TWENTY-FIRST STREET BRIDGE

OVER THE

BIG ARKANSAS RIVER

CITY OF WICHITA

A. PRICE WOODARD JR., MAYOR

WALTER M. KEELER — DONALD K. ENOCH

JACK H. GREENE — JOHN S. STEVENS

COMMISSIONERS

RALPH WULZ, CITY MANAGER

INDEX OF SHEETS

DEPARTMENT OF PUBLIC WORKS

R. W. BRUGGEMAN, P.E. DIRECTOR OF PUBLIC WORKS

BILL E. SMITH, P.E. CITY ENGINEER

R. S. DELAMATER & ASSOCIATES, WICHITA, CONSULTING ENGINEERS

PROJECT C10-51

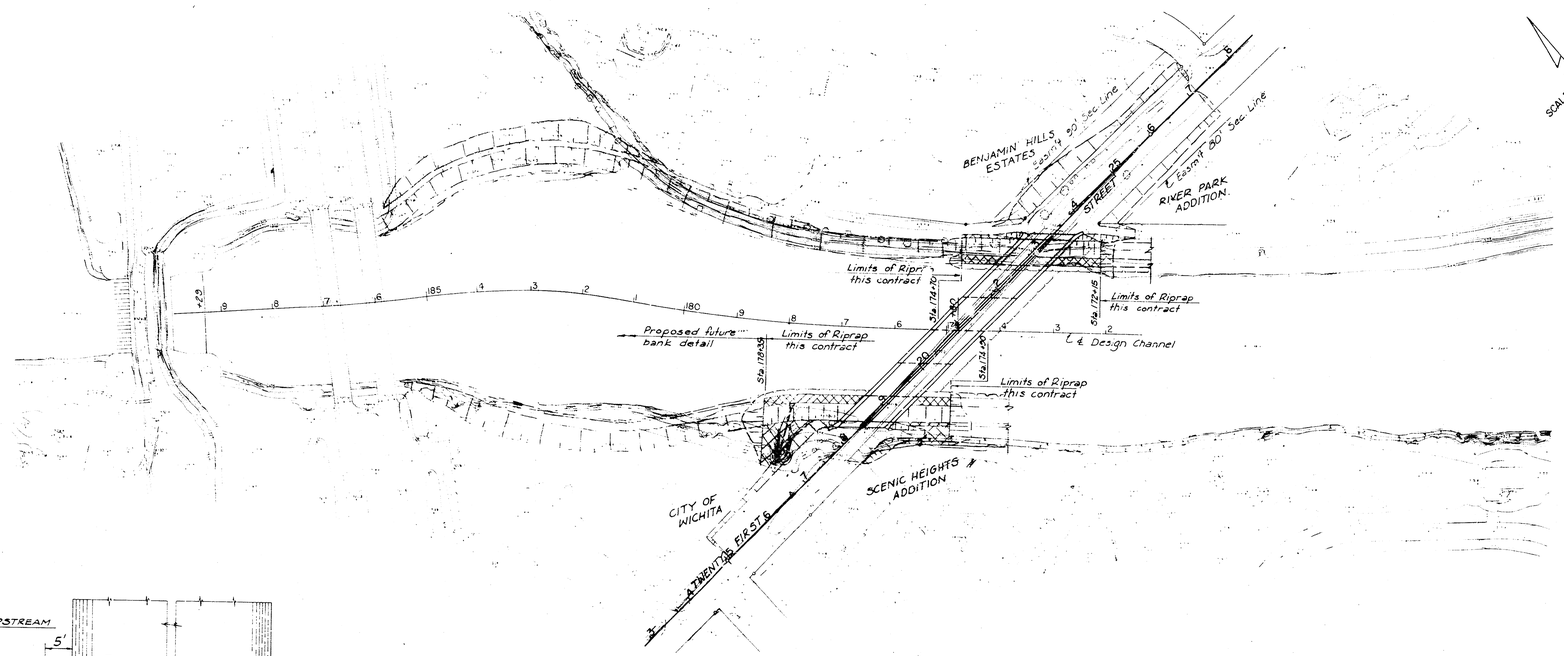
DECEMBER, 1970

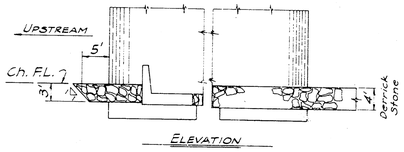
P.I. Sta. 15+00

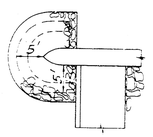
Reference Point
Iron Pipe at ¼ S.C. Sta. 16+67.71
℄ 21st. Street extended from the west

Reference Point
R.R. Spike Sta. 23+94.00
℄ 21st. Street extended from the east

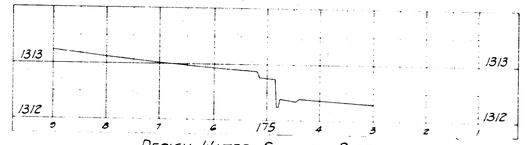
P.I. Sta. 26+00



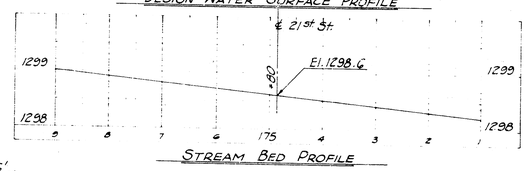




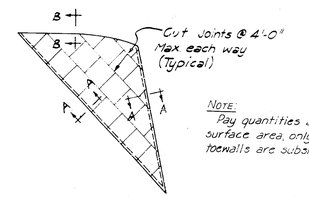
RIPRAP AT PIER NOSES



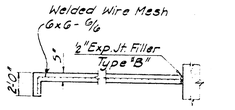
DESIGN WATER SURFACE PROFILE



STREAM BED PROFILE



Note:
Pay quantities are surface area, only; toewalls are subsidiary.

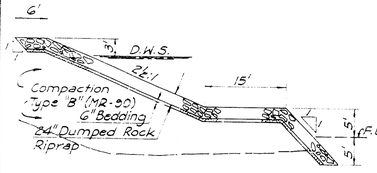


SECTION A-A SECTION B-B

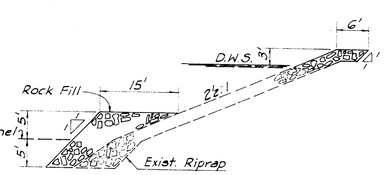
CONCRETE RIPRAP DETAILS

Notes.
See Sheet 3 for ℄ Profile.
See Sheet 8 and 14 for details of storm sewer extension.
See Sheet 4 for location of concrete riprap.
See Sheet 13 for limits and grade on Derrick Stone.

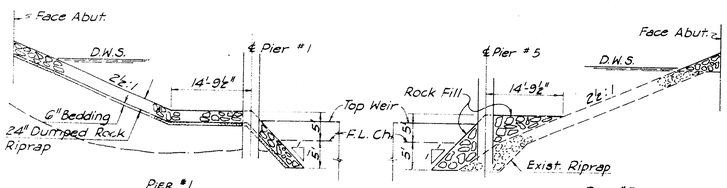
Drainage Data
Big Arkansas River design discharge at Twenty-First Street, Wichita-Valley Center Flood Control project, 20,000 c.f.s.



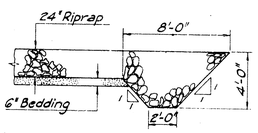
WEST BANK



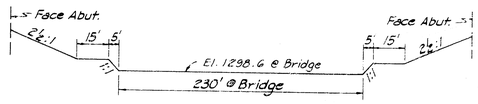
EAST BANK



RIPRAP SECTIONS



ROCK TOE AT ENDS OF RIPRAP



DESIGN CHANNEL SECTION

As Built Nov. 1972 C.P.S./K.H.

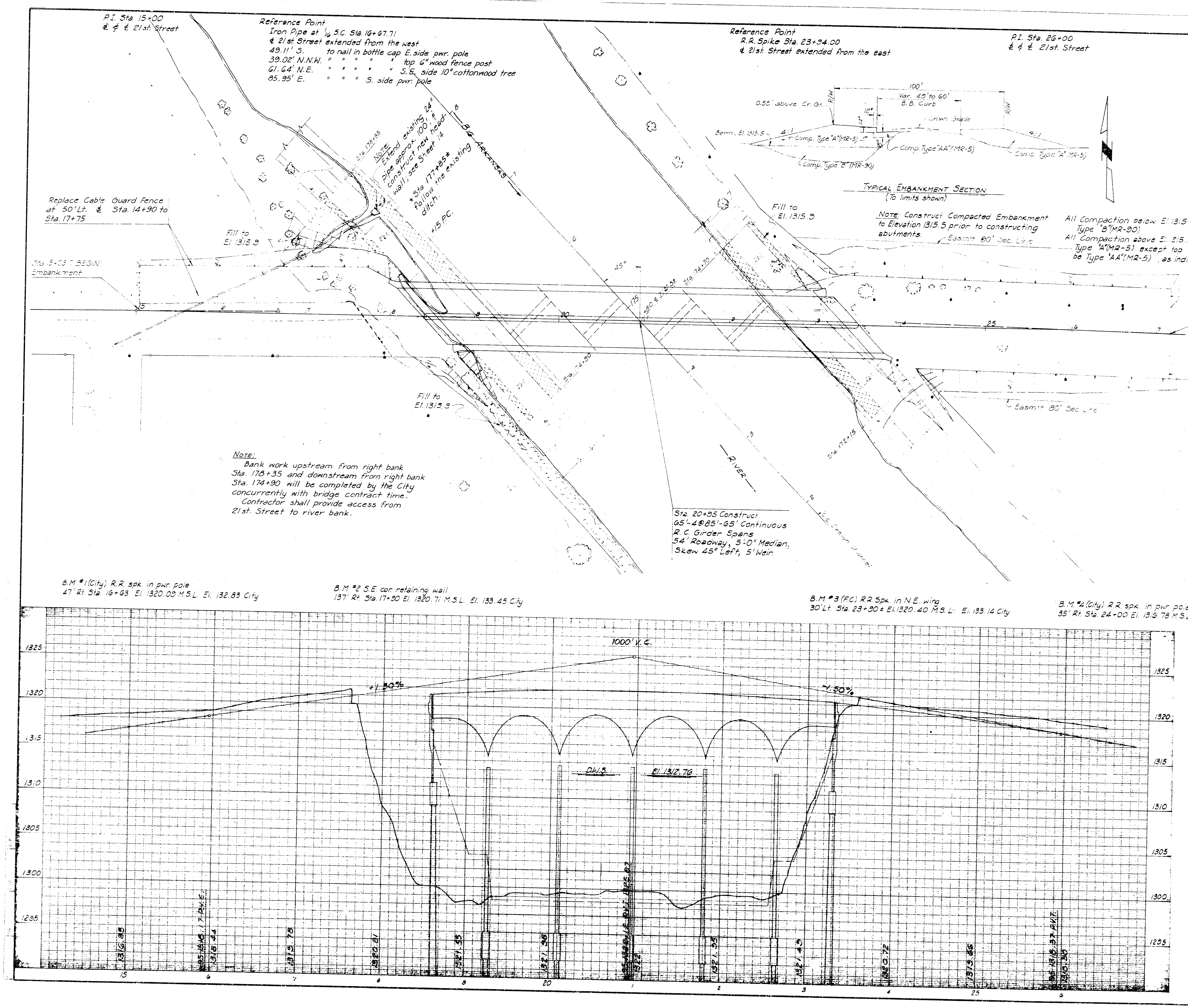
CITY OF WICHITA, KANSAS
B. E. SMITH, P.E., CITY ENGINEER

TWENTY-FIRST STREET BRIDGE OVER THE BIG ARKANSAS RIVER

CONTOUR MAP

R. S. DELAMATER
CONSULTING ENGINEER
WICHITA, KANSAS

DATE DECEMBER, 1971
SCALE
DWG. NO. 69-F-2


P.I. Sta. 15+00
℄ ℄ 21st. Street
Reference Point
Iron Pipe at 1/16 S.C. Sta. 16+67.71
℄ 21st Street extended from the west
49.11' S. to nail in bottle cap E. side pwr. pole
39.02' N.N.W. " " " " " top 6" wood fence post
61.64' N.E. " " " " " S.E. side 10" cottonwood tree
85.95' E. " " " S. side pwr. pole
Reference Point
R.R. Spike Sta. 23+34.00
℄ 21st. Street extended from the east
P.I. Sta. 26+00
℄ ℄ 21st. Street
Note: Extend existing 24" pipe approx. 100', construct new headwall; see Sheet 14
Sta. 177+85± Follow the existing ditch.
BIG ARKANSAS
Replace Cable Guard Fence at 50' Lt. & Sta. 14+90 to Sta. 17+75
Fill to El. 1315.5
Sta. 15+23 T. BEGIN Embankment
Fill to El. 1315.5
Fill to El. 1315.5
Typical Embankment Section
(To limits shown)
100'
Var. 45' to 60' B.B. Curb
0.55' above Cr. Gr.
Crown Grade
Berm El. 1315.5
4:1
Comp. Type "A" (MR-5)
Comp. Type "B" (MR-30)
Comp. Type "AA" (MR-5)
R/W
Note: Construct Compacted Embankment to Elevation 1315.5 prior to constructing abutments.
All Compaction below El. 1315.5 to be Type "B" (MR-30)
All Compaction above El. 1315.5 to be Type "A" (MR-5) except top 18" to be Type "AA" (MR-5), as indicated.
Easmt. 80' Sec. Line
Sta. 27+ T. END Embankment
Note:
Bank work upstream from right bank Sta. 178+35 and downstream from right bank Sta. 174+90 will be completed by the City concurrently with bridge contract time.
Contractor shall provide access from 21st. Street to river bank.
RIVER
Sta. 20+95 Construct 65'-4@85'-65' Continuous R.C. Girder Spans 54' Roadway, 5'-0" Median, Skew 45° Left, 5' Weir.
B.M. #1 (City) R.R. spk. in pwr. pole 47' Rt. Sta. 16+63 El. 1320.09 M.S.L. El. 132.83 City
B.M. #2 S.E. cor. retaining wall 137' Rt. Sta. 17+30 El. 1320.71 M.S.L. El. 133.45 City
B.M. #3 (F.C.) R.R. Spk. in N.E. wing 30' Lt. Sta. 23+30± El. 1320.40 M.S.L. El. 133.14 City
B.M. #4 (City) R.R. spk. in pwr. pole 35' Rt. Sta. 24+00 El. 1316.78 M.S.L. El. 129.52 City
1000' V.C.
+1.50%
-1.50%
D.W.S. El. 1312.76
1325
1320
1315
1310
1305
1300
1295

Notes:

See Sheet 4 for dimensions of concrete riprap

See Sheet 2 for details and sections of riprap, and bank grading sections.

See Sheet 14 for details of storm sewer headwalls.

See Sheet 14 for Summary of Quantities

As Built Nov, 1972 C.P.S./K.H.

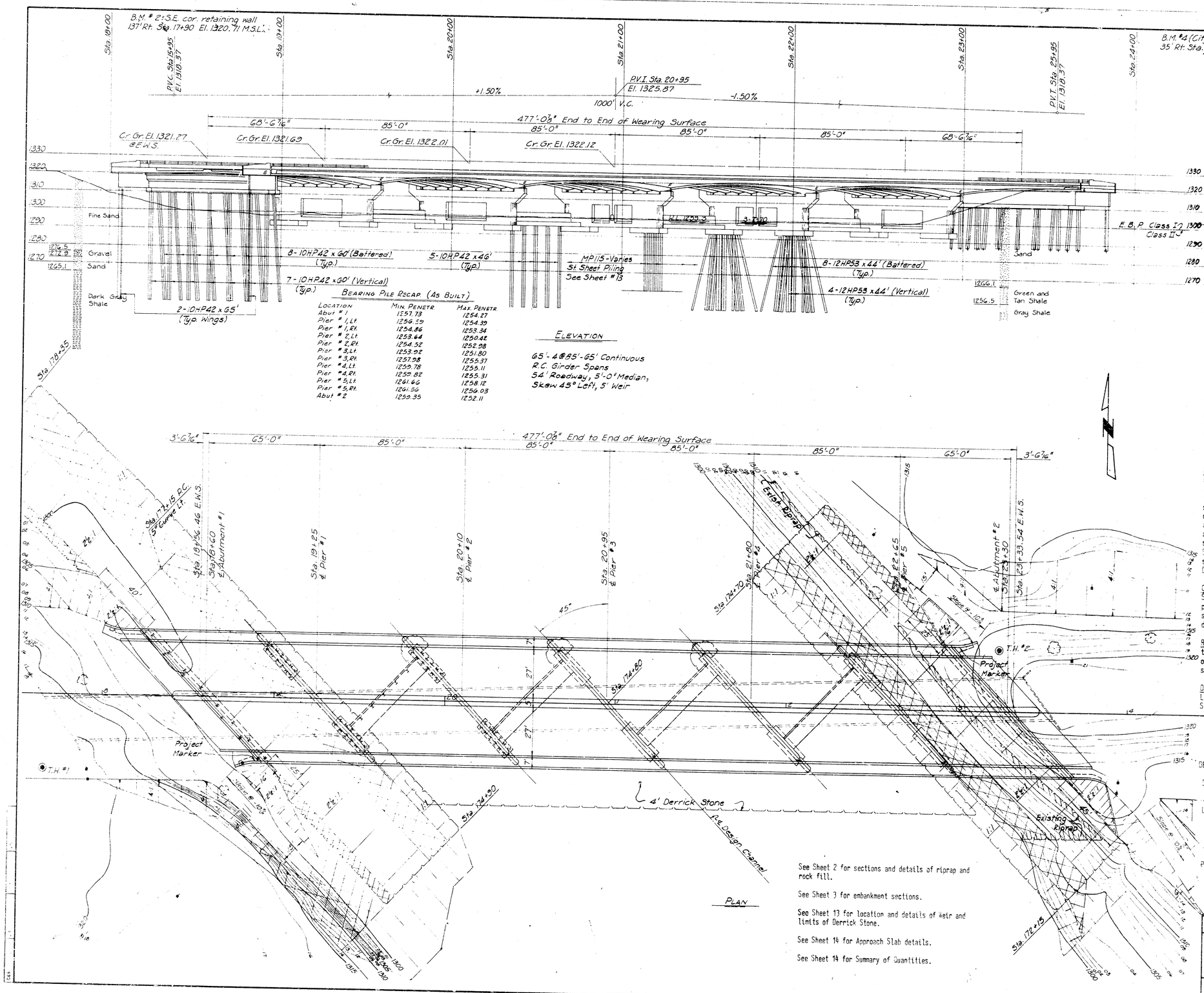
CITY OF WICHITA, KANSAS
B. E. SMITH, P.E., CITY ENGINEER

TWENTY-FIRST STREET BRIDGE OVER THE BIG ARKANSAS RIVER

PLAN - PROFILE

R. S. DELAMATER
CONSULTING ENGINEER
WICHITA, KANSAS

DATE
SCALE
DWG. NO. 89-F



BEARING PILE RECAP (AS BUILT)

LOCATION	MIN. PENETR.	MAX. PENETR.
Abut #1	1257.73	1254.27
Pier #1, Lt.	1256.59	1254.39
Pier #1, Rt.	1254.86	1253.34
Pier #2, Lt.	1253.64	1250.42
Pier #2, Rt.	1254.52	1252.98
Pier #3, Lt.	1253.92	1251.80
Pier #3, Rt.	1257.98	1255.37
Pier #4, Lt.	1259.78	1255.11
Pier #4, Rt.	1259.82	1255.31
Pier #5, Lt.	1261.66	1258.12
Pier #5, Rt.	1261.36	1256.03
Abut #2	1259.35	1252.11

ELEVATION

65'-4@85'-65' Continuous R.C. Girder Spans
54' Roadway, 5'-0" Median, Skew 45° Left, 5' Weir

PLAN

See Sheet 2 for sections and details of riprap and rock fill.

See Sheet 3 for embankment sections.

See Sheet 13 for location and details of weir and limits of Derrick Stone.

See Sheet 14 for Approach Slab details.

See Sheet 14 for Summary of Quantities.

GENERAL NOTES

COMMON EXCAVATION: There will be no separate pay item for Common Excavation, or borrow, as such. All excavation will be for material in place, as shown on the plans.

EMBANKMENTS: The Contractor shall construct the embankments and grade the berms to the lines and elevations at the abutments as shown on the Bridge Profile, Sheet No. 3, prior to construction of the bridge.

EXCAVATION: Elevation 1320.0 constitutes the Excavation Boundary Plane for estimating quantities for Class I and Class II Bridge Excavation. See Slab Excavation, Class I above, Class II and Class Slab Excavation below; see Sheet 14 for limits of pay excavation.

SOUNDINGS: Soundings information shown on Sheet 13 as obtained from borings made in the field and represents the best information available to the City of Wichita.

PILES: All piles shall be driven to the penetration shown unless in the opinion of the Engineer such penetration cannot be secured without injury to the pile. Piles shall be driven to a minimum computed bearing value, for steel bearing piles, of 70 tons per pile in piers, 55 tons per pile in abutments and 30 tons in weir base, and for steel sheet piles, of 15 tons per pile.

PILE DRIVING: All piles shall be driven with a steam or diesel hammer; if a diesel hammer is used, sufficient hammer data shall be provided to permit rating by the Engineer before driving starts.

EXISTING STRUCTURE: The Contractor will remove the existing structure, consisting of a steel beam bridge on wood pile piers. All material to become the property of the Contractor, to be removed from the site.

FALSEWORK AND FORMING: Falsework under superstructure, including each sidewalk slab, shall be left in place in any span until the concrete in that span and the adjacent span constructed latest shall have attained its design strength; but in no case shall the falsework be removed before 14 days after placing concrete. Handrail parapet walls and traffic rails shall be placed before falsework supporting the walk has been removed. See note on Sheet 9 regarding median curb forming. Camber shall be provided in the amounts shown on the Dead-Load Camber Diagram.

CONCRETE: Class AAA(AE) Concrete shall be used in Superstructure, including sidewalks, rails and parapets, and approach slab. Class A Concrete shall be used in abutments, piers and in dam foundation, weir wall, and reinforced concrete riprap.

REINFORCING STEEL: All dimensions shown relative to reinforcing steel placement are to centerline of bars unless otherwise noted. All dimensions shown in bending diagrams are out to out of bars.

DECK TREATMENT: Bridge deck shall be cured with Linseed Oil emulsion, in accordance with the Specifications.

DESIGN:

Design Loading: H20-44 A.A.S.H.O. Specifications (1949 Ed.)

Unit Stresses: fc = 1,600 p.s.i. Class AAA(AE)
f'c = 4,000 p.s.i. Class AAA(AE)
fc = 1,200 p.s.i. Class A
f'c = 3,000 p.s.i. Class A
fs = 20,000 p.s.i. (Reinf.)

Pile Loading: 70 tons per pile in piers
45 tons per pile in abutments
30 tons per pile in weir
15 tons per pile for sheet piling

As Built Nov. 1972 C.P.S./K.M.

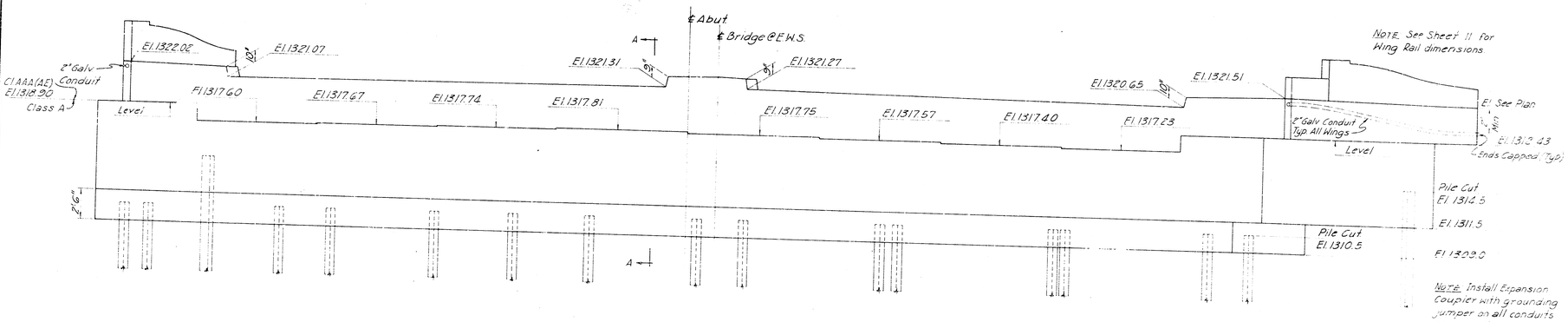
CITY OF WICHITA, KANSAS
B. E. SMITH, P.E., CITY ENGINEER

TWENTY-FIRST STREET BRIDGE OVER THE BIG ARKANSAS RIVER

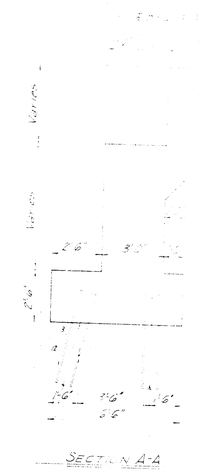
CONSTRUCTION LAYOUT

R. S. DELAMATER
CONSULTING ENGINEER
WICHITA, KANSAS

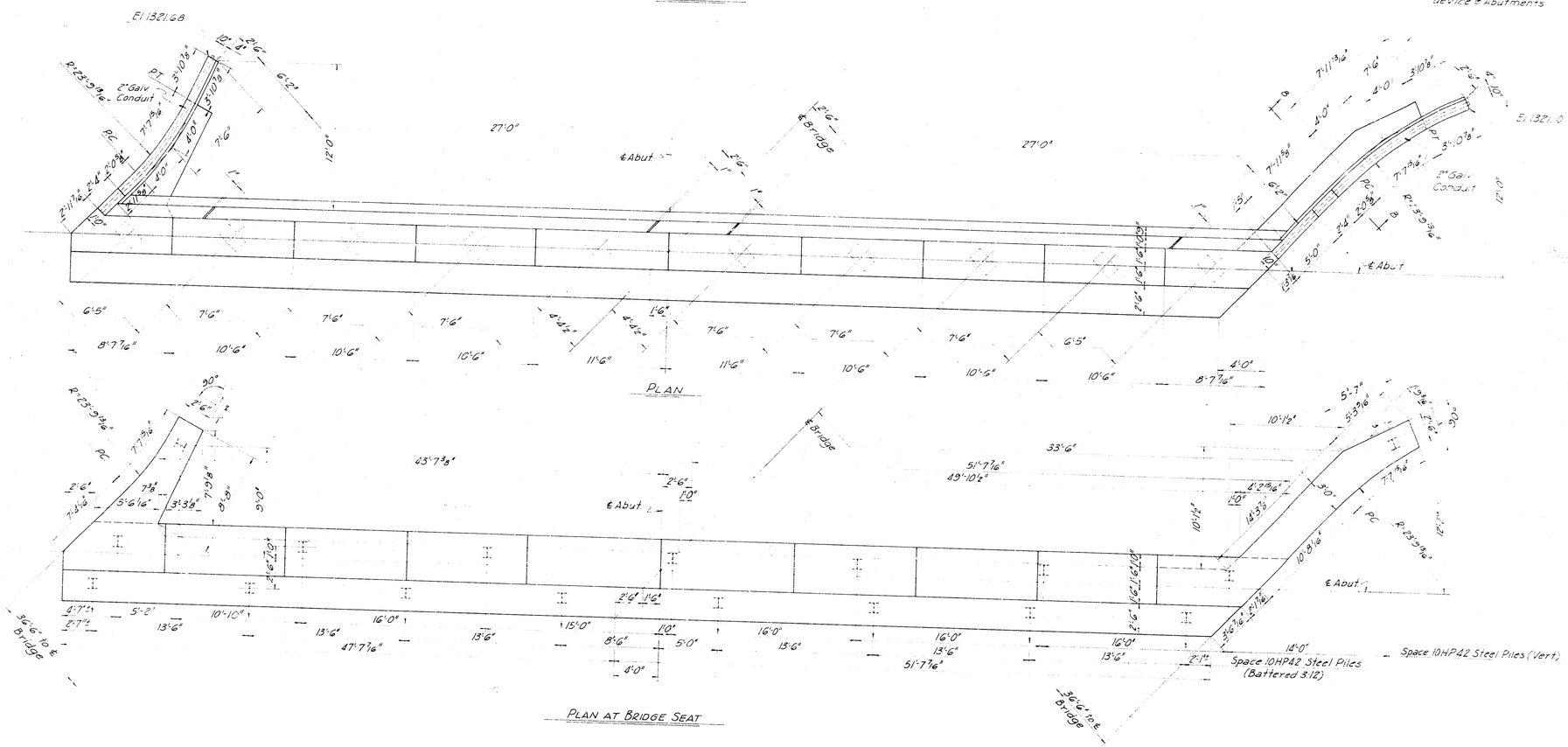
DATE: SEPTEMBER, 1971
SCALE: 1"=20'
DWG. NO. 89 F-4



ELEVATION

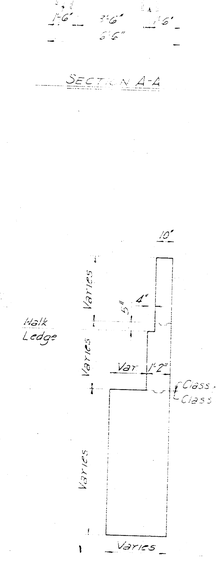


SECTION A-A



PLAN

PLAN AT BRIDGE SEAT



SECTION B-B

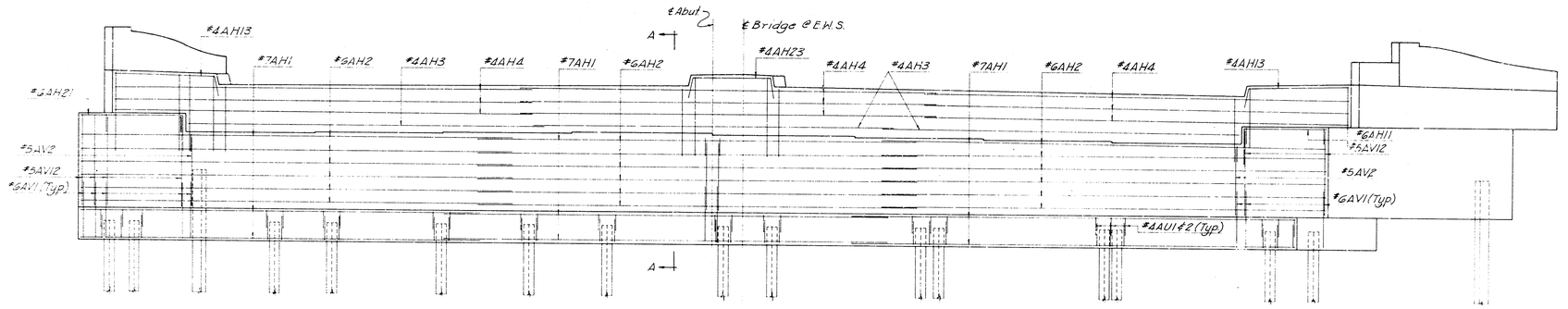
Note
Use Class A Concrete below Bridge Seat elevation
Use Class AAA (AE) Concrete above Bridge Seat elevation
See Sheet 4 for General Notes
See Sheet ... for ...
See Sheet 5 for ...
Design Live Load ...
Design Pile Loads ...

As Built Nov. 1978

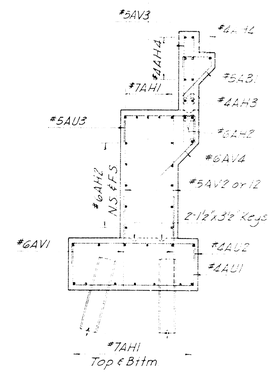
CITY OF WICHITA
B. E. SMITH, ME...
TWENTY-FIRST STREET ...
THE BIG ARKANSAS ...

ABUTMENT PLAN

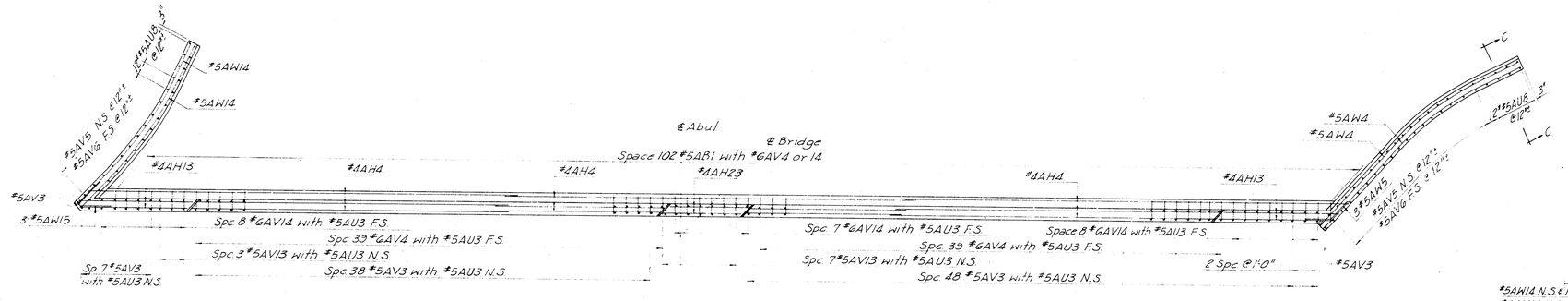
R. S. DELAMATER
CONSULTING ENGINEER
WICHITA, KANSAS



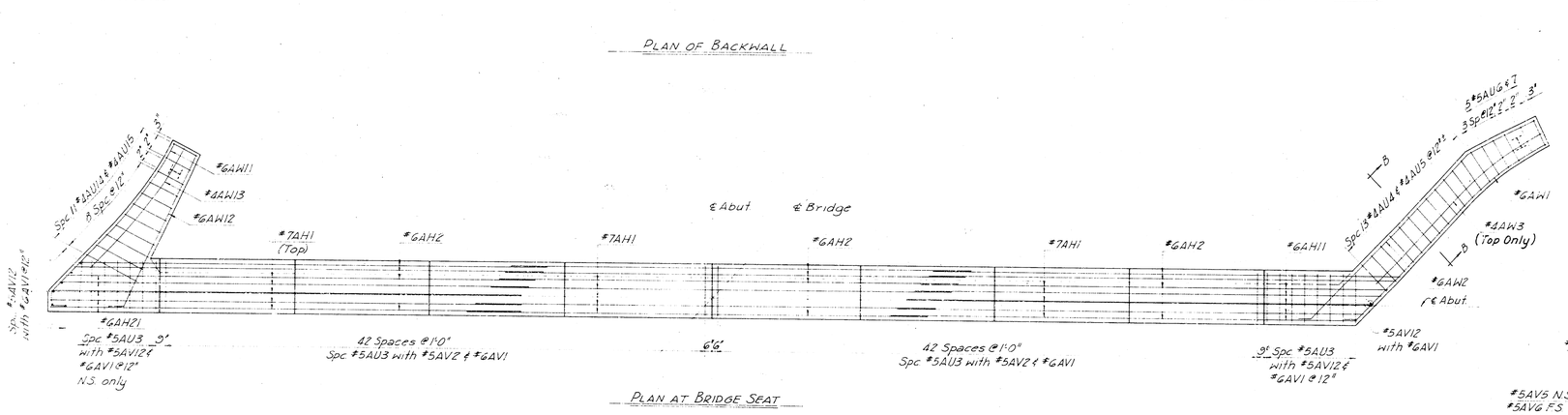
ELEVATION



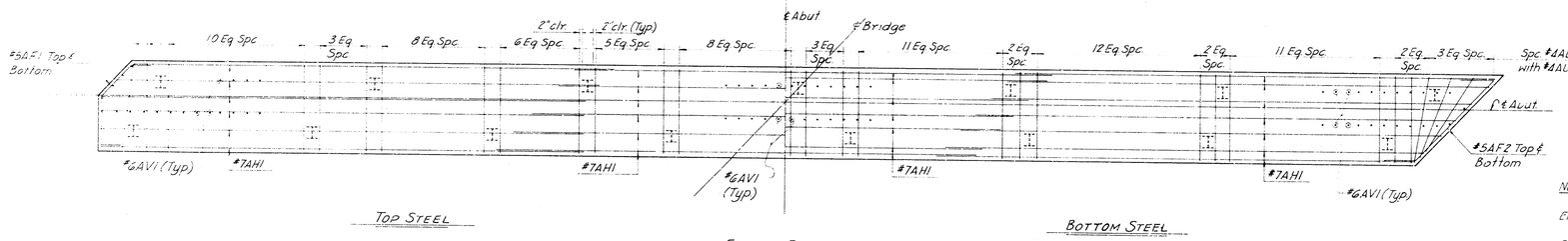
SECTION A-A



PLAN OF BACKWALL



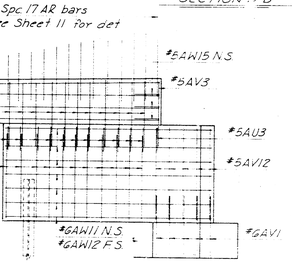
PLAN AT BRIDGE SEAT



TOP STEEL

BOTTOM STEEL

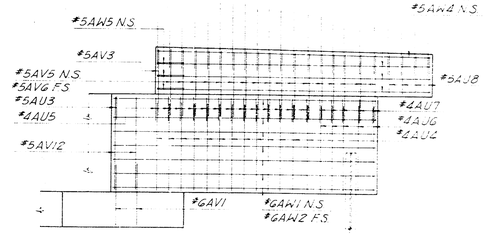
FOOTING PLAN



SECTION B-B

SECTION C-C

DEVELOPED VIEW OF SHORT WING



DEVELOPED VIEW OF LONG WING

Note.
See Sheet 5 for Dimensions and Elevations.
See Sheet 15 for Bar List and Bending Diagrams.

As Built Nov. 1978 C.P.S./K.H.

CITY OF WICHITA, KANSAS
B. E. SMITH, P.E., CITY ENGINEER

TWENTY-FIRST STREET BRIDGE OVER THE BIG ARKANSAS RIVER

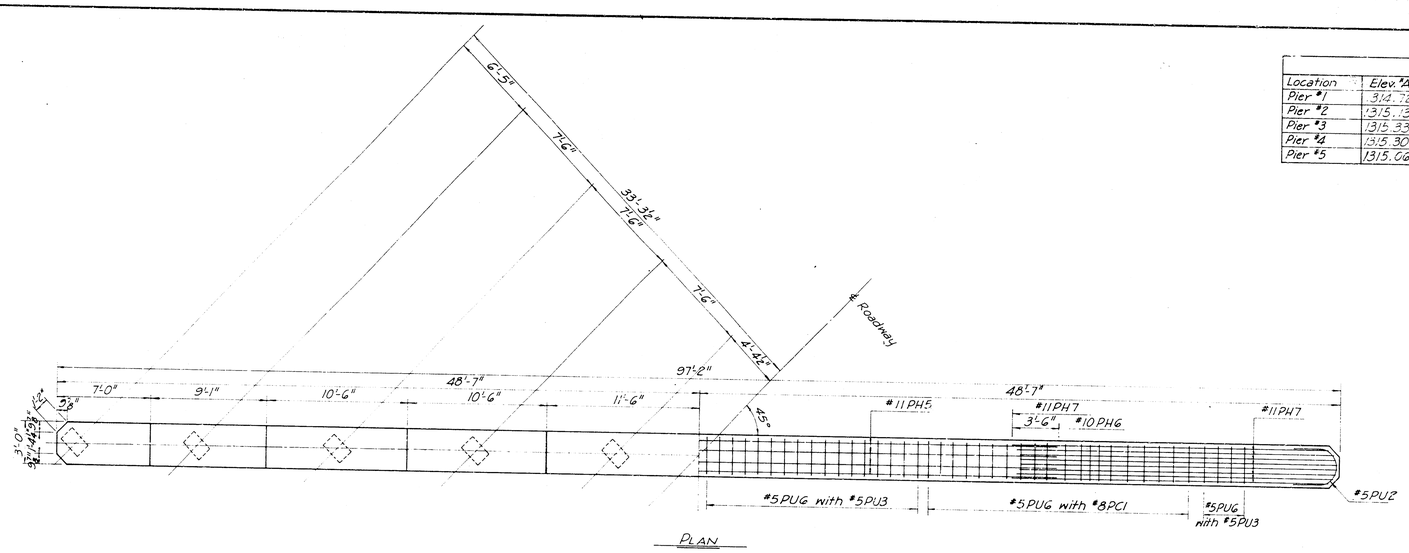
ABUTMENT REINFORCING

R. S. DELAMATER
CONSULTING ENGINEER
WICHITA, KANSAS

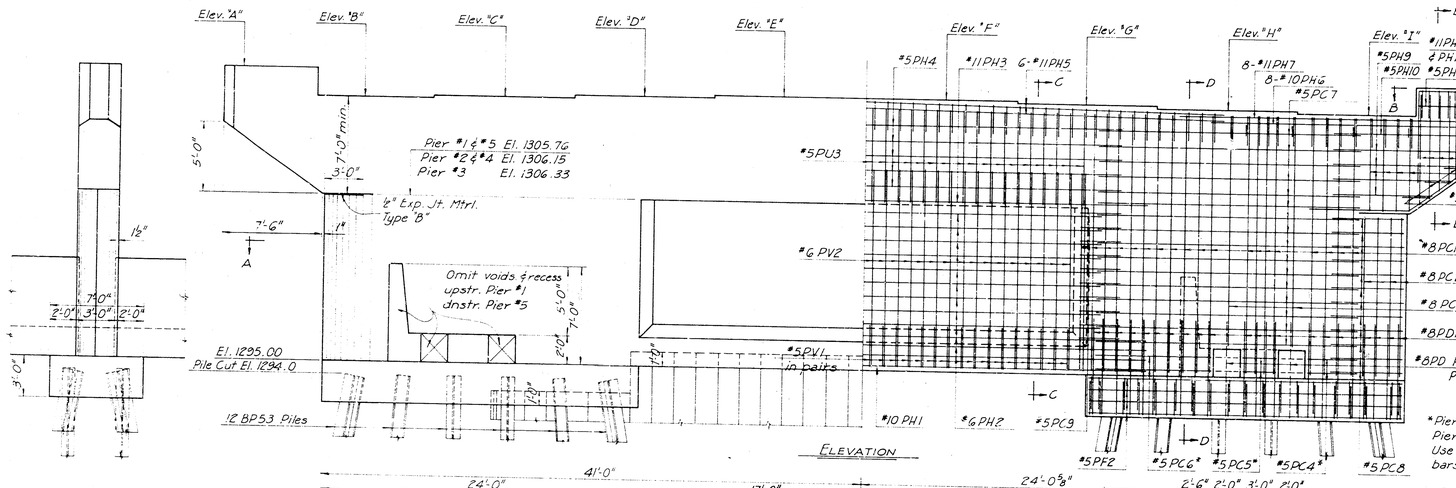
DATE DECEMBER, 19--
SCALE
DWG. NO. 89-F-8

BRIDGE SEAT ELEVATIONS

Location	Elev. "A"	Elev. "B"	Elev. "C"	Elev. "D"	Elev. "E"	Elev. "F"	Elev. "G"	Elev. "H"	Elev. "I"	Elev. "J"
Pier #1	1314.72	1312.76	1312.92	1313.08	1313.23	1313.28	1313.20	1312	1312	1312
Pier #2	1315.13	1313.15	1313.29	1313.43	1313.57	1313.59	1313.49	1313	1312	1312
Pier #3	1315.33	1313.33	1313.45	1313.57	1313.69	1313.69	1313.57	1313	1312	1312
Pier #4	1315.30	1313.29	1313.39	1313.49	1313.59	1312.87	1313.43	1313	1312	1312
Pier #5	1315.06	1313.03	1313.12	1313.21	1313.24	1313.23	1313	1312	1312	1312

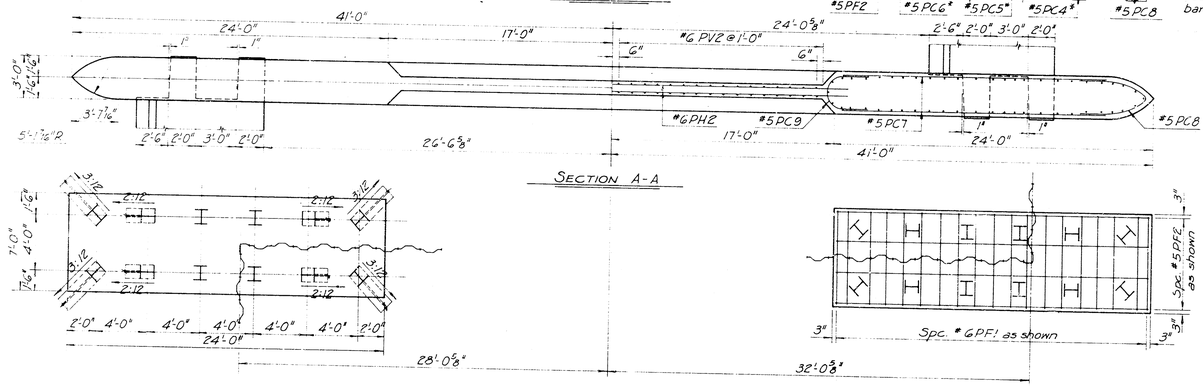


PLAN



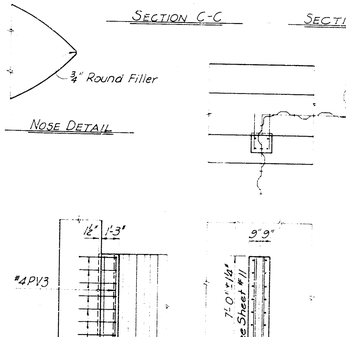
ELEVATION

SIDE VIEW



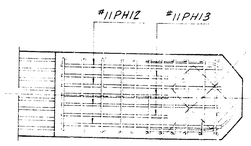
SECTION A-A

FOOTING PLAN

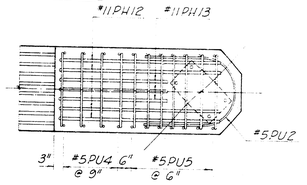


NOSE DETAIL

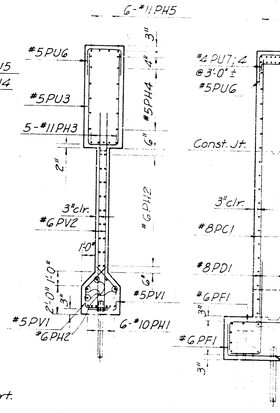
DETAIL AT OUTER FACE, PIERS #1 & #5



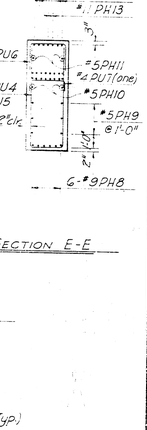
SECTION B-B
(Typical at Piers No. 1, 2, 4, & 5)
As Built



SECTION B-B
Typical at Pier #3



SECTION C-C



SECTION E-E

SECTION D-D

Note:
Use Class A Concrete in piers.
Design Loading: HS20-44 (1969 Ed.)
Design Pile load:
60 Tons on 12" H-piles
10 Tons each on Sheet Piles
See Sheet 4 for General Notes.
See Sheet 13 for Pier Details & Elevations.
See Sheet 15 for Bar List and Bending Diagrams.

As Built Nov. 1972 C.P.S. K.

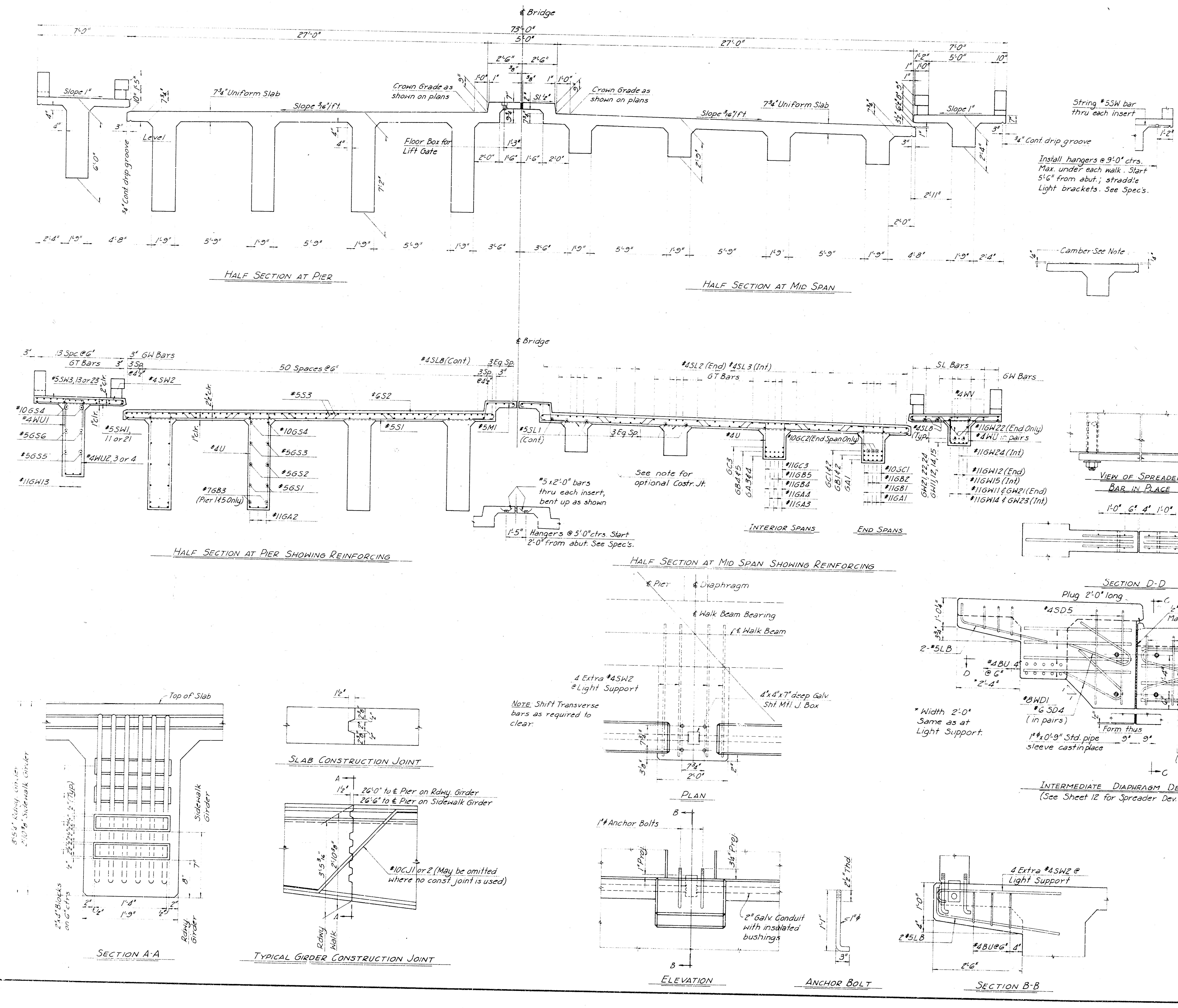
CITY OF WICHITA, KANSAS
B. E. SMITH, P.E., CITY ENGINEER

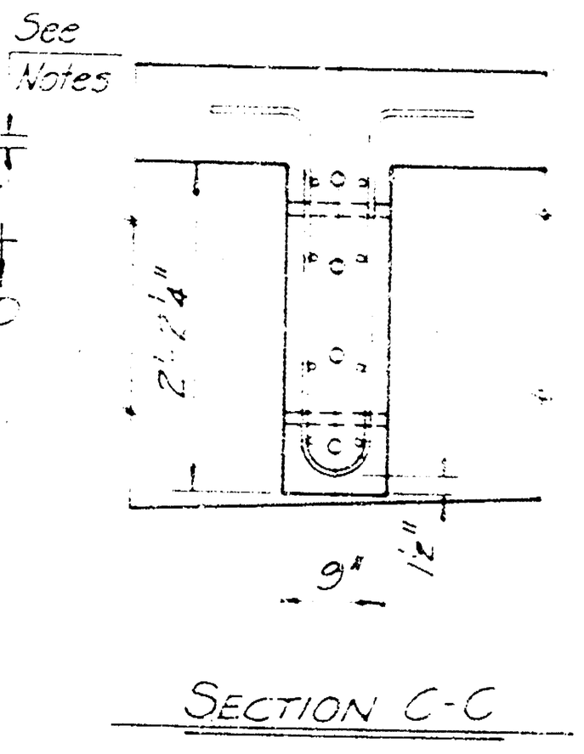
TWENTY-FIRST STREET BRIDGE OVER THE BIG ARKANSAS RIVER

PIER DETAILS

R. S. DELAMATER
CONSULTING ENGINEER
WICHITA KANSAS

DATE
SCALE
89-F-





CONSTRUCTION NOTES:

At the Contractor's option concrete in the [illegible] stems may be placed ahead of and separately from the flanges, provided: that the stems are placed to a level above the fillets as shown; laitance is brushed from the surface before final set, and the surface thoroughly soaked and dampened before placing flange concrete. Place the flange concrete as soon as practically possible after concrete in the stems has fully settled.

Median curbs shall be poured after falsework is removed from both sides of superstructure on forms suspended from superstructure concrete. [illegible] may be installed under superstructure for support of the median forms.

Camber edges of walk upward as shown [illegible] brackets and/or fixed diaphragms.

NOTE:

Use Class AAA(AE) Concrete thruout on superstructure.

Design Loading: HS20-44 (1969 Ed.)

See Sheet 9 for Superstructure Plan.

See Sheet 4 for General Notes.

See Sheet 11 for Handrail Details.

See Sheet 12 for details of structural steel tie bars.

See Sheet 15 for Bar List and Bending Diagrams.

As Built Nov 1972

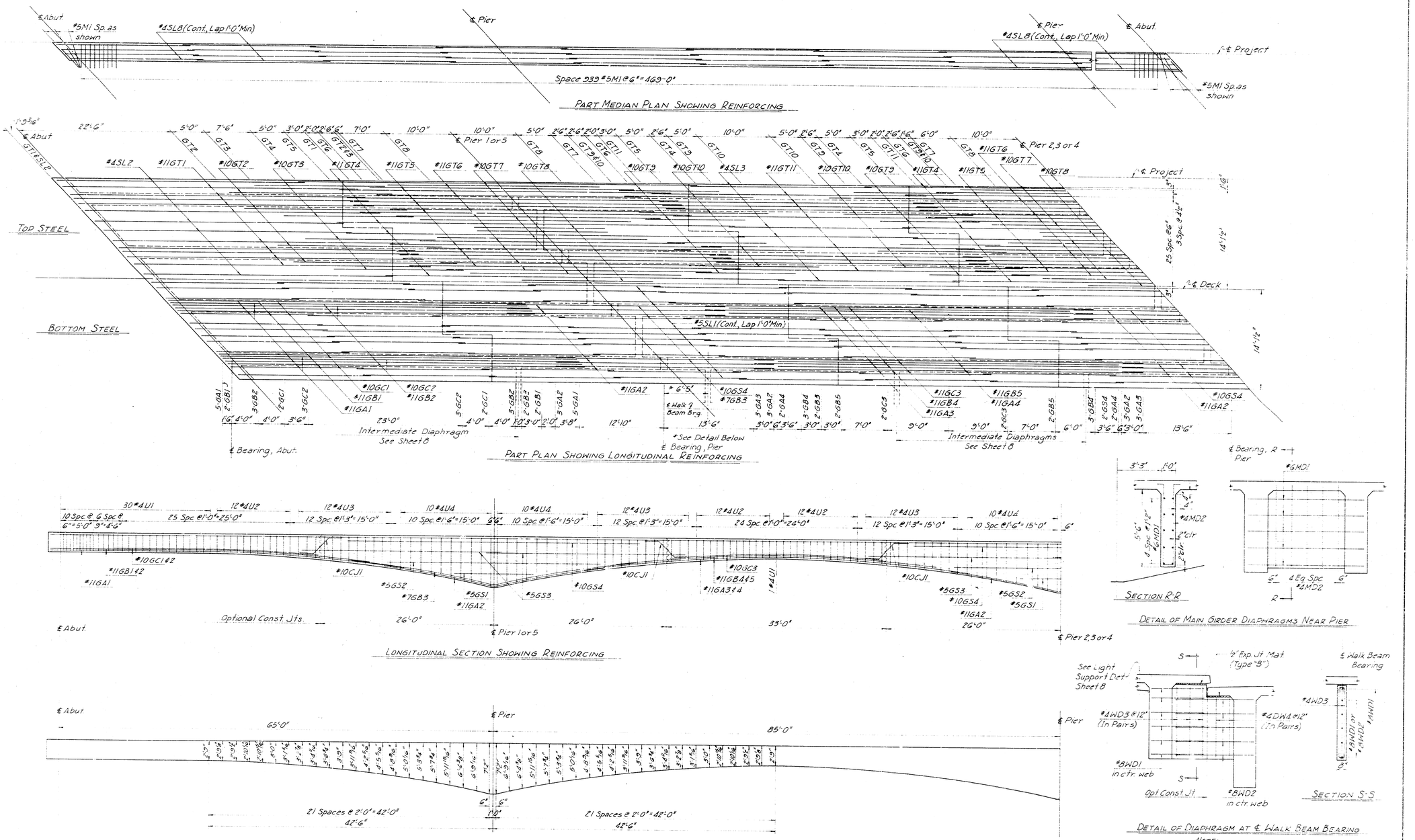
CITY OF WICHITA, KANSAS
B. E. SMITH, P.E., CITY ENGINEER

TWENTY-FIRST STREET BRIDGE OVER THE BIG ARKANSAS RIVER

DECK SECTIONS

R. S. DELAMATER
CONSULTING ENGINEER
WICHITA, KANSAS

DATE: DECEMBER, [illegible]
SCALE:
DWG. NO. 69-F-8



NOTE:
Use Class AAA(AE) Concrete thruout on Superstructure.
See Sheet 8 for Deck Section and Notes

As Built Nov, 1972 C.P.S./K.H.

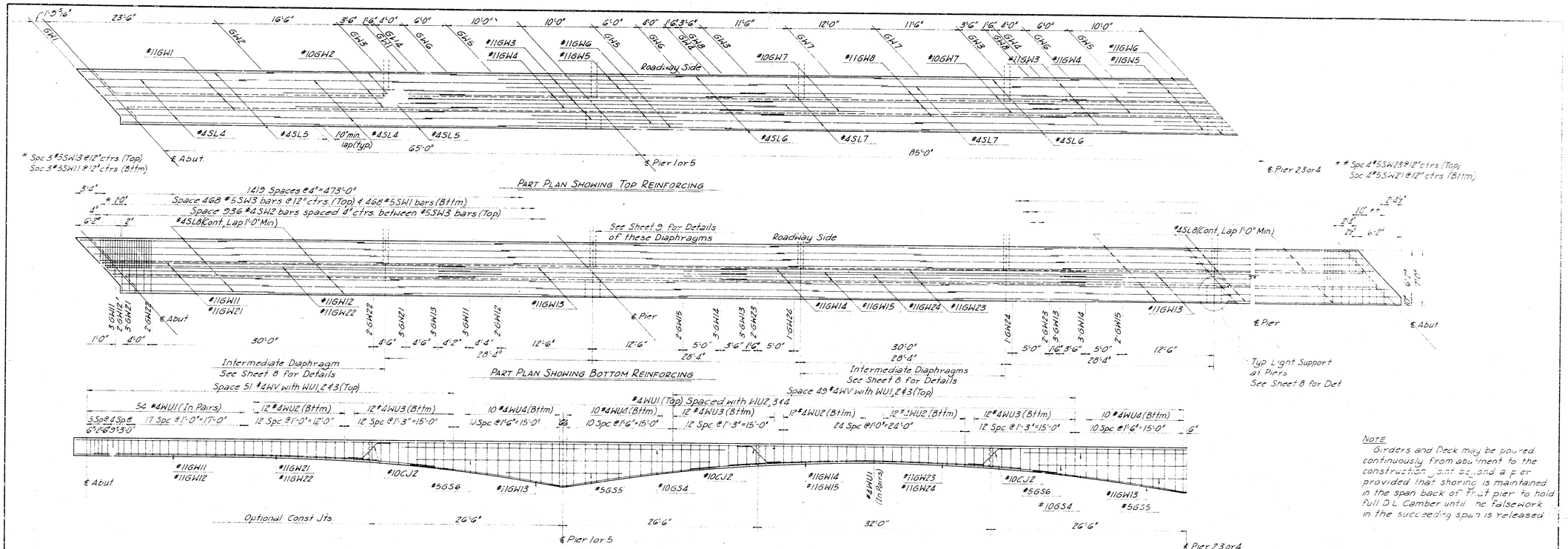
CITY OF WICHITA, KANSAS
B. E. SMITH, P.E., CITY ENGINEER

TWENTY-FIRST STREET BRIDGE OVER THE BIG ARKANSAS RIVER

SUPERSTRUCTURE PLAN

R. S. DELAMATER
CONSULTING ENGINEER
WICHITA, KANSAS

DATE: DEC. 1971
SCALE:
SHEET NO. 89-F-6



NOTE

Girders and Deck may be poured continuously from abutment to the construction joint at pier and at pier provided that shoring is maintained in the span back of first pier to hold full D.L. Camber until the falsework in the succeeding span is released

NOTE

Use Class AAA(AE) Concrete throughout superstructure.
Design Loading: HS20-44 (1969 Ed.)
See Sheet 4 for General Notes
See Sheet 8 for Deck Section, Intermediate Sidewalk Diaphragms & Light Support Bracket Details
See Sheet 15 for Bar List and Bending Diagrams
See Sheet 11 for Handrail & Curb Rail Details.

As Built Nov. 1972 C.P.S.

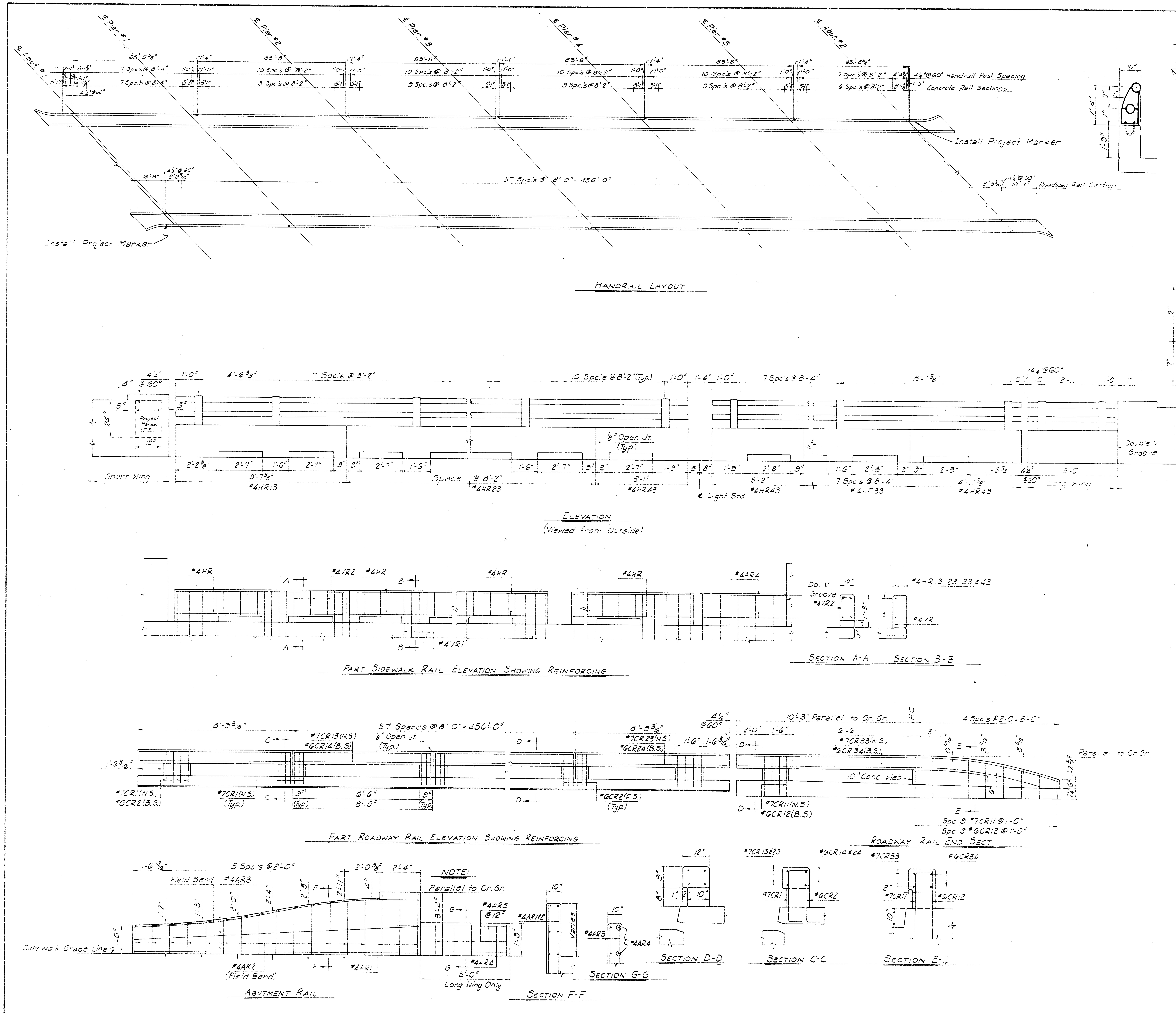
CITY OF WICHITA, KANSAS
B. E. SMITH, P.E., CITY ENGINEER

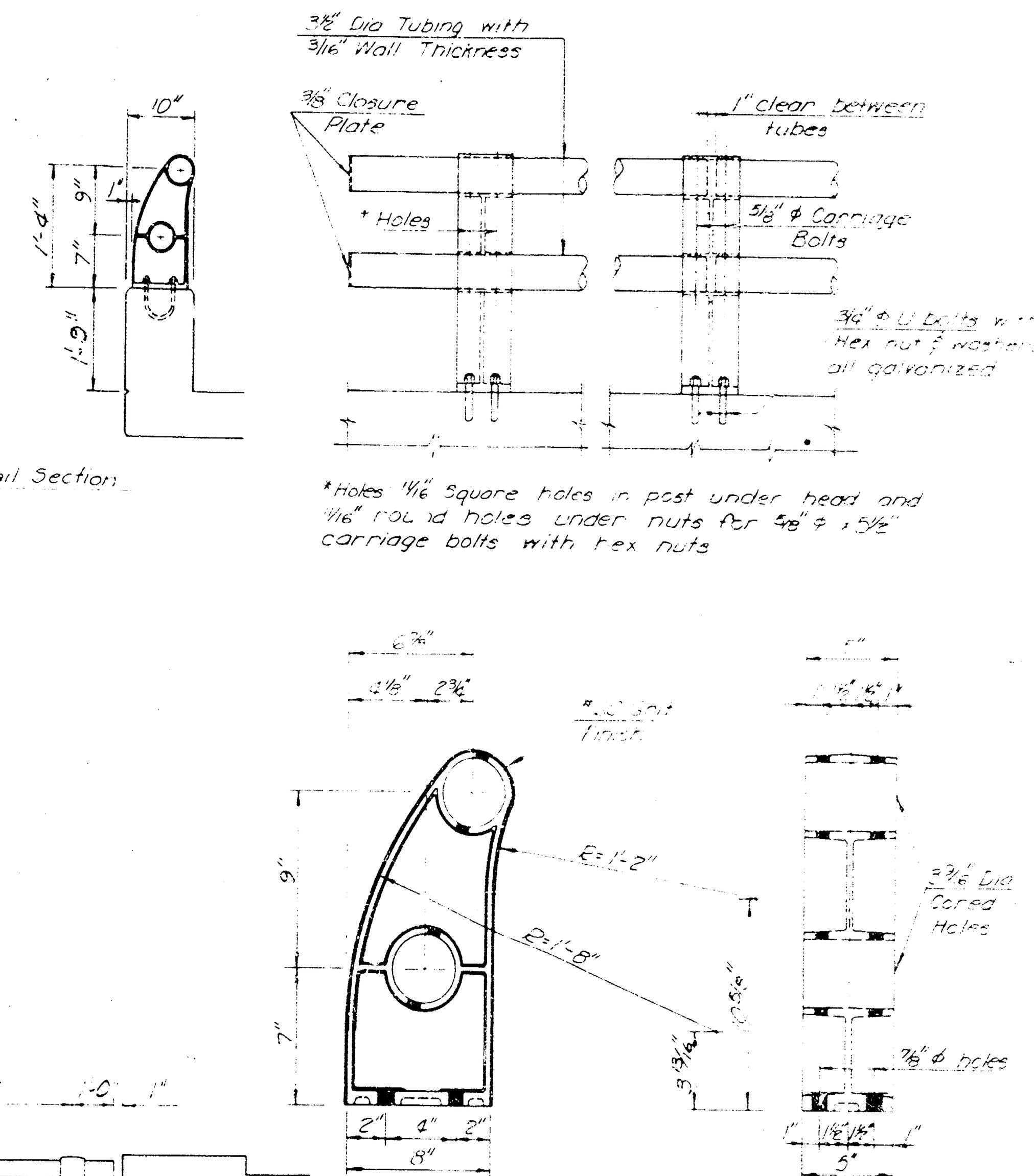
TWENTY-FIRST STREET BRIDGE OVER THE BIG ARKANSAS RIVER

SUPERSTRUCTURE AND SIDEWALK DETAILS

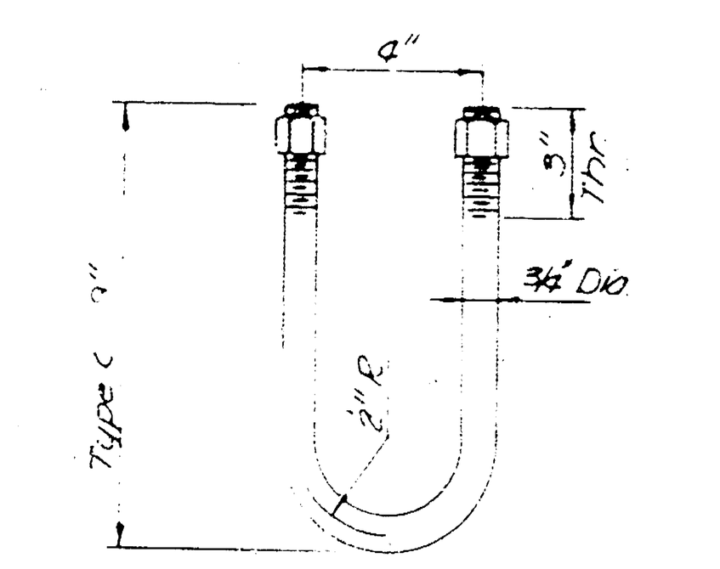
R. S. DELAMATER
CONSULTING ENGINEER
WICHITA, KANSAS

DATE
SCALE
89-F-





POST FOR TYPE C RAIL



GALVANIZED U-BOLTS DETAILS

Notes: (Aluminum Handrail)
Handrail Tubing shall be fabricated in lengths to include two or three spaces.
Bolt holes in tubing of intermediate posts to be 11/16" diameter. At other posts 11/16" slotted holes centered on bolts @ 60°F
All rail post flanges and webs shall have a minimum thickness of 5/16" with 3° draft Nominal thickness of base shall be 3/4" with minimum of 3/8".
Aluminum shims between concrete and post base may be used The space below post shall be thoroughly caulked with Alumilastic compound or other approved material.

ALUMINUM HANDRAIL DETAILS TYPE C

NOTE
Use Class AA [illegible] for Handrails and Traffic Rails.
See Sheet 4 for General Notes
See Sheet 15 for Bar List and Bending Diagrams

As Built Nov, 1972

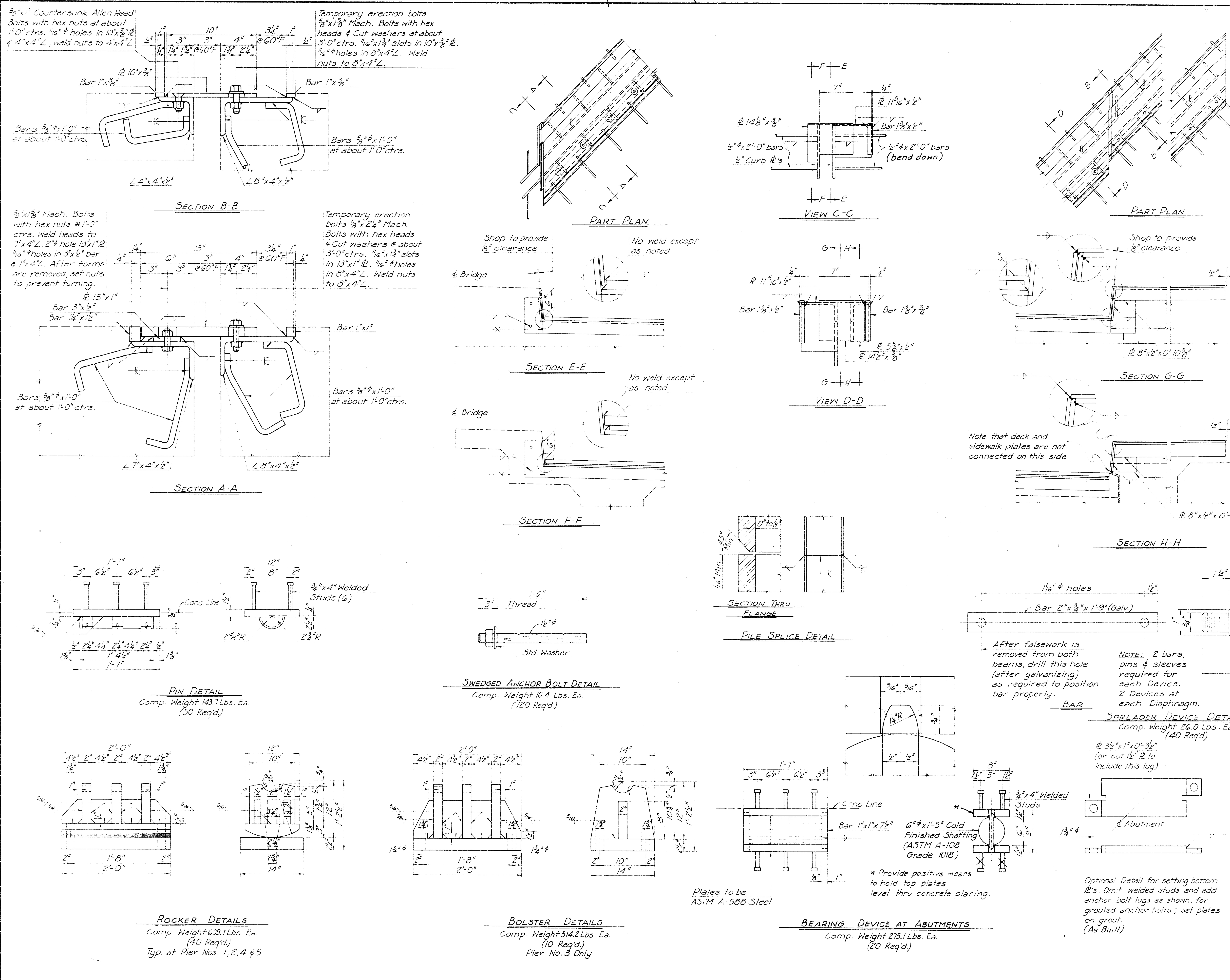
CITY OF WICHITA, KANSAS
B. E. SMITH, P.E., CITY ENGINEER

TWENTY-FIRST STREET BRIDGE OVER THE BIG ARKANSAS RIVER

HANDRAIL DETAILS

R. S. DELAMATER
CONSULTING ENGINEER

89-F-



Section B-B
Section A-A
Part Plan
Section E-E
Section F-F
View C-C
View D-D
Part Plan
Section G-G
Section H-H
Note that deck and sidewalk plates are not connected on this side
Pin Detail
Comp. Weight 143.7 Lbs. Ea.
(30 Req'd.)
Swedged Anchor Bolt Detail
Comp. Weight 10.4 Lbs. Ea.
(120 Req'd.)
Section Thru Flange
Pile Splice Detail
After falsework is removed from both beams, drill this hole (after galvanizing) as required to position bar properly.
Bar
Note: 2 bars, pins & sleeves required for each Device. 2 Devices at each Diaphragm.
Spreader Device Details
Comp. Weight 26.0 Lbs. Ea.
(40 Req'd)
Note. Burr threads or tack weld after erection.
Pin
Rocker Details
Comp. Weight 609.1 Lbs. Ea.
(40 Req'd.)
Typ. at Pier Nos. 1, 2, 4 & 5
Bolster Details
Comp. Weight 514.2 Lbs. Ea.
(10 Req'd.)
Pier No. 3 Only
Plates to be ASTM A-588 Steel
Bearing Device at Abutments
Comp. Weight 275.1 Lbs. Ea.
(20 Req'd.)
* Provide positive means to hold top plates level thru concrete placing.
Optional Detail for setting bottom ℘'s. Omit welded studs and add anchor bolt lugs as shown, for grouted anchor bolts; set plates on grout.
(As Built)

NOTE:
All parts of expansion devices and spreader devices shall be structural steel A-[illegible].

Sole plates, pins, rockers, rollers, bolsters, anchor bolts and nuts shall be included in Bearing Devices bid item. All parts of bearing devices shall be A-36 steel except bearing pins and rollers shall be A-10[illegible], Grade 101[illegible], and sole plates for rollers shall be A-5[illegible] steel.

Structural Steel bid item includes all parts of expansion devices and spreader devices only.

See Sheet 4 for General Notes.

As Built Nov, 1972 CPS/K[illegible]

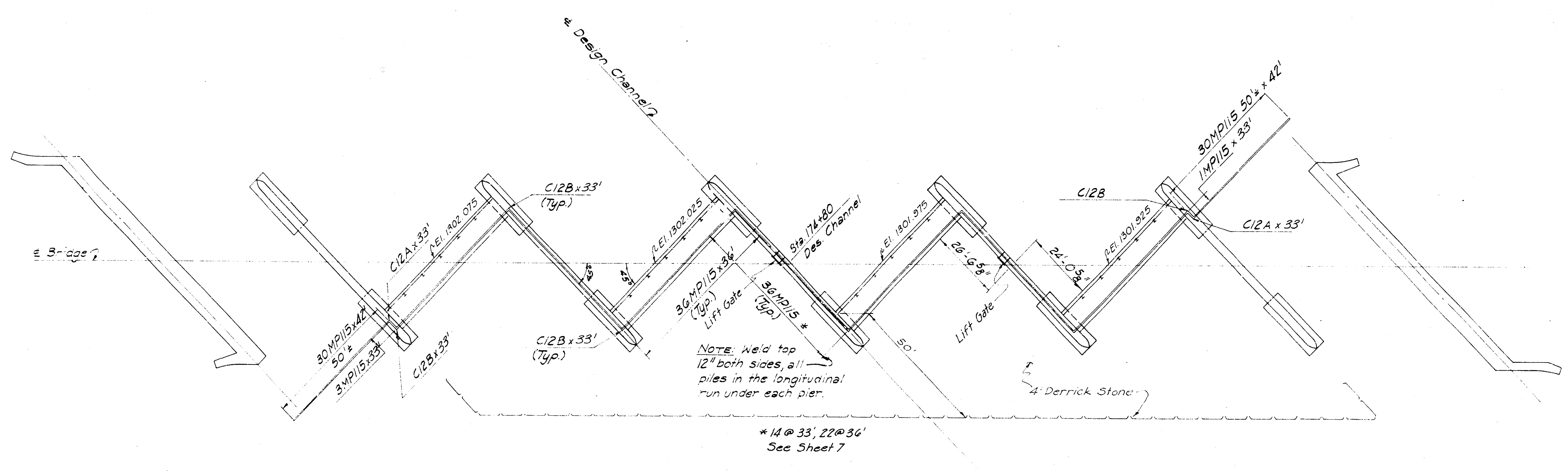
CITY OF WICHITA, KANSAS
B. E. SMITH, P.E., CITY ENGINEER

TWENTY-FIRST STREET BRIDGE OVER THE BIG ARKANSAS RIVER

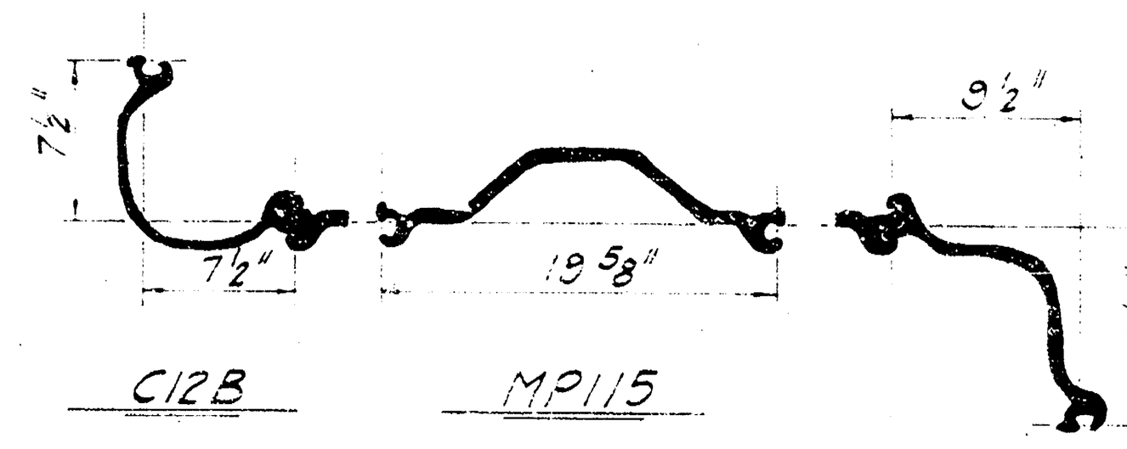
STRUCTURAL STEEL DETAILS & BEARING DEVICES

R. S. DELAMATER
CONSULTING ENGINEER
WICHITA, KANSAS

89-F

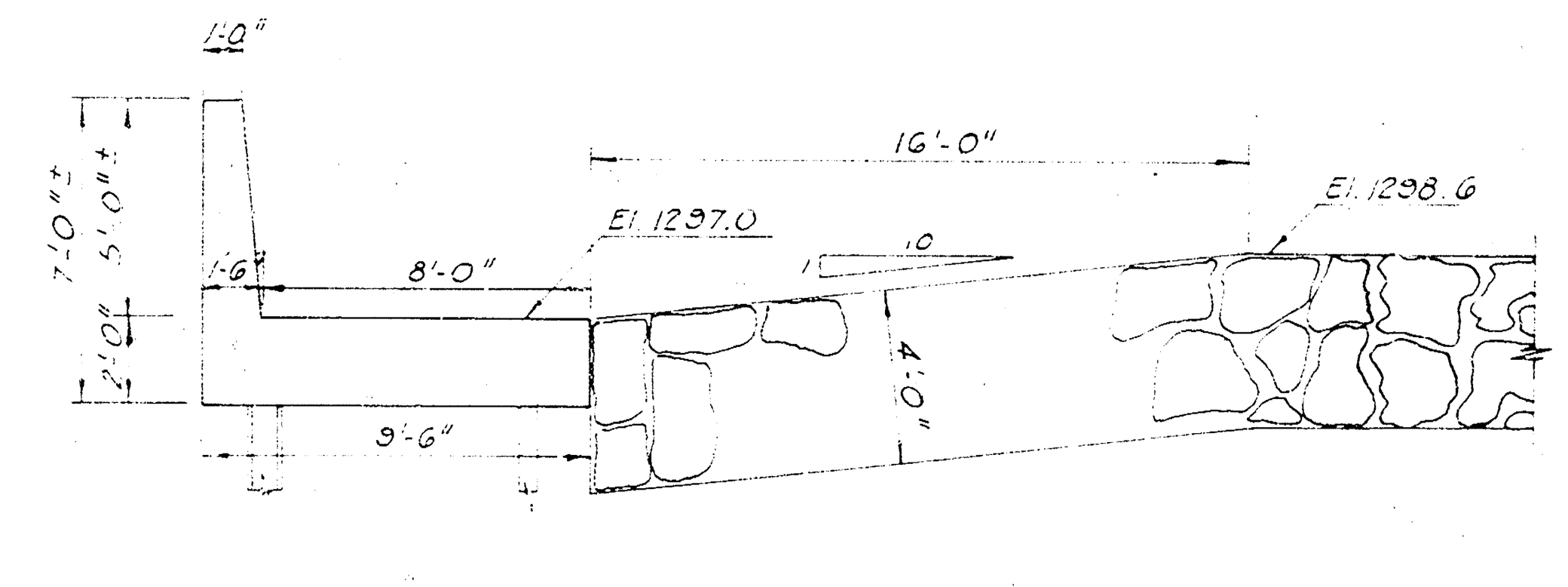


SECTION THRU PIERS



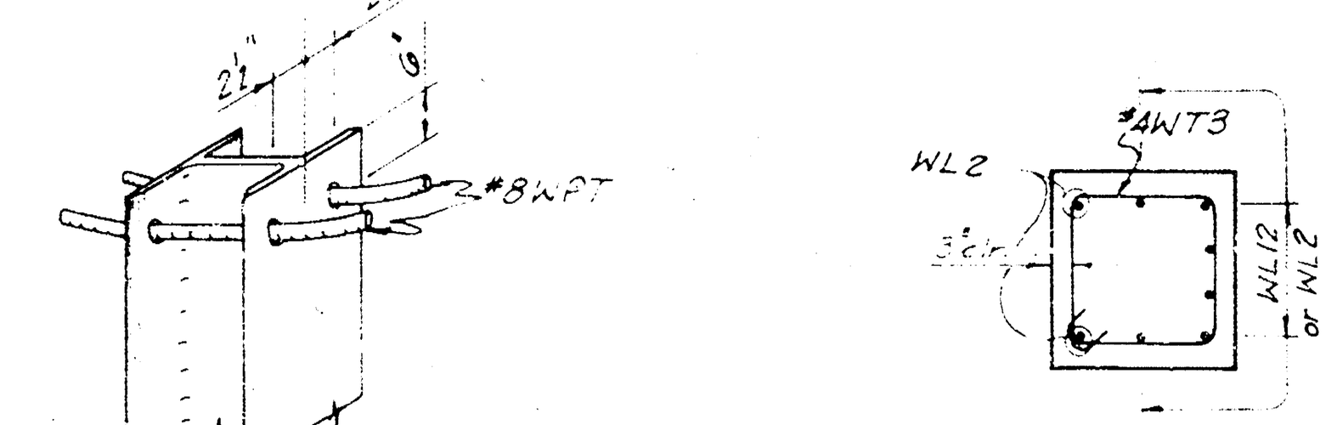
RECAP OF STEEL SHEET PILING

C12A	2 pcs.	@	33'	=	66 Lin. Ft.
C12B	8 pcs.	@	33'	=	264 " "
MP115	56 pcs.	@	33'	=	1,848 " "
"	202 pcs.	@	36'	=	7,272 " "
"	58 pcs.	@	42'	=	2,436 " "
	Total			=	11,886 " "



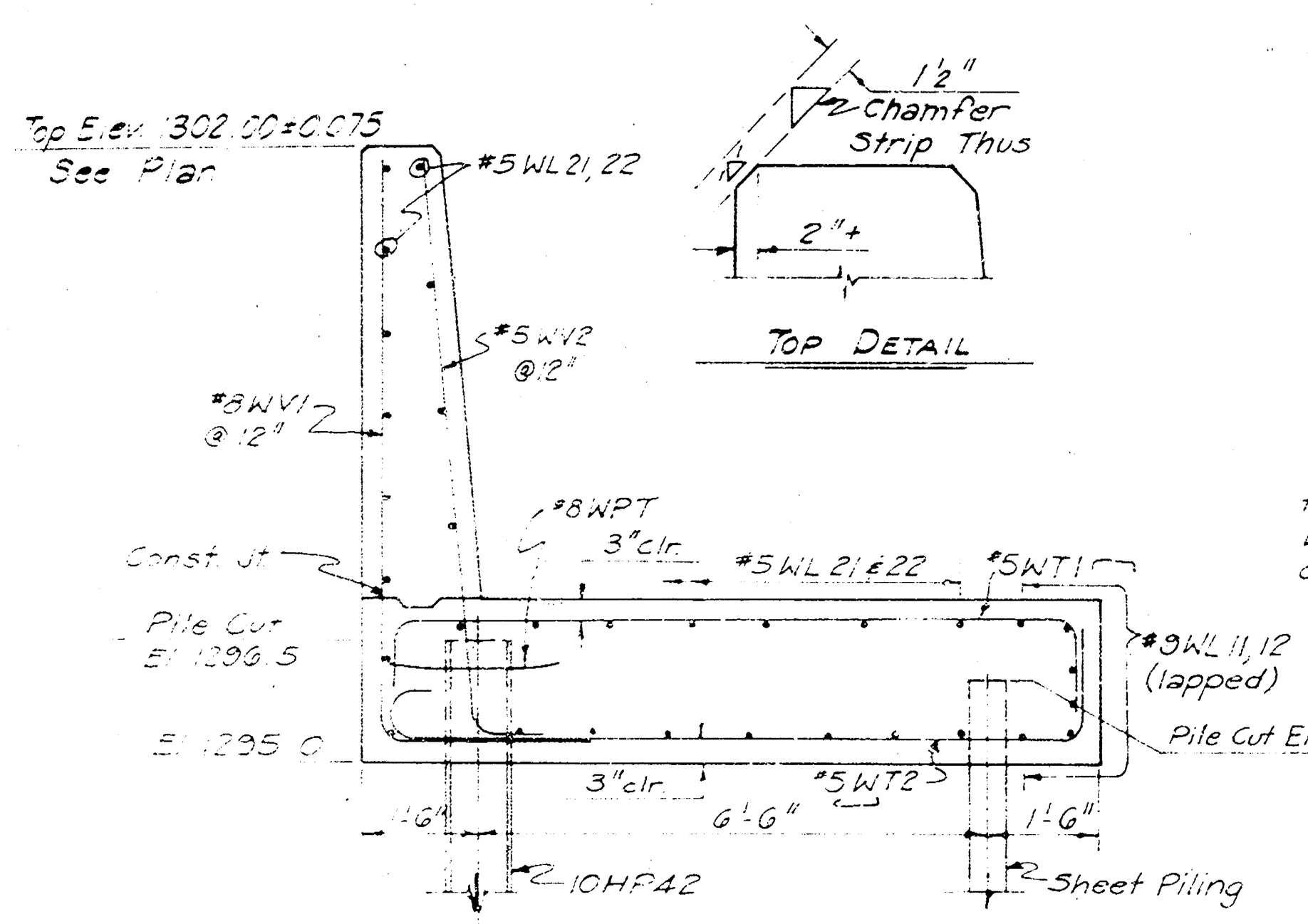
SECTION THRU WEIR & DERRICK STONE

Note:
Place ½" Expansion Joint Filler, Type "B", against pier face, entire end contact area of each weir.



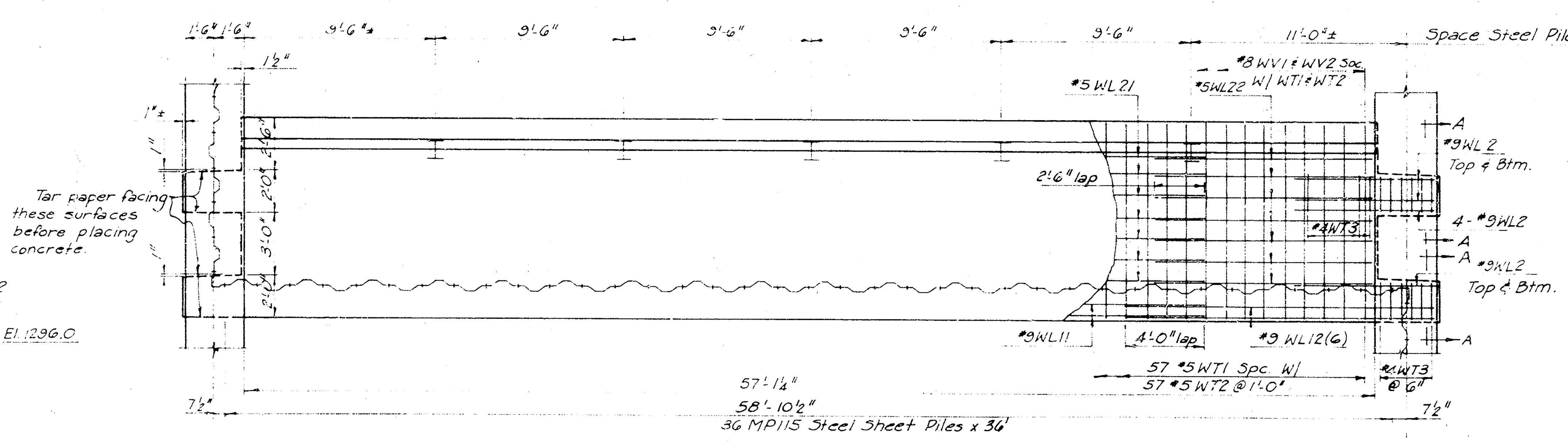
PILE TOP DETAIL

SECTION A-A

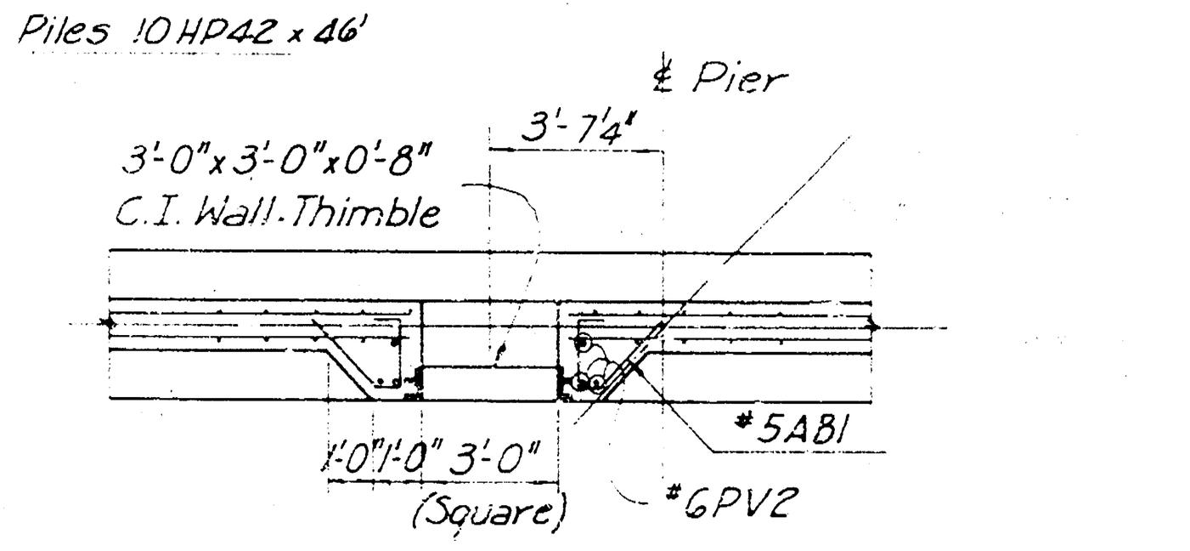


TOP DETAIL

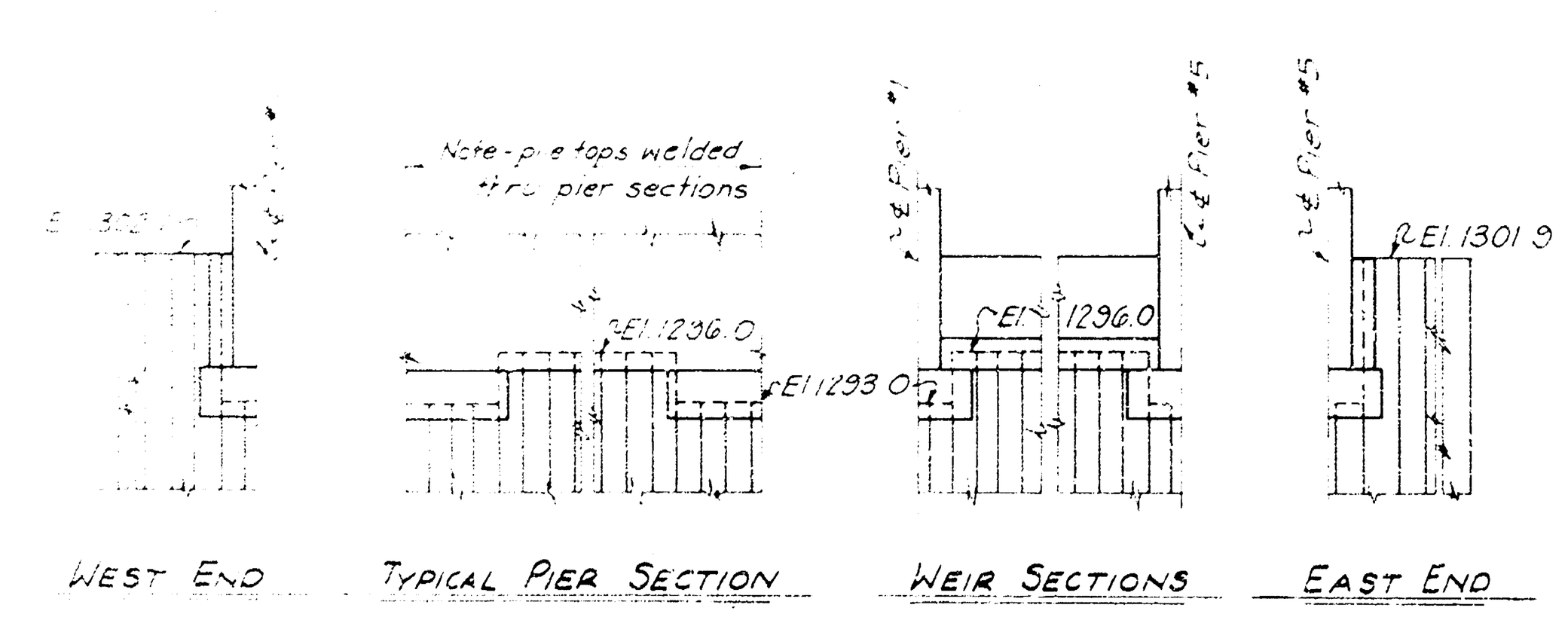
DETAIL SECTION



PLAN

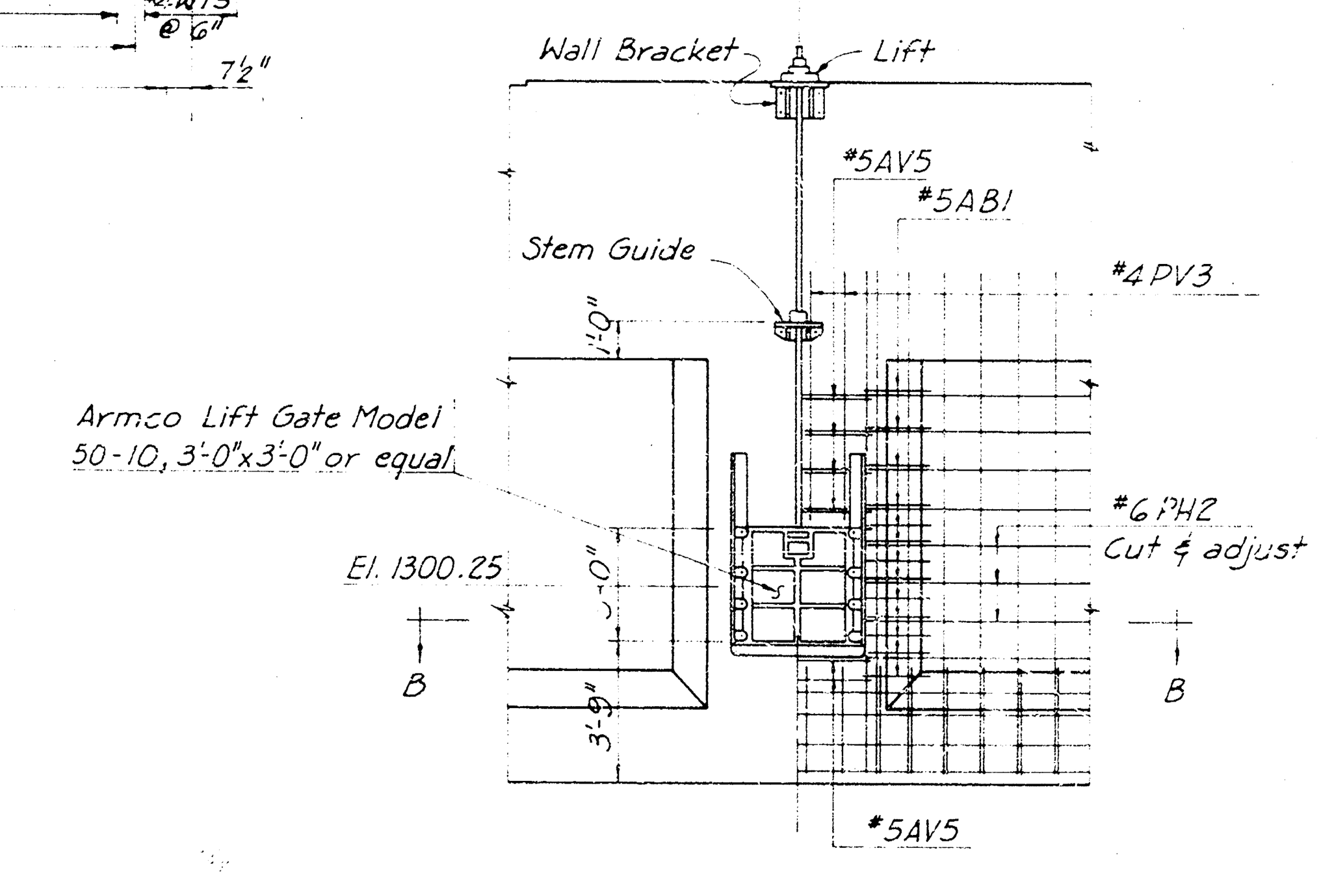


SECTION B-B



WEST END TYPICAL PIER SECTION WEIR SECTIONS EAST END

STEEL SHEET PILE CUTOFF ELEVATIONS



ELEVATION OF LIFT GATE INSTALLATION
PIER No. 3 & 4 ONLY

NOTES
Use Class A concrete throughout in the weir.
See Sheet 4 for General Notes.
See Sheet 5 for Bar List and Bending Diagrams.
See Sheet 7 for details of Sheet Piling location thru piers.

DESIGN PILE LOADING
20 Tons per pile on 10" bearing piles
10 Tons per pile on sheet piles

As Built Nov. 1972 C.P.S./K.H.

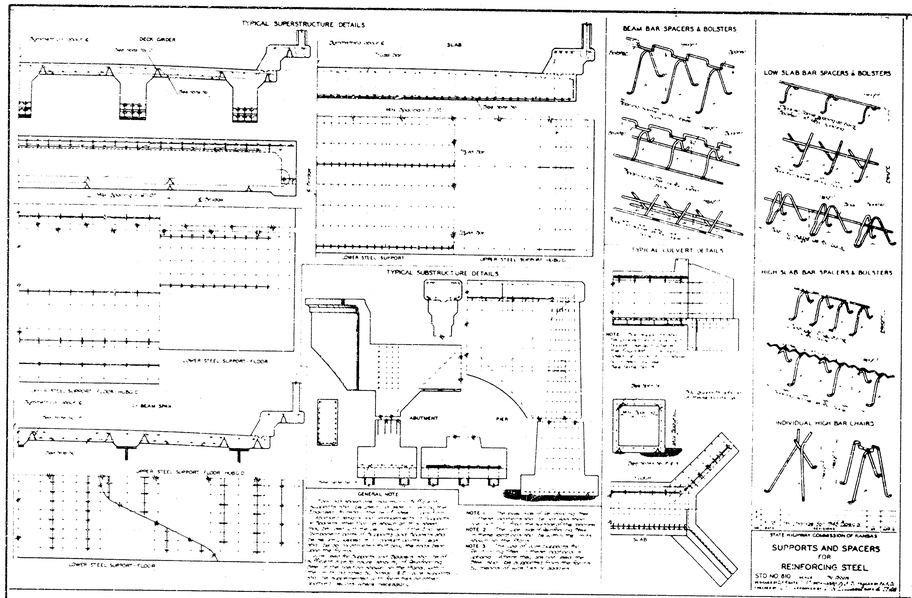
CITY OF WICHITA, KANSAS
B. E. SMITH, P.E., CITY ENGINEER

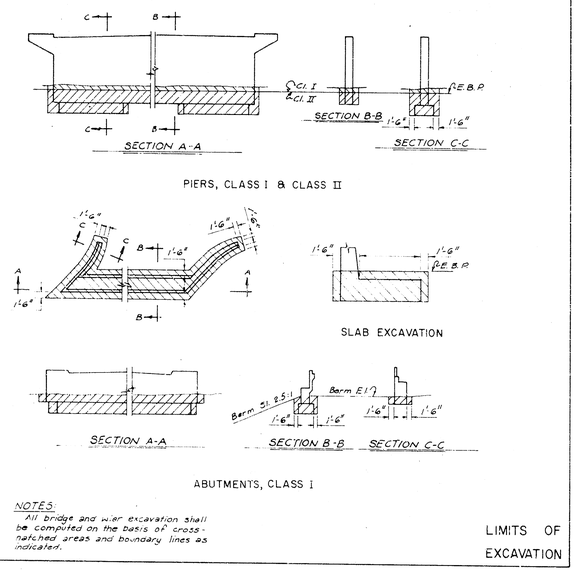
TWENTY-FIRST STREET BRIDGE OVER THE BIG ARKANSAS RIVER

WEIR DETAILS

R. S. DELAMATER
CONSULTING ENGINEER
WICHITA, KANSAS

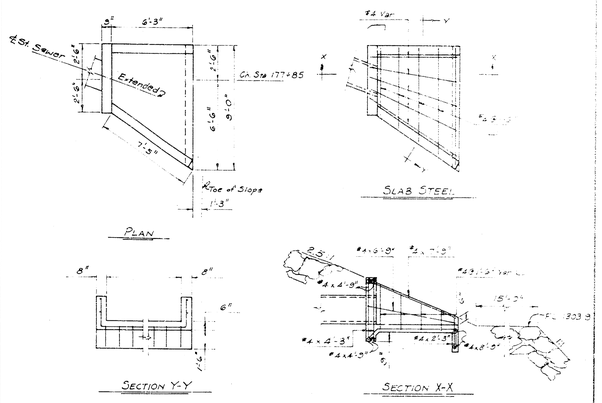
DWG. NO. 89-F-





NOTES:
All bridge and pier excavation shall be computed on the basis of cross-hatched areas and boundary lines as indicated.

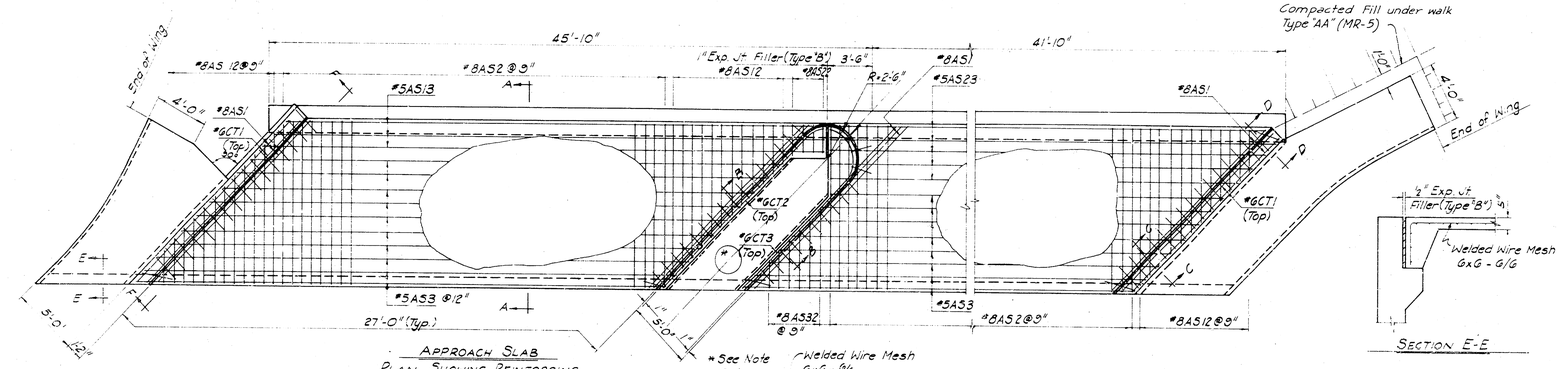
LIMITS OF EXCAVATION



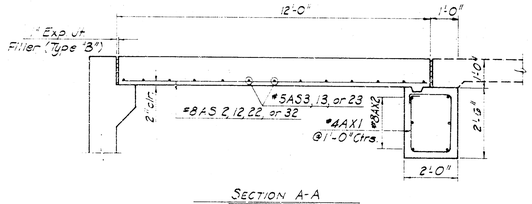
Approx. Quantities*
2.3 Cubic Yds. Conc. Class A
88.5 Lbs. #4 Reinf. St.
100.0 Lin. Ft. 24" R.C.P.

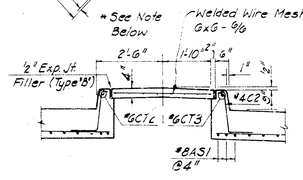
* for information only

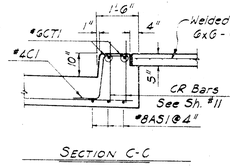
HEADWALL DETAILS

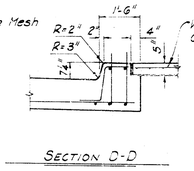


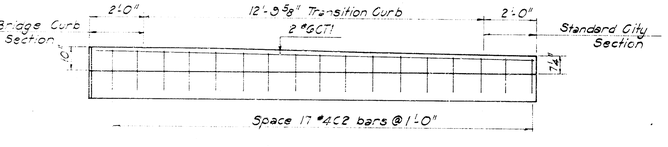
APPROACH SLAB
PLAN SHOWING REINFORCING











Approximate Quantities, Each Slab (Two thus)
Concrete, Class AAA(AE) 58.5 Cu. Yds.
Reinforcing Steel 7340 Lbs. **
** Includes 110 Lbs. wire mesh

Notes:
Use Class AAA(AE) Concrete in Approach slabs including sidewalks.
See Sheet 4 for General Notes
See Sheet 8 for Bar List and Bending Diagram.
(For Information Only)

~~* Contractor shall provide for construction of cable manholes by K.G.&E., see specifications.~~

Item "Approach Slab" includes grading, compaction, and furnishing, forming, placing and finishing all concrete and reinforcing steel required for one approach slab at each end of the bridge, as detailed on this sheet.

*Compacted Embankment includes:
11,581 Cu. Yds. Type "B" (MR-90)
4,586 Cu. Yds. Type "A" (MR-5)
933 Cu. Yds. Type "AA" (MR-5)

SUMMARY OF GRADING AND BANK PROTECTION QUANTITIES

Item	Quant.	Unit
Removal of Exist. Structure	L.S.	L.S.
*Compacted Embankment	9,100	Cu. Yds.
Dumped Rock Embankment	684	Cu. Yds.
Dumped Rock Riprap	1,614	Cu. Yds.
Bedding	988	Cu. Yds.
Derrick Stone	2,398	Cu. Yds.
R.C. Riprap (5")	80	Sq. Yds.
Storm Sewer Ext.	L.S.	L.S.
Seeding and Mulching	0.50	Acres

SUMMARY OF WEIR QUANTITIES

Item	Quant.	Unit
Slab Excavation	371	Cu. Yds.
10" Steel Piles	920	Lin. Ft.
Sheet Piles	1,586	Lin. Ft.
Class A Concrete	221.7	Cu. Yds.
Reinforcing Steel	38,700	Lbs.
Lift Gates	2	Each

SUMMARY OF BRIDGE QUANTITIES

Location	Excavation Class I Cu. Yds.	Excavation Class II Cu. Yds.	Concrete Class A Cu. Yds.	Concrete Class AAA(AE) Cu. Yds.	Steel Reinforcing Lbs.	Steel Struc. Lbs.	Bearing Dev. Lbs.	12" Steel Piles Lin. Ft.	10" Steel Piles Lin. Ft.	Bridge Handrail Lin. Ft.		Approach Slabs Each
Abut. #1	280	—	165.4	23.5	15,390	—	2,751	—	1,030	—		one
Pier #1	—	98	189.5	—	25,130	—	7,742	1,056	—	—		—
Pier #2	—	98	190.8	—	24,940	—	7,742	1,056	—	—		—
Pier #3	—	98	191.2	—	25,230	—	6,995	1,056	—	—		—
Pier #4	—	98	190.8	—	25,230	—	7,742	1,056	—	—		—
Pier #5	—	98	189.5	—	25,130	—	7,742	1,056	—	—		—
Abut. #2	280	—	165.4	23.5	15,390	—	2,751	—	1,030	—		one
Supstr.	—	—	—	2,025.6	718,000	18,650	—	—	—	915.5		—
Total	560	490	1,282.6	2,072.6	874,440	18,650	43,465	5,280	2,060	915.5		2

As Built Nov. 1972 CPS/K.H.
CITY OF WICHITA, KANSAS
S. E. SMITH, P.E., CITY ENGINEER

TWENTY-FIRST STREET BRIDGE OVER THE BIG ARKANSAS RIVER

AUXILIARY DETAILS
SUMMARY OF QUANTITIES

R. S. DELAMATER
CONSULTING ENGINEER
WICHITA, KANSAS

DATE DECEMBER 57
SCALE
DWG. NO. 89-F-4

SUPERSTRUCTURE

STRAIGHT BARS				BENT BARS			
Mark	No. Req.	Size	Length	Mark	No. Req.	Size	Length
GA1	80	11	53'-8"				
GA3	96	11	58'-0"	GA2	120	11	33'8"
GA4	64	11	51'-0"				
GB1	32	11	48'0"				
GB2	48	11	38'-6"	GB3	32	7	45'8"
GB4	96	11	44'-0"				
GB5	64	11	32'0"				
GC1	32	10	30'-6"				
GC2	48	10	23'-0"				
GC3	64	11	18'-0"				
GS1	80	5	12'-0"				
GS2	80	5	32'-0"				
GS3	160	5	30'-0"	CJ1	480	10	8'-0"
GS4	100	10	44'-0"	CJ2	120	10	7'-6"
GS5	20	5	16'-0"				
GS6	20	5	40'-0"				
				M1	1890	5	5'-0"
GT1	80	11	44'6"				
GT2	32	10	25'-0"				
GT3	32	10	20'-0"				
GT4	80	11	60'-0"				
GT5	200	11	50'-0"	U1	512	4	7'-6"
GT6	160	11	40'-0"	U2	960	4	***
GT7	80	10	32'-0"	U3	960	4	***
GT8	60	10	20'-0"	U4	800	4	***
GT9	128	10	15'-0"				
GT10	128	10	20'-0"				
GT11	160	11	41'-0"				
GW1	16	11	45'-0"	WU1	912	4	5'-6"
GW2	8	10	25'-0"	WU2	240	4	***
GW3	60	11	50'-0"	WU3	240	4	***
GW4	20	11	40'-0"	WU4	200	4	***
GW5	40	11	20'-0"				
GW6	20	11	32'-0"				
GW7	32	10	20'-0"	WV	596	4	5'-6"
GW8	32	11	42'0"				
GW11	12	11	49'8"				
GW12	8	11	54'-0"	GW13	30	11	42'-8"
GW14	64	11	50'-0"				
GW15	16	11	60'-0"				
GW21	12	11	38'-6"				
GW22	8	11	30'-0"				
GW23	16	11	40'-0"				
GW24	8	11	30'-0"				
				SW2	1912	4	4'-0"
SW1	936	5	6'-8"	SW3	936	5	7'-3"
SW11	6	5	***	SW13	6	5	***
SW21	8	5	***	SW23	8	5	***
S1	830	5	28'-0"	S2	890	6	29'4"
S11	104	5	***	S3	892	5	30'06"
				S12	104	6	***
SL1	1100	5	20'-0"	S13	100	5	***
SL2	32	4	38'0"				
SL3	64	4	27'0"				
SL4	16	4	22'0"				
SL5	16	4	26'6"				
SL6	32	4	28'0"	CR1	736	7	2'11"
SL7	32	4	19'0"	CR2	496	6	2'4"
SL8	550	4	20'0"	CR11	52	7	3'6"
CR12	52	6	2'11"				
CR13	232	7	7'9"	CR33	8	7	18'2"
CR14	232	6	7'9"	CR34	3	6	17'2"
CR23	8	7	8'7"				
CR24	8	6	8'7"				
AP1	24	4	4'4"	VR1	338	4	6'0"
AP2	112	4	4'0"	VR2	666	4	4'6"
AP3	24	4	15'8"				
AP4	8	4	6'0"				
AP5	20	4	2'9"				
HP1	3	4	5'5"	LB	60	5	4'3"
HP3	336	4	7'-1"				
HP33	56	4	8'-1"	3U	90	4	***
HP43	38	4	6'-10"				
WD1	160	8	4'0"	WD3	60	4	5'-8"
WD2	50	8	6'0"	WD4	40	4	5'0"
MD1	300	6	7'0"	MD2	150	4	13'4"
				ED1	48	4	7'4"
				ED2	24	4	***
				ED3	24	4	6'6"
				ED4	16	6	39'10"
				ED5	16	6	9'2"
SD1	30	8	3'6"	SD2	80	6	4'0"
				SD3	40	4	6'6"
				SD4	30	6	5'0"
				SD5	10	4	8'3"

*** See Bending Diagrams

ABUTMENT (ONE)

STRAIGHT BARS				BENT BARS			
Mark	No. Req.	Size	Length	Mark	No. Req.	Size	Length
AH1	54	7	37'0"	AH11	5	6	***
AH2	39	6	36'0"	AH13	4	4	11'0"
AH3	6	4	30'0"	AH21	5	6	***
AH4	21	4	36'0"	AH23	2	4	9'6"
				AU1	96	4	10'0"
				AU2	96	4	8'6
				AU3	101	5	6'-1"
				AU4	13	4	15'8"
				AU5	13	4	5'2"
				AU6	5	4	***
				AU7	5	4	***
				AU8	8	5	6'0"
AV1	202	6	4'6"	AU14	11	4	***
AV2	179	5	5'6"	AU15	11	4	***
AV3	98	5	5'0"				
AV6	28	5	4'6"	AV4	78	6	6'6"
AV12	30	5	6'5"	AV6	28	5	4'0"
AV13	10	5	5'9"	AV14	23	6	7'2"
				AB1	102	5	4'6"
				AF1	2	5	9'11"
				AF2	2	5	11'6"
				AW1	7	6	21'6"
				AW2	7	6	25'5"
				AW3	1	4	17'6"
				AW4	7	5	20'8"
				AW5	3	5	4'0"
				AW11	7	6	17'7"
				AW12	7	6	4'-3"
				AW13	1	4	12'6"
				AW14	7	5	15'8"
				AW15	3	5	4'10"

*** See Bending Diagrams

PIERS 2, 3 & 4 (ONE PIER)

STRAIGHT BARS				BENT BARS			
Mark	No. Req.	Size	Length	Mark	No. Req.	Size	Length
PC1	@78	8	17'6"	PU1	8	5	6'6"
PC2	14	8	10'6"	PU2	8	5	8'0"
PC3	@8	8	15'6"	PU3	42	5	16'0"
PC4	@8	5	3'9"	PU4	8	5	***
PC5	@8	5	2'6"	PU5	14	5	***
PC6	@8	5	8'6"	PU6	104	5	6'8"
PC7	@64	5	20'0"	PU7	10	4	4'0"
				PC8	24	5	11'8"
PH1	6	10	43'0"	PC9	20	5	8'0"
PH2	24	6	36'0"				
PH3	5	11	43'0"	PD1	@86	8	9'0"
PH4	10	5	33'0"				
PH5	6	11	54'0"	PH6	16	10	21'0"
PH9	16	5	***	PH7	16	11	25'6"
PH10	4	5	12'6"	PH8	12	9	15'9"
PH11	4	5	6'0"	PH12	8	11	12'0"
				PH13	6	11	11'0"
PF2	28	5	23'6"	PF1	76	6	11'0"
PV2	64	6	13'6"	PV1	64	5	6'3"
PV3#	8	4	6'6"	AB1#	26	5	4'6"
AV5#	7	5	4'6"	*** See Bending Diagrams			
				# Per Nos. 3 & 4 Only			

@ PIERS 1 & 5 (ONE PIER) (SAME AS ABOVE EXCEPT)

PC1	4	5	3'9"				
PC5	4	5	2'6"				
PC6	4	5	8'6"				
PC7	68	5	20'0"	PD1	90	8	9'0"
PD2	16	4	2'6"				
PV3	4	4	6'6"				
PC1	82	8	17'6"				
PC3	4	8	15'6"				

APPROACH SLAB (ONE)

STRAIGHT BARS				BENT BARS			
Mark	No. Req.	Size	Length	Mark	No. Req.	Size	Length
AS1	12	8	16'6"				
AS2	86	8	11'8"				
AS3	18	5	40'9"	C1	34	4	3'3"
AS12	36	8	***	C2	31	4	2'7"
AS13	3	5	***				
AS22	4	8	2'8"				
AS23	5	5	***				
AS32	6	8	***				
				AX1	86	4	7'8"
AX2	12	8	45'0"				
				CT2	1	6	17'6"
CT1	4	6	16'6"	CT3	1	6	16'4"

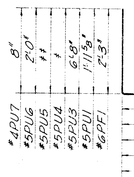
*** See Bending Diagrams

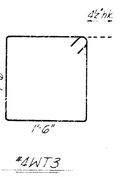
WEIR (EACH)

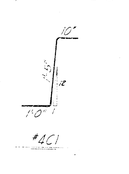
STRAIGHT BARS				BENT BARS			
Mark	No. Req.	Size	Length	Mark	No. Req.	Size	Length
WL2	20	9	7'0"	WT1	57	5	11'3"
WL11	6	9	40'0"	WT2	57	5	11'1"
WL12	12	9	15'6"	WT3	30	4	6'9"
WL21	26	5	40'0"				
WL22	52	5	11'0"	WV1	57	8	10'0"
				WV2	57	5	9'3"
WPT	10	8	2'0"				

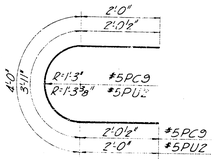
Incr from 40'9" to 42'9" by 1'0" _ #5...
Cut 2 Ea Lgth
Incr from 7'3" to 11'9" by 1'6" _ #5PH1...
Cut 20 Ea Lgth
Incr from 2'8" to 10'11" by 9" _ #PA5...
Cut 6 Ea Lgth
Incr from 41'9" to 44'9" by 1'0" _ #5AV2,3,5
Cut 2 Ea Lgth
Incr from 2'0" to 5'9" by 9" _ #8W...
Cut 2 Ea Lgth

#Except Cut 4 @ 43'-9"

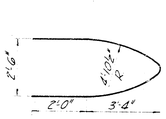


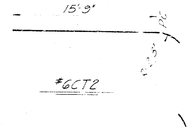


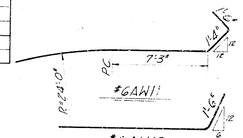


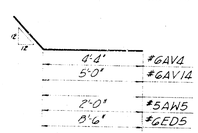


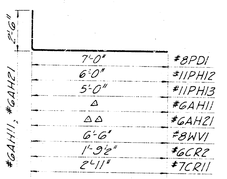
* Incr from 6'6" to 8'0" by 6"
Cut 10 Ea Lgth.
** Incr from 4'-2" to 6'-2" by 4"
Cut 10 Ea Lgth.

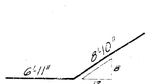


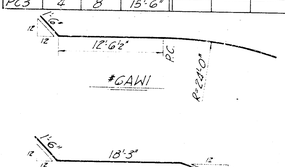


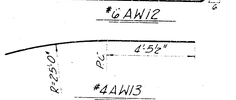


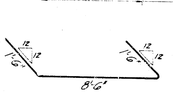


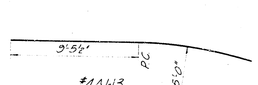


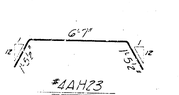


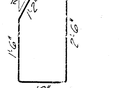


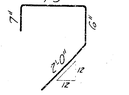


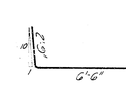


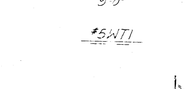




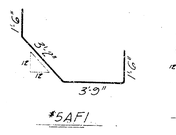


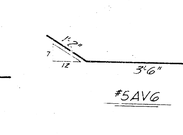


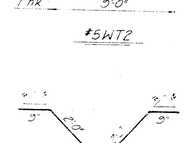


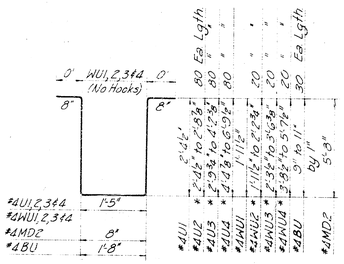


△ Incr from 7'-0" to 9'-6" by 7½"
Cut 2 Ea Lgth.
△△ Incr from 7'-0" to 8'-8" by 7½"
Cut 2 Ea Lgth. except cut 6 of longest lgth.

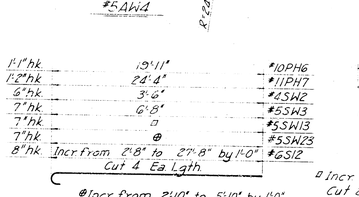




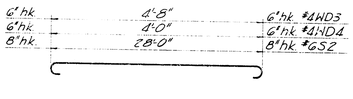


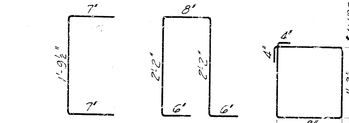


* Increase by Parabolic Increments

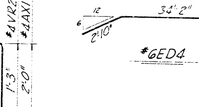


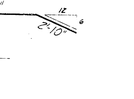
@ Incr from 2'-10" to 5'-10" by 1'-0"
Cut 2 Ea Lgth.

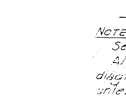




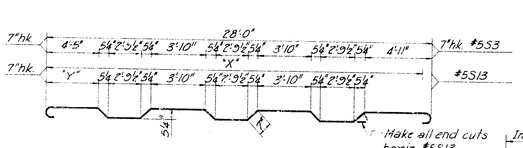
□ Incr from 2'-6" to 4'-6" by 1'-0"
Cut 2 Ea Lgth.



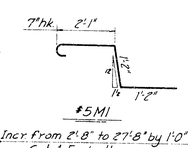


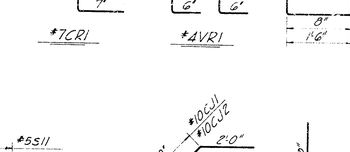


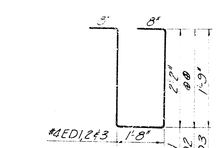
#7CR33 & #6CR34



"X" Incr from 3'-2" to 27'-2" by 1'-0"
Cut 4 Ea Lgth.
"Y" Alternate between 4'-5" & 4'-11"



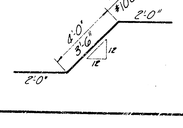


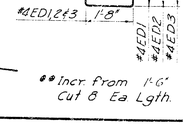


NOTE.
See Sheet 4 for General Notes.
All dimensions shown in the bending diagrams are out to out of bars unless otherwise noted.
Note that bar data is given for approach slab for information only.

Make all end cuts horiz. #5S13

Incr from 2'-8" to 27'-8" by 1'-0" #5S11
Cut 4 Ea Lgth.
Incr from 3'-0" to 5'-0" by 1'-0" #5SW11
Cut 2 Ea Lgth.
Incr from 2'-10" to 5'-10" by 1'-0" #5SW21
Cut 2 Ea Lgth.





@@ Incr from 1'-6" to 2'-0" by 3"
Cut 6 Ea Lgth.

As Built Nov. 1972 C.P.S. K...

CITY OF WICHITA, KANSAS
B. E. SMITH, P.E., CITY ENGINEER

TWENTY-FIRST STREET BRIDGE OVER THE BIG ARKANSAS RIVER

BAR LIST & BENDING DIAGRAMS

R. S. DELAMATER
CONSULTING ENGINEER
WICHITA, KANSAS

DATE ... LEVEL ...
SCALE ... 89-P...

1 12 3 (8)