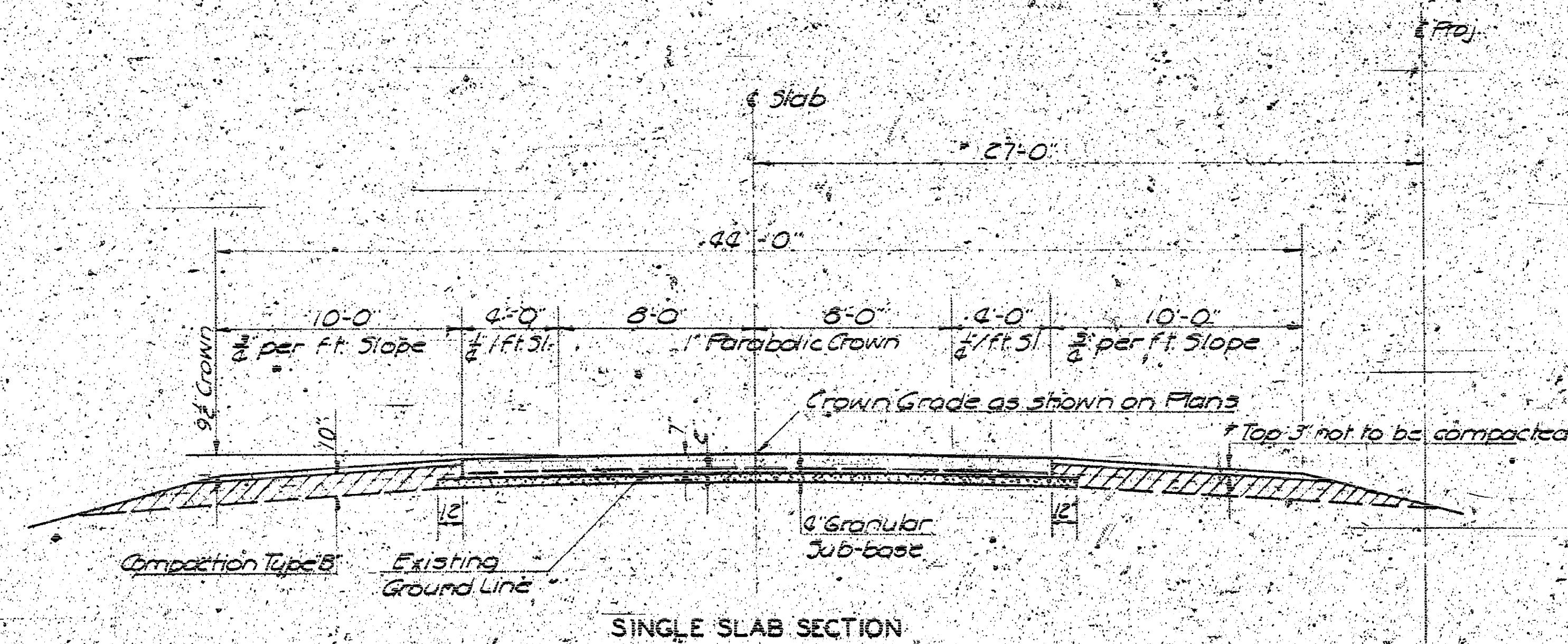
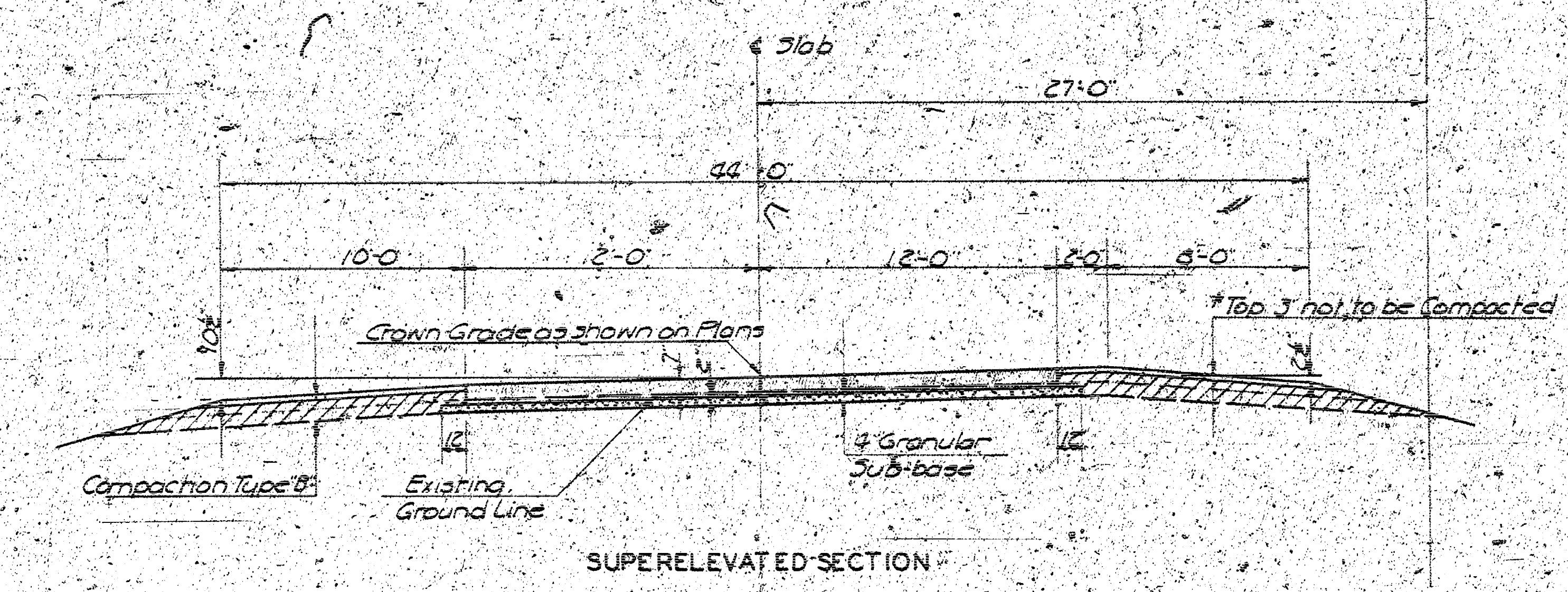




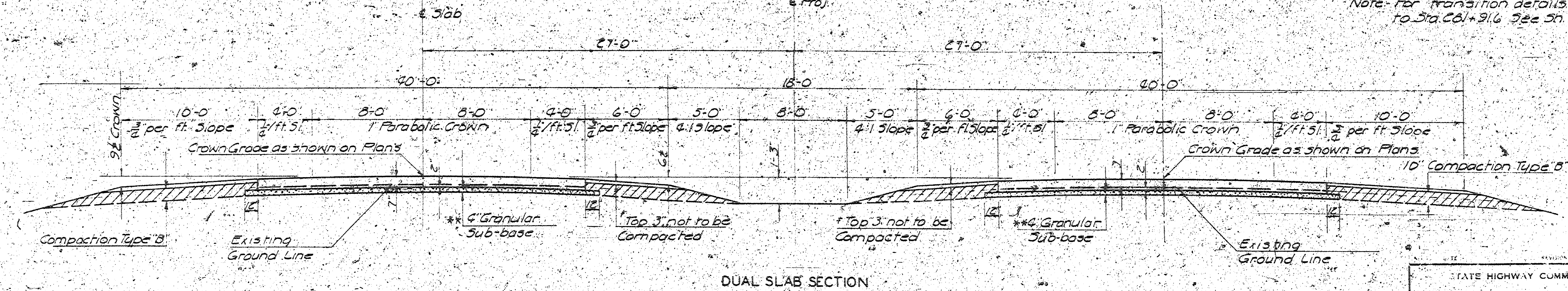
*Varies from 0' at Sta. 17+71.5 to 27' at Sta. 29+40.



*The top 3" of shoulder material is to be obtained from shallow pits so that suitable seedbed material is secured for seeding.

Note: The material excavated by paving contractor is to be used for pavement curing and shouldering.

Note: For transition details Sta. 270+30 to Sta. 281+31.6 See Sht. No. 5.



**Note: Granular sub-base not required from Sta. 331+00 to Sta. 399+330.

STATE HIGHWAY COMMISSION OF KANSAS			
TYPICAL SECTIONS			
SHEET NO.	OF	SCALE	APP'D.
DESIGNED	BY	DETAILS	QUANTITIES
DESIGN CK.	BY	DETAIL CK.	QUANT. CK.
		TRAILED	
		SCALE	

Lineal Feet of Pipe Shown on Plans

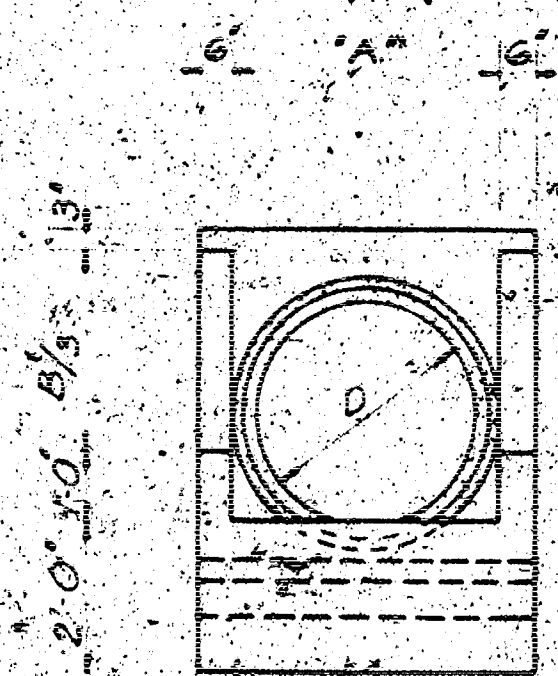
Roadway or Length (11'-6" - K) less than Lineal Feet of Pipe

Roadway or Length Lt

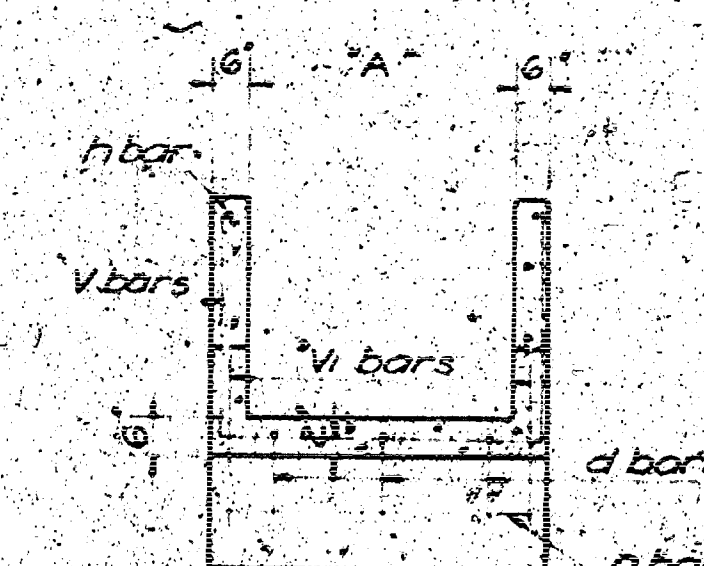
Roadway or Length Rt



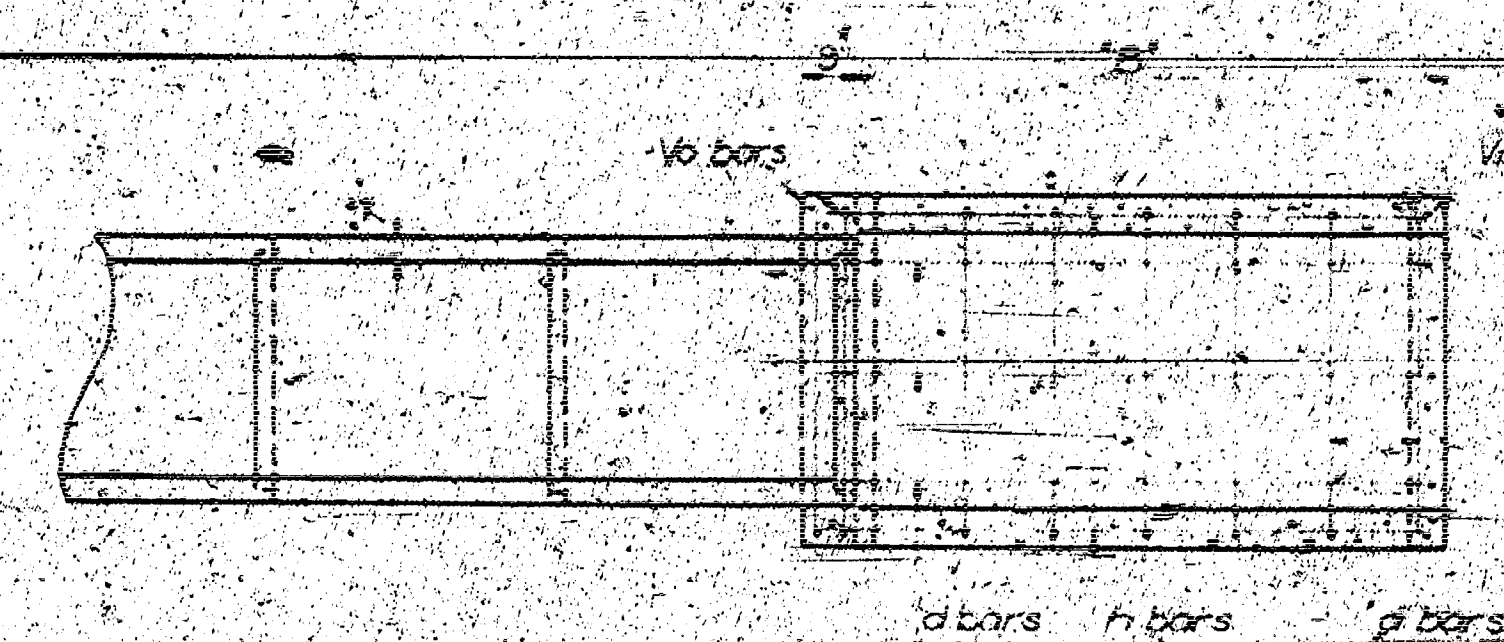
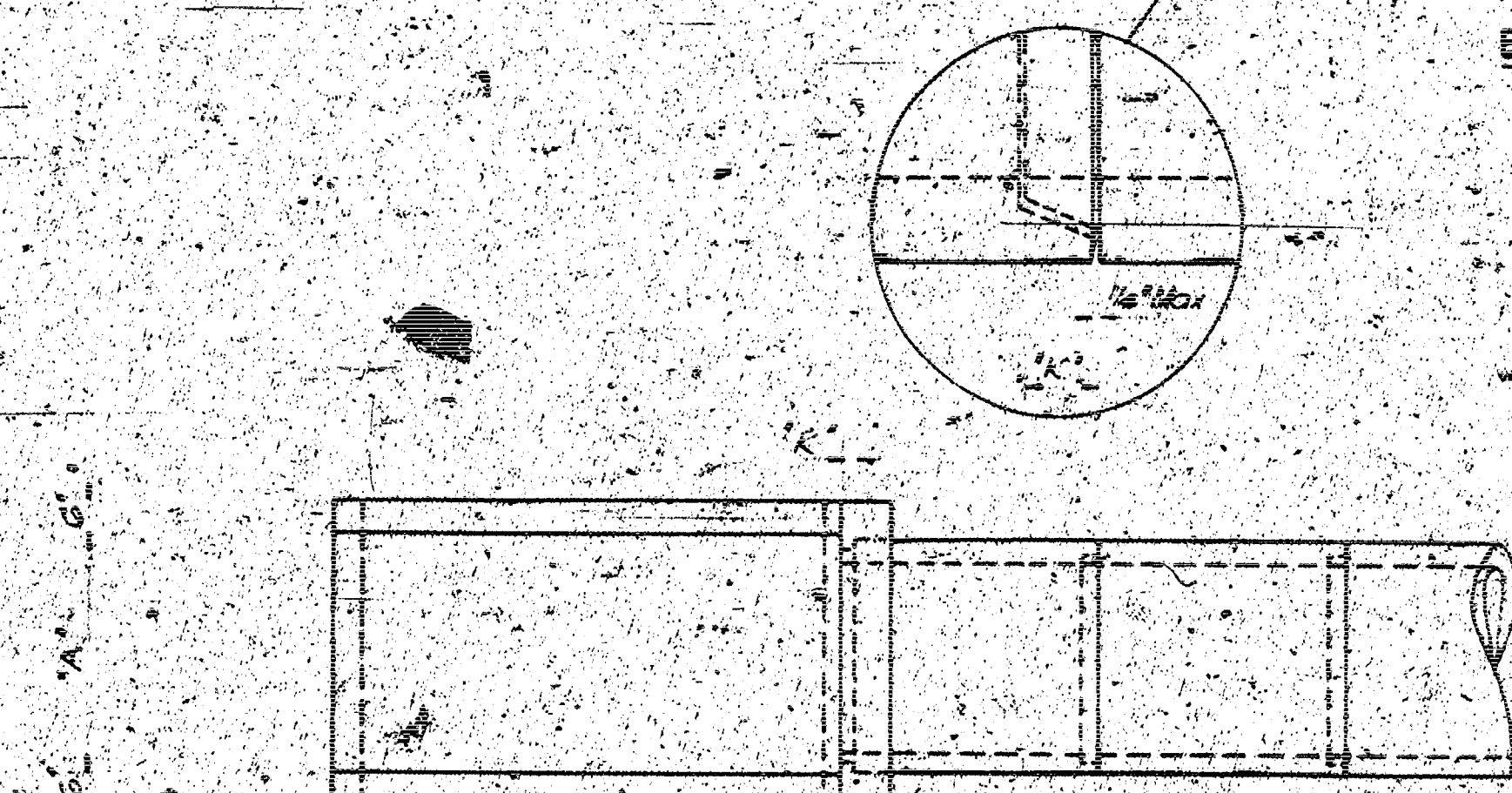
ELEVATION AND SECTION



END ELEVATION



SECTION A-A



PLAN AND SECTION

LIST OF BARS, DIMENSIONS AND QUANTITIES

TWO HEADVALS FOR 30" PIPE

Letter	A	B	D	K	T
Dimension	2'-6"	5'-5"	2'-0"	3"	3"
Bar	O	d	h	V	Vo
Number	16	4	8	8	4
Length	3'-9"	6'-11"	5'-11"	4'-0"	2'-0"
Class A Concrete	2.4		Cu Yds		
Reinforcing Steel	120		Lbs		

TWO HEADVALS FOR 36" PIPE

Letter	A	B	D	K	T
Dimension	3'-9"	8'-3"	3'-0"	3/4"	4"
Bar	O	d	h	V	Vo
Number	16	6	8	10	8
Length	4'-6"	9'-11"	3'-2"	5'-0"	2'-0"
Class A Concrete	6.6		Cu Yds		
Reinforcing Steel	210		Lbs		

TWO HEADVALS FOR 30" PIPE

Letter	A	B	D	K	T
Dimension	3'-0"	6'-3"	2'-6"	5/8"	3/4"
Bar	O	d	h	V	Vo
Number	16	4	8	8	4
Length	3'-9"	8'-5"	7'-6"	4'-6"	2'-0"
Class A Concrete	3.4		Cu Yds		
Reinforcing Steel	160		Lbs		

TWO HEADVALS FOR 42" PIPE

Letter	A	B	D	K	T
Dimension	4'-3"	9'-9"	3'-6"	3/4"	4 1/2"
Bar	O	d	h	V	Vo
Number	16	6	8	12	8
Length	5'-0"	11'-5"	10'-8"	5'-6"	2'-0"
Class A Concrete	5.8		Cu Yds		
Reinforcing Steel	250		Lbs		

GENERAL NOTES

LOADING: H20-44 AASHTO Specifications, 1993 Edition
UNIT STRENGTHS: $f_c = 3000 \text{ psi}$; $f_y = 1000 \text{ psi}$; $f_s = 20,000 \text{ psi}$.
Class A Concrete shall be used thruout. Bevel
all exposed edges with a $\frac{1}{4}$ " triangular molding.
No deductions shall be made for pipe openings.
All reinforcing shall be billet steel, intermediate
grades. All dimensions are to center-line of
bars unless otherwise noted.

[illegible]

NOTE: ALL REINFORCING BARS ARE 1/2" Ø

NO.	DATE	REVISIONS	BY	APP.
1	6-28-50	Revised Roadway & Length	J.H.B.	E.A.R.

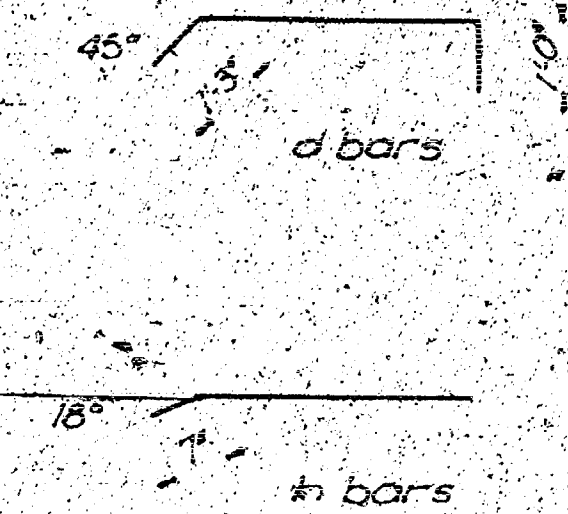
STATE HIGHWAY COMMISSION OF KANSAS

CONCRETE HEADWALLS
FOR
PIPE CULVERTS

STD. NO. 300.1

SHEET NO. 1	OF 1	SCALE 1/8" = 1'	APPROVED <i>[Signature]</i>	
DESIGNED JMB	DETAILED JMB	QUANTITIES JMB	TRACED JF	
DESIGN CK JML	DETAIL CK JML	QUAN CK JML	TRACE CK JMB	

BENDING DIAGRAMS



SIX'S CULVERTS

Letter	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Dimension	6'-0"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	15'-6"	16'-0"	16'-6"	17'-0"	17'-6"	18'-0"	18'-6"	19'-0"
Bar	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
dia	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4	#4
Length	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"

d bars

2 bar = (S + T) d = 3'

v bar = (H + T) v = 3d = 9'

Hooked a 6' v bars

d bars
v bars

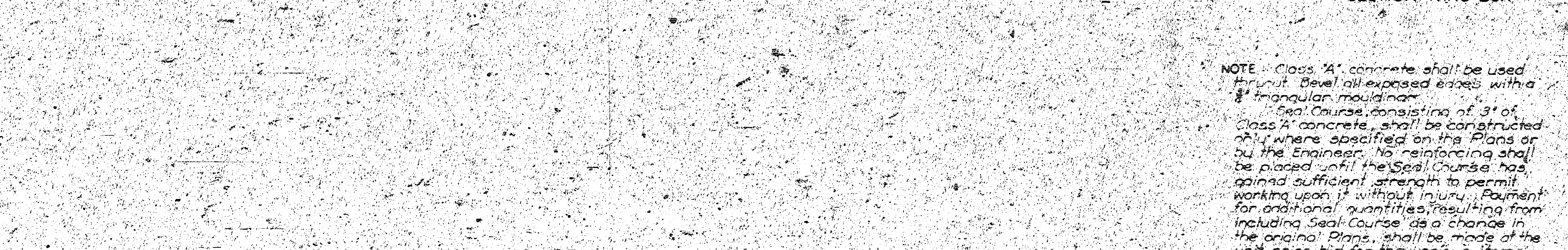
Increase this dimension by 6" increments from length shown above. Cut 2 bars each length.

v bars

d bars

- Use hooked d bars only on 6' x 6' spalls and under design fills of 10'-0" or more.
- Use hooked v bars only on 6' x 6' spalls and under design fills of 10'-0" or more.

BENDING DIAGRAMS

[illegible]

NOTE: Class A1 concrete shall be used through level all-exposed areas, with a 3" triangular moulding.

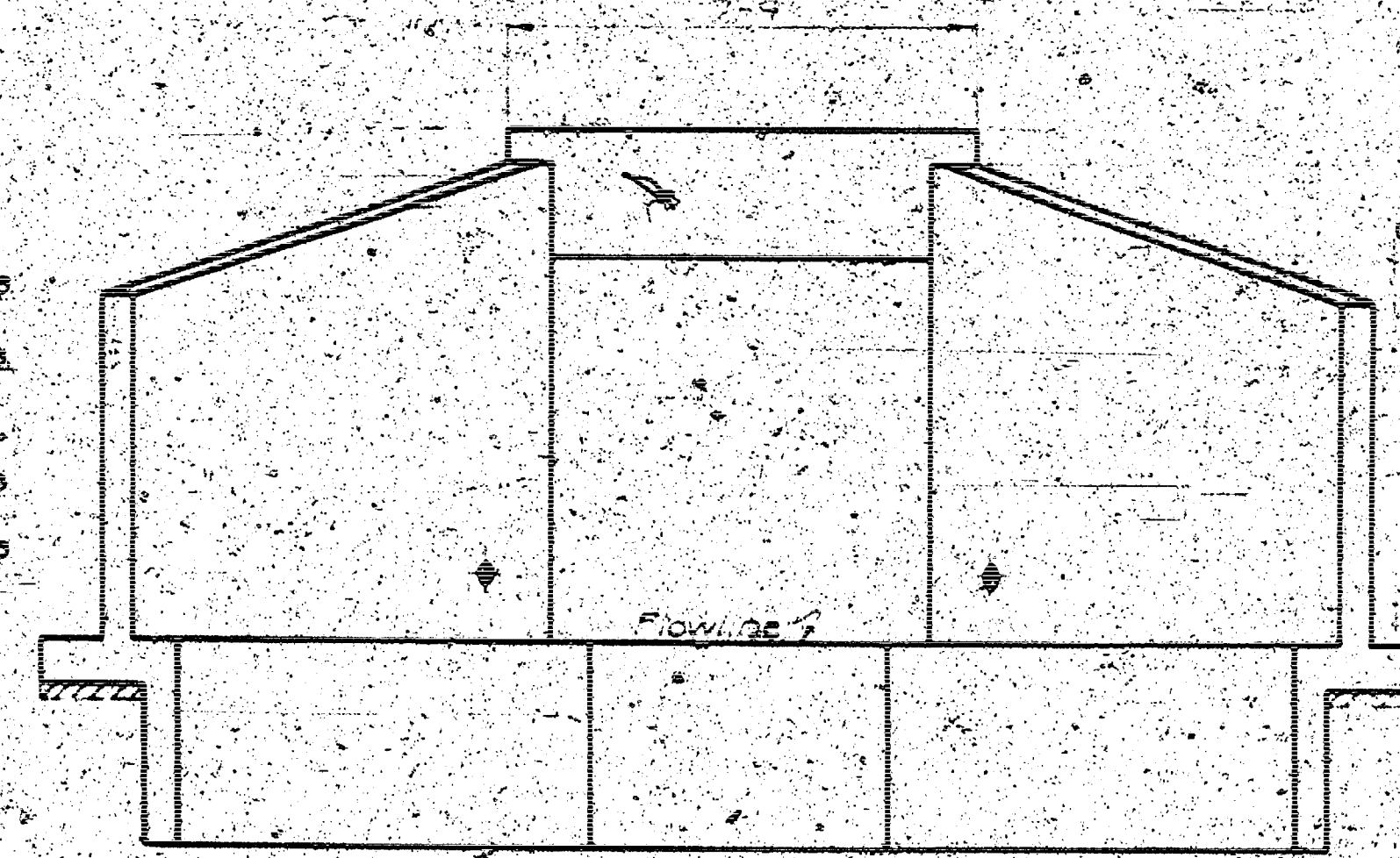
Seal Course, consisting of 3" of Class A1 concrete, shall be constructed at all corners above the Plans or by the Engineer. No reinforcing shall be placed until the Seal Course has gained sufficient strength to permit the placement of the concrete without additional quantities, resulting from including Seal Course as a change in the original Plans, shall be made of the unit to be bid for the various items involved.

Corrosive materials shall be deposited behind each wheelbase, to keep away any penetrating oil or dirt, directly from the wheels. This waste shall not be paid for directly but shall be considered a part of the excavation.

Reveal joints shall be provided as shown on all locations, except at corners, which are 45° or more, in box lengths. They shall be spaced so as to divide the box in sections of equal length.

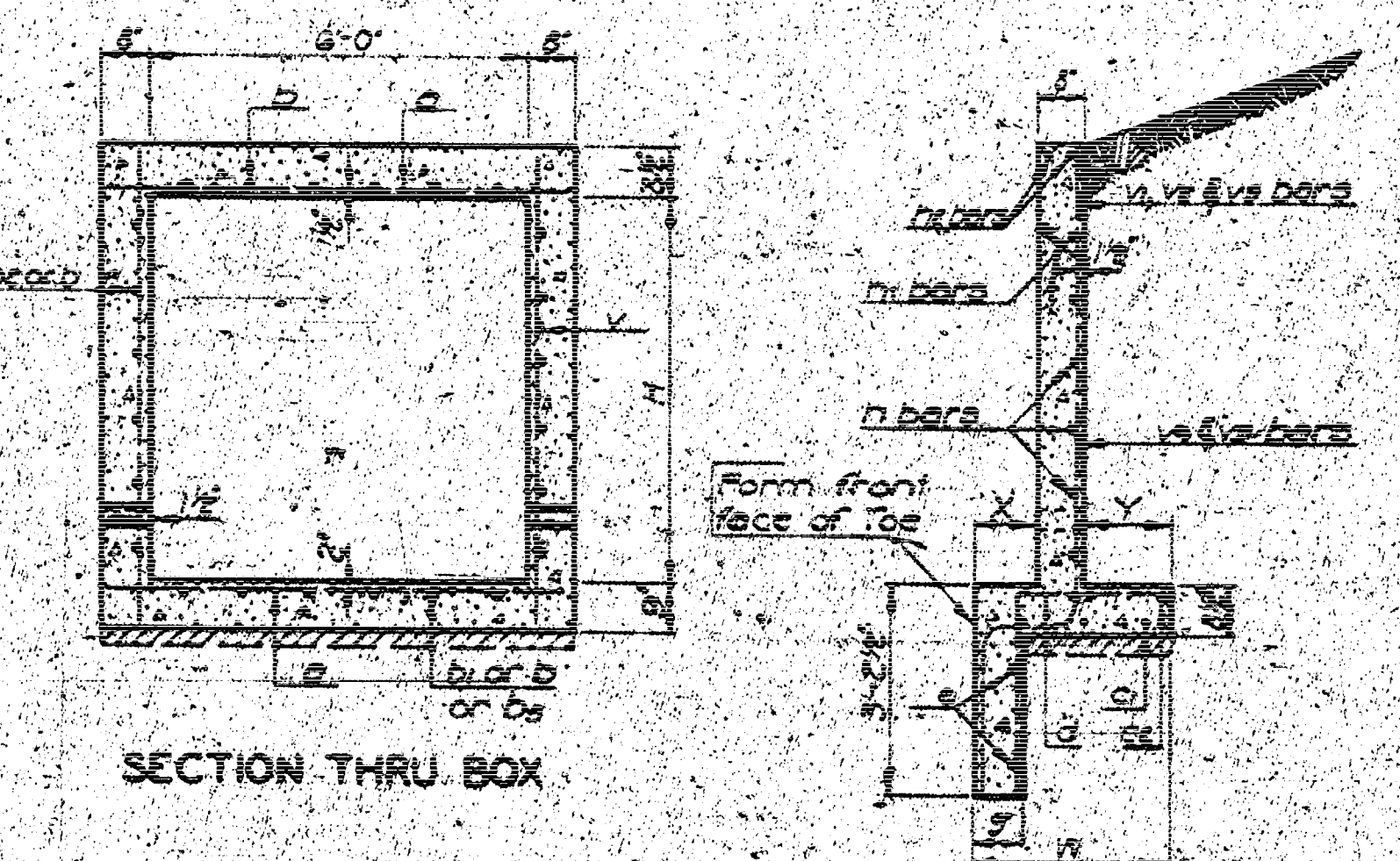
Reveal joints shall be provided as follows: 25° to 59° - 3 joints; 60° to 79° - 2 joints; 80° to 99° - 3 joints; 100° to 119° - 4 joints; 120° to 139° - 5 joints; etc.

46 29 Barna Highway WED 4
 NO DAY REVISIONS BY APPD
 STATE HIGHWAY COMMISSION OF KANSAS
 CONCRETE
 BOX CULVERT
 2.3, 4 & 5 FT SPANS
 STD. NO. 310 SCALE 1/4" = 1' (See 29-10-1000)
 DESIGNED BY: L. A. H. & S. DETAILER: J. J. L. TRACER: H. A. S.
 CHECKED BY: J. J. L. APPROVED BY: J. J. L. DATE: 6-26-64



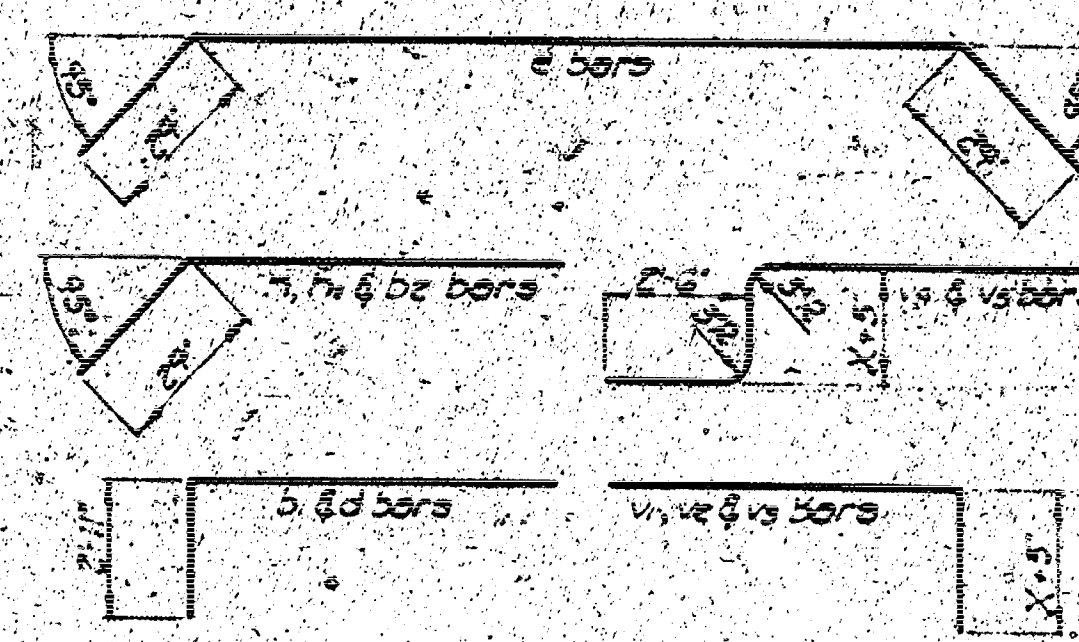
ELEVATION AND SECTION

END ELEVATION



SECTION THRU BOX

SECTION THRU WING



SECTION THRU APRON

NOTE: Keyed joints to be provided as shown and all curves to be 15' or more in length and to be as specified on the drawings. To divide the box into sections of equal length, the number of joints to be used shall be as follows:

45' to 55'	1 joint
60' to 70'	2 joints
80' to 90'	3 joints
100' to 110'	4 joints
120' to 130'	5 joints

Maximum height of fill for
this design - 13'-0"

NOTE: Class A Concrete to be used thruout. Bevel all exposed edges in a dry random mending.

Base Course consisting of 4" or Class A Concrete to be constructed only where specified on the Plans or by the Engineer. No reinforcing shall be placed until Seal Course has gained sufficient strength to permit working upon it without raveling.

Drainage Apron to be constructed only between downstream wings in locations subject to scour where specified on the Plans or by the Engineer.

Payment for additional quantities resulting from including Seal Course and Apron, see changes in original Plans, shall be made of unit price bid for various items involved.

Wire reinforcing mesh shall be of the electrically welded square mesh type and shall be composed of No. 10 gauge steel wire spaced at 6" centers each way.

[illegible]

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3	3-89	Revise Max. fill height. (WRD)	WAB	GOM
2	4-96	1-2 bars deleted	WRD	LHV
1	4-96	Notations & Revisions (WRD)	WAB	LHV
NO.	DATE	REVISIONS	BY	APP'D

STATE HIGHWAY COMMISSION OF KANSAS

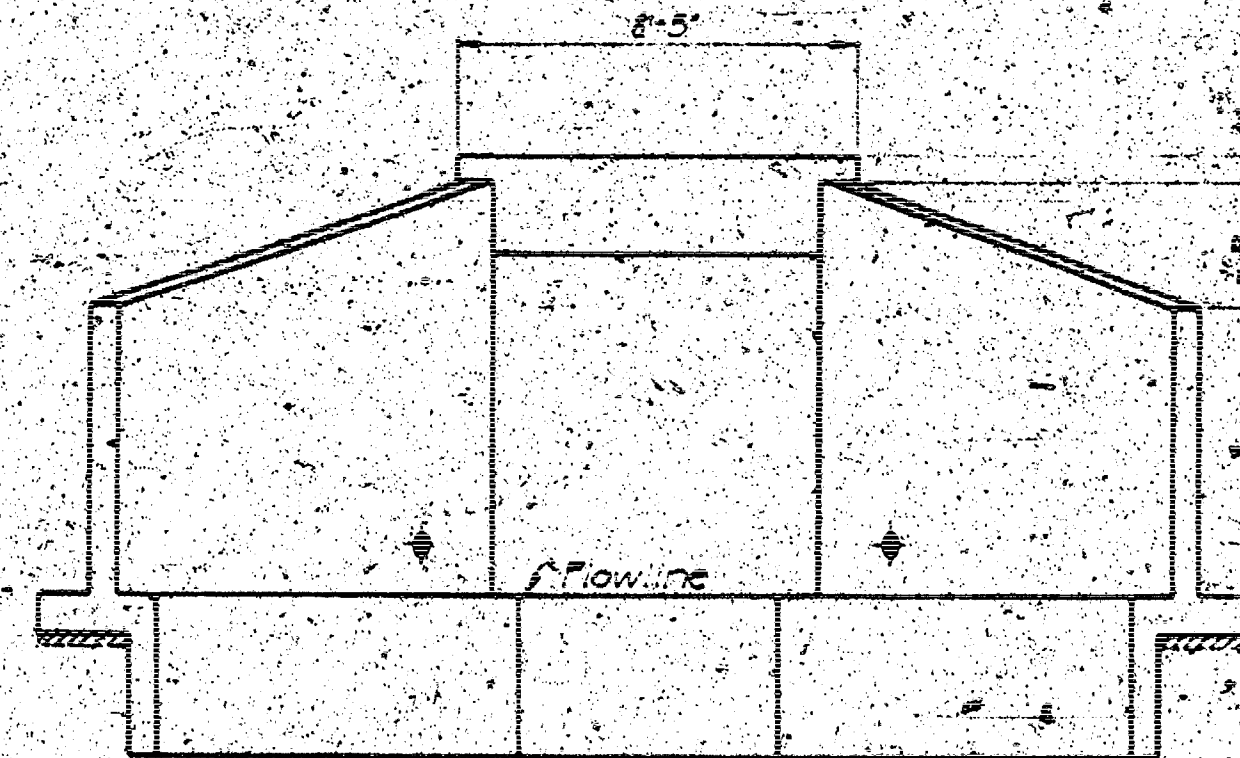
CONCRETE
BOX CULVERT
6 FT. SPAN

STD. NO. 312

SCALE 8"=1'

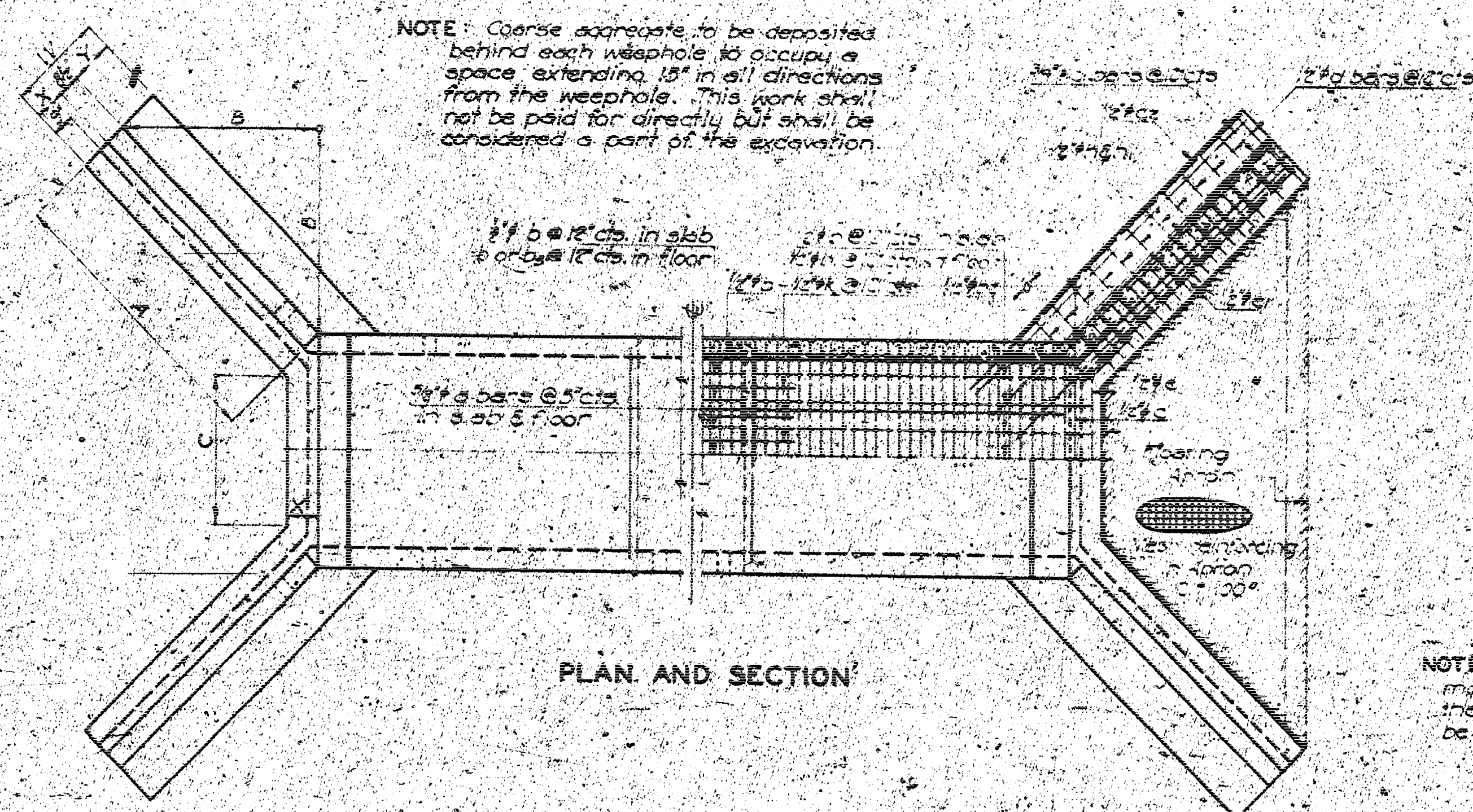
DESIGNED BY M.D. DATE 4-8-82 CHECKED BY B.G.G. TRACED BY M.D.S.

CHECKED BY G.L.R. APPROVED BY _____ DATE _____

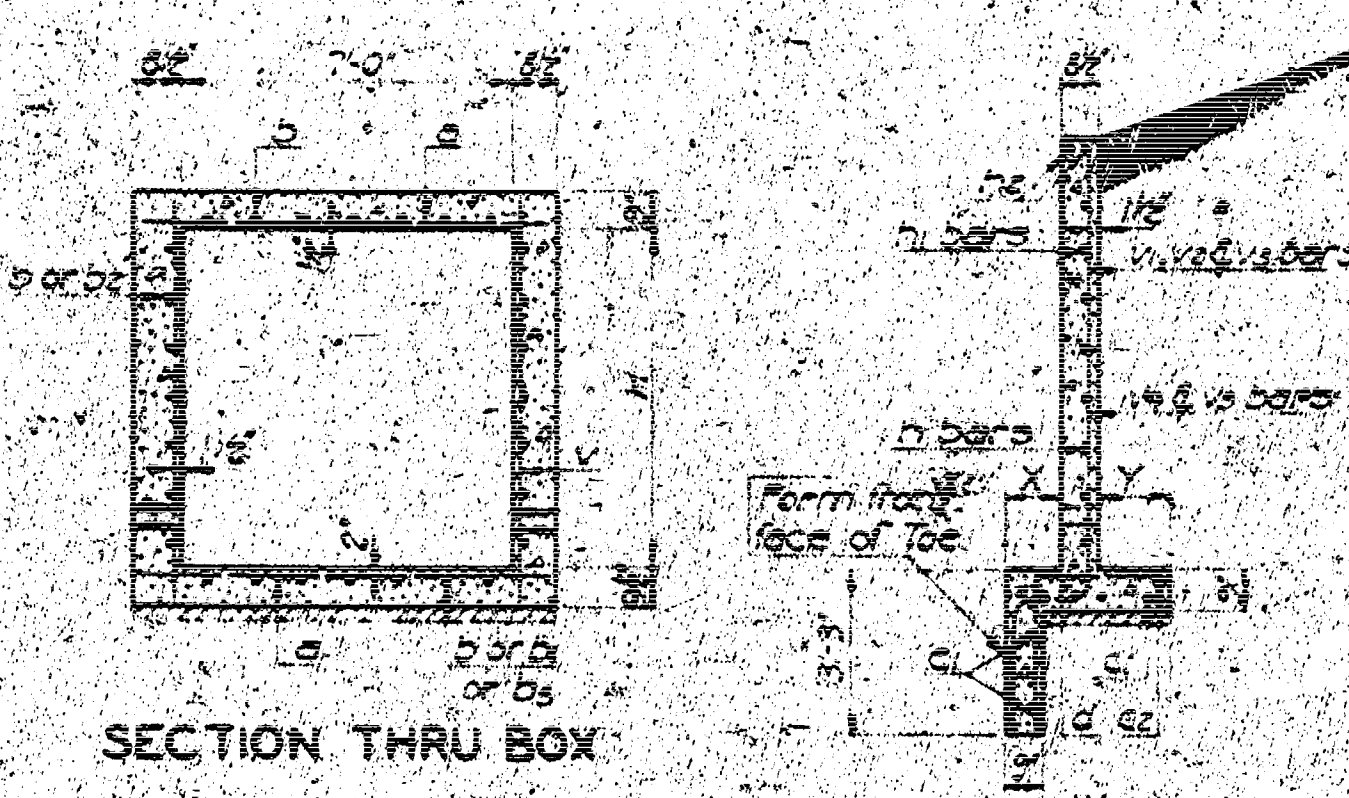


ELEVATION AND SECTION

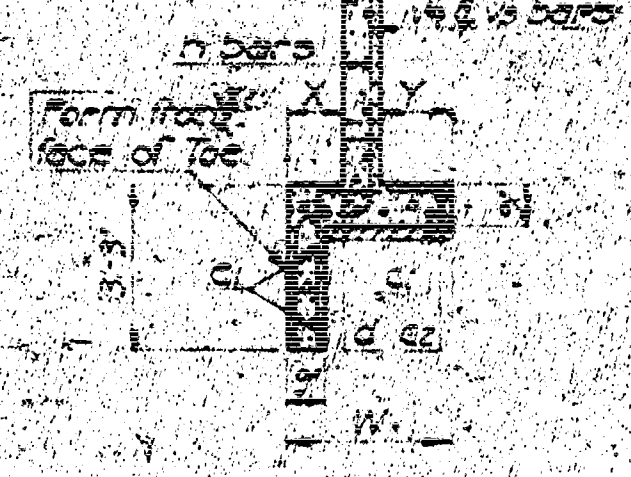
END ELEVATION



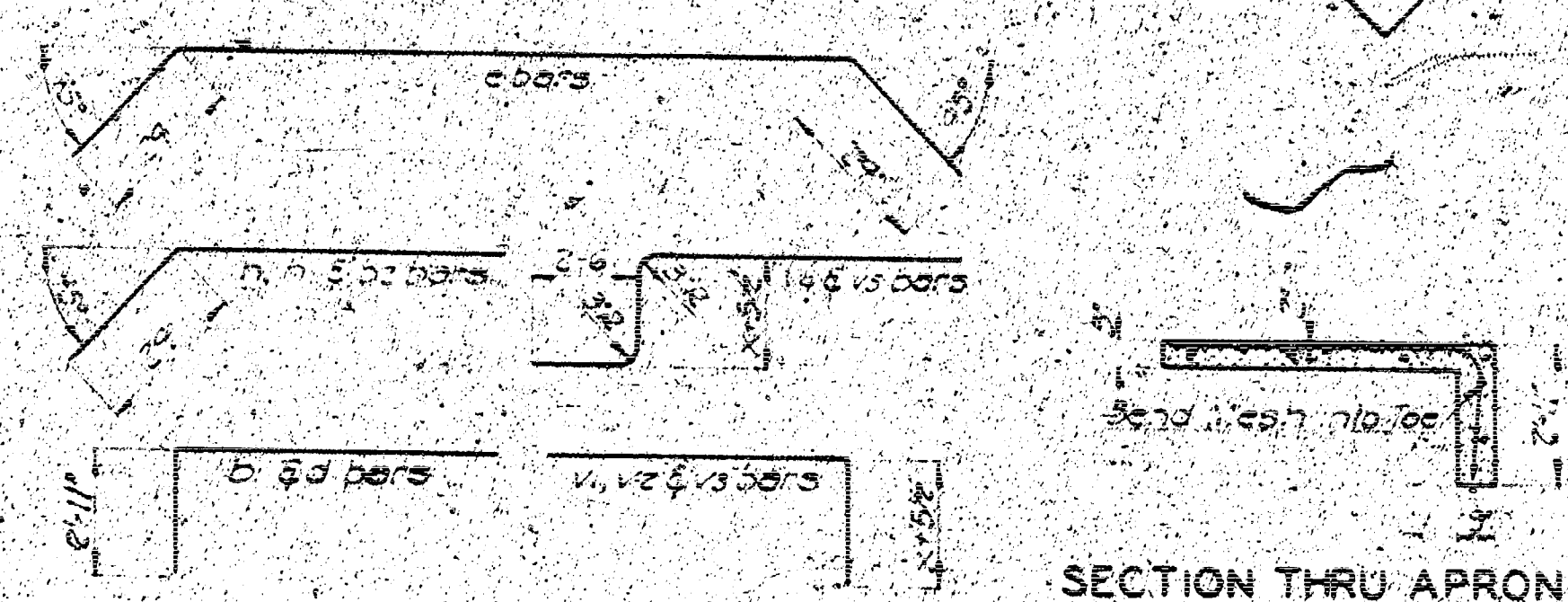
PLAN AND SECTION



SECTION THRU BOX



SECTION THRU WING



SECTION THRU APRON

NOTE: - Knees joints to be provided as shown on all girders of 45" or more in depth. Box girders ending to be spaced as to fit the depth of the box. Units sections of equal length. The number shown to be used shall be as follows:

45 to 59" - 1 joint	Box
60 to 79" - 2 joints	
80 to 99" - 3 joints	
100 to 119" - 4 joints	
120 to 139" - 5 joints	

Max. min. height of girder to be used shall be as follows:

14'0" to 14'6" - 70'	Box
14'6" to 15'0" - 75'	

[illegible]

NOTE: Class A Concrete to be used in road base on exposed edges with a minimum depth of 12" and Class A Concrete Seal Course consisting of 1" of Class A Concrete to be constructed only where specified on Plans or by the Engineer. No reinforcing shall be placed until Seal Course has gained sufficient strength to permit working upon it without injury.

Rolling Apron to be constructed only between downstream and upstream abutments to be located where specified on Plans or by the Engineer.

Payment for additional quantities resulting from including Seal Course and Apron, as changes in original Plans, shall be made at unit price bid for various items involved.

Reinforcing mesh shall be of the electrically welded, square mesh type and shall be composed of No. 6 gauge, steel wire spaced of 6" centers, each way.

[illegible]

3			
2	6-66	2nd bars deleted	W.R.D. L.H.V.
1	4-68	Notations & Tables (W.R.D.)	W.R.D. L.H.V.
NO.	DATE	REVISIONS	BY APP'D

STATE HIGHWAY COMMISSION OF KANSAS

CONCRETE

BOX CULVERT

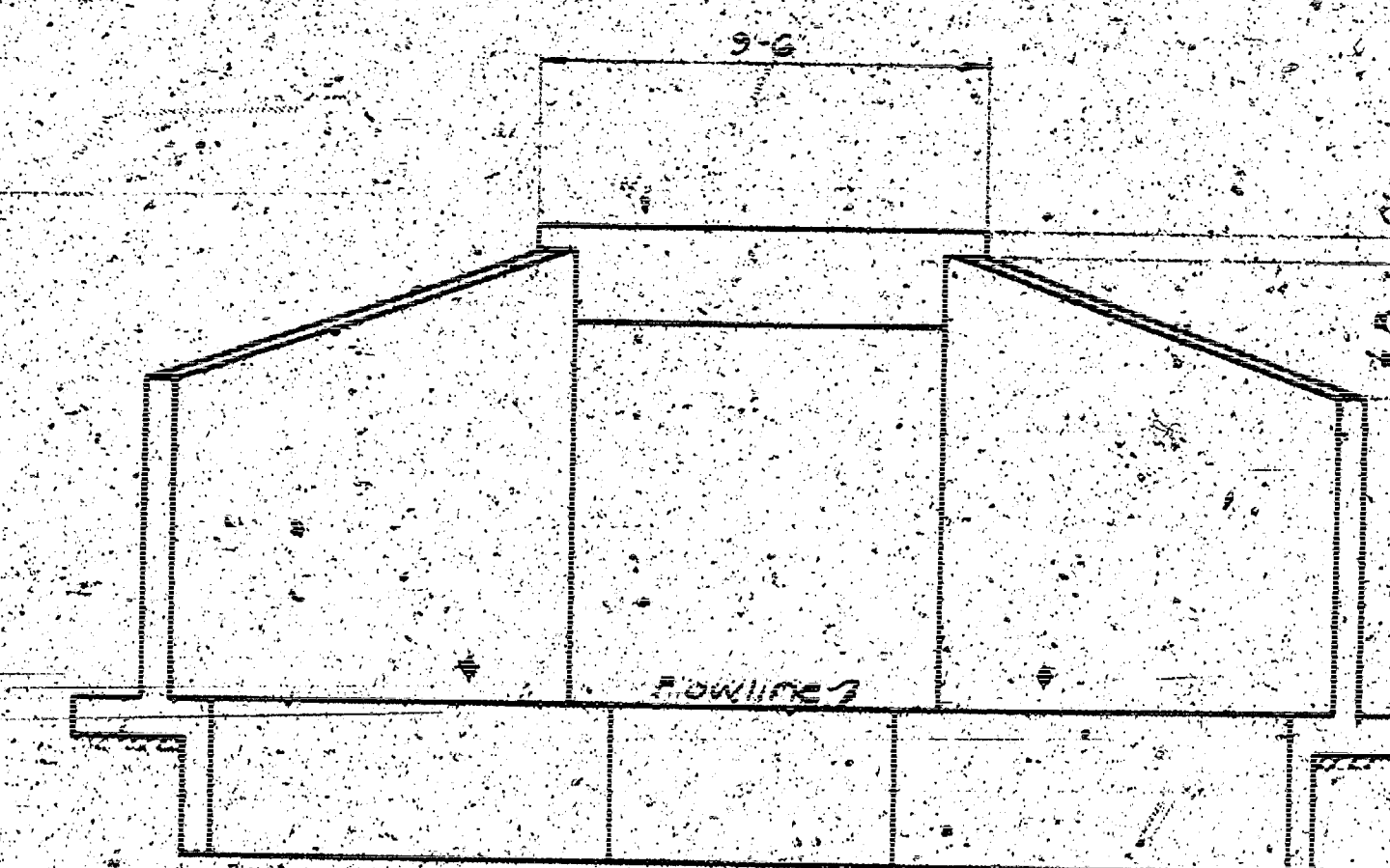
7 FT. SPAN

STD. NO. 314

SCALE 1" = 1'

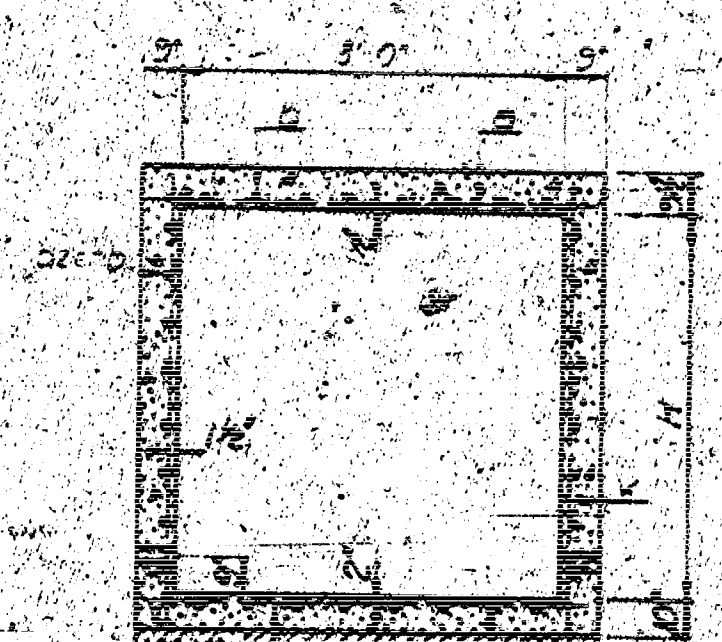
DESIGNED BY T.M.C. DATE 7-21 DETAIL'D BY R.O.G. TRANS'D BY M.C.S.

CITY

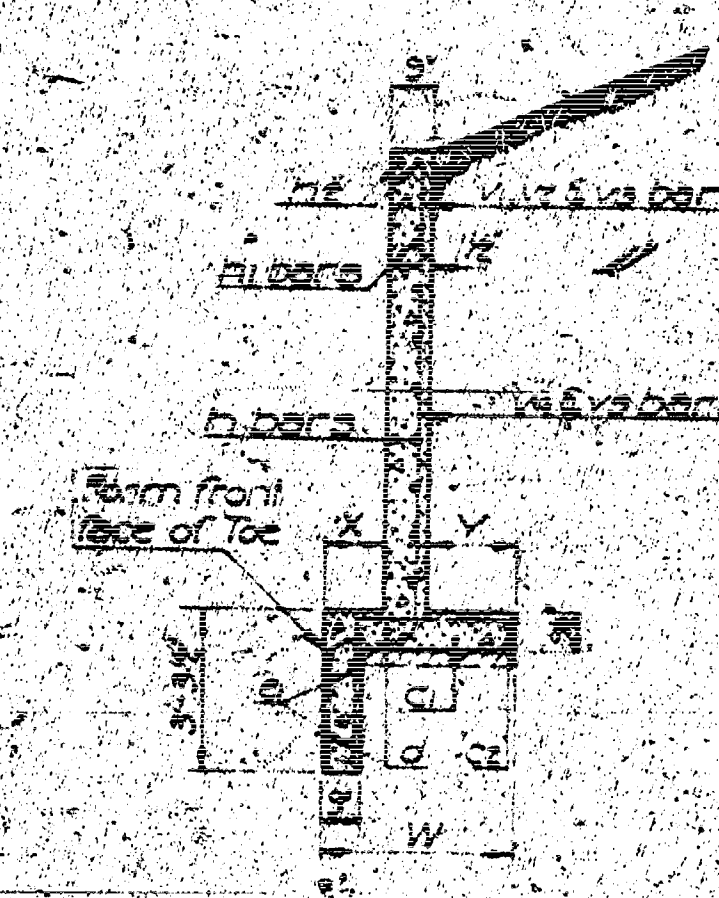


ELEVATION AND SECTION

END ELEVATION



SECTION THRU BOX

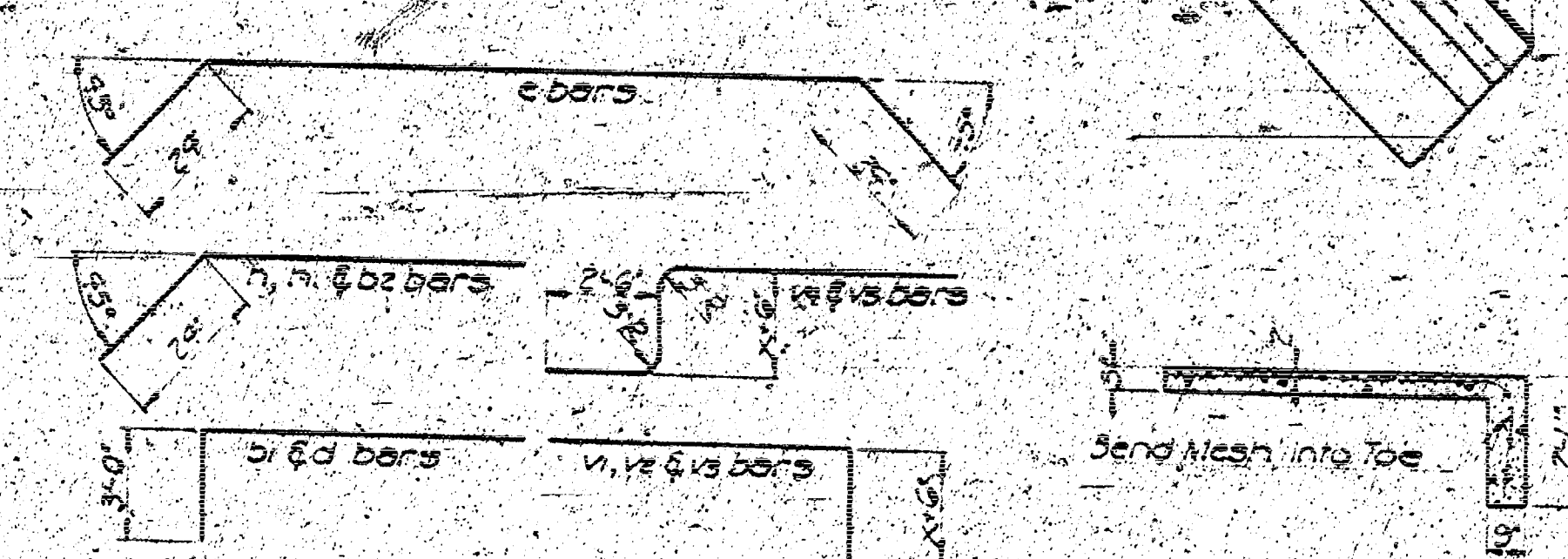


SECTION THRU WING

NOTE: Keyed joints are provided as shown on all culverts
4' or more in box length and 16" or spaced at
to divide the box into sections of equal length. The number
of joints to be used shall be as follows:

45 to 55': 1 joint
60 to 75': 2 joints
80 to 95': 3 joints
100 to 115': 4 joints
120 to 135': 5 joints

Maximum height fill
in this design - 5'-0"



SECTION THRU APRON

* "Roadway" = Horizontal distance
"Length" = Distance along box

BENDING DIAGRAMS

LIST OF CULVERTS

[illegible]

BILL OF MATERIAL

8x

Reinforcing Steel	Welded Steel	Carbon Steel	Aluminum Steel	Letter	A	B	C	H	W	X	Y	Bar
Conc.	Loc.	Conc.	Loc.	Conc.	Loc.	Conc.	Loc.	Conc.	Loc.	Conc.	Loc.	Conc.
Bar	a	b	d	e	f	g	h	i	j	k	l	m
Size												
Length												

Total Class A Concrete Cu Yds
Total Reinforcing Steel Lbs

Standard Box Box Seal Box Apron Box Seal Apron

8x6x

Reinforcing Steel	Welded Steel	Carbon Steel	Aluminum Steel	Letter	A	B	C	H	W	X	Y	Bar
Conc.	Loc.	Conc.	Loc.	Conc.	Loc.	Conc.	Loc.	Conc.	Loc.	Conc.	Loc.	Conc.
Bar	a	b	d	e	f	g	h	i	j	k	l	m
Size												
Length												

Total Class A Concrete Cu Yds
Total Reinforcing Steel Lbs

Standard Box Box Seal Box Apron Box Seal Apron

8x7x

Reinforcing Steel	Welded Steel	Carbon Steel	Aluminum Steel	Letter	A	B	C	H	W	X	Y	Bar
Conc.	Loc.	Conc.	Loc.	Conc.	Loc.	Conc.	Loc.	Conc.	Loc.	Conc.	Loc.	Conc.
Bar	a	b	d	e	f	g	h	i	j	k	l	m
Size												
Length												

Total Class A Concrete Cu Yds
Total Reinforcing Steel Lbs

Standard Box Box Seal Box Apron Box Seal Apron

8x7x

Reinforcing Steel	Welded Steel	Carbon Steel	Aluminum Steel	Letter	A	B	C	H	W	X	Y	Bar
Conc.	Loc.	Conc.	Loc.	Conc.	Loc.	Conc.	Loc.	Conc.	Loc.	Conc.	Loc.	Conc.
Bar	a	b	d	e	f	g	h	i	j	k	l	m
Size												
Length												

Total Class A Concrete Cu Yds
Total Reinforcing Steel Lbs

Standard Box Box Seal Box Apron Box Seal Apron

8x8x

Reinforcing Steel	Welded Steel	Carbon Steel	Aluminum Steel	Letter	A	B	C	H	W	X	Y	Bar
Conc.	Loc.	Conc.	Loc.	Conc.	Loc.	Conc.	Loc.	Conc.	Loc.	Conc.	Loc.	Conc.
Bar	a	b	d	e	f	g	h	i	j	k	l	m
Size												
Length												

Total Class A Concrete Cu Yds
Total Reinforcing Steel Lbs

Standard Box Box Seal Box Apron Box Seal Apron

NOTE: Class A Concrete to be used thru-out. Bevel all exposed edges with a 34" triangular mitering.

Reinforcing steel Course consisting of 3' of Class A Concrete to be constructed only where the Plans or the Specifications require. No reinforcing shall be placed in the steel Course has gained sufficient strength to permit working upon it without injury.

Reinforcing steel to be constructed only between down-slope. All slopes subject to scour where specified on the Plans or by the Specifications.

Payment for additional quantities resulting from including steel Course and Apron, as changes in original Plans, shall be made at unit price bid for various items involved.

Wire reinforcing mesh shall be of the electrically welded square mesh type and shall be composed of No 10 gauge steel wire spaced at 6" centers each way.

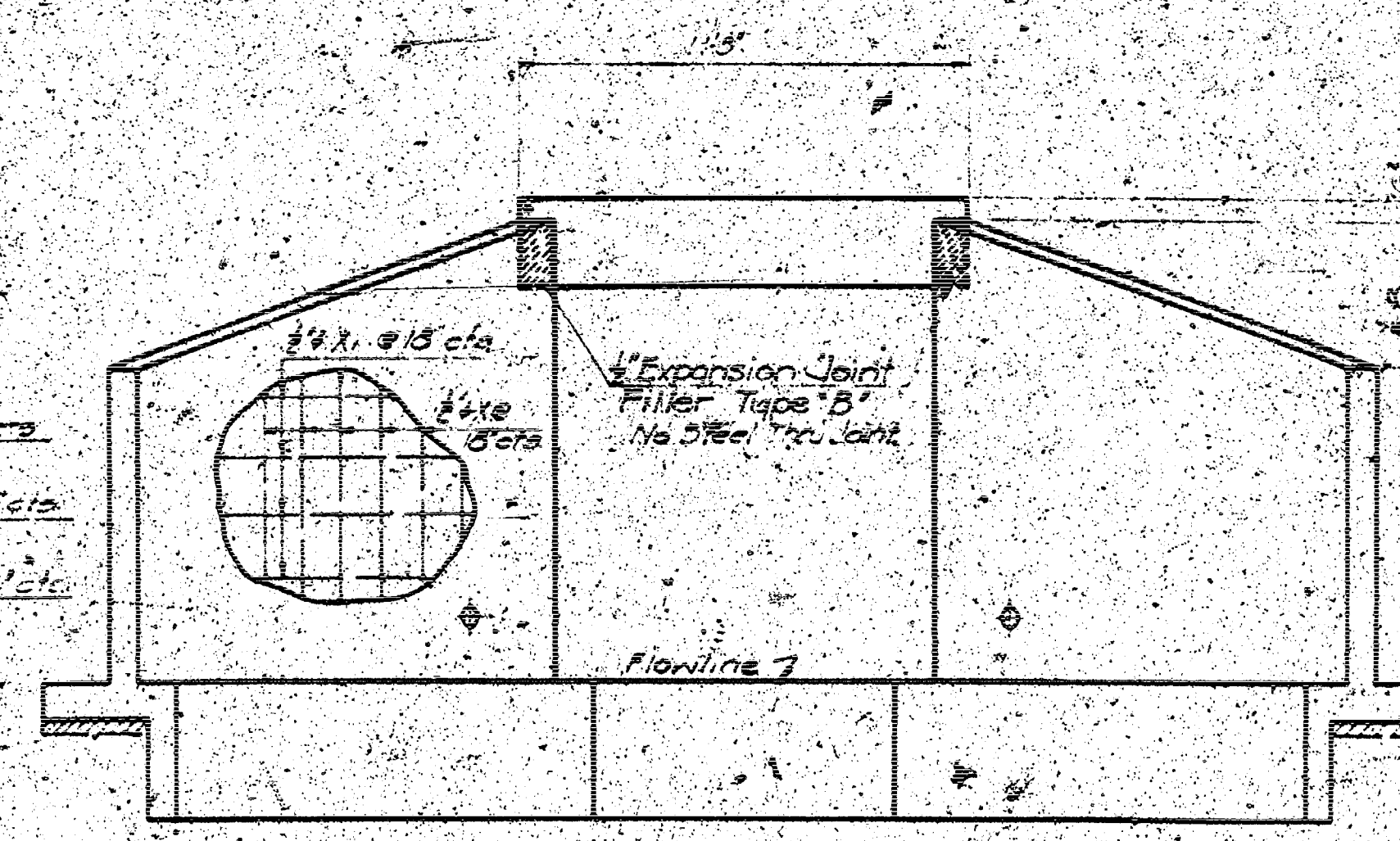
1	0-0	1/4" bars deleted	W.R.D.	L.H.V.
2	0-44	Notations & Tables (W.R.D.)	W.A.	L.H.V.
NO.	DATE	REVISIONS	BY	APPROV.

STATE HIGHWAY COMMISSION OF KANSAS

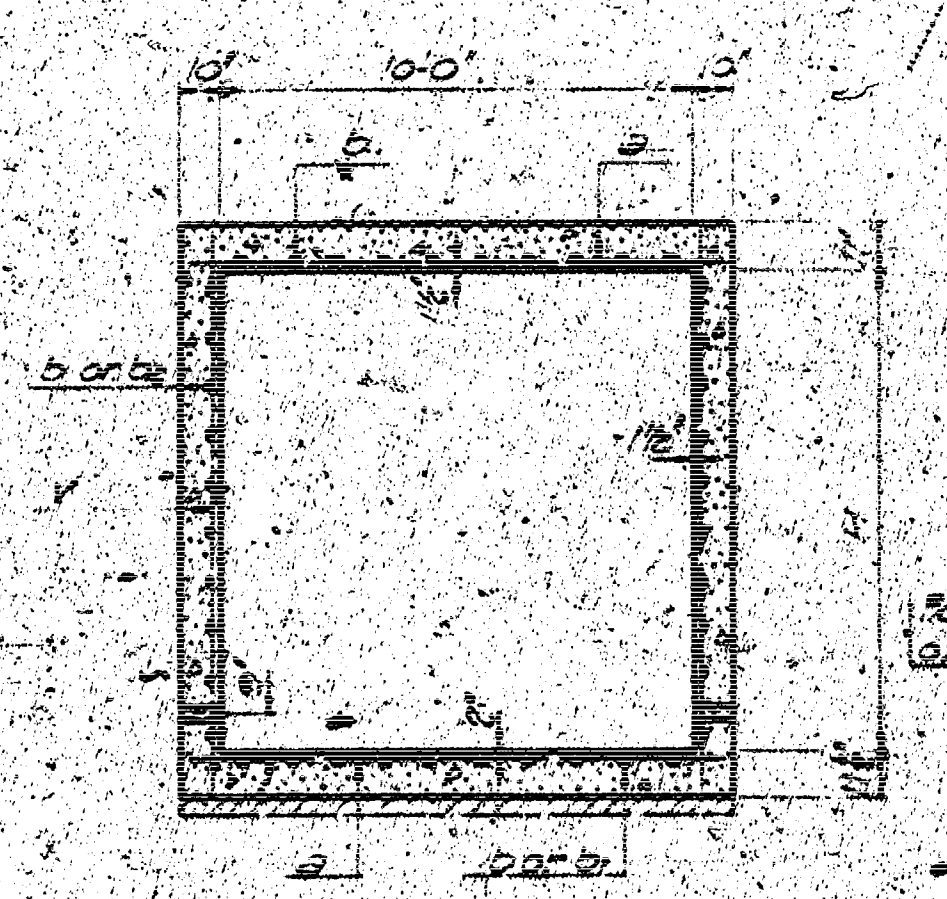
CONCRETE
BOX CULVERT
8 FT. SPAN

STD. NO. 315

DESIGNED BY TRC/DGA APPROVED BY R.C. TRACY DATE 11-1-57
CHECKED BY G.L.E. APPROVED BY _____ DATE _____



ELEVATION AND SECTION



SECTION THRU WING

NOTE: Class 4 Concrete to be used throughout. Detail all exposed edges with a 90° triangular mauling.

Concrete consisting of 3" of Class A Concrete to be constructed only where specified on the Plans or in the Specifications and to be maintained until Seal Course has gained sufficient strength to permit working upon it without injury.

Reinforcing Bars to be constructed only between downstream wingtips in locations shown to be necessary on the Plans by the Engineer.

Payment for additional quantities resulting from, including Seal Course and Bars, as changes in original Plans, shall be made at unit price bid for various items involved.

Wire mesh reinforcement shall be of the electrically welded square mesh type and shall be composed of No. 10 gauge steel wire spaced at 6" centers each way.



Roadway - Horizontal distance.
Length - Distance along box.

[illegible][illegible]

3					
2	6-96	1/2" bars deleted	WPD	LHV	
1	6-94	Notations & Tables. (WPD.)	WAB	LHV	
NO.	DATE	REVISIONS	BY	APP'D	

STATE HIGHWAY COMMISSION OF KANSAS

CONCRETE
BOX CULVERT
10.0 FT. SPAN

STD. NO. 317

DESIGNED BY WPD; DATE 6-96; DETAIL BY C.E.B.; TRACED BY W.H.H.M.
CHECKED BY C.E.; APPROVED BY _____ DATE _____