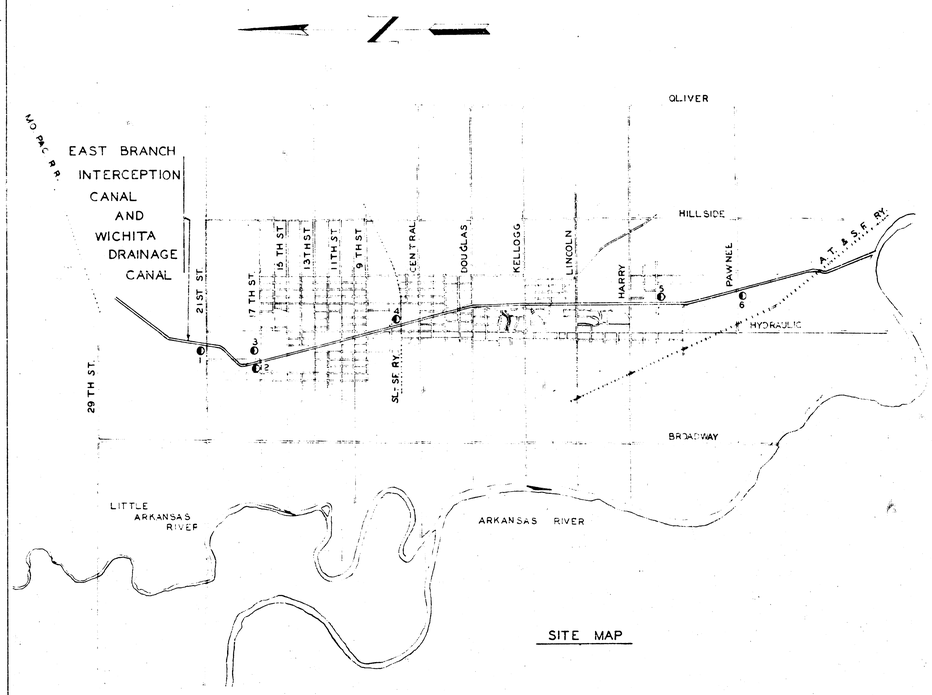
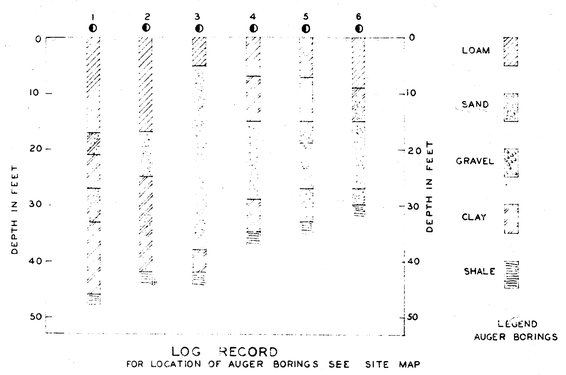


SITE MAP



LOG RECORD
FOR LOCATION OF AUGER BORINGS SEE SITE MAP

RECAPITULATION OF ESTIMATED QUANTITIES

Station	Culvert Size	Steel Piling Linear feet	Wood Piling Linear feet	Excavation Cu Yds	Concrete Cu Yds	Reinforcing Steel Pounds	Bar Mats Sq Ft	Equivalent 24" Pipe Linear Feet	Riprap Cu Yds	Remarks
5+50 Rt	36 C.M.P.	324.0		28.76	10.51	786.59	18.26		6.0	
6+30 Lt	24" C.M.P.							72.0	4.3	
10+50 Rt	24" C.M.P.								9.3	
19+40 Lt	4-4'x6' Box	336.0		39.10	15.11	1141.1	24.11		10.3	
21+30 Lt	4-4'x6' Conc. Box	450.0		53.37	19.40	1411.21	29.06	90+30	5.7	
33+30 Lt	4-4'x6' Box	486.0		56.56	20.53	1494.64	30.81	98+63	8.5	
38+10 Lt	4-4'x6' Conc. Box	456.0		52.67	19.13	1391.97	28.69	92+63	7.9	
50+10 Lt	18" C.M.P.								5.6	
110+10 Rt	24" R.C.P.								6.3	
112+90 Rt	18" C.I.P.								4.3	
116+90 Rt	3-3'x6' Conc. Box								2.0	
1+81 Rt	5' C.I.P.								3.3	
10+30 Rt	3-3'x6' Conc. Box	420.0		45.96	16.83	1211.87	24.92	30+00	13.7	
10+100 Rt	30" R.C.P.								5.0	
13+80 Lt	2-3'x6' Conc. Box & 2-3'x5' Conc. Box	372.0		50.0	31.35	1702.0	8.1	60+60 66+60		2
14+30 Rt	2-3'x6' Conc. Box	402.0		32.07	14.82	732.80	16.13	48+48	2.4	
14+30 Rt	24" Tile Pipe								6.0	
15+20 Lt	24" Conc. Box	402.0		19.11	11.38	543.15	14.15	48+48	2.3	
15+40 Rt	2-6'x6' Conc. Box	402.0		41.11	15.27	951.26	26.80	36+36	12.5	
15+70 Lt	30" R.C.P.	234.0		769.32	10.22	306.39	575.90	60+6	32.23	196 L.F. Rip Rap 2
19+40 Lt	48" R.C.P.	402.0		46.87	12.52	1339.69	142.28	48+6	7.45	118.38 S.Y. 3
20+50 Lt	3-3'x6' Conc. Box	336.0		27.91	12.06	200.56	17.43	36+36	20.6	
21+20 Rt	3-3'x6' Conc. Box	462.0		38.99	15.76	722.24	23.82	36+36	10.3	
21+45 Lt	4-4'x6' Conc. Box	396.0		44.1	14.29	2771.90	12.40	48+48	4.5	3
22+50 Rt	2-6'x6' Conc. Box	498.0		42.02	21.95	3361.19	11.31	48+48	4.7	
24+80 Lt	3-3'x6' Conc. Box								5.0	
25+40 Rt	24" Tile Pipe								4.4	
29+70 Lt	4-6'x6' Conc. Box	240.0	260.0	24.16	9.48	1203.67			5.0	
30+35	3-3'x6' Conc. Box								2.0	
31+60 Lt	10" Tile Pipe								3.1	
36+20 Rt	30" Tile Pipe								8.0	
219+60 Rt	3-8'x6' Conc. Box								6.0	
219+80 Lt	5-5'x6' Conc. Box								5.0	
233+50 Lt	24" Tile Pipe								9.3	
233+50 Rt	5-5'x6' Conc. Box								5.0	
234+10 Lt	3-3'x6' Conc. Box								19.3	
235+20 Rt	3-3'x6' Conc. Box								30.3	
251+30 Lt	18" Tile Headwall	216.0			Wood piling 16 ft. apart, 4 rows, 4 ft. each in front of headwall					on top of rip
257+90 Lt	12" Tile Pipe								6.0	
258+60 Rt	3-6'x6' Conc. Box								17.0	
279+50 Lt	36" Tile Pipe	396.0		50.46	12.15	336.95	38.31		11.26	2
297+20 Lt	60" R.C.P.								8.3	
297+30 Rt	18" C.I.P.								12.5	
310+50 Lt	36" C.M.P.								30.0	
311+20 Rt	3' R.C.P.								7.0	
323+80 Rt	5-5'x6' Conc. Box	252.0		45.68	13.11	413.47	21.98		9.7	3
351+10 Rt	18" C.M.P.								3.3	
361+30 Lt	4-4'x5' Gates								10.0	
364+00 Lt	6 Tile Headwalls								10.0	
371+80 Lt	3' R.C.P.								10.0	
371+80 Rt	3-5'x6' Conc. Box								10.0	
383+00 Lt	18" C.M.P.								1.0	
TOTALS		7584.00	260.0	1984.44	381.26	8542.47	1283.25	17 Flap gates	304.16	372 L.F. Rip Rap 29

Rip - Reinforcing Steel in Pounds Indicates weight of Reinforcing Steel and Wire Mesh
Corrugated Metal Pipe (Asphalt Coated Paved Invert, may be substituted for Reinforced Concrete Pipe
Minimum thickness of Rip Rap shall be 9".
The payment line for excavation and backfill will be 5'0" outside the footing except where the distance to wing wall of bridge is less.

1 Revised Nov 2 1950 J.S.B.

ARKANSAS RIVER BASIN
WICHITA AND VALLEY CENTER
FLOOD CONTROL PROJECT
EAST BRANCH INTERCEPTION CANAL &
WICHITA DRAINAGE CANAL
SITE MAP, LOG RECORD &
RECAPITULATION OF ESTIMATED QUANTITIES

SCALE 1 INCH = 1/2 M.E.
CITY COUNTY ENGINEER OFFICE WICHITA KANSAS
APPROVED
APPROVED

CITY-ENGINEER
ENGINEER IN CHARGE

DRAWN BLH
TRACED
H. CK'D

SHEET 1 OF 12

STA 53+50 RT
48" C.M.P.
Construct Headwall with Flap Gate & Apron

DOUGLAS AVE.

E. EAST BRANCH INTERCEPTION CANAL

Flap Gate & R.R. Rap Apron
STA 67+53 LT
24" C.M.P.

Construct Headwall & Apron

13TH ST.

PENNSYLVANIA AVE.

STA 79+25 LT
4'x4' CONCRETE BOX

STA 79+25 RT
12" TILE

Construct Headwall with Flap Gate & Apron
STA 93+30
4'x4' CONCRETE BOX LT

18TH ST.

Construct Headwall with Flap Gate & Apron
STA 93+30 LT
4'x4' CONCRETE BOX

CLEVELAND AVE.

END EAST BRANCH INTERCEPTION CANAL

Construct Headwall with Flap Gate & Apron
STA 109+30 LT
4'x4' CONCRETE BOX

Repair with Rip Rap
STA 110+10
18" C.M.P. LT

STA 112+90
12" C.I.P. RT
Repair with Rip Rap

BEGIN WICHITA DRAINAGE CANAL

STA 113+20 RT
24" CONCRETE BOX

27TH ST. R.R. Rap Headwall & Apron

Construct Headwall with Flap Gate & Apron
STA 176+50 LT
4'x4' CONCRETE BOX

Relay 36"ø RCP or 30" MP
Construct Headwall with Flap Gate & Apron
STA 157+70 LT
60" R.C.P.

Relay 78"x58" RCP or 48" CMP
Construct Headwall with Flap Gate & Apron
STA 163+40 LT
3'-9" CONCRETE PIPE

Construct Headwall with Flap Gate & Apron
STA 164+50 LT
3'x2'-6" CONCRETE BOX

Construct Headwall with Flap Gate & Apron
STA 150+70 LT
4'x4' CONCRETE BOX

Construct Headwall with Flap Gate & Apron
STA 137+30 LT
4'-6" & 5'-5" CONCRETE BOXES

STA 164+50 RT
3'x2'-6" CONCRETE BOX
Construct Headwall with Flap Gate & Apron

STA 157+40 RT
3'x2'-6" CONCRETE BOX
Construct Headwall with Flap Gate & Apron

MEETS LINE STA 177+00

STA 176+50 RT
4'x4' CONCRETE BOX
Construct Headwall with Flap Gate & Apron

MCHOOD AVE.

NEW YORK AVE.

STA 143+40 RT
24" TILE
R.R. Rap Apron

MATHERSON AVE.

STA 135+00 RT
2-6' CONCRETE PIPE
R.R. Rap Apron

STA 137+30 RT
4'x4' CONCRETE BOX
Construct Headwall with Flap Gate & Apron

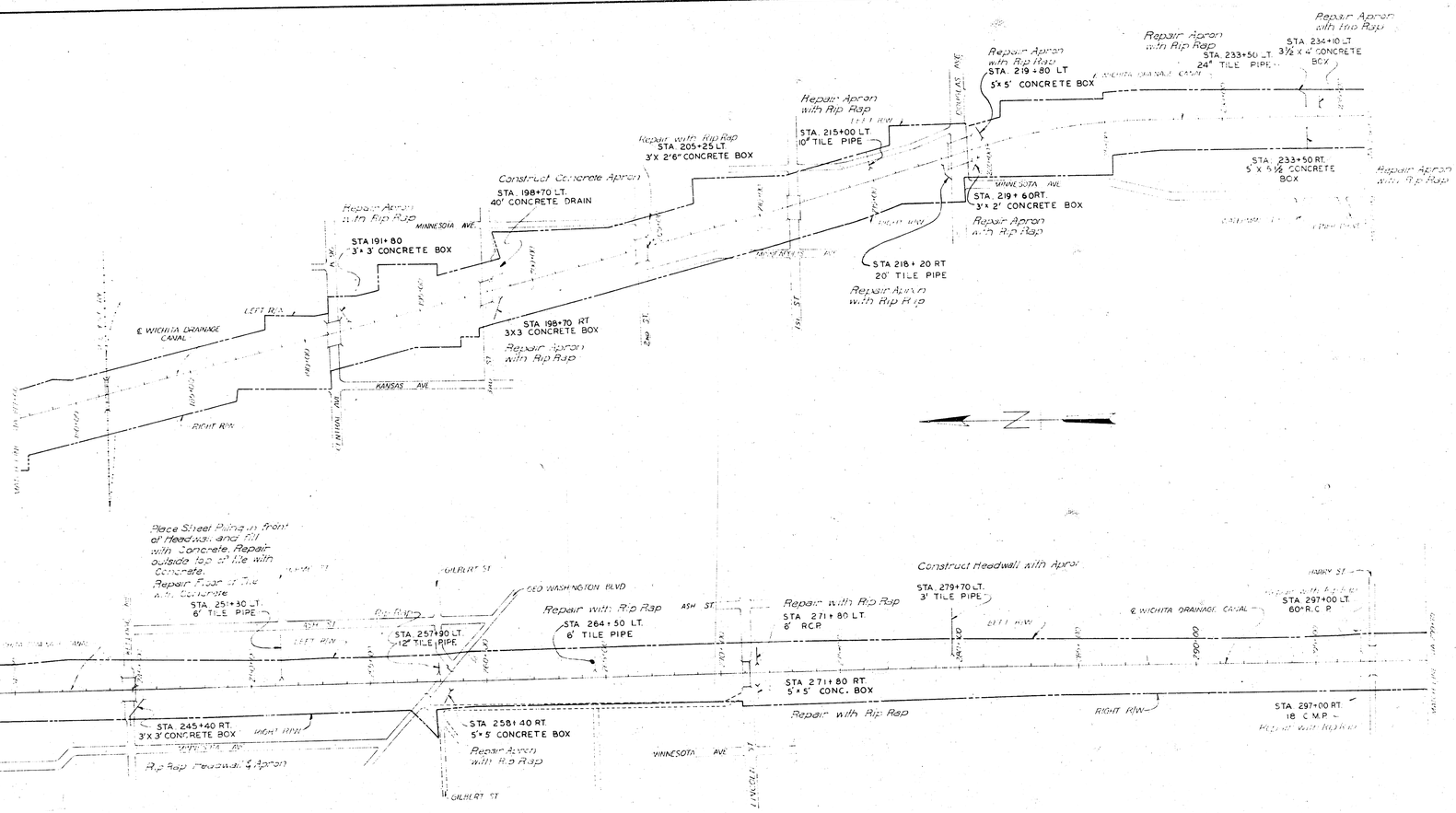
STA 123+80 RT
3'x3' CONCRETE BOX
Construct Headwall with Flap Gate & Apron

STA 118+50 RT
4" IRON PIPE
R.R. Rap Apron

STA 116+80 RT
3'X3' CONCRETE BOX
Repair with Rip Rap

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
APPROVED
CITY-ENGINEER
ENGINEER-IN-CHARGE
DRAWN GJP
TRACED
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

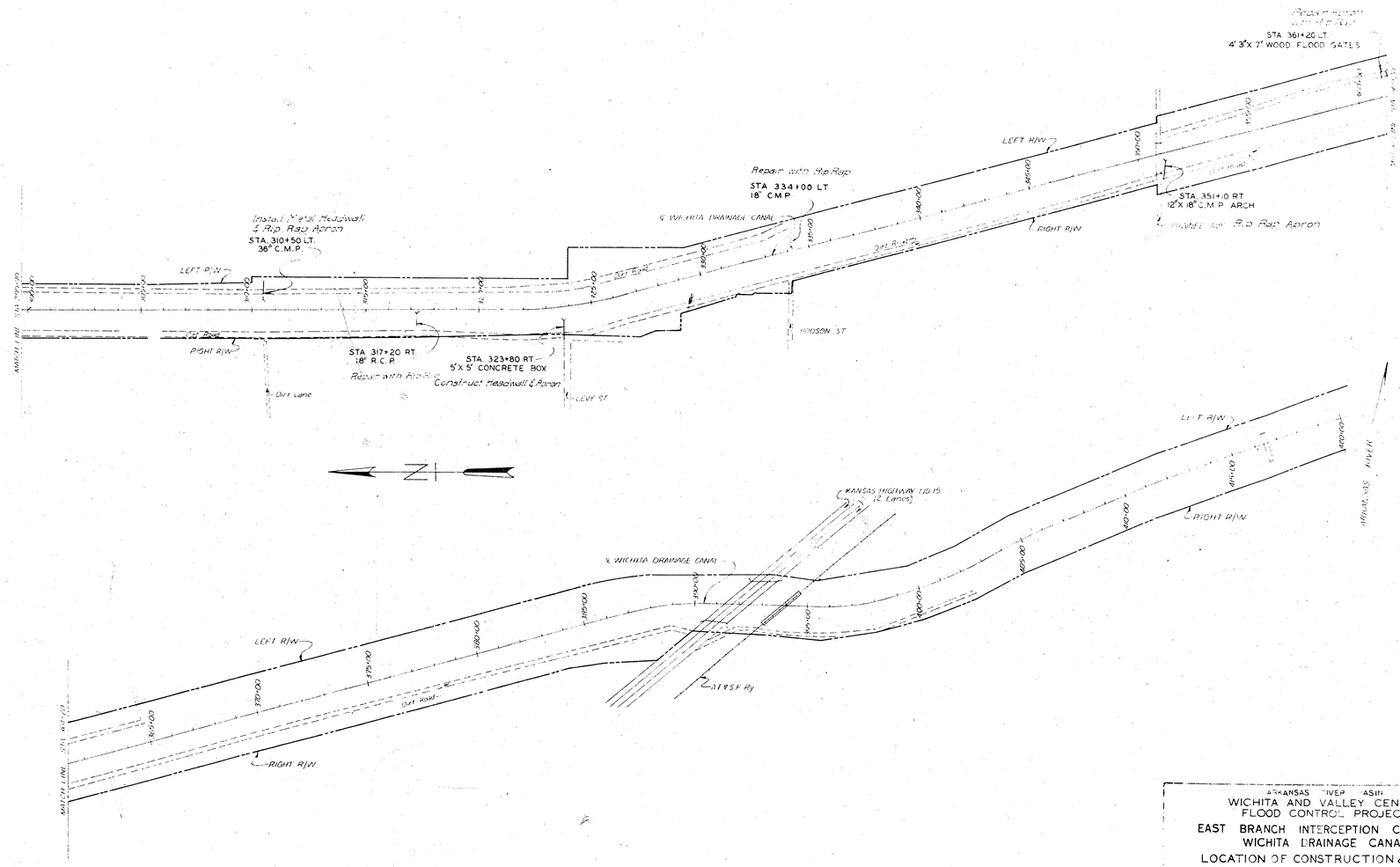
SCALE 1 INCH 200 FEET
CITY-COUNTY ENGINEER OFFICE WICHITA KANSAS
APPROVED:

CITY-ENGINEER | ENGIN. IN CHARGE

DRAWN J.H.S.
TRACED
CHECKED

Revised Oct 31, 1951 GSC

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

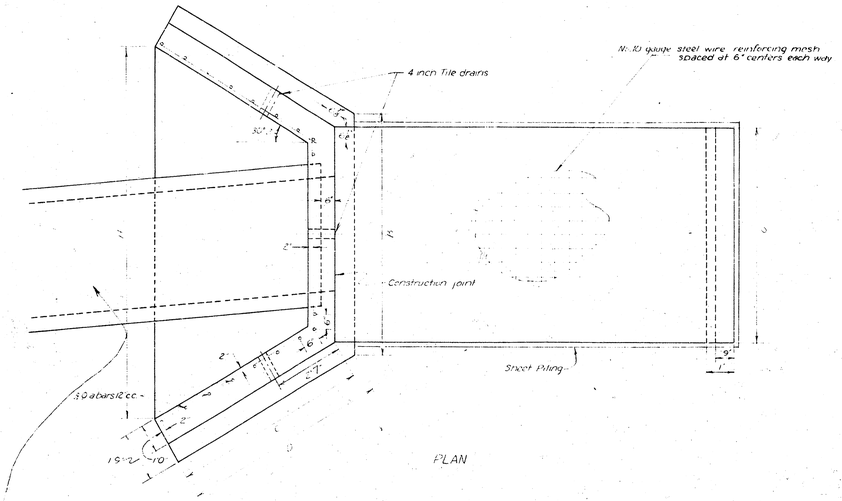
APPROVED: _____ CITY ENGINEER

APPROVED _____

DRAWN CHS
TRACED
CHECKED

Revised Oct 31, 1950 GSG

SHEET 4 OF 12



Note:
Tubematic Flap gate similar to or equal to Calco Model "107" Manufactured by Margedity Manufacturing Co. Denver, Colo. to operate at maximum head of 10 feet

LISTS OF BARS, DIMENSIONS, AND QUANTITIES FOR HEADWALLS

FOR 4'X4' CONCRETE BOX AT STA 79+40 LT.

	A	B	C	D	E	F	G	H	K			Flow Line Elevs
Letter										Excavation	30.06 Cu Yds	
Dimension	5'10½"	8'8"	5'2½"	5'8"	10'9"	13'7"	7'9½"	11'3½"	4'0"	Concrete	Hdwl 11.04 cu yds Apron 4.17 cu yds	
Bar	a	b	c	d						Reinf. Steel	⅝ ø 241'-6" ± ℄ 130.0 lbs	
Number	14	22	7	5						Sheet Piling	Hdwl 37 secs Apron 36 secs	
Size	⅝ ø	⅝ ø	⅝ ø	⅝ ø						Flapgate	None needed	
Length	11'10"	4'8"	7'0"	5'7"						Steel Wire Reinf	No 10 gauge 27.3 #	

FOR 4'X4' CONCRETE BOX AT 86+30 LT.

	A	b	C	D	E	F	G	H	K			Flow Line Elev
Letter										Excavation	33.35 Cu Yds	
Dimension	8'-8"	9'8"	6'2½"	8'8"	9'9⅜"	10'1"	7'0⅝"	14'3⅜"	2'-3"	Concrete	Hdwl 15.2 - yd Apron 3.31 cu yds	
Bar	a	b	c	d						Reinf. Steel	⅝ ø 315.4 # ℄ 130.8 #	
Number	20	20	7	5						Sheet Piling	Hdwl 49 secs Apron 21 secs	
Size	⅝ ø	⅝ ø	⅝ ø	⅝ ø						Flapgate	One 4'0" x 4'0"	
Length	10'6"	7'8"	7'0"	6'3"						Steel Wire Reinf	No 10 gauge 22.47 #	

FOR 4'X4' CONCRETE BOX AT 93+30 LT.

	A	B	C	D	E	F	G	H	K			Flow Line Elev
Letter										Excavation	36.96 Cu Yds	
Dimension	11'1"	8'8"	7'2⅝"	7'8"	11'5"	15'1"	7'4½"	13'3⅜"	4'3⅝"	Concrete	Hdwl 15.06 cu yds Apron 4.17 cu yds	
Bar	a	b	c	d						Reinf. Steel	⅝ ø 337.5 # ℄ 164.7 #	
Number	16	24	8	5						Sheet Piling	Hdwl 43 secs Apron 19 secs	
Size	⅝ ø	⅝ ø	⅝ ø	⅝ ø						Flapgate	One 4'0" x 4'0"	
Length	12'6"	6'8"	7'0"	7'2"						Steel Wire Reinf	No 10 gauge 40.6 #	

FOR 4'X4' CONCRETE BOX AT 109+30 LT.

	A	B	C	D	E	F	G	H	K			Flow Line Elev
Letter										Excavation	32.27 Cu Yds	
Dimension	9'10⅝"	8'8"	5'2⅝"	5'8"	9'10⅝"	8'7"	12'1⅝"	16'3⅝"	5'1⅝"	Concrete	Hdwl 14.30 cu yds Apron 4.49 cu yds	
Bar	a	b	c	d						Reinf. Steel	⅝ ø 297.6 # ℄ 126.8 #	
Number	18	20	6	4						Sheet Piling	Hdwl 47 secs Apron 24 secs	
Size	⅝ ø	⅝ ø	⅝ ø	⅝ ø						Flapgate	One 4'0" x 4'0"	
Length	11'0"	4'8"	12'0"	3'11"						Steel Wire Reinf	No 10 gauge 29.2 #	

FOR 4'X4' CONCRETE BOX AT 176+50 LT.

	A	B	C	D	E	F	G	H	K			Flow Line Elev
Letter										Excavation	26.01 Cu Yds	
Dimension	5'0"	8'8"	4'2⅝"	4'8"	8'4⅝"	11'1"	7'0½"	10'1½"	1'9⅝"	Concrete	Hdwl 8.05 cu yds Apron 3.62 cu yds	
Bar	a	b	c	d						Reinf. Steel	⅝ ø 174.0 # ℄ 71.4 #	
Number	12	18	5	5						Sheet Piling	Hdwl 31 secs Apron 17 secs	
Size	⅝ ø	⅝ ø	⅝ ø	⅝ ø						Flapgate	One 4'0" x 4'0"	
Length	9'8"	3'8"	7'0"	3'7"						Steel Wire Reinf	No 10 gauge 22.1 #	

FOR 5'X5' CONCRETE BOX AT STA 323+80 RT.

	A	B	C	D	E	F	G	H	K			Flow Line Elev
Letter										Excavation	45.48 Cu Yds	
Dimension	6'9⅜"	9'8"	6'2½"	6'8"	13'1⅜"		9'4½"	13'3⅜"		Concrete	Hdwl 13.70 cu yds	
Bar	a	b	c	d						Reinf. Steel	⅝ ø 276.37 # ℄ 116.10 #	
Number	16	22	7	6						Sheet Piling	Hdwl - 49 secs Apron 23 secs	
Size	⅝ ø	⅝ ø	⅝ ø	⅝ ø						Flapgate	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 secs of 4 inch tile - feet long shall be required for each headwall

Corrugated Sheet Piling

GENERAL NOTES

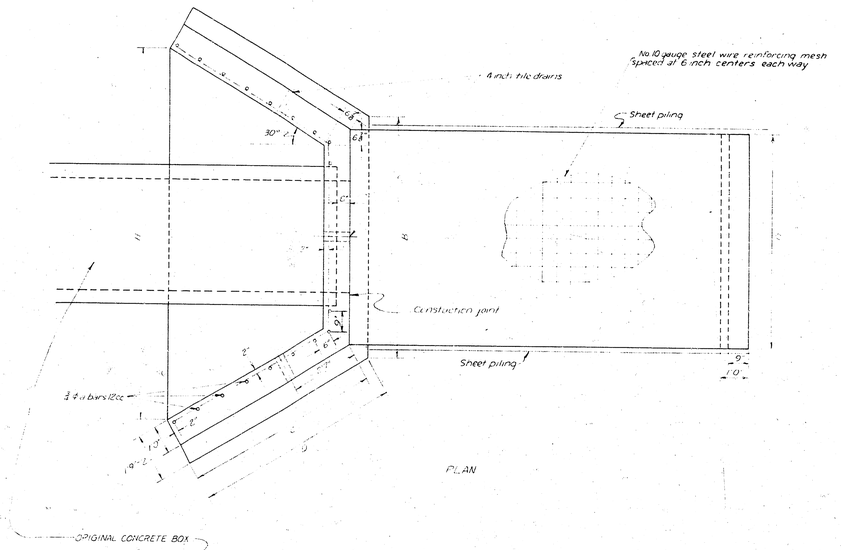
Earth approach shall be kept free from rock projections or other irregularities in excess of 6 inches in any direction.
The front face of the headwalls shall be placed on the dividing line or in front of the face of the concrete box and shall be vertical.
All exposed edges shall be beveled with a ¾ inch triangular bevel.
All reinforcing dimensions are to the outside of the bars.
Two feet of riprap shall be placed around each corner of the headwalls.
The distance that riprap extends in front of each headwall is as follows:
Sta 79+40 Lt 6 feet
Sta 86+30 Lt 6 "
Sta 93+30 Lt 8 "
Sta 109+30 Lt 8 "
Sta 176+50 Lt 8 "
Sta 323+80 Rt 10 "

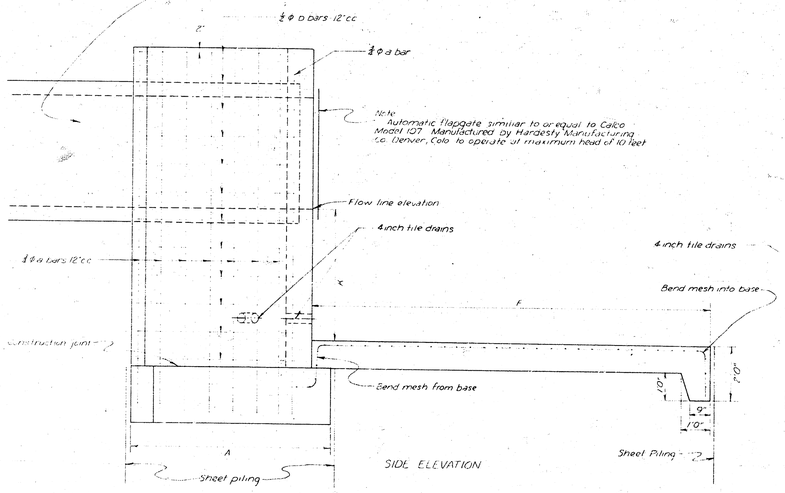
ARKANSAS RIVER BASIN
WICHITA AND VALLEY CENTER
FLOOD CONTROL PROJECT
EAST BRANCH INTERCEPTION CANAL
WICHITA DRAINAGE CANAL
HEADWALLS FOR BOX CULVERTS

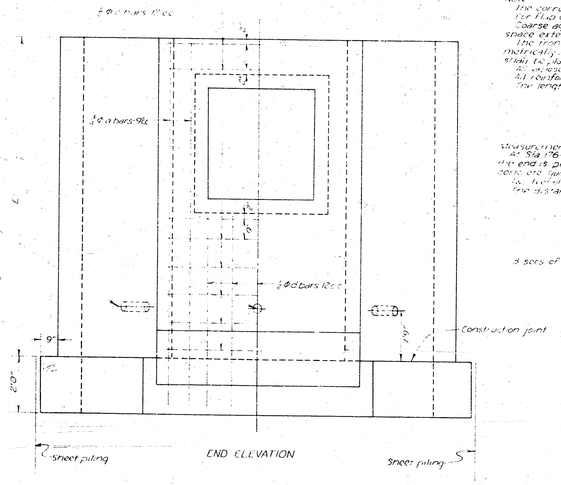
SCALE 1 INCH 2 FEET
CITY COUNTY ENGINEER OFFICE WICHITA KANSAS
APPROVED APPROVED
CITY ENGINEER

DRAWN J.R.S.
TRACED
CHECKED

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	L	F	G	H	K
Dimension	5'9½"	7'8"	5'2⅜"	5'8"	6'6"	14'7"	6'9½"	10'3⅜"	8"
Bar	a	b	c	d					
Number	14	14	4	4					
Size	⅝ ø	⅝ ø	1 ø	⅝ ø					
Length	8'0"	4'8"	5'10"	9'8"					

Excavation	45.95 cu yds	Flow line elevation
Concrete	16wl 12.71 cu yds Apron 3.86 cu yds	1294.50
Backfill	23.74 cu yds	Top flap 1297.50 ø.ft
Reinforcing Steel	16wl - 234 lbs Apron - 23.2 lbs	
Sheet piling	16wl - 35 secs Apron - 35 secs	
Flap Gate	One 36" x 36"	

FOR 4'X4' CONCRETE BOX AT STA 147+30 RT.

Letter	A	B	C	D	L	F	G	H	K
Dimension	4'0⅜"	8'8"	3'2⅜"	3'8"	7'6"	14'7"	7'9½"	9'3⅜"	8"
Bar	a	b	c	d					
Number	10	16	4	5					
Size	⅝ ø	⅝ ø	1 ø	⅝ ø					
Length	9'0"	2'0"	6'10"	9'8"					

Excavation	37.07 cu yds	Flow line elevation
Concrete	16wl 10.38 cu yds Apron 4.41 cu yds	1292.90
Backfill	16.15 cu yds	Top flap 1297.90 ø.ft
Reinforcing Steel	16wl - 206.6 lbs Apron - 26.7 lbs	
Sheet Piling	16wl - 31 secs Apron - 36 secs	
Flap Gate	One 45" x 45"	

FOR 4'X4' CONCRETE BOX AT STA 150+80 LT.

Letter	A	B	C	D	L	F	G	H	K
Dimension	4'0⅜"	8'8"	3'2⅜"	3'8"	8'6"	14'7"	7'9½"	9'3⅜"	1'8"
Bar	a	b	c	d					
Number	10	18	5	5					
Size	⅝ ø	⅝ ø	⅝ ø	⅝ ø					
Length	8'10"	2'8"	6'10"	9'8"					

Excavation	39.71 cu yds	Flow line elevation
Concrete	16wl 10.96 cu yds Apron 4.44 cu yds	1293.30
Backfill	15.91 cu yds	Top flap 1298.30 ø.ft
Reinforcing Steel	16wl 217.10 lbs Apron 27.1 lbs	
Sheet Piling	16wl 31 secs Apron 36 secs	
Flap Gate	One 45" x 45"	

FOR 3'X3' CONCRETE BOX AT STA 157+40 RT.

Letter	A	B	C	D	L	F	G	H	K
Dimension	4'0⅜"	7'8"	4'2⅜"	4'8"	7'6"	14'7"	6'9½"	9'3⅜"	8"
Bar	a	b	c	d					
Number	12	16	5	5					
Size	⅝ ø	⅝ ø	⅝ ø	⅝ ø					
Length	9'0"	3'8"	5'10"	2'8"					

Excavation	42.31 cu yds	Flow line elevation
Concrete	16wl 11.63 cu yds Apron 4.68 cu yds	1293.3
Backfill	16.80 cu yds	Top flap 1298.30 ø.ft
Reinforcing Steel	16wl 232.05 lbs Apron 29.0 lbs	
Sheet Piling	16wl - 32 secs Apron - 35 secs	
Flap Gate	One 36" x 36"	

FOR 2'X3' CONCRETE BOX AT STA 164+50 LT.

Letter	A	B	C	D	L	F	G	H	K
Dimension	4'0⅜"	7'8"	4'2⅜"	4'8"	6'0"	10'7"	6'9½"	9'3⅜"	8"
Bar	a	b	c	d					
Number	12	14	4	4					
Size	⅝ ø	⅝ ø	⅝ ø	⅝ ø					
Length	7'6"	3'8"	5'10"	2'8"					

Excavation	35.67 cu yds	Flow line elevation
Concrete	16wl 9.16 cu yds Apron 3.66 cu yds	1291.30
Backfill	13.85 cu yds	Top flap 1296.30 ø.ft
Reinforcing Steel	16wl 162.7 lbs Apron 20.3 lbs	
Sheet Piling	16wl - 32 secs Apron - 35 secs	
Flap Gate	One 36" x 36"	

FOR 2'X3' CONCRETE BOX AT STA 164+50 RT.

Letter	A	B	C	D	L	F	G	H	K
Dimension	4'0⅜"	7'8"	3'2⅜"	3'8"	7'0"	10'7"	6'9½"	8'3⅜"	8"
Bar	a	b	c	d					
Number	12	16	5	4					
Size	⅝ ø	⅝ ø	⅝ ø	⅝ ø					
Length	8'6"	2'8"	5'10"	2'8"					

Excavation	31.93 cu yds	Flow line elevation
Concrete	16wl 9.63 cu yds Apron 3.66 cu yds	1292.30
Backfill	11.93 cu yds	Top flap 1297.30 ø.ft
Reinforcing Steel	16wl - 180.1 lbs Apron - 17.7 lbs	
Sheet Piling	16wl - 27 secs Apron - 27 secs	
Flap Gate	One 36" x 36"	

FOR 4'X3' CONCRETE BOX AT STA 176+50 RT.

Letter	A	B	C	D	L	F	G	H	K
Dimension	5'6¾"	8'8"	5'2⅜"	5'8"	8'6"	19'7"	7'9½"	11'3⅜"	1'8"
Bar	a	b	c	d					
Number	14	18	5	5					
Size	⅝ ø	⅝ ø	⅝ ø	⅝ ø					
Length	10'0"	4'8"	6'10"	9'8"					

Excavation	47.02 cu yds	Flow line elevation
Concrete	16wl 16.01 cu yds Apron 4.66 cu yds	1293.30
Backfill	19.94 cu yds	Top flap 1298.30 ø.ft
Reinforcing Steel	16wl - 314.7 lbs Apron - 34.6 lbs	
Sheet Piling	16wl - 37 secs Apron - 38 secs	
Flap Gate	One 48" x 48"	

Note:
The corrugated sheet piling extension shall be left in place and not pulled
For Flap gate detail see sheet No 12
Coarse aggregate shall be deposited to embed in concrete
space extending 15 inches in all directions from the apron
The front two of the headwalls shall be placed perpendicular to
materially that the remaining
shall be placed normal to
All exposed corners shall be rounded to a
All reinforcing measurements are to the
The length of concrete box to be removed

Station	
123+80 RT	5 feet
147+30 RT	5 feet
150+80 LT	None
157+40 RT	5 feet
164+50 LT	12 feet
164+50 RT	12 feet

Stream arms are along axis of the box from the front face of the headwall
At Sta 176+50 RT the concrete box shall be extended into the headwall
the end is perpendicular. Concrete quantity shall be included with
concrete quantity

Rip rap shall be placed on each side, full approach
The distance that riprap shall extend in front of each

Sta 123+80 LT	4.0 feet
Sta 147+30 RT	4.0 feet
Sta 150+80 LT	4.0 feet
Sta 157+40 RT	4.5 feet
Sta 164+50 RT	8.0 feet
Sta 164+50 LT	19.0 feet
Sta 176+50 RT	8.0 feet

3 sacs of 4 inch tile 1 foot long shall be required for each

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

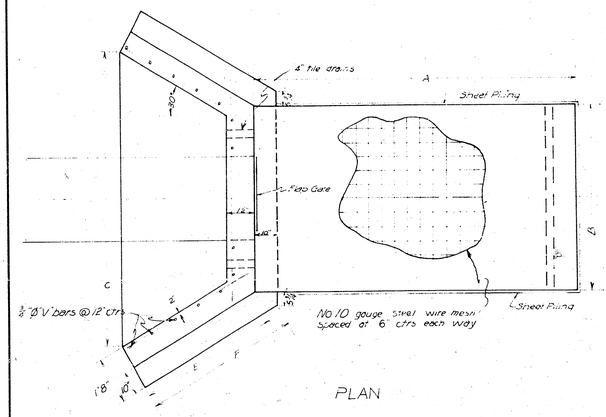
APPROVED _____ CITY-ENGINEER

APPROVED _____ ENGINEER IN CHARGE

DRAWN JRS
TRACED
CHECKED

SHEET 6 OF 12

INVERT ELEVATION OF PIPE	
Station	Elevation
53+50	1303.00
279+70 Lt	1278.70
157+70	1293.00



PLAN

NOTE:

Outfall apron at sta 157+70 to be rip raped bottom and sides for a length of 24 ft from headwall. The bottom shall be 0.2" wide. Slope of sides shall be one to one to top of natural bank.

NOTE:

Automatic flap gates to be similar to or equal to Calco Model 100 Manufactured by Hardesty Manufacturing Co Denver Colo. To operate at a maximum head of 10 ft.

The corrugated sheet piling sections shall be of 12 gauge steel and 6 ft long

Remove one 40 in section of 36 in tile pipe before placing headwall

Cut 2 ft off of 48 IN. C.M.P. before Placing headwall

Headwalls to be placed at rt angles to ℄ of pipe

For flap gate detail see sheet no. 11

Piece of 4 inch tile 1 foot long are required for each headwall

LISTS OF BARS, DIMENSIONS, AND QUANTITIES FOR HEADWALLS FOR

36" TILE PIPE AT STA 279 + 70 LT.

Letter	A	B	C	D	D_a	E	F	G	K
Dimension	12'8"	6'8"	10'1½"	36"	42"	5'3"	5'8"	8'0"	3'0"
Bar	A	B	C	V	H	D			
Number	5	4	4	14	14	4			
Size	#10	#10	#10	#10	#10	#10			
Length	7'6"	2'9"	1'9"	9'0"	5'4"	3'8"			

Excavation	50.46 cu yds
Concrete	H&W - 9.41 cu yds - Apron 3.34 cu yds
Rein Steel	313.85 #
Sheet Piling	66 Sections*
Wire Mesh	23.1 #
Flap Gate	None
Backfill	38.31 cu yds
Rip Rap	11.26 sq yds

48" C M PIPE AT STA 53 + 50 Lt

Letter	A	B	C	D	D_a	E	F	G	K
Dimension	6'8"	6'0"	10'1½"	48"		5'3"	5'8"	7'0"	4'0"
Bar	A	B	V	H	D				
Number	3	4	14	16	4				
Size	#10	#10	#10	#10	#10				
Length	7'6"	2'5"	8'0"	5'4"	4'3"				

Excavation	28.76 cu yds
Concrete	H&W - 8.65 cu yds Apron 1.85 cu yds
Rein Steel	271.68 #
Sheet Piling	54 Sections*
Wire Mesh	14.91 #
Flap Gate	48"
Backfill	18.[illegible] cu yds
Rip Rap	6.22 sq yds

60" CONCRETE PIPE AT STA 157+70 Lt

Letter	A	B	C	D	D_a	E	F	G	K
Dimension	24'0"	6'8"	12'4½"	60"	70"	5'3"	5'8"	8'0"	7'0"
Bar	A	B	V	H	D				
Number	3	4	14	10	4				
Size	#10	#10	#10	#10	#10				
Length	9'0"	3'9"	9'0"	5'4"	4'2"				

Excavation	84.45 cu yds
Concrete	H&W - 10.22 cu yds
Rein Steel	306.39 #
Sheet Piling	39 Sections
Rip Rap	52.03 Sq yd.
Flap Gate	60"
Backfill	37.90 cu yds

AT STA 157+70 LT.

QUANTITIES FOR RELAYING PIPE	
Excavation	680.8 cu yds
Reinf Conc Pipe	196.0 ℓf 60" ϕ
Backfill	288.0 cu yds

General Notes

Coarse aggregate shall be deposited behind [illegible] to occupy a space extending 15 in in all direction from the weepholes

All exposed edges shall be beveled with ¾ in. triangular [illegible]

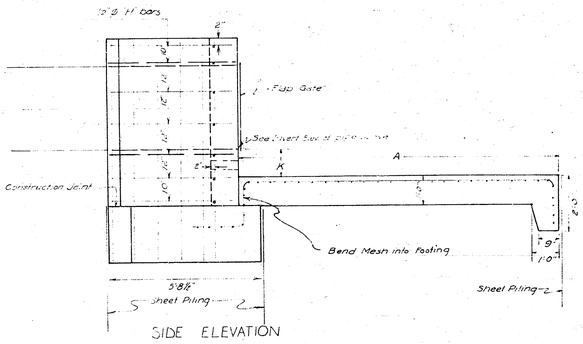
All reinforcing dimensions are to centerlines of bars

Two feet of riprap shall be placed on each side of all aprons

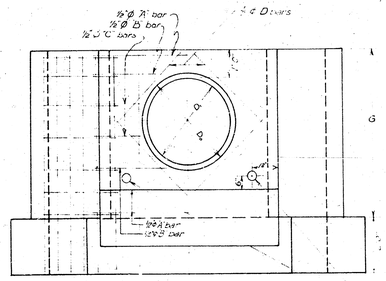
The distance that riprap shall extend in front of each apron shall be as follows

Sta 279+70 Lt 5 feet

Sta 53+50 Lt 3 feet



SIDE ELEVATION



END ELEVATION

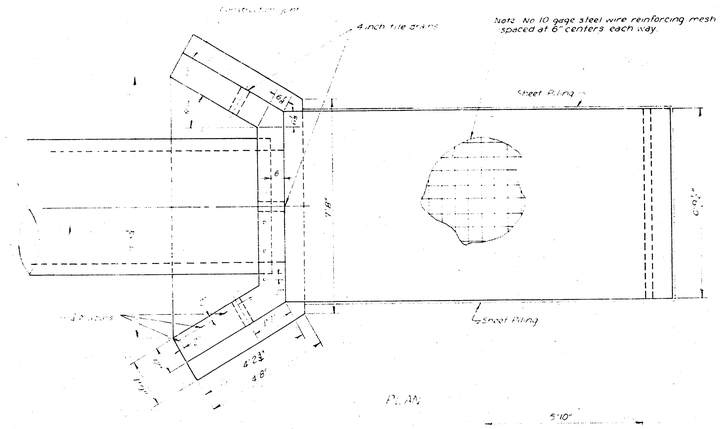
4 inch tile drains

Revised Nov 6 1950 [illegible]

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

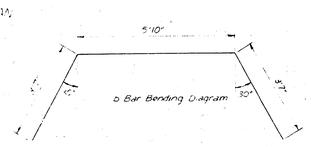
SCALE: 1 INCH = 2 FT.
CITY COUNTY ENGINEER OFFICE, WICHITA, KANSAS
APPROVED: APPROVED:
CITY-ENGINEER ENGINEER-IN-CHARGE
DRAWN [illegible]
TRACED
CHECKED

SHEET 7 OF 12

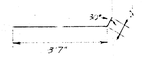


PLAN

RELAID CONCRETE PIPE



b Bar Bending Diagram



c Bar Bending Diagram

LIST OF BARS AND QUANTITIES FOR HEADWALL AT STA. 163+40 LT.

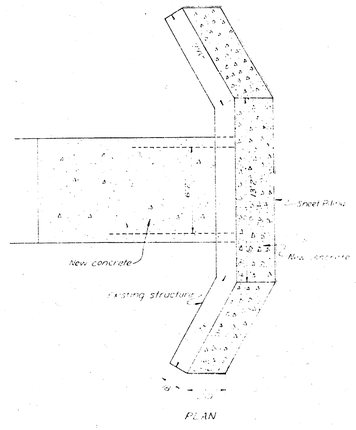
REINFORCING STEEL SCHEDULE					
Bar	a	b	c	d	h
Number	10	6	8	4	4
Size	⅜ ϕ	⅜ ϕ	½ ϕ	½ ϕ	½ ϕ
Length	11'0"	13'0"	4'0"	5'0"	4'0"

ESTIMATE OF QUANTITIES	
Excavation	45.72 cu yds.
Concrete	Hdwl - 9.08 cu yds Apron - 3.87 cu yds
Reinforcing Steel	Hdwl - 262.75 # Apron - 25.94 #
Sheet Piling	Hdwl - 32 secs Apron - 35 secs
Flap Gate	One 48 inch ϕ
Backfill	33.77 cu yds
Rip Rap	76.5 sq yds
Tile Drains	3 - 4" Tile

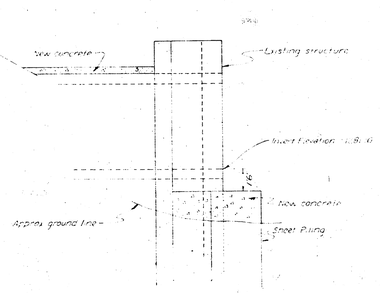
QUANTITIES FOR RELAYING CONCRETE PIPE	
Excavation	416.15 cu yds
Reinf Conc Pipe	176.0 feet of 48" ϕ
Backfill	312.61 cu yds

Note: All exposed edges shall be beveled with ¾ inch triangular molding
All reinforcing dimensions are to the center-line of the bars
The headwall shall be placed perpendicular to the axis of the pipe with the front face of the headwall 6 inches in front of the end of the pipe
Rip Rap shall be placed around the apron for a distance of 2 feet
The corrugated sheet piling sections shall be of 12 gauge steel 6 feet long
Structure shall be symmetrical about the vertical center line

REPAIR OF HEADWALL AT STA. 251+30 LT.



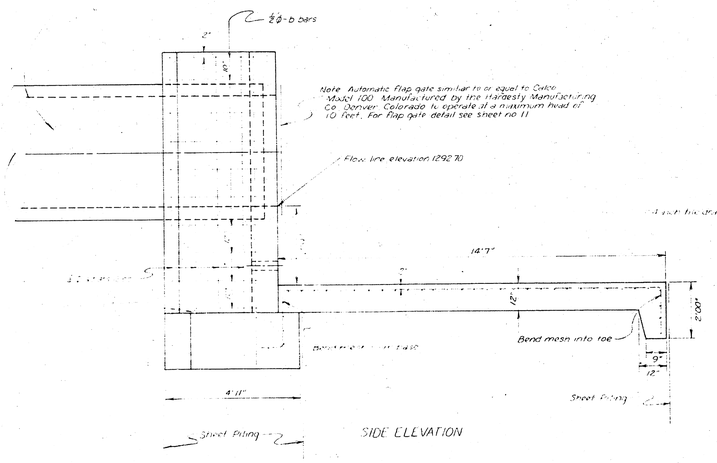
PLAN



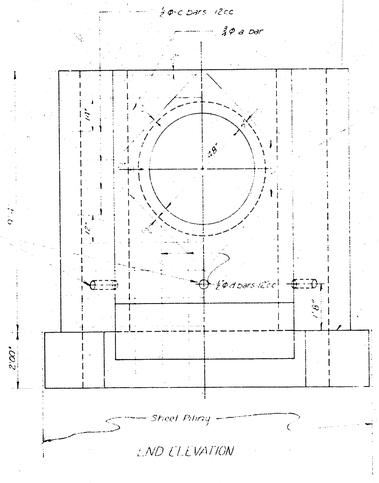
SIDE ELEVATION

Scale 1"=4'

Note: The corrugated sheet piling shall be of 12 gauge steel and 6 feet long. 36 sections are required for repair as per sheet 9 of 12. 2 cu yds. are placed for repair as per sheet 9 of 12.



SIDE ELEVATION



END ELEVATION

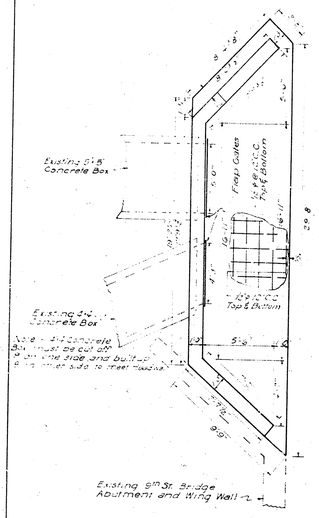
Scale 1"=2'

REVISED NOV. 3, 1950 BY J.H.S. CKD.

ARKANSAS RIVER BASIN
WICHITA AND VALLEY CENTER FLOOD CONTROL PROJECT
EAST BRANCH INTERCEPTION CANAL & WICHITA DRAINAGE CANAL
HEADWALL FOR CONCRETE PIPE AT STA. 163+40 LT.
REPAIR OF HEADWALL AT STA. 251+30 LT.
SCALE: 1 INCH = AS SHOWN
CITY-COUNTY ENGINEER OFFICE, WICHITA, KANSAS
APPROVED: APPROVED:
CITY ENGINEER
DRAWN
TRACED
CHECKED

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

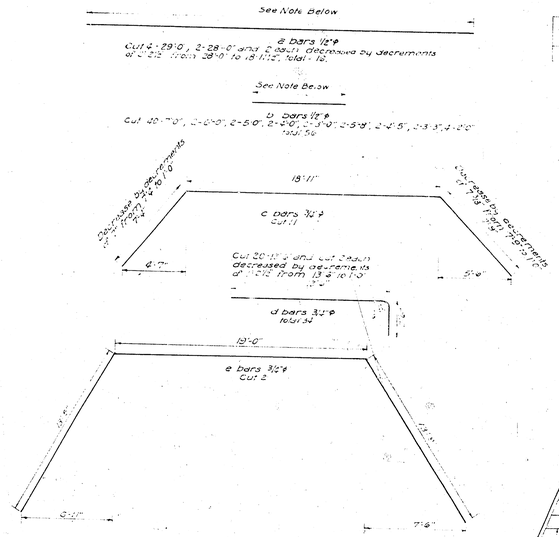
Excavation Cu Yds	Sheet Piling Lineal Feet	Reinforcing Steel Lbs	Concrete Cu Yds	Flap Gates Inches	Backfill Cu Yds	Drain Tile Lineal Feet
57.0	37.6	7424	31.35	2-40" Ø	8.1	2



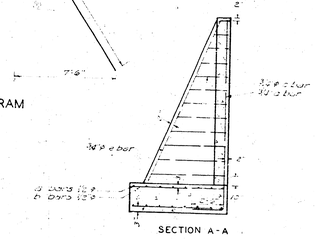
PLAN

Note: Flume must be cut off at an angle and built up on outer side to meet flashing

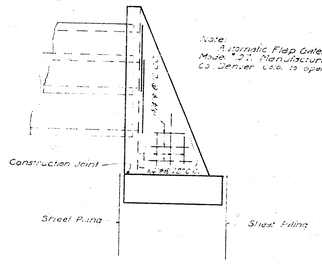
Note: Flume must be cut off at an angle and built up on outer side to meet flashing



REINFORCING BAR BENDING DIAGRAM

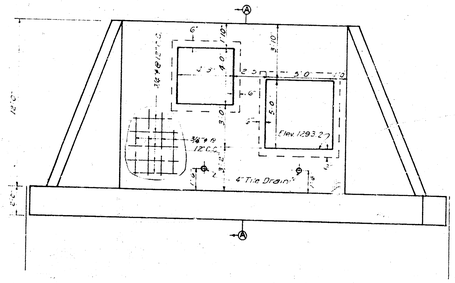


SECTION A-A



Note: Alternate Flap Gates similar to or equal to Calco Model "FG" manufactured by Hardesty Manufacturing Co. Denver Colo. to operate at maximum head of 16 feet.

SIDE ELEVATION



FRONT ELEVATION

GENERAL NOTES

Corrugated Sheet Piling Sections shall be of 12 gauge steel and 6 feet in length
For Flap Gates see Sheet No 12
Coarse aggregate shall be deposited behind each wing wall 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 molding
All reinforcing dimensions are to the center line of the bar

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

APPROVED _____ ENGINEER IN CHARGE

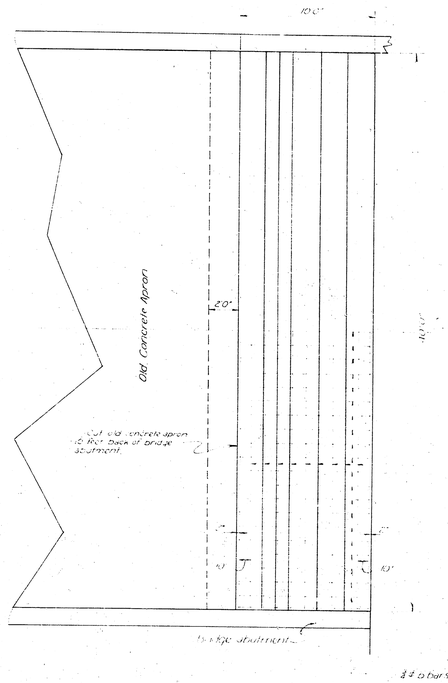
DRAWN [illegible]

SHEET 9 OF 12

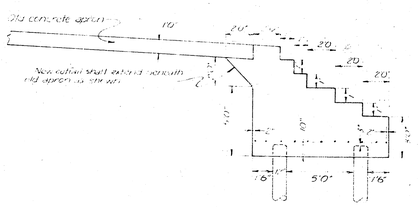
MAIN STEEL SCHEDULE		
Bar	a	b
Number	11	41
Size	#4	#4
Length	39'8"	9'8"

ESTIMATE OF QUANTITIES	
Excavation	94.81 cu yds
Concrete	31.48 cu yds
Reinforcing steel	#4 - 1250.67#
Timber piling	40 pcs of 6"gauge 6' long
Fitting	13 - 6" treated pile 20' long

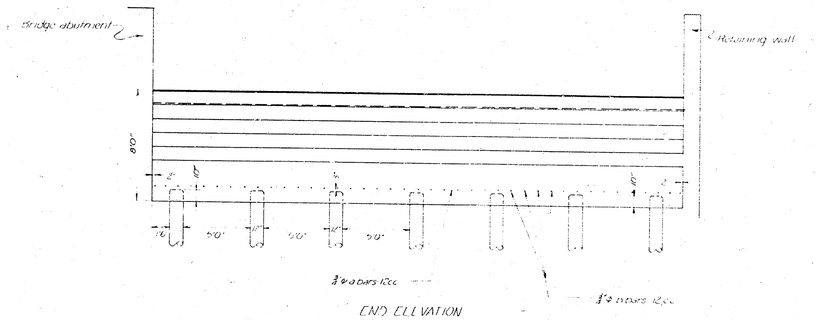
NOTE
All curtain piling dimensions are to the center line of the bars.
Steel to expose slope with 3 inch triangular molding.
Removal of old concrete shall be considered part of the excavation and shall be paid for accordingly.
Top apron shall be constructed perpendicular to the axis of the drain and the front face shall be flush with the existing bridge abutment.
New concrete at top of outfall shall be made flush with old apron.



PLAN



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 108+80.00

SCALE 1 INCH 4 FEET

CITY COUNTY ENGINEER OFFICE WICHITA KANSAS

APPROVED

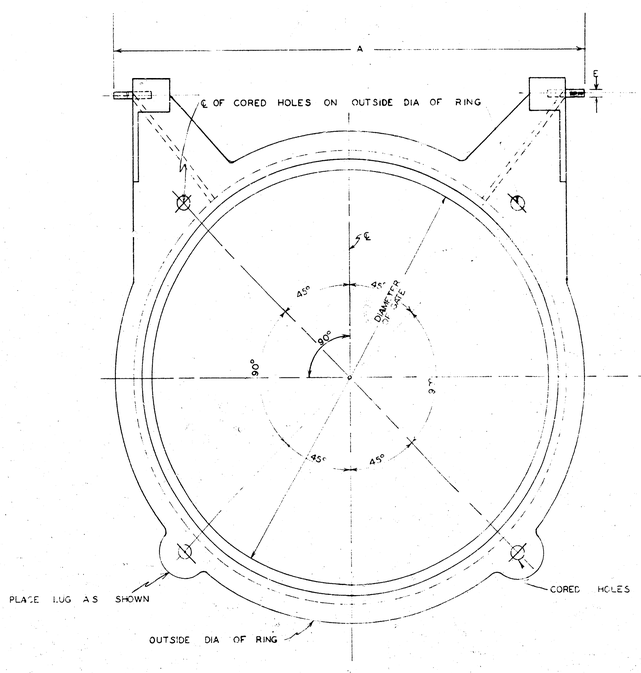
APPROVED

CITY ENGINEER

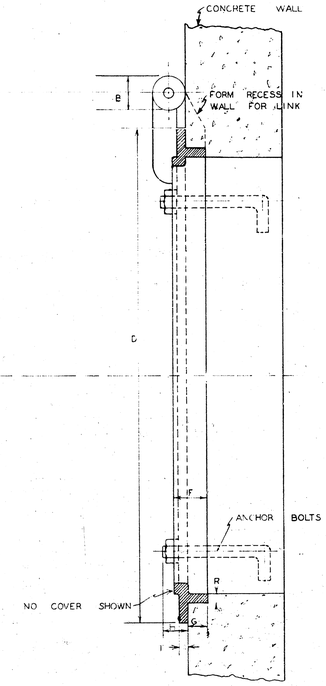
ENGINEER IN CHARGE

DRAWN
TRACED
CHECKED

SHEET 10 OF 12



FRONT ELEVATION
RING ONLY



SECTION ON ℄

FLAP GATE SCHEDULE

STATION	DIA	A	B	C	D	E	F	G	H	R	T	ANCHOR BOLT DIA
53+50	48"	53½"	2½"	34"	54"	1"	4"	2¾	1¾"	¾"	½	¾
61+50	24"	28⅝"	2"	17"	27½	¾"	2¾	1½	1⅛"	9/16"	⅜	⅜
157+70	60"	66⅜"	2½	42"	60½	1¼"	4⅜	2¾"	2¼"	⅞	11/16	1"
163+40	48"	53⅜"	2½	34"	54"	1"	4"	2¾	1¾	¾"	½	¾"

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

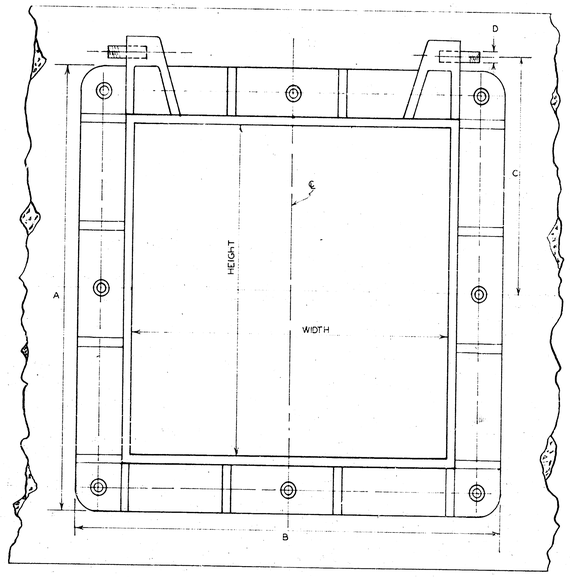
SCALE 1 INCH= 4 INCHES
CITY COUNTY ENGINEER OFFICE WICHITA KANSAS

APPROVED

CITY ENGINEER ENGINEER IN CHARGE

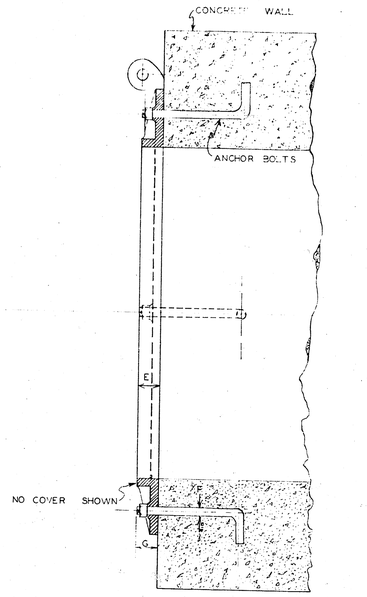
DRAWN
TRACED
CHECKED

SHEET



FRONT ELEVATION

RING ONLY



SECTION ON ℄

FLAP GATE SCHEDULE —

STATION	GATE SIZE WIDTH	GATE SIZE HEIGHT	A	B	C	D	E	F	G
86 + 30Lt	60"	60"	70"	70"	42"	1¼	2½	1"	2¼"
93 + 30Lt	40"	40"	51"	57"	34"	1"	2 5/16	¾"	1 ¾"
109 + 30	60"	60"	70"	70"	42"	1¼	2½	1"	2¼"
123 + 80	36"	36"	44"	44"	25"	1"	2 1/16	⅝"	1 ⅜"
137 + 30Lt	60"	60"	70"	70"	42"	1¼	2½	1"	2¼"
137 + 30Rt	60"	60"	70"	70"	42"	1¼	2½	1"	2¼"
137 + 30Rt	40"	40"	51"	57"	34"	1"	2 5/16	¾"	1 ⅜"
150 + 50Lt	40"	40"	51"	51"	34"	1"	2 5/16	¾"	1 ⅜"
157 + 40Rt	36"	36"	44"	44"	25"	1"	2 1/16	⅝"	1 ⅜"
163 + 50Lt	36"	36"	44"	44"	25"	1"	2 1/16	⅝"	1 ⅜"
164 + 50Rt	36"	36"	44"	44"	25"	1"	2 1/16	⅝"	1 ⅜"
176 + 50Lt	40"	40"	51"	51"	34"	1"	2 5/16	¾"	1 ⅜"
176 + 50Rt	40"	40"	51"	51"	34"	1"	2 5/16	¾"	1 ⅜"

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

SCALE: 1 INCH = 4 INCHES
CITY COUNTY ENGINEER OFFICE WICHITA KANSAS

APPROVED

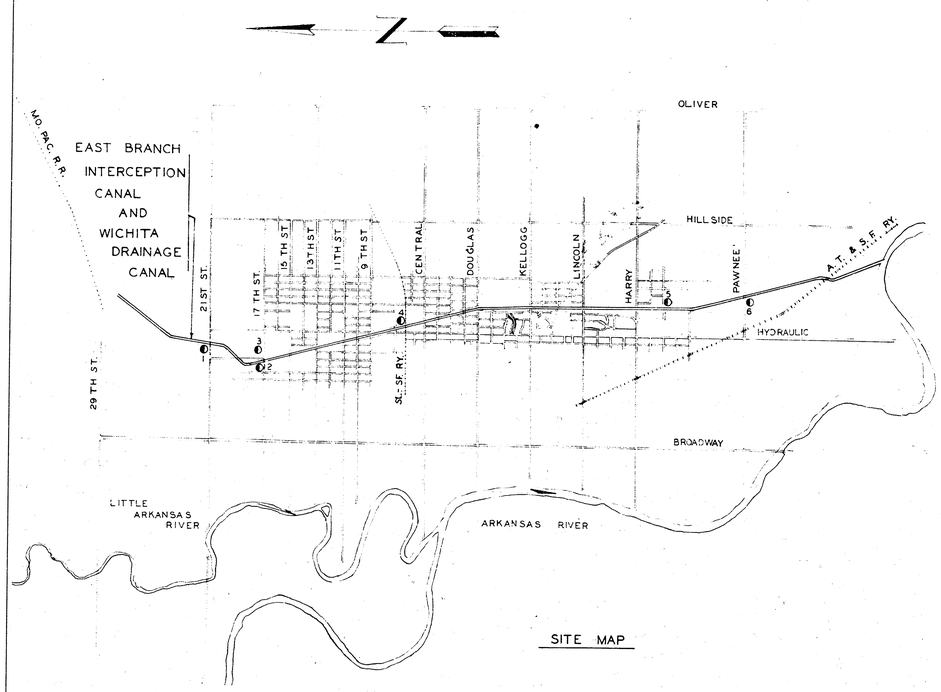
CITY ENGINEER

APPROVED

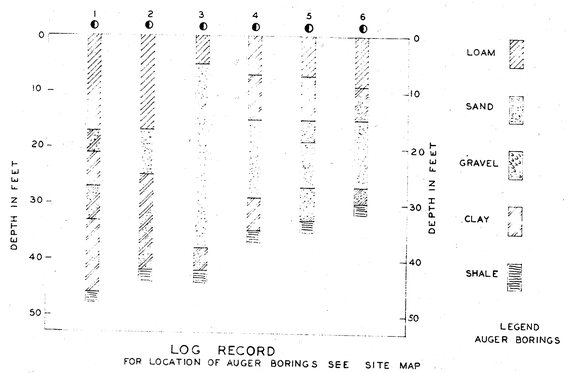
ENGINEER IN CHARGE

DRAWN C.I.V.O.
TRACED
CHECKED

SHEET N. OF N.



SITE MAP



LOG RECORD
FOR LOCATION OF AUGER BORINGS SEE SITE MAP

RECAPITULATION OF ESTIMATED QUANTITIES

Station	Culvert Size	Steel Piling Lineal Feet	Wood Piling Lineal Feet	Excavation Cu. Yds.	Concrete Cu. Yds.	Reinforcing Steel Pounds	Backfill Cu. Yds.	Flap Gate Size-Inches	Rip Rap Sq. Yds.	Concrete Pipe Lineal Feet	Metal Headwall	4" Drain Tile Lineal Feet
531+50 Rt	15"C.M.P.	318.0		28.76	9.17	201.72	17.28	15"?	6.22			2.
677+30 Lt	24"-C.M.P.							24"?	4.9			
714+25 Rt	18"-Tile Pipe								9.9			
744+48 Lt	4-4 Conc. Box	438.0		39.06	15.21	396.06	21.61		10.0			3
881+30 Lt	4-4 Conc. Box	450.0		53.35	18.90	483.21	29.06	CC-48"	4.7			3
931+30 Lt	4-4 Conc. Box	486.0		56.96	20.00	536.69	33.74	48"-48"	9.5			3
1091+30 Lt	4-4 Conc. Box	456.0		52.27	18.72	463.87	31.65	30"-30"	7.8			3
1101+10 Lt	18" C.M.P.								5.0			
1101+20 Rt	24" R.C.P.								6.2			
1112+90 Rt	18" C.I.P.								4.0			
1161+80 Rt	3-3 Conc. Box								20.0			
1181+50 Rt	4" C.I.P.								2.0			
1231+80 Rt	3-3 Conc. Box	420.0		45.95	16.63	457.81	28.59	36"-36"	13.7			
1351+00 Rt	30" R.C.P.								5.0			
1371+30 Lt	3-3 Conc. Box 3-5 Conc. Box	372		50.0	31.35	1762.0	8.1	30"-30" 30"-30"				2
1371+30 Rt	4-4 Conc. Box	402.0		32.07	14.82	232.80	16.13	48"-48"	22.1			
1434+40 Rt	24" Tile Pipe								6.0			
1501+80 Lt	4-4 Conc. Box	402.0		29.71	15.33	244.15	13.25	48"-48"	13.0			
1571+40 Rt	3-4 Conc. Box	402.0		42.31	15.27	251.26	26.80	36"-36"	12.5			
1571+70 Lt	60 R.C.P.	228		84.45	8.62	208.63	37.90	60"-?	30.03	192 60RCP		2
1631+40 Lt	45" R.C.P.	192		14.45	6.0	150.47	6.32	48"-?	7.07	176 - 24" RCP		
1641+50 Lt	3-6 Conc. Box	336.0		29.94	12.26	200.56	17.43	24"-24"	32.6			
1651+00 Rt	3-6 Conc. Box	462.0		36.09	15.79	222.24	23.82	36"-36"	32.6			
1761+50 Lt	4-4 Conc. Box	342.0		26.01	11.65	277.90	12.10	48"-48"	6.5			3
1761+50 Rt	4-4 Conc. Box	498.0		42.02	21.88	336.15	19.94	48"-48"	28.7			
1811+90 Lt	3-3 Conc. Box								5.0			
1981+40 Rt	3-3 Conc. Box								10.0			
1981+70 Lt	60 Conc. Apron	240.0	280.0	34.81	8.48	125.67			27.0			
2051+25 Lt	3-5 Conc. Box								8.0			
2151+00 Lt	10" Tile Pipe								3.1			
2161+20 Rt	30" Tile Pipe								8.0			
2191+60 Rt	3-5 Conc. Box								12.0			
2191+80 Lt	5-5 Conc. Box								9.0			
2331+50 Lt	24" Tile Pipe								4.0			
2331+50 Rt	5-5 Conc. Box								8.0			
2341+10 Lt	3-3 Conc. Box								15.0			
2451+40 Lt	3-3 Conc. box								30.0			
2511+30 Lt	8 Tile Masonry			38 (Concrete on Bot. of Tile)								
2571+90 Lt	[illegible] Pipe								8.0			
2584+40 Rt	5-5 Conc. Box								12.0			
2791+70 Lt	33" Tile Pipe	378		30.79	10.83	197.45	18.55		11.26			2
2871+20 Lt	20" R.C.P.								8.3			
2871+90 Rt	15" C.I.P.								4.0			
3101+50 Lt	36" C.M.P.								20.0	32		
3171+20 Rt	18" R.C.P.								7.0			
3231+80 Rt	5-5 Conc. Box	252.0		45.48	13.17	418.47	21.98		97			3
3511+10 Rt	12-18" C.M.P.A.								15.0			
3611+20 Lt	4-4 5'-7" Gates								102			
TOTALS		7,128	280	836.48	360.00	8,082.12	384.63	17 Flap Gates	654.8	372	1	36

Note - Reinforcing Steel in Pounds includes weight of Reinforcing Steel and Wire Mesh. Corrugated Metal Pipe (Asphalt Coated Paved Invert) may be substituted for Reinforced Concrete Pipe

ARKANSAS RIVER BASIN
WICHITA AND VALLEY CENTER
FLOOD CONTROL PROJECT
EAST BRANCH INTERCEPTION CANAL &
WICHITA DRAINAGE CANAL
SITE MAP, LOG RECORD &
RECAPITULATION OF ESTIMATED QUANTITIES

SCALE 1 INCH 1/2 MILE
CITY-COUNTY ENGINEER OFFICE WICHITA KANSAS
APPROVED:

CITY-ENGINEER

APPROVED:
ENGINEER-IN-CHARGE

DRAWN
TRACED
CHECKED

SHEET 1 OF 12

HYDRAULIC AVE.

STA 53 - 50 RT
48" C.M. P.

Construct Headwall with Flap Gate & Apron

℄ EAST BRANCH INTERCEPTION CANAL

Flap Gate & Rip Rap Apron
STA 67+50 LT
24" C.M.P.

Construct Headwall & Apron

21ST ST.

PENNSYLVANIA AVE.

STA 79+25 LT
4'×4' CONCRETE BOX

Construct Headwall with Flap Gate & Apron
STA 86+30
4'×4' CONCRETE BOX LT

STA 79+25 RT
12" TILE
Rip Rap

18TH ST.

Construct Headwall with Flap Gate & Apron
STA 93+30 LT
4'×4' CONCRETE BOX

Construct Headwall with Flap Gate & Apron
STA 109+30 LT
4'×4' CONCRETE BOX

Repair with Rip Rap
STA 110+10
18" C.M.P LT

CLEVELAND AVE.

END EAST BRANCH INTERCEPTION CANAL

BEGIN WICHITA DRAINAGE CANAL

STA 112+90
12" C.I.P. RT
Repair with Rip Rap

STA 110+20 RT
24" CONCRETE BOX
17TH ST. Rip Rap Headwall & Apron

Construct Headwall with Flap Gate & Apron
STA 176+50 LT
4'×4' CONCRETE BOX

MATCH LINE STA 177+40

STA 176+50 RT
4'×4' CONCRETE BOX
Construct Headwall with Flap Gate & Apron

Relay 196"-60" RCP or 90" C.M.P.
Construct Headwall with Flap Gate & Apron
STA 157+70 LT
60" R.C.P.

Relay 176"-48" R.C.P. or 48" C.M.P.
Construct Headwall with Flap Gate & Apron
STA 163+40 LT
3'-9" CONCRETE PIPE

Construct Headwall with Flap Gate & Apron
STA 164+50 LT
3'×2'-6" CONCRETE BOX

Construct Headwall with Flap Gate & Apron
STA 150+70 LT
4'×4' CONCRETE BOX

Construct Headwall with Flap Gate & Apron
STA 164+50 RT
3'×2'-6" CONCRETE BOX

Construct Headwall with Flap Gate & Apron
STA 157+40 RT
3'×2'-6" CONCRETE BOX

Construct Headwall with Flap Gate & Apron
STA 137+30 LT
4'×6' & 5'×5' CONCRETE BOXES

NEW YORK AVE.

STA 143+40 RT
24" TILE
Rip Rap Apron

MATHERSON AVE.

STA 135+00 RT
2 - 6' CONCRETE PIPE
Rip Rap Apron

STA 137+30 RT
4'×4' CONCRETE BOX
Construct Headwall with Flap Gate & Apron

STA 123+80 RT
3'×3' CONCRETE BOX
Construct Headwall with Flap Gate & Apron

STA. 116+80 RT
3'X 3' CONCRETE BOX
Repair with Rip Rap

STA 118+50 RT
4" IRON PIPE
Rip Rap Apron

MURDOCK AVE.

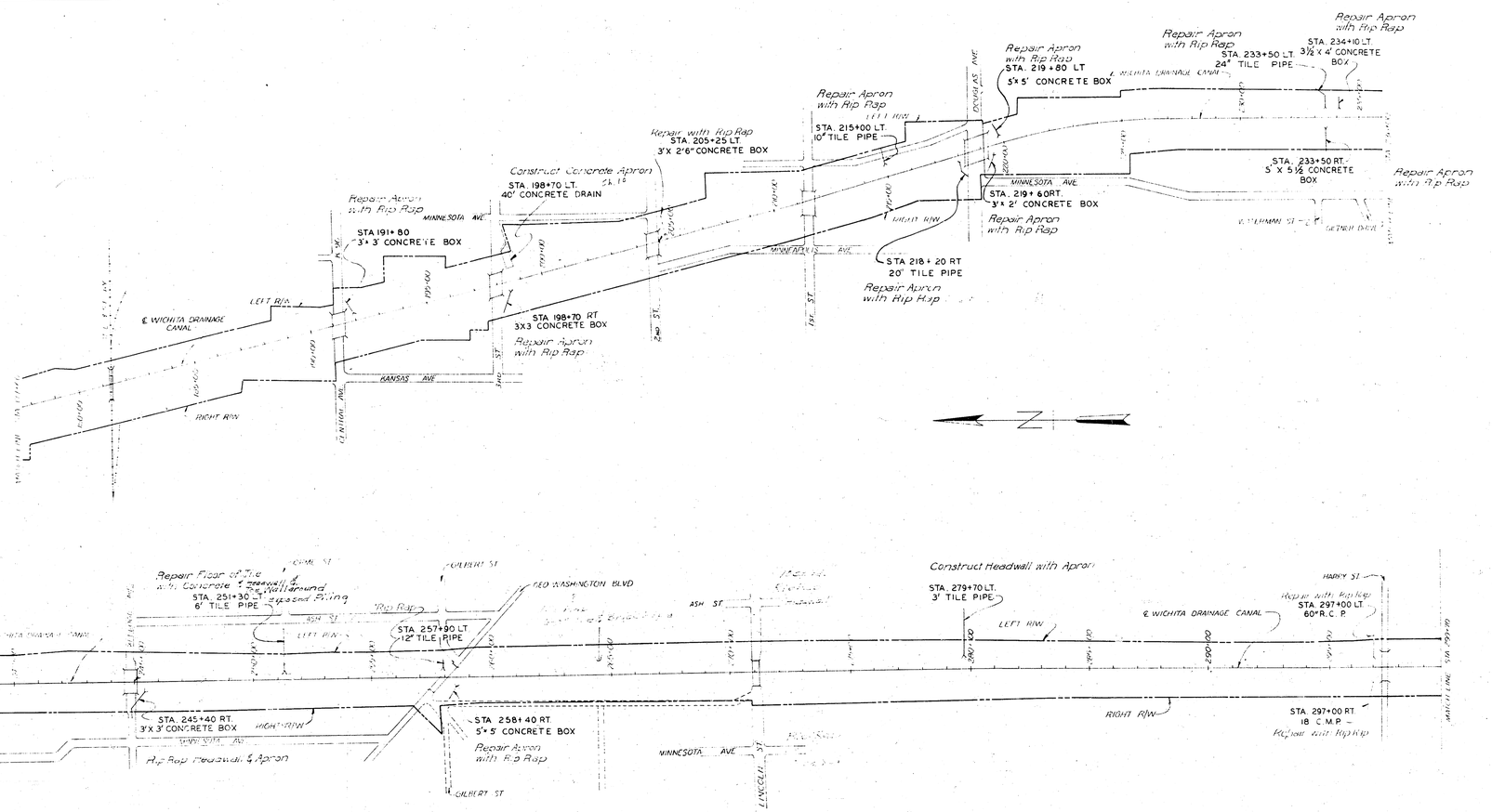
ARKANSAS RIVER BASIN
WICHITA AND VALLEY CENTER
FLOOD CONTROL PROJECT
EAST BRANCH INTERCEPTION CANAL &
WICHITA DRAINAGE CANAL
LOCATION OF CONSTRUCTION & REPAIR

SCALE 1 INCH = 200 FEET
CITY-COUNTY ENGINEER OFFICE WICHITA, KANSAS
APPROVED: APPROVED

CITY-ENGINEER ENGINEER-IN-CHARGE

DRAWN GB
TRACED
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

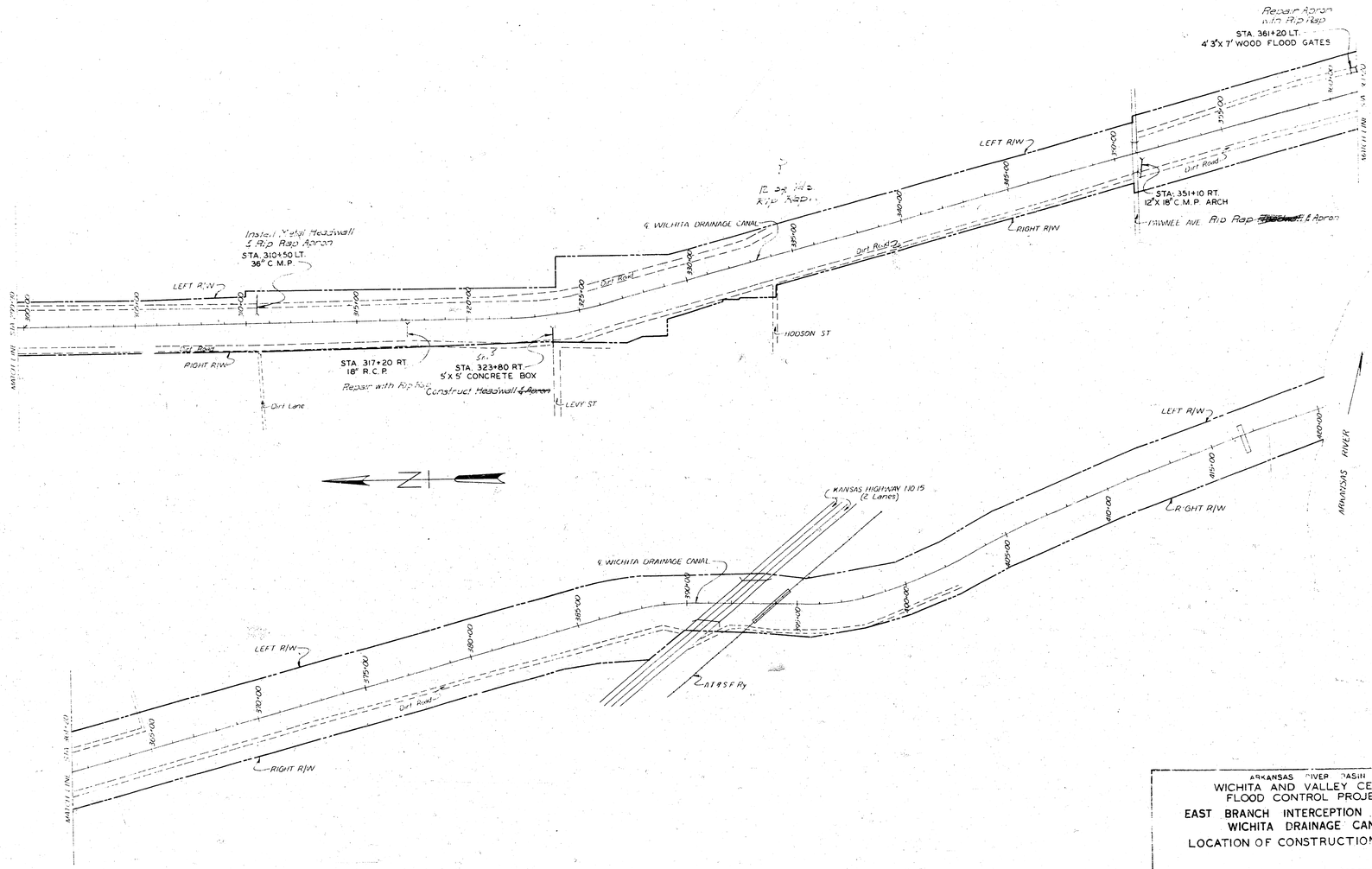
APPROVED

CITY ENGINEER

ENGINEER-IN-CHARGE

DRAWN J.R.S.
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

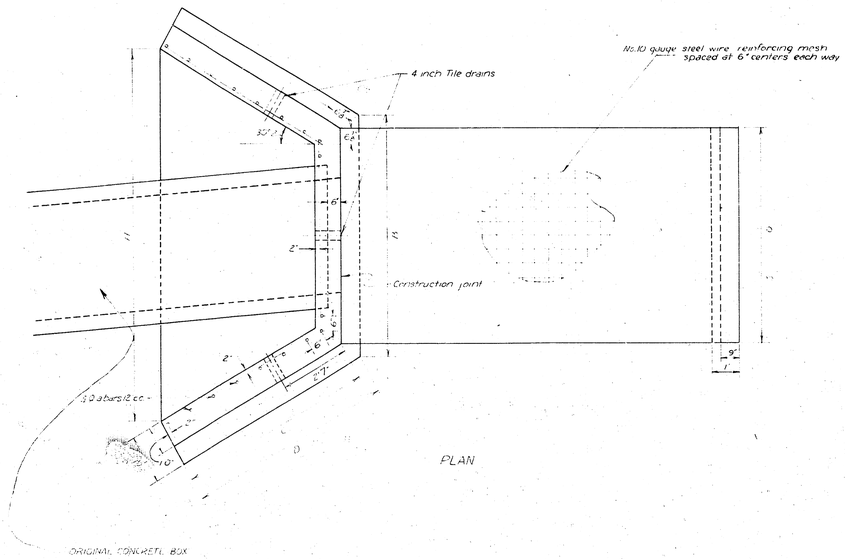
SCALE 1 INCH = 200 FEET
CITY-COUNTY ENGINEER OFFICE WICHITA KANSAS

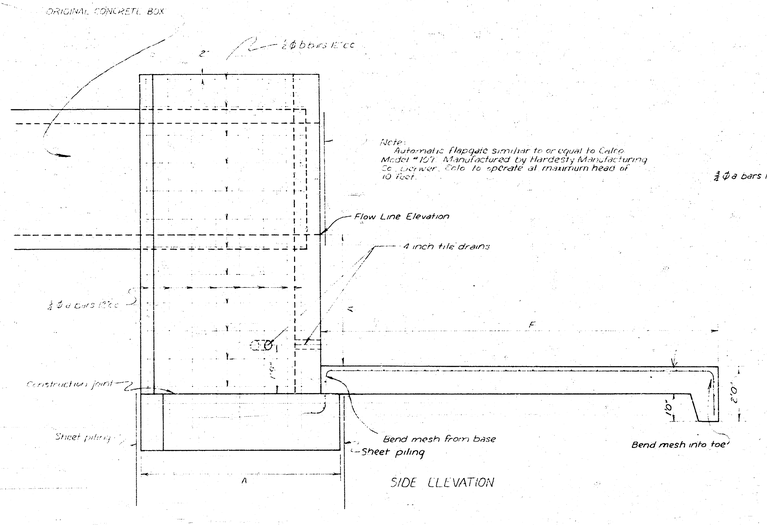
APPROVED:
CITY-ENGINEER

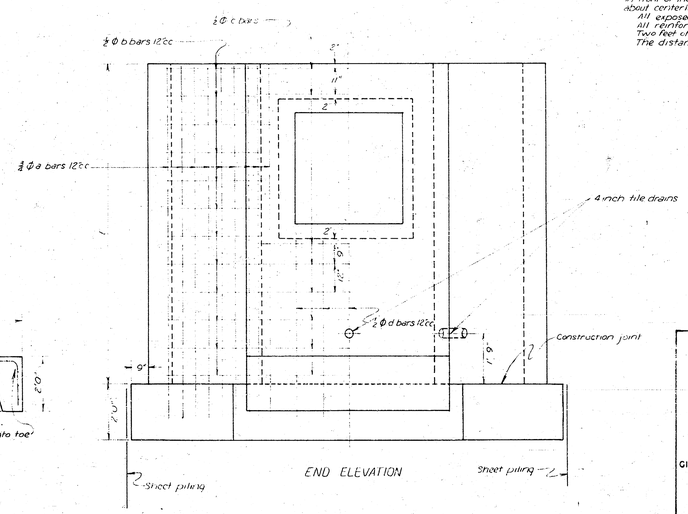
APPROVED
ENGINEER-IN-CHARGE

DRAWN U.R.S.
TRACED
CHECKED

SHEET 4 OF 12







LISTS OF BARS, DIMENSIONS, AND QUANTITIES FOR HEADWALLS

FOR 4'X4' CONCRETE BOX AT STA. 79+40 Lt.												Flow Line Elevs
Letter	A	B	C	D	E	F	G	H	K	Excavation	39.06 Cu Yds	1301.05
Dimension	5'10¼"	8'8"	5'2⅜"	5'8"	10'9"	13'7"	7'9⅝"	11'3⅛"	4'0"	Concrete	HdWl 11.04 cu yds Apron 4.17 cu yds	Backfill - 21.61 cu yds
Bar	a	b	c	d						Reinf. Steel	⅝ Ø - 248.76" ℄ @ 12.00"	Rip Rap - 9.95 sq yds
Number	14	22	7	5						Sheet Piling	HdWl - 37 secs Apron - 36 secs	
Size	⅝ Ø	⅝ Ø	⅝ Ø	⅝ Ø						Flapgate	None needed	
Length	11'10"	4'8"	7'0"	5'7"						Steel Wire Reinf	No 10 gauge - 173"	

FOR 4'X4' CONCRETE BOX AT 86+30 Lt.												Flow Line Elev.
Letter	A	B	C	D	E	F	G	H	K	Excavation	53.35 Cu Yds	1299.20
Dimension	8'-8"	8'8"	8'2⅜"	8'0"	9'5⅜"	10'7"	7'9⅝"	14'3⅛"	2'8⅛"	Concrete	HdWl 15.49 cu yds Apron 3.31 cu yds	Backfill - 29.06 cu yds
Bar	a	b	c	d						Reinf. Steel	⅝ Ø - 315.45" ℄ @ 14.5.32"	Rip Rap - 4.70 sq yds
Number	20	20	11	5						Sheet Piling	HdWl - 46 secs. Apron - 29 secs	
Size	⅝ Ø	⅝ Ø	⅝ Ø	⅝ Ø						Flapgate	One 60" x 60"	
Length	10'6"	7'8"	7'0"	4'3"						Steel Wire Reinf	No 10 gauge - 227.4"	

FOR 4'X4' CONCRETE BOX AT 93+30 Lt.												Flow Line Elev.
Letter	A	B	C	D	E	F	G	H	K	Excavation	56.96 Cu Yds	1299.30
Dimension	7'7"	8'8"	7'2⅜"	7'8"	11'5⅝"	15'7"	7'9⅝"	13'3⅛"	4'8⅛"	Concrete	HdWl 15.28 cu yds Apron 4.72 cu yds	Backfill - 33.74 cu yds
Bar	a	b	c	d						Reinf. Steel	⅝ Ø - 337.95" ℄ @ 12.29"	Rip Rap - 9.94 sq yds
Number	18	34	8	5						Sheet Piling	HdWl - 43 secs Apron - 38 secs	
Size	⅝ Ø	⅝ Ø	⅝ Ø	⅝ Ø						Flapgate	One 48" x 48"	
Length	12'6"	6'8"	7'0"	7'2"						Steel Wire Reinf	No 10 gauge - 307.45"	

FOR 4'X4' CONCRETE BOX AT 109+30 LT.												Flow Line Elev.
Letter	A	B	C	D	E	F	G	H	K	Excavation	52.27 Cu Yds	1297.10
Dimension	5'10¼"	13'8"	5'2⅜"	5'8"	9'10⅝"	8'7"	12'9½"	16'2⅛"	3'1⅛"	Concrete	HdWl 14.30 cu yds Apron 4.49 cu yds	Backfill - 31.65 cu yds
Bar	a	b	c	d						Reinf. Steel	⅝ Ø - 297.6" ℄ @ - 126.87"	Rip Rap - 7.78 sq yds
Number	18	10	6	5						Sheet Piling	HdWl 47 secs Apron 29 secs	
Size	⅝ Ø	⅝ Ø	⅝ Ø	⅝ Ø						Flapgate	One 60" x 60"	
Length	11'0"	4'8"	12'0"	4'11"						Steel Wire Reinf	No 10 gauge - 294"	

FOR 4'X4' CONCRETE BOX AT 176+50 LT.												Flow Line Elev.
Letter	A	B	C	D	E	F	G	H	K	Excavation	26.01 Cu Yds	1291.30
Dimension	5'0"	8'8"	4'2⅜"	4'8"	8'6⅝"	11'7"	7'9⅝"	10'3⅛"	1'8⅛"	Concrete	HdWl 6.05 cu yds Apron 3.60 cu yds	Backfill - 12.40 cu yds
Bar	a	b	c	d						Reinf. Steel	⅝ Ø - 174.20" ℄ @ - 79.41"	Rip Rap - 6.49 sq yds
Number	12	18	6	5						Sheet Piling	HdWl 34 secs Apron 37 secs	
Size	⅝ Ø	⅝ Ø	⅝ Ø	⅝ Ø						Flapgate	One 42" x 48"	
Length	9'8"	3'8"	7'0"	3'7"						Steel Wire Reinf	No 10 gauge 214.5"	

FOR 5'x5' CONCRETE BOX AT STA 323+80 RT.												Flow Line Elev.
Letter	A	B	C	D	E	F	G	H	K	Excavation	35.48 Cu Yds	1274.20
Dimension	6'3⅜"	9'6"	6'2⅜"	6'8"	10'5⅝"		8'9½"	13'3⅛"	2'5"	Concrete	HdWl 13.17 cu yds	Backfill - 21.98 cu yds
Bar	a	b	c	d						Reinf. Steel	⅝ Ø - 276.37" ℄ @ 14.2.10"	Rip Rap - 9.72 sq yds
Number	16	22	7	6						Sheet Piling	HdWl - 42 sections	
Size	⅝ Ø	⅝ Ø	⅝ Ø	⅝ Ø						Flapgate	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 secs 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 boxes 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 ¾ inch, triangular molding.
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 Lt. - 3 feet
Sta 86+30 Lt. - 2 "
Sta 93+30 Lt. - 2 "
Sta 109+30 Lt. - 3 "
Sta 176+50 Lt. - 3 "
Sta 323+80 Rt. - 10 "

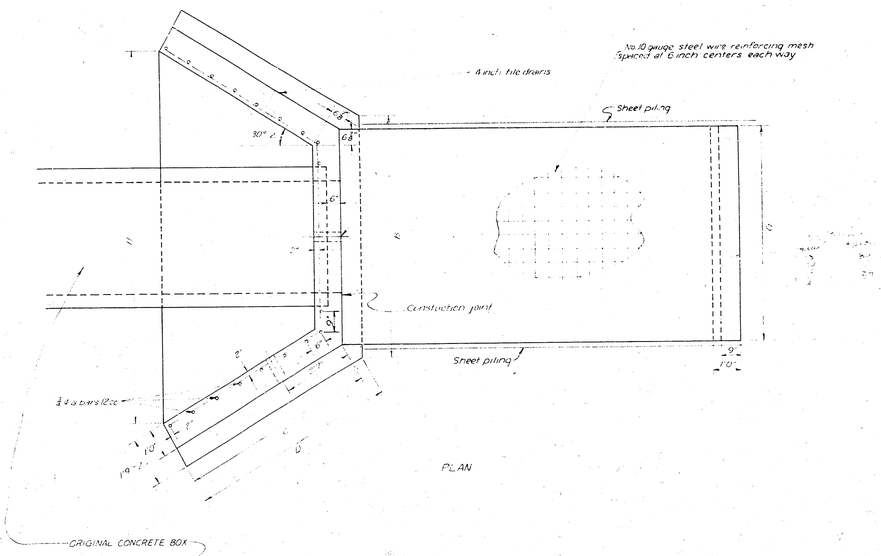
ARKANSAS RIVER BASIN
WICHITA AND VALLEY CENTER
FLOOD CONTROL PROJECT
EAST BRANCH INTERCEPTION CANAL
WICHITA DRAINAGE CANAL
HEADWALLS FOR BOX CULVERTS

SCALE 1 INCH 2 FEET
CITY COUNTY ENGINEER OFFICE WICHITA KANSAS

APPROVED: CITY-ENGINEER
APPROVED: ENGINEER-IN-CHARGE

DRAWN J.R.S.
TRACED
CHECKED

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	Flow line elevation
Dimension	5'-9½"	7'-8"	5'-2⅜"	5'-8"	8'-6"	14'-7"	6'-9½"	10'-3⅜"	8"	Concrete	HEwl-127 1cuyds Apron 38Lcuyd	1294.50
Bar	a	b	c	d						Backfill	28.59 cu yds	Rip Rap - 13.65 sq yds
Number	14	14	4	4						Reinforcing Steel	HEwl - 234.61# Apron - 232.1#	
Size	¾ ϕ	½ ϕ	½ ϕ	½ ϕ						Sheet piling	HEwl - 35 secs Apron - 30 secs	
Length	8'0"	4'8"	5'10"	3'8"						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	Flow line elevation
Dimension	4'-0⅜"	8'-8"	5'-2⅜"	5'-8"	8'-6"	14'-7"	7'-9⅜"	9'-3⅜"	8"	Concrete	HEwl-108 3cuyds Apron-44.4cuyds	1292.90
Bar	a	b	c	d						Backfill	11.13 cu yds	Rip Rap - 26.06 sq yds
Number	10	10	4	5						Reinforcing Steel	HEwl - 206.02# Apron - 126.78#	
Size	¾ ϕ	½ ϕ	½ ϕ	½ ϕ						Sheet Piling	HEwl - 31 secs Apron - 36 secs	
Length	9'0"	2'8"	6'10"	3'8"						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	39.71 cu yds	Flow line elevation
Dimension	4'-0⅜"	8'-8"	5'-2⅜"	5'-8"	8'-6"	14'-7"	7'-9½"	9'-3⅜"	1'-8"	Concrete	HEwl 1090cuyds Apron-44.4cuyds	1292.90
Bar	a	b	c	d						Backfill	13.25 cu yds	Rip Rap - 15.54 sq yds
Number	10	18	5	5						Reinforcing Steel	HEwl - 217.37# Apron - 126.78#	
Size	¾ ϕ	½ ϕ	½ ϕ	½ ϕ						Sheet Piling	HEwl - 31 secs Apron - 36 secs	
Length	10'0"	2'8"	6'10"	3'8"						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	Flow line elevation
Dimension	5'-10⅞"	7'-8"	4'-2⅜"	4'-8"	7'-6"	14'-7"	6'-9½"	9'-3⅜"	8"	Concrete	HEwl 114cuyds Apron-12.6cuyds	1290.9
Bar	a	b	c	d						Backfill	26.80 cu yds	Rip Rap - 12.45 sq yds
Number	12	16	5	4						Reinforcing Steel	HEwl - 228.05# Apron - 232.1#	
Size	¾ ϕ	½ ϕ	½ ϕ	½ ϕ						Sheet piling	HEwl - 32 secs Apron - 35 secs	
Length	9'0"	3'8"	5'10"	2'8"						Flap Gate	One 36" x 36"	

FOR 2½'x3' CONCRETL BOX AT STA 164+50 RT.

Letter	A	B	C	D	E	F	G	H	K	Excavation	35.09 cu yds	Flow line elevation
Dimension	4'-10⅜"	7'-8"	4'-2⅜"	4'-8"	6'-0"	19'-7"	6'-9½"	9'-3⅜"	8"	Concrete	HEwl-106.8cuyds Apron-3.1cuyds	1291.00
Bar	a	b	c	d						Backfill	33.85 cu yds	Rip Rap - 32.59 sq yds
Number	12	14	4	4						Reinforcing Steel	HEwl - 192.21# Apron - 30.03#	
Size	¾ ϕ	½ ϕ	½ ϕ	½ ϕ						Sheet Piling	HEwl - 32 secs Apron - 45 secs	
Length	7'6"	3'8"	5'10"	2'8"						Flap Gate	One 36" x 36"	

FOR 2½'x3' CONCRETE BOX AT STA 164+50 LT

Letter	A	B	C	D	E	F	G	H	K	Excavation	29.98 cu yds	Flow line elevation
Dimension	4'-0⅜"	7'-8"	3'-2⅜"	3'-8"	7'-0"	10'-7"	6'-9½"	8'-3⅜"	8"	Concrete	HEwl 940cuyds Apron 2.8cuyds	1292.90
Bar	a	b	c	d						Backfill	17.43 cu yds	Rip Rap - 22.62 sq yds
Number	10	16	5	4						Reinforcing Steel	HEwl - 182.81# Apron - 17.75#	
Size	¾ ϕ	½ ϕ	½ ϕ	½ ϕ						Sheet Piling	HEwl - 29 secs Apron - 27 secs	
Length	8'6"	2'8"	5'10"	2'8"						Flap Gate	One 36" x 36"	

FOR 4'x4' CONCRETL BOX AT STA 176+50 RT.

Letter	A	B	C	D	E	F	G	H	K	Excavation	42.02 cu yds	Flow line elevation
Dimension	5'-9⅜"	8'-8"	5'-2⅜"	5'-8"	8'-6"	19'-7"	7'-9½"	11'-3⅜"	1'-8"	Concrete	HEwl 1601 cuyds Apron-3.8cuyds	1290.80
Bar	a	b	c	d						Backfill	19.94 cu yds	Rip Rap - 28.69 sq yds
Number	14	18	5	5						Reinforcing Steel	HEwl - 301.50# Apron - 34.65#	
Size	¾ ϕ	½ ϕ	½ ϕ	½ ϕ						Sheet Piling	HEwl - 37 secs - Apron - 46 secs	
Length	10'0"	4'8"	6'10"	3'9"						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 weephole.
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 ¾ inch triangular mulding
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
137+30 RT. — 6 feet
150+80 LT. — None
157+40 RT. — 9 feet
164+50 RT. — 12 feet
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 extending into the headwall until the end is perpendicular. Concrete quantity shall be included with the headwalls concrete quantity.
Rip rap shall be placed on each side of all aprons
The distance that riprap shall extend in front of each apron is as follows:

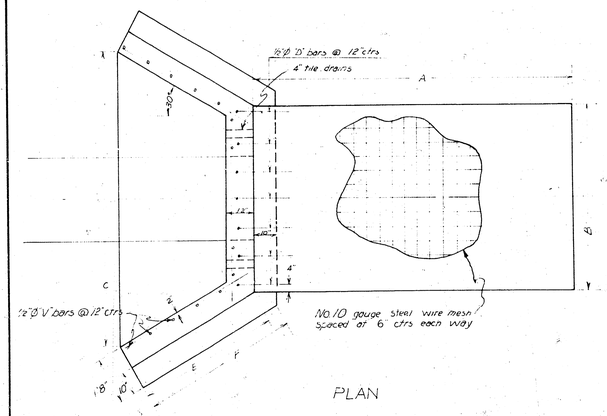
Sta 123+80 Rt — 6.0 feet
Sta 137+30 Rt — 15.0 feet
Sta 150+80 Lt — 5.0 feet
Sta 157+40 Rt — 9.0 feet
Sta 164+50 Rt — 20.0 feet
Sta 164+50 Lt — 15.0 feet
Sta 176+50 Rt — 18.0 feet

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:
APPROVED
CITY-ENGINEER
ENGINEER-IN-CHARGE
DRAWN J.R.S
TRACED
CHECKED
SHEET 6 OF 12

STATION	ELEVATION		
	A	B	C
53+50	1305.00	1299.25	1300.10
279+70 Lt	1280.20	1274.00	1273.00
157+70	1294.50	1289.00	1288.50



NOTE:

Outfall apron at sta 157+70 to be rip raped bottom and sides for a length of 24 ft. from headwall. The bottom shall be 8'2" wide. Slope of sides shall be one to one to top of natural bank.

NOTE:

Automatic flapgates to be similar to or equal to Calco Model 100 Manufactured by Hardesty Manufacturing Co Denver, Colo. to operate at a maximum head of 10 ft.

The corrugated sheet piling sections shall be of 12 gauge steel and 6 ft long

Remove one 40 in section of 36 in tile pipe before placing headwall

Cut 2 ft off of 48 IN CMP before Placing headwall

Headwalls to be placed at rt angles to ℄ of pipe.

For flap gate detail see sheet no. 11

2 secs of 4 inch tile 1 foot long are required for each headwall

LISTS OF BARS, DIMENSIONS, AND QUANTITIES FOR HEADWALLS FOR

36" TILE PIPE AT STA 279 + 70 LT.

Letter	A	B	C	D_1	D_2	E	F	G	H	J	K	L
Dimension	12'0"	6'8"	102¾"	36"	42"	5'3"	5'8"	11'11"	8'0"	6'0"	5'10"	12"
Bar	A	B	C	V	H	D	E					
Number	3	4	4	14	14	7	4					
Size	#8	#8	#8	#8	#8	#8	#8					
Length	7'6"	2'9"	1'9"	7'0"	5'4"	3'6"	36"					

Excavation	301.79 cu yds
Concrete	Hdwl - 7.60 cu yds - Apron 3.23 cu yds
Rein. Steel	174.35 lbs
Sheet Piling	63 Sections
Wire Mesh	23.1 lbs
Flap Gate	None
Backfill	18.65 cu yds
Rip Rap	11.26 sq yds

48" C.M. PIPE AT STA. 53+50 LT.

Letter	A	B	C	D_1	D_2	E	F	G	H	J	K	L
Dimension	6'0"	6'0"	102¾"	48"		5'3"	5'8"	11'11"	9'0"	7'0"	5'10"	12"
Bar	A	B	V	H	D	E						
Number	3	4	14	16	7	4						
Size	#8	#8	#8	#8	#8	#8						
Length	7'6"	2'3"	0'8"	5'4"	3'6"	3'3"						

Excavation	28.76 cu yds
Concrete	Hdw. 7.76 cu yds Apron 1.41 cu yds
Rein Steel	186.81 lbs
Sheet Piling	53 Sections
Wire Mesh	14.91 lbs
Flap Gate	48"
Backfill	17.26 cu yds
Rip Rap	6.22 sq yds

60" CONCRETE PIPE AT STA 157+70 LT

Letter	A	B	C	D_1	D_2	E	F	G	H	J	K	L
Dimension	24'0"	6'2"	11'8¾"	60"	70"	5'3"	5'8"	13'5"	10'0"	8'0"	5'10"	12"
Bar	A	B	V	H	D	E						
Number	3	4	14	18	8	4						
Size	#8	#8	#8	#8	#8	#8						
Length	9'6"	2'4"	9'6"	5'4"	3'6"	3'2"						

Excavation	84.45 cu yds
Concrete	Hdwl 8.62 cu yds
Rein. Steel	209.63 lbs
Sheet Piling	38 sections
Rip Rap	52.03 Sq yd.
Flap Gate	60"
Backfill	37.90 cu yds

AT STA 157+70 LT.

QUANTITIES FOR RELAYING PIPE	
Excavation	430.81 cu yds
Reinf Conc Pipe	196.0' of 60" ℄
Backfill	59.80 cu yds

General Notes

Coarse aggregate shall be deposited behind each weephole to occupy a space extending 15 in in all direction from the weephole

All exposed edges shall be beveled with ¾ in triangular molding

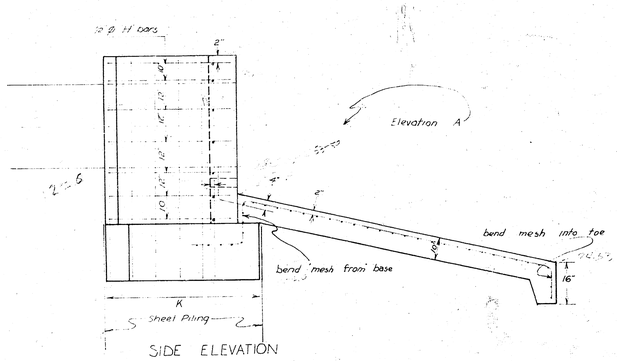
All reinforcing dimensions are to centerlines of bars

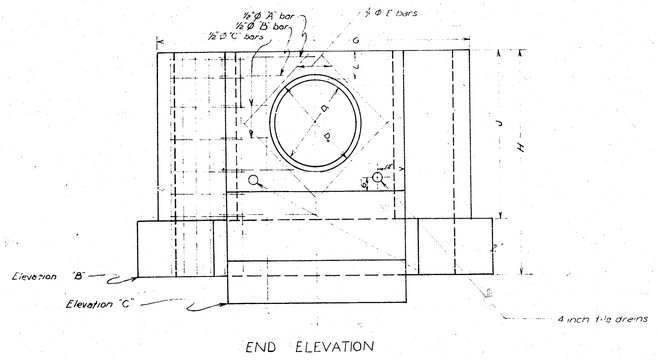
Two feet of riprap shall be placed on each side of all aprons

The distance that no rap shall extend in front of each apron is as follows.

Sta 279+70 Lt - 5 feet

Sta 53+50 Lt 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.

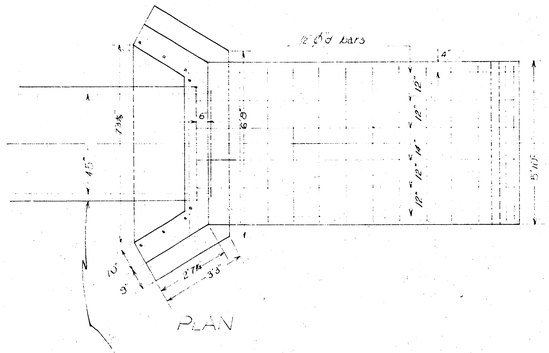
CITY-COUNTY ENGINEER OFFICE, WICHITA, KANSAS

APPROVED: _____ CITY-ENGINEER

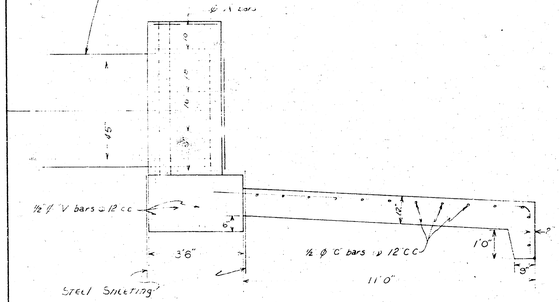
APPROVED: _____ ENGINEER-IN-CHARGE

DRAWN C.W.G
TRACED
CHECKED

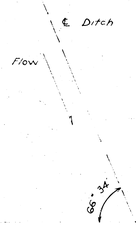
SHEET 7 OF 12



Original concrete pipe



SIDE ELEVATION



Sta. 163 + 40 Lt.

REIN. STEEL SCHEDULE

Type	A	C	D	H	V
Number	5	13	6	3	8
Size	10 ℄	½ ℄	12 ℄	5 ℄	16 ℄
Length	21' 9"	5'6"	13'6"	6'0"	5'11½"

ESTIMATE OF QUANTITIES

Exca.	14.43 Cu. Yds.
Conc.	6.00 Cu. Yds.
Rein. Steel	150.47 Lbs.
Sheet Piling	192.00 Ft.
Flap Gate	48" ℄
Backfill	6.31 cu. yds.
Rip Rap	7.07 sq. y'ds.

QUANTITIES FOR RELAYING PIPE

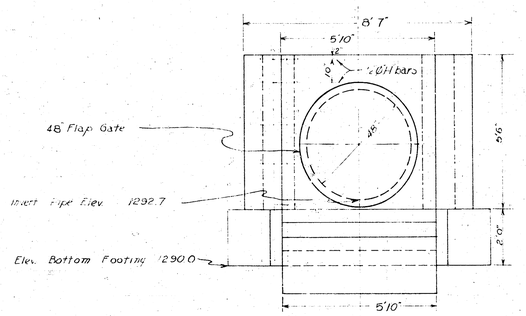
Excavation	416.15 cu. yds.
Reinf. Conc. Pipe	176.0 l.f. 18" ℄
Backfill	312.51 cu. yds.

Note:

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 Armco Flange Type 12 gauge manufactured by Armco Drainage and Metal Products Inc. Middletown, Ohio

All exposed edges shall be beveled with a ¾ inch triangular molding
All reinforcing dimensions are to the centerline of the bars
The headwall shall be placed perpendicular to the axis of the pipe
Rip rap shall be placed around the apron for a distance of 2 feet



END ELEVATION

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

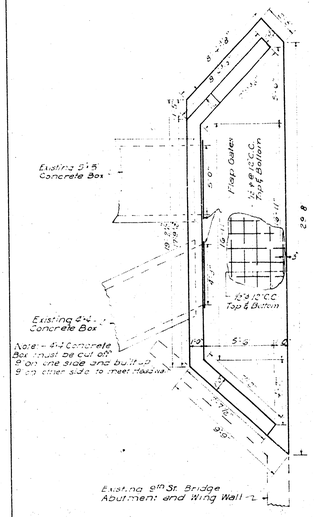
APPROVED: _____ CHAIRMAN

DRAWN C.W.O.
TRACED
CHECKED

SHEET 8 OF 12

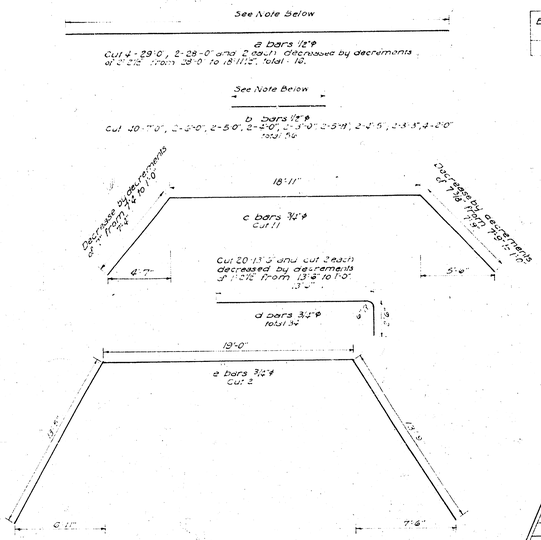
ESTIMATE OF QUANTITIES FOR HEADWALL AT STA 137+30 LT.

Excavation Cu Yds.	Sheet Piling Lineal Feet	Reinforcing Steel Lbs.	Concrete Cu Yds.	Flap Gates Inches	Backfill Cu Yds.	Drain Tile Lineal Feet
50.0	372	1742	31.35	2-40"x 60"	8.1	2

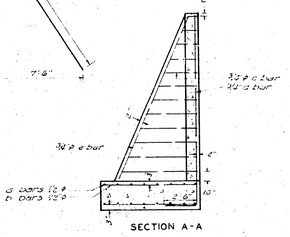


PLAN

Note: Place flap gate & headwall 3' in front of existing 8'-8 Concrete Box and perpendicular to axis of Str.



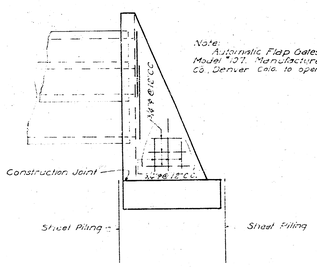
REINFORCING BAR BENDING DIAGRAM



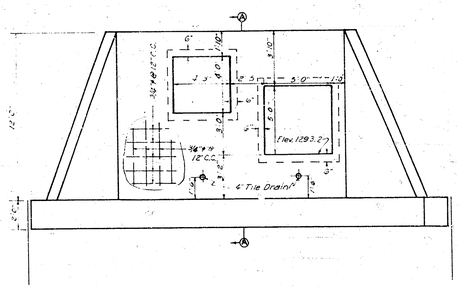
SECTION A-A

GENERAL NOTES

Corrugated Sheet Piling Sections shall be of 12 gauge steel and 6 feet in length.
For Flap Gates 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.
All exposed edges shall be beveled with 3/4 inch triangular molding
All reinforcing dimensions are to the center-line of the bar.



SIDE ELEVATION



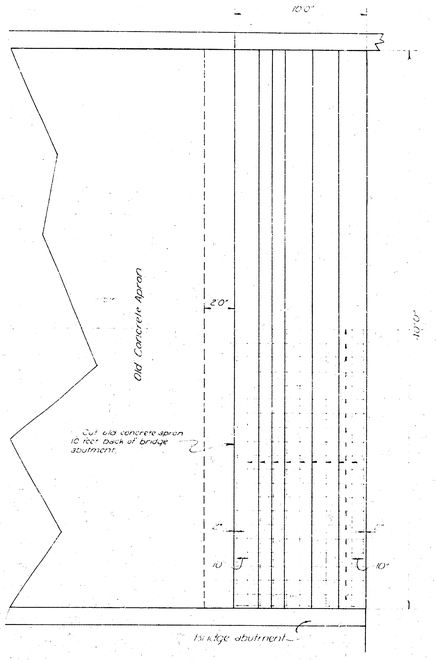
FRONT ELEVATION

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
APPROVED: _____ ENGINEER IN CHARGE

DRAWN
TRACED
CHECKED

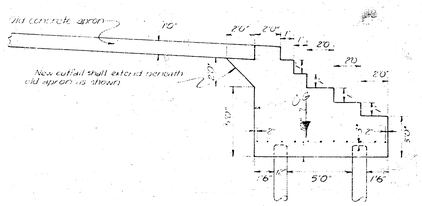


PLAN

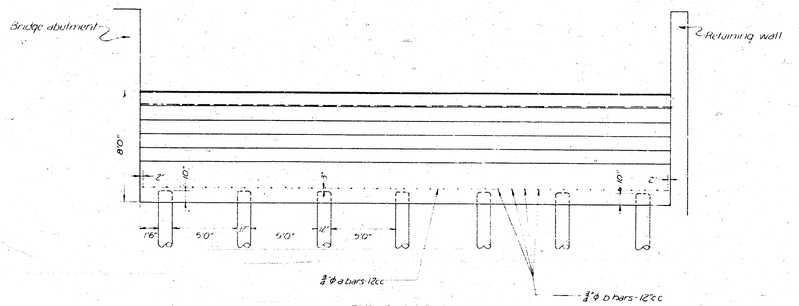
REIN STELL SCHEDULE		
Bar	a	b
Number	11	41
Size	1 ϕ	¾ ϕ
Length	39'8"	9'8"

ESTIMATE OF QUANTITIES	
Excavation	94.81 cu yds.
Concrete	81.48 cu yds.
Reinforcing Steel	1 ϕ - 1250.67#
Sheet Piling	40 secs of 18 gauge - 6' long
Piling	14 - 12" treated pile - 20' long

NOTE
All centering measurements are to the center line of the bars.
Bevel all exposed edges with ¾ inch triangular molding.
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.
New concrete at top of outfall shall be made flush with old apron.



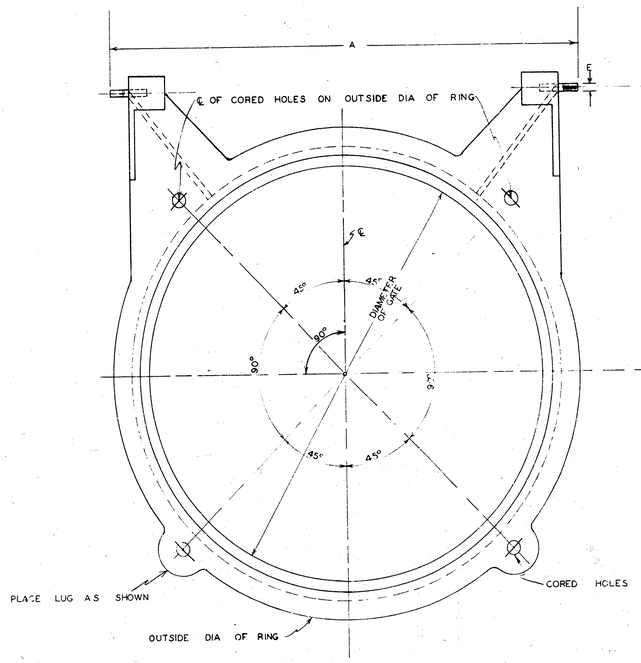
SIDE ELLVATION



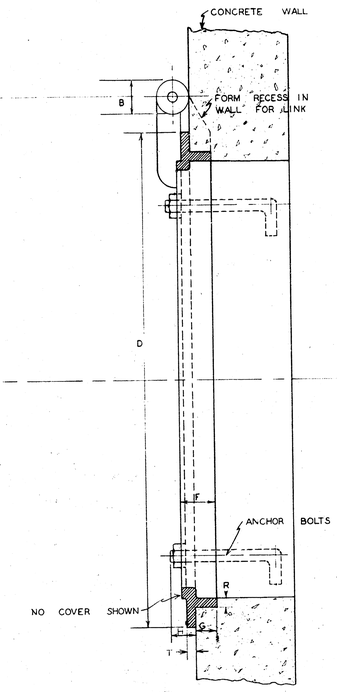
END ELLVATION

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 L.T.

SCALE 1 INCH 4 FEET
CITY-COUNTY ENGINEER OFFICE WICHITA KANSAS
APPROVED:
CITY-ENGINEER
APPROVED
ENGINEER IN CHARGE
DRAWN J.R.S.
TRACED
CHECKED
SHEET 10 OF 12



FRONT ELEVATION
RING ONLY

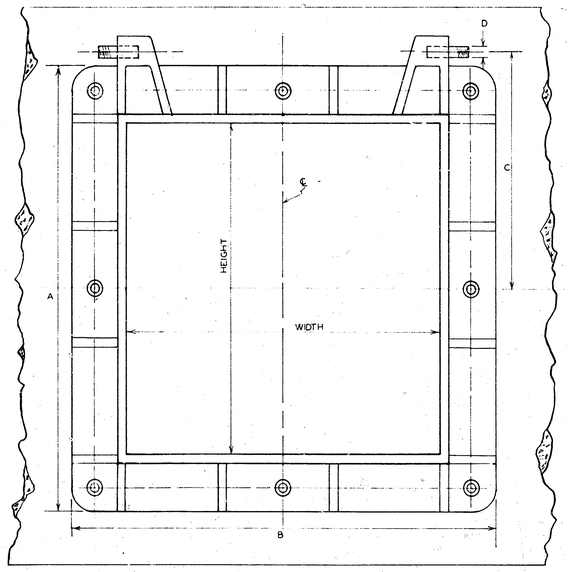


SECTION ON ℄

FLAP GATE SCHEDULE — CALCO MODEL #100												
STATION	DIA	A	B	C	D	E	F	G	H	R	T	ANCHOR BOLT DIA
53+50	48"	53½"	2⅛"	34"	54"	1"	4"	2 3/16"	1 3/16"	¾"	⅜"	⅜"
61+50	24"	28¼"	2"	17"	27½"	¾"	2 7/16"	1 1/2"	1 1/16"	9/16"	5/16"	5/16"
157+70	60"	66¾"	2½"	42"	60½"	1¼"	4 3/16"	2 3/16"	2 1/16"	7/16"	15/16	1"
163+40	48"	53⅛"	2½"	34"	54"	1"	4"	2 3/16"	1 3/16"	¾"	⅜"	⅜"

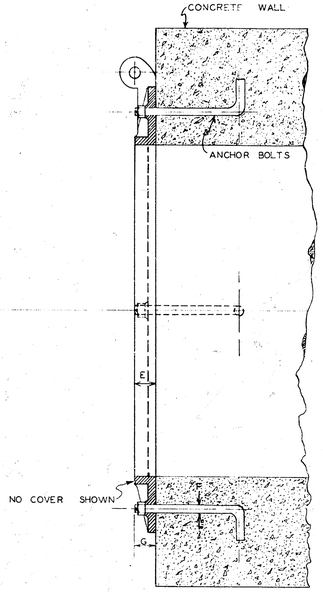
ARKANSAS RIVER BASIN
WICHITA AND VALLEY CENTER
FLOOD CONTROL PROJECT
EAST BRANCH INTERCEPTION CANAL &
WICHITA DRAINAGE CANAL
FLAP GATE DETAIL
MODEL 100

SCALE: 1 INCH= 4 INCHES
CITY-COUNTY ENGINEER OFFICE WICHITA KANSAS
APPROVED: APPROVED:
CITY-ENGINEER ENGINEER-IN-CHARGE
DRAWN CWG
TRACED
CHECKED
SHEET 11 OF 12



FRONT ELEVATION

RING ONLY



SECTION ON ℄

FLAP GATE SCHEDULE — CALCO MODEL 107

STATION	GATE SIZE WIDTH	GATE SIZE HEIGHT	A	B	C	D	E	F	G
86 + 30Lt	60"	60"	70"	70"	42"	1¼"	2⅛"	1"	2¼"
93 + 30Lt	40"	40"	57"	57"	34"	1"	2⅛"	⅝"	1⅜"
109 + 30	60"	60"	70"	70"	42"	1¼	2⅛	1"	2¼"
123 + 80	36"	36"	44"	44"	25"	1"	2⅛	⅝"	1⅜"
137 + 30Lt	60"	60"	70"	70"	42"	1¼"	2⅛	1"	2¼"
137 + 30Rt	60"	60"	70"	70"	42"	1¼"	2⅛	1"	2¼"
137 + 70Rt	40"	40"	57"	57"	34"	1"	2⅛	½"	1⅜"
150 + 60Lt	40"	40"	57"	57"	34	1"	2⅛	½"	1⅜"
157 + 40Rt	36"	36"	44"	44"	25"	1"	2⅛	⅝	1⅜"
164 + 50Lt	36"	36"	44"	44"	25"	1"	2⅛	⅝"	1⅜"
164 + 50Rt	36"	36"	44"	44"	25"	1"	2⅛	⅝"	1⅜"
176 + 50Lt	40"	40"	57"	57"	34"	1"	2⅛	½"	1⅜"
176 + 50Rt	40"	40"	57"	57"	34"	1"	2⅛"	½"	1⅜"

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

APPROVED: _____ ENGINEER-IN-CHARGE

DRAWN CWG
TRACED
CHECKED

SHEET 12 OF 12