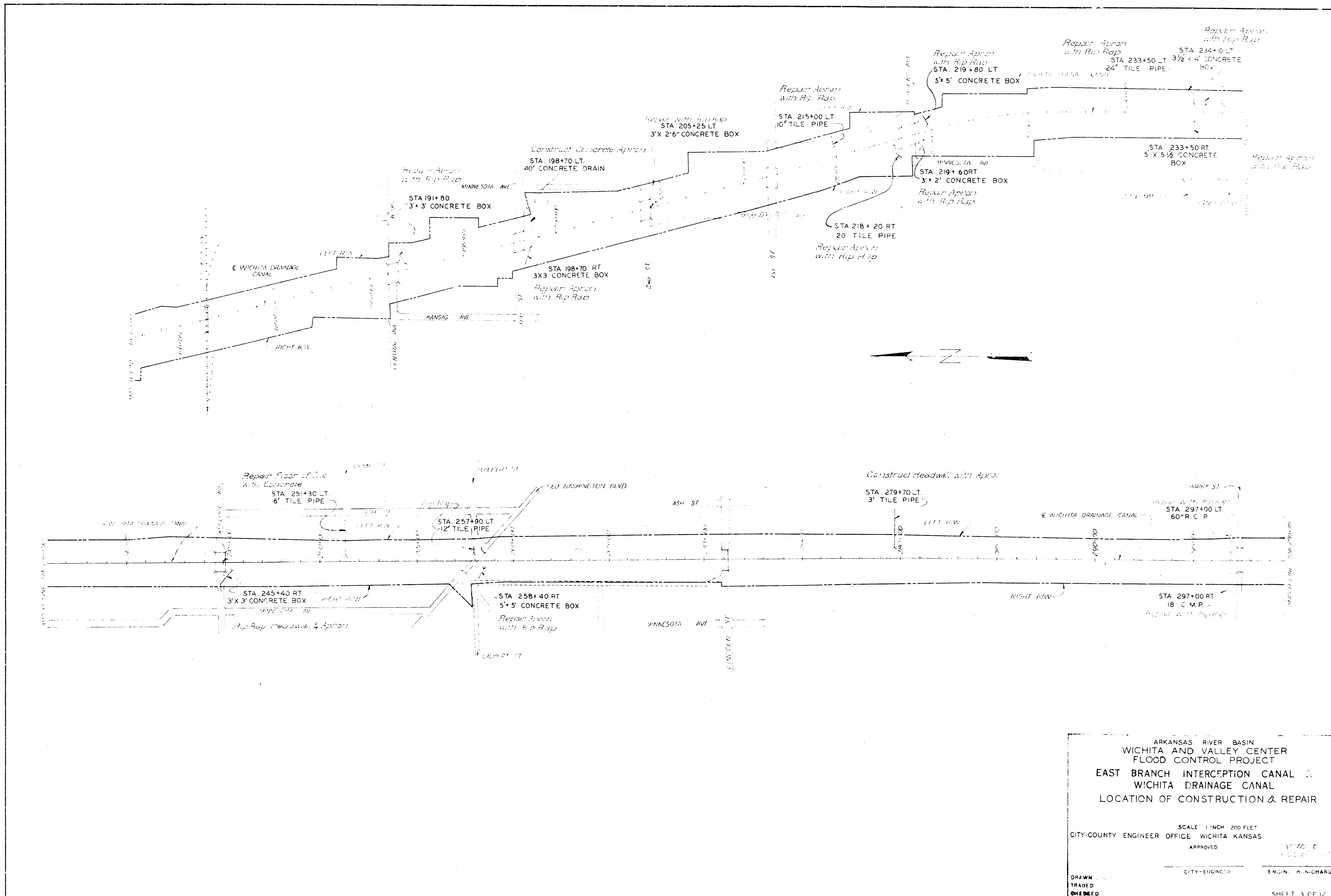


ARKANSAS RIVER BASIN
 WICHITA AND VALLEY CENTER
 FLOOD CONTROL PROJECT
 EAST BRANCH INTERCEPTION CANAL &
 WICHITA DRAINAGE CANAL
 LOCATION OF CONSTRUCTION & REPAIR

SCALE 1 INCH = 200 FEET
 CITY-COUNTY ENGINEER OFFICE WICHITA KANSAS
 APPROVED: _____
 CITY-ENGINEER: _____
 DRAWN BY: _____
 CHECKED: _____
 SHEET 2 OF 12

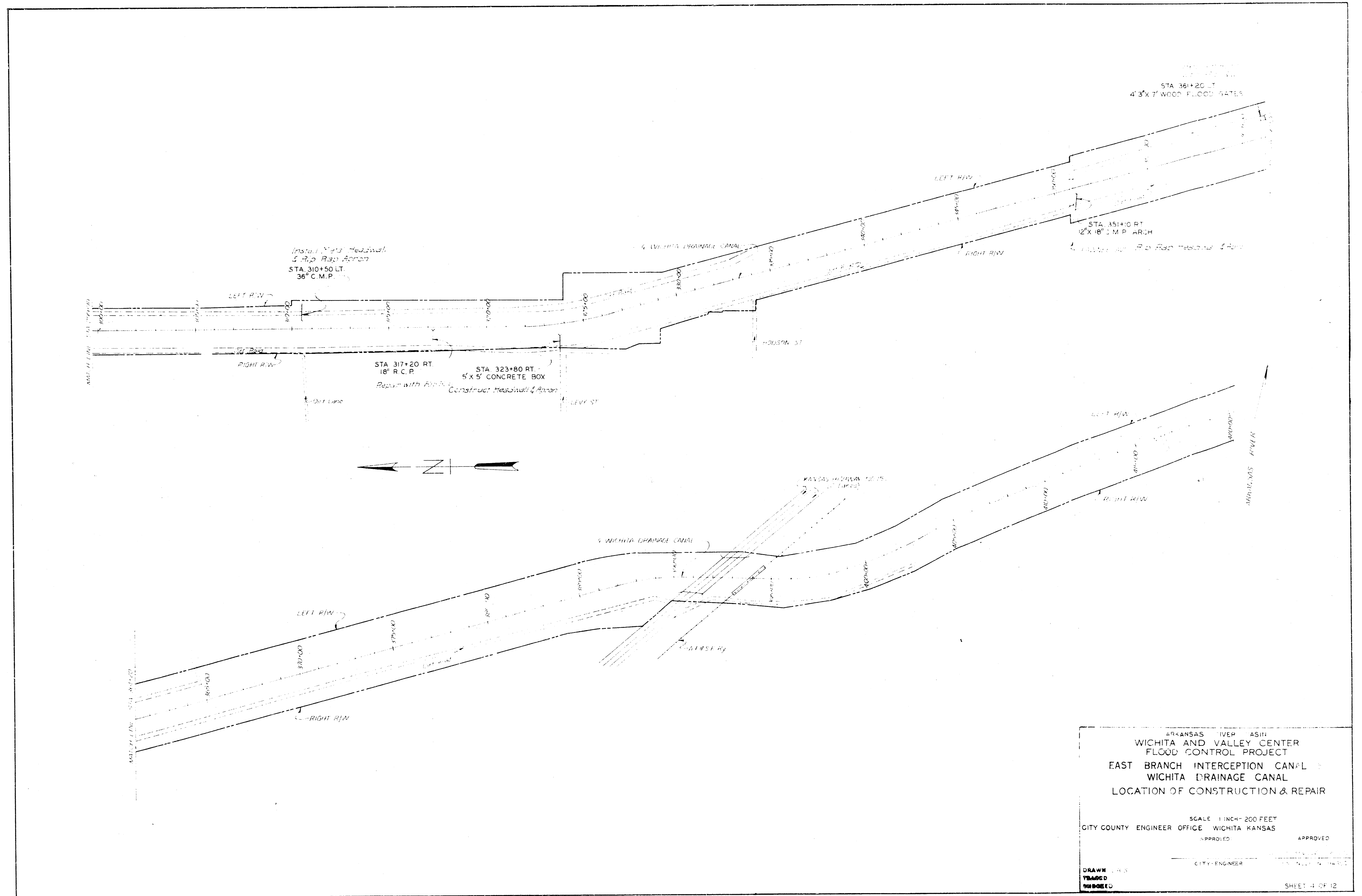


ARKANSAS RIVER BASIN
 WICHITA AND VALLEY CENTER
 FLOOD CONTROL PROJECT
 EAST BRANCH INTERCEPTION CANAL &
 WICHITA DRAINAGE CANAL
 LOCATION OF CONSTRUCTION & REPAIR

SCALE 1 INCH = 200 FEET
 CITY-COUNTY ENGINEER OFFICE WICHITA KANSAS
 APPROVED _____
 CITY-ENGINEER _____ ENGR. IN CHARGE

DRAWN _____
 TRACED _____
 CHECKED _____

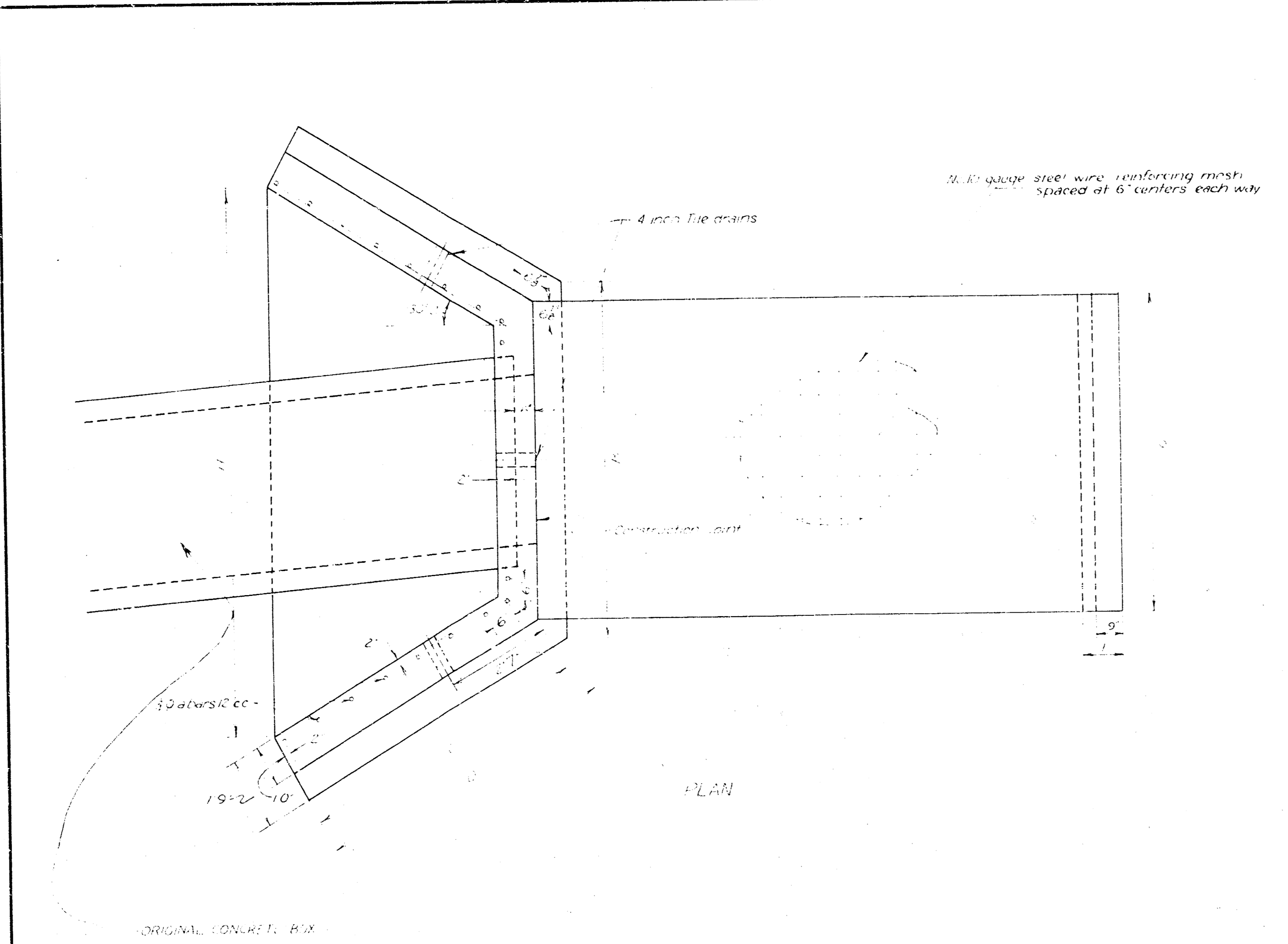
SHEET 3 OF 12



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

SCALE 1 INCH = 200 FEET
 CITY COUNTY ENGINEER OFFICE WICHITA KANSAS
 APPROVED _____
 CITY ENGINEER

DRAWN BY _____
 TRACED BY _____
 CHECKED BY _____
 SHEET 4 OF 12



LISTS OF BARS, DIMENSIONS, AND QUANTITIES FOR HEADWALLS

FOR 4'x4' CONCRETE BOX AT STA 79+00 LT										Excavation		Flow Line Elev.	
Letter	A	B	C	D	E	F	G	H	K	Concrete	Sheet Piling	Flow Line Elev.	Flow Line Elev.
Dimension	5'0"	8'0"	5'7 1/2"	4'0"	10'9"	18'7"	1'4 1/2"	11'3 1/2"	4'0"	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds
Bar	4	4	4	4	4	4	4	4	4	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds
Number	14	20	7	5	1	1	1	1	1	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds
Size	#4	#4	#4	#4	#4	#4	#4	#4	#4	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds
Length	11'0"	4'8"	7'0"	4'8"	11'0"	4'8"	7'0"	4'8"	11'0"	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds

FOR 4'x4' CONCRETE BOX AT STA 80+00 LT										Excavation		Flow Line Elev.	
Letter	A	B	C	D	E	F	G	H	K	Concrete	Sheet Piling	Flow Line Elev.	Flow Line Elev.
Dimension	5'0"	8'0"	5'7 1/2"	4'0"	10'9"	18'7"	1'4 1/2"	11'3 1/2"	4'0"	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds
Bar	4	4	4	4	4	4	4	4	4	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds
Number	14	20	7	5	1	1	1	1	1	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds
Size	#4	#4	#4	#4	#4	#4	#4	#4	#4	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds
Length	11'0"	4'8"	7'0"	4'8"	11'0"	4'8"	7'0"	4'8"	11'0"	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds

FOR 4'x4' CONCRETE BOX AT STA 93+00 LT										Excavation		Flow Line Elev.	
Letter	A	B	C	D	E	F	G	H	K	Concrete	Sheet Piling	Flow Line Elev.	Flow Line Elev.
Dimension	5'0"	8'0"	5'7 1/2"	4'0"	10'9"	18'7"	1'4 1/2"	11'3 1/2"	4'0"	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds
Bar	4	4	4	4	4	4	4	4	4	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds
Number	14	20	7	5	1	1	1	1	1	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds
Size	#4	#4	#4	#4	#4	#4	#4	#4	#4	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds
Length	11'0"	4'8"	7'0"	4'8"	11'0"	4'8"	7'0"	4'8"	11'0"	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds

FOR 4'x4' CONCRETE BOX AT STA 105+00 LT										Excavation		Flow Line Elev.	
Letter	A	B	C	D	E	F	G	H	K	Concrete	Sheet Piling	Flow Line Elev.	Flow Line Elev.
Dimension	5'0"	8'0"	5'7 1/2"	4'0"	10'9"	18'7"	1'4 1/2"	11'3 1/2"	4'0"	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds
Bar	4	4	4	4	4	4	4	4	4	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds
Number	14	20	7	5	1	1	1	1	1	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds
Size	#4	#4	#4	#4	#4	#4	#4	#4	#4	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds
Length	11'0"	4'8"	7'0"	4'8"	11'0"	4'8"	7'0"	4'8"	11'0"	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds

FOR 4'x4' CONCRETE BOX AT STA 106+00 LT										Excavation		Flow Line Elev.	
Letter	A	B	C	D	E	F	G	H	K	Concrete	Sheet Piling	Flow Line Elev.	Flow Line Elev.
Dimension	5'0"	8'0"	5'7 1/2"	4'0"	10'9"	18'7"	1'4 1/2"	11'3 1/2"	4'0"	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds
Bar	4	4	4	4	4	4	4	4	4	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds
Number	14	20	7	5	1	1	1	1	1	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds
Size	#4	#4	#4	#4	#4	#4	#4	#4	#4	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds
Length	11'0"	4'8"	7'0"	4'8"	11'0"	4'8"	7'0"	4'8"	11'0"	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds

FOR 4'x4' CONCRETE BOX AT STA 323+00 RT										Excavation		Flow Line Elev.	
Letter	A	B	C	D	E	F	G	H	K	Concrete	Sheet Piling	Flow Line Elev.	Flow Line Elev.
Dimension	5'0"	8'0"	5'7 1/2"	4'0"	10'9"	18'7"	1'4 1/2"	11'3 1/2"	4'0"	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds
Bar	4	4	4	4	4	4	4	4	4	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds
Number	14	20	7	5	1	1	1	1	1	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds
Size	#4	#4	#4	#4	#4	#4	#4	#4	#4	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds
Length	11'0"	4'8"	7'0"	4'8"	11'0"	4'8"	7'0"	4'8"	11'0"	10'0" Cu Yds	Sheet Piling	10'0" Cu Yds	10'0" Cu Yds

Note: The corrugated sheet piling sections shall be of 12 gauge steel and 6' long. The spacing shall be 2' on center. No bracing shall be required for each headwall.

GENERAL NOTES

1. The contractor shall be responsible for obtaining all necessary permits for this project.

2. The contractor shall be responsible for obtaining all necessary permits for this project.

3. The contractor shall be responsible for obtaining all necessary permits for this project.

4. The contractor shall be responsible for obtaining all necessary permits for this project.

5. The contractor shall be responsible for obtaining all necessary permits for this project.

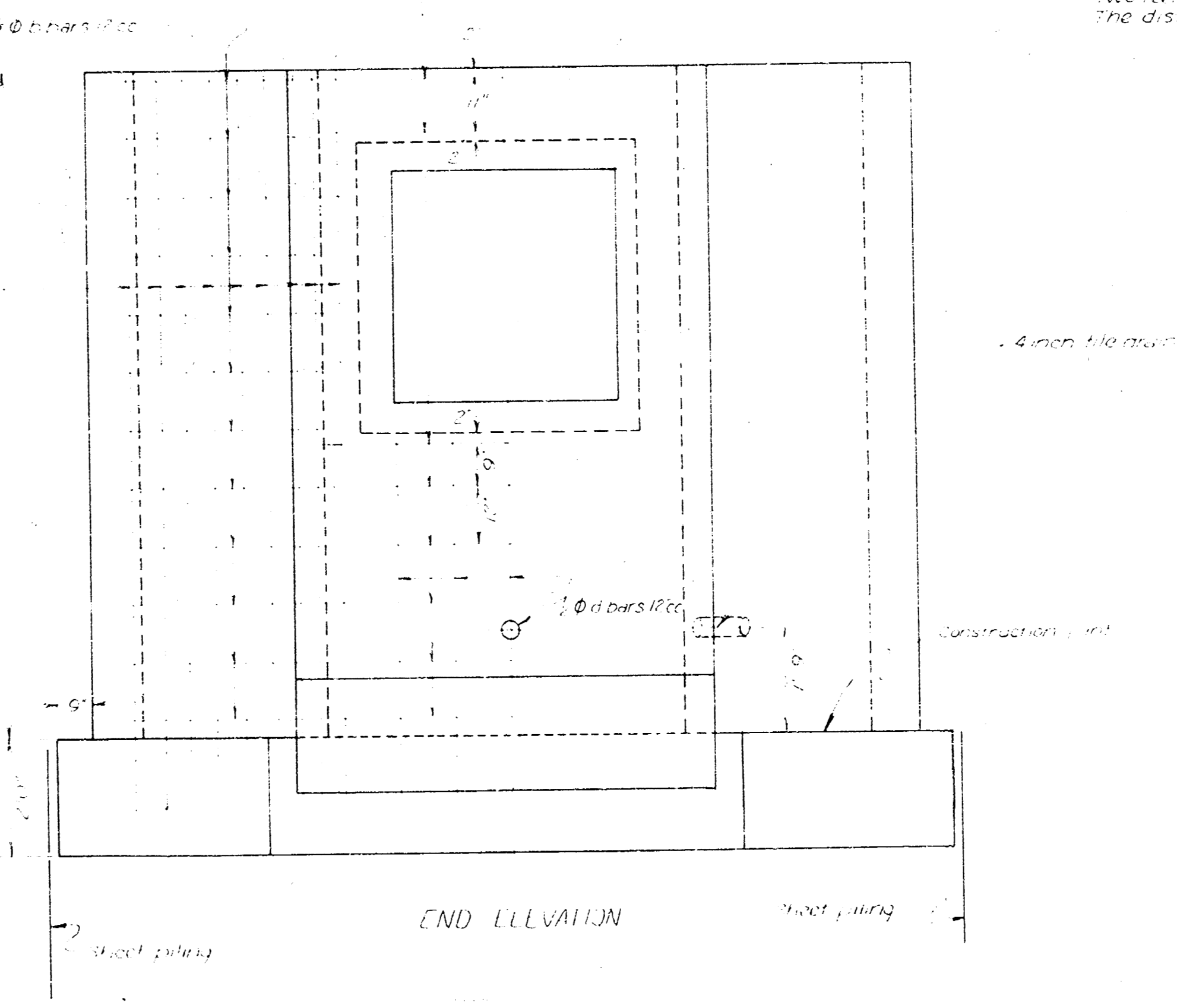
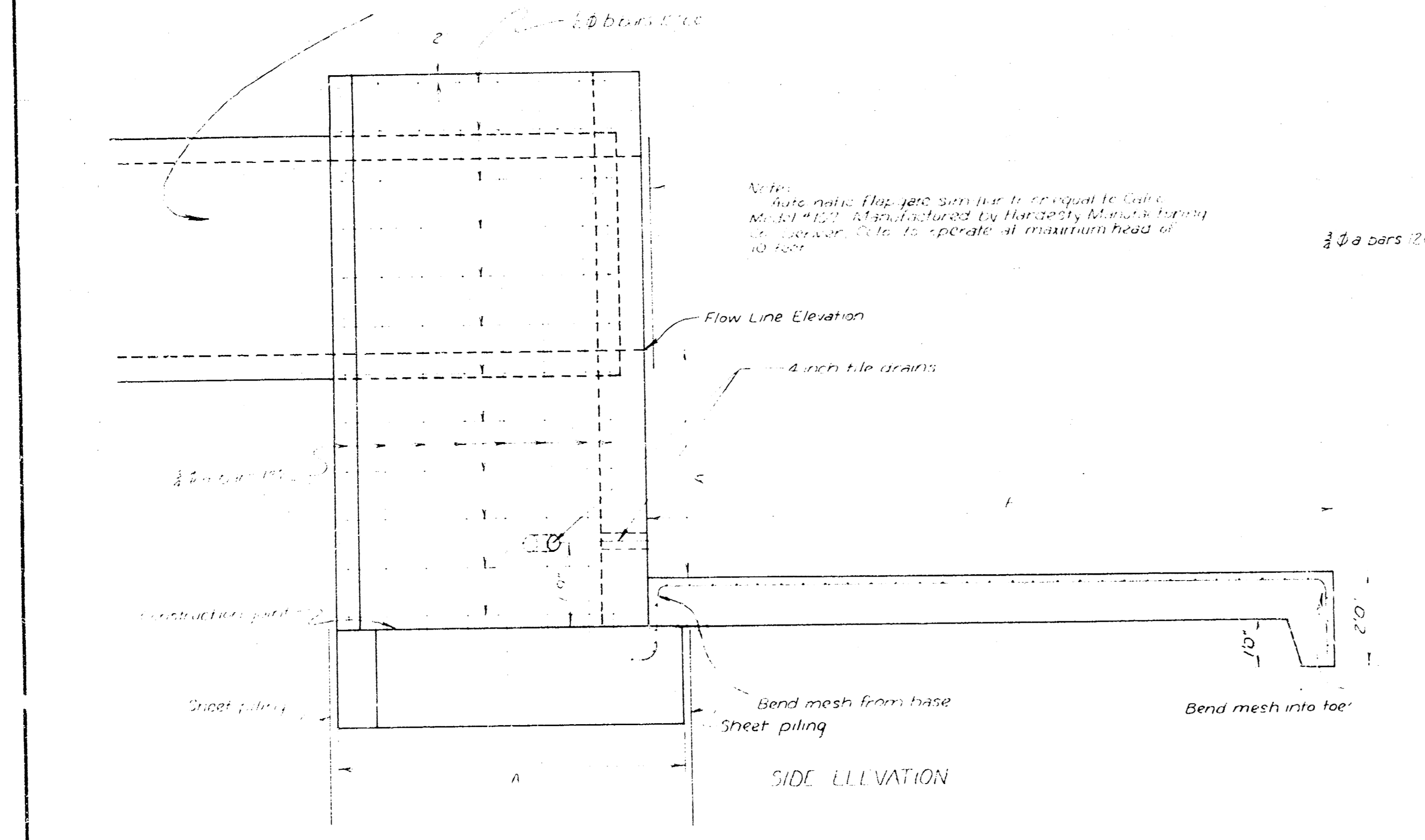
6. The contractor shall be responsible for obtaining all necessary permits for this project.

7. The contractor shall be responsible for obtaining all necessary permits for this project.

8. The contractor shall be responsible for obtaining all necessary permits for this project.

9. The contractor shall be responsible for obtaining all necessary permits for this project.

10. The contractor shall be responsible for obtaining all necessary permits for this project.



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 _____ APPROVED _____
 CITY ENGINEER PROJECT CHARGE

DRAWN J.R.S.
 TRACED
 CHECKED

SHEET 5 OF 12

STATION	ELEVATION		
	A	B	C
43+50	1309.00	1299.25	1300.10
279+70 LI	1280.20	1274.00	1273.00
157+70	1294.50	1289.00	1288.50

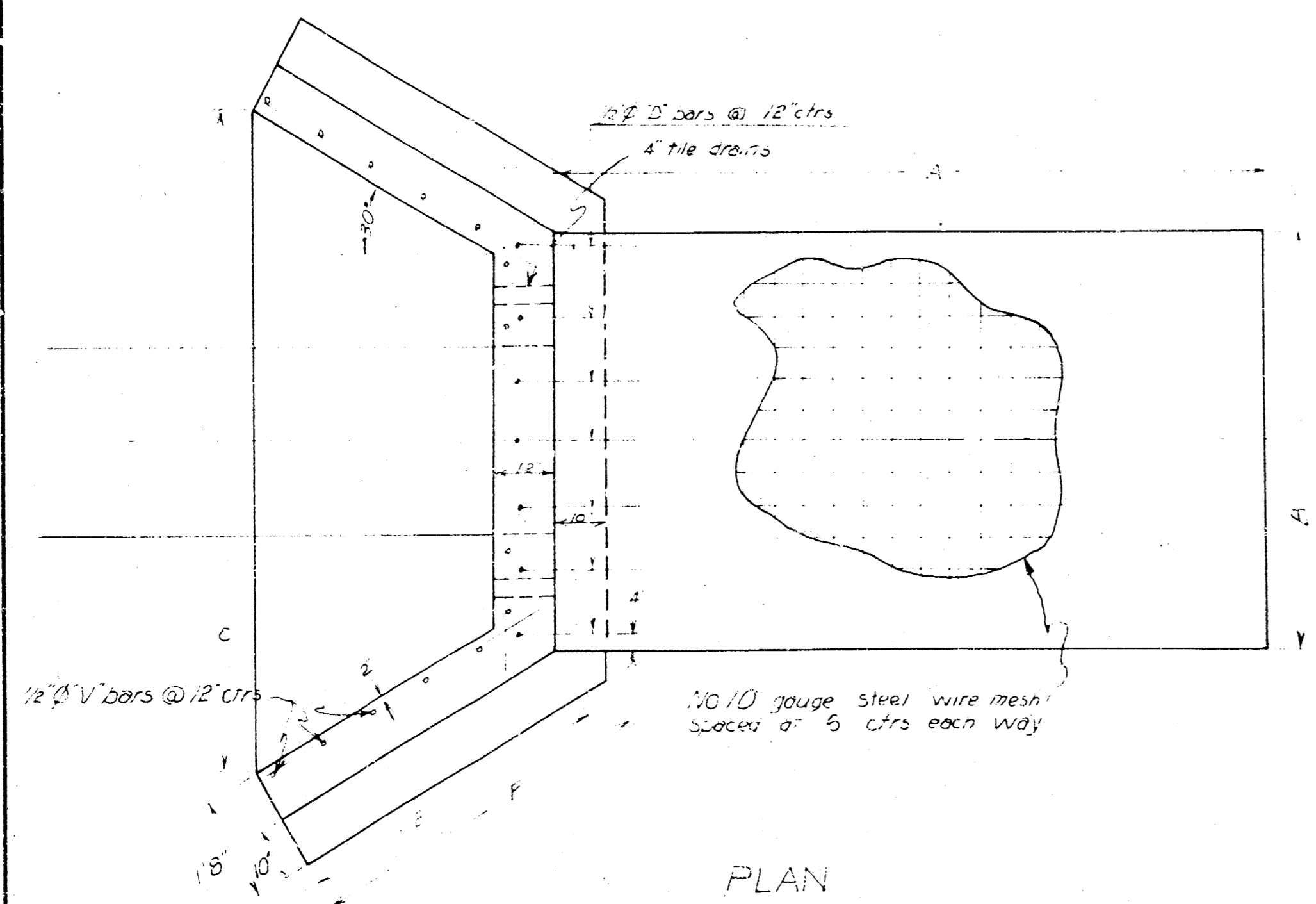
LISTS OF BARS, DIMENSIONS, AND QUANTITIES FOR HEADWALLS FOR

36" TILE PIPE AT STA 279+70 LI												
Letter	A	B	C	D	D ₁	E	F	G	H	J	K	L
Excavation	3079 cu yds											
Concrete	120.70 cu yds Apron 323 cu ft											
Rein Steel	174.35 "											
Sheet Piling	63 Sections*											
Wire Mesh	23.1 "											
Flap Gate	None											
Backfill	18.5 cu yds											
Rip Rap	11.25 sq yds											

48" C.M. PIPE AT STA 63+50 LI												
Letter	A	B	C	D	D ₁	E	F	G	H	J	K	L
Excavation	20.56 cu yds											
Concrete	12.70 cu yds Apron 141 cu ft											
Rein Steel	196.8 "											
Sheet Piling	53 Sections*											
Wire Mesh	14.91 "											
Flap Gate	48											
Backfill	17.7 cu yds											
Rip Rap	6.22 sq yds											

60" CONCRETE PIPE AT STA 157+70 LI												
Letter	A	B	C	D	D ₁	E	F	G	H	J	K	L
Excavation	64.45 cu yds											
Concrete	140.82 cu yds											
Rein Steel	209.83 "											
Sheet Piling	36 Sections											
Rip Rap	5203 sq yds											
Flap Gate	60"											
Backfill	47.90 cu yds											

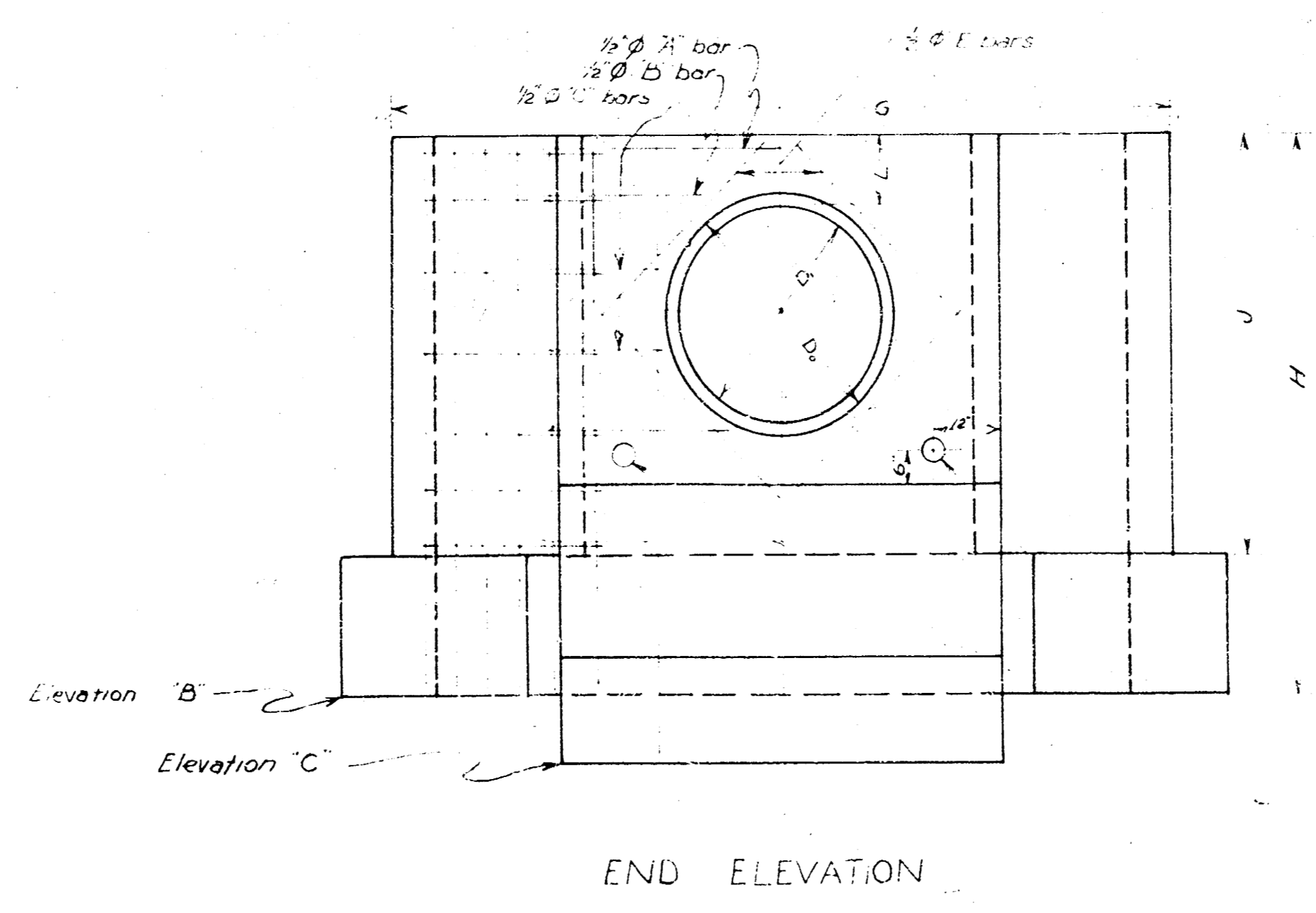
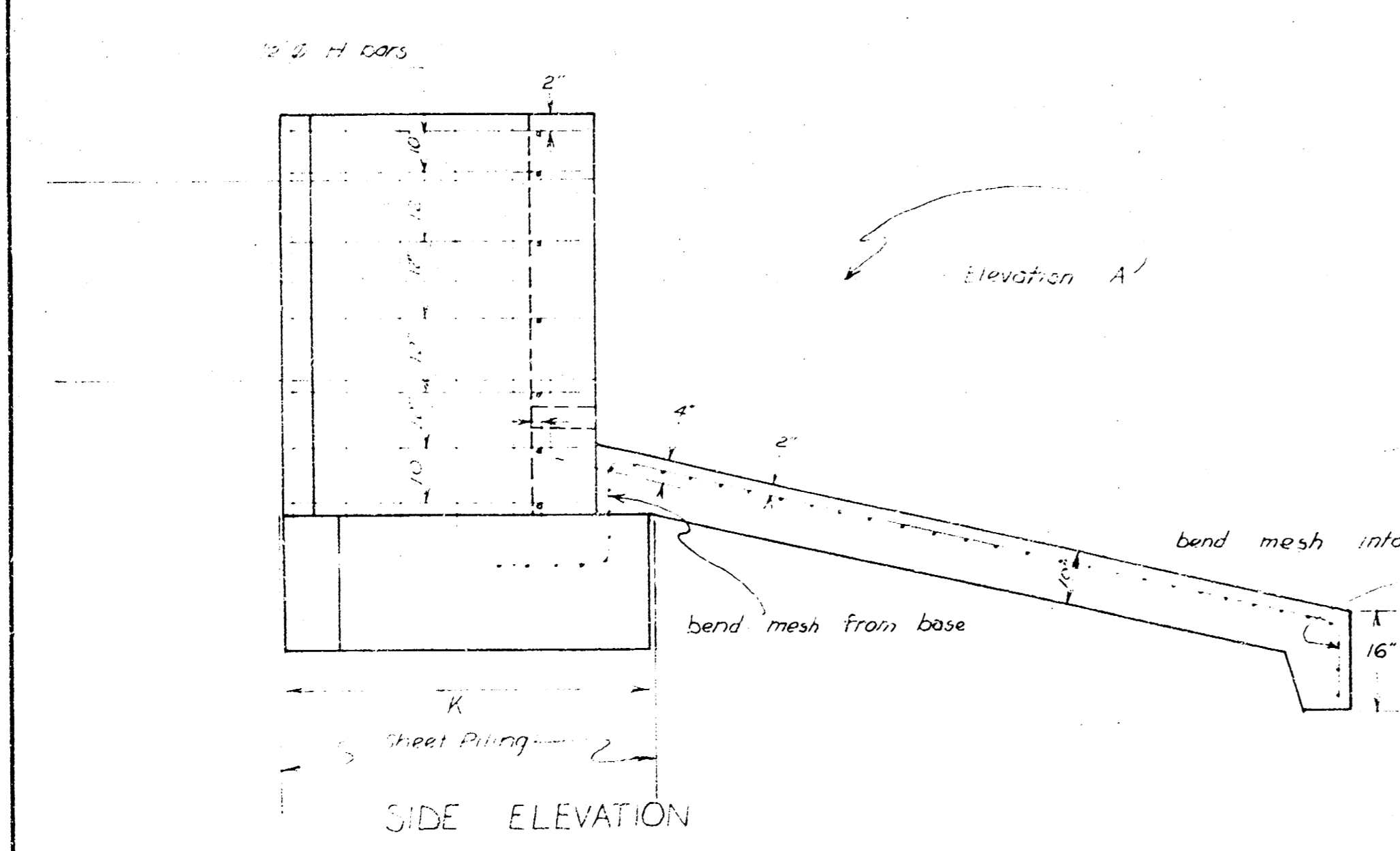
AT STA 157+70 LI		
QUANTITIES FOR RELAYING PIPE		
Excavation	1.80 cu yds	
Rein Steel	145.01 cu ft	
Backfill	1.95 cu yds	



NOTE:
 1. Rip rap at sta 157+70 to be rip rapped with 12\"/>

NOTE:
 1. All materials specified to be similar to or equal to Galvalume 40 Manufactured by Harsco Manufacturing Co Denver, Colo. to operate at a maximum wind of 10 ft.
 2. The corrugated sheet piling sections shall be of 12 gauge steel and 6 ft long.
 3. The mesh shall be 40 in section of 36 in tile pipe before placing headwall.
 4. Cut 2 ft off of 48 in C.M.P. before placing headwall.
 5. Headwalls to be pinned at 45 degree angles to & of pipe.
 6. For flap gate detail see sheet no. 11.
 7. Two sets of 4 inch dia. tie rods are required for each headwall.

General Notes
 1. Concrete aggregate shall be deposited behind each weep hole to occupy a space extending 15 in in all direction from the weep hole.
 2. Weep hole ends shall be sealed with 1/2 in diameter packing.
 3. Packing dimensions are to centerlines of bars.
 4. The mesh shall be placed on each side of all aprons.
 5. The mesh that apron shall extend in front of each apron as is Ref. to Sta. 279+70 LI - 5 feet.
 Sta. 44+50 LI - 3 feet.



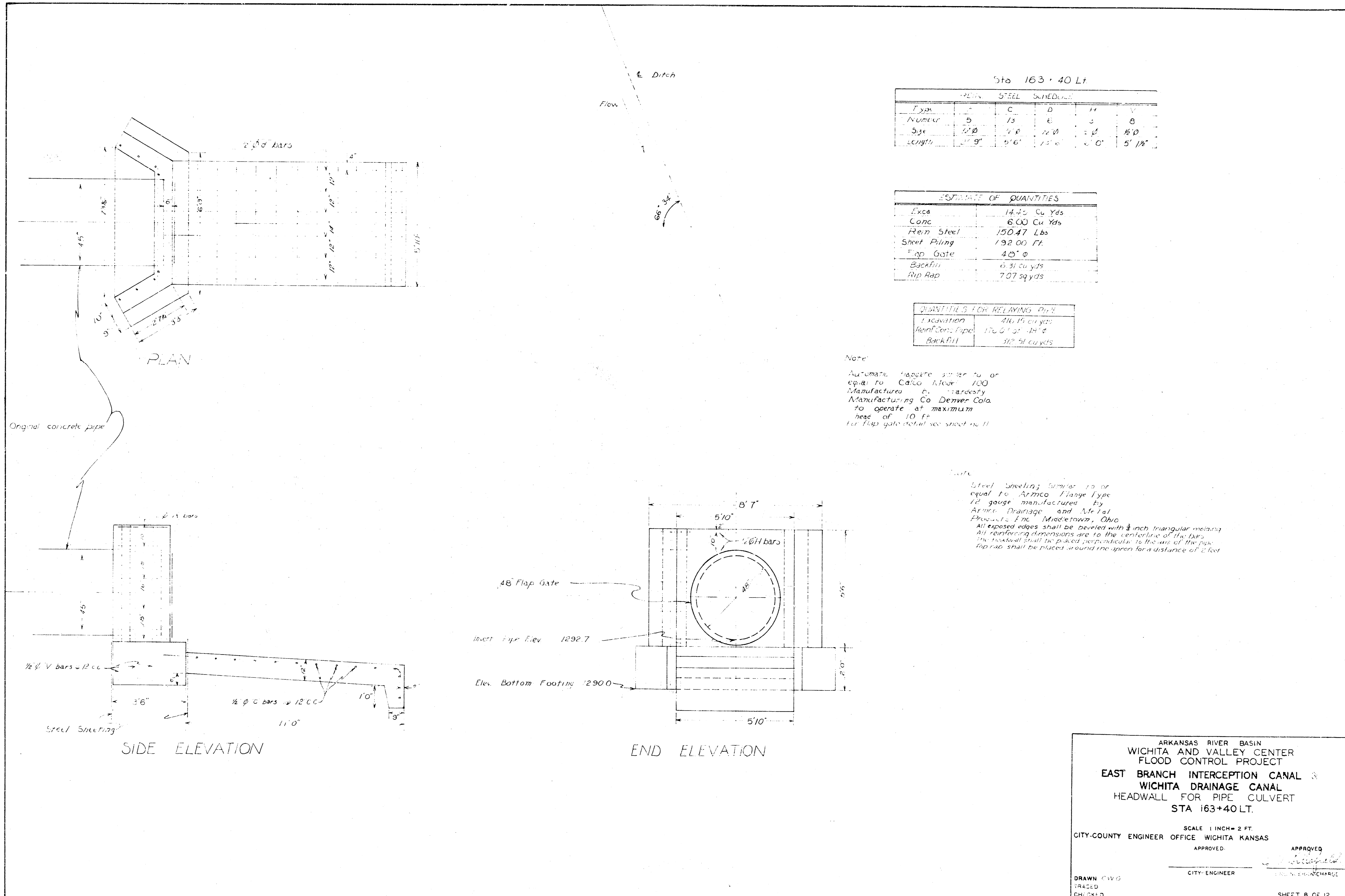
ARKANSAS RIVER BASIN
 WICHITA AND VALLEY CENTER
 FLOOD CONTROL PROJECT
 EAST BRANCH INTERCEPTION CANAL &
 WICHITA DRAINAGE CANAL
 HEADWALLS FOR PIPE CULVERTS

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

APPROVED: _____
 CITY-ENGINEER ENGINEER-IN-CHARGE

DRAWN: C.W.G.
 TRACED
 CHECKED

SHEET 7 OF 12



Sta 163+40 Lt

TYPE	STEEL	SCHEDULE	W	D	T
Number	5	75	6	5	8
Size	1/2"	1/2"	1/2"	1/2"	1/2"
Length	11'9"	5'6"	11'6"	5'0"	5'11"

ESTIMATE OF QUANTITIES

Exca	14.25 Cu Yds
Conc	6.00 Cu Yds
Rein Steel	150.47 Lbs
Sheet Piling	192.00 Ft.
Flap Gate	48" x 6"
Backfill	6.31 Cu Yds
Rip Rap	7.07 sq yds

QUANTITIES FOR RELAYING PIPE

Excavation	46.15 cu yds
Reinforcing Pipe	176.51 sq ft
Backfill	32.91 cu yds

Note:
Automatic flaps similar to or equal to Calco River Tool Manufacturing Co. Denver Colo. to operate at maximum head of 10 ft. for flap gate detail see sheet no. 11.

Note:
Steel sheeting similar to or equal to Armo-Flange type 10 gauge manufactured by Armo Drainage and Metal Products, Inc. Middletown, Ohio. All exposed edges shall be covered with 1/2 inch triangular meshing. All reinforcing dimensions are to the centerline of the bars. The headwall shall be placed perpendicular to the axis of the pipe. Riprap shall be placed around the apron for a distance of 2 feet.

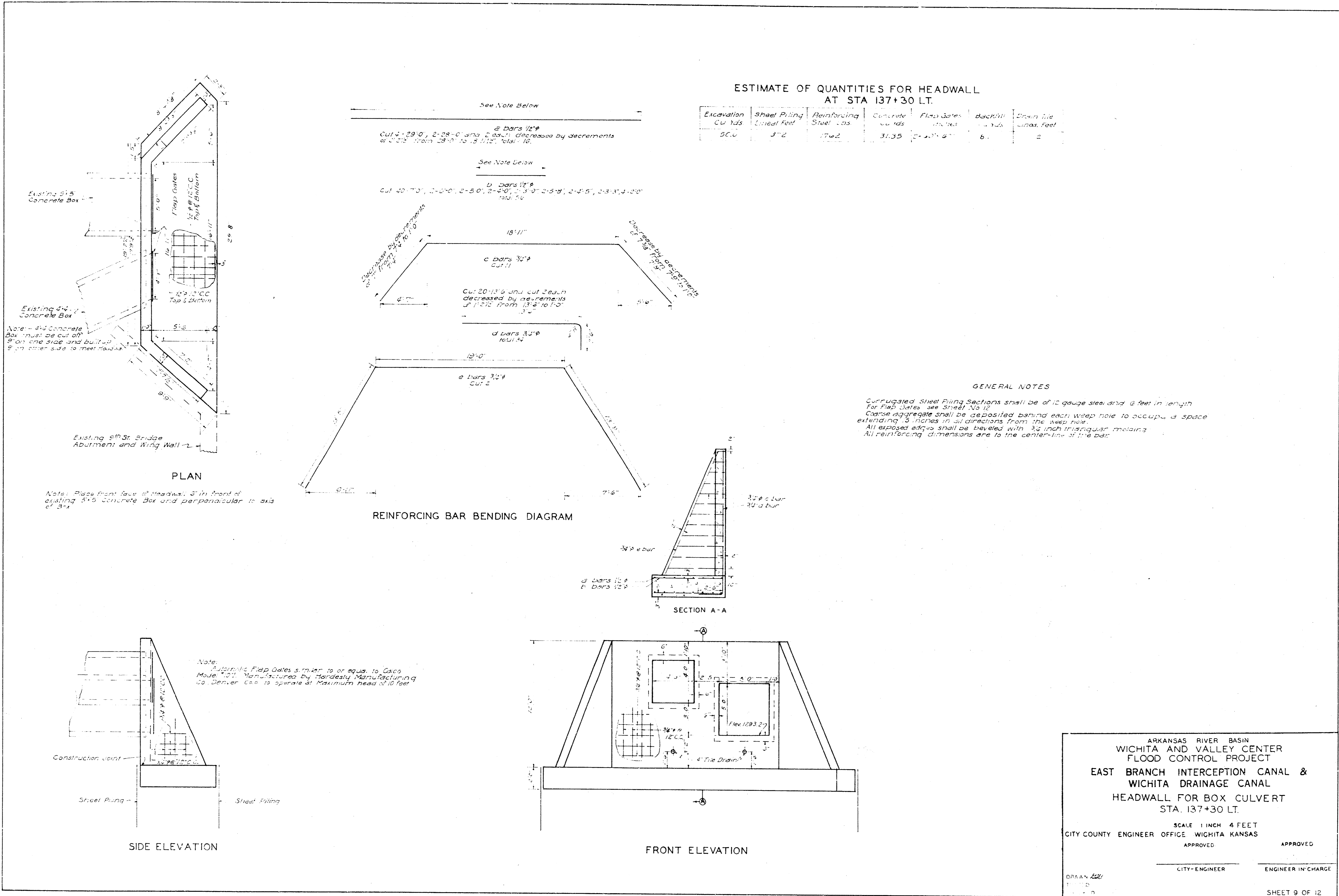
ARKANSAS RIVER BASIN
WICHITA AND VALLEY CENTER
FLOOD CONTROL PROJECT
EAST BRANCH INTERCEPTION CANAL &
WICHITA DRAINAGE CANAL
HEADWALL FOR PIPE CULVERT
STA 163+40 LT.

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

APPROVED: _____
CITY ENGINEER

APPROVED: _____
CHIEF ENGINEER

DRAWN: CAVG
CHECKED: _____
SHEET 8 OF 12



ESTIMATE OF QUANTITIES FOR HEADWALL
AT STA 137+30 LT.

Excavation Cu Yds	Steel Piling Linear Feet	Reinforcing Steel Lbs	Concrete Cu Yds	Flash Joints No. Joints	Jacking No. Joints	Down the Linear Feet
90.0	372	1762	31.35	2	2	2

GENERAL NOTES

Corrugated Steel Piling sections shall be of 12 gauge steel and 6 feet in length
For flap bars see sheet 10-12
Coarse aggregate shall be deposited behind each weep hole to occupy a space
extending 3 inches in all directions from the weep hole.
All exposed edges shall be beveled with 3/4 inch triangular melinae.
All reinforcing dimensions are to the center-line of the bar.

PLAN

REINFORCING BAR BENDING DIAGRAM

SECTION A-A

FRONT ELEVATION

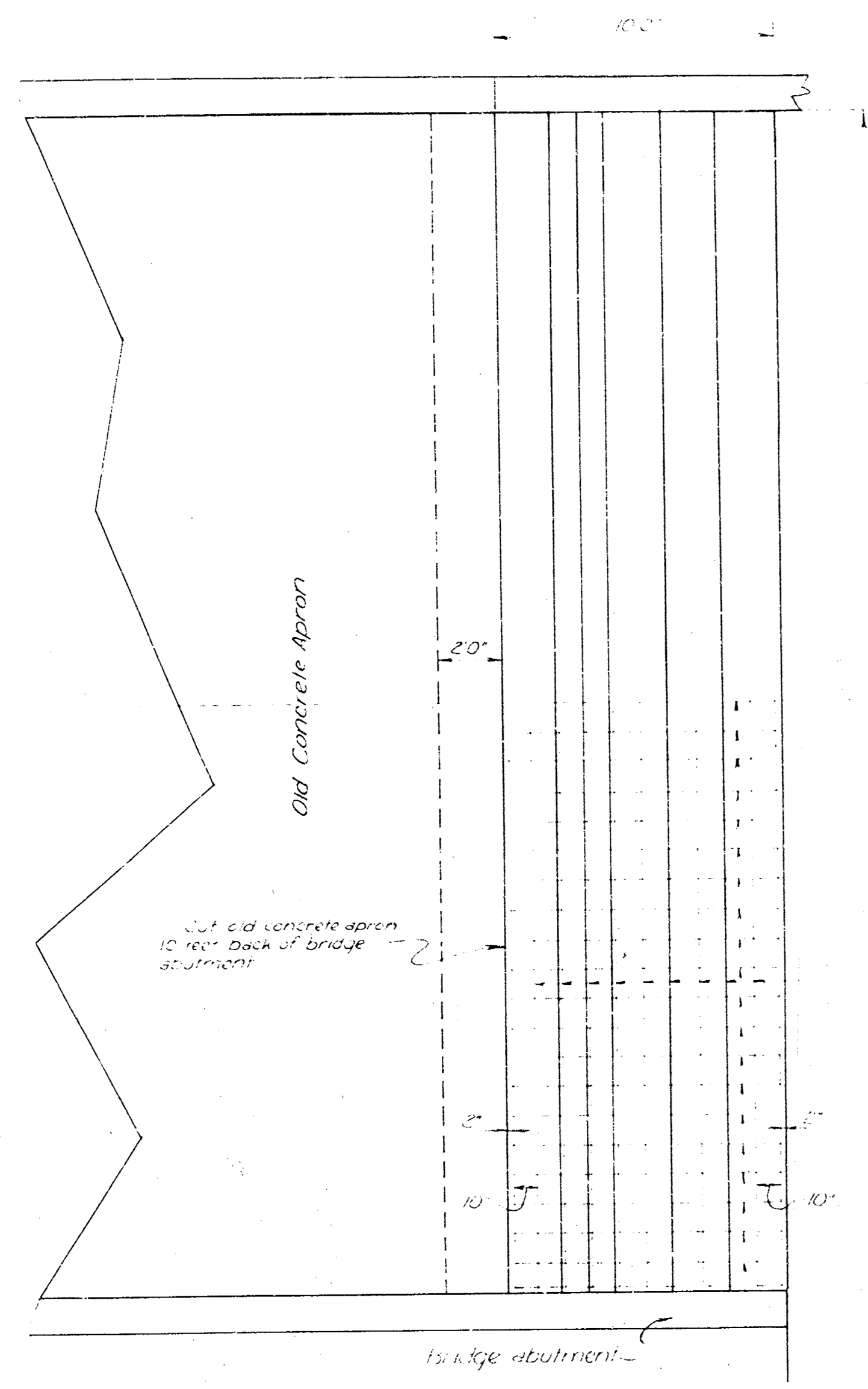
SIDE ELEVATION

ARKANSAS RIVER BASIN
WICHITA AND VALLEY CENTER
FLOOD CONTROL PROJECT
EAST BRANCH INTERCEPTION CANAL &
WICHITA DRAINAGE CANAL
HEADWALL FOR BOX CULVERT
STA. 137+30 LT.

SCALE 1 INCH = 4 FEET
CITY COUNTY ENGINEER OFFICE WICHITA KANSAS
APPROVED

CITY-ENGINEER _____ ENGINEER IN CHARGE _____

DRAWN: [Signature]
SHEET 9 OF 12

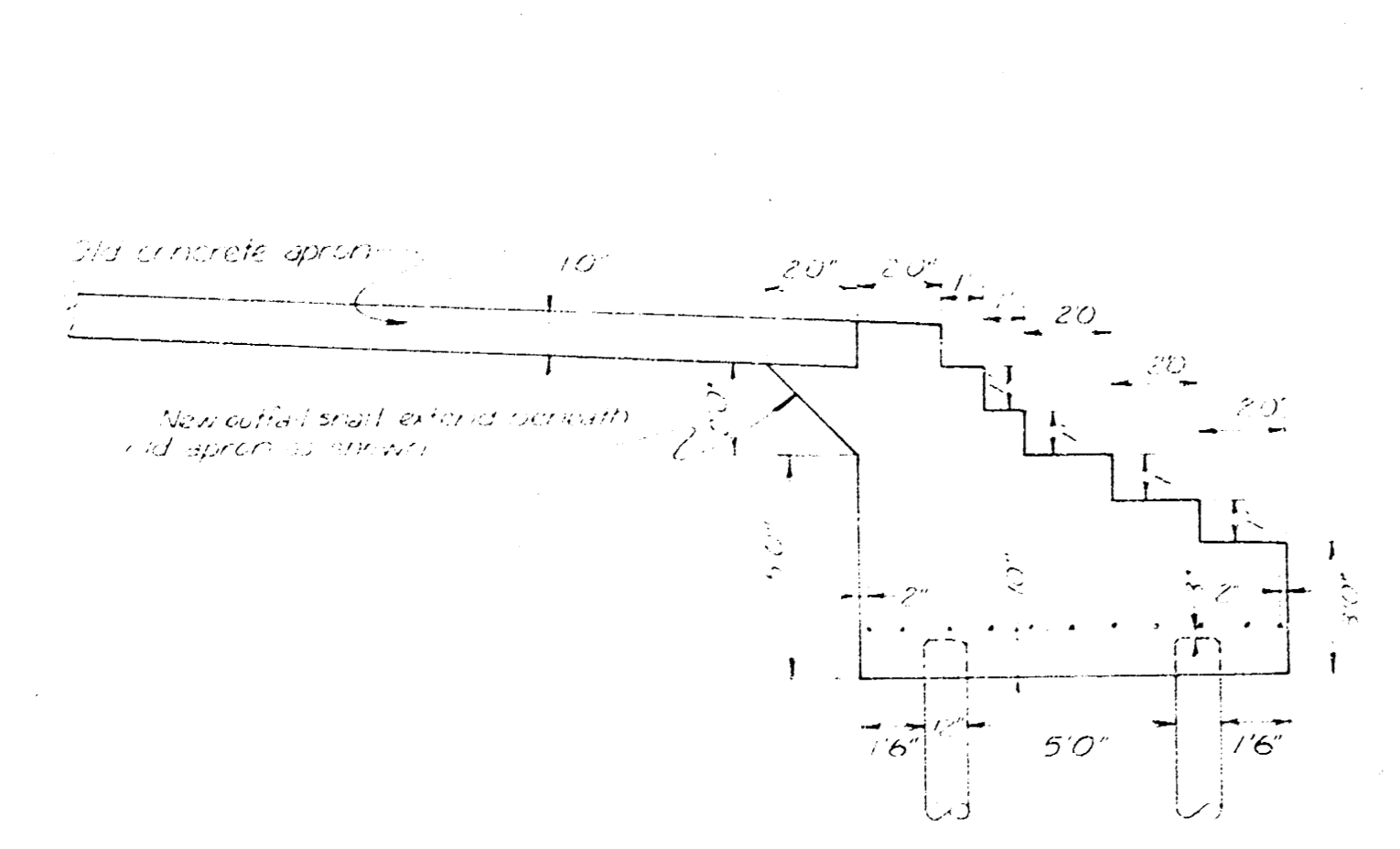


PLAN

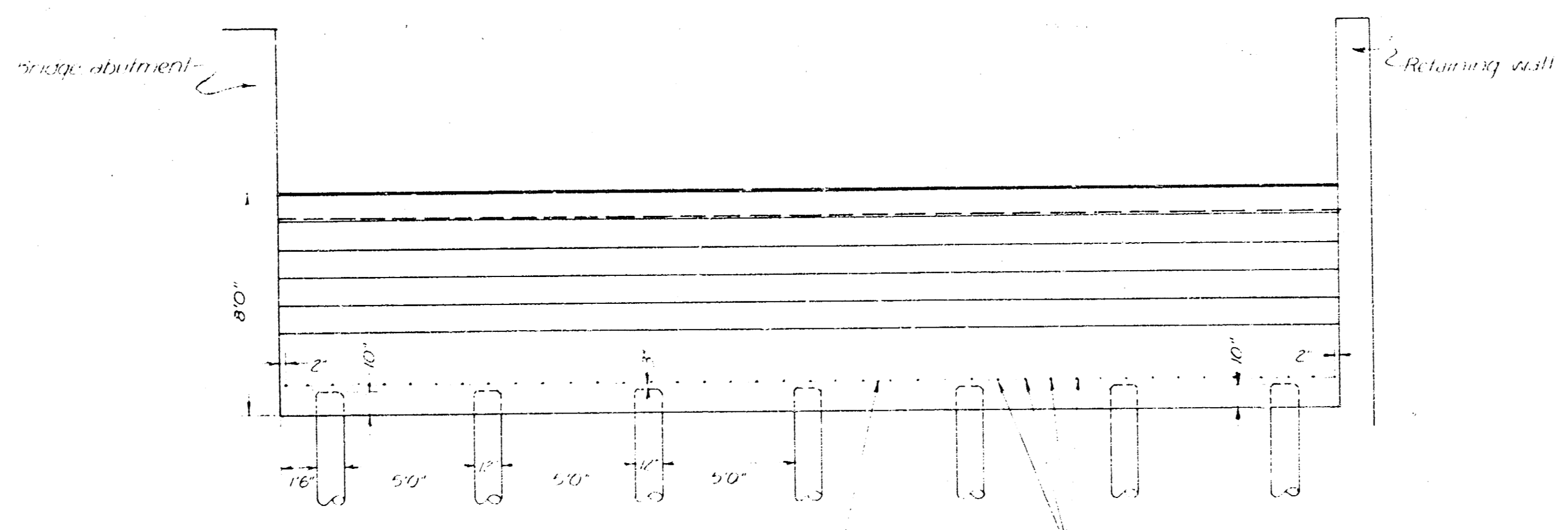
MAIN BILL SCHEDULE		
Bar	A	B
Number	11	41
Size	14	14
Length	39' 2"	4' 8"

ESTIMATE OF QUANTITIES	
Excavation	94.81 cu yds
Concrete	41.58 cu yds
Reinforcing steel	30 - 1250.62'
Steel filing	40' x 6" of gauge - 6' long
Form	14 - 6' treated pile - 20' long

NOTE:
 All dimensions measurements to be to the center line of the bars
 Level of exposed edges with 1/2 inch triangular masonry
 Removal of old concrete shall be considered part of the excavation and
 shall be paid for accordingly.
 The apron shall be cast perpendicular to the axis of the drain
 and the front face shall be flush with the existing bridge abutment.
 New concrete at top of abutment shall be made flush with old apron.



SIDE ELEVATION



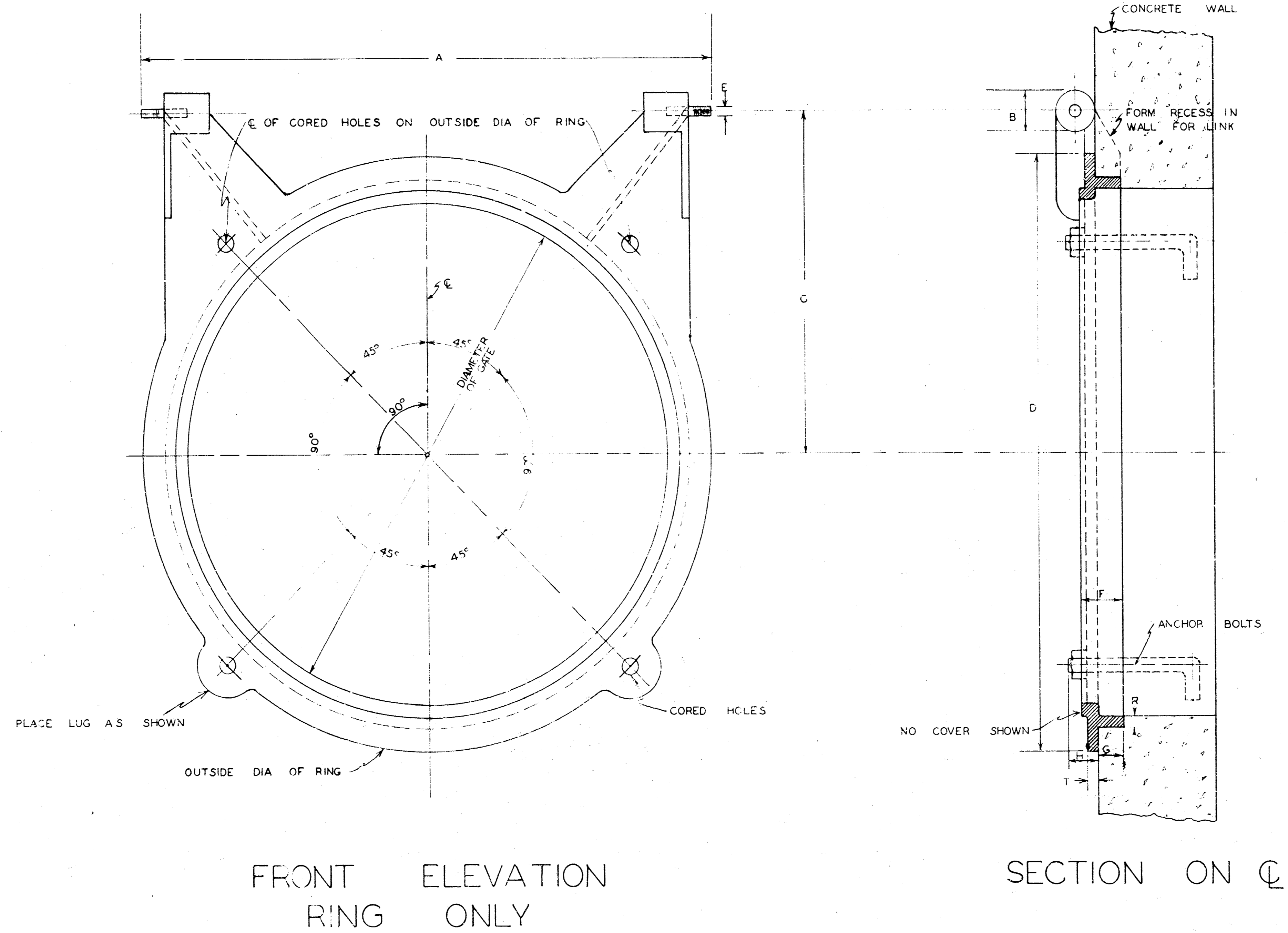
END ELEVATION

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 LT.

SCALE 1 INCH = 4 FEET
 CITY-COUNTY ENGINEER OFFICE WICHITA KANSAS
 APPROVED: [Signature]
 CITY-ENGINEER [Signature] ENGINEER IN CHARGE [Signature]

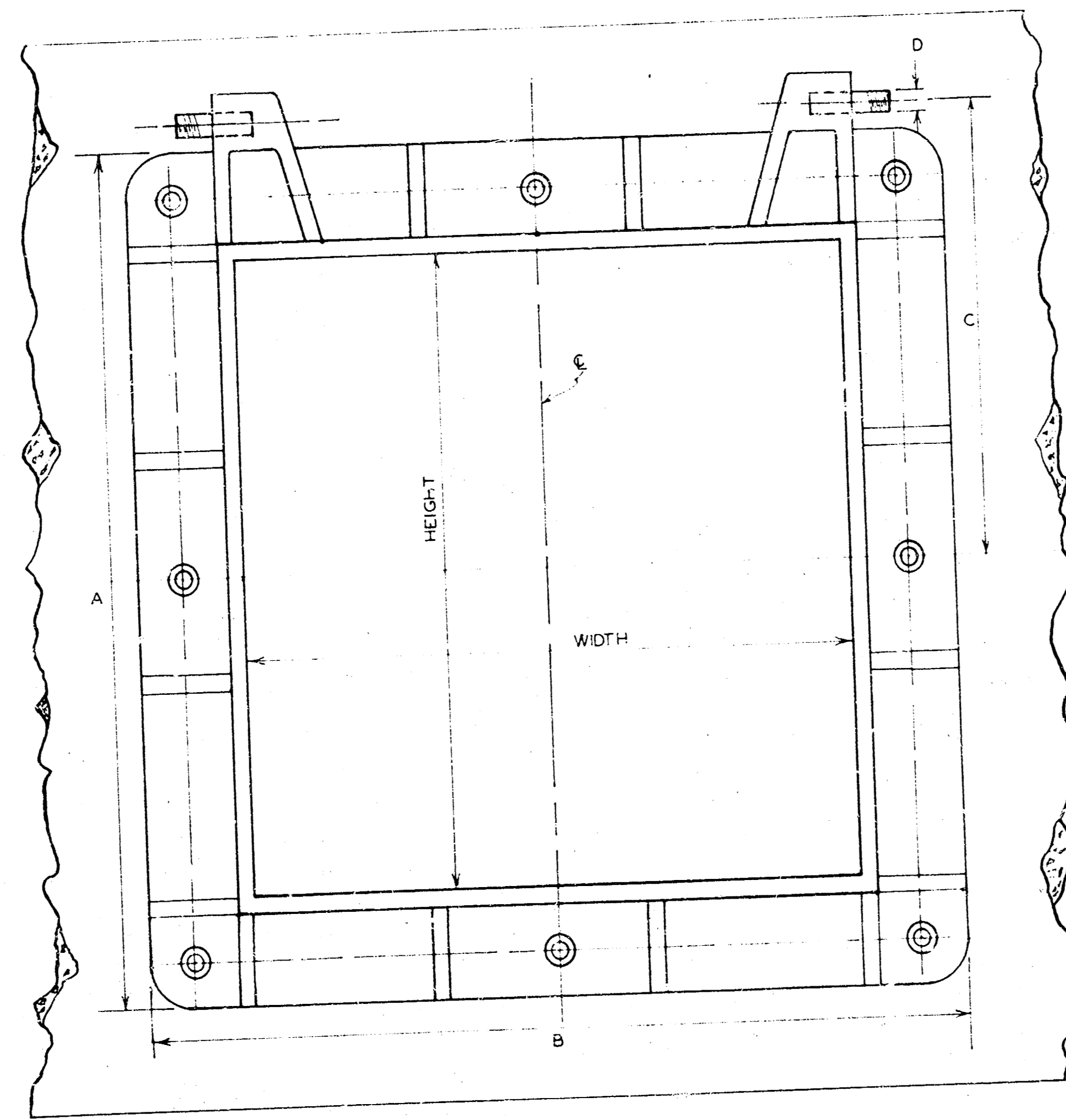
DRAWN JMS
 TRACED
 CHECKED

SHEET 10 OF 12

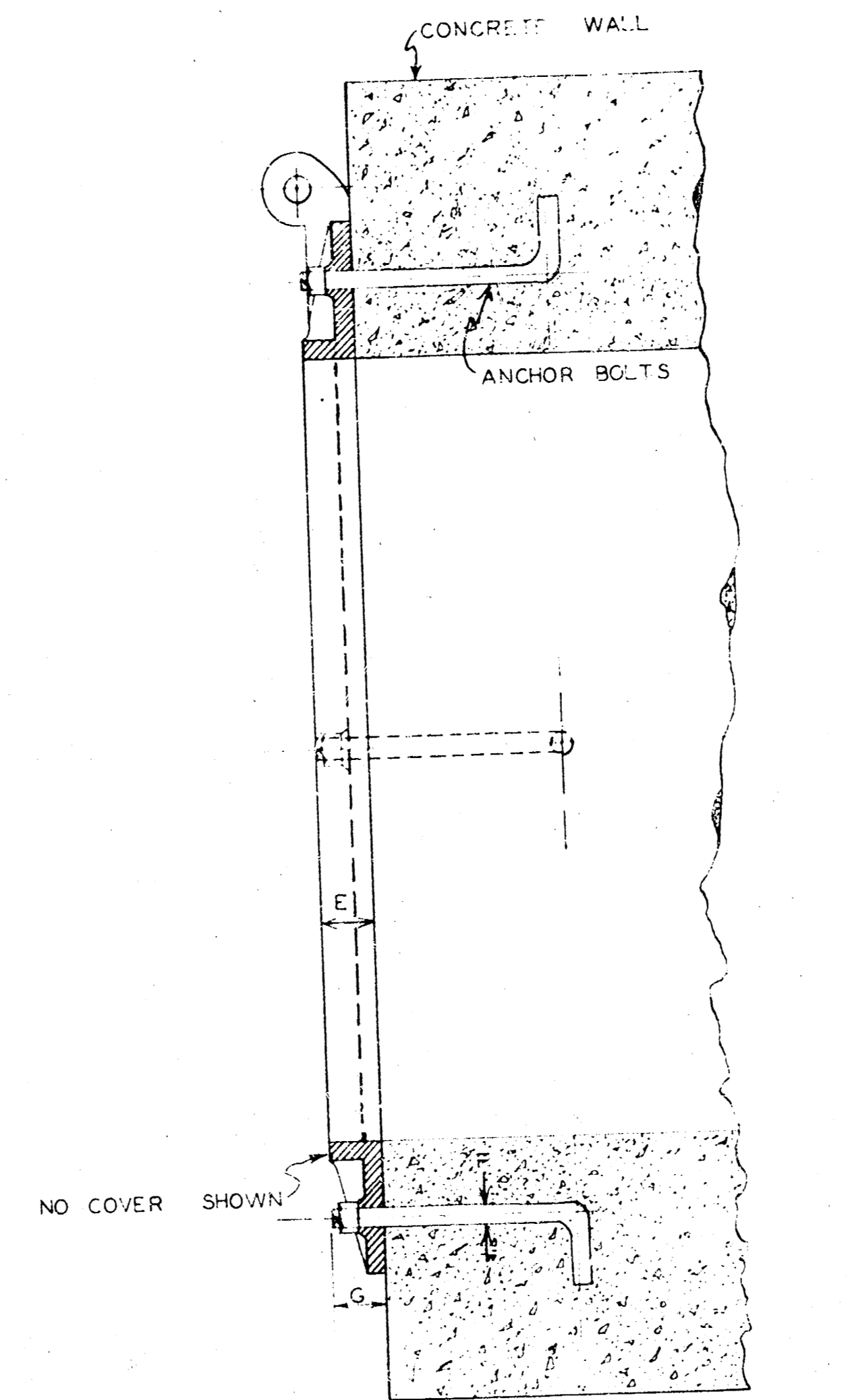


STATION	DIA	FLAP GATE		SCHEDULE		CALCO MODEL #100									
		A	B	C	D	E	F	G	h	R	T	ANCHOR BOLT DIA.			
53+50	48"	5 3/4"	2 1/2"	3 1/2"	5 1/4"	7"	4"	2 1/2"	1 1/4"	3/4"	3/4"	3/4"	3/4"		
67+50	24"	2 8/16"	2"	1 7/8"	2 7/8"	3/4"	2 1/2"	1 1/2"	1 1/2"	3/4"	3/4"	3/4"	3/4"		
157+70	60"	6 0/16"	2 3/8"	4 2"	6 0/16"	1 1/4"	4 3/16"	2 3/4"	2 1/4"	7/8"	7/8"	7/8"	7/8"		
763+40	40"	5 3/16"	2 1/2"	3 1/2"	5 1/4"	7"	4"	2 3/4"	1 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: _____
 CITY-ENGINEER ENGINEER-IN-CHARGE
 DRAWN: C.W.G.
 TRACED
 CHECKED
 SHEET 11 OF 12



FRONT ELEVATION
RING ONLY



SECTION ON C-C

FLAP GATE SCHEDULE		CALCO MODEL 107								
STATION	GATE SIZE		A	B	C	D	E	F	G	
	WIDTH	HEIGHT								
86 + 30LT	6'0"	6'0"	70"	70"	42"	1 1/4"	2 1/2"	1"	2 1/4"	
93 + 30LT	4'6"	4'6"	57"	57"	34"	1"	2 1/2"	3/4"	1 3/4"	
109 + 30	6'0"	6'0"	70"	70"	42"	1 1/4"	2 1/2"	1"	2 1/4"	
123 + 60	3'6"	3'6"	44"	44"	25"	1"	2 1/2"	3/4"	1 3/4"	
137 + 30LT	6'0"	6'0"	70"	70"	42"	1 1/4"	2 1/2"	1"	2 1/4"	
151 + 30LT	6'0"	6'0"	70"	70"	42"	1 1/4"	2 1/2"	1"	2 1/4"	
17 + 30RT	4'0"	4'0"	57"	57"	34"	1"	2 1/2"	3/4"	1 3/4"	
150 + 60LT	4'6"	4'6"	57"	57"	34"	1"	2 1/2"	3/4"	1 3/4"	
157 + 40RT	3'6"	3'6"	44"	44"	25"	1"	2 1/2"	3/4"	1 3/4"	
164 + 60LT	3'6"	3'6"	44"	44"	25"	1"	2 1/2"	3/4"	1 3/4"	
164 + 60RT	3'6"	3'6"	44"	44"	25"	1"	2 1/2"	3/4"	1 3/4"	
176 + 60LT	4'0"	4'0"	57"	57"	34"	1"	2 1/2"	3/4"	1 3/4"	
176 + 60RT	4'0"	4'0"	57"	57"	34"	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 INCHES
CITY COUNTY ENGINEER OFFICE WICHITA KANSAS
APPROVED: _____
CITY ENGINEER ENGINEER IN CHARGE

DRAWN: GLE
TRACED
CHECKED

SHEET NO. 10