriented rock fragments of other units.

Upper contact appears to be chert seam which may or may not be continuous.

Unit 10

Subunit A - Dolomite (2 distinguishing units)

1.5' ± Upper 1/2 of subunit A, Dolomite, pink-gray, moderately hard, very thin bedded (beds varying 1/2-3"). Beds marked by shale veneer. No separations along beds except locally single discontinuous chert horizon at the unit base. Badly fractured with shale veneer on fracture faces. No separation along fractures except in scattered areas. This unit contains a very fine grained texture, is strongly undulating, and possesses several shale veneer bedding surfaces developing into lamellas shale stringers.

Lower 1/2 of subunit A, Dolomite, dark gray, course grained (sandy), massive with scattered high angle healed fractures (lightly fractured). No bedding planes are apparent. A strong continuous lamellas, gray, shale seam 1/2 - 1" thick is at the contact between the upper and lower subunits.

Subunit 1 - 2.5'± Dolomite, gray, moderately hard, massive, hackly, very fine grained but not tripolitic. A discontinuous wide 4"± chert band appears at a horizon about 1-2 feet below top of unit. The chert is very hard, dark blue and white banded. A very thin continuous blue chert band underrides the upper contact ranging in thickness between 1/2 - 4". These bands locally reflect prelithification disturbance and/or distortion. Most prominent in the upper half of this unit are discontinuous horizons of dolomite, very fine grained, very thin bedded (beds 1"±), locally deformed and disturbed, and undulating.

Subunit 2 - 1.5'± (top of Unit 10) Dolomite, moderately hard, light gray, thin bedded (beds 2-6") very fine grained (argillaceous) and containing conchoidal fracture characteristic. Unit is lightly fractured to unfractured. Shale veneer on bedding planes.

Lower 1/2 reflects a shaly appearance with blue-gray shale stringers, lamellar (1/4"-1 1/2") scattered throughout. Shaly dolomite, light blue-gray, is common. Contact with upper unit indistinct except for rock texture.

Revisions			
Symbol	Descriptions	Date	Approved

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OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

GEOLOGIC UNIT DESCRIPTIONS
SPILLWAY
POWERHOUSE EXCAVATION

Scale
Sheet number
Date MARCH 1966
Drawing No. 0-12-9189

PLATE NO. 59

GEOLOGIC UNIT DESCRIPTIONS

Unit 11 — Unit 11 (From base to top)

11A (1.5'±) — Shale, dolomitic, blue-gray and white interbeds; lamellar to very thin bedded (± 1"), moderately hard, scattered fractures, undulating; varies in thickness locally. (Reduces to flat and elongated shards under artificial breaking).

11B (1.5'±) — Dolomite, dark gray to brown-gray, dense, cherty, gnarly, very finely crystalline, hard, and very thin bedded (beds 1/2 - 1" but without separations). Bedding often obliterated and replaced by massive unfractured conglomeration of brown and dark gray dolomite in random pattern. Rock is badly fractured with very fine or incipient discontinuous fractures, with dark gray chert common locally (no tripolitic chert).

11C (0.5'±) — Dolomite, light gray, very fine grained, (not argillaceous), hard, dense, with considerable healed high-angle fractures with shale veneer. Unit is undulating, massive (bedding indistinct), cherty, black-gray and white, in discontinuous seam along upper contact.

11D (1.5'±) — Dolomite, dark gray and brown-gray, mottled, hard, dense, unfractured, (except locally) and massive. Locally, traces of very thin beds, 1/2" and less, deformed and undulating occur without bed separations. This unit may, with small differences, be defined as a sister unit to 11B in texture except that chert is only widely scattered. Beds are not pronounced. The small differences are locally indistinguishable.

11E (1.0'±) — Chert, very hard, black and white, oolitic, very thin bedded (beds ± 1-2") intensely fractured and locally vuggy.

Unit 12

$12A_1$ — Contact with top of Unit 13 (Base of Unit 12)

(3'±) — Dolomite, moderately hard, brown, dark gray to black-gray, massive, hackly, intensely fractured (high angle) in areas of local distortion. This unit reflects a dense, finely crystalline dolomite, that has been severely broken up and redeposited in a random fashion with a softer, lighter gray dolomite as matrix; appearing to weather more easily, this resembling a tripolitic mass. Dark crystalline fragment sizes vary widely. Chert is scattered throughout. Scattered evidence of very thin beds (1-2"), deformed, are in lower 1/2 of the unit. Lower one-half of $12A_1$ consists of a hard dense, blue-gray to brown-gray dolomite portraying a very thin bedded structure (beds one-inch thick and less) deformed and distorted. Mass looks like whorls around large chert nodules intensely fractured and broken. Deformation and distortion common. Seepage avenues with accompanying permineralization locally prominent.

$12A_2$ (1.5'±) — Dolomite, hard, light gray, very fine grained, sandy, thin bedded (1"-6") but with relatively indistinct bedding separations. Unit is gnarly with considerable number of healed, discontinuous, vertical and high angle fractures.

$12A_3$ (0.5'±) — Chert, very hard, oolitic, dense, blue, brown, and gray, lightly fractured with intense fracturing associated with undulations.

$12B_1$ (1.0'±) — Dolomite, tan-gray, massive, hackly (resembles pebble conglomerate locally), unfractured, and capped with a black and white 1" chert band, lightly fractured, and strongly tripolitic.

$12C_1$

$12C_2$

$12B_2$

$12B_{2a}$

Unit

"S"

Unit

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STAGE III CONSTRUCTION

Truman Dam and Reservoir, Missouri

Mapping - Spillway Powerhouse Area

GEOLOGIC UNIT DESCRIPTIONS

$12C_1$ (6.5'±) — Dolomite, brown-gray, hackly, massive, but possessing bedding locally that is generally indistinct. Unit appears sandy, very fine grained at the base but reflects a transitional finer texture toward the top. Argillaceous appearance is characteristic near top of unit. Oolitic dark gray and blue chert mixed with dark gray dense dolomite, produces a mottling appearance that can locally be defined as bedding, very thin (beds 1 - 3"). This unit resembles a conglomeration of units (more than one) mixed together prior to the completion of lithification and redeposited in a deformed distorted mass.

$12C_2$ (1.5'±) — Dolomite, gray and tan-gray, very fine grained, very thin bedded, (beds 3" and less), intensely fractured, gnarly, with scattered discontinuous chert seams locally deformed, distorted, and undulating.

$12B_2$ (1.0'±) — Dolomite, moderately hard, pink to tan-gray, very thin bedded, (beds 3 - 5"), argillaceous appearing, unfractured except for scattered high angle fractures marked by shale veneer. This unit is capped and based with shale stringers, blue-gray, lamellar, soft to moderately hard, with blue and white chert scattered throughout the shale. Considerable undulation is noted in the shale.

$12B_{2a}$ — Locally identified as shale with chert prominent enough to be considered as an independent subunit.

Unit 13

Dolomite, light gray, uniformly very fine grained, argillaceous, scattered high angle healed fractures with shale veneer, very thin bedded with shale veneer along bedding plane (no separations) massive appearing, undulating. Unit bounded at the base by the "S" chert horizon and at 1'± below the top by a prominent stringer of chert 1" thick, continuous, blue and white, very hard, and undulating with the unit. Chert is locally interlaced with lamellar blue-gray shale.

"S" — Chert, blue and white, very hard, badly fractured with dark gray, dense, dolomite fragments, tripolitic (white) chert, and barite deposits widely scattered throughout. Black and gray shale interstices locally common. Iron stain on exposures prominent. This unit forms the base and is identified with Unit 13.

Unit 14

This unit is generally uniformly hackly portraying secondary deposition or a redeposition of semilithified primary sediments earlier distrubed by possible wave action. The unit is considered hackly, locally vuggy and possessing white tripolitic chert bands on a spacing of 6 to 10" (notably 5 bands passing through the center of the unit). This unit is bounded by chert zones each identified individually. There is some evidence that this unit doubles in thickness (2X? or 8') on the powerhouse wall indicating possible translational movement along a bedding plane (bedding plane fault)

Revisions			
Symbol	Descriptions	Date	Approved

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HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

GEOLOGIC UNIT DESCRIPTIONS
SPILLWAY
POWERHOUSE EXCAVATION

Date: MARCH 1985

Title No. 0-12-9190

PLATE NO. 60

GEOLOGIC UNIT DESCRIPTIONS

Unit 14A rests atop Unit 15C, the sandy unit of 15.

Unit 14A - Dolomite, and chert, light gray to dark gray, hard, dense to crystalline, badly fractured (fracture internal (1-3") very thin bedded (beds 1/2'-4") capped with white to blue gray discontinuous chert seam, very hard and lightly fractured. Estimated thickness 1 - 1.5'.

Unit 14B - Dolomite, hackly, moderately hard, gray to brown gray (locally), lightly tripolitic with 5 nearly continuous hard white tripolitic chert seams 1/4-1" thick on 6 to 10" spacings. Within the five bands is confined the vuggy formation with vugs not larger than 1" diameter. No interconnections are apparent.

Unit 14C - Dolomite, cherty, hard, dense, finely crystalline, gray to black gnarly, with interbeds (indistinct) of brown gray dolomite. Chert, crystalline and tripolitic scattered throughout with nearly continuous seam of blue-gray and white chert on upper contact with Unit 13. Unit appears massive with indistinct beds and locally deformed and/or distorted.

Unit 15

15A — Contact with top of Unit 16 (Base of Unit 15) Dolomite, moderately hard, brown gray, massive, strong pattern of incipient healed fracture with pyrolusite or shale veneer in random pattern. No bedding orientation except locally deformed striae blue-white and black chert randomly oriented and scattered throughout, very fine grained.

15B — Dolomite, very hard, dark gray, dense, massive, but containing very thin beds of cyclic deposition ranging from black-gray to light gray, (beds 1/4"+) without distinct separation planes. Bedding strongly deformed and distorted with considerable blue-gray and white chert bands distorted and deformed penetrating at random throughout the mass. Texture is sandy (but fine grained). Chert comprises the majority of the whole in local instances.

15C — Dolomite, sandy, medium grained, resembling possible fossil debris, massive, light gray, (bedding not apparent) scattered traces of one chert band, undulating but continuous portraying a specific temporal horizon. This band is about 2' from base of 15B, 0.2' thick blue-gray, and oolitic. Above the band appears a lightly tripolitic and hackly texture. Tripolitic chert bands discontinuous but resembling the same temporal horizons are scattered more prominently in the upper 1/2 - 1/3 of 15C. Spacing 3-6".

15D — Dolomite, light (white) gray, moderately hard, very thin bedded (1/2-3") medium grained sandy texture, not in contact with 15C to very fine argillaceous texture in contact with U14. Unit undulates. Unit contains some minute vugs and considerable number of high angle fractures. Shale veneer common on beds and on high angle fractures locally.

Unit 16

Dolomite, very fine grained, massive to very thick bedded, (beds 12±)containing shale veneer (may be defined as shale stylolites - see 16 definition KCDO). Bottom third is tripolitic, with thin beds of tripolitic chert, one of which is continuous one-fourth up from unit base. One-third up from unit base is stylolitic shale seams 1/2" on center for a thickness of 3-4 inches. Above the shale, the dolomite portrays an aphanitic texture with considerable perpendicular and high angle fractures healed or containing a shale veneer. Fracture frequency 4 in 12 inches.

III CONSTRUCTION

Dam and Reservoir, Missouri

g - Spillway Powerhouse Area

GEOLOGIC UNIT DESCRIPTIONS

Unit 17

A_3 - Base of 17
Shale, moderately hard, gray and green gray, lamellar, but possessing massive characteristics, widely scattered fractures, healed, undulating, deformed occasionally and containing scattered white chert nodules, bounded by white chert seams and nodules relatively discontinuous. Chert seams serving suitable markers immediately below and above the shale with greater chert concentration at the base.

A_2 Dolomite, gray, moderately hard, massive, gnarly, tripolitic upper half, with trace of hard, dark gray and blue, discontinuous, chert zone midway throughout the unit. Scattered blue and white chert throughout the lower half. Unit possesses very fine grain, sandy texture.

A_1 Dolomite, very thin bedded, (beds 1/4 to 1"), moderately hard, brown-gray, unfractured, (possessing massive characteristic), and containing very fine grain sandy texture. (This unit may be the top of the massive tripolitic unit defined by A_2 as tripolitic rock is exposed on the 583 floor)

A Dolomite, dark gray, moderately hard, very thin bedded, (beds 1-3"), intensely fractured, with bands of chert, white, gray, scattered in uniformly horizontal orientation throughout. Unit is capped with white chert band, 1±" thick. Fractures noted are healed and partially healed. Upper section is sandy dolomite, very fine grained.

B Dolomite, massive to thick bedded, gray, moderately hard.
Upper 1.5' - Unit is tripolitic, vuggy, indicating some solution cavitation in the sandy tripolitic zone.
Lower 2.5' - Shale veneer on beds 1-6" thick with no separation planes. Fractures are scattered and healed. Dolomite is smooth, aphanitic, and massive in appearance with scattered bands of white chert in the lower 1/4 of the unit.

C Chert, light gray to white, very hard, sandy, very fine grained with some gray shale lenses. Lower contact is tripolitic, soft, white, 1/2-3" thick.

D Dolomite, gray, massive, lightly tripolitic, sandy, (coarsely crystalline), locally vuggy, and scattered discontinuous shale veneers. Unit is sandy, moderately hard.

E Chert, dark gray to blue, very hard, lightly fractured, massive.

E Top of Unit 17.

Revisions			
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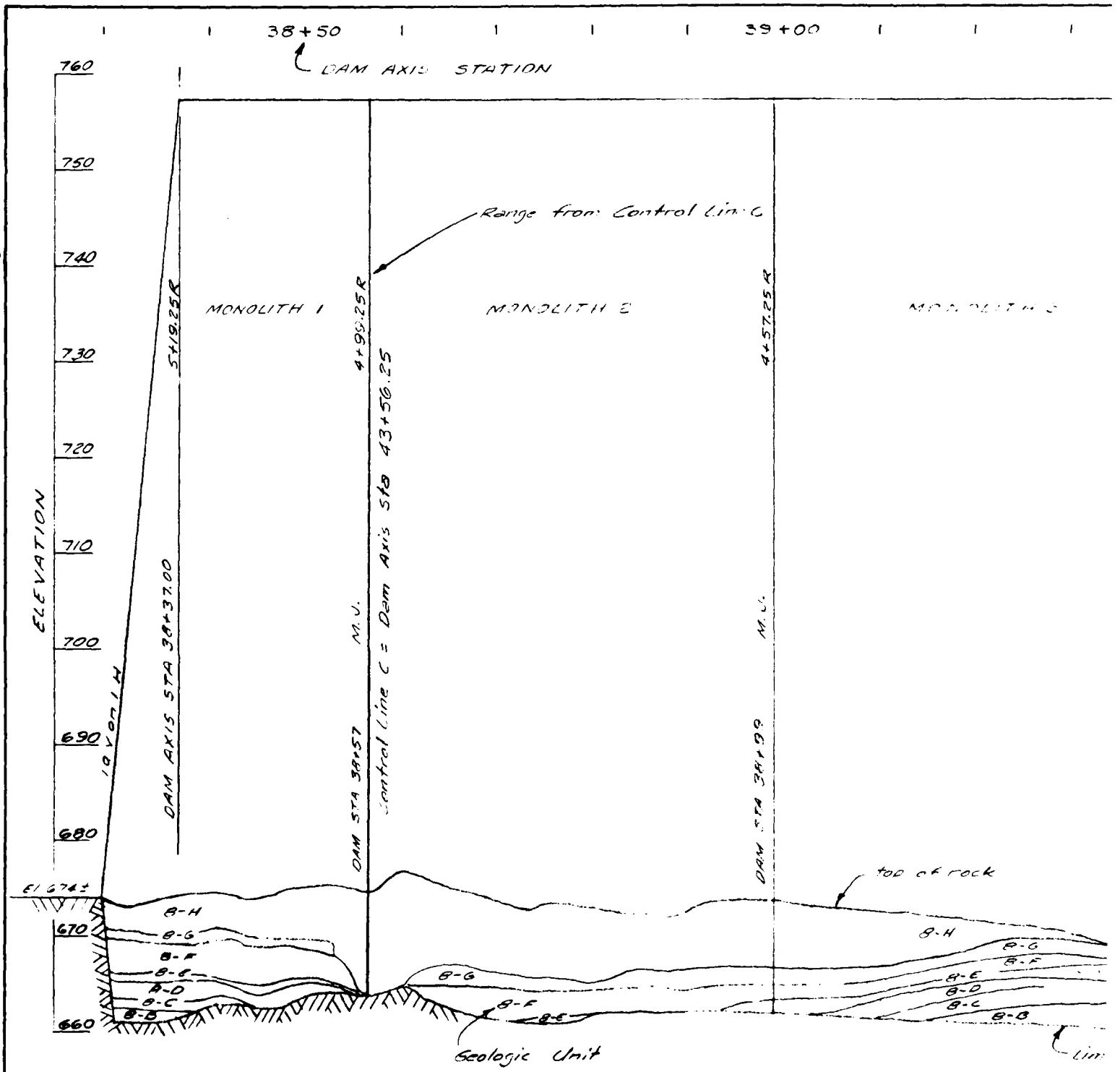
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CONSTRUCTION FOUNDATION REPORT

GEOLOGIC UNIT DESCRIPTIONS
SPILLWAY
POWERHOUSE EXCAVATION

Scale
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File No. 0-12-9191

PLATE NO. 6



STAGE III UPSTREAM FACE EXCAVATION NON-OVERF

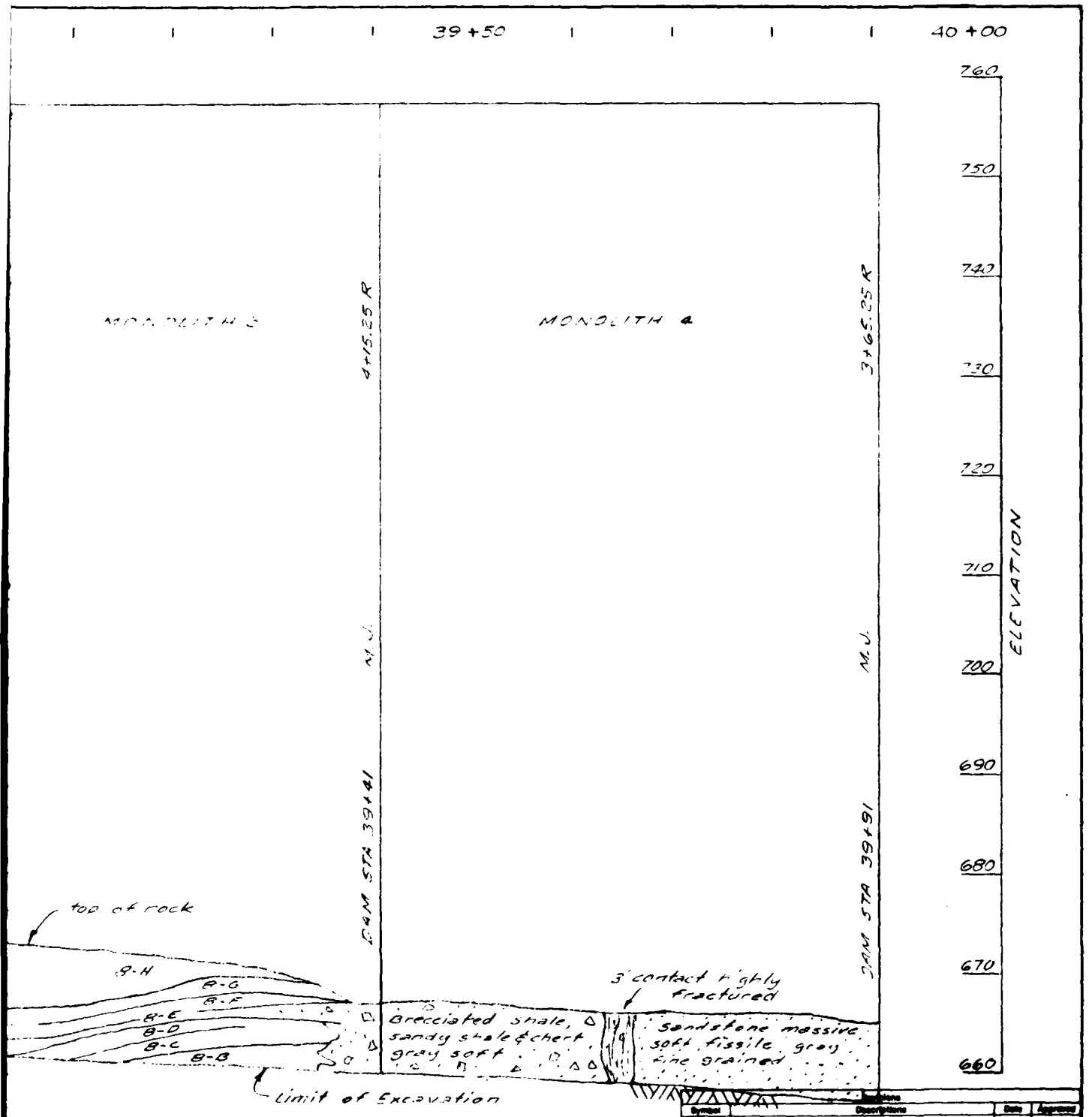
1 THRU 4 ELEVATION AT R

LOOKING UPSTREAM

For Legend See Plates 59, 60 & 61

0 10

SCALE IN FEET



...ON NON-OVERFLOW MONOLITHS

...4 ELEVATION AT R 0+18.25 UP

10

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Symbol	Revisions Description	Date	Approved

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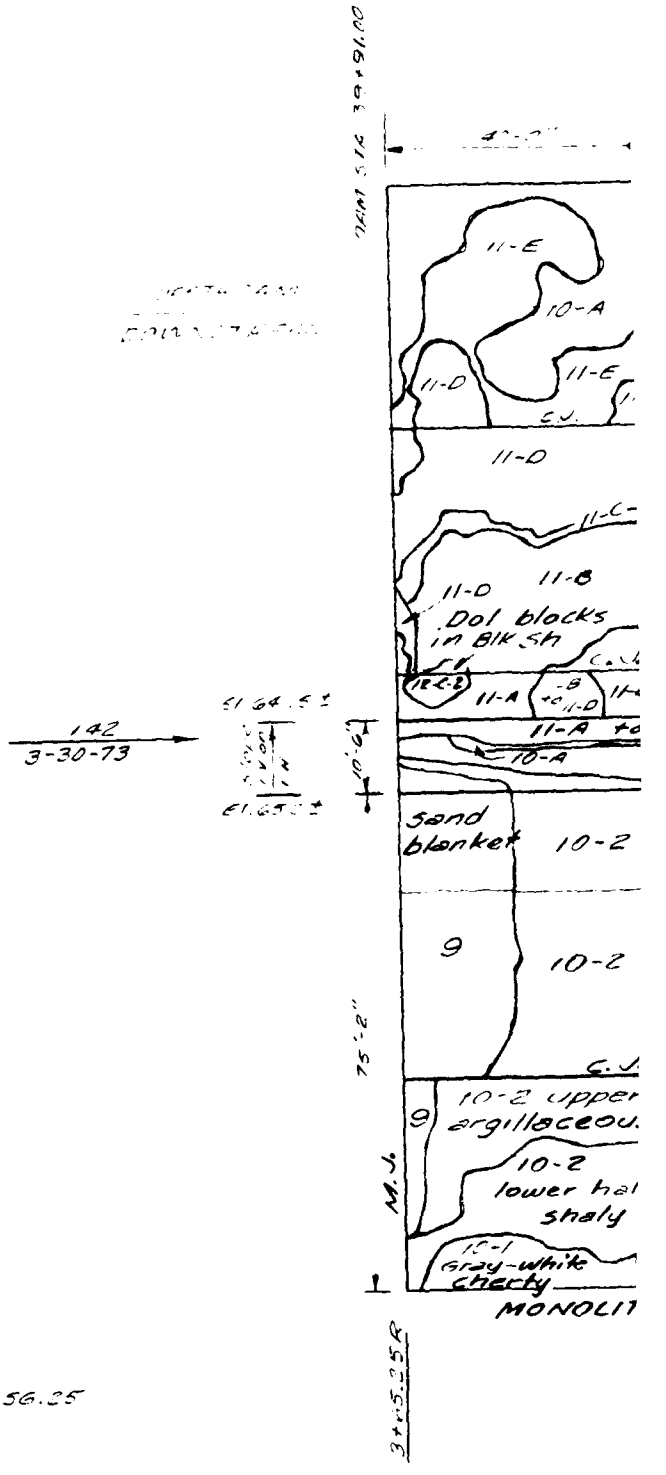
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UPSTREAM FACE EXCAVATION NON-OVERFLOW MONOLITHS 1 THRU 4

Scale
Date: MARCH 1956
Drawing number:
File No. 0-12-9192

PLATE NO. 62

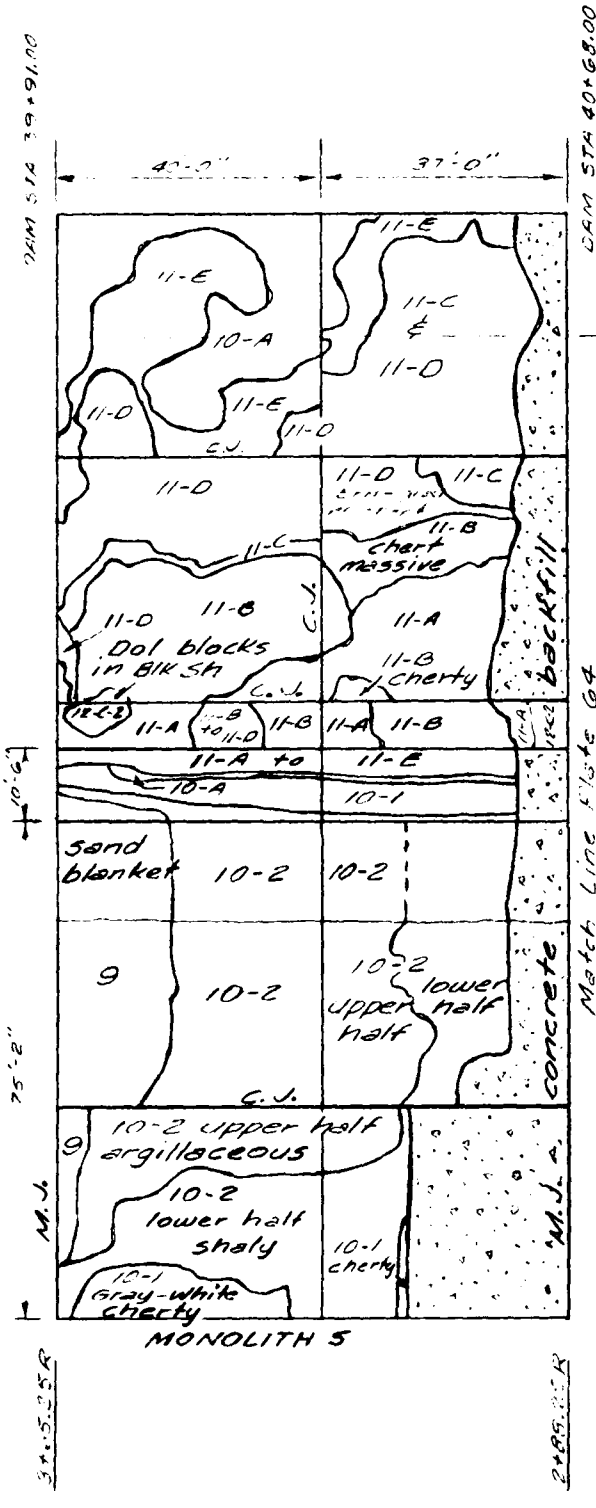


Range From Control Line C
Control Line C = Dam Axis Sta 43+56.25

STAGE III FOUNDATION MAP ERECTIOI MONOLITH 5

For Legend See Plates 59, 60 & 61

SCALE IN FEET



45+91.75

℄ Dam = Spillway Sta 50+00.00

50+18.25

50+55.25

50+62.26

50+72.76

51+16.92

51+47.92

ON MAP ERECTION BAY
OLITH 5

SCALE IN FEET

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

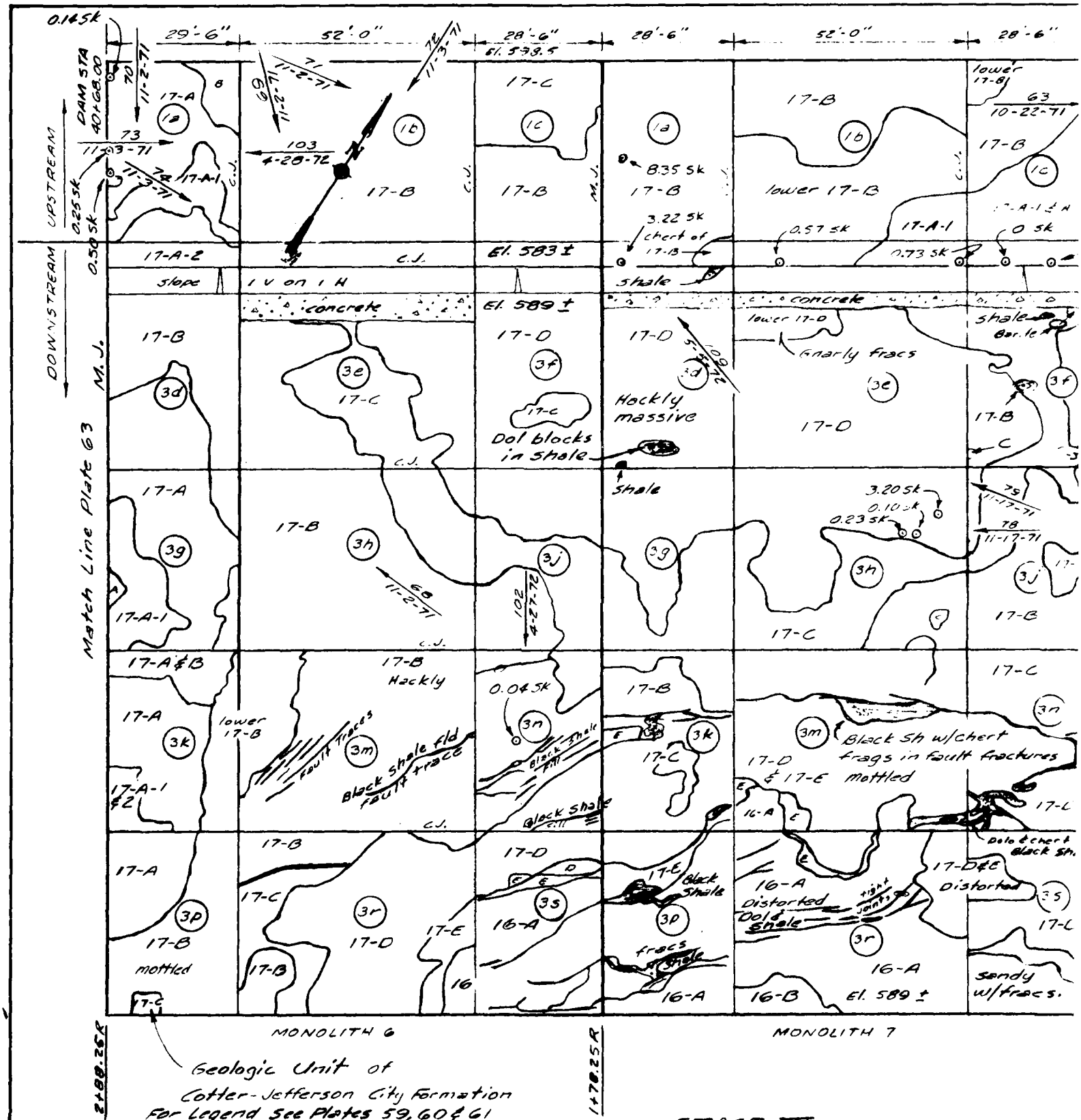
Designed by
Drawn by
Checked by
Submitted by

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

FOUNDATION MAP ERECTION
BAY MONOLITH 5

Scale
Date: MARCH 1958
Sheet number
File No. 0-12-9103

PLATE NO. 63



STAGE III

FOUNDATION MAP POWERHOUSE MONOLI

Range From Control Line C

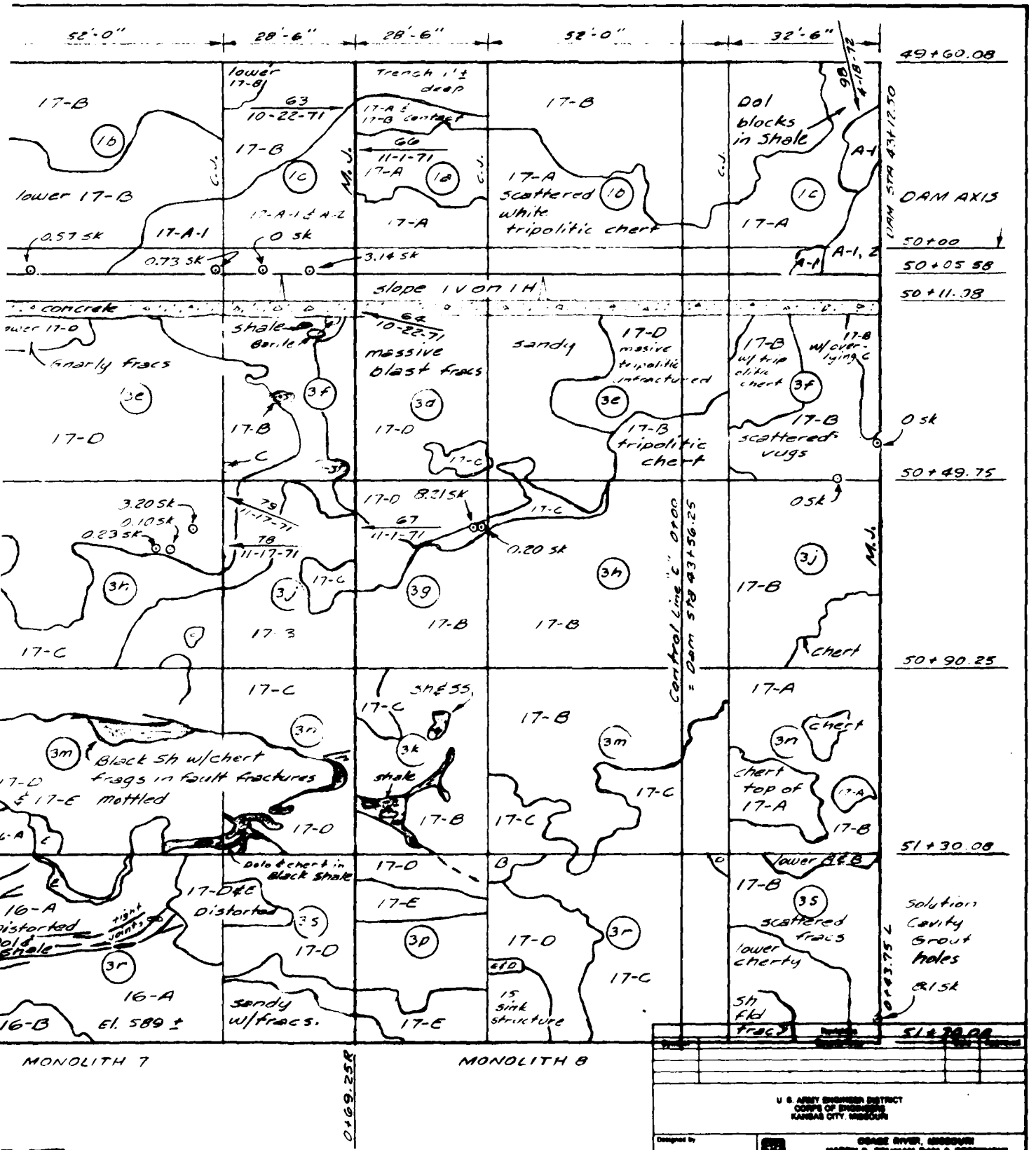
Control Line C = Dam Axis Sta 43+56.25

(1a) ← Concrete Pour No. First Lift

0 ——— 20

SCALE IN FEET

71 / 11-2-71 — Direction Number & Date of Photo



E III

VERHOUSE MONOLITHS 6, 7 & 8

71 / 11-2-71 — Direction Number & Date of Photo

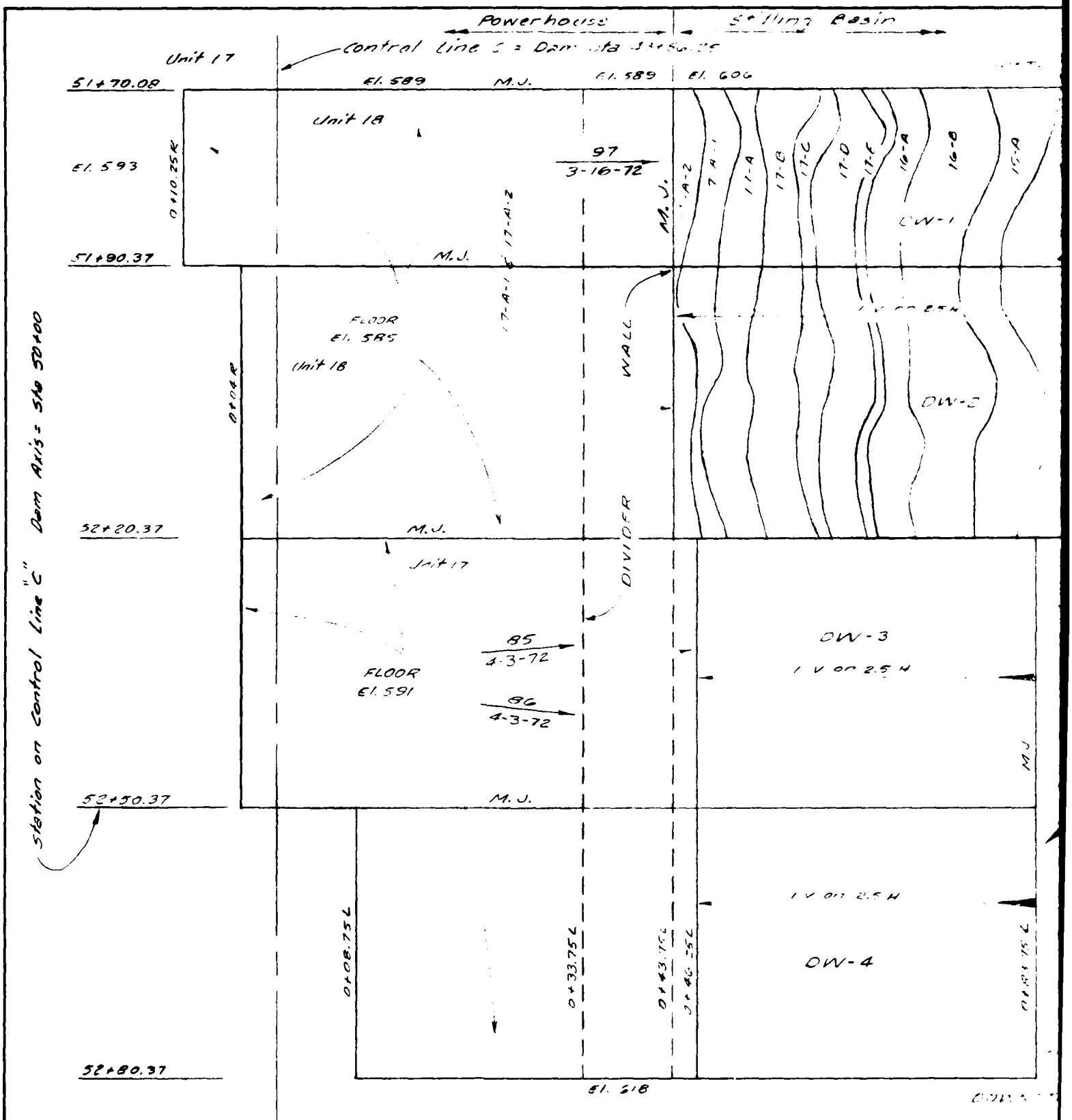
U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

OSAGE RIVER, MISSOURI
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CONSTRUCTION FOUNDATION REPORT

FOUNDATION MAP POWERHOUSE
MONOLITHS 6, 7, & 8

Designed by
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Checked by
Submitted by
Scale
Date MARCH 1968
Sheet number
File 0-2-9184

PLATE NO. 64

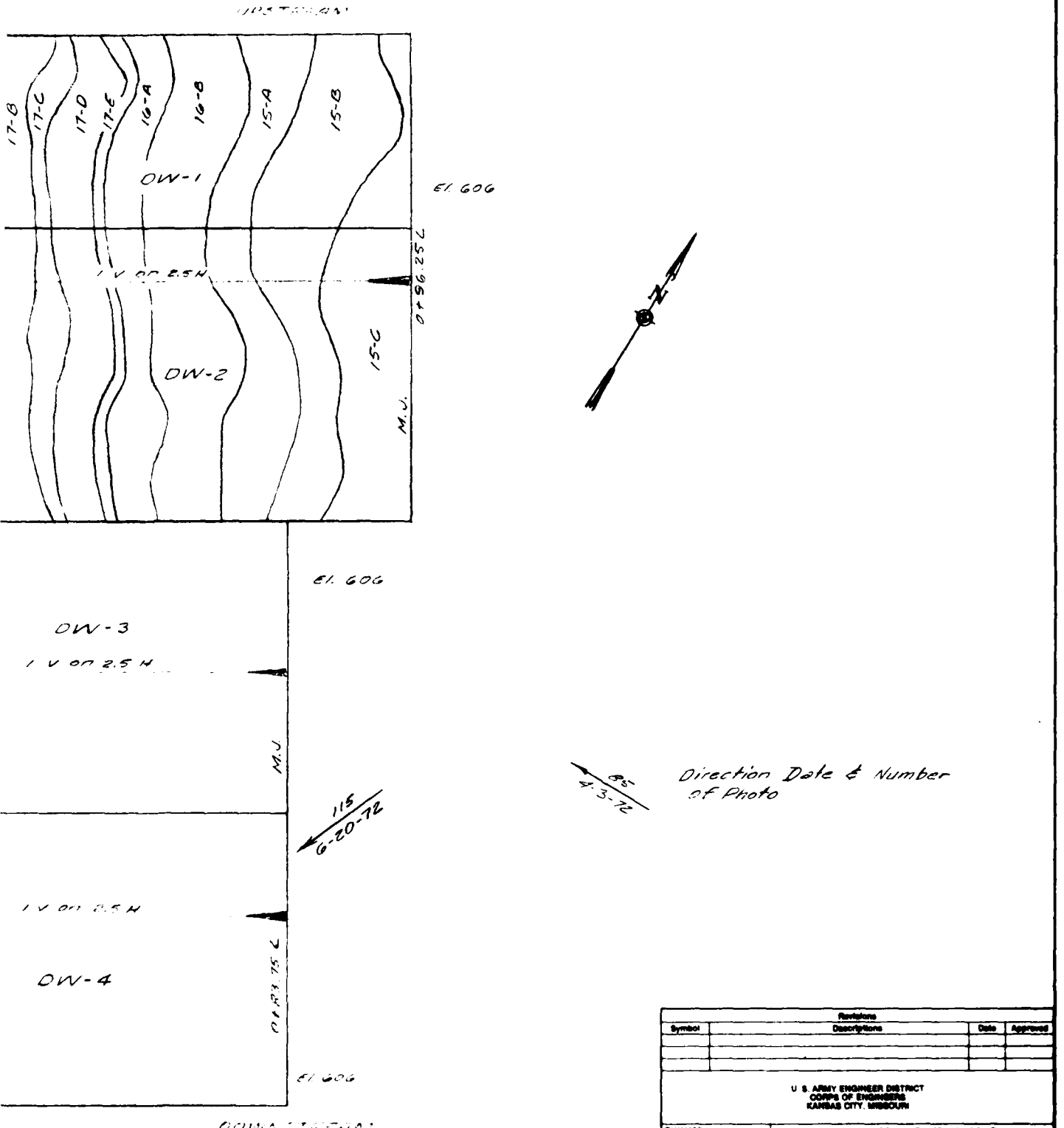


STAGE III FOUNDATION MAP DIVIDER WALL AREA

For Legend See Plates 59, 60 & 61

SCALE IN FEET

ing Basin



DER WALL AREA

10

IN FEET

Revisions			
Symbol	Descriptions	Date	Approved

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CONSTRUCTION FOUNDATION REPORT

FOUNDATION MAP
DIVIDER WALL AREA

Scale

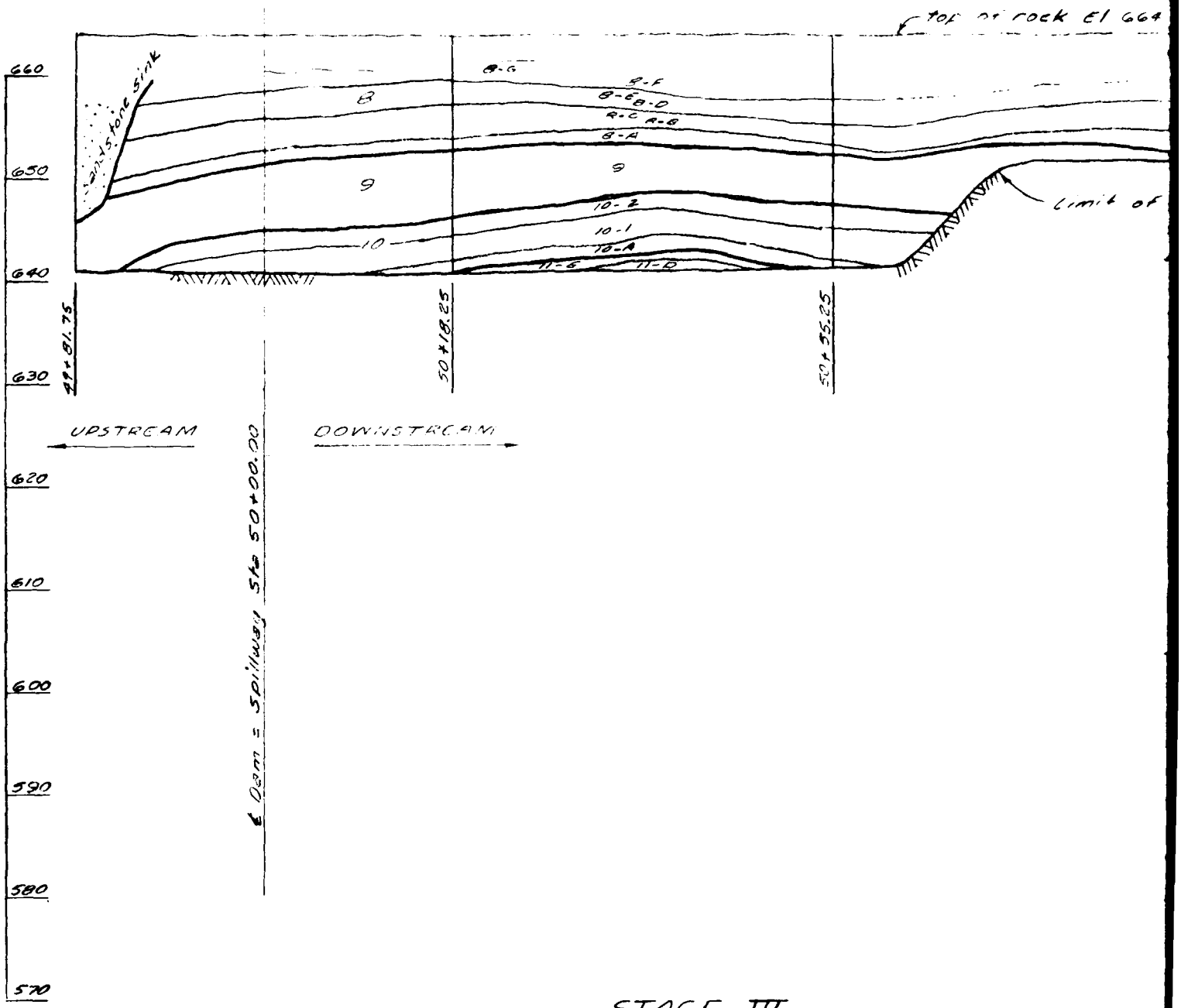
Sheet number

Date: MARCH 1968

Drg. No.

File No. 0-12-9195

PLATE NO. 65



STAGE III

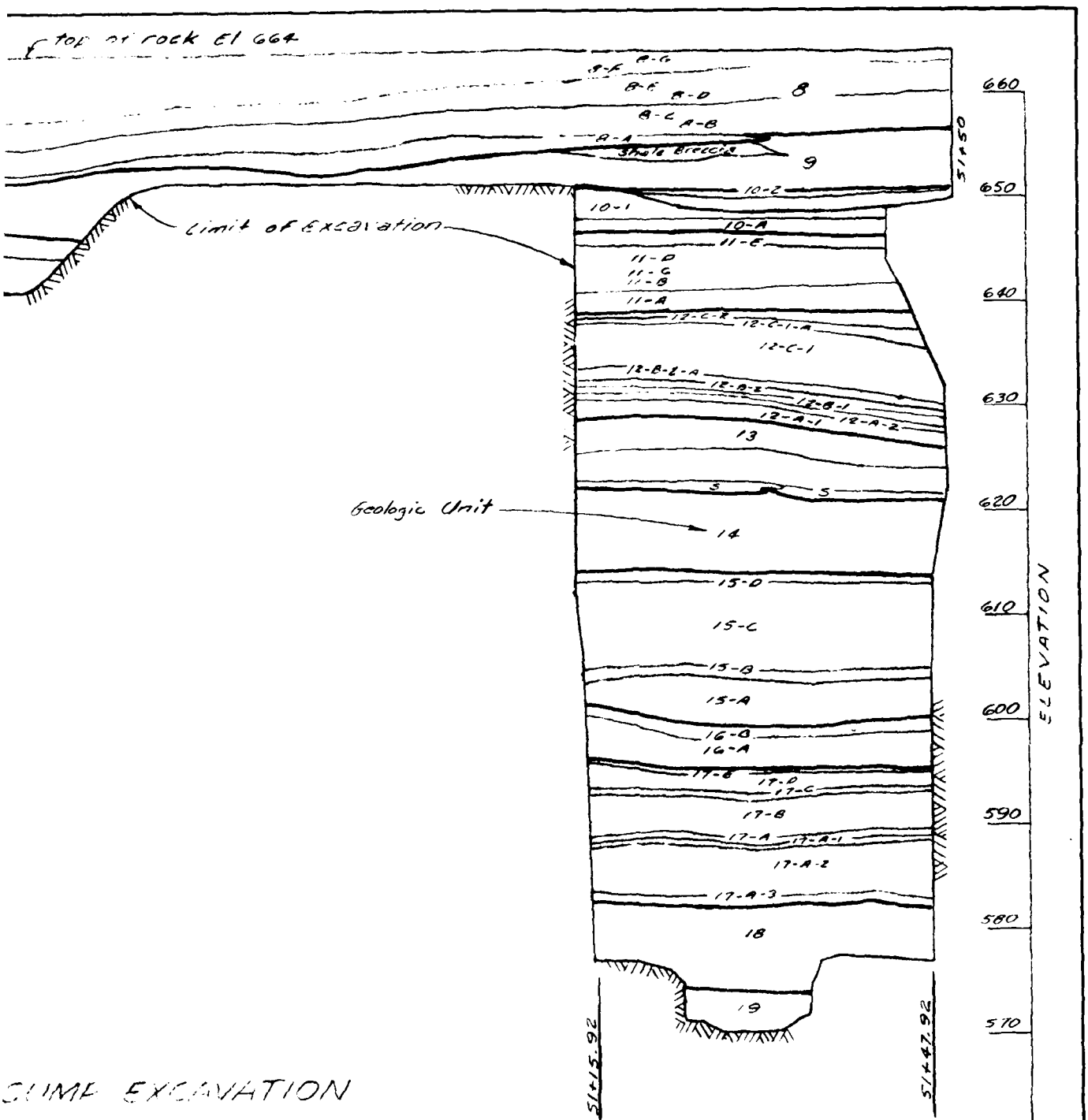
POWERHOUSE ERECTION BAY AND SUMP EXCAVATI

LEFT WALL

SECTION AT DAM AXIS STA
CONTROL LINE C RANGE 2

0 10
SCALE IN FEET

For Legend See Plates 59, 60 & 61



SUMP EXCAVATION

SECTION AT DAM AXIS STA 40+68
CONTROL LINE C RANGE 21 B.S.P.C.R

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CONSTRUCTION FOUNDATION REPORT

POWERHOUSE ERECTION BAY & SUMP EXCAVATION LEFT WALL

Scale

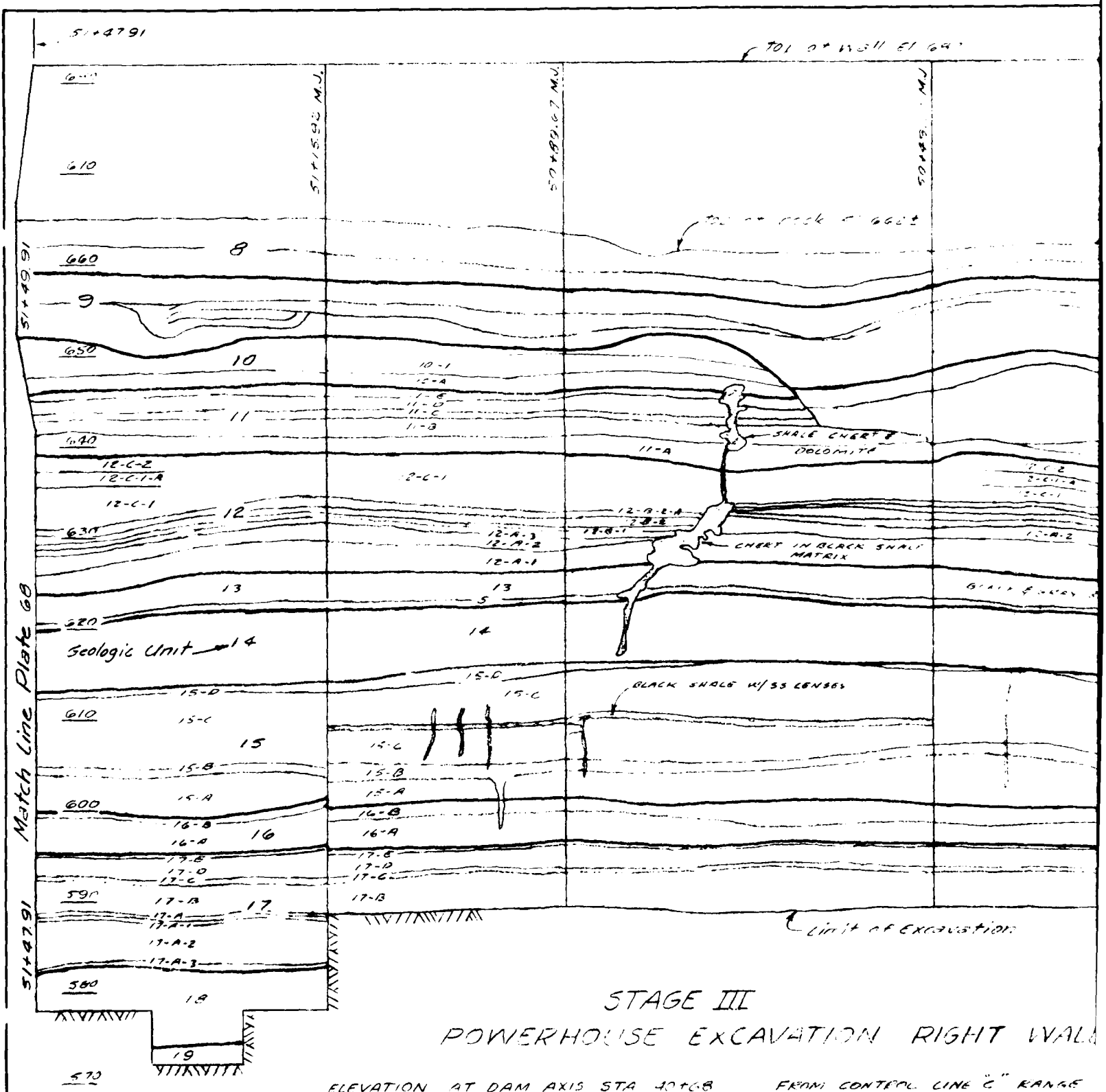
Date: MARCH 1955

Drg. No.

Sheet number:

File No. 0-12-9106

PLATE NO. 66

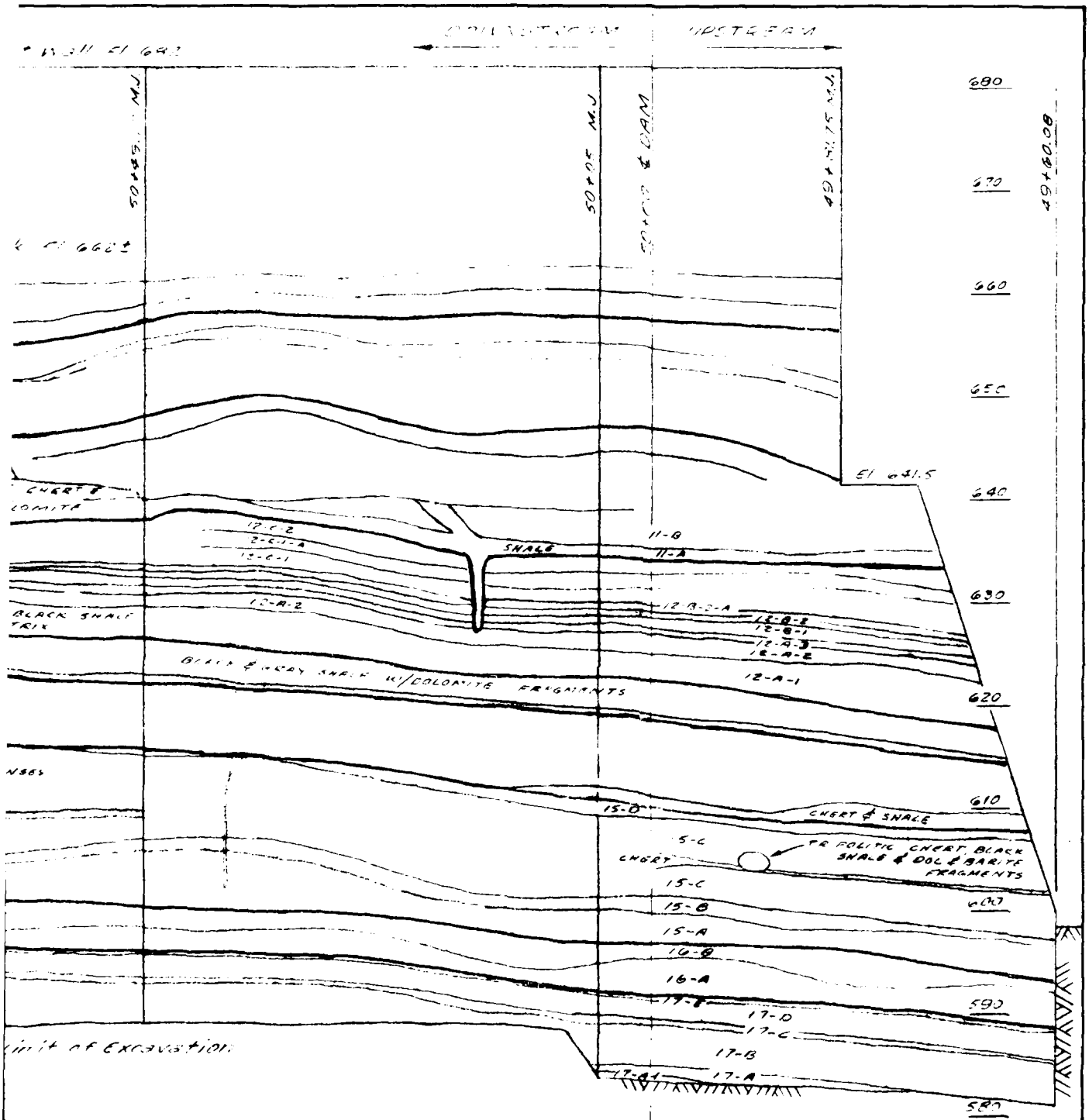


STAGE III
POWERHOUSE EXCAVATION RIGHT WALL

ELEVATION AT DAM AXIS STA 49+68 FROM CONTROL LINE "C" RANGE

0 10
SCALE IN FEET

For Legend See Plates 59, 60 & 61



TION RIGHT WALL

W/ CONTROL LINE "C" RANGE 21+88.25 R

Revisions			
Symbol	Descriptions	Date	Approved

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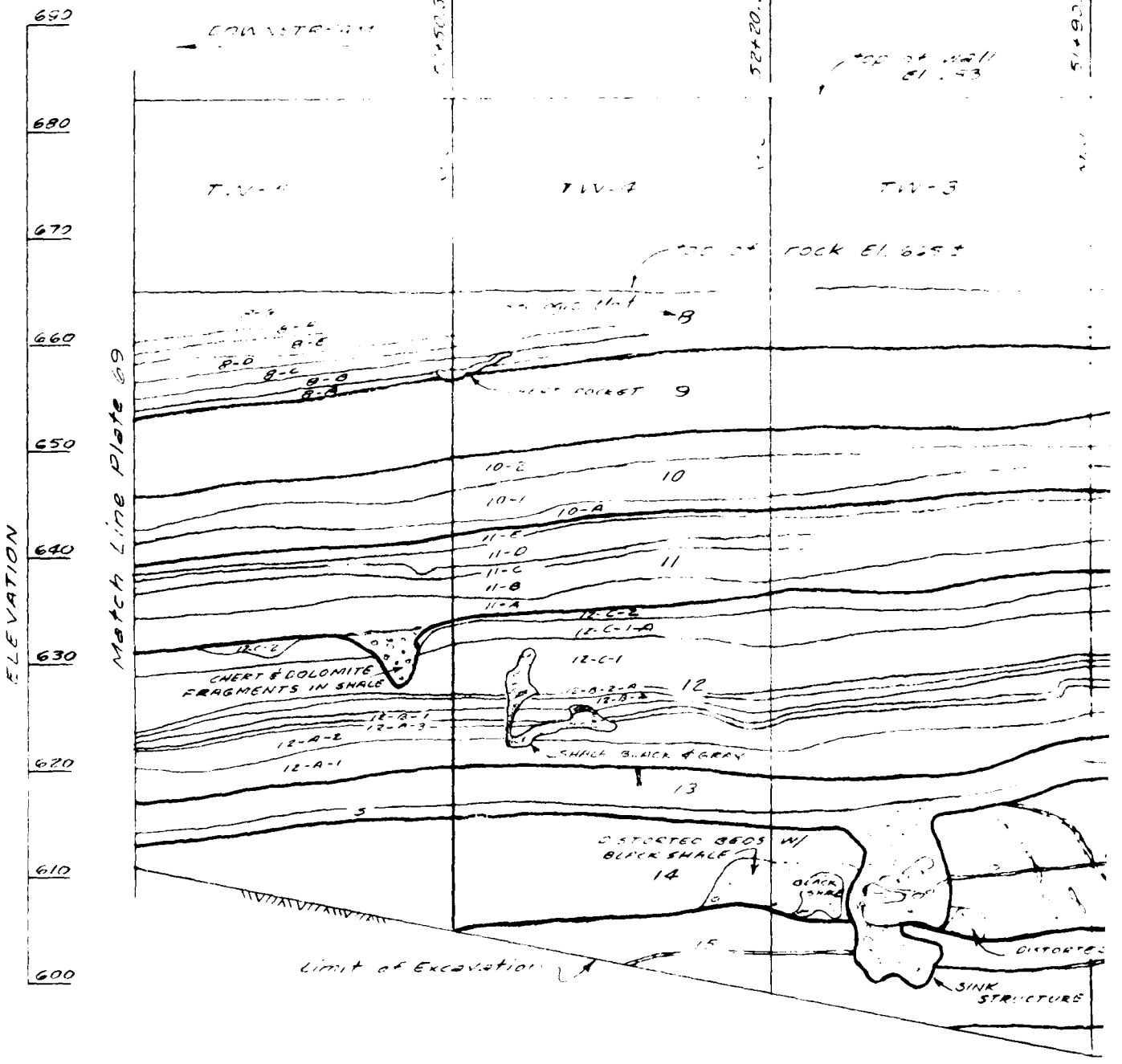
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CONSTRUCTION FOUNDATION REPORT

POWERHOUSE EXCAVATION RIGHT WALL

Scale
Date: MARCH 1966
Sheet Number
Dwg. No.
W.O. 0-12-9197

PLATE NO. 67



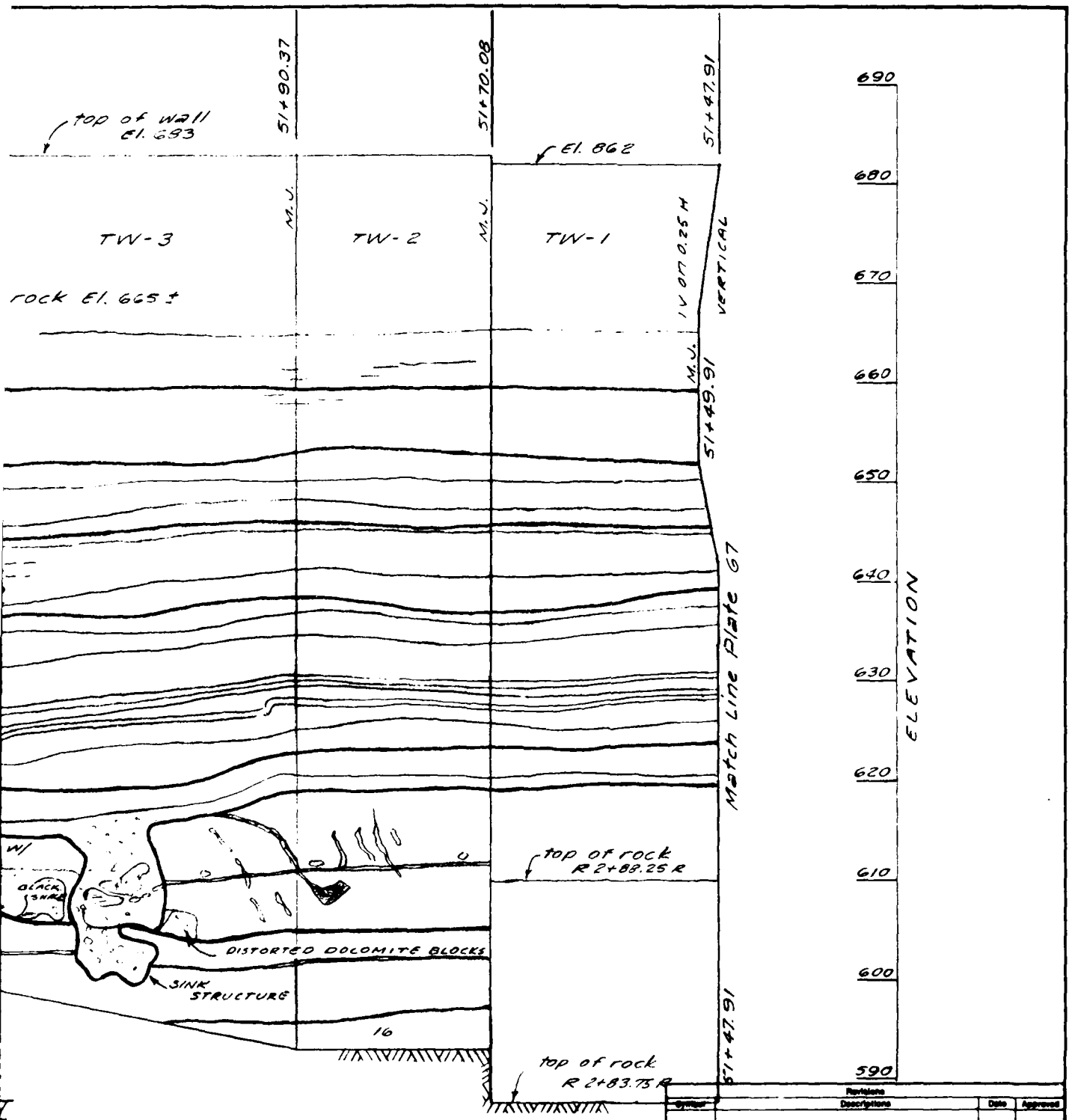
STAGE III

TAILRACE EXCAVATION RIGHT WALL

ELEVATION AT ℄ DAM AXIS STA 52+68 ON ℄ CONTROL LINE "C"

For Legend See Plates 59, 60 & 61

SCALE IN FEET



RIGHT WALL STA 52+80 TO STA 51+47

ONTROL LINE "C" RANGE 2+88.25 R

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
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KANSAS CITY, MISSOURI

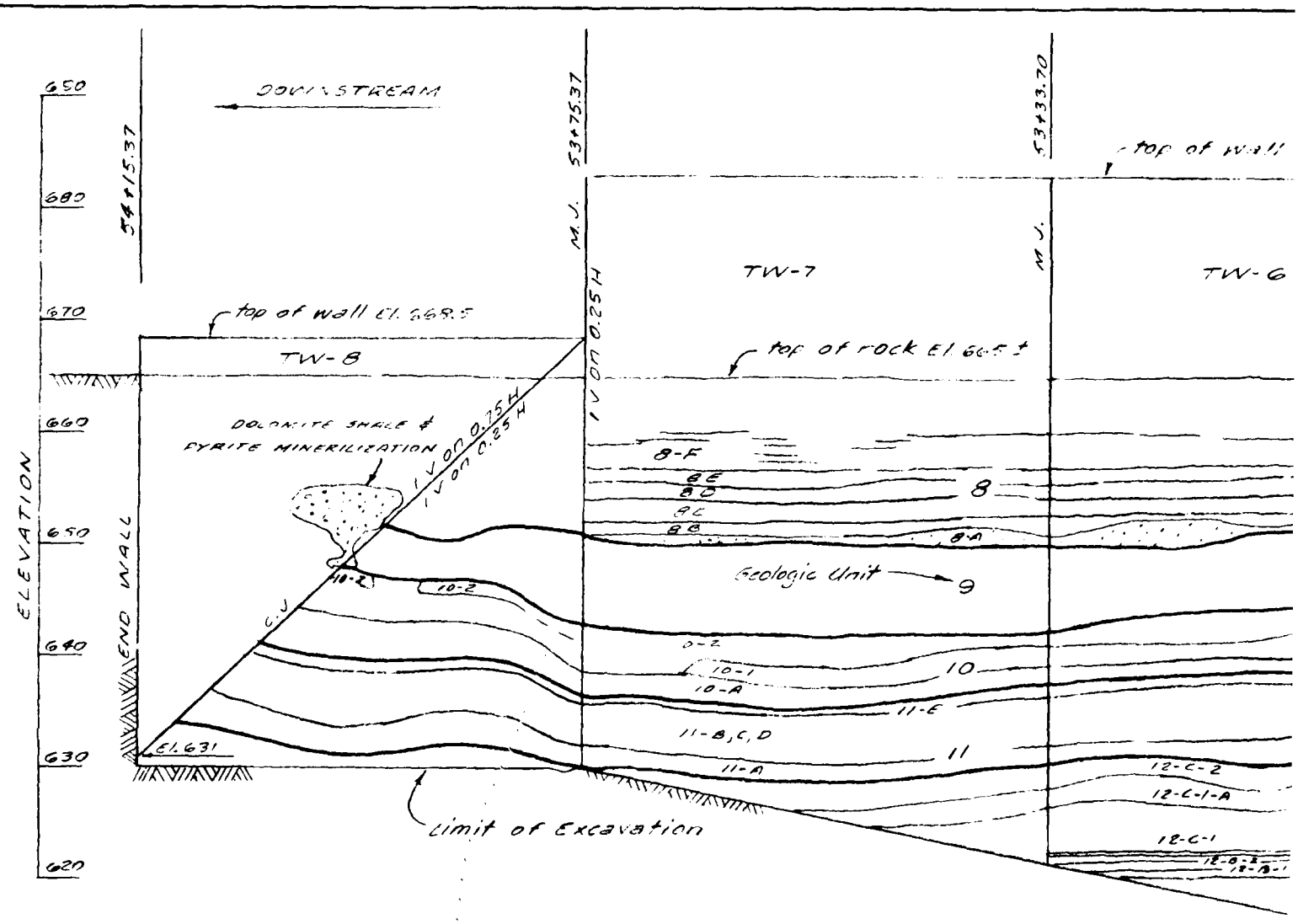
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CONSTRUCTION FOUNDATION REPORT

TAILRACE EXCAVATION
RIGHT WALL

Scale
Date MARCH 1986
Sheet number
File No. 0-12-9196

PLATE NO. 68



STAGE III

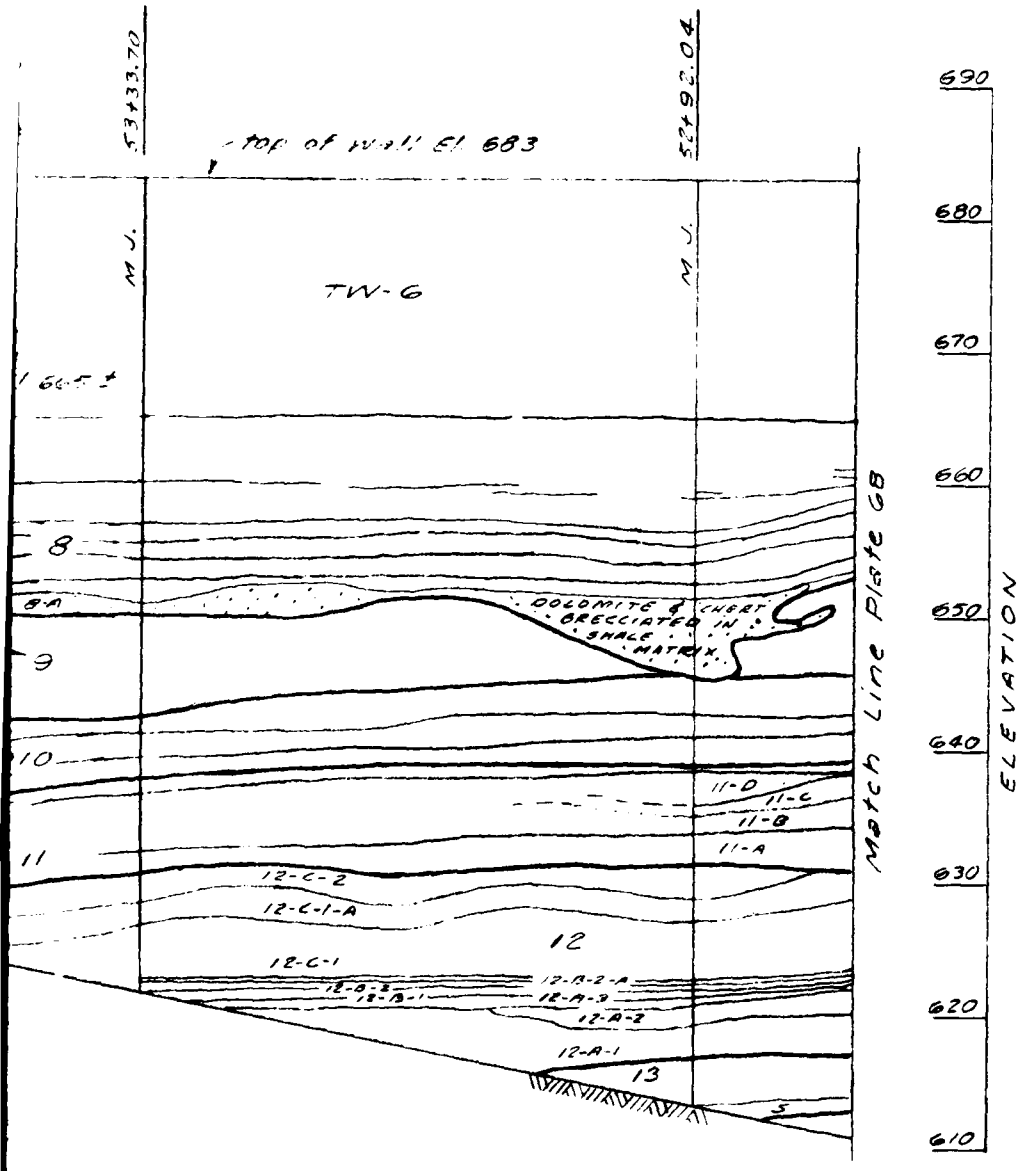
TAILRACE EXCAVATION RIGHT WALL STA

ELEVATION AT STA 40+68 FROM CONTROL LINE "C" RANGE 2+88.25 R

For Legend see Plates 59, 60 & 61

0 10

SCALE IN FEET



IGHT WALL STA 54+15 TO STA 52+80

GE 2+88.25 R

10

FEET

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TAILRACE EXCAVATION RIGHT WALL

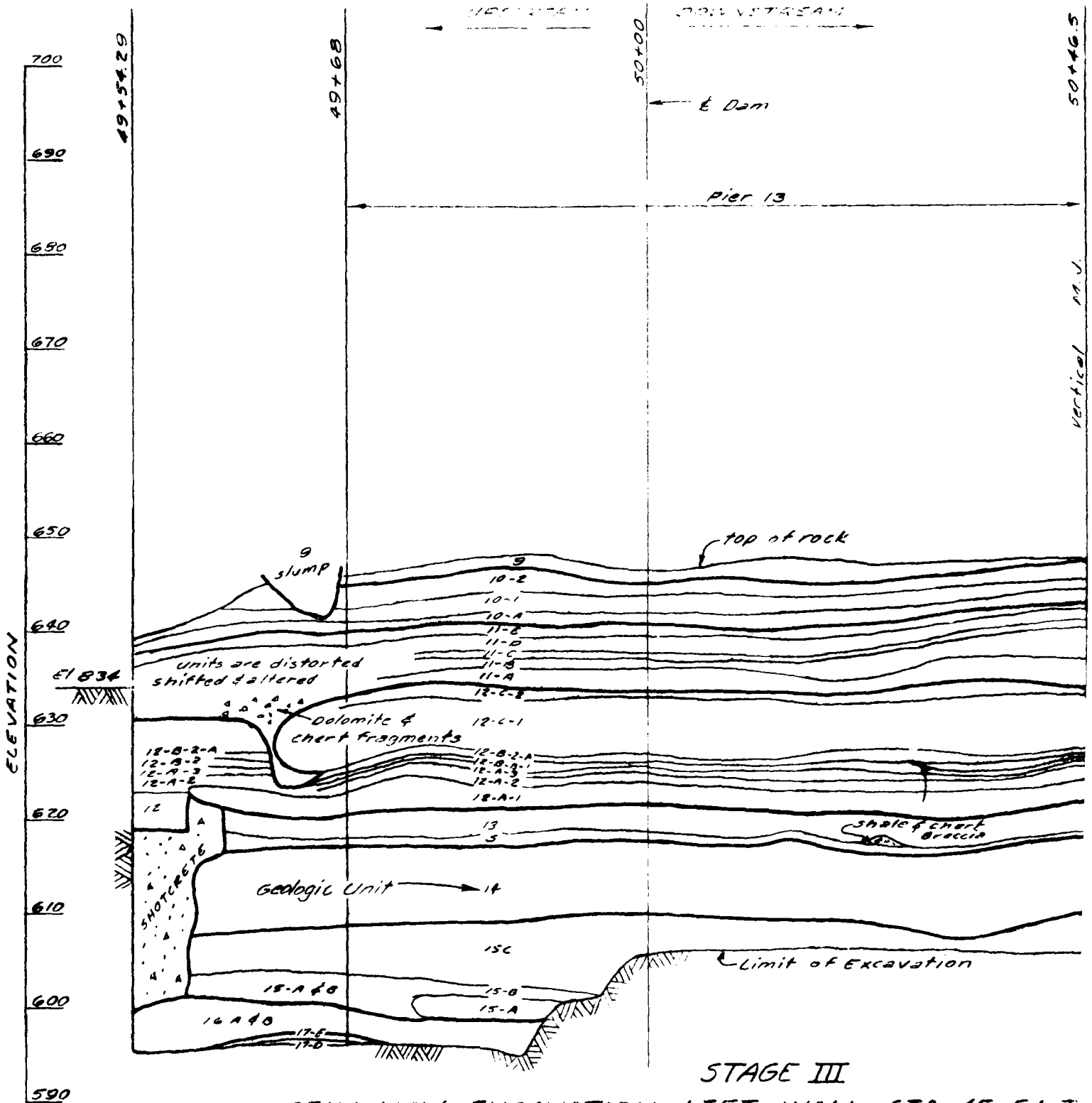
Scale
Date: MARCH 1966
Sheet number
Drawing No. 0-12-9199

PLATE NO. 69

STAGE I CONSTRUCTION

RUCTION

STAGE I CONSTRUCTION



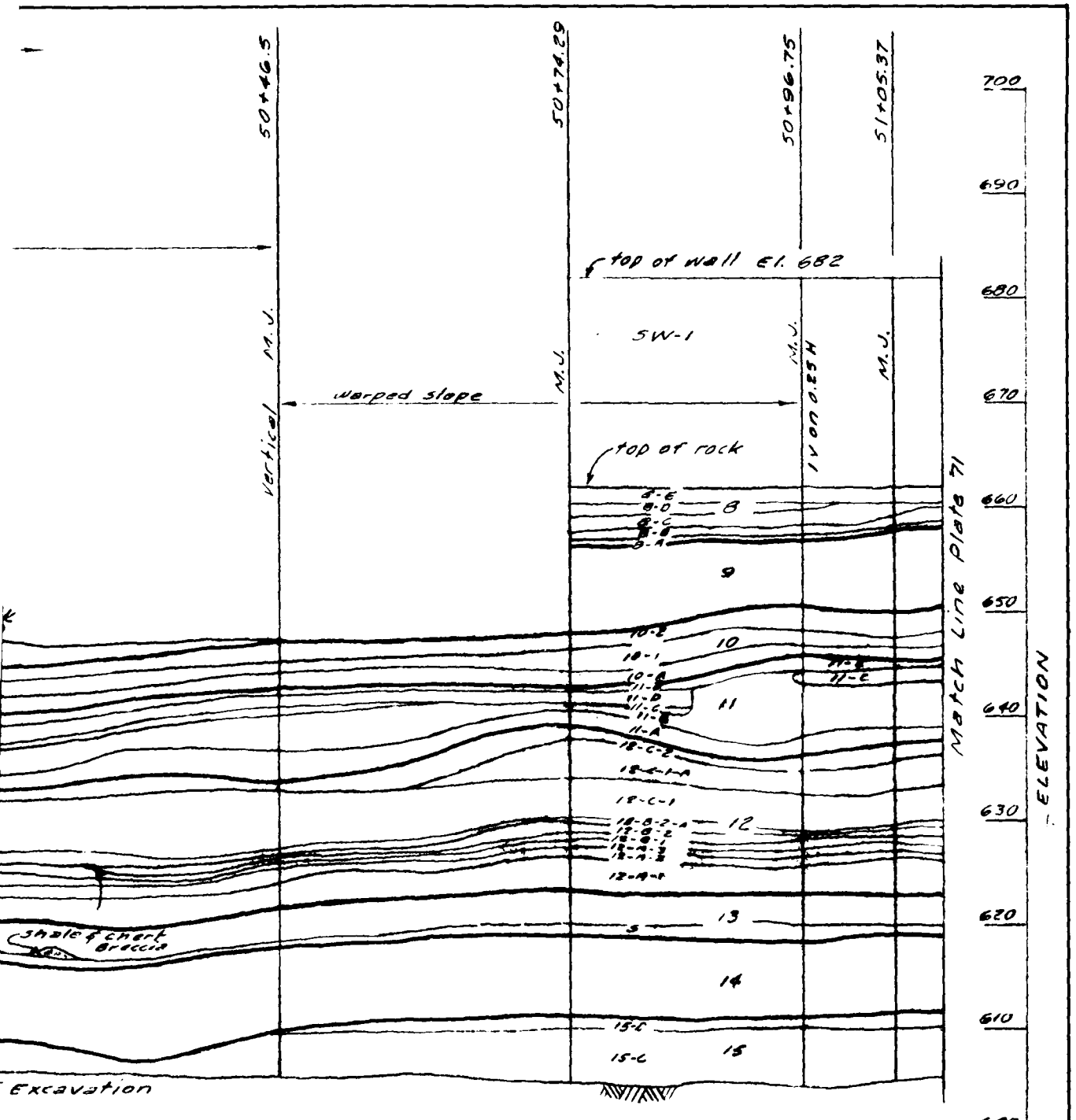
STAGE III

SPILLWAY EXCAVATION LEFT WALL STA 45+54 T

ELEVATION AT DAM AXIS STA 46+10
FROM CONTROL LINE "C" RANGE 2+43.75 L

0 10
SCALE IN FEET

For Legend See Plates 59, 60 & 61



I

L STA 45+54 TO STA 51+10

0 10

ALE IN FEET

Revisions			
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CONSTRUCTION FOUNDATION REPORT

SPILLWAY EXCAVATION
LEFT WALL

Scale

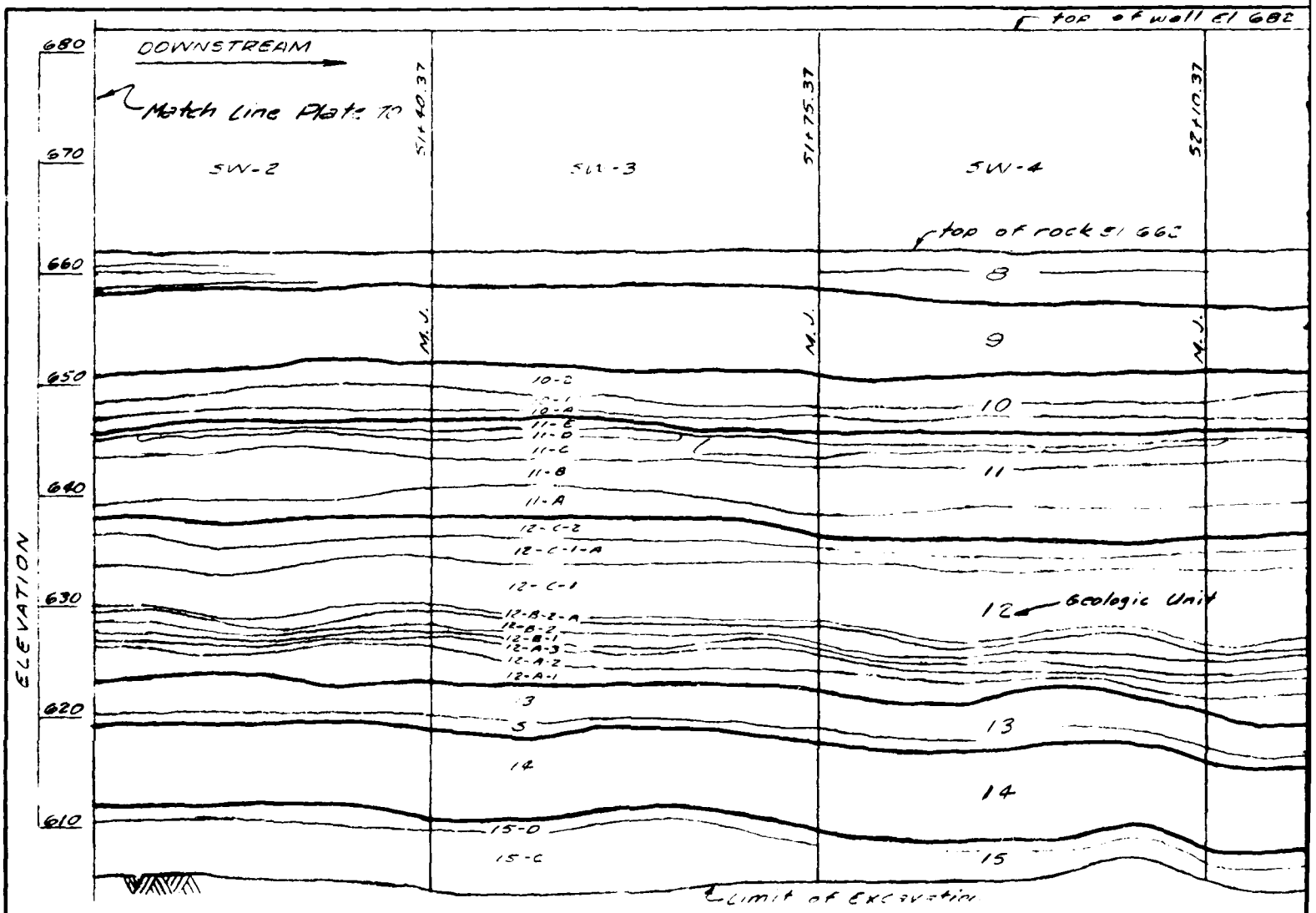
Date: MARCH 1966

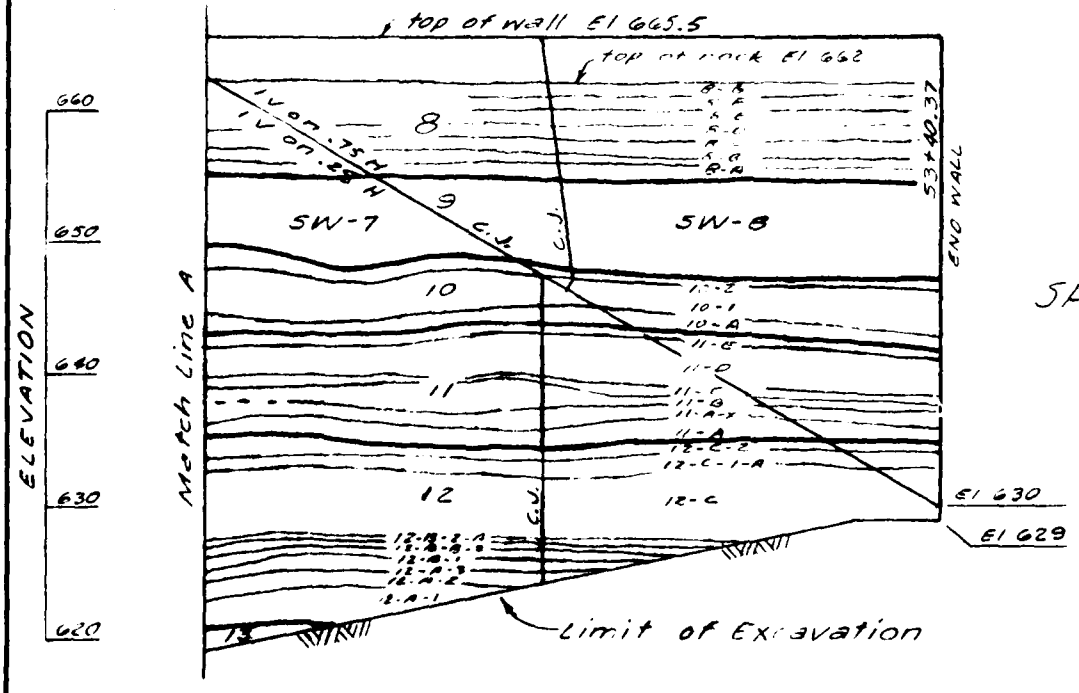
Sheet number

Drawing No.

File No. 0-12-9200

PLATE NO. 70





STAG

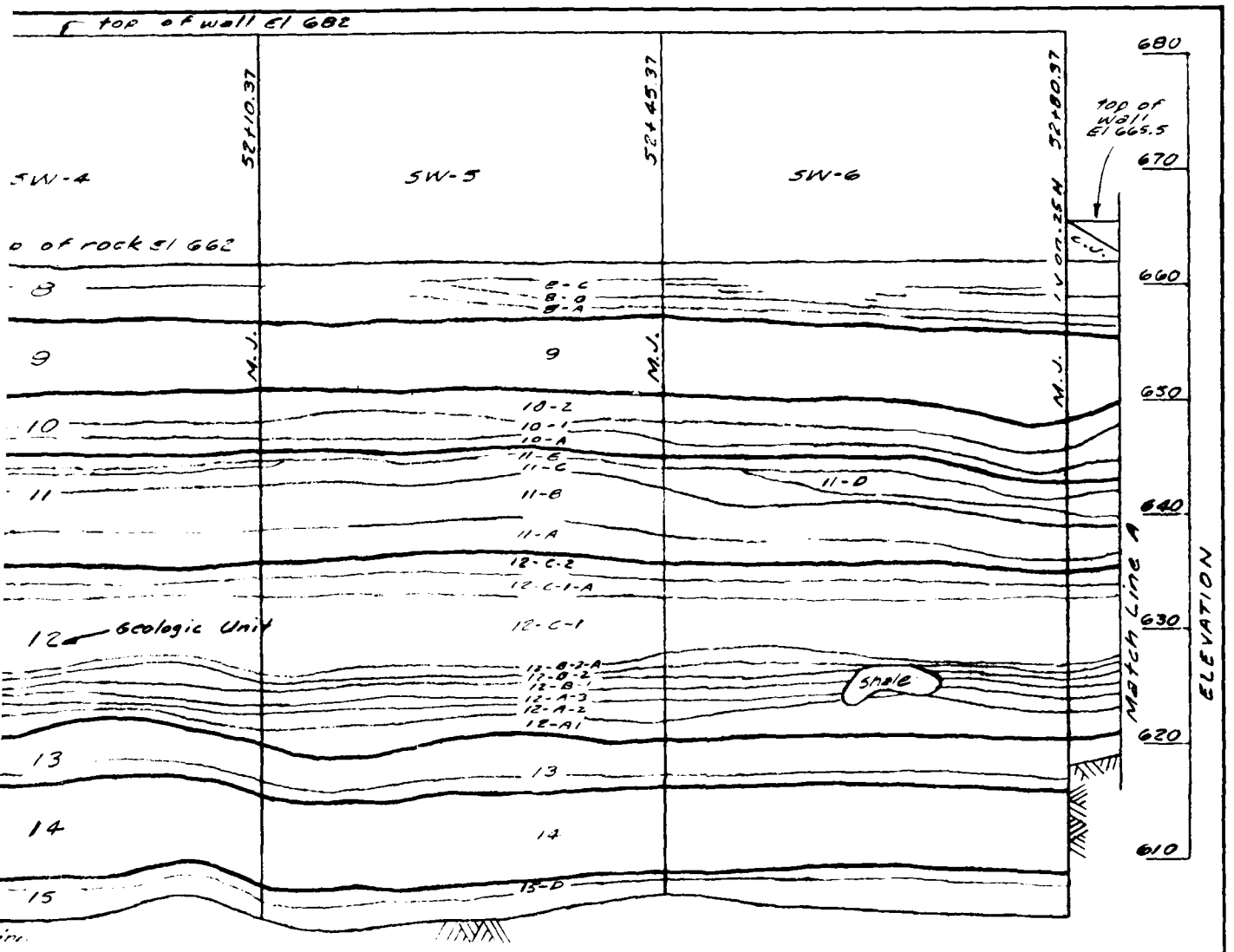
SPILLWAY EXCAVATION

0

SCALE IN

ELEVATION AT DAM
FROM CONTROL LIN

For Legend See Plates 59.



STAGE III

LWAY EXCAVATION LEFT WALL STA 51+10 TO STA 53+40

0 10

SCALE IN FEET

ELEVATION AT DAM AXIS STA 46+10
FROM CONTROL LINE "C" RANGE 2+43.75 L

Legend See Plates 59, 60 & 61

Revisions			
Symbol	Descriptions	Date	Approved

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KANSAS CITY, MISSOURI

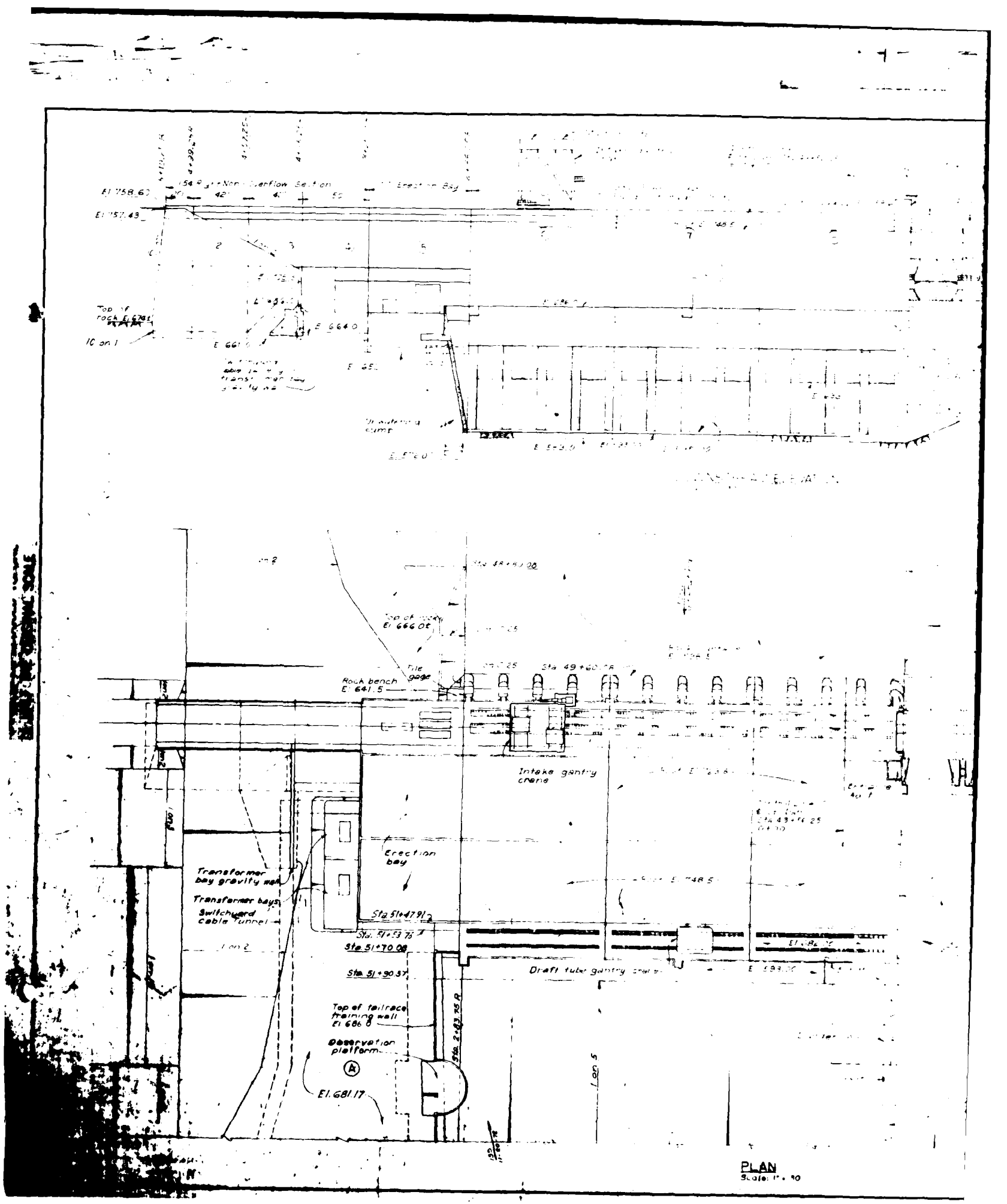
Designed by
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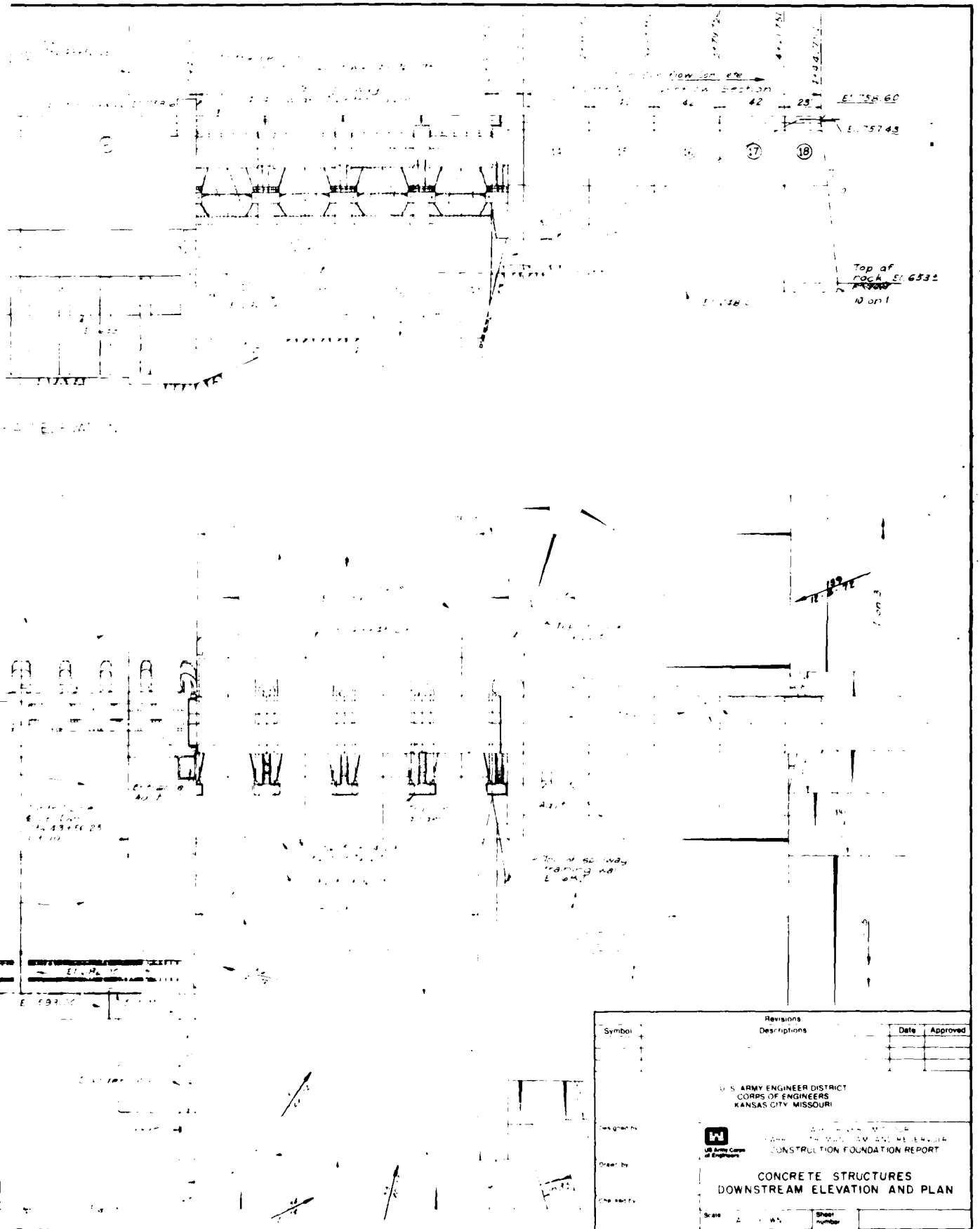
OSAGE RIVER, MISSOURI
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CONSTRUCTION FOUNDATION REPORT

SPILLWAY EXCAVATION
LEFT WALL

Scale
Date: MARCH 1966
Sheet number
Drawing No.
File No. 0-12-9201

PLATE NO. 71


Top of rock El 678.1
10 on 1
Rock bench El 641.5
Tile gage
Intake gantry crane
Erection bay
Transformer bay gravity wall
Transformer bays
Switchyard cable tunnel
Sta 51+47.92
Sta 51+53.75
Sta 51+70.08
Sta 51+90.37
Top of tailrace training wall El 686.0
Observation platform
El. 681.17
Draft tube gantry crane
PLAN
Scale: 1" = 40'



Revisions		
Symbol	Descriptions	Date / Approved

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KANSAS CITY, MISSOURI

US Army Corps of Engineers

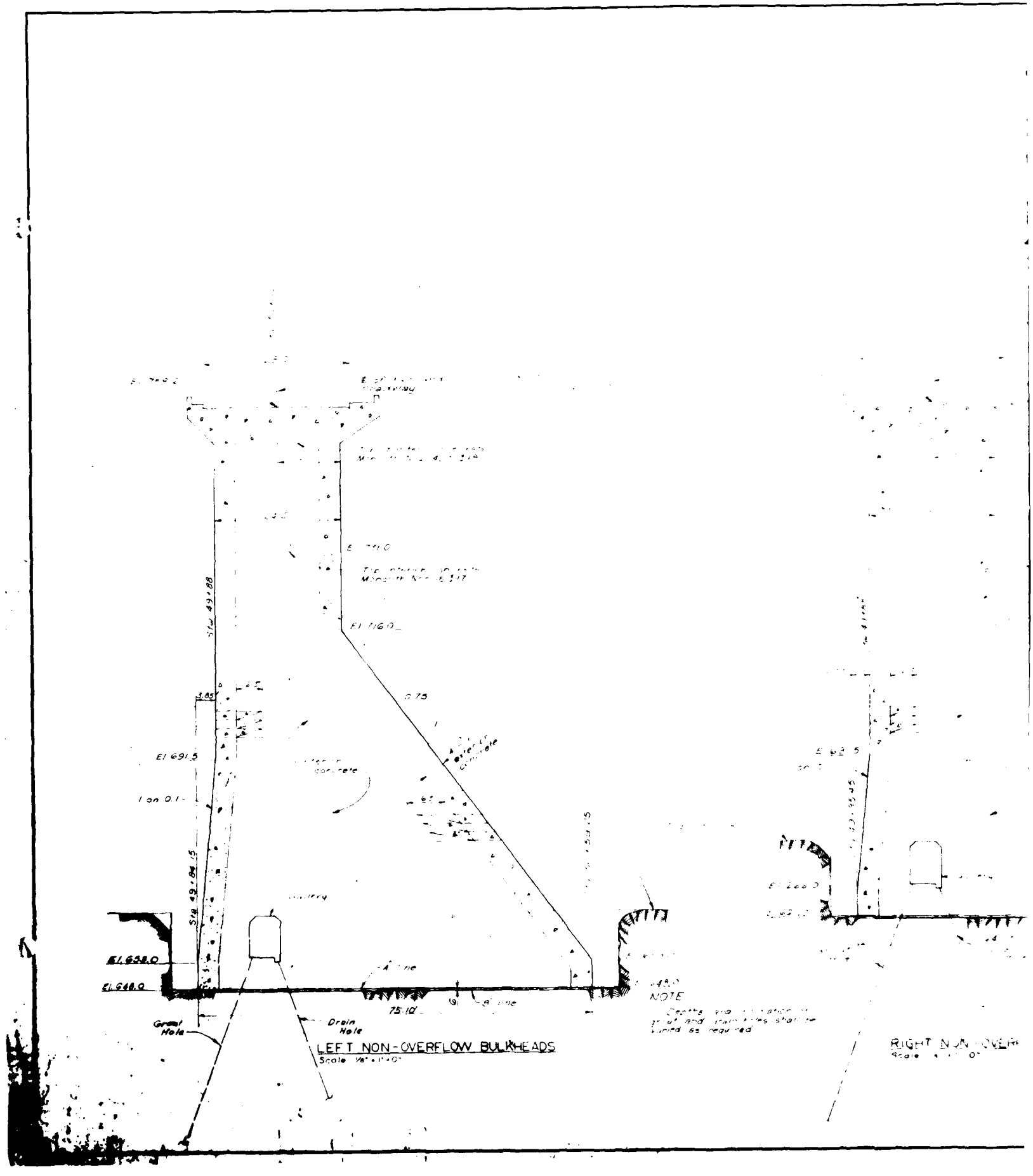
CONSTRUCTION FOUNDATION REPORT

CONCRETE STRUCTURES
DOWNSTREAM ELEVATION AND PLAN

Designed by
Drawn by
Checked by
Submitted by

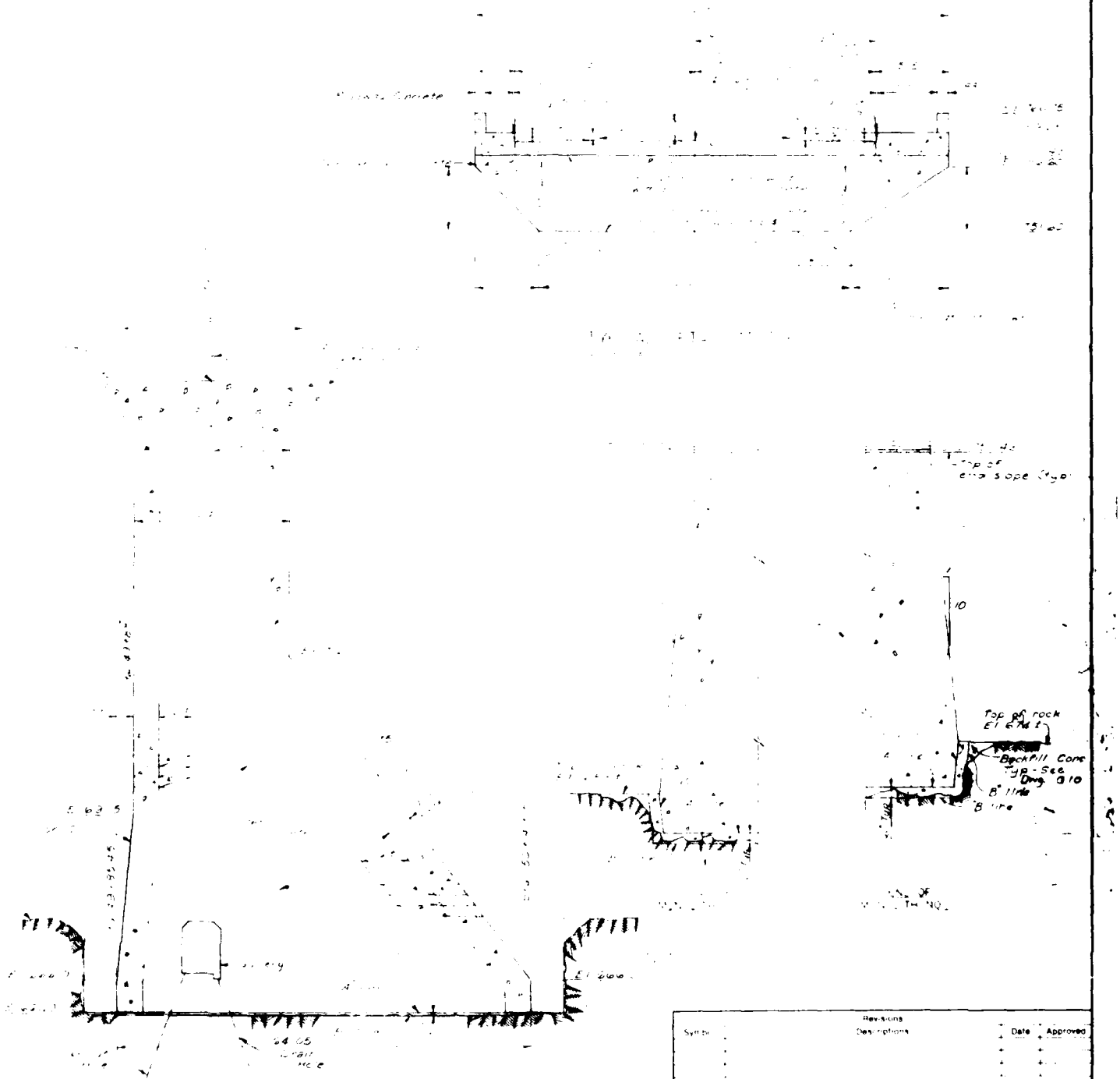
Scale: 1" = 10'
Date: MARCH 1985
Sheet number
Dwg No. 0-12-9202

PLATE NO. 72



LEFT NON-OVERFLOW BULKHEADS
Scale 1/8" = 1'-0"

RIGHT NON-OVER



RIGHT NON-OVERFLOW BULKHEADS

DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

Symbol	Revisions Descriptions	Date	Approved

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US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

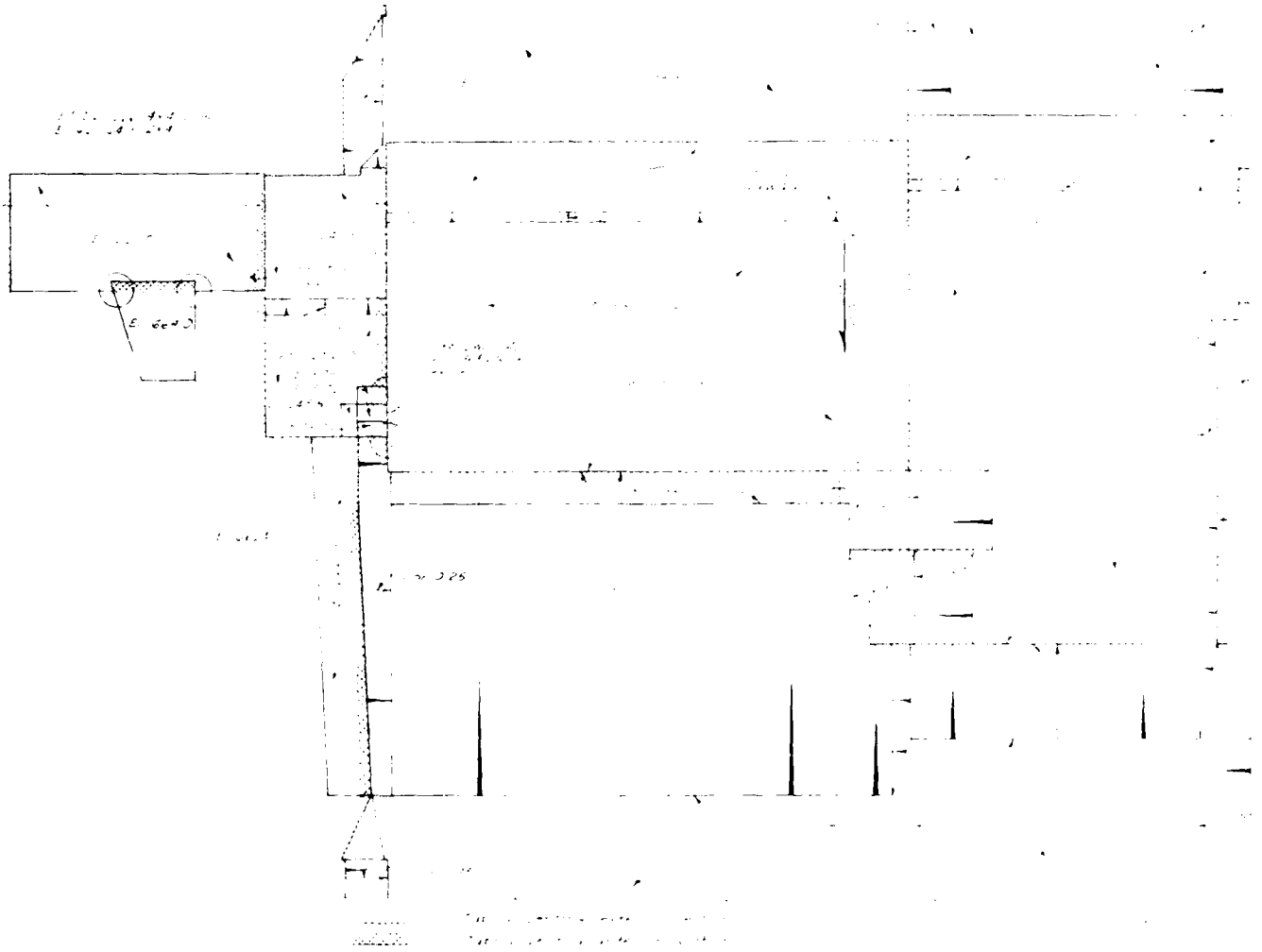
N. N. OVERFLOW BULKHEAD SECTIONS

Scale: AS SHOWN | Sheet number

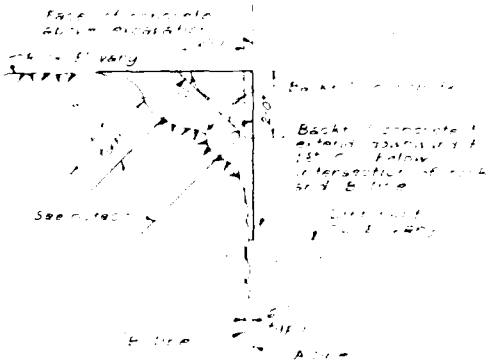
Date: MARCH 1985

0-12-9203

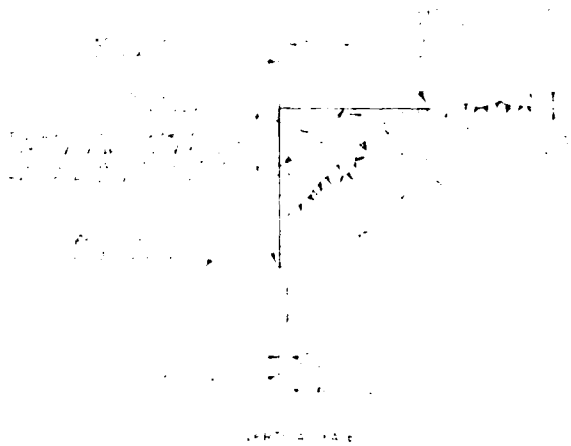
PLATE NO 73



PLAN OF ROCK EXCAVATION

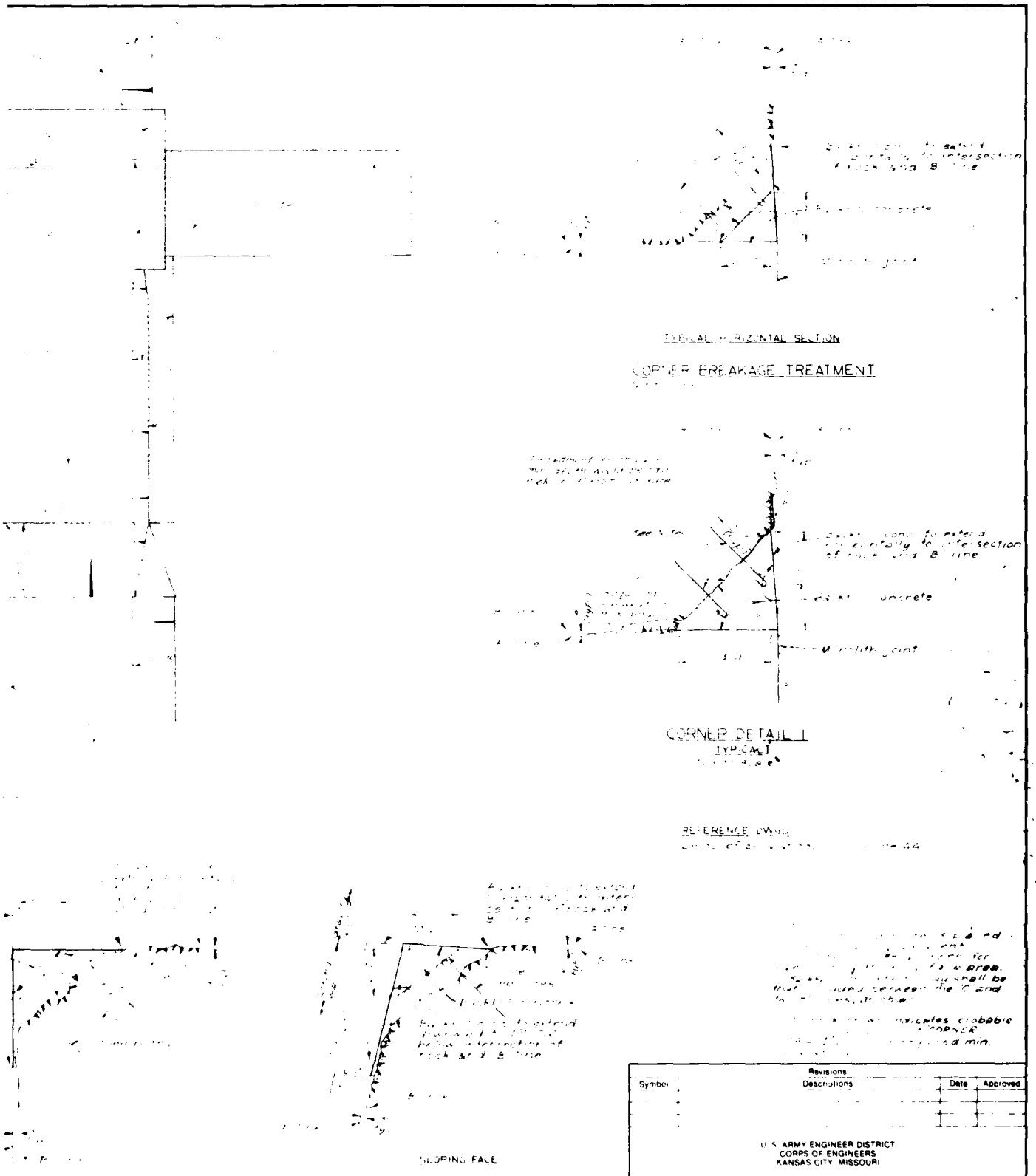


TYPICAL VERTICAL EXTERIOR SECTION



TYPICAL VERTICAL

EDGE BREAKAGE TREATMENT



TYPICAL HORIZONTAL SECTION

CORNER BREAKAGE TREATMENT

CORNER DETAIL 1
TYPICAL

REFERENCE

SLOPING FACE

RTICAL FACE

TYPICAL VERTICAL INTERSECTIONS

AGE TREATMENT

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CONSTRUCTION FOUNDATION REPORT

BACKFILL CONCRETE DETAILS

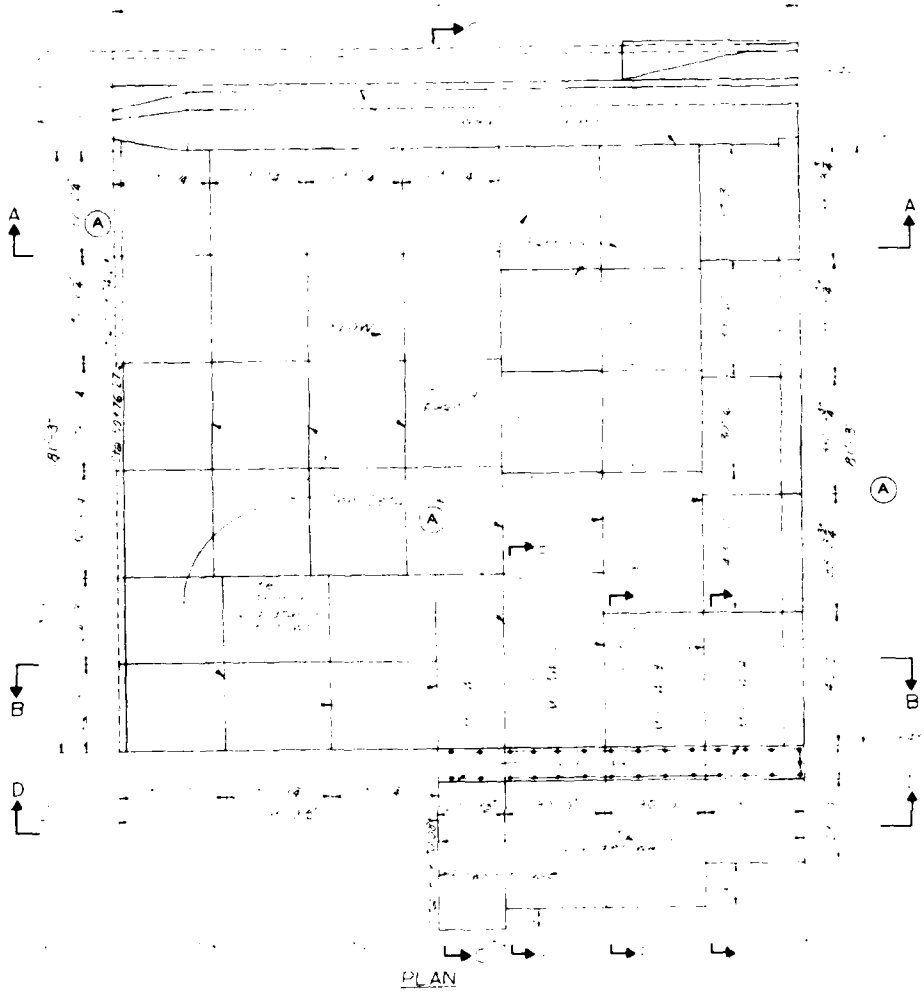
Scale

Date MARCH 1985

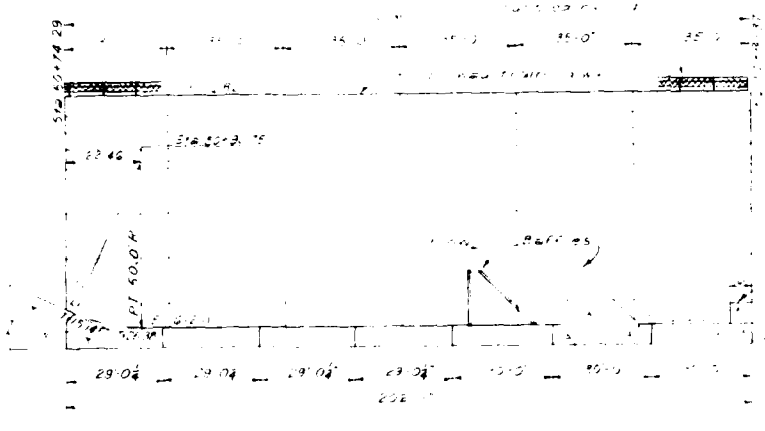
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No 0-12-9204

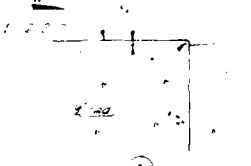
PLATE NO 74



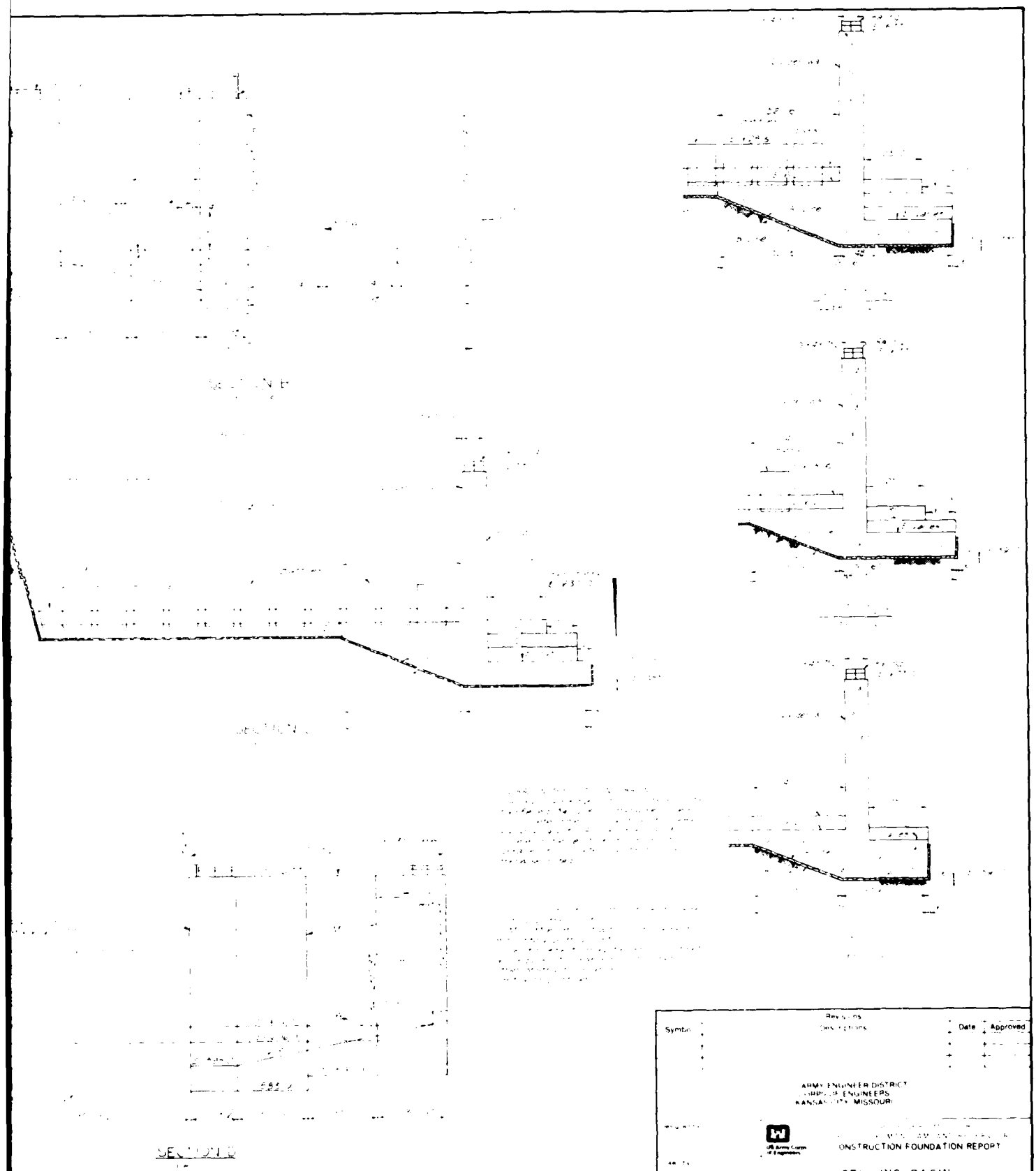
PLAN



SECTION A



A DETAIL 1



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CONSTRUCTION FOUNDATION REPORT

STILLING BASIN
GENERAL LAYOUT

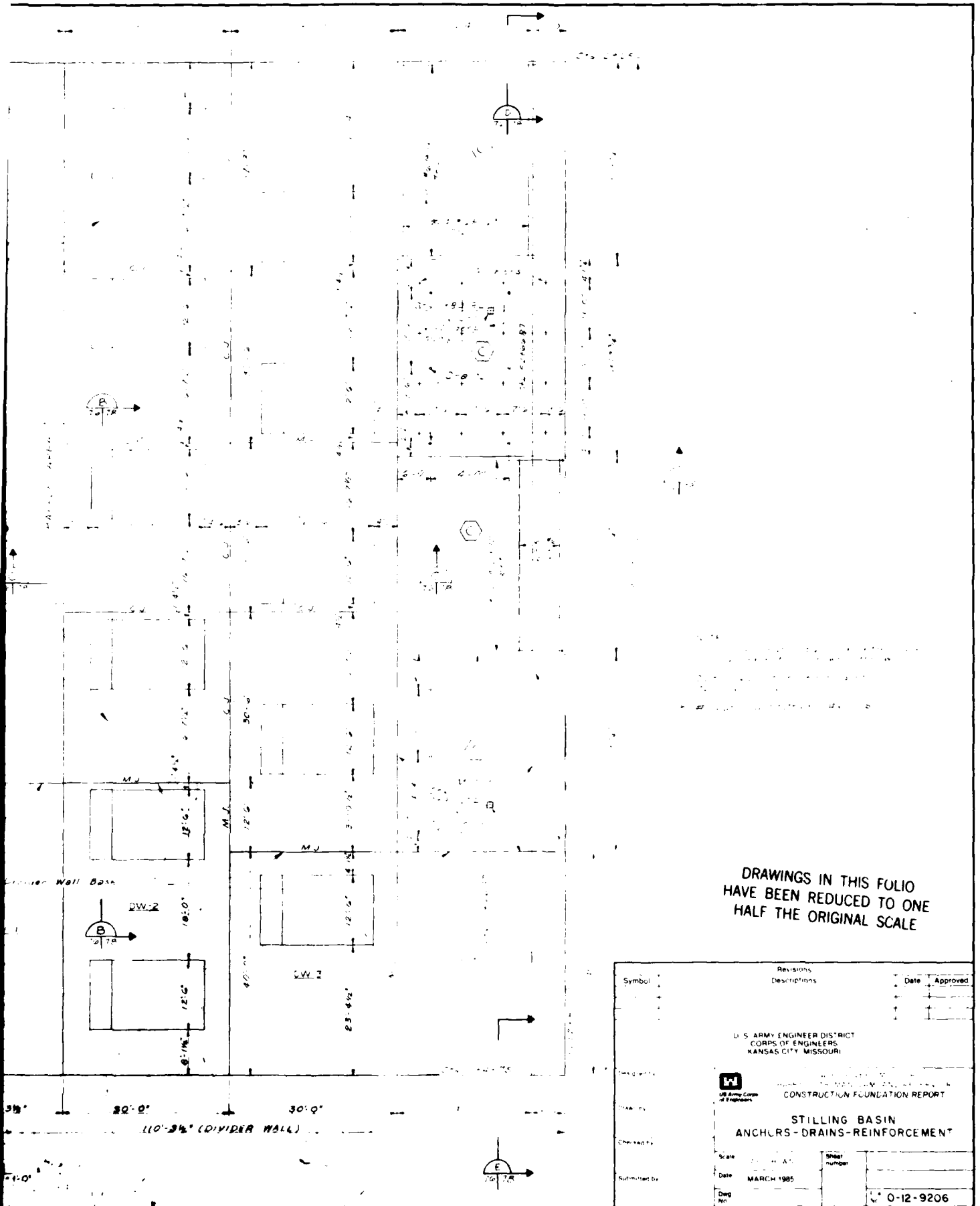
Date: MARCH 1985

Sheet number

0-12-9205

PLATE NO 75


FLOW
Drains
Anchors
M.J (typ.)
Divider Wall Base
DW-1
DW-2
PLAN
Scale 1/8" = 1'-0"



DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

Symbol	Revisions Descriptions	Date	Approved

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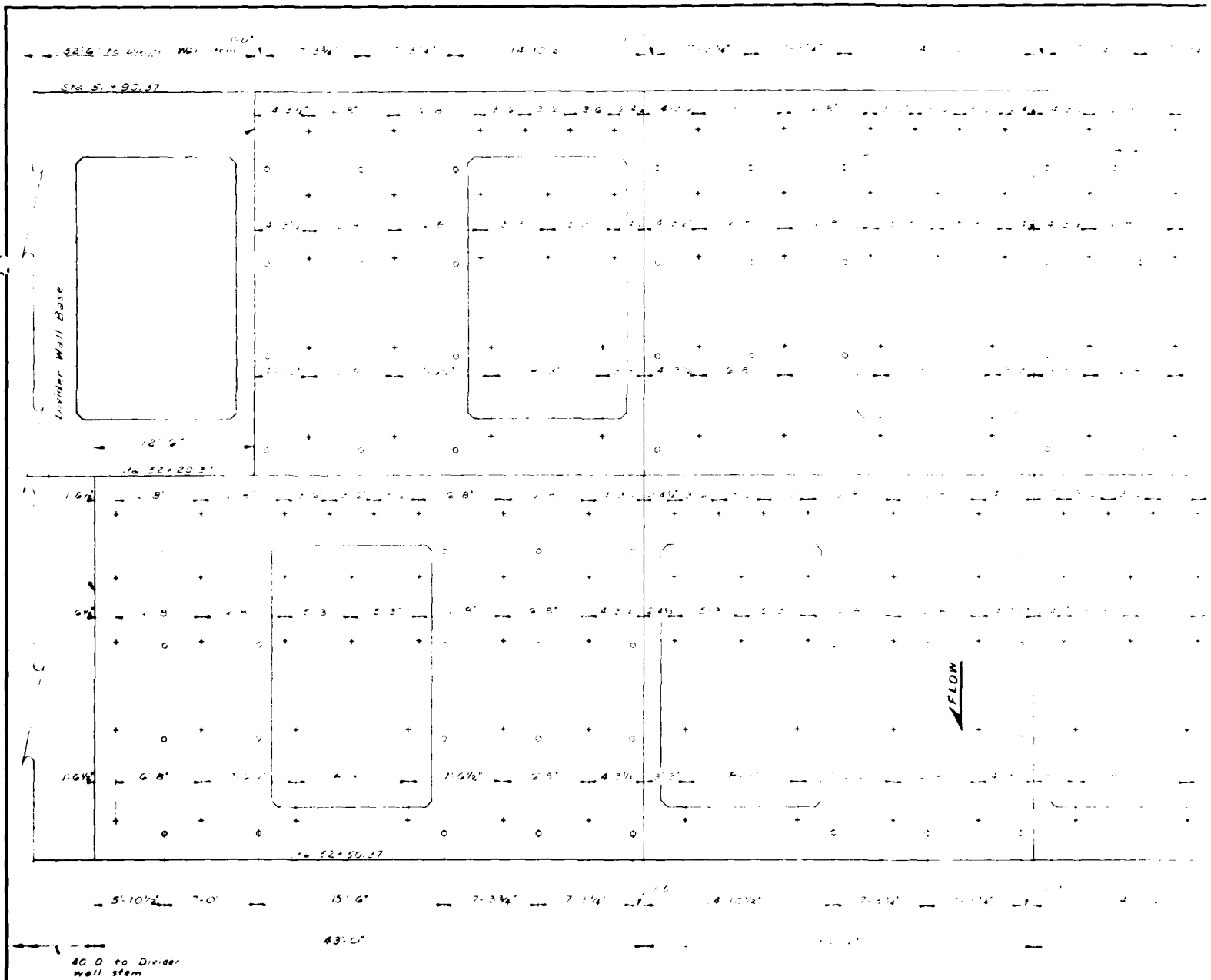
US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

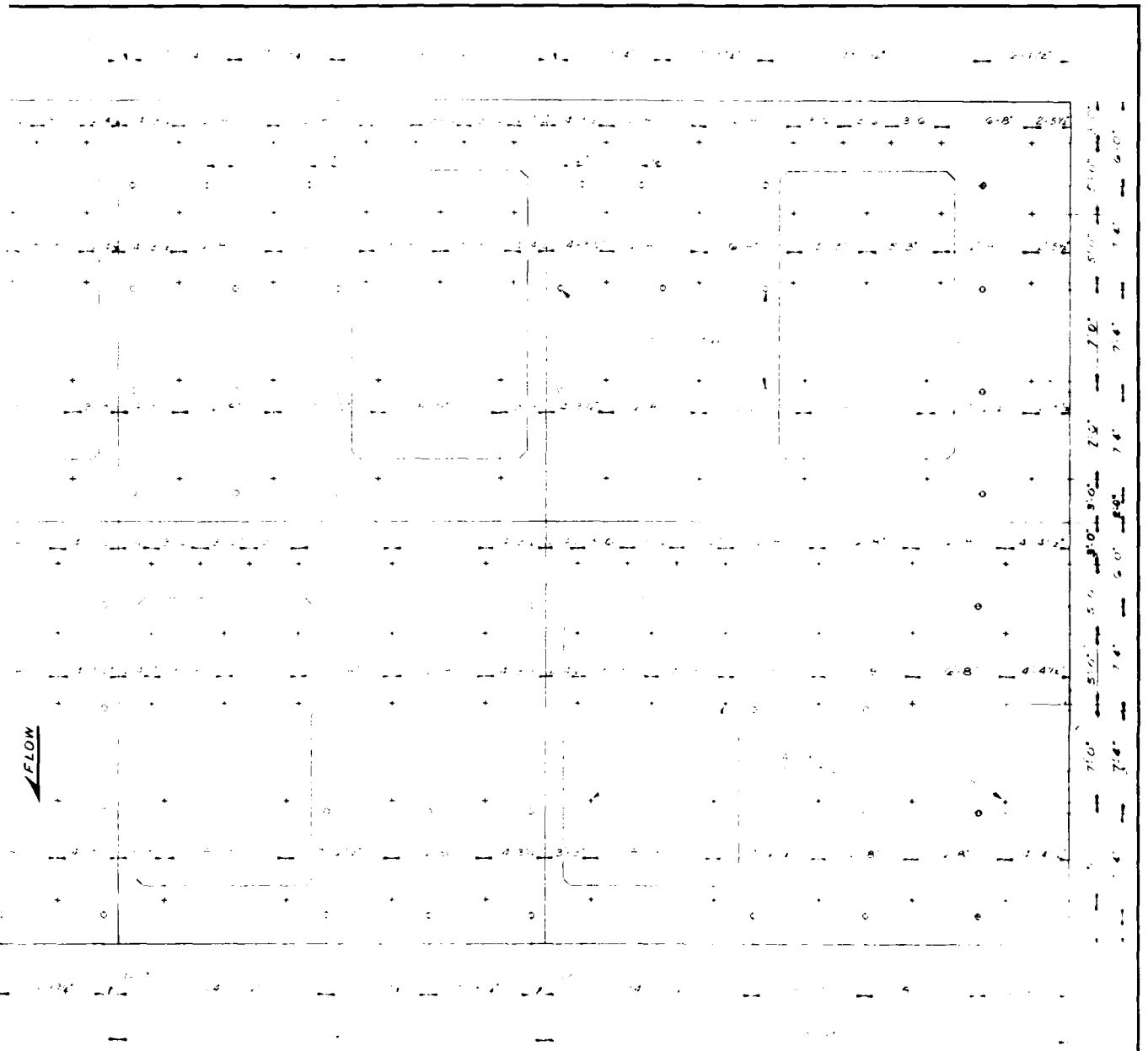
STILLING BASIN
ANCHORS - DRAINS - REINFORCEMENT

Scale
Date MARCH 1985
Dwg No. 0-12-9206
Sheet number

PLATE NO 76



PLAN - BAFFLE AREA



PLAN - BAFFLE AREA

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HALF THE ORIGINAL SCALE

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KANSAS CITY, MISSOURI

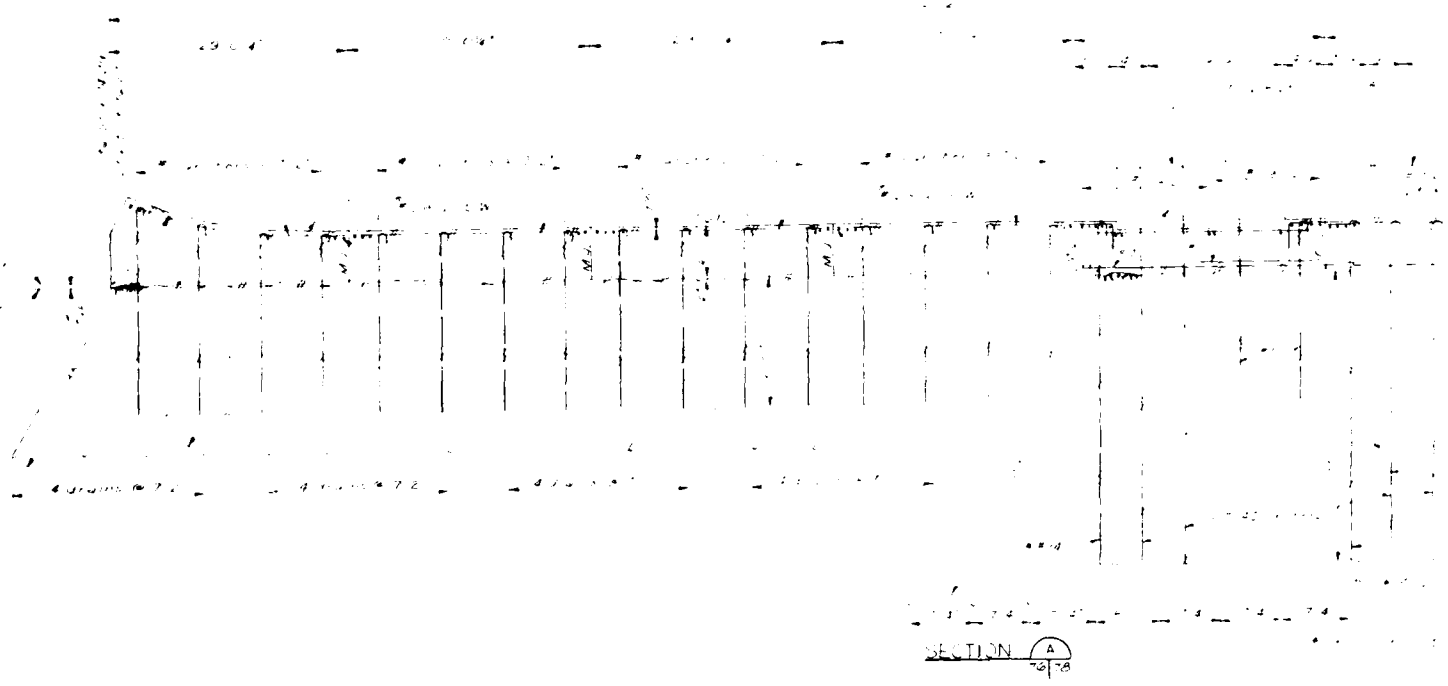
US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

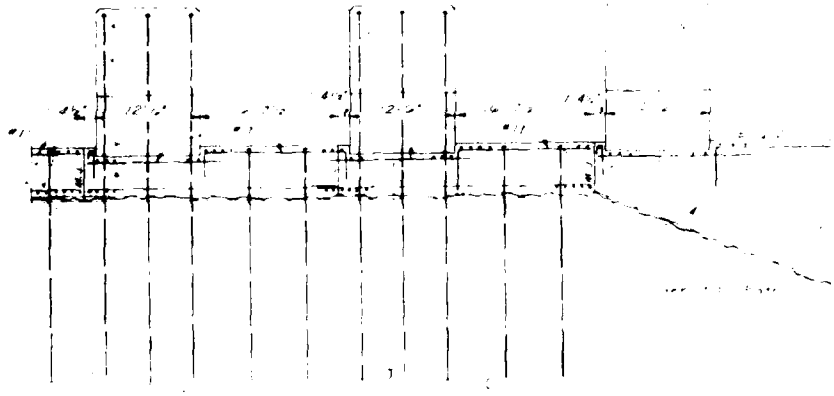
STILLING BASIN
BAFFLE AREA-ANCHORS AND DRAINS

Scale
Date MARCH 1985
Drawing No.
Sheet number
E 0-12-9207

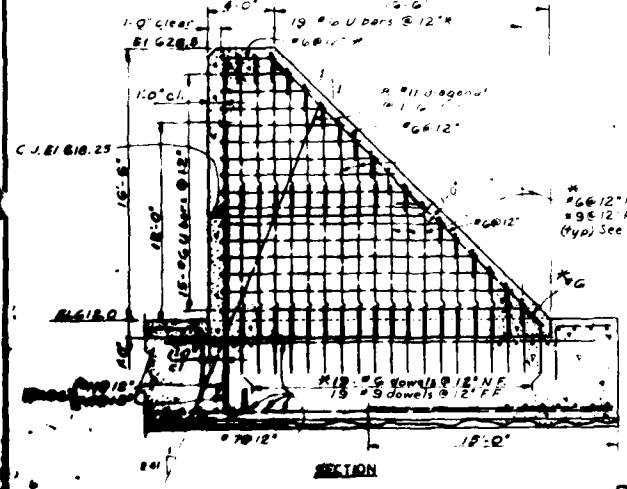
PLATE NO 77



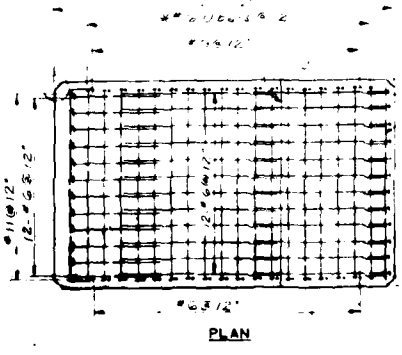
SECTION A



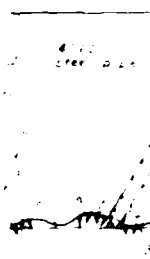
SECTION B



SECTION



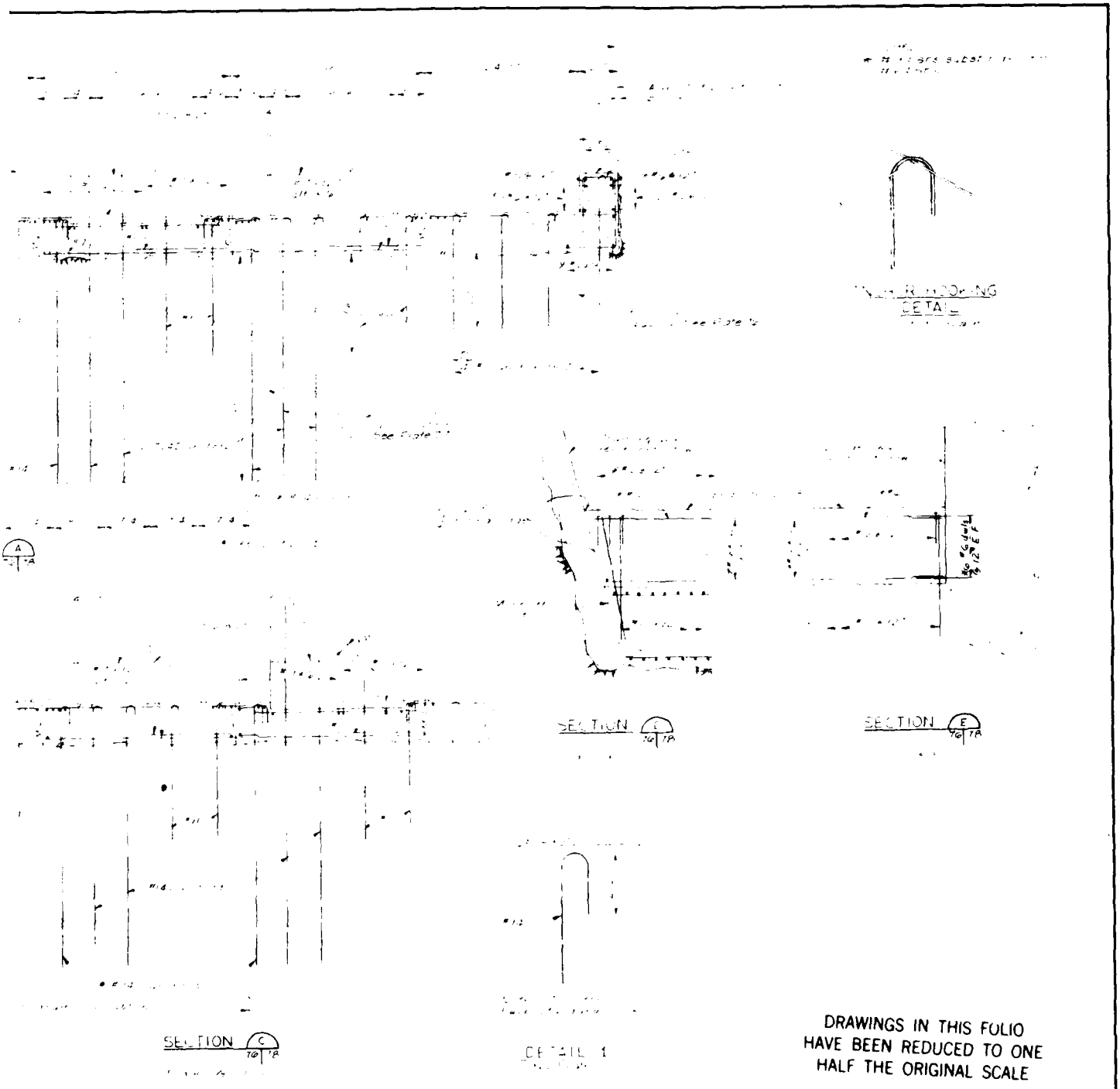
PLAN



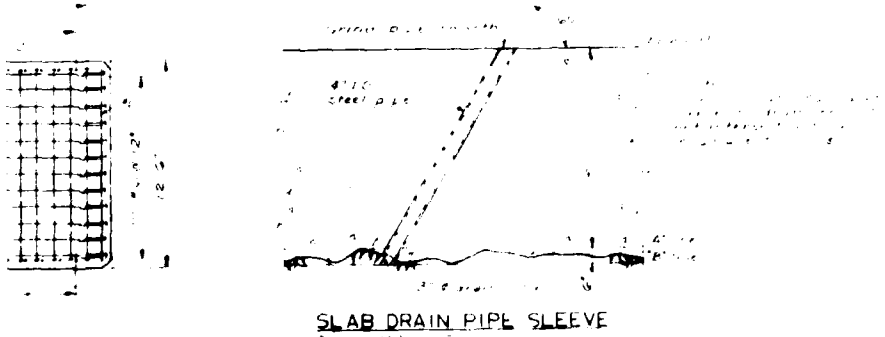
SLAB DRAIN

BAFFLE DETAILS

Scale: "A" = 1'-0"



DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE



SLAB DRAIN PIPE SLEEVE

Symbo	Revisions Descriptions	Date	Approved

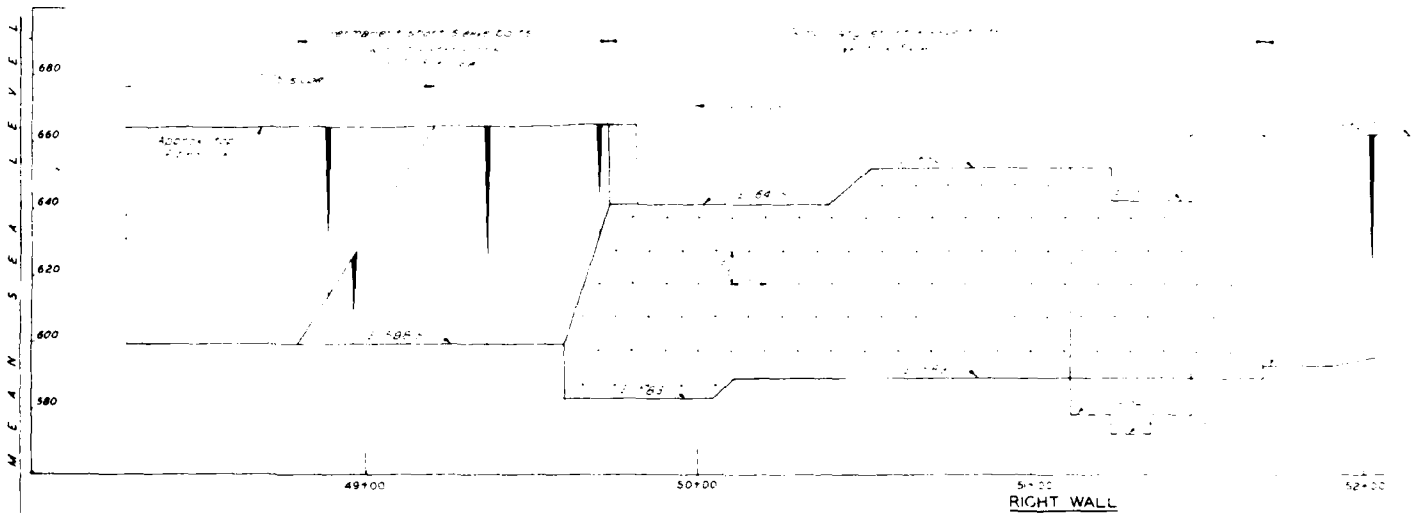
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

CONSTRUCTION FOUNDATION REPORT

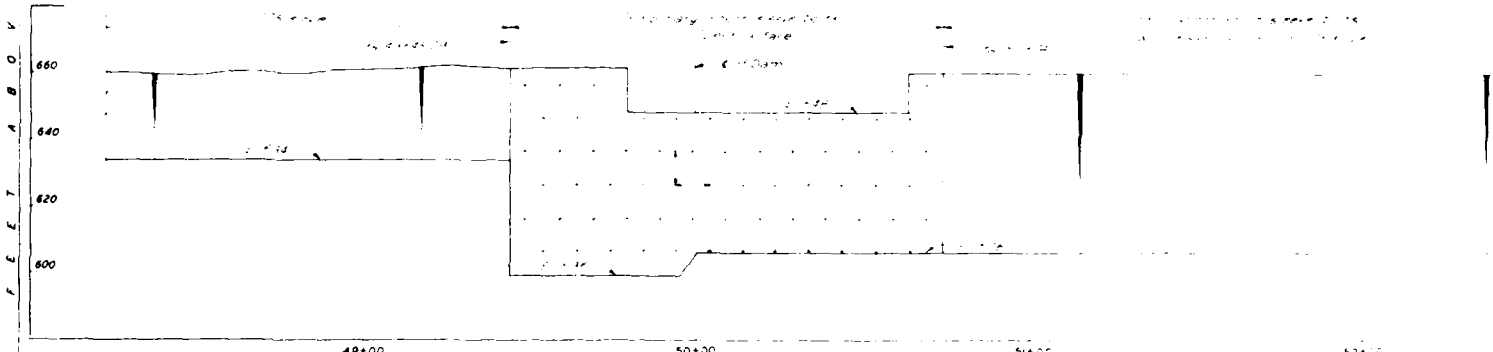
STILLING BASIN
SECTIONS AND DETAILS

Scale
Date MARCH 1985
Dwg No.
Sheet number
No. 0-12-9208

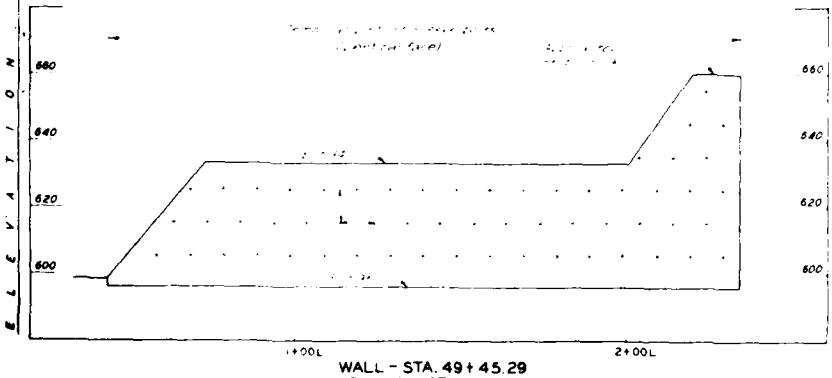
PLATE NO. 78



RIGHT WALL

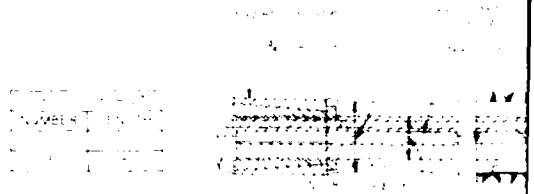


LEFT WALL

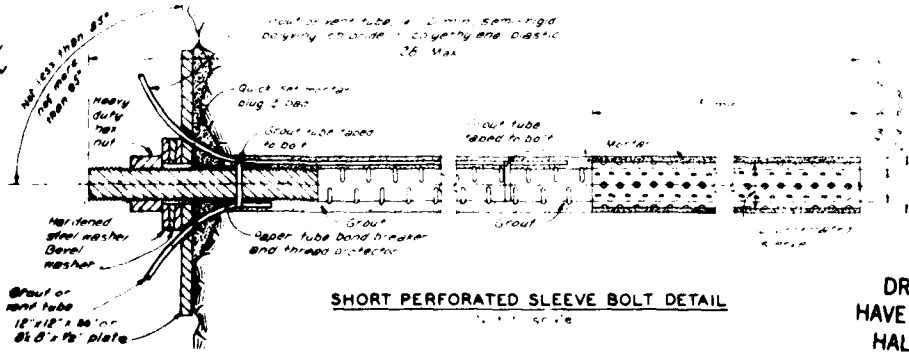


WALL - STA. 49+45.29

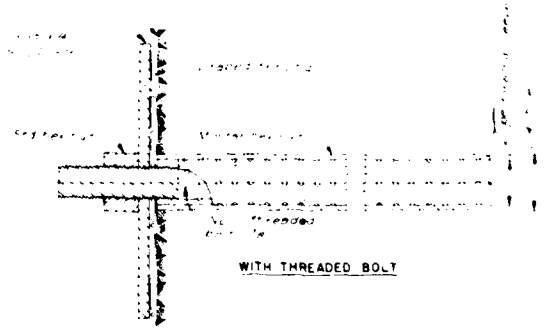
LOOKING UPSTREAM



ROCK DEFORMETER BOLT DETAIL

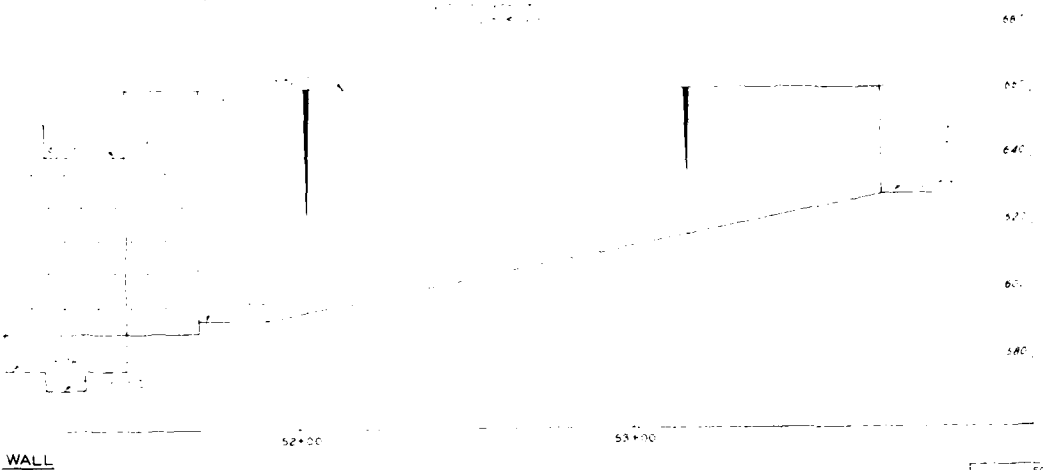


SHORT PERFORATED SLEEVE BOLT DETAIL

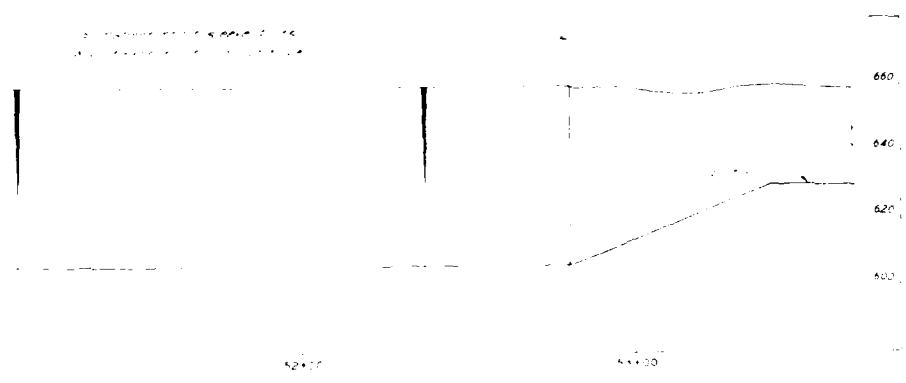


FULL PERFORATED SLEEVE BOLT

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

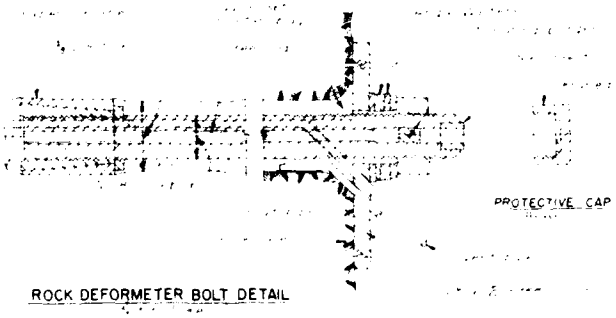


WALL



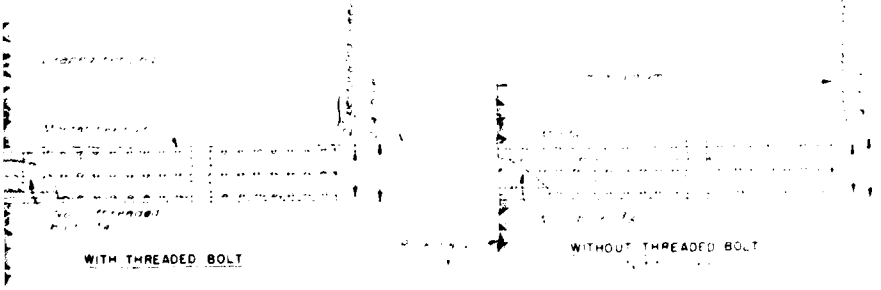
SCHEDULE FOR SPECIAL SURFACES
TEMPORARY BOLTS

HEIGHT OF ROCK CUT	LENGTH *	GENERAL SPACING **



PROTECTIVE CAP

ROCK DEFORMETER BOLT DETAIL



WITH THREADED BOLT

WITHOUT THREADED BOLT

FULL PERFORATED SLEEVE BOLT DETAIL

OLIO
O ONE
CALE

Symbol	Revisions Description	Date	Approved

ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

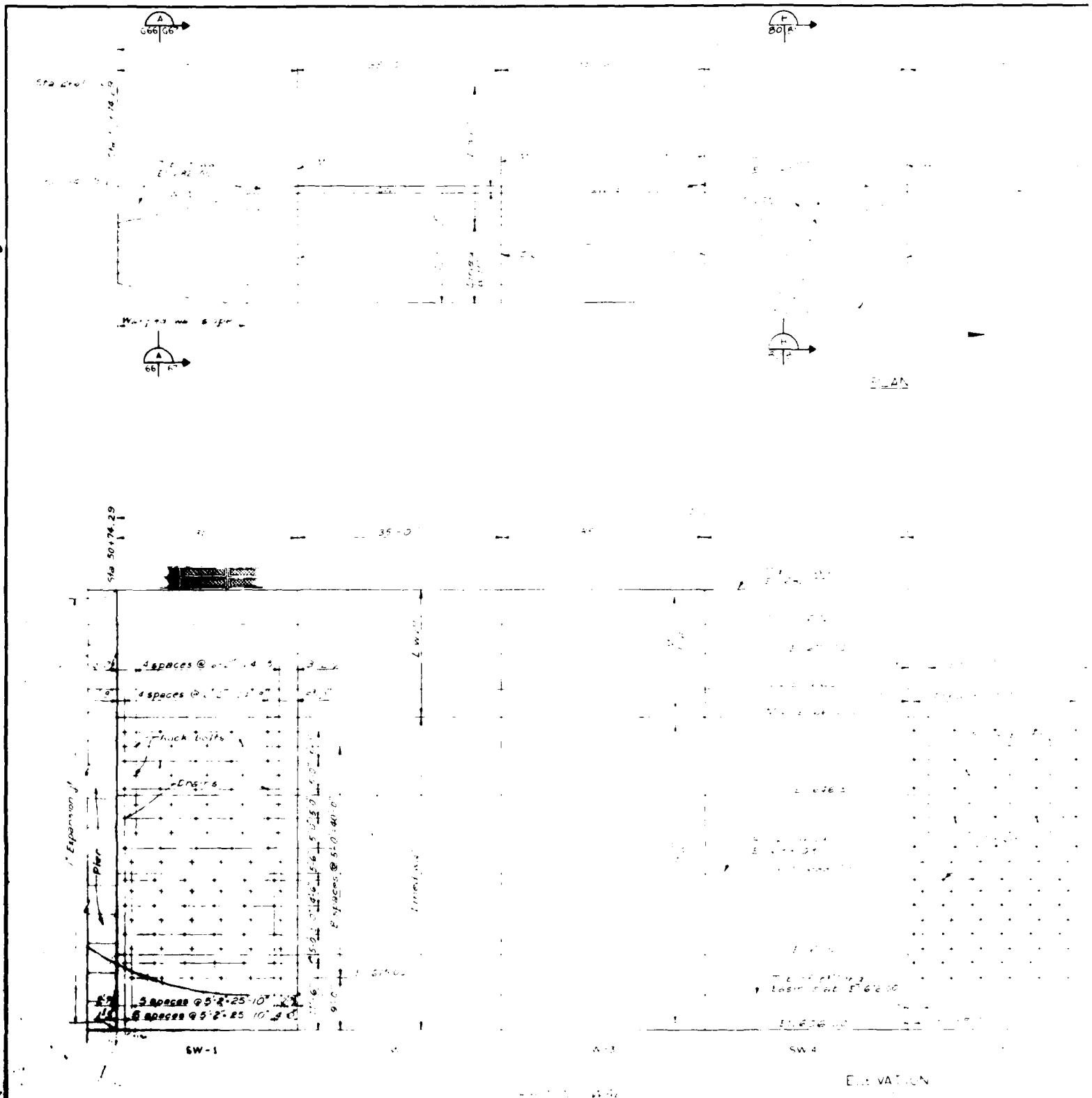
CONSTRUCTION FOUNDATION REPORT

SPILLWAY-POWERHOUSE EXCAVATION
ROCK BOLTING

Sheet number

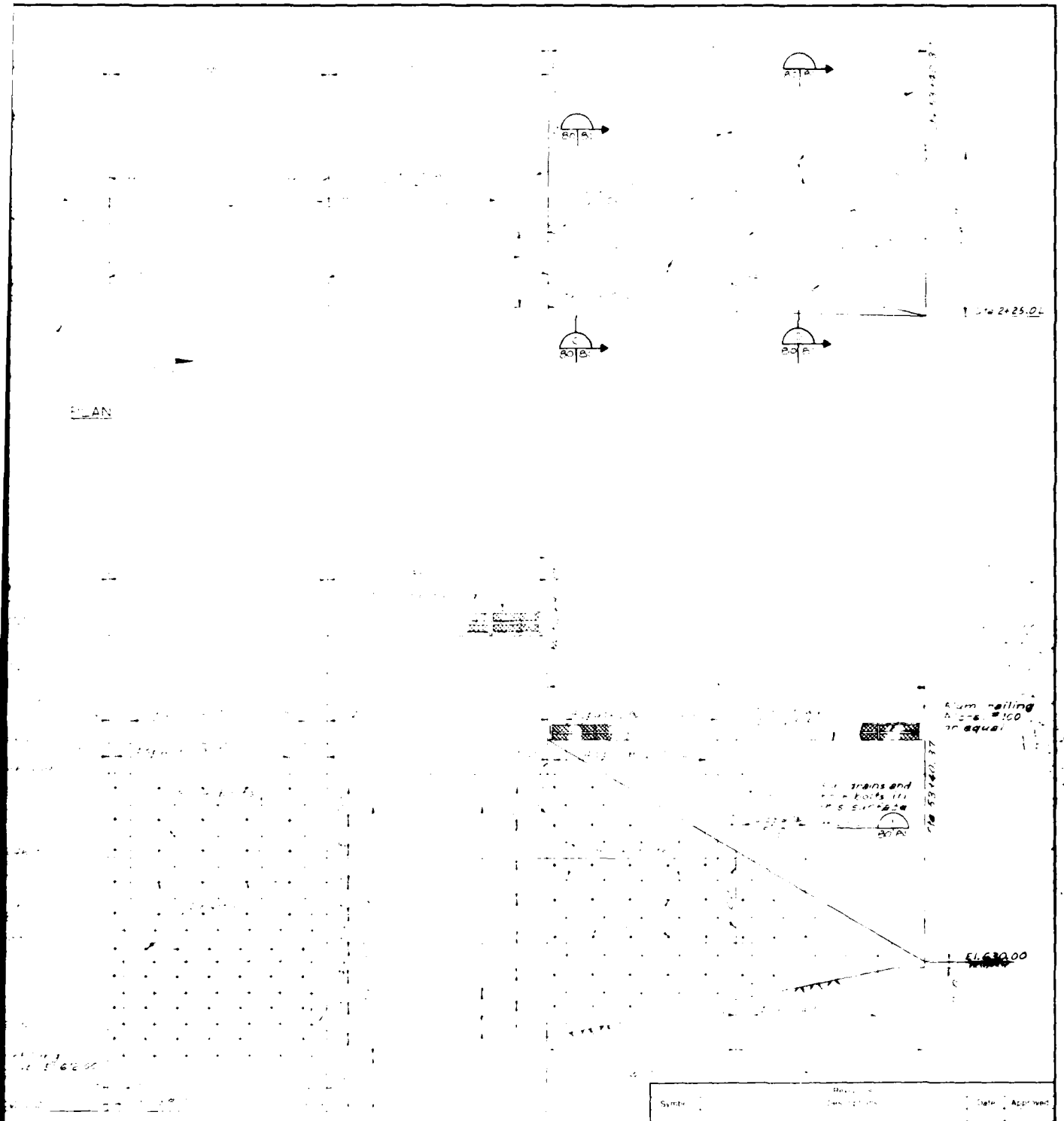
Drawing No. 0-12-9209

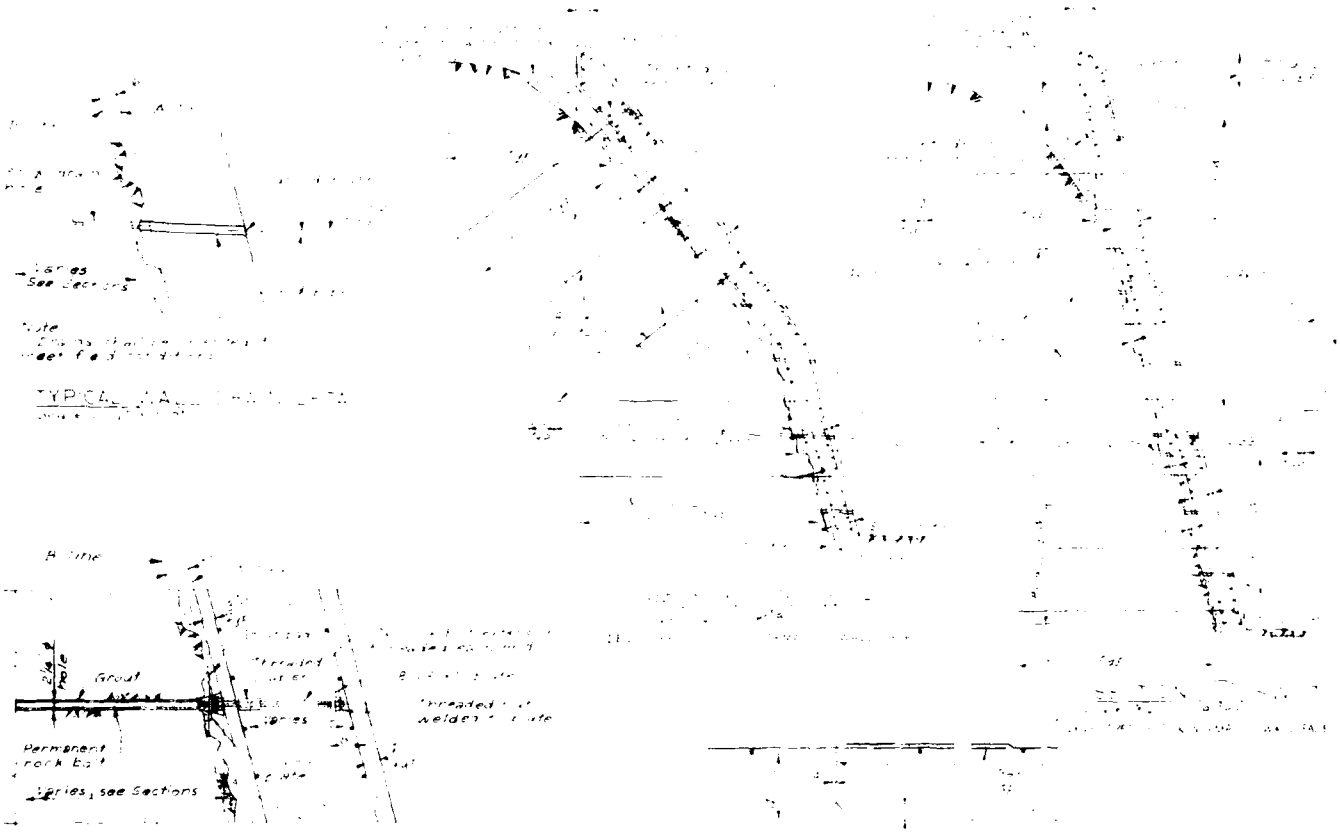
PLATE NO 79



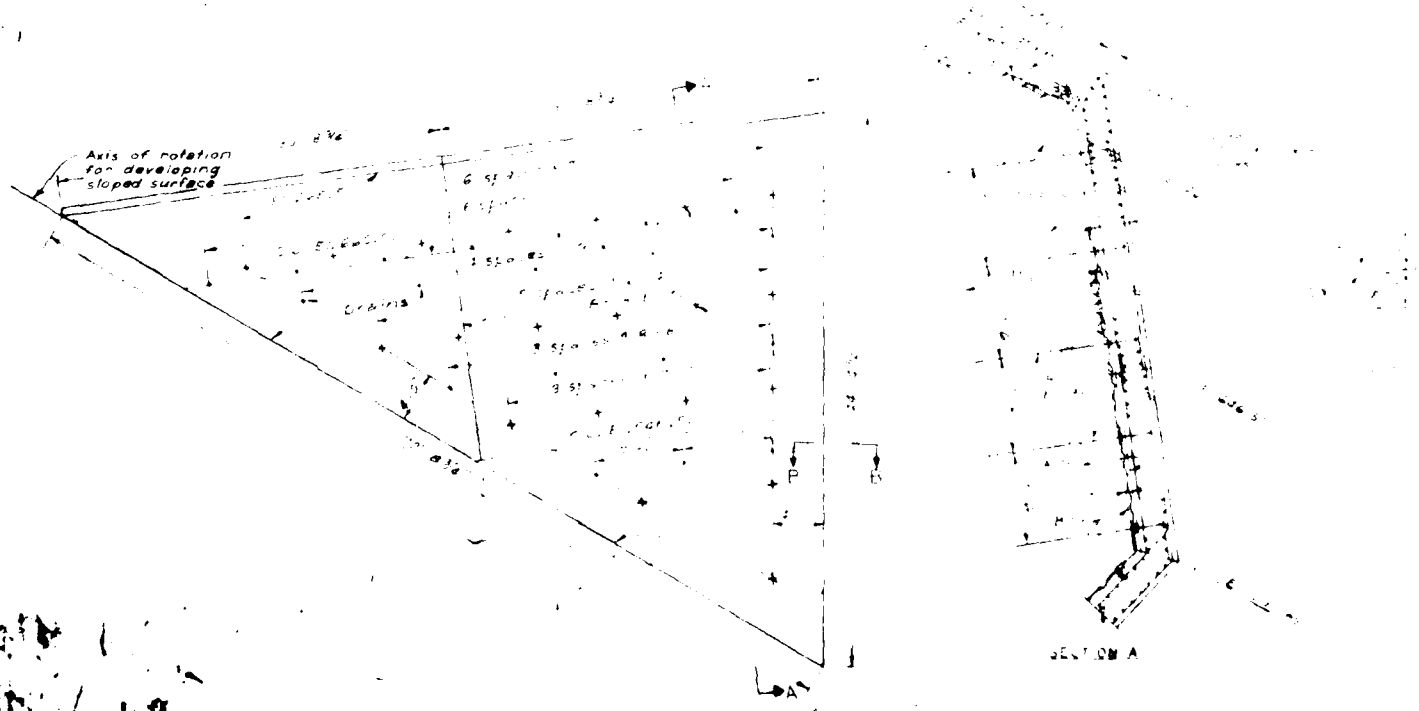
PLAN

ELEVATION

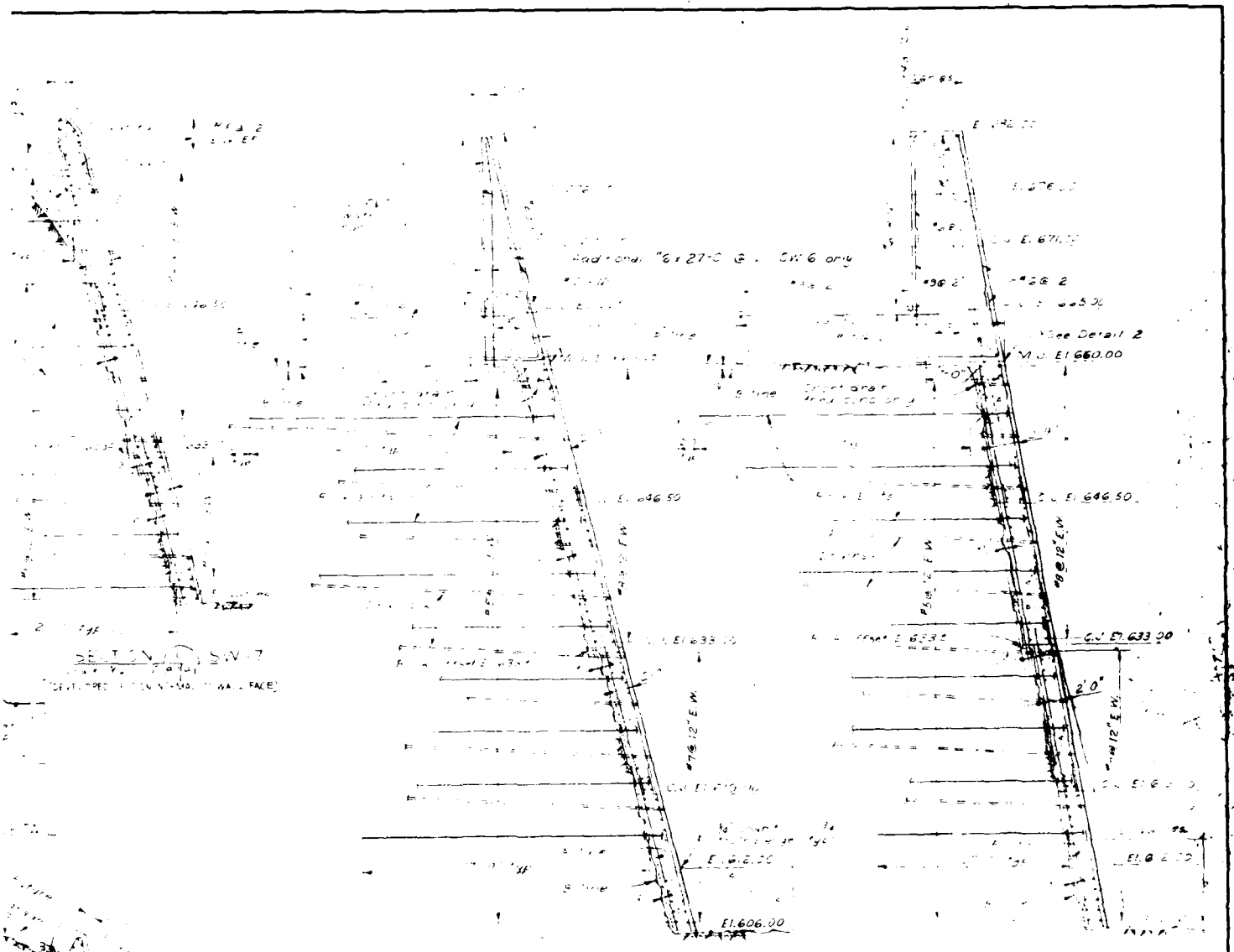

PLAN
ELEVATION
DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE
CONSTRUCTION FOUNDATION REPORT
SPILLWAY TRAINING WALL
PLAN AND ELEVATION
0-12-9210
PLATE NO 80



TYPICAL WALL & ROCK BOLT EXTENSION
Scale: 3/4" = 1'-0"



DETAIL (1) DEVELOPED VIEW
Scale: 1/4" = 1'-0"



SECTION (P) SW-7

SECTION (P) SW-2,3,4,5 & 6



SECTION A

SECTION B

DETAIL (2)

DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

Symbol	Revisions	Date	Approved

ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

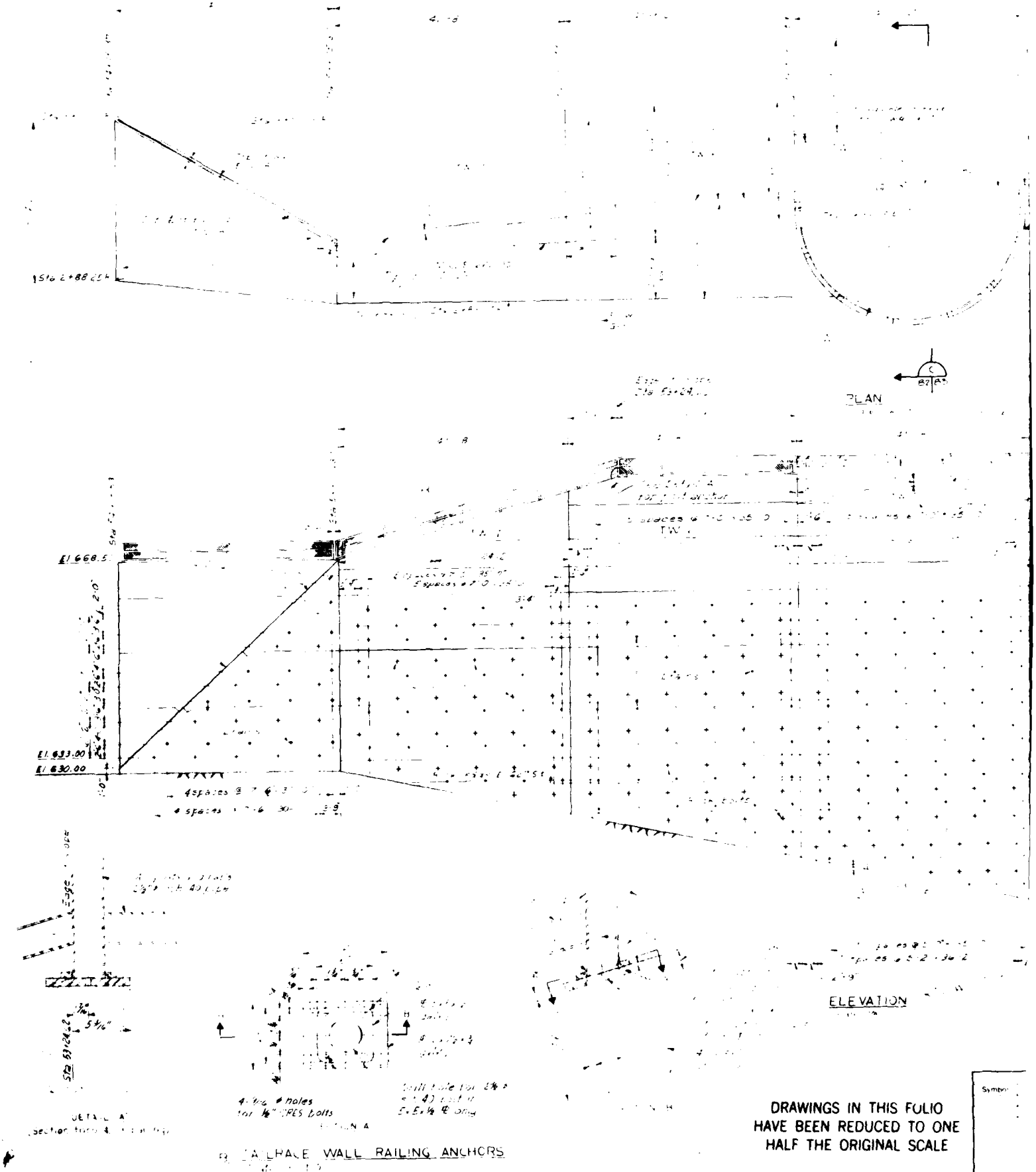
CONSTRUCTION FOUNDATION REPORT

SPILLWAY TRAINING WALL
SECTIONS AND DETAILS - REINFORCEMENT

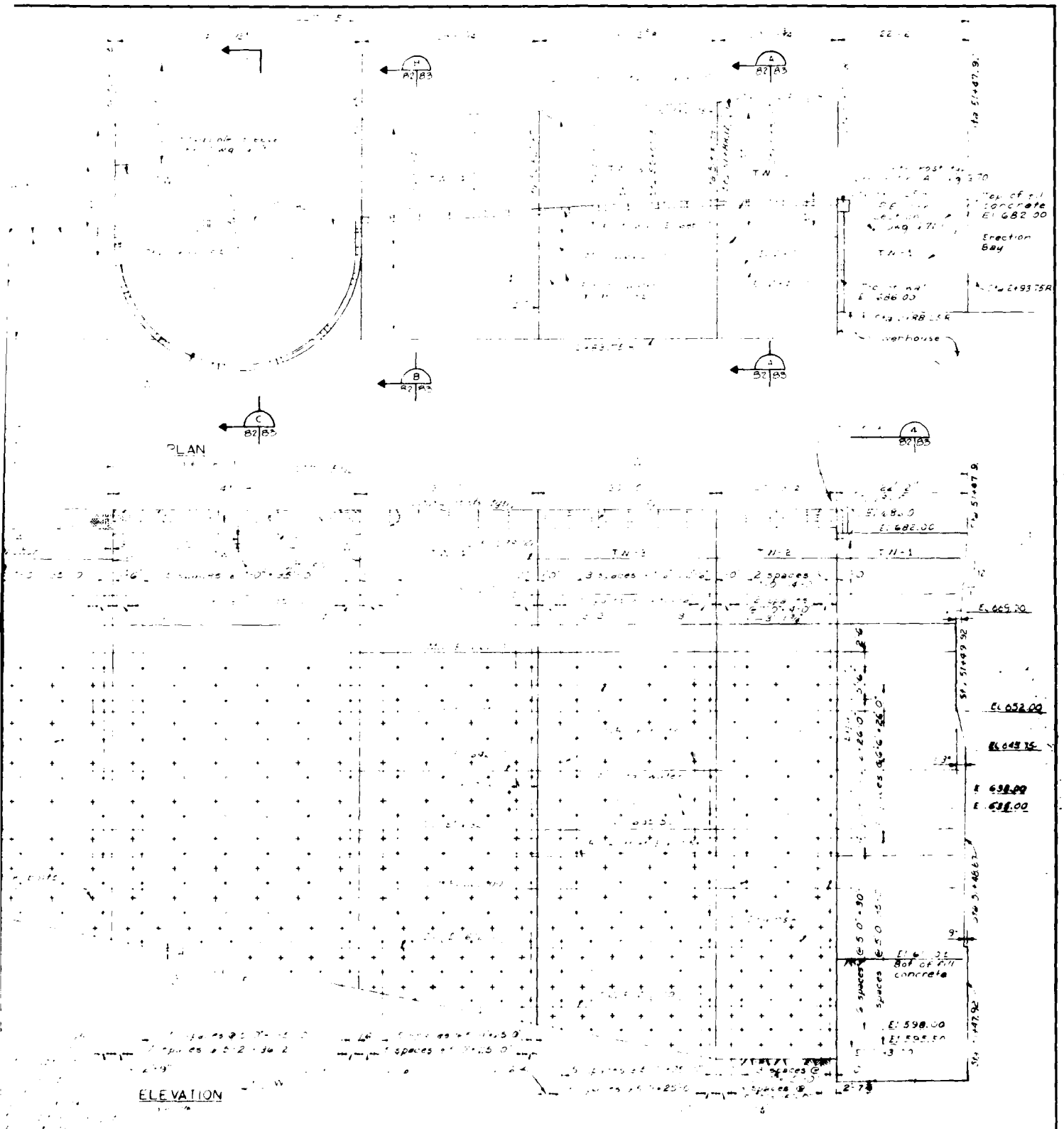
DATE MARCH 1985

0-12-9211

PLATE NO 81



DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE



DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

Symbol	Revisions Descriptions	Date	Approved

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

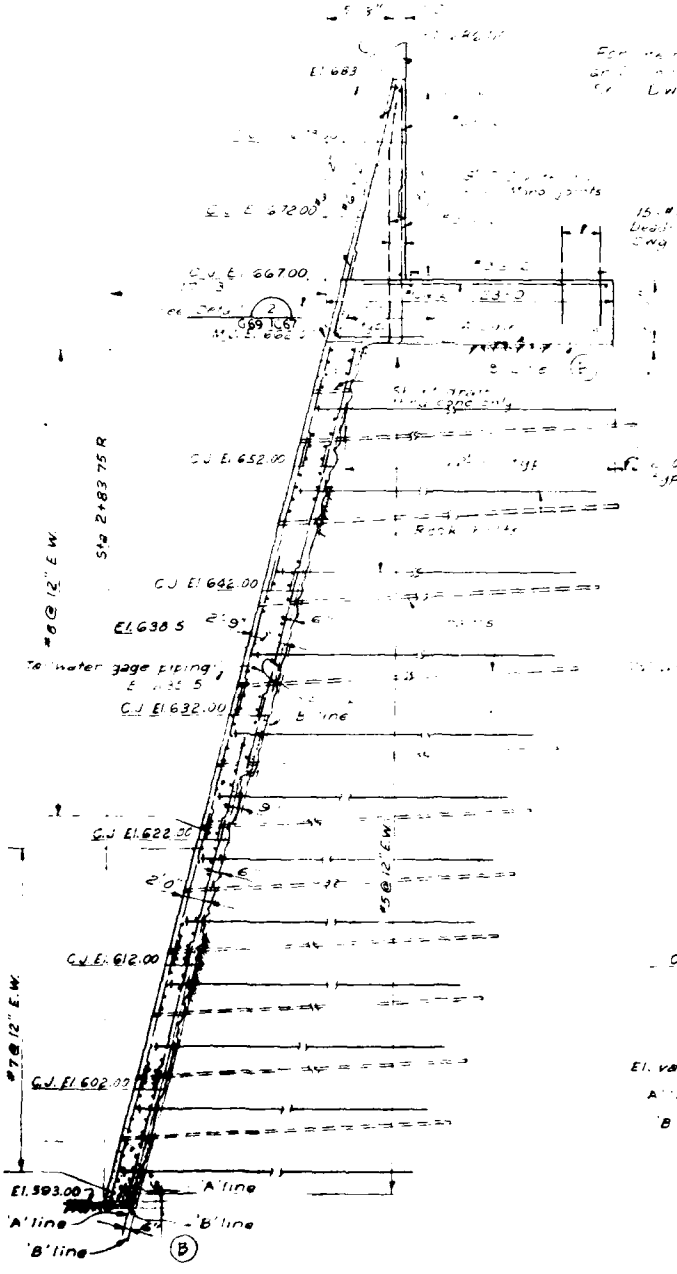
US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

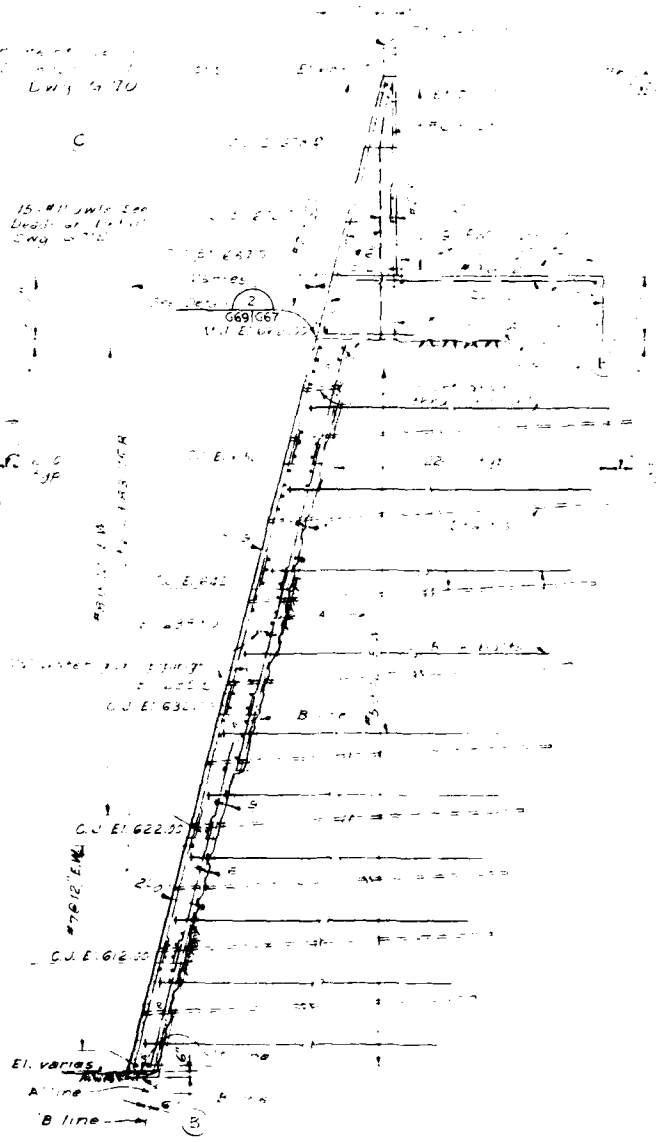
TAILRACE TRAINING WALL
PLAN AND ELEVATION

Scale: AS SHOWN
Date: MARCH 1985
Sheet number
Dwg No. 0-12-9212

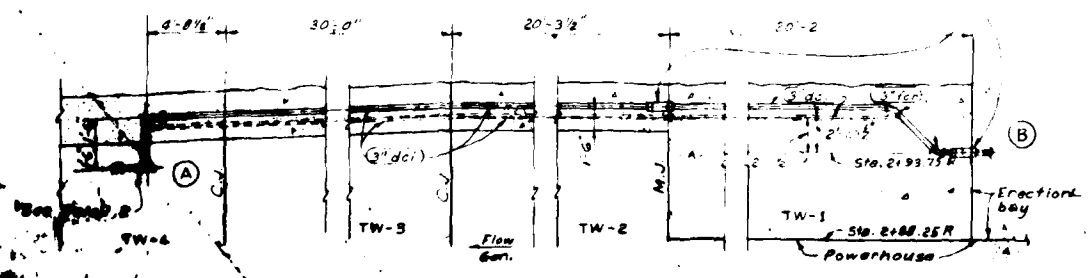
PLATE NO 82



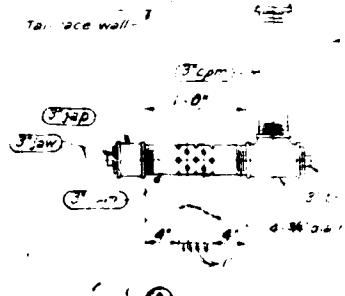
SECTION (A) TW-2



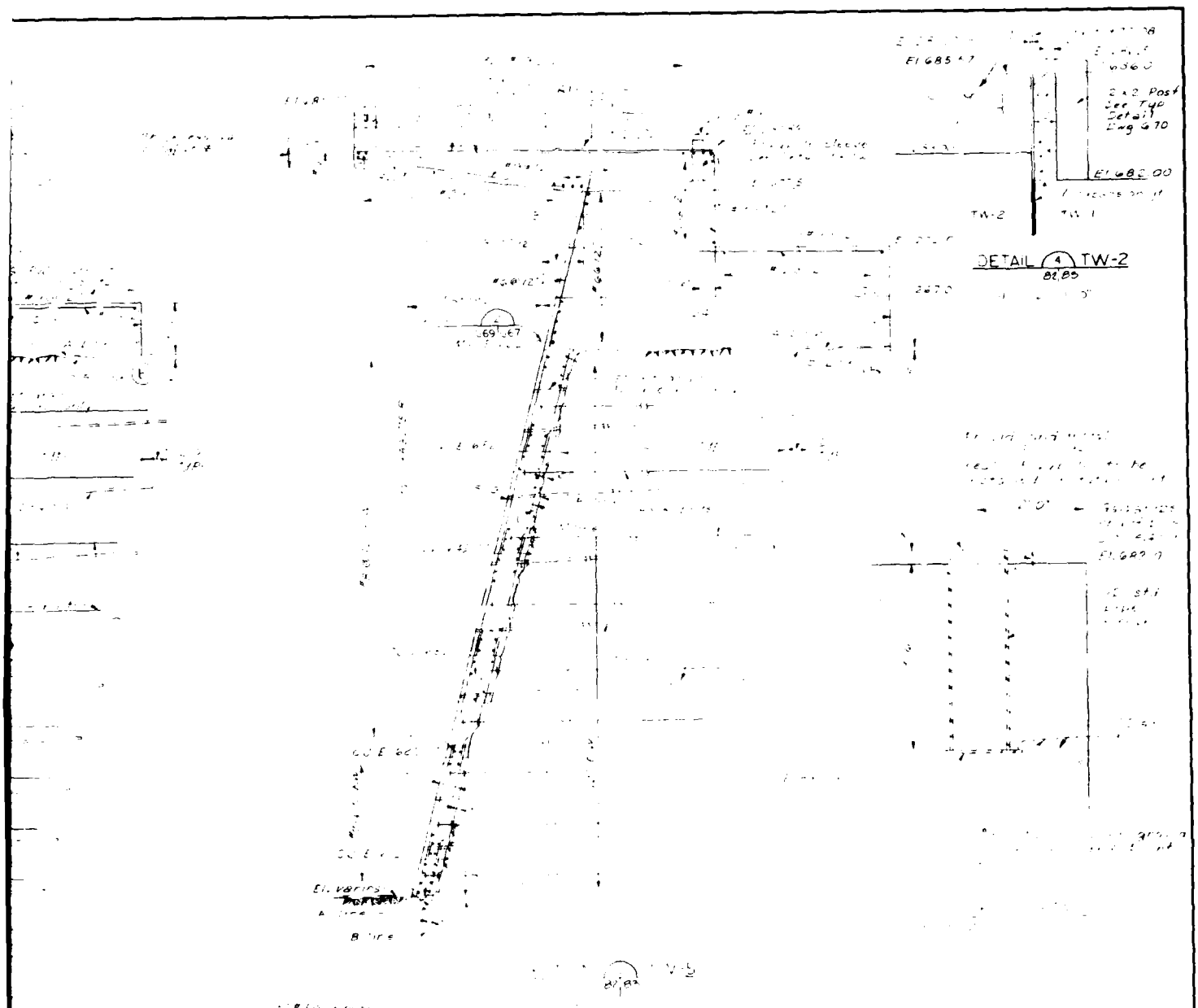
SECTION (B) TW-3 & TW-4

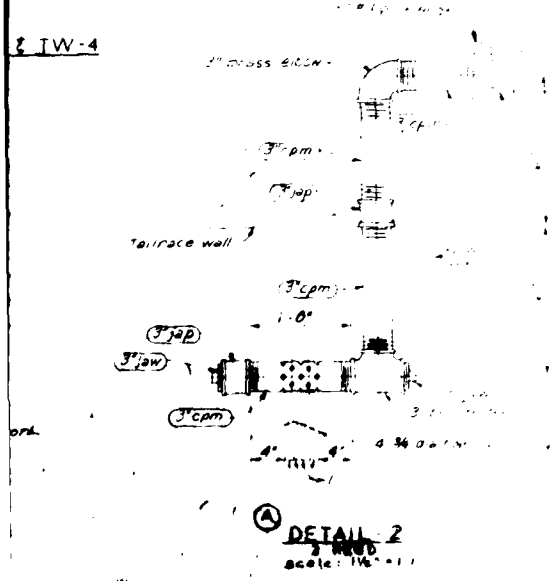


PLAN AT El. 638.5
FOR WATER GAGE PIPING



(A) DETAIL 2





DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

Symbol	Revisions Descriptions	Date	Approved

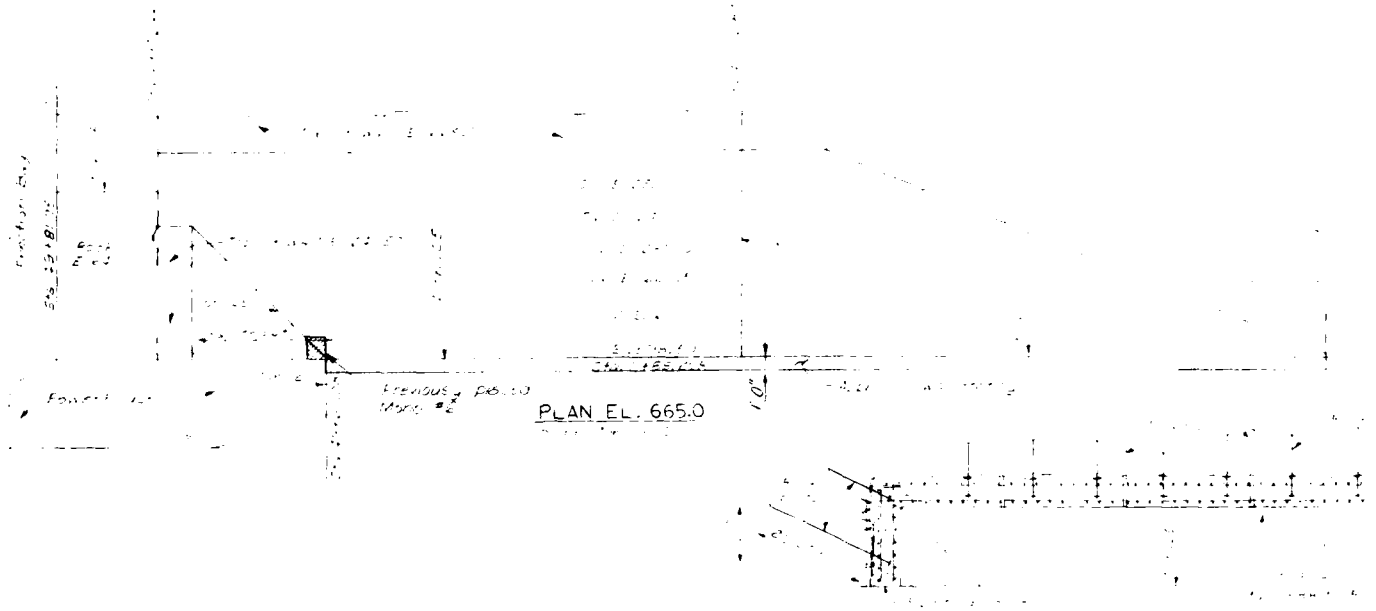
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

CONSTRUCTION FOUNDATION REPORT

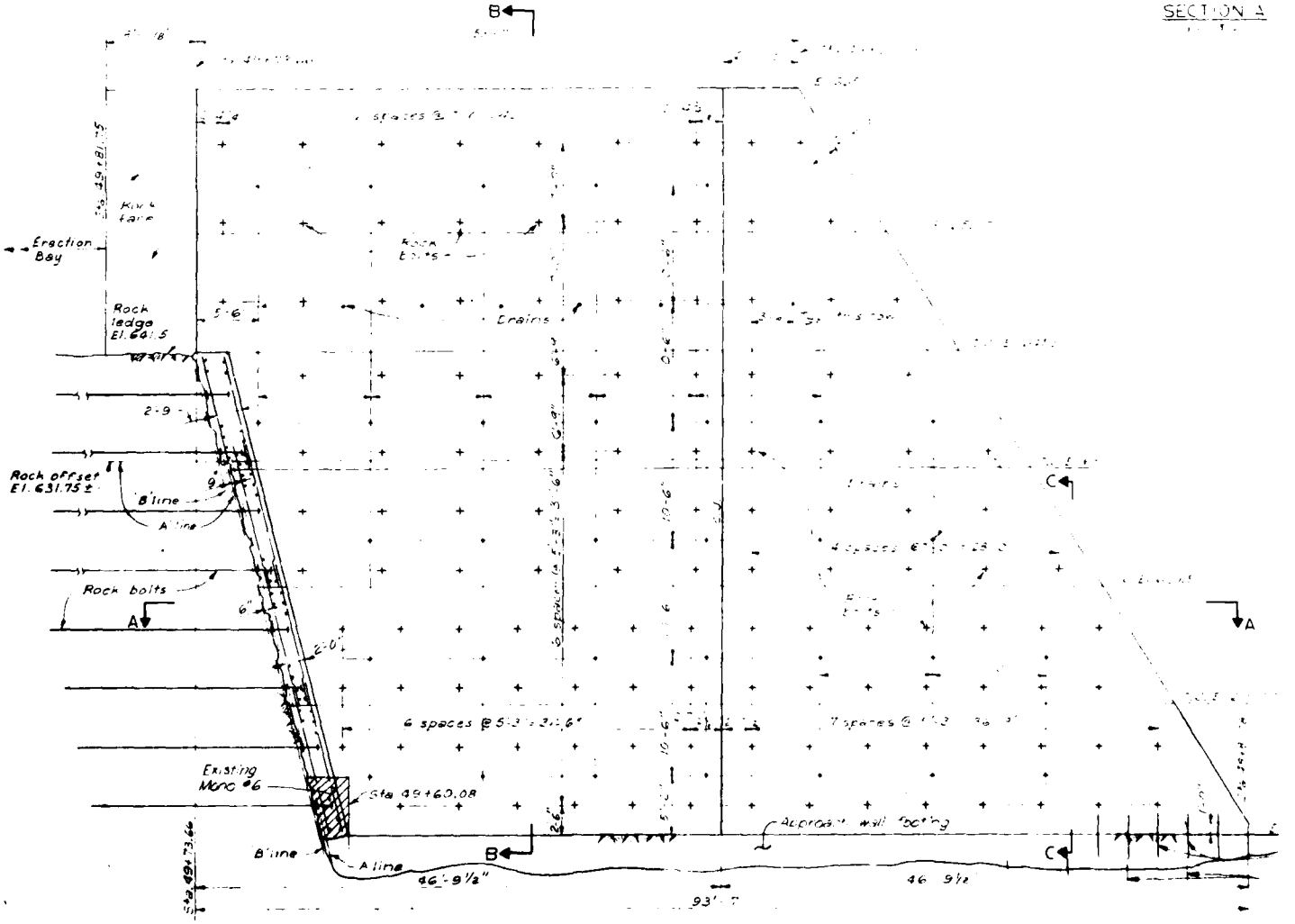
TAILRACE TRAINING WALL
SECTIONS AND DETAILS - REINFORCEMENT

Scale: AS NOTED
Date: MARCH 1985
Sheet number:
Drawing No. 0-12-9213

PLATE NO 83

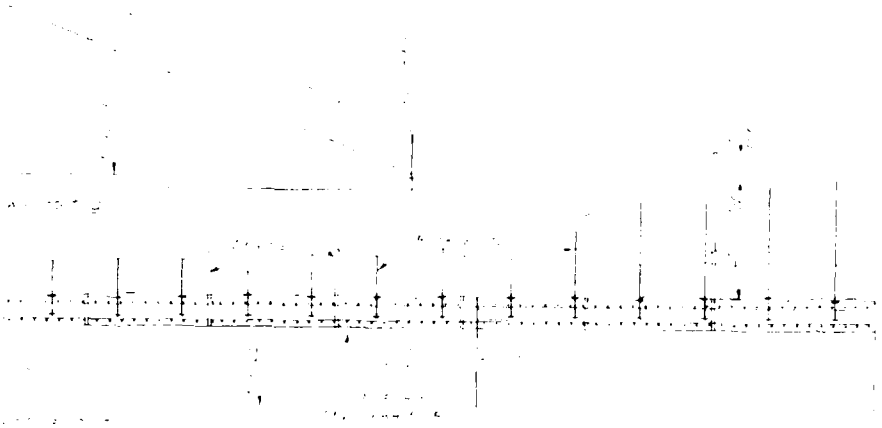


SECTION A



ELEVATION

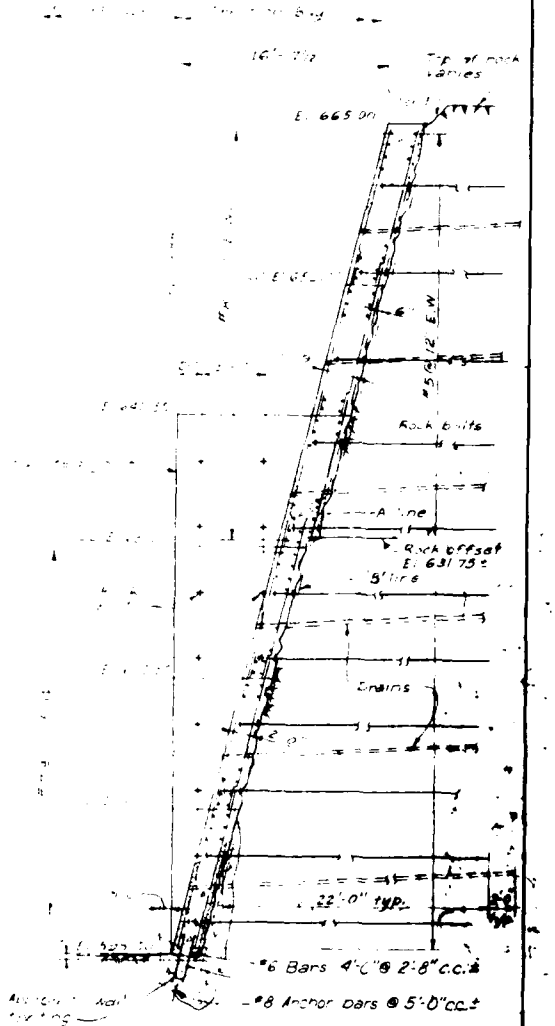
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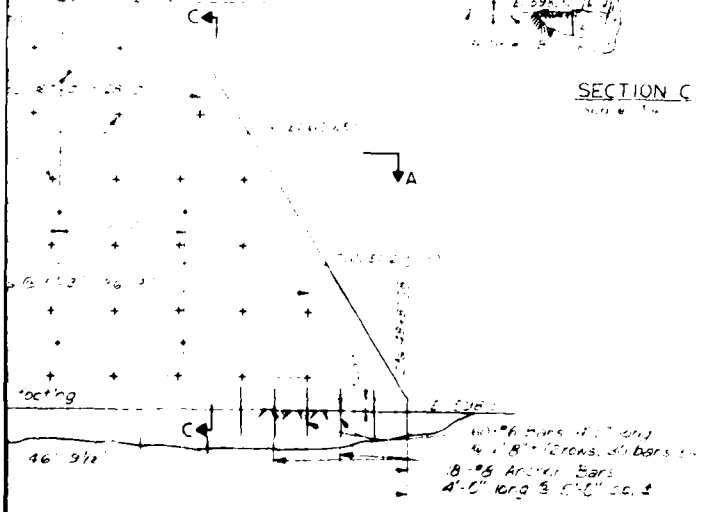
SECTION A



SECTION C



SECTION B



DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

Symbol	Revisions Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

CONSTRUCTION FOUNDATION REPORT

APPROACH WALL - POWERHOUSE

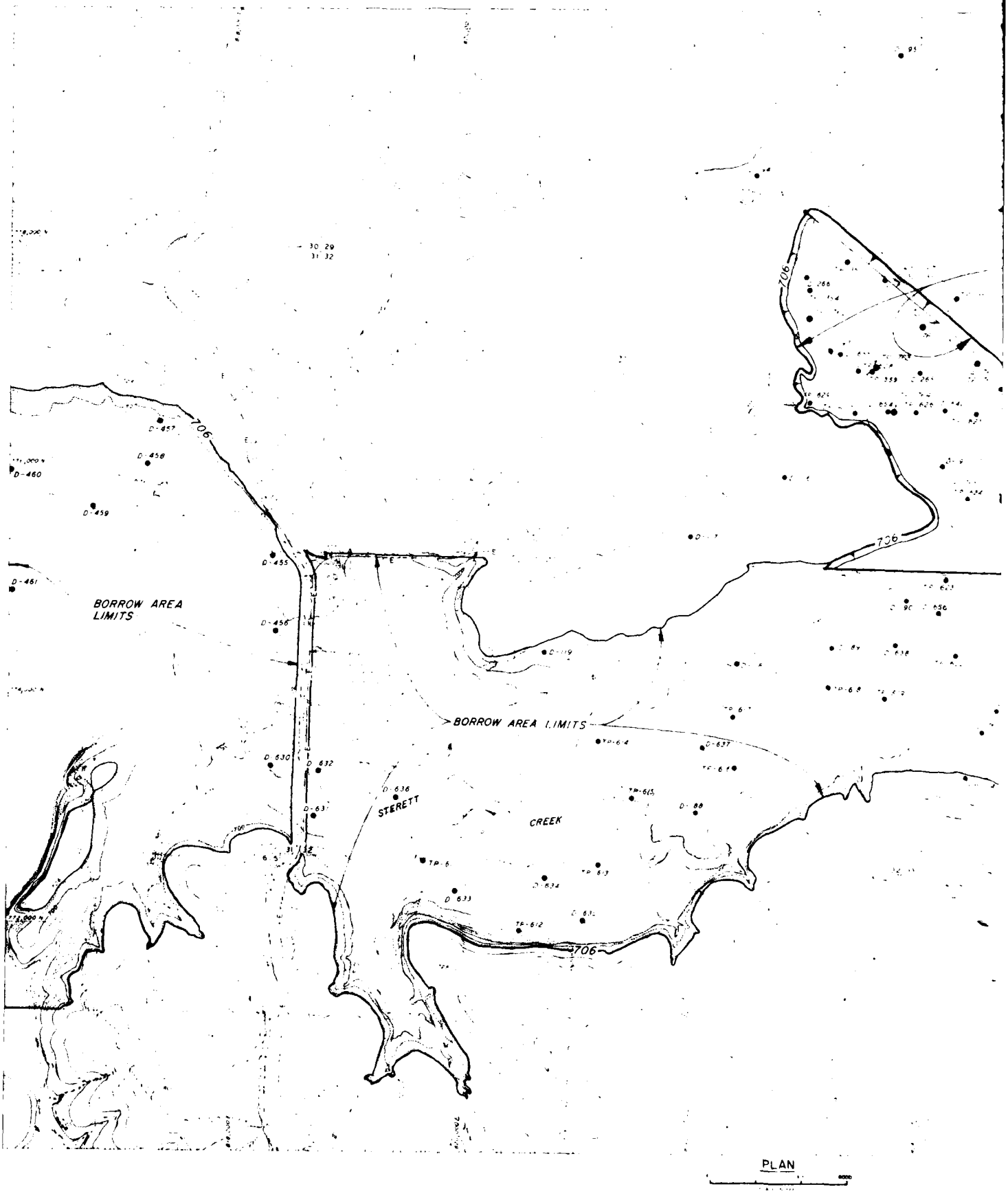
Date: MARCH 1985

Sheet number: 0-12-9214

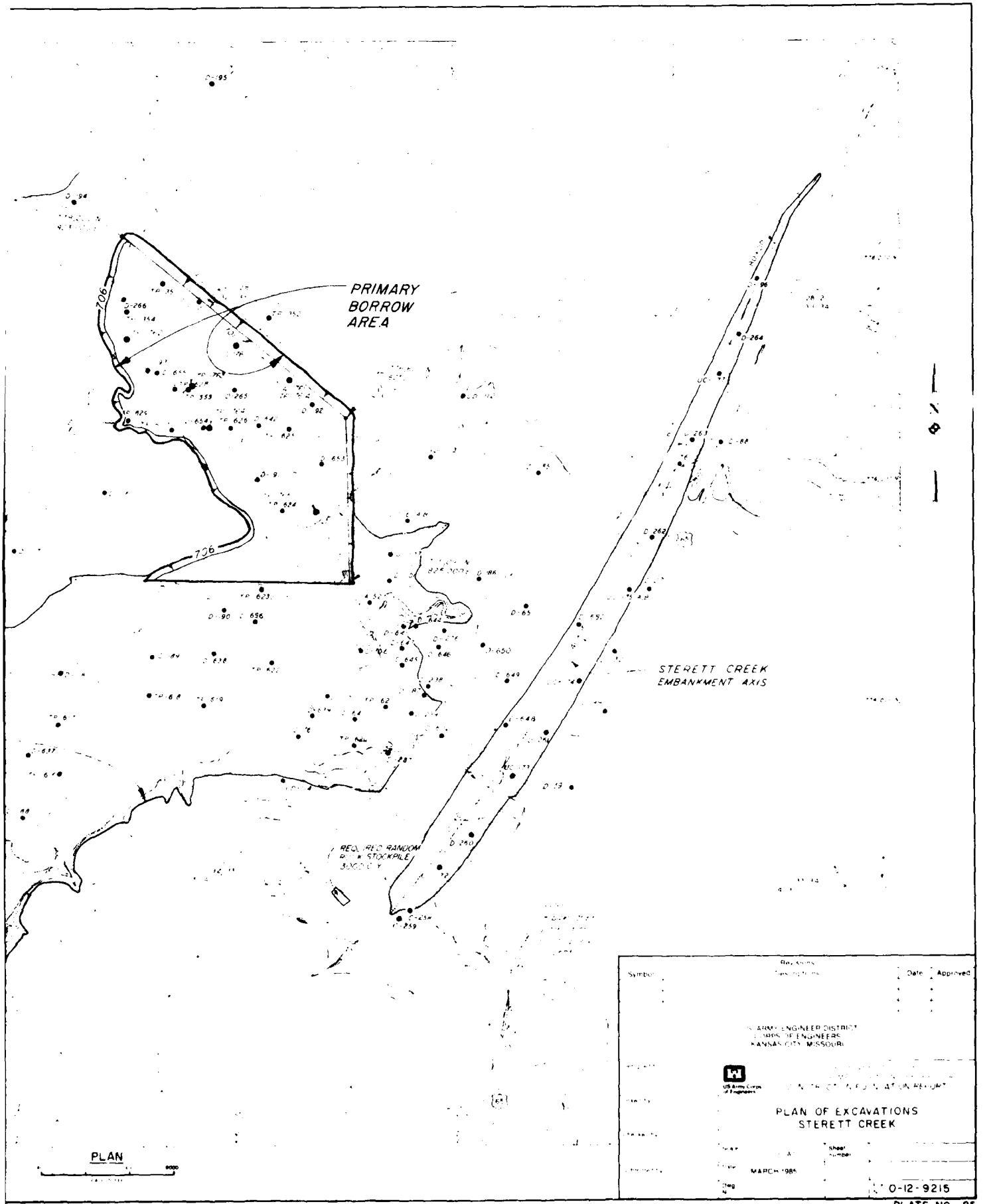
PLATE NO 84

STAGE IV CONSTRUCTION

STRUCTION



DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE



Symbol	Revisions	Date	Approved

ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

PLAN OF EXCAVATIONS
STERETT CREEK

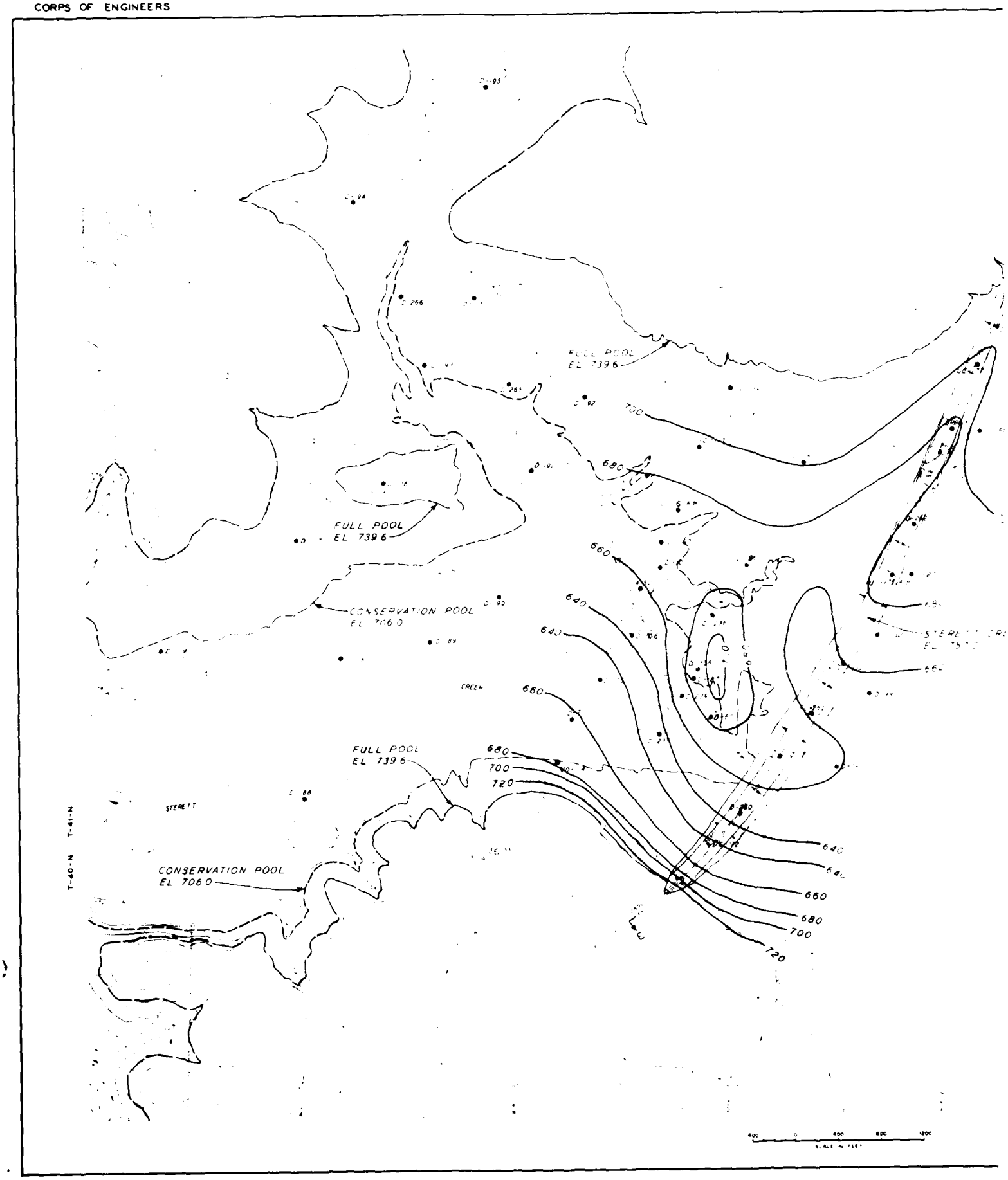
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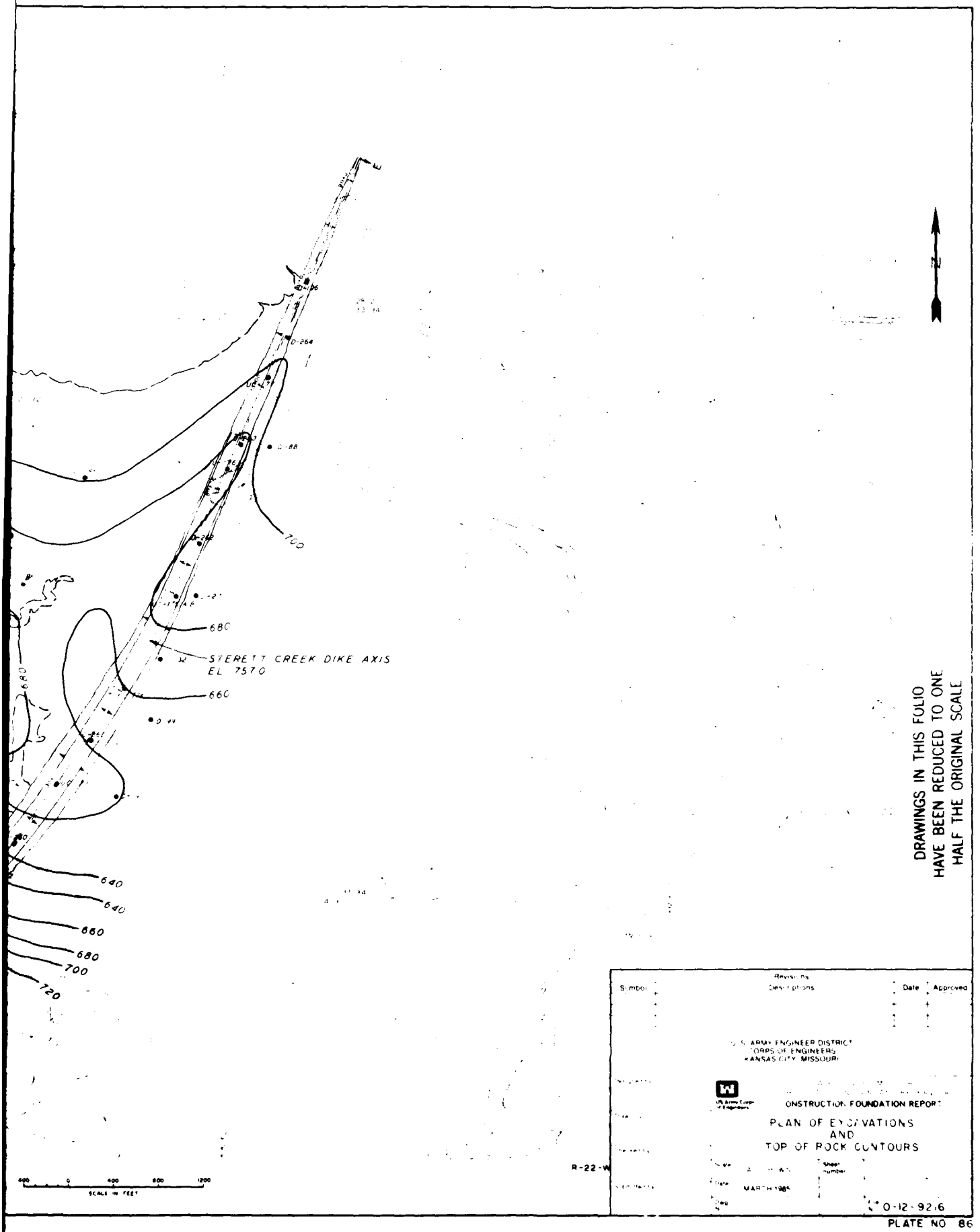
MARCH 1985

Drawing No. 0-12-9215

PLATE NO. 85

CORPS OF ENGINEERS





DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

CONSTRUCTION FOUNDATION REPORT

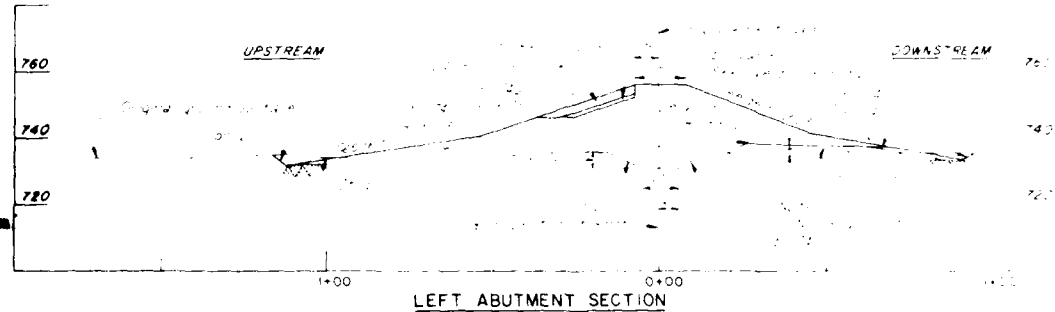
PLAN OF EXCAVATIONS
AND
TOP OF ROCK CONTOURS

Date: MARCH 1985

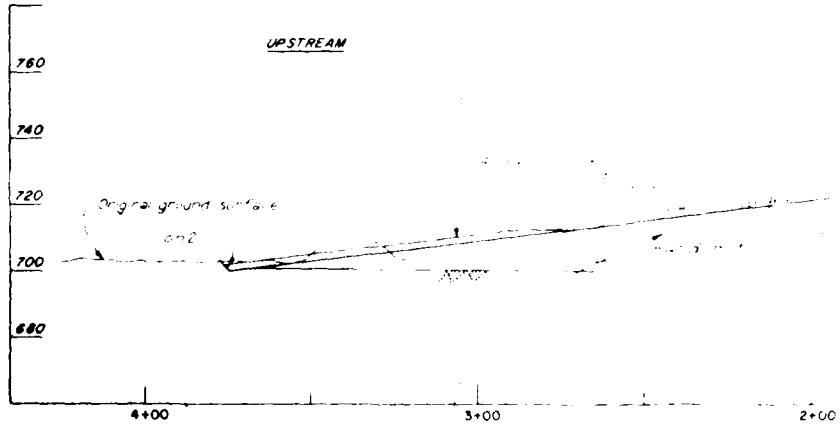
Sheet number: 0-12-92.6

PLATE NO 86

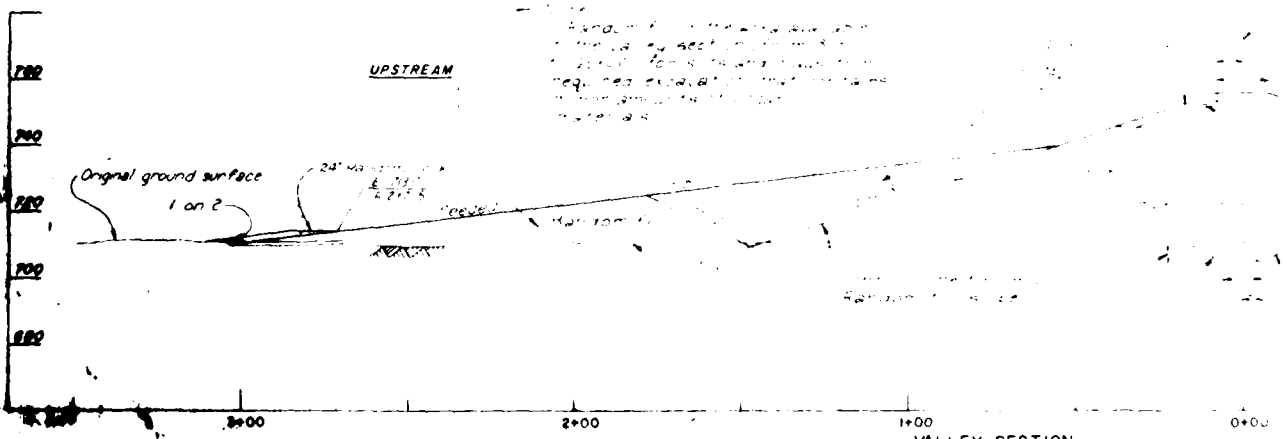
OVERBUILD DETAIL



LEFT ABUTMENT SECTION
STA 73+00 TO STA 85+60±



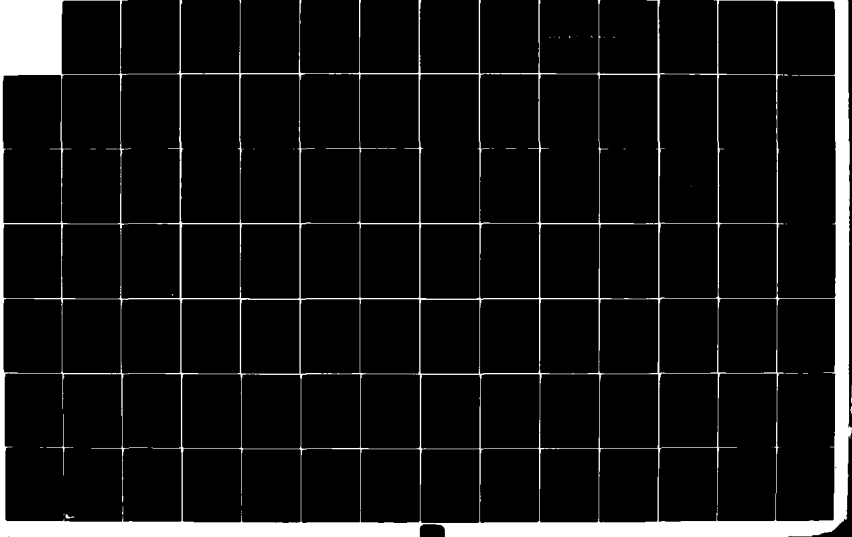
VALLEY SECTION
STA 11+40 TO STA 33+00

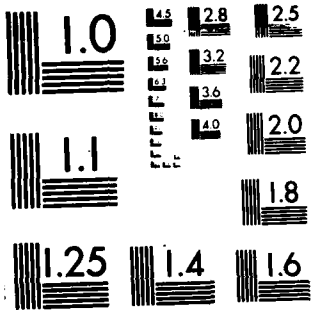


VALLEY SECTION
STA 33+00 TO STA 73+00

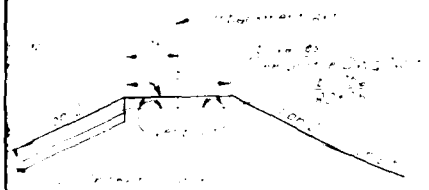
AD-A154 456 OSAGE RIVER BASIN OSAGE RIVER MISSOURI HARRY S TRUMAN DAM & RESERVOIR MU..(U) CORPS OF ENGINEERS KANSAS CITY MO KANSAS CITY DISTRICT R F GRIFFITH ET AL. 1984 3/3

UNCLASSIFIED F/G 13/13 NL

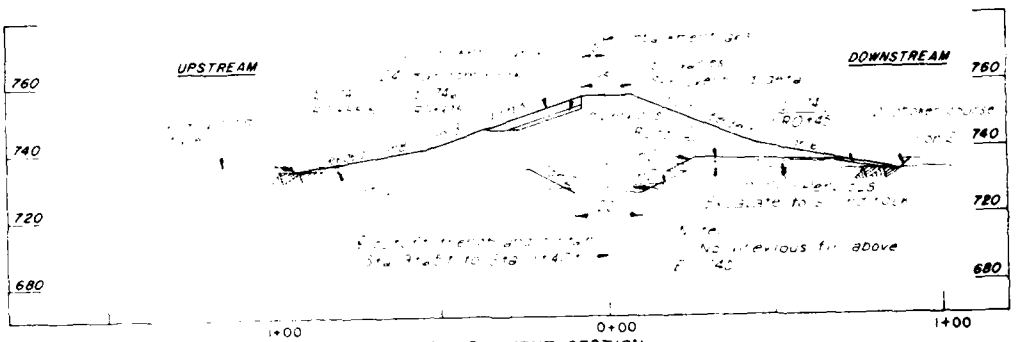




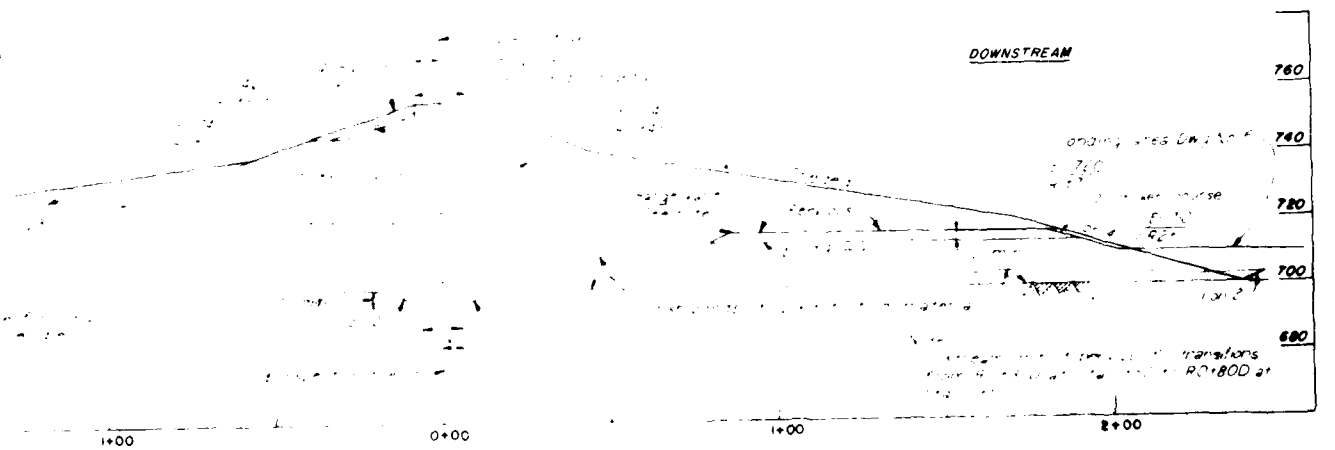
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A



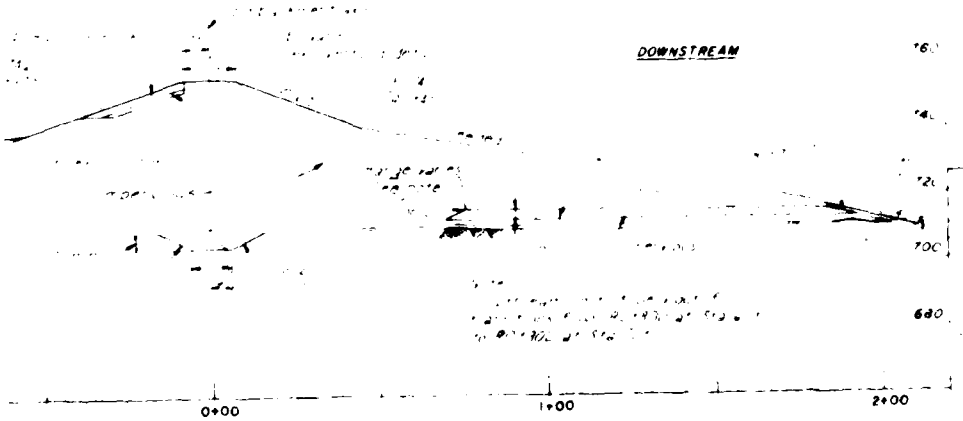
OVERBUILD DETAIL



RIGHT ABUTMENT SECTION
STA. 9+70± TO STA 11+40



VALLEY SECTION
STA 11+40 TO STA 33+00



ION
73+00

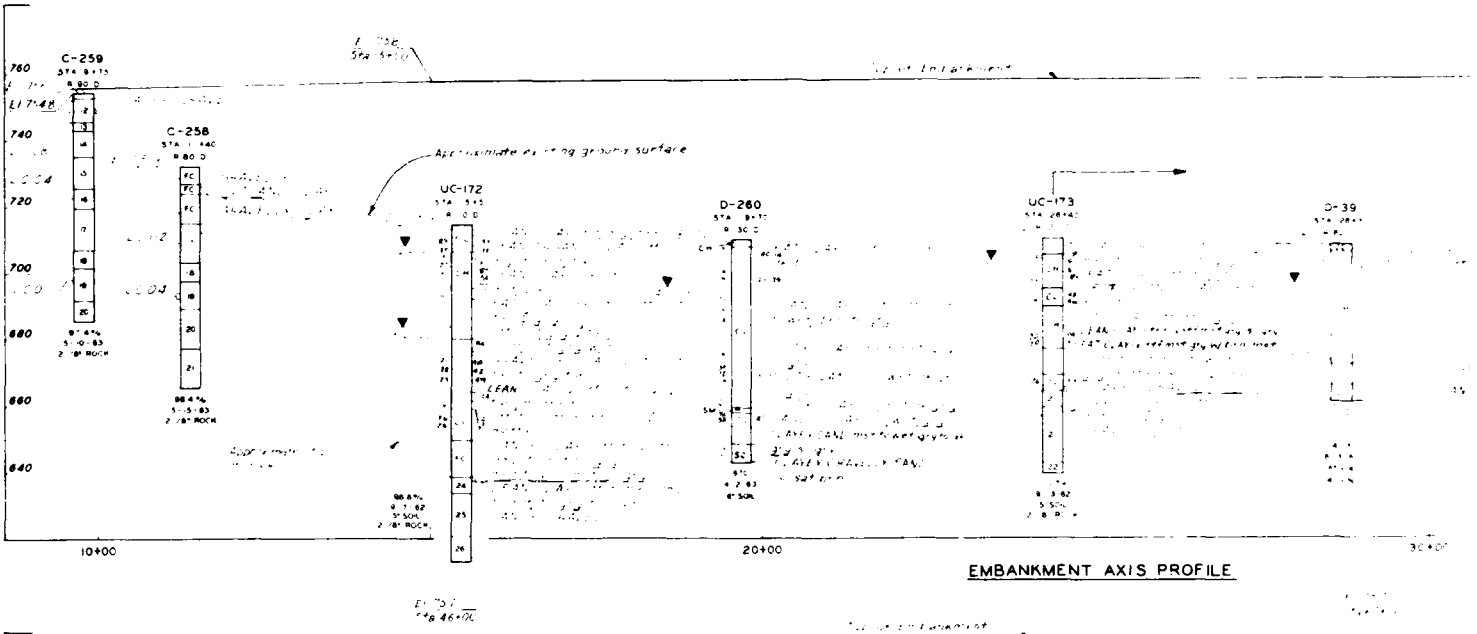
DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

INSTRUCTION FOUNDATION REPORT

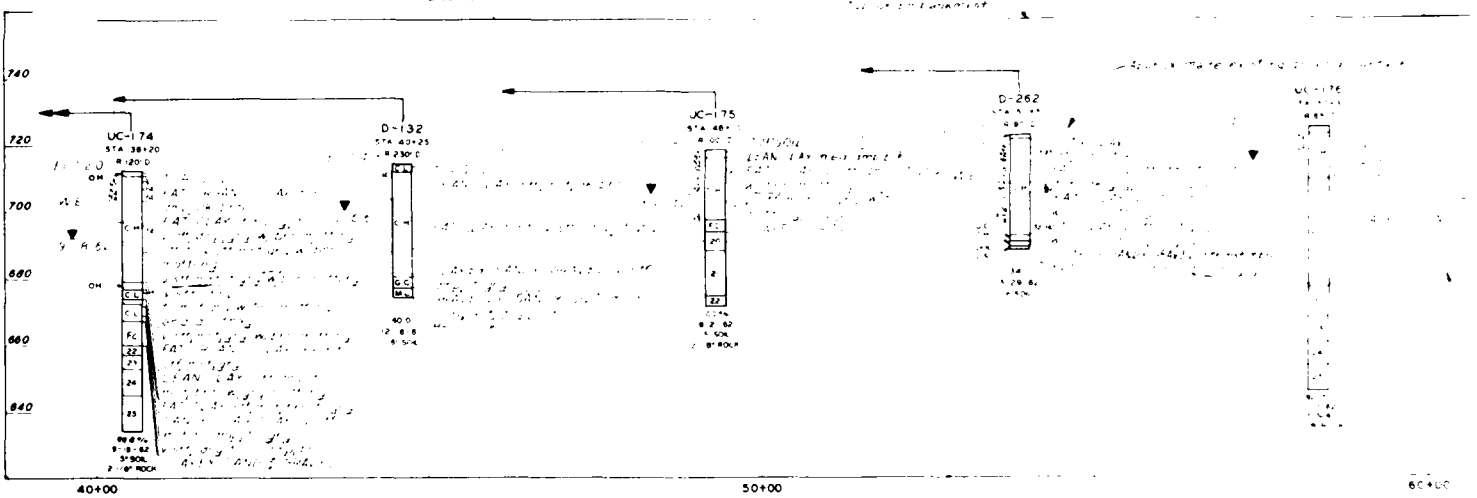
EMBANKMENT SECTIONS
TERETT CREEK

0-12-9217

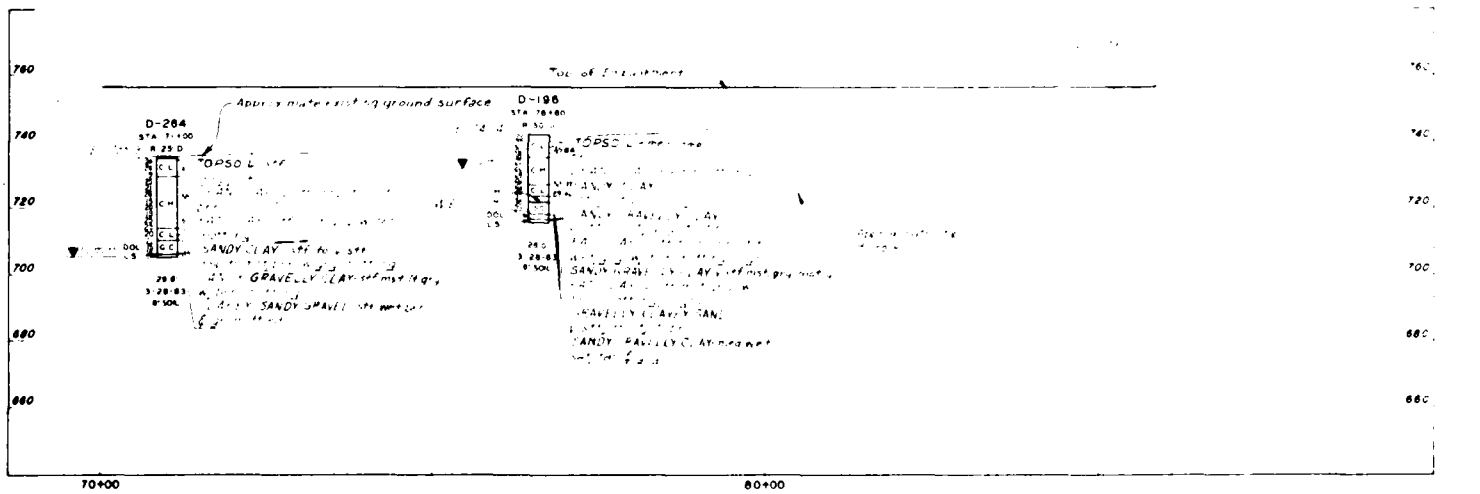
PLATE NO. 87



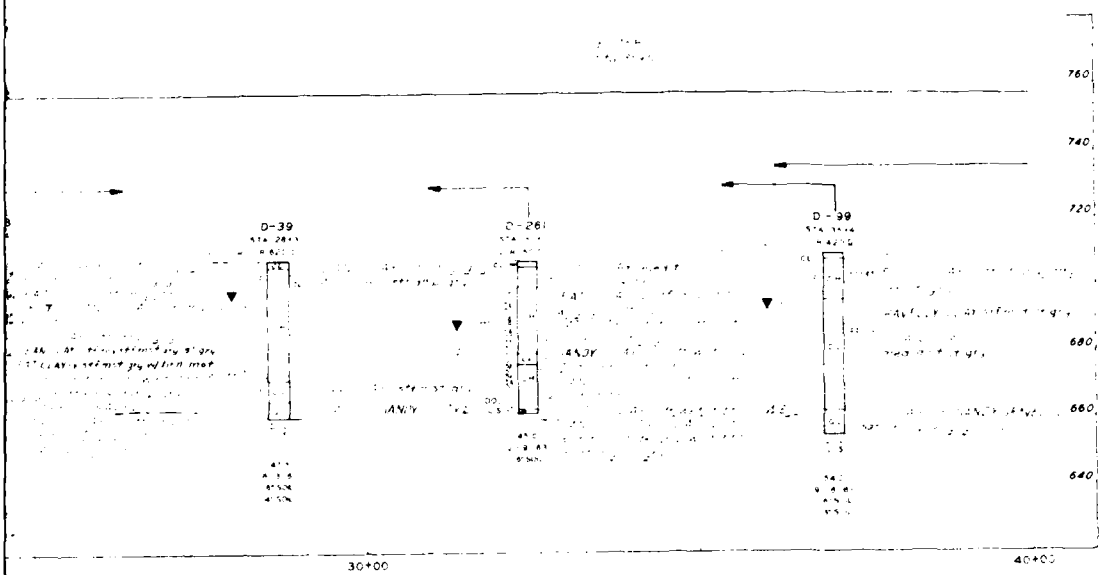
EMBANKMENT AXIS PROFILE



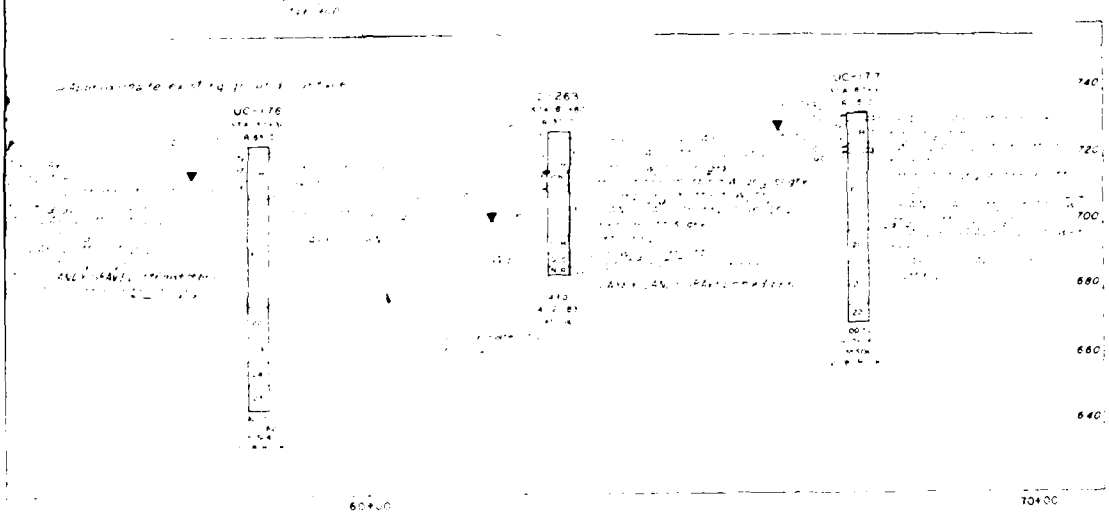
EMBANKMENT AXIS PROFILE



EMBANKMENT AXIS PROFILE



NT AXIS PROFILE



NT AXIS PROFILE

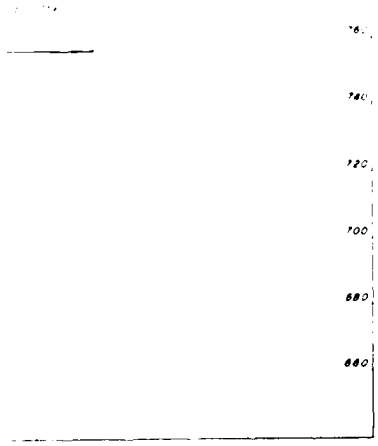


Plate B5

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Symbo	Revisions Descriptions	Date	Approved

ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

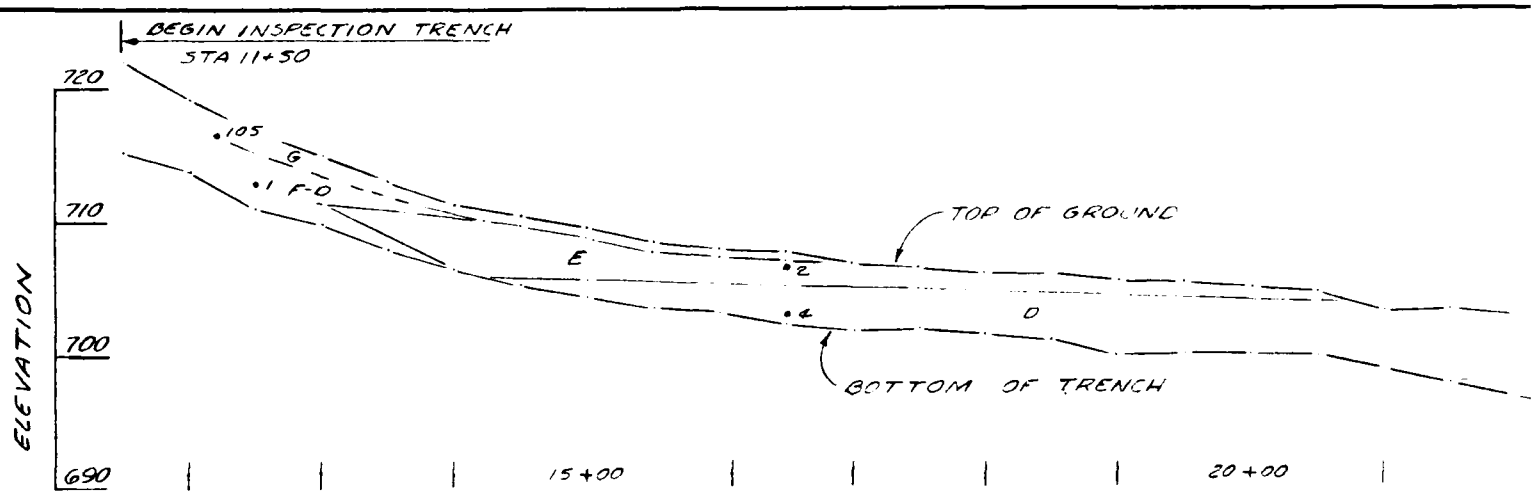
US Army Corps of Engineers

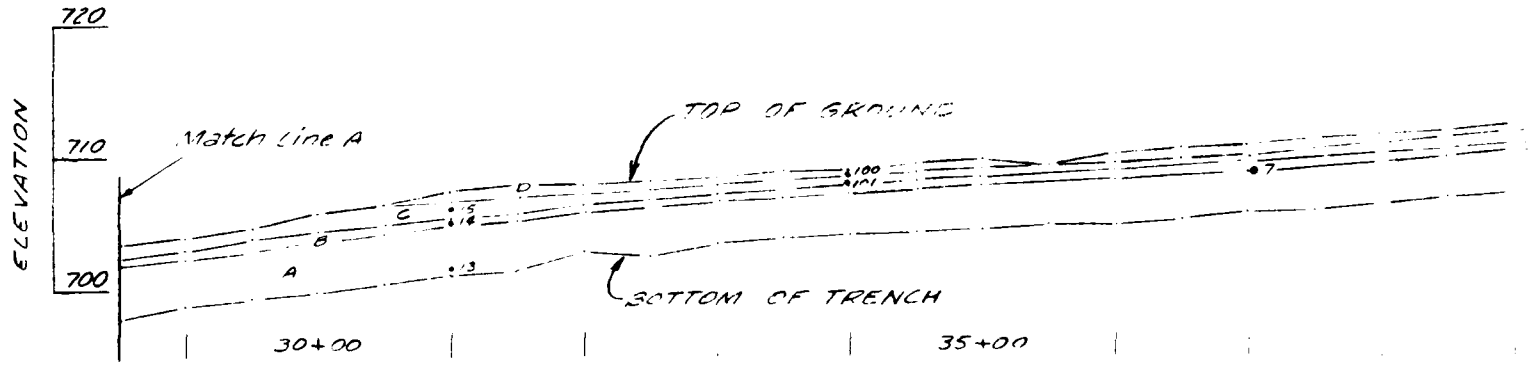
CONSTRUCTION FOUNDATION REPORT

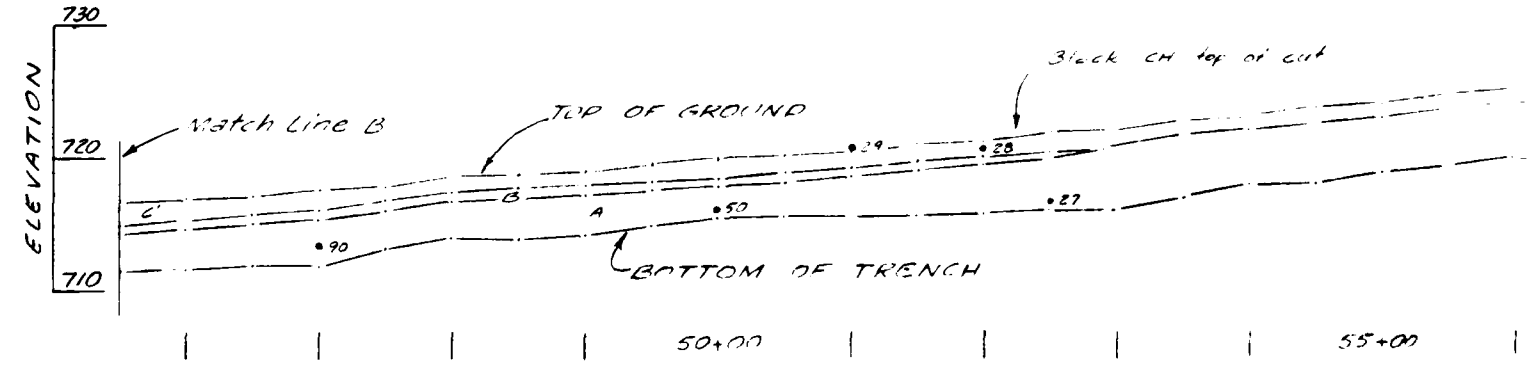
EMBANKMENT AXIS PROFILE
LOGS OF EXPLORATIONS
STERETT CREEK

Scale: AS
Date: MARCH 1985
Drwg No.:
Sheet number:
File No. 0-12-9218

PLATE NO. 88







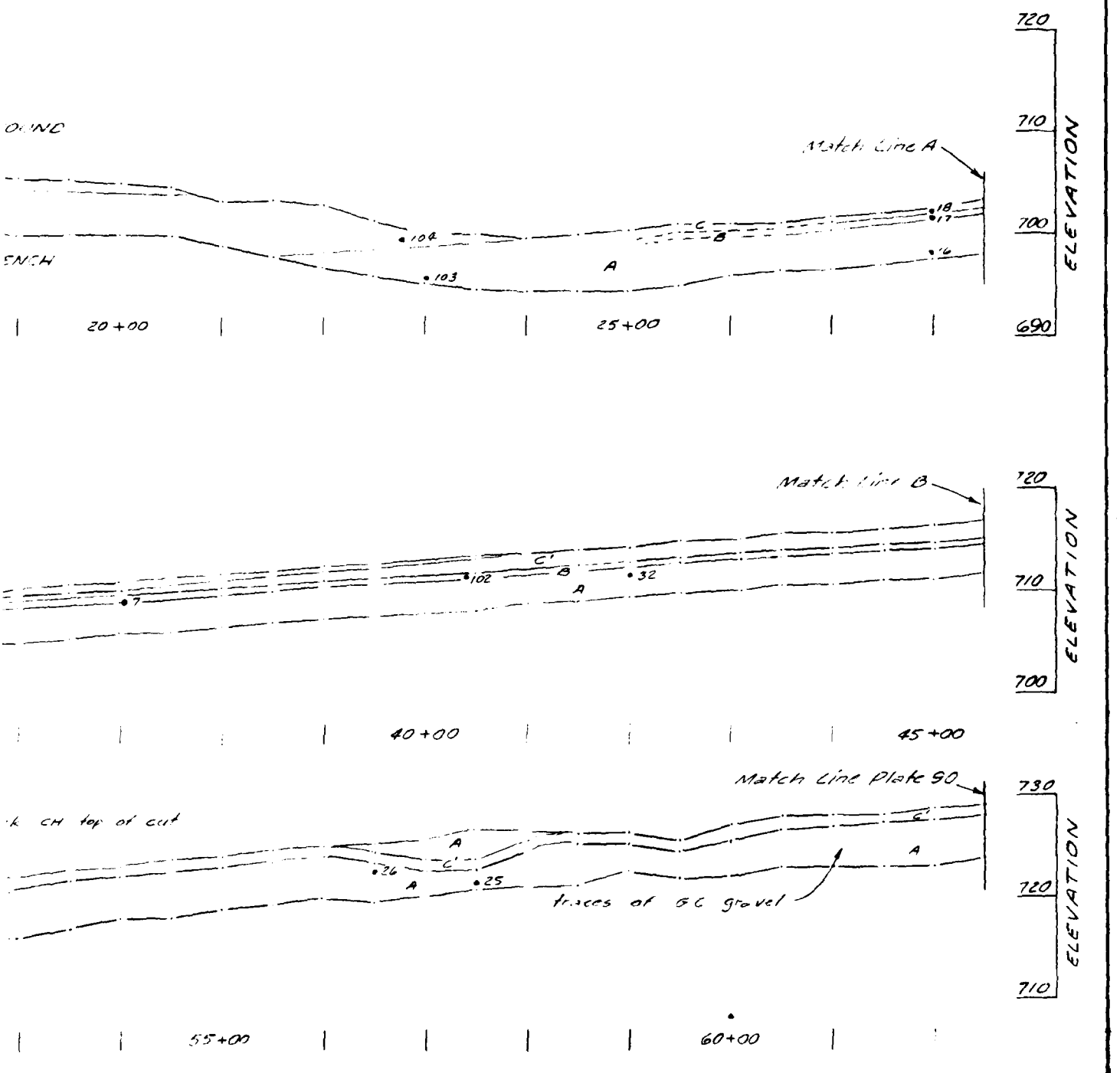
STERETT CREEK DIKE

INSPECTION TRENCH DIKE STA

LOOKING UPSTREAM

for

SCALE AS SHOW



CREEK DIKE STAGE IV

STA 11+50 TO STA 62+50

for Legend See Plate 90

SCALE AS SHOWN

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

Designed by

Drawn by

Checked by

Submitted by

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

STERETT CREEK DIKE
INSPECTION TRENCH PROFILE
STA. 11 + 50 TO STA. 62+50

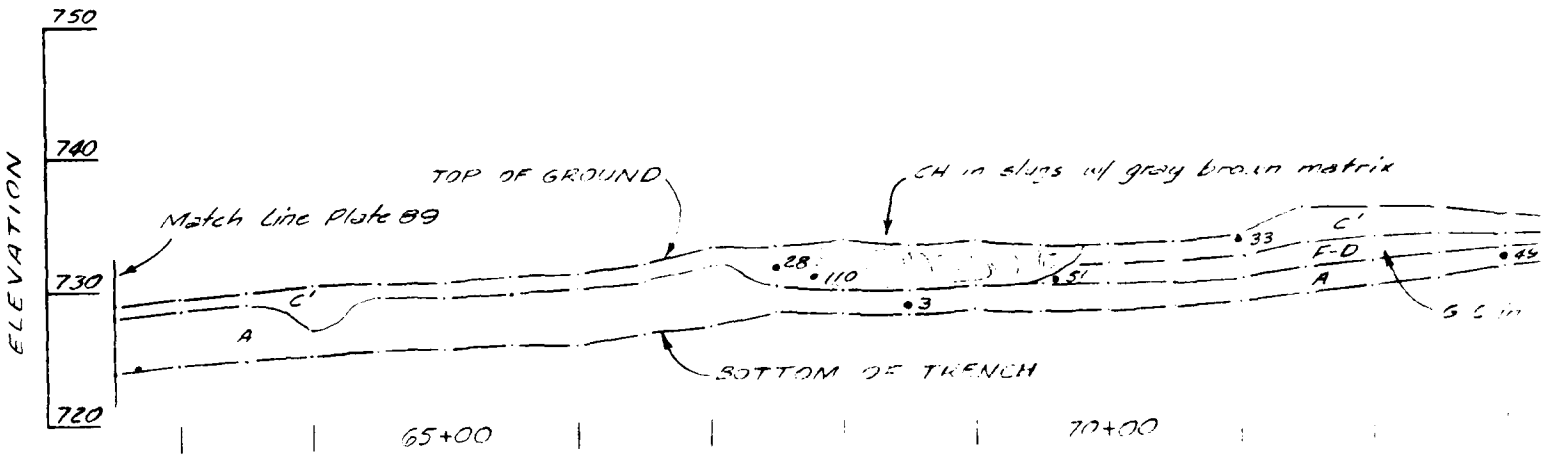
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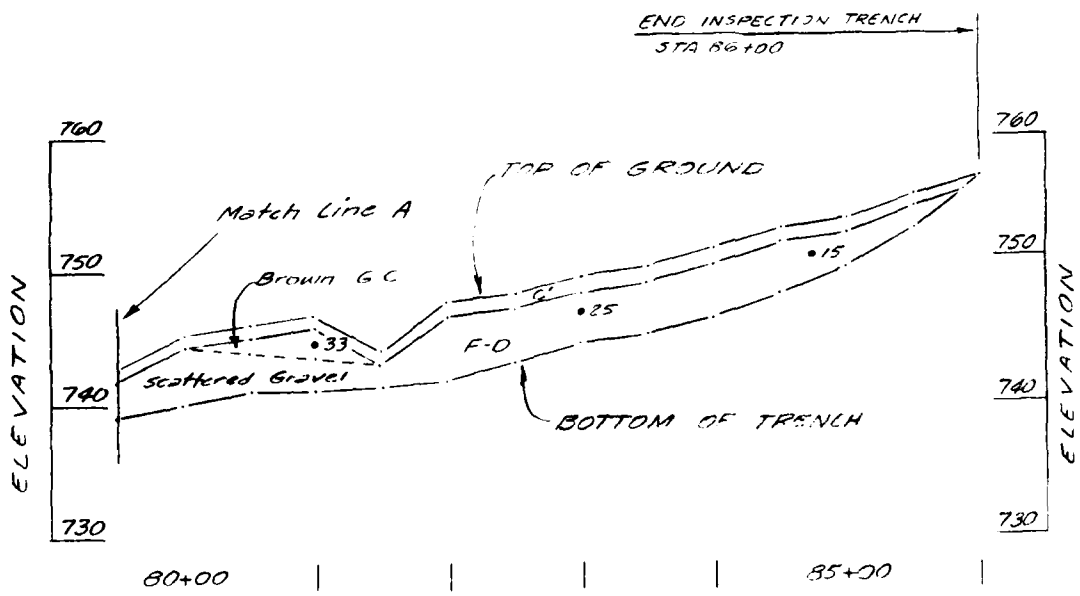
Date: MARCH 1958

Sheet number

File No. 0-12-9219

PLATE NO. 89





LEGEND

Zone		
A	CH	Gray with locally
B	CH	Gray with gray br
C	CH	Light brown gra
D	CH	Dark gray gray br
E	CH	Gray
F-D	CH	Dark gray gray br
G	CH	Black

• = sample number, LL = Liq

ZONE A

•	LL	PI
103	76	49
16	69	47
13	66	39
32	48	25
90	61	38
50	51	35
27	65	42
25	75	51
26	93	54
3	66	45
49	62	44
45	60	40

ZONE B

•	LL
17	61
14	58
7	46
102	58

ZONE

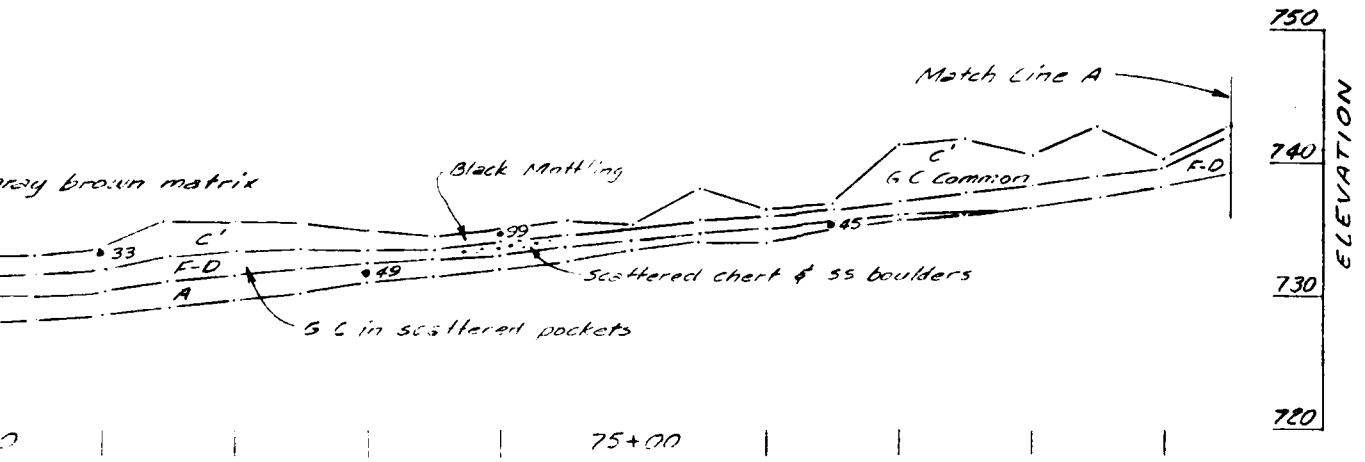
•	LL
2	

STERETT CREEK DIKE

INSPECTION TRENCH PROFILE STA 62

LOOKING UPSTREAM

SCALE AS SHOWN



LEGEND

ne
A CH Gray with locally brown mottling
3 CH Gray with gray black
C CH Light brown gray, C' Brown at base blending to black at top
D CH Dark gray gray black & brown gray
E CH Gray
F-D CH Dark gray, gray black & brown gray with gravel
G CH Black
• = Sample number, LL = Liquid Limit, PI = Plastic Index

ZONE A

•	LL	PI
103	76	49
16	69	47
13	66	39
32	48	25
90	61	38
50	51	35
27	65	42
25	75	51
26	93	59
3	66	45
49	62	44
45	60	40

ZONE B

•	LL	PI
17	61	37
14	58	37
7	46	28
102	52	26

ZONE C

•	LL	PI
18	78	53
15	88	51
101	66	42

ZONE C'

•	LL	PI
29	66	41
28	75	53
28A	58	25
110	53	33
33	55	35
99	53	32

ZONE D

•	LL	PI
4	78	53
104	62	39
100	82	47

ZONE E

•	LL	PI
2		

ZONE F-D

•	LL	PI
1	50	32
51	43	25
25	70	47
15	48	30
35	57	37

ZONE G

•	LL	PI
105	69	49

T CREEK DIKE STAGE IV

PROFILE STA 62+50 TO STA 86+00

UPSTREAM

SCALE AS SHOWN

Revisions			
Symbol	Description	Date	Approved

U S ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

Designed by
Drawn by
Checked by
Submitted by

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

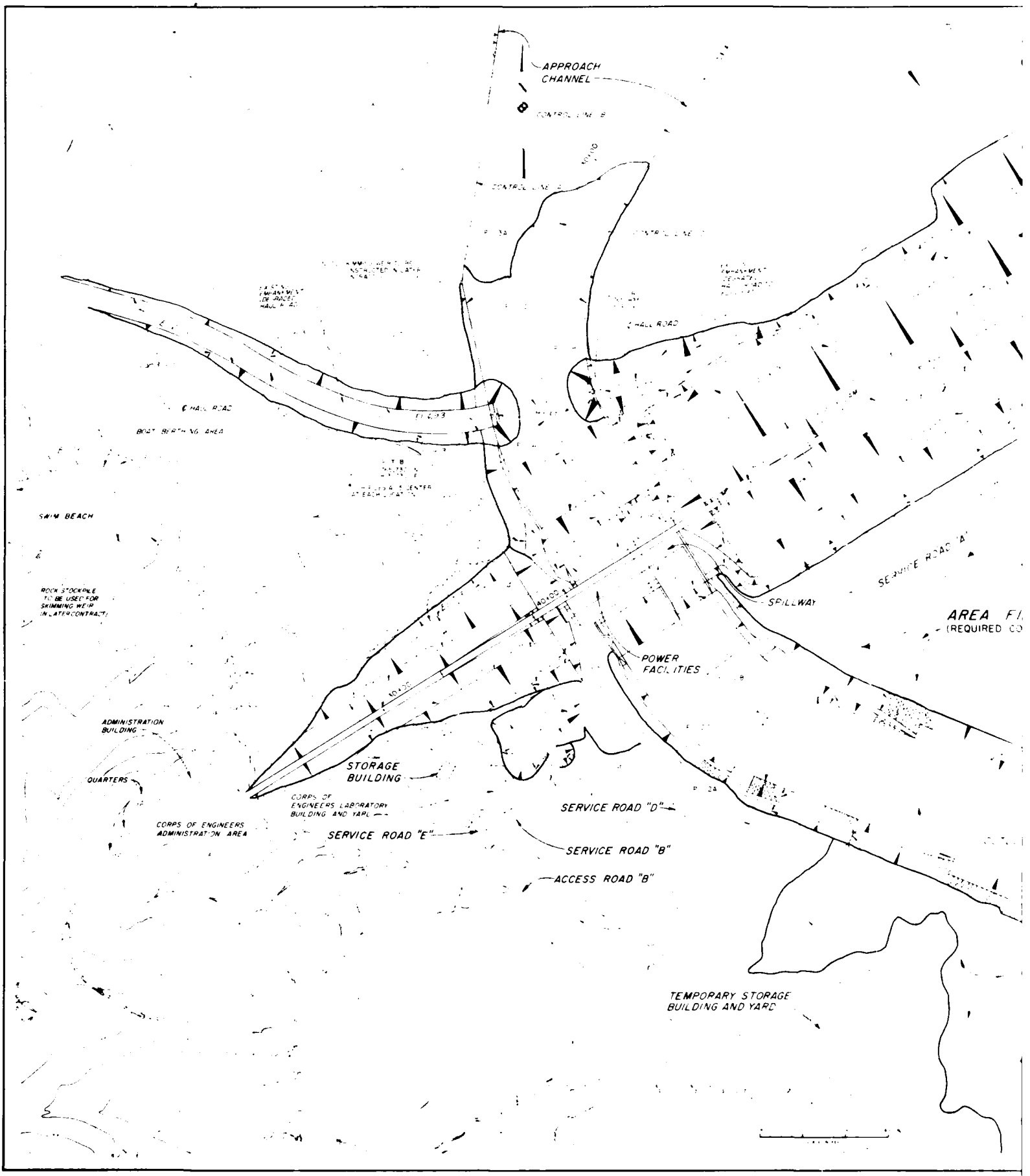
STERETT CREEK DIKE
INSPECTION TRENCH PROFILE
STA. 62+50 TO STA. 86+00

Scale
Date: MARCH 1986
Sheet number
Drawing No.
File No. 0-12-9220

PLATE NO. 90

STAGE VI CONSTRUCTION

RUCTION



DRAWINGS IN THIS FOLIO

BASE FILE NO 0-12-450

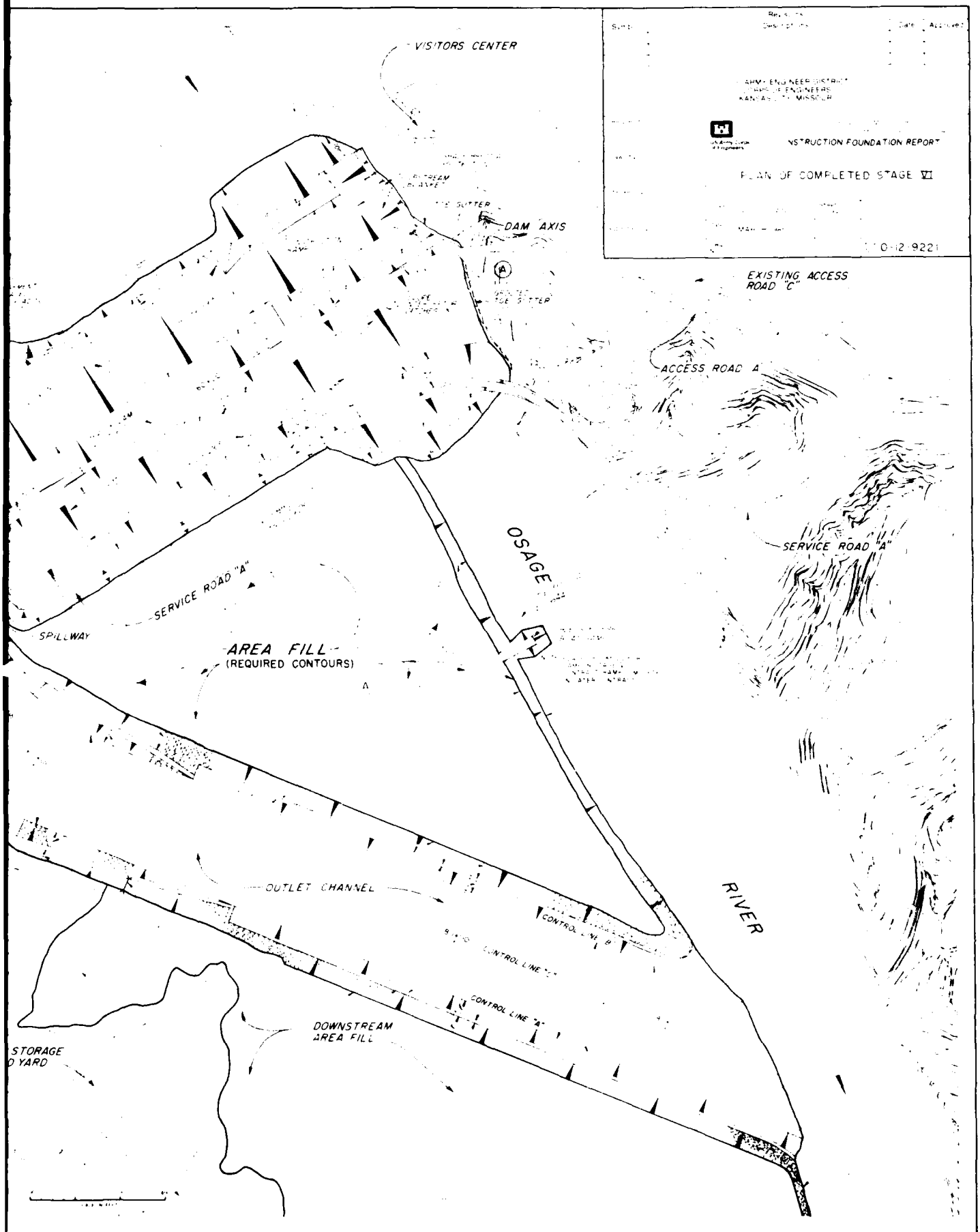
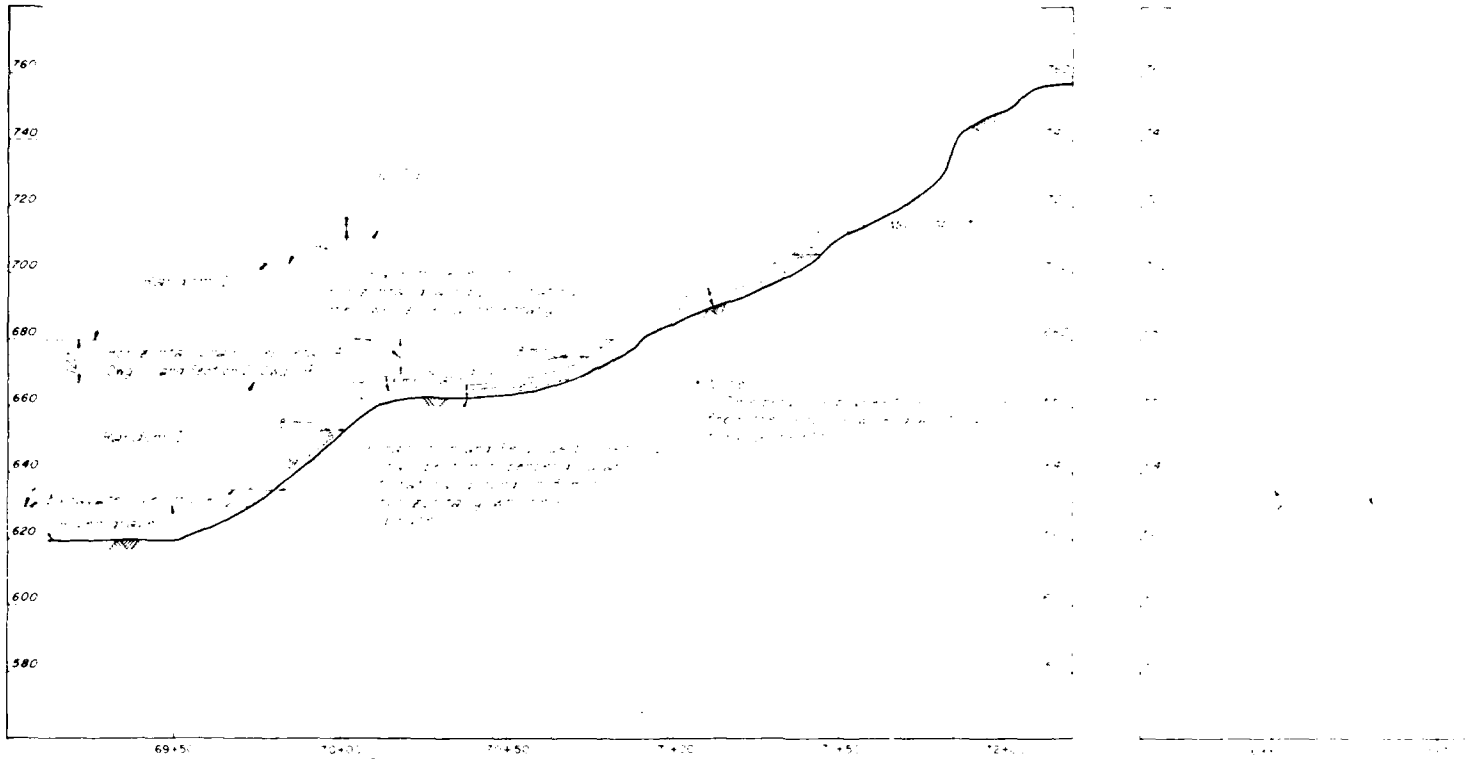
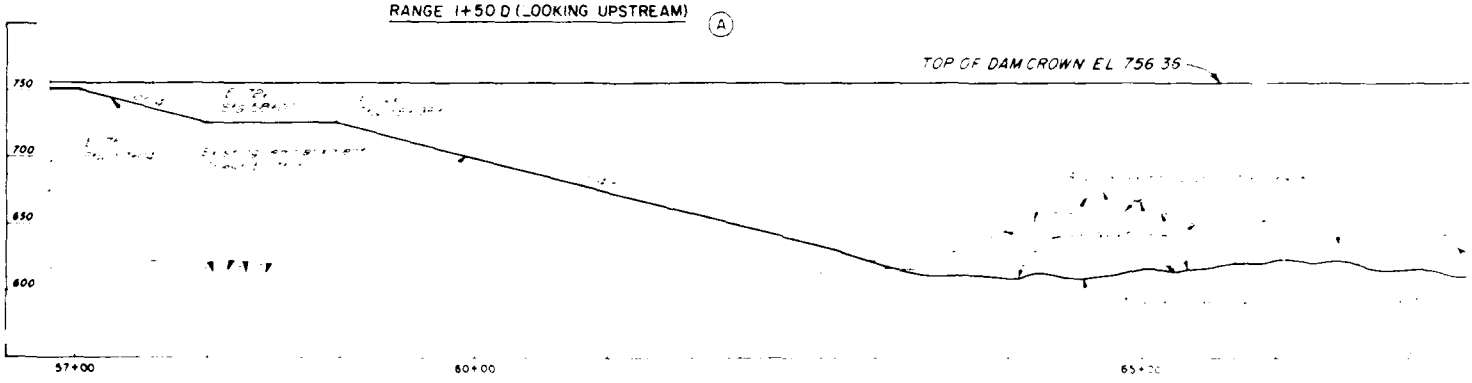

VISITORS CENTER
DAM AXIS
EXISTING ACCESS ROAD "C"
ACCESS ROAD A
SERVICE ROAD "A"
SERVICE ROAD "A"
OSAGE
SPILLWAY
AREA FILL
(REQUIRED CONTOURS)
OUTLET CHANNEL
CONTROL LINE "B"
CONTROL LINE "A"
RIVER
DOWNSTREAM AREA FILL
STORAGE
D YARD
ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
NSTRUCTION FOUNDATION REPORT
PLAN OF COMPLETED STAGE VI
0-12-9221

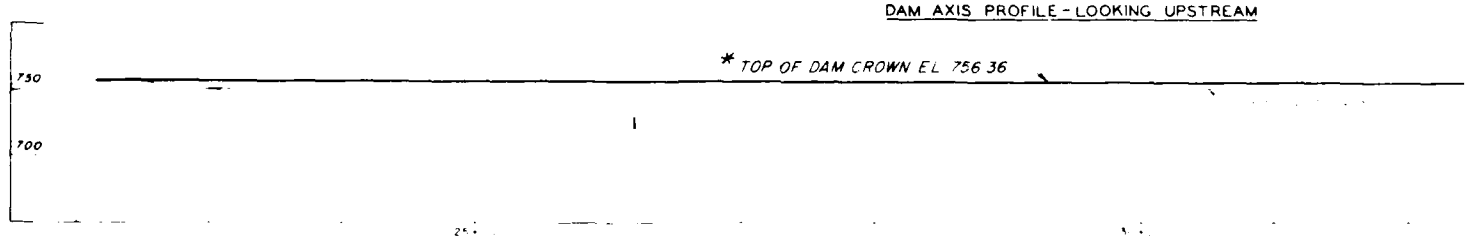
PLATE NO 9



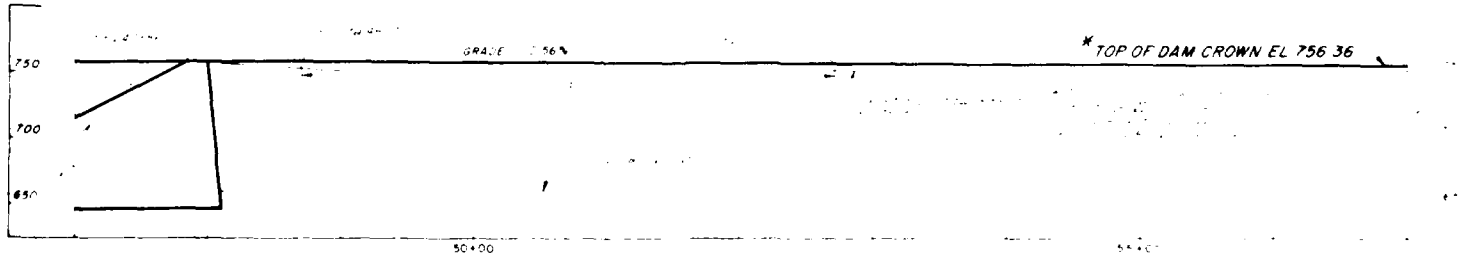
LEFT ABUTMENT PERVIOUS BLANKET DETAIL
RANGE 1+50 D (LOOKING UPSTREAM) (A)



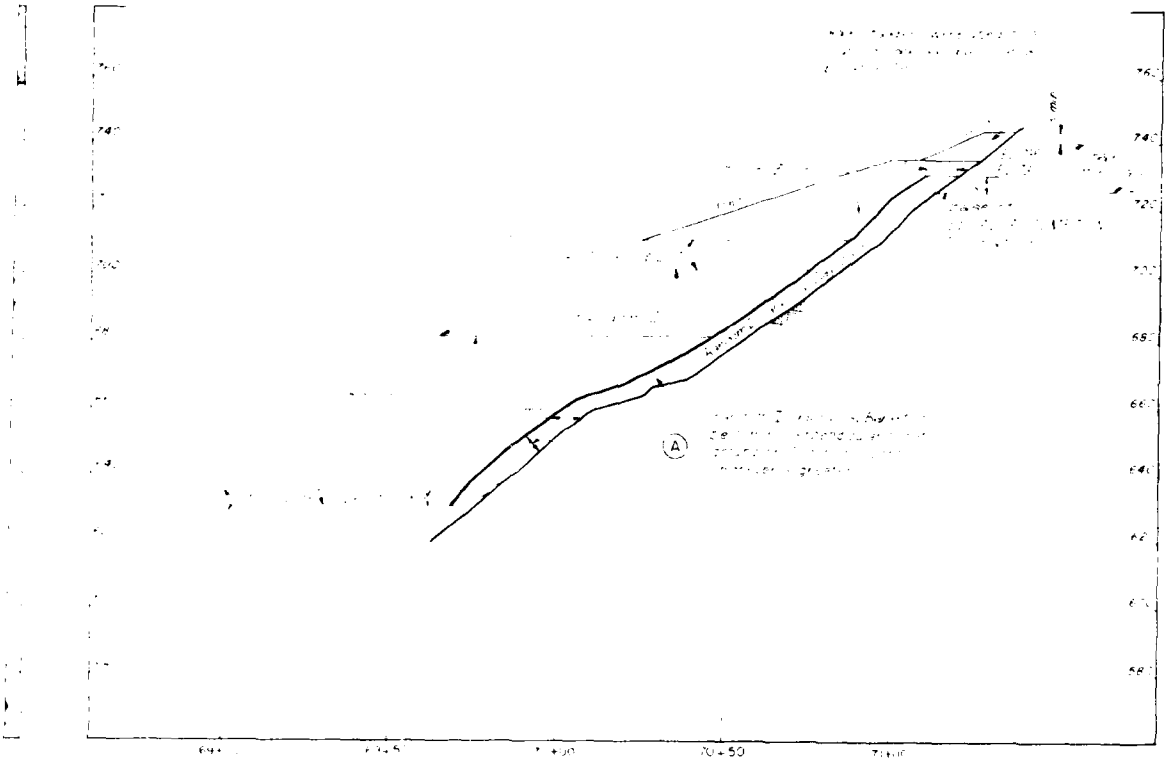
DAM AXIS PROFILE - LOOKING UPSTREAM



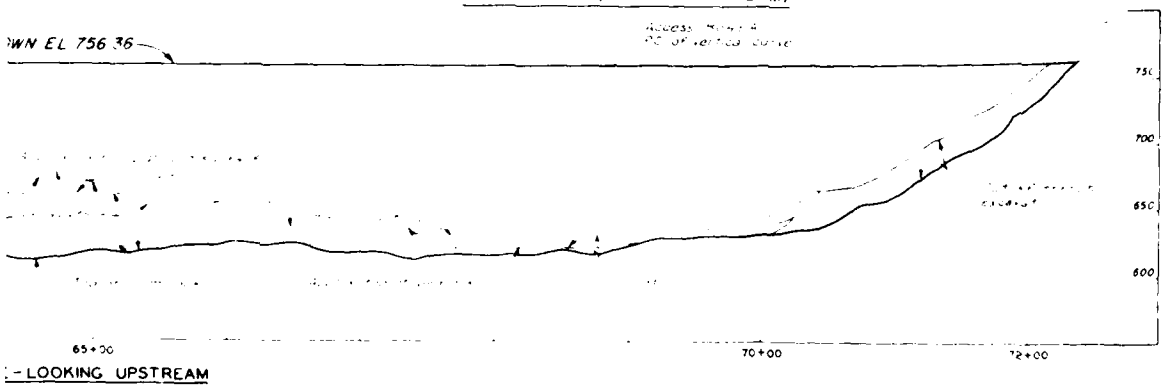
DAM AXIS PROFILE - LOOKING UPSTREAM



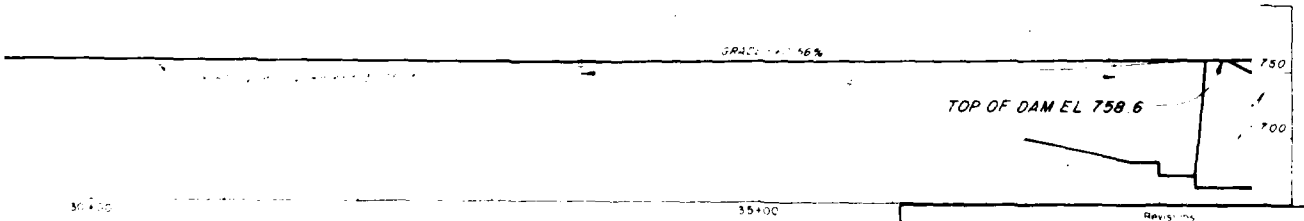
DAM AXIS PROFILE - LOOKING UPSTREAM



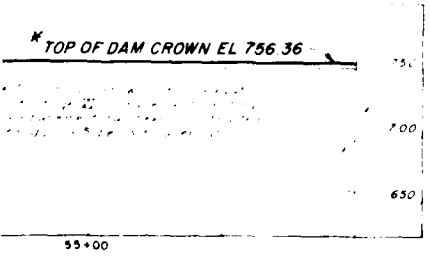
LEFT ABUTMENT UPSTREAM BL .NKET DETAIL
RANGE 1+97 U (LOOKING UPSTREAM)



-LOOKING UPSTREAM



IS PROFILE - LOOKING UPSTREAM



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HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

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Symbol | Description | Date | Approved

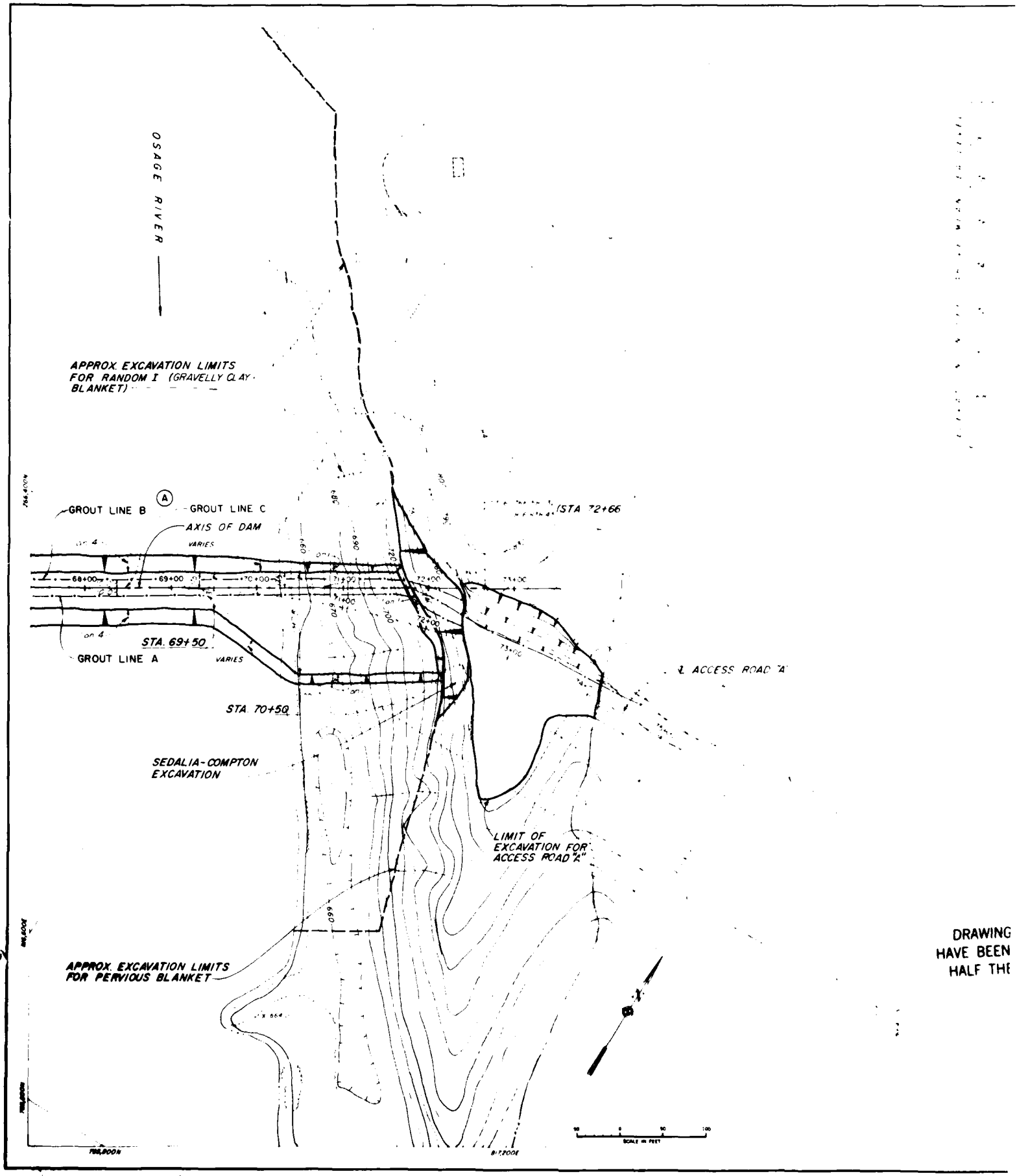
ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

CONSTRUCTION FOUNDATION REPORT

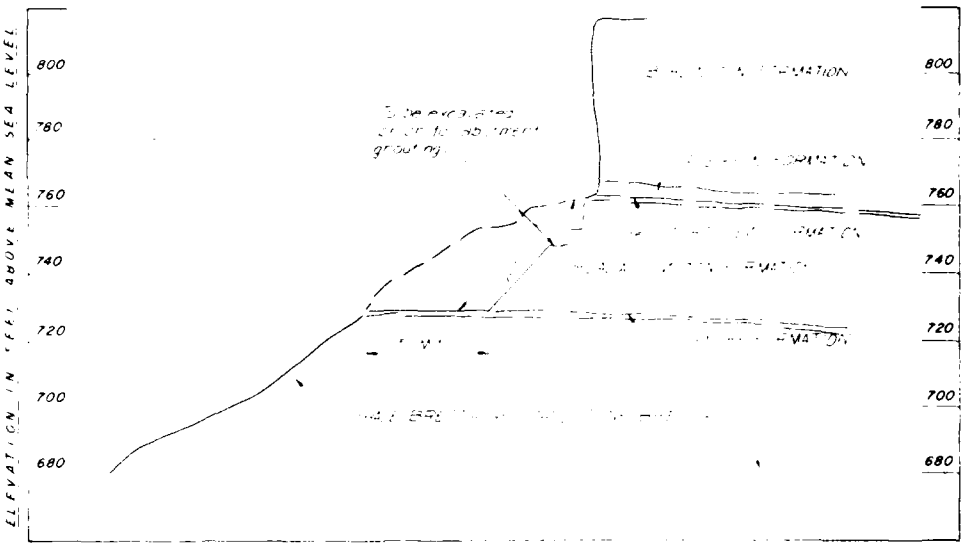
DIVERSION AND CLOSURE
PROFILES

Scale
Date MARCH 1985
Drawing No.
Sheet Number
No. 0-12-9222

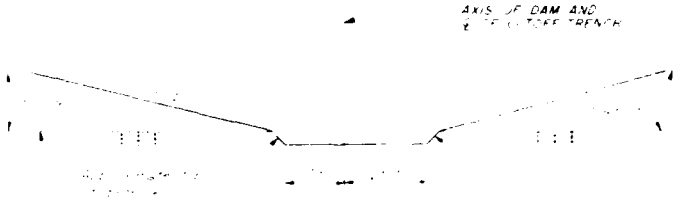
PLATE NO. 92



DRAWING
HAVE BEEN
HALF THE



SEDALIA - COMPTON FORMATION
EXCAVATION DETAIL



ROAD "A"

(A) CUTOFF TRENCH TYPICAL SECTION

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HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

Symbol	Revisions Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

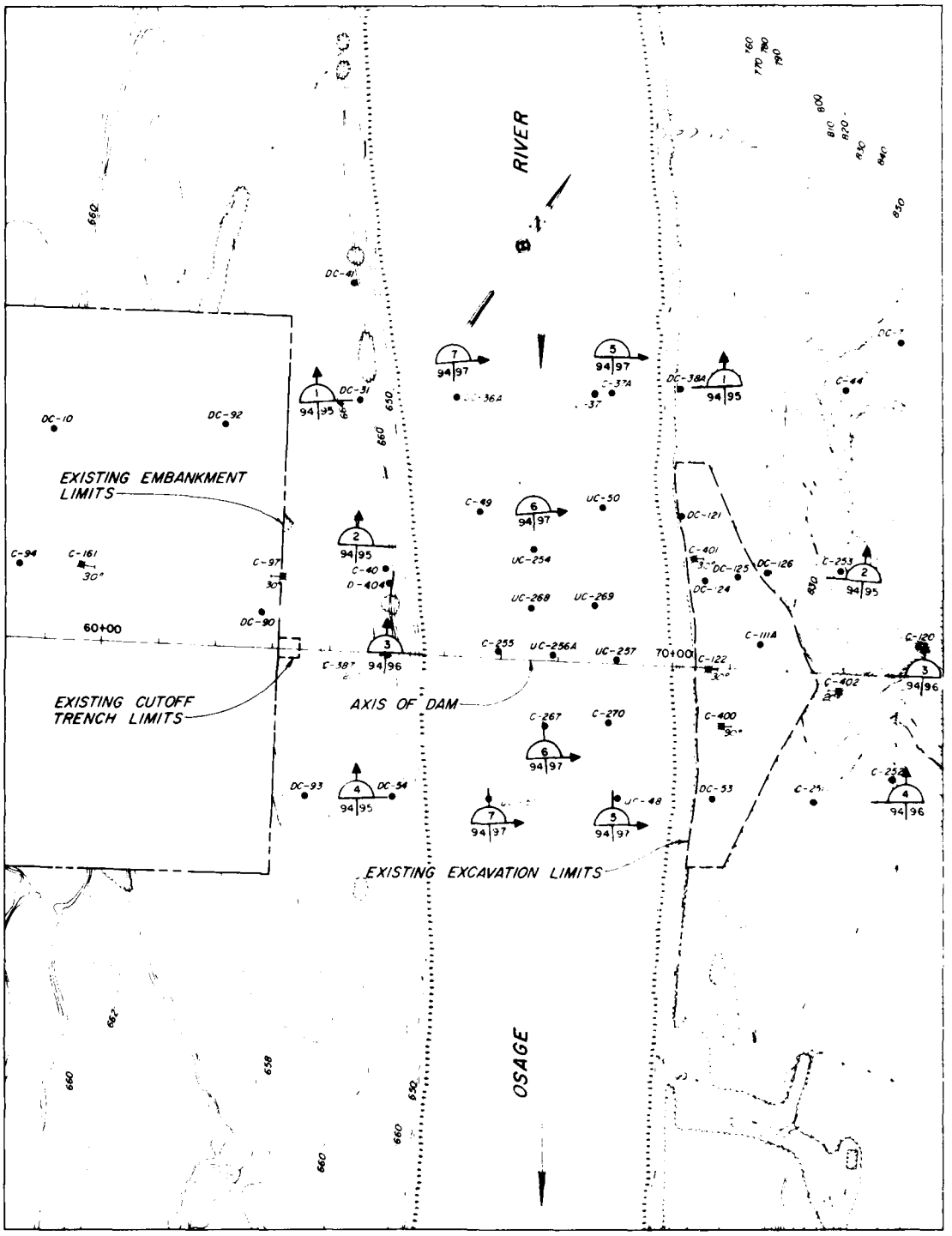
LEFT ABUTMENT EXCAVATION
PLAN AND DETAILS

Date: MARCH 1985

Sheet number

File No. 0-12-9223

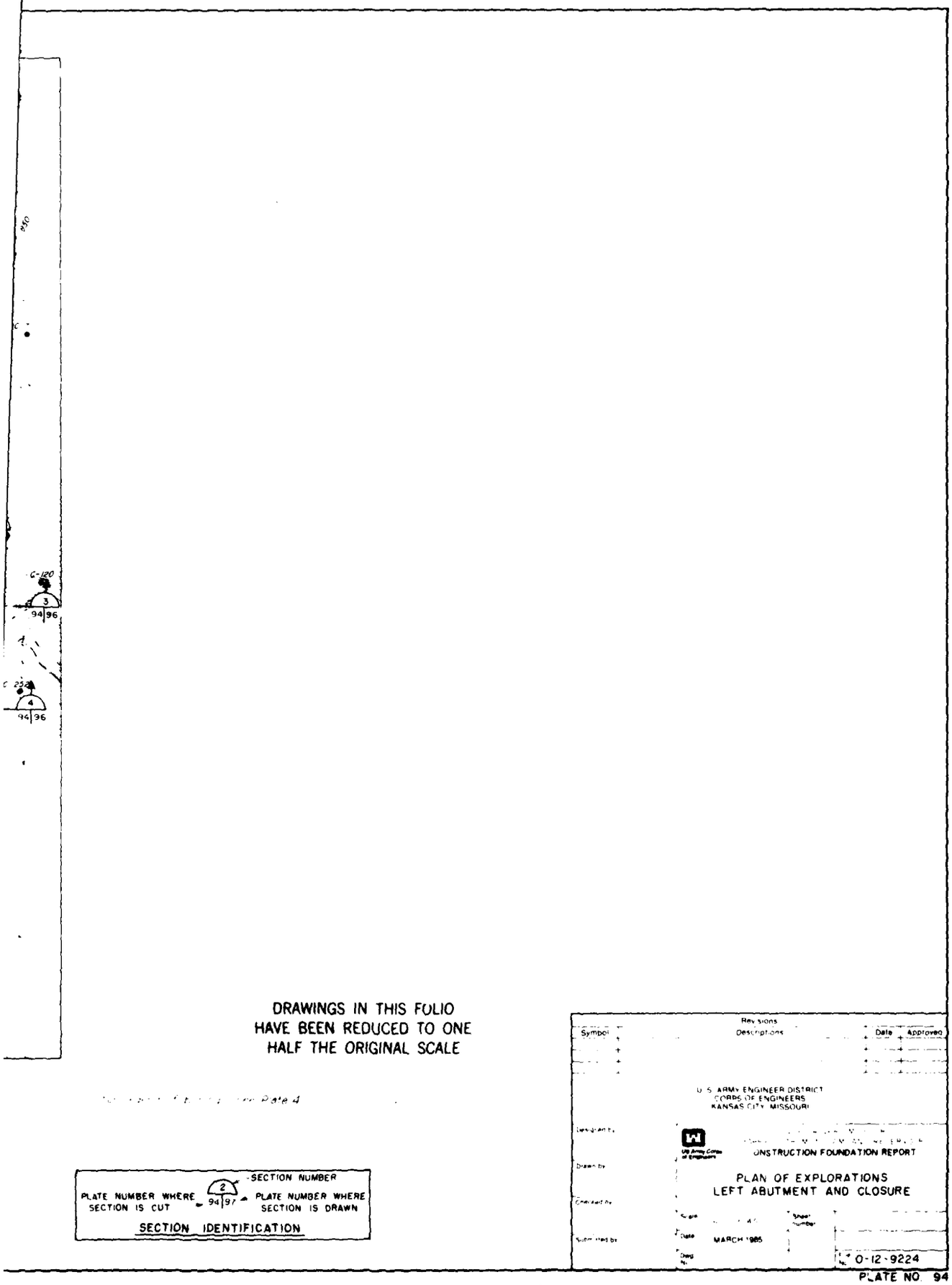
PLATE NO 93



PLAN OF EXPLORATIONS
LEFT ABUTMENT & CLOSURE AREA

PLATE NUMBER WHERE SECTION IS CUT — 2 / 94|97

SECTION IDENTI



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Symbol | Description | Date | Approved

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

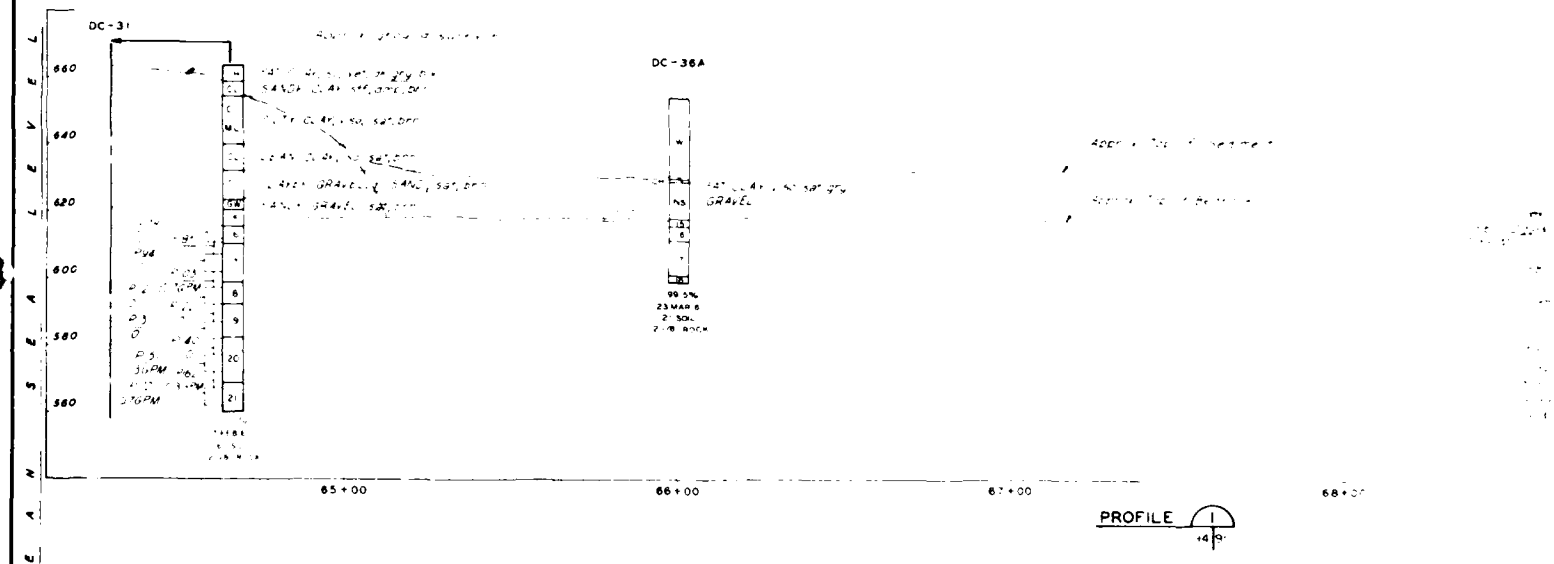
PLAN OF EXPLORATIONS
LEFT ABUTMENT AND CLOSURE

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Drawn by
Checked by
Submitted by
Scale
Date MARCH 1985
Sheet number
Dwg. No. 0-12-9224

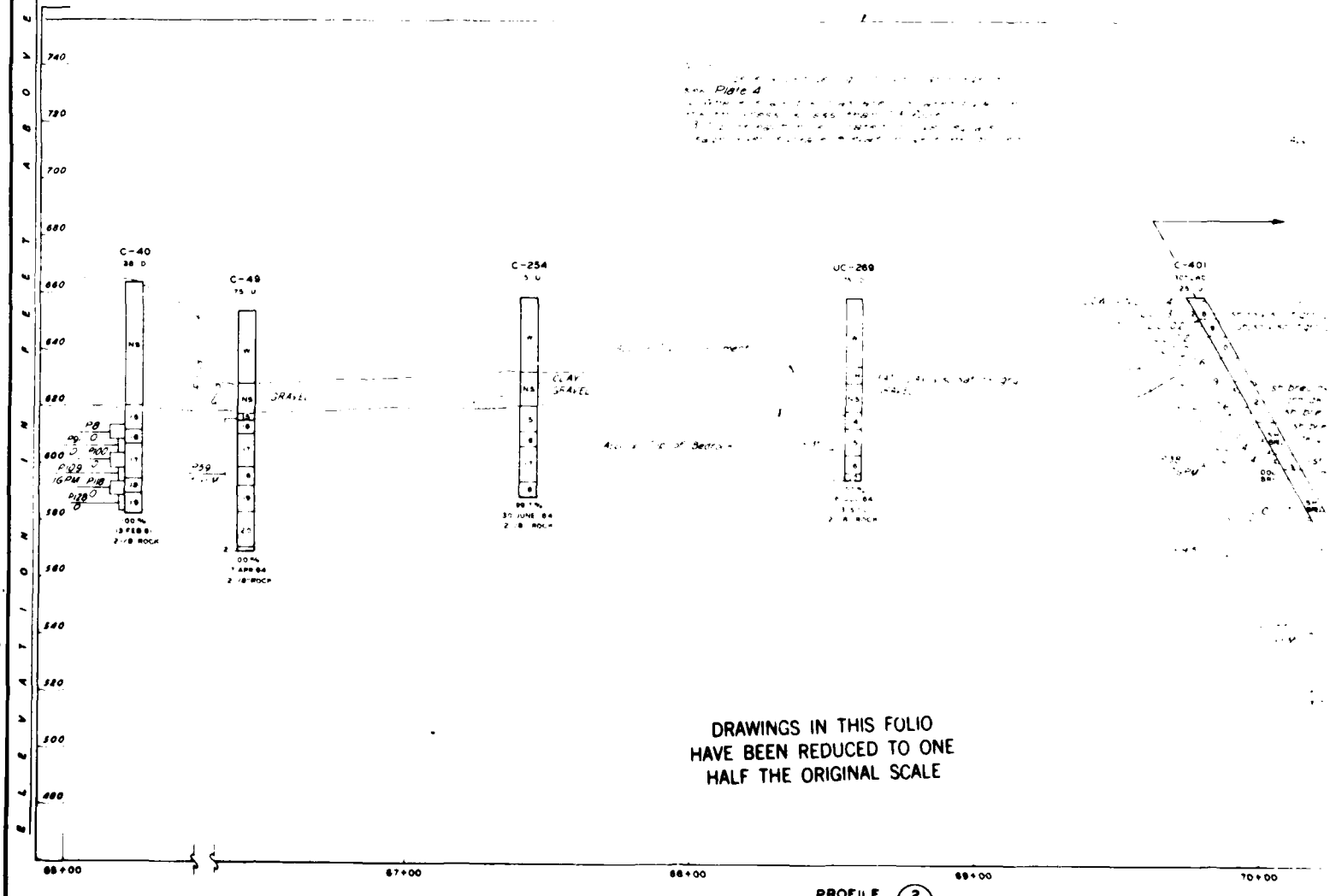
PLATE NO. 94

PLATE NUMBER WHERE SECTION IS CUT — 94|97 — PLATE NUMBER WHERE SECTION IS DRAWN
SECTION NUMBER 2

SECTION IDENTIFICATION

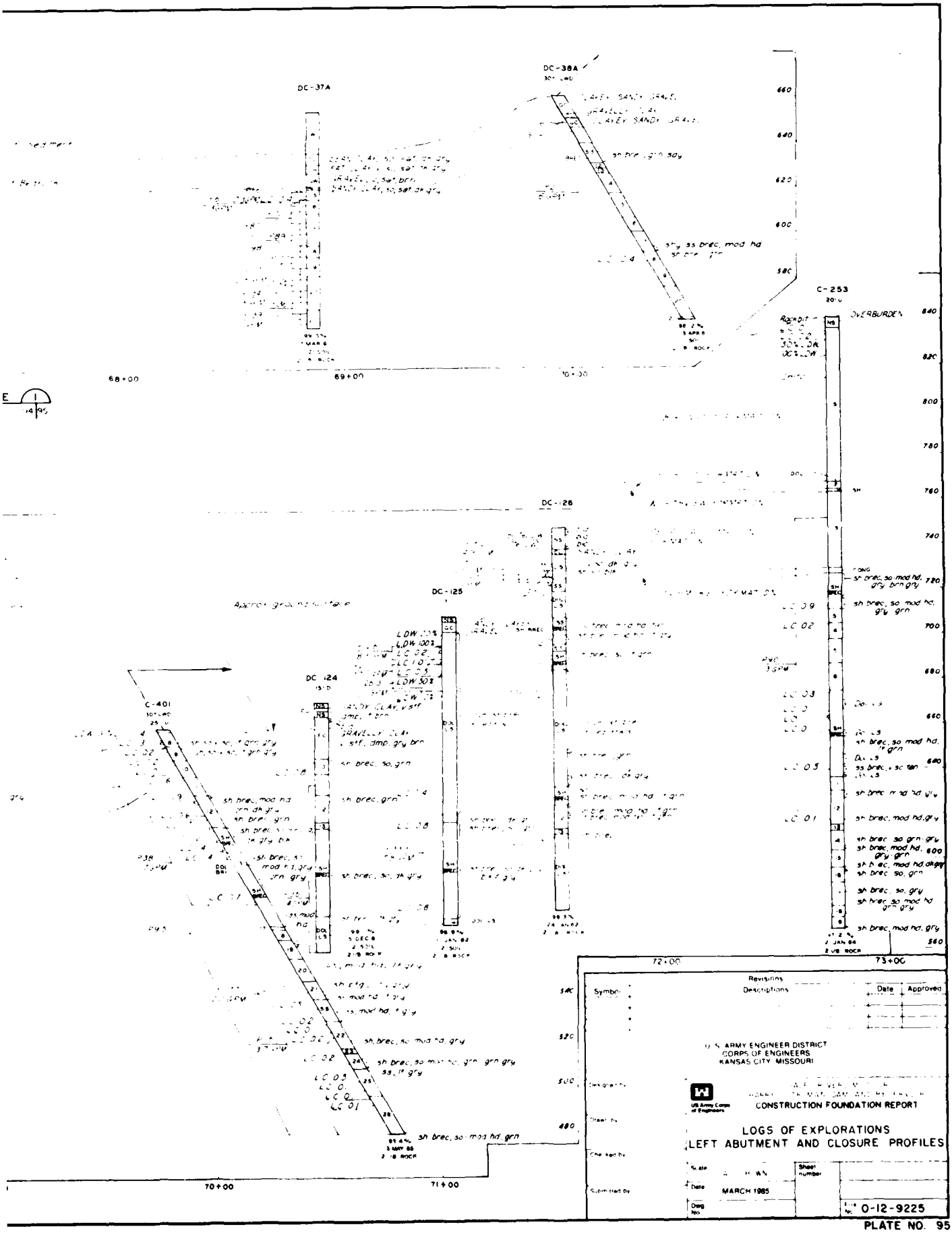


PROFILE 1



PROFILE 2

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HALF THE ORIGINAL SCALE



Revisions

Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY MISSOURI

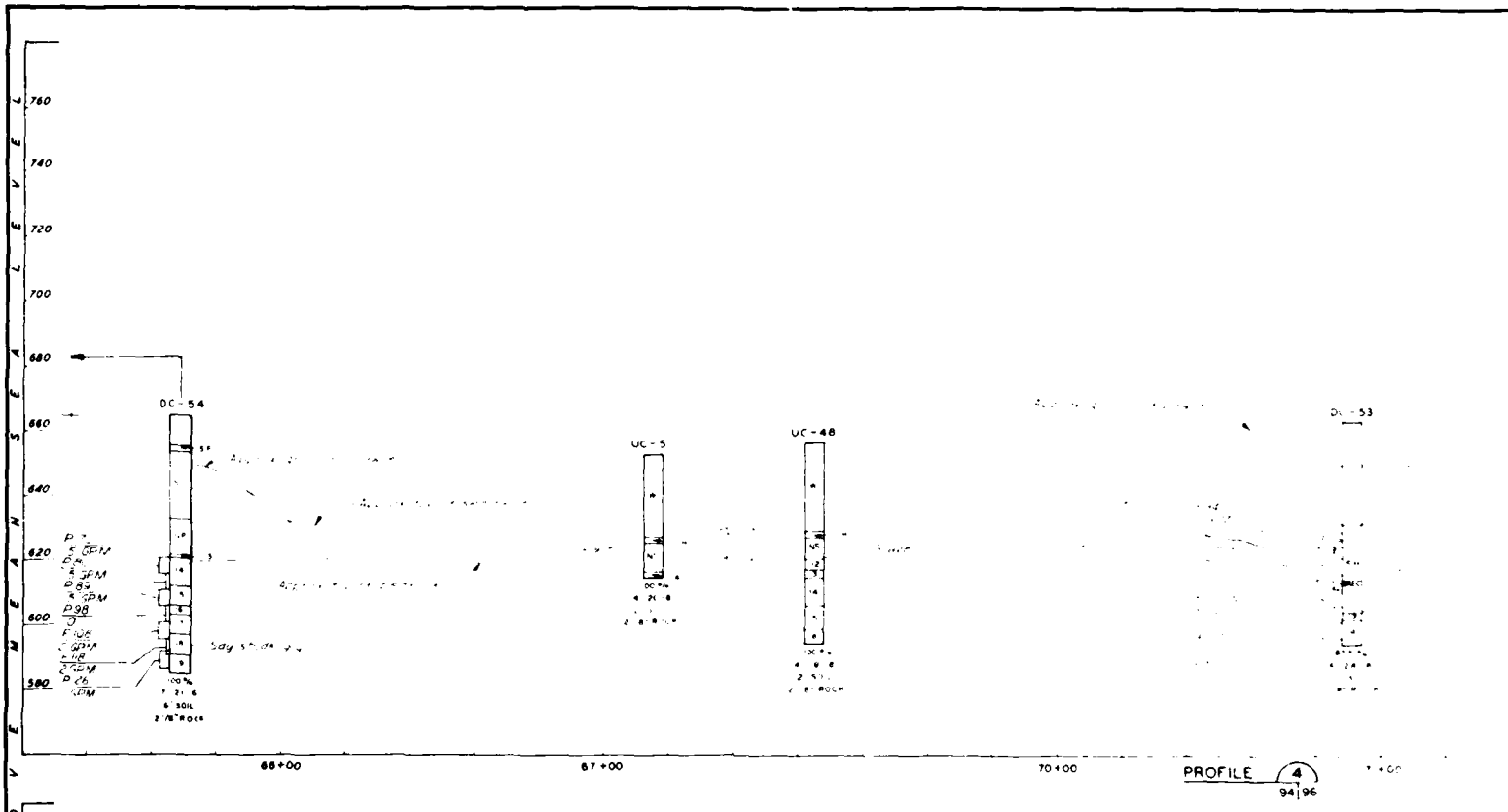
US Army Corps of Engineers

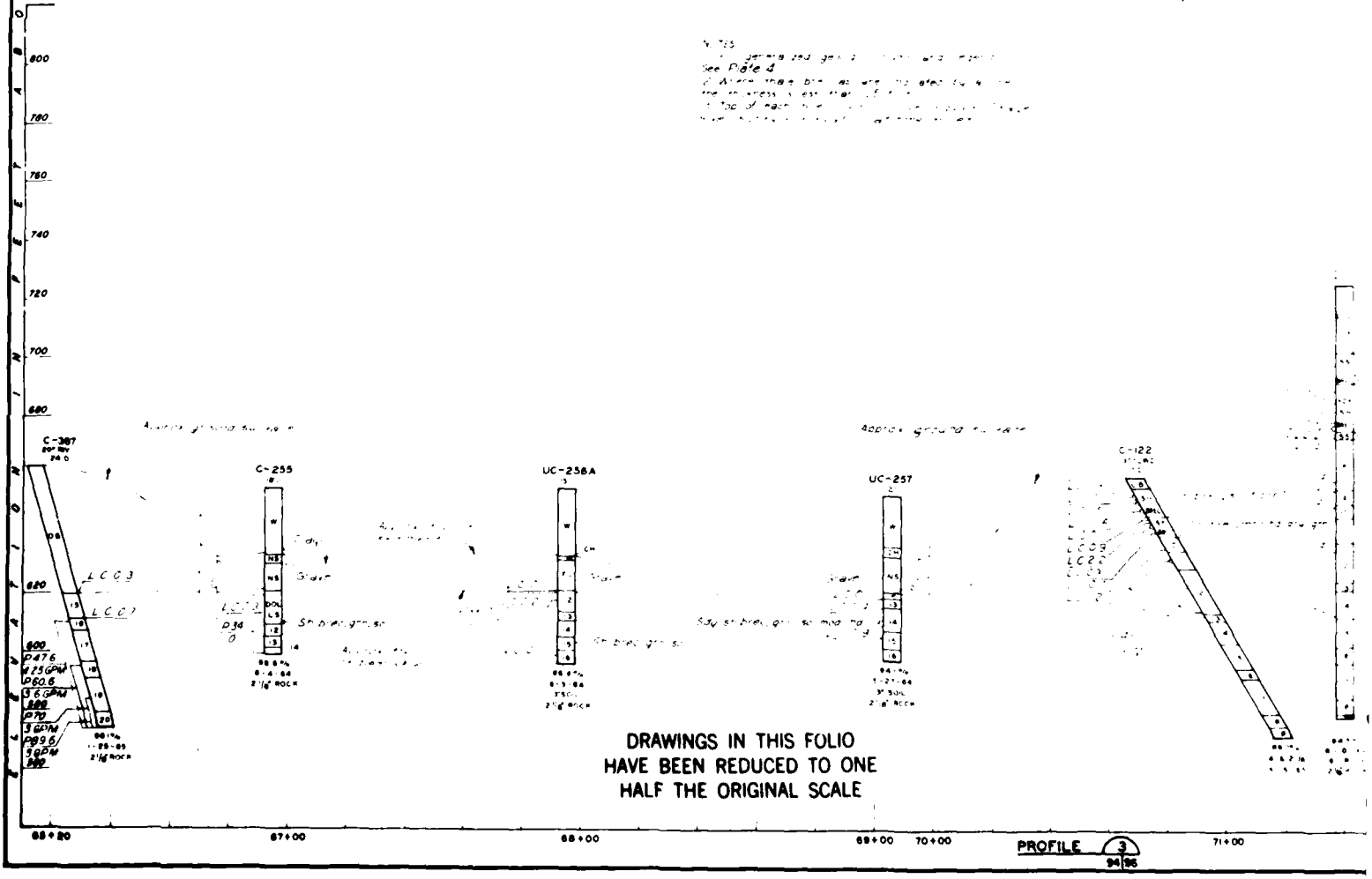
CONSTRUCTION FOUNDATION REPORT

LOGS OF EXPLORATIONS
LEFT ABUTMENT AND CLOSURE PROFILES

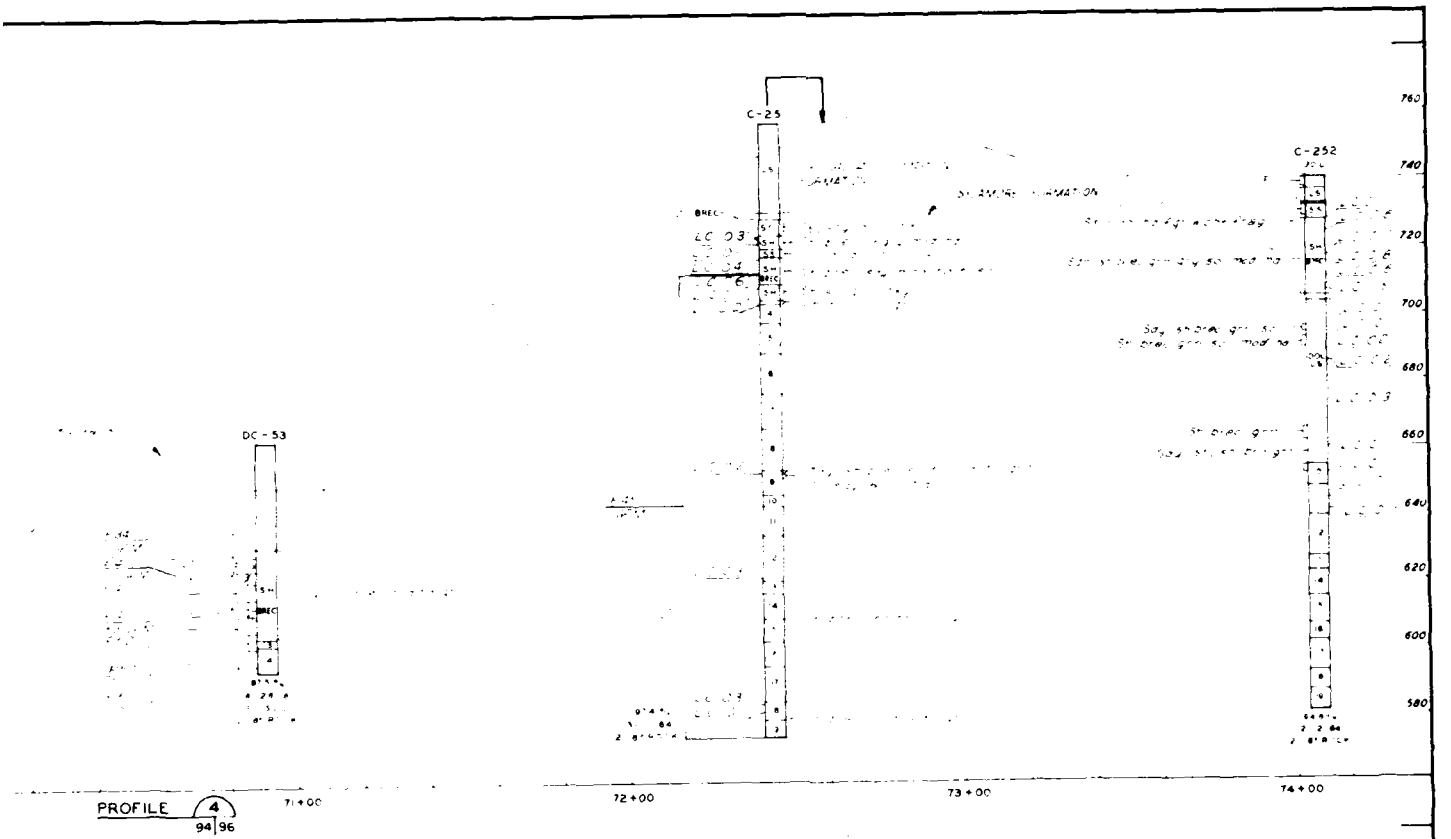
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File No. 0-12-9225

PLATE NO. 95

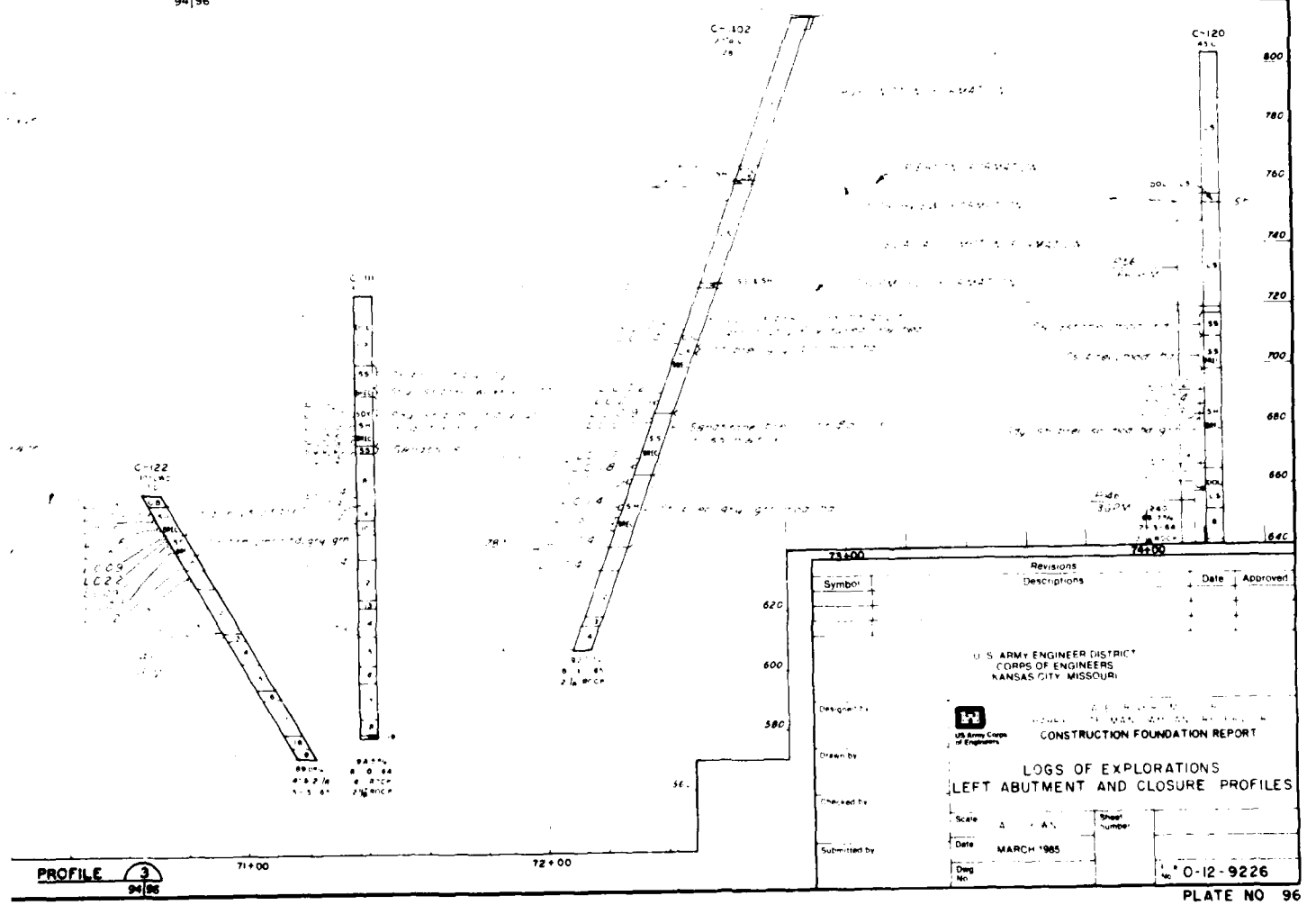




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HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE



PROFILE 4
94 96



PROFILE 3
94 96

Symbol	Revisions Descriptions	Date	Approved

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

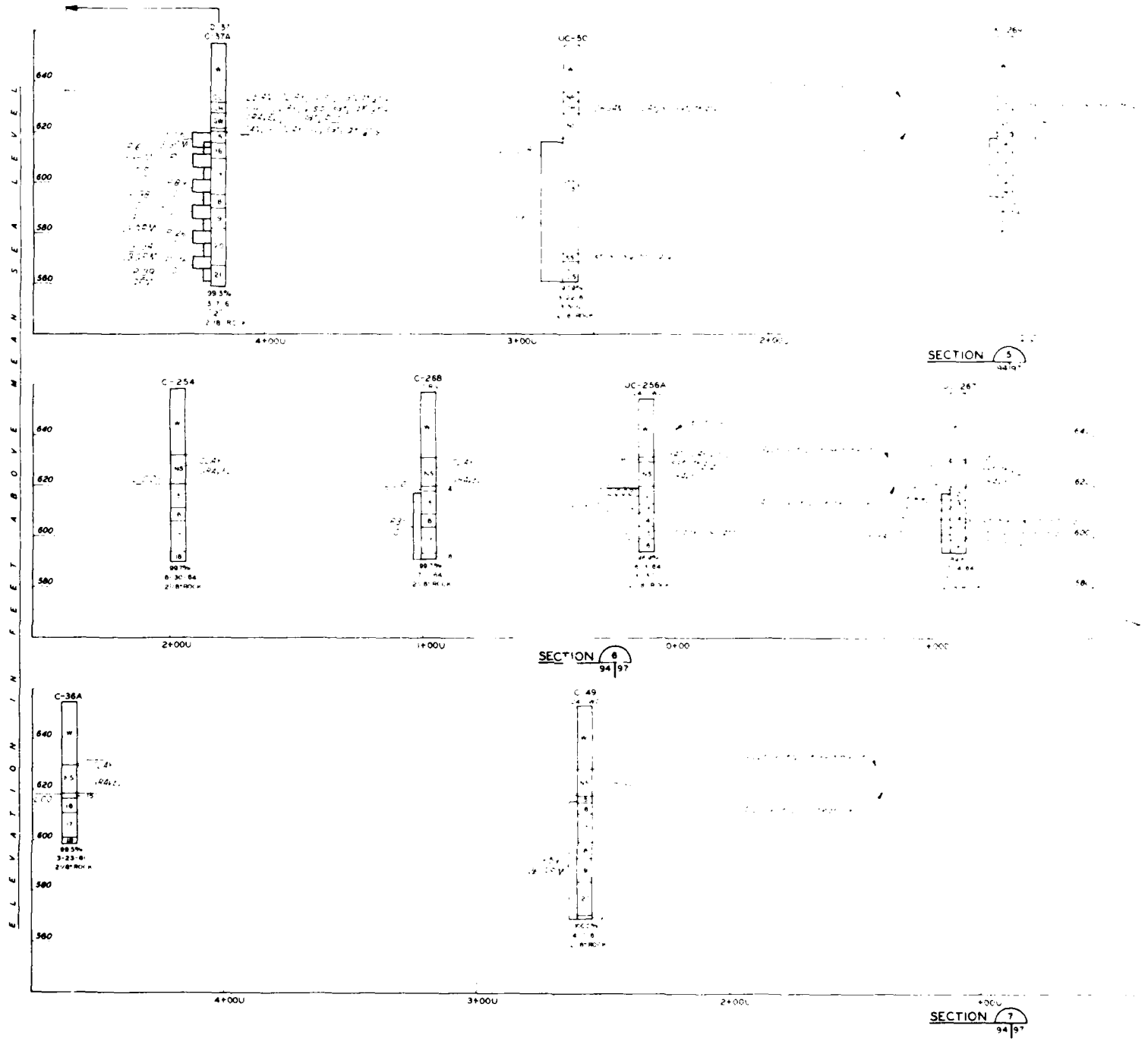
US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

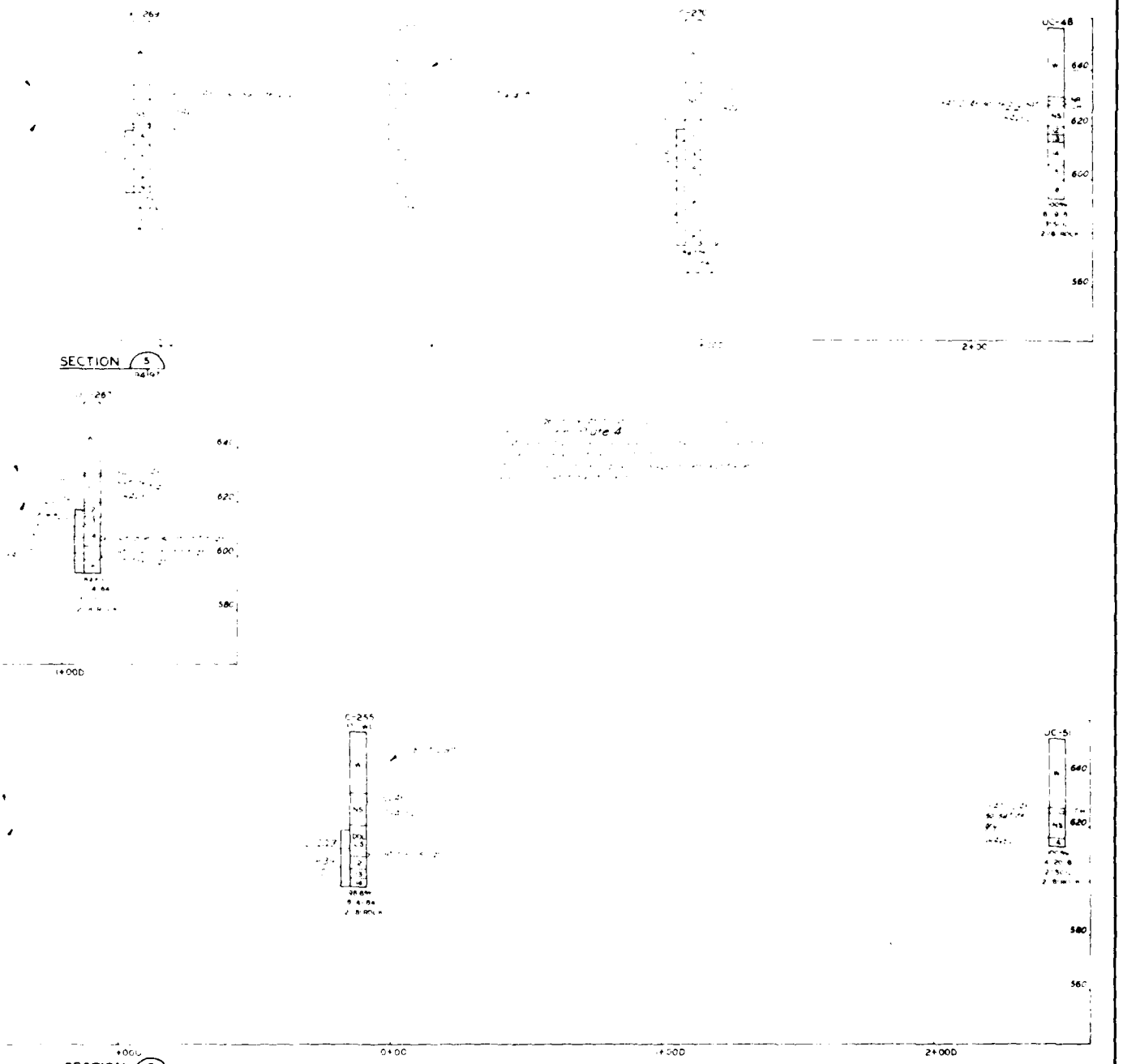
LOGS OF EXPLORATIONS
LEFT ABUTMENT AND CLOSURE PROFILES

Designed by
Drawn by
Checked by
Submitted by
Scale
Date MARCH 1985
Sheet Number
Dwg No. 0-12-9226

PLATE NO 96



DRAW
HAVE BE
HALF



DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

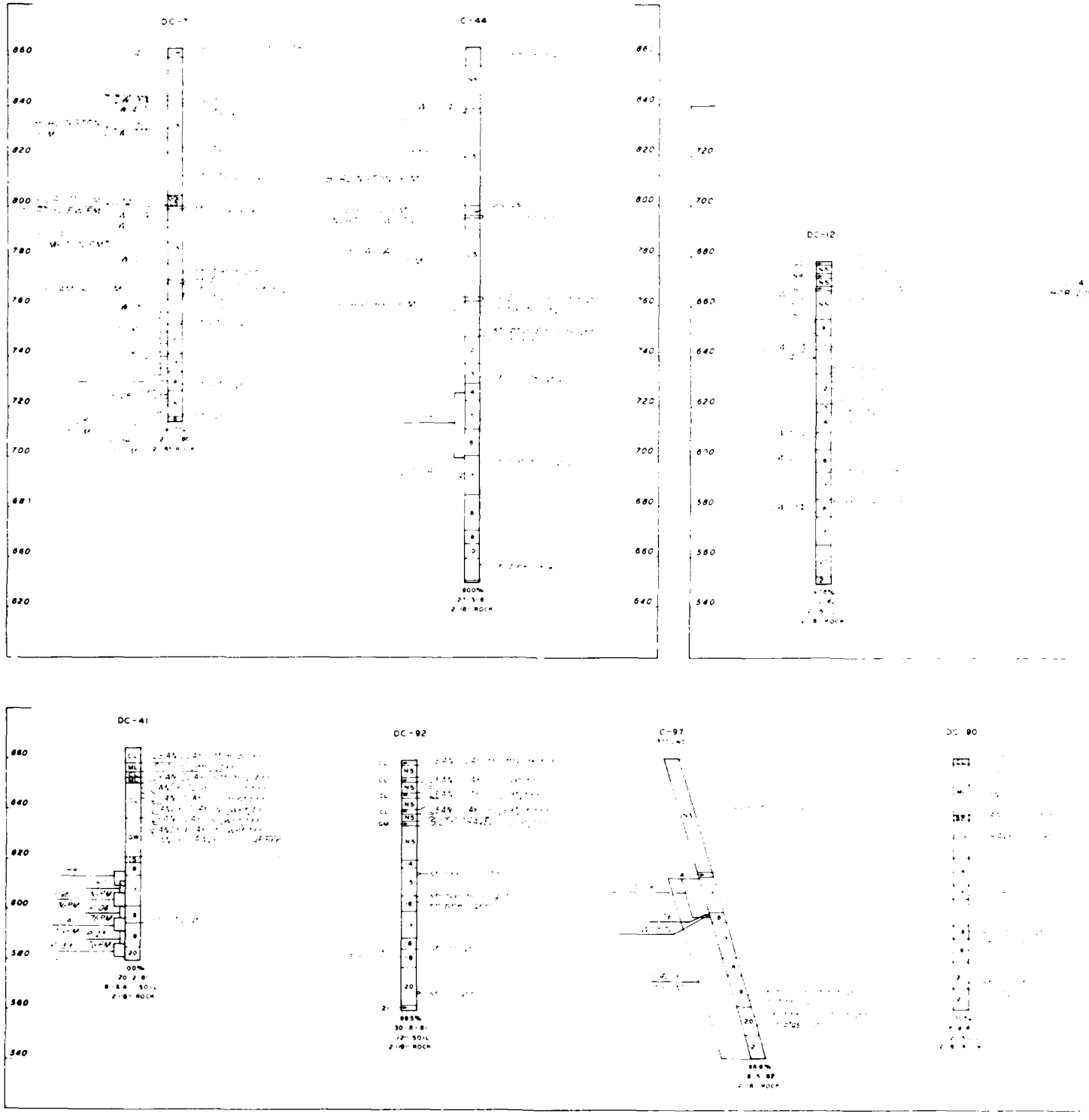
US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

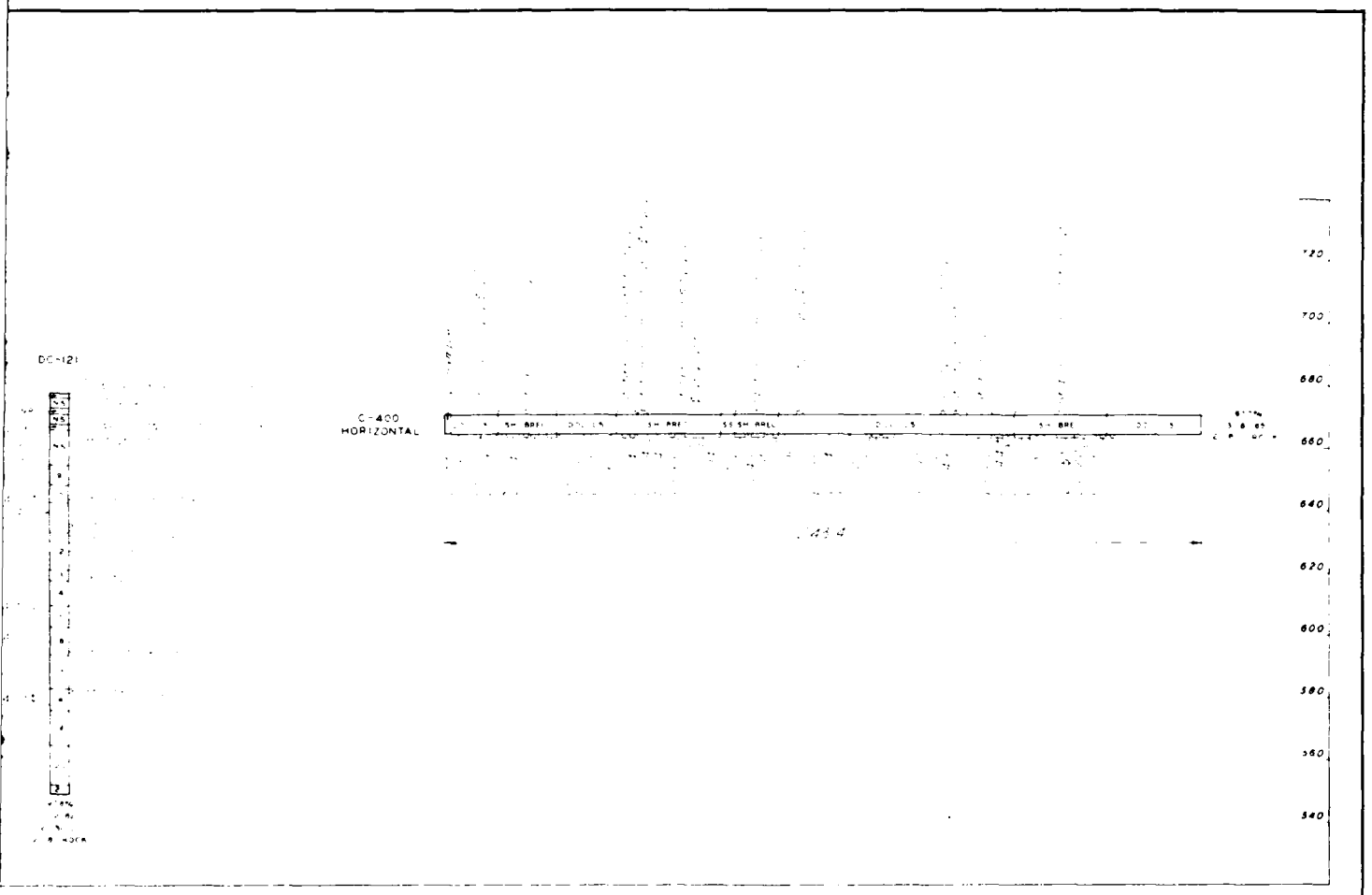
LOGS OF EXPLORATIONS
CLOSURE SECTIONS

Scale: 1" = 40'
Date: MARCH 1985
Sheet number
Dwg No.
File No. 0-12-9227

PLATE NO 97



DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE



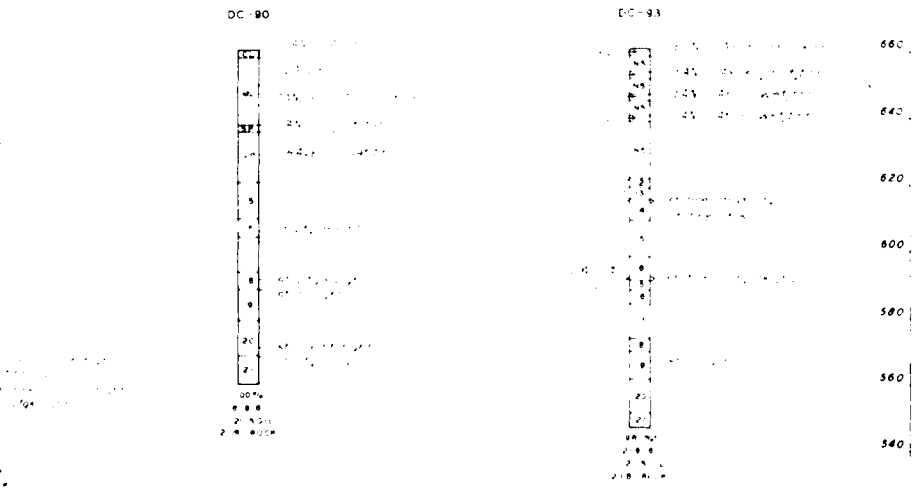


Plate 94

Plate 4

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Symbol	Revisions Descriptions	Date	Approved

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

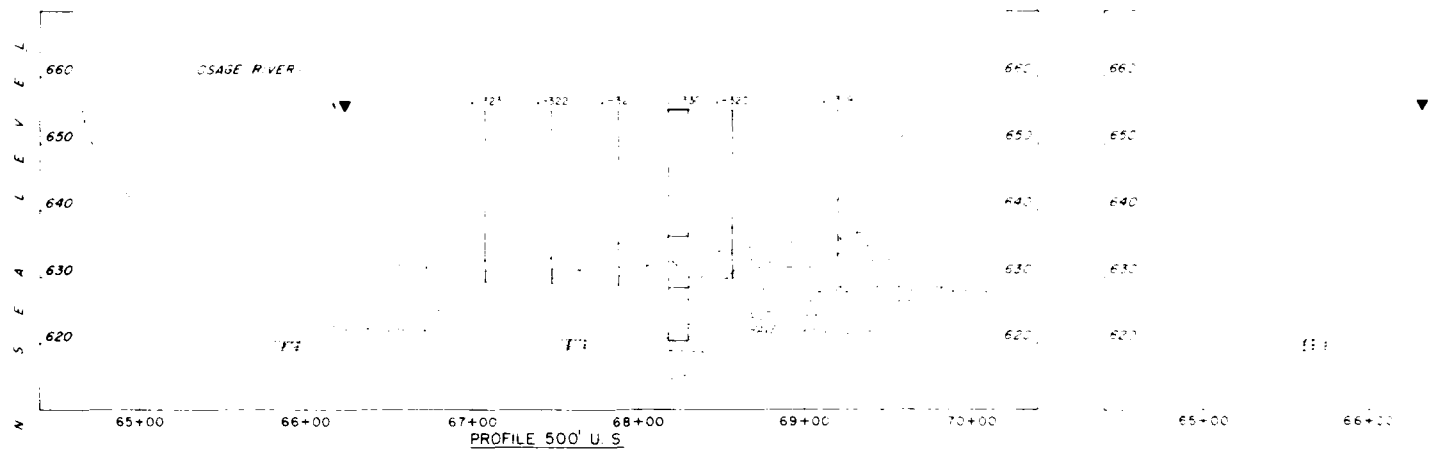
LOGS OF EXPLORATIONS
LEFT ABUTMENT AND CLOSURE PROFILES
DETACHED BORINGS

Designed by
Drawn by
Checked by
Scale
Date MARCH 1985
Submitted by
Chief

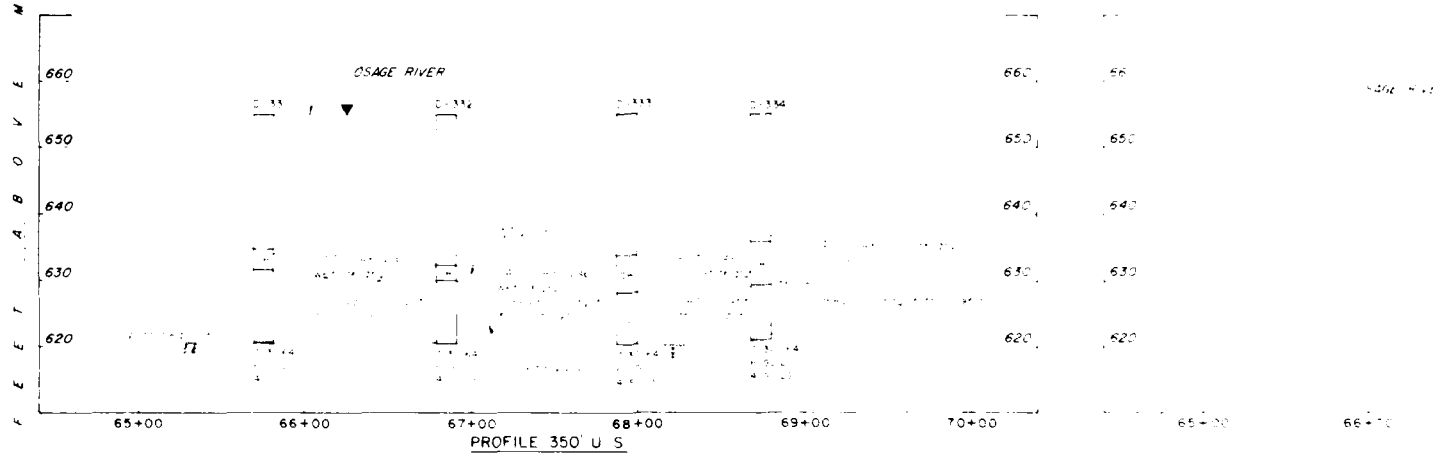
Sheet number

0-12-9228

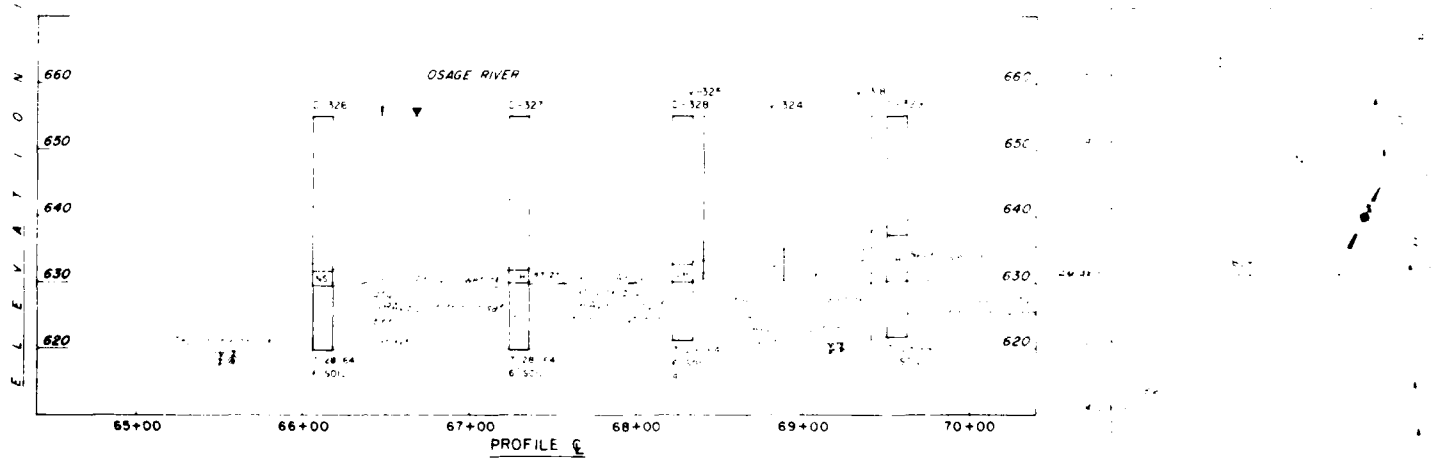
PLATE NO 98



PROFILE 500' U. S



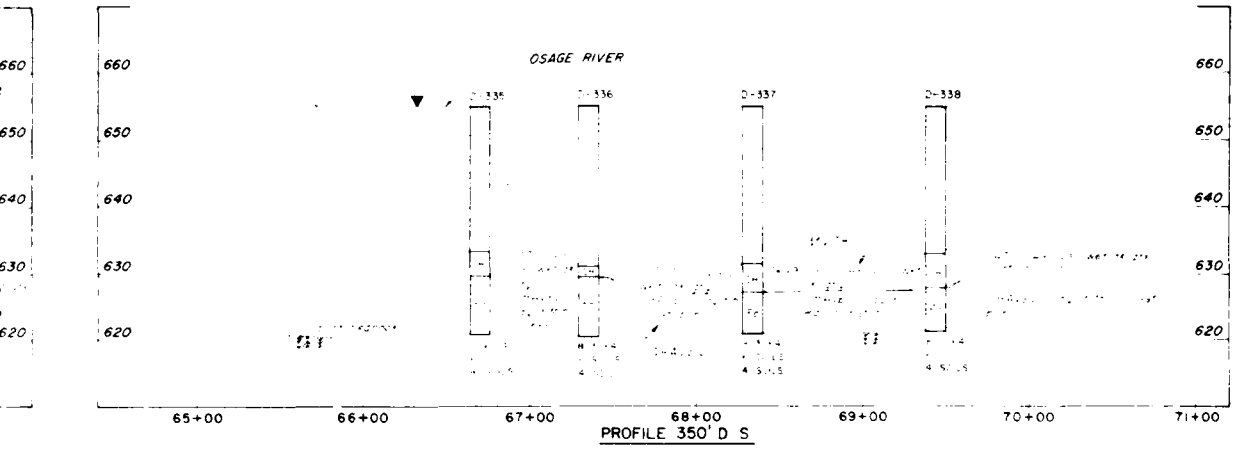
PROFILE 350' U. S



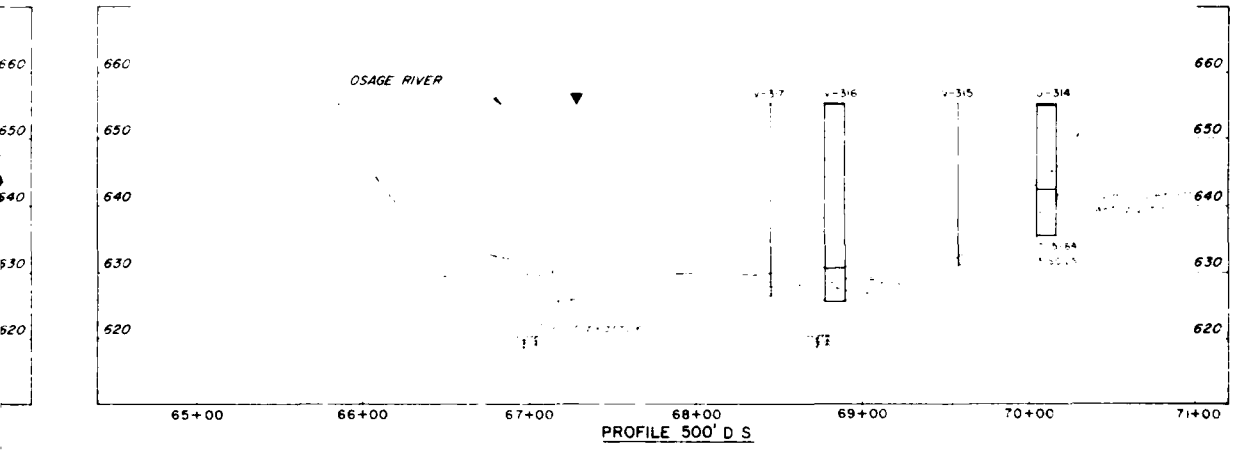
PROFILE ℄

DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

PLA

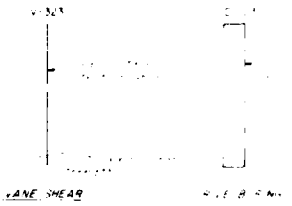


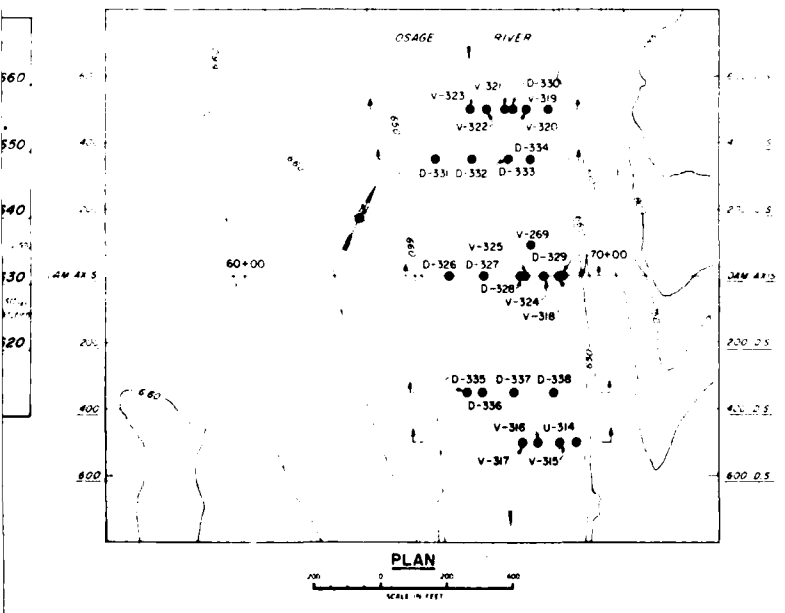
PROFILE 350' D S



PROFILE 500' D S

LEGEND





PLAN

Revisions			
Symbol	Descriptions	Date	Approved

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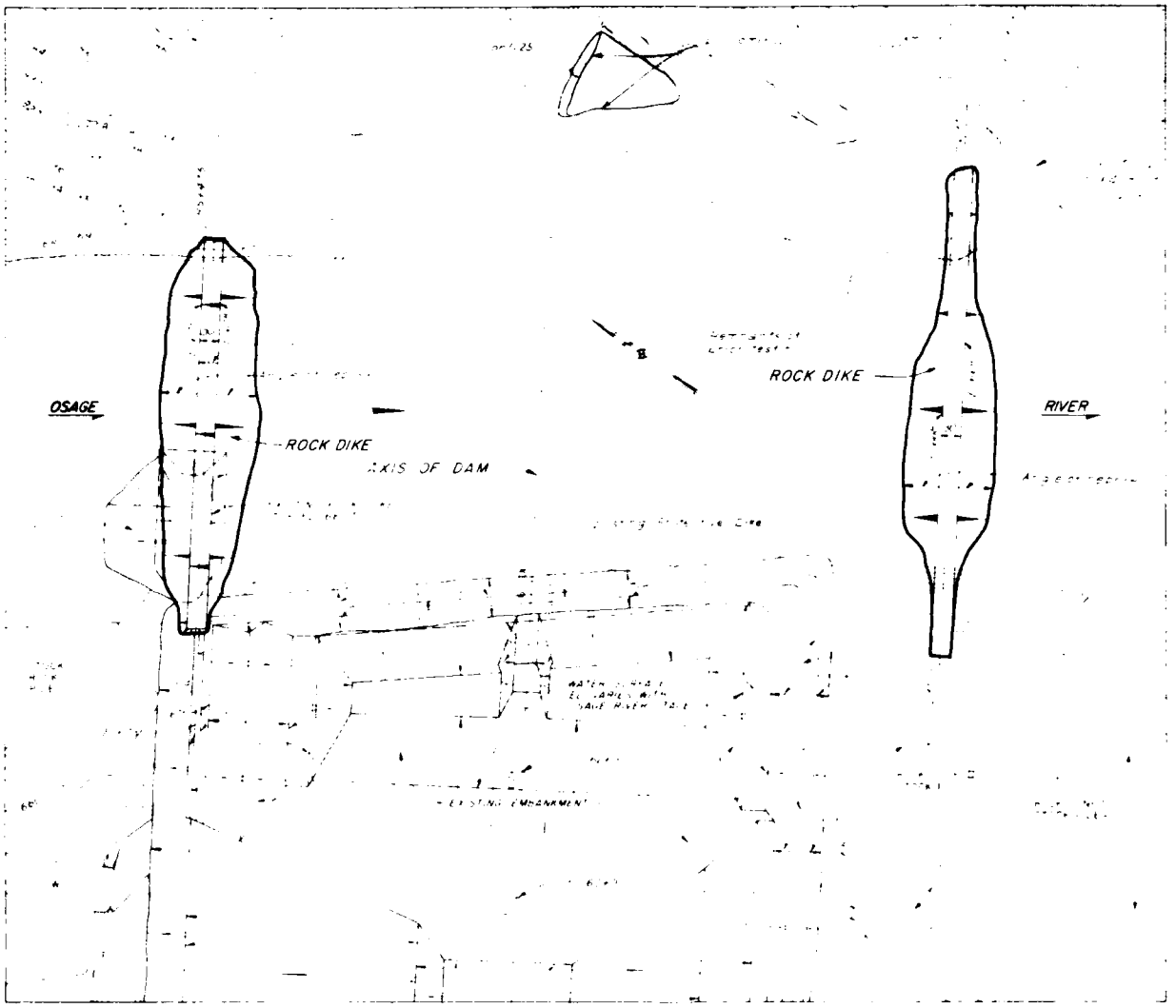
US Army Corps of Engineers

HARRY S. TRUMAN DAM AND RESERVOIR
CONSTRUCTION FOUNDATION REPORT

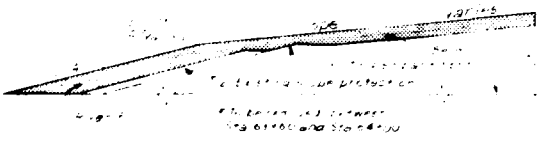
RIVER CHANNEL BORING
LAYOUT AND PROFILES

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Drawn by			
Checked by			
Submitted by	Scale: AS SHOWN	Sheet number	
	Date: MARCH 1985		
	Dwg No.	File No. 0-12-9229	

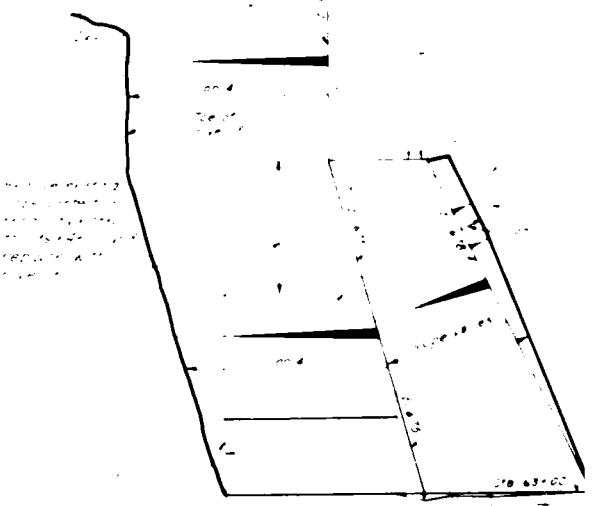
PLATE NO. 99



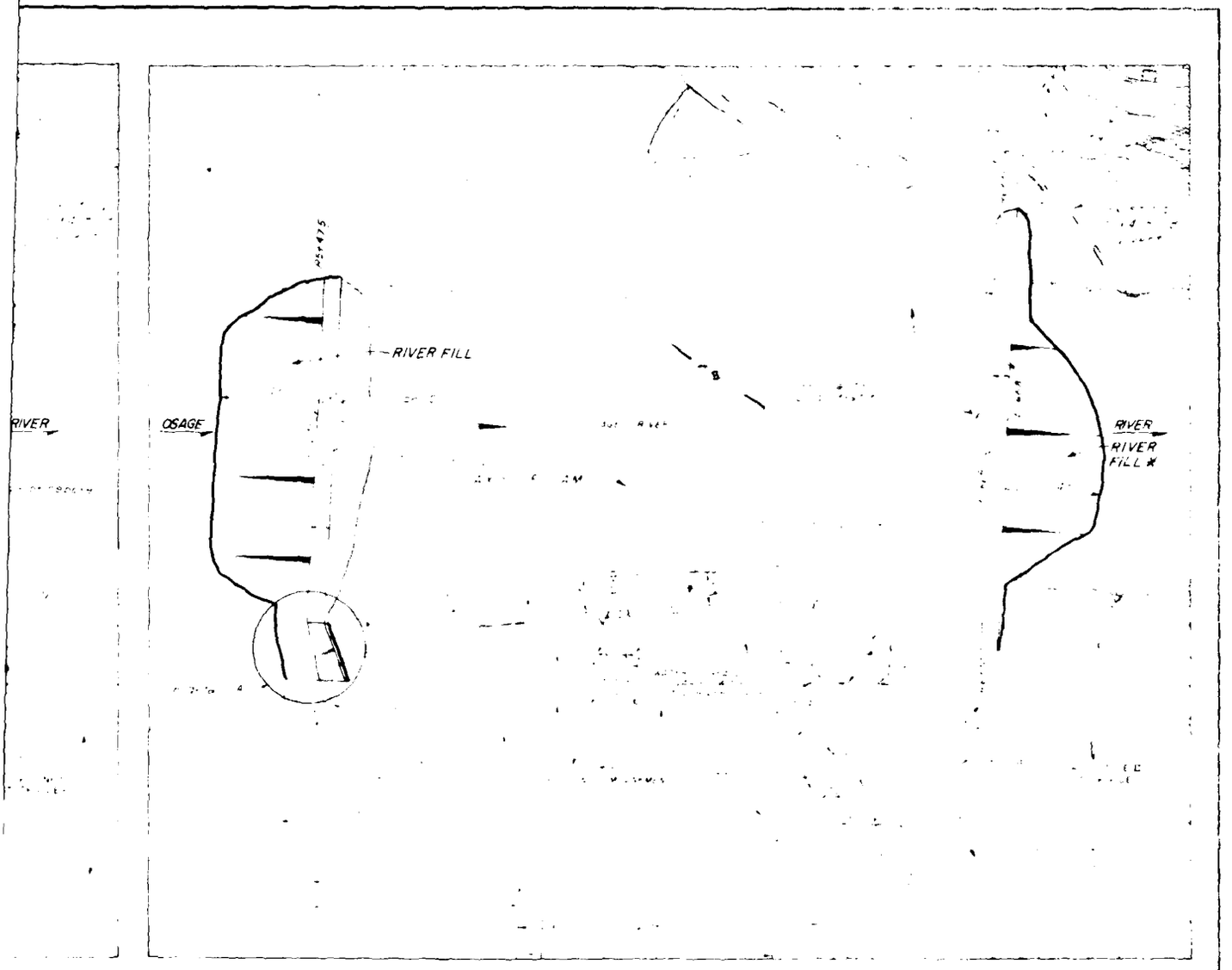
STEP I
PLACEMENT OF ROCK DIKES



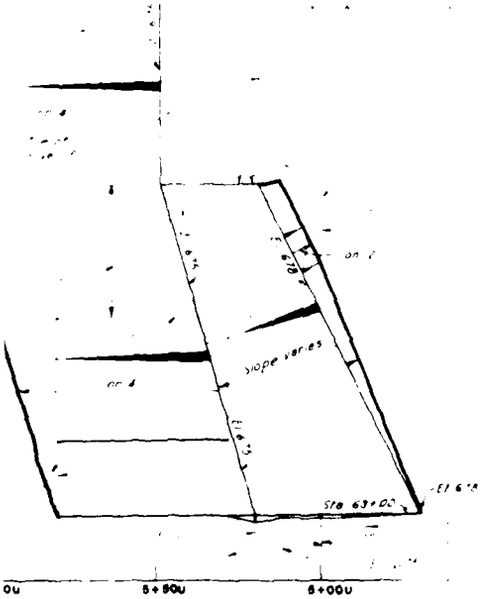
STA. 63+00 TO STA. 64+00
DETAIL "B"



DETAIL "A"



STEP 2
PLACEMENT OF RIVER FILL



DETAIL "A"



DETAIL "B"
EXISTING EMBANKMENT TO STA 63+00

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

* Closure area to be dewatered after placement of river fill

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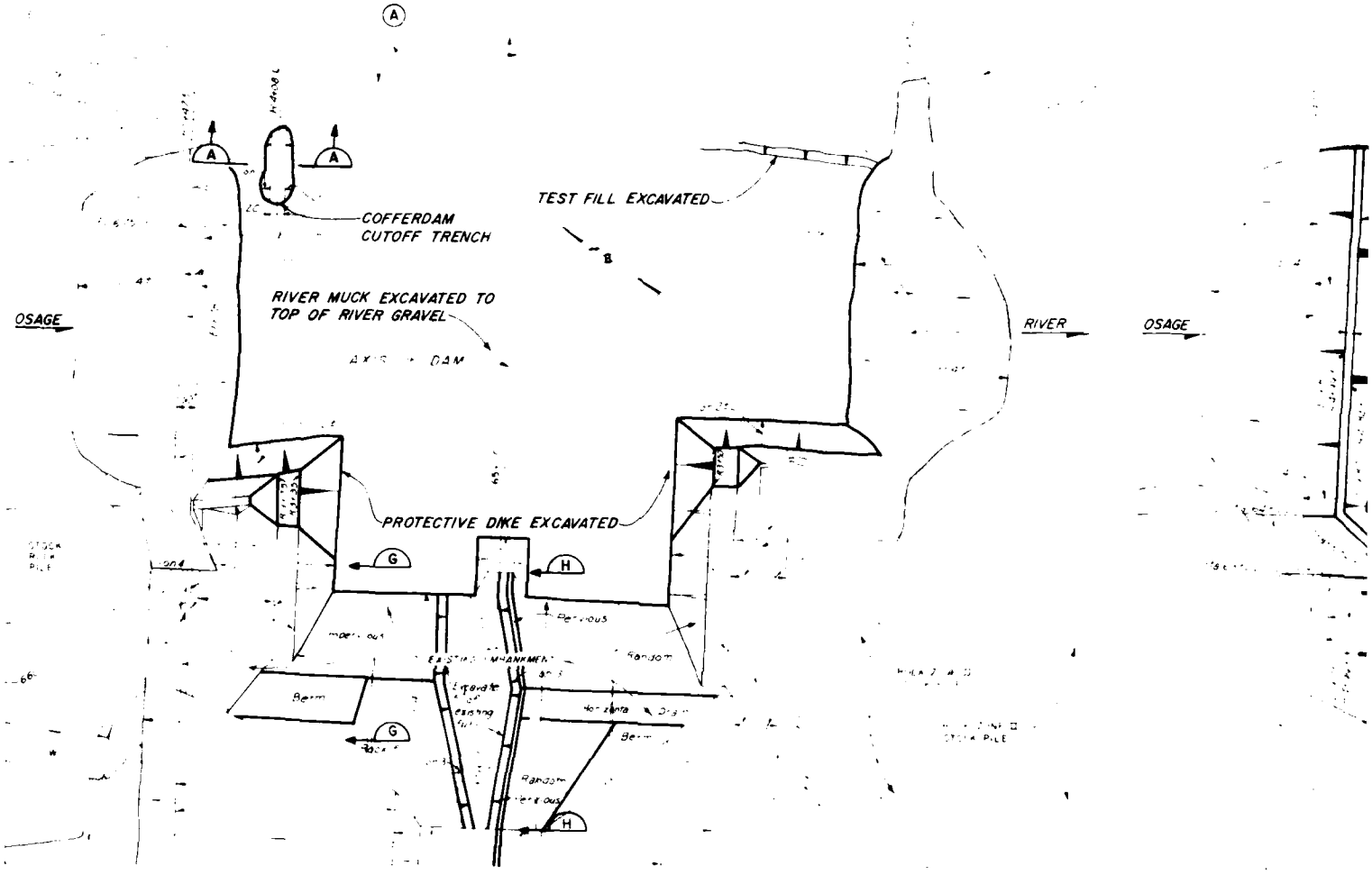
US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

DIVERSION AND CLOSURE
PHASE 2

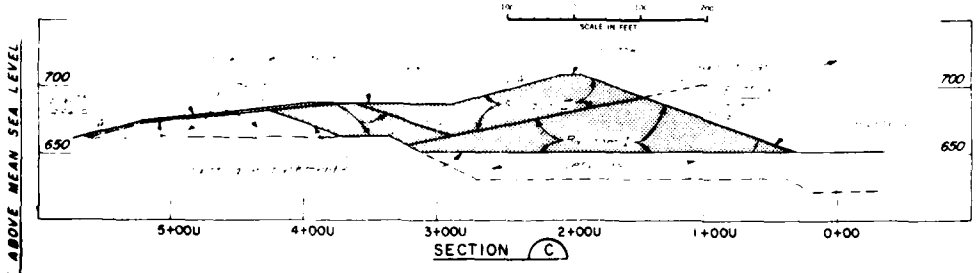
Files prepared by
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Drawing No.
Sheet number
14-0-12-9230

PLATE NO 100

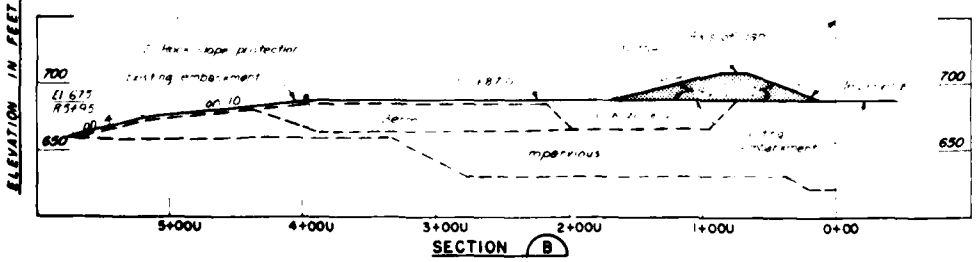


STEP I

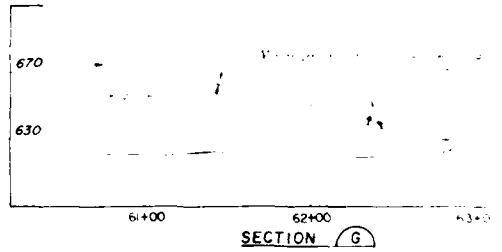
EXCAVATION OF RIVER BOTTOM, AND PROTECTIVE DIKE, AND EXISTING EMBANKMENT



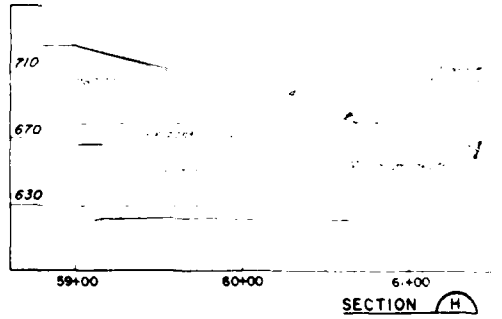
SECTION C



SECTION B



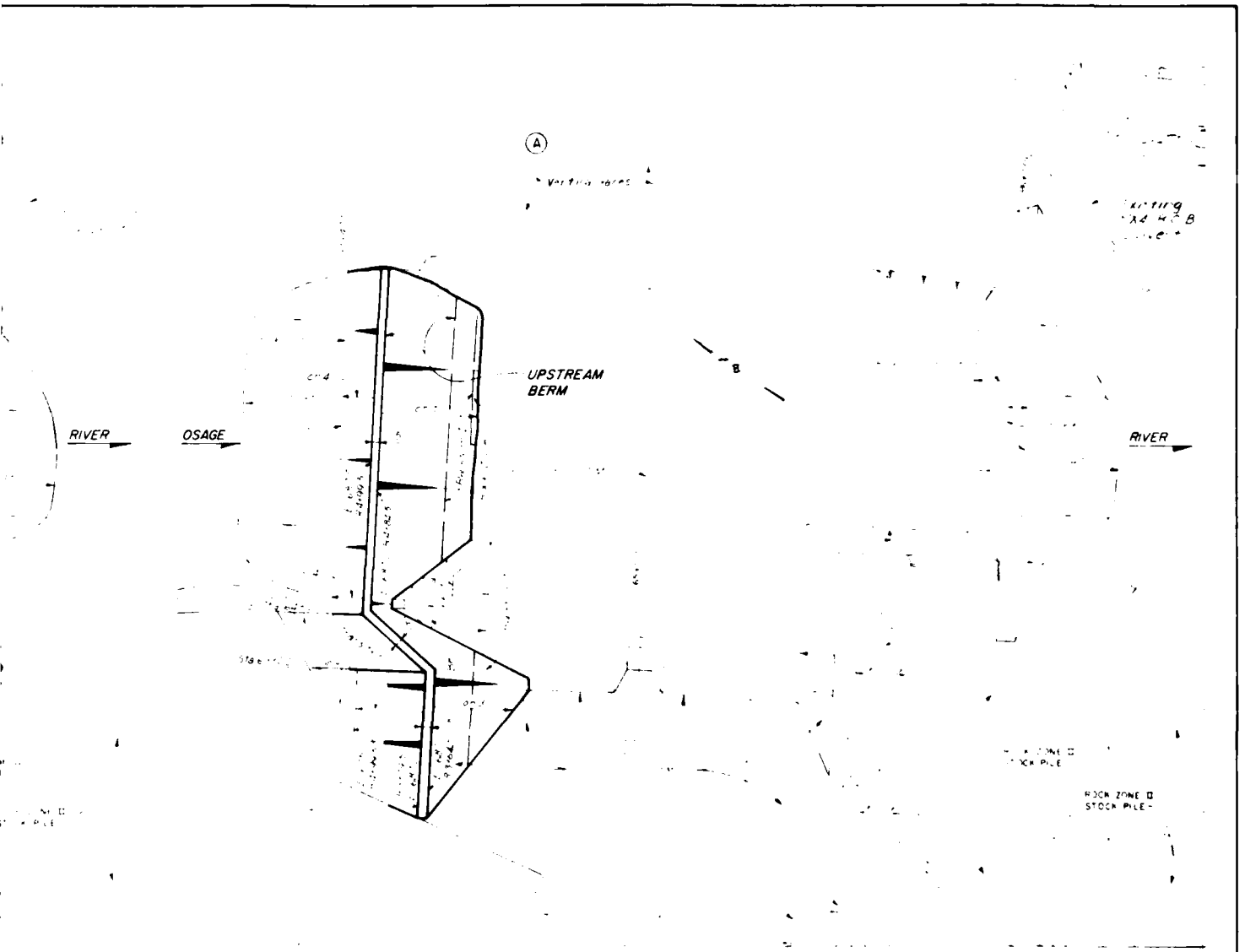
SECTION G



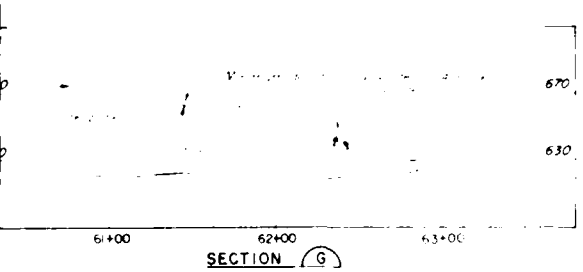
SECTION H

ELEVATION IN FEET ABOVE MEAN SEA LEVEL

COFFERDAM SECTIONS



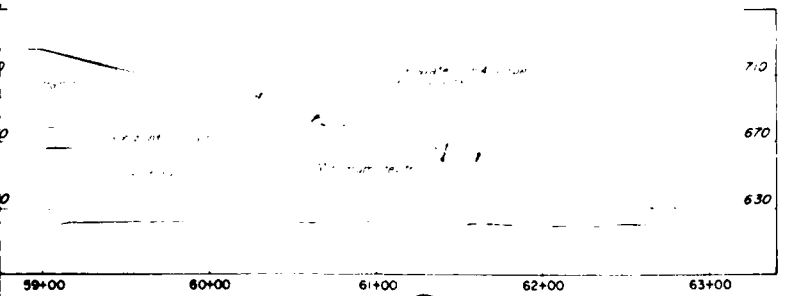
STEP 2
PLACEMENT OF US BERM



SECTION G

SECTION A

COFFERDAM CUTOFF TRENCH



SECTION H

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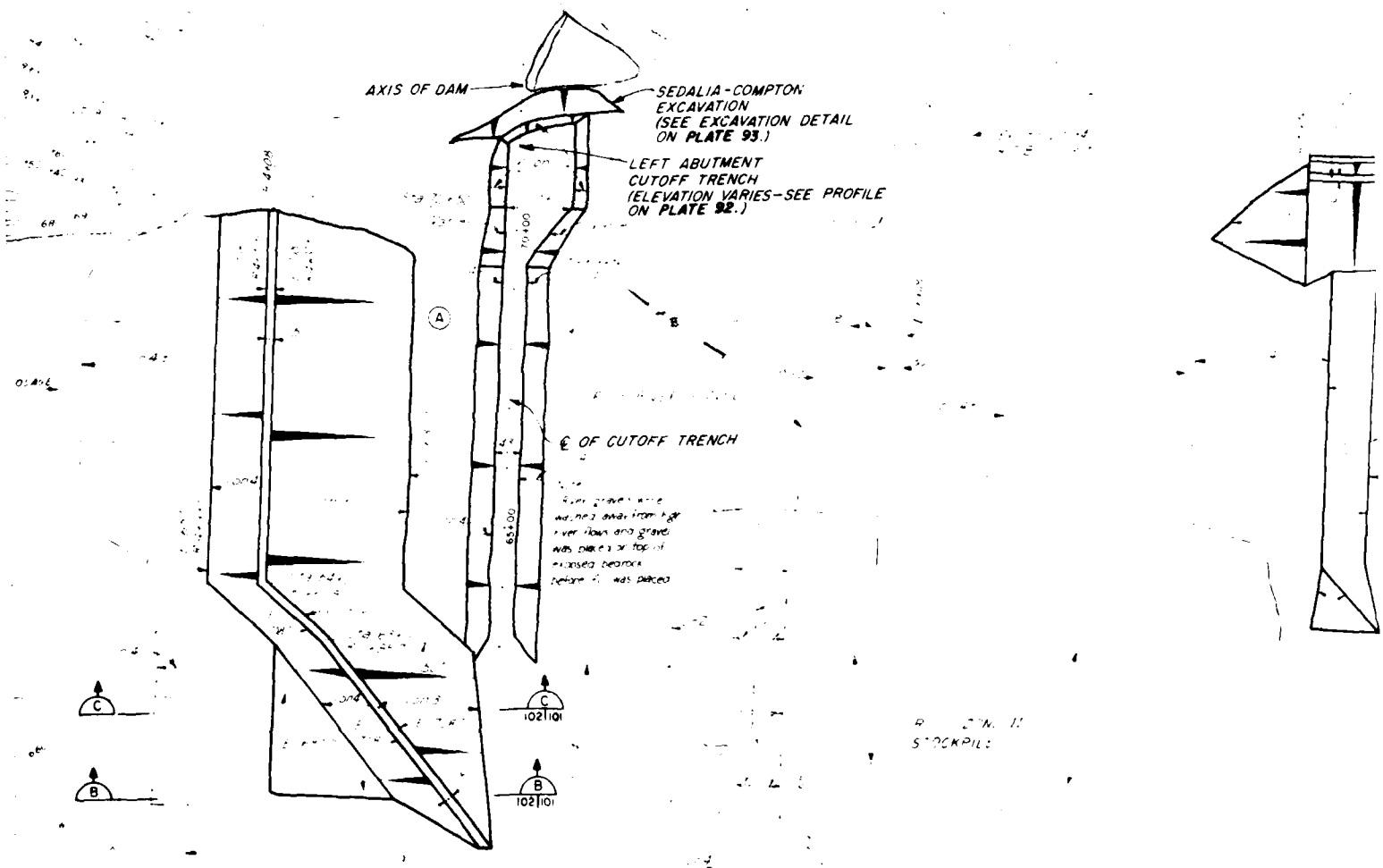
US Army Corps of Engineers

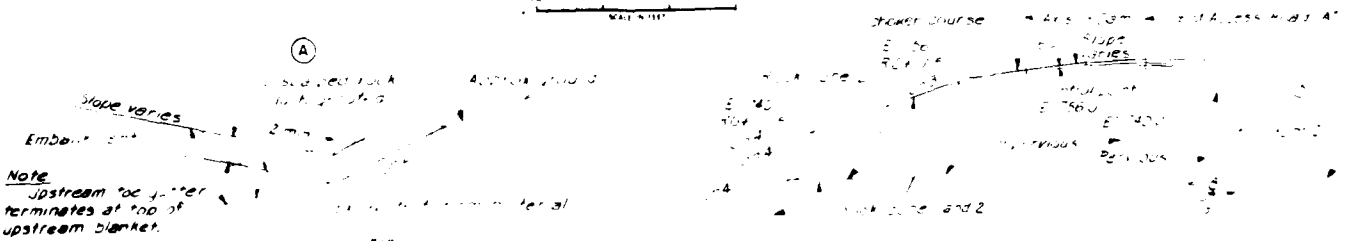
ONSTRUCTION FOUNDATION REPORT

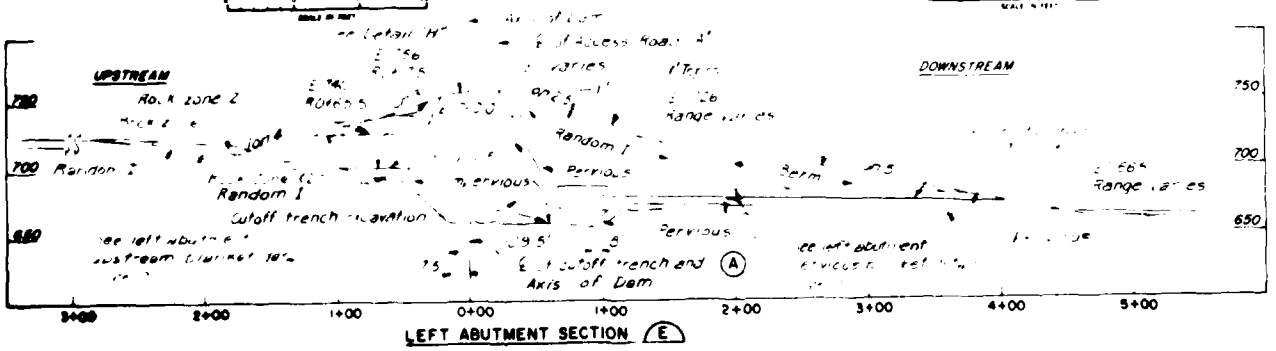
DIVERSION AND CLOSURE
PHASE 3

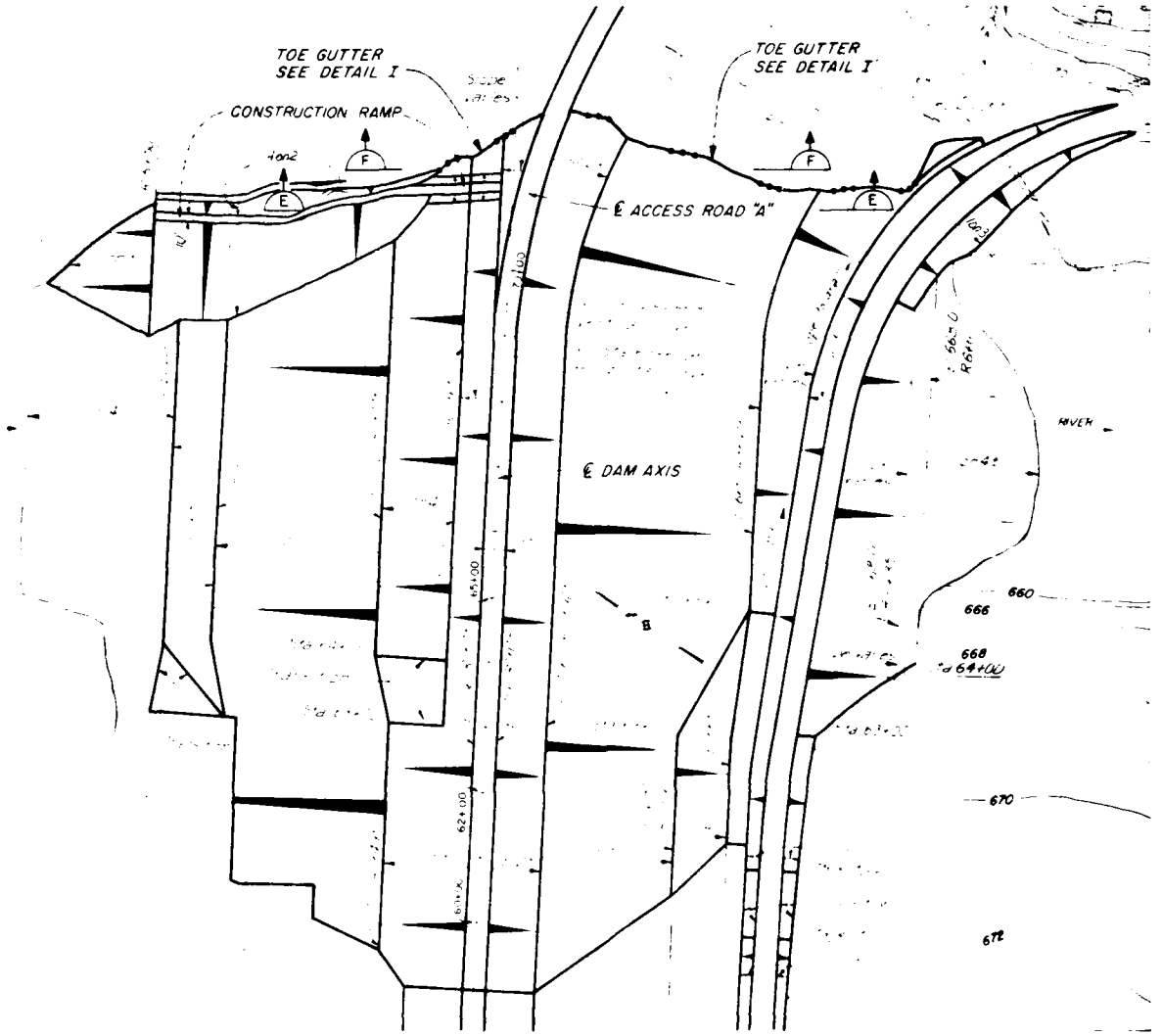
Scale AS SHOWN
Date MARCH 1985
Drawing No. 0-12-9231
Sheet number

PLATE NO. 101


AXIS OF DAM
SEDALIA-COMPTON EXCAVATION (SEE EXCAVATION DETAIL ON PLATE 93.)
LEFT ABUTMENT CUTOFF TRENCH (ELEVATION VARIES-SEE PROFILE ON PLATE 92.)
℄ OF CUTOFF TRENCH
STOCKPILE
STEP 1
PLACEMENT OF U.S. COFFERDAM


Slope varies
Note
Upstream toe gutter terminates at top of upstream blanket.
DETAIL "I"
LEFT ABUTMENT TOE GUTTER
DETAIL "H"


UPSTREAM
DOWNSTREAM
Random 1
Pervious
Cutoff trench excavation
Axis of Dam
LEFT ABUTMENT SECTION (E)



STEP 2
COMPLETION OF EMBANKMENT

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE



LEFT ABUTMENT SECTION (F)

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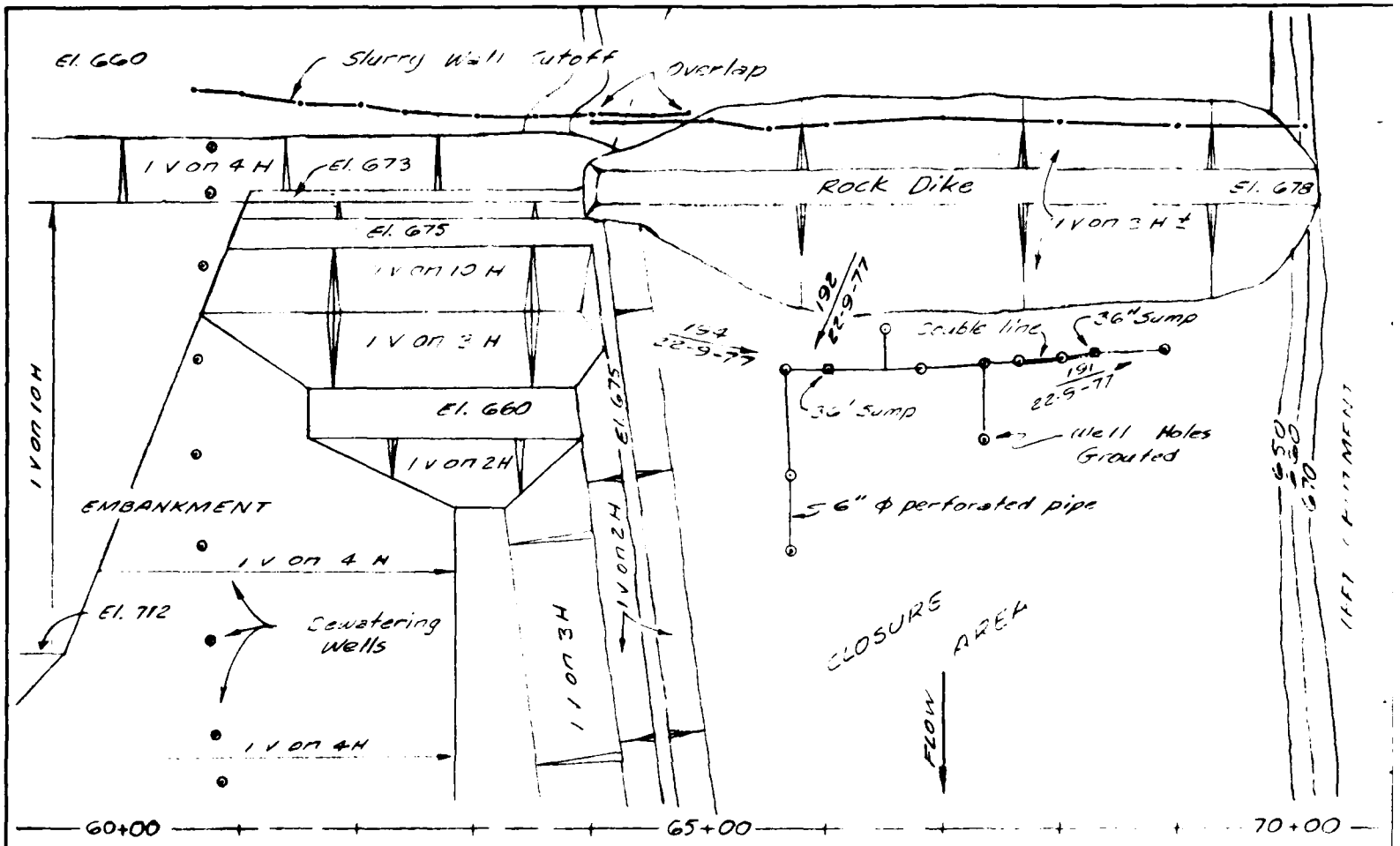
US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

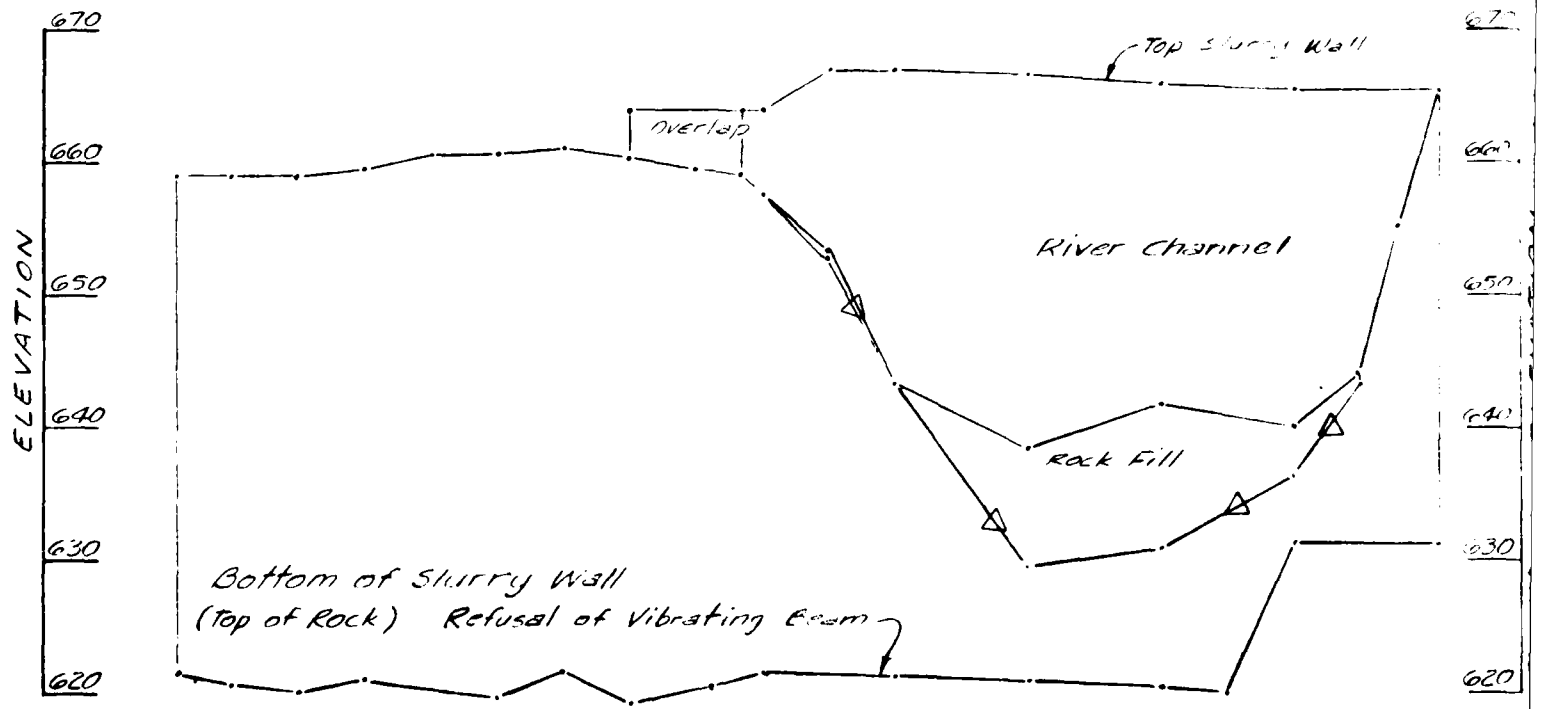
DIVERSION AND CLOSURE
PHASE 4

Scale AS SHOWN
Date MARCH 1985
Sheet number
Drawing No. 0-12-9232

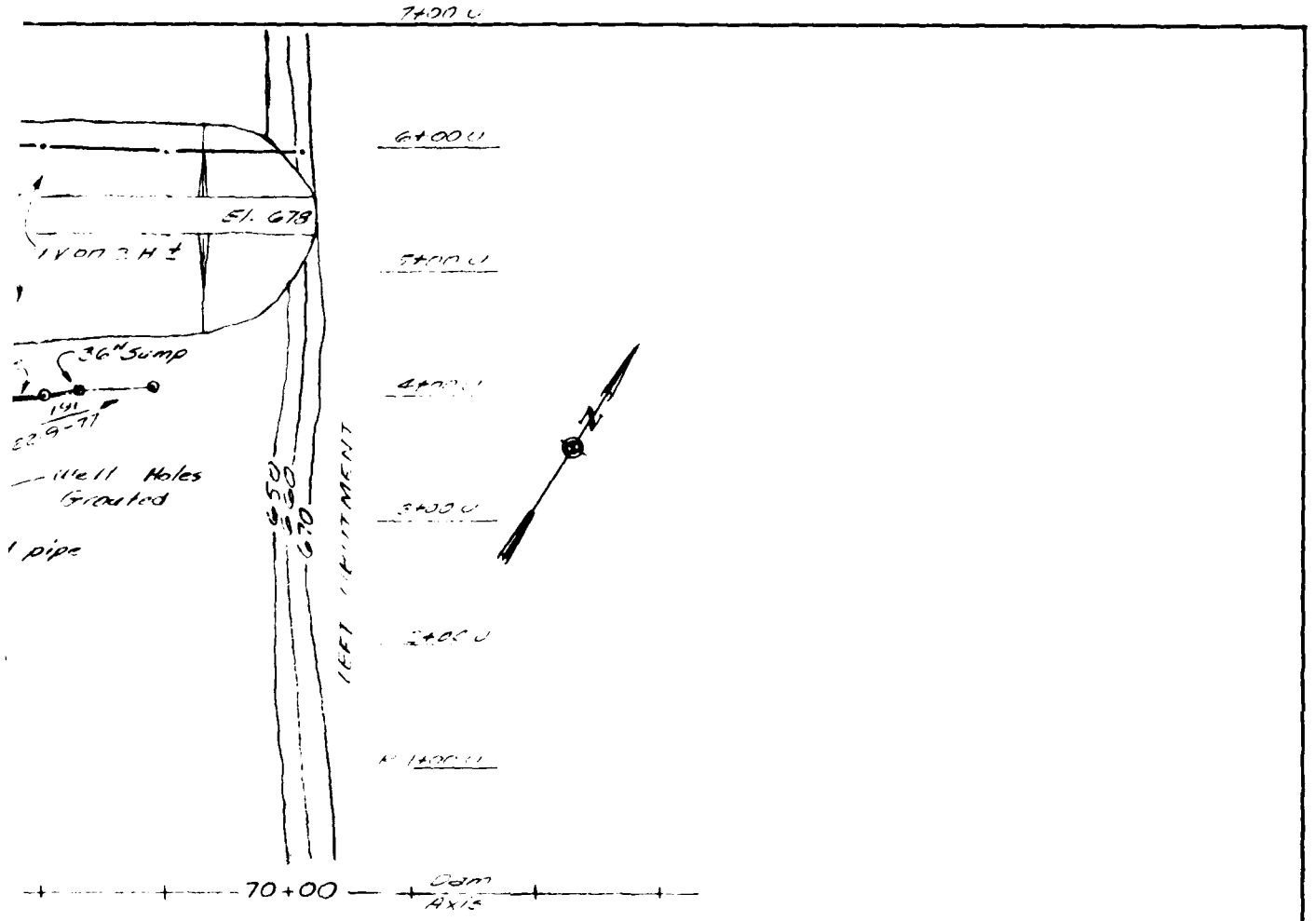
PLATE NO 102



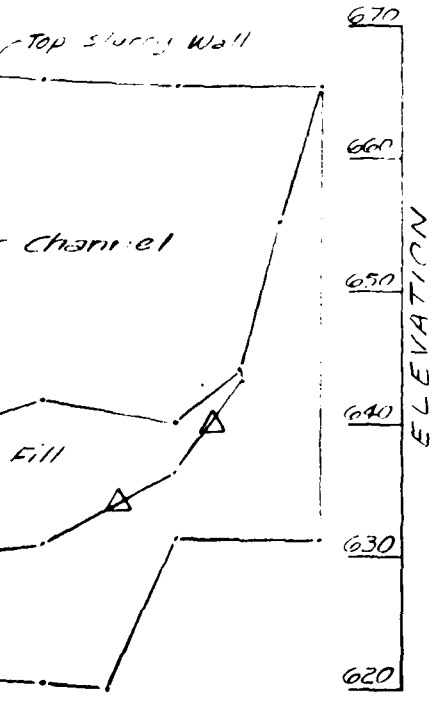
PLAN UPSTREAM DEWATERING COLLECTOR SYSTEM AND SL



PROFILE UPSTREAM SLURRY WALL



SYSTEM AND SLURRY WALL CLOSURE AREA



191
22-9-77 Direction Date & Number of Photo

△ Prominant Seepage Points

0 100
SCALE IN FEET

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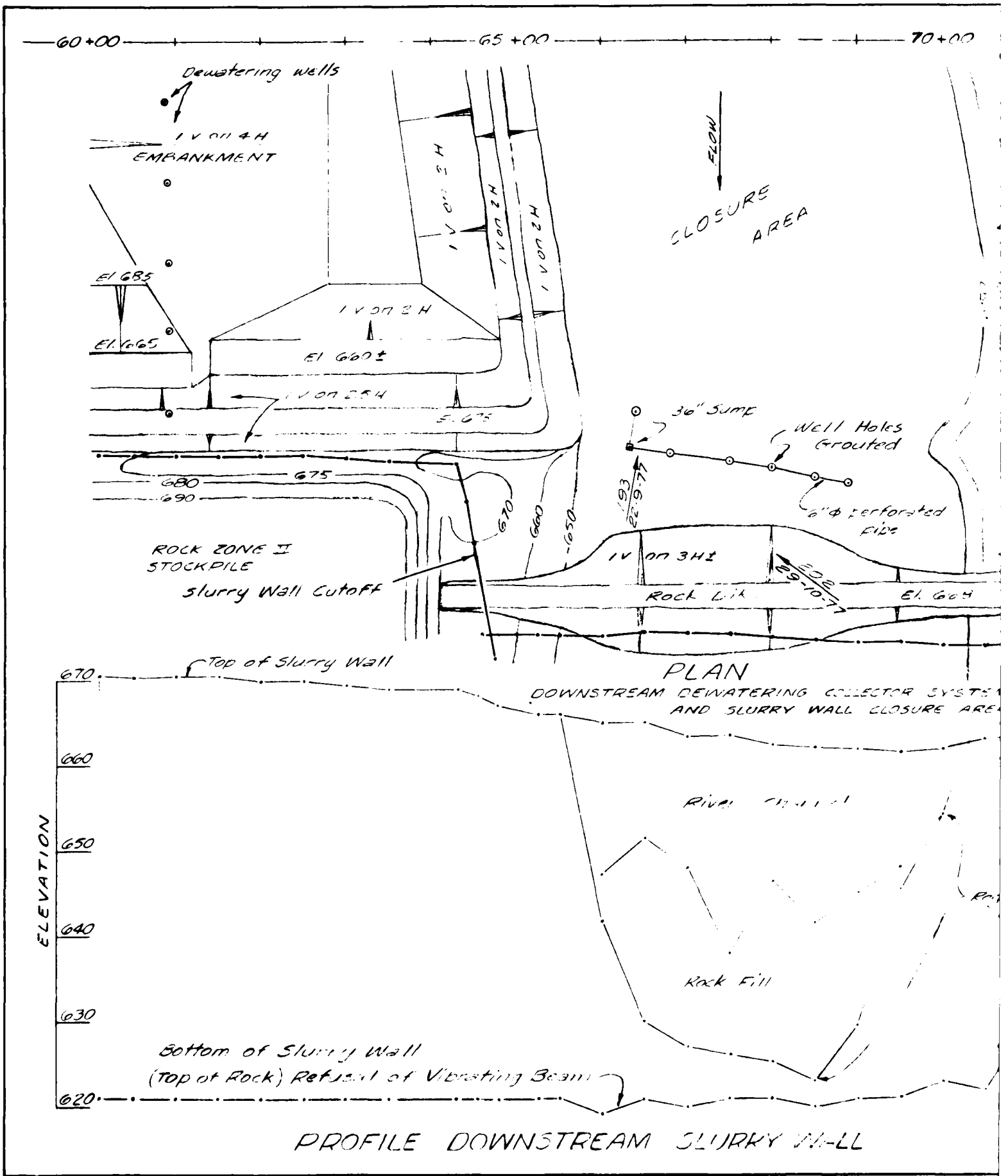
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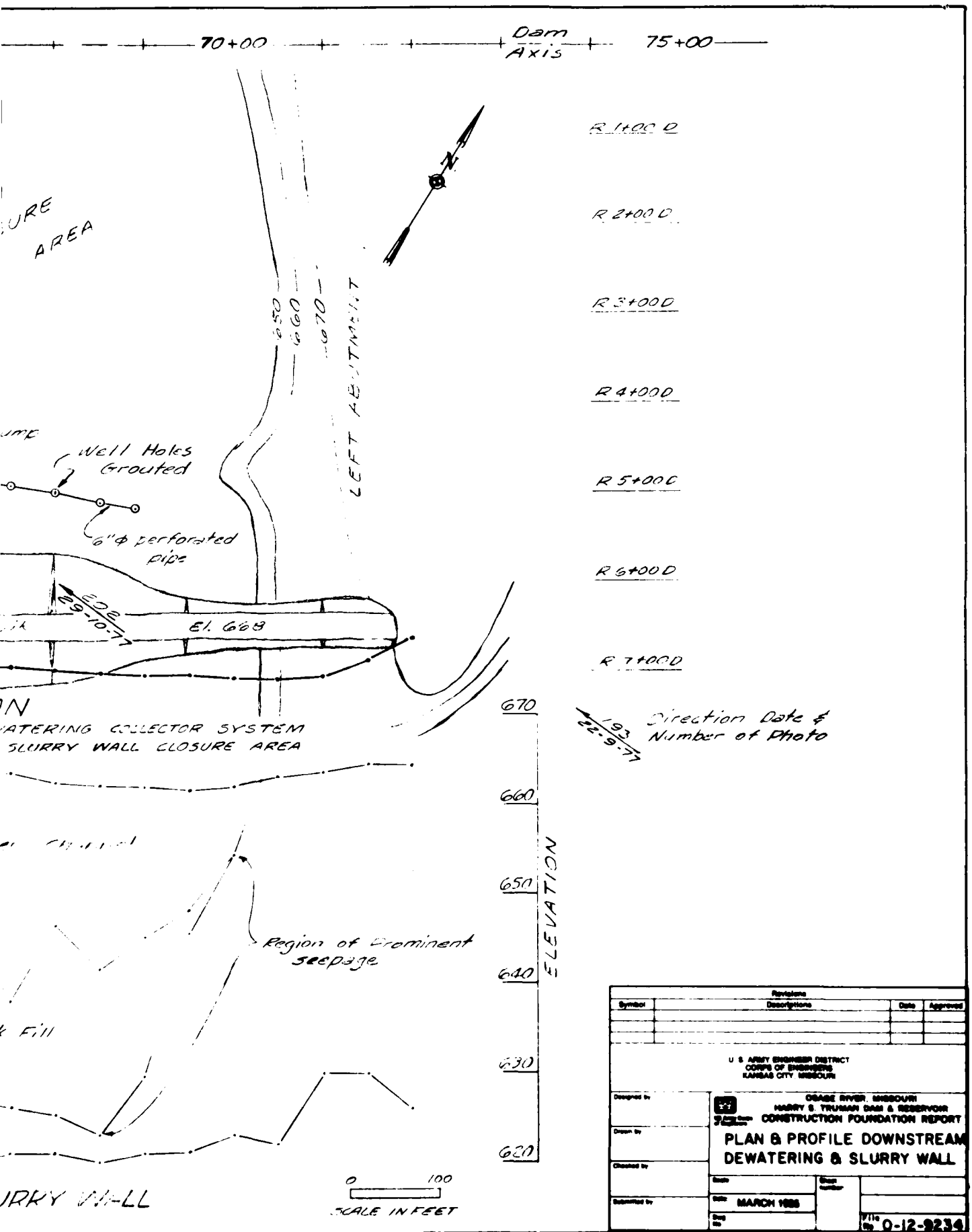
OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

PLAN & PROFILE UPSTREAM DEWATERING & SLURRY WALL

Date: MARCH 1978
Sheet number:
Drawing No. 0-12-9233

PLATE NO. 103


60+00
65+00
70+00
Dewatering wells
1V on 4H
EMBANKMENT
FLOW
CLOSURE
AREA
1V on 2H
1V on 3H
El 685
El. 665
El 660±
5.675
680
675
690
670
660
650
36" Sump
Well Holes
Grouted
6"Φ perforated
pipe
193
22-9-77
ROCK ZONE II
STOCKPILE
Slurry Wall Cutoff
1V on 3H±
Rock Lik
El. 604
Top of Slurry Wall
PLAN
DOWNSTREAM DEWATERING COLLECTOR SYSTEM
AND SLURRY WALL CLOSURE AREA
River
Rock Fill
ELEVATION
670
660
650
640
630
620
Bottom of Slurry Wall
(Top of Rock) Refusal of Vibrating Beam
PROFILE DOWNSTREAM SLURRY WALL



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CONSTRUCTION FOUNDATION REPORT

PLAN & PROFILE DOWNSTREAM DEWATERING & SLURRY WALL

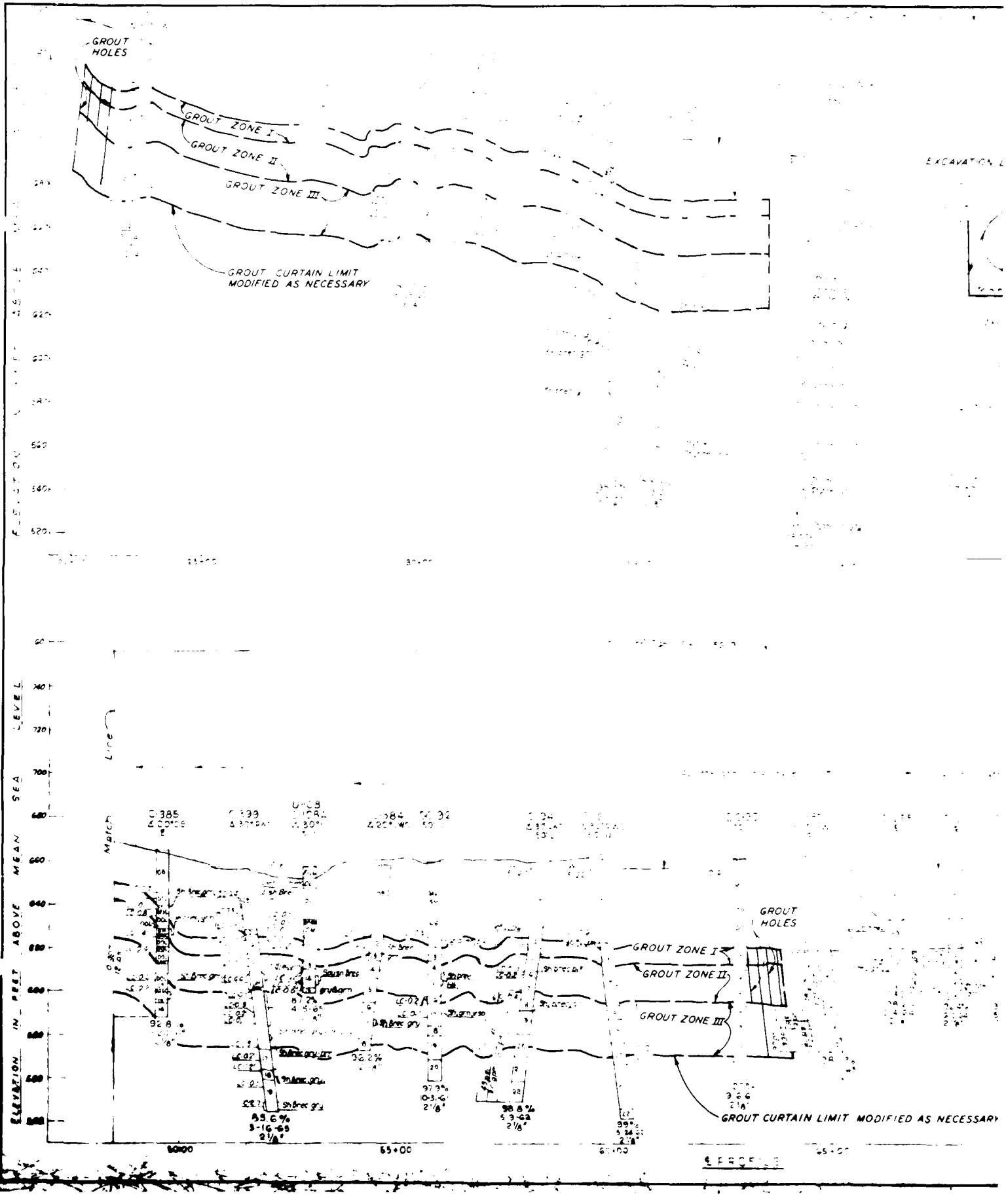
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Date: MARCH 1988
Sheet number
File No. 0-12-9234

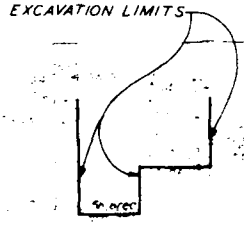
PLATE NO. 104

STAGE I CONSTRUCTION

STRUCTION

CORPS OF ENGINEERS





NOTES

For Legend of Explorations and generalized geologic column see Plate 4

Water level readings were taken immediately prior to backfilling hole or when hole was left open, readings are the last reported

Where zones indicated by letters A1-10 are not indicated they are generally masked or not legible

Where Shale Breccias are indicated by a line the thickness is less than 0.5 foot

CORE BOX DETAILS

FOR EXPLORATORY DRILLING

GROUT HOLES

T CURTAIN LIMIT MODIFIED AS NECESSARY

65+00

FILE

DRAWINGS IN THIS FULIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

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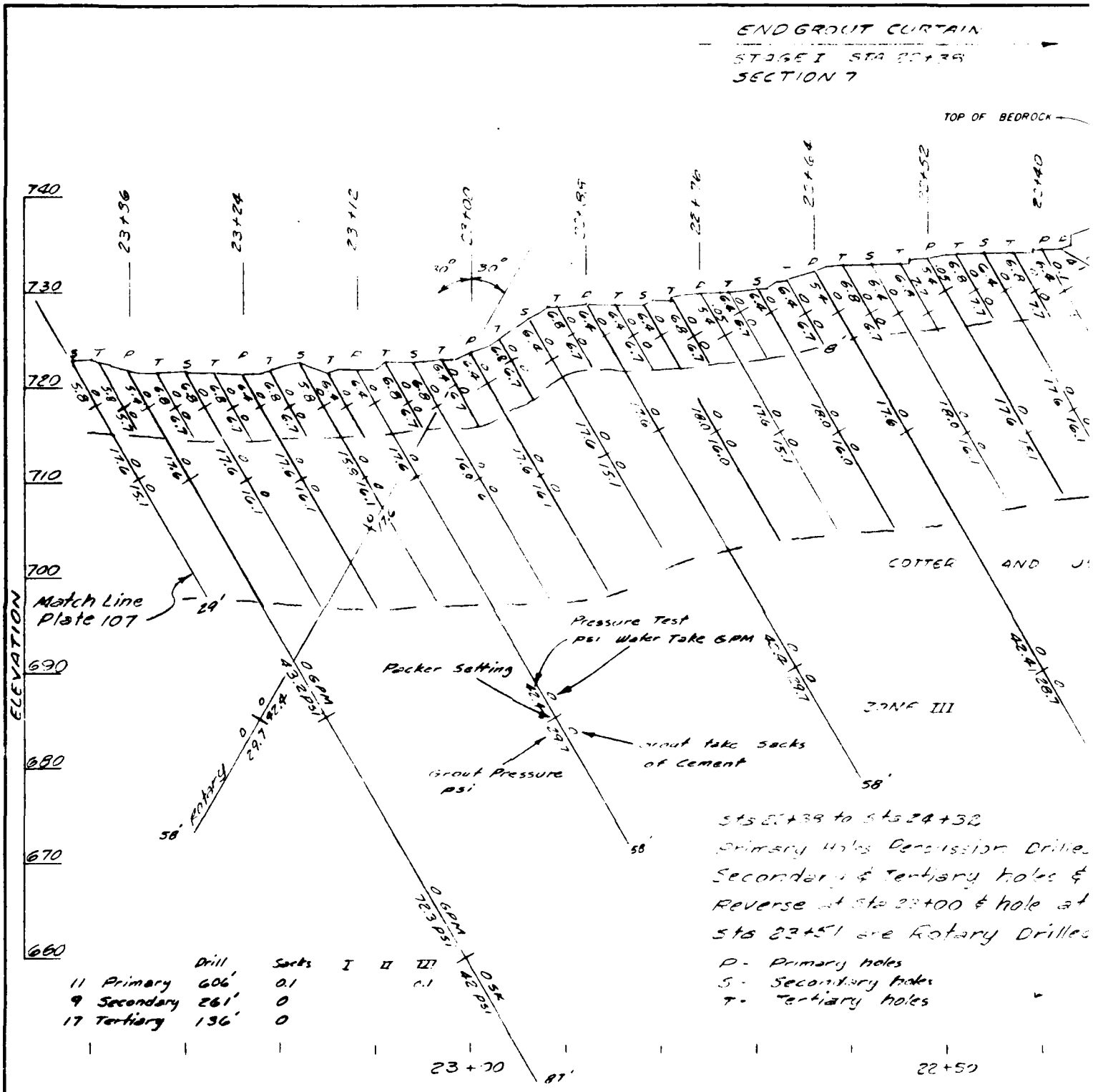
DAM AXIS FOUNDATION BEDROCK AND GROUT CURTAIN PROFILE

Scale: AS SHOWN | Sheet number

Date: MARCH 1985

Dwg No. 0-12-9235

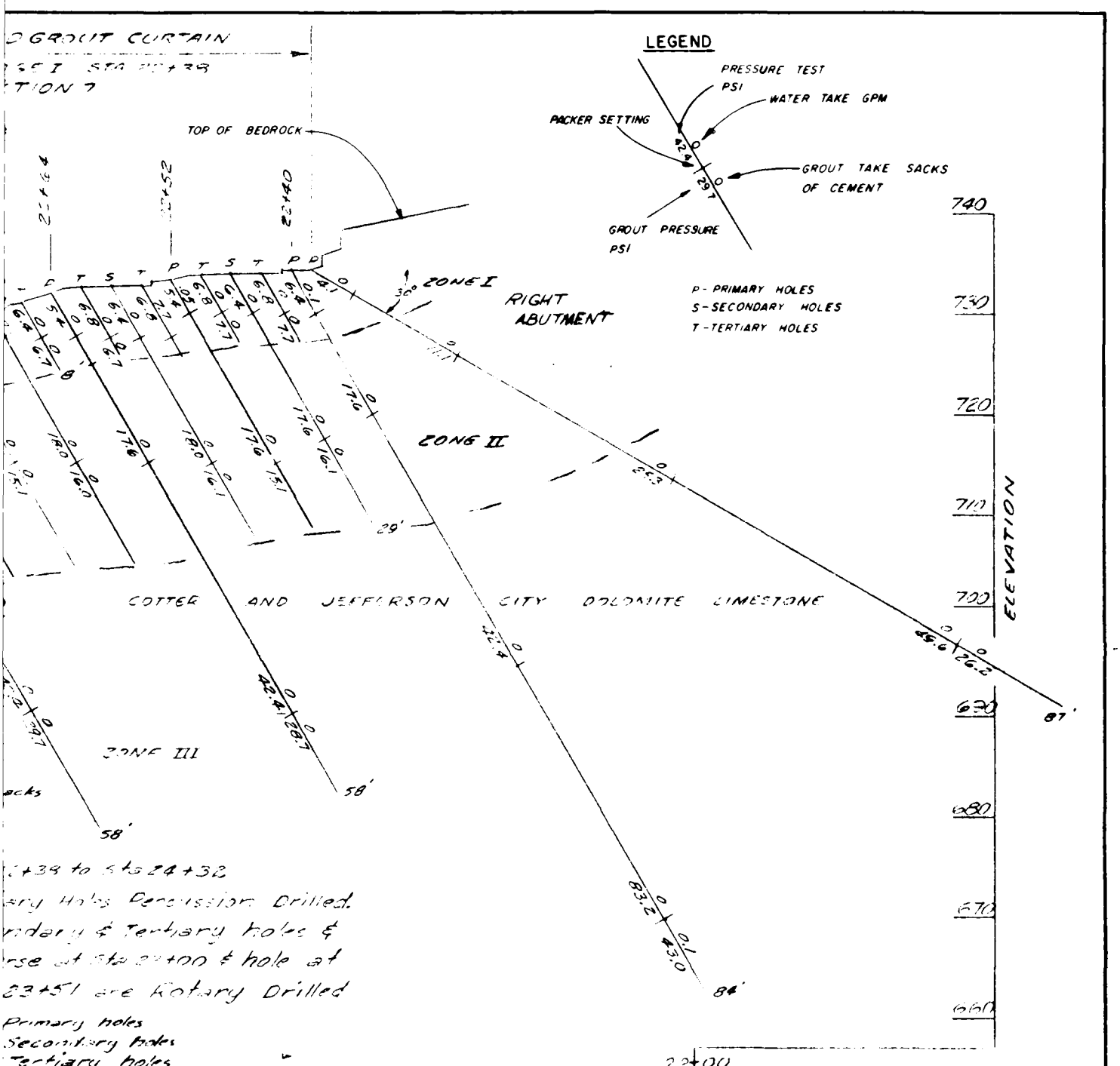
PLATE NO. 105



LINE C STAGE I GROUT CURTAIN PROFILE STA
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

0 10
SCALE IN FEET



+39 to Sta 24+32
ary Holes Percussion Drilled.
ndary & Tertiary holes &
rse at Sta 23+00 & hole at
23+51 are Rotary Drilled
Primary holes
Secondary holes
Tertiary holes

IN PROFILE STA 22+38 TO STA 23+42
NG DOWNSTREAM

0 10
SCALE IN FEET

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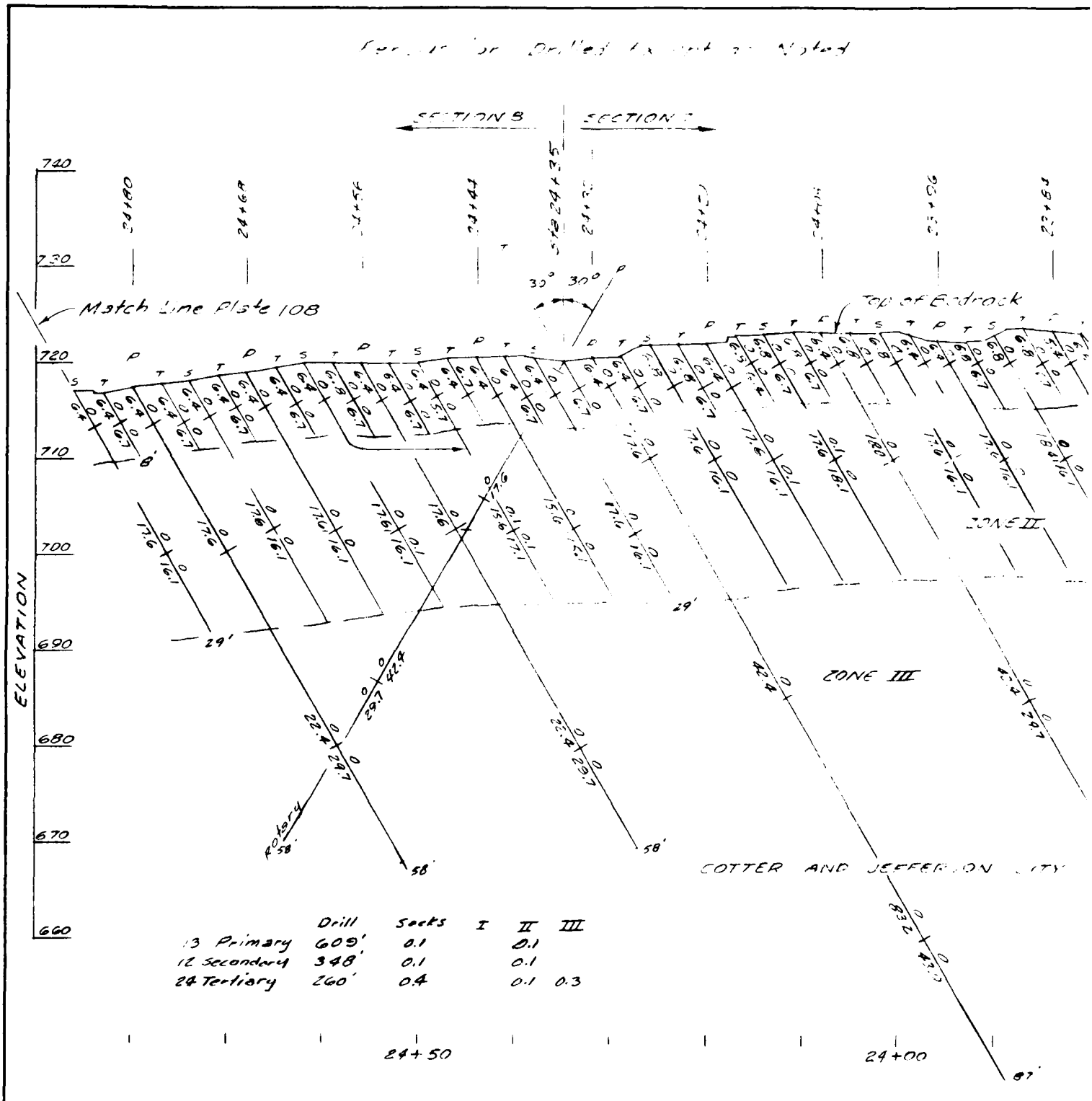
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CONSTRUCTION FOUNDATION REPORT

GROUT CURTAIN PROFILE, LINE C STA. 22+38 TO STA. 23+42

Scale: AS SHOWN
Date: MARCH 1968
Drawing No.:
Contract No.:

106

PLATE NO. 106



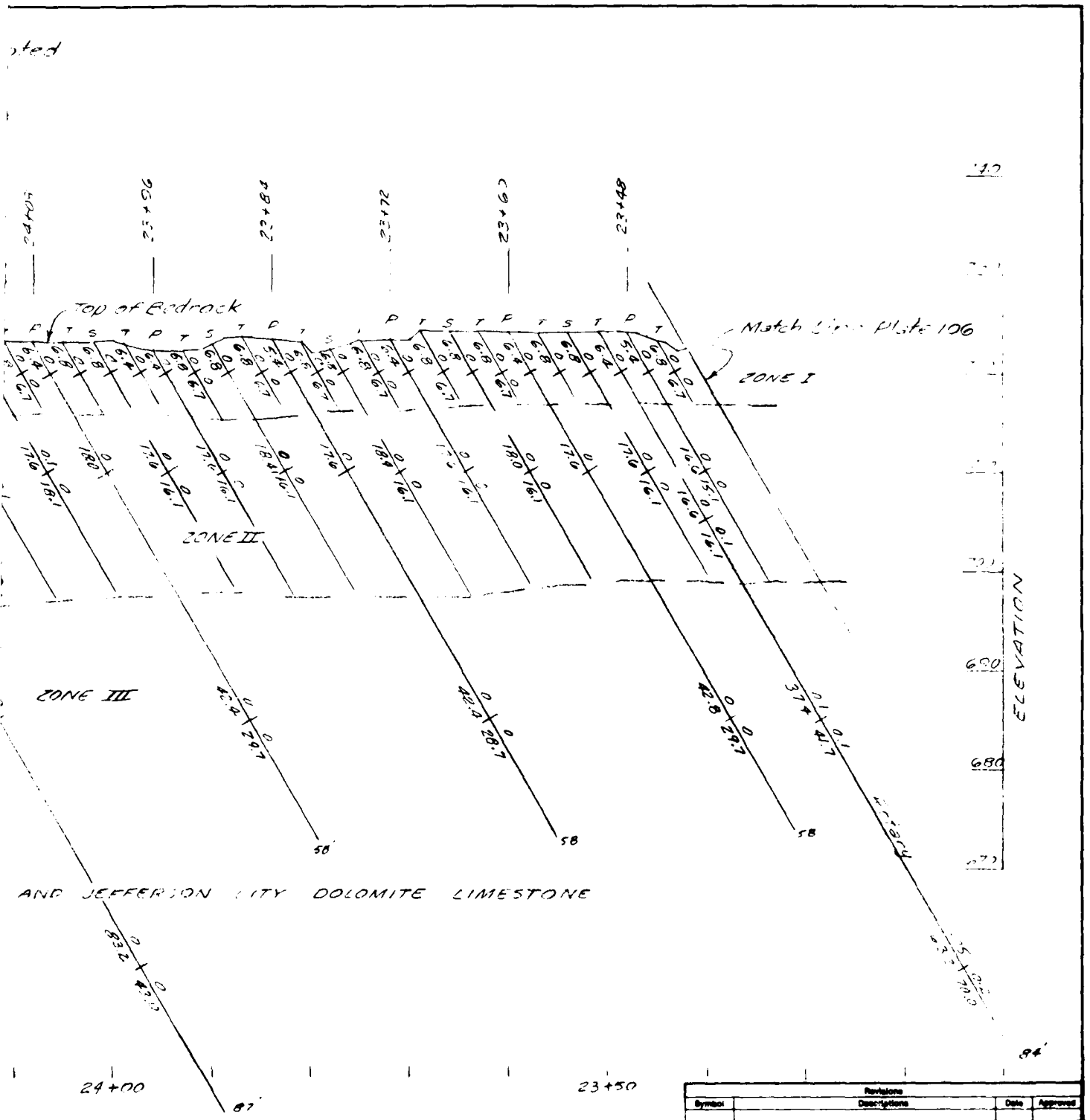
LINE C STAGE I GROUT CURTAIN PROFILE STA 23+42

LOOKING DOWNSTREAM

Grout Line is on Dam Axis

0 10

SCALE IN FEET



OFILE STA 23+42 TO STA 24+86

ING DOWNSTREAM

0 10

SCALE IN FEET

For Legend see Plate 106

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CONSTRUCTION FOUNDATION REPORT

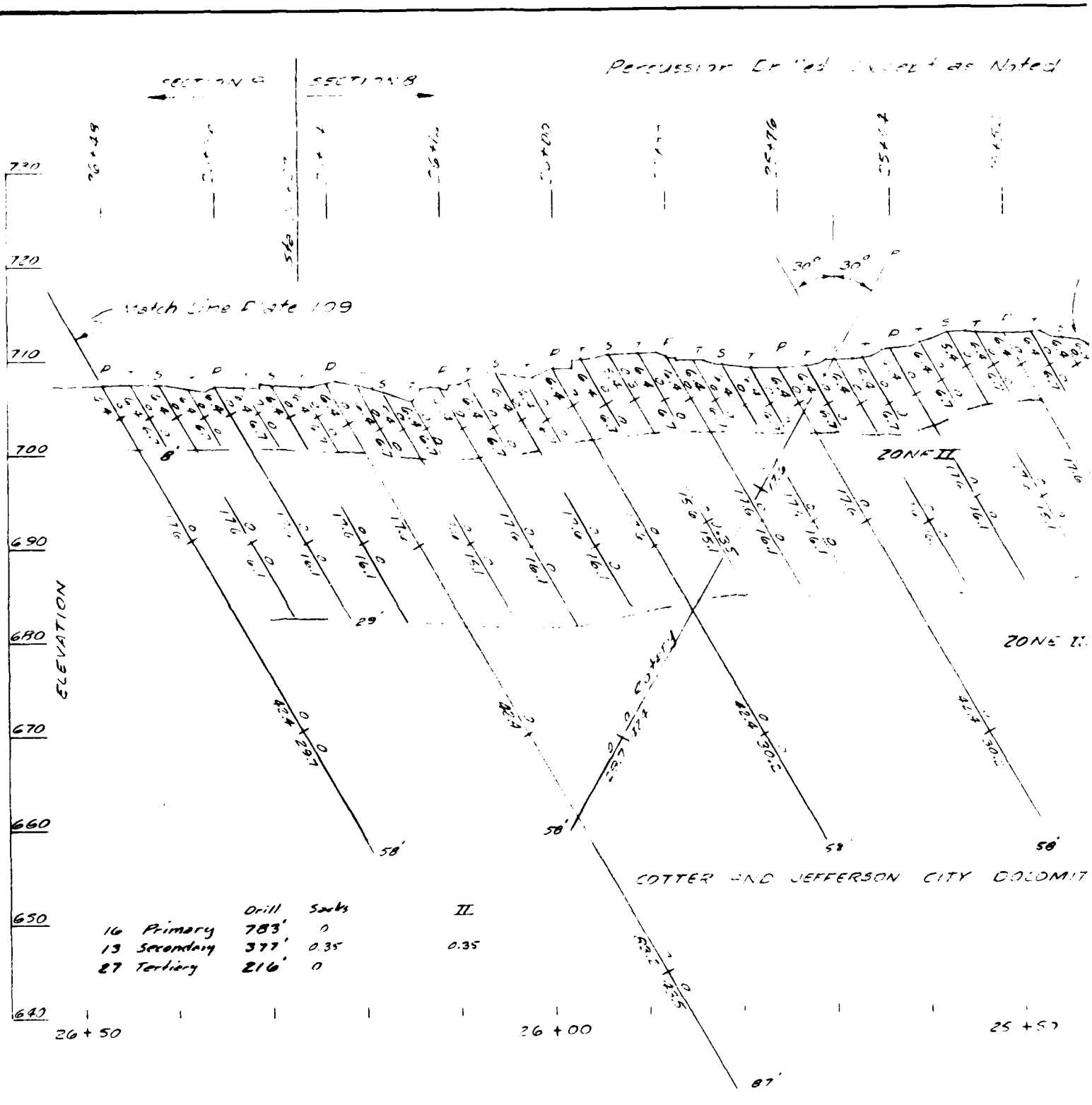
GROUT CURTAIN PROFILE, LINE C STA. 23+42 TO STA 24+86

Scale AS SHOWN

Date MARCH 1968

Sheet number

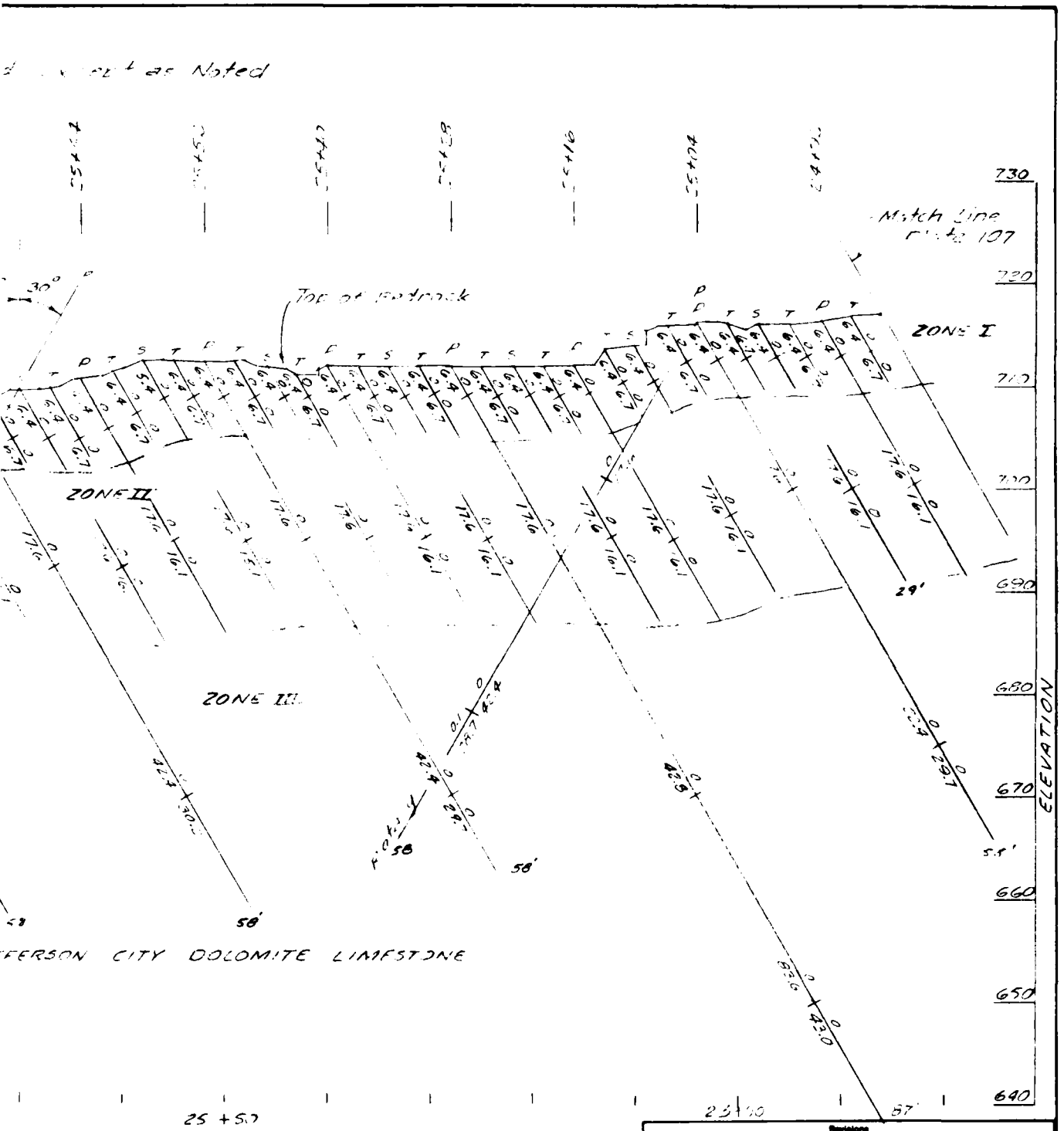
File No. 0-12-9231



LINE C STAGE I GROUT CURTAIN PROFILE STA
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

SCALE IN FEET



JEFFERSON CITY DOLOMITE LIMESTONE

PROFILE STA 24+86 TO STA 26+48
DOWNSTREAM

FOR LEGEND SEE PLATE 106

Revisions			
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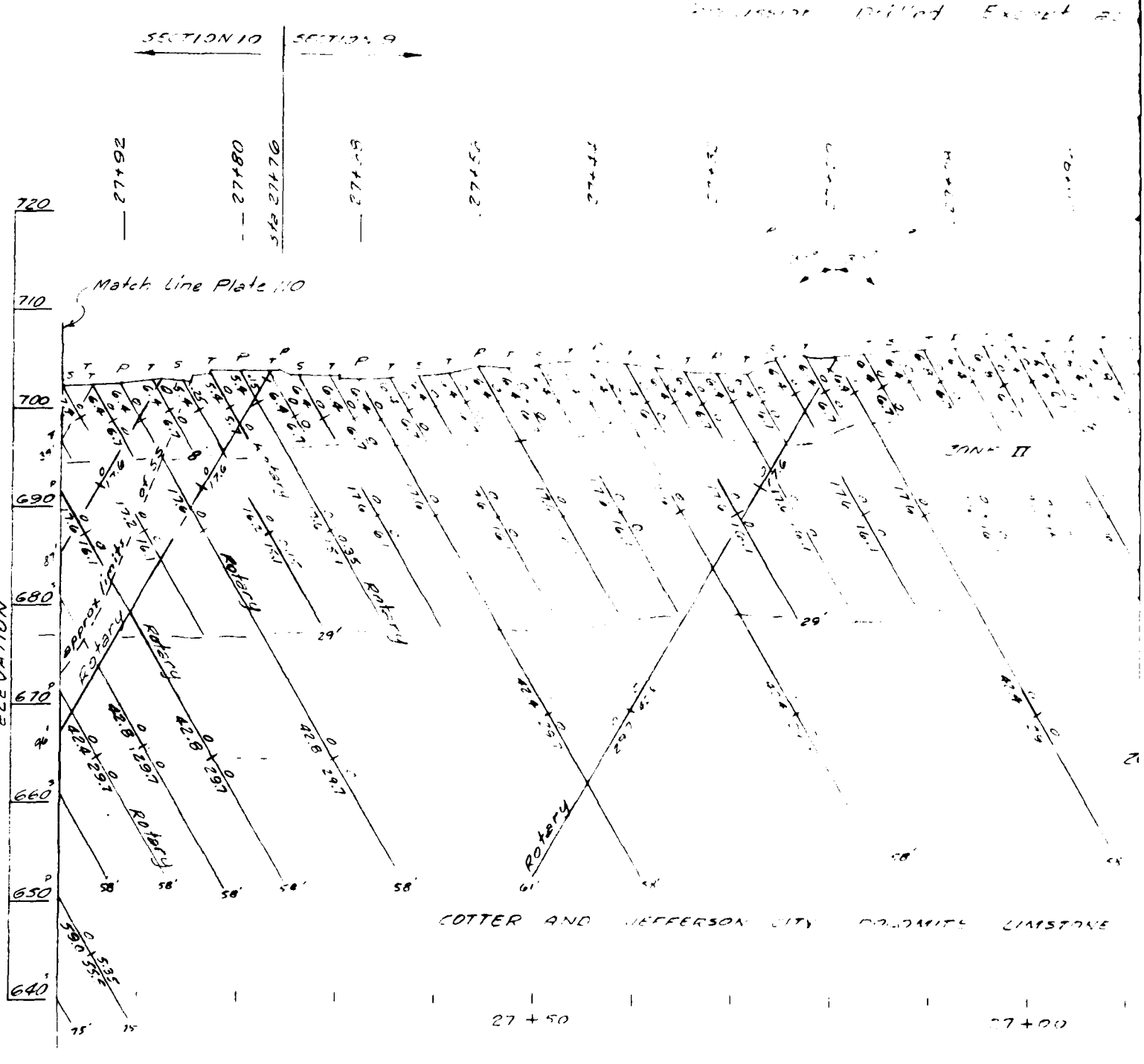
OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

GROUT CURTAIN PROFILE, LINE C STA. 24+86 TO STA. 26+48

Scale: AS SHOWN
Date: MARCH 1986
Sheet number:
File No. 0-12-9238

106

PLATE NO. 108

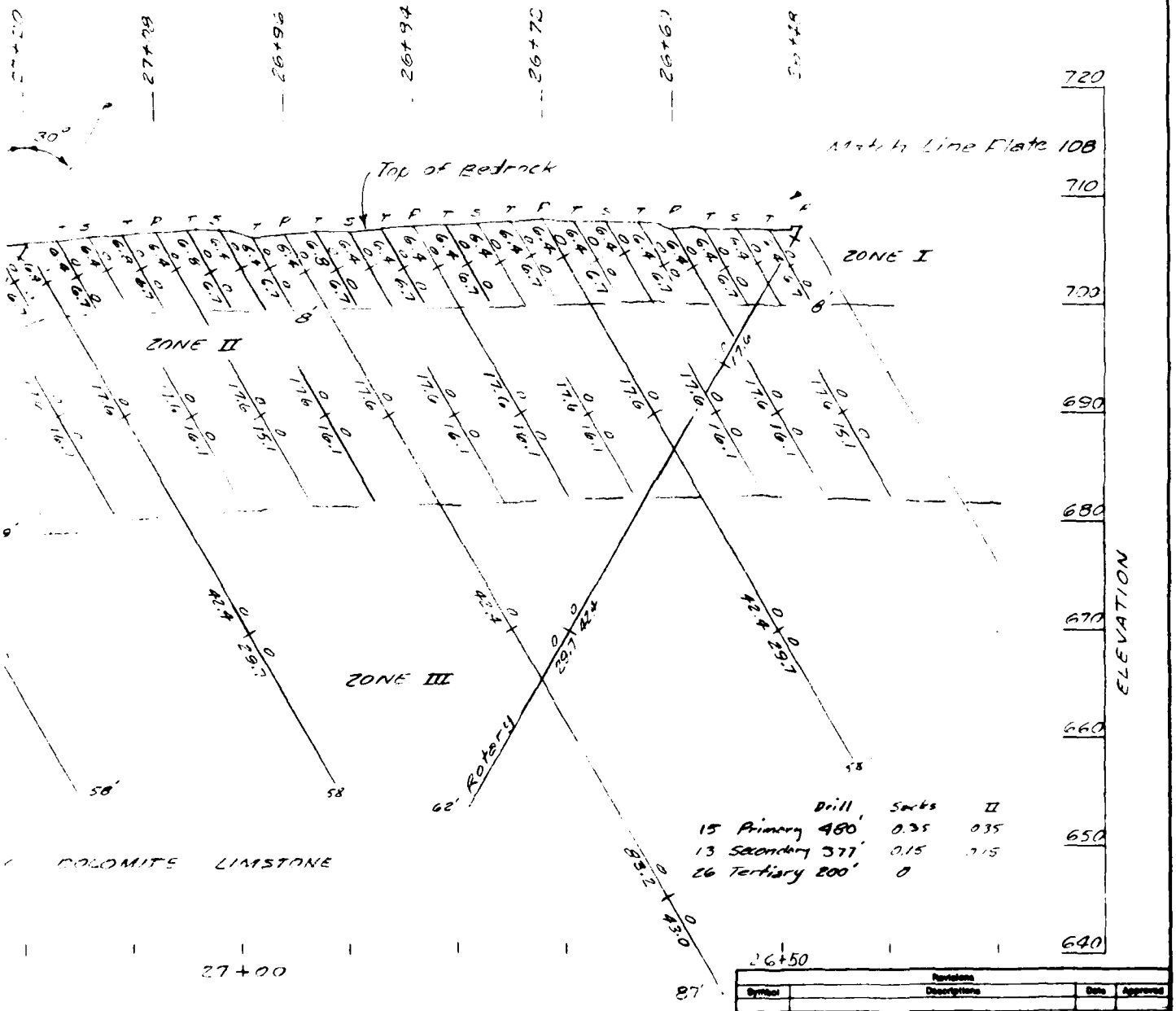


LINE C STAGE I GROUT CURTAIN PROFILE STA 26+48
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

SCALE IN FEET

Drilled Except as Noted



FILE STA 26+48 TO STA 27+98 DOWNSTREAM

10 FEET

For Legend see Plate 106

Revisions			
Symbol	Description	Date	Approved

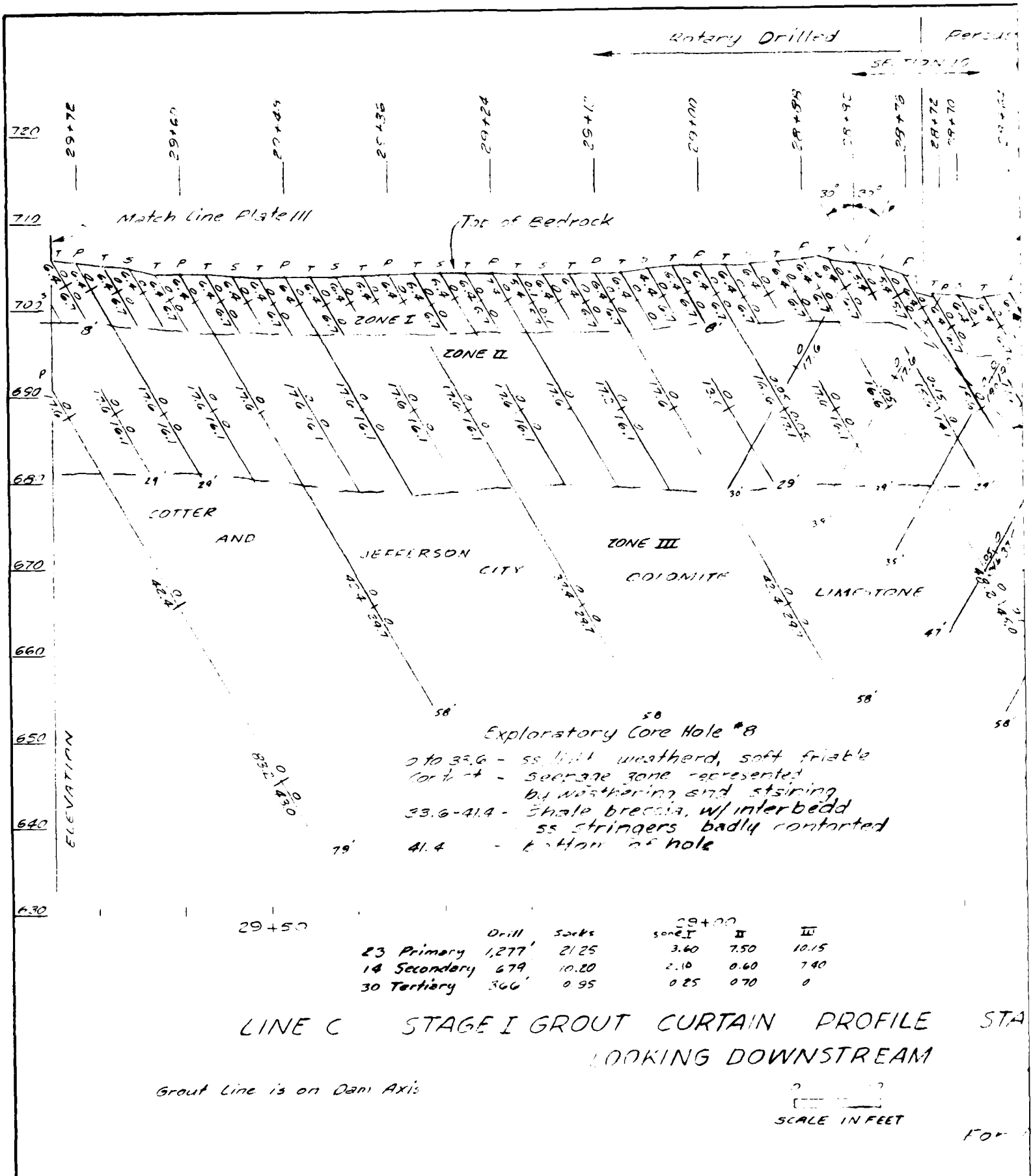
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GROUT CURTAIN PROFILE, LINE C STA. 26+48 TO STA. 27+98

Scale: AS SHOWN
Date: MARCH 1968
Sheet number:
File No. 0-2-9250

PLATE NO. 109



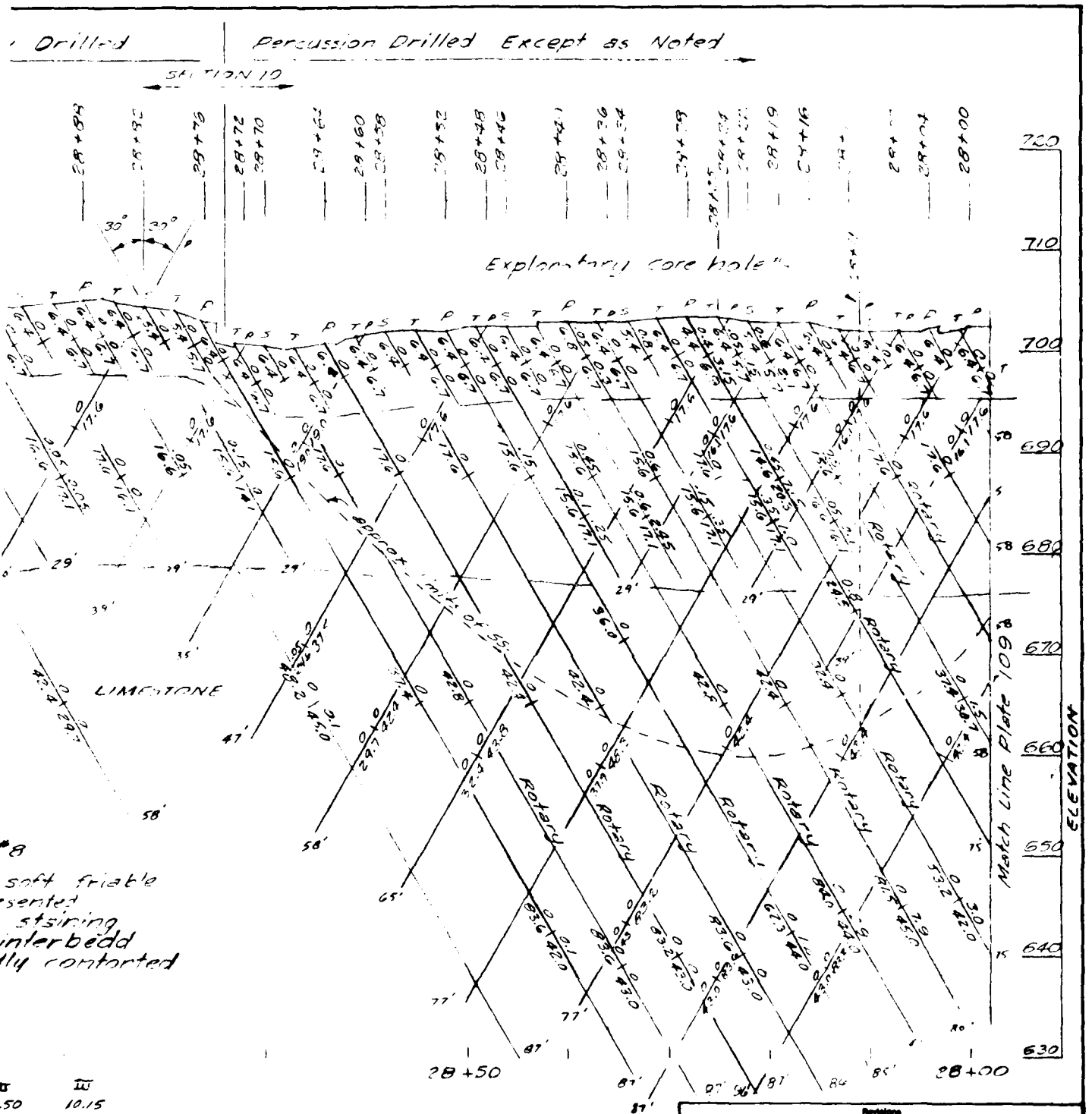
	Drill	Socks	Zone I	II	III
23 Primary	1,277'	21.25	3.60	7.50	10.15
14 Secondary	679'	10.20	2.10	0.60	7.40
30 Tertiary	366'	0.95	0.25	0.70	0

LINE C STAGE I GROUT CURTAIN PROFILE STA
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

SCALE IN FEET

FOR



soft friable
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interbedd
lly contorted

II	III
.50	10.15
.60	7.40
.70	0

AIN PROFILE STA 27+98 TO STA 29+75
OWNSTREAM

0 10
SCALE IN FEET

For Legend see Plate 106

Revisions			
Symbol	Descriptions	Date	Approved

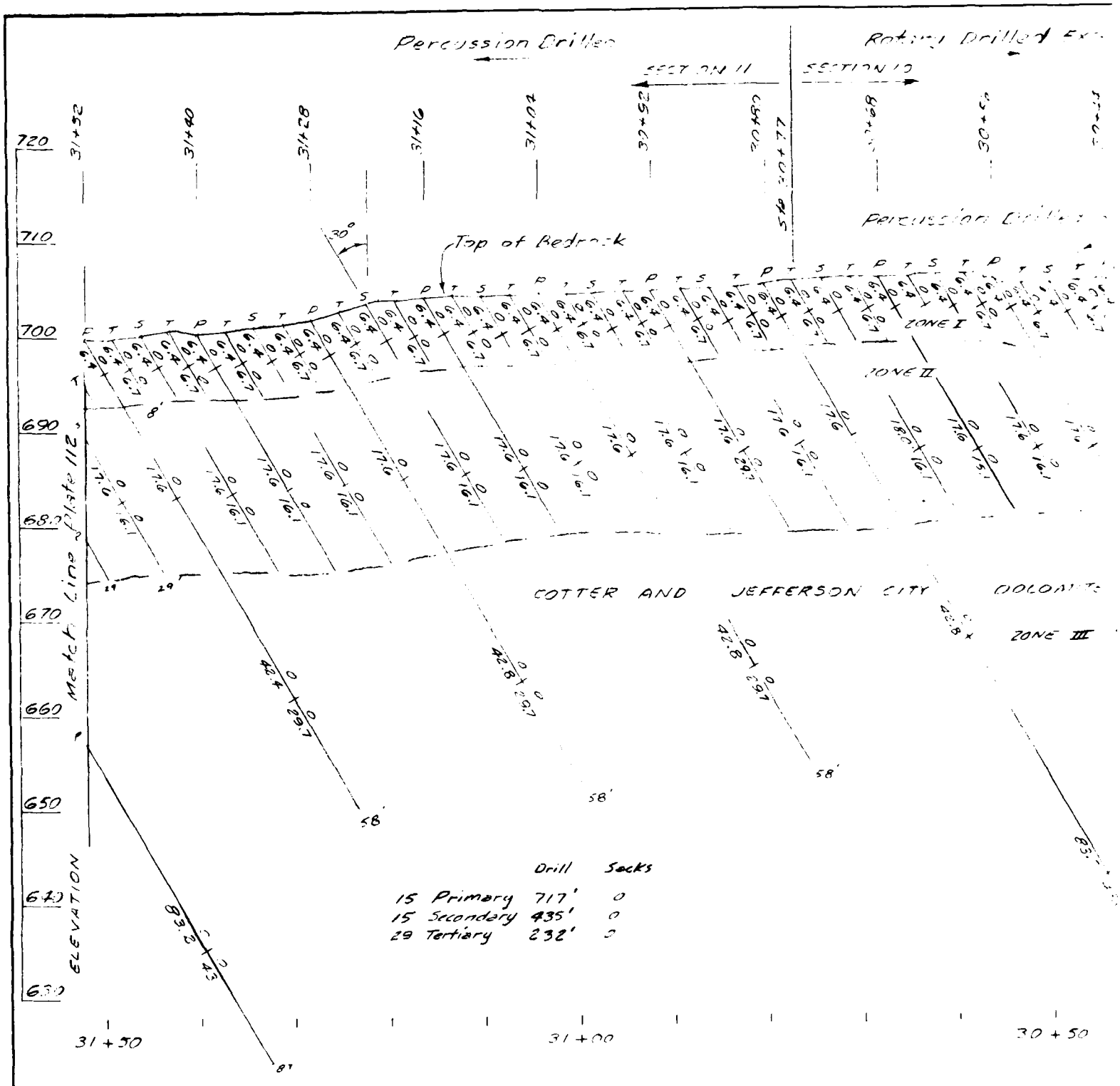
U S ARMY ENGINEER DISTRICT
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KANSAS CITY MISSOURI

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

GROUT CURTAIN PROFILE, LINE C STA. 27+98 TO STA. 29+75

Designed by
Drawn by
Checked by
Submitted by
Scale AS SHOWN
Date MARCH 1968
Sheet number
File No. 0-12-9240

PLATE NO. 110



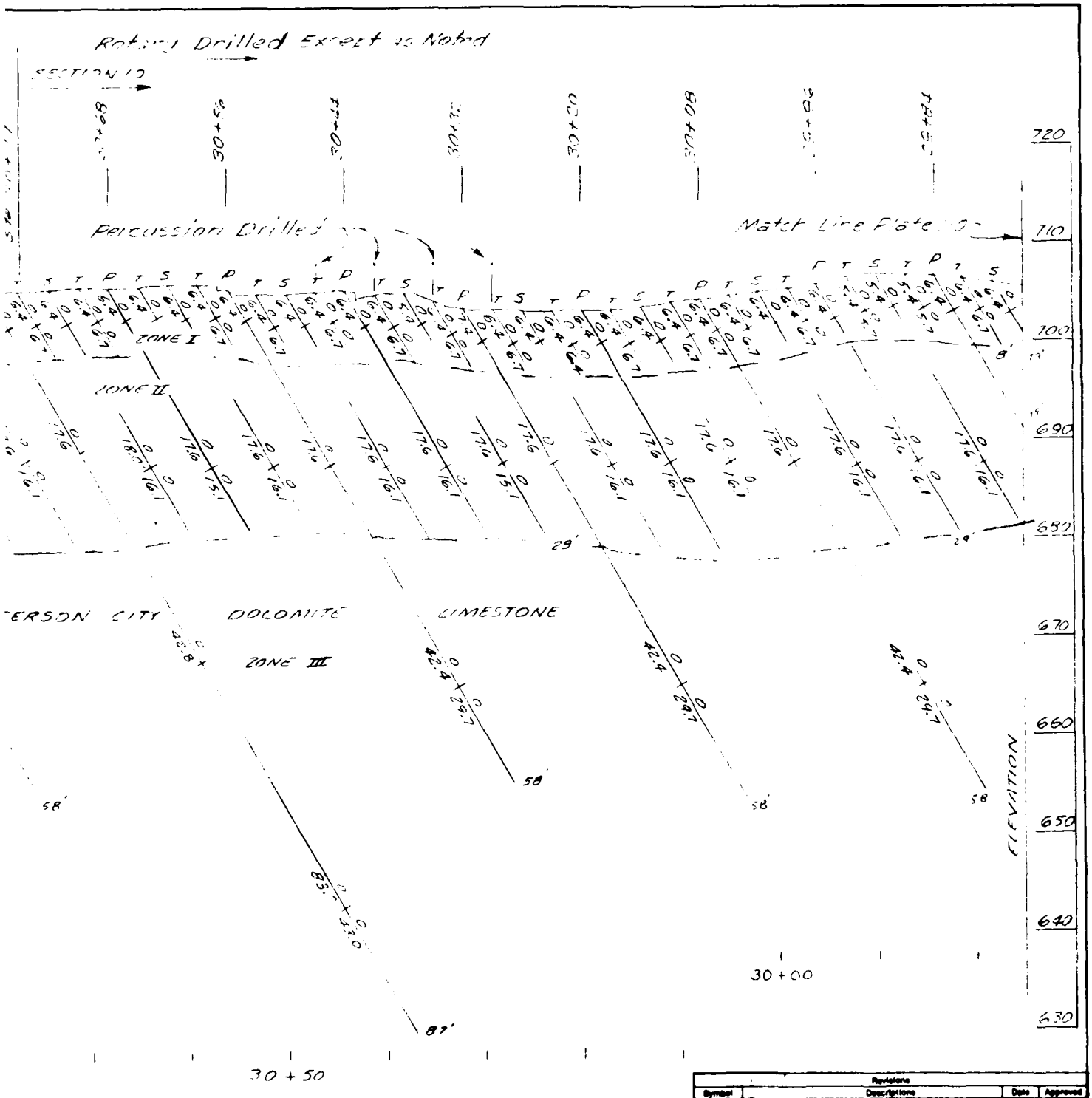
LINE C STAGE I GROUT CURTAIN PROFILE STA

LOOKING DOWNSTREAM

Grout Line is on D.S. Axis

0 10

SCALE IN FEET



TAIN PROFILE STA 29+75 TO STA 31+52

DAM DOWNSTREAM

0 10

SCALE IN FEET

For ... see Plate 106

Revisions			
Symbol	Descriptions	Date	Approved

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GROUT CURTAIN PROFILE, LINE C STA. 29+75 TO STA. 31+52

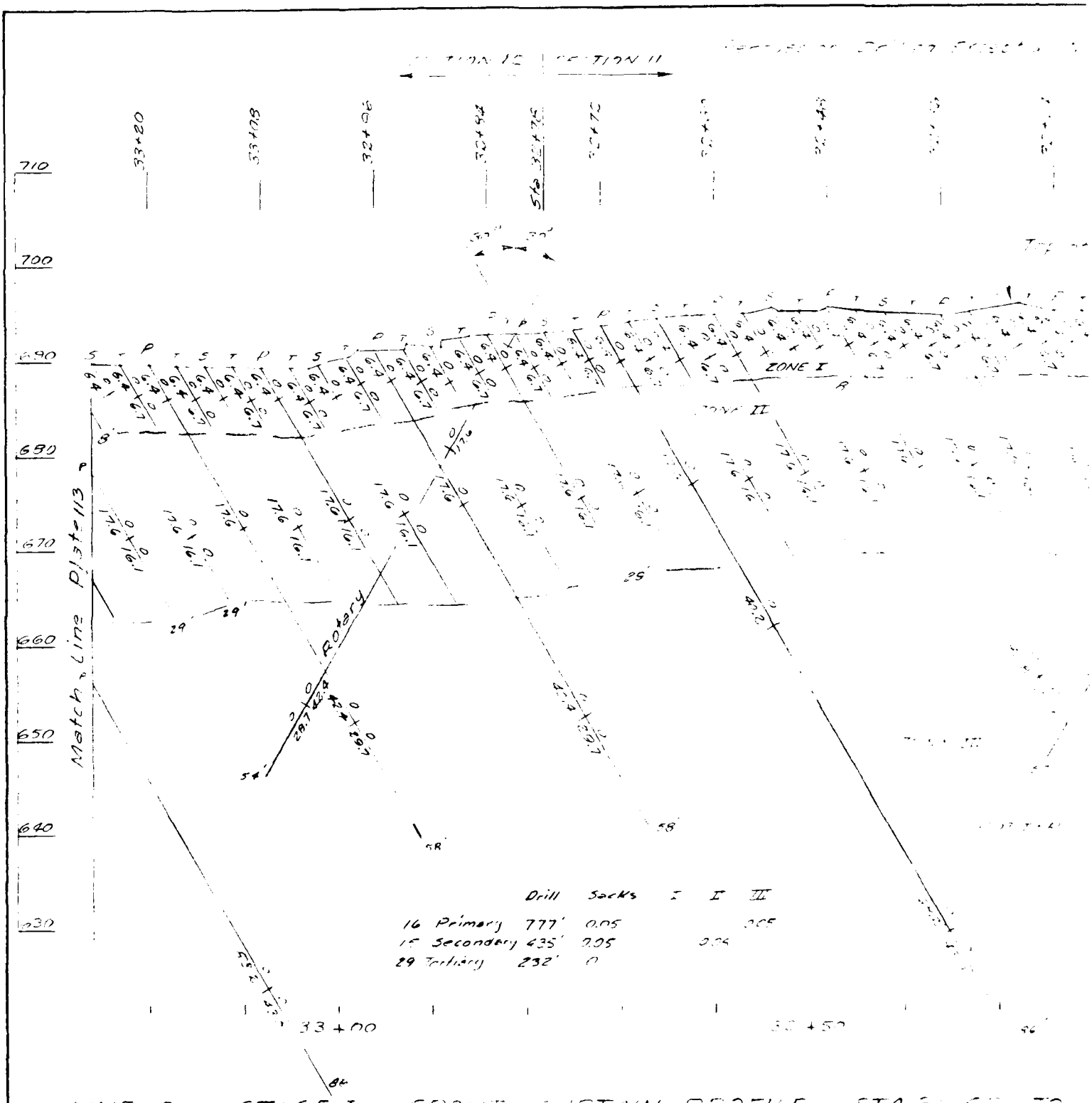
Scale: AS SHOWN

Date: MARCH 1988

Sheet number:

Drawing No. 0-12-9241

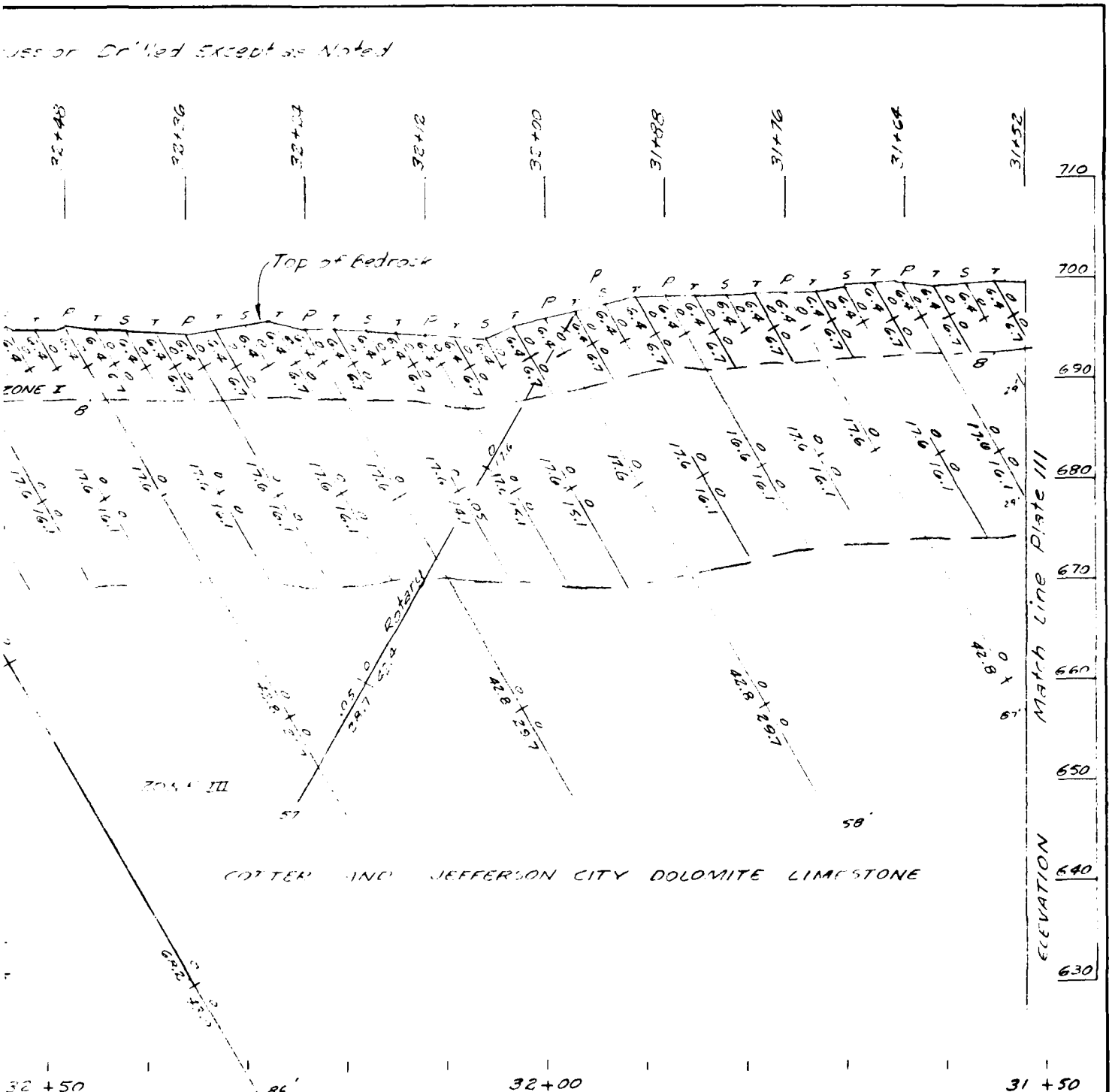
PLATE NO. 11



LINE C STAGE I GROUT CURTAIN PROFILE STA 3+50 TO STA 40+00

Grout Line is on Dam Axis

SCALE IN FEET



LE STA 31+52 TO STA 33+26

OWNSTREAM

0 50

SCALE IN FEET

For Layout See Plate 106

Revisions			
Symbol	Descriptions	Date	Approved

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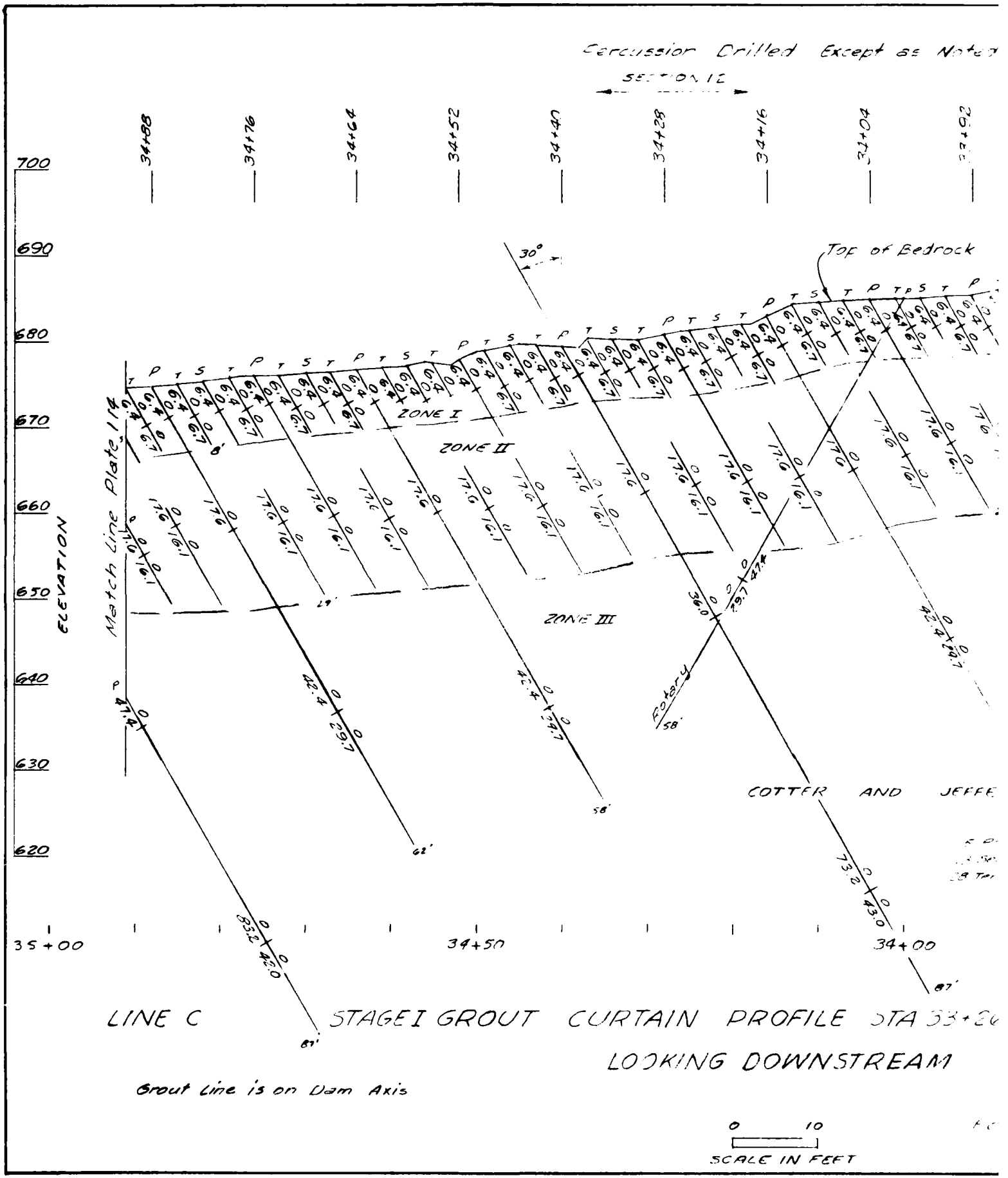
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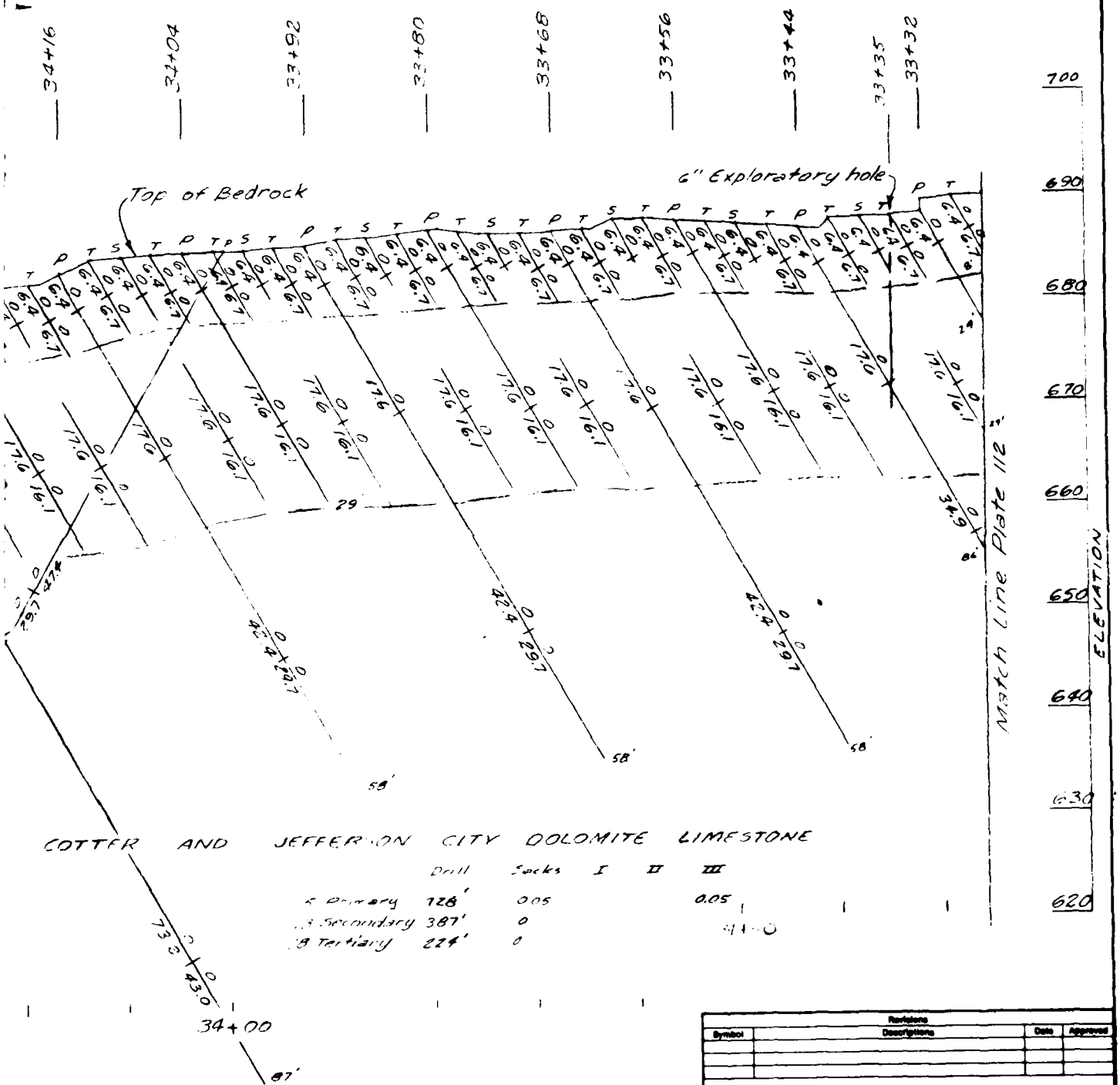
GROUT CURTAIN PROFILE, LINE C STA. 31+52 TO STA. 33+26

Scale AS SHOWN
Date MARCH 1968
Sheet number
Dwg No. 0-12-924

PLATE NO. 112


Percussion Drilled Except as Noted
SECTION C
34+88
34+76
34+64
34+52
34+40
34+28
34+16
34+04
33+92
700
690
680
670
660
650
640
630
620
ELEVATION
Match Line Plate 1/4
Top of Bedrock
30°
ZONE I
ZONE II
ZONE III
Rotary
COTTER AND JEFFE
35+00
34+50
34+00
LINE C STAGE I GROUT CURTAIN PROFILE STA 33+20
LOOKING DOWNSTREAM
Grout Line is on Dam Axis
0 10
SCALE IN FEET

Drilled Except as Noted



PROFILE STA 33+26 TO STA 34+91

DOWNSTREAM

0 10

SCALE IN FEET

For Legend see Plate 106

Revisions			
Symbol	Description	Date	Approved

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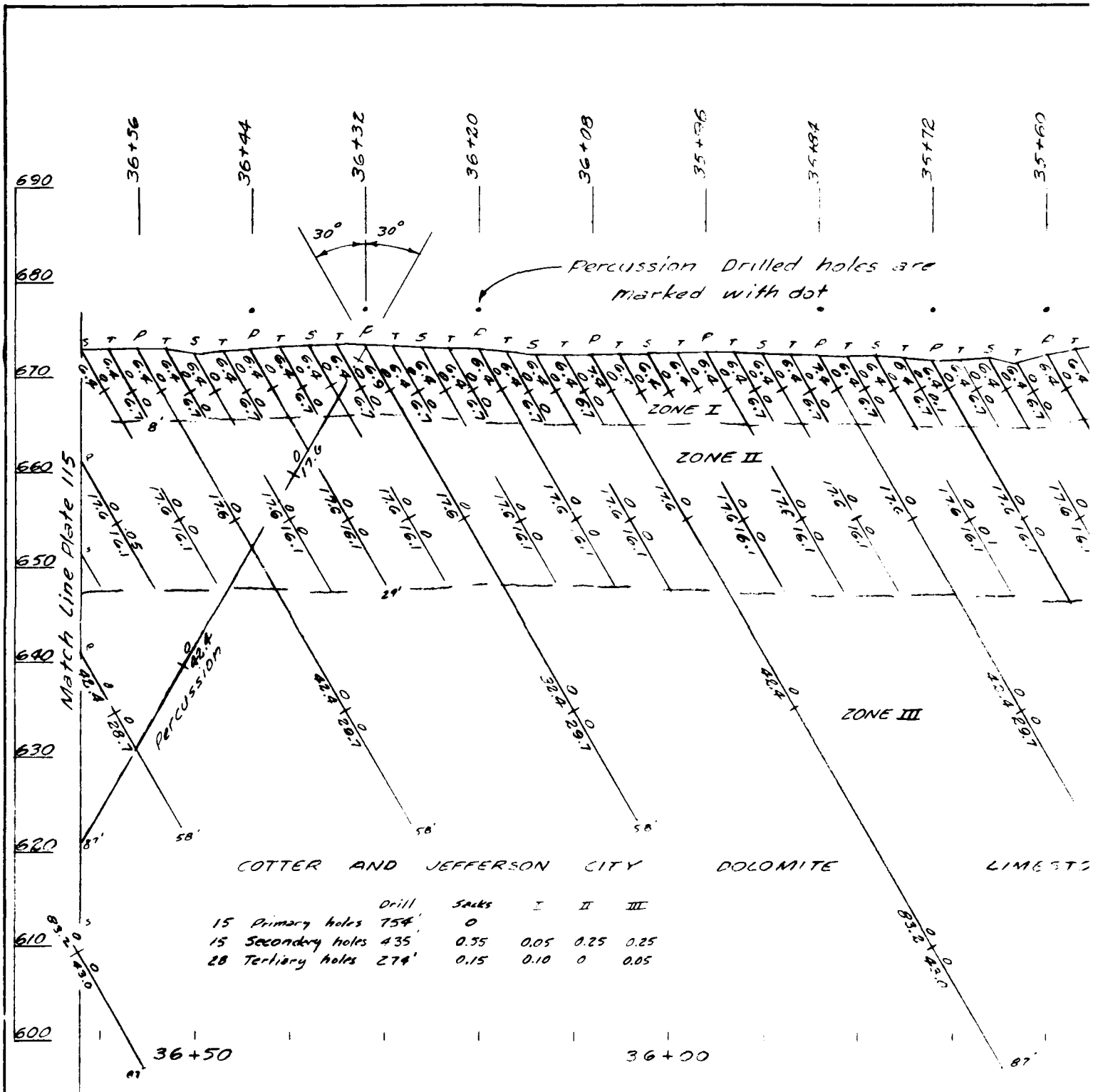
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CONSTRUCTION FOUNDATION REPORT

GROUT CURTAIN PROFILE, LINE C STA. 33+26 TO STA. 34+91

Scale: AS SHOWN
Date: MARCH 1966
Sheet number:
No. 0-12-8243

PLATE NO. 113



	Drill	Seals	I	II	III
15 Primary holes	754'	0			
15 Secondary holes	435'	0.35	0.05	0.25	0.25
28 Tertiary holes	274'	0.15	0.10	0	0.05

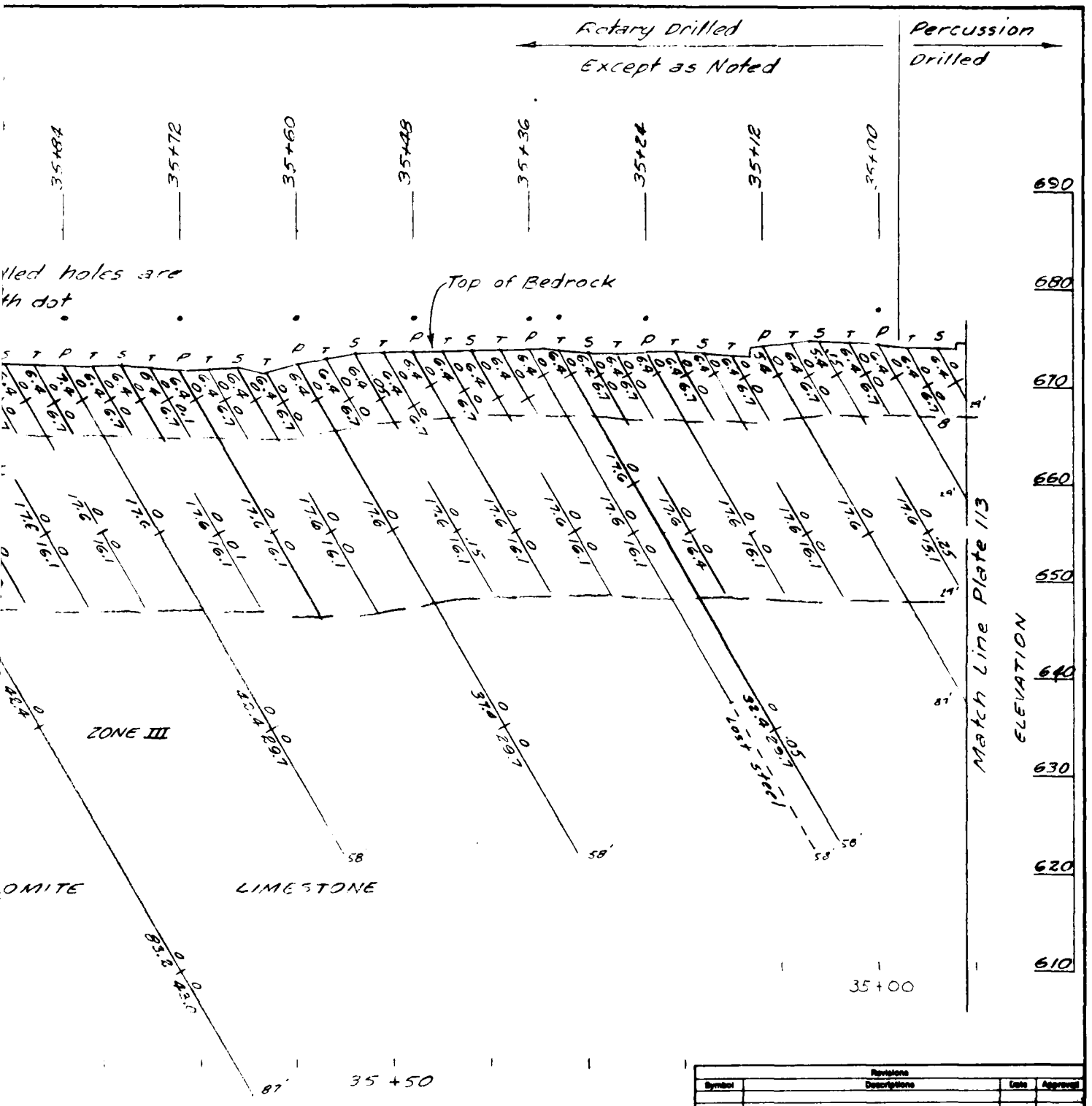
LINE C STAGE I GROUT CURTAIN PROFILE STA 34+

LOOKING DOWNSTREAM

Grout Line is on Dam Axis

0 10

SCALE IN FEET



N PROFILE STA 34+91 TO STA 36+62

ING DOWNSTREAM

0 10

SCALE IN FEET

For Legend see Plate 106

Revisions			
Symbol	Descriptions	Date	Approved

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CONSTRUCTION FOUNDATION REPORT

GROUT CURTAIN PROFILE, LINE C STA. 34+91 TO STA. 36+62

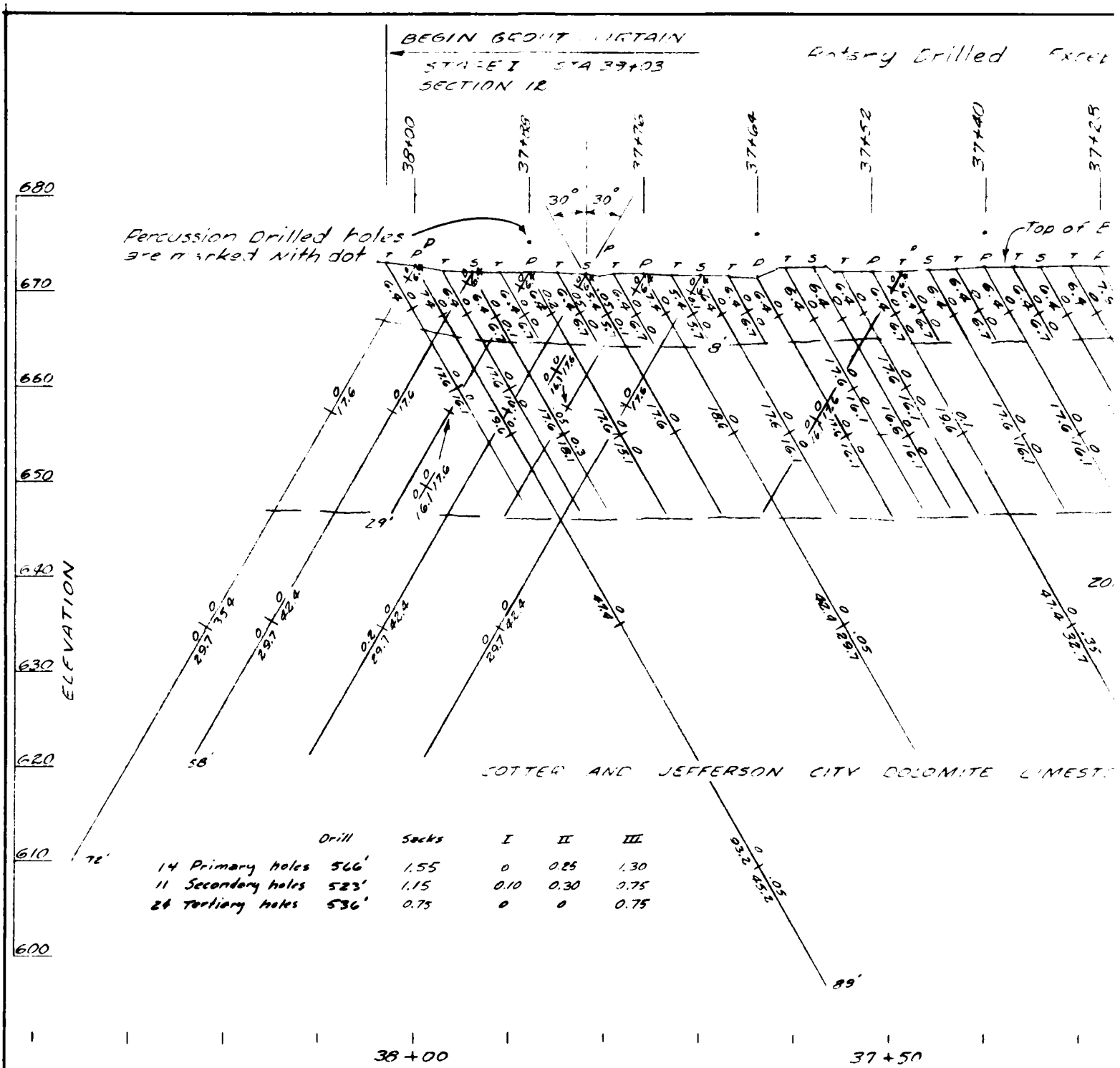
Scale AS SHOWN

Date MARCH 1966

Sheet number

Drawing No. 0-12-2244

PLATE NO. 114



	Drill	Sacks	I	II	III
14 Primary holes	566'	1.55	0	0.85	1.30
11 Secondary holes	523'	1.15	0.10	0.30	0.75
26 Tertiary holes	536'	0.75	0	0	0.75

LINE C STAGE I GROUT CURTAIN PROFILE STA 36+6

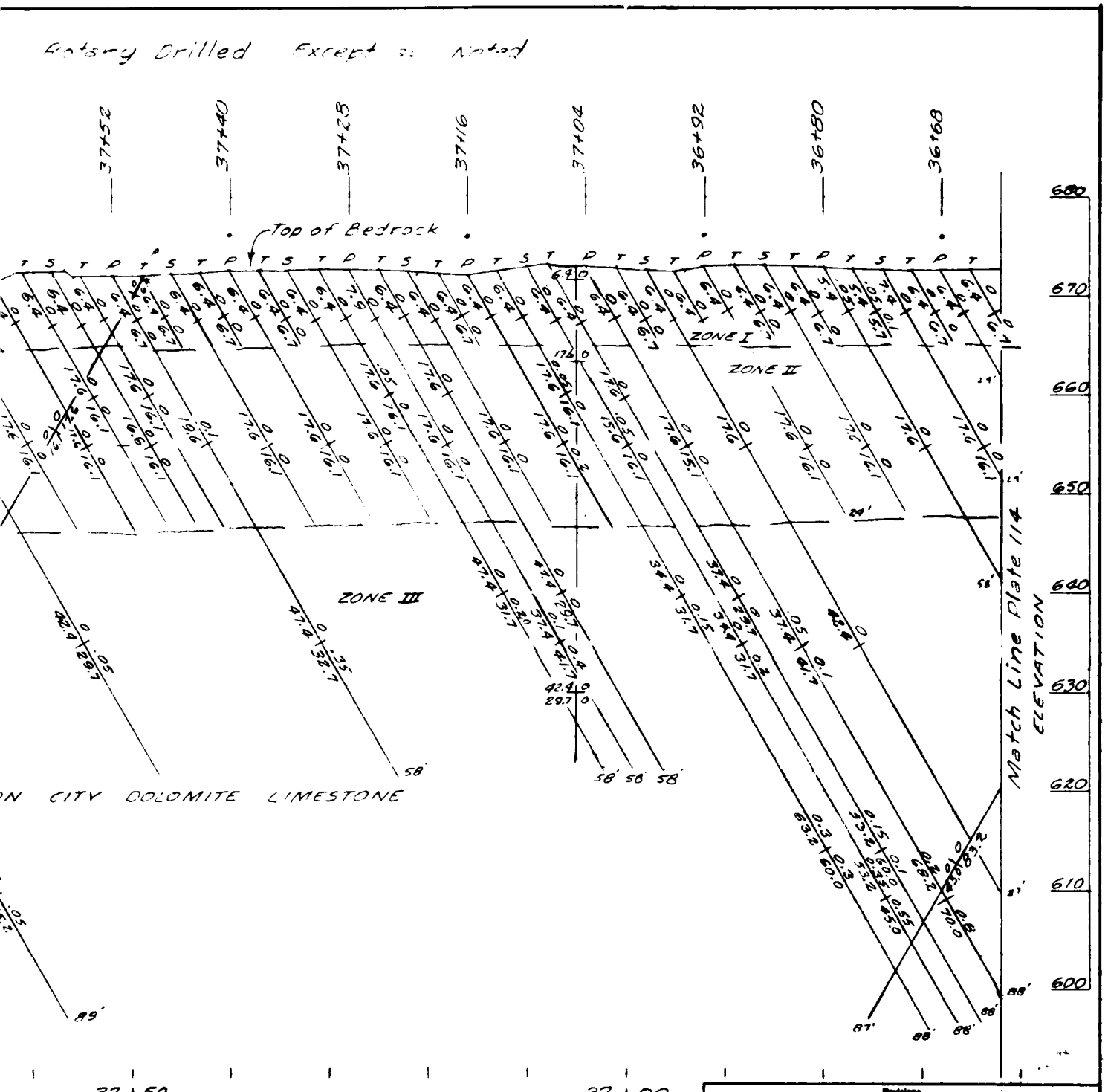
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

0 10

SCALE IN FEET

For Le



IN PROFILE STA 36+62 TO STA 38+03
KING DOWNSTREAM

0 10
SCALE IN FEET

For Legend see Plate 106

Revisions			
Symbol	Descriptions	Date	Approved

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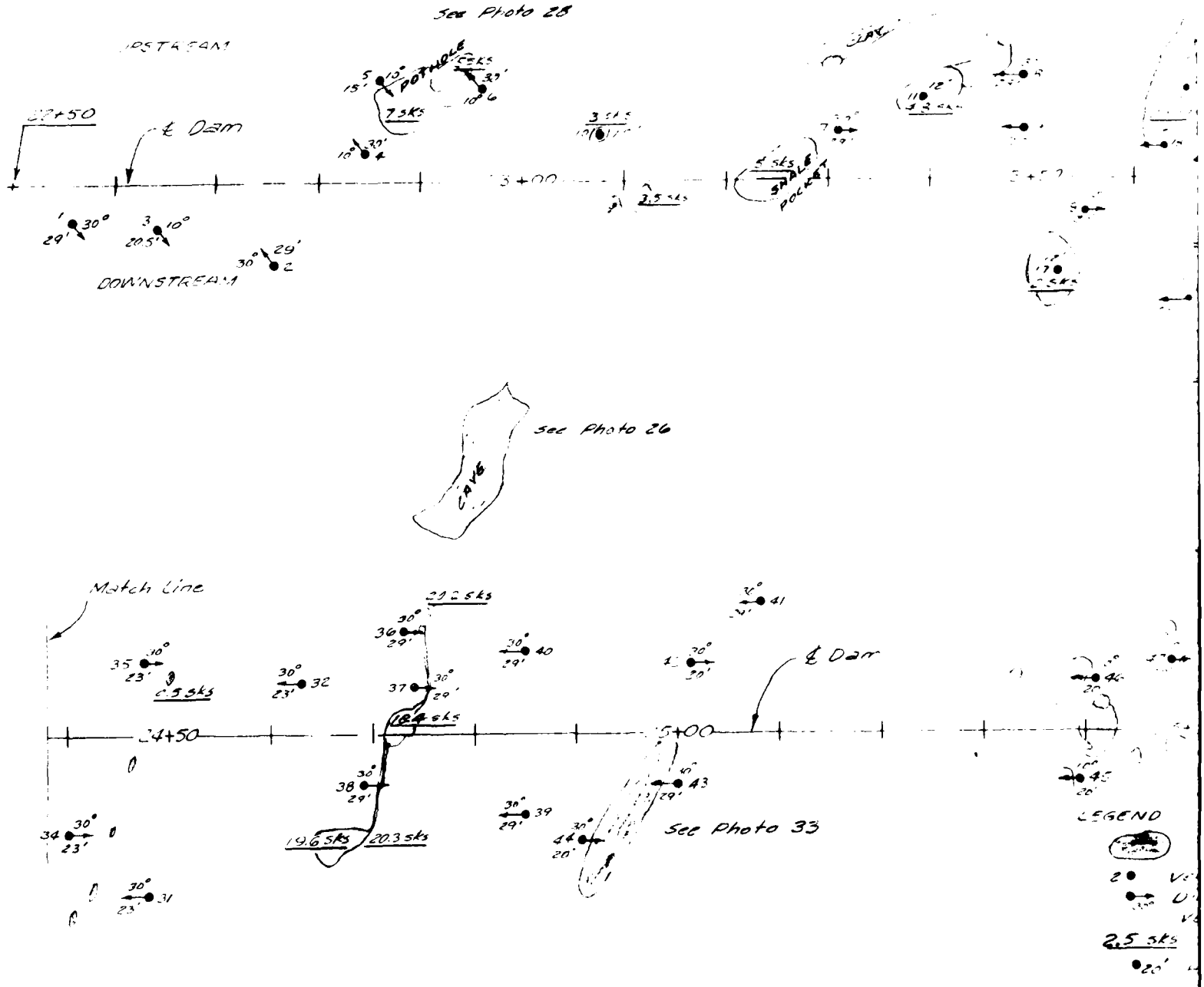
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GROUT CURTAIN PROFILE, LINE C STA. 36+62 TO STA. 38+03

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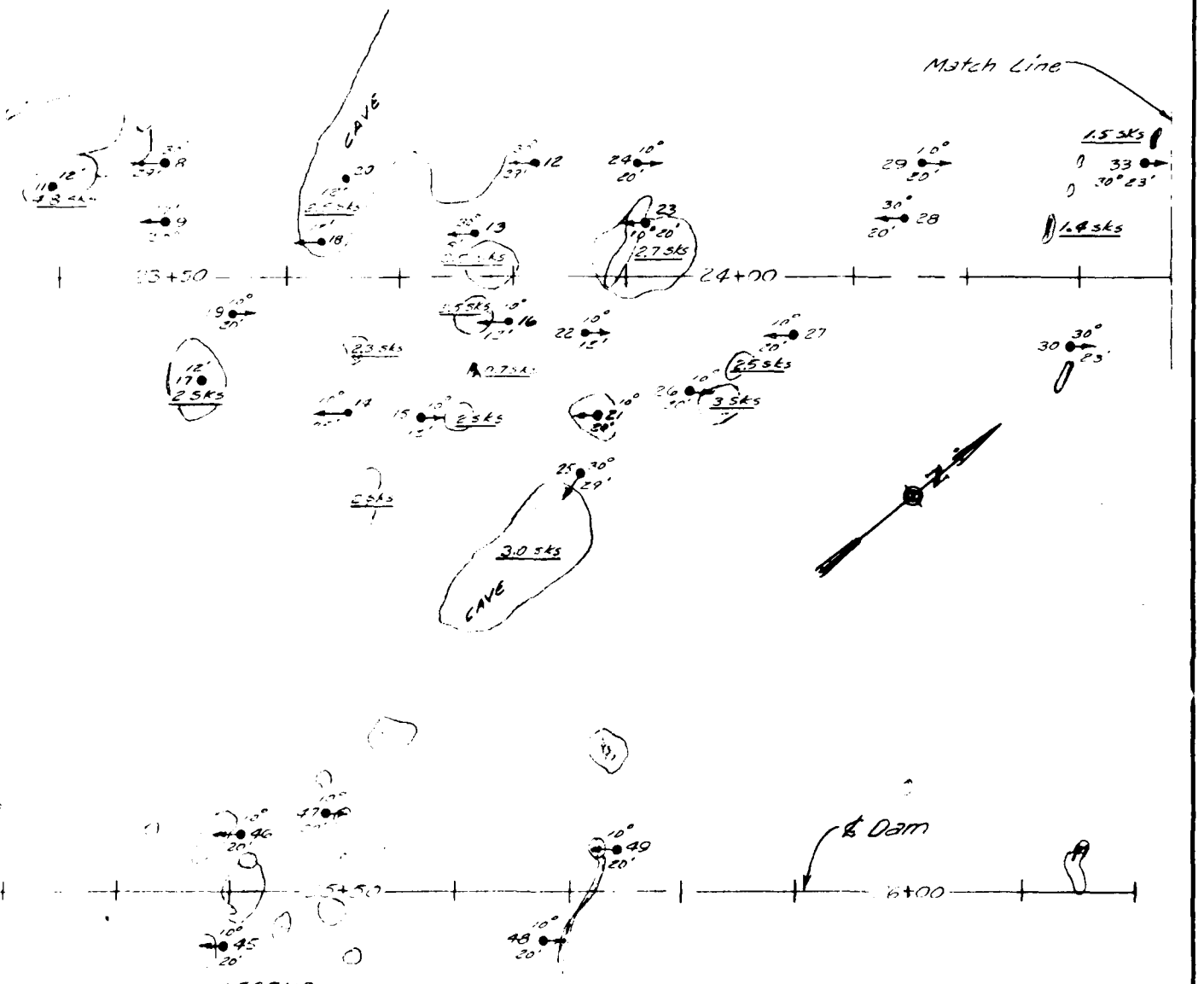
Scale: AS SHOWN
Date: MARCH 1983
Sheet number:
File No.: 0-12-6245

PLATE NO. 115



STAGE I LOCATION OF GROUT HOLES AND KARS IN CUTOFF TRENCH

Drilled 1,086.5 Lineal feet in 50 holes
Injected 58.7 Sacks of Grout in 13 holes
Injected 79.2 Sacks of Grout in 12 Open caves



LEGEND

- Ca. C. Shale or clay Pothole
- 2 ● Vertical Grout Hole & Number
- Direction of Hole & Degree from Vertical of Inclined Hole
- 2.5 Sks Grout Injected - Sacks
- ●20' Hole Depth - Feet

Sept 66

HOLES AND KARST FEATURES FF TRENCH

SCALE IN FEET

Revisions			
Symbol	Descriptions	Date	Approved

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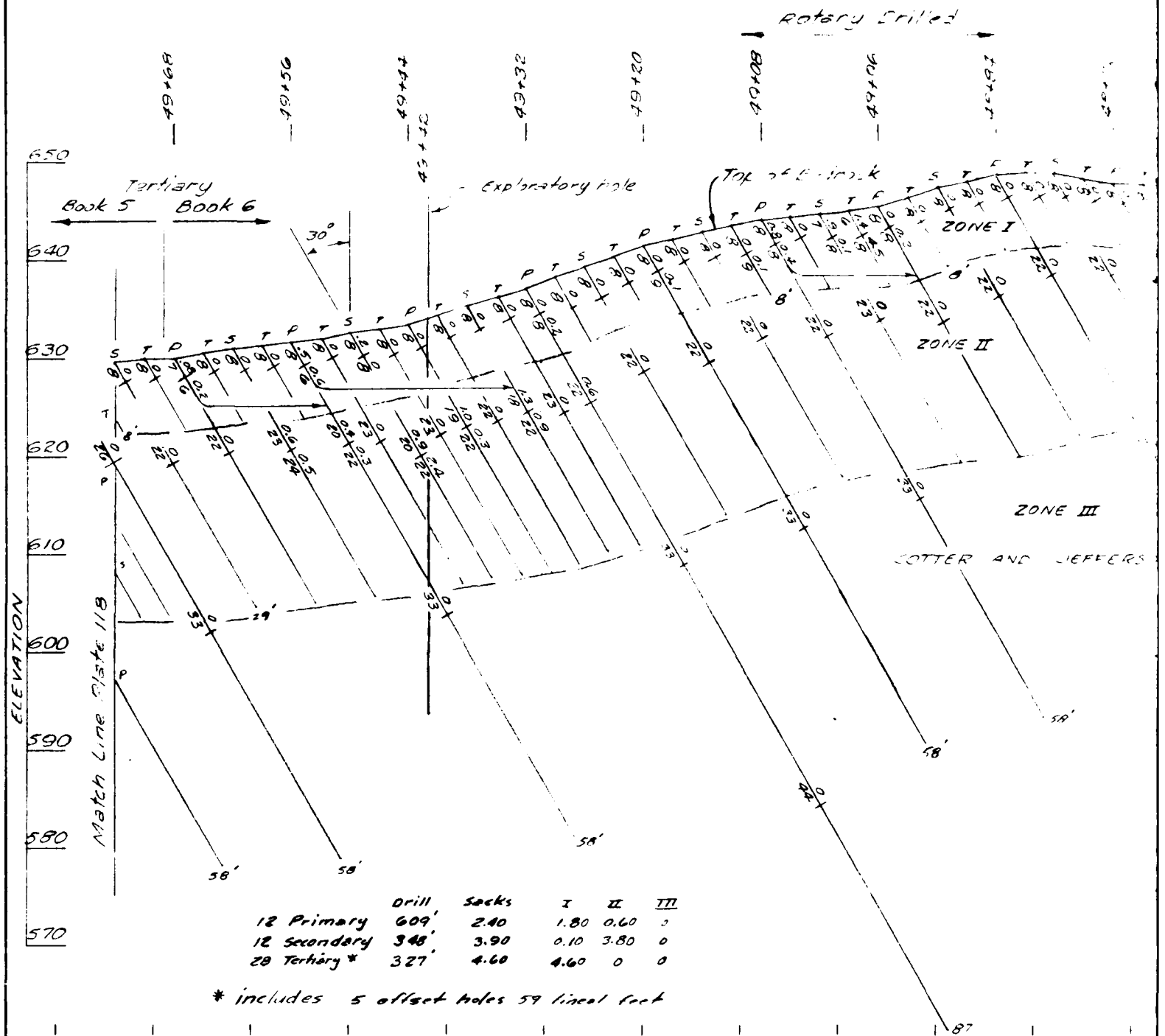
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CONSTRUCTION FOUNDATION REPORT

LOCATION OF GROUT HOLES & KARST FEATURES IN CUTOFF TRENCH

Scale: AS SHOWN
Date: MARCH 1968
Sheet number:
File No. 0-12-3246

PLATE NO. 116



	Drill	Sacks	I	II	III
12 Primary	609'	2.40	1.80	0.60	0
12 Secondary	348'	3.90	0.10	3.80	0
28 Tertiary *	327'	4.60	4.60	0	0

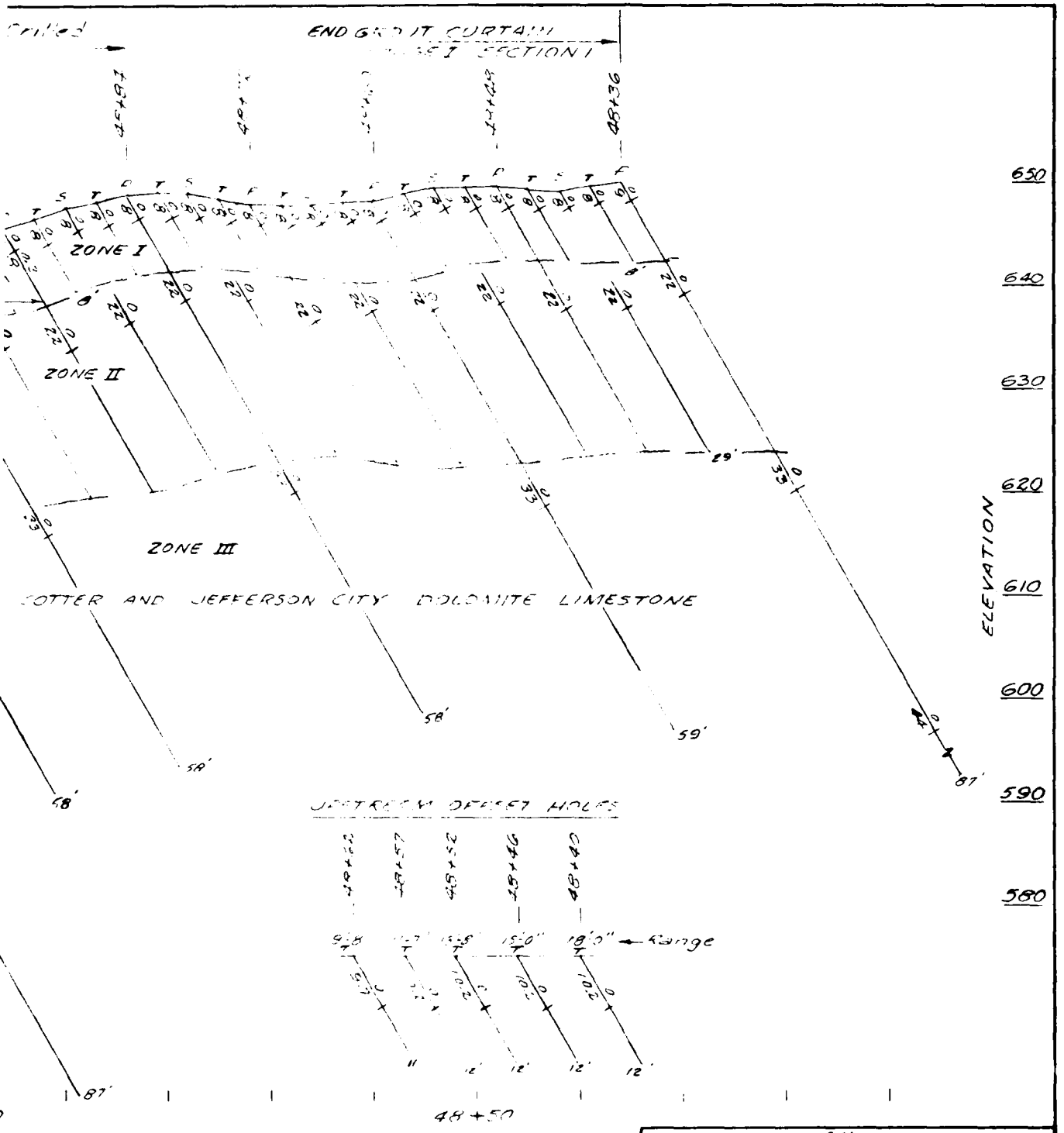
* includes 5 offset holes 59 lineal feet

LINE C STAGE I GROUT CURTAIN PROFILE STA 45+3
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

0 10
SCALE IN FEET

For Le



OFILE STA 48+36 TO STA 49+74
WNSTREAM

10
IN FEET

For Legend see Plate 106

Revisions			
Symbol	Descriptions	Date	Approved

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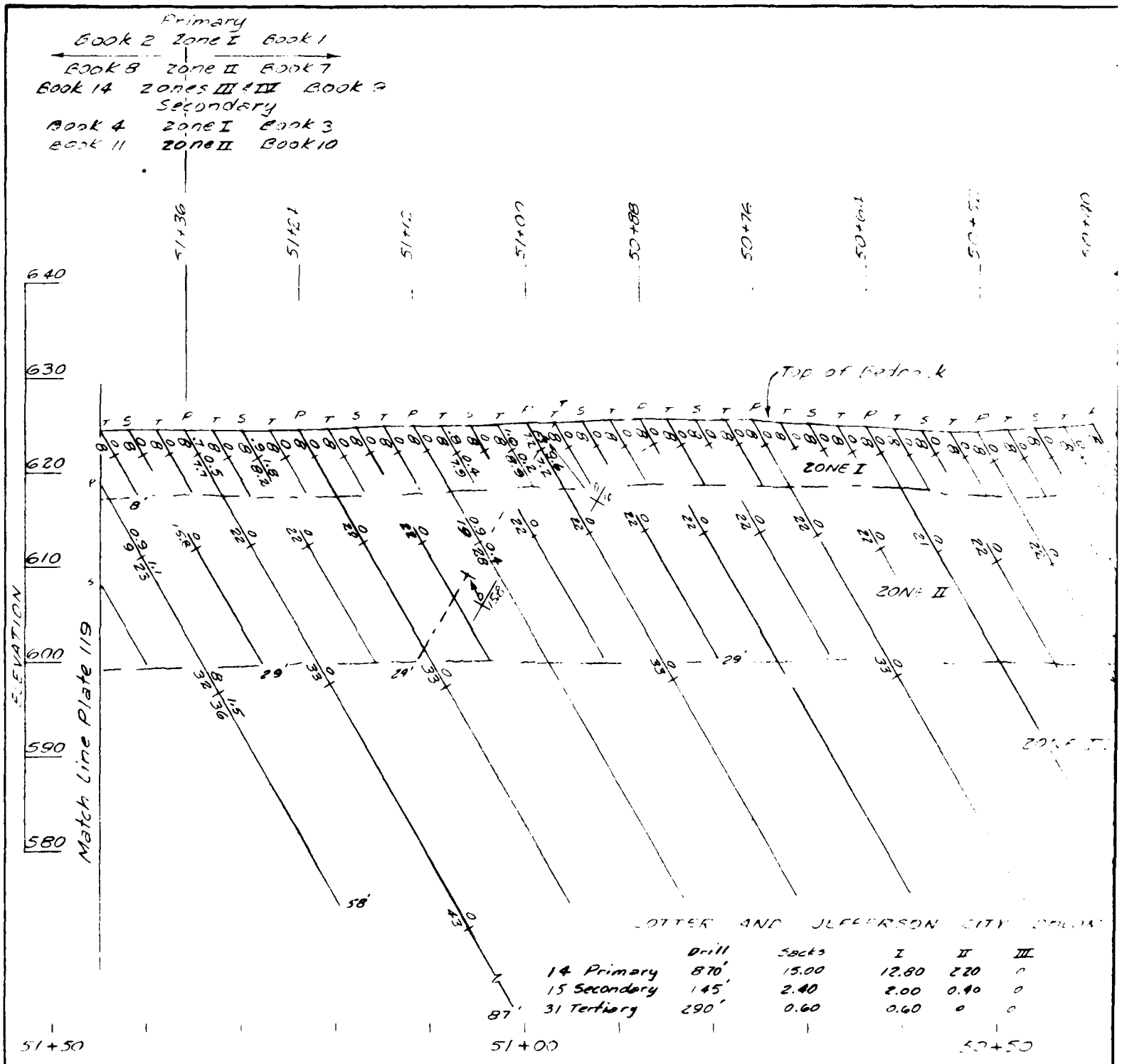
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CONSTRUCTION FOUNDATION REPORT

GROUT CURTAIN PROFILE, LINE C STA. 48+36 TO STA. 49+74

Scale: AS SHOWN
Date: MARCH 1966
Sheet number:
Drawing No. 0-12-9247

PLATE NO. 117

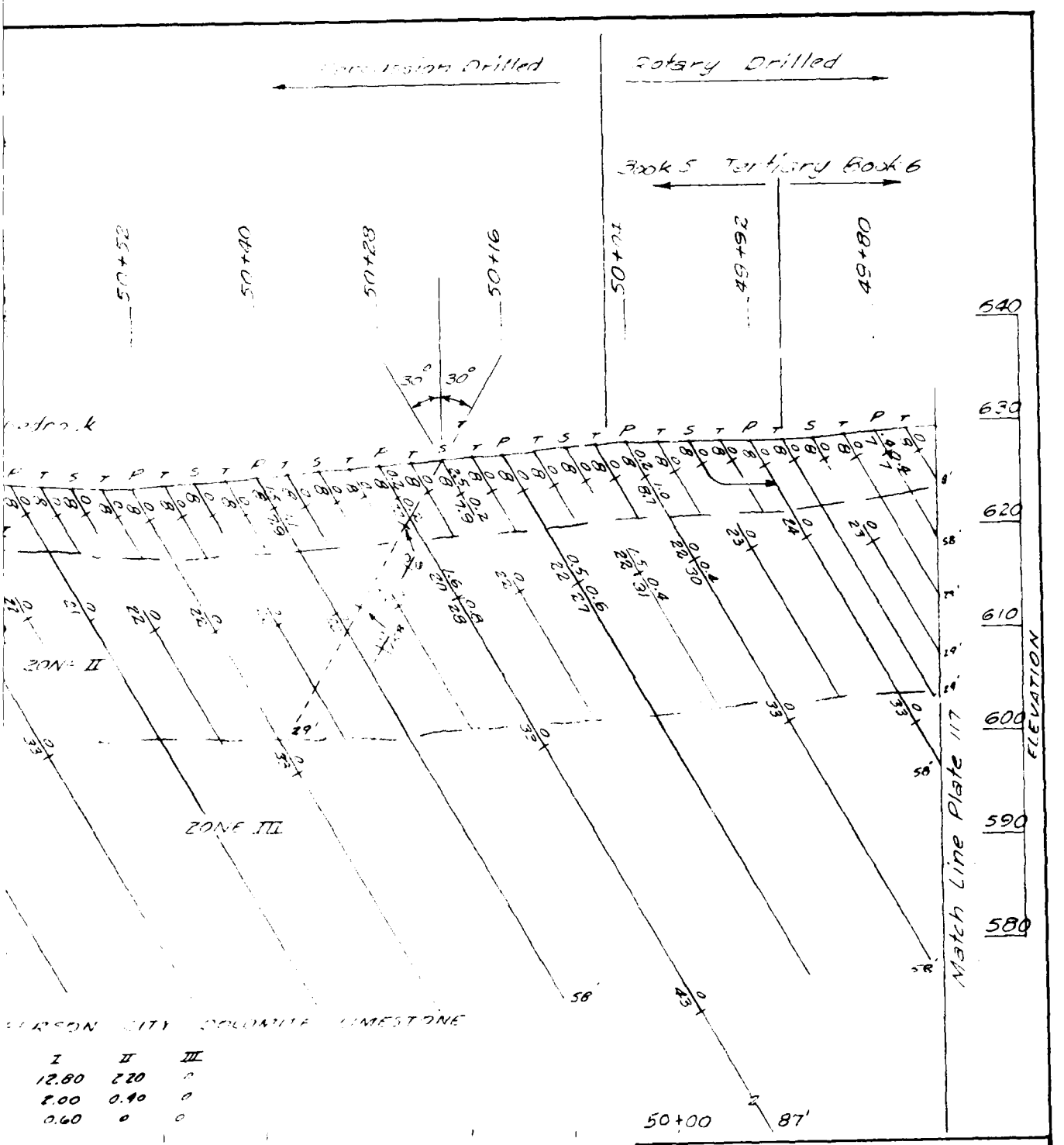


	Drill	Sacks	I	II	III
14 Primary	870'	15.00	12.80	2.20	0
15 Secondary	145'	2.40	2.00	0.40	0
31 Tertiary	290'	0.60	0.60	0	0

LINE C STAGE I GROUT CURTAIN PROFILE STA 49+74 TO
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

0 10
SCALE IN FEET



STA 49+74 TO STA 51+45

TREAM

IN FEET

For Legend see Plate 106

Revisions			
Symbol	Descriptions	Date	Approved

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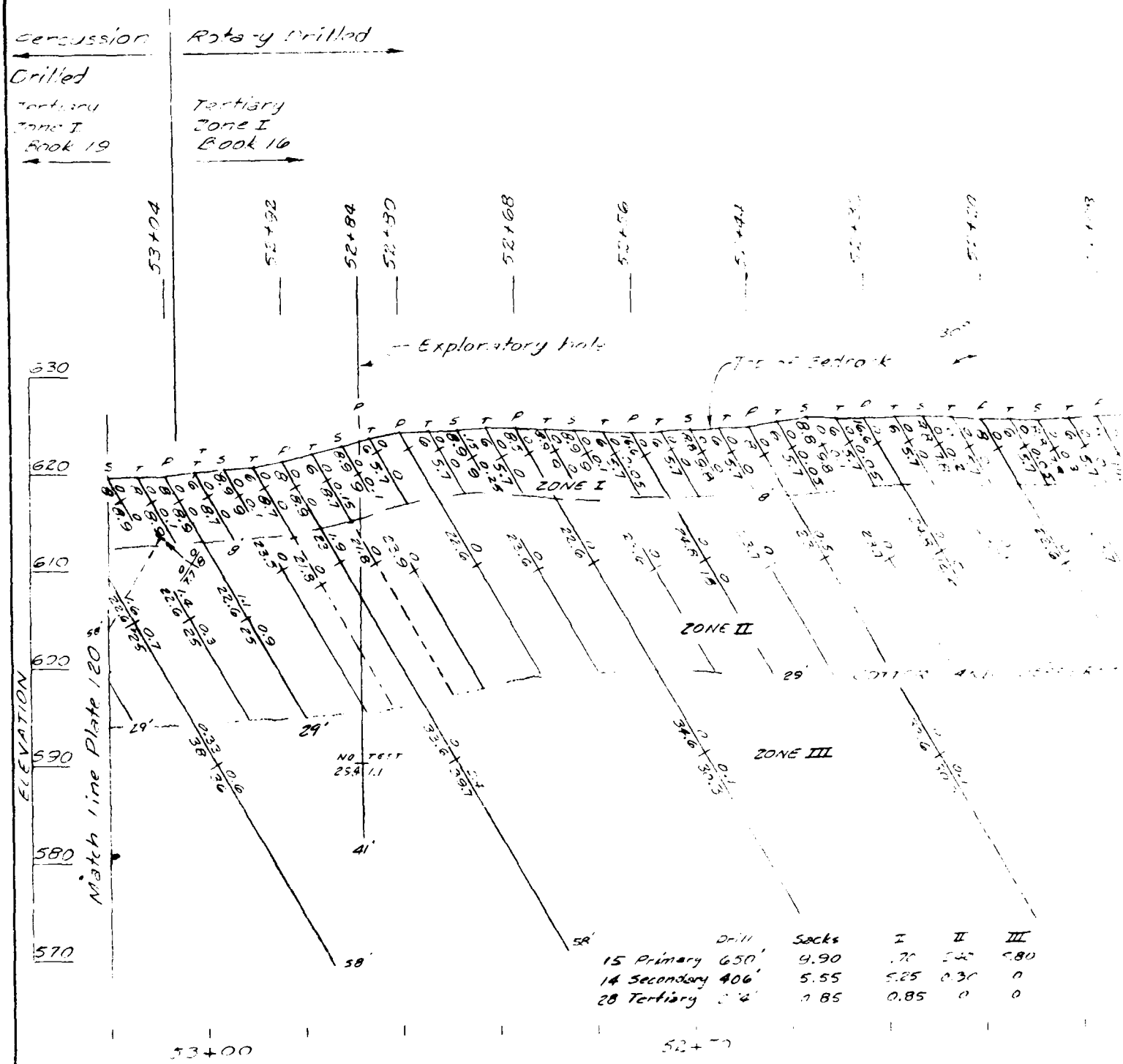
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GROUT CURTAIN PROFILE, LINE C STA. 49+74 TO STA. 51+45

Scale AS SHOWN
Date MARCH 1966
Sheet number
Proj No 0-12-9248

PLATE NO. 118



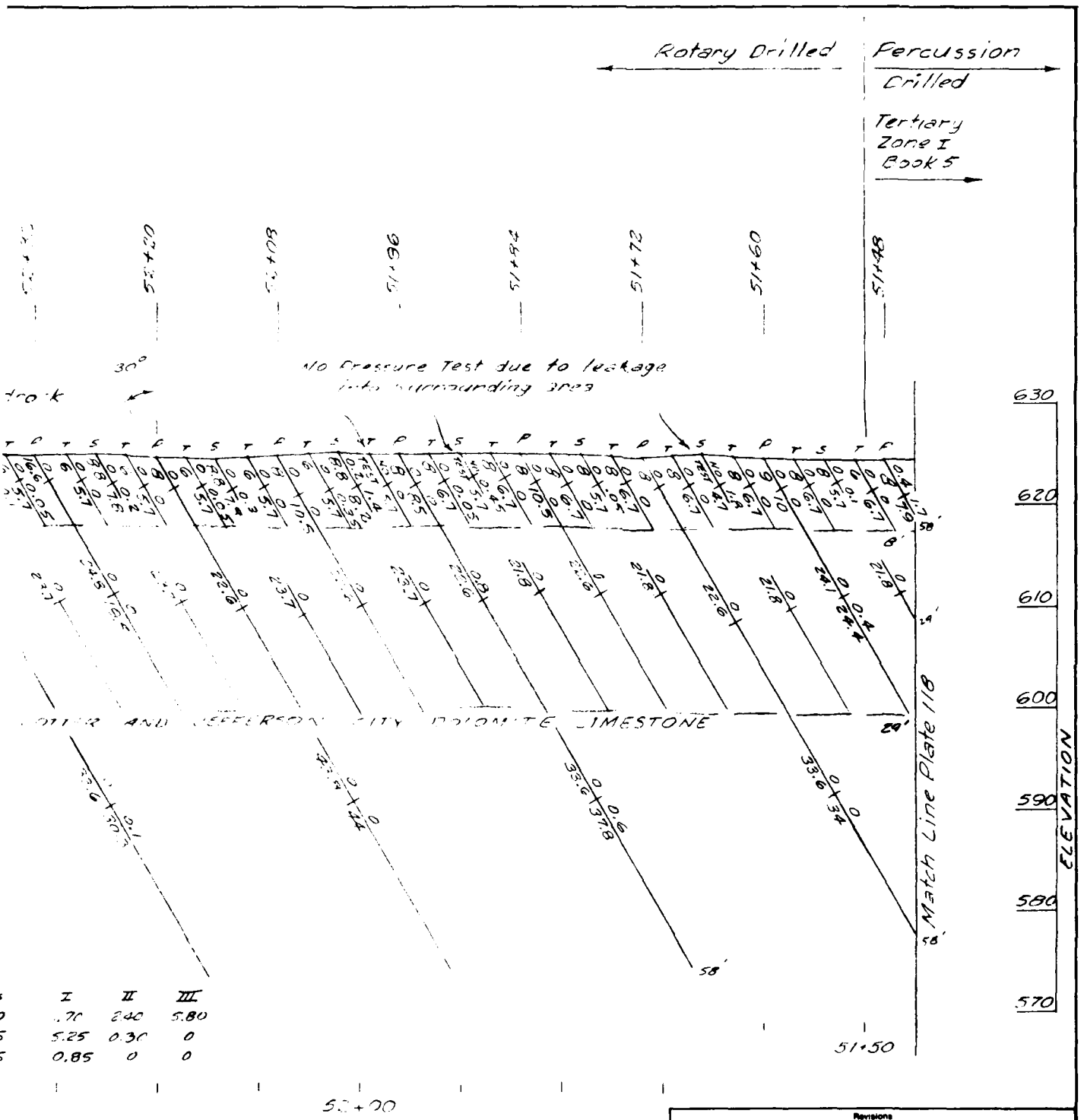
	Drill	Sacks	I	II	III
15 Primary	650'	9.90	.70	[illegible]	<80
14 Secondary	406'	5.55	5.25	0.30	0
28 Tertiary	[illegible]	0.85	0.85	0	0

LINE C STAGE I GROUT CURTAIN PROFILE STA 51+45 TO
LOOKING DOWNSTREAM

Grout line is on Dam Axis

SCALE IN FEET

For L



LE STA 51+45 TO STA 53+10

NSTREAM

10

F IN FEET

For Legend see Plate 106

Revisions			
Symbol	Descriptions	Date	Approved

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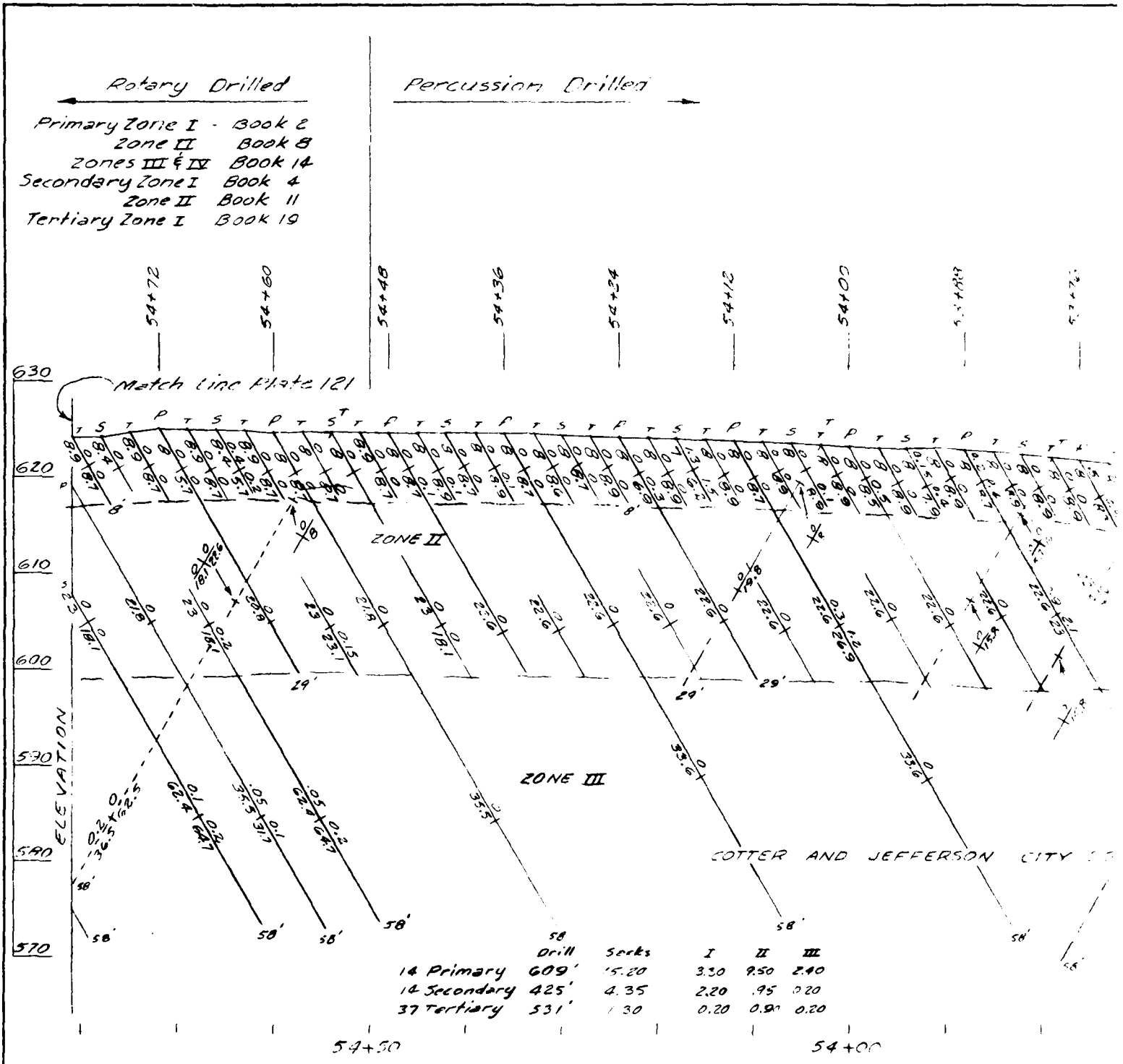
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GROUT CURTAIN PROFILE LINE C STA. 51+45 TO STA. 53+10

Scale AS SHOWN
Date MARCH 1966
Drawing No. 711-D-12-9249

PLATE NO. 119

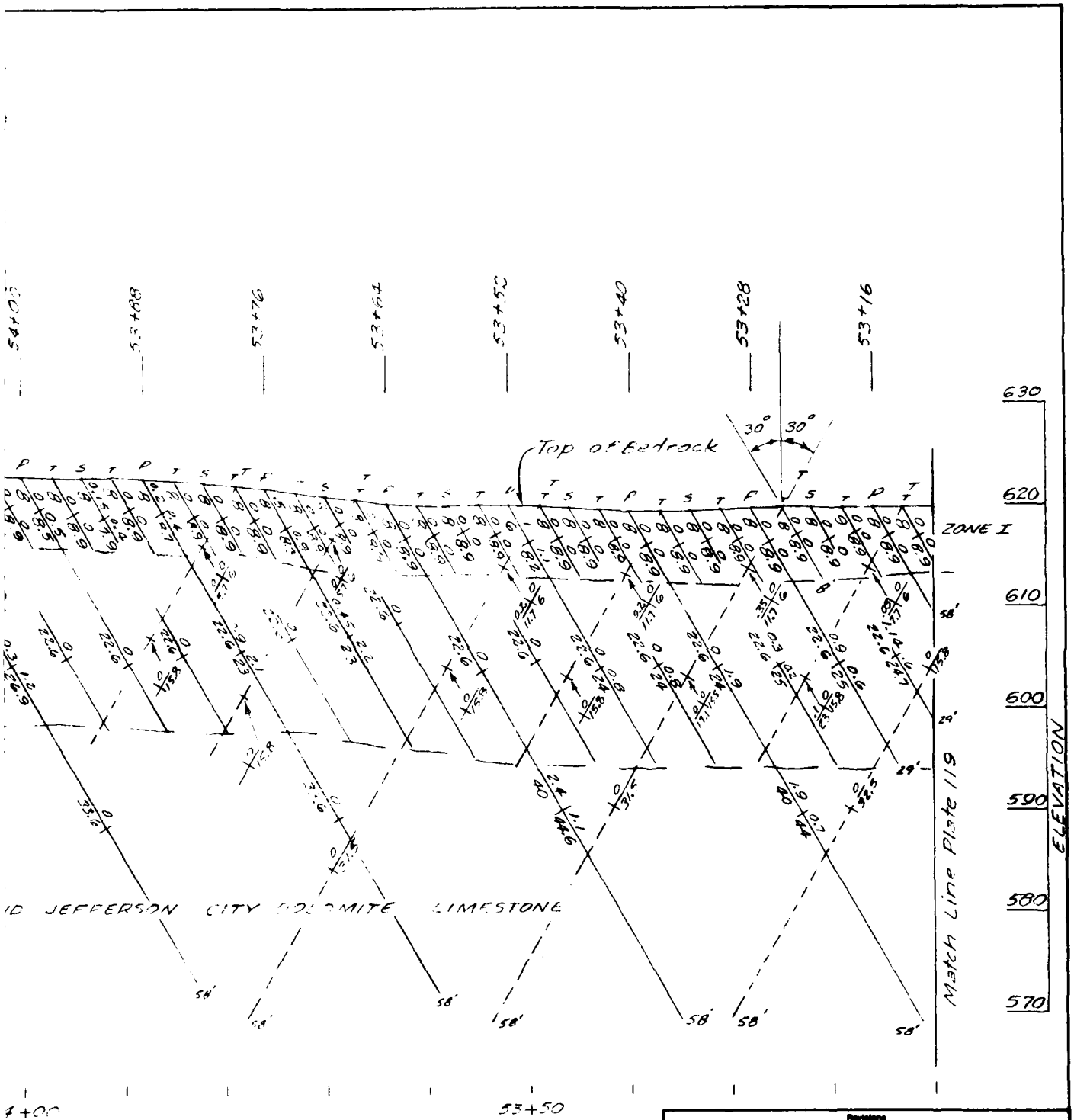


LINE C STAGE I GROUT CURTAIN PROFILE STA 53+10 TO
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

0 10
SCALE IN FEET

Fig 1.



E STA 53+10 TO STA 54+81

VSTREAM

10

1 FEET

For Legend see Plate 106

Revisions			
Symbol	Descriptions	Date	Approved

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GROUT CURTAIN PROFILE
LINE C
STA. 53+10 TO STA. 54+81

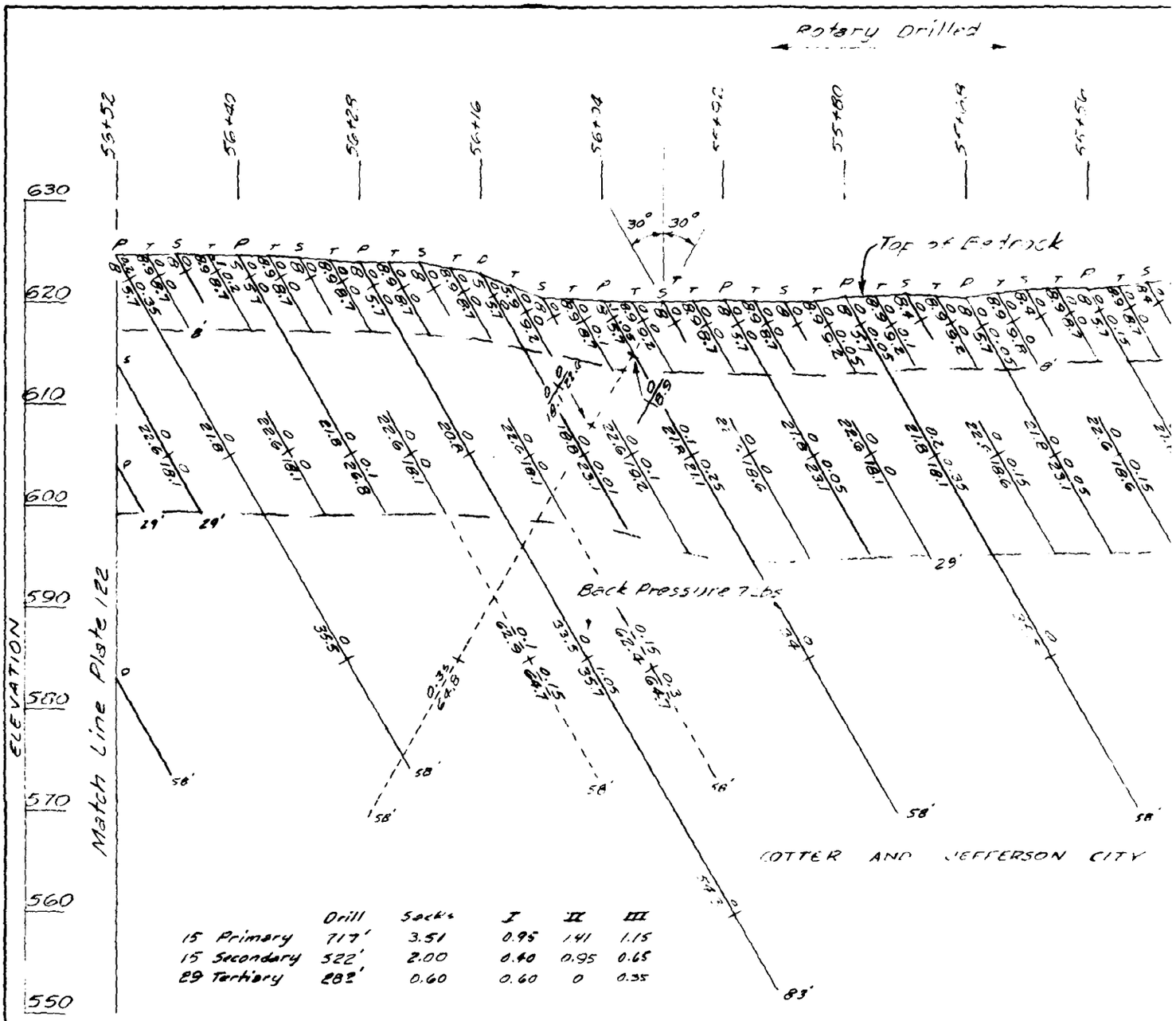
Scale AS SHOWN

Date MARCH 1986

Sheet number

File No. 0-12-9250

PLATE NO. 120



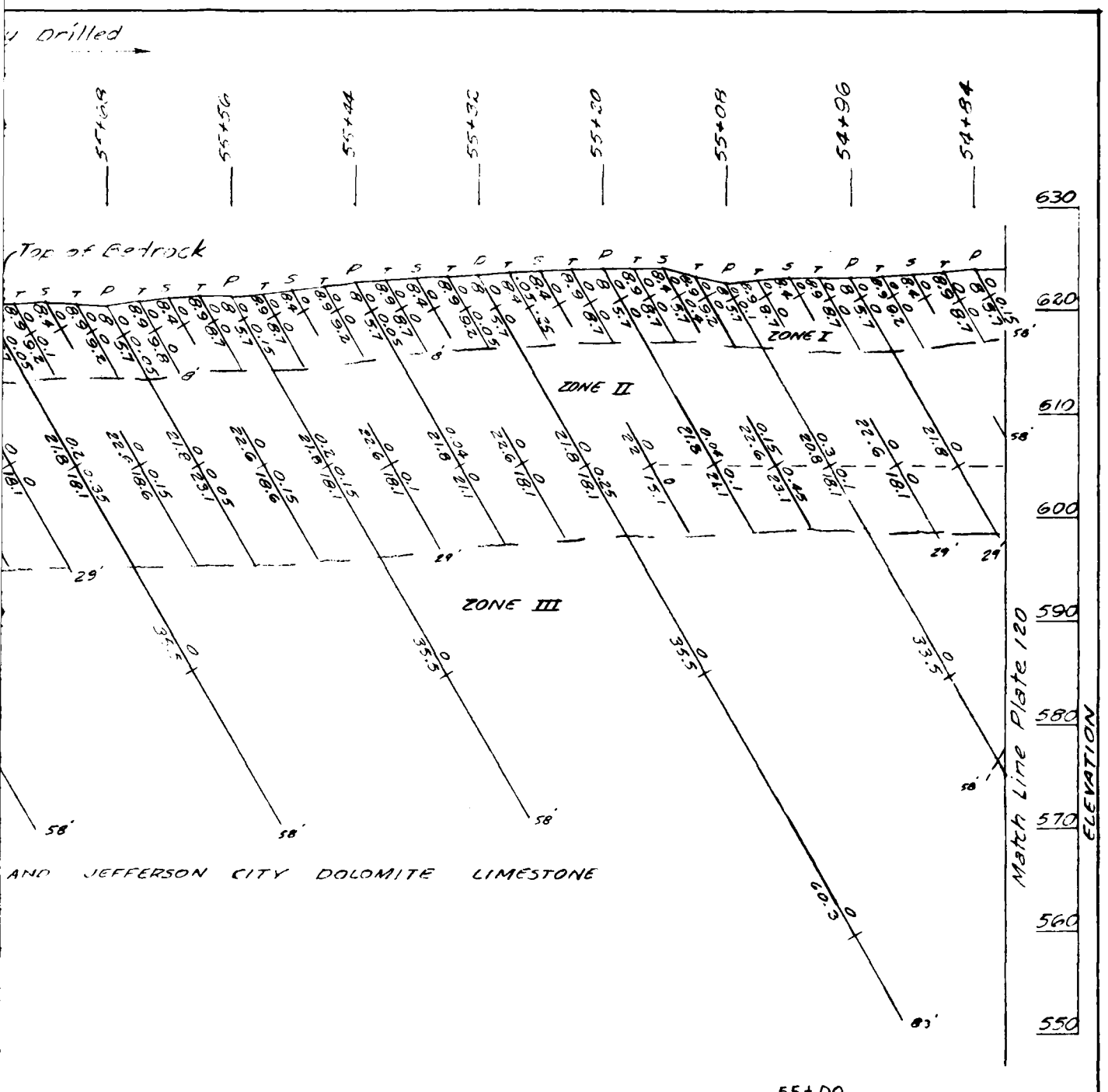
	Drill	Sacks	I	II	III
15 Primary	717'	3.51	0.95	1.41	1.15
15 Secondary	522'	2.00	0.40	0.95	0.65
29 Tertiary	282'	0.60	0.60	0	0.35

LINE C STAGE I GROUT CURTAIN PROFILE STA 54+81 TO
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

SCALE IN FEET

For le



LE STA 54+81 TO STA 56+52

OWNSTREAM

0 10

CALE IN FEET

For legend see Plate 106

Revisions			
Symbol	Description	Date	Approved

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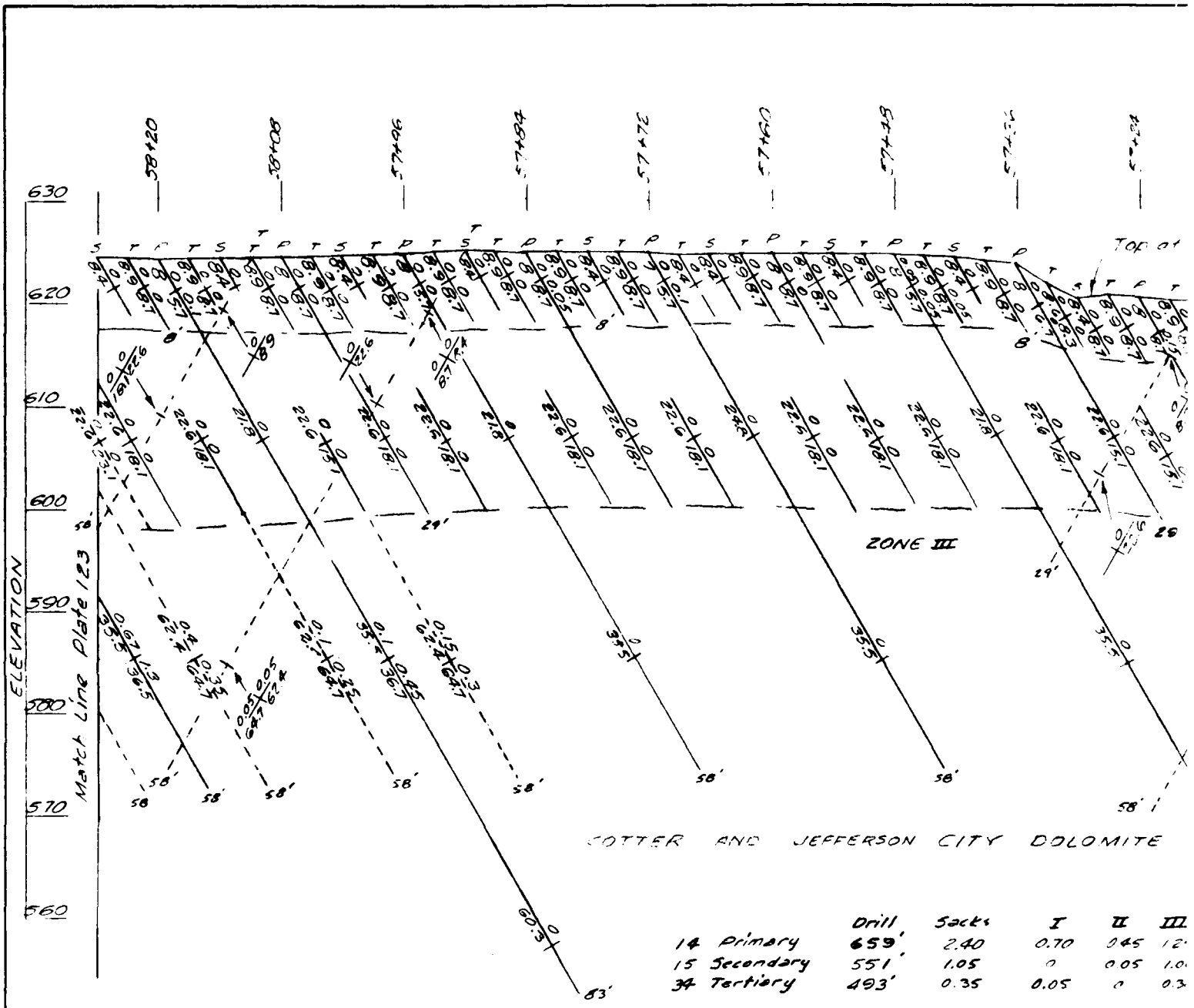
Submitted by:

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CONSTRUCTION, FOUNDATION REPORT

GROUT CURTAIN PROFILE
LINE C
STA. 54+81 TO STA. 56+52

Scale: AS SHOWN
Date: MARCH 1956
Sheet number:
Proj. No.
File No: 0-12-9251

PLATE NO. 121



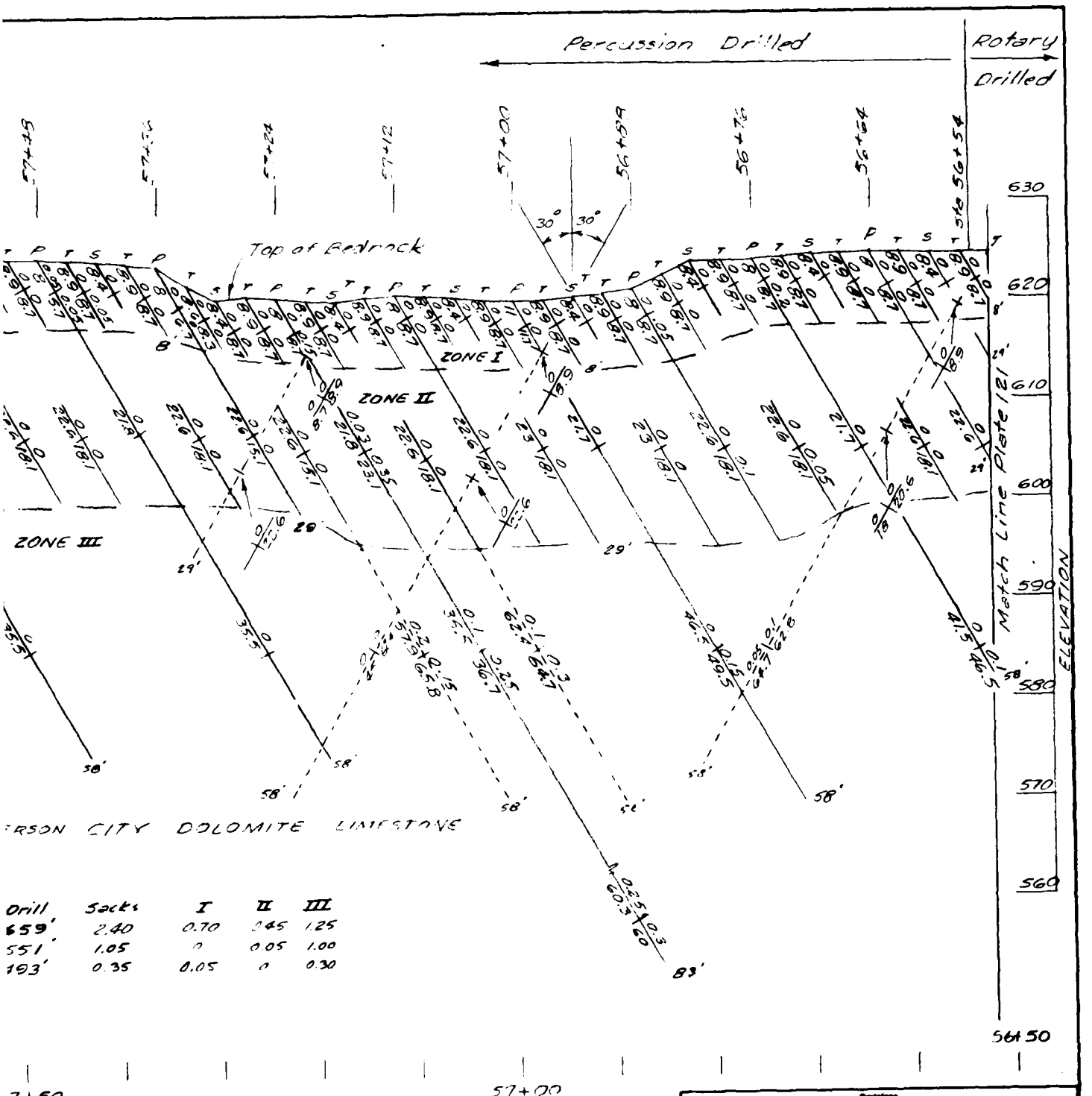
	Drill	Sacks	I	II	III
14 Primary	659'	2.40	0.70	0.45	12
15 Secondary	551'	1.05	0	0.05	1.0
34 Tertiary	493'	0.35	0.05	0	0.3

LINE C STAGE I GROUT CURTAIN PROFILE STA 56+52 TO
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

0 10
SCALE IN FEET

For Leg



ERSON CITY DOLOMITE LIMESTONE

Drill	Sacks	I	II	III
659'	2.40	0.70	0.45	1.25
551'	1.05	0	0.05	1.00
193'	0.35	0.05	0	0.30

FILE STA 56+52 TO STA 58+26
DOWNSTREAM

0 10
SCALE IN FEET

For Legend see Plate 106

Revisions			
Symbol	Descriptions	Date	Approved

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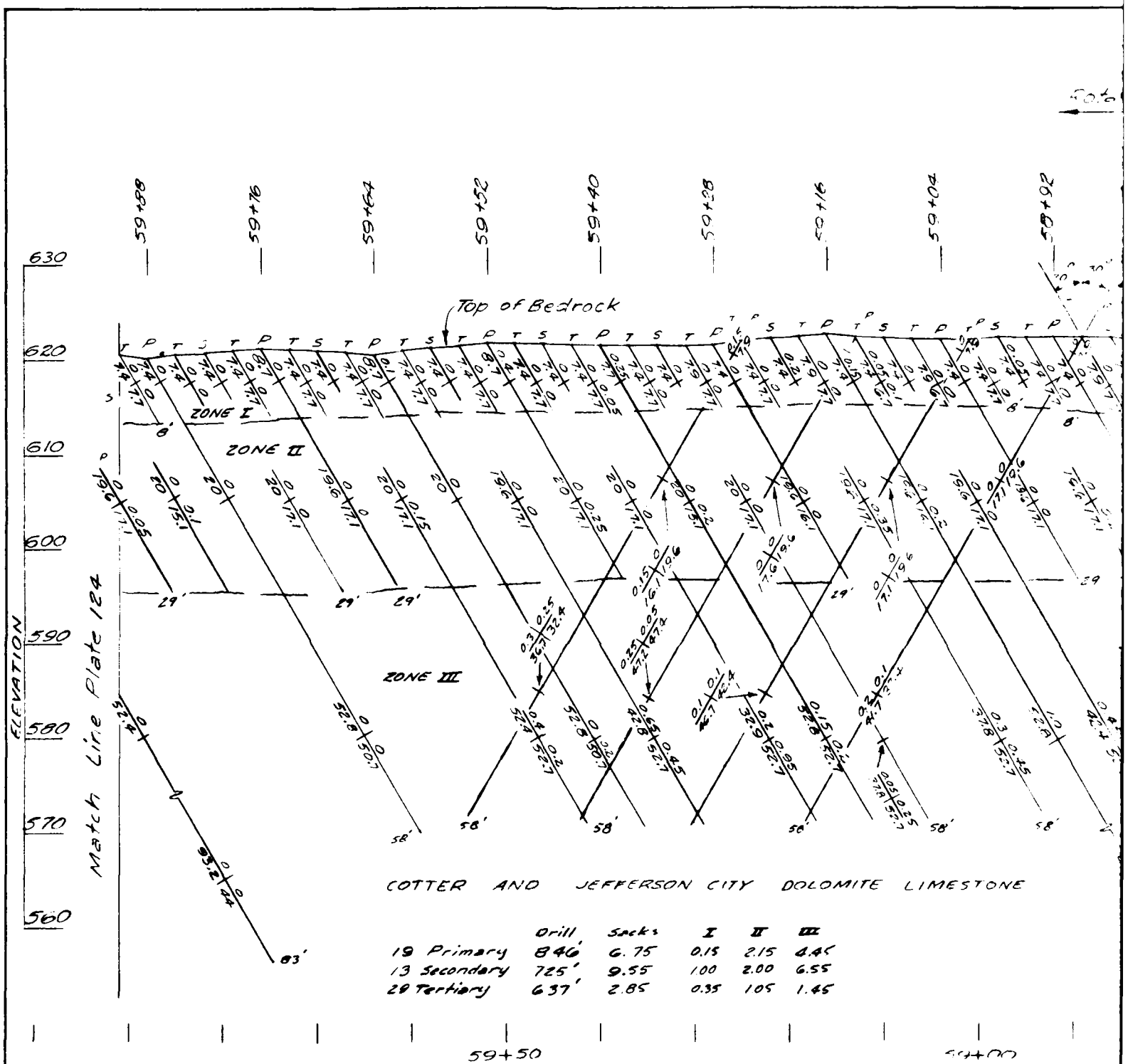
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CONSTRUCTION FOUNDATION REPORT

GROUT CURTAIN PROFILE
LINE C
STA. 56+52 TO STA. 58+26

Scale: AS SHOWN
Date: MARCH 1966
Sheet number:
File No. 0-12-9252

PLATE NO. 122



	Drill	Sacks	I	II	III
19 Primary	846'	6.75	0.15	2.15	4.45
13 Secondary	725'	9.55	1.00	2.00	6.55
29 Tertiary	637'	2.85	0.35	1.05	1.45

LINE C STAGE I GROUT CURTAIN PROFILE STA 58+26 TO S

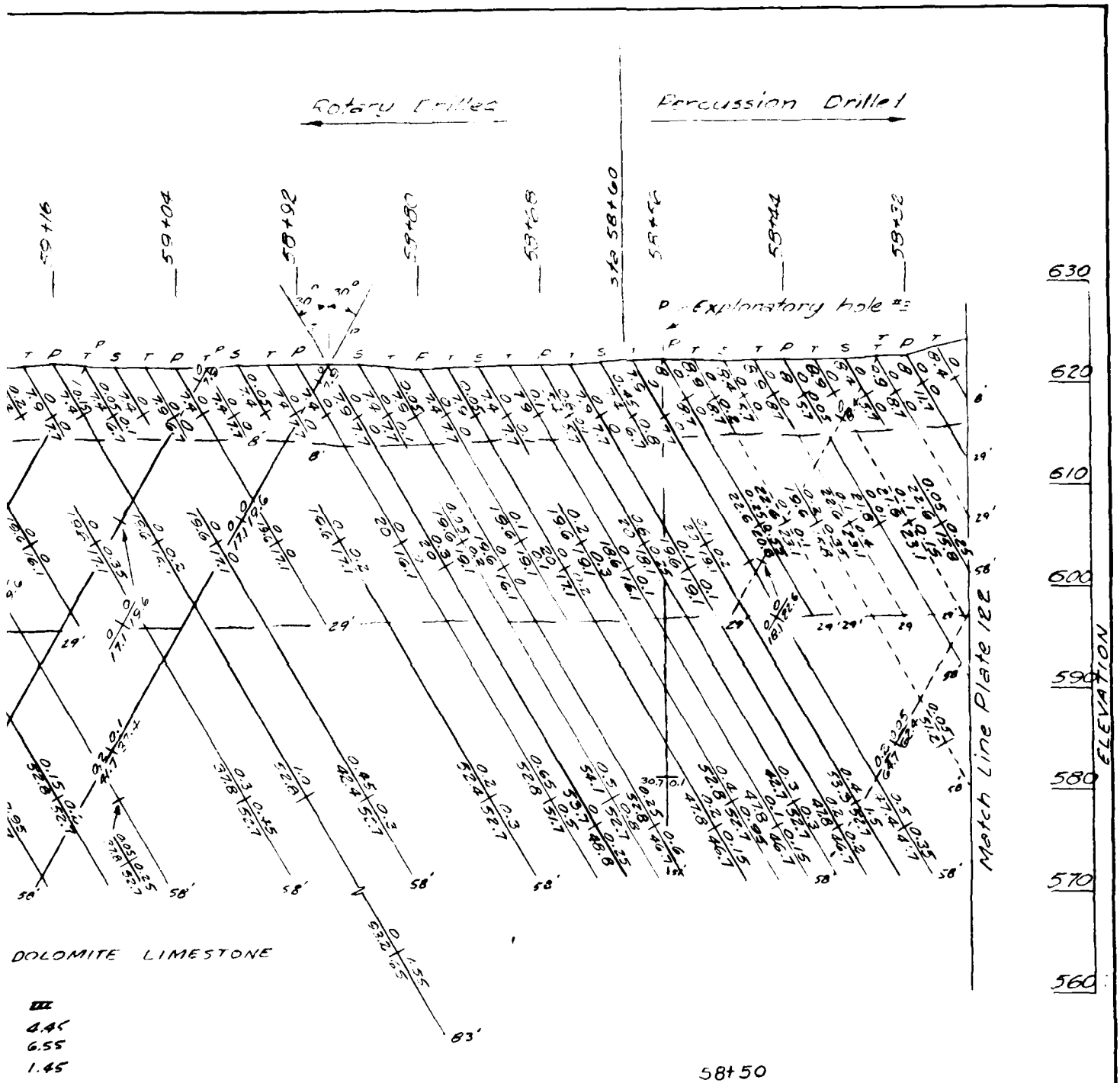
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

0 10

SCALE IN FEET

For Legend s



FILE STA 58+26 TO STA 59+91

UPSTREAM

0 10

SCALE IN FEET

For legend see Plate 106

Revisions			
Symbol	Description	Date	Approved

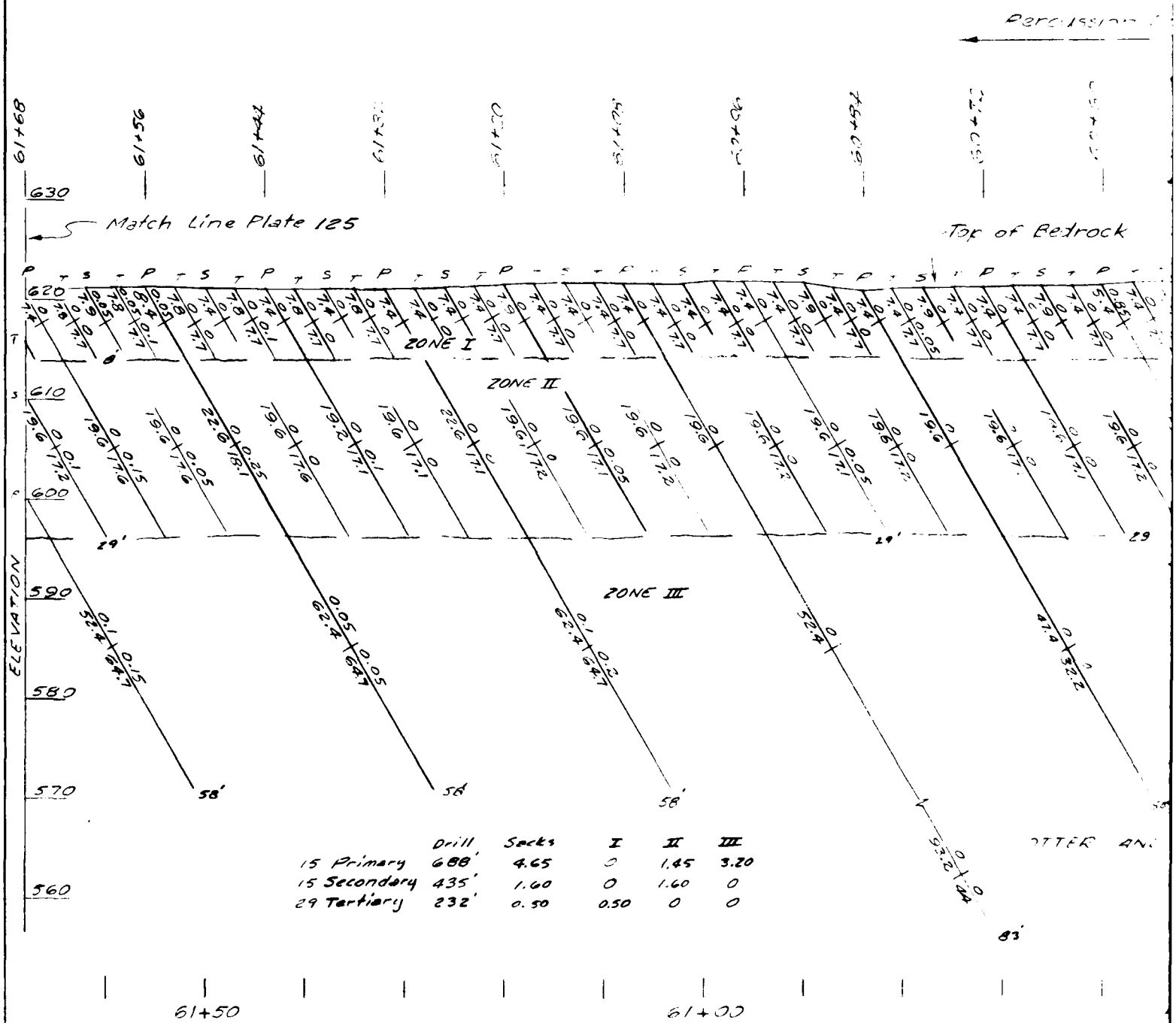
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CONSTRUCTION FOUNDATION REPORT
GROUT CURTAIN PROFILE
LINE C
STA. 58+26 TO STA. 59+91

Scale: AS SHOWN
Date: MARCH 1965
Sheet number:
Contract No.
DACW 41-66-C-0012-9253

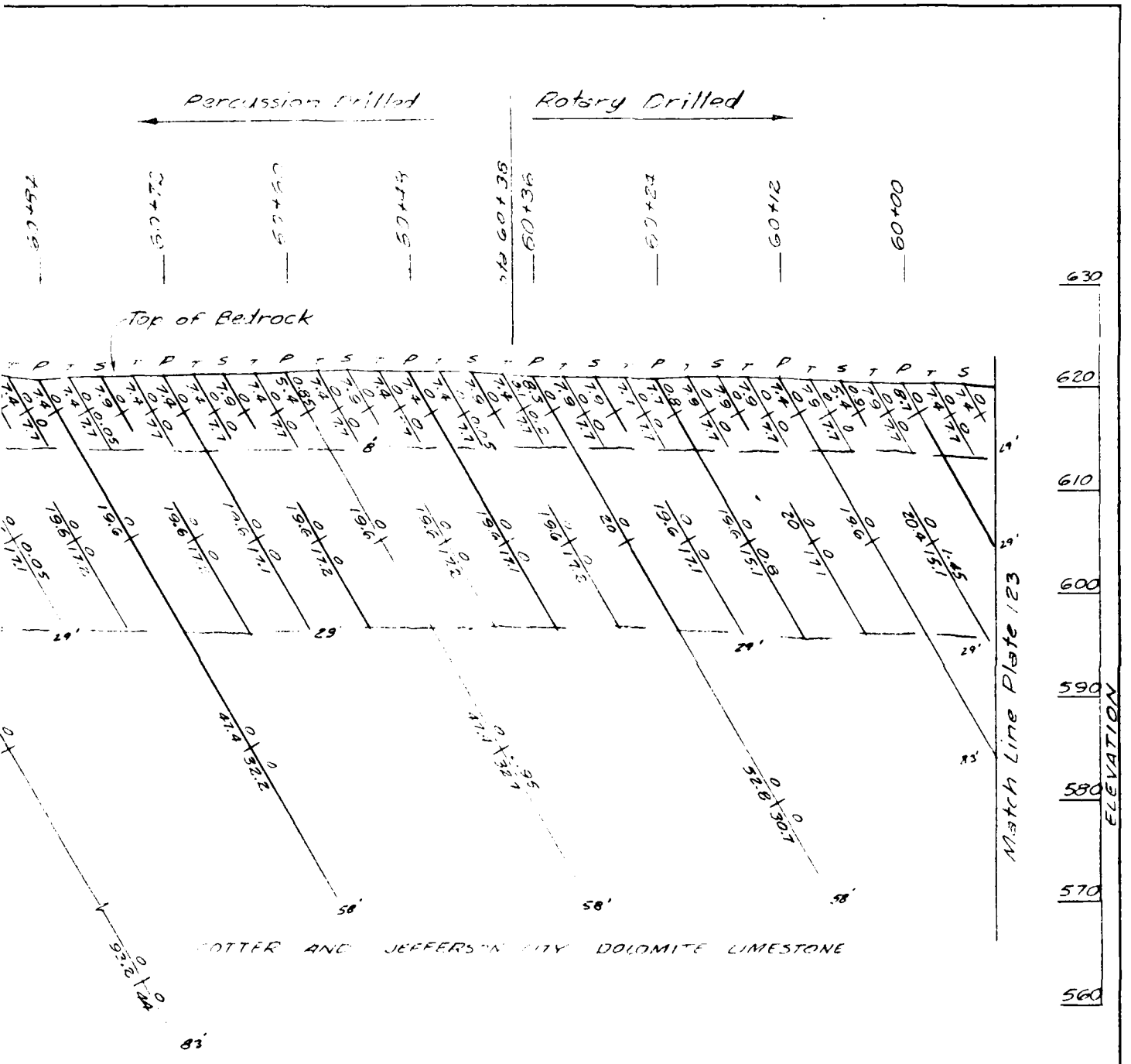
PLATE NO. 123



LINE C STAGE I GROUT CURTAIN FROM STA 59+91 TO
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

For Legend



LINE STA 59+91 TO STA 61+68
DOWNSTREAM

For Legend see Plate 106

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

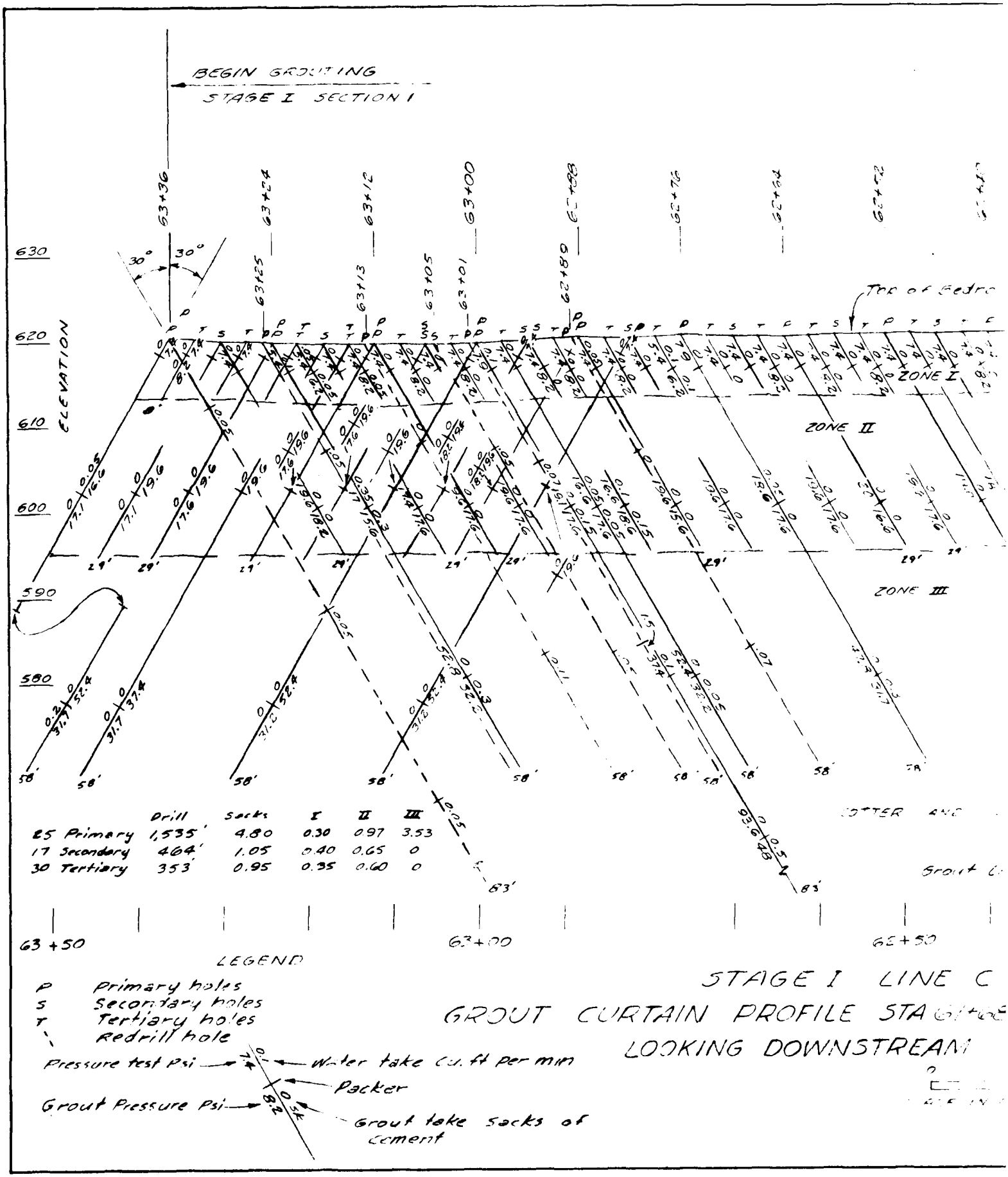
Designed by
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Checked by
Submitted by

GRAND RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

GROUT CURTAIN PROFILE
LINE C
STA 59+91 TO STA. 61+68

Scale AS SHOWN
Date MARCH 1986
Sheet number
Drawing No. 0-12-9254

PLATE NO. 124

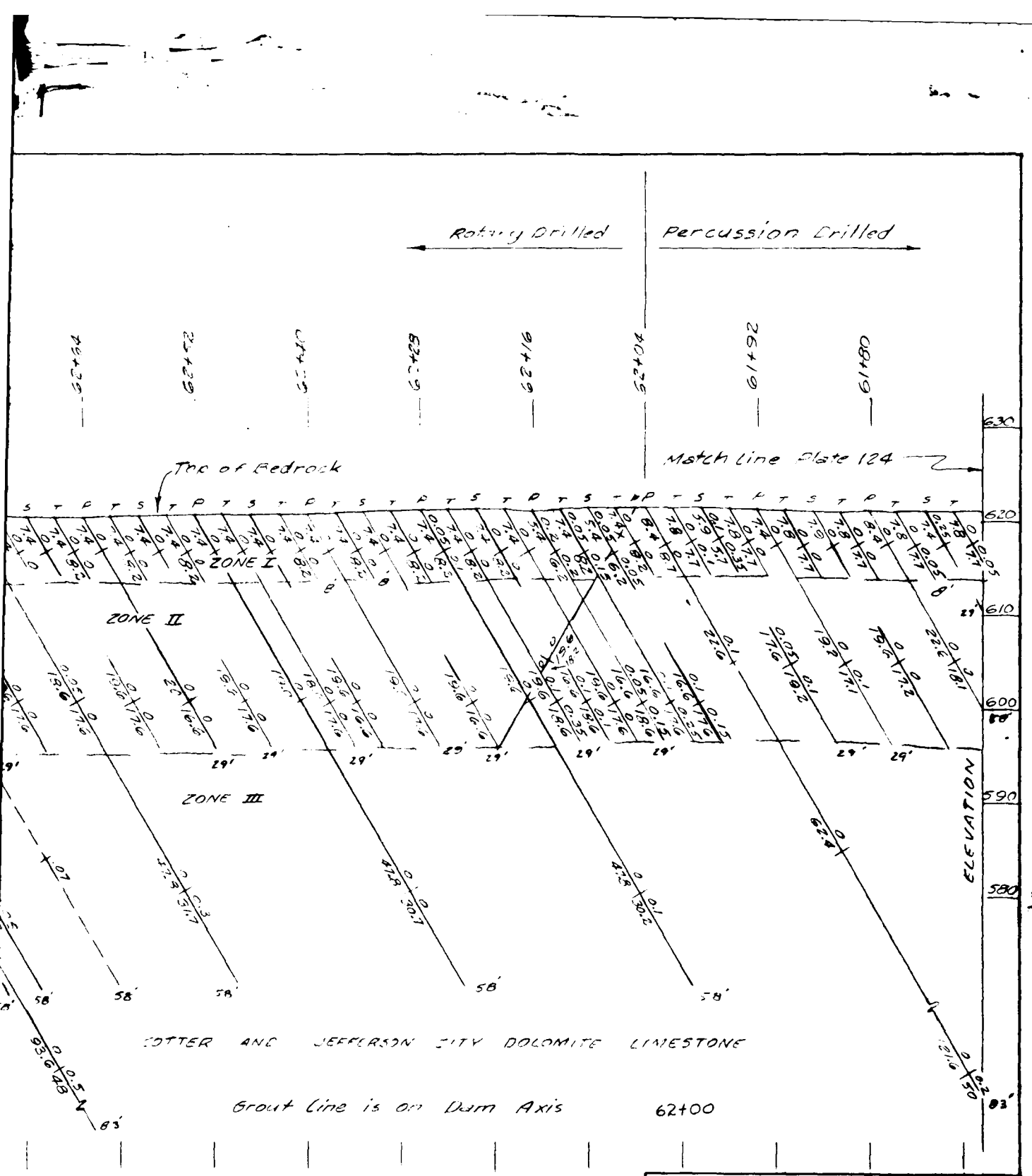


	Drill	Sacks	I	II	III
85 Primary	1,535'	4.80	0.30	0.97	3.53
17 Secondary	464'	1.05	0.40	0.65	0
30 Tertiary	353'	0.95	0.35	0.60	0

STAGE I LINE C

GROUT CURTAIN PROFILE STA 63+00

LOOKING DOWNSTREAM



STAGE I LINE C

PROFILE STA 61+68 TO STA 63+36

NG DOWNSTREAM

0 10

SCALE IN FEET

Symbol	Revisions Description	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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Submitted by

GRAND RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

GROUT CURTAIN PROFILE
LINE C
STA. 61+68 TO STA. 63+36

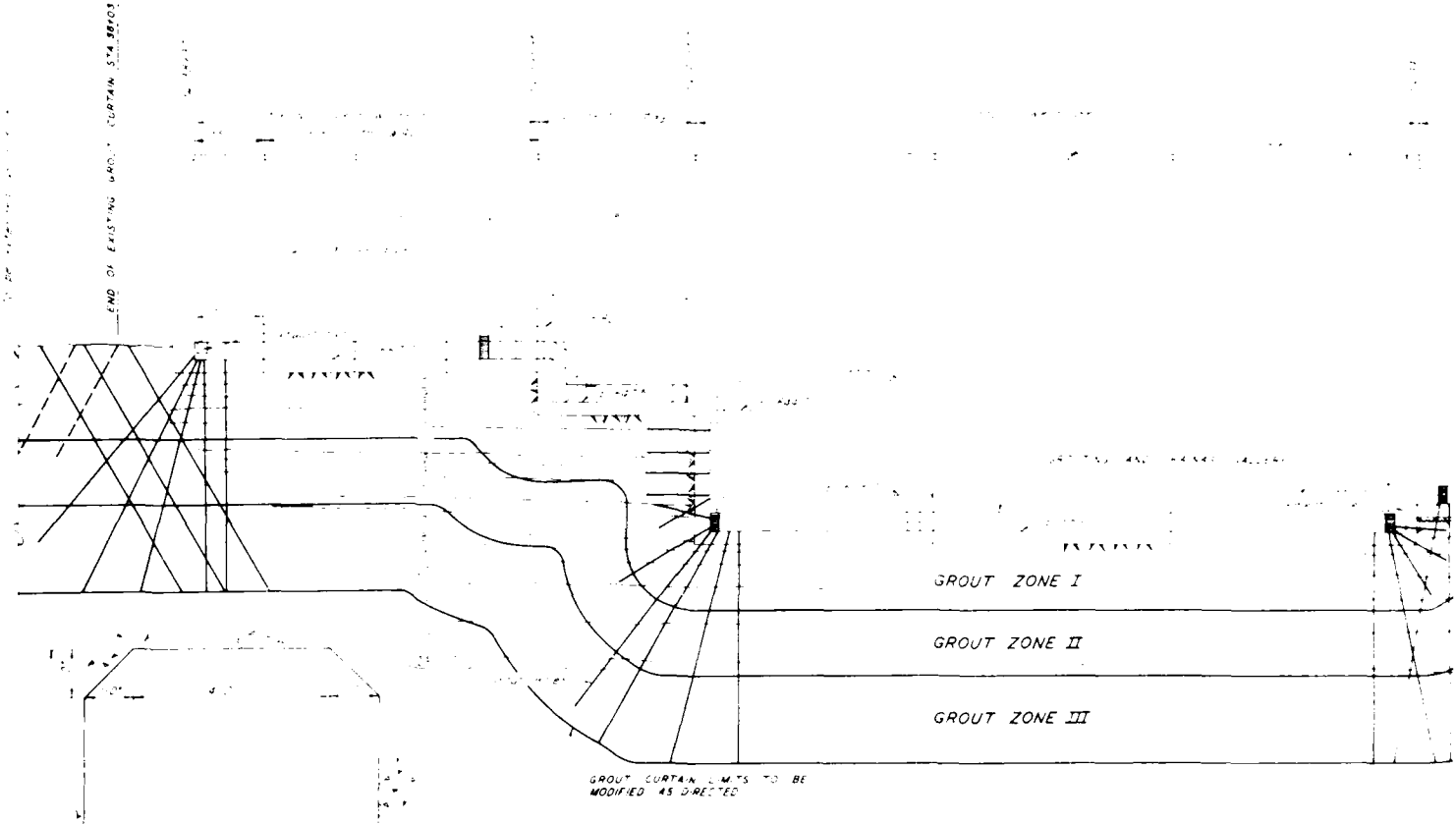
Scale: AS SHOWN

Date: MARCH 1958

Sheet number:

Drawing No. E-0-12-[illegible]

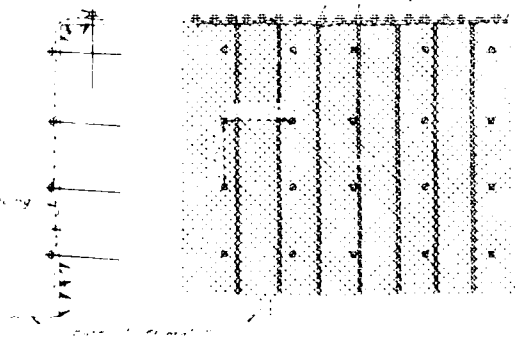
PLATE NO. 125



GROUT CURTAIN FOR SPILLWAY-POWERHOUSE LOOKING

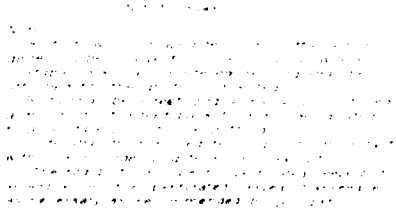


TYPICAL GALLERY



SECTION ELEVATION

INSTALLATION OF DRAPED FENCING



DETAIL - AT
ON SHO

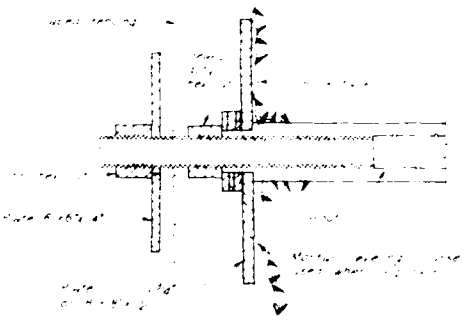
DETAIL - ATTACI
ON DRA

DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

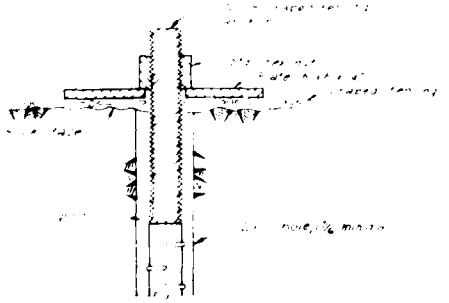
END OF EXISTING GROUT CURTAIN STA 48+36

GROUTING AND DRAINAGE GALLERY

LWAY-POWERHOUSE LOOKING UPSTREAM



DETAIL-ATTACHMENT OF DRAPED FENCING
ON SHORT PERFORATED SLEEVE BOLT



DETAIL ATTACHMENT OF DRAPED FENCING
ON DRAPED FENCING ANCHOR



CORE BOX DETAILS
(FOR EXPLORATORY DRILLING)

Symbol	Revisions Descriptions	Date	Approved

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KANSAS CITY, MISSOURI

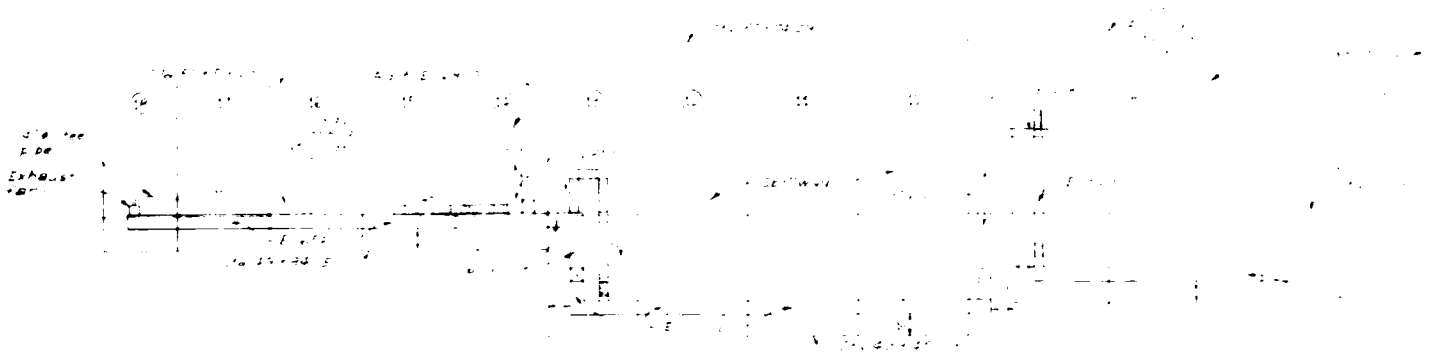
US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

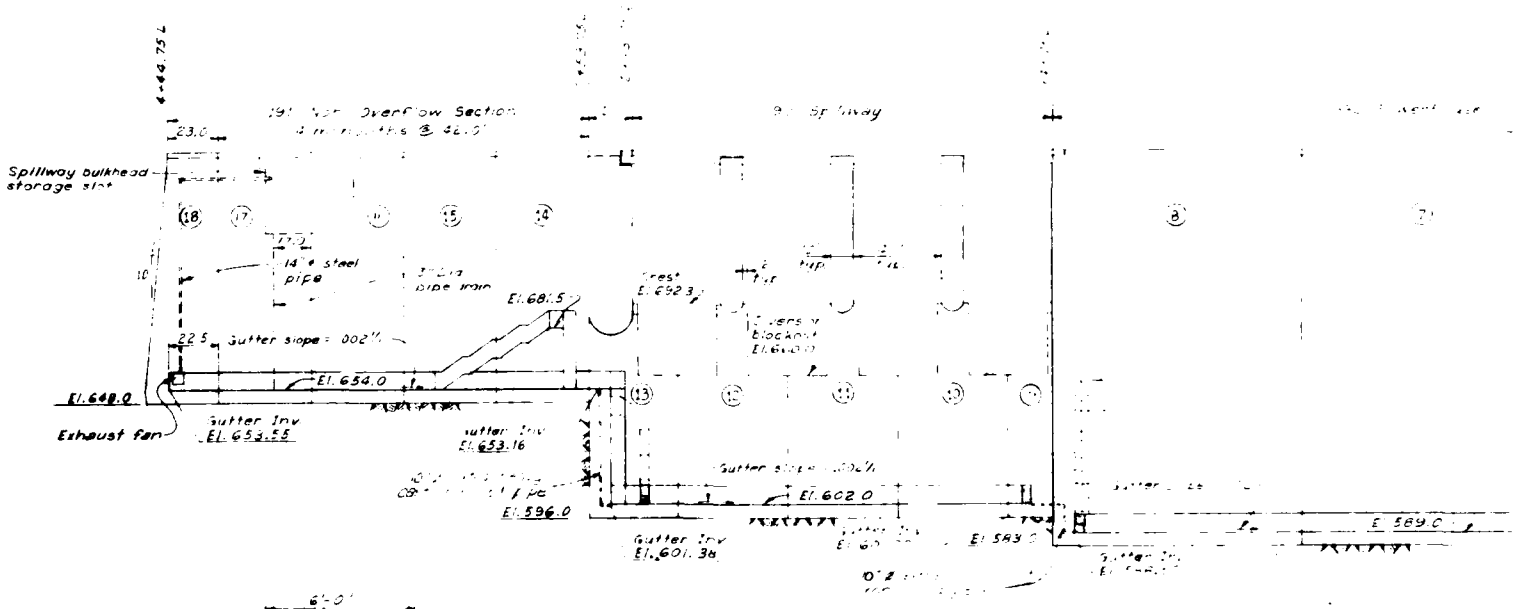
SPILLWAY - POWERHOUSE
GROUT CURTAIN AND
DRAPED FENCING DETAIL

Scale: AS SHOWN
Date: MARCH 1985
Sheet number:
File No: 0-12-9256

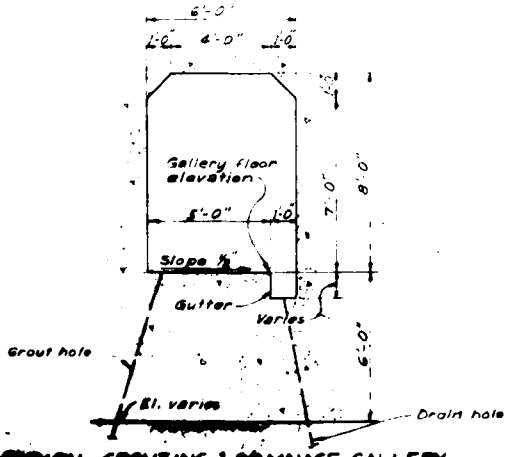
PLATE NO. 126



PLAN OF GALLERIES

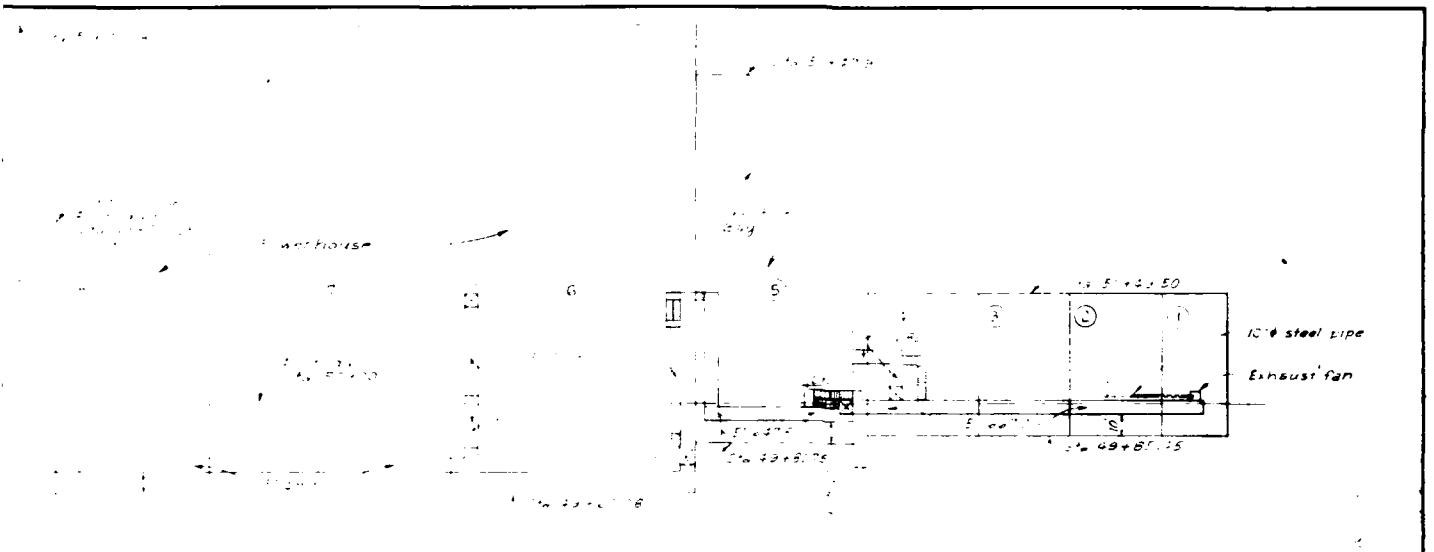


PROFILE OF GALLERIES

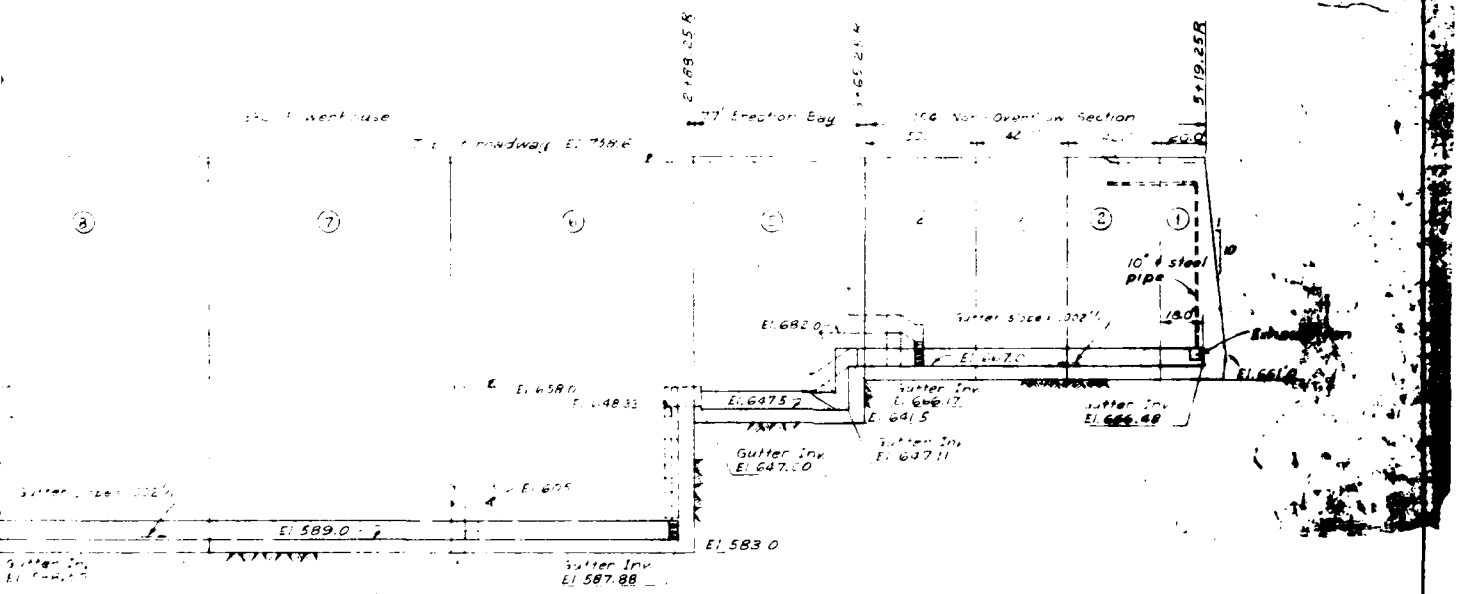


TYPICAL GROUTING & DRAINAGE GALLERY

DRAWIN
HAVE BEE
HALF TH



PLAN OF GALLERIES



PROFILE OF GALLERIES

Scale 30' 0

DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

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U.S. ARMY ENGINEER DISTRICT
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KANSAS CITY, MISSOURI

US Army Corps of Engineers

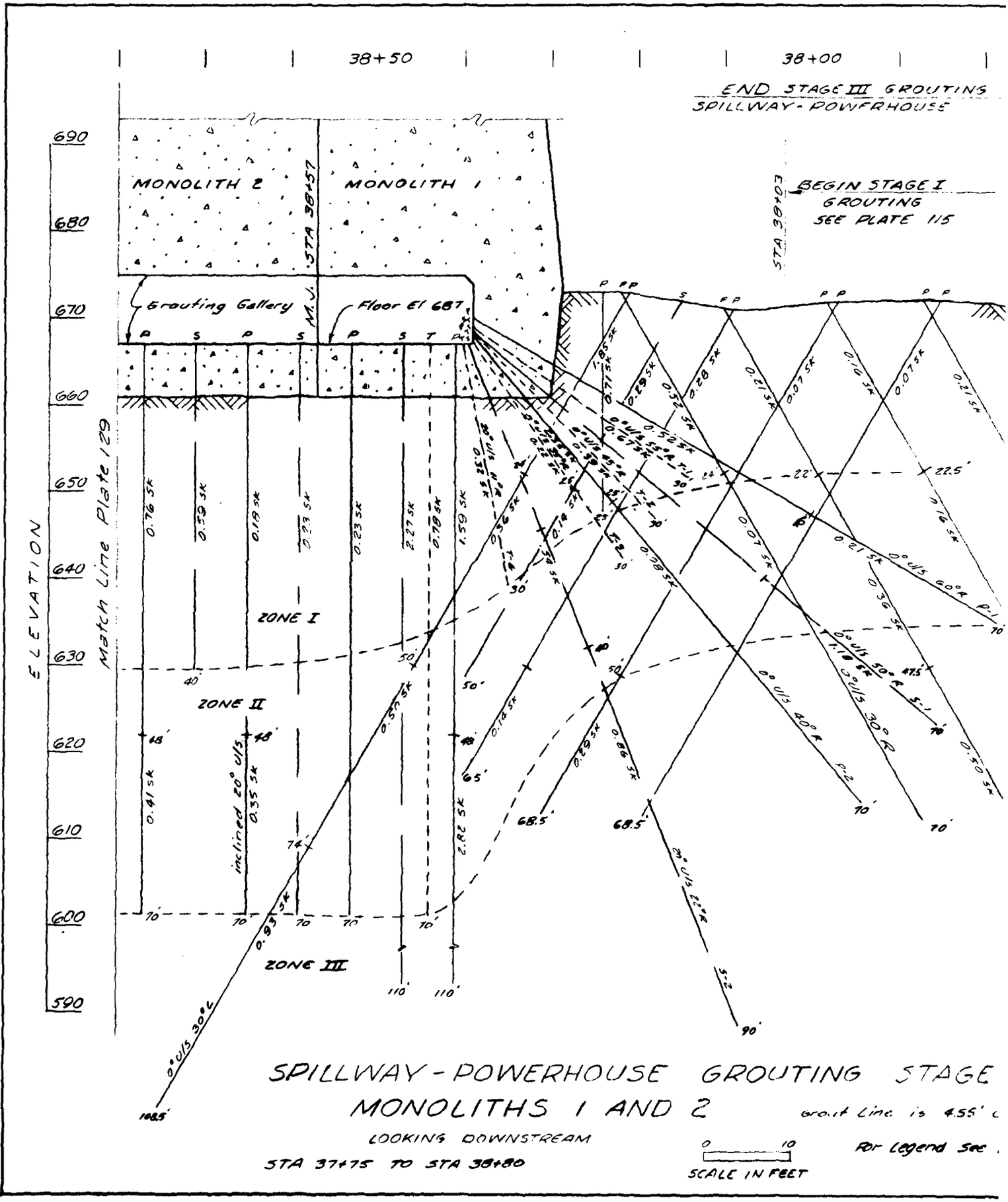
MISSOURI RIVER DIVISION
HARRY S. TRUMAN DAM AND RESERVOIR
CONSTRUCTION FOUNDATION REPORT

GALLERIES
GENERAL LAYOUT

Designed by
Drawn by
Checked by
Submitted by

Scale AS NOTED
Date MARCH 1985
Drwg No.
Sheet number
File No 0-12-9257

PLATE NO. 127



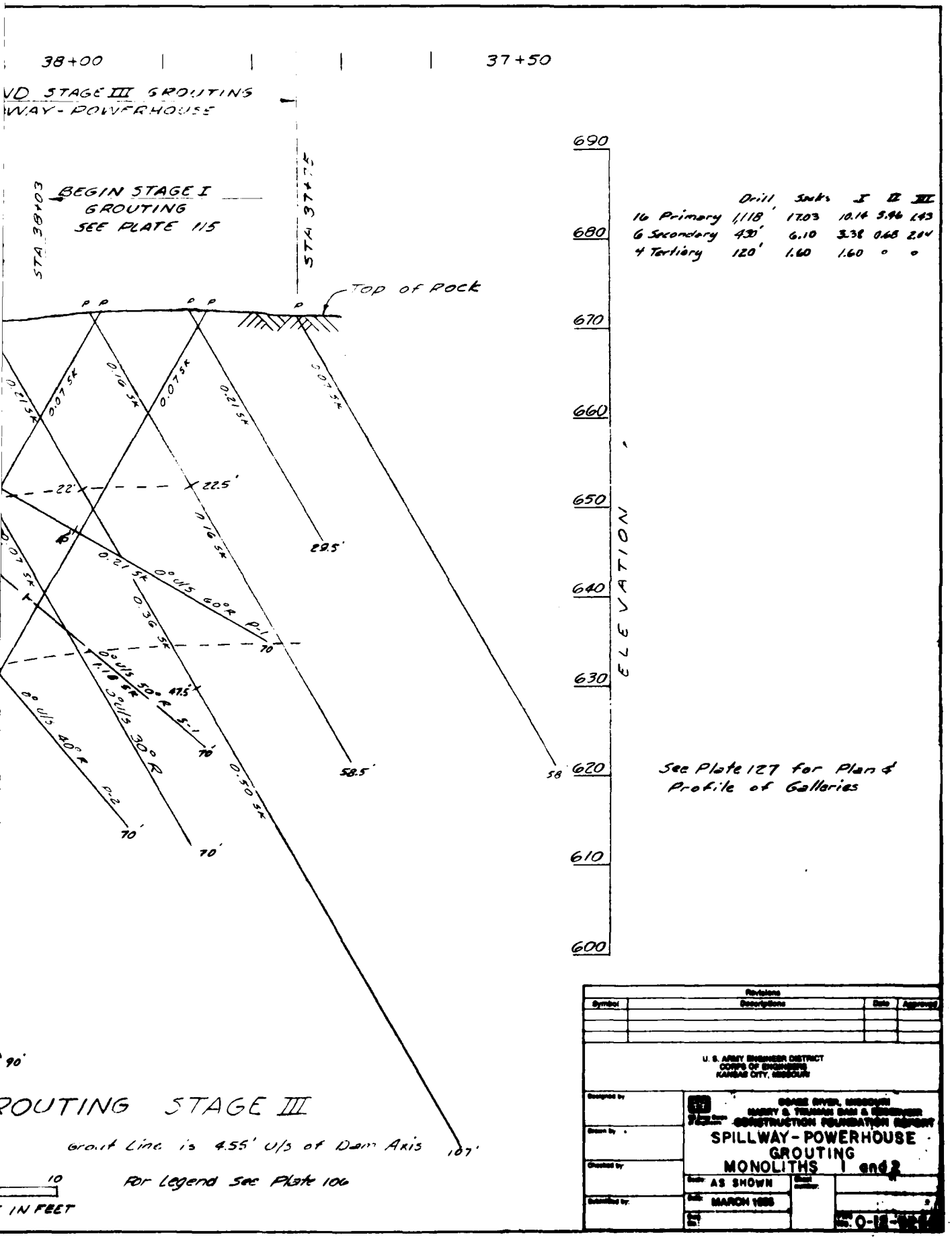
SPILLWAY - POWERHOUSE GROUTING STAGE
MONOLITHS 1 AND 2

LOOKING DOWNSTREAM

STA 37+75 TO STA 38+80

grout line is 4.55' c

For Legend See



	Drill	Sacks	I	II	III
16 Primary	1,118'	17.03	10.14	5.96	1.43
6 Secondary	430'	6.10	3.38	0.68	2.04
4 Tertiary	120'	1.60	1.60	0	0

See Plate 127 for Plan & Profile of Galleries

ROUTING STAGE III

Grout Line is 4.55' U/S of Dam Axis

10

IN FEET

For Legend See Plate 106

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

SPILLWAY-POWERHOUSE GROUTING MONOLITHS 1 and 2

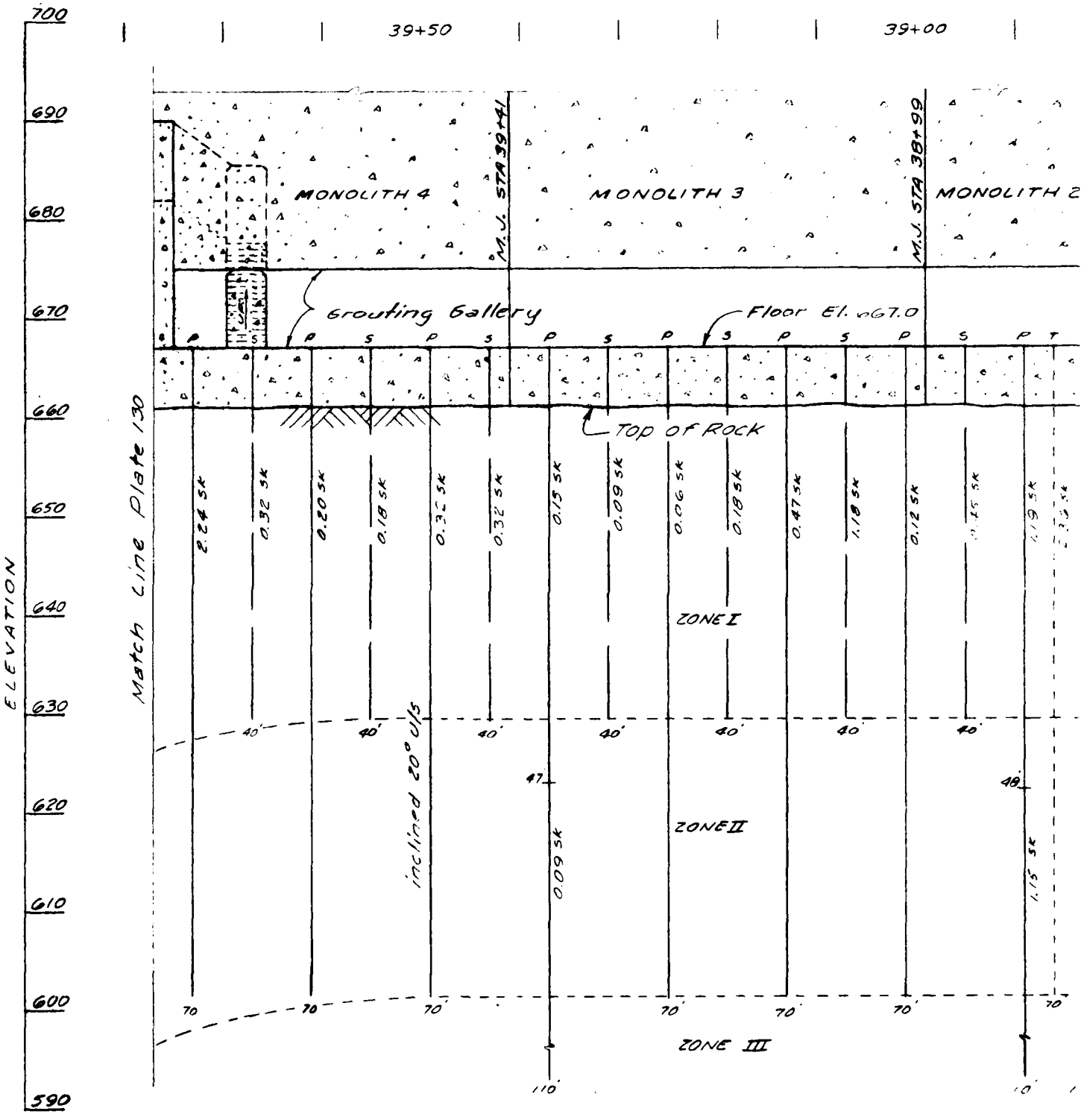
Scale: AS SHOWN

Date: MARCH 1966

Sheet number

Drawing No. 0-12-

PLATE NO. 128



SPILLWAY - POWERHOUSE GROUTING STAGE III

MONOLITHS 2, 3, AND 4

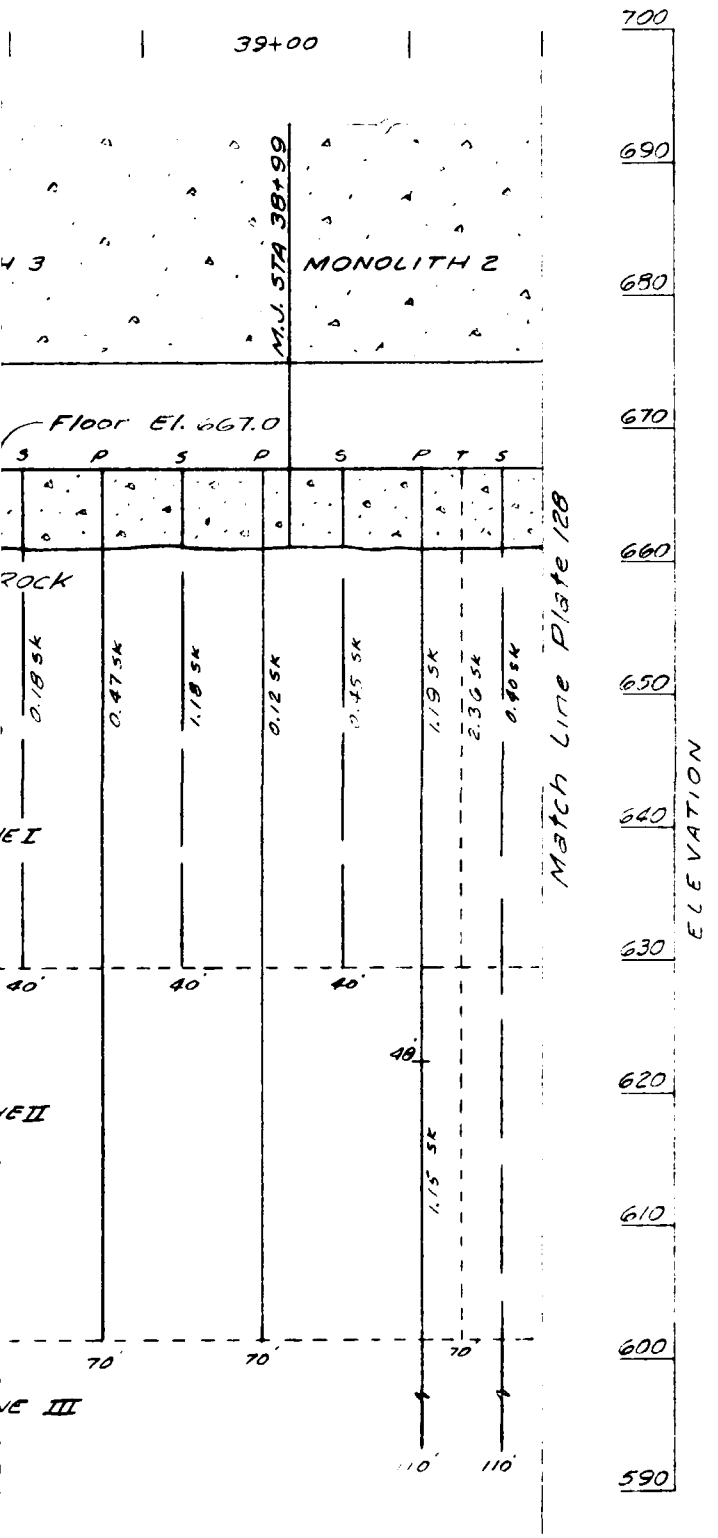
LOOKING DOWNSTREAM

STA 38+80 TO STA 39+77

Grout Line

0 10

SCALE IN FEET



	Drill	Sacks	I	II	III
8 Primary	640'	5.99	4.75	1.24	0
8 Secondary	390'	3.12	3.12	0	0
1 Tertiary	70'	2.36	2.36	0	0

OUTING STAGE III

O 4

Grout Line is 4.55' u/s of Dam Axis

0 10
SCALE IN FEET

Revisions			
Symbol	Descriptions	Date	Approved

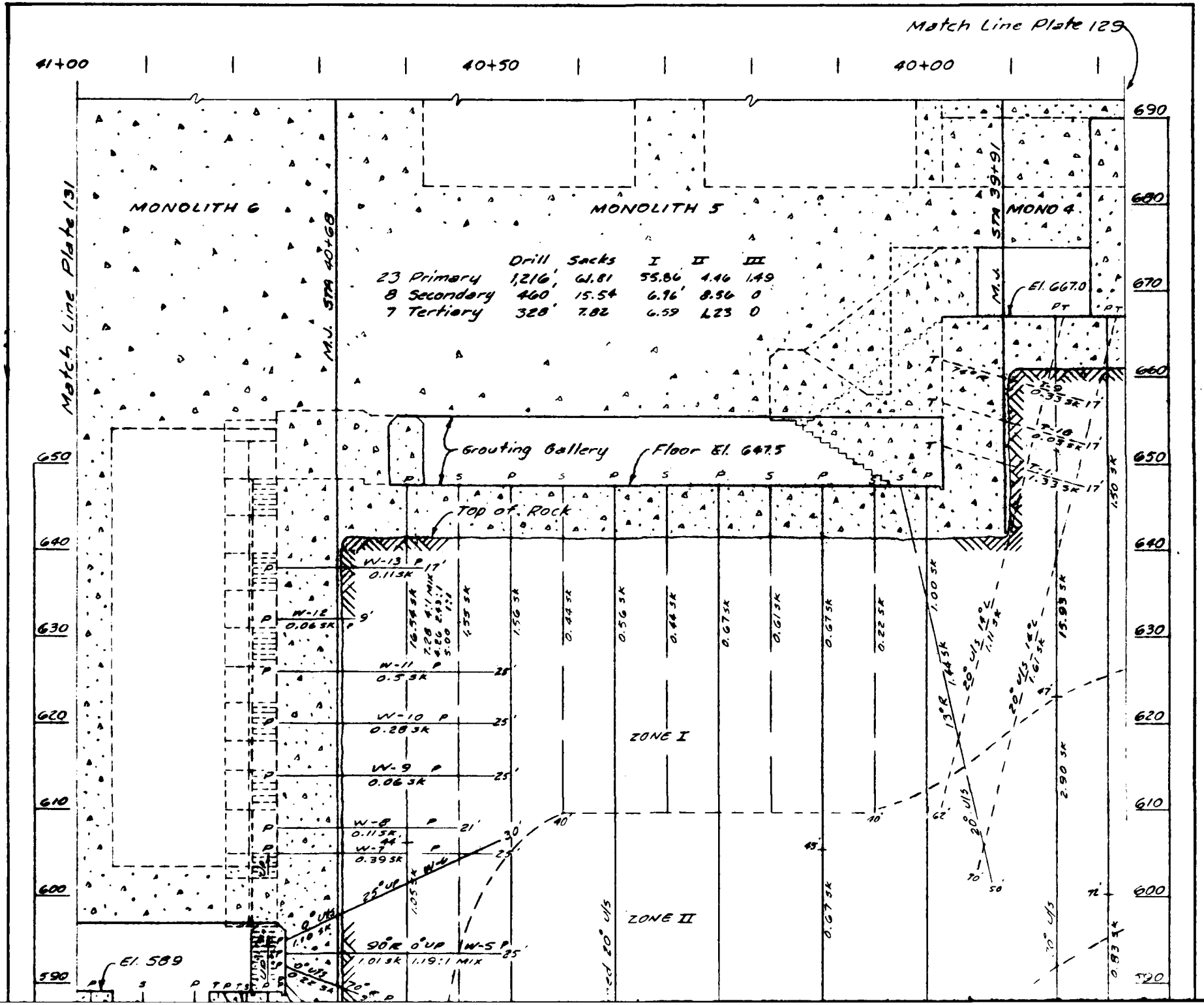
U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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Checked by
Submitted by

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT
SPILLWAY - POWERHOUSE
GROUTING
MONOLITHS 2,3, and 4

Scale: AS SHOWN
Date: MARCH 1966
Sheet number:
Drawing No.:
FILE NO. 0-18-9259

PLATE NO. 129


Match Line Plate 129
41+00
40+50
40+00
Match Line Plate 131
MONOLITH 6
M.J. STA 40+68
MONOLITH 5
STA 39+91
MONO 4
M.J.
El. 667.0
PT
Drill Sacks I II III
23 Primary 1,216' 61.81 55.86 4.46 1.49
8 Secondary 460' 15.54 6.96 8.56 0
7 Tertiary 328' 7.82 6.59 1.23 0
Grouting Gallery
Floor El. 647.5
Top of Rock
W-13 P 17' 0.11 SK
W-12 P 9' 0.06 SK
W-11 P 25' 0.5 SK
W-10 P 25' 0.28 SK
W-9 P 25' 0.06 SK
W-8 P 21' 0.11 SK
W-7 P 25' 0.39 SK
W-5 P 25' 1.01 SK 1.19:1 MIX
90° R 0° UP
25° UP
0° U/S
20° U/S
70° U/S
ZONE I
ZONE II
El. 589
690
680
670
660
650
640
630
620
610
600
590
720

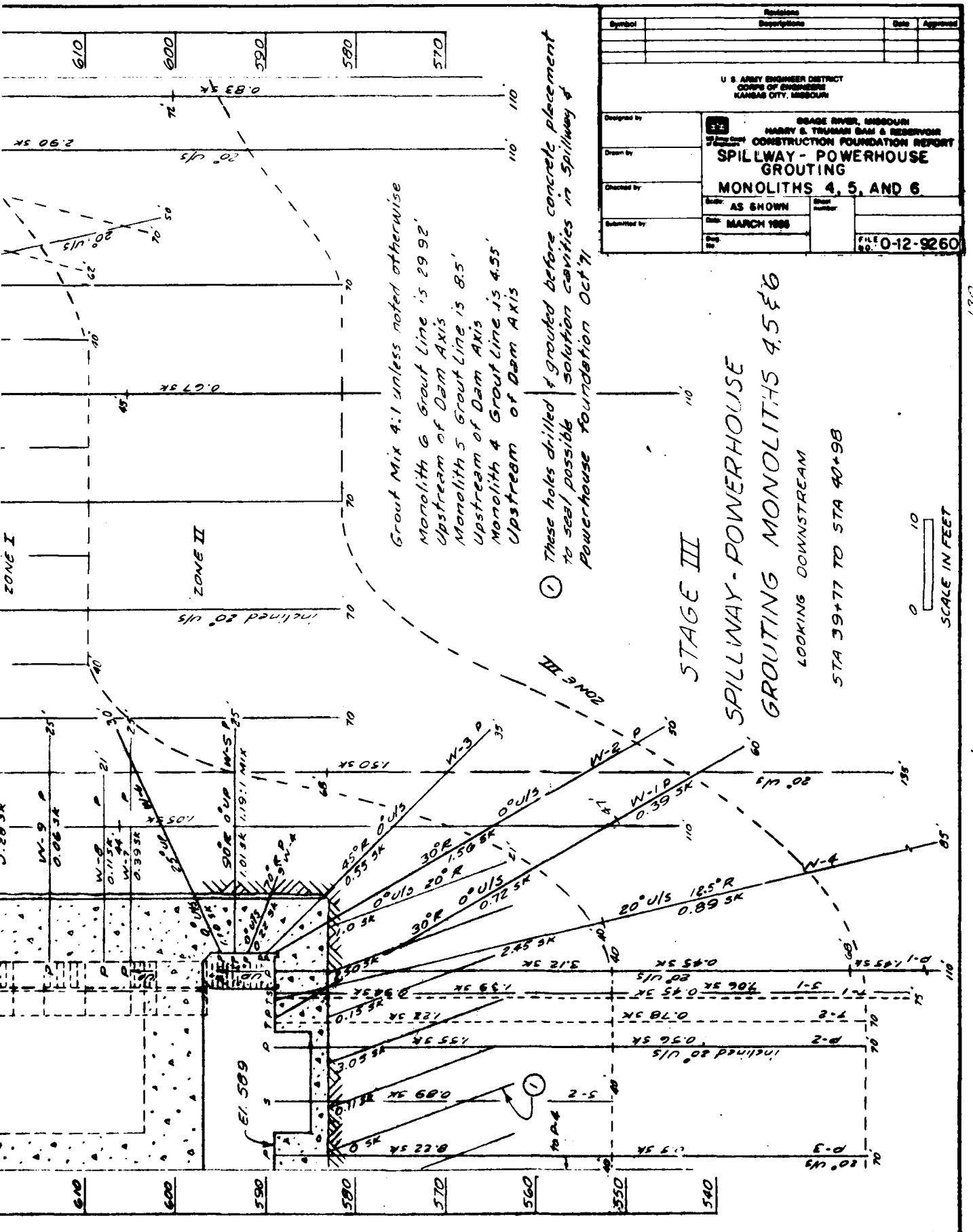
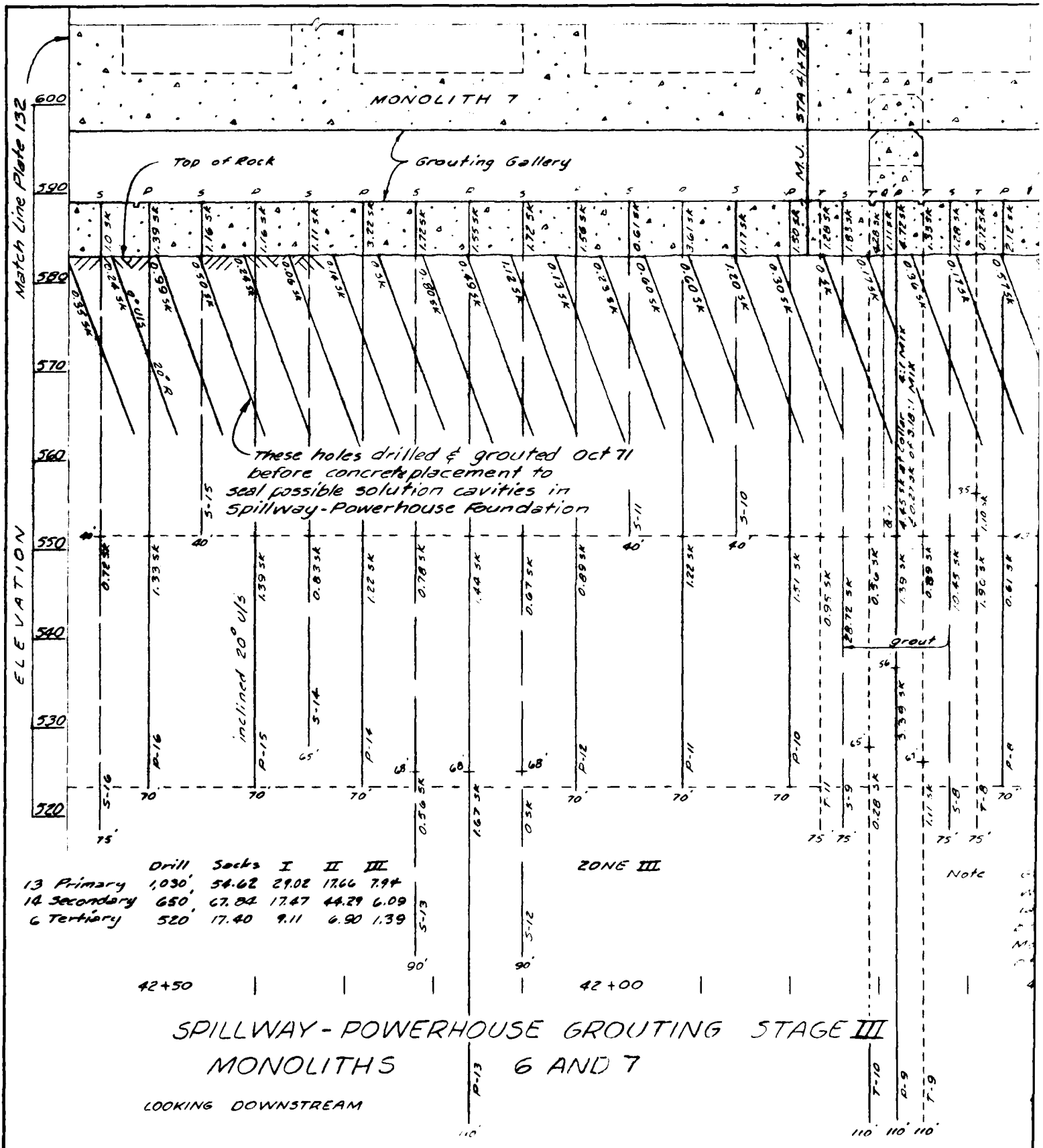

Revisions
Symbol | Descriptions | Date | Approved
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CORPS OF ENGINEERS
KANSAS CITY, MISSOURI
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Submitted by
GRAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT
SPILLWAY - POWERHOUSE GROUTING
MONOLITHS 4, 5, AND 6
Scale AS SHOWN
Date MARCH 1956
FILE NO. 0-12-9260
Grout Mix 4:1 unless noted otherwise
Monolith 6 Grout Line is 29.92' Upstream of Dam Axis
Monolith 5 Grout Line is 8.5' Upstream of Dam Axis
Monolith 4 Grout Line is 4.55' Upstream of Dam Axis
① These holes drilled & grouted before concrete placement to seal possible solution cavities in Spillway & Powerhouse foundation Oct '71
STAGE III
SPILLWAY-POWERHOUSE GROUTING MONOLITHS 4,5&6
LOOKING DOWNSTREAM
STA 39+77 TO STA 40+98
SCALE IN FEET
ZONE I
ZONE II
ZONE III
El. 589
W-1 P
W-2 P
W-3 P
W-4
P-1
P-2
P-3
S-1
S-2
S-3
S-4
S-5
610
600
590
580
570
560
550
540

PLATE NO. 130



	Drill	Sacks	I	II	III
13 Primary	1,030'	54.62	29.02	17.66	7.94
14 Secondary	650'	67.84	17.47	44.29	6.09
6 Tertiary	520'	17.40	9.11	6.90	1.39

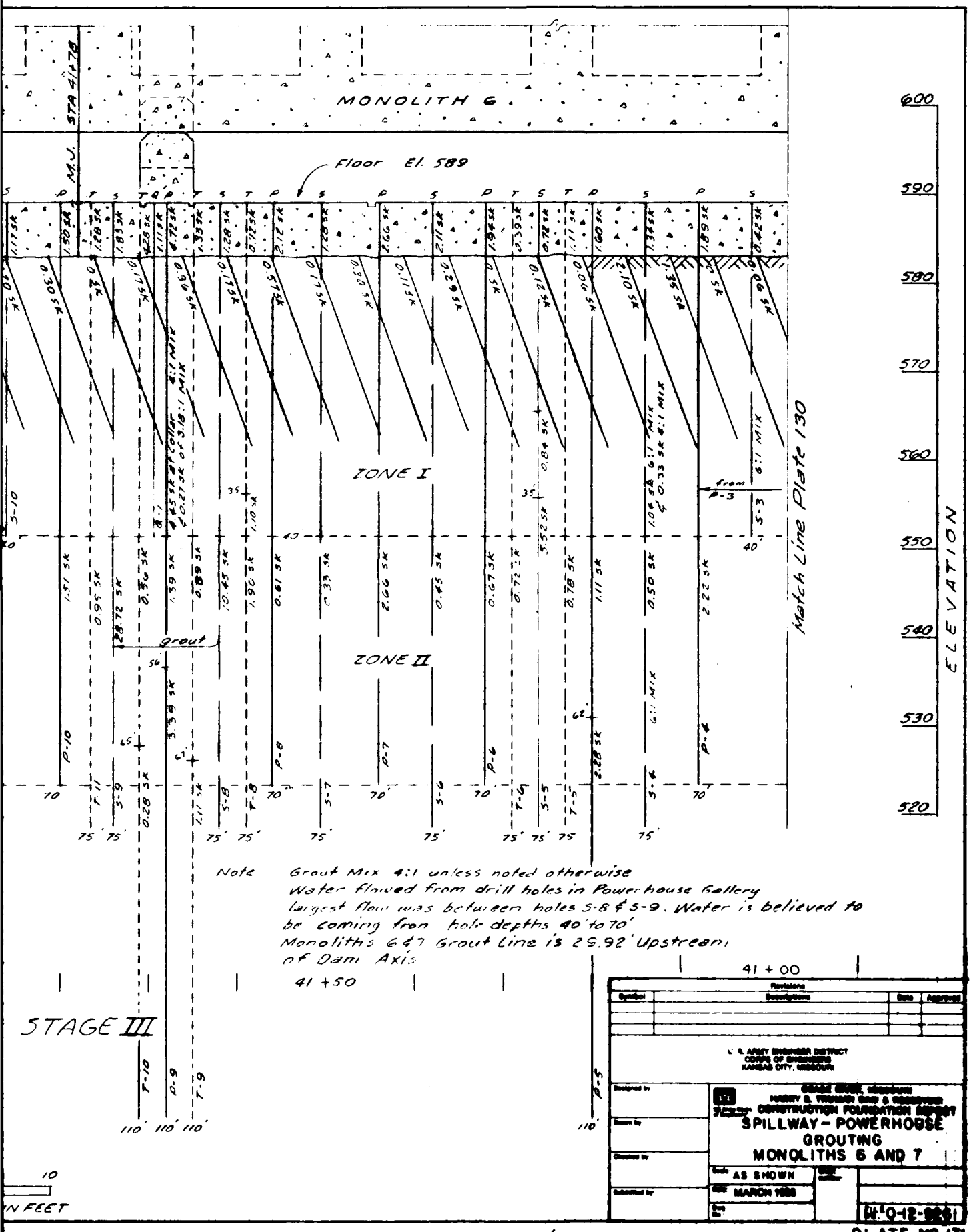
SPILLWAY - POWERHOUSE GROUTING STAGE III
MONOLITHS 6 AND 7

LOOKING DOWNSTREAM

STA 40+98 TO STA 42+61

Fall '73 to Spring 74

0 10
SCALE IN FEET



Note Grout Mix 4:1 unless noted otherwise
Water flowed from drill holes in Powerhouse Gallery
largest flow was between holes S-8 & S-9. Water is believed to
be coming from hole depths 40' to 70'
Monoliths 6 & 7 Grout Line is 29.92' Upstream
of Dam Axis

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

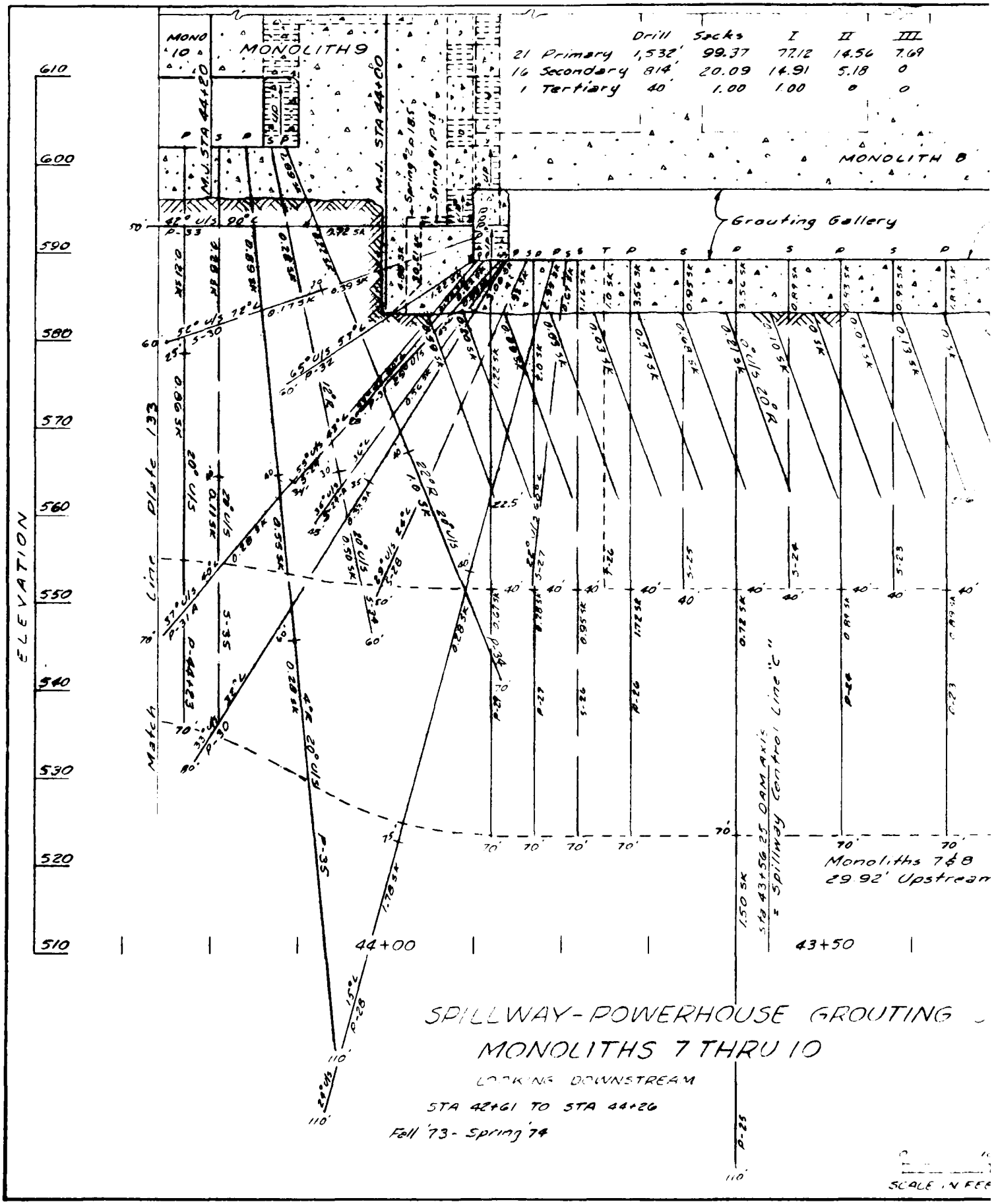
GRAND RIVER, OKLAHOMA
HUDSON G. THOMAS DAM & RESERVOIR
CONSTRUCTION FOUNDATION GROUT

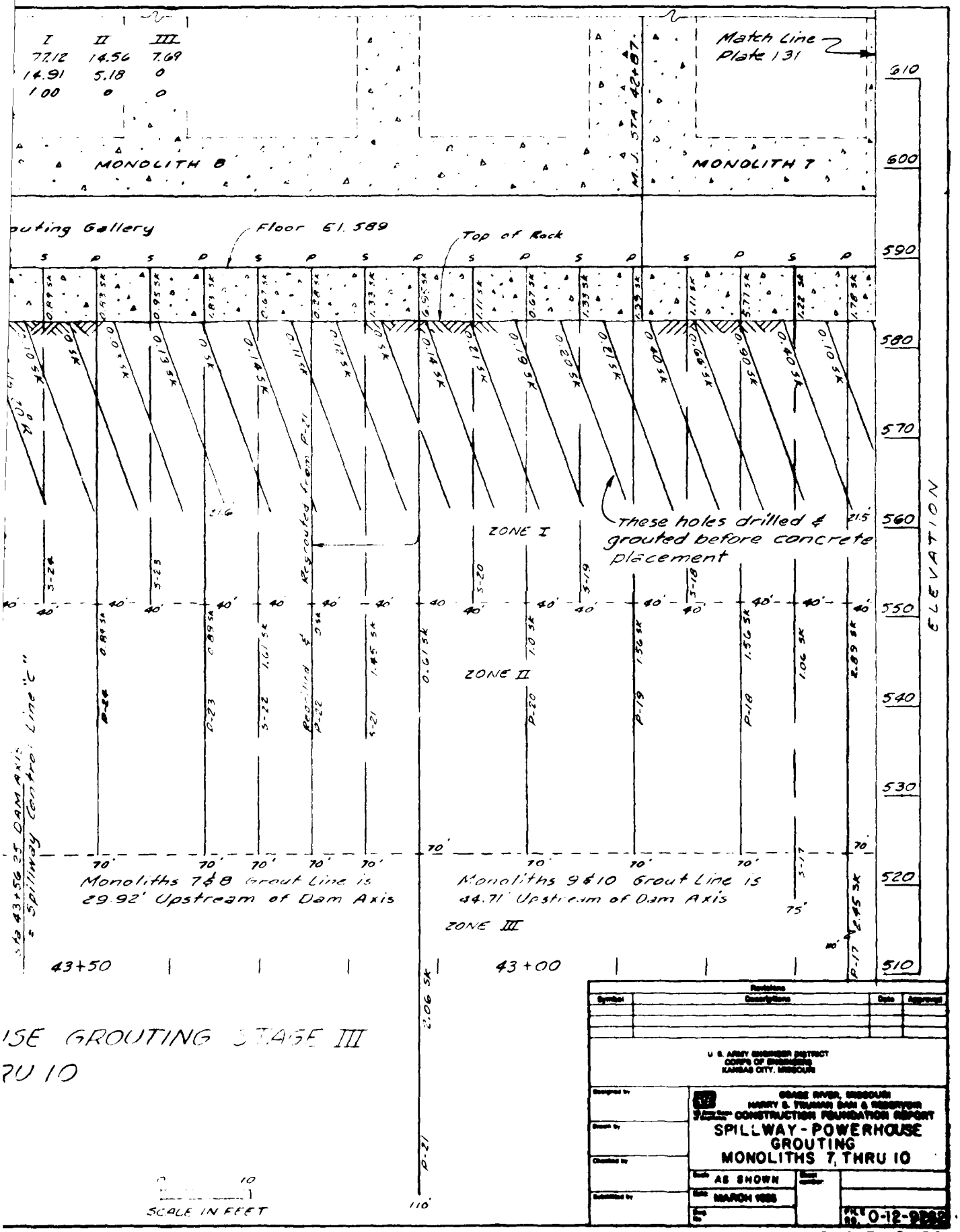
SPILLWAY - POWERHOUSE
GROUTING
MONOLITHS 6 AND 7

Designed by	
Drawn by	
Checked by	
Submitted by	
Scale AS SHOWN	
Date MARCH 1956	

KC-0-12-8881

PLATE NO. 131


MONO 10
MONOLITH 9
MONOLITH 8
M.J. STA 44+20
M.J. STA 44+00
Grouting Gallery
Drill Sacks I II III
21 Primary 1,532' 99.37 77.12 14.56 7.69
16 Secondary 814' 20.09 14.91 5.18 0
1 Tertiary 40' 1.00 1.00 0 0
ELEVATION
610
600
590
580
570
560
550
540
530
520
510
Match Line Plate 133
Match Line "C"
Spillway Control Line "C"
Sta 43+56.25 ORAM Axis
44+00
43+50
Monoliths 7 & 8
29.92' Upstream
SPILLWAY-POWERHOUSE GROUTING
MONOLITHS 7 THRU 10
LOOKING DOWNSTREAM
STA 42+61 TO STA 44+26
Fall '73 - Spring '74
SCALE: 1" = FEET



ISE GROUTING STAGE III
7U 10

Revisions			
Symbol	Descriptions	Date	Approved

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CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

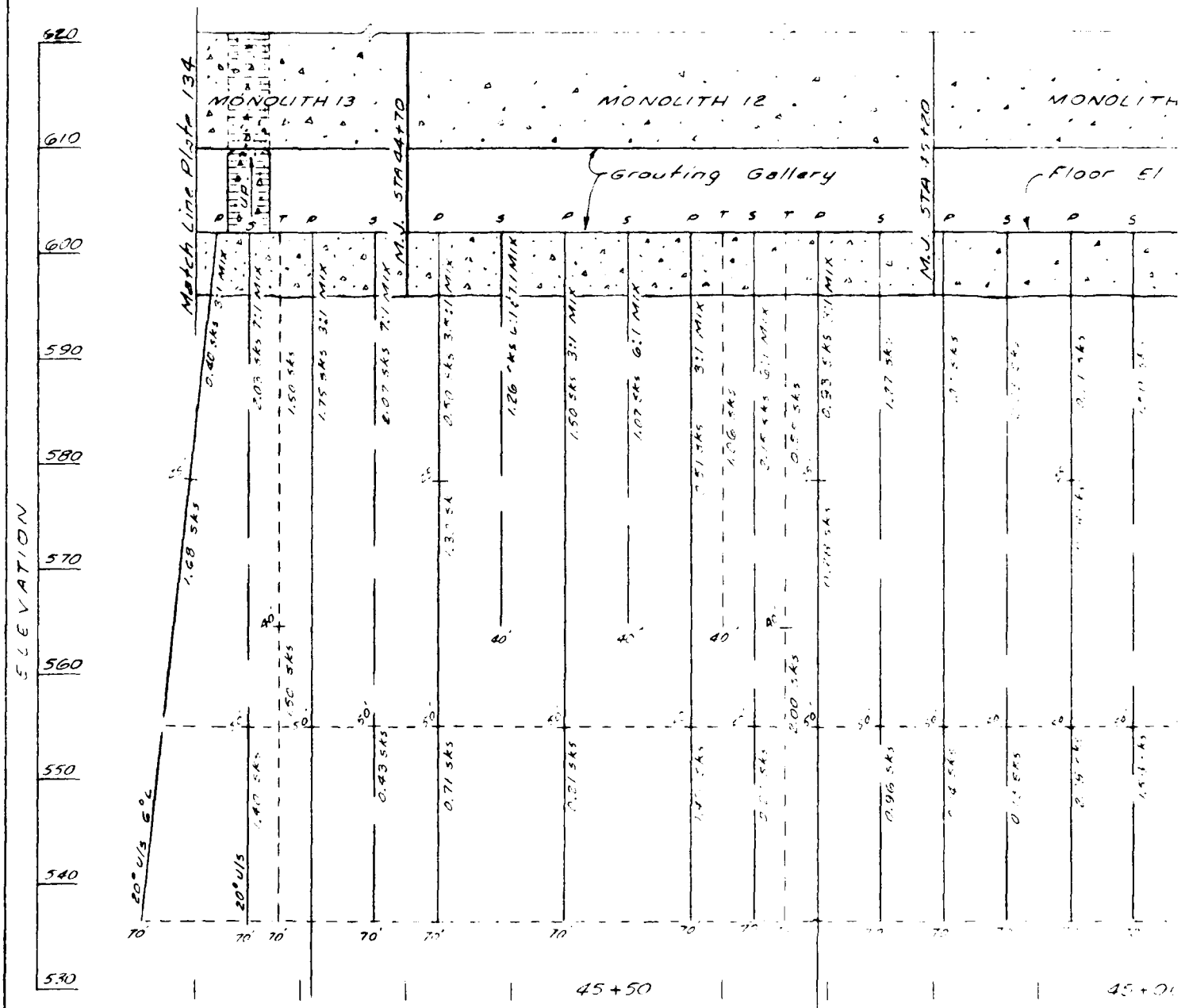
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HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

SPILLWAY - POWERHOUSE GROUTING
MONOLITHS 7, THRU 10

Scale AS SHOWN
Date MARCH 1966
Sheet number
File No. 0-12-9866

PLATE NO. 132

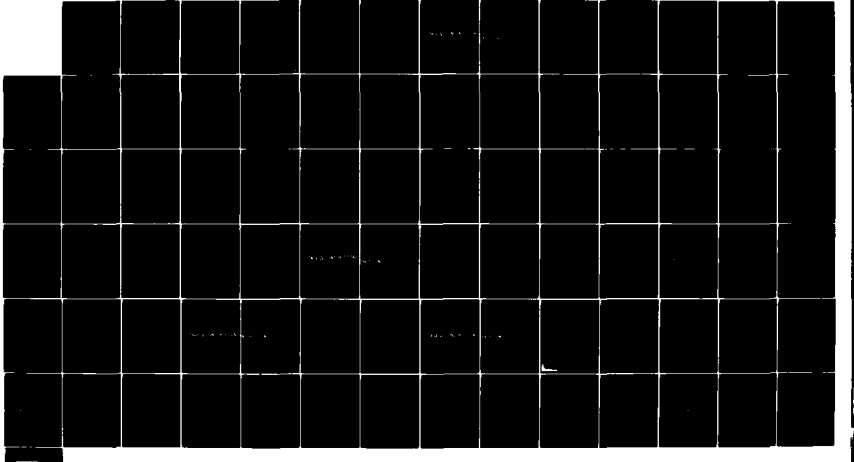


	Drill	Sacks	I	II	III
14 Primary	1,100'	30.53	16.41	12.06	2.06
14 Secondary	800'	23.07	17.40	5.67	0
5 Tertiary	280'	9.67	6.17	3.50	0

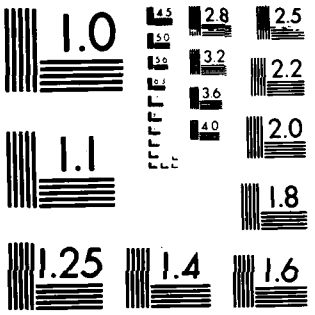
SPILLWAY-POWERHOUSE GROUTING STAGE
MONOLITHS 10 THRU 13
LOOKING DOWNSTREAM
STA 44+26 TO STA 45+90

AD-A154 456 OSAGE RIVER BASIN OSAGE RIVER MISSOURI HARRY S TRUMAN DAM & RESERVOIR MU..(U) CORPS OF ENGINEERS KANSAS CITY MO KANSAS CITY DISTRICT R F GRIFFITH ET AL. 1984 4/4

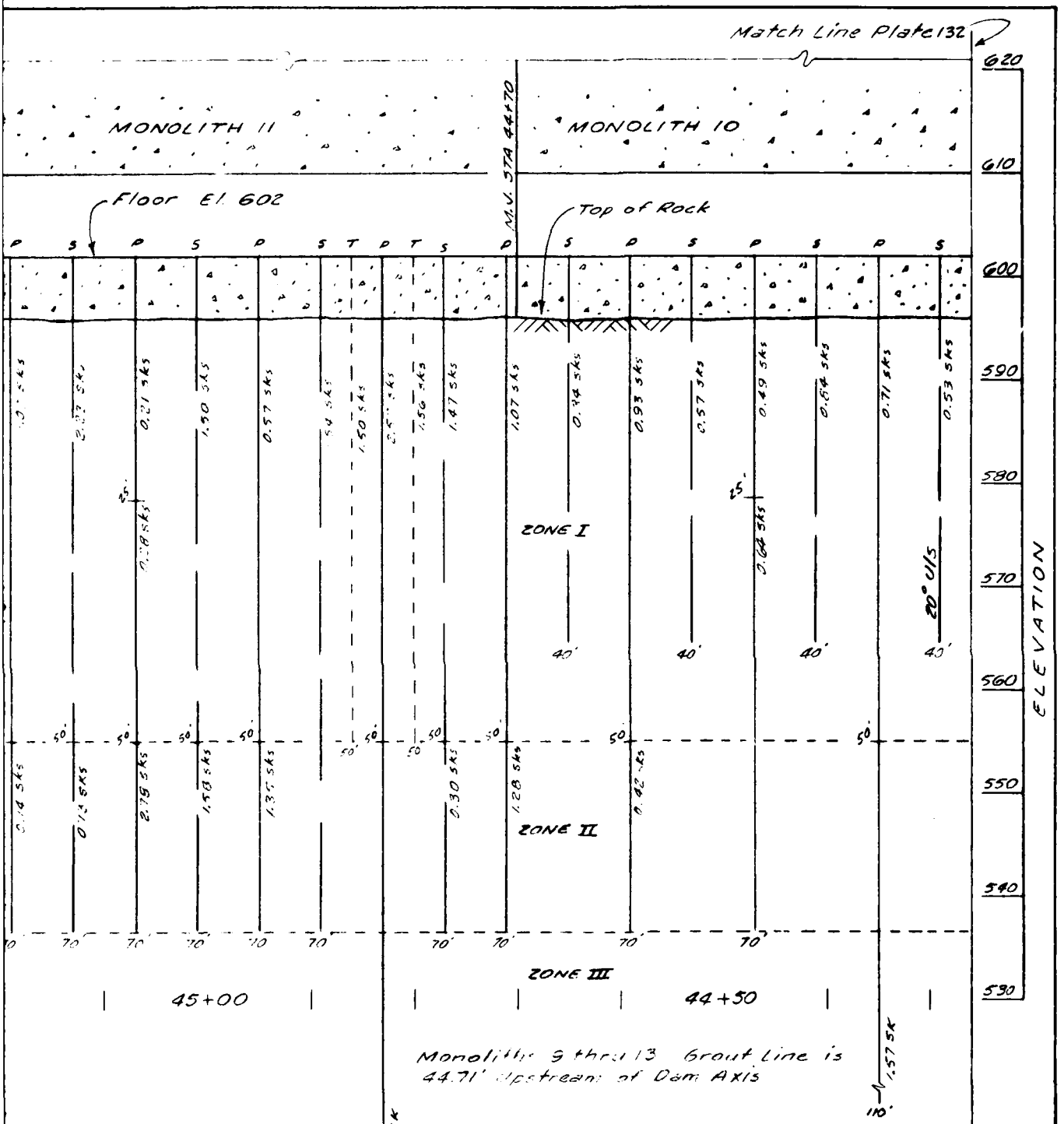
UNCLASSIFIED F/G 13/13 NL



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



TING STAGE III

SCALE IN FEET

Revisions			
Symbol	Description	Date	Approved

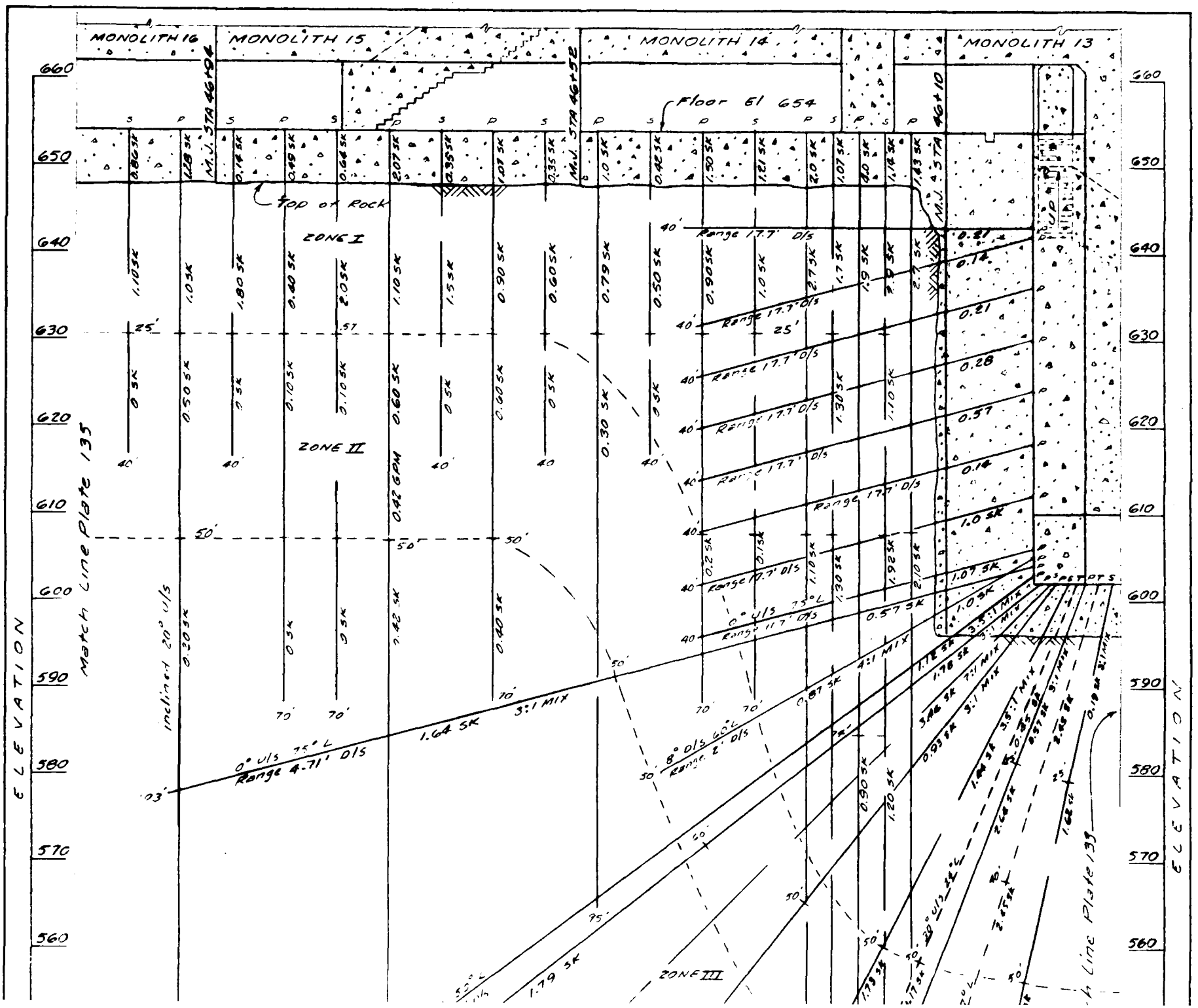
U S ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

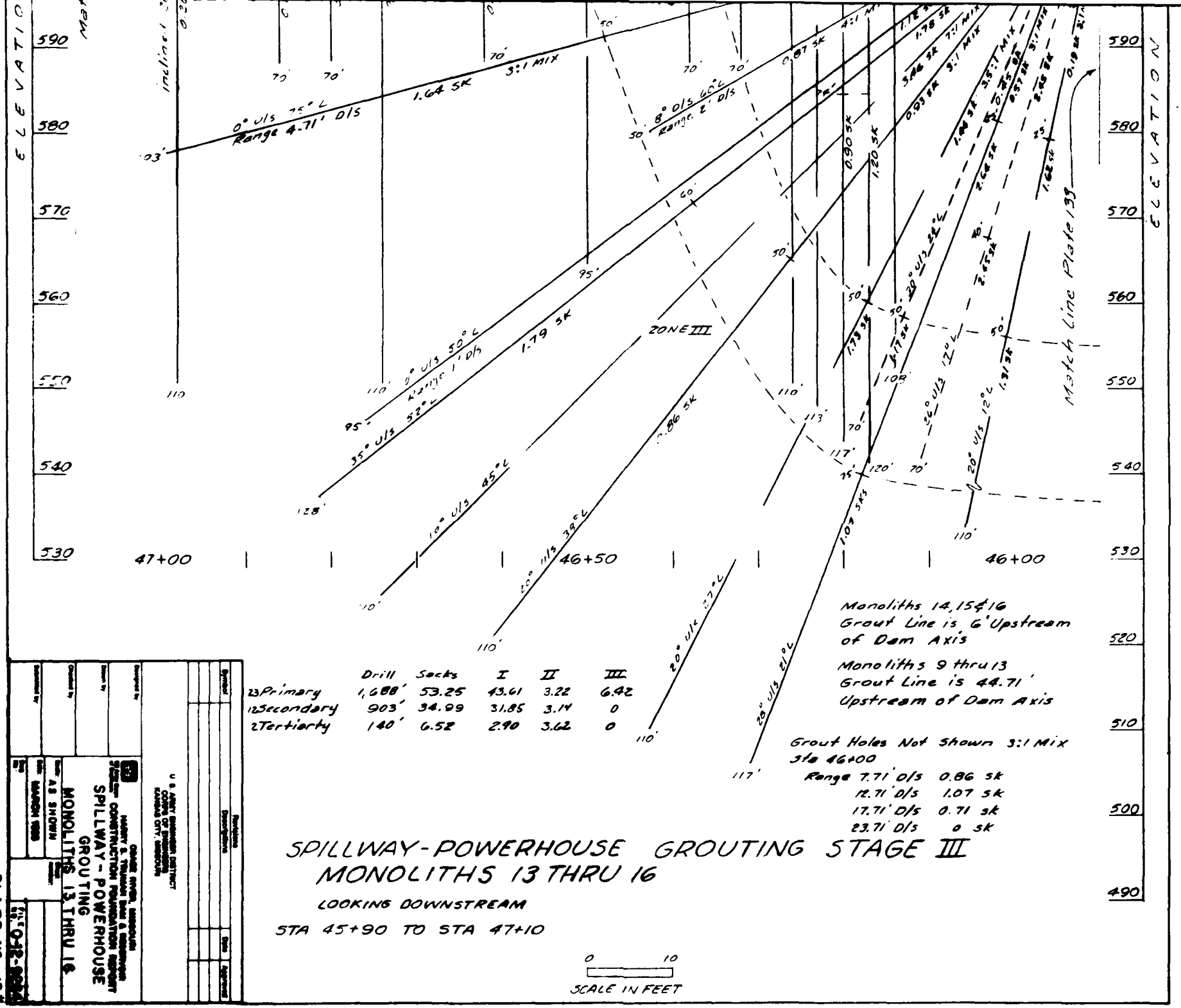
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HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT
SPILLWAY - POWERHOUSE
GROUTING
MONOLITHS 10 THRU 13

Scale AS SHOWN
Date MARCH 1956
File No. 0-12-9263

PLATE NO. 133


MONOLITH 16
MONOLITH 15
MONOLITH 14
MONOLITH 13
M.J. STA 46+94
M.J. STA 46+52
M.J. STA 46+10
Floor El 654
Top of Rock
ZONE I
ZONE II
ZONE III
Match Line Plate 135
ELEVATION
660
650
640
630
620
610
600
590
580
570
560
Range 17.7° D/S
0.42 GPM
1.64 SK
3:1 MIX
1.79 SK
0.90 SK
1.20 SK
0.57 SK
1.07 SK
1.0 SK
0.21
0.14
0.28
1.30 SK
1.10 SK
1.92 SK
2.10 SK
1.78 SK
2.65 SK
1.68 SK



	Drill	Sacks	I	II	III
23 Primary	1,688'	53.25	43.61	3.22	6.42
12 Secondary	903'	34.99	31.85	3.14	0
2 Tertiary	140'	6.52	2.90	3.62	0

Monoliths 14, 15 & 16
Grout Line is 6' Upstream of Dam Axis

Monoliths 9 thru 13
Grout Line is 44.71' Upstream of Dam Axis

Grout Holes Not Shown 3:1 Mix
Sta 46+00
Range 7.71' D/S 0.86 SK
12.71' D/S 1.07 SK
17.71' D/S 0.71 SK
23.71' D/S 0 SK

SPILLWAY-POWERHOUSE GROUTING STAGE III
MONOLITHS 13 THRU 16

LOOKING DOWNSTREAM

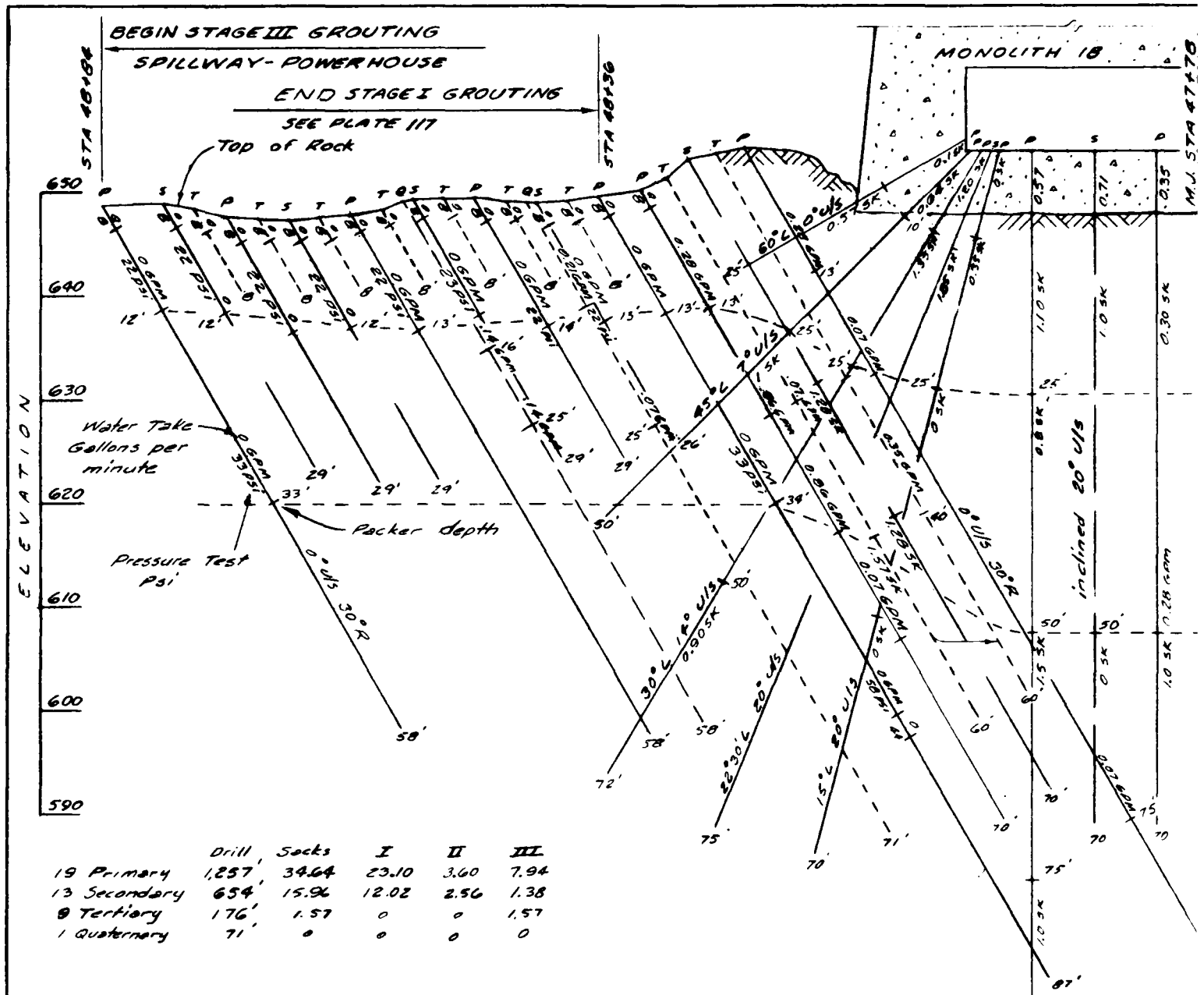
STA 45+90 TO STA 47+10

0 10
SCALE IN FEET

HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT
SPILLWAY - POWERHOUSE
GROUTING
MONOLITHS 13 THRU 16
AS SHOWN
MARCH 1960

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

PLATE NO. 134



	Drill	Sacks	I	II	III
19 Primary	1,257'	34.64	23.10	3.60	7.94
13 Secondary	654'	15.96	12.02	2.56	1.38
9 Tertiary	176'	1.57	0	0	1.57
1 Quaternary	71'	0	0	0	0

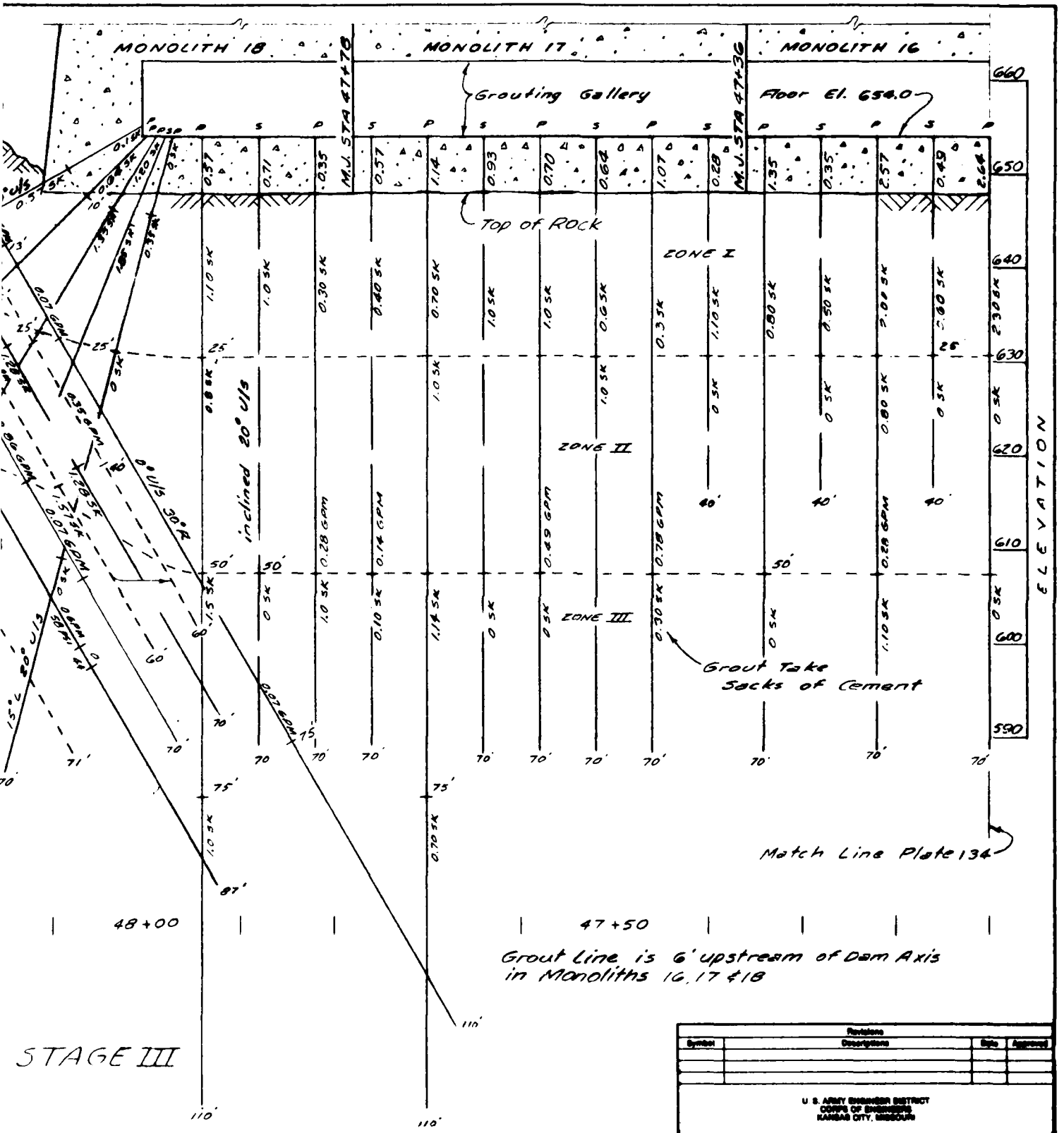
SPILLWAY - POWERHOUSE GROUTING STAGE III
MONOLITHS 16, 17 AND 18

LOOKING DOWNSTREAM

STA 47+10 TO STA 48+84

0 10

SCALE IN FEET



Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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Drawn by
Checked by
Submitted by

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

SPILLWAY - POWERHOUSE GROUTING MONOLITHS 16, 17 AND 18

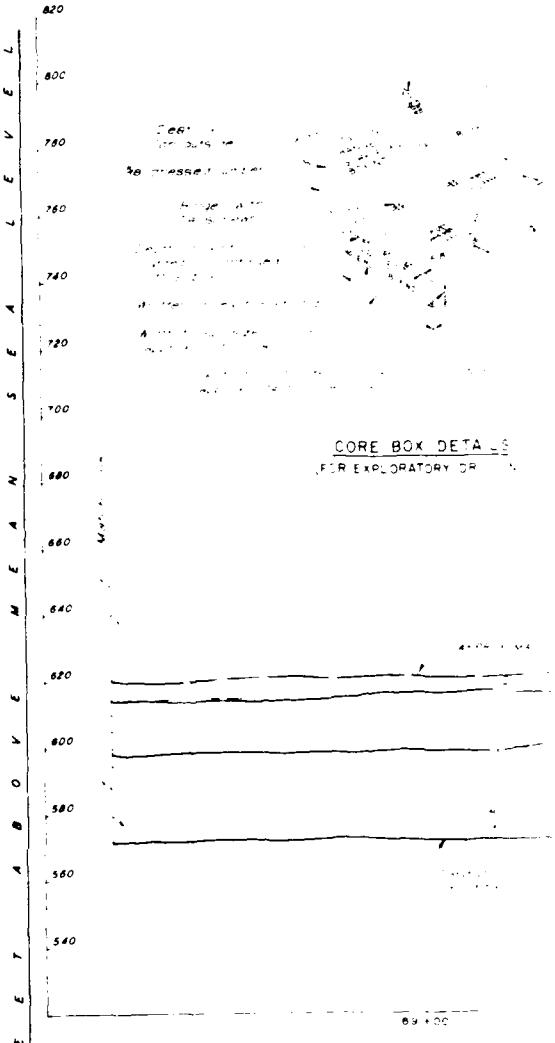
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Date: MARCH 1966
Sheet number:
File No. 0-12-9285

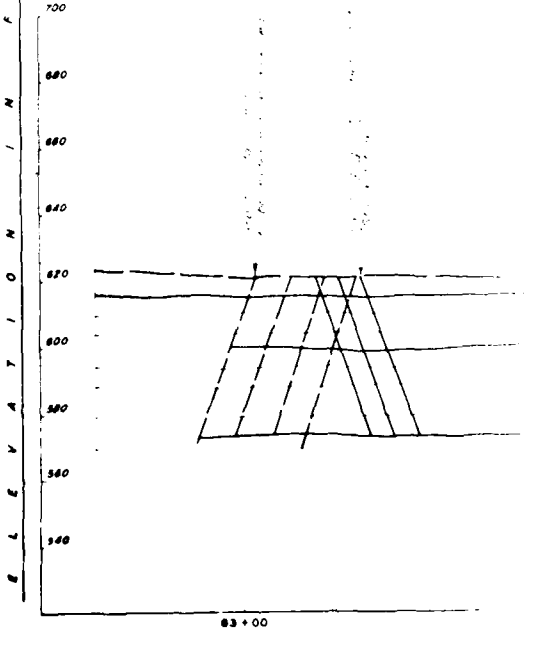
PLATE NO. 135

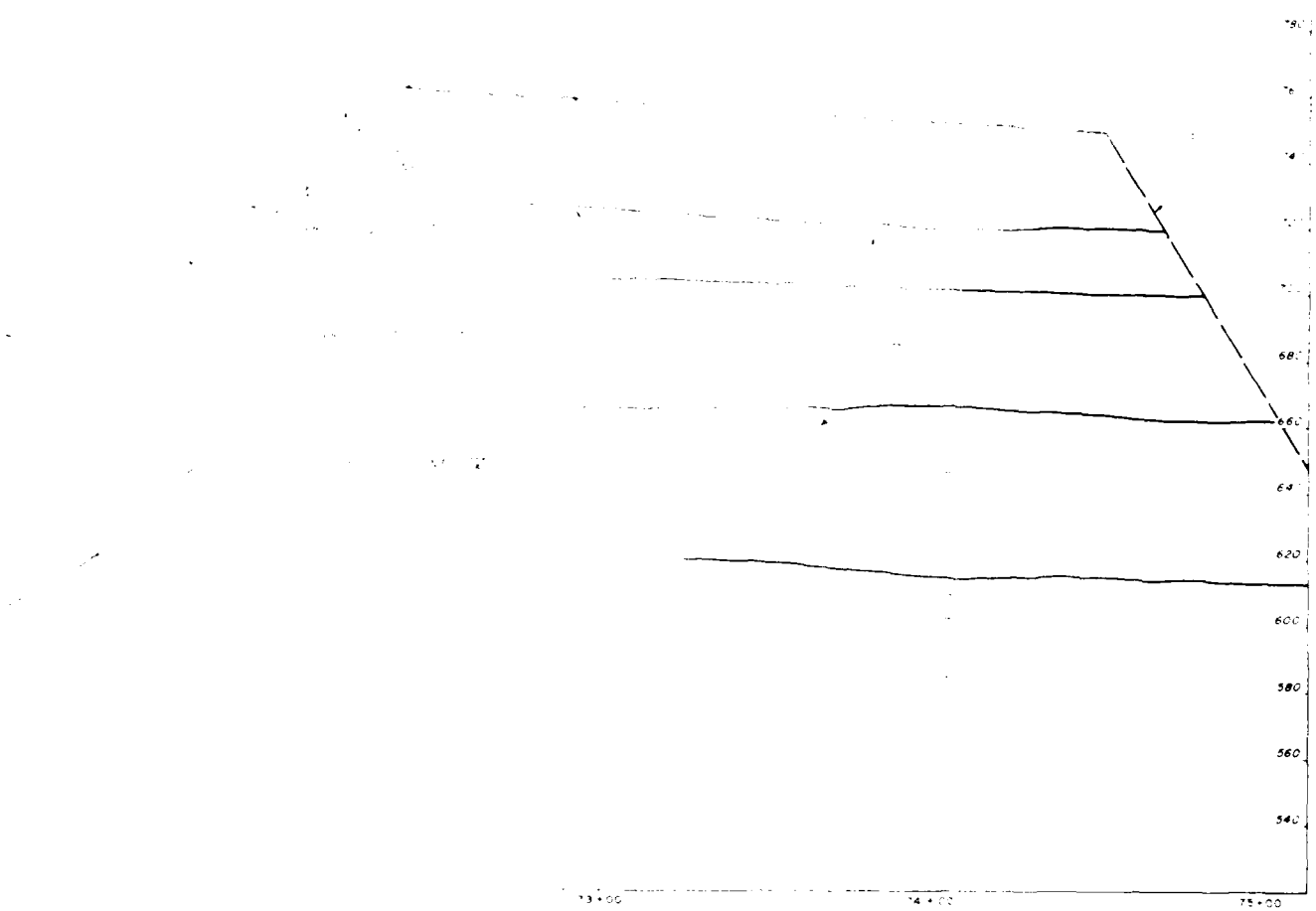
STAGE VI CONSTRUCTION

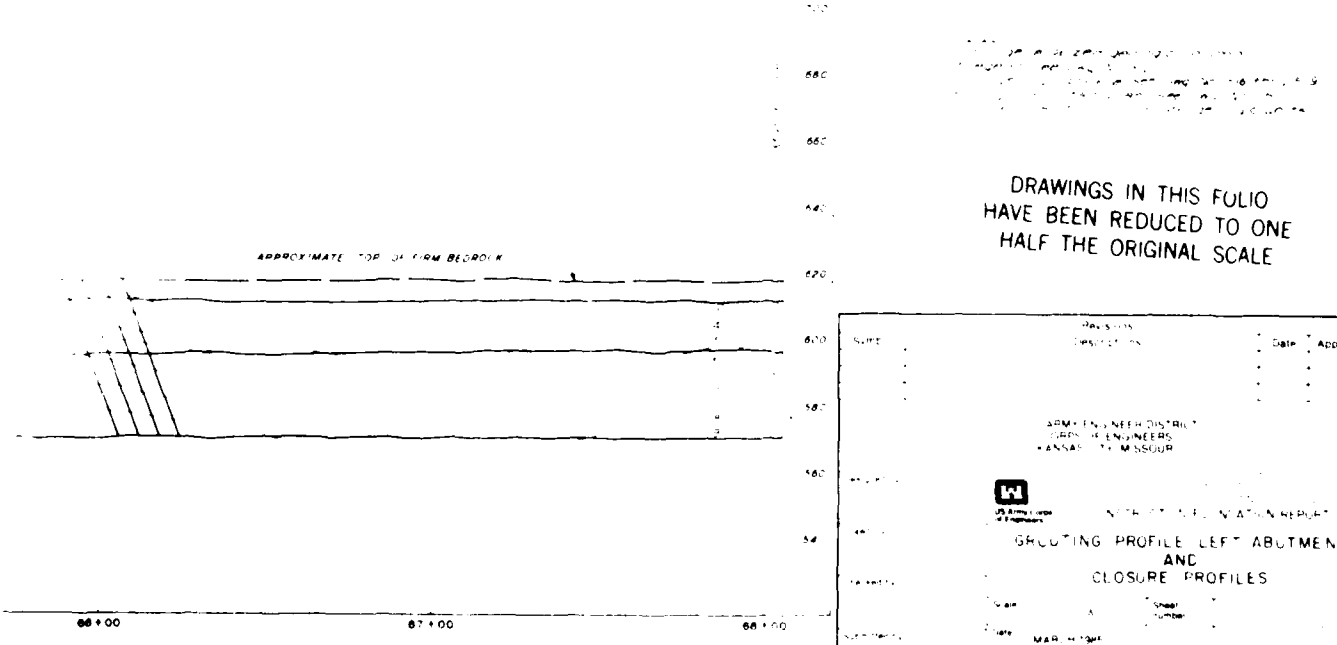
TRUCTION

CORE BOX DETAILS
FOR EXPLORATORY DR









DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE

SCALE | Revisions | Date | Approved

ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

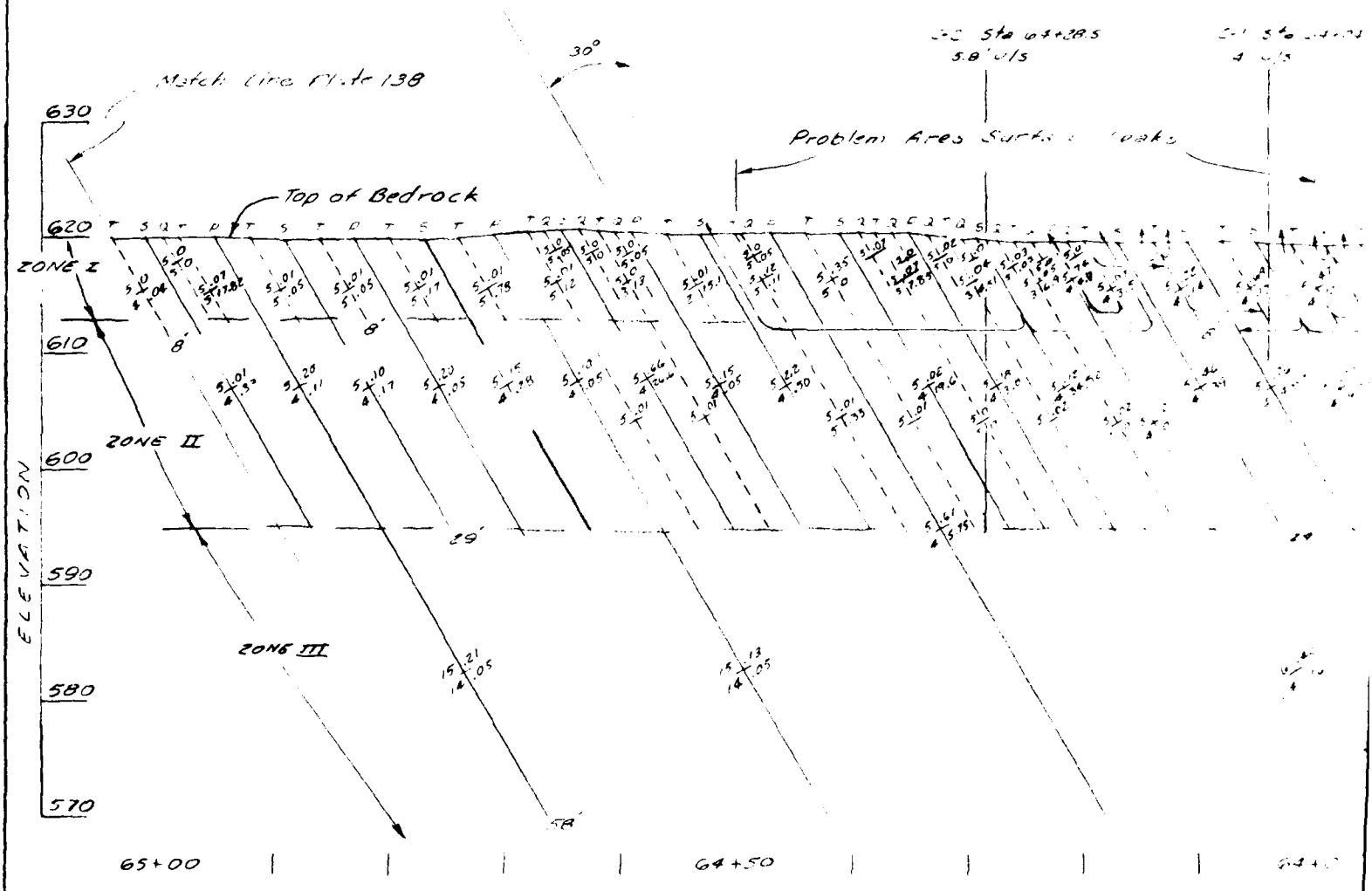
MISSOURI RIVER MAIN REPORT

GROUTING PROFILE LEFT ABUTMENT
AND
CLOSURE PROFILES

Design | Drawn | Sheet Number | Date | Check | MAR. H. Sept.

0-12-9266

PLATE NO 136



Pressure Test C-1
at 8' 5 Psi 0.06 CFM in 10 Min
at top 5 Psi 0.04 CFM in 10 Min

Pressure Test C-2
at 22' 16 Psi 0.01 CFM in 10 Min
at 12' 10 Psi 0.11 CFM in 10 Min
at 8' 6 Psi 0 CFM in 10 Min
at top 5 Psi 0.20 CFM in 5 Min
Grouting
at 8' 5 Psi 0.07 Sks in 30 Min
at top 4 Psi 6.12 Sks in 30 Min
Grout emitted at sta 64+28 & 4' U/S

While grouting 63+63 grout emitted at sta 63+69 & to D/S
During Pres Test at 63+77 at top & 8' water lost in 63+65 & 63+95 while grouting at the surface lost between 63+70 to 63+80
While grouting 63+78 from surface leaks at this hole & at 63+85
While grouting 63+70.5 grout emitted at other holes & 63+81 at other holes & 63+84 line 3 lost water while grouting 63+90 surface leaks within hole & hole at 63+84 D/S

While grouting 64+33 from surface leaks at 64+40 & 64+45 While grouting 64+30 leaks at 64+33 & D/S At top while grouting 64+25 leaks at sta 64+05 While grouting 64+25 leaks at sta line 2 & 3 at 64+28 & 64+30 lost water while grouting

STAGE VI GROUTING LINE STA 63+39 TO STA

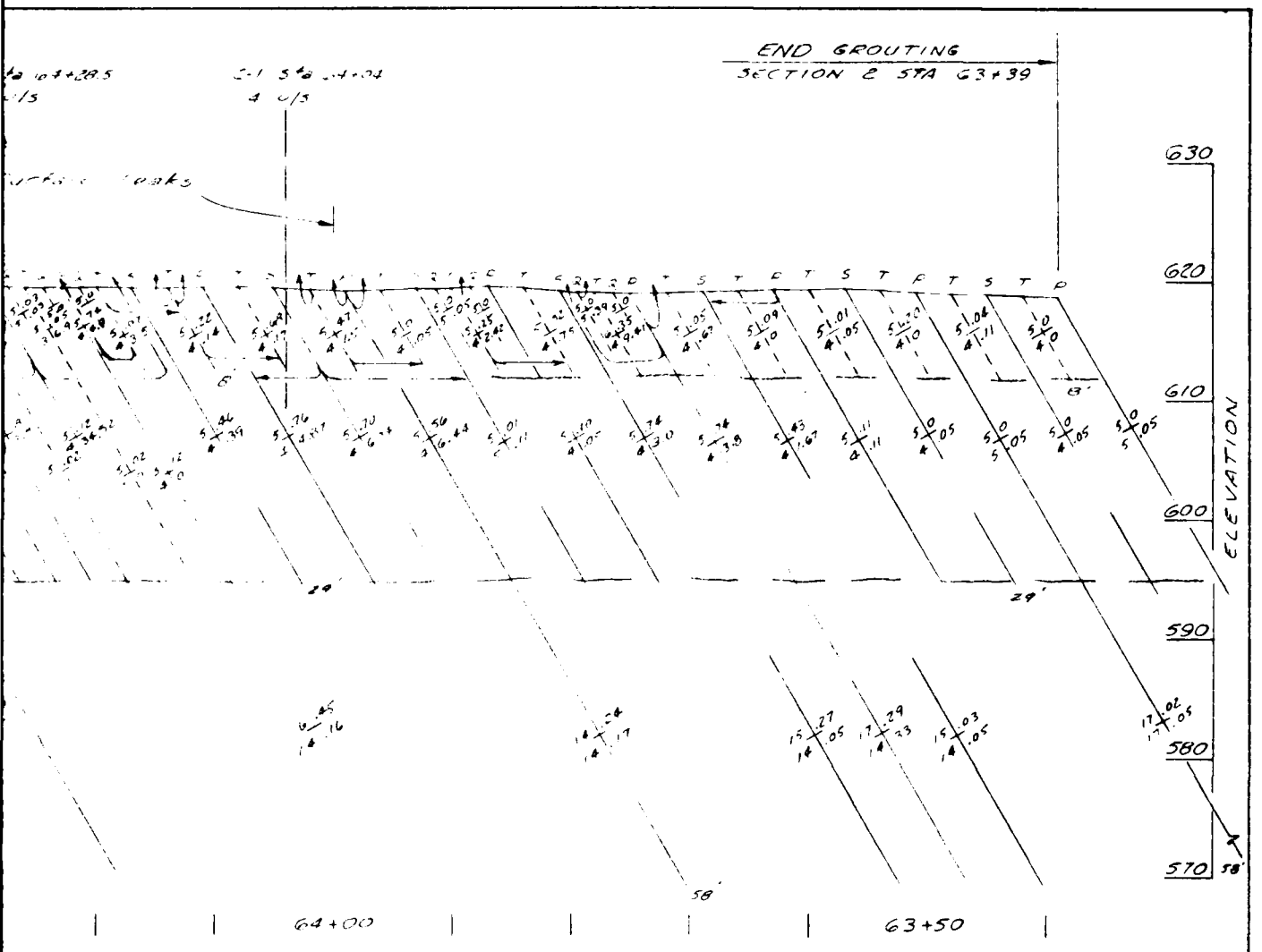
LOOKING DOWNSTREAM

Grout line is on Dam axis

For Legend See Plate 106

0 10

SCALE IN FEET



[illegible] grout @ 64+33 m[illegible] While grouting [illegible] leak at 63+96 & 4' o/s [illegible] 64+35 [illegible] While grout[illegible] 1+05 leaks 6'+0" & to 64+11. [illegible] grouting 64+[illegible] surface leaks [illegible] grouting 64+14 surface leak at [illegible] & 64+08 5' & 3' o/s. While grouting 64+33 leaks 64+14 & 3' u/s & 64+33 5' o/s [illegible] While grouting 64+63 grout [illegible] While grouting 64+63 leaks at 64+[illegible] & 64+53 on [illegible] & 64+38 & 64+56 leak & 64+37 on [illegible] many surface leaks.

While grouting 64+32 leaks at 64+38 4' u/s & 64+46 & 64+38. While grouting 64+35 leaks at surface between 64+53 line C & B & at 64+36 line B. While grouting 64+38 leaks at 64+26, 64+28, 64+32 64+44 & C-2. While grouting 64+68 leaks 5' o/s to 12' u/s & 64+70 5' u/s. While grouting 64+98 leaks at 65+04, 65+10 10' u/s & 65+01 5' & 12' u/s.

96'

	Drill	Sacks	I	II	III
14 Primary	637'	30.25	4.90	18.63	6.72
14 Secondary	464'	93.71	0	93.61	0.10
14 Tertiary	371'	97.53	97.20	0.33	0

63+39 TO STA 65+04

10

EET

Revisions			
Symbol	Descriptions	Date	Approved

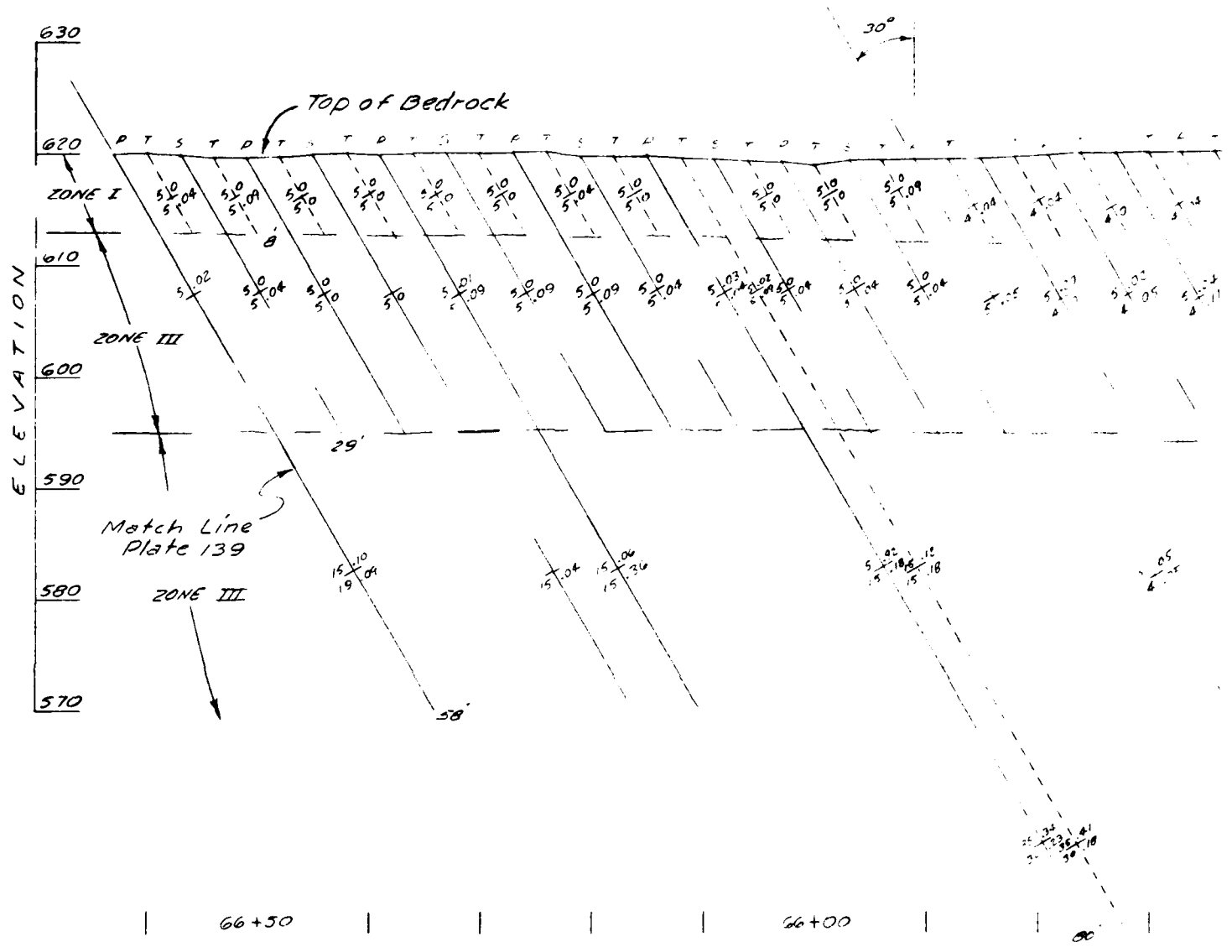
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CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

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Submitted by

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT
GROUTING LINE C
STA. 63+39 TO STA. 64+04

Scale: AS SHOWN
Date: MARCH 1965
Sheet number:
Dwg No: 96-0-12-9267

PLATE NO. 137



	Drill	Sacks	I	II	III
14 Primary	652'	1.25	0	0.04	1.68
13 Secondary	435'	1.25	0	1.08	0.17
27 Tertiary	288'	1.05	0.60	0.00	0.36

STAGE VI GROUTING LINE STA 65+04 TO STA 66

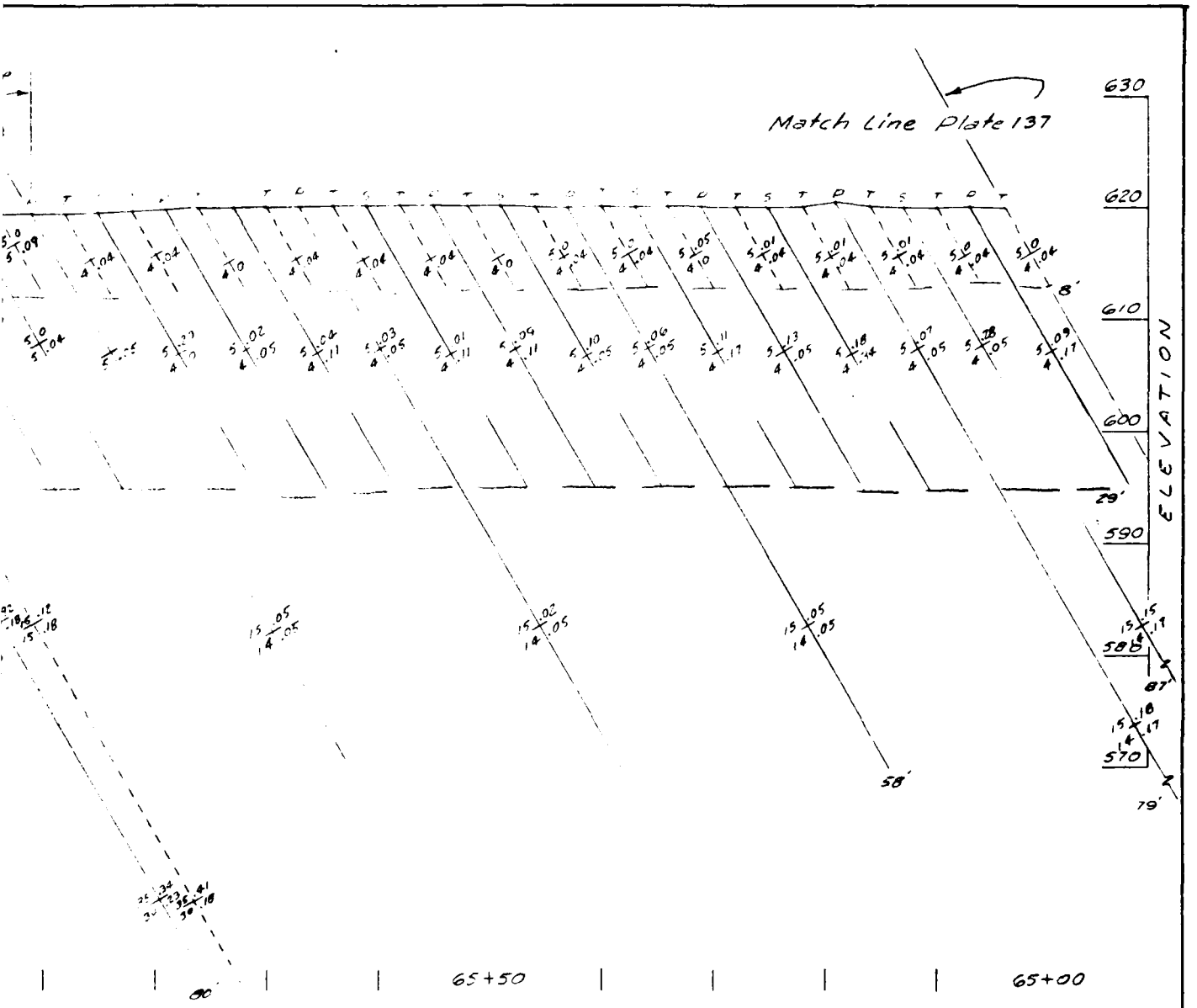
LOOKING DOWNSTREAM

Grout Line ... Dam Axis

For Legend See Plate 106

0 10

SCALE IN FEET



STA 65+04 TO STA 66+63

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CONSTRUCTION FOUNDATION REPORT

GROUTING LINE C
STA. 65+04 TO STA. 66+63

Scale AS SHOWN

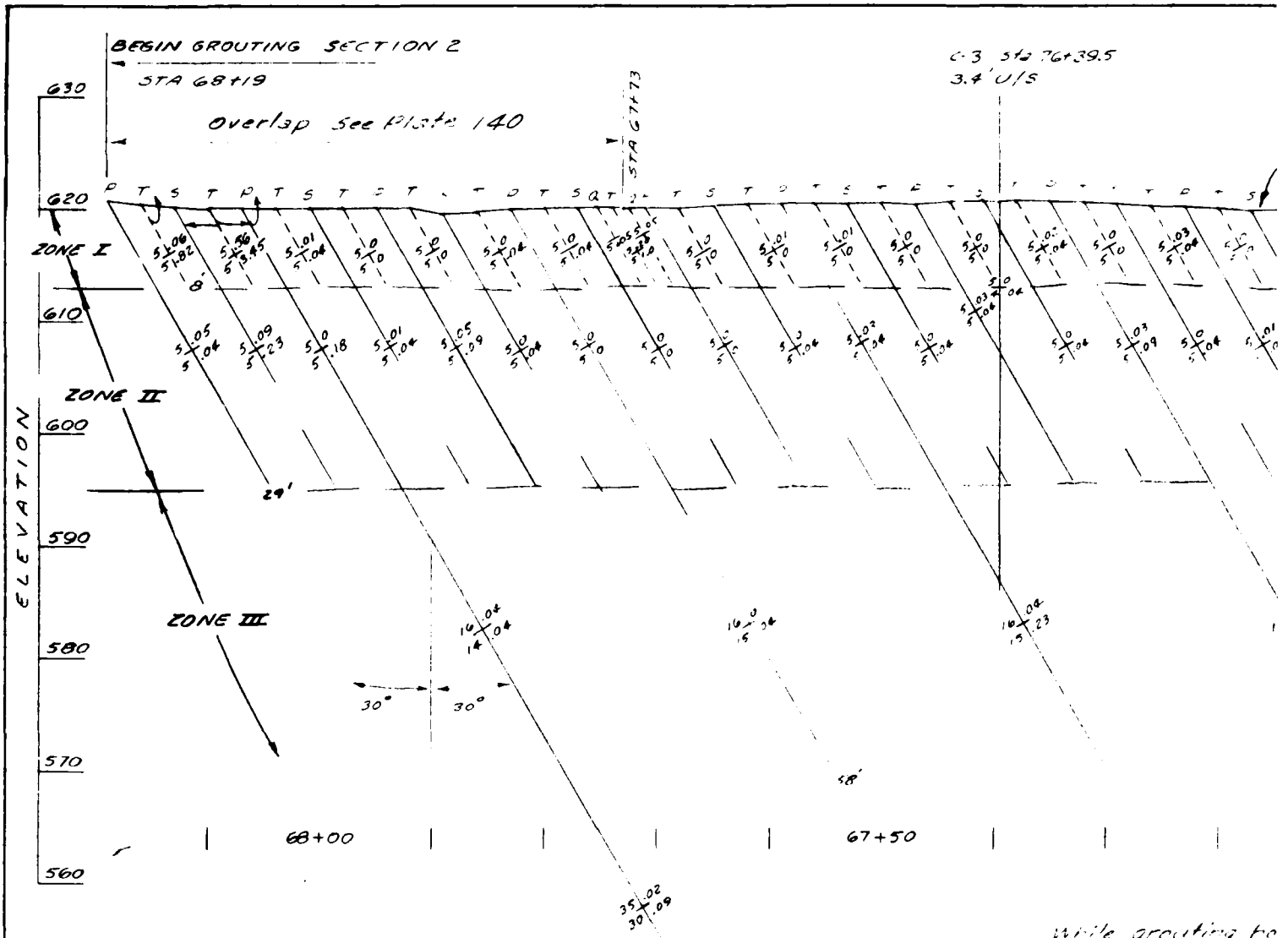
Date MARCH 1966

Sheet number

Drawing No.

File No. 0-12-9266

PLATE NO. 138



	Drill	Sacks	I	II	III
13 Primary	607'	1.51	0	0.60	0.91
13 Secondary	377'	0.55	0	0.55	0
26 Tertiary	208'	4.75	4.75	0	0
2 Quaternary	16'	0.10	0.10	0	0

While grouting ho
from nipples at GA
While grouting hole
68+16 on line

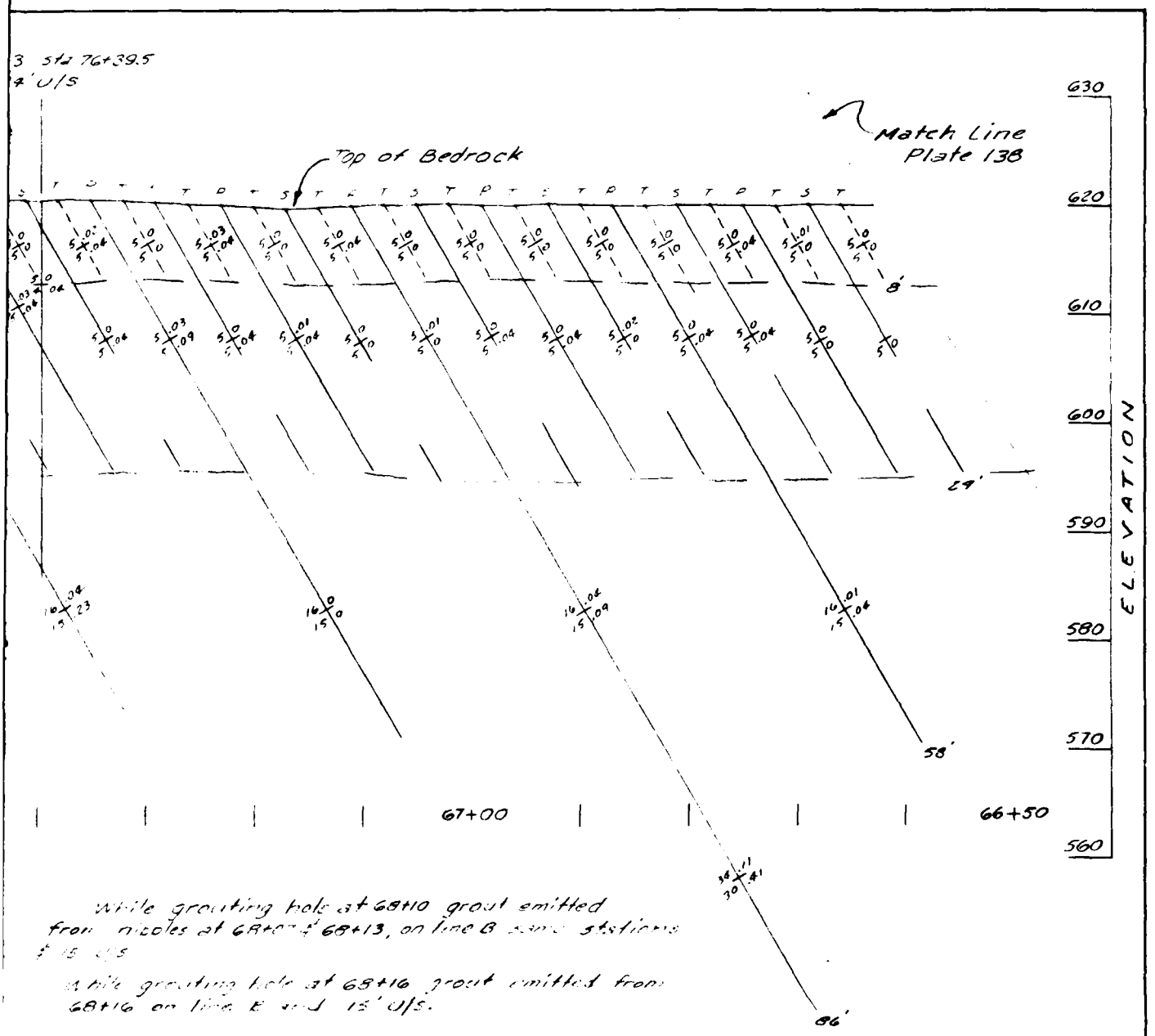
STAGE VI GROUTING LINE C STA 66+63 TO

LOOKING DOWNSTREAM

Grout Line is on Dam Axis

For Legend See Plate 06

0 10
SCALE IN FEET



While grouting hole at 68+10 grout emitted from nipples at 68+07 & 68+13, on line B same stations 5' U/S

While grouting hole at 68+16 grout emitted from 68+16 on line E and J 15' U/S.

STA 66+63 TO STA 68+19

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10
FEET

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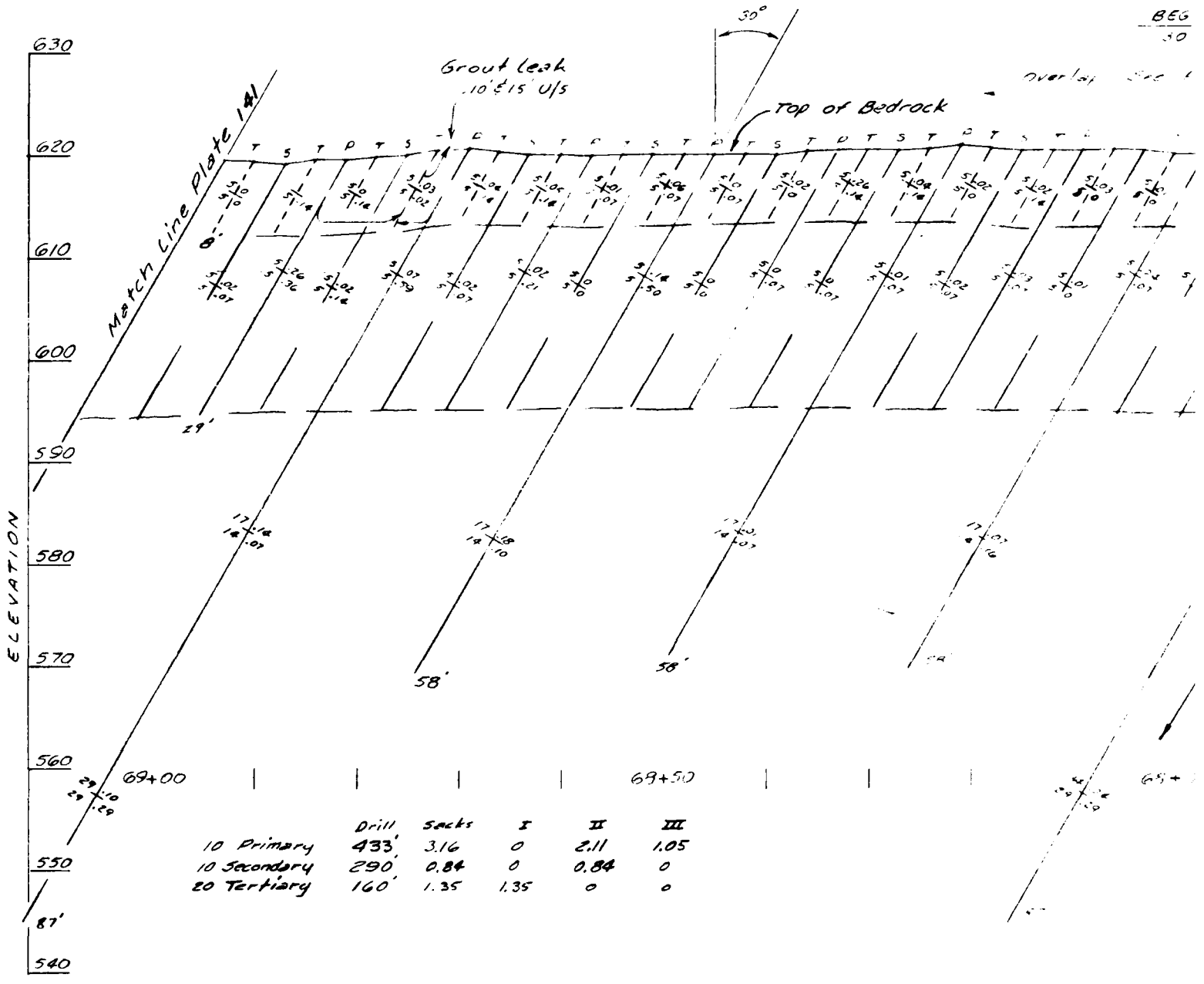
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GROUTING LINE C
STA. 66+63 TO STA. 68+19

Scale: AS SHOWN
Date: MARCH 1958
Sheet number:
Drawing No.
FILE NO. 0-12-9269

PLATE NO. 139



STAGE VI GROUTING LINE C STA 67+73 TO STA

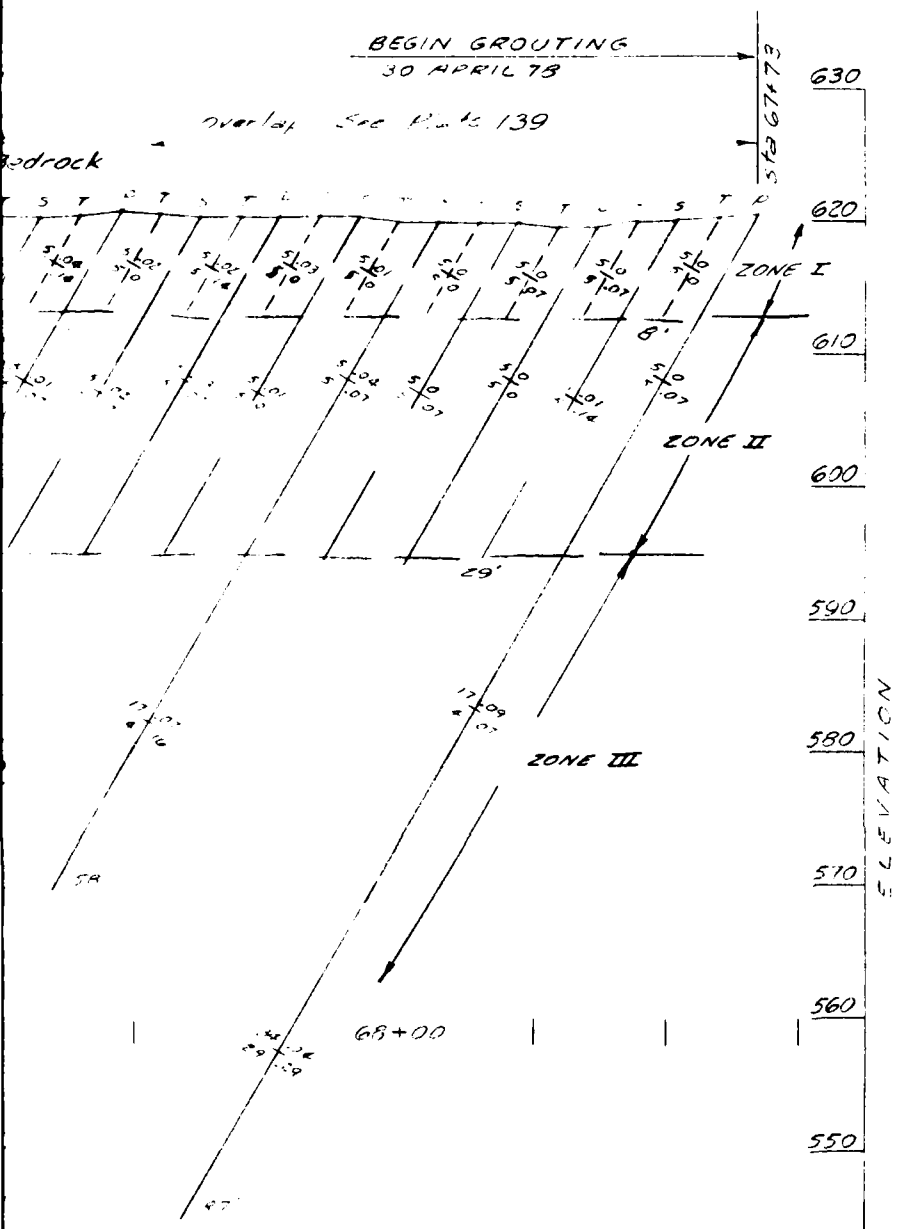
LOOKING DOWNSTREAM

Grout Line is on Dam Axis

For Legend See Plate 106

0 10

SCALE IN FEET



STA 67+73 TO STA 68+93

Revisions			
Symbol	Descriptions	Date	Approved

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CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

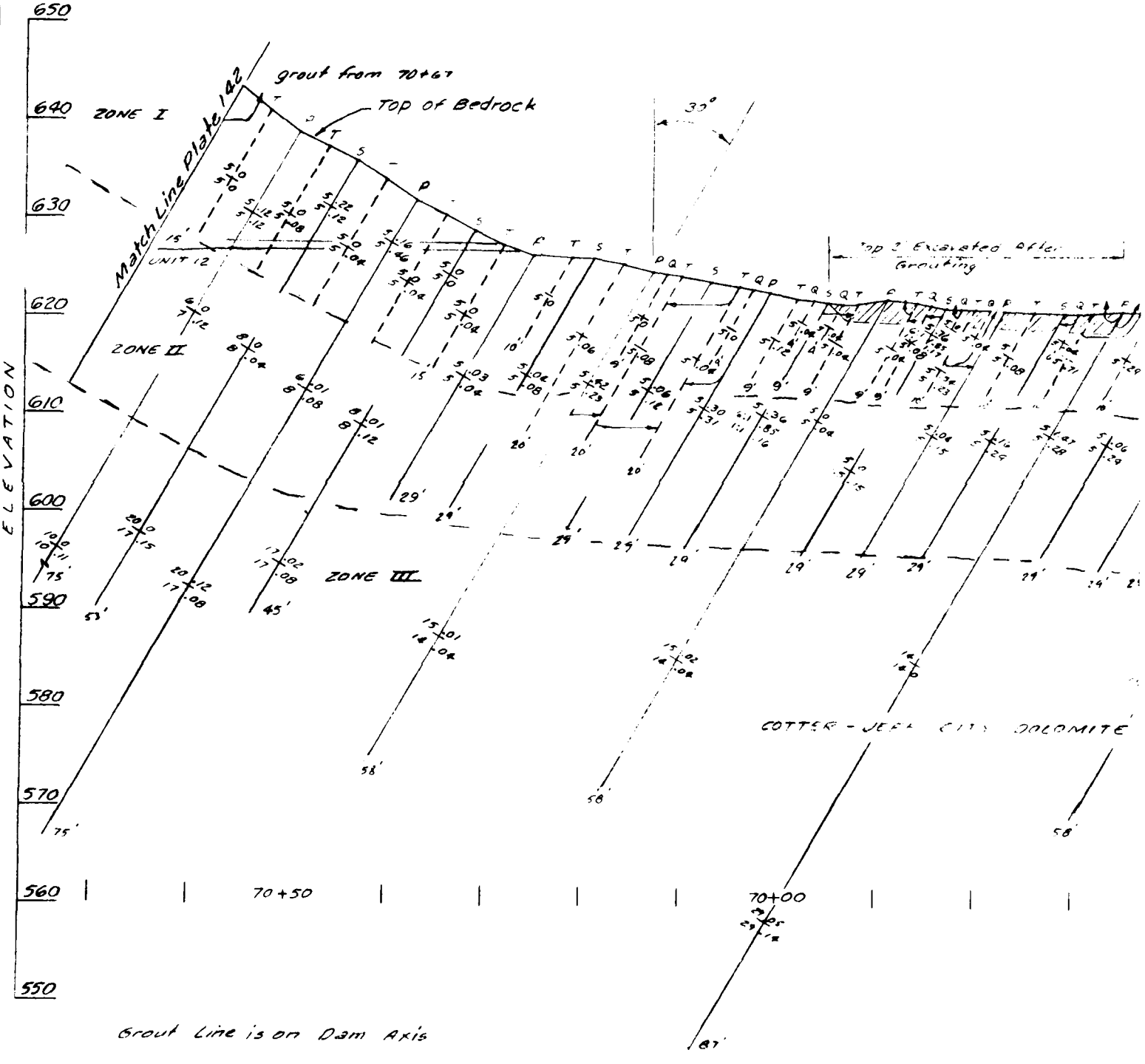
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GROUTING LINE C
STA. 67+73 TO STA. 68+93

Scale: AS SHOWN
Date: MARCH 1986
Sheet number
Drawing No.
File No. 0-12-9270

PLATE NO. 140



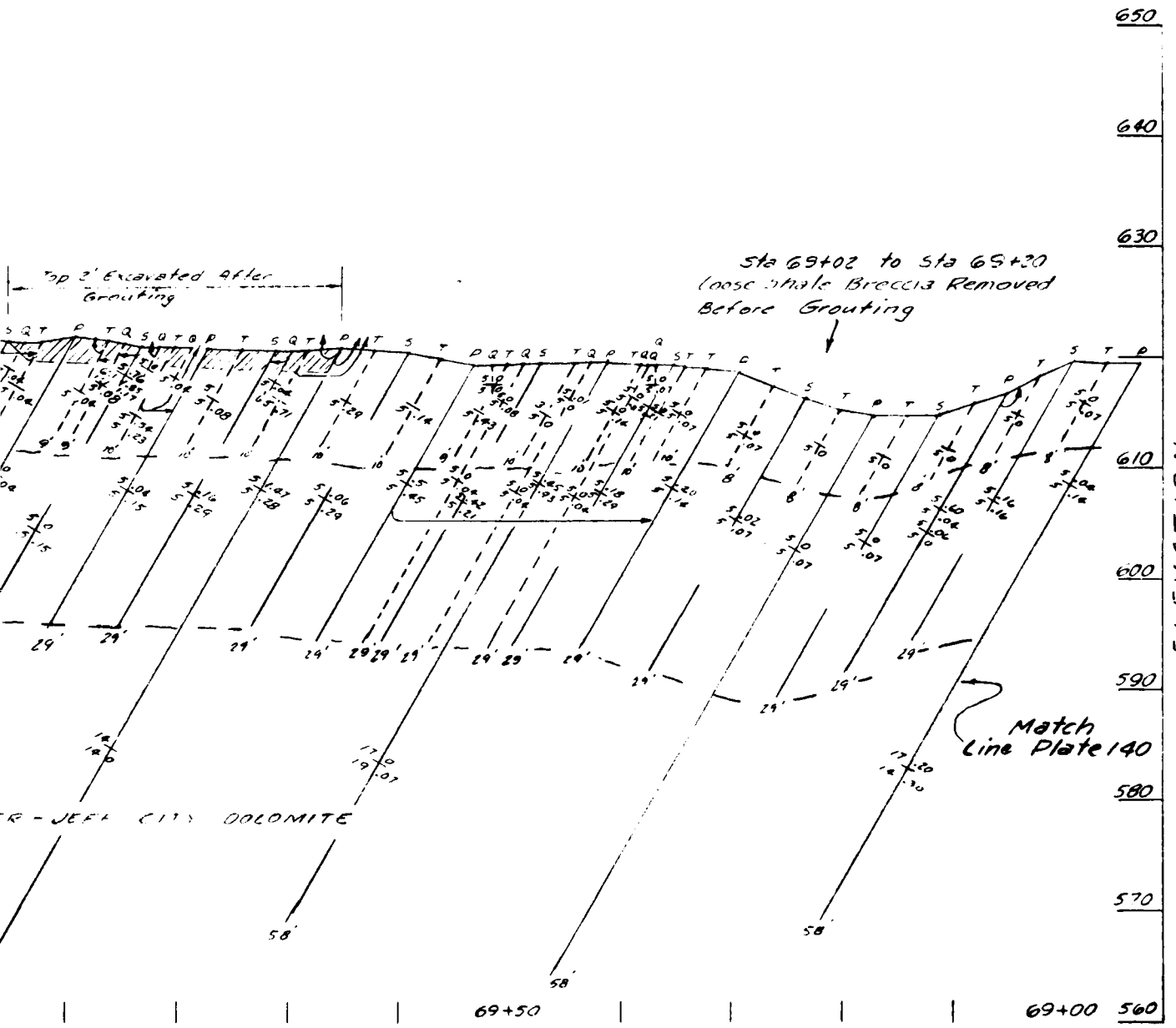
Grout Line is on Dam Axis

STAGE VI GROUTING LIFT ST-1 FROM 69+32 TO 67+

LOOKING DOWNSTREAM

For Legend See Plate 106

	Drill	Sacks	I	II	III
14 Primary	701'	4.63	0.58	3.27	0.78
13 Secondary	417'	6.98	3.35	2.90	0.23
28 Tertiary	319'	3.36	3.36	0	0
14 Quaternary	165'	1.21	1.17	0.04	0



OT-1 STA 68+93 TO STA 70+55

STREAM

0 10

SCALE IN FEET

Revisions			
Symbol	Descriptions	Date	Approved

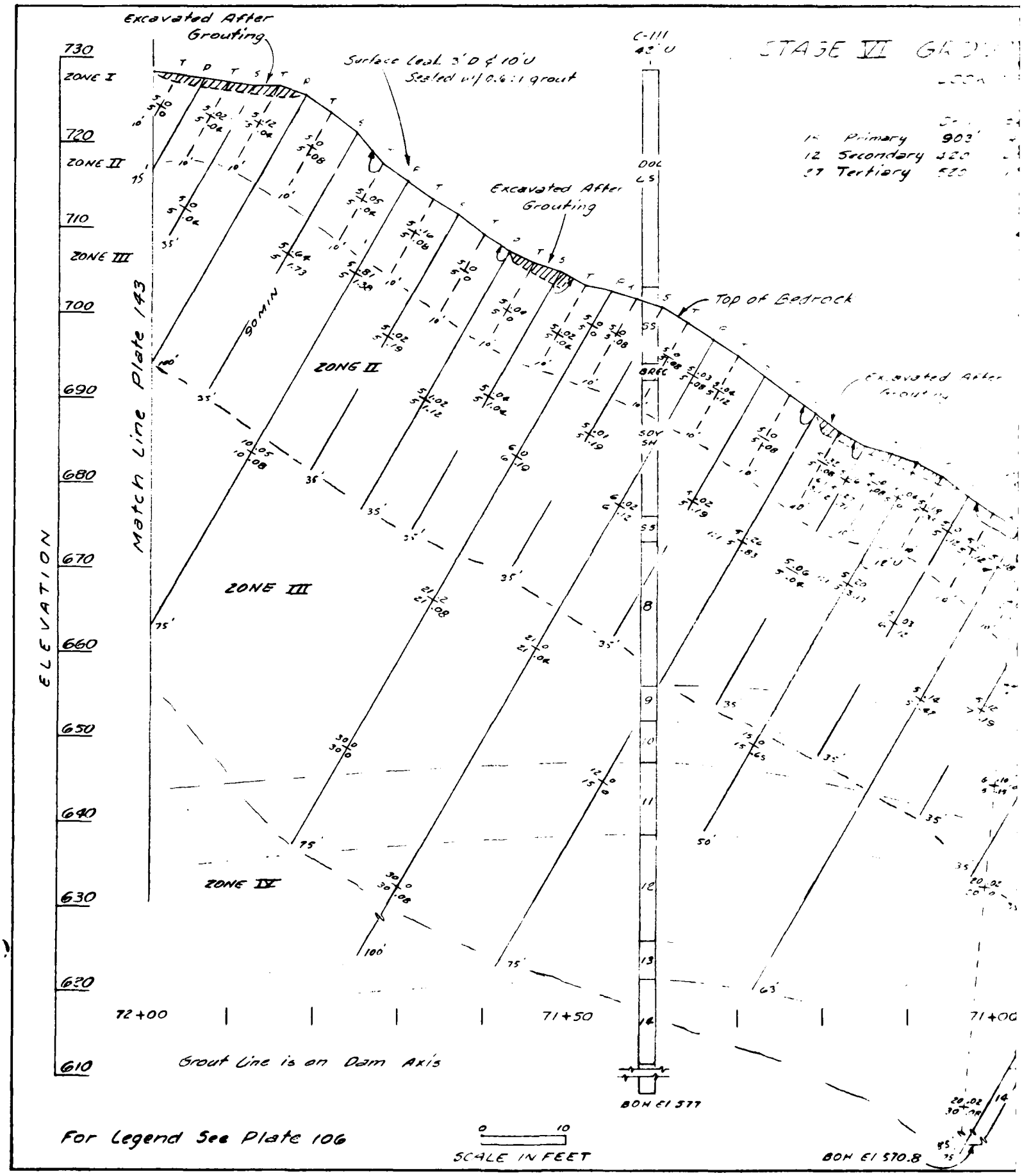
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KANSAS CITY, MISSOURI

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CONSTRUCTION FOUNDATION REPORT

GROUTING LINE C
STA. 68+93 TO STA. 70+55

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Scale AS SHOWN
Date MARCH 1966
Sheet number
Dwg No.
File No. 0-12-9271

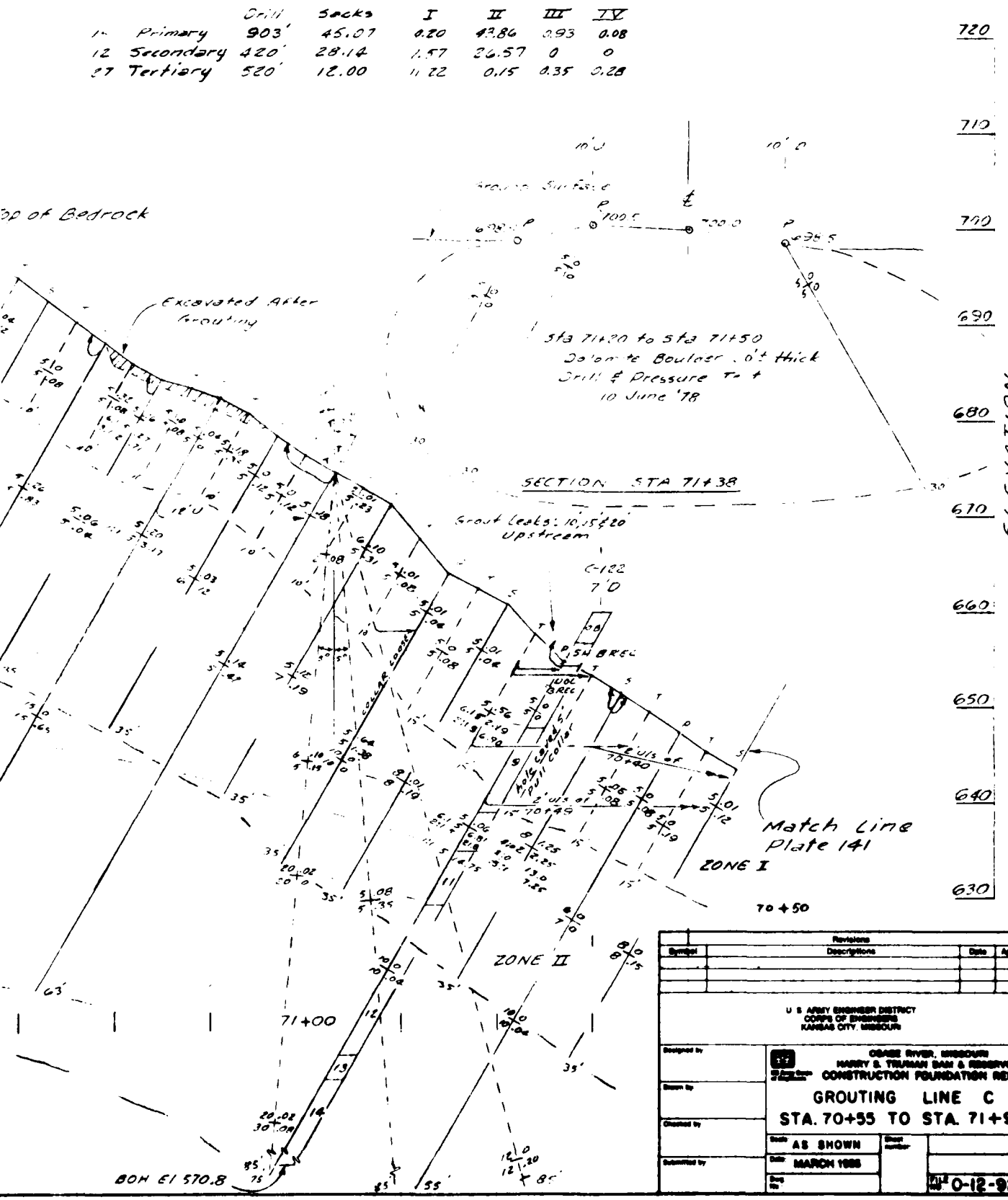
PLATE NO. 141


Excavated After Grouting
Surface Seal 3'D & 10'U Sealed w/ 0.6:1 grout
Excavated After Grouting
Top of Bedrock
C-111
42'U
STAGE VI
1° Primary 903'
2° Secondary 322
3° Tertiary 522
ZONE I
ZONE II
ZONE III
ZONE IV
ZONE II
ZONE III
ZONE IV
90 MIN
Match Line Plate 143
ELEVATION
730
720
710
700
690
680
670
660
650
640
630
620
610
72+00
71+50
71+00
Grout Line is on Dam Axis
BOH El 577
BOH El 570.8
For Legend See Plate 106
0
10
SCALE IN FEET

STAGE VI GROUTING LINE C STA 70+55 TO STA 71+99

LOOKING DOWNSTREAM

		Drill	Sacks	I	II	III	IV
1	Primary	903'	45.07	0.20	43.86	0.93	0.08
12	Secondary	420'	28.14	1.57	26.57	0	0
27	Tertiary	520'	12.00	11.22	0.15	0.35	0.28



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CONSTRUCTION FOUNDATION REPORT

GROUTING LINE C
STA. 70+55 TO STA. 71+99

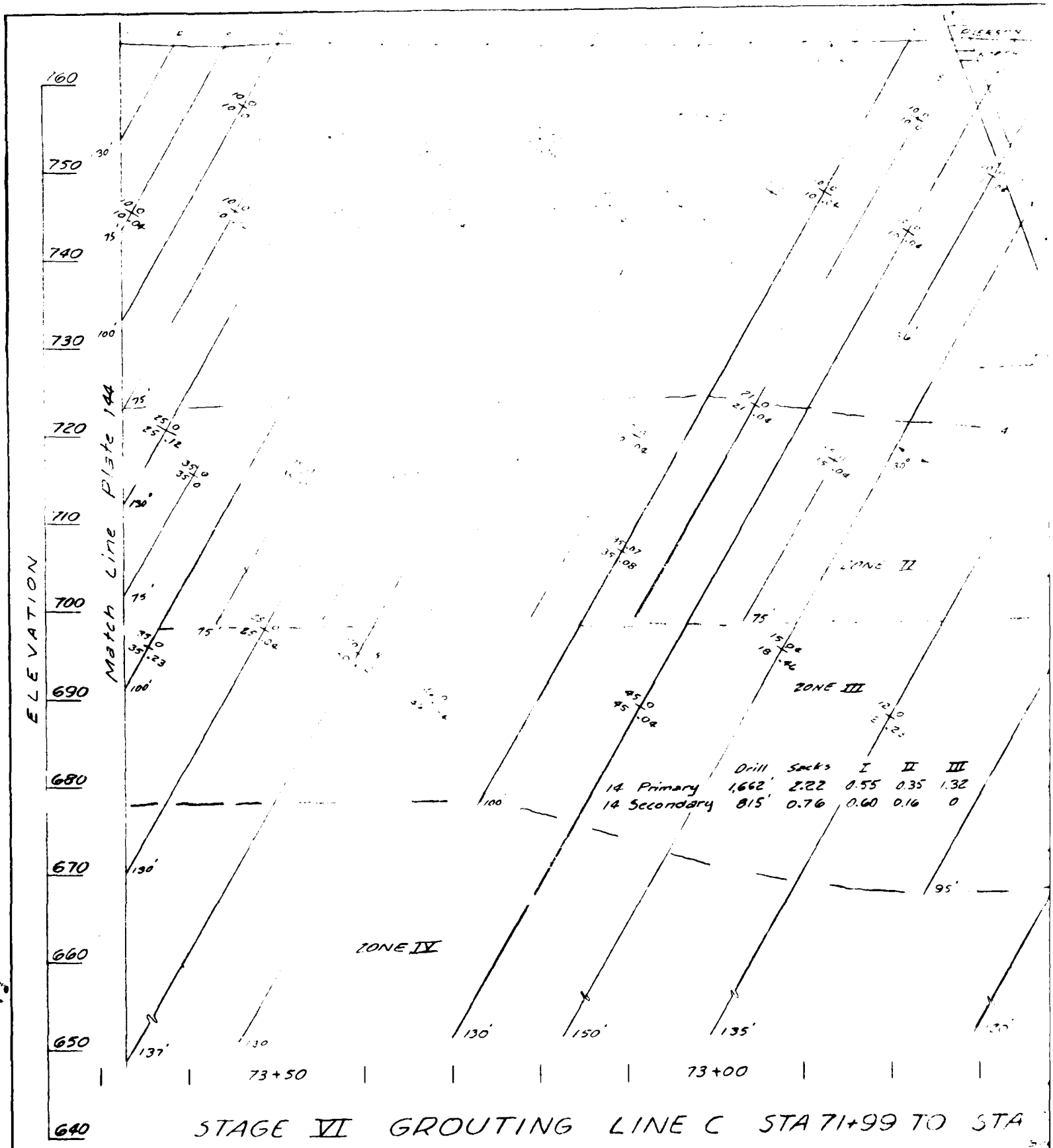
Scale AS SHOWN

Date MARCH 1985

Sheet number

Drawing No. 0-12-9272

PLATE NO. 142



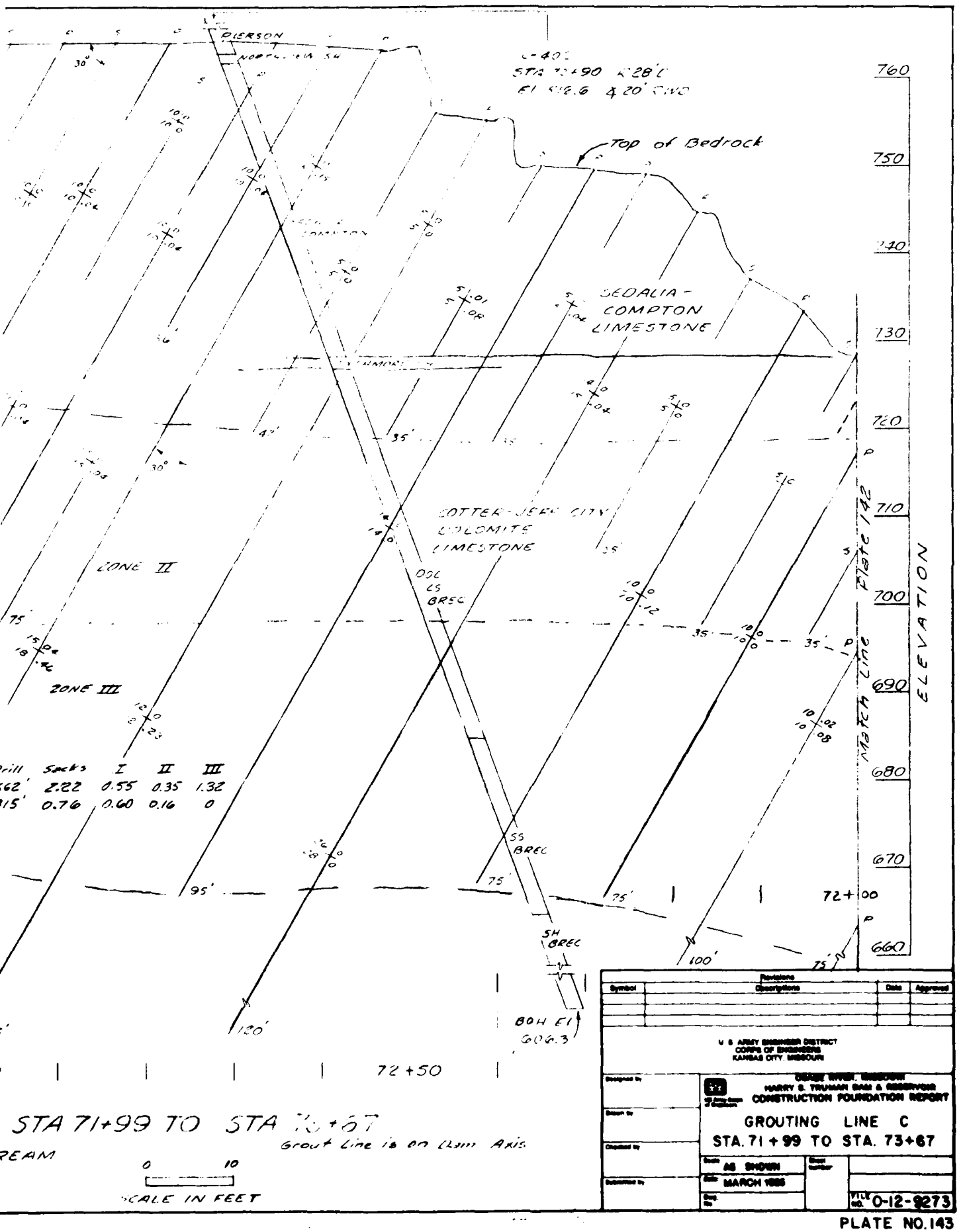
STAGE VI GROUTING LINE C STA 71+99 TO STA

LOOKING DOWNSTREAM

For Legend See Plate 106

0 10

SCALE IN FEET



STA 71+99 TO STA 73+67

Grout Line is on Ctrm Axis

REAM

0 10

SCALE IN FEET

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Symbol	Description	Date	Approved

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KANSAS CITY, MISSOURI

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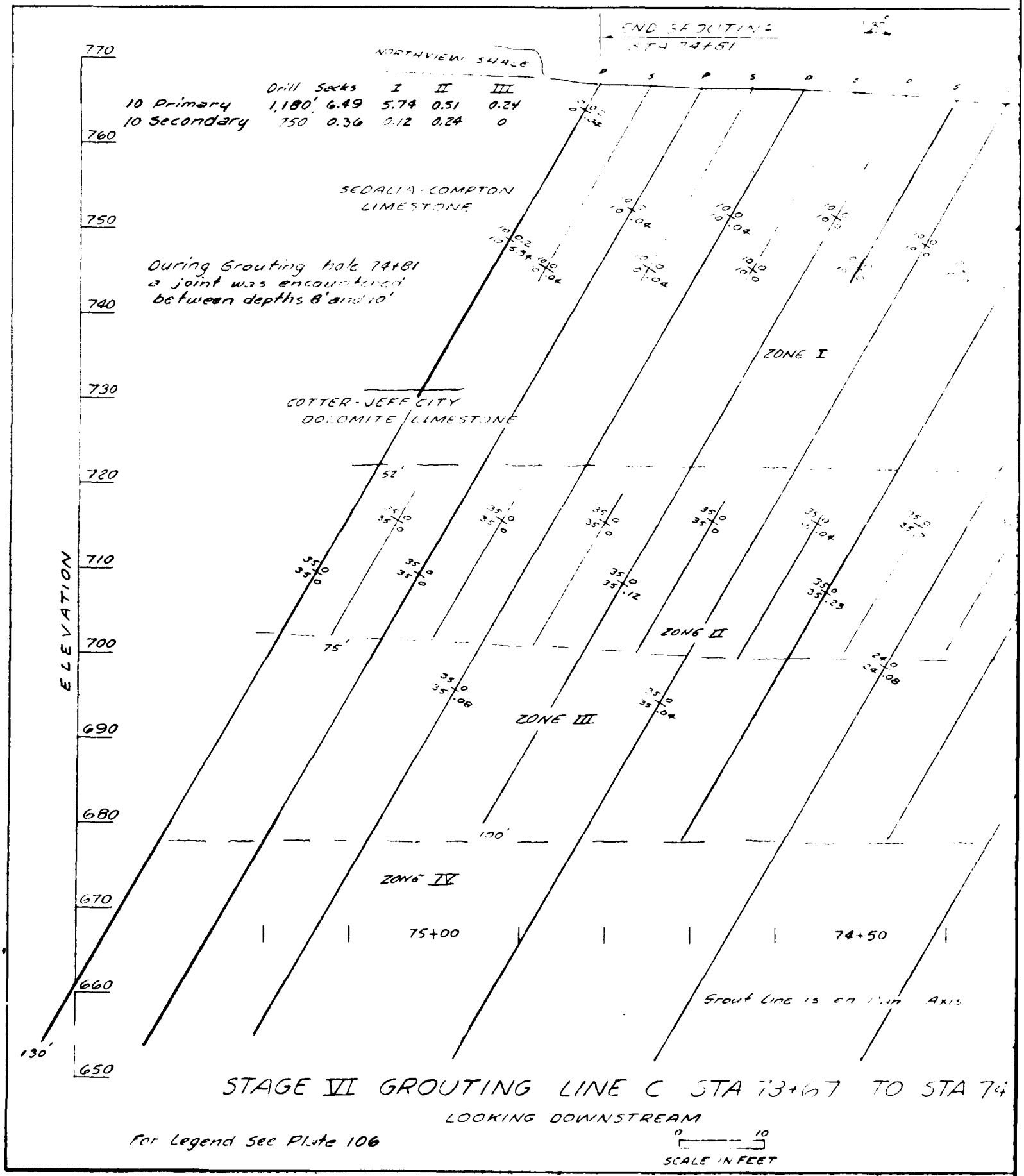
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CONSTRUCTION FOUNDATION REPORT

GROUTING LINE C
STA. 71 + 99 TO STA. 73+67

Scale AS SHOWN
Date MARCH 1966
Sheet No.
File No. 0-12-9273

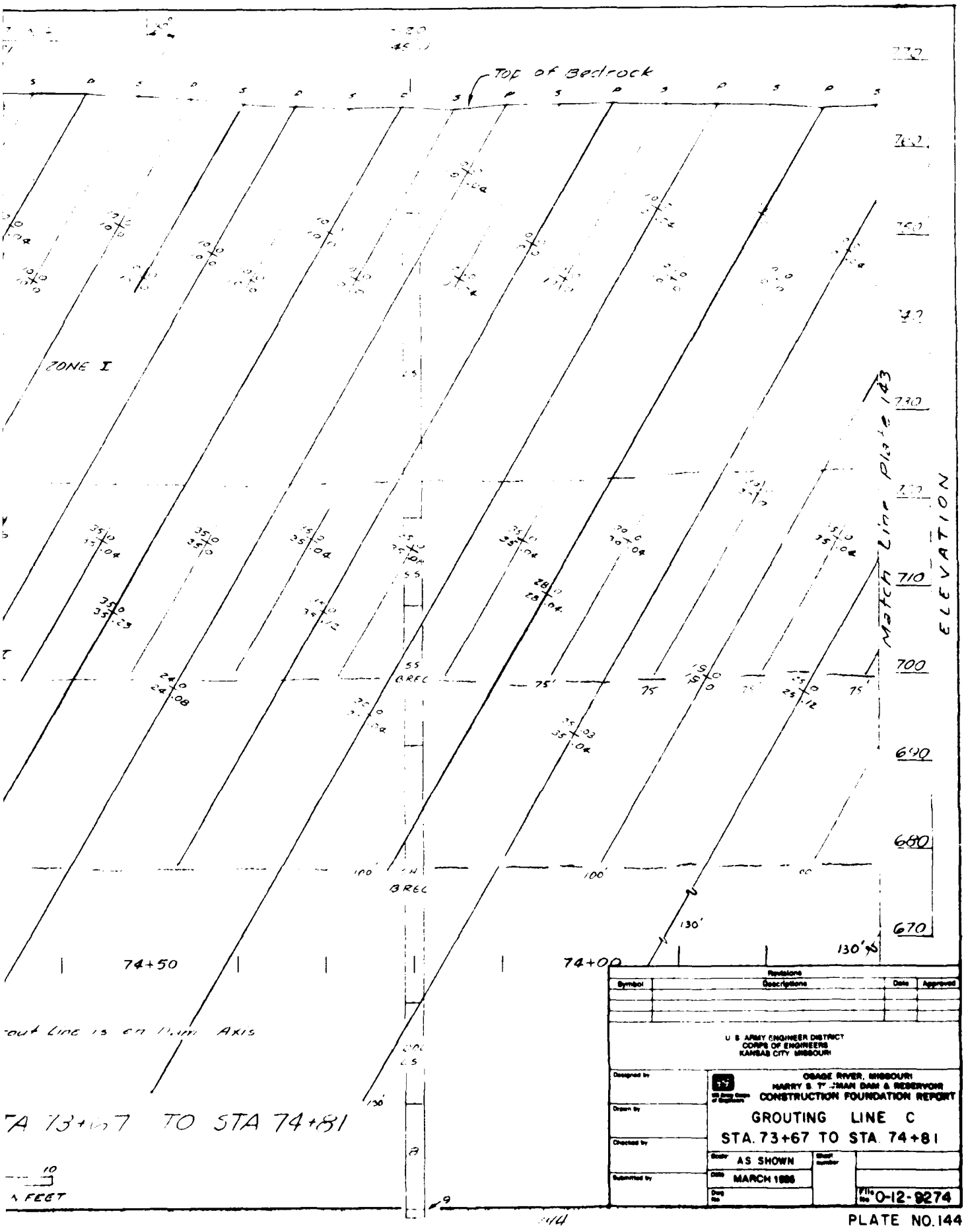
PLATE NO. 143



STAGE VI GROUTING LINE C STA 73+67 TO STA 74

LOOKING DOWNSTREAM

For Legend See Plate 106

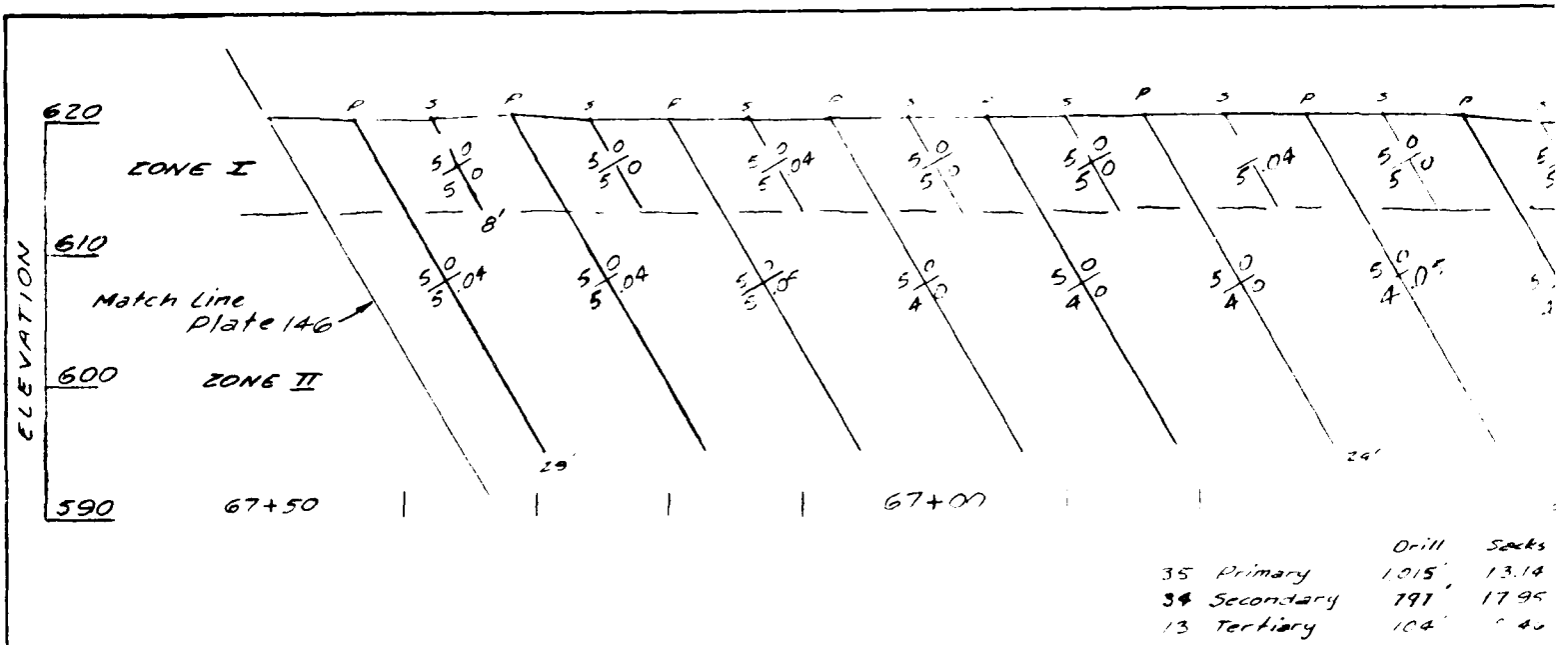


out Line is on 11.4m Axis

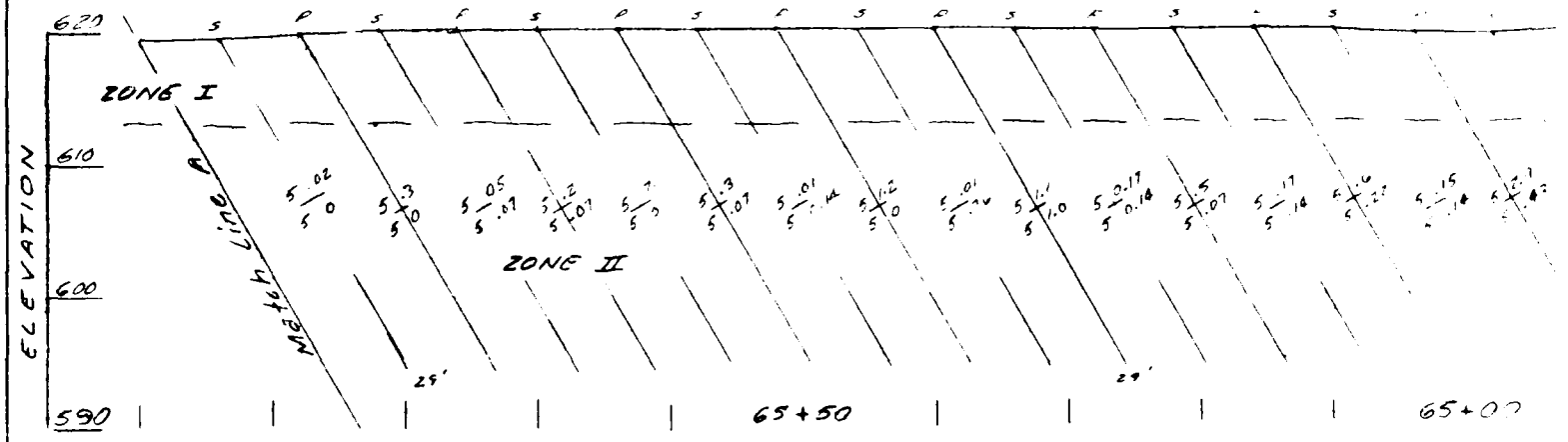
TA 73+67 TO STA 74+81

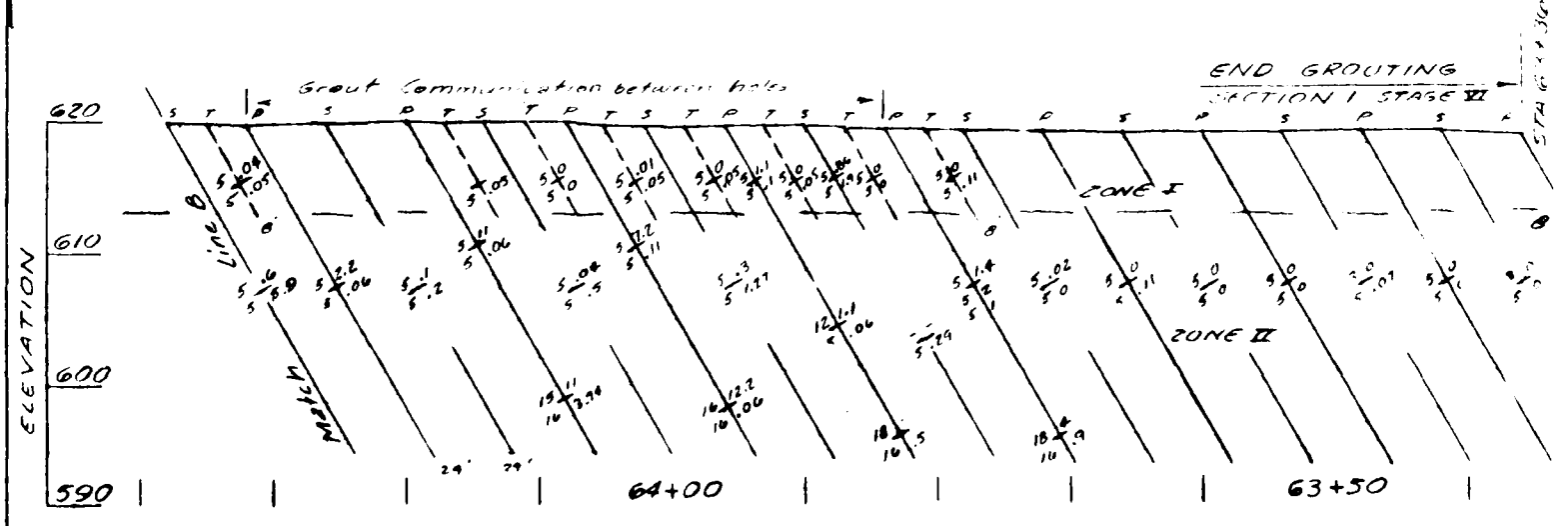
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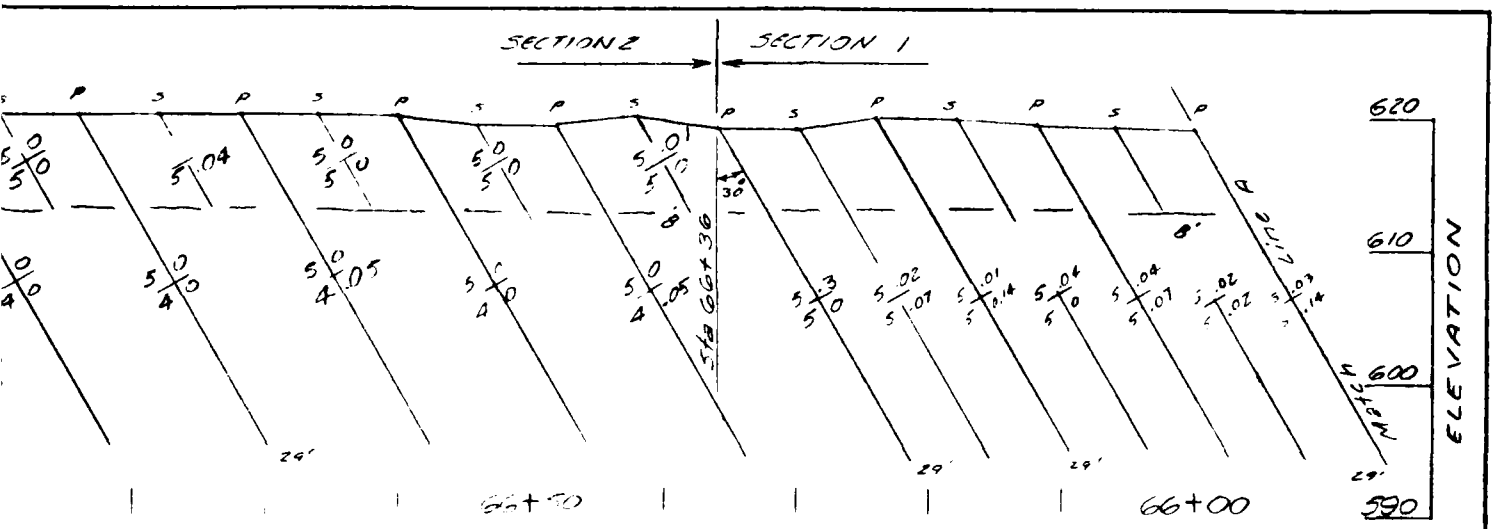
PLATE NO. 144



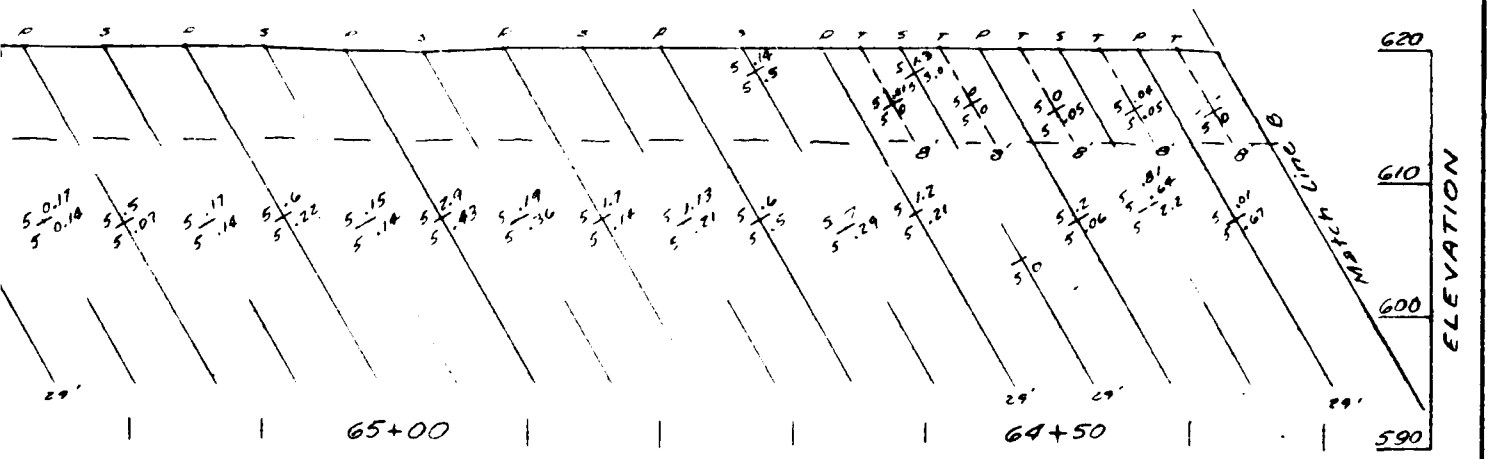
		Drill	Sacks
35	Primary	1,015'	13.14
34	Secondary	791'	17.95
13	Tertiary	104'	[illegible]







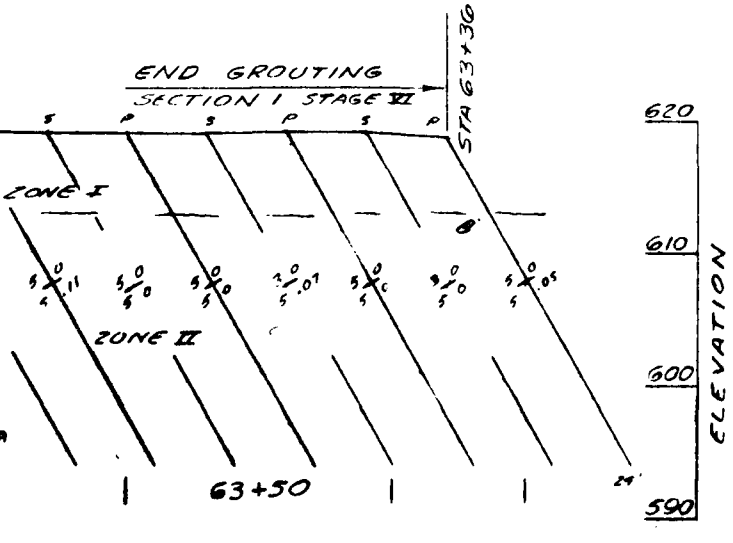
		Drill	Sacks	I	II
35	Primary	1,015'	13.14	0	13.14
34	Secondary	791'	17.95	5.53	12.42
13	Tertiary	104'	0.46	0.46	0



Grout Line is 10' D/S of Dam Axis

STAGE VI GROUTING LINE A
STA 63+36 TO STA 67+50

LOOKING DOWNSTREAM
For Legend See Plate 106



Revisions			
Symbol	Description	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

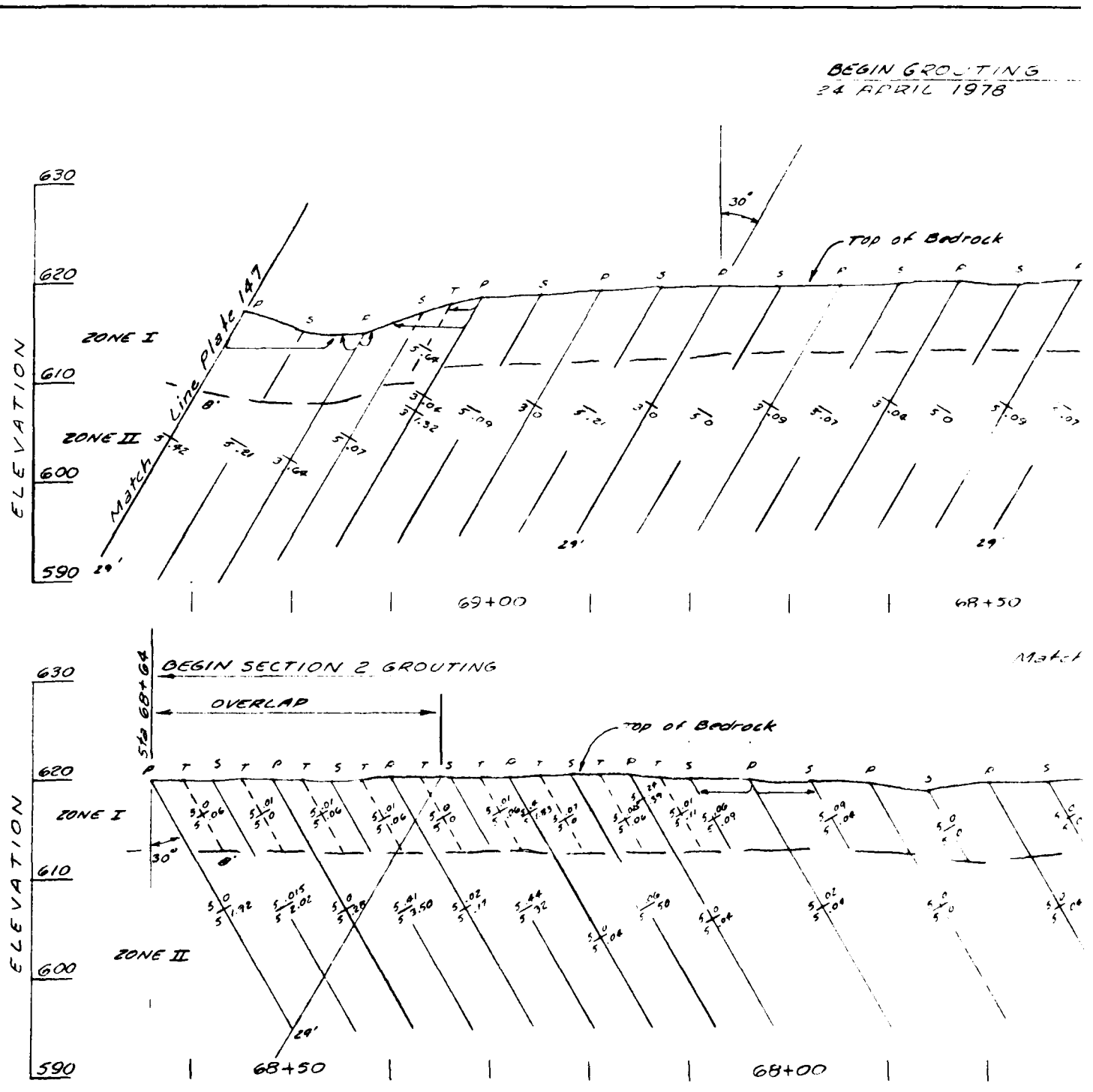
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CONSTRUCTION FOUNDATION REPORT

GROUTING LINE A
STA. 63+36 TO STA. 67+50

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Date: MARCH 1958
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PLATE NO. 145



STAGE VI GROUTING LINE A STA 67+50 TO ST

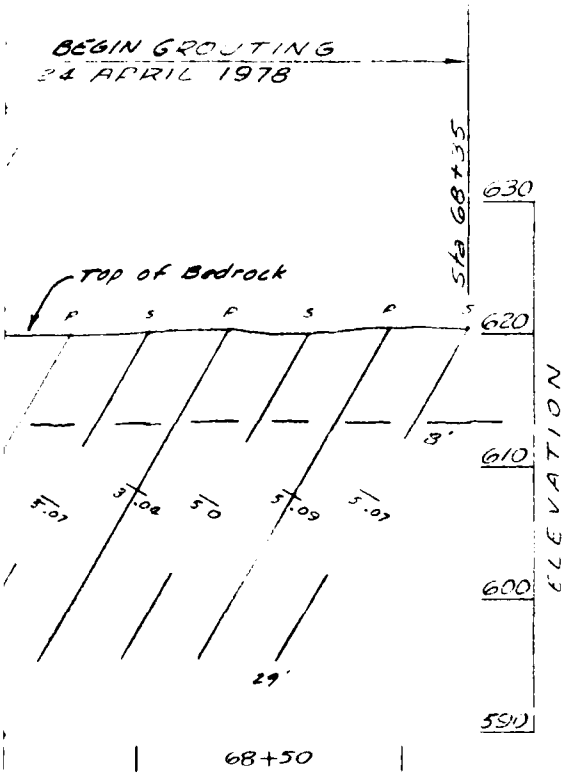
LOOKING DOWNSTREAM

Grout Line is 10 O

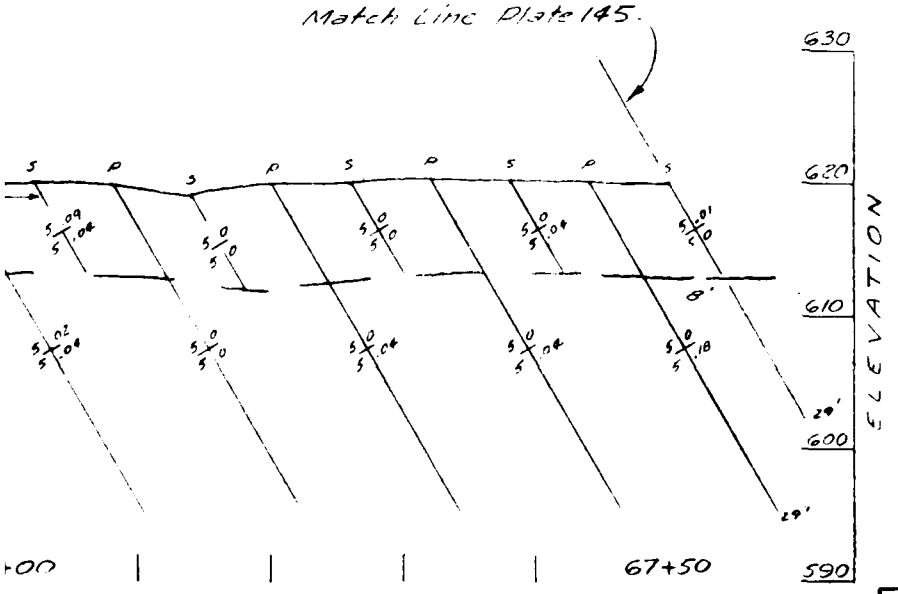
For Legend See Plate 106

0 10

SCALE IN FEET



	Drill	Sacks	I	II
18 Primary	232'	5.39	0	5.39
18 Secondary	232'	7.23	0.17	7.06
10 Tertiary	80'	0.99	0.99	0



TA 67+50 TO STA 69+25

STREAM

Grout Line is 10' D/S of Dam Axis

0 10

LE IN FEET

Revisions			
Symbol	Description	Date	Approved

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KANSAS CITY, MISSOURI

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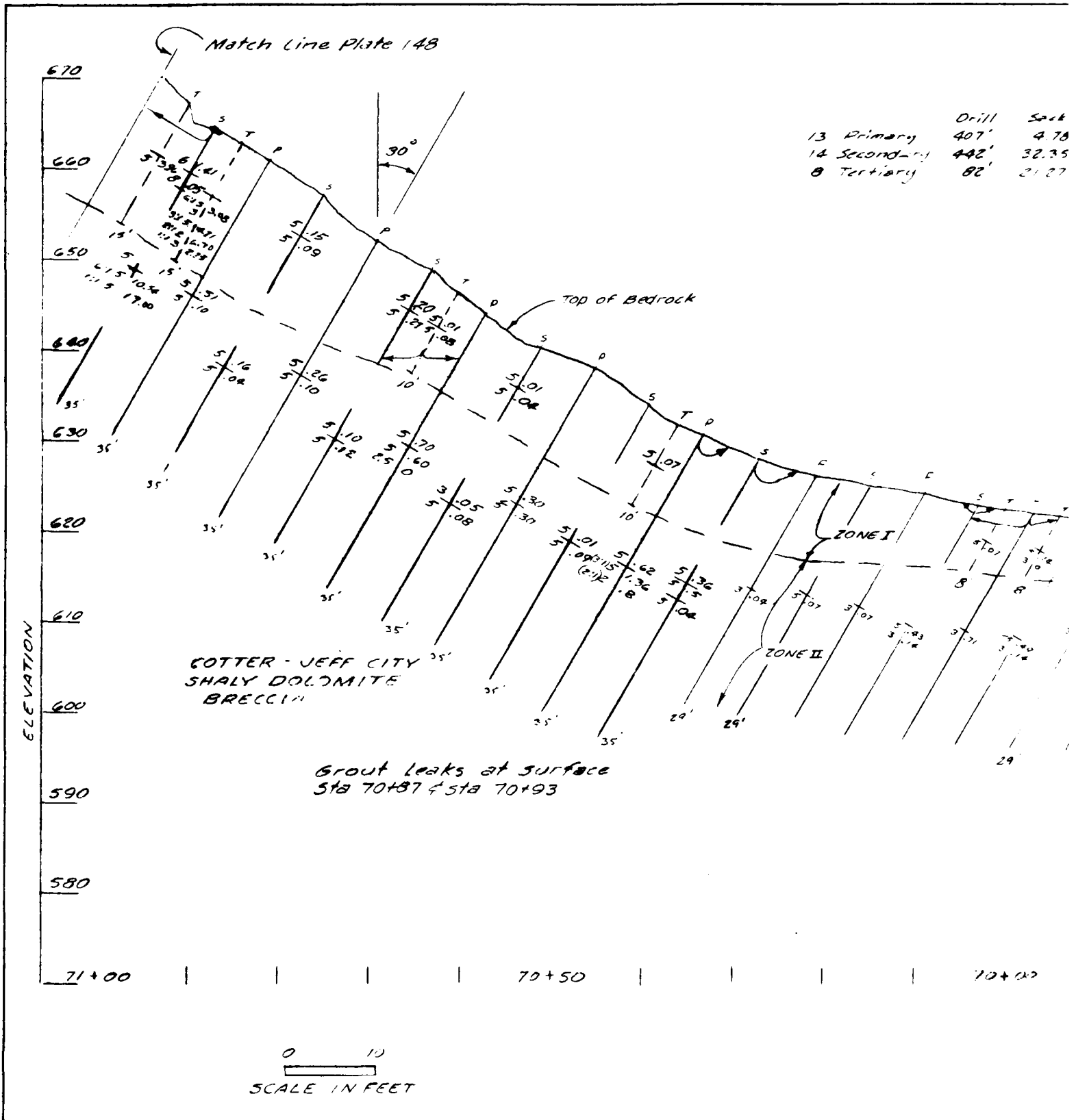
Submitted by

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HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

GROUTING LINE A
STA. 67+50 TO STA. 69+25

Scale: AS SHOWN
Date: MARCH 1980
Sheet number:
Approved by:
File No.: 0-12-9276

PLATE NO. 146



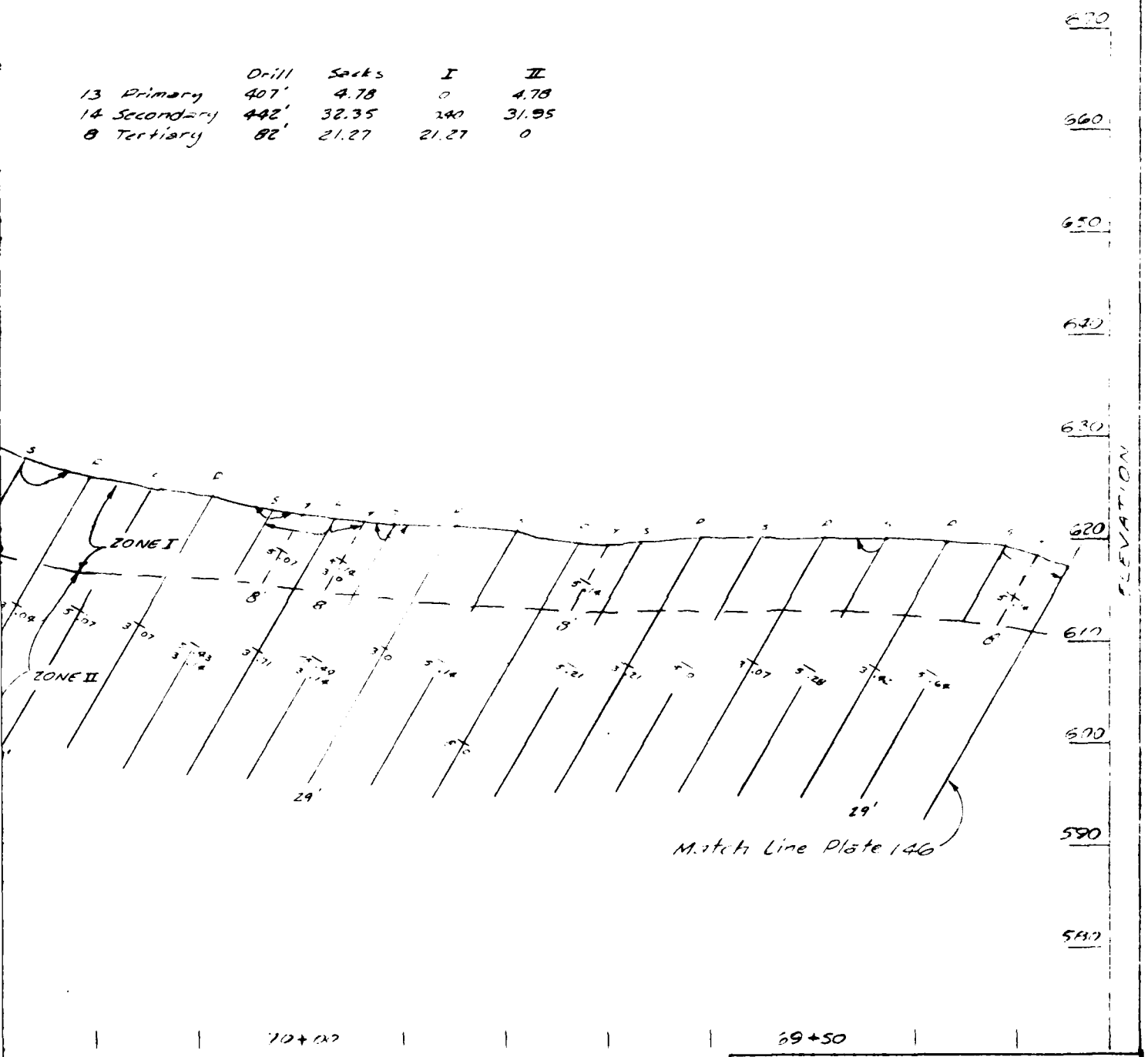
For Legend See Plate 106

STAGE VI GROUTING LINE A STA 6

LOOKING DOWNSTREAM

Grout

	Drill	Sacks	I	II
13 Primary	407'	4.78	0	4.78
14 Secondary	442'	32.35	240	31.95
8 Tertiary	82'	21.27	21.27	0



70+00 69+50

NG LINE A STA 69+25 TO STA 70+93

OKING DOWNSTREAM

Grout Line is 10' D/s of Dam Axis

Revisions			
Symbol	Descriptions	Date	Approved

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KANSAS CITY MISSOURI

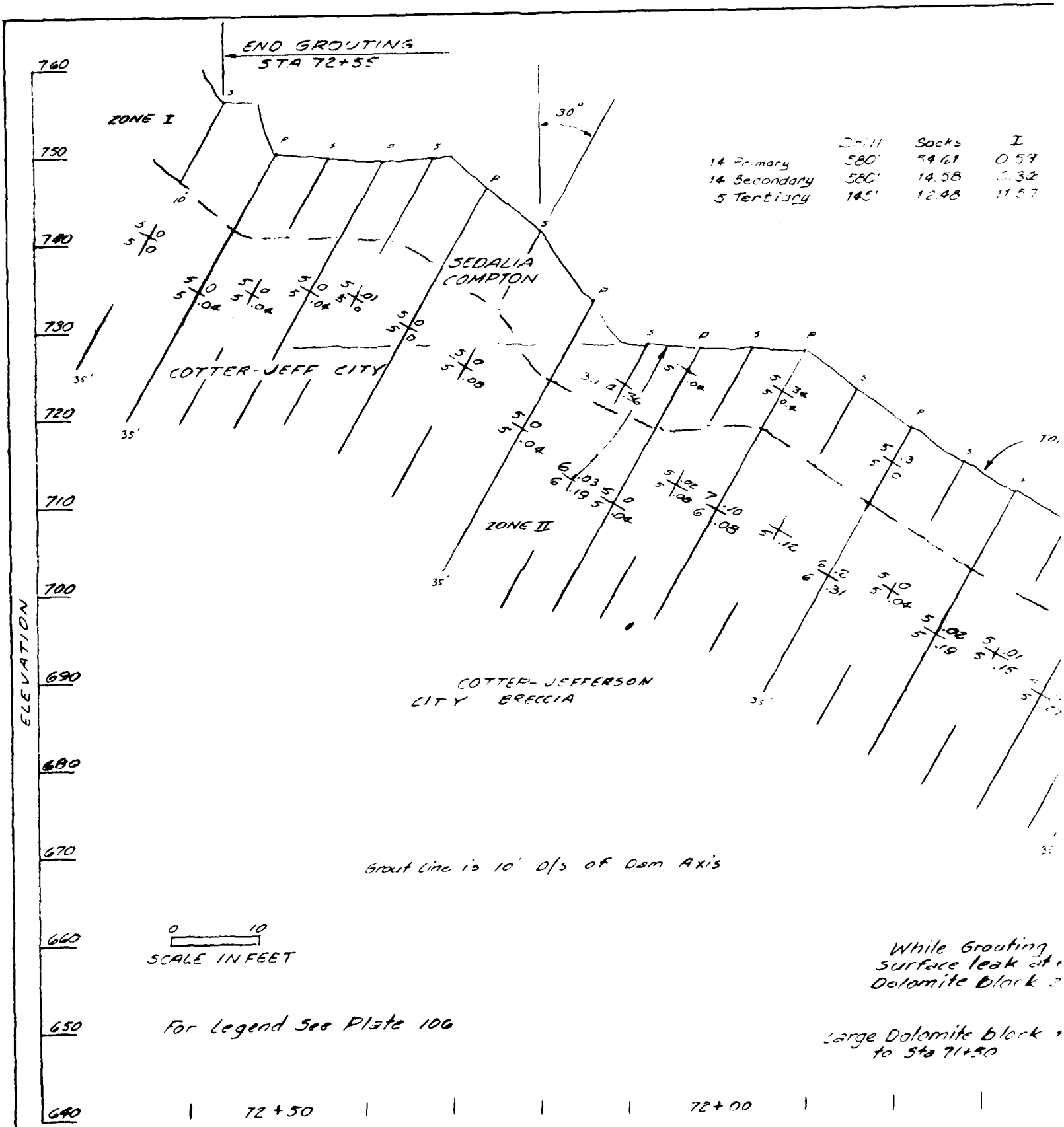
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CONSTRUCTION FOUNDATION REPORT

GROUTING LINE A
STA. 69+25 TO STA. 70+93

Scale: AS SHOWN
Date: MARCH 1966
Sheet number
Drawing No.
File No. 0-12-9277

PLATE NO. 147



	Drill	Sacks	I
14 Primary	580'	9461	0.59
14 Secondary	580'	1458	2.32
5 Tertiary	145'	1248	11.57

While Grouting
Surface leak at
Dolomite Block

Large Dolomite block
to Sta 71+50

STAGE VI GROUTING LINE A STA

LOOKING DOWNSTREAM

Revisions			
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KANSAS CITY MISSOURI

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US Army Corps of Engineers

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CONSTRUCTION FOUNDATION REPORT

GROUTING LINE A
STA. 70+93 TO STA 72+55

Scale: AS SHOWN
Date: MARCH 1965
Sheet number
Dwg No
File No 0-12-9278

	Drill	Sacks	I	II
Primary	580'	54.61	0.59	54.02
Secondary	580'	14.58	0.36	14.22
Tertiary	145'	12.48	11.57	0.91

760
750
740
730
720
710
700
690
680
670
660
650
640

ELEVATION

Top of Bedrock

Match Line Plate 147

While Grouting at Sta 71+26 surface leak at edge of Dolomite Block 2½' uphill

Large Dolomite block from Sta 71+20 to Sta 71+50

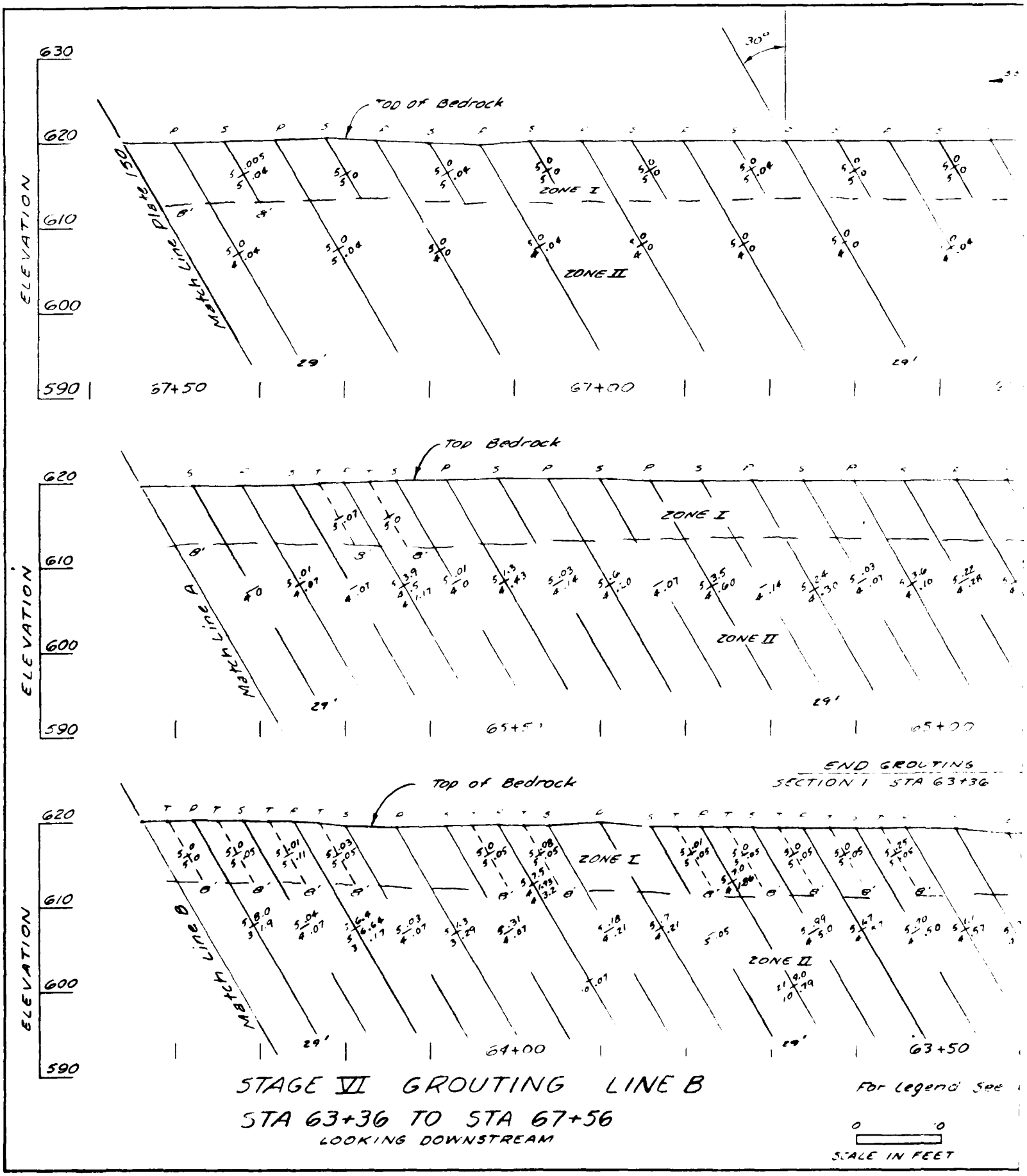
71+50

71+00

35'

NG LINE A STA 70+93 TO STA 72+55

PLATE NO. 148



STAGE VI GROUTING LINE B

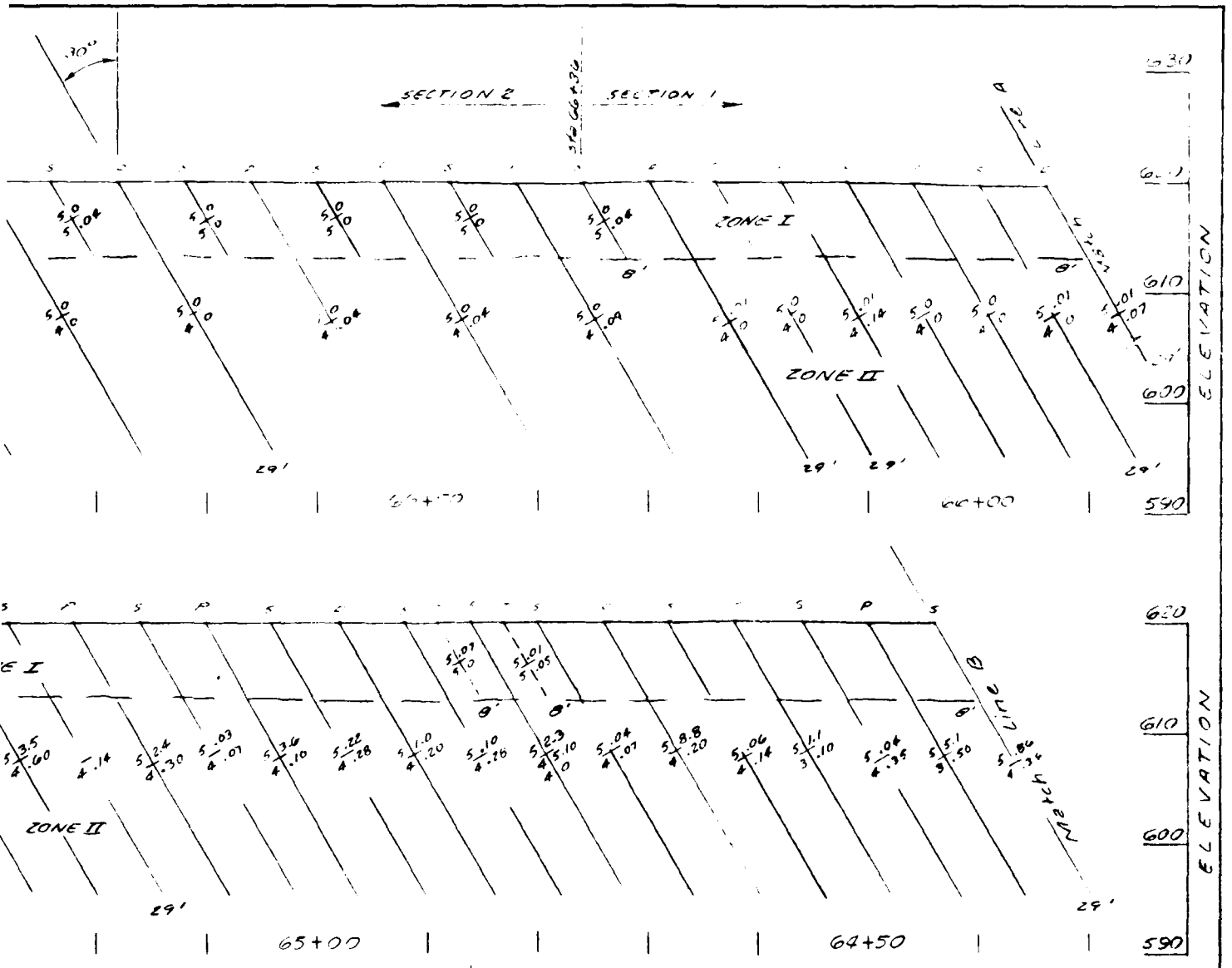
STA 63+36 TO STA 67+56

LOOKING DOWNSTREAM

For Legend See

0 0

SCALE IN FEET



	Drill	Sacks	I	II
35 Primary	1,015'	16.25	0	16.25
35 Secondary	805'	10.04	0.16	9.88
15 Tertiary	120'	0.68	0.68	0

Grout Line is 10' U/s of Dam Axis

For Legend See Plate 106

0 10
SCALE IN FEET

Revisions			
Symbol	Description	Date	Approved

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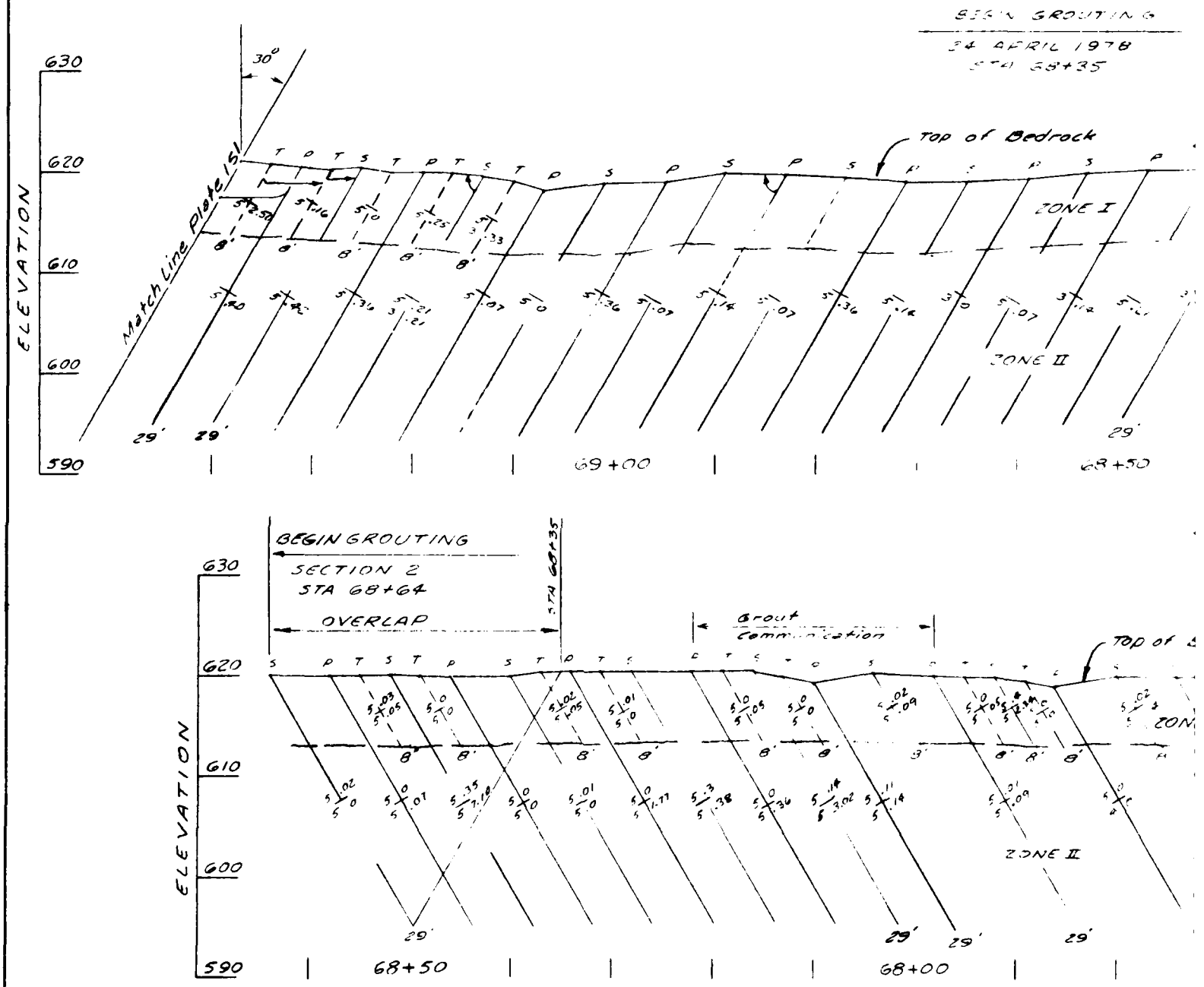
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CONSTRUCTION FOUNDATION REPORT

GROUTING LINE B
STA. 63+36 TO STA. 67+56

Designed by
Drawn by
Checked by
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Scale: AS SHOWN
Date: MARCH 1966
Drawing No.
Sheet number
File No. 0-12-9279

PLATE NO. 149



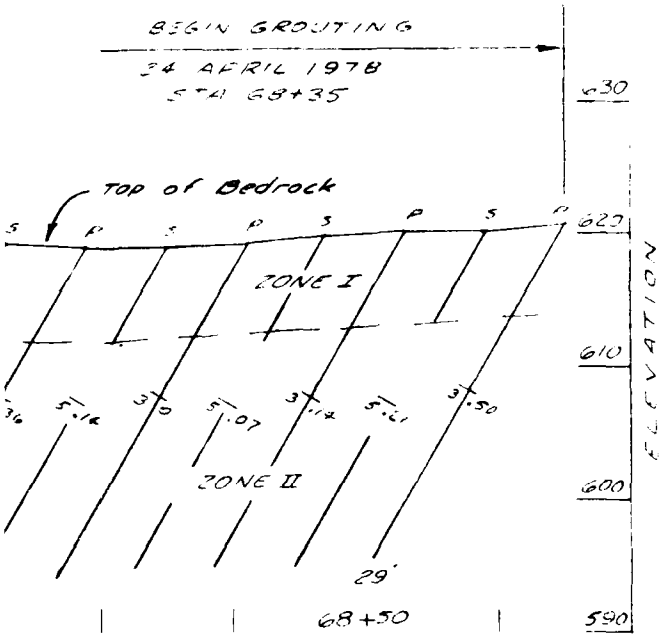
STAGE VI GROUTING LINE B
STA 67+56 TO STA 69+37

LOOKING DOWNSTREAM

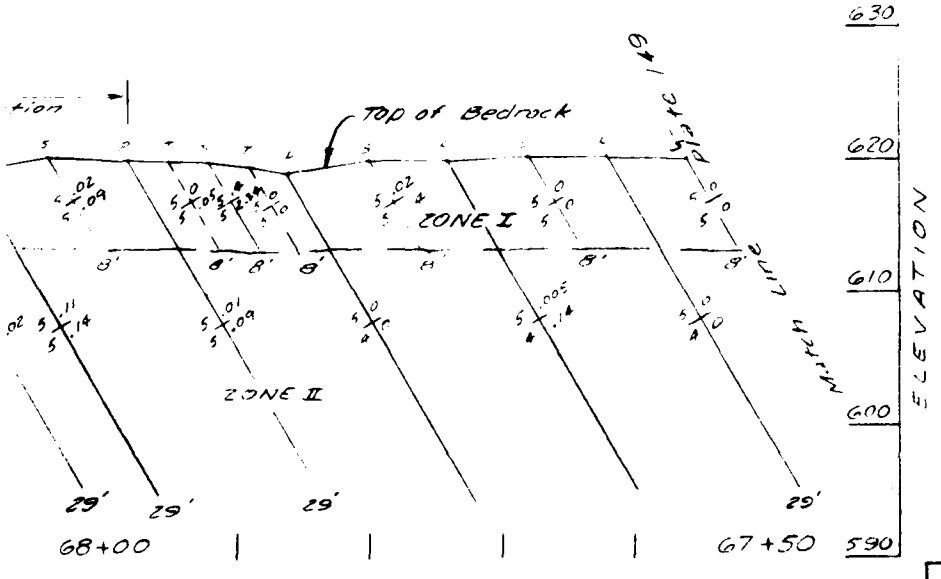
Grout Line is (1) 1/3 of

For Legend See Plate 106

0 10
SCALE IN FEET



	Drill	Sacks	I	II
18 Primary	522'	4.30	0	4.90
18 Secondary	417'	14.47	2.57	11.90
13 Tertiary	104'	3.44	3.44	0



B

Grout Line is 10' u/s of D.m. Axis

Revisions			
Symbol	Descriptions	Date	Approved

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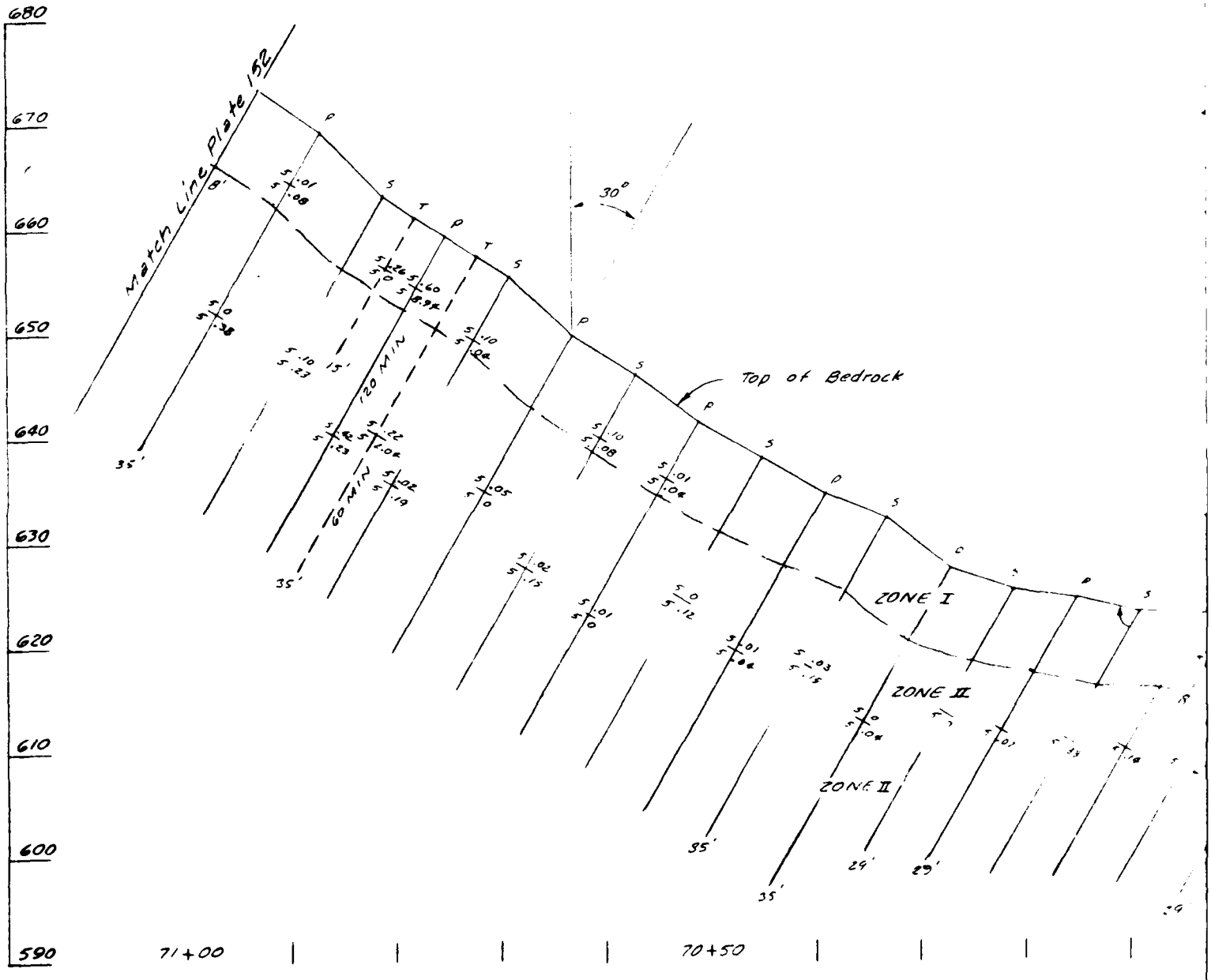
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GROUTING LINE B
STA. 67+56 TO STA. 69+37

Scale AS SHOWN
Date MARCH 1986
File No. 0-12-9280

PLATE NO. 150



STAGE VI GROUTING LINE B

STA 69+37 TO STA 70+93

LOOKING DOWNSTREAM

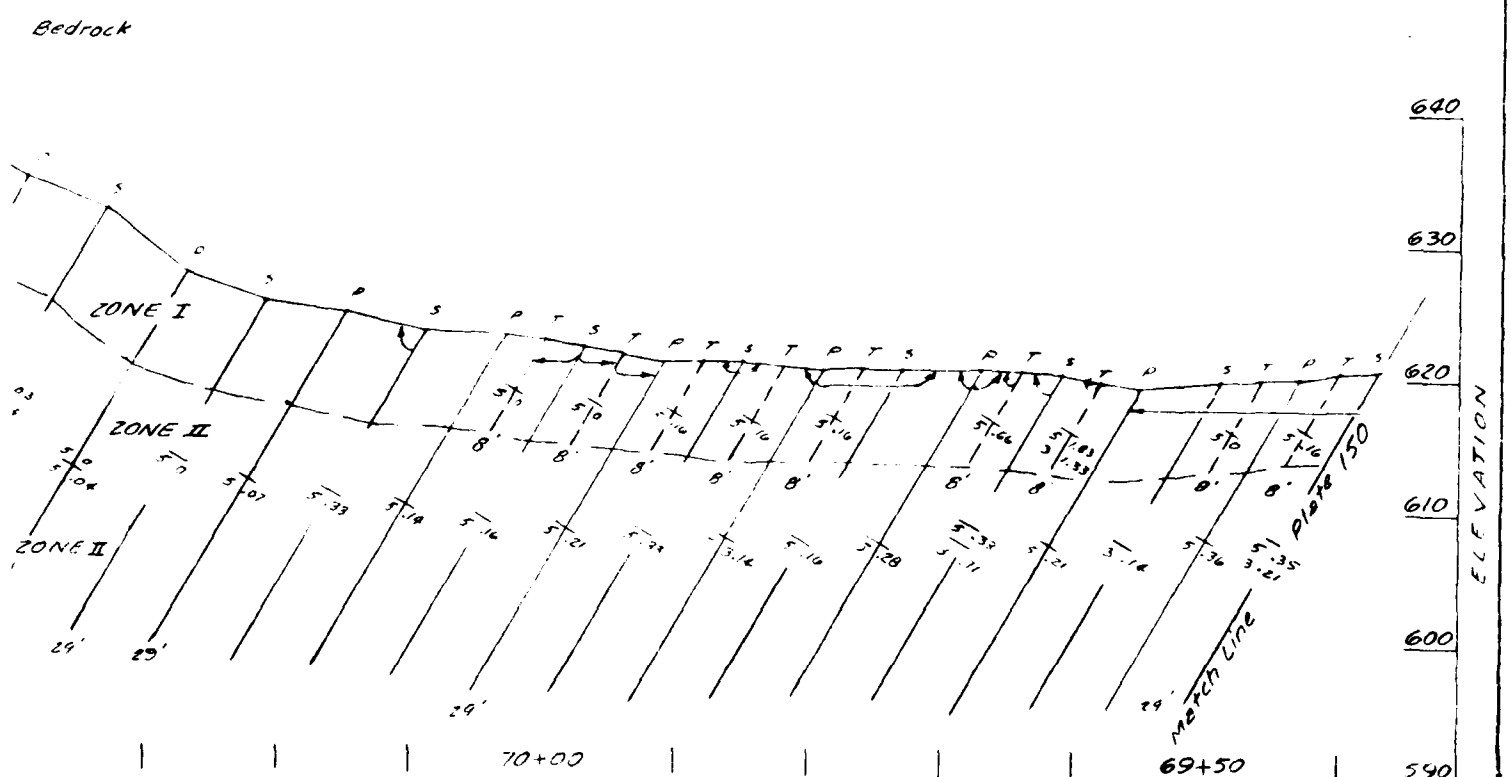
Grout Line is 10' U/S of Dam

For Legend See Plate 106

0 10

SCALE IN FEET

	Drill	Sack	I	II
13 Primary	413'	14.16	9.06	5.10
13 Secondary	27'	3.68	0.12	3.56
11 Tertiary	122'	6.44	4.40	2.04



9

· out Line is 10' U/S of Dam Axis

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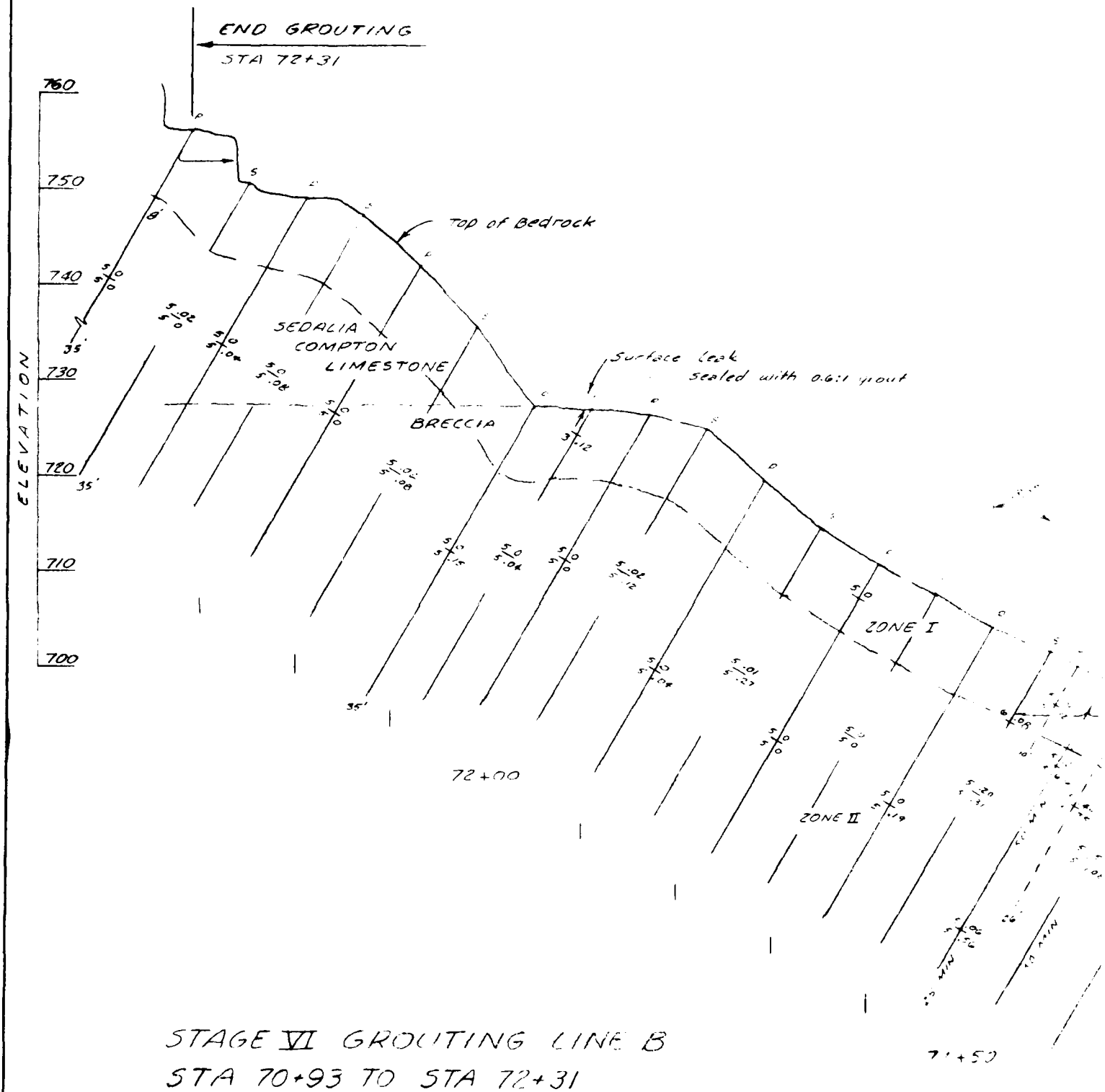
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GROUTING LINE B
STA. 69+37 TO STA. 70+93

Scale AS SHOWN
Date MARCH 1968
Sheet number
Drawing No. 0-12-9281

PLATE NO. 151



STAGE VI GROUTING LINE B
STA 70+93 TO STA 72+31
LOOKING DOWNSTREAM

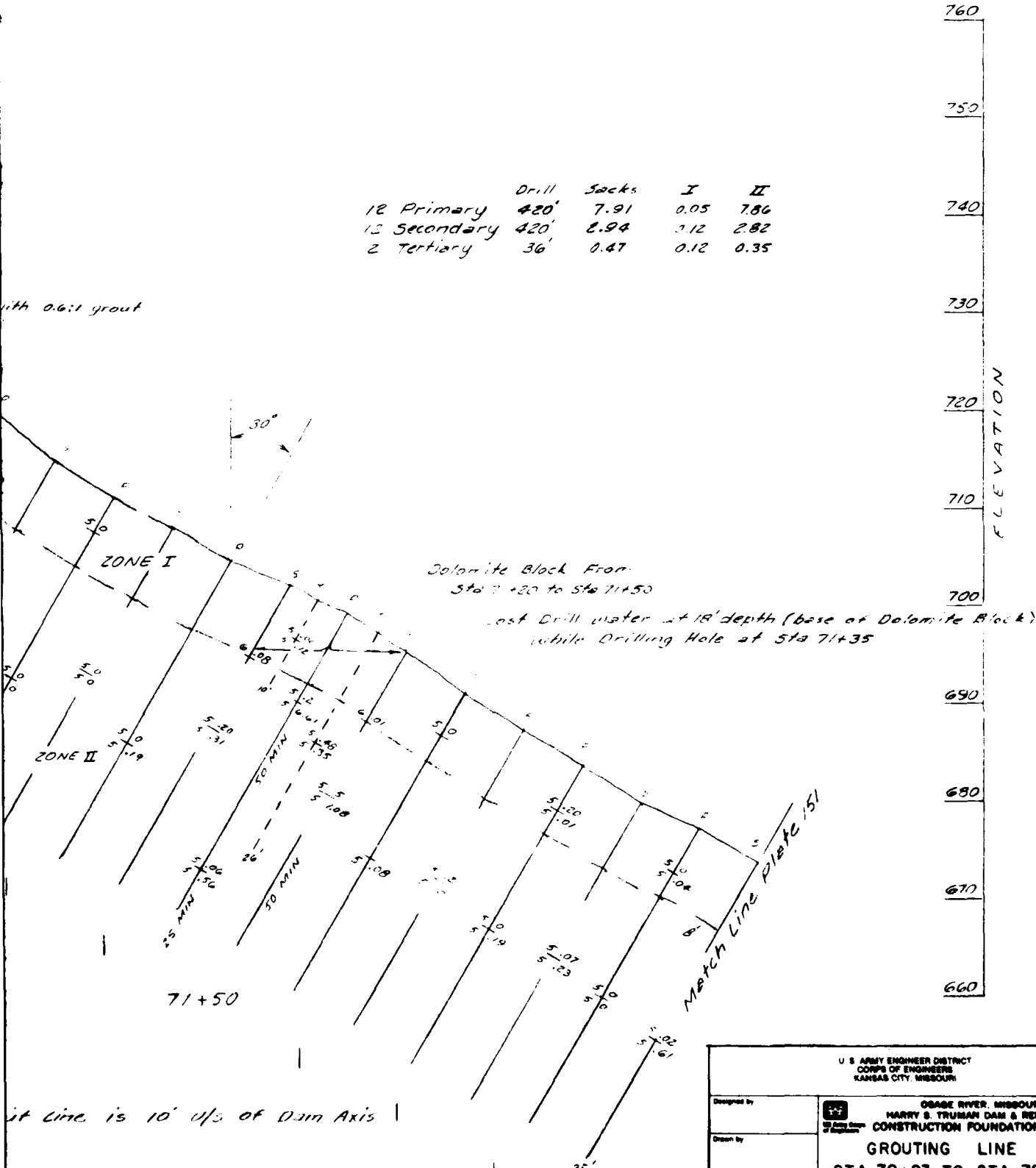
Grout line is 10' u/s of D.H. A

For Legend See Plate 106

0 10
SCALE IN FEET

	Drill	Sacks	I	II
12 Primary	420'	7.91	0.05	7.86
12 Secondary	420'	2.94	0.12	2.82
2 Tertiary	36'	0.47	0.12	0.35

ith 0.6:1 grout



it Line is 10' U/S of Dam Axis

10

LE IN FEET

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GROUTING LINE B
STA. 70+93 TO STA. 72+31

Scale: AS SHOWN
Date: MARCH 1966
Sheet number
File No. 0-12-9282

PLATE NO. 152

NUMBER TYPE OF HOLE AND LINEAL FT. DRILLED			SACKS OF CEMENT INJECTED AND PERCENT OF TOTAL		SACKS INJECTED PER Z(I	%	II	%
			STAGE I STA 22+38 TO STA 38+03 & STA 48+36 TO ST					
296	PRIMARY	14,480	88.06	59.98	25.30	28.73	29.33	33.31
260	SECONDARY	8,278	43.90	29.90	13.65	31.09	13.45	30.64
536	TERTIARY	6,067	14.85	10.12	8.45	56.90	3.35	22.56
1,092	TOTAL	28,825	146.81 10.82	100.00	47.40	32.29	46.13	31.42
			STAGE III SPILLWAY - POWERHOUSE STA 37+75 TO					
134	PRIMARY	9,581	357.19	60.50	259.96	72.78	62.26	17.42
89	SECONDARY	5,101	186.70	31.50	107.11	57.37	70.08	37.54
35	TERTIARY	1,674	47.94	8.00	29.73	62.02	5.25	31.81
1	QUATERNARY	71	0	0				
259	TOTAL	16,427	591.83 43.60	100.00	396.80	67.04	147.59	24.94
			STAGE VI LINE A 10' DOWNSTREAM STA 63+36 TO					
80	PRIMARY	2,234	71.92	42.07	0.59	0.76	77.33	99.24
80	SECONDARY	2,051	72.11	38.93	6.46	8.96	65.65	91.04
36	TERTIARY	411	35.20	19.00	34.29	97.41	0.91	2.59
196	TOTAL	4,696	185.23 13.65	100.00	41.34	22.32	143.89	77.68
			LINE B 10' UPSTREAM STA 63+36 T					
78	PRIMARY	2,370	43.22	50.62	9.11	21.08	34.11	78.92
78	SECONDARY	2,059	31.13	36.46	2.97	9.54	28.16	90.46
41	TERTIARY	382	11.03	12.92	8.64	78.33	2.39	21.67
197	TOTAL	4,811	85.38 6.29	100.00	20.72	24.27	64.66	75.63
			LINE C & STA 63+39 TO STA 74+81					
104	PRIMARY	6,775	94.58	27.18	11.97	12.66	70.41	74.44
89	SECONDARY	3,968	132.09	37.95	5.64	4.27	125.95	95.35
156	TERTIARY	1,866	120.04	34.49	118.48	98.70	0.57	0.48
16	QUATERNARY	181	1.31	0.38	1.27	96.95	0.04	3.05
375	TOTAL	12,790	348.02 25.64	100.00	137.36	39.47	196.97	56.60
			TOTAL GROUT CURTAIN STA 22+38 TO STA 74+81					
692	PRIMARY	36,440	660.97	48.70	306.93	46.44	273.44	41.37
569	SECONDARY	21,457	465.93	34.33	135.83	29.15	303.29	65.10
804	TERTIARY	10,500	229.06	16.87	199.59	87.14	22.47	9.81
17	QUATERNARY	252	1.31	0.10	1.27	96.95	0.04	3.05
2,082	GRAND TOTALS	68,649	1,357.27 100.00	100.00	643.62	47.42	599.24	44.15

CURTAIN GROUTING SUMMARY

Does not include Sterett Creek Dike

CKS INJECTED PER ZONE AND PERCENT OF TOTAL							
I	%	II	%	III	%	IV	%
03 & STA 48+36 TO STA 48+36 TO STA 63+96 &							
30	28.73	39.33	33.31	33.43	37.96		
.65	31.09	13.45	30.64	16.80	38.27		
.45	56.90	3.35	22.56	3.05	20.54		
40	32.20	46.13	31.42	53.28	36.29		
USE STA 37+75 TO STA 48+84							
9.96	72.78	62.26	17.42	34.97	9.80		
7.11	57.37	70.08	37.54	9.51	5.09		
9.73	62.02	5.25	31.81	2.96	6.17		
6.80	67.04	147.59	24.94	47.44	8.02		
TREAM STA 63+36 TO STA 72+55							
3.59	0.76	77.33	99.24				
5.46	8.96	65.65	91.04				
4.29	97.41	0.91	2.59				
1.34	22.32	143.89	77.68				
STREAM STA 63+36 TO STA 72+31							
9.11	21.08	34.11	78.92				
2.97	9.54	28.16	90.46				
9.64	78.33	2.39	21.67				
0.72	24.27	64.66	75.63				
39 TO STA 74+81							
1.97	12.66	70.41	74.44	12.12	12.82	0.08	0.08
5.64	4.27	125.95	95.35	0.50	0.38		
18.48	98.70	0.57	0.48	0.71	0.59	0.28	0.23
1.27	96.95	0.04	3.05	0			
17.36	39.47	196.97	56.60	13.33	3.83	0.36	0.10
22+38 TO STA 74+81							
96.93	46.44	273.44	41.37	80.52	12.18	0.08	0.01
35.83	29.15	303.29	65.10	26.81	5.75		
99.59	87.14	22.47	9.81	6.72	2.93	0.28	0.12
1.27	96.95	0.04	3.05				
43.62	47.42	599.24	44.15	114.15	8.41	0.36	0.02

1ARY

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HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

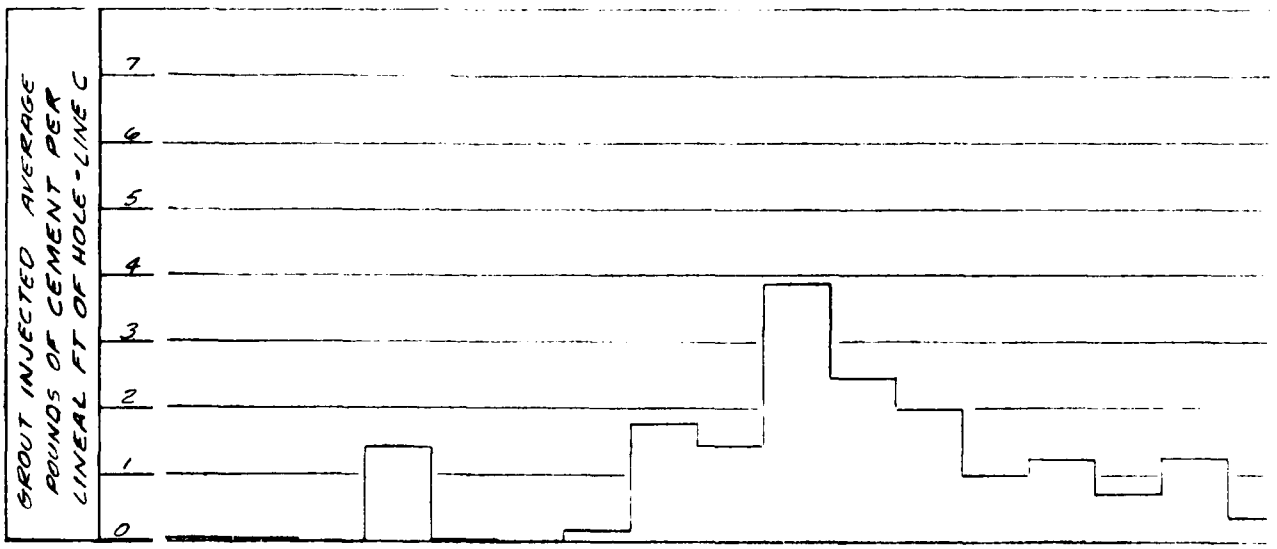
CURTAIN GROUTING SUMMARY

Scale: AS SHOWN
Date: MARCH 1966
Sheet number:
Dwg. No.
File No. 0-12-9283

PLATE NO. 153

GROUT INJECTED IN POUNDS OF CEMENT PER LINEAL FT OF HOLE

		STAGE I							STAGE III					STAGE II				
		22+38 to 24+32	24+55 to 26+24	26+27 to 27+77	27+80 to 30+74	30+77 to 32+75	32+78 to 34+97	35+00 to 38+00	38+37 to 39+96	39+96 to 40+68	40+68 to 44+00	44+00 to 46+10	46+10 to 48+01	48+36 to 50+04	50+04 to 51+48	51+51 to 53+01	53+04 to 54+48	54+51 to 56+52
		SINK STRUCTURE STA 29+19 TO STA 28+52							MONOLITHS 1 THRU 4 RIGHT NON OVERFLOW	MONOLITH 5 ERECTION BAY	MONOLITHS 6,7&8 POWERHOUSE	MONOLITHS 9 THRU 13 SPILLWAY	MONOLITHS 14 THRU 18 LEFT NON OVERFLOW					
PRIMARY	P	0.02	0	2.01	.76	0	0	0.16	2.51	1.16	4.99 (2)	2.61	2.50	0.47	2.70	0.58	.50	0.1
SECONDARY	S	0	0.11	0	2.09	2.01	0	2.20	1.47	1.69	3.64	2.54	1.45	0.90	0.65	1.23	1.13	0.4
TERTIARY	T	0.11	0	0	1.62	0	0	0.12	1.30	0	2.90	2.07	0	1.50	0.29	0.28	0.15	0.2
QUATERNARY	Q																	
AVERAGE	A	0.043	0.037	0.003	1.423	0.003	0	0.160	1.760	1.425	3.843	2.423	1.975	0.975	1.213	0.697	1.26	0.3



(1) Does not include average of 2.12 pounds per lineal ft for 66 holes grouted from Sta 40+71.25 to Sta 43+96.25 drilled & grouted before placing placing concrete

(2) Thin open bedding planes at top 1.5'

(3) Osage River Channel Area

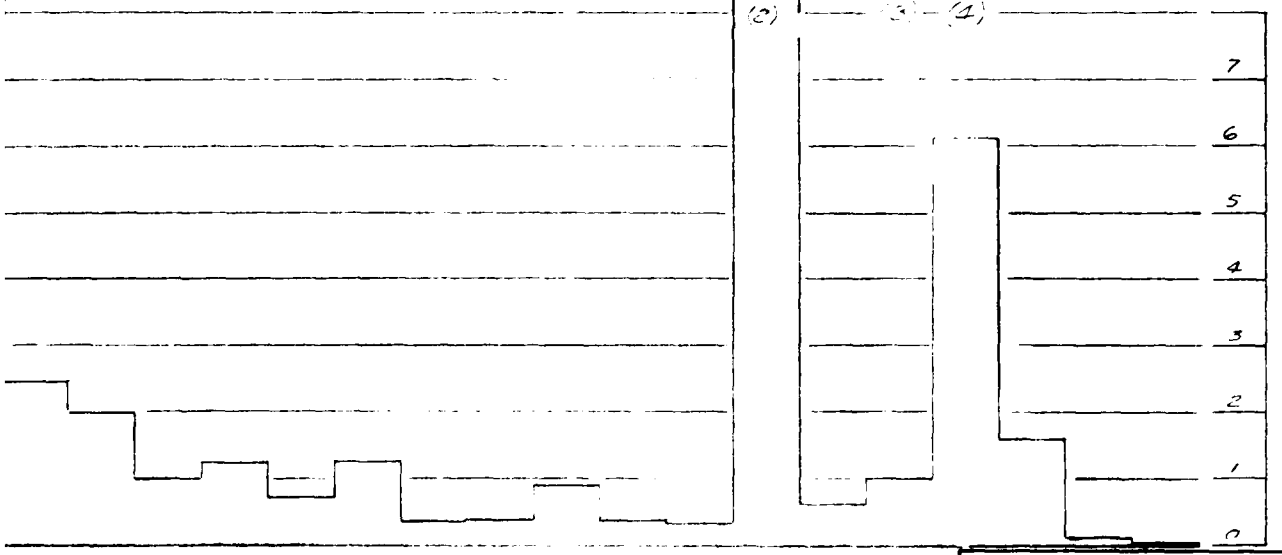
(4) Le Se

SUMMARY OF GROUT TAKES

For Stereft Creek Dike Grouting during Stage IV which is not included summary see Plates 154 & 155.

STATION	LINE C DAM AXIS											LINE B 10'D						LINE A 10'D						MONOLITHS 14 THRU 18 LEFT NON OVERFLOW	MONOLITHS 9 THRU 13 SPILLWAY
44+00 to 46+10																									2.01
46+10 to 48+01																								2.50	2.54
48+36 to 50+04																								1.45	2.07
50+04 to 51+48																								0	
51+51 to 53+01																									2.423
53+04 to 54+48																								1.975	
54+51 to 56+52																								0.975	
56+55 to 58+56																								1.213	
58+59 to 60+36																								0.697	
60+39 to 62+07																								1.26	
62+10 to 63+36																								0.38	
63+36 to 65+91																								1.397	
65+97 to 68+19																								0.86	
67+73 to 70+21																								0.34	
70+25 to 71+09																								0.323	
71+12 to 71+99																								8.695	
72+00 to 72+60																								0.607	
72+60 to 74+91																								0.997	
																								6.100	
																								1.593	
																								0.088	
																								0.126	

STAGE I — STAGE VI



…en bedding planes
…' 1.5'
…River Channel Area

(4) Left Abutment shale & sandstone breccia

TAKES

…which is not included in this

Revisions			
Symbol	Descriptions	Date	Approved

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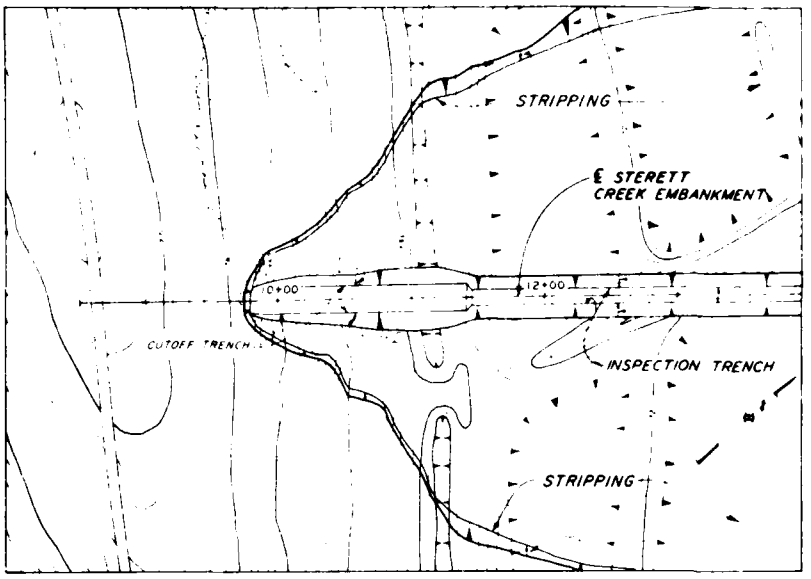
SUMMARY OF GROUT TAKES

Scale AS SHOWN
Date MARCH 1966
Sheet number
File No. 0-12-9284

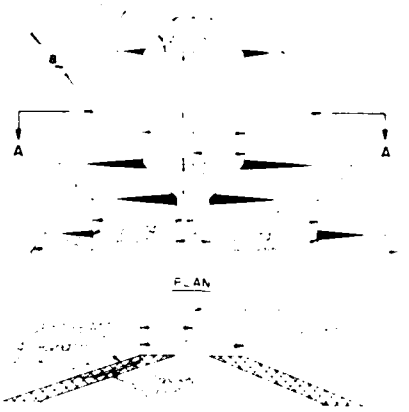
PLATE NO. 153-A

STAGE IV CONSTRUCTION

STRUCTION



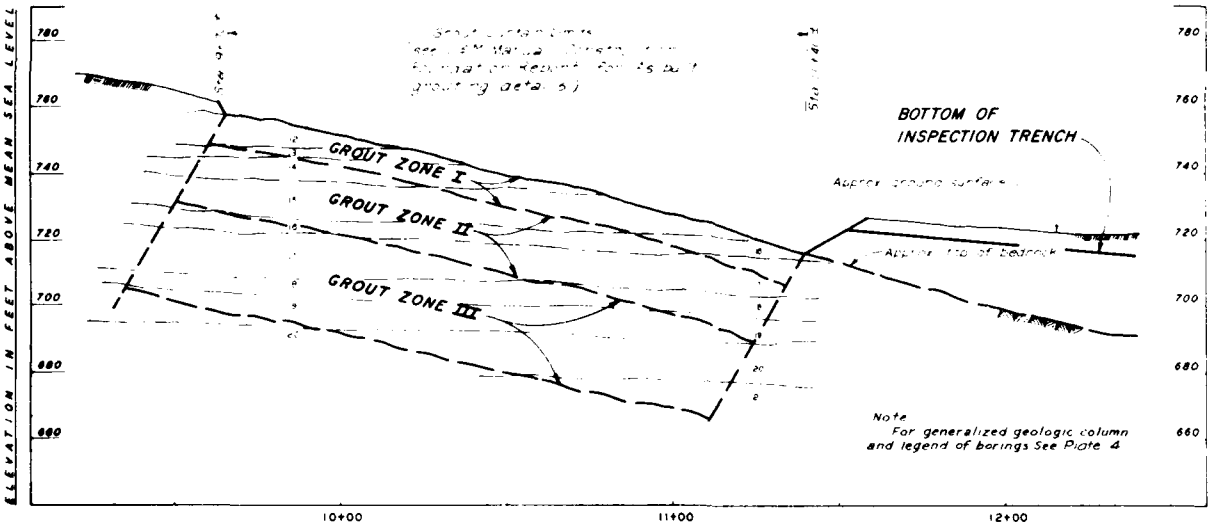
PLAN



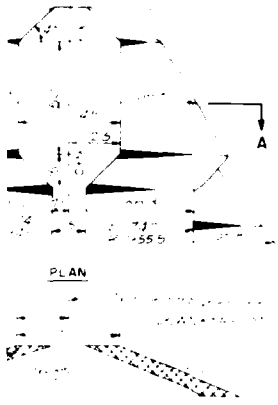
PLAN

SECTION A

TURNAROUND DETAIL



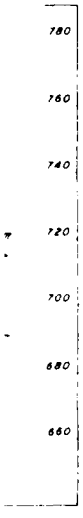
GROUT CURTAIN PROFILE



PLAN

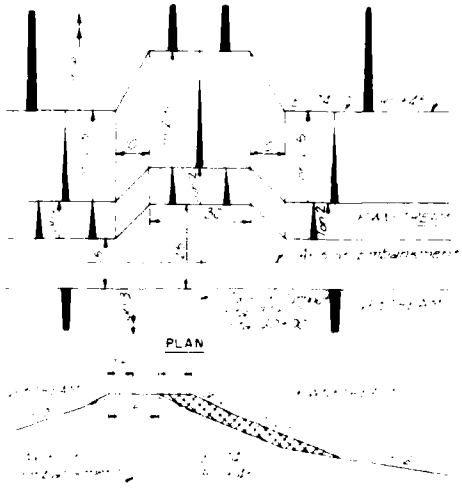
SECTION A

RNAROUND DETAIL





CUTOFF TRENCH DETAIL
EXCAVATION AND DENTAL TREATMENT



PLAN

SECTION

TURNOUT DETAIL

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

Revisions			
Symbol	Descriptions	Date	Approved

U S ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY MISSOURI

Designed by

Drawn by

Checked by

Submitted by

US Army Corps of Engineers

HARRY S. TRUMAN DAM AND RESERVOIR

CONSTRUCTION FOUNDATION REPORT

RIGHT ABUTMENT GROUT CURTAIN
STERETT CREEK

Scale AS SHOWN

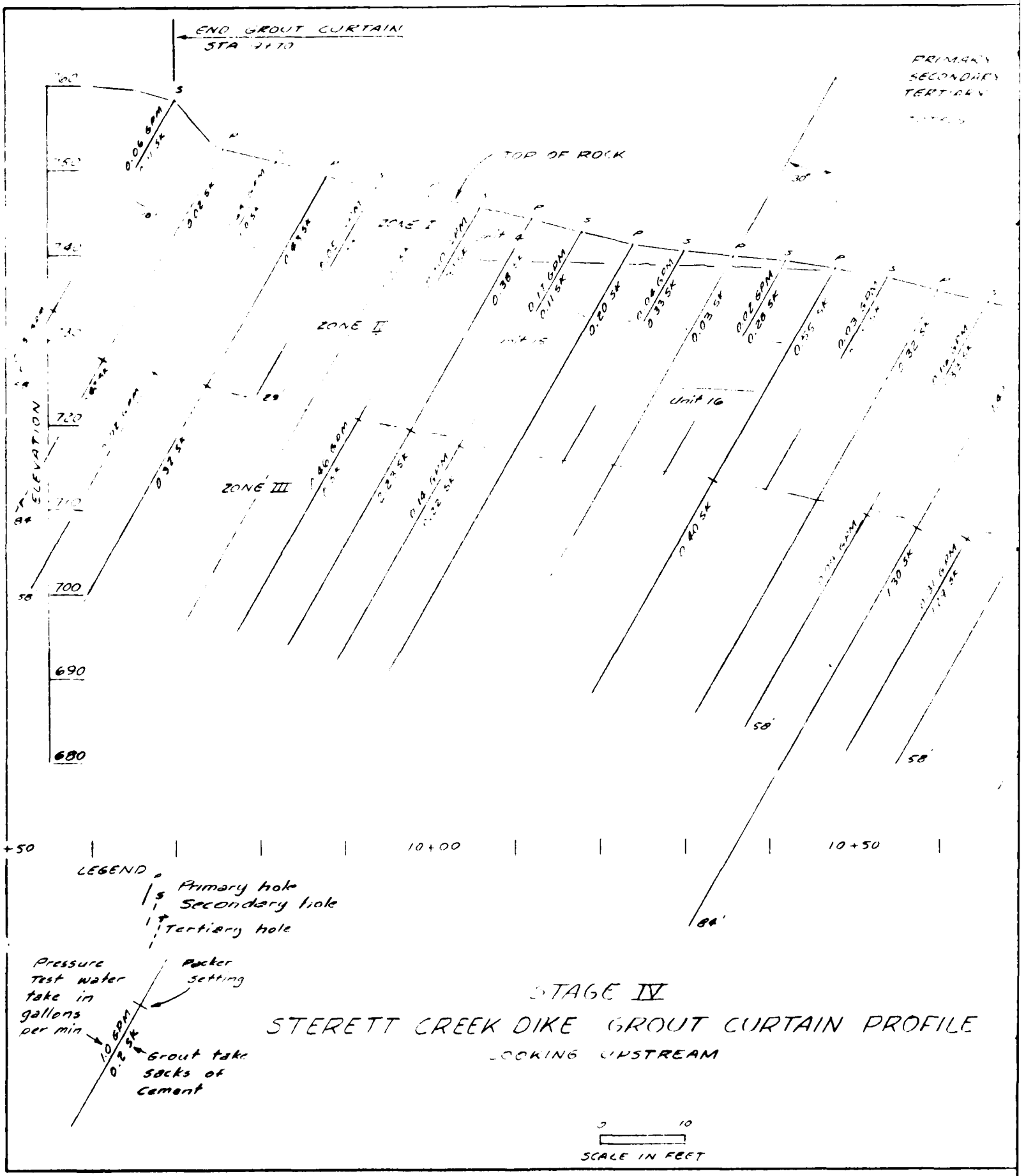
Date MARCH 1986

Dwg No

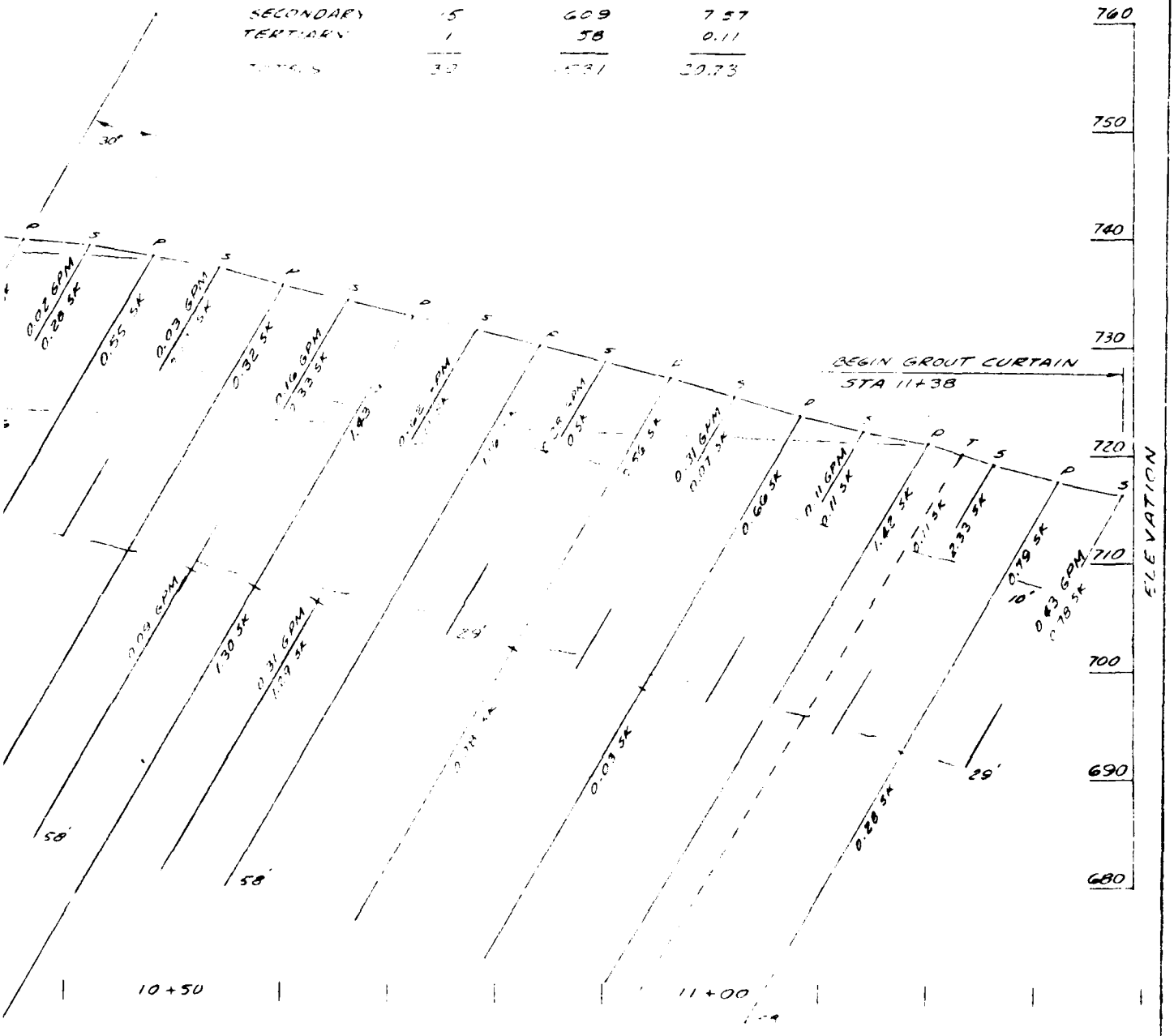
Sheet number

File No 0-12-9285

PLATE NO 154


END GROUT CURTAIN
STA 9+70
PRIMARY
SECONDARY
TERTIARY
TOP OF ROCK
ZONE I
ZONE II
ZONE III
Unit 16
ELEVATION
760
740
720
700
690
680
0.06 GPM
0.11 SK
0.02 SK
0.38 SK
0.17 GPM
0.11 SK
0.20 SK
0.04 GPM
0.33 SK
0.03 SK
0.02 GPM
0.20 SK
0.55 SK
0.03 GPM
0.32 SK
0.32 SK
0.46 GPM
0.14 GPM
0.60 SK
0.03 GPM
1.30 SK
0.31 GPM
1.14 SK
58'
84'
7+50
10+00
10+50
LEGEND
Primary hole
Secondary hole
Tertiary hole
Pressure Test water take in gallons per min
Packer setting
10 GPM
0.2 SK
Grout take sacks of cement
STAGE IV
STERETT CREEK DIKE GROUT CURTAIN PROFILE
LOOKING UPSTREAM
0
10
SCALE IN FEET

	NUMBER OF HOLES	LINEAL FEET	GROUT SACKS
PRIMARY	14	414	13.05
SECONDARY	15	609	7.57
TERTIARY	1	58	0.11
TOTALS	30	1081	20.73



Grout curtain on centerline

CURTAIN PROFILE

Revisions			
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CORPS OF ENGINEERS
KANSAS CITY MISSOURI

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Submitted by

US Army Corps of Engineers

OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

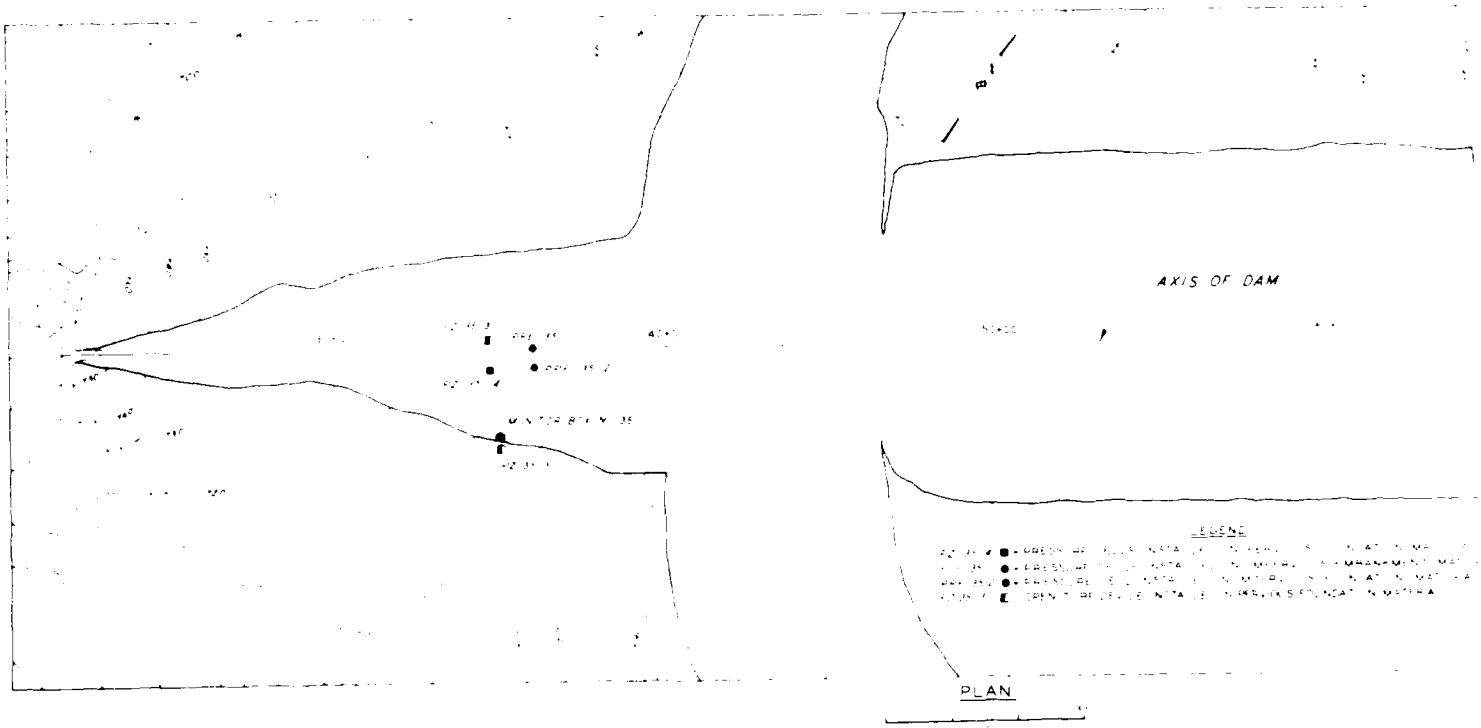
STERETT CREEK DIKE
GROUT CURTAIN PROFILE

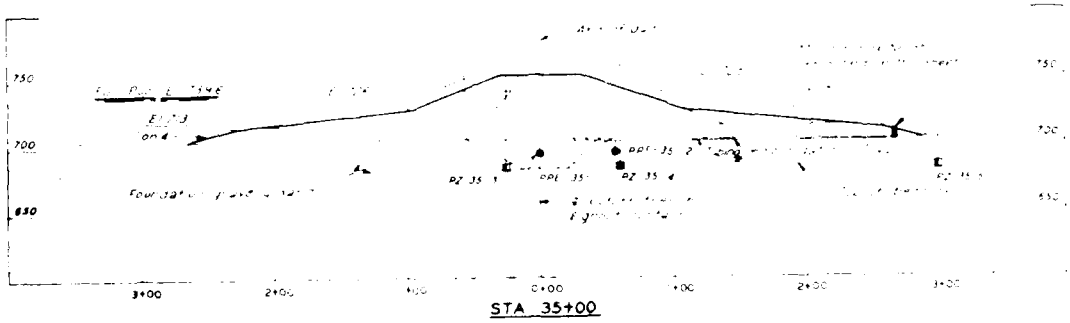
Scale AS SHOWN
Date MARCH 1986
Sheet number
Drawing No.
File No. 0-12-92 86

PLATE NO. 155

STAGE III CONSTRUCTION

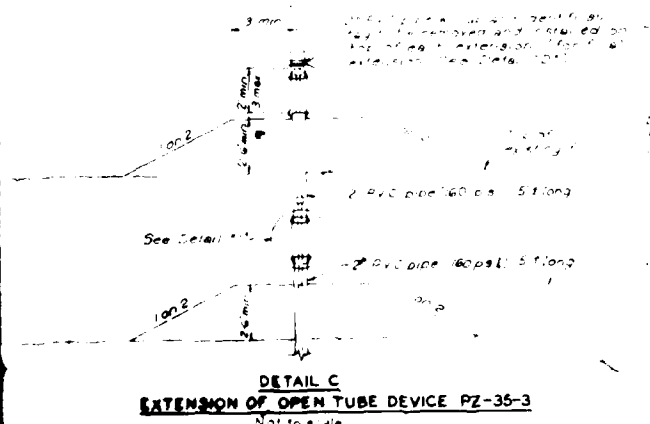
TRUCTION



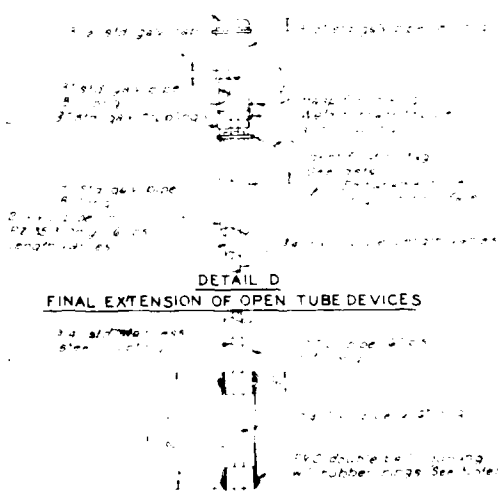


STA 35+00

KAYSINGER BLUFF EMBANKMEN

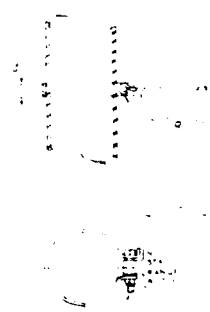


DETAIL C
EXTENSION OF OPEN TUBE DEVICE PZ-35-3
Not to scale



DETAIL D
FINAL EXTENSION OF OPEN TUBE DEVICES

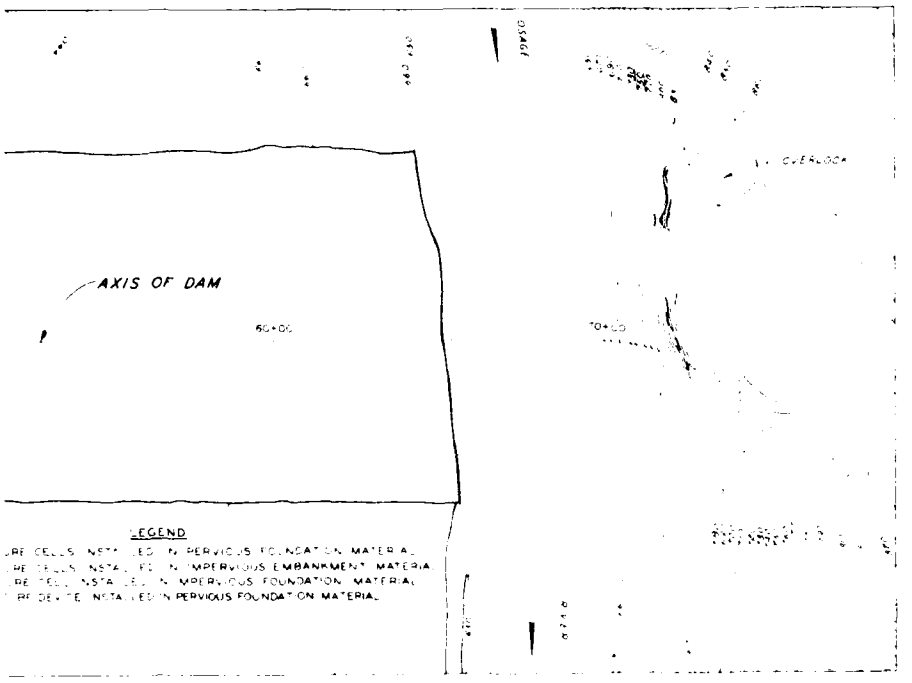
DETAIL I
PROTECTIVE PIPE COUPLING
Not to scale

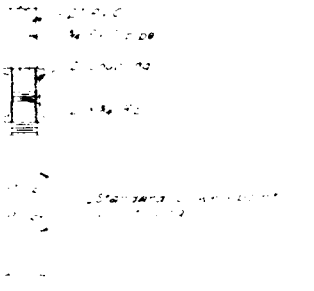


IDENTIFICATION TAG DETAIL

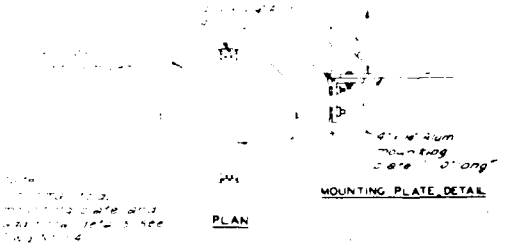
double bell coupling
PVC double bell coupling

All extensions shall be protected
against construction equipment damage



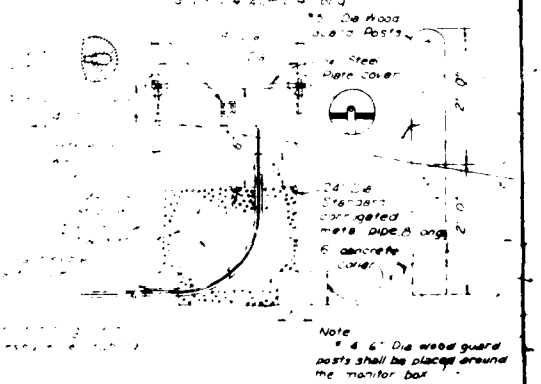


OPEN TUBE DEVICE TIP
DETAIL E



MOUNTING PLATE DETAIL

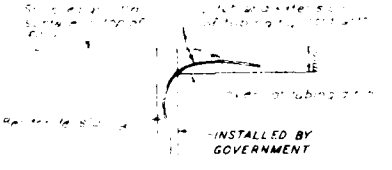
PLAN



TYPICAL SECTION
EMBANKMENT MONITOR BOX
DETAIL B
Not to scale

KAYSINGER BLUFF EMBANKMENT
OBSERVATION DEVICE SCHEDULE

SCHEDULE OF
MONITOR BOX INSTALLATION



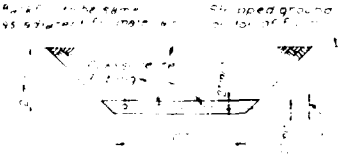
PROFILE

DRAWINGS IN THIS FOLIO
HAVE BEEN REDUCED TO ONE
HALF THE ORIGINAL SCALE





IDENTIFICATION TAG DETAIL



SECTION

TUBING DITCH DETAILS

DETAIL A
Not to scale

Symbol | Date | Approved

ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

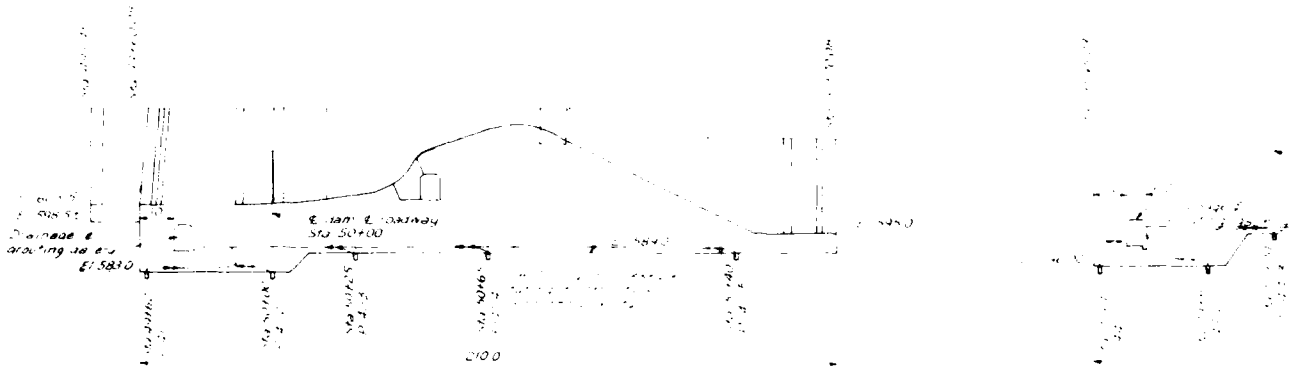
CONSTRUCTION FOUNDATION REPORT

OBSERVATION DEVICES
EMBANKMENT

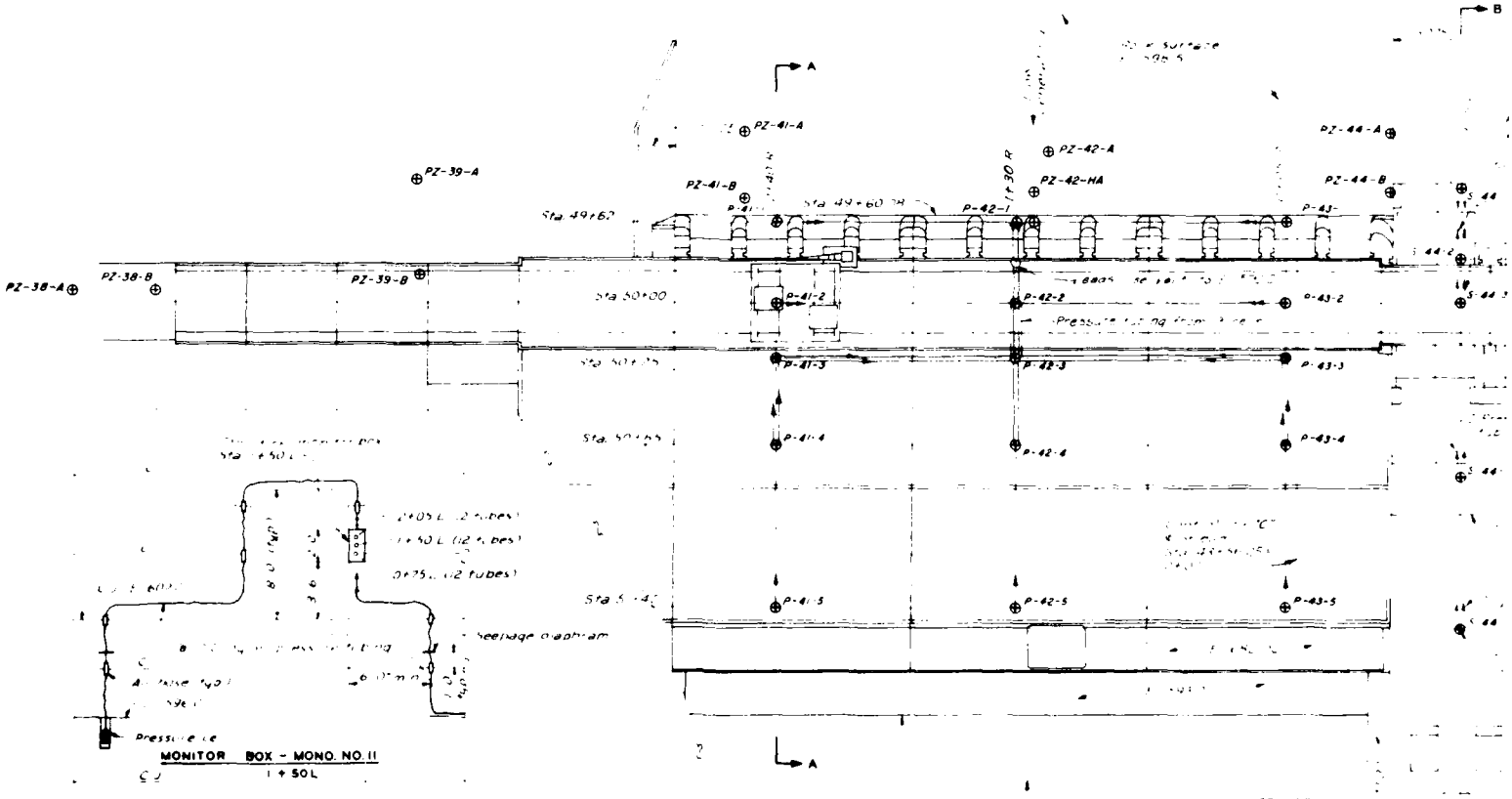
MARCH 1985

E.N. 0-12-9287

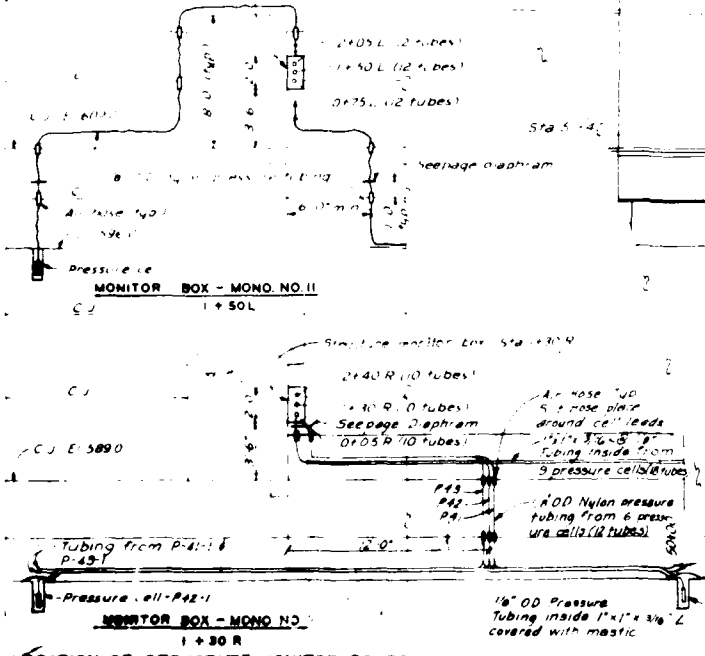
PLATE NO 156



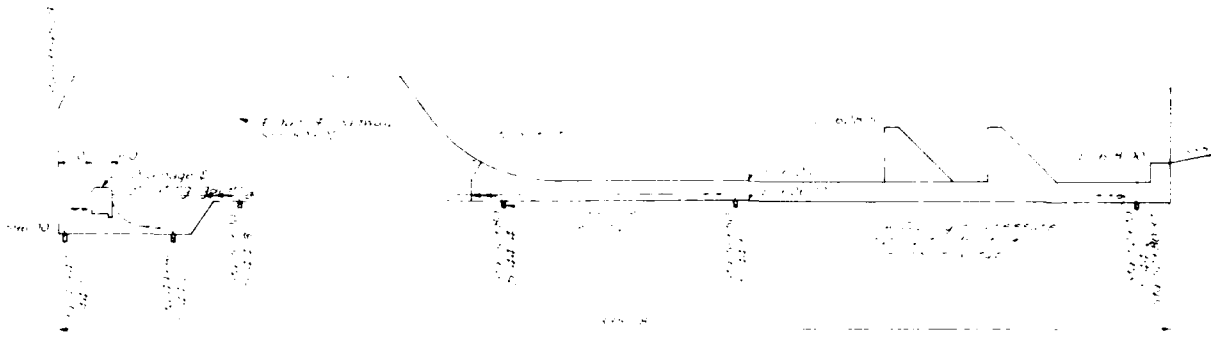
SECTION A



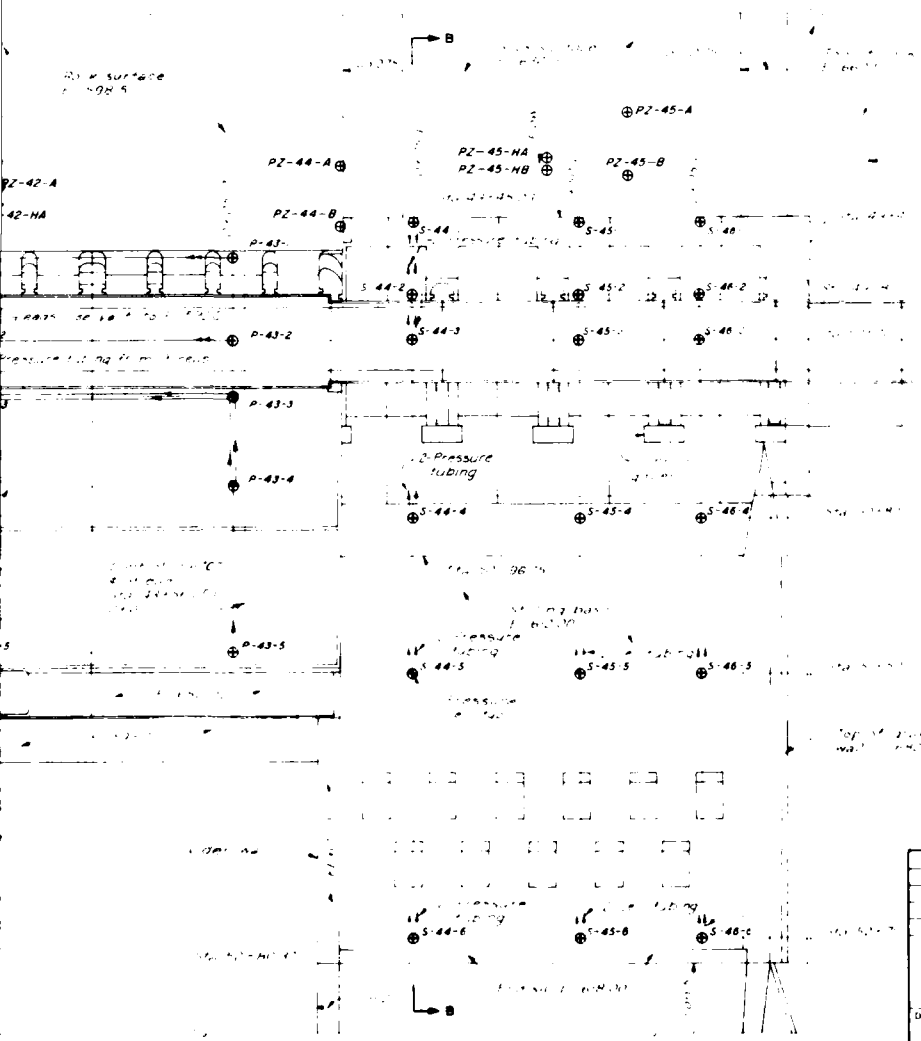
LOCATION PLAN
Scale 1" = 30'



LOCATION OF STRUCTURE MONITOR BOXES



SECTION B



LOCATION PLAN

Scale 1" = 30'

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

REFERENCE DWGS

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

OBSERVATION DEVICES
SPILLWAY - POWERHOUSE

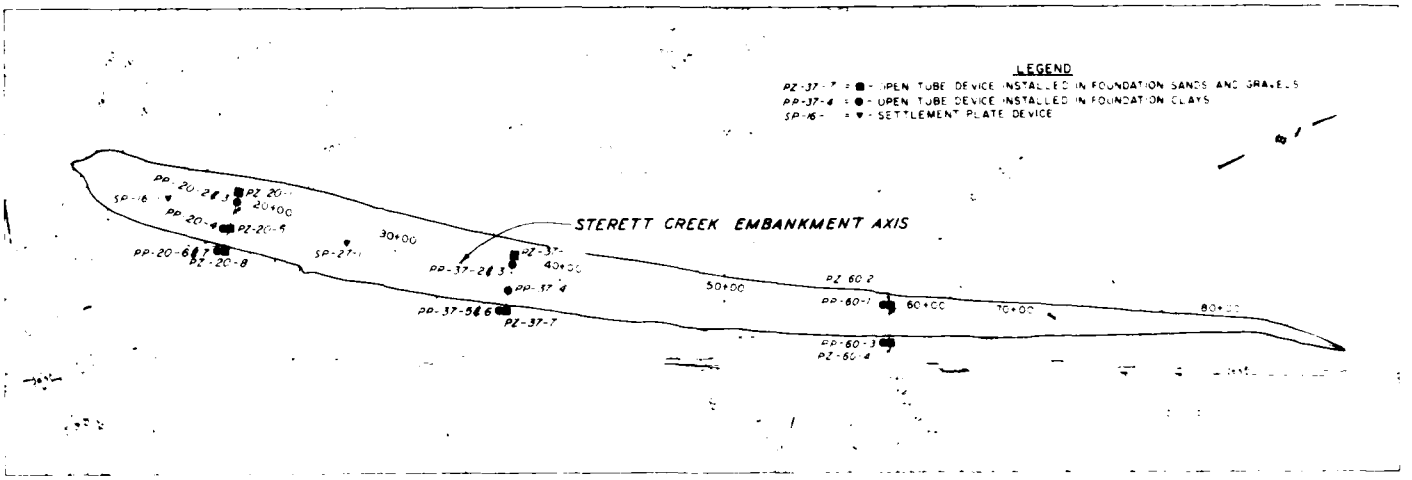
Designed by			
Drawn by			
Checked by			
Submitted by	Scale AS SHOWN	Sheet number	
	Date MARCH 1985		
	Dwg No		File No. 0-12-9288

PLATE NO. 157

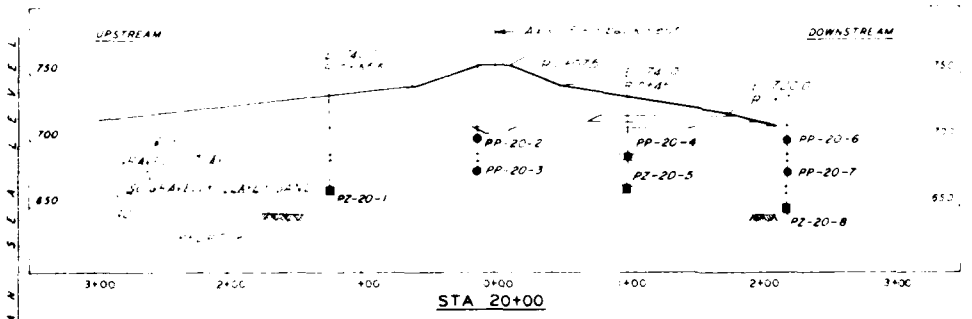
STAGE IV CONSTRUCTION

NSTRUCTION

STAGE IV CONSTRUCTION

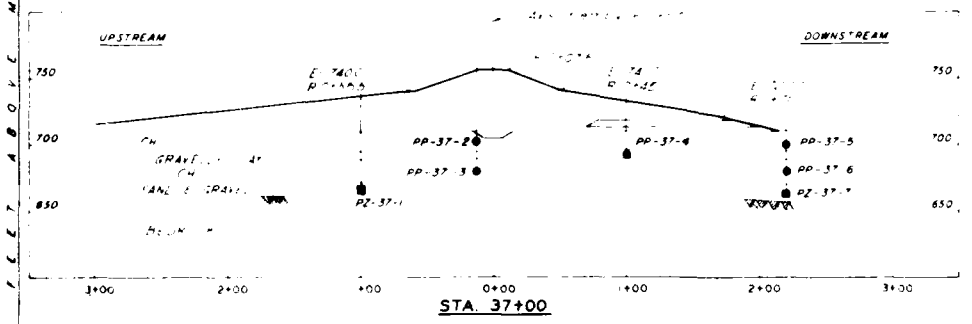


PLAN

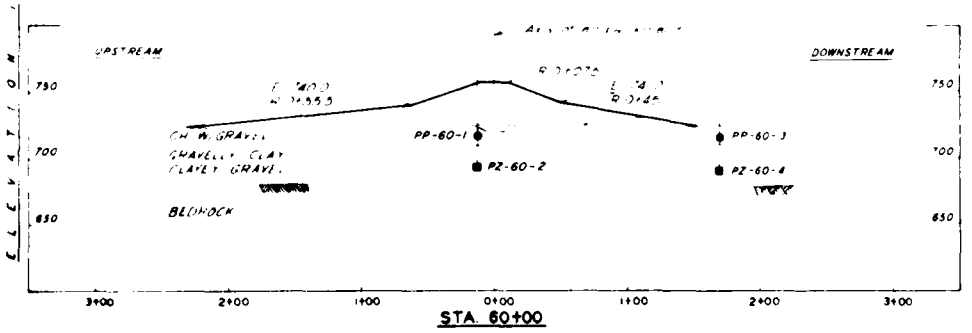


STA 20+00

STERETT CREEK EMBANKMENT
SCHEDULE OF TEST
SETTLEMENT MONUMENTS



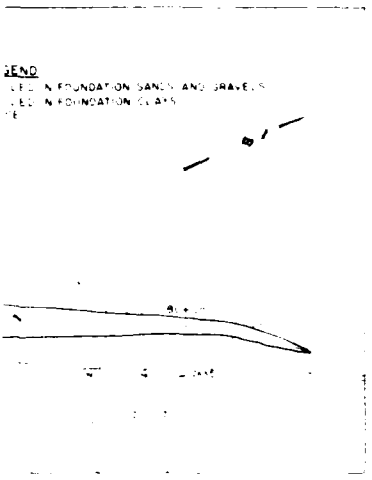
STA. 37+00



STA. 60+00

ELEVATION IN FEET ABOVE MEAN SEA LEVEL

DRAWINGS IN TH
HAVE BEEN REDUCE
HALF THE ORIGINA



STERETT CREEK EMBANKMENT
SCHEDULE OF OBSERVATION DEVICES

STERETT CREEK EMBANKMENT
SCHEDULE OF REFERENCE SETTLEMENT MONUMENTS

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

Revisions

Symbol	Description	Date	Approved

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

OBSERVATION DEVICES
STERETT CREEK

Designed by
Drawn by
Checked by
Submitted by

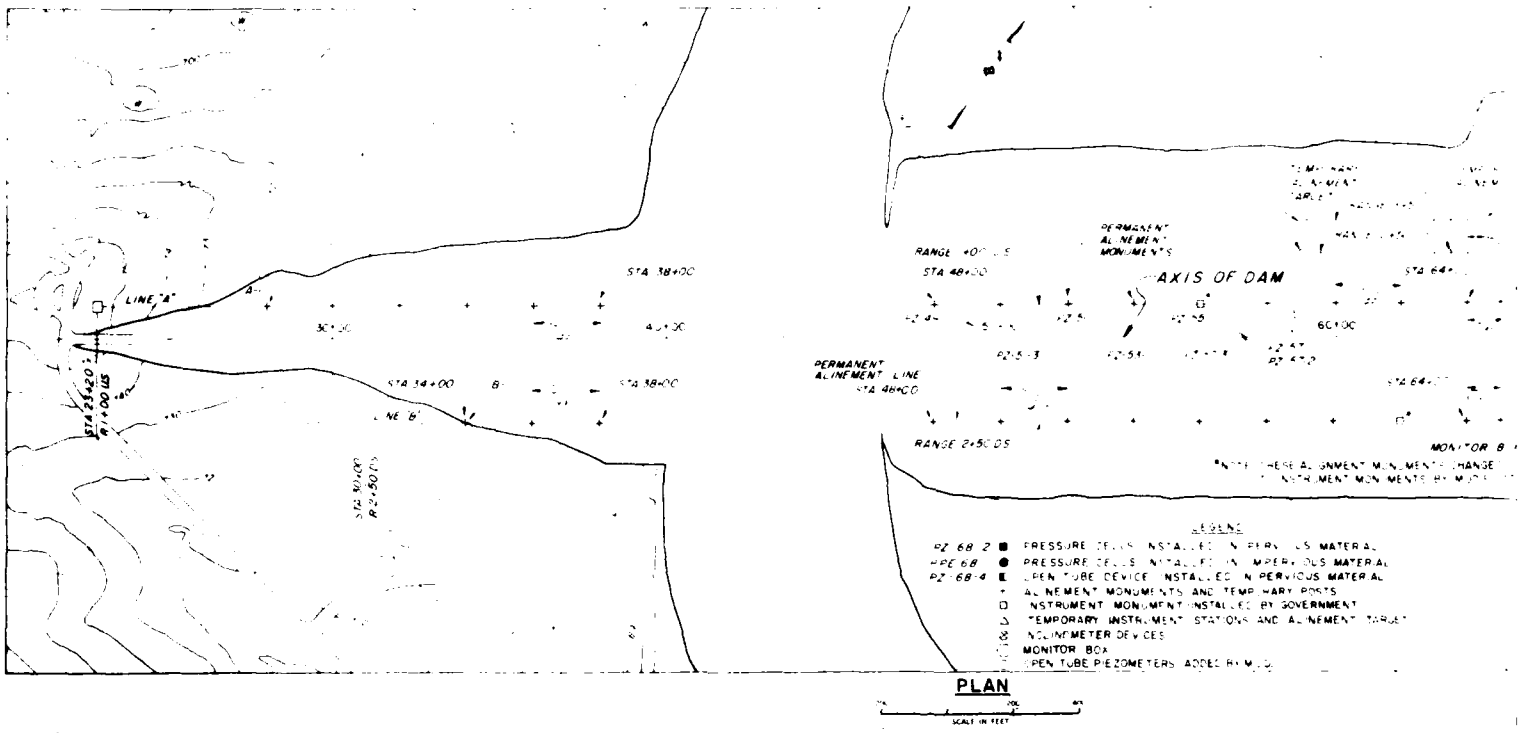
Scale: AS SHOWN
Date: MARCH 1985
Drawing No.
Sheet number
File No. 0-12-9289

PLATE NO 158

STAGE VI CONSTRUCTION

TRUCTION

STAGE VI CONSTRUCTION



SCHEDULE OF MONITOR BOX INSTALLATION

BOX NO	STATION	RANGE	ELEV TOP OF BOX
68-A	68+00	4+000	[illegible]
68-B	68+00	0+700	76

CREST SETTLEMENT MONUMENTS

NUMBER	STATION	RANGE	ORIGINAL TOP ELEV
SM-1	29+00	0+16.50	755.46
SM-2	39+00	0+16.50	755.9
SM-3	329+00	0+16.50	758.30
SM-4	49+00	0+16.50	758.21
SM-5	54+00	0+16.50	755.99
SM-6	59+00	0+16.50	755.95
SM-7	64+00	0+16.50	756.04
SM-8	69+00	0+16.50	755.39

Note: Original top elevation determined by government

MAIN EMBANKMENT
OPEN TUBE PIEZOMETER

DEVICE NO	STATION	RANGE	TIP ELEVATION	MATERIAL
PZ 49-1	49+50	0+30 DS	631	Foundation Gravels
PZ 51-1	51+50	0+20 US	615	Limestone
PZ 51-3	51+50	0+30 DS	615	Limestone
PZ 53-1	53+00	0+30 DS	645	Foundation Gravels
PZ 55-1	55+00	0+20 US	669	Impervious Embankment
PZ 57-1*	57+00	0+20 US	591	Limestone
PZ 57-2*	57+00	0+20 US	622	Foundation Gravels
PZ 57-3	57+00	0+30 DS	595	Limestone

*Installed in same protective pipe

Open tube piezometers with PVC extension pipe and protective pipe were furnished and installed by government through the existing embankment to elev 750. The Contractor extended (under contract modification) Piezometers to the final dam elevation of 756.

MAIN EMBANKMENT
PIEZOMETER DEVICE SCHEDULE

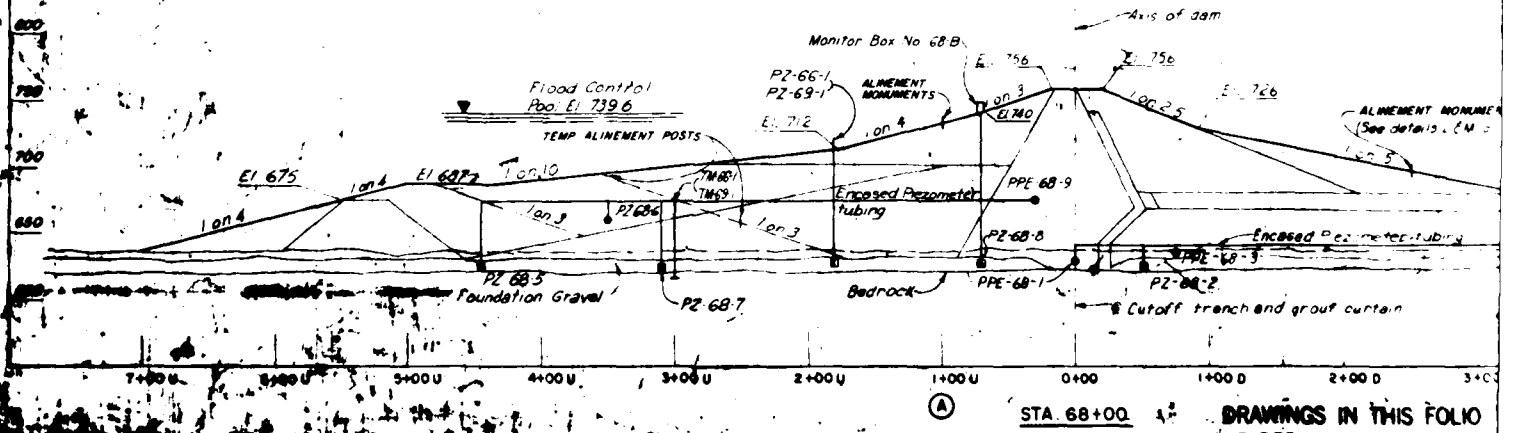
DEVICE NO	STATION	RANGE	TIP ELEVATION	MATERIAL
PZ 66	66+	[illegible]	[illegible]	Pervious Foundation
PPE 68-1	68+00	[illegible]	[illegible]	Impervious Embankment
PZ 68-2	68+00	0+50 US	635*	Pervious Foundation
PPE 68-3	66+00	0+750	635*	Pervious Foundation
PZ 68-4	68+00	4+000	635*	Pervious Foundation
PZ 68-5	68+00	4+150	625*	Pervious Foundation
PPE 68-6	68+00	3+500	665*	Impervious Embankment
PZ 68-7	68+00	3+100	625*	Pervious Foundation
PZ 68-8	68+00	0+750	635*	Pervious Foundation
PPE 68-9	68+00	3+300	665*	Impervious Embankment
PZ 69-1	68+00	1+800	625*	Pervious Foundation

Pressure cells to be furnished by government and installed by government. Piezometers to be furnished by government and extended by contractor.

Open tube piezometers

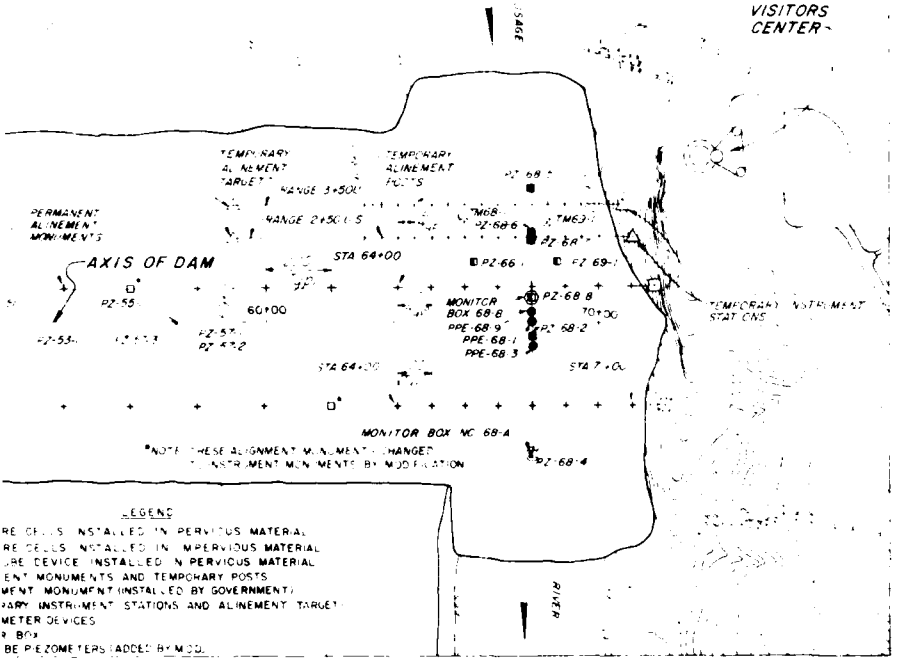
① PZ 66-1, PZ 68-4, PZ 68-8 and PZ 69-1 to be installed in the foundation gravels by government and extended above the gravel by contractor

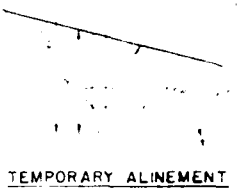
② For details see this sheet and Dwg No E2



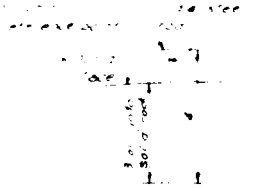
Ⓐ STA. 68+00

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE





TEMPORARY ALINEMENT POST DETAIL



TEMPORARY INSTRUMENT STATION DETAIL

MAIN EMBANKMENT
PIEZOMETER DEVICE SCHEDULE

STATION	RANGE	TOP ELEVATION	MATERIAL	TYPE OF INSTALLATION
68+20	0+50 D	625±	Pervious Foundation	A E G
68+00		635±	Impervious Embankment	B
66+00	0+75 D	635±	Impervious Embankment	B
62+30	4+00 D	625±	Pervious Foundation	A
62+00	4+50 D	625±	Pervious Foundation	A
60+00	3+50 D	660±	Impervious Embankment	B-D
57+00	3+10 D	625±	Pervious Foundation	B-D
63+00	0+75 D	625±	Pervious Foundation	C-F-G-H-D
65+00	2+30 D	675±	Impervious Embankment	B
68+60	1+80 D	625±	Pervious Foundation	A E-G C

...es to be furnished by government
...n installed by government. Tubing to be
...rnished by government and extended by
...r tractor.
...ube piezometers
...PZ 66-1, PZ 68 4, PZ 68 8 and PZ 70-1 to be
...nstalled in the foundation gravels by government
...and extended above the gravel by contractor
...for details see this sheet and Dwg No E2

ALINEMENT MONUMENTS LINE "A"

NUMBER	STATION	ORIGINAL TOP ELEV
A 1	28+00	
A 2		
A 3		
A 4		
A 5		
A 6	48+00	721.45
A 6-B		729.7
A 7	52+00	730.70
A 8	54+00	728.78
A 9	56+00	733.06
A 10	58+20	733.35
A 11	60+00	729.60
A 12	62+00	729.28
A 13	64+00	732.10
A 14	65+00	732.29
A 15	66+00	732.29
A 16	67+00	732.50
A 17	68+00	732.25
A 20	69+00	732.54
A 21	70+00	732.51
A 22	72+00	733.30

ALINEMENT MONUMENTS LINE "B"

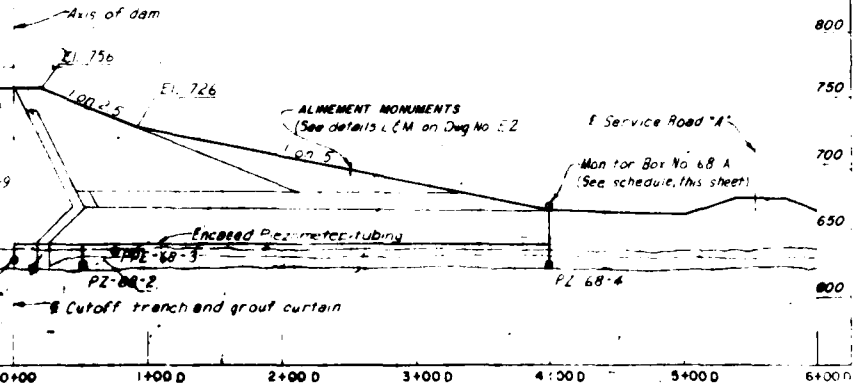
NUMBER	STATION	ORIGINAL TOP ELEV
B 1		
B 2		
B 3		
B 4		
B 5		696.23
B 6		695.94
B 7		696.28
B 8		696.23
B 9		696.66
B 10		696.08
B 11		698.39
B 12		695.95
B 13	65+00	695.6
B 14	66+00	696.96
B 15	67+00	695.76
B 16	68+00	696.8
B 17	69+00	697.18
B 18	70+00	697.4
B 19		694.53

"Note: ... top elevation determined by government
* ... Monuments

SCHEDULE OF INCLINOMETERS DEVICES (TEMPORARY)

INCLINOMETER NUMBER	STATION	RANGE	ELEVATION
*M66	66+50	3+00 D	5Ft into bedrock
*M63	63+50	3+00 D	5Ft into bedrock

(A) Inclinometer devices to be installed through the cofferdam by government and abandoned after remaining embankment construction reaches the full elevation at the device



DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

Symbol	Revisions	Date	Approved

ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

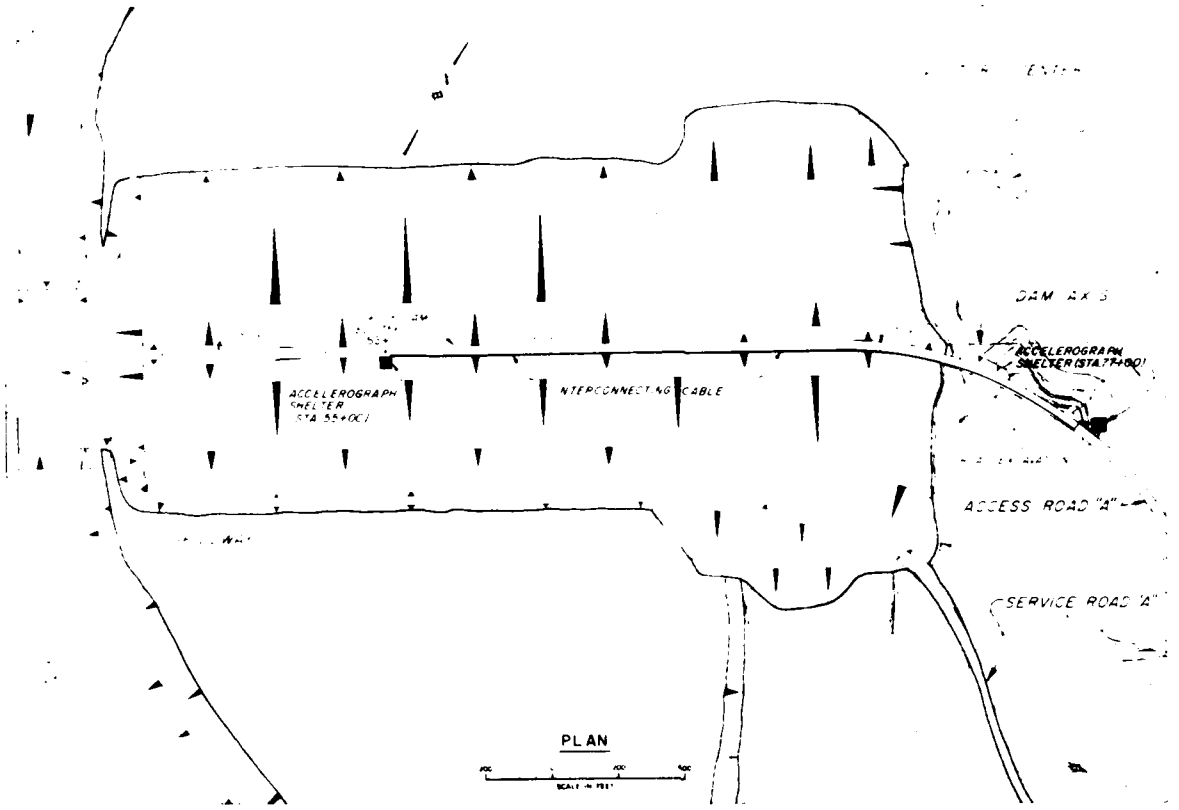
US Army Corps of Engineers

CONSTRUCTION FOUNDATION REPORT

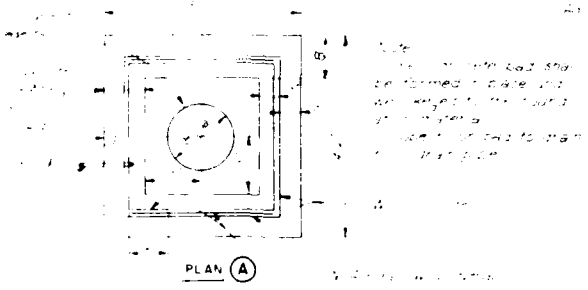
OBSERVATION DEVICES
MAIN EMBANKMENT

Designed by
Drawn by
Checked by
Traced by
Submitted by
Date MARCH 1985
Sheet number
Drawing No. 0-12-9290

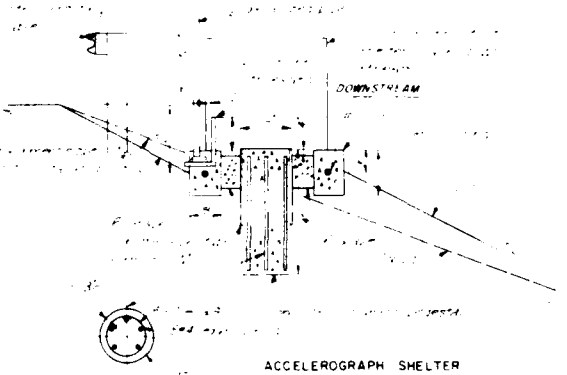
PLATE NO 159



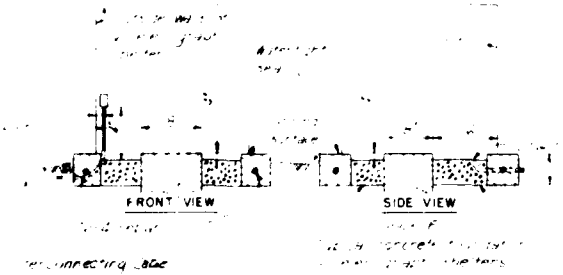
PLAN



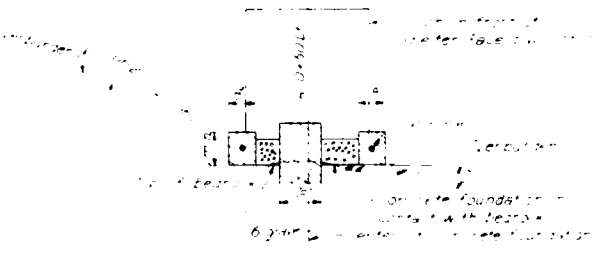
PLAN (A)



ACCELEROGRAPH SHELTER
CREST INSTALLATION
STA 55+00
SECTION



ACCELEROGRAPH SHELTER (A)



ACCELEROGRAPH SHELTER
ABUTMENT INSTALLATION (A)
STA 77+00
SECTION

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

ARMY ENGINEER DISTRICT
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KANSAS CITY, MISSOURI

CONSTRUCTION FOUNDATION REPORT

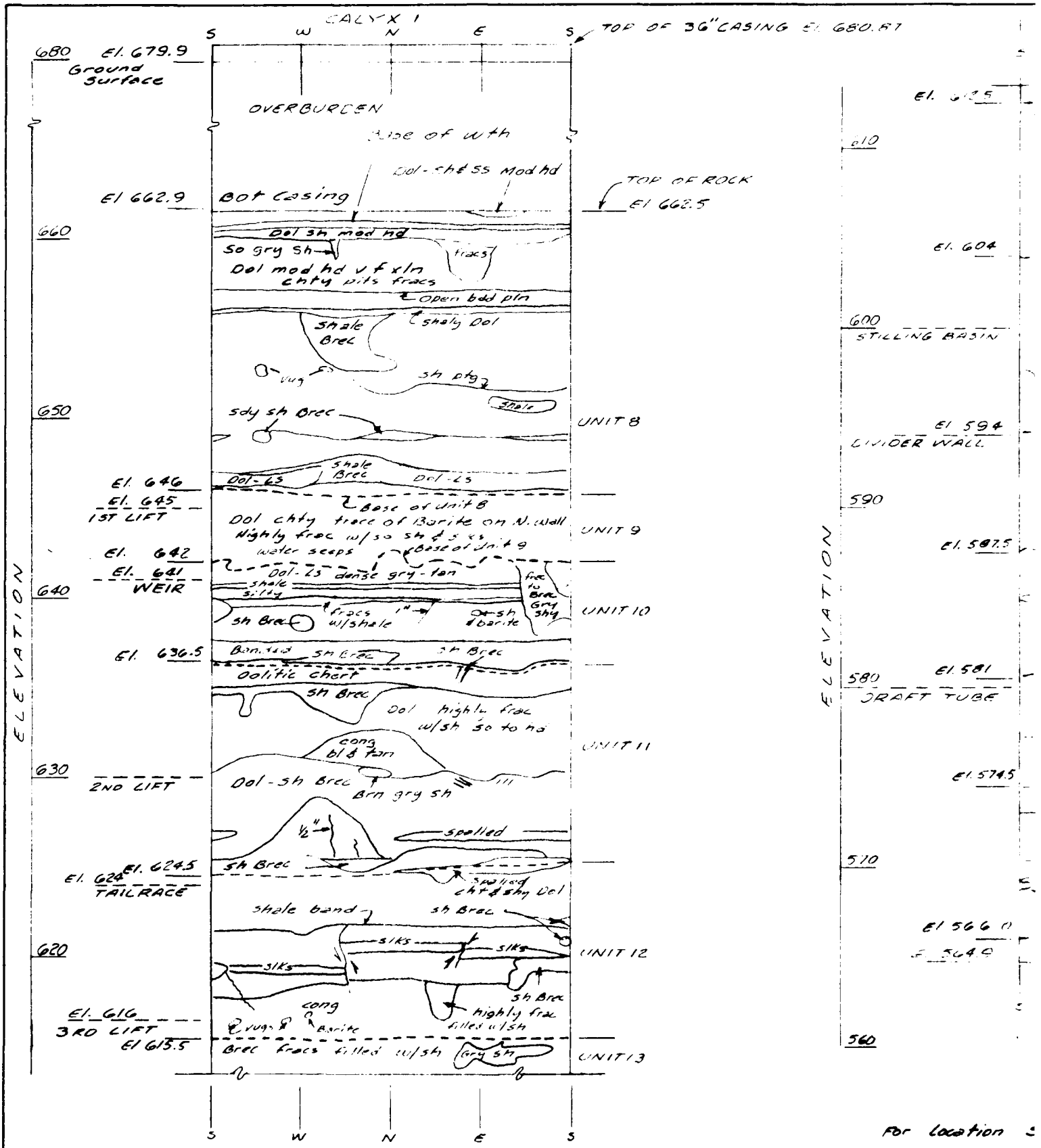
STRONG MOTION ACCELEROGRAPH
PLAN AND DETAILS

0-12-9291

PLATE NO 16

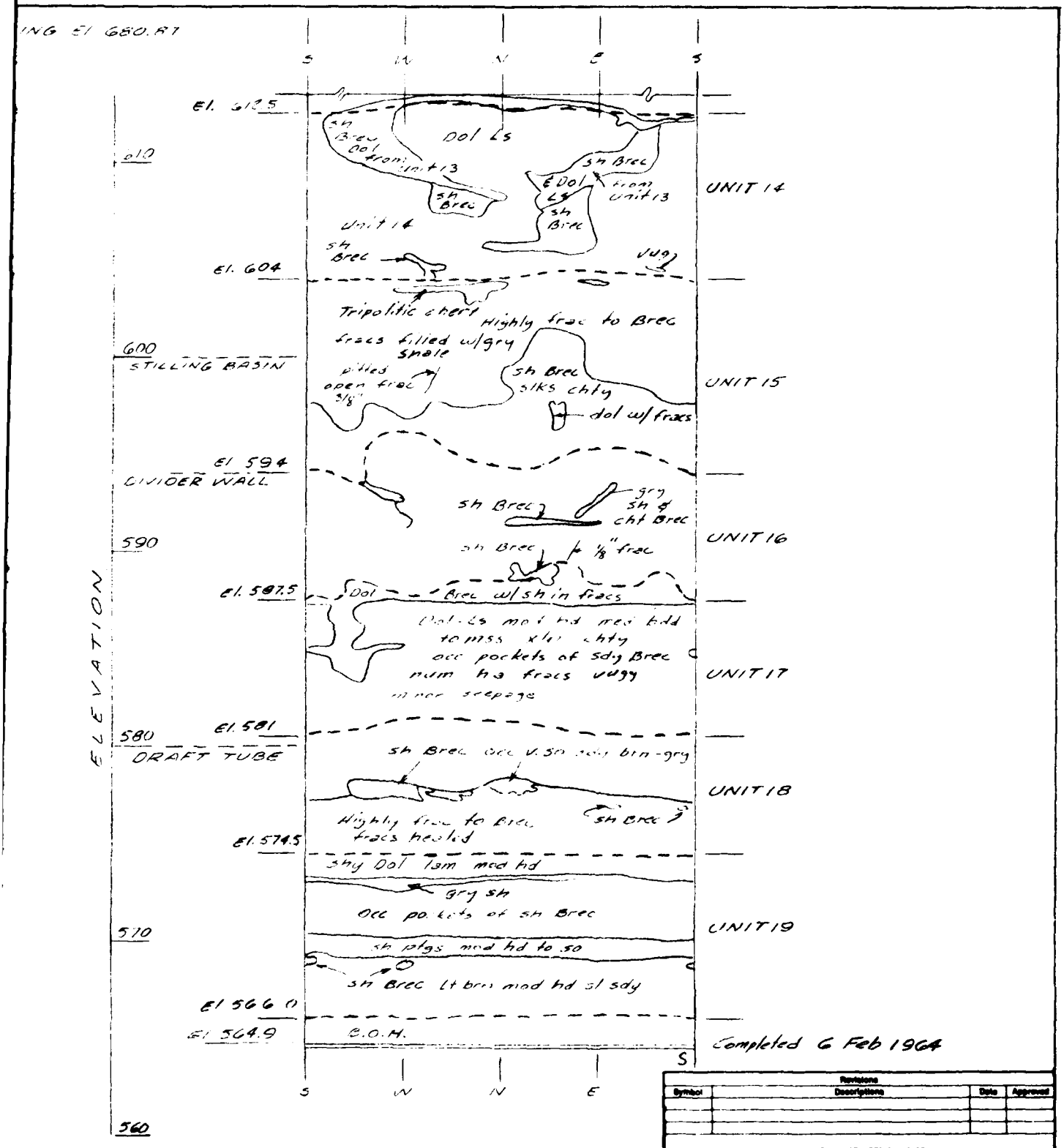
STAGE I CONSTRUCTION

TRUCTION



LOG OF CALYX HOLE NO 1

0 5
SCALE IN FEET



For location See Plan of Borings Plate 2

F NO 1

0 5

SCALE IN FEET

Revisions			
Symbol	Descriptions	Date	Approved

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KANSAS CITY, MISSOURI

Designed by

Drawn by

Checked by

Submitted by

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HARRY S. TRUMAN DAM & RESERVOIR
CONSTRUCTION FOUNDATION REPORT

LOG OF CALYX
HOLE NO. 1

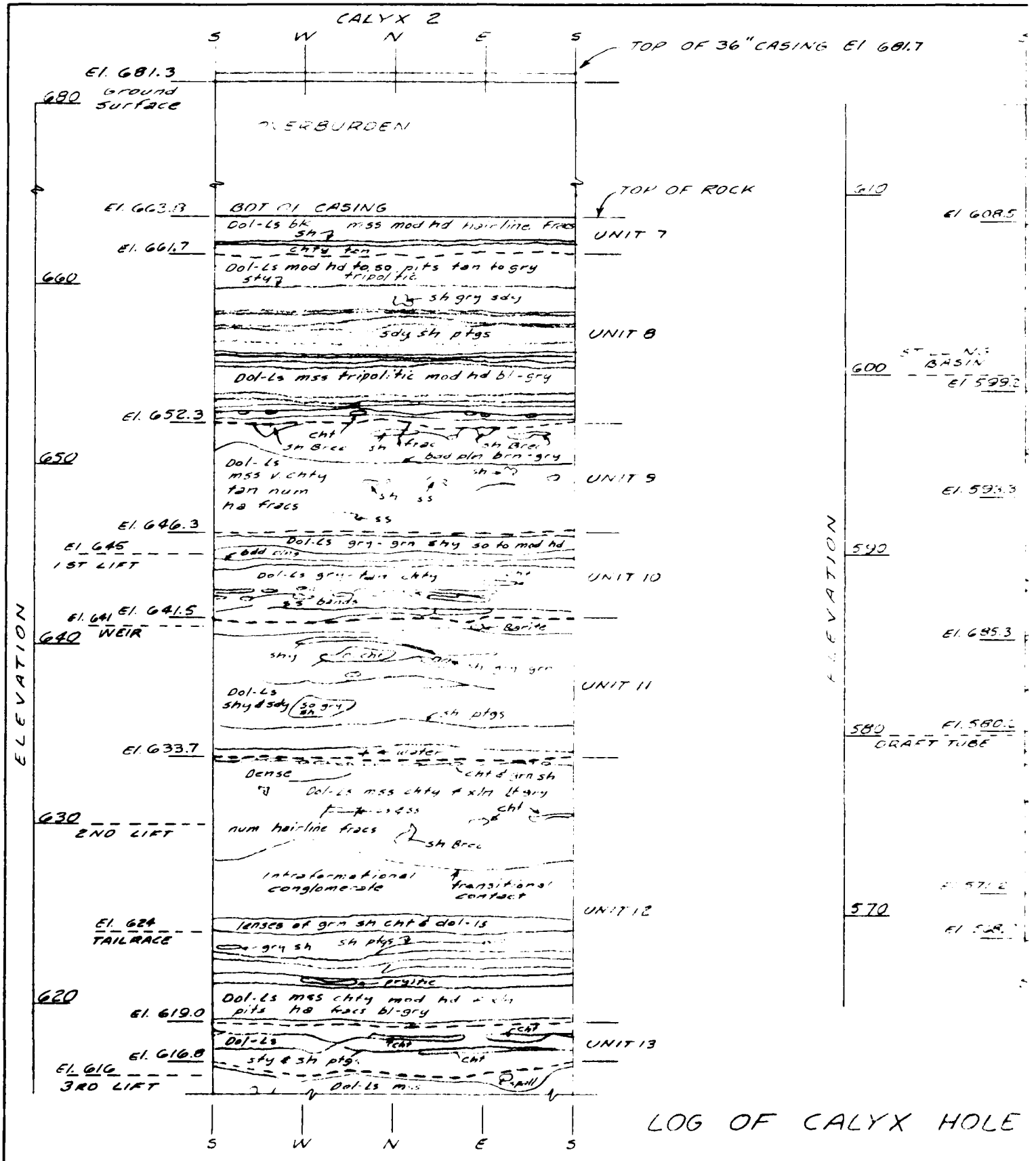
Scale AS SHOWN

Date MARCH 1966

Sheet number

File no. 0-12-9292

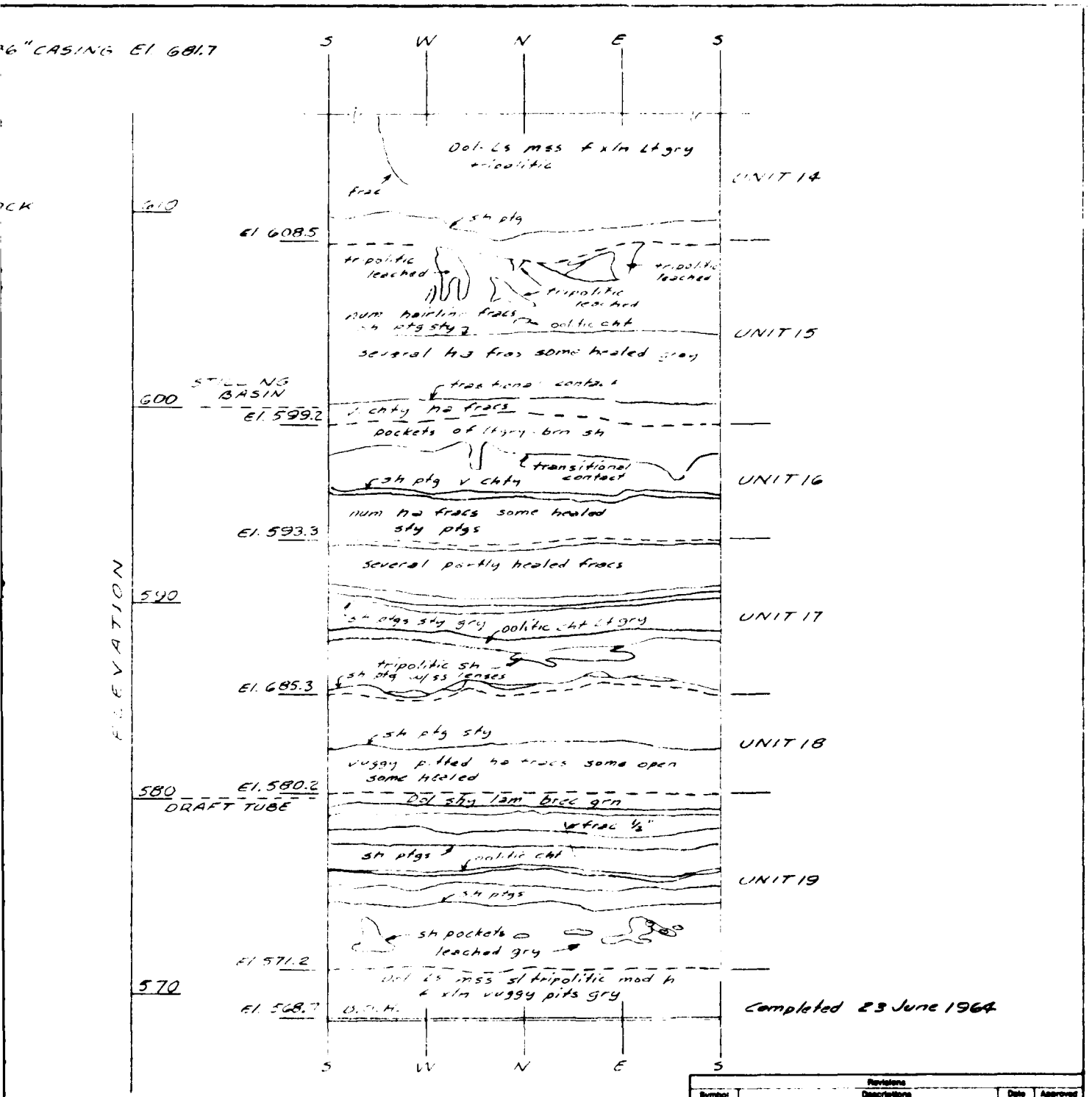
PLATE NO. 161



LOG OF CALYX HOLE

For Location See Plan of Borings Plate 2

SCALE IN F



OF CALYX HOLE NO 2

Plan of Borings

0 5

SCALE IN FEET

Revisions			
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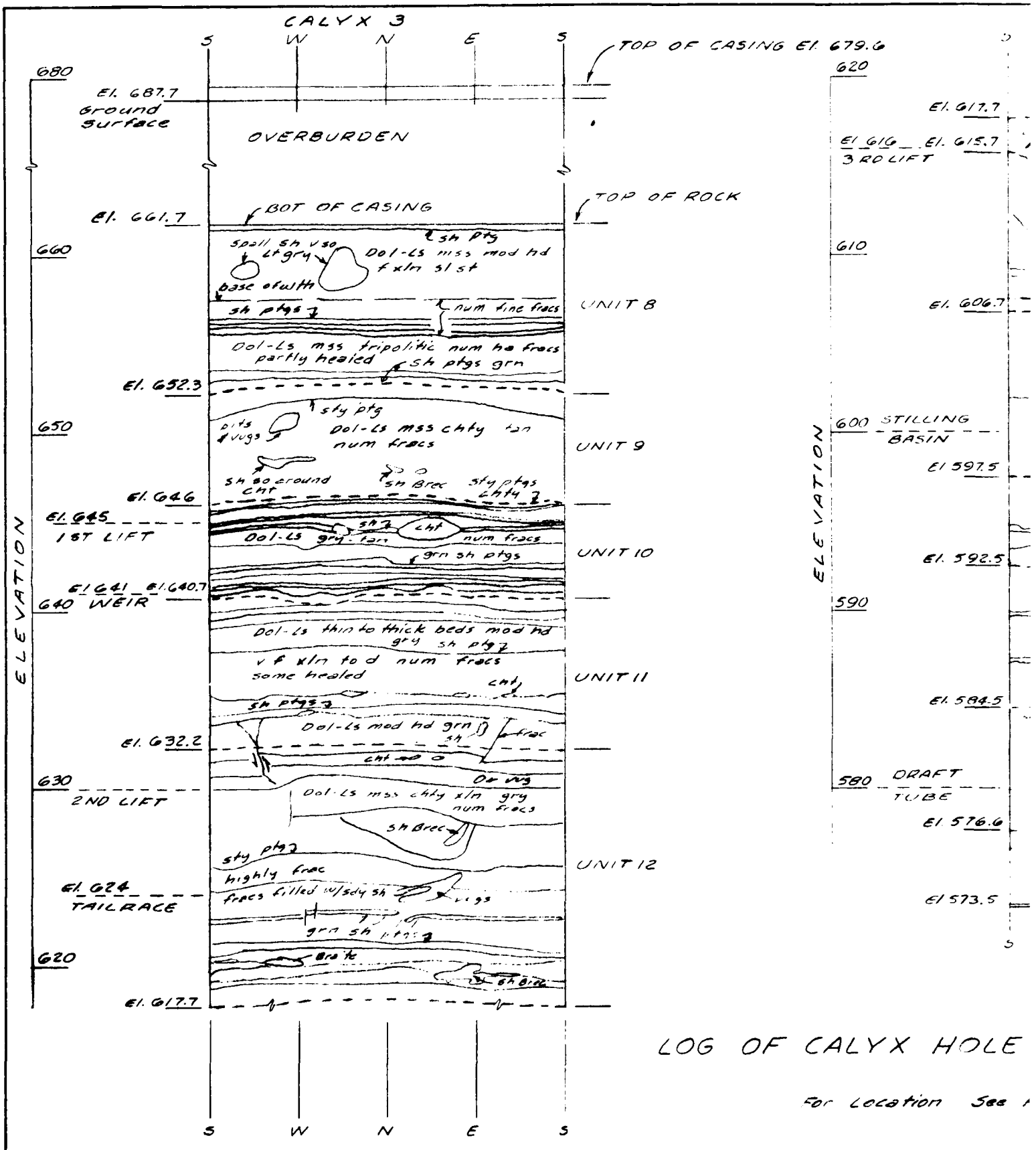
US Army Corps of Engineers

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LOG OF CALYX
HOLE NO. 2

Scale AS SHOWN
Date MARCH 1966
Drawing No. NCK 0-12-9293

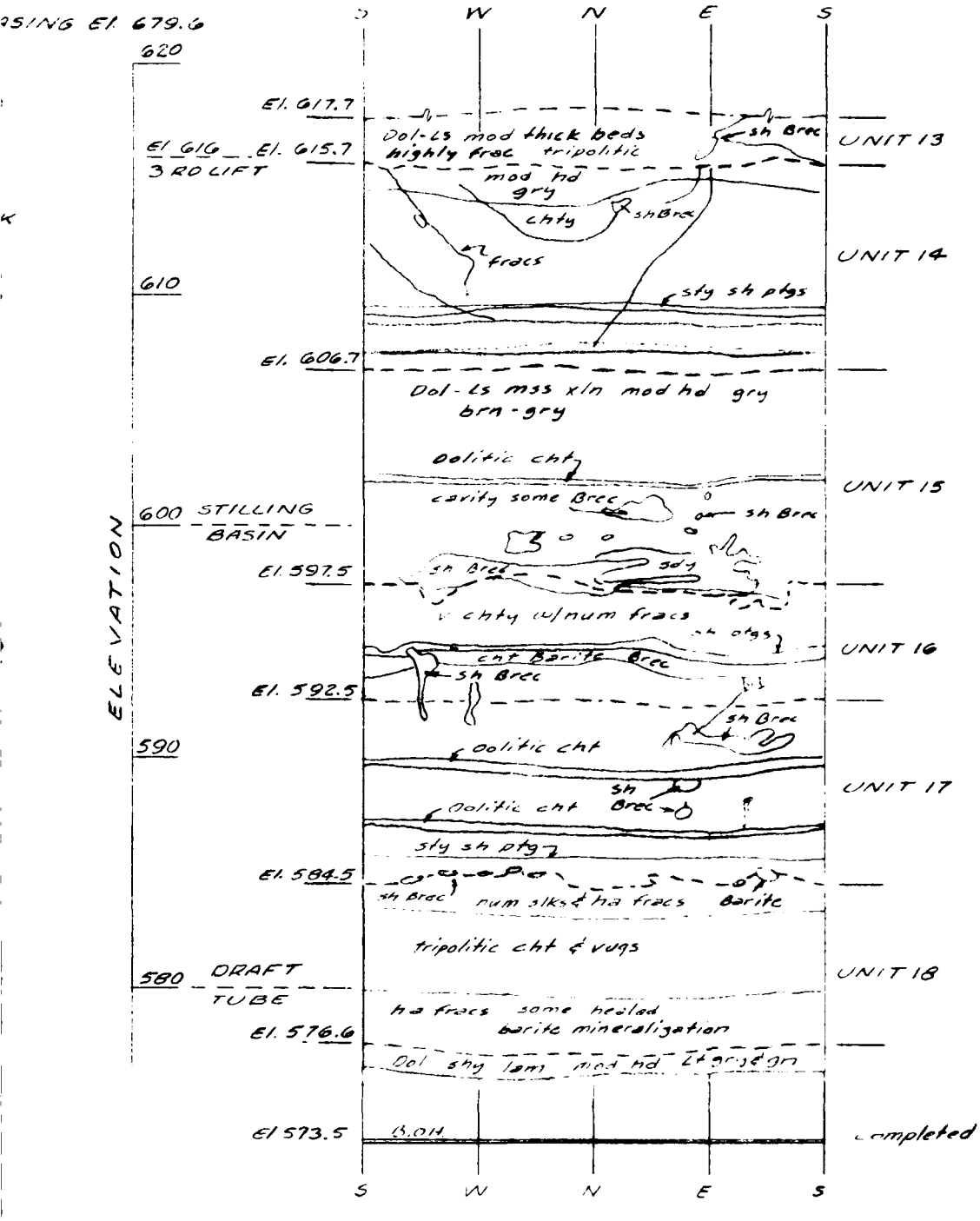
PLATE NO. 162



LOG OF CALYX HOLE

For Location See

SCAL



Completed 3 July 1964

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CONSTRUCTION FOUNDATION REPORT

LOG OF CALYX HOLE NO. 3

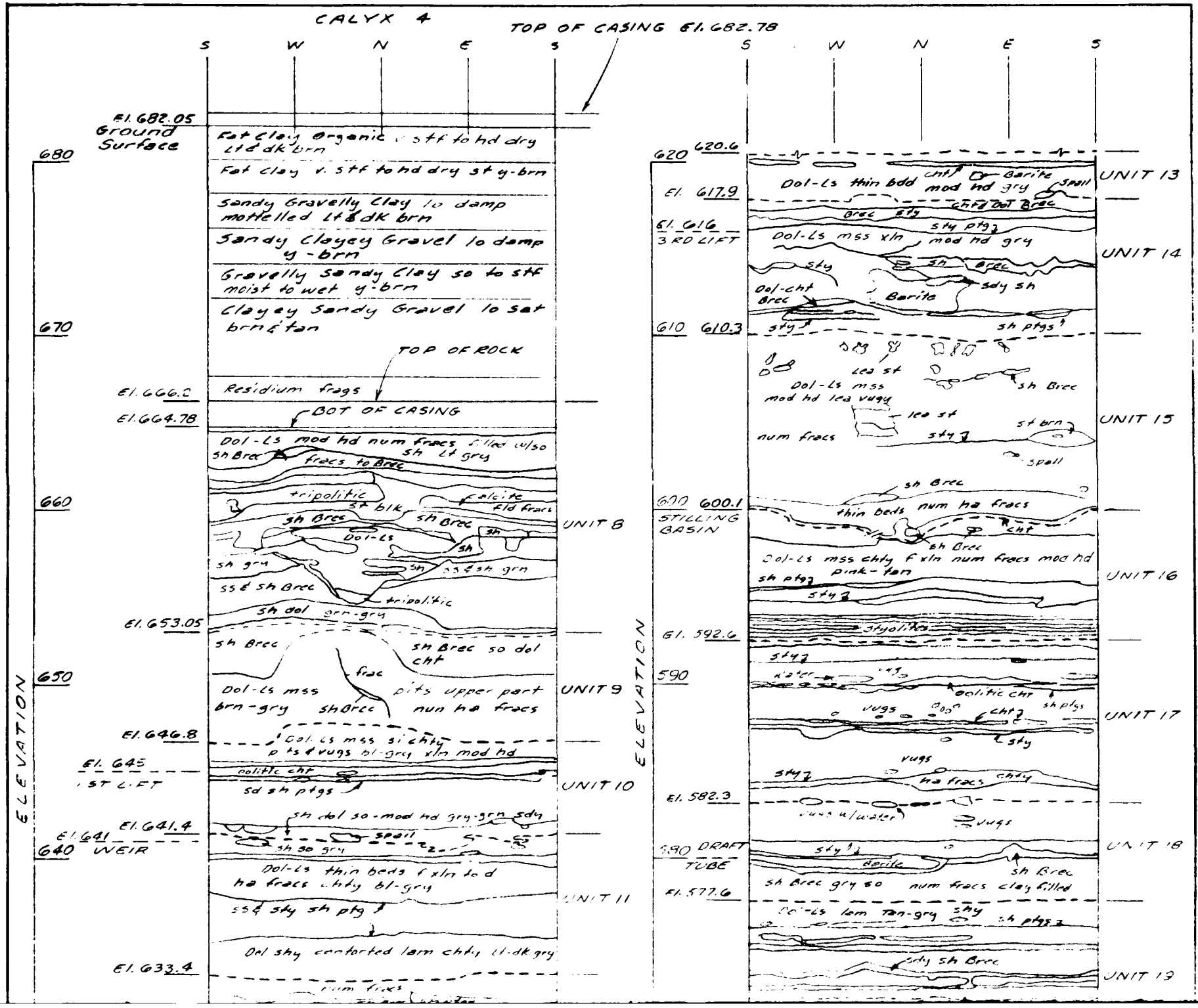
Scale AS SHOWN
Date MARCH 1966
Sheet number
Drawing No. 0-12-9294

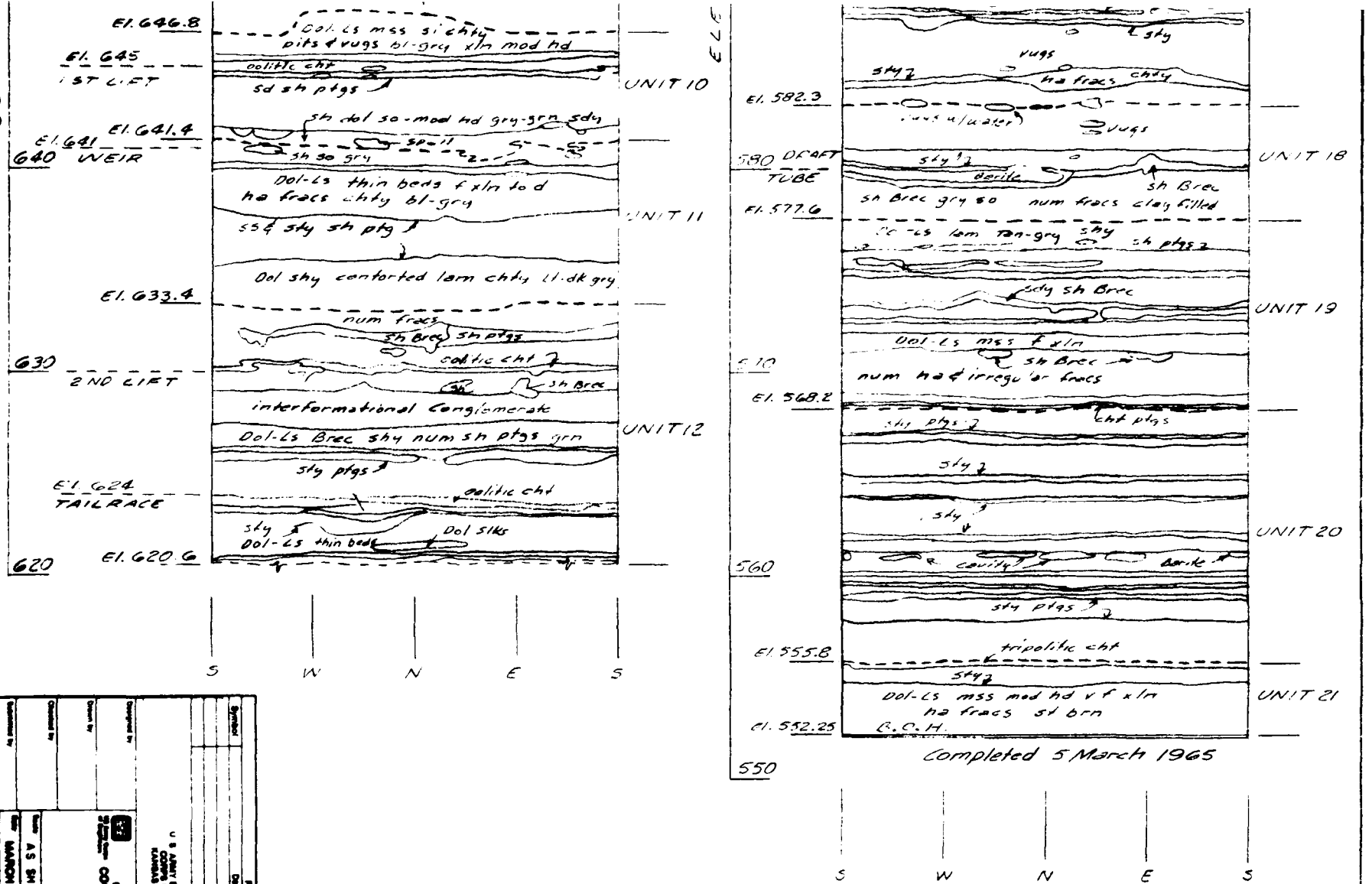
OF CALYX HOLE NO 3

For Location See Plan of Borings Plate 2

0 5
SCALE IN FEET

PLATE NO. 163


CALYX 4
TOP OF CASING El. 682.78
S W N E S
El. 682.05
Ground Surface
Fat clay Organic v. stf to hd dry lt & dk brn
Fat clay v. stf to hd dry sl y-brn
Sandy Gravelly Clay lo damp mottelled lt & dk brn
Sandy Clayey Gravel lo damp y-brn
Gravelly Sandy Clay so to stf moist to wet y-brn
Clayey Sandy Gravel lo sat brn & tan
TOP OF ROCK
El. 666.2
Residium frags
El. 664.78
BOT OF CASING
Dol-Ls mod hd num fracs filled w/so sh Lt grey
sh Brec
fracs to Brec
tripolitic
calcite fld fracs
sh Brec
sh Brec
Dol-Ls
sh
sh gry
ss & sh grn
ss & sh Brec
tripolitic
sh dol grn-gry
El. 653.05
sh Brec
sh Brec so dol cht
frac
Dol-Ls mss brn-gry
sh Brec
pits upper part nun ha fracs
El. 646.8
Dol-Ls mss sl chty pits & vugs bl-gry xln mod hd
El. 645
1ST CLIFT
oolitic cht
sd sh ptgs
El. 641.4
El. 641
WEIR
sh dol so-mod hd gry-grn sdy
spoil
sh so gry
Dol-Ls thin beds f xln to d ha fracs chty bl-gry
ss & sty sh ptg
Dol shy contorted lam chty lt-dk gry
El. 633.4
num fracs
UNIT 8
UNIT 9
UNIT 10
UNIT 11
ELEVATION
680
670
660
650
640
S W N E S
620
610
590
580
570
620.6
El. 617.9
El. 616
3RD CLIFT
610.3
600.1
STILLING BASIN
592.6
582.3
590 DRAFT TUBE
577.6
Dol-Ls thin bdd mod hd gry
cht
Barite
spoil
chty Dol Brec
Brec
sty
sty ptg
Dol-Ls mss xln mod hd gry
sh Brec
sdy sh
Dol-cht Brec
Barite
sty
sh ptgs
lea st
sh Brec
Dol-Ls mss mod hd lea vugy
lea st
num fracs
sty
sl brn
spoil
sh Brec
thin beds num ha fracs
cht
sh Brec
Dol-Ls mss chty f xln num fracs mod hd pink-tan
sh ptgs
sty
Stylolites
sty
water
oolitic cht
sh ptgs
vugs
cht
sty
vugs
sty
ha fracs chty
vugs w/water
vugs
sty
dolite
sh Brec
sh Brec grysa num fracs clay filled
Dol-Ls lam tan-grey shy
sh ptgs
sdy sh Brec
UNIT 13
UNIT 14
UNIT 15
UNIT 16
UNIT 17
UNIT 18
UNIT 19



LOG OF CALYX HOLE NO 4

For Location See Plan of Borings Plate

0 5

SCALE IN FEET

Designed by	Symbol
Drawn by	Revisions Descriptions
Checked by	Date
Submitted by	Approved

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

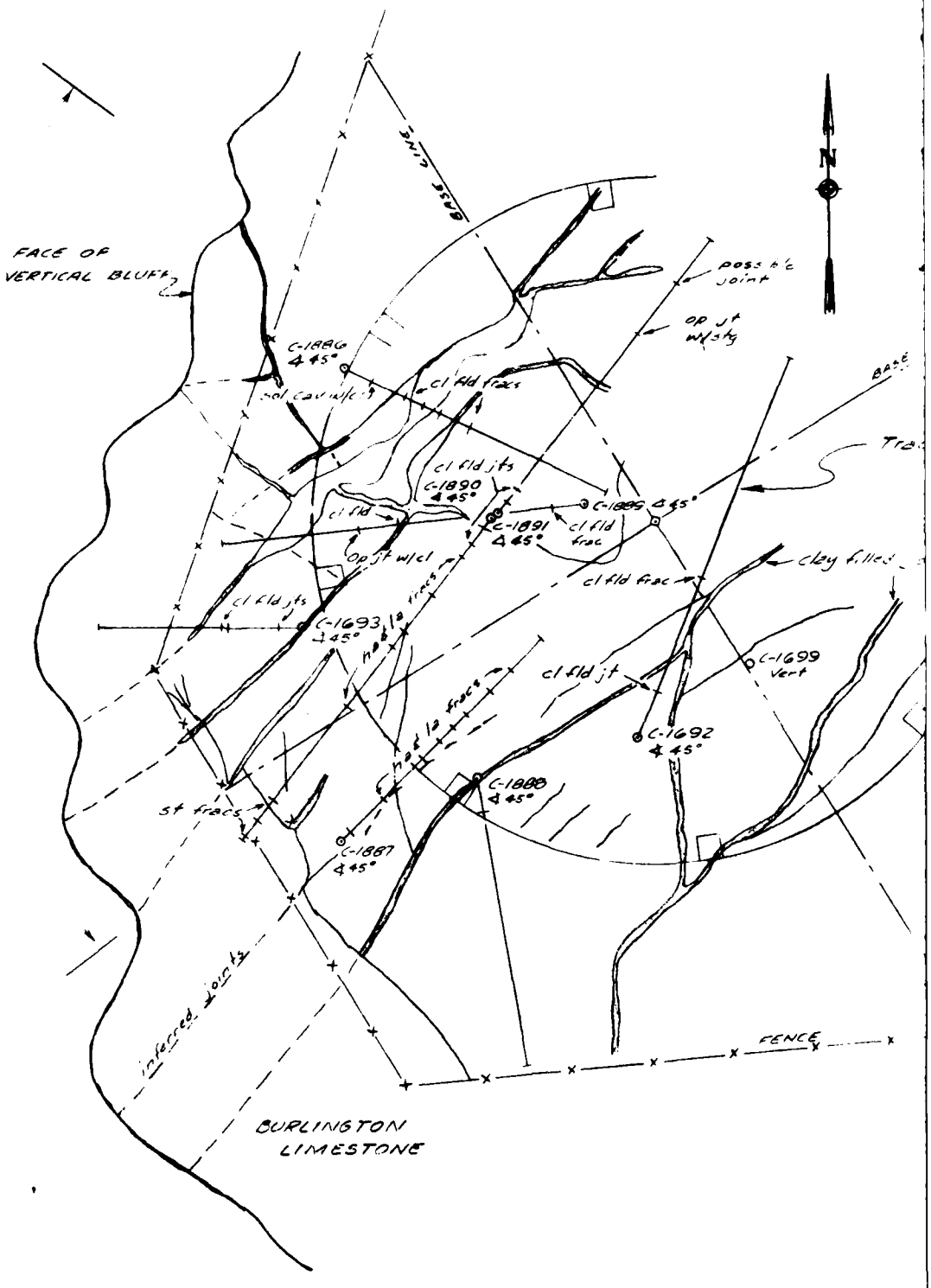
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CONSTRUCTION FOUNDATION REPORT

LOG OF CALYX
HOLE NO. 4

Scale AS SHOWN
Date MARCH 1966
Sheet number
File No. 0-12-9295

PLATE NO. 164

164

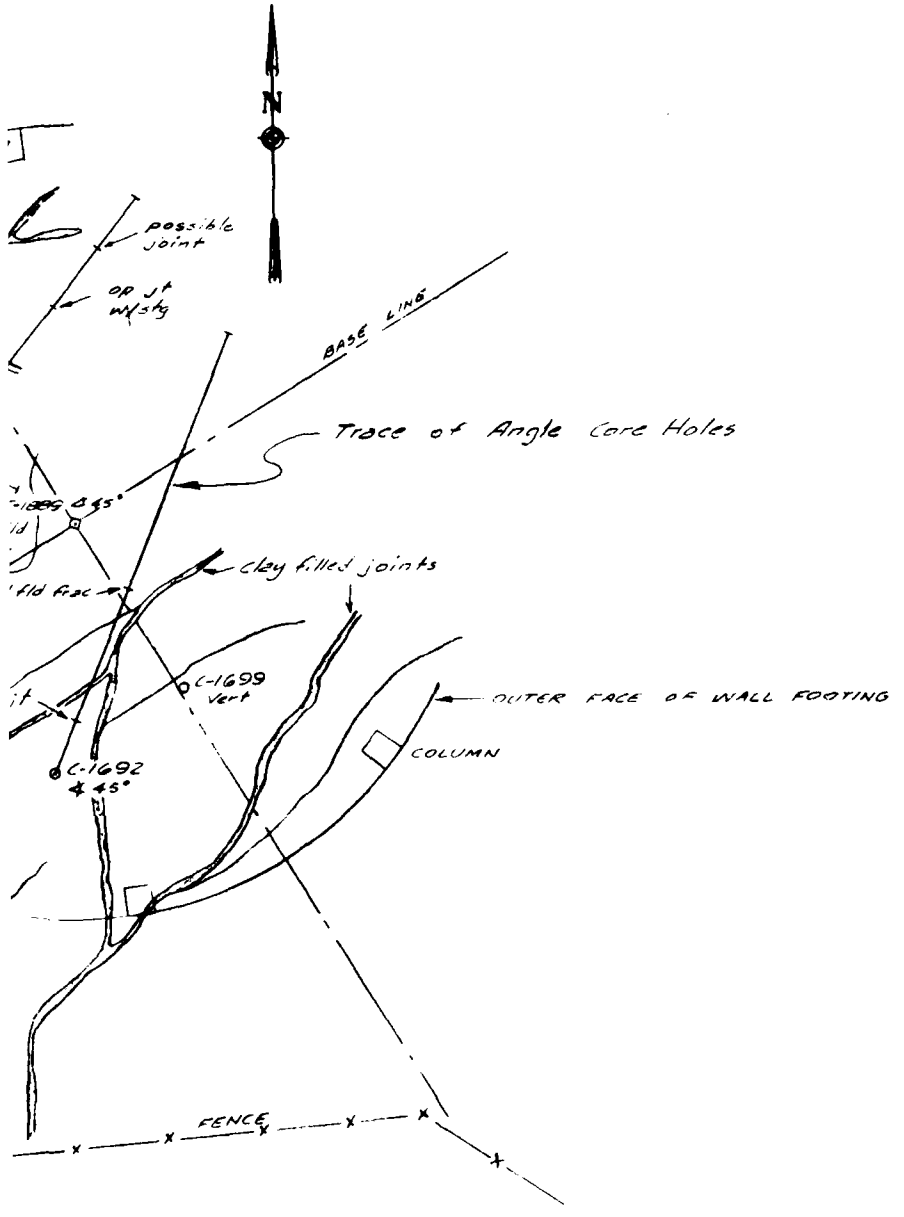


FOUNDATION MAP VISITOR CENTER

WITH ANGLE BORING DATA

0 10

SCALE IN FEET



VTER

JULY 1975

Revisions			
Symbol	Descriptions	Date	Approved

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CONSTRUCTION FOUNDATION REPORT

FOUNDATION MAP,
VISITOR CENTER

Designed by	Scale: AS SHOWN	Sheet number	
Drawn by	Date: MARCH 1966		
Checked by	Drawing title	File No. 0-12-9296	
Submitted by			

PLATE NO. 165

TABLE

TABLE D-2
SHOT DATA - HARRY S. TRUMAN DAM
STAGE II BLASTING

1st LIFT

SHOT NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
YIELD (CUBIC YARDS)	3415	998	2963	4187	4730	4400	4735	4667	4021	4249	4200	3851	4393	4458	4175	4827	4216	4438	2520	2553
EXPLOSIVES (LBS)	4[illegible] GEL 2	4[illegible] GEL 2	560 GEL 2	800 GEL 2	375 GEL 2	350 GEL 2	725 GEL 2	775 GEL 2	500 GEL 2	275 GEL 2	625 GEL 2	600 GEL 2	650 GEL 2	300 GEL 2	675 GEL 2	300 GEL 2	650 GEL 2	550 GEL 2	200 GEL 2	[illegible] GE
TYPE & AMOUNT	[illegible] HERC	[illegible] 3 HERC 4	2 HERCOL 4	2[illegible] HERCOL 4	3200 HP 9	3225 HP 9	2875 HP 9	2000 HER 4	1125 HERC 800 HP 9	2350 HP 9	1360 HERC	350 HERC	1550 HERCOL	1450 HP 9 575 HERCOL	1425 HERCOL	400 HP 9 500 HERCOL	525 HERCOL	200 HERCOL	375 HERCOL 1000 HP 9	[illegible] HERC
ROWS	4	5	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	5
NUMBER OF HOLES	45	4[illegible]	56	80	70	72	72	80	40 A / 40 B	53	62	62	66	60	66	63	66	57	42	57
BURDEN SPACING	7 X 11	7 X 11	7 X 11	7 X 11	8 X 12	8 X 12	8 X 12	7 X 11	7 X 14	7 X 14	7 X 14	7 X 14	7 X 14	7 X 14	7 X 14	7 X 14	7 X 14	7 X 14	7 X 14	7 X [illegible]
BENCH HEIGHT	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
HOLE DEPTH	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
COLUMN LOAD (AVERAGE)	13 HERCOL 4	13 HERCOL 4	10 HERCOL 4	14 HERCOL 4	9 HP 9	5 HP 9	# HP 9 SEE 2 4 HP 9	12 HERCOL 4	14 HER 9 HP 9 A / B	9 HP 9	12 HERCOL 4	12 HERCOL 4	13 HERCOL 4	ALTERNATE 5 HERCOL 4 HP 9	11 HERCOL 4	[illegible] 4 HP 9	12 HERCOL 4		SEE 2 4 HP 9 GEL 2 HP 9	12 HERC
TOE CHARGE	2 GEL 2	2 GEL 2	2 GEL 2	2 GEL 2	1 GEL 2	1 GEL 2	1 GEL 2	2 GEL 2	2 GEL 2 / 1 GEL 2	1 GEL 2	2 GEL 2	2 GEL 2	2 GEL 2	1 GEL 2 HP 9	2 GEL 2	[illegible] GEL 2 HP 9	2 GEL 2		GEL 2 HP 9	2 GEL
STEMMING	5'	ROW 1 7.5 ROW 2 6.5 ROW 3 5.5	ROW 1 & 2 6.5 ROW 3 5.5	5.0	5.5	5.5	6.0	5.5 AVRG	6.0	6.0	5.0	5.0	5-6	6	6'	7'	5	5	6	5
DELAY (BY ROW)	1, 2, 3, 4	0, 1, 2, 3, 4	1, 2, 3	0, 1, 2, 4	0, 1, 2, 4	0, 1, 2, 4	0, 1, 2, 4	0, 1, 2, 4	0, 1, 2, 4	0, 1, 2, 4	0, 1, 2, 3	0, 1, 2, 3	0, 1, 2, 3	0, 1, 2, 3	1, 2, 3, 4	0, 1, 2, 3	0, 1, 2, 3	0, 1, 2, 3	0, 1, 2	[illegible]
THEORETICAL PF	0.62	0.60	0.50	0.63	0.72	0.70	0.70	0.61	A 0.52 B 0.69	0.69	0.44	0.44	0.46	0.53	0.44	0.48	0.45	0.42	0.52	0.4
ACTUAL PF	0.66	0.69	0.56	0.68	0.76	0.81	0.76	0.59	A 0.56 B 0.68	0.62	0.47	0.51	0.50	0.52	0.50	0.45	0.52		0.62	0.4
GRADATIONS		GRAD 1	GRAD 2			GRAD. 3										GRAD 4		NOT DOCUMENTED		
BLASTING RATIOS																				
$K_B = \frac{2B}{H}$	42.0	42.0	42.0	42.0	32.0	32.0	32.0	42.0	28w/HP 9 42 w/HERCOL	28	42	42	42	28-42	42	28-42	42	42	28-42	42
$K_H = \frac{H}{B}$	3.14	3.14	3.14	3.14	2.75	2.75	2.75	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14
$K_J = \frac{J}{B}$	0.29	0.29	0.29	0.29	0.25	0.25	0.25	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
$K_T = \frac{T}{B}$	0.72	ROW 1 0.86 ROW 2 0.72	ROW 1 & 2 0.86 ROW 3 0.79	0.72	0.69	0.69	0.75	0.79	0.86	0.86	0.72	0.72	0.79	0.86	0.86	0.86	0.72	0.72	0.86	0.72
$K_S = \frac{S}{B}$	1.57	1.57	1.57	1.57	1.50	1.50	1.50	1.57	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	[illegible]

2nd LIFT

SHOT NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
YIELD (CUBIC YARDS)	2700	4400	1737	2268	2170	2350	1839	633	1945	1590	711	1850	2822	1003	1310	661	2108	1415	2380	59
EXPLOSIVES (LBS)	1000 GEL 2	1750 GEL 2	450 GEL 2	175 GEL 2	250 GEL 2	225 GEL 2	150 GEL 2	50 GEL 2	250 GEL 2	100 GEL 2	65 GEL 2	200 GEL 2	275 GEL 2	50 GEL 2	225 GEL 2	150 GEL 2	350 GEL 2	300 GEL 2	400 GEL [illegible]	[illegible]
TYPE & AMOUNT	10 GEL 1 750 HERCOL 4	1400 HERCOL	450 HERCOL	450 HERCOL	8 GEL 1 850 HERC	7 GEL 1 800 HERC	450 HERCOL	3 GEL 1 150 HERC	550 HERCOL	325 HERCOL	200 HERCOL	17 GEL 1 550 HERC	3 GEL 1 750 HERC	200 HERC	400 HERC	150 HERC	350 HERCOL	350 HERCOL	6 GEL 500 HERC	[illegible] HERC
ROWS	10	10	4	2 TO 5	10	10	2	3	7	2-3	3	5	3	3	2 TO 3	3	5	4	5	5
NUMBER OF HOLES	81	142	35	36	61	59	34	17	45	24	16	47	57	16	32	15	36	32	44	
BURDEN SPACING	7 X 10	7 X 10	7 X 14	7 X 14	7 X 10	7 X 10	7 X 14	7 X 14	7 X 10	7 X 14	7 X 14	7 X 14	7 X 14	7 X 14	7 X 14	7 X 14	7 X 14	7 X 14	7 X 14	7 X [illegible]
BENCH HEIGHT	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	[illegible]
HOLE DEPTH	17	17	17	17	17	17	17	17	17	17	[illegible]	17	[illegible]	17	17	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
COLUMN LOAD (AVERAGE)	5 HERC 4	5 HERC 4	7 HERC 4	6-7 HERCOL 4	8 HERC 4	8 HERCOL	7 HERCOL	7 HERCOL	8 HERCOL	8 HERCOL	7 HERC 4	7 HERC 4	7 HERCOL	7 HERCOL	6 HERCOL	6 HERCOL	ALT 6 8 5 HERCOL	ROWS [illegible] ROW 4 [illegible]	ROWS [illegible] ROW 5 [illegible]	ROWS [illegible]
TOE CHARGE	3 GEL 2	3 GEL 2	1 GEL 2	1 GEL 2	1 GEL 2	1 GEL 2	1 GEL 2	1 GEL 2	1 GEL 2	1 GEL 2	1 GEL 2	1 GEL 2	1 GEL 2	1 GEL 2	2 GEL 2	2 GEL 2	[illegible] GEL 2	[illegible] GEL 2	[illegible]	[illegible]
STEMMING	5	5	5	5	5	5-1/2 AVRG	6 AVRG	6 AVRG	5	5	5	5	5	5	5	5	5-6	5-6	5-6	[illegible]
DELAY (BY ROW)	[CONF] TOW CENTER	[CONF] TOW CENTER	0, 1, 2	0, 1, 2, 3, 4	0, 1, 2, 3, 4 CTR FC PULL	0, 1, 2, 3, 4, 5 CTR FC PULL	0, 1	0, 1, 2	0, 1, 2, 3, 4, 5	0, 1, 2	0, 1, 2	0, [illegible] 2, 3, 4	0, 1, 2	0, 1, 2	0, 1, 2	0, 1, 2	0, 2, 3	[illegible]	[illegible]	[illegible]
THEORETICAL PF	0.56	0.57	0.32	0.32	0.47	0.45	0.32	0.22	0.46	0.32	0.30	0.30	0.33	0.29	0.36	0.36	0.36	0.37	0.34	[illegible]
ACTUAL PF	0.65	0.72	0.34	0.28	0.51	0.44	0.33	0.32	0.41	0.27	0.37	0.41	0.36	0.24	0.48	0.45	0.33	[illegible]	[illegible]	[illegible]
GRADATIONS		GRAD 5		GRAD 6									GRAD 7							
BLASTING RATIOS																				
$K_B = \frac{2B}{H}$	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	[illegible]
$K_H = \frac{H}{B}$	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	[illegible]
$K_J = \frac{J}{B}$	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	[illegible]
$K_T = \frac{T}{B}$	0.72	0.72	0.72	0.72	0.72	0.79	0.72-1.00	0.72-1.00	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.86	0.93-1.00	[illegible]	[illegible]	0.93
$K_S = \frac{S}{B}$	1.40	1.40	2.0	2.0	1.4	1.4	2.0	2.0	1.4	2.0	2.0	1.4	2.0	2.0	2.0	2.0	2.0	2.0	[illegible]	[illegible]

3rd LIFT

SHOT NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
YIELD (CUBIC YARDS)	1395	1425	1220	590	1365	720	840	2680	2040	2350	3660	1760	2020	2860	1978	503	3960	933	2475	[illegible]
EXPLOSIVES (LBS)	250 GEL D	600 GEL D	250 GEL D	90 GEL D	275 GEL D	130 GEL D	100 GEL D	700 GEL D	675 GEL D	200 GEL D	225 GEL D	175 GEL D	200 GEL D	275 GEL D	400 GEL D	400 GEL D	750 GEL D 500 HP 9	400 GEL D 150 HP 9	400 GEL D 250 HERC 4	400 [illegible]
TYPE & AMOUNT	1 GEL 1 490 HERC 4	650 HERC 4	250 HERC 4	200 HERC 4	500 HERC 4	200 HERC 4	150 HERC 4	675 HERC 4	700 HERC 4	2 GEL 1 550 HERC 4	700 HP 9 525 HERC 4	400 HP 9 125 HERC 4	275 HERC 4 500 HP 9	375 HP 9 175 HERC 4	500 HP 9	400 HP 9 200 HERC 4	525 HERCOL 4	150 HERCOL 4	150 GEL 2 125 HP 9	[illegible]
ROWS	5	7	3	3	7	3	2	6	3	3	6	3	4	3	3	4	3	6	3	3
NUMBER OF HOLES	40	50	20	15	38	13	13	41	32	34	56	27	31	32	31	33	60	32	38	45
BURDEN SPACING	7 X 12	7 X 12	7 X 14	7 X 14	7 X 12	7 X 14	7 X 14	7 X 14	7 X 14	7 X 14	7 X 14	7 X 14	7 X 14	7 X 14	7 X 14	7 X 14	7 X 14	7 X 14	7 X 14	7 X [illegible]
BENCH HEIGHT	16	16	16	16	16	18	18	18	18	18	18	18	18	18	17	17	17	17	15	[illegible]
HOLE DEPTH	18	18	18	18	18	19	19	19	19	19	19	19	19	19	19	19	19	19	19	[illegible]
COLUMN LOAD (AVERAGE)	8 HERCOL 4	8 HERC 4	7 HERC 4	7 HERC 4	8 HERC 4	8 HERC 4	8 HERC 4	6 HERC 4	8 HERC 4	8 HERC 4	3 HP 9 4 HERC 4	[illegible] 2 H 9 3 HP 9	ALT 4 H 4 3 HP 9	1 HERC 4 4 HP 9	5 HP 9	[illegible] ALT SH FOR [illegible]	ALT HERC 4 & HP 9	ALT HERC 4 & HP 9	ALT HERC 4 & HP 9	[illegible]
TOE CHARGE	1 GEL D	2 GEL D	2 GEL D	1 GEL D	1 GEL D	1 GEL D	1 GEL D	2 GEL D	1 GEL D	1 GEL D / DECKED 4 HOLES @ 4 STEM	1 GEL D	DECKED 4 @ 4 @ 5	1 GEL D	1 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	400 GEL D OR 2 GEL 2	2 GE
STEMMING	7	5	7	7	6	6	6	6	5	5	6	7	12	ALT 6 8 8	ALT 7 8 11	ALT 7 8 11	ALT 7 8 11	ALT [illegible]		
DELAY (BY ROW)	3, 1, 0, 2, 4	0, 1, 2, 3, 4, 6, 8, 9	0, 1, 3	0, 2, 4	0, 1, 2, 4, 6, 8, 11	0, 1, 3	0, 3	0, 4, 6, 8, 10, 11	0, 1, 3	0, 1, 3	0, 1, 2, 4, 6, 8, 10	0, 1, 3	0, 1, 2, 4	0, 1, 2, 3, 4, 8, 9, 10	0, 1, 3	ALT IN ROW 0, 1, 2, 3	ALT IN ROW 0, 1, 2, 3, 4	0, 1, 2, 3 4, 5, 6	ALT IN ROW 0, 1, 2, 3, 4	0, 1, 2
THEORETICAL PF	0.37	0.50	0.43	0.33	0.35	0.35	0.29	0.51	0.66	0.34	0.40	0.40	0.48	0.49	0.47	0.49	0.42	0.35	[illegible]	0.4
ACTUAL PF	0.53	0.88	0.41	0.49	0.57	0.42	0.30	0.51	0.67	0.32	0.40	0.40	0.48	0.36	0.46	0.66	0.40	0.36	0.35	0.4
GRADATIONS																				
BLASTING RATIOS																				
$K_B = \frac{2B}{H}$	42	42	42	42	42	42	42	42	42	42	28-42	28-42	28-42	28-42	28	28-42	28-42	28-42	28-42	28-
$K_H = \frac{H}{B}$	2.58	2.58	2.58	2.58	2.58	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.7
$K_J = \frac{J}{B}$	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.1
$K_T = \frac{T}{B}$	1.00	0.72	1.00	1.00	0.86	0.86	0.86	0.86	0.57-0.72	0.57	0.72	0.57	0.86	1.00	1.70	0.86-1.14	0.93-1.57	1.0-1.57	1.0-1.57	1.0-1
$K_S = \frac{S}{B}$	1.70	1.7	2.00	2.00	1.70	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.0

TABLE D-2
SHOT DATA - HARRY S. TRUMAN DAM
STAGE II BLASTING

WHERE B = BURDEN EXPRESSED IN FEET
D_e = DIAMETER OF EXPLOSIVE CARTRIDGE IN INCHES
H = BENCH HEIGHT IN FEET
J = SUBDRILL DEPTH IN FEET
T = STEM IN FEET
S = SPACING OF HOLES EXPRESSED IN FEET

	14	15	16	17	18	19	20	21	22	23
	4458	4171	4827	4216	4138	2520	2532	3117	2118	2792
	300 GEL 2 450 HP 9 575 HERCOL	675 GEL 2 1425 HERCOL	300 GEL 2 400 HP 9 500 HERCOL	650 GEL 2 525 HERCOL	550 GEL 2 1200 HERCOL	200 GEL 2 375 HERCOL 1000 HP 9	350 GEL 2 800 HERCOL	200 GEL 2 1050 HP 9 375 HERCOL	350 GEL 2 675 HERCOL	525 GEL 2 1150 HERCOL
	4	4	4	4	4	3	3	3	3	2 & 4
	60	66	63	66	57	42	37	45	32	58
	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14
	20	20	20	20	20	20	20	20	20	20
	22	22	22	22	22	22	22	22	22	22
	ALT 6 & 8 4 HP 9 11 HERCOL 4 1 GEL 2 HP 9 2 GEL 2		ALT 6 & 8 4 HP 9 12 HERCOL 4 1 GEL 2 HP 9 2 GEL 2		ALT 6 & 8 4 HP 9 12 HERCOL 4 1 GEL 2 HP 9 2 GEL 2		ALT 6 & 8 4 HP 9 12 HERCOL 4 1 GEL 2 HP 9 2 GEL 2		12 HERCOL 2 GEL 2	12 HERCOL 2 GEL 2
	6	6	7	5	5	6	5-1/2	5	6	6
	0,1,2,3	1,2,3,4	0,1,2,3	0,1,2,3	0,1,2,3	0,1,2	0,1,2	0,1,2	0,1,2	0,1,2,3
	0.53	0.44	0.48	0.45	0.42	0.52	0.43	0.50	0.48	0.40
	0.52	0.50	0.45 GRAD 4	0.52	NOT DOCUMENTED	0.62	0.45	0.52	0.48	0.60
	28-42	42	28-42	42	42	28-42	42	28-42	42	42
	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14
	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
	0.86	0.86	1.00	0.72	0.72	0.86	0.72	0.72	0.86	0.86
	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

DRAWINGS IN THIS FOLIO HAVE BEEN REDUCED TO ONE HALF THE ORIGINAL SCALE

	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
	1003	1310	661	2108	1415	2380	1594	2570	2495		785	776	779	293	1334	278	534	2775	945	864
	50 GEL 2 200 HERC	225 GEL 2 400 HERC	150 GEL 2 150 HERC	350 GEL 2 350 HERCOL	300 GEL 2 350 HERCOL	400 GEL 2 6 GEL 1 500 HERC	225 GEL 2 250 HERCOL	450 GEL 2 600 HERCOL	450 GEL 2 675 HERCOL		50 GEL 2 54 HERCOL	250 GEL 2 450 HERC	650 GEL 2 825 HERC	225 GEL 2 54 HERCOL	450 GEL 2 700 HERC	450 GEL 2 650 HERC	650 GEL 2 650 HERCOL	550 GEL 2 650 HERC	115 GEL 2 500 GEL 1 700 HERC	150 GEL 2 534 GEL 1 675 HERC
	3	2 TO 3	3	3	4	5	3	4	4		3	4	4	4	4	5	3	4	3	2
	16	32	15	36	32	48	27	41	4		8	54	46	42	68	42	4	54	59	48
	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14		7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14
	15	15	15	15	15	15	4	5	4		5	4	5	5	15	4	4	5	5	14
	17	17	17	17	17	4	4	4	4		4	4	4	4	4	4	4	4	4	4
	7 HERCOL 2 GEL 2	6 HERCOL 2 GEL 2	6 HERCOL 2 GEL 2	ALT 6 & 8 5 HERCOL 2 GEL 2	ROWS 1-3 5H ROW 4 6 HER 5-6	ROWS 1-4 5H ROW 5 6 HER 6	ROWS 2 5H 5 6 HER 6	ROWS 1-3 6H ROW 4 7 HER 6	6 HERCOL 4 2 GEL 2		6 HERCOL 4 2 GEL 2	6 HERCOL 4 2 GEL 2	6 HERCOL 4 2 GEL 2	6 HERCOL 4 2 GEL 2	6 HERCOL 4 2 GEL 2	6 HERCOL 4 2 GEL 2	6 HERCOL 4 2 GEL 2	6 HERCOL 4 2 GEL 2	6 HERCOL 4 2 GEL 2	7 HERCOL 4 2 GEL 2
	5	5	5	5-6	5-6	5-6	4	4	4		4	4	4	4	4	4	4	4	4-1/2	5
	0,1,2	0,1,2	0,2,3	0,1,2	0,1,2,3	0,1,2,3,4	1,2,3,4	ALT IN ROWS 1,2,3,4	ALT IN ROWS 1,2,3,4		1,2,3,4	1,2,3,4	ALT IN ROWS 1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	0,1,2,3
	0.29	0.36	0.36	0.36	0.37	0.34	0.32	0.36	4		4	4	4	4	4	4	4	4	38	0.35
	0.24	0.48	0.45	0.33	0.46	0.38	4	4	4		4	4	4	4	4	4	4	4	2.44	0.48
	42	42	42	42	42	42	42	42	42		42	42	42	42	42	42	42	42	42	42
	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43		2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43	2.43
	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29		0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
	0.72	0.72	0.86	0.93-1.00	1.00	1.00	0.93	1.00	0.93		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.86	0.72
	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00		2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
	2860	1978	1503	3960	1933	2475	2815	4[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4 8	[illegible]	2381	2700	4170	1490	4060
	275 GEL D 575 HP 9 175 HERC 4	400 GEL D 500 HP 9	400 GEL D 400 HP 9 200 HERC 4	750 GEL D 525 HERCOL 4	400 GEL D 300 HP 9 150 HP 9	400 GEL D 200 HERC 4	250 HP 9 400 HERC 4	600 GEL D 225 HP 9 375 HERC 4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	550 GEL D 650 HERCOL 4	925 GEL D 1100 HERCOL 4	750 GEL D 1025 GEL 2 850 HERC 4	1050 GEL D 150 HERC
	3	3	4	3	6	3	3	6	5	5	5	4	6	5	5	3	5	3	4	4	4
	32	31	33	60	32	38	49	51	41	29	47	57	62	48	45	25	47	44	78	59	89
	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14	7x14
	18	17	17	17	17	15	17	17	9	9	9	19	9	20	20	20	20	20	18	18	18
	19	19	19	19	19	19	19	19	9	9	9	19	9	20	20	20	20	20	20	20	20
	1 HERC 4 4 HP 9	3 HP 9	ALT 5H, 1 HP 9 FOR 1 ROW IN FOR 4 ROWS 6 STEM ZONE	ALT 5H, 1 HP 9 FOR 1 ROW IN FOR 4 ROWS 6 STEM ZONE	ALT HERC 4 6 HP 9	ALT HERC 4 6 HP 9 2 GEL D OR 2 GEL 2	1 HP 9 W 6 HERC 4 OR 4 HERC 4	SAME AS 20	AVRG (5.5) 4-5 HERC	AVRG (4.5) 4-5 HERC 4	AVRG (5) 4-5 HERC 4	AVRG (5.5) 5-6 HERC 4	AVRG (5.5) 5-6 HERC	AVRG 7.6 7-8 HERC	AVRG 7.3 7-8 HERC	AVRG 6.8 6-7 HERC	AVRG 7.5 7-8 HERC	AVRG 7.8 8 HERC	AVRG 7.4 7-8 HERC	AVRG 7.5 7-8 HERC	AVRG 6.7 6-7 HERC 4
	1 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D	2 GEL D
	7	12	ALT 6 & 8 8 ALT IN ROW 0,1,2,3	ALT 7 & 11 ALT IN ROW 0,1,2,3,4	ALT 7 & 11 0,1,2,3 4,5,6	ALT 7 & 11 ALT IN ROW 0,1,2,5,4	ALT 7 & 11 ALT IN ROW 0,1,2,3	ALT 7 & 11 ALT IN ROW 0,1,2,3,4,5,6	ALT 7 & 11 ALT IN ROW 0,1,2,3	ALT 7 & 11 ALT IN ROW 0,1,2,3	ALT 7 & 11 ALT IN ROW 0,1,2,3	ALT 7 & 11 ALT IN ROW 0,1,2,3,4	ALT 7 & 11 ALT IN ROW 0,1,2,3,4,5	ALT 6 & 10 ALT IN ROW 0,1,2,3	ALT 7 & 11 ALT IN ROW 0,1,2,4	ALT 7 & 11 ALT IN ROW 0,1,2,4	ALT 7 & 11 ALT IN ROW 0,1,2,4	ALT 7 & 11 ALT IN ROW 0,1,2,4	ALT 7 & 11 ALT IN ROW 0,1,2,3,4	ALT 7 & 11 ALT IN ROW 0,1,2,3,4	ALT 7 & 11 ALT IN ROW 0,1,2,3,4
	0.49	0.47	0.49	0.42	0.35	0.42	0.43	0.38	0.36	0.34	0.36	0.37	0.38	0.41	0.43	0.43	0.43	.44	0.40	0.42	0.38
	0.36	0.46	0.66	0.40	0.36	0.35	0.46	0.63	0.35 GRAD 6	0.36	0.47 FINAL BACKSLOPE	0.56	0.38	0.47	49	.53	0.52	0.44	0.49 FINAL BACKSLOPE	0.46	0.54
	28-42	28	28-42	28-42	28-42	28-42	28-42	28-42	42	42	42	42	42	42	42	42	42	42	42	42	42
	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86
	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
	1.00	1.70	0.86-1.14	0.93-1.57	1.0-1.57	1.0-1.57	1.0-1.57	1.0-1.57	0.93-1.57	1.00-1.57	1.00-1.57	1.00-1.57	1.00-1.57	0.86-1.43	1.00-1.57	1.00-1.57	1.00-1.57	1.00-1.57	1.00-1.57	1.00-1.57	1.00-1.57
	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

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