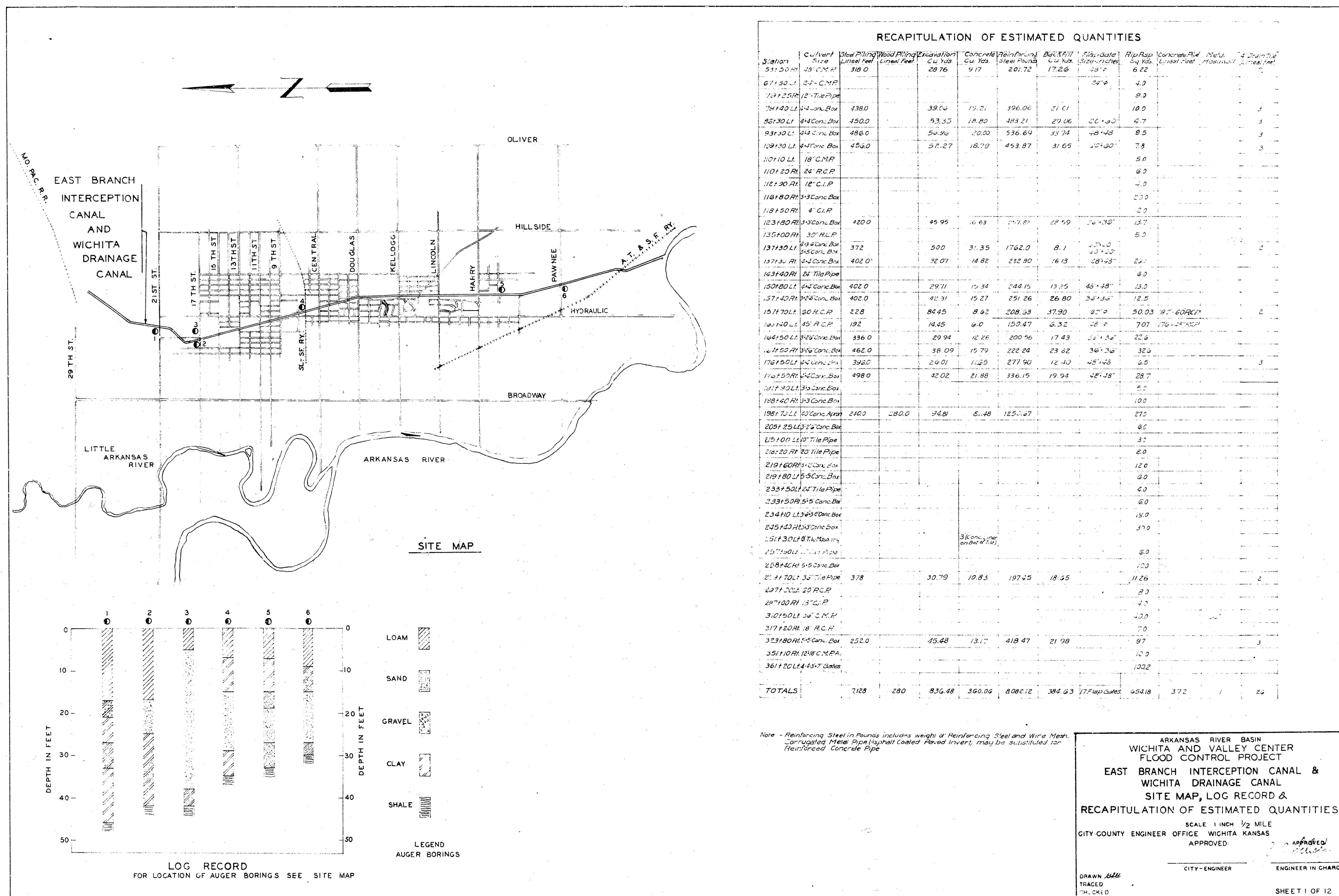
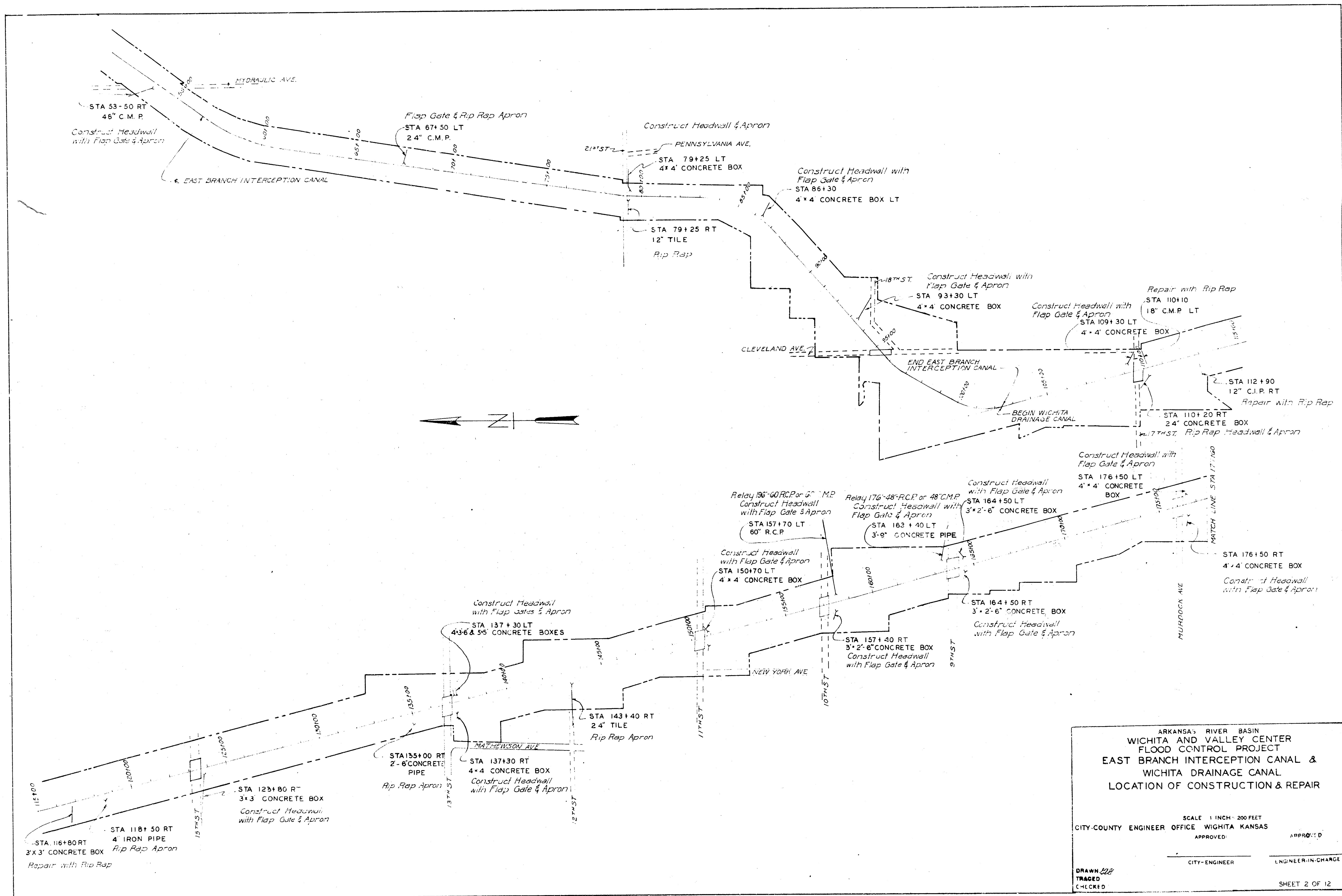
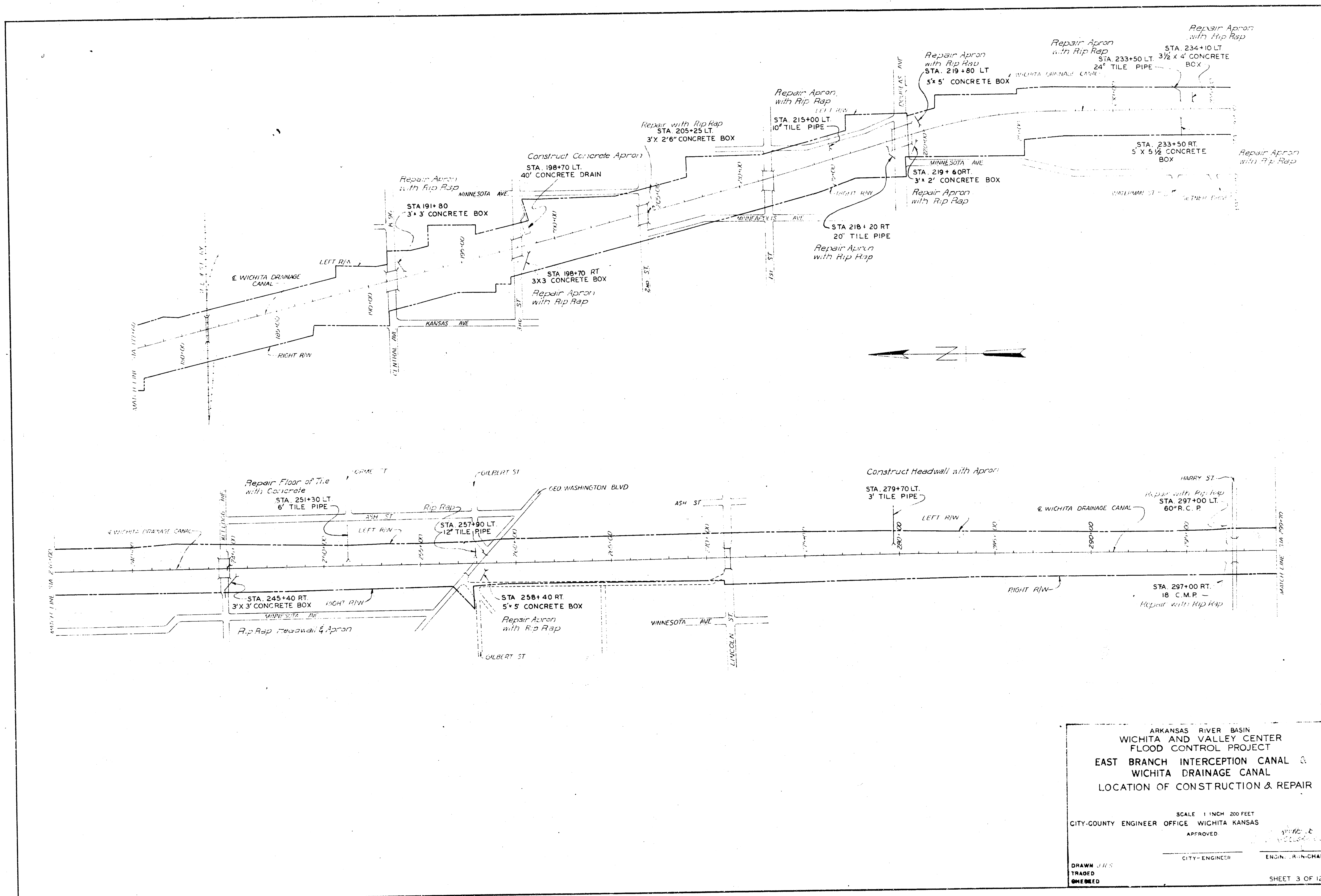
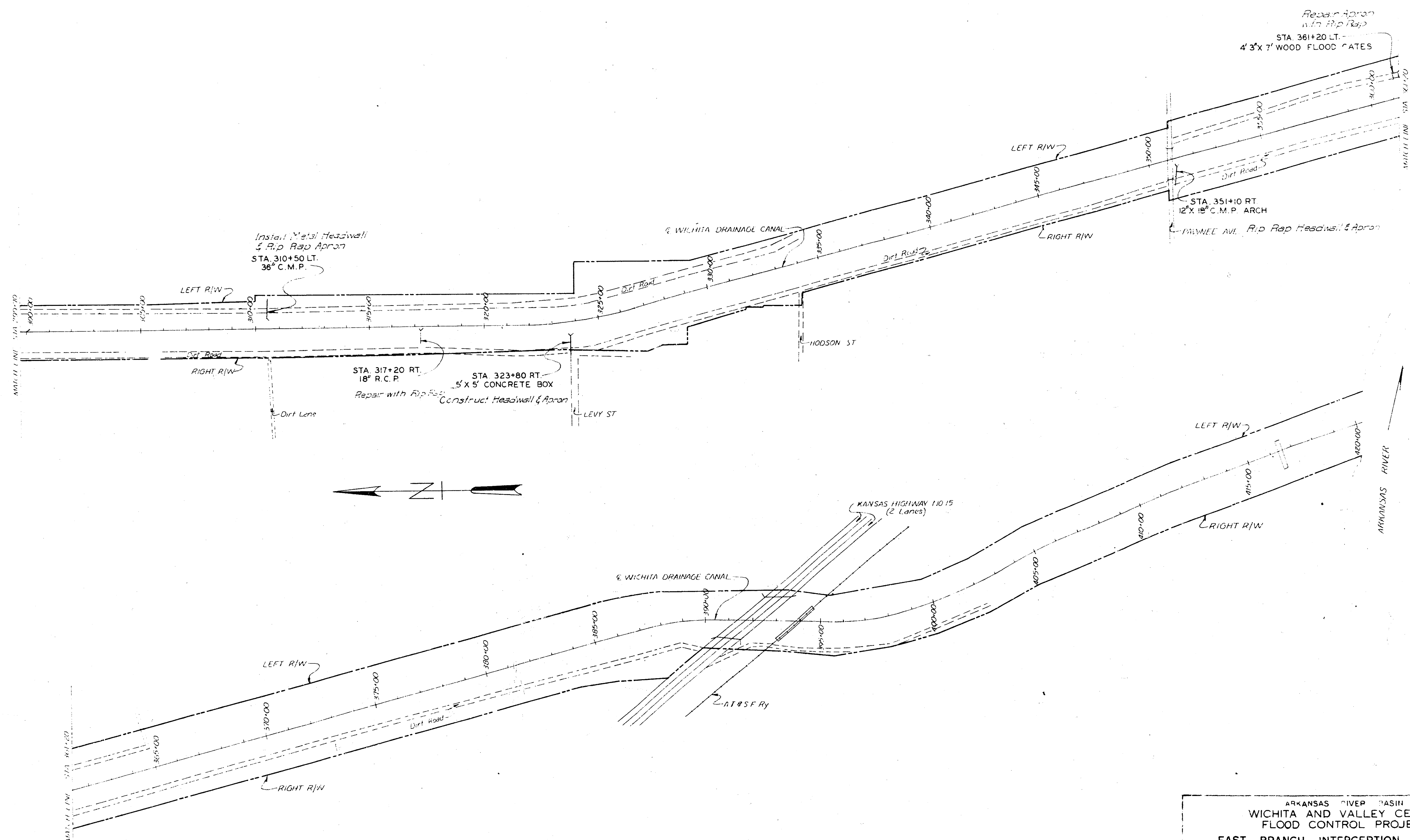










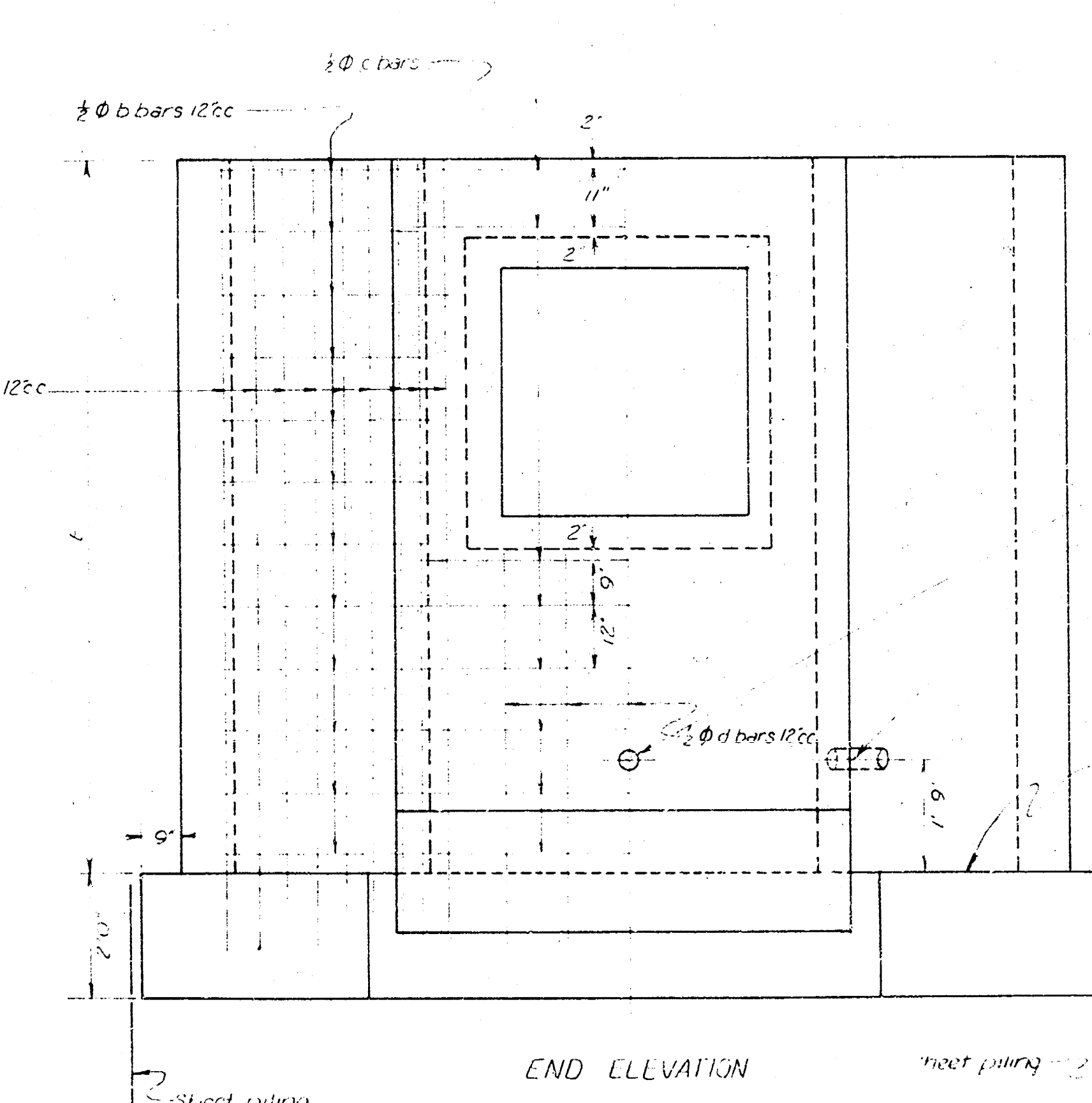
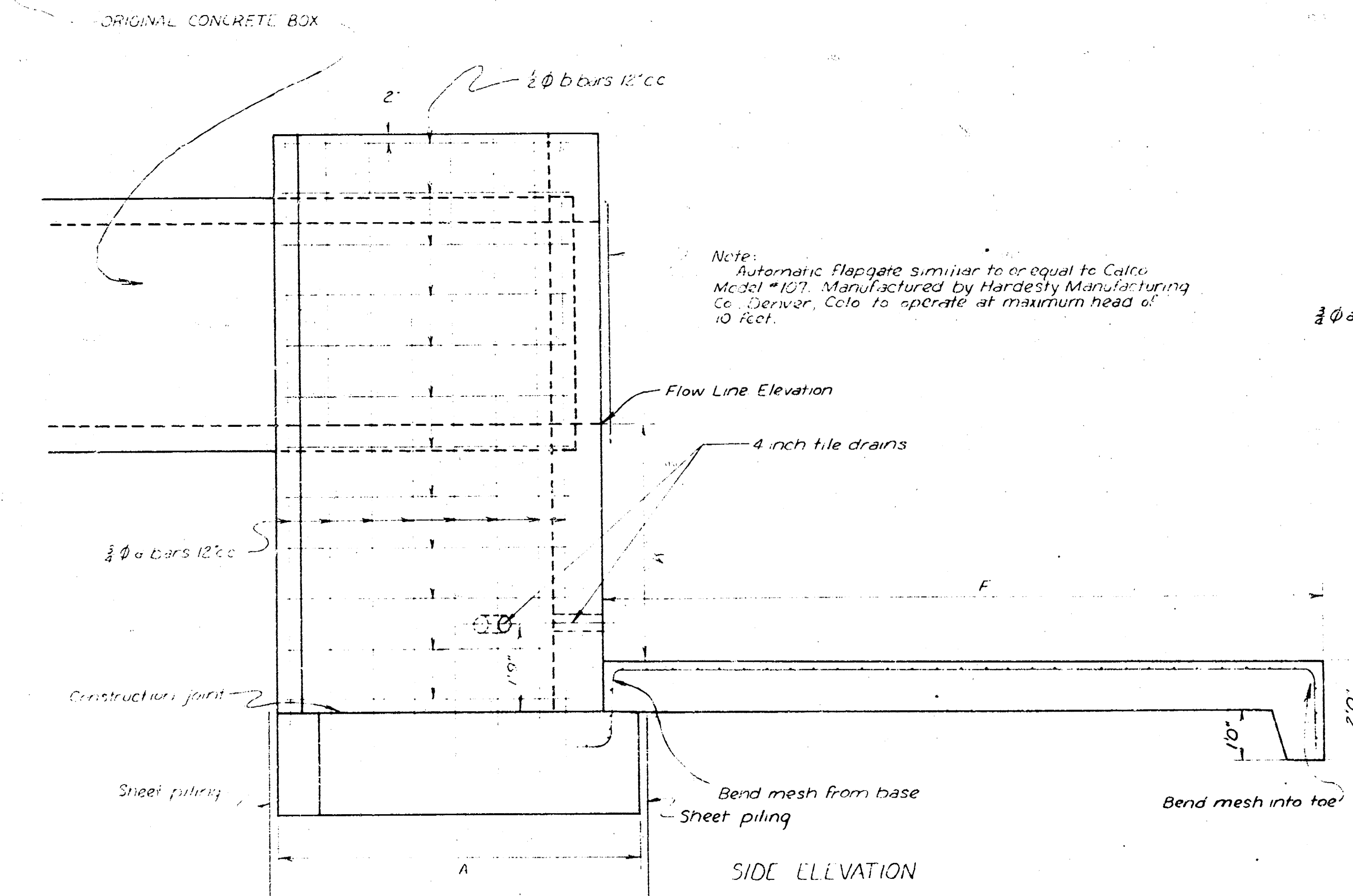
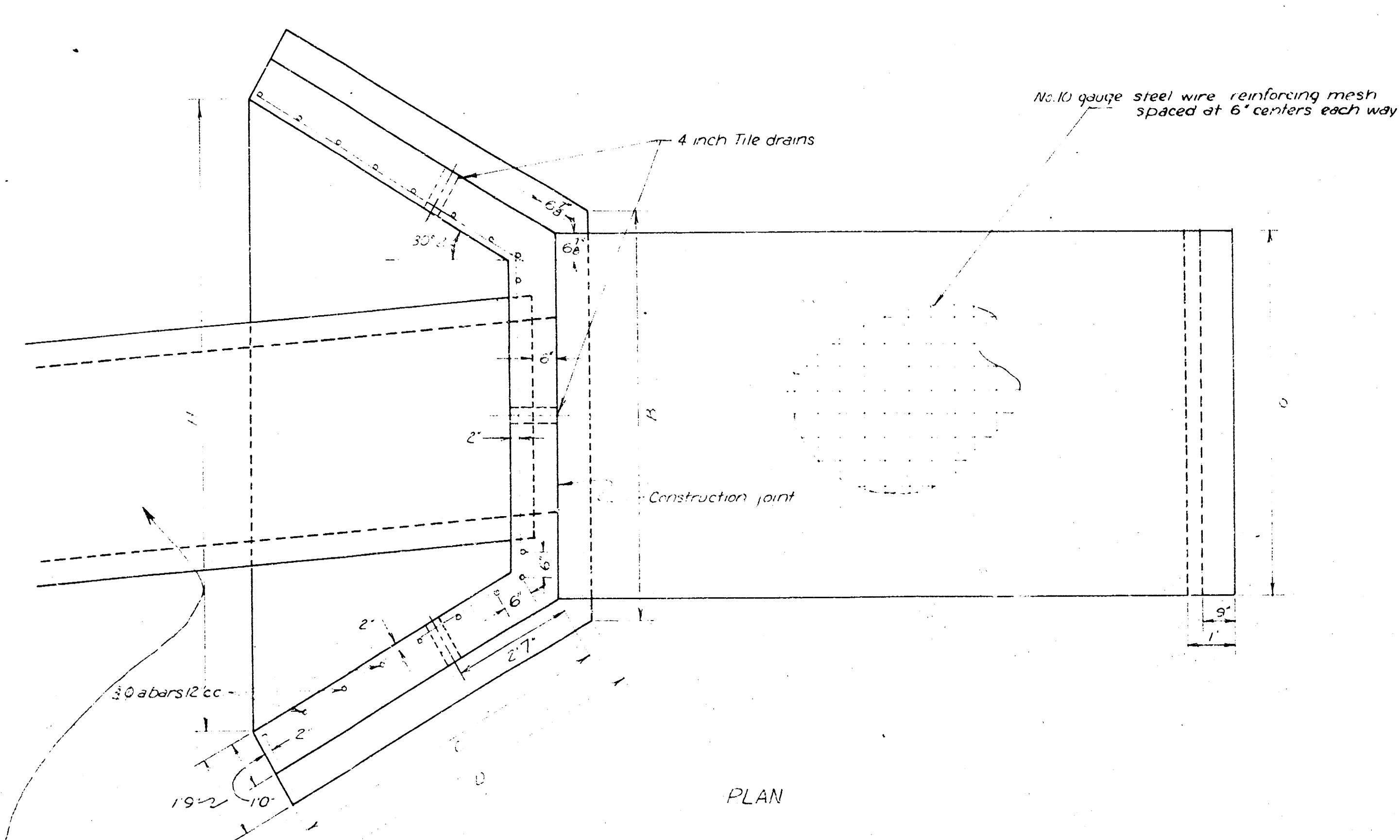
ARKANSAS RIVER BASIN
 WICHITA AND VALLEY CENTER
 FLOOD CONTROL PROJECT
 EAST BRANCH INTERCEPTION CANAL &
 WICHITA DRAINAGE CANAL
 LOCATION OF CONSTRUCTION & REPAIR

SCALE: 1" = 200 FEET
 CITY-COUNTY ENGINEER OFFICE WICHITA KANSAS

APPROVED: *[Signature]*
 CITY-ENGINEER

DRAWN: C.H.S.
 TRACED
 CHECKED

SHEET 4 OF 12



LISTS OF BARS, DIMENSIONS, AND QUANTITIES FOR HEADWALLS

FOR 4'x4' CONCRETE BOX AT STA. 79+40.1													Excavation	Flow Line Elev.
Letter	A	B	C	D	E	F	G	H	I	J	K	L	39.06 Cu Yds	1501.00
Dimension	5'10"	8'9"	5'2 1/2"	5'8"	10'9"	13'1"	7'9 1/2"	11'3 1/2"	4'0"				Howl 11.04 cu yds Apron 4.17 yds	Backfill - 21.61 cu yds
Bar	a	b	c	d	e	f	g	h	i	j	k	l	3" - 24.876 # 1/2" 120.00"	Rip Rap - 9.95 sq yds
Number	14	22	7	5									Howl 37 secs Apron 36 secs	
Size	3/8"	1/2"	1/2"	1/2"									None needed	
Length	11'10"	7'8"	7'0"	5'1"									No. 10 gauge - 27.3 #	

FOR 4'x4' CONCRETE BOX AT 86+30.1													Excavation	Flow Line Elev.
Letter	A	B	C	D	E	F	G	H	I	J	K	L	53.35 Cu Yds	1501.00
Dimension	8'5 1/2"	8'8"	6'2 1/2"	8'8"	9'9"	10'7"	7'9 1/2"	14'3 1/2"	2'8 1/2"				Howl 15.45 cu yds Apron 3.31 cu yds	Backfill - 29.06 cu yds
Bar	a	b	c	d	e	f	g	h	i	j	k	l	3" - 315.41 # 1/2" 145.32"	Rip Rap - 4.70 sq yds
Number	20	20	0	5									Howl 46 secs Apron 29 secs	
Size	3/8"	1/2"	1/2"	1/2"									One 60" x 60"	
Length	10'6"	7'8"	7'0"	4'3"									No. 10 gauge - 22.47 #	

FOR 4'x4' CONCRETE BOX AT 93+30.1													Excavation	Flow Line Elev.
Letter	A	B	C	D	E	F	G	H	I	J	K	L	56.96 Cu Yds	1501.00
Dimension	7'7"	8'8"	7'2 1/2"	7'8"	11'5"	15'7"	7'9 1/2"	13'3 1/2"	4'8 1/2"				Howl 15.28 cu yds Apron 4.26 cu yds	Backfill - 33.72 cu yds
Bar	a	b	c	d	e	f	g	h	i	j	k	l	3" - 237.95 # 1/2" 168.29"	Rip Rap - 9.94 sq yds
Number	16	24	8	5									Howl 43 secs Apron 38 secs	
Size	3/8"	1/2"	1/2"	1/2"									One 48" x 48"	
Length	12'6"	6'8"	7'0"	7'2"									No. 10 gauge - 30.85 #	

FOR 4'x4' CONCRETE BOX AT 109+33.1													Excavation	Flow Line Elev.
Letter	A	B	C	D	E	F	G	H	I	J	K	L	52.27 Cu Yds	1501.00
Dimension	5'10"	8'8"	5'2 1/2"	5'8"	9'10"	8'7"	12'3 1/2"	16'3 1/2"	3'1 1/2"				Howl 14.30 cu yds Apron 4.49 cu yds	Backfill - 31.65 cu yds
Bar	a	b	c	d	e	f	g	h	i	j	k	l	3" - 297.6 # 1/2" 126.87"	Rip Rap - 7.78 sq yds
Number	12	18	9	5									Howl 47 secs Apron 29 secs	
Size	3/8"	1/2"	1/2"	1/2"									One 60" x 60"	
Length	11'0"	7'8"	7'0"	4'11"									No. 10 gauge - 29.4 #	

FOR 4'x4' CONCRETE BOX AT 176+50.1													Excavation	Flow Line Elev.
Letter	A	B	C	D	E	F	G	H	I	J	K	L	26.01 Cu Yds	1501.00
Dimension	5'10"	8'8"	4'2 1/2"	4'8"	8'6 1/2"	11'1"	7'9 1/2"	10'3 1/2"	1'9 1/2"				Howl 10.05 cu yds Apron 3.60 cu yds	Backfill - 12.40 cu yds
Bar	a	b	c	d	e	f	g	h	i	j	k	l	3" - 174.59 # 1/2" 79.16"	Rip Rap - 6.45 sq yds
Number	12	18	9	5									Howl 34 secs Apron 37 secs	
Size	3/8"	1/2"	1/2"	1/2"									One 48" x 48"	
Length	9'8"	3'8"	7'0"	3'7"									No. 10 gauge - 24.15 #	

FOR 5'x5' CONCRETE BOX AT STA. 323+80.1													Excavation	Flow Line Elev.
Letter	A	B	C	D	E	F	G	H	I	J	K	L	45.48 Cu Yds	1274.20
Dimension	6'3 1/2"	9'8"	6'2 1/2"	6'8"	10'5 1/2"	11'1"	8'9 1/2"	13'3 1/2"	1'9 1/2"				Howl 19.17 cu yds	Backfill - 21.93 cu yds
Bar	a	b	c	d	e	f	g	h	i	j	k	l	3" - 276.37 # 1/2" 142.10"	Rip Rap - 9.72 sq yds
Number	16	24	7	6									Howl 42 secs Apron 37 secs	
Size	3/8"	1/2"	1/2"	1/2"									None needed	
Length	11'6"	5'8"	8'0"	5'3"										

Note:
The corrugated sheet piling sections shall be of 12 gauge steel and 6 feet long.
For Flapgate detail see sheet no. 12.
3 sets of 4 inch tile 1 foot long shall be required for each headwall.

GENERAL NOTES

Coarse aggregate shall be deposited behind each weep hole to occupy a space extending 15 inches in all directions from the weephole.

The front face of the headwalls shall be placed parallel and 6 inches in front of the face of the concrete bases and shall be placed symmetrically about centerline of the concrete boxes at the front face of the headwall.

All exposed edges shall be beveled with 2 inch triangular beveling.

All reinforcing dimensions are to the centerline of the bars.

Two feet of rip rap shall be placed on each side of all aprons.

The distance that rip rap extends in front of each apron is as follows:

- Sta 79+40.1 - 3 feet
- Sta 86+30.1 - 2 "
- Sta 93+30.1 - 2 "
- Sta 109+30.1 - 3 "
- Sta 176+50.1 - 3 "
- Sta 323+80.1 - 10 "

ARKANSAS RIVER BASIN
WICHITA AND VALLEY CENTER
FLOOD CONTROL PROJECT
EAST BRANCH INTERCEPTION CANAL
WICHITA DRAINAGE CANAL
HEADWALLS FOR BOX CULVERTS

SCALE 1 INCH = 2 FEET

CITY COUNTY ENGINEER OFFICE WICHITA KANSAS

APPROVED: _____

CITY-ENGINEER

DRAWN J.R.S.

TRACED

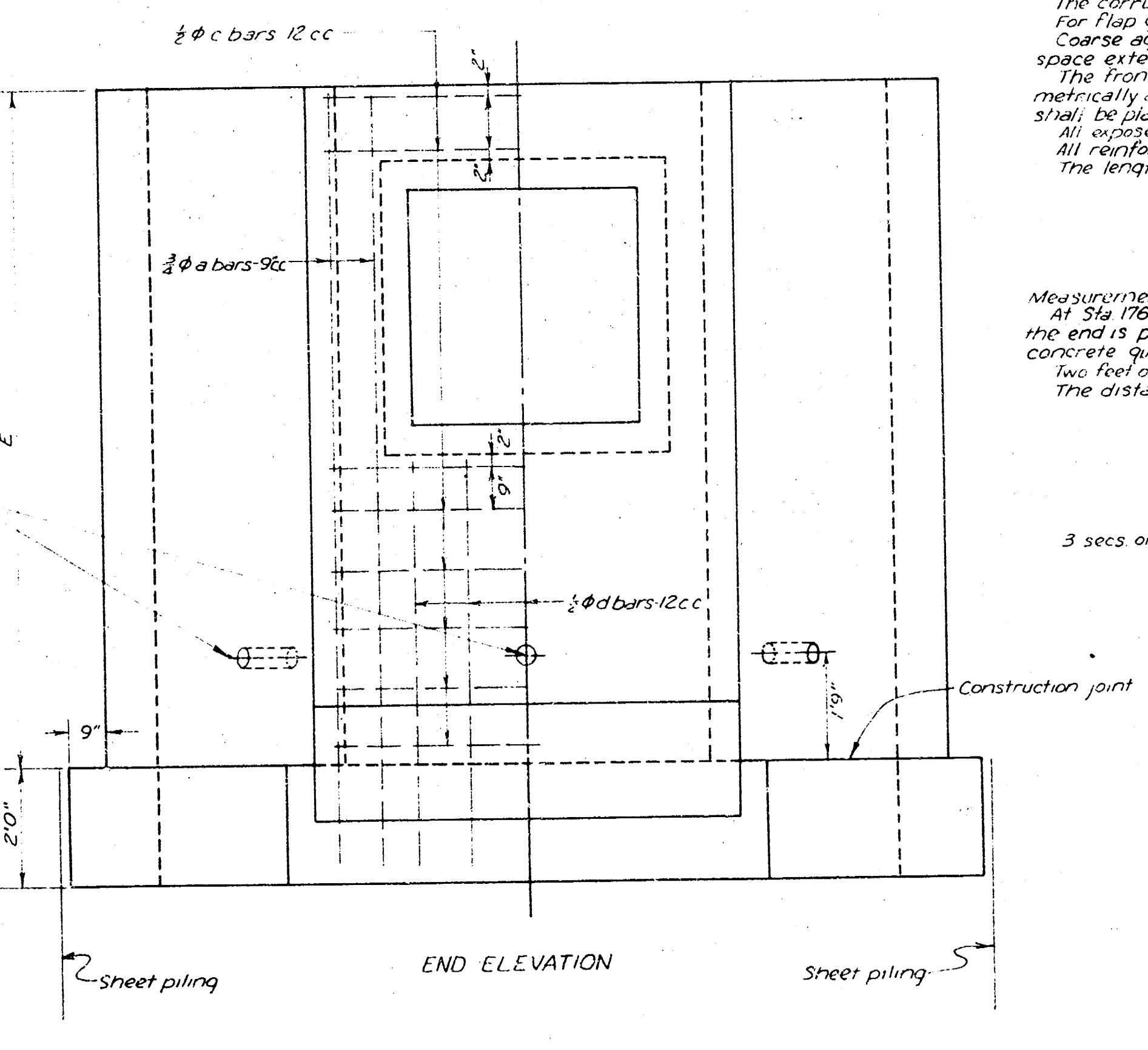
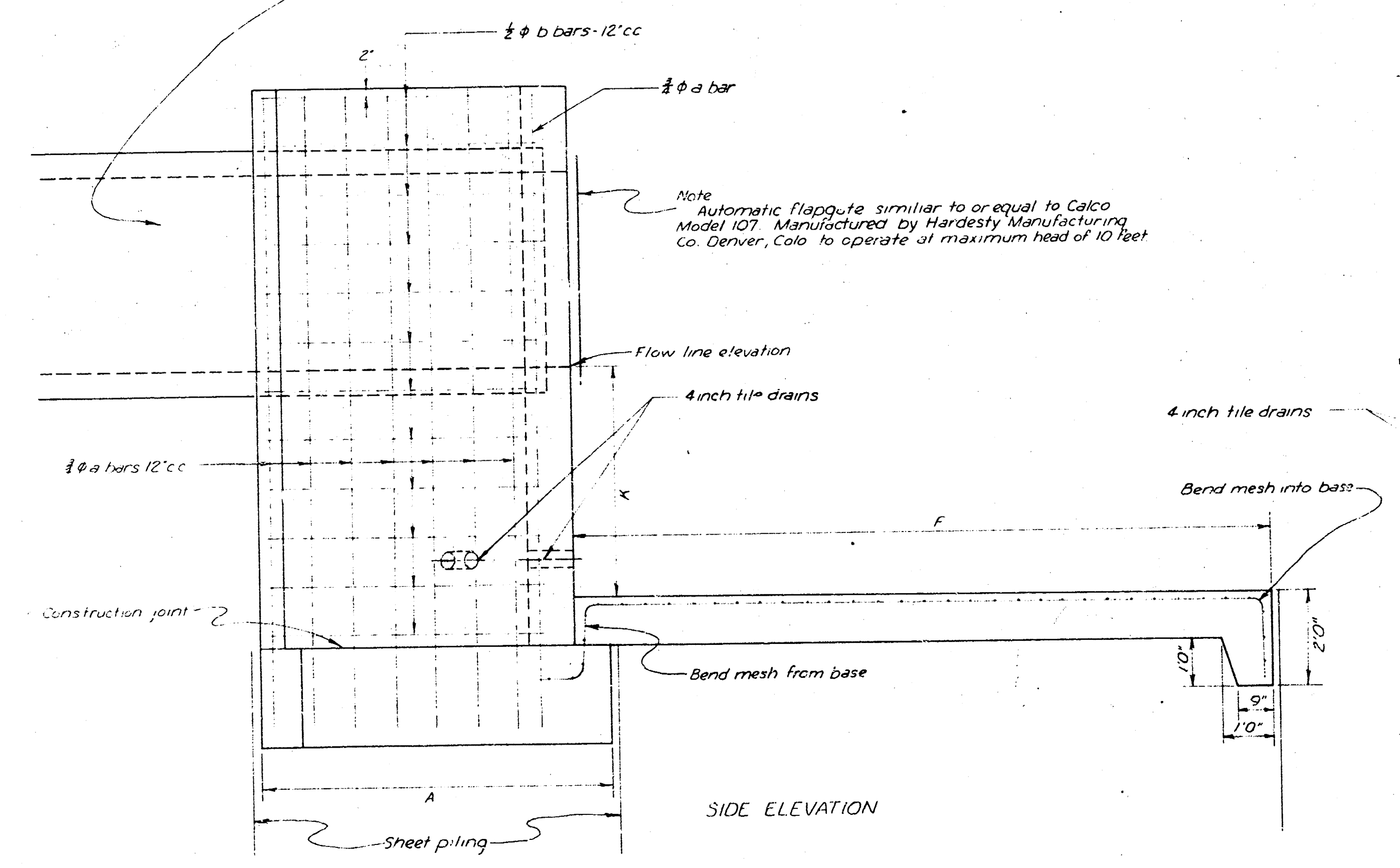
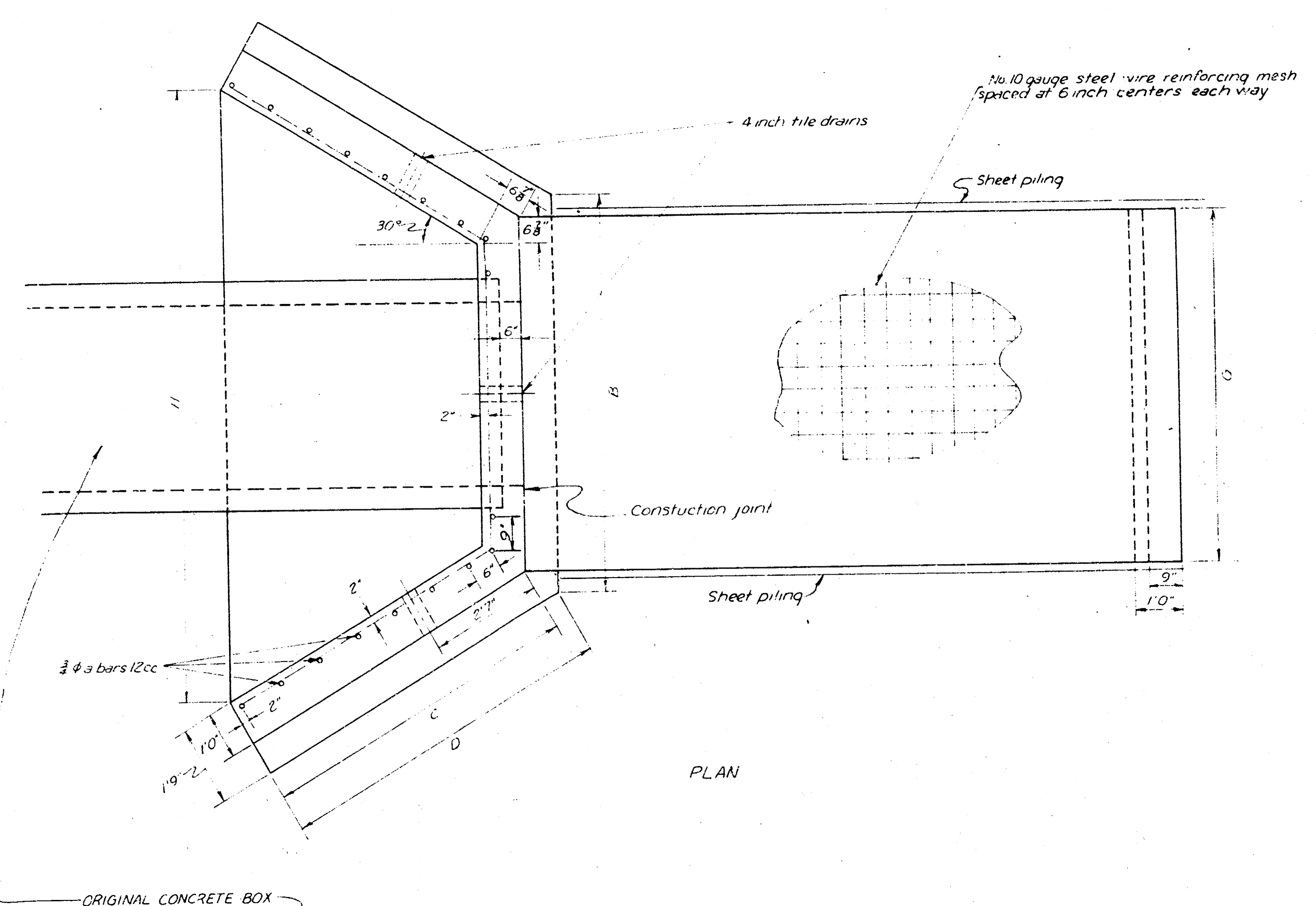
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APPROVED: _____

ENGINEER

CHANGE

SHEET 5 OF 12



LISTS OF BARS, DIMENSIONS, AND QUANTITIES FOR HEADWALL

FOR 3'x3' CONCRETE BOX AT STA 123+80 RT											
Letter	A	B	C	D	E	F	G	H	K	Excavation	45.95 cu yds
Dimension	5'9"	7'8"	5'2"	3'8"	6'6"	14'7"	6'9"	10'3"	8"	Concrete	12.71 cu yds Apron - 306"
Bar	a	b	c	d	e	f	g	h	k	Backfill	26.59 cu yds
Number	10	10	4	5	10	10	4	5	5	Reinforcing Steel	12.71 cu yds Apron - 306"
Size	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	Sheet Piling	12.71 cu yds Apron - 306"
Length	9'0"	4'8"	5'10"	2'8"	9'0"	4'8"	5'10"	2'8"	9'0"	Flap Gate	One 36" x 36"

FOR 4'x4' CONCRETE BOX AT STA 137+30 RT											
Letter	A	B	C	D	E	F	G	H	K	Excavation	32.07 cu yds
Dimension	4'0"	8'8"	3'2"	3'8"	7'6"	14'7"	7'9"	9'3"	8"	Concrete	10.90 cu yds Apron - 444 cu yds
Bar	a	b	c	d	e	f	g	h	k	Backfill	16.13 cu yds
Number	10	10	4	5	10	10	4	5	5	Reinforcing Steel	10.90 cu yds Apron - 444 cu yds
Size	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	Sheet Piling	10.90 cu yds Apron - 444 cu yds
Length	9'0"	4'8"	5'10"	2'8"	9'0"	4'8"	5'10"	2'8"	9'0"	Flap Gate	One 48" x 48"

FOR 4'x4' CONCRETE BOX AT STA 150+80 LT											
Letter	A	B	C	D	E	F	G	H	K	Excavation	29.71 cu yds
Dimension	4'0"	8'8"	3'2"	3'8"	8'6"	14'7"	7'9"	9'3"	1'8"	Concrete	10.90 cu yds Apron - 444 cu yds
Bar	a	b	c	d	e	f	g	h	k	Backfill	13.25 cu yds
Number	10	10	4	5	10	10	4	5	5	Reinforcing Steel	10.90 cu yds Apron - 444 cu yds
Size	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	Sheet Piling	10.90 cu yds Apron - 444 cu yds
Length	9'0"	4'8"	5'10"	2'8"	9'0"	4'8"	5'10"	2'8"	9'0"	Flap Gate	One 48" x 48"

FOR 3'x3' CONCRETE BOX AT STA 157+40 RT											
Letter	A	B	C	D	E	F	G	H	K	Excavation	42.31 cu yds
Dimension	4'0"	7'8"	4'2"	4'8"	7'6"	14'7"	6'9"	9'3"	8"	Concrete	10.90 cu yds Apron - 444 cu yds
Bar	a	b	c	d	e	f	g	h	k	Backfill	26.80 cu yds
Number	10	10	4	4	10	10	4	4	4	Reinforcing Steel	10.90 cu yds Apron - 444 cu yds
Size	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	Sheet Piling	10.90 cu yds Apron - 444 cu yds
Length	9'0"	3'8"	5'10"	2'8"	9'0"	3'8"	5'10"	2'8"	9'0"	Flap Gate	One 36" x 36"

FOR 2'x3' CONCRETE BOX AT STA 164+50 RT											
Letter	A	B	C	D	E	F	G	H	K	Excavation	38.09 cu yds
Dimension	4'0"	7'8"	4'2"	4'8"	6'0"	19'7"	6'9"	9'3"	8"	Concrete	10.90 cu yds Apron - 444 cu yds
Bar	a	b	c	d	e	f	g	h	k	Backfill	23.82 cu yds
Number	10	10	4	4	10	10	4	4	4	Reinforcing Steel	10.90 cu yds Apron - 444 cu yds
Size	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	Sheet Piling	10.90 cu yds Apron - 444 cu yds
Length	7'6"	3'8"	5'10"	2'8"	7'6"	3'8"	5'10"	2'8"	7'6"	Flap Gate	One 36" x 36"

FOR 2'x3' CONCRETE BOX AT STA 164+50 LT											
Letter	A	B	C	D	E	F	G	H	K	Excavation	39.94 cu yds
Dimension	4'0"	7'8"	4'2"	4'8"	7'0"	19'7"	6'9"	9'3"	8"	Concrete	10.90 cu yds Apron - 444 cu yds
Bar	a	b	c	d	e	f	g	h	k	Backfill	17.43 cu yds
Number	10	10	4	4	10	10	4	4	4	Reinforcing Steel	10.90 cu yds Apron - 444 cu yds
Size	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	Sheet Piling	10.90 cu yds Apron - 444 cu yds
Length	8'6"	2'8"	5'10"	2'8"	8'6"	2'8"	5'10"	2'8"	8'6"	Flap Gate	One 36" x 36"

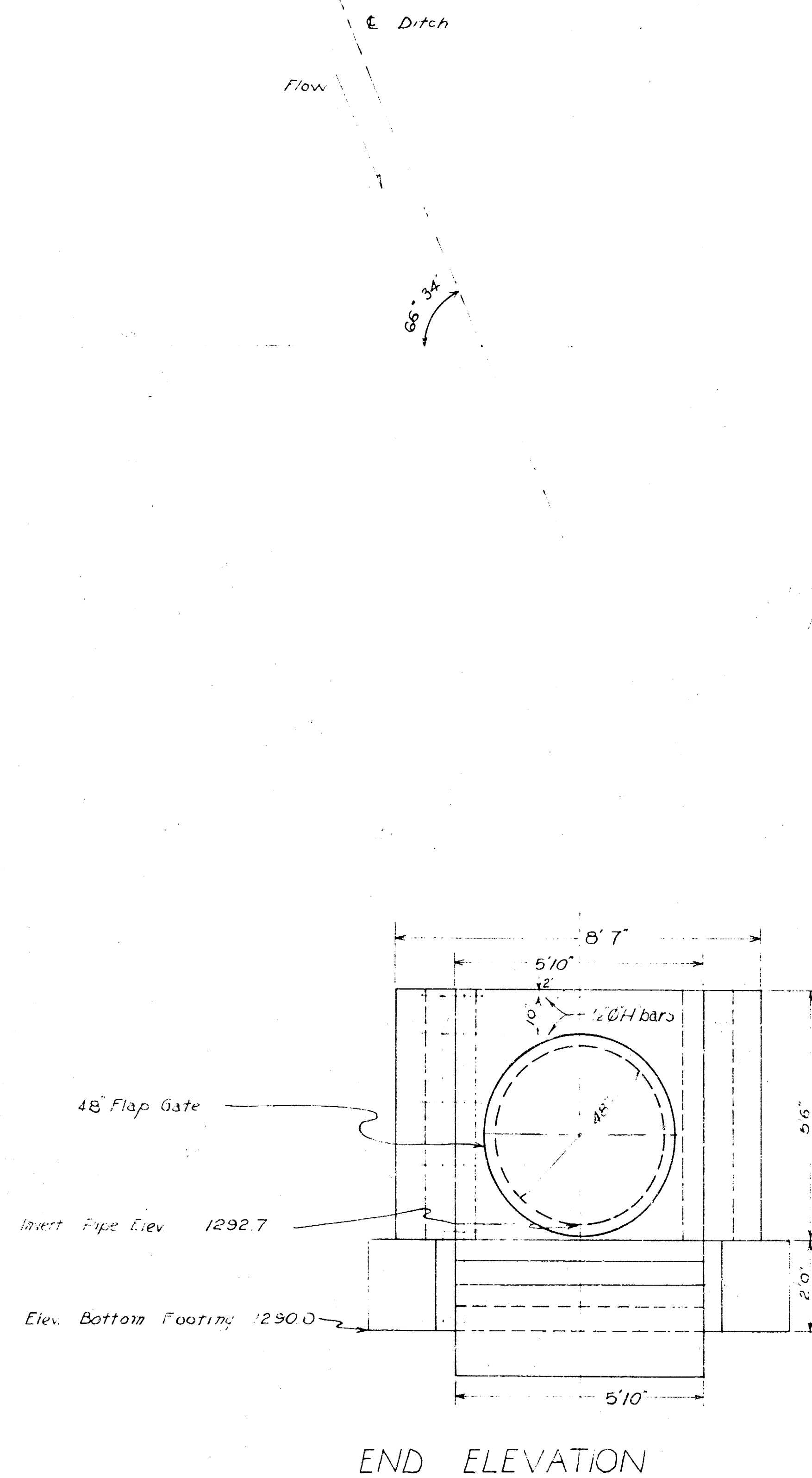
FOR 4'x4' CONCRETE BOX AT STA 176+50 RT											
Letter	A	B	C	D	E	F	G	H	K	Excavation	42.02 cu yds
Dimension	5'9"	8'8"	5'2"	5'8"	8'6"	19'7"	7'9"	11'3"	1'8"	Concrete	10.90 cu yds Apron - 444 cu yds
Bar	a	b	c	d	e	f	g	h	k	Backfill	19.04 cu yds
Number	10	10	4	4	10	10	4	4	4	Reinforcing Steel	10.90 cu yds Apron - 444 cu yds
Size	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	Sheet Piling	10.90 cu yds Apron - 444 cu yds
Length	10'0"	4'8"	6'10"	3'8"	10'0"	4'8"	6'10"	3'8"	10'0"	Flap Gate	One 48" x 48"

Note:
The corrugated sheet piling sections shall be of 12 gauge steel and 6 feet long.
For flap gate detail see sheet no. 12.
Coarse aggregate shall be deposited behind each weep hole to occupy a space extending 15 inches in all directions from the weep hole.
The front face of the headwalls shall be placed perpendicular to and symmetrically about the centerline of the boxes. The front face of the headwalls shall be placed 6 inches in front of the ends of the boxes.
All exposed edges shall be beveled with 1/4 inch triangular mauling.
All reinforcing measurements are to the centerline of the bars.
The length of concrete box to be removed at each station is as follows:
Station 123+80 RT - 9 feet
Sta 137+30 RT - 14 feet
Sta 150+80 LT - None
Sta 157+40 RT - 9 feet
Sta 164+50 RT - 12 feet
Sta 164+50 LT - 12 feet
Measurements are along axis of the box from the front face of the top headwall.
At Sta 176+50 RT the concrete box shall be extended into the headwall until the end is perpendicular. Concrete quantity shall be included with the headwalls concrete quantity.
Two feet of rip rap shall be placed on each side of all aprons.
The distance that rip rap shall extend in front of each apron is as follows:
Sta 123+80 RT - 6.0 feet
Sta 137+30 RT - 15.0 feet
Sta 150+80 LT - 5.0 feet
Sta 157+40 RT - 5.0 feet
Sta 164+50 RT - 20.0 feet
Sta 164+50 LT - 15.0 feet
Sta 176+50 RT - 18.0 feet
3 secs of 4 inch tile - 1 foot long shall be required for each headwall.

ARKANSAS RIVER BASIN
WICHITA AND VALLEY CENTER
FLOOD CONTROL PROJECT
EAST BRANCH INTERCEPTION CANAL &
WICHITA DRAINAGE CANAL
HEADWALLS FOR BOX CULVERTS

SCALE: 1 INCH = 2 FEET
CITY-COUNTY ENGINEER OFFICE, WICHITA, KANSAS
APPROVED: _____
CITY-ENGINEER ENGINEER IN CHARGE
DRAWN: JRS
TRACED
CHECKED

SHEET 6 OF 12



	PIPE	STEEL	SCHEDULE		
Type	A	C	D	H	V
Number	5	13	6	3	8
Size	14" Ø	4" Ø	12" Ø	8" Ø	16" Ø
Length	3' 9"	5' 6"	15' 0"	6' 0"	5' 1/8"

ESTIMATE OF QUANTITIES	
Exca	14.45 Cu Yds
Conc	6.00 Cu Yds
Rein Steel	150.47 Lbs
Sheet Piling	192.00 Fts
Top Gate	40" Ø
Backfill	6.31 cu yds
Rip Rap	707 sq yds

QUANTITIES FOR RELAYING PIPE	
Excavation	416.15 cu yds
Reinf Conc Pipe	170.0' of 48"Ø
Backfill	312.51 cu yds

Automatic flapgate similar to or equal to Calco Model 100 Manufactured by Hardesty Manufacturing Co. Denver Colo. to operate at maximum head of 10 ft for flap gate detail see sheet no 11

Steel sheeting similar to or equal to Armo Flange type 12 gauge manufactured by Armo Drainage and Metal Products Inc. Middletown, Ohio. All exposed edges shall be covered with 4 inch triangular melting. All reinforcing dimensions shall to the centerline of the base. The headwall shall be placed perpendicular to the axis of the pipe. Rip rap shall be placed around the apron for a distance of 1 foot

ARKANSAS RIVER BASIN
WICHITA AND VALLEY CENTER
FLOOD CONTROL PROJECT
EAST BRANCH INTERCEPTION CANAL &
WICHITA DRAINAGE CANAL
HEADWALL FOR PIPE CULVERT
STA 163+40 LT.

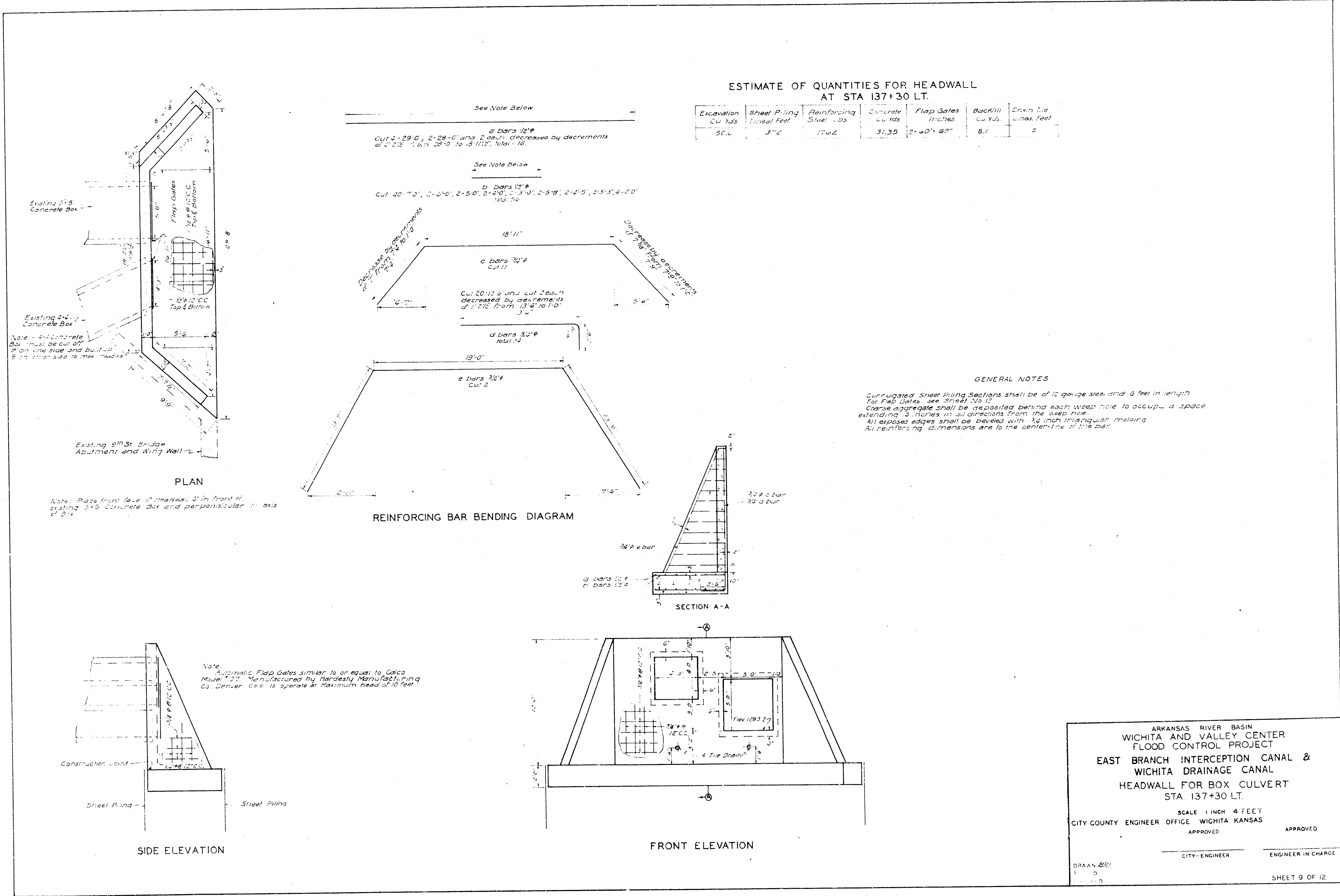
SCALE 1 INCH = 2 FT.
CITY-COUNTY ENGINEER OFFICE WICHITA KANSAS

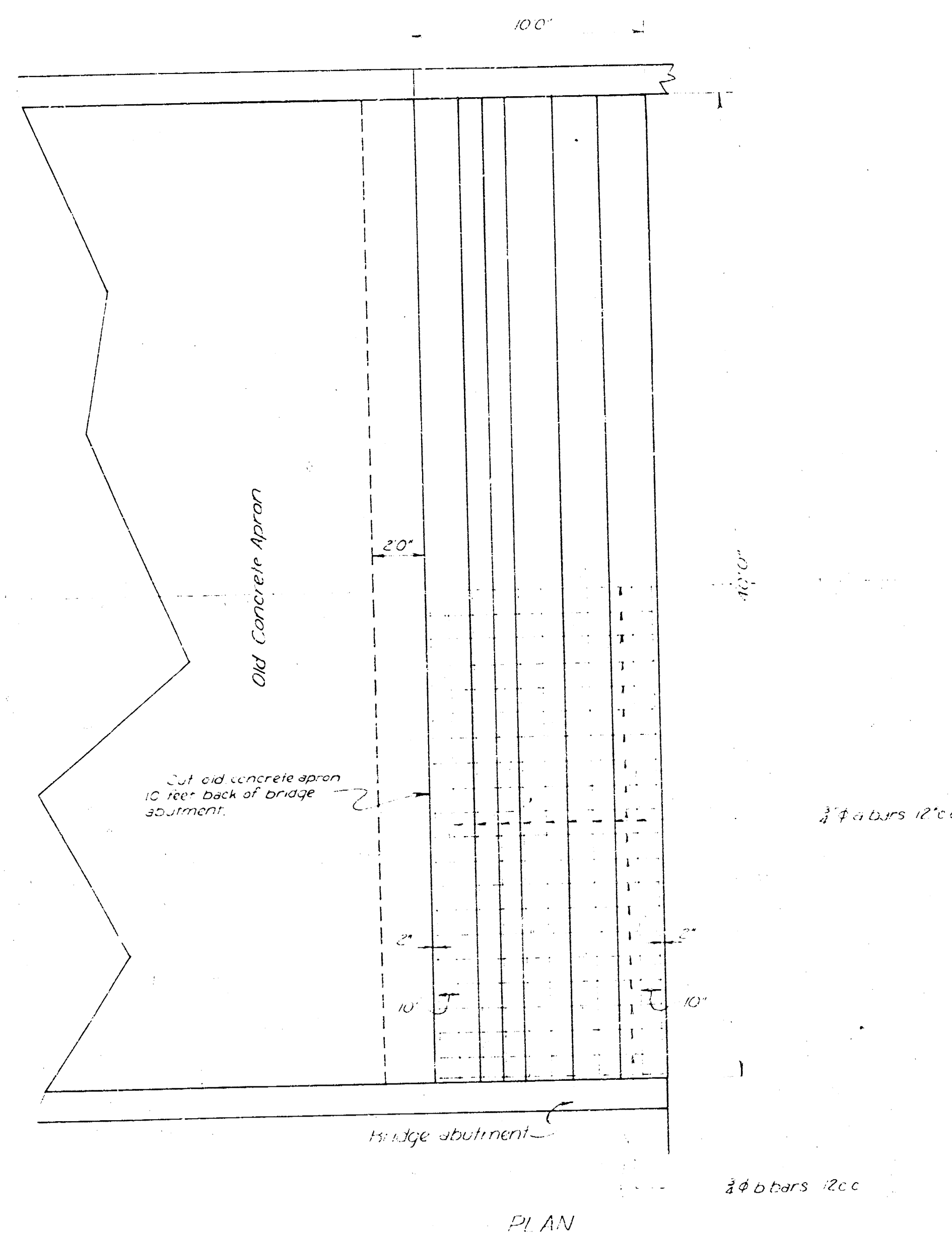
APPROVED.

CITY-ENGINEER

DRAWN (446)
TRACED

CHUCKED

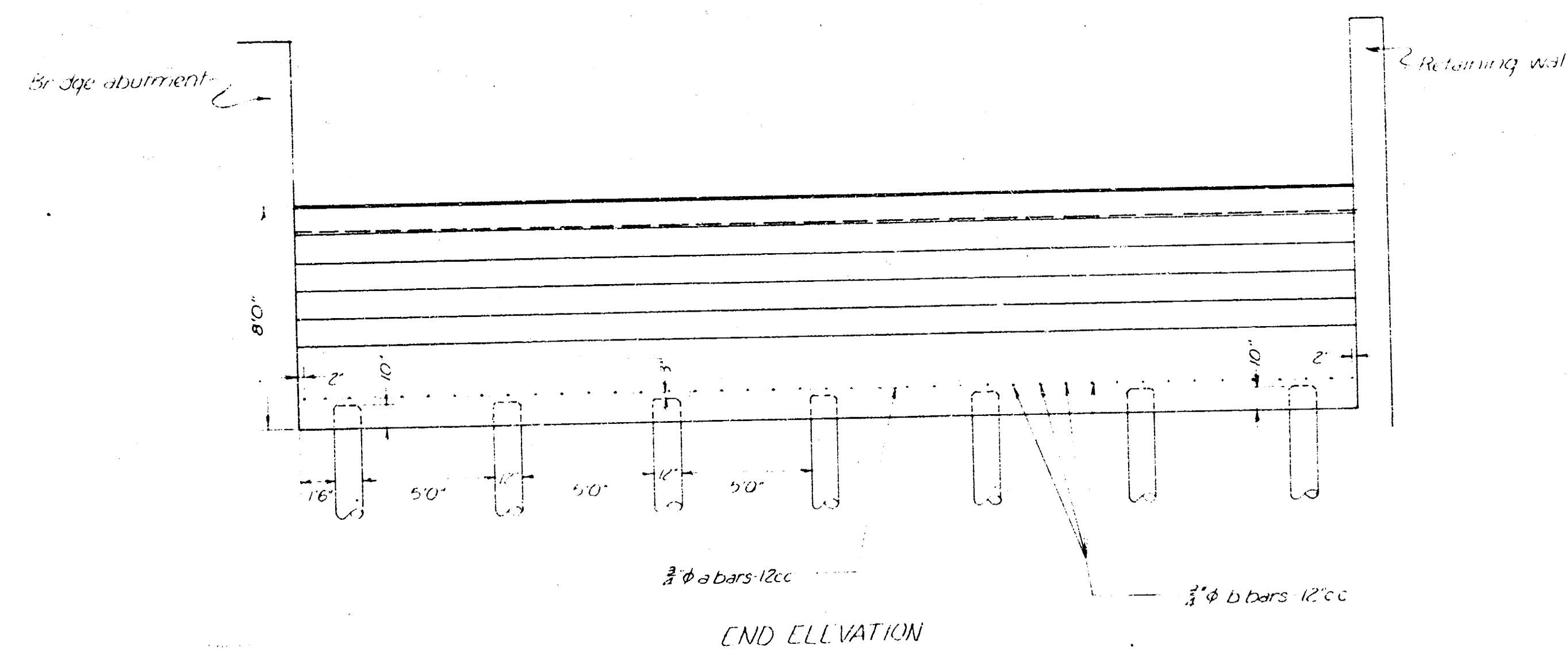
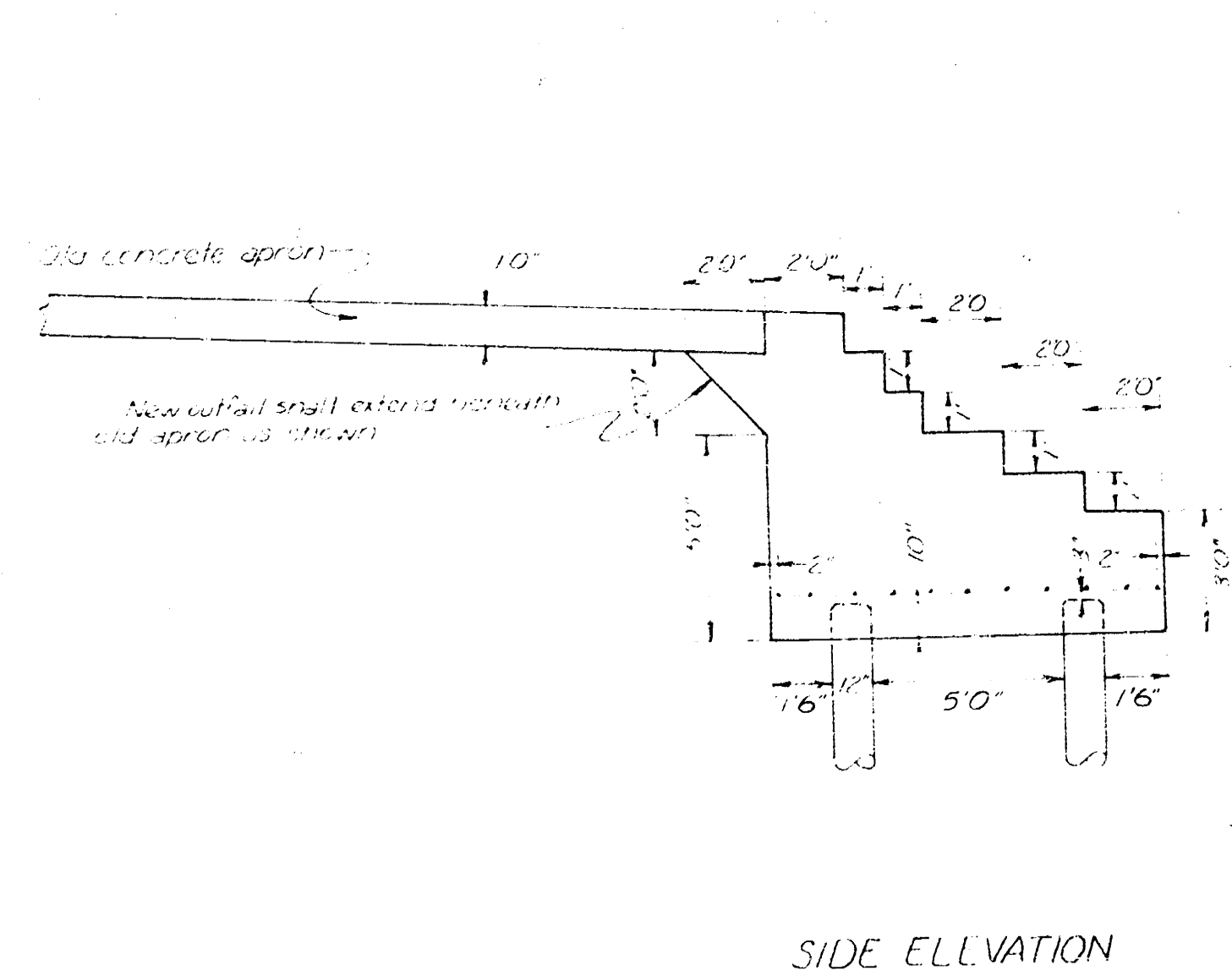




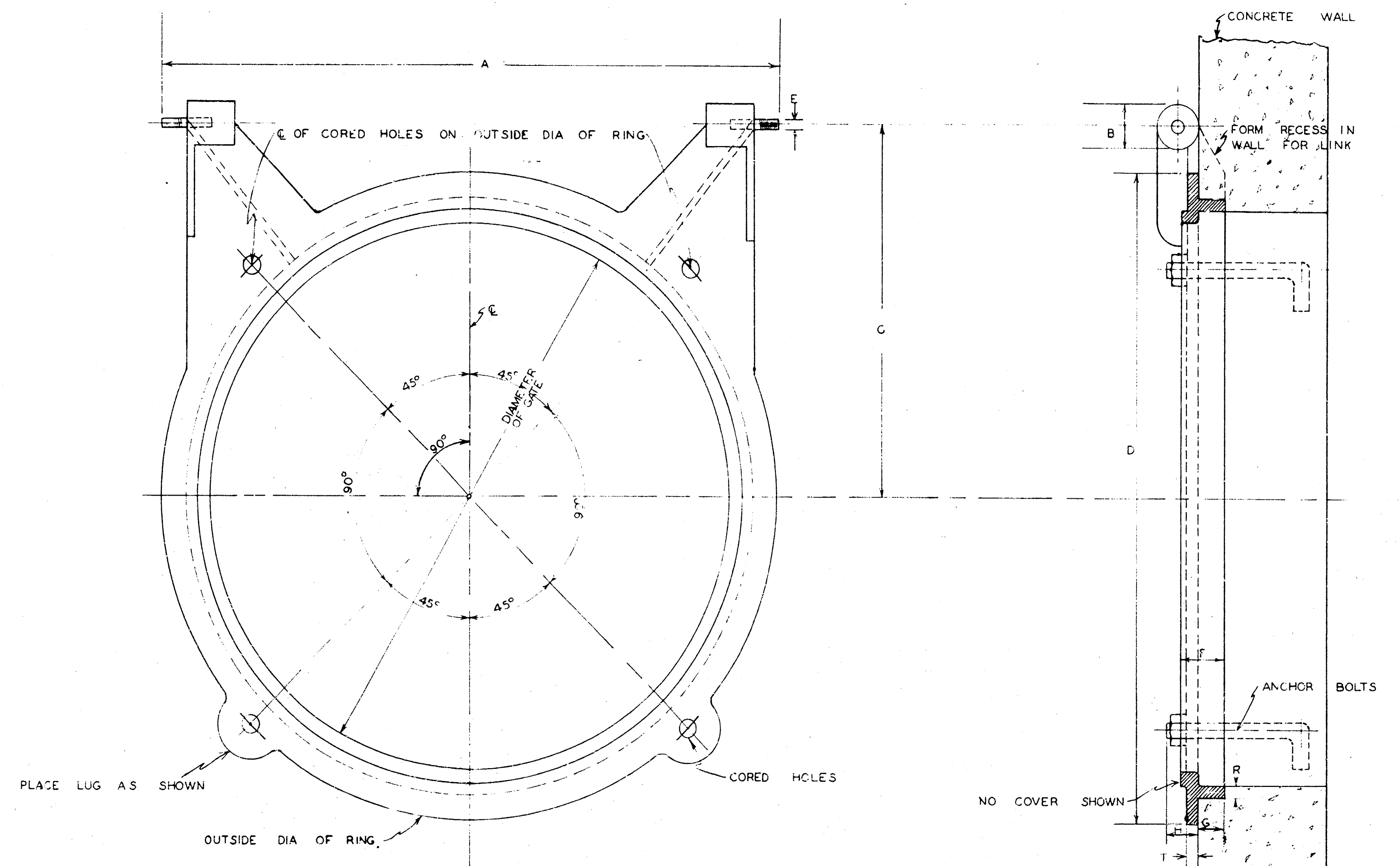
RUN SILL SCHEDULE		
Bar	a	b
Number	11	41
Size	3/4"	3/4"
Length	39'8"	9'8"

ESTIMATE OF QUANTITIES	
Excavation	94.81 cu yds
Concrete	41.48 cu yds
Reinforcing Steel	20 - 1250.67*
Sheet Piling	40' sec of 12 gauge - 6' long
Piling	14 - 12" treated pile - 20' long

NOTE:
 All reinforcing measurements are to the center line of the bars.
 Bevel all exposed edges with 3/4 inch triangular mounding.
 Removal of old concrete shall be considered part of the excavation and shall be paid for accordingly.
 The apron shall be constructed perpendicular to the axis of the drain and the front face shall be flush with the existing bridge abutment and the front face of the apron shall be made flush with old apron.
 New concrete at top of outfall shall be made flush with old apron.



ARKANSAS RIVER BASIN WICHITA AND VALLEY CENTER FLOOD CONTROL PROJECT EAST BRANCH INTERCEPTION CANAL & WICHITA DRAINAGE CANAL OUTFALL APRON AT 3RD STREET STA. 198+80.17	
SCALE 1 INCH = 4 FEET CITY-COUNTY ENGINEER OFFICE WICHITA KANSAS APPROVED DRAWN JRS TRACED CHECKED	APPROVED ENGINEER IN CHARGE SHEET 10 OF 12

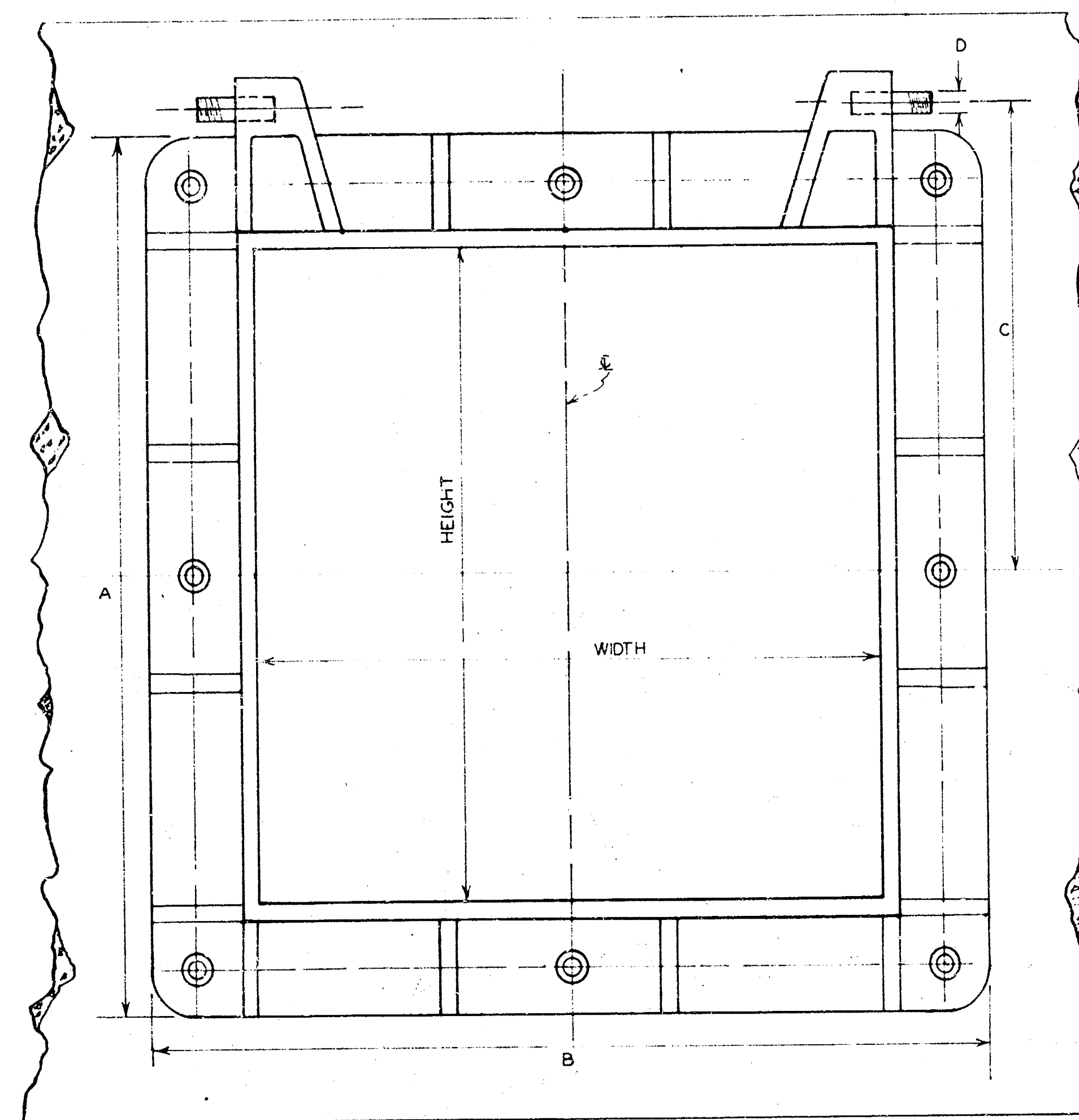


FRONT ELEVATION
RING ONLY

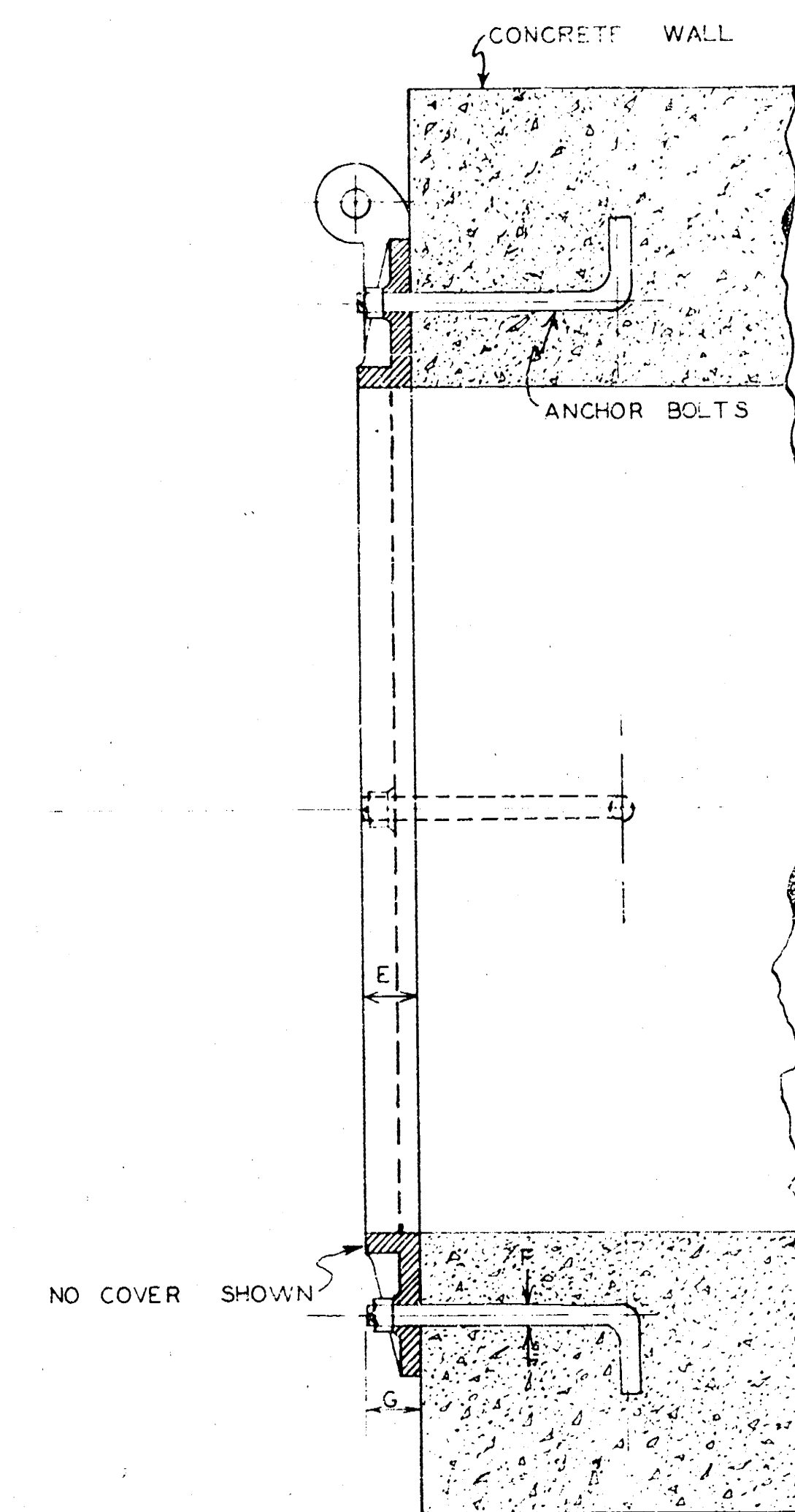
SECTION ON C

		FLAP		GATE		SCHEDULE				CALCO		MODEL		#100		
STATION	DIA	A	B	A	B	D	E	F	G	H	I	J	K	L	M	ANCHOR BOLT
53+50	46"	53 1/2"	2 1/2"	34"	54"	1"		4"	2 3/4"	1 3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	
67+50	24"	28 1/2"	2"	17"	27 1/2"	3/4"		2 1/2"	1 1/2"	1 1/2"	3/4"	3/4"	3/4"	3/4"	3/4"	
157+70	60"	66 1/2"	2 1/2"	42"	60 1/2"	1 1/4"		4 3/16"	2 3/4"	2 1/4"	7/8"	7/8"	1"	1"	1"	
163+40	46"	53 1/2"	2 1/2"	34"	54"	1"		4"	2 3/4"	1 3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	

ARKANSAS RIVER BASIN
WICHITA AND VALLEY CENTER
FLOOD CONTROL PROJECT
EAST BRANCH INTERCEPTION CANAL &
WICHITA DRAINAGE CANAL
FLAP GATE DETAIL
MODEL 100
SCALE: 1 INCH = 4 INCHES
CITY-COUNTY ENGINEER OFFICE WICHITA KANSAS
APPROVED: _____
ENGINEER-IN-CHARGE
DRAWN: C.V.G.
TRACED
CHECKED
SHEET 1 OF 2



FRONT ELEVATION
RING ONLY



SECTION ON C-C

FLAP GATE SCHEDULE — CALCO MODEL 107									
STATION	GATE SIZE								
	WIDTH	HEIGHT	A	B	C	D	E	F	G
86 + 30L1	6'0"	6'0"	7'0"	7'0"	4'2"	1'1/4"	2'1/2"	1"	2'1/4"
93 + 30L1	4'0"	4'0"	5'7"	5'7"	3'4"	1"	2'1/2"	3/4"	1'3/4"
109 + 30	6'0"	6'0"	7'0"	7'0"	4'2"	1'1/4"	2'1/2"	1"	2'1/4"
123 + 30	3'6"	3'6"	4'4"	4'4"	2'5"	1"	2'1/2"	3/8"	1'3/8"
137 + 30L1	6'0"	6'0"	7'0"	7'0"	4'2"	1'1/4"	2'1/2"	1"	2'1/4"
137 + 30L2	6'0"	6'0"	7'0"	7'0"	4'2"	1'1/4"	2'1/2"	1"	2'1/4"
137 + 30R2	4'0"	4'0"	5'7"	5'7"	3'4"	1"	2'1/2"	3/4"	1'3/4"
150 + 30L1	4'0"	4'0"	5'7"	5'7"	3'4"	1"	2'1/2"	3/4"	1'3/4"
157 + 40H1	3'6"	3'6"	4'4"	4'4"	2'5"	1"	2'1/2"	3/8"	1'3/8"
163 + 50L1	3'6"	3'6"	4'4"	4'4"	2'5"	1"	2'1/2"	3/8"	1'3/8"
164 + 50R1	3'6"	3'6"	4'4"	4'4"	2'5"	1"	2'1/2"	3/8"	1'3/8"
176 + 50L1	4'0"	4'0"	5'7"	5'7"	3'4"	1"	2'1/2"	3/4"	1'3/4"
176 + 50R1	4'0"	4'0"	5'7"	5'7"	3'4"	1"	2'1/2"	3/4"	1'3/4"

ARKANSAS RIVER BASIN
WICHITA AND VALLEY CENTER
FLOOD CONTROL PROJECT
EAST BRANCH INTERCEPTION CANAL &
WICHITA DRAINAGE CANAL
FLAP GATE DETAIL
MODEL 107

SCALE: 1 INCH = 4 FEET

CITY COUNTY ENGINEER OFFICE WICHITA KANSAS

APPROVED _____

CITY ENGINEER _____ ENGINEER IN CHARGE _____

DRAWN C.W.G.
TRACED
CHECKED

SHEET 1 OF 1