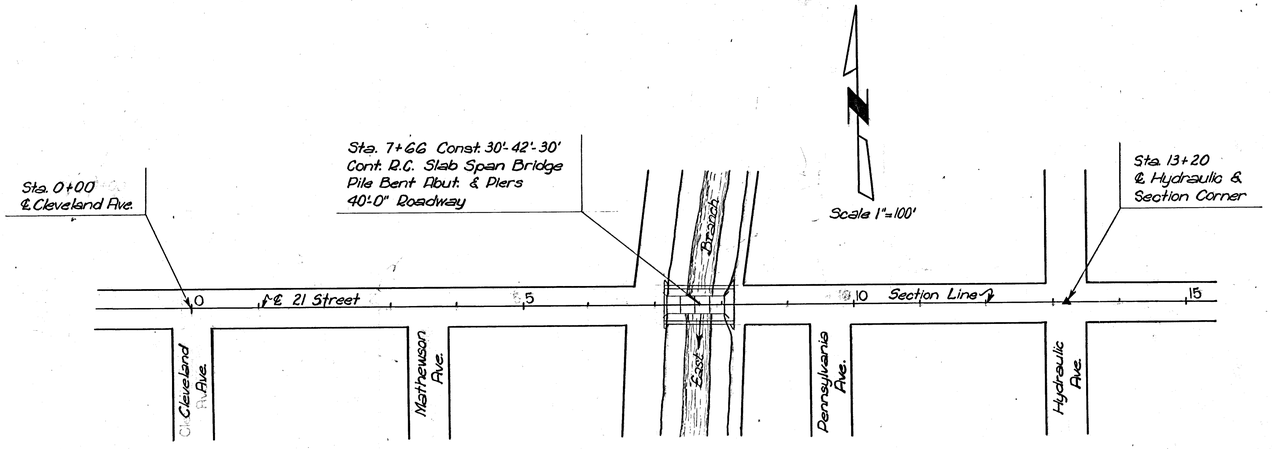
21 ST. STREET BRIDGE

C13-27

OVER THE

WICHITA DRAINAGE CANAL
(EAST BRANCH, CHISHOLM CREEK)



CITY ENGINEERING DEPARTMENT

WICHITA, KANSAS

B. E. SMITH, CITY ENGINEER

PLANS PREPARED BY

R.S. DELAMATER, CONSULTING ENGINEER

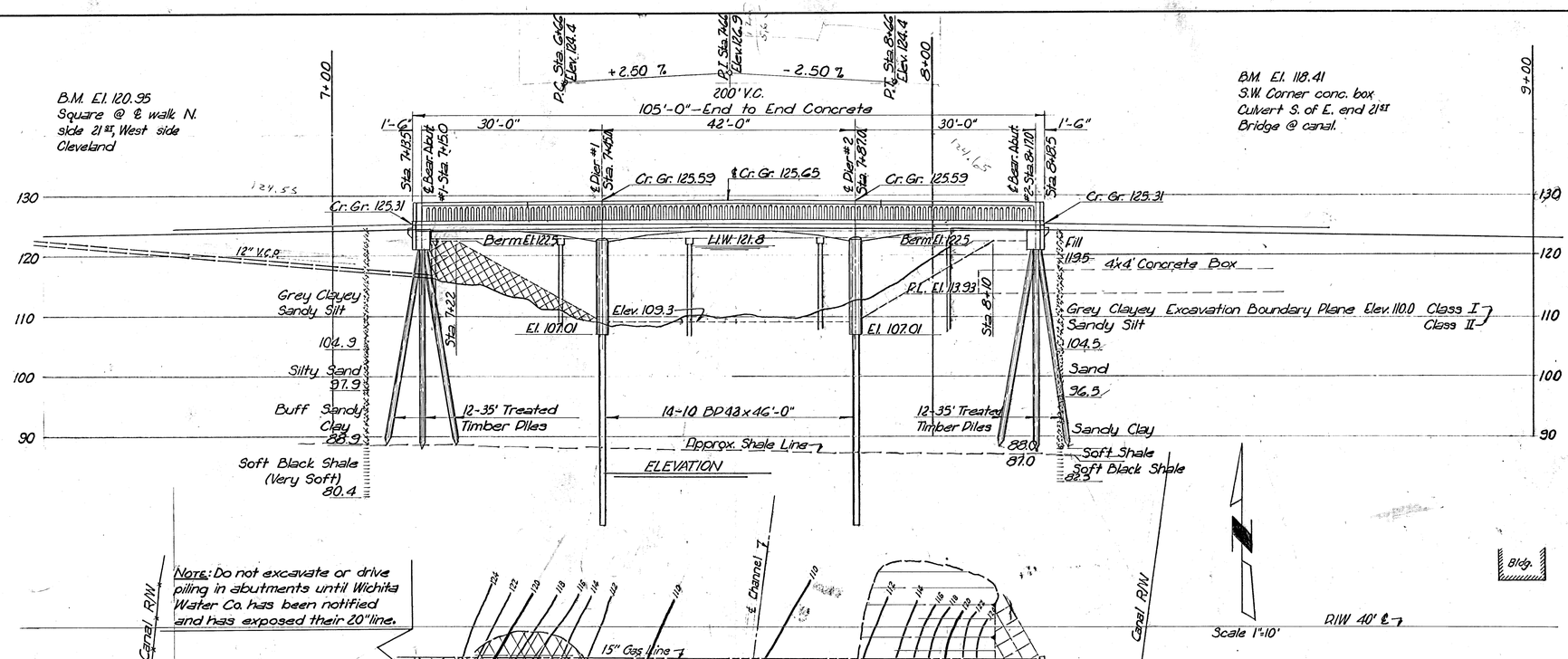
WICHITA, KANSAS

JUNE, 1953

INDEX OF SHEETS

SHEET NO.	
1	Title Sheet
2	Construction Layout
3	Abutment Details
4	Pier Details
5	Superstructure Details
6	Auxiliary Details
7	Bar Supports and Spacers

R. S. DELAMATER LICENSED 513 KANSAS PROFESSIONAL ENGINEER



General Notes:

Common Excavation: Common Excavation consists of grading the East bank to the lines indicated and extending North to approximately 50' from ℄, removing material of whatever nature is encountered. Excavated material shall be stockpiled as directed by the Engineer.

Rock Embankment: Rock Embankment includes filling the West bank to the slope and over the areas indicated, and filling around and below the 4 x 4 box outlet to a thickness of from 12 to 18 inches. Material for Rock Embankment, consisting of broken concrete, shall be furnished by the City, stockpiled at the site. Contractor shall dump the Rock Embankment directly on the slope; hand placing will be required only as necessary to obtain a reasonably even and presentable surface.

Removal of Existing Structure: Contractor shall remove the superstructure and caps of the existing bridge, storing any useable material at the site as directed by the Engineer. Piles and backwalls shall be either pulled out or cut off at finished grade line at the option of the Contractor.

Bridge Excavation: Elevation 110.0 shall designate the Excavation Boundary Plane, Class I excavation above the plane and Class II below. Bridge excavation quantities shall be computed to a line 1'-6" outside of concrete lines all around.

Concrete: Concrete shall be class A in abutments, piers and handrail and Class AAA concrete in superstructure.

Piles: All piles shall be driven to the penetration shown unless in the opinion of the Engineer such penetration cannot be obtained without injury to the piles. All Treated Timber Piles shall be driven to a minimum bearing value of 20 Tons per pile and all steel piles driven to a minimum bearing value of 37 Tons per pile.

Soundings: Soundings are as taken by borings in the field and represent the best information available to the City of Wichita.

Reinforcing Steel: All reinforcing steel shall conform to A.S.T.M. Specification A 305-49

Design:

Design Loading: H20-S-16-49 AASHO Specifications.

Unit Stresses: fs = 20,000 p.s.i., reinforcing
fc = 1000 p.s.i., Class A
fc = 1350 p.s.i., Class AAA

Pile Loading: 20 tons per pile, Treated Timber
37 tons per pile, Steel

General Requirements: It is the intention of these plans and specifications that construction of the bridge shall be in accordance with applicable standard specifications and requirements of the Kansas State Highway Commission and that materials shall conform to those specifications unless otherwise expressly noted.

R. S. DELAMATER LICENSED 513 KANSAS PROFESSIONAL ENGINEER

Summary of Grading Quantities

	Common Excavation Cu. Yds.	Rock Embankment Cu. Yds.	Removal Existing Structure
East Bank	181	125	—
West Bank	—	244	—
Total	181	269	Lump Sum

Summary of Bridge Quantities

Location	Bridge Excavation Class I Cu. Yds.	Bridge Excavation Class II Cu. Yds.	Concrete Class A Cu. Yds.	Concrete Class AAA Cu. Yds.	Reinf. Steel Lbs.	Expans. Devices Lbs.	Bear. Devices Lbs.	Tr. Timber Piles Lin. Ft.	Metal Pile Pts. Each	Steel Piles Lin. Ft.	Conc. Handrail Lin. Ft.
Abut. #1	65	—	30.8	—	3830	—	—	420	12	—	8.0
Pier #1	—	31	61.3	—	5090	—	—	—	—	644	—
Pier #2	1	31	61.3	—	5,090	—	—	—	—	644	—
Abut. #2	65	—	30.8	—	3830	—	—	420	12	—	8.0
Superstructure	—	—	—	328.7	59340	2340	2265	—	—	—	206.5
Totals	131	62	184.2	328.7	77,900	2340	2265	*840	24	*1288	222.5

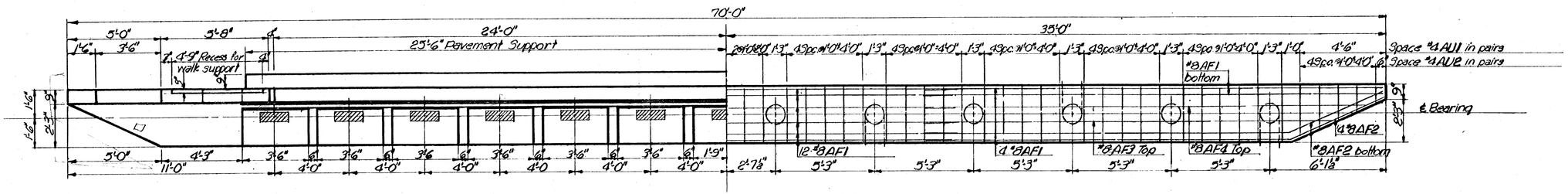
*21@35' *28@46'

21 ST. STREET BRIDGE
CONSTRUCTION LAYOUT
EAST BRANCH, CHISHOLM CREEK

R. S. DELAMATER
CONSULTING ENGINEER
WICHITA, KANSAS

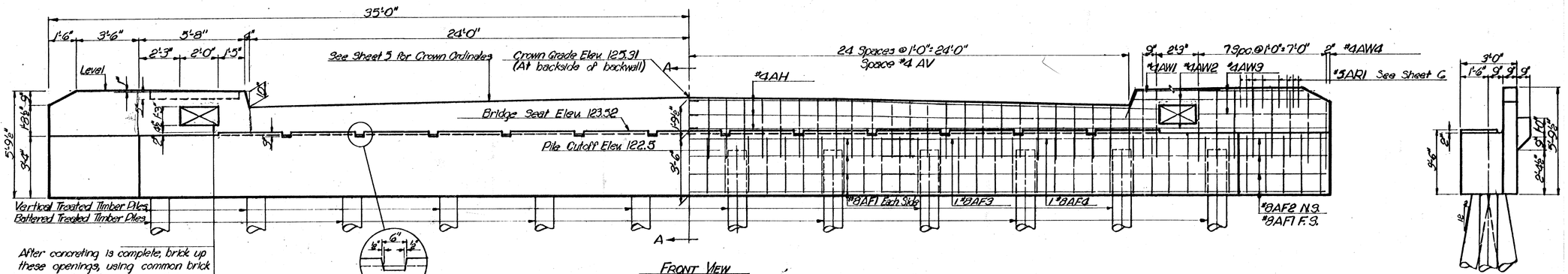
DATE June 1953
SCALE 1" = 10'
DWG. NO. 79-C-2

SURV. | PLOT. | DES. R.S.D. | DR. PCT | TR. ALC, MM, FAH | CKD. AH, PCT | APP.



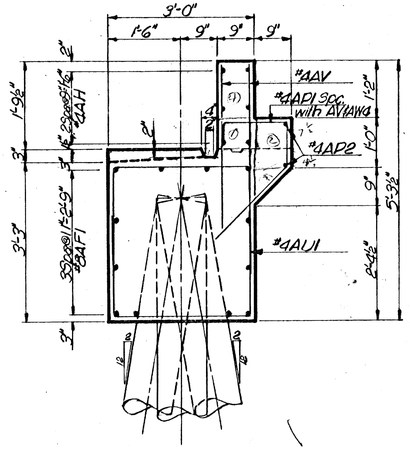
HALF PLAN

HALF PLAN OF FOOTING

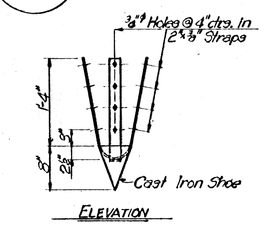


FRONT VIEW

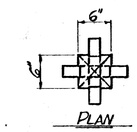
END VIEW



SECTION A-A
Scale 3/4"=1'-0"



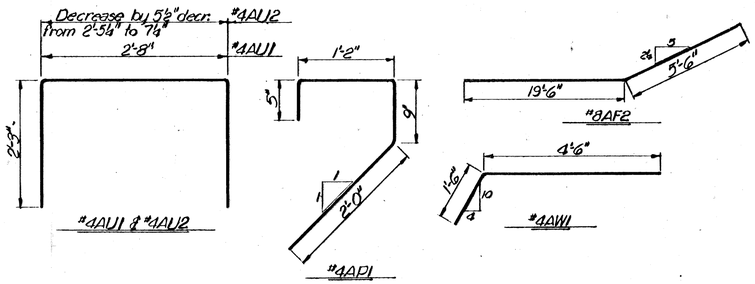
ELEVATION



PLAN

METAL PILE POINTS

Note:
Pile points shall be substantially symmetrical with tips centered. Not more than 1/4" convexity nor more than 1/8" convexity shall be permitted in the top face.
Pile points shall be fastened to pile by one 1/4"x4" boat spike or two 60-d spikes per hole.



BENDING DIAGRAMS
(All dimensions are out to out of bar)

NOTES:
Class A Concrete shall be used throughout.
Bevel all exposed edges with a 3/4" triangular molding and fillet all corners 3/4" unless otherwise indicated.
All dimensions shown relative to reinforcing steel placement are to ℄ of bars. Refer to A.A.S.H.O. Manual of Recommended Practice for Detailing Reinforced Concrete Highway Structures.
See Sheet 6 for Handrail Details, Expansion Device Details and Abutment Bearing Device Details.

ALLEN R. HENSON LICENSED 2338 KANSAS PROFESSIONAL ENGINEER

BAR LIST & SUMMARY OF QUANTITIES

Mark	AF1	AF2	AF3	AF4	AH	AV	AW1	AW2	AW3	AW4	AP1	AP2	AR1	AR2	AU1	AU2
No. Reqd.	22	10	2	2	12	98	4	8	8	40	51	4	16	4	114	20
Size	#3	#3	#3	#3	#4	#4	#4	#4	#4	#4	#4	#4	#5	#4	#4	#4
Length	24'4"	25'0"	21'8"	23'4"	26'1"	3'3"	6'-0"	11'3"	7'0"	3'-6"	4'-4"	25'10"	4'-0"	3'9"	7'2"	*
Shape	———	———	———	———	———	———	———	———	———	———	———	———	———	———	———	———

Class A Concrete	30.8	Cu. Yd.	*See Bending Diagrams.
Reinforcing Steel	3890	Lbs.	
Treated Timber Piles	420	Lin. Ft.	
Metal Pile Points	12	Each	Concrete Handrail 80 Lin. Ft.

21 ST. STREET BRIDGE

ABUTMENT DETAILS

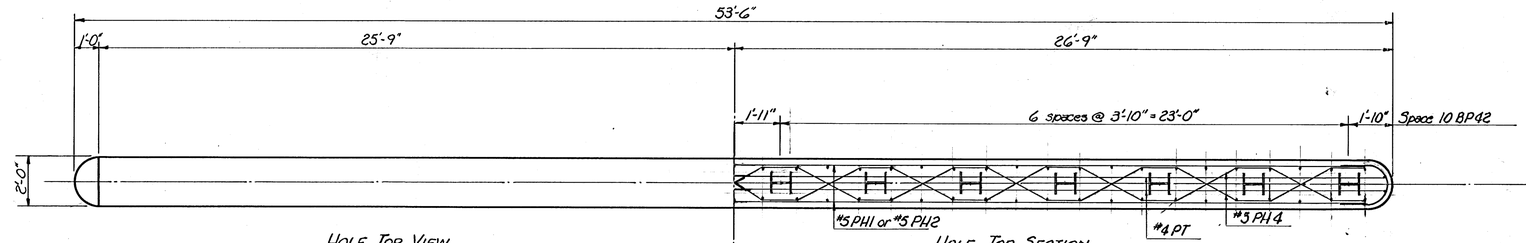
EAST BRANCH, CHISHOLM CREEK

R. S. DELAMATER
CONSULTING ENGINEER
WICHITA, KANSAS

DATE June, 1963
SCALE 3/4"=1'-0"
DWG. NO. 79-C-3

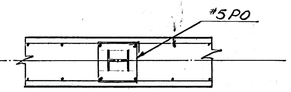
SURV. | PLOT. | DES. | DR. A.R.H. | TR. | CKD. R.C.T. | APP.

Sheet No.	Total Sheets
4	7

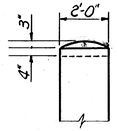


HALF TOP VIEW

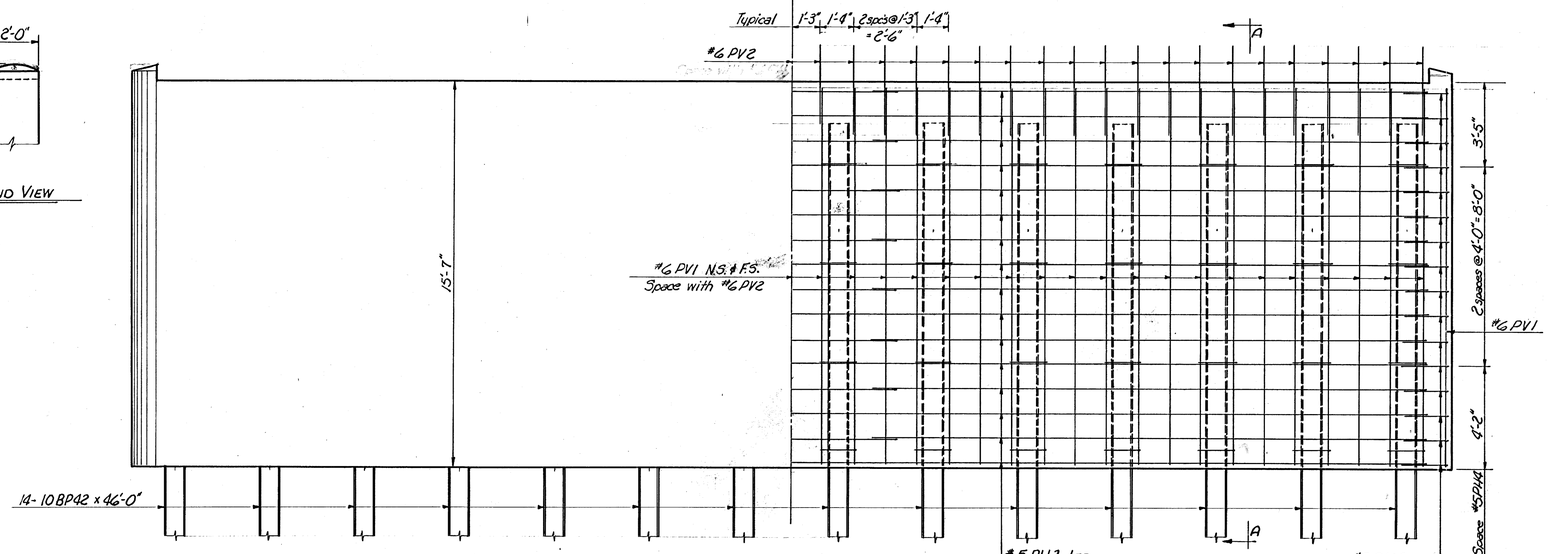
HALF TOP SECTION



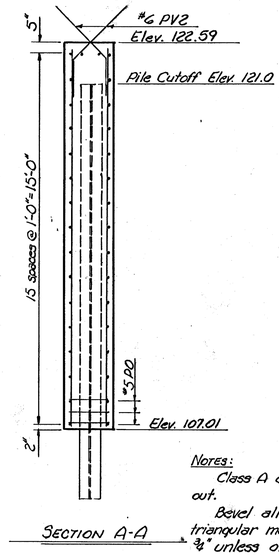
TYPICAL SECTION AT PIER BOTTOM



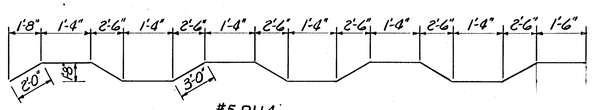
PART END VIEW



FACE VIEW



SECTION A-A



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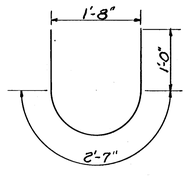

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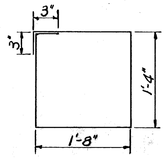

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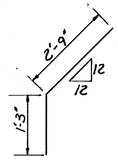
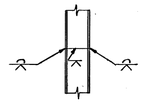


#6 PV2

BENDING DIAGRAMS



TYPICAL PILE SPLICE

Notes:

Class A concrete shall be used throughout.

Bevel all exposed edges with a ¾" triangular molding and fillet all corners ¾" unless otherwise indicated.

All dimensions shown relative to reinforcing steel placement are to ℄ bars unless otherwise noted. All dimensions shown in the bending diagrams are out to out of bars; refer to AASHO Manual of Recommended Practice for Detailing Reinforced Concrete Structures.

Design Loading: H 20-S16-49

Pile Loading: 37 tons per pile

SUMMARY OF PIER QUANTITIES

Mark	PH1	PH2	PH3	PH4	PV1	PV2	PO	PT			
No. Reqd.	32	32	32	12	86	82	42	4			
Size	#5	#5	#5	#5	#6	#6	#5	#4			
Length	30'-0"	22'-6"	4'-7"	29'-6"	15'-3"	4'-0"	6'-6"	26'-9"			
Shape	—	—	U	∿∿∿	—	⌐	□	—			

Class A Concrete 61.3 Cu. Yds.
Reinforcing Steel 5090 Lbs.
Steel Piles (10BP42) 644 Lin. Ft.

21ST. STREET BRIDGE

PIER DETAILS

EAST BRANCH, CHISHOLM CREEK

R. S. DELAMATER
CONSULTING ENGINEER
WICHITA, KANSAS

DATE June 1953

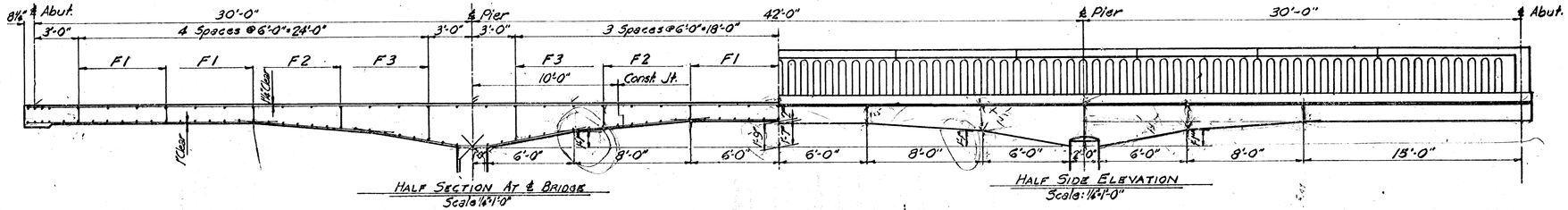
SCALE 3/8" = 1'-0"

DWG. NO. 79-C-4

R. S. DELAMATER LICENSED 513 KANSAS PROFESSIONAL ENGINEER

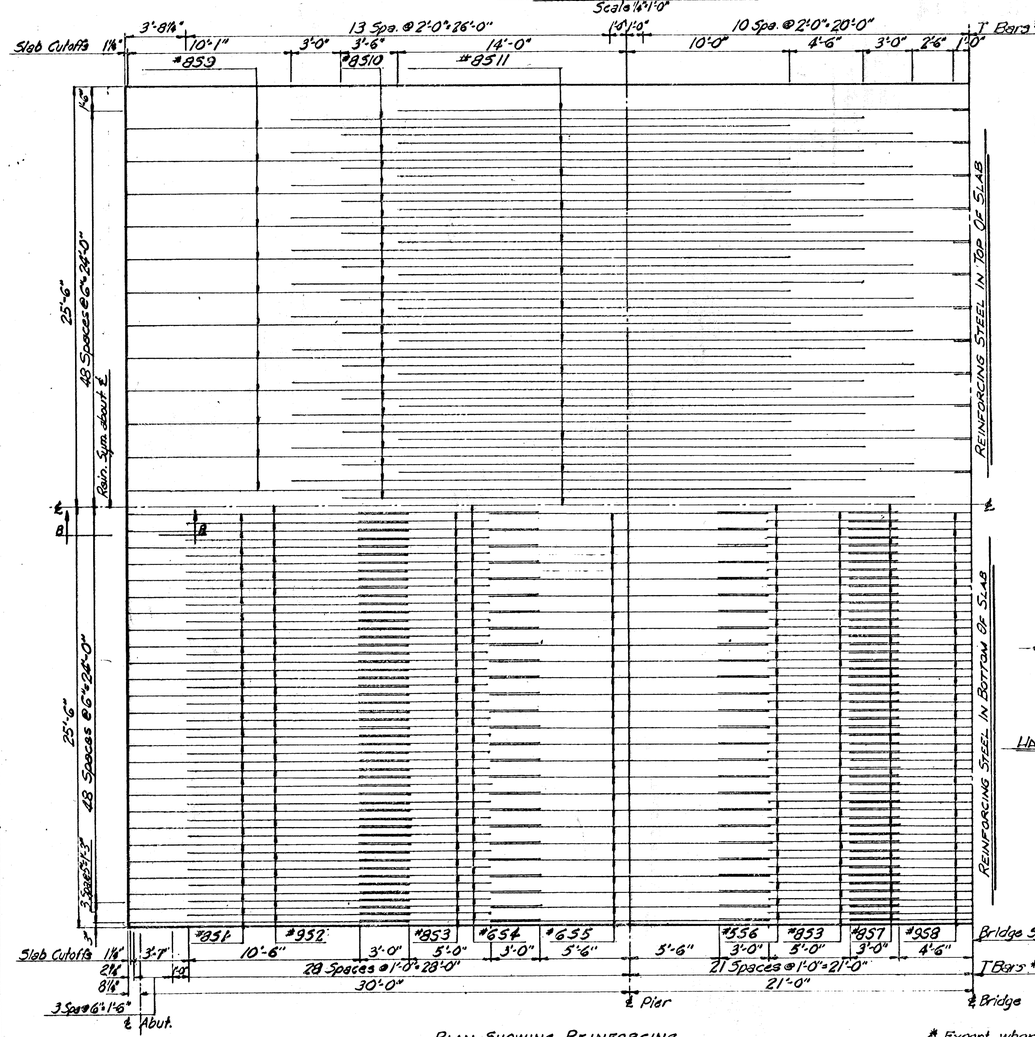
APP. A.H. CKD. PCT DR. PCT TR. DES. PLOT. SURV.

SHEET NO. 5 | TOTAL SHEETS 7



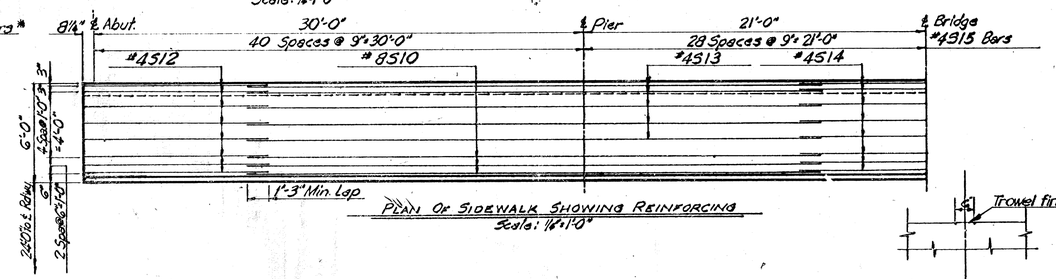
HALF SECTION AT ℄ BRIDGE
Scale: 1/8" = 1'-0"

HALF SIDE ELEVATION
Scale: 1/8" = 1'-0"

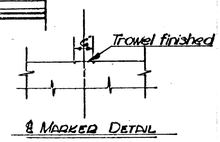


PLAN SHOWING REINFORCING
Scale: 1/16" = 1'-0"

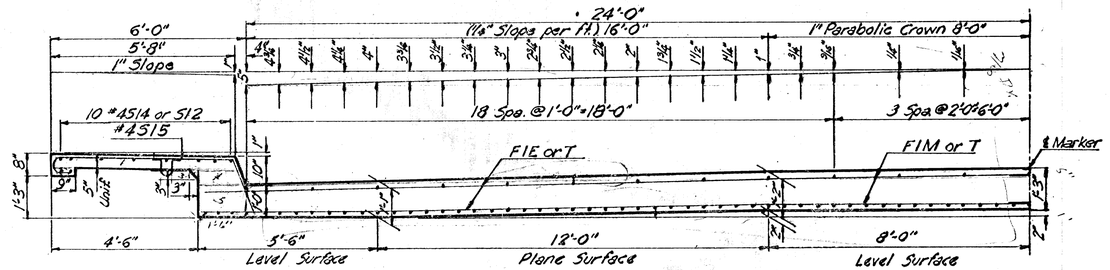
* Except where replaced by F Frames.

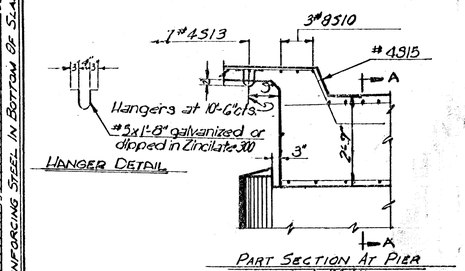


PLAN OF SIDEWALK SHOWING REINFORCING
Scale: 1/16" = 1'-0"



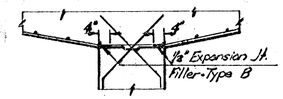
℄ MARKER DETAIL



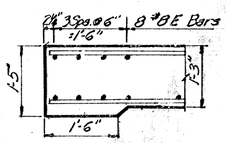


HANGER DETAIL

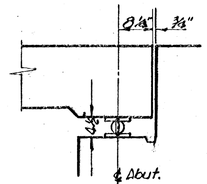
PART SECTION AT PIER
Scale: 1/8" = 1'-0"



SECTION A-A
Scale: 1/8" = 1'-0"



SECTION B-B
Scale: ¾" = 1'-0"



VIEW OF BEARING DEVICE
Scale: ¾" = 1'-0"

HALF SECTION AT MID-SPAN
Scale: 1/8" = 1'-0"

NOTES:

All concrete shall be Class AAA. Bevel all exposed edges with a ¾" Triangular molding and fillet all corners ¾" unless otherwise indicated.

All dimensions for placement of Reinforcing Steel are to ℄ of bar unless otherwise noted.

Falsework shall be left in place for the entire structure until both slab and sidewalk concrete have attained their design strength.

Construction joints in slab are optional but if used shall be at the points indicated and constructed as shown. Walk and curb shall be poured integrally with the slab, as shown.

Provide ½" dead load camber in each span.

DESIGN LOADING: H20-S16-44, AASHO.

Unit Stresses: f_c = 1350 p.s.i.
f_s = 20,000 p.s.i.

See Sheet 6 for handrail details, bar list, Quantities and Bending Diagrams.

Hangers shall not be paid for directly but shall be included in Class AAA concrete bid item.

ARNOLD R. HENSON LICENSED 2338 KANSAS PROFESSIONAL ENGINEER

21 ST. STREET BRIDGE
SUPERSTRUCTURE DETAILS
EAST BRANCH, CHISHOLM CREEK

R. S. DELAMATER
CONSULTING ENGINEER
WICHITA, KANSAS

DATE June, 1953
SCALE As shown
DWG. NO. 79-C-5

SURV. | PLOT. | DES. A.H. | DR. H.T | TR. | CKD. AR. | APP. 1

R. S. DELAMATER, CONSULTING ENGINEER PROJ NO

CLIENT CITY OF WICHITA, KANSAS SHEET

PROJECT 21st Street Bridge DATE BY

COMPUTATIONS FOR Comparative Pier Costs Estimate CK'D BY

PEDESTAL TYPE PIER (Similar to Levy St. Bridge

Piles (Tr. Timber)	
32@20' = 640 Lin. Ft @ $4.50 per Ft.	$ 2,880
Class A Concrete	
135 Cu. Yd @ $55.00 per Yd.	7,425
Reinforcing Steel	
7,500 Lbs @ $0.14 per Lb.	1,050
Excavation	
125 Cu. Yd. @ $4.00 per Yd.	500
TOTAL	$ 11,855

STEEL PILE BENT TYPE PIER

Piles (Steel H)	
7@40' = 280 Lin. Ft @ $7.00 per Ft.	$ 1,960
Class A Concrete	
60 Cu. Yd @ $55.00 per Yd.	3,300
Reinforcing Steel	
5,000 Lbs @ $0.14 per Lb.	700
Excavation	
35 Cu. Yd @ $4.00 per Yd.	140
TOTAL	$ 6,100

TELEPHONE 2-0742

R. S. DELAMATER
CONSULTING ENGINEER

311 DERBY BUILDING
WICHITA 2, KANSAS
April 10, 1953

21st Street Bridge
East Branch Chisholm Creek

Mr. B. E. Smith
City Engineer
Wichita, Kansas

Dear Mr. Smith:

I am handing you herewith prints of primary plans for the above bridge including title sheet and location map, construction layout and a sheet showing proposed dimensions and outlines of the slab and piers.

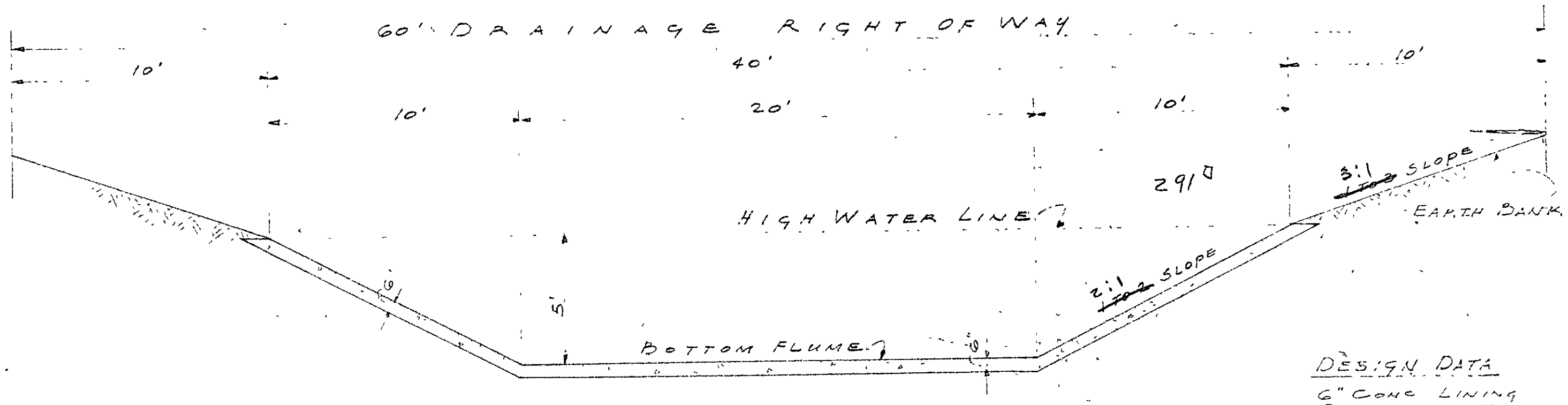
We are proposing a continuous slab, using rather deep haunches in order to reduce the thickness at the centerline because of the limited headroom available above highwater. We also indicate pile bent piers encased in concrete, such as we discussed previously, and I am including an estimate of the comparsion of costs between that type of pier and a heavier pedestal type pier on wood piling, which it seems to us would undoubtedly cost quite a bit more and would not on this bridge be of any particular advantage. We are designing on a basis of H 20-S 16 loading.

On the construction layout the centerline of channel shown is as obtained from the Wichita-Valley Center Flood Control office for the centerline of the East Branch Diversion Ditch, as constructed, and we have centered the bridge on this centerline. The channel outline and the highwater mark shown are also taken from the design plans for the flood control project and our proposed layout is to clear that channel in accordance with their requirements. The minimum crown grade we show will provide just over the required two feet of clearance at the center of the bridge; we are assuming that the bridge will be built on a vertical curve, grades for which we will determine in coordination with your street paving plans.

Yours very truly,

R. S. Delamater

Encs.
RSD:md



DESIGN DATA

6" CONC LINING
REINFORCED.

DRAINAGE AREA 5700 A.
MAX. RUNOFF 1050 C.F.S

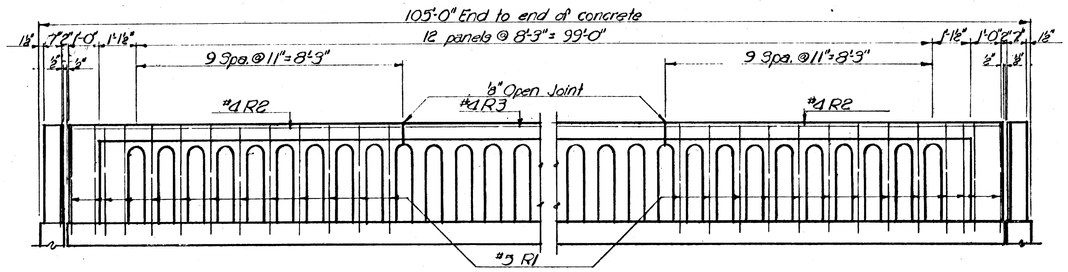
NOTE.

DESIGN DATA BY
H R HUNTER,
ENGINEER.

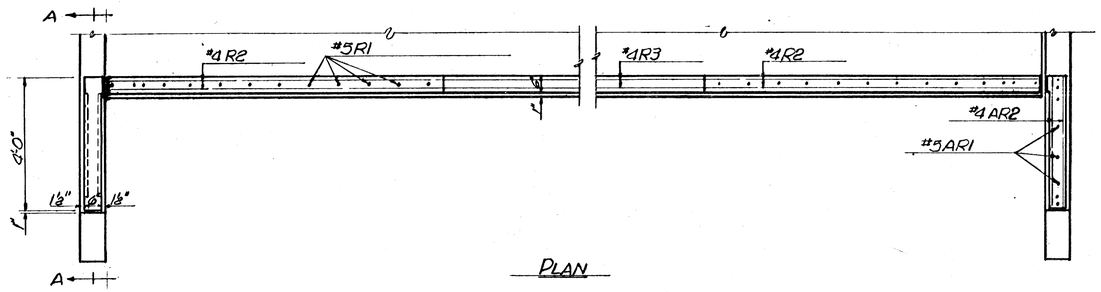
CROSS - SECTION
CONCRETE DRAINAGE FLUME.

SCALE 1/4" = 1'-0"

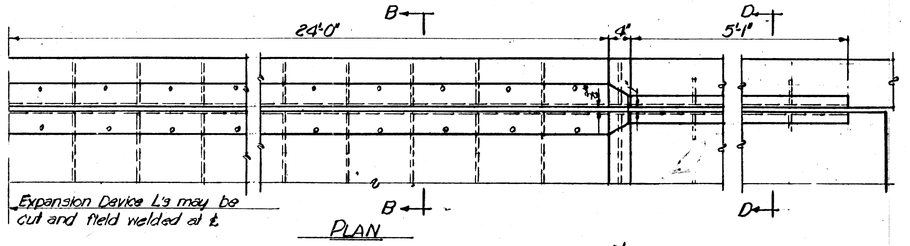
BIGGS BASE ADDITION



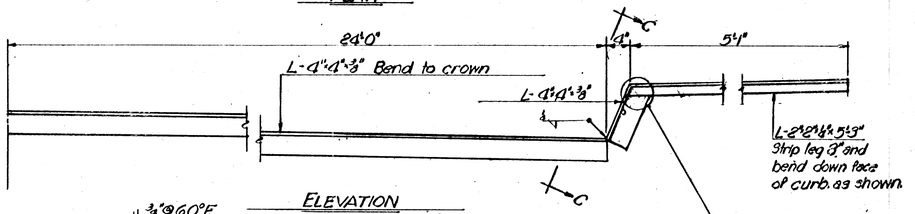
ELEVATION



PLAN



PLAN



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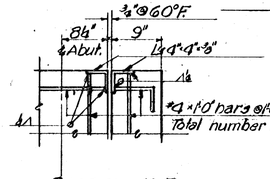
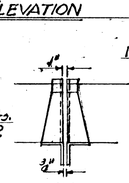
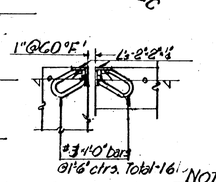


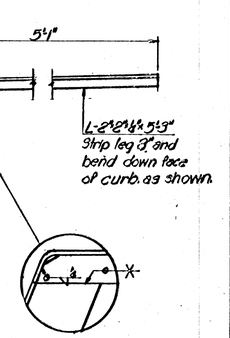
SECTION B-B



VIEW C-C



SECTION D-D



NOTES:

Bid item "Concrete Handrail" shall include only concrete and labor involved. Reinforcing steel is included in the abutment and superstructure quantities. All concrete shall be Class A in handrail.

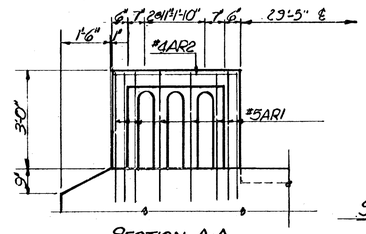
Bevel all exposed edges with a ¾" triangular molding and fillet all corners ¾" unless otherwise indicated.

All dimensions relative to placement of reinforcing steel are to ℄ of bar unless otherwise noted. All dimensions in Bending Diagrams are out to out of bar. Refer to AASHO Manual of Recommended Practice for Detailing Reinforced Concrete Highway Structures.

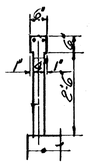
All welds shall be ¼" continuous fillet welds unless otherwise indicated.

All parts of Bearing Devices shall be Structural Steel. All rollers, bearing plates, anchor bars and alignment bars shall be included in the "Bearing Device" bid item.

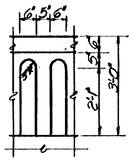
All parts of Expansion Devices shall be painted as specified for Structural Steel by Kans. State Highway Comm. specifications except those parts that are to be in contact with concrete when erected, which shall receive no paint.



SECTION A-A
(AR Bars listed on Sheet 3)

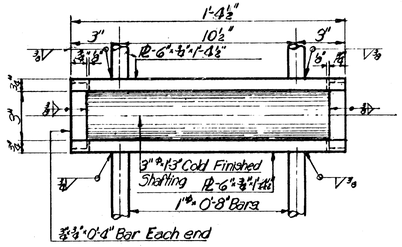


SECTION THRU RAIL

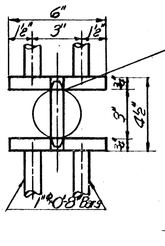


TYPICAL RAIL SECTION

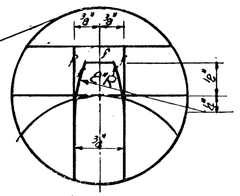
HANDRAIL DETAILS



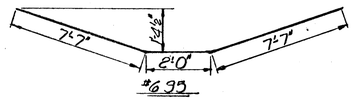
FRONT VIEW

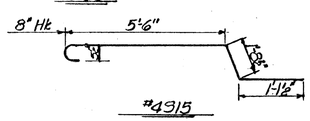


END VIEW

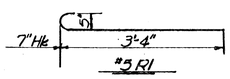


FULL SIZE DETAIL OF ALIGNMENT BAR AND SLOT





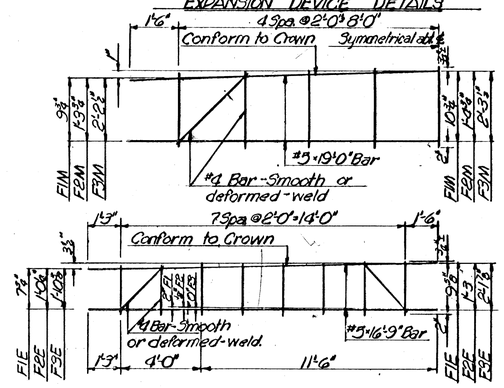
#4S15



#5 R1

BENDING DIAGRAMS

EXPANSION DEVICE DETAILS



SUPERSTRUCTURE QUANTITIES & BAR LIST

Mark	E	F1M	F2M	F3M	F1E	F2E	F3E	R1	R2	R3	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
No. Reqd	32	9	4	4	18	8	8	232	8	40	104	102	208	102	104	102	21	52	48	108
Size	#8	*	*	*	*	*	*	#5	#4	#4	#8	#9	#8	#6	#6	#5	#8	#9	#8	#8
Length	26'-6"	*	*	*	*	*	*	3'-11"	10'-2"	8'-0"	17'-1"	13'-6"	11'-0"	8'-0"	17'-0"	8'-0"	15'-0"	15'-0"	40'-7"	35'-0"
Shape																				

Mark	F1	F2	F3	F4	F5	T
No. Reqd	50	40	28	20	274	224
Size	#8	#4	#4	#4	#4	#5
Length	36'-0"	11'-4"	35'-0"	15'-6"	9'-0"	26'-3"
Shape						

* See Bending Diagrams

Class AAA Concrete	328.7 Cu. Yd.
Concrete Handrail	204.3 Lin. Ft.
Reinforcing Steel	59,340 Lbs.
Expansion Devices	2340 Lbs.
Bearing Devices	2268 Lbs.

BEARING DEVICES
26 Assemblies Required
87.1 Lbs. Each

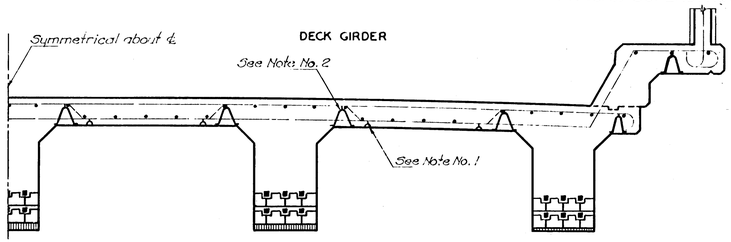
21ST. STREET BRIDGE
AUXILIARY DETAILS
EAST BRANCH, CHISHOLM CREEK

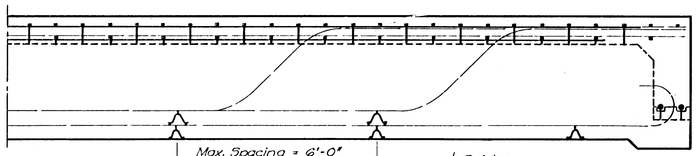
R. S. DELAMATER
CONSULTING ENGINEER
WICHITA, KANSAS

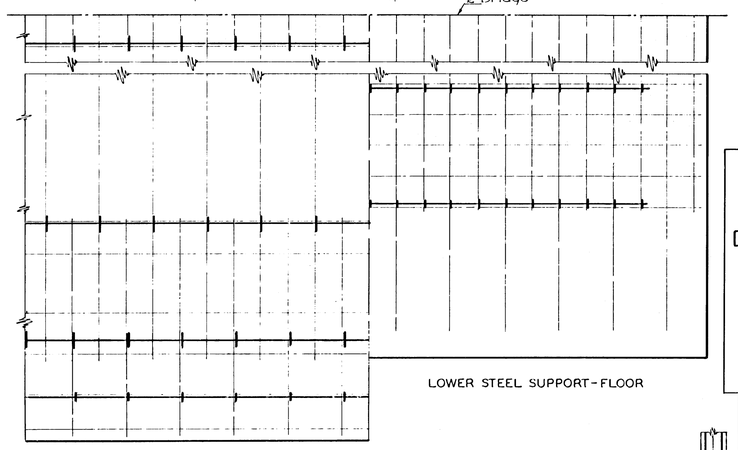
DATE June, 1953
SCALE Use Dim.
DWG. NO. 79-C-6

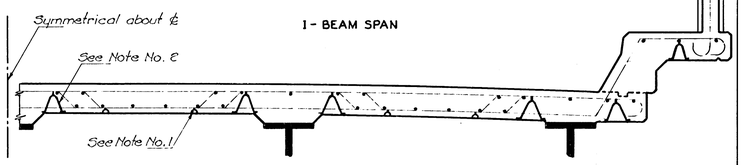
SUBM. | PLOT. | DES. | DR. A.R.H. | TR. | CKD. P.C.T. | APP.

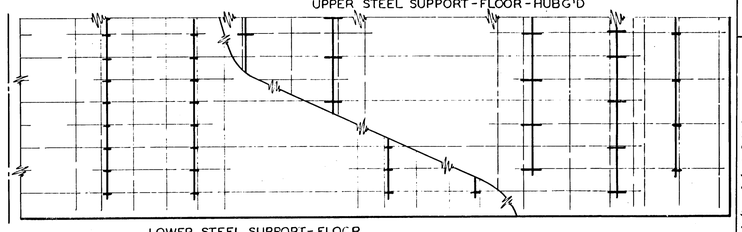
TYPICAL SUPERSTRUCTURE DETAILS

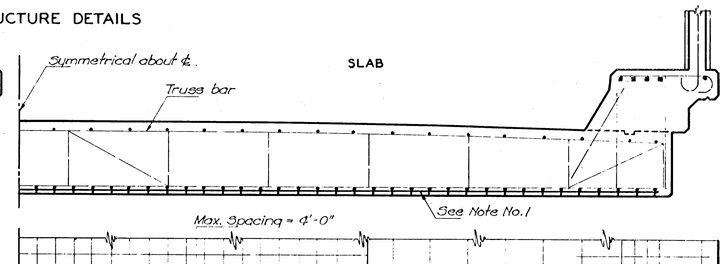


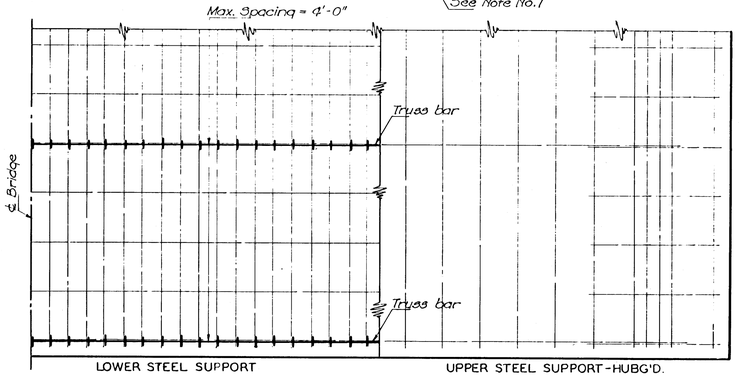




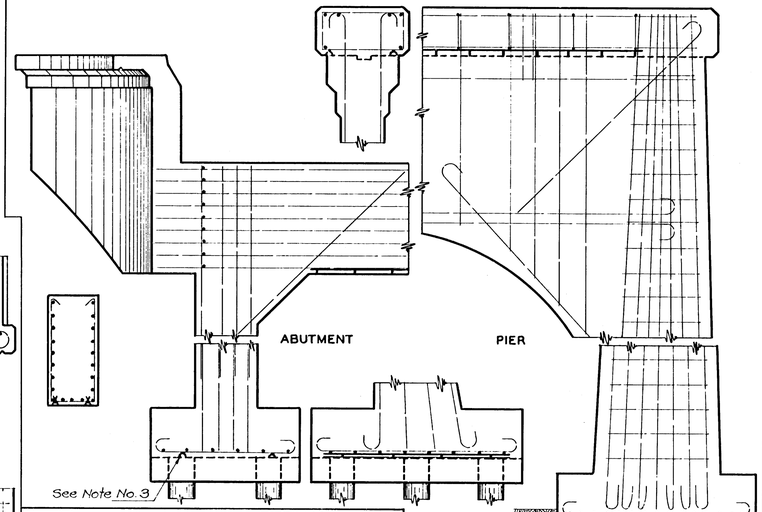








TYPICAL SUBSTRUCTURE DETAILS



GENERAL NOTE

Spacings shown are maximum. Sufficient supports shall be used, as determined by the Engineer, to retain the reinf. steel in position.

Approved designs and arrangements of Supports or Spacers other than as shown on this sheet, may be used with the permission of the Engineer. Component parts of Supports and Spacers shall be securely welded at all contact points. Legs shall be so constructed that only the ends bear upon the forms.

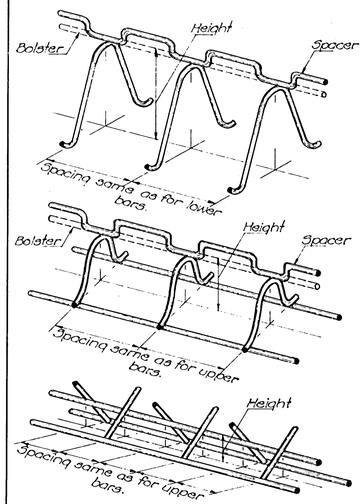
Wire used for Supports and Spacers shall be of sufficient size to insure stability of Reinforcing Steel at the position shown on the Plans, within the limits indicated by Notes 1 & 2. Wire supports shall be supplemented with form ties or other approved devices where necessary.

NOTE 1: The lower side of Reinforcing Steel in these locations shall be not less than one inch (1") from the surface of the concrete.

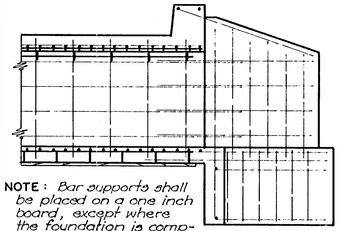
NOTE 2: The upper side of Reinforcing Steel in these locations shall be within the limits shown on the Plans.

NOTE 3: The use of Wire Supports for Reinforcing Steel in these locations is optional. Where they are not used the Steel shall be supported from the forms by means of wire ties or saddles.

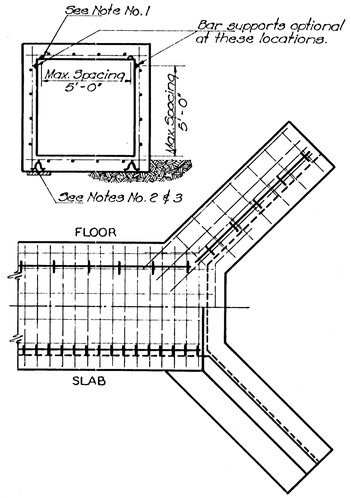
BEAM BAR SPACERS & BOLSTERS



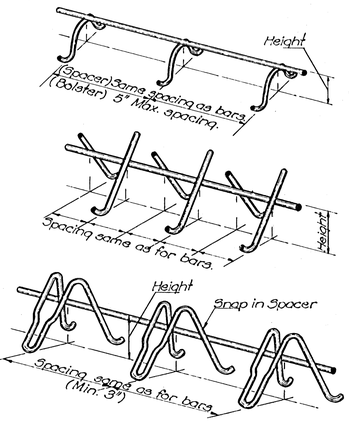
TYPICAL CULVERT DETAILS



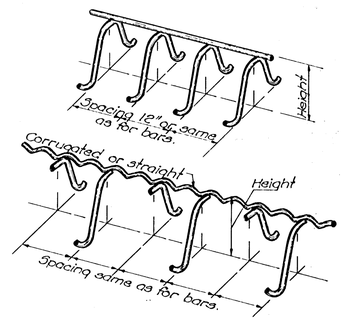
NOTE: Bar supports shall be placed on a one inch board, except where the foundation is composed of rock, firm shale or a seal course. See Note No. 3.



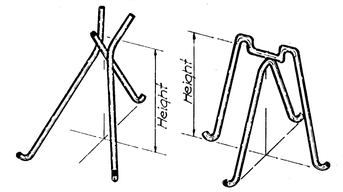
LOW SLAB BAR SPACERS & BOLSTERS



HIGH SLAB BAR SPACERS & BOLSTERS



INDIVIDUAL HIGH BAR CHAIRS



No.	Sheets
7	7

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1	3-45	No change for 1945 Spec's.	-	-

SUPPORTS AND SPACERS FOR REINFORCING STEEL

STD. NO. 610 SCALE ---- No Scale

DESIGNED BY C.A.R. DATE 7-43 DETAILED BY W.A.D. TRACED BY W.A.D.

CHECKED BY S.T. APPROVED BY L.A. Unwin DATE 4-17-44