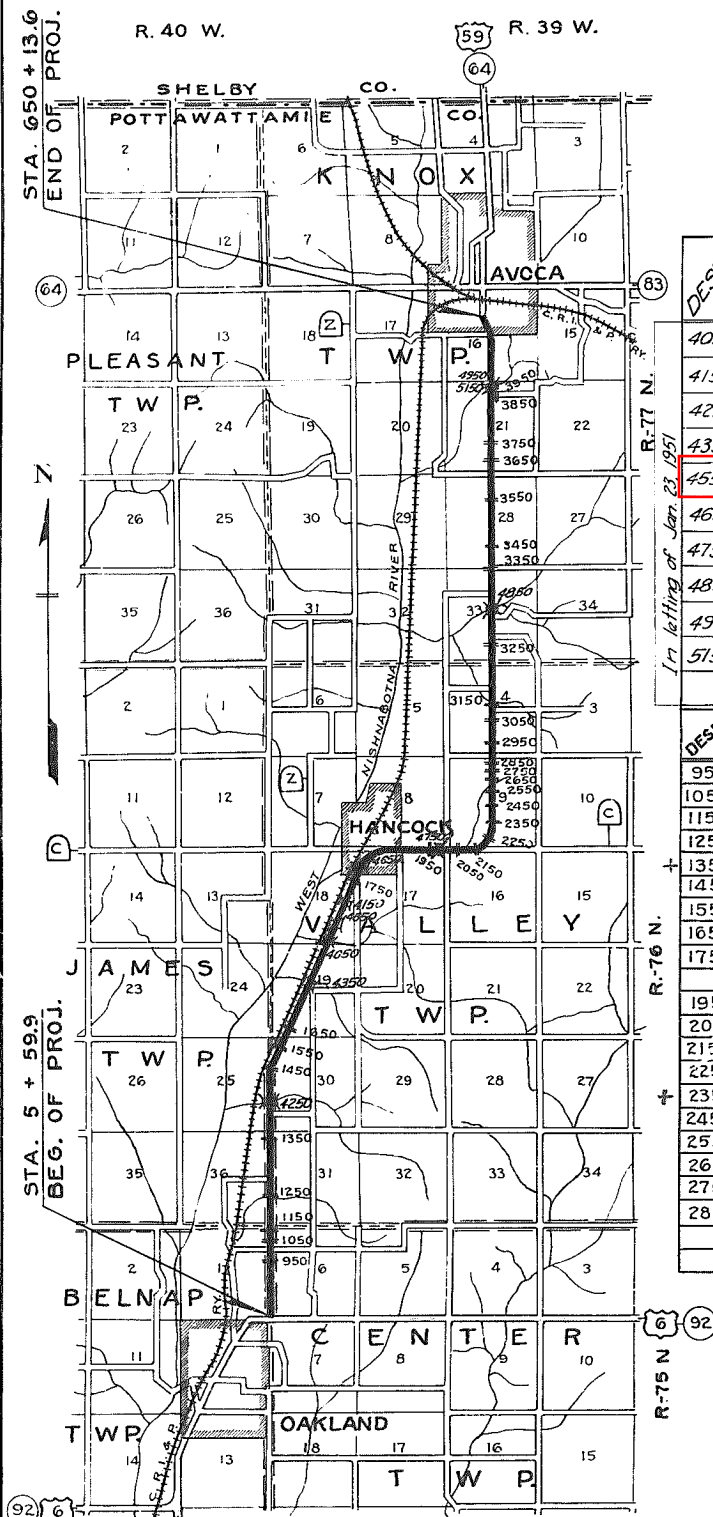


STATE OF IOWA
STATE HIGHWAY COMMISSION
DESIGNS FOR
BRIDGES AND CULVERTS

PRIMARY ROAD SYSTEM F. PROJECT NO. 554(3) (4)

POTTAWATTAMIE COUNTY

OCTOBER 1950



DESIGN	LOCATION			DESCRIPTION	ESTIMATE OF QUANTITIES													REMOVAL		
	SECTION	TOWNSHIP	STATION		SIZE AND TYPE	CONCRETE CU. YD.	STEEL REIN. LB.	STRUCT. LB.	TREATED PILING L.F.	UNTREATED PILING L.F.	PRECAST CONCRETE OR UNION METAL BEARING PILES	CONCRETE SHEET PILING	CREOSOTED LUMBER	HARDWARE	EXCAVATION CU. YD.	CLASS 10	CLASS 20		CLASS 24	CLASS 28
4050	18	Valley	228+16.2	Widening 16'x24' I-beam to 44'	15.4	2292	4780	8@40' 4@20' 400				2402 FBM	225							Shoring concrete & masonry walls
4150	18	Valley	250+67.5	Widening 16'x24' I-beam to 44'	15.4	2292	4780	8@40' 4@20' 400				2163 FBM	214							Shoring concrete & masonry walls
4250	30-25	Valley-James	129+34.95	77.5'x30' Concrete Slab Bridge	226.0	27447	240	18@40' 720						65	13					3'x4' I-beam under structure and road
4350	19	Valley	205+65	32'x30' I beam Bridge	281.4	23535	16955		104@35' 3640					265	380	225				3'x4' I-beam str.
4550	18	Valley	236+40	80'x30' Continuous concrete slab bridge	257.1	31365	1486	2@30' 60		1040 L.F.	3790 S.F.			396	193					2'x4' I-beam str.
4650	17	Valley	273+34.1	180'x30' Continuous concrete slab bridge	246.8	30483	1054	2@30' 60		1040 L.F.	2925 S.F.			187	175					2'x4' I-beam str.
4750	8-17	Valley	317+35	110'x26' Continuous concrete slab bridge	311.8	48500	1480	2@25' 50		1120 L.F.	3646 S.F.			160	248					3'x8'x20' I-beam str.
4850	33	Knox	479+80.3	Widen 102'x20' 3-span I-beam to 26'	105.1	8487	26560	8@40' 320							62					Present concrete & steel wall
4950	21	Knox	609+85.95	288'x26' Continuous I-beam bridge	397.7	59251	365586	30@40' 1200						160	180					100'x20' I-beam str. 40'x20' I-beam app.
5150	16-21	Knox	609+85.95	Tree Retard																
				Total	1856.7	233,652	422,921	3210	3640	3200 L.F.	10,361 S.F.	4565 FBM	439	1233	1251	225	125			225

DESIGN	LOCATION			SIZE & TYPE	CONC. CU. YDS.	REINF. STEEL LBS.	Excavation Class	
	SEC.	TOWNSHIP	STATION				23	24
950	1-6	Center-Belnap	29+90.8	8'x8' R.C.B. Ext.	92.7	10,225	235	
1050	"	"	40+00.4	6'x6' " "	88.9	8,533	52	48
1150	"	"	55+44.4	3'x3' " "	19.0	1,250	15	
1250	36-31	James, Valley	75+33.1	Twins 8'x8' to 8'x6' R.C.B. Ext.	70.2	8,701	80	
1350	"	"	104+42.5	Twin 10'x5' R.C.B. Ext.	208.6	18,549	50	
1450	30	Valley	149+08.9	2'x2' R.C.B. Ext.	8.0	432	7	
1550	19	"	163+62.2	2'x2' " "	9.8	586	8	
1650	19	"	167+03.0	6'x6' " "	5.7	65	6	
1750	18	"	265+10.5	3'x3' " "	6.3	383	8	
1950	8-17	"	310+52.7	3'x3' " "	5.6	347	10	
2050	9-16	"	328+45.5	5'x5.5' " Ext. Flume	53.0	4,540	42	40
2150	9-16	"	339+25.6	3'x2' R.C.B. Ext.	12.0	692	9	
2250	9	"	349+86	6'x6' " "	117.0	9,870	10	94
2350	9	"	355+85.9	10'x12.3' Arch Culv.	101.3	75,561	70	1558
2450	"	"	363+37.5	3'x2' R.C.B. Ext.	14.3	822	21	
2550	"	"	373+95.2	3'x3' " "	13.5	762	18	
2650	"	"	381+35	5'x5' " "	35.8	3,108	70	60
2750	"	"	387+374	2'x2' " "	5.0	268	4	
2850	"	"	396+92.9	4'x3' " "	28.8	2605	20	
Sub Total					895.5	147,971	735	242
					899.4	79560		

DESIGN	LOCATION			SIZE & TYPE	CONC. CU. YDS.	REINF. STEEL LBS.	Excavation CY		Pipe	Hdwe	Cred Lumber	Cred Lumber	Cred Lumber
	SEC.	TOWNSHIP	STATION				Class 23	Class 24					
2950	4	Valley	411+38.5	SUB TOTAL	895.5	147,971	735	242					
3050	"	"	432+61.3	12'x12' Skew Ext.	230.1	25,360	117	53					
3150	"	"	440+53.3	3'x3' R.C.B. "	15.9	881	36		88				
3250	33	Knox	462+74.3	6'x6' " "	39.0	4888	43						
3350	33-28	Knox	504+36.1	3'x2' " "	13.3	760	13	23					
3450	"	"	519+56.8	8'x6' " "	27.3	3470	55						
3550	28	"	540+85.8	10'x6' " "	60.1	7189	45						
3650	21	"	567+14.5	2'x2' " "	12.8	652	11						
3750	"	"	577+26.1	8'x8' " "	15.8	16,340	34	22	155				
3850	"	"	603+77.58	12'x0' R.C. Slab Br.	27.1	3,222		300		54	2859	12@20' 16@40' 660	
3950	"	"	608+40.28	10'x4' Conc Flume	31.0	2,113	59						
Total					1503.8	213,190	1103	340	300	243	54	2859	880
					1507.7	175,490							
					1467.6	147,971							

Specifications:-
All material & construction to be in accordance with Iowa State Highway Commission Specifications Series of 1948.
Design: A.A.S.H.O. Series of 1944, 1949.

APPROVED
CHIEF ENGINEER
IOWA HIGHWAY COMMISSION
DATE

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

RECOMMENDED FOR APPROVAL

DISTRICT ENGINEER
DATE

APPROVED

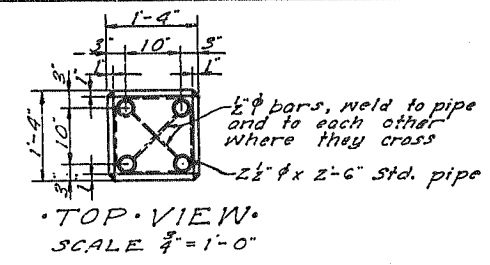
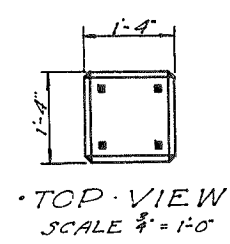
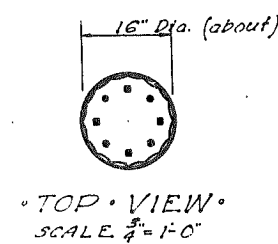
DIVISION ENGINEER
DATE

Revised 5-29-51, Flume outlet added to design 3050
Revised 3-8-51 Station of Design 4650 to be changed on construction from 213+34 to Sta. 213+14.
+ Revised 12-14-50 Estimates of designs 1350 and 2350 corrected.
• Revised 11-21-50 Outlet of culvert skewed 30°
* Revised 11-15-50 Grade raised 2' Lumber estimate increased
Revised 1-8-51 - Designs 4050 to 4350, Incl. & 4550 to 4950 Incl. & 5150 added as F-554(4)

Pottawattamie Co. F- Proj. 554 (3) (4) File No. 14712

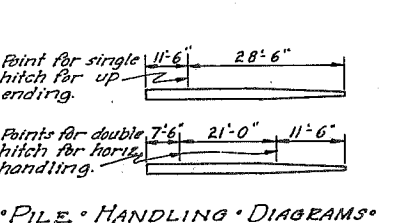
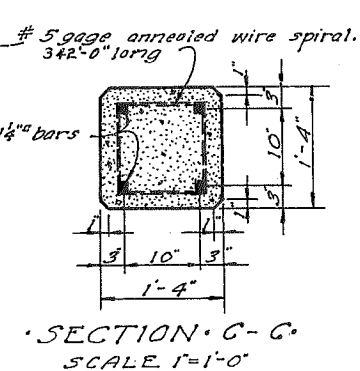
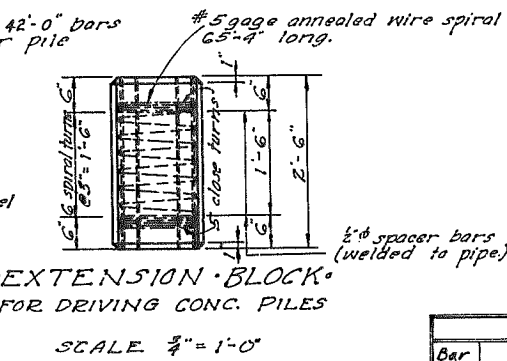
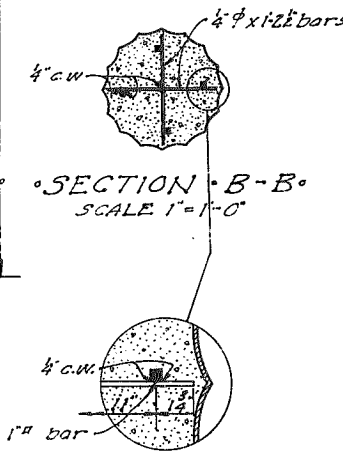
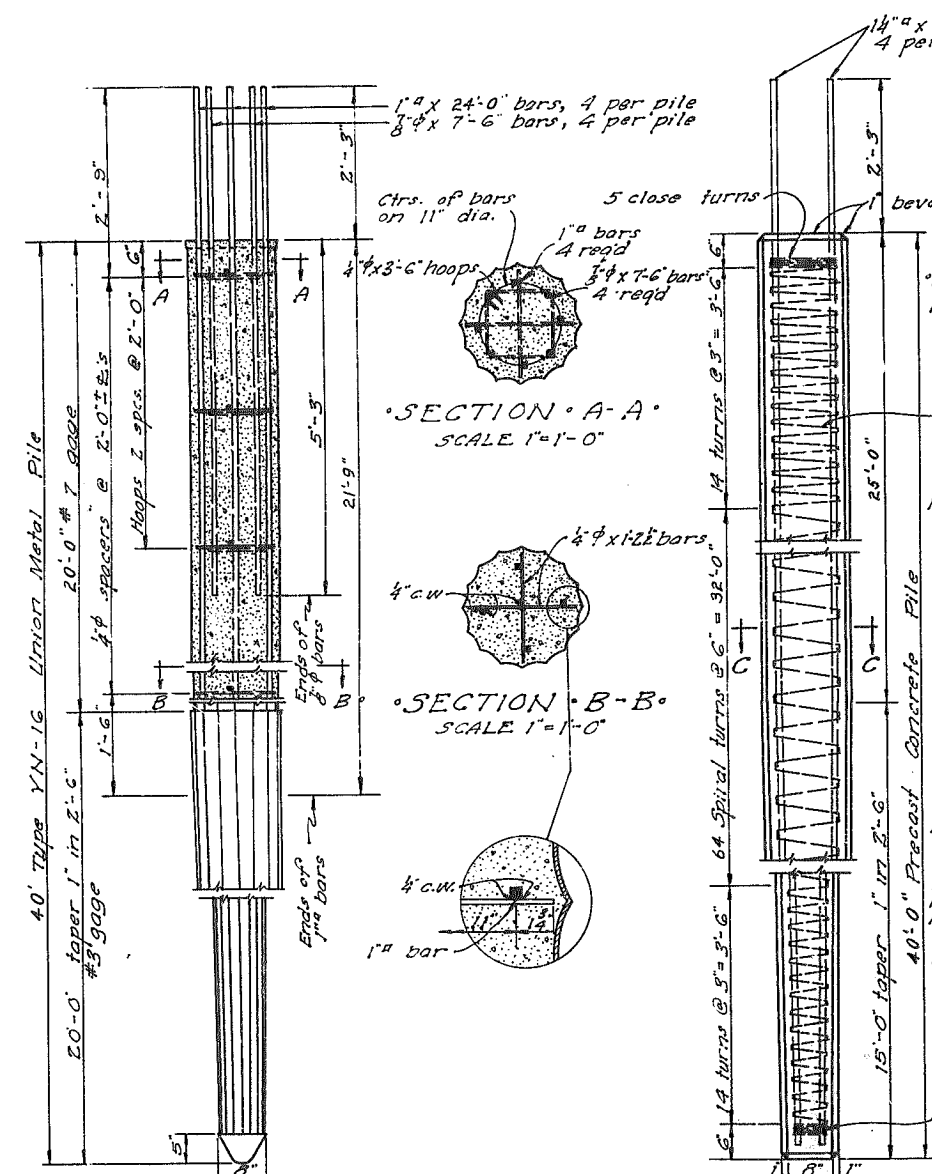
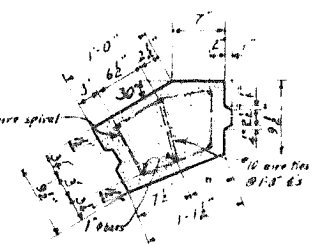
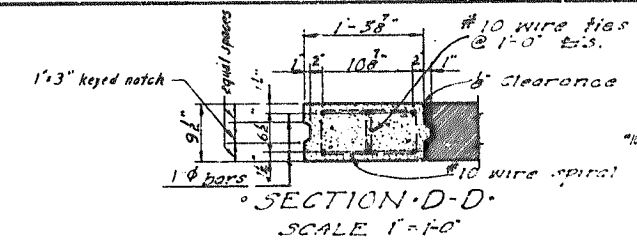
V.C.





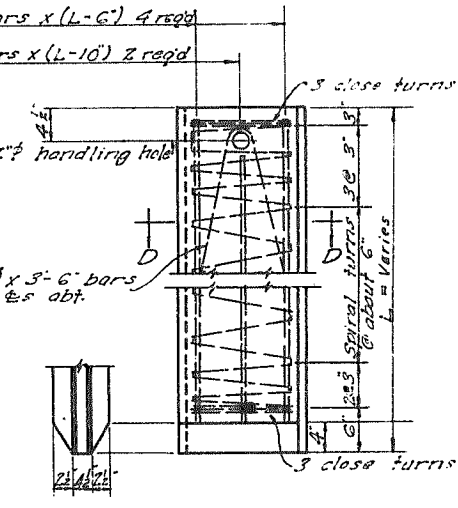
CONCRETE SHEET PILE TABLE
For Two Abuts.

Piles	No.	Length
Piles "A"	84	22'-0"
Piles "B"	36	19'-0"
Piles "C"	14	14'-0"
Corner Piles "D"	2	22'-0"
Corner Piles "D2"	2	22'-0"



REINFORCING STEEL TWO ABUTS.

Bar	Location	Shape	No.	Size	Length	Weight
a1	Bridge Seat, F.F.		6	3/4"	23'-2"	209
a2	" " " "		6	3/4"	23'-5"	211
a3	Bridge Seat, B.F.		12	3/4"	22'-0"	397
b	Bridge Seat Hoops		44	1/2"	10'-3"	301
c	Wing Wall Hoops		16	1/2"	12'-10"	137
d1	" " " "		4	1/2"	10'-0"	294
d2	" " " "		4	1/2"	10'-5"	28
e1	Long Wing Wall, F.F.		2	3/4"	35'-5"	106
e2	" " " "		2	3/4"	35'-4"	106
e3	" " " "		2	3/4"	35'-2"	106
f	Long Wing Wall, B.F.		2	3/4"	39'-3"	118
f2	" " " "		2	3/4"	39'-2"	118
f3	" " " "		2	3/4"	39'-2"	118
g1	Short Wing Wall, Longit.		4	3/4"	23'-6"	141
g2	" " " "		4	3/4"	23'-4"	140
g3	" " " "		2	3/4"	23'-2"	70
g4	" " " "		2	3/4"	22'-0"	70
h	Wing Wall, Vertical		88	1/2"	3'-2"	186
k	Short Wing Wall, Longit.		8	1/2"	14'-9"	79
m	Long Wing Wall, Longit.		8	1/2"	28'-0"	150
n	Fillet		6	3/4"	8'-7"	77
p	Deadman Hoops		32	1/2"	5'-0"	107
q	Long Deadman, Hor.		8	3/4"	21'-6"	256
r	Short Deadman, Hor.		8	3/4"	12'-6"	150
s	Bridge Seat Dowels		34	1/2"	2'-0"	45
Total						3750 lb.



DETAILS FOR 9 1/2" x 16" CONCRETE SHEET PILES
SCALE 1" = 1'-0"

SHEET PILE NOTES:
Sheet piles are to be made with special high strength 4000# concrete. (Class X)

EST. QUAN. ONE PILE

Pile	Conc.	Reinf.
A	0.86	356
B	0.74	307
C	0.54	225
D1	0.95	356
D2	0.86	242

REINFORCING STEEL TWO PIERS

Bar	Location	Shape	No.	Size	Length	Weight
x	Cap, Horiz.		12	3/4"	39'-10"	718
y	Cap, Hoops		36	1/2"	10'-2"	244
z	Cap, Ends		12	3/4"	7'-8"	138
Total						1100

EST. QUAN. TWO PIERS

Concrete	Reinforcing Steel	Concrete Bearing Piles
22.8 cy	1100 lb.	560 LF

UNION METAL MFG. CO.
FLUTED MONOTUBE PILE
CAST IN PLACE
SCALE 1" = 1'-0"

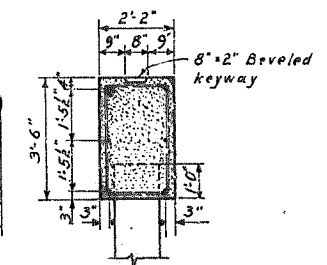
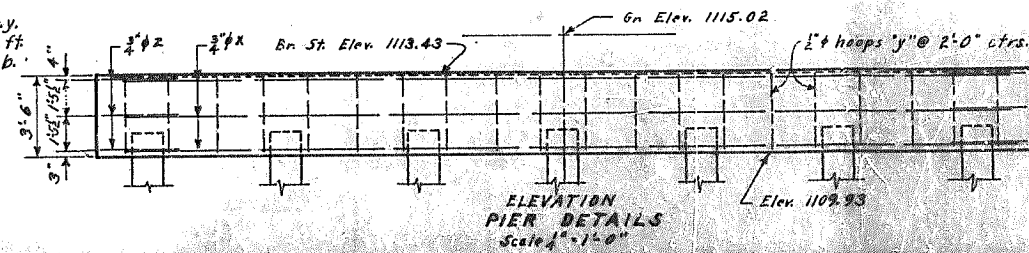
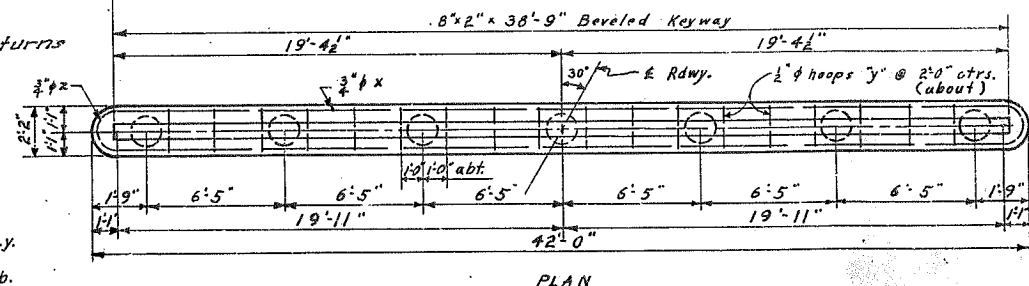
One Pile... Concrete 193 c.y.
Reinf. Steel 394 lb.

PRECAST CONG. PILE
SCALE 1" = 1'-0"

One Pile... Concrete 233 c.y.
Reinf. Steel 931 lb.

One Extension Block... Concrete 0.16 c.y.
Std. Pipe 10 lin. ft.
Reinf. Steel 10 lb.

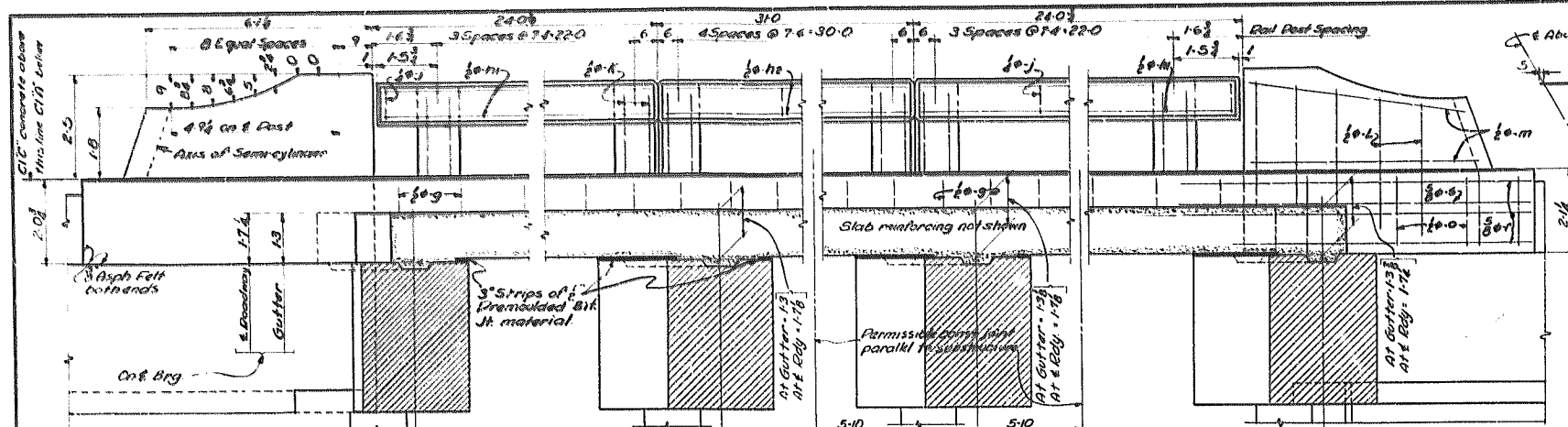
PILE NOTE:
Piles are to be made with special high strength 4000# concrete. (Class X)



Design for 30° Skew
80' x 30' CONTINUOUS CONCRETE SLAB
BRIDGE

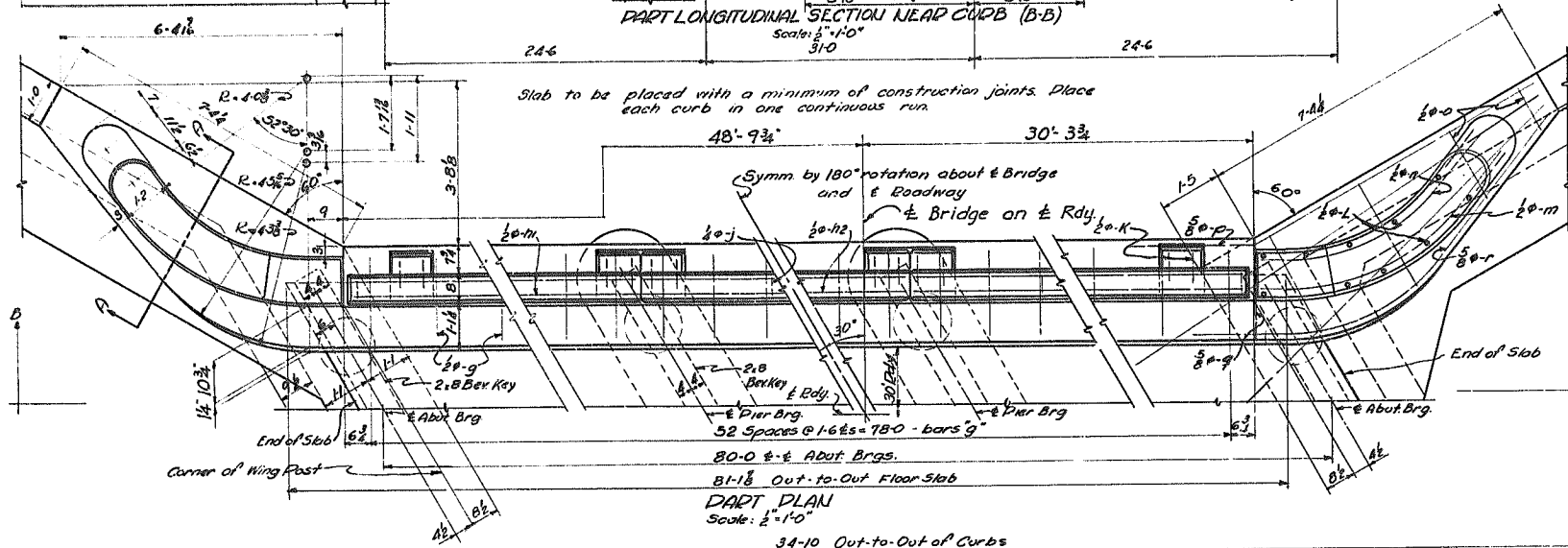
31'-0" Center Span 24'-6" End Spans
Concrete Floor & Substructure Concrete Rail
SUBSTRUCTURE DETAILS
Sta. 236+40 Proj. No. F-554(4)
POTTAWATTAMIE COUNTY
Iowa State Highway Commission
October, 1950 Sheet 3 of 4
Design A550 Pottawattamie Co. File 14-7125
Designed by A.D.F. Checked by E. J. ...

Concrete Bearing Pile and Sheet Pile Details (7-25-40)



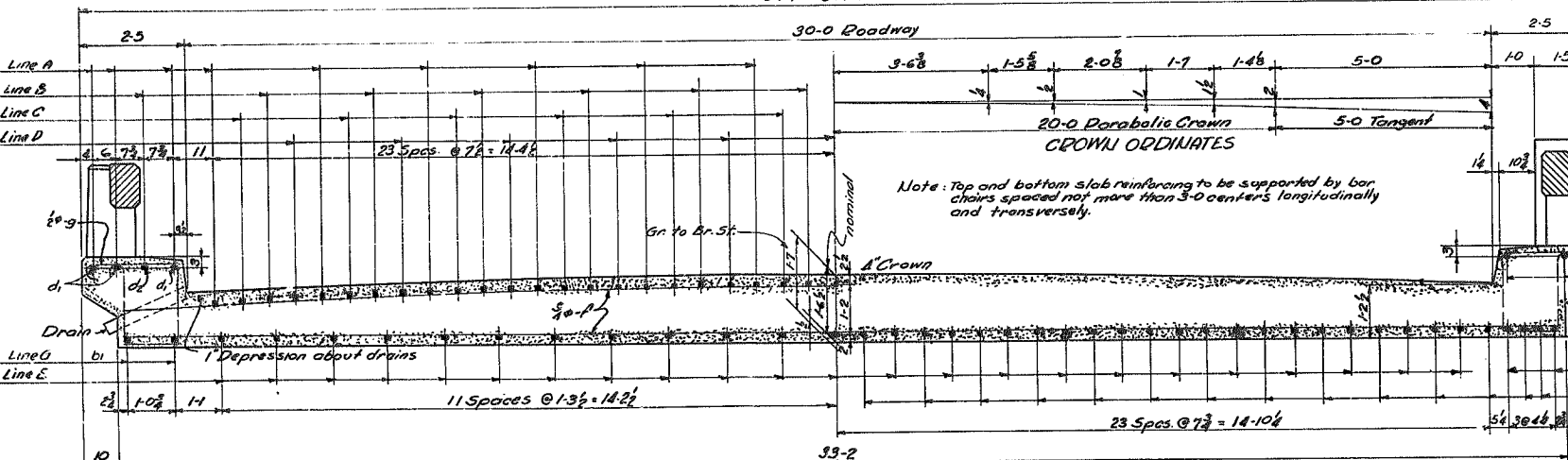
PART LONGITUDINAL SECTION NEAR CURB (B-B)

Scale: $\frac{1}{2}" = 1'-0"$



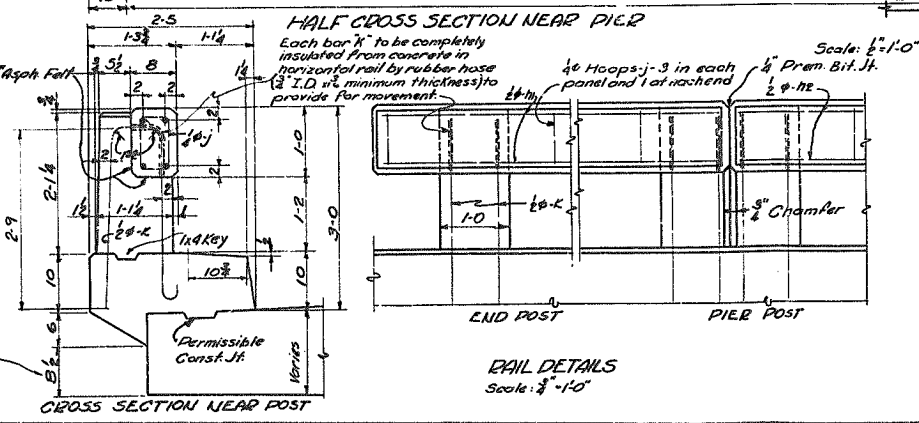
PART PLAN

Scale: $\frac{1}{2}" = 1'-0"$



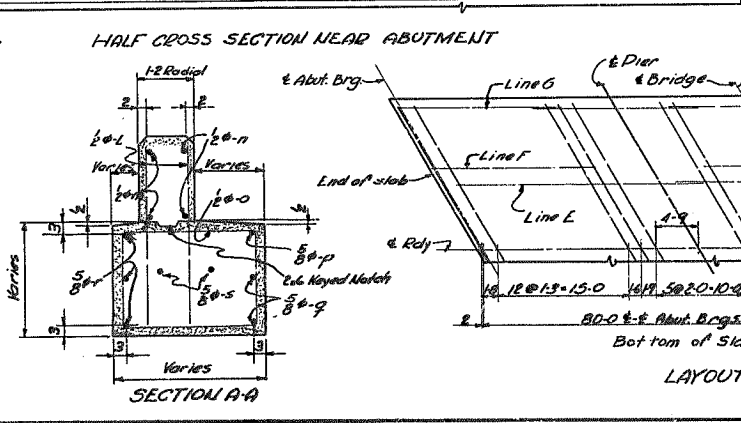
CROWN ORDINATES

Note: Top and bottom slab reinforcing to be supported by bar chairs spaced not more than 3'-0" centers longitudinally and transversely.



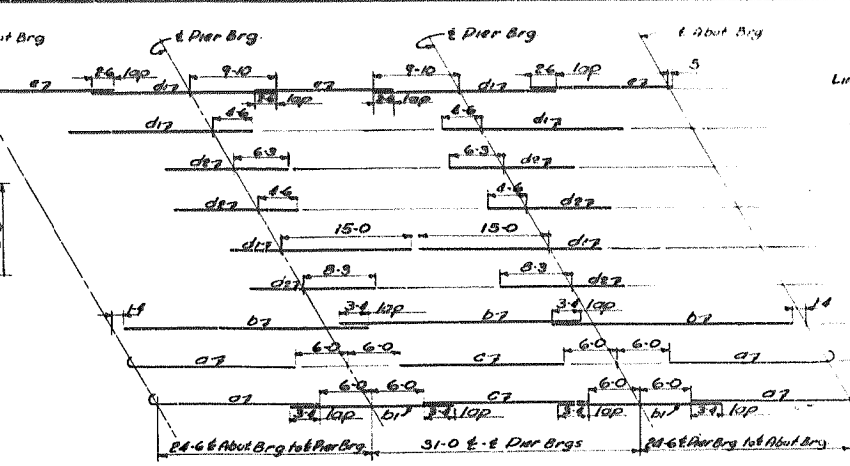
HALF CROSS SECTION NEAR PIER

Scale: $\frac{1}{2}" = 1'-0"$



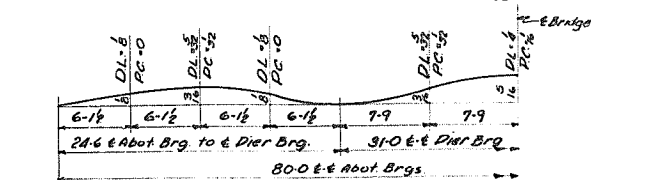
HALF CROSS SECTION NEAR ABUTMENT

SECTION A-A



LAYOUT OF LONGITUDINAL REINFORCING BARS

Scale: $\frac{3}{8}" = 1'-0"$



NOTE: Diagram shown above includes permanent camber (PC) and total anticipated dead load deflection (DL). Immediate dead load deflection is about $\frac{1}{2}$ DL. No allowance for form settlement is included in figures shown above.

GENERAL NOTES

This bridge is designed for H20-44 loading of the AASHTO specifications (RAA) plus an allowance of 19% of roadway for future wearing surface. The slab shown includes 1" of wearing surface. All exposed corners of 90° or sharper, except vertical corners of rail posts and wing posts, are to be filleted with $\frac{1}{2}$ " radius. All reinforcing steel to be securely wired in position before concrete is placed. All hooked reinforcing bars to have standard 16 diameter hooks with a bend radius of 4 bar diameters.

Design Modifications:

Intermediate grade reinforcing steel to be used. Allowable design stress for reinforcing steel = 20,000 psi. For negative live load moment, each lane was loaded with two 12 ton axles with one axle in each span adjacent to pier. This bridge is designed so that an increase in the live load and impact by 100% will not increase the total stress to more than 150% of the specification stresses.

SPECIFICATIONS

Iowa State Highway Commission, series of 1948, for construction.

SLAB CONSTRUCTION JOINT

Note: Reinforcing runs through slab

REINFORCING STEEL		SUPERSTRUCTURE				
Location	Shape	Mark	No	Size	Length	Weight
Slab Bottom Long		a	64	10	19.10	3,384
Do		b	64	10	28.0	6,569
Do		c	52	10	19.0	1,623
Slab and Curb Top Long		d	60	10	21.0	4,284
Do		e	50	10	14.3	2,423
Curb Top Long		f	18	30	16.3	440
Slab Trans Top and Bottom		g	75	30	38.0	5,422
Curb Hoops		h	106	20	7.7	517
Rail Long - End Span		i	16	16	23.8	253
Do - Center Span		j	8	16	30.8	164
Rail Hoops		k	64	10	2.9	29
Rail Posts		l	32	16	7.4	253
Wing Post Vert		m	48	16	3.6	112
Do B.F.H.		n	8	16	6.4	34
Do F.F.H.		o	8	16	5.7	30
Post Base Hoops		p	16	Varies		46
Do Horiz		q	4	16	10.0	42
Do		r	8	16	9.3	77
Do		s	12	16	10.6	131
Do		t	8	16	11.8	97
Curb Bottom		u	8	16	18.8	508
Total						26,515 lb

CONCRETE PLACEMENT QUANTITIES	
Slab	13.5 cu yd
Curb and End Post Bases	18.4 cu yd
Rail Posts and Wing Posts	4.2 cu yd
Hoops	3.8 cu yd

ESTIMATED QUANTITIES - SUPER	
Reinforcing Steel	26,515 lbs
Concrete (C1 A')	161 cu yd
Concrete (C1 C')	80 cu yd

Location
Over a Creek
Section 18
Volley Township
Pottawattamie County

Design for 30° Skew
80' x 30' CONTINUOUS CONCRETE SLAB
BRIDGE

31'-0" Center Span
Concrete Floor and Substructure

24'-6" End Spans
Concrete Rail

SUPERSTRUCTURE DETAILS

Station 236+10

POTTAWATTAMIE COUNTY

Iowa State Highway Commission

October 1950

Project F-554

Sheet 4 of 4

Design 4550 Pottawattamie County File 14712

Designed by JAW Checked by E.J. v. 10