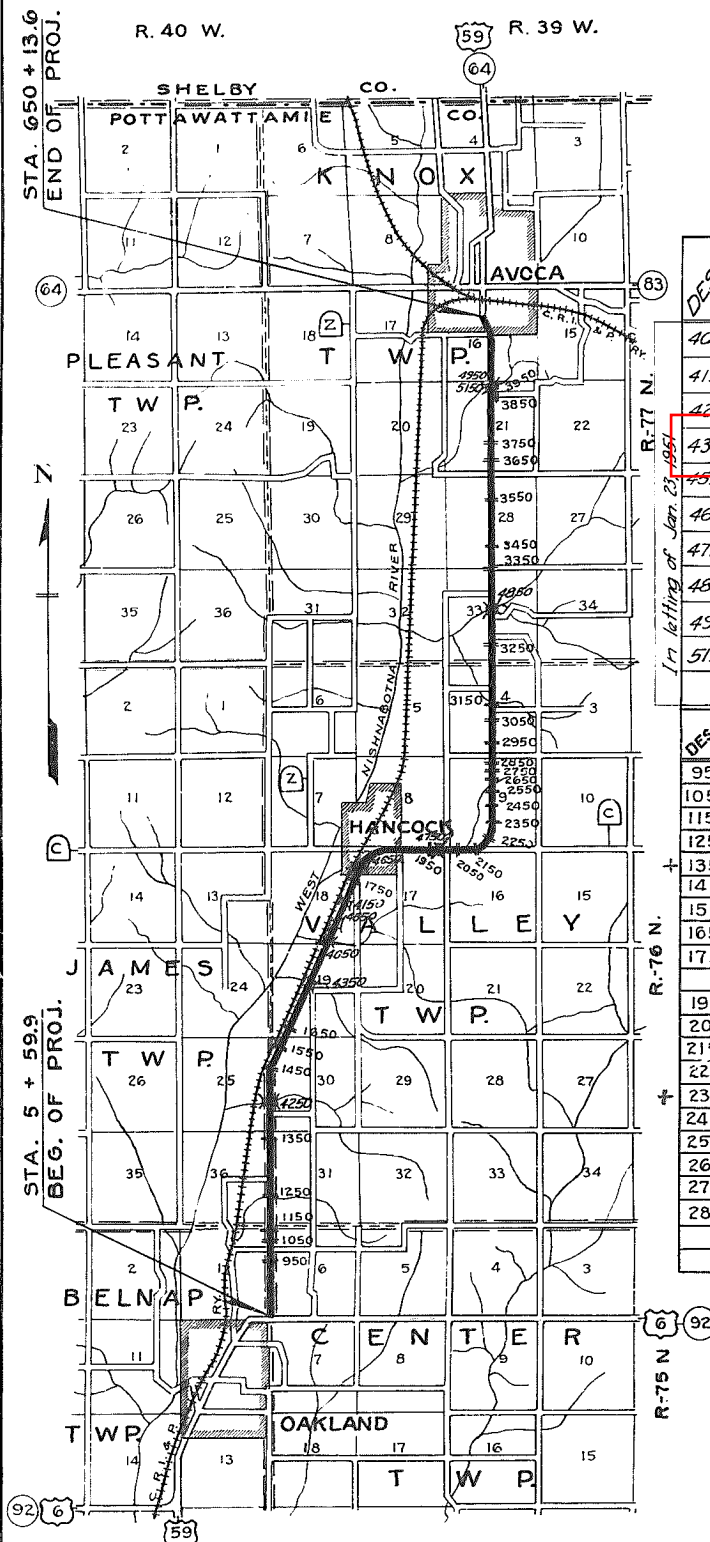


STATE OF IOWA
STATE HIGHWAY COMMISSION
DESIGNS FOR
BRIDGES AND CULVERTS

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

POTTAWATTAMIE COUNTY

OCTOBER 1950



LAYOUT

SCALE, 1 INCH = 1 MILE

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 CONC. OR UNION METAL BEARING PILES	CONCRETE SHEET PILING	CREOSOTED LUMBER	HARDWARE	EXCAVATION CU. YD.	CLASS 10	CLASS 20	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 24	CLASS 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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+37.4	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	15,340	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							

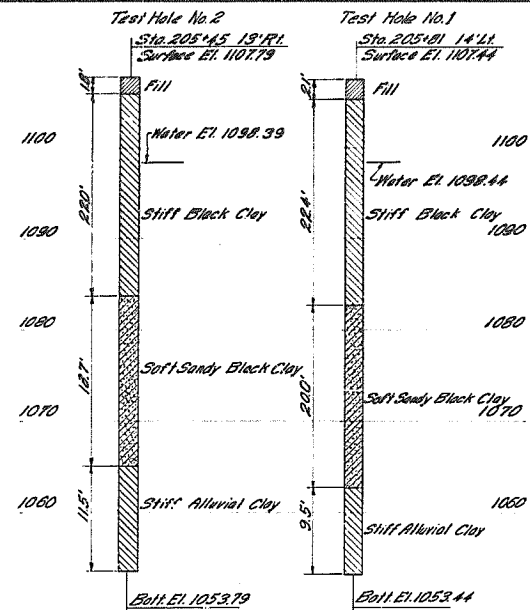
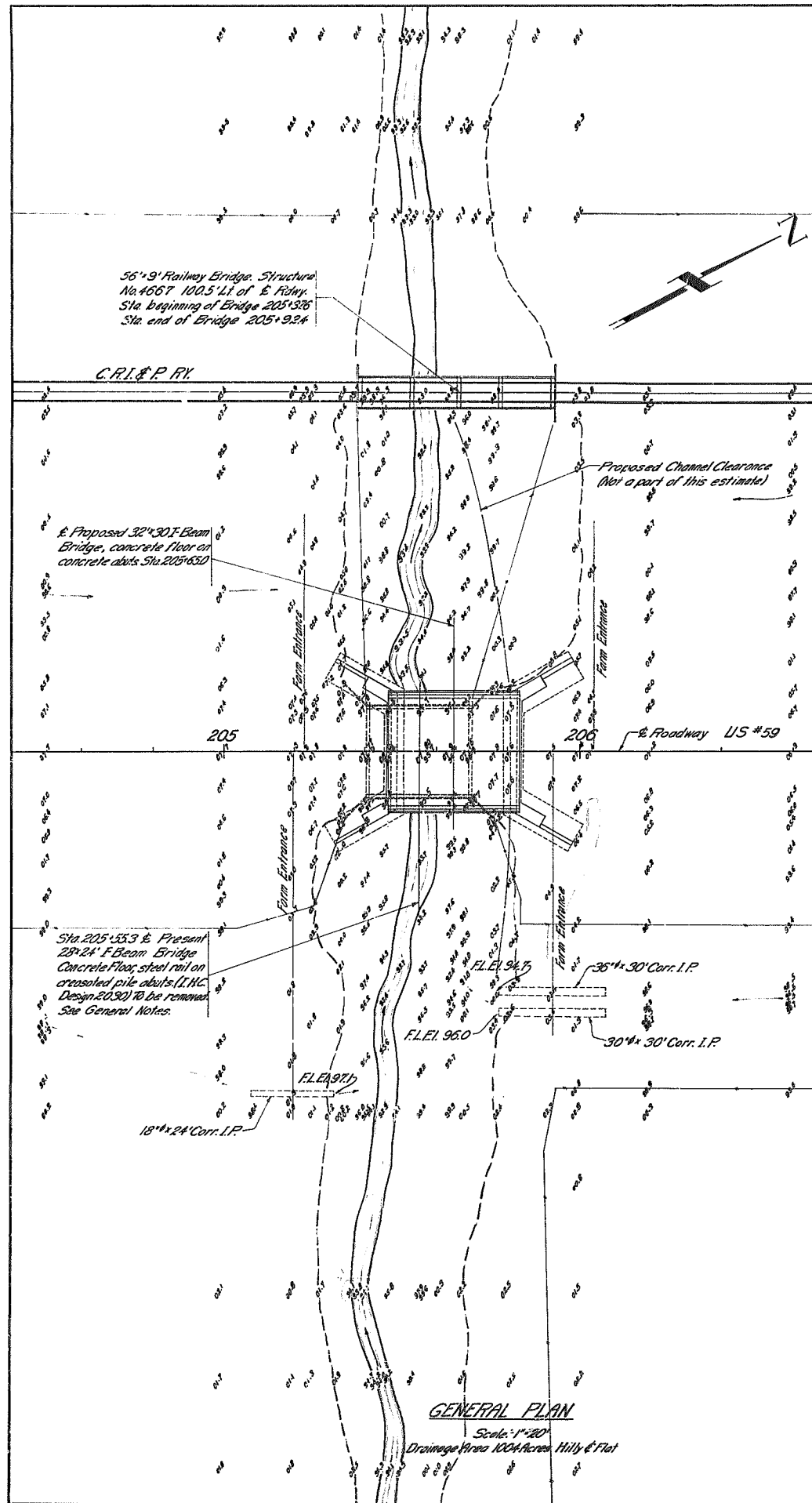
Specifications:-
All material & construction to be in accordance with Iowa State Highway Commission Specifications Series of 1948.
Design: A.A.S.H.O. Series of 1944, 1949.

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

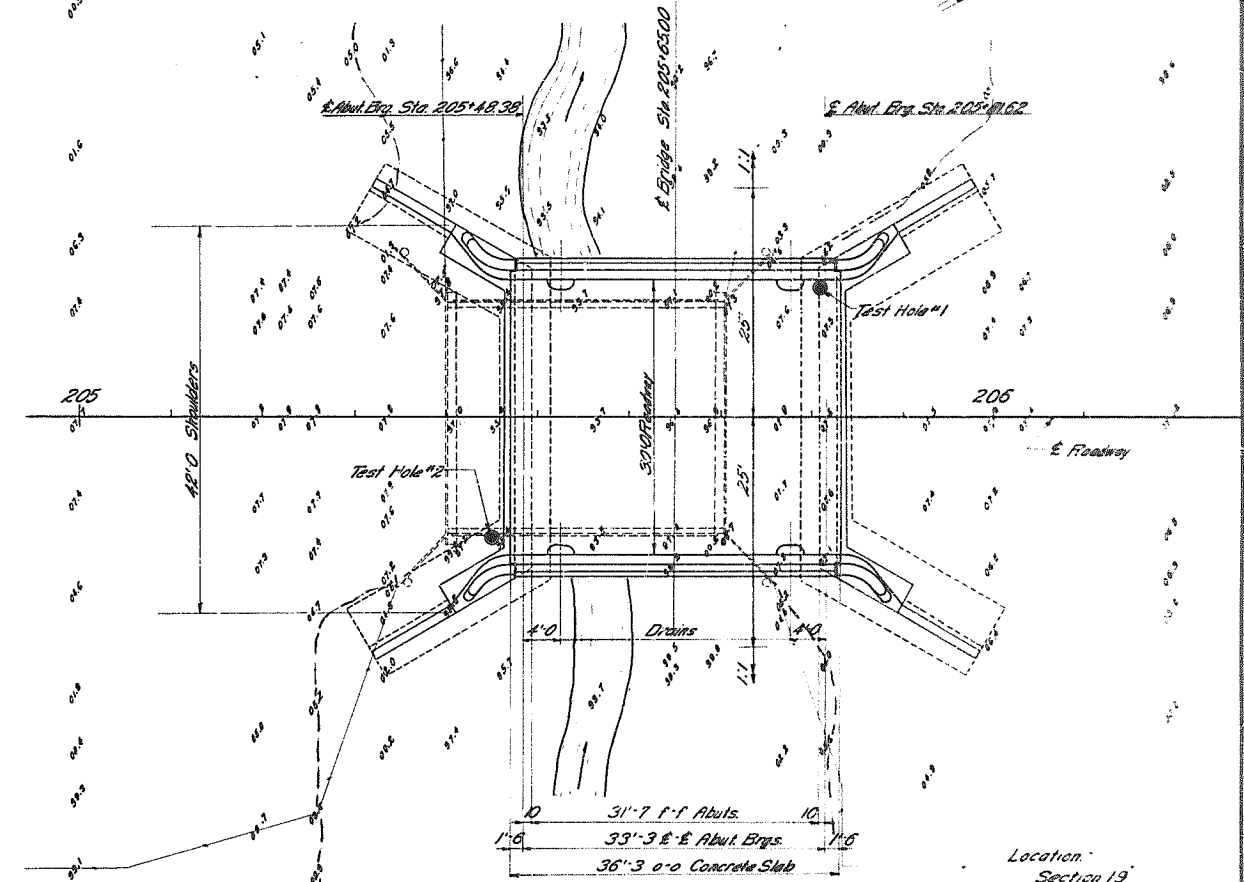
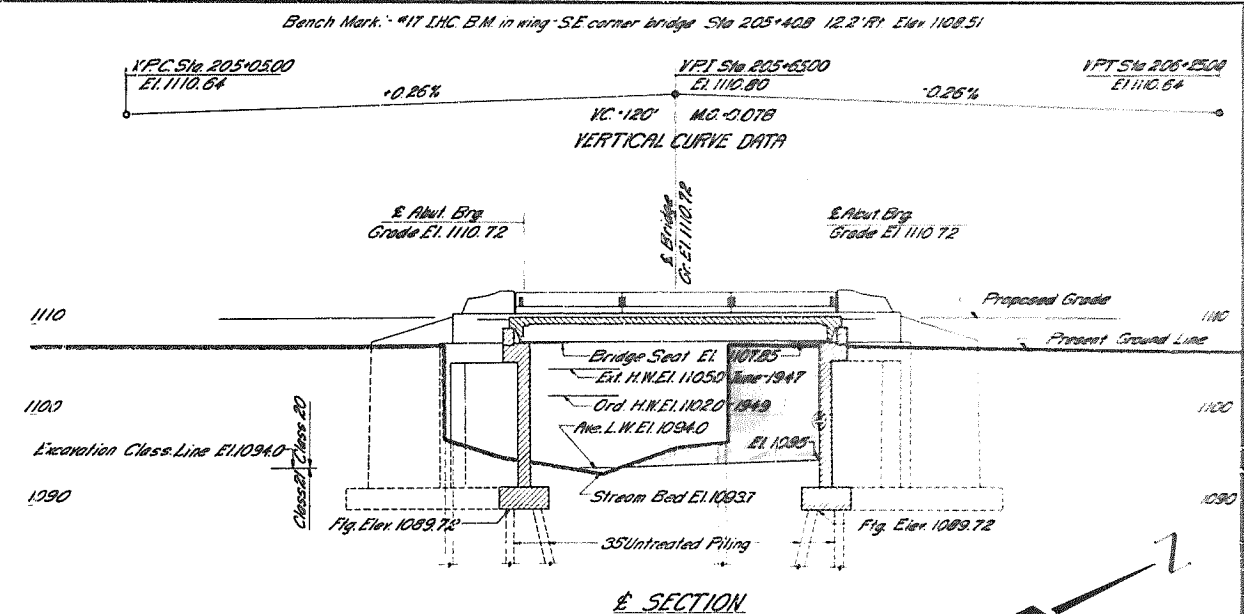
V.C.



SOUNDING DATA
Scale: 1"=10'
Dated: 8-15-50

GENERAL NOTES:
This bridge is designed for H-20-44 loading plus an allowance of 19 lbs. per sq. ft. of roadway for future wearing surface.
Bridge contractor to remove present bridge. (See General Plan) and pile all material neatly within 200' of site. Cut off piles of North abut. at El. 1094 and remove backing and wing plank from South abut. Nails, bolts, and other hardware to be removed from soluble lumber.
Bridge contractor to clear channel under bridge for distance of 25' each side of E. Ry. as shown in Situation Plan and by shaded area in E. Section.
Red lines on tracing or faint lines on print indicate present construction.

SPECIFICATIONS:
Design: A.A.S.H.O. Series 1949 for H-20-44 loading with modifications noted on sheet 3.
Construction: I.H.C. Series 1948.



TOTAL ESTIMATED QUANTITIES			
	Superst.	2 Abut.	Total
Concrete	45.0cy.	25.0cy.	281.4cy.
Reinforcing Steel	8,021 lbs.	15,512 lbs.	23,533 lbs.
Structural Steel	15,905 lbs.		15,905 lbs.
Untreated Piling	2000'		3600' lin. ft.
Class 20 Excavation	390cy.		390cy.
Class 21 Excavation	225cy.		225cy.
Class 10 Excavation (Channel Clearance)			265cy.
Removal of Present Bridge			Lump Sum

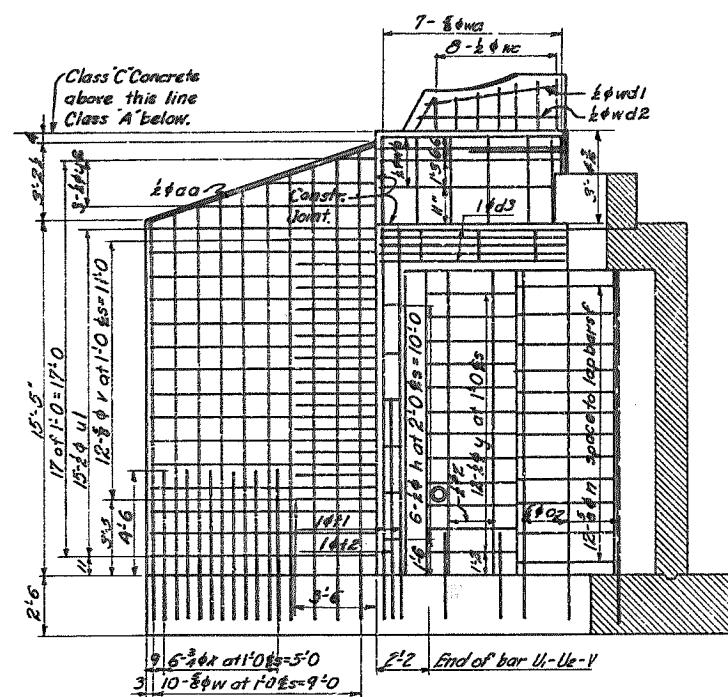
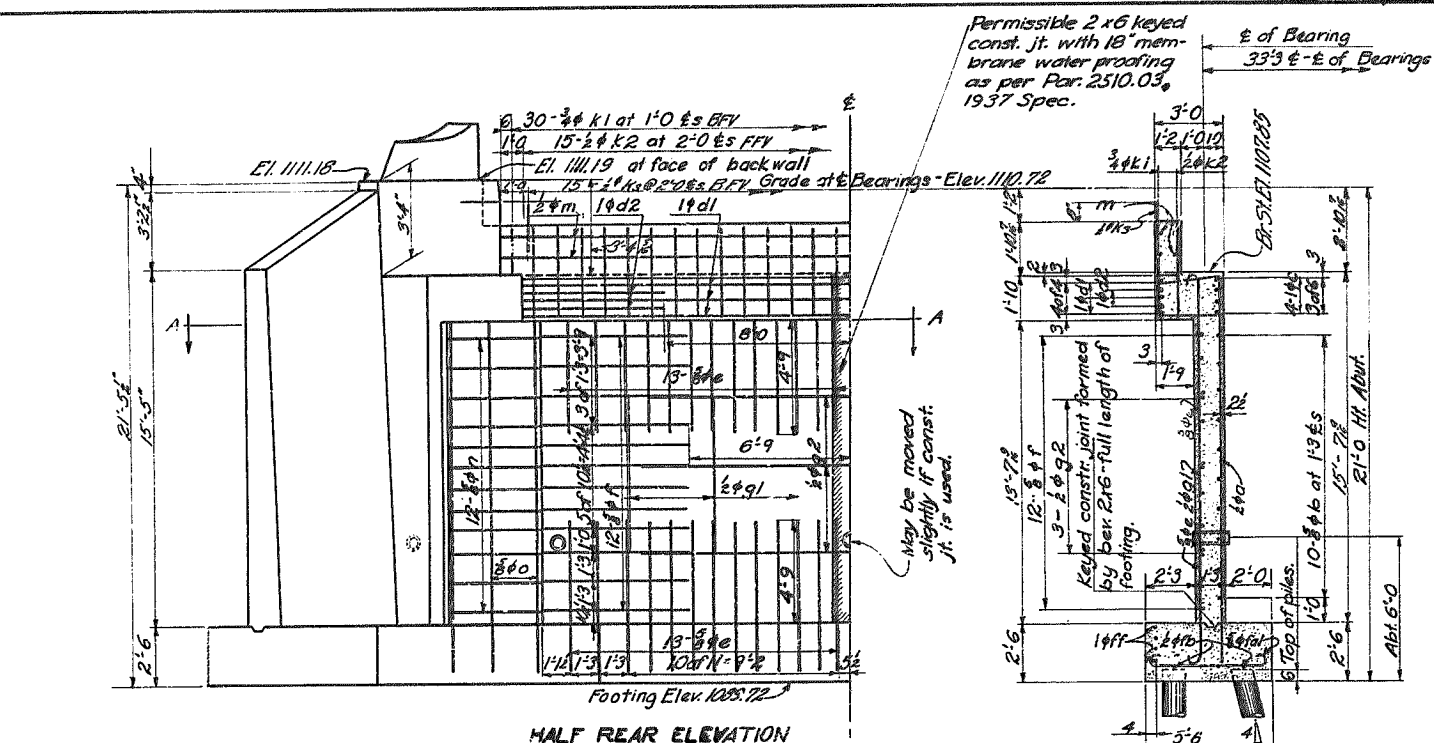
Design for
32'x30' I-BEAM BRIDGE
Concrete Floor, Substructure & Rail

SITUATION & GENERAL PLANS
Sta. 205+63.00 Project No. F354 (3)
POTTAWATTAMIE COUNTY
Iowa State Highway Commission
September 1950 Sheet 1 of 3

Location:
Section 19
Valley Township
Pottawattamie County

13

Bench Mark: - #17 I.H.C. BM in mag. SE corner bridge Sta. 205+40.8 12.2' R/L Elev. 1108.51



BILL OF REINFORCING - ONE ABUTMENT						
Mark	Location	No.	Size	Length	Shape	Weight
a	Stem Wall - FFV	36	3/8	19'-0"	FT	43.3
b	" " - FFH	10	3/8	36'-8"	FT	32.8
c	Bridge Seat - FFH	4	1/2	36'-8"	FT	41.3
d1	" " - BFH	3	1/2	34'-0"	—	27.6
d2	" " - BFH	4	1/2	9'-4"	—	10.0
d3	Bracket - BFH	10	1/2	11'-4"	—	30.3
e	Stem Wall - BFV	52	3/8	6'-10"	C	37.1
f	" " - BFH	24	3/8	6'-7"	—	21.3
g1	" " - BFV Ties	6	3/8	6'-6"	—	2.0
g2	" " - BFH Ties	3	3/8	16'-10"	—	3.4
h	Vertical Beam Hoops	12	3/8	8'-7"	—	6.3
j	Bracket Stirrups	6	3/8	8'-10"	—	3.9
k1	Backwall - BFV	30	3/8	6'-1"	FT	27.0
k2	" " - FFV	15	3/8	3'-6"	—	3.3
m	" " Both Faces Hor.	4	3/8	34'-6"	—	9.8
n	Fillet - Hor.	24	3/8	8'-10"	FT	22.1
o	" " - Vert.	6	3/8	17'-7"	—	11.0
p	Wing Wall - FFH Top	8	3/8	Varies	FT	12.3
q1	" " - FFH	24	3/8	19'-4"	—	40.4
q2	" " - FFV	12	3/8	Varies	—	13.3
r2	" " - FFV	8	3/8	18'-11"	—	10.1
s	Vert. Beam - FFV	6	3/8	17'-6"	—	11.0
t1	" " - BFV	4	1/2	18'-6"	—	19.0
t2	" " - BFV	2	1/2	10'-0"	—	5.5
u1	Wing Wall - BFH	30	3/8	12'-0"	FT	24.0
u2	" " - BFH Top	6	3/8	Varies	—	3.3
v	" " - BFH	24	3/8	5'-9"	—	14.4
w	" " - BFV	20	3/8	Varies	—	59.3
x	" " - BFV	12	3/8	7'-0"	—	12.0
y	Face " - BFH	24	3/8	7'-6"	—	12.0
z	" " - BFV	4	3/8	15'-1"	—	4.0
aa	Wing " - Top	4	3/8	12'-6"	FT	3.3
fab	Stem Foot. Trans. Bott.	26	3/8	6'-3"	C	16.3
fab	Wing " " "	38	3/8	9'-0"	C	22.8
fb	Stem Foot. Long. Bott.	2	3/8	25'-3"	—	5.9
fc	Wing " " "	6	3/8	18'-3"	—	7.3
fd	" " Trans. Top	40	3/8	8'-2"	—	49.3
fe	" " Long. " "	8	3/8	17'-0"	—	9.1
ff	Stem Foot. Long. Back	4	1/2	28'-6"	—	30.4
fg	Wing " " "	6	1/2	12'-4"	—	10.0
wo	Wing Post Wall - BFV	14	3/8	5'-7"	—	9.3
wb	" " " - BFH	8	3/8	9'-6"	—	5.5
wc	Wing Rail - Vert.	32	3/8	3'-11"	—	8.4
wd1	" " - Hor.	2	3/8	12'-6"	—	17.1
wd2	" " " "	2	3/8	13'-6"	—	18.3
ftg	Downs for boxes a1-a2-z	60	3/8	3'-6"	—	14.0
k3	Endwall - BFV	15	1/2	2'-0"	—	2.0
TOTAL						

General Notes:
All concrete is to be Class A, except wing rails, which are to be Class C.

All exposed corners of 90° or sharper, except vertical corners on wing rail, are to be filled with a $\frac{3}{4}$ " dressed and beveled strip.

All reinforcing is to be securely wired in position before concrete is placed.

All hooked bars are to have a standard 16 diam hook with a bend radius of four diameters.

Distance from face of concrete to E of near bar is to be 2" unless shown or noted.

Specifications: Construction - Standard Specifications of the Iowa State Highway Commission, Series 1948

ESTIMATED QUANTITIES - TWO ARGUMENTS

Concrete, Class A- 29.90c/yd

Concrete, Class C - 2.6 cu yds

Concrete, Class C 2.0 cu. yds.
Reinforcing Steel 19.56 lbs.

Untreated Piles - 104035'

Excavation, Class 20-	300 cu yd
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Excavation, Class 20-	300 cu yds
Excavation, Class 21-	225 cu yds

Design for

32' x 30' I-BEAM BRIDGE

Concrete floor Substructure of floor

RENTMENT DETAILS

54-25-000

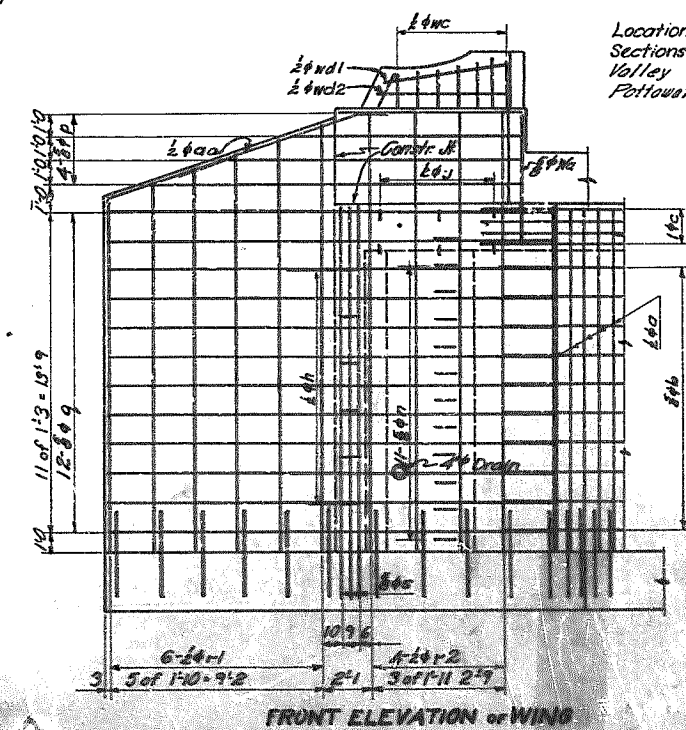
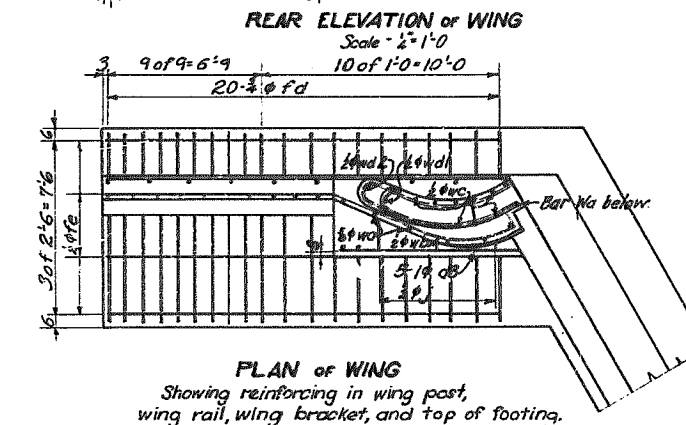
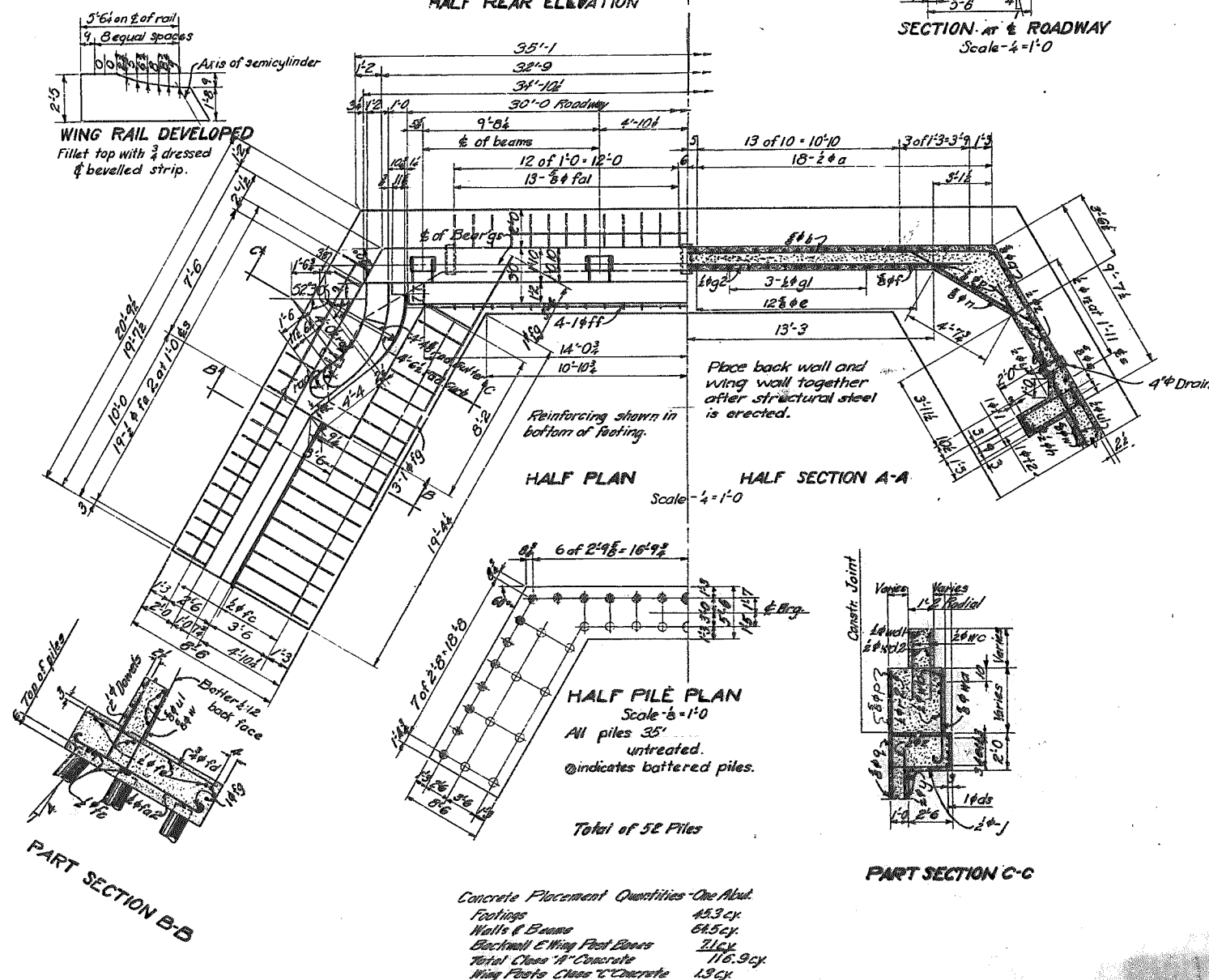
Project F554

POTTAWATTAMIE COUNTY

IOWA STATE HIGHWAY COMMISSION
September 1957 Sheet 2 of 3

DONOR: _____

Detailed by R.D.H. C.M.



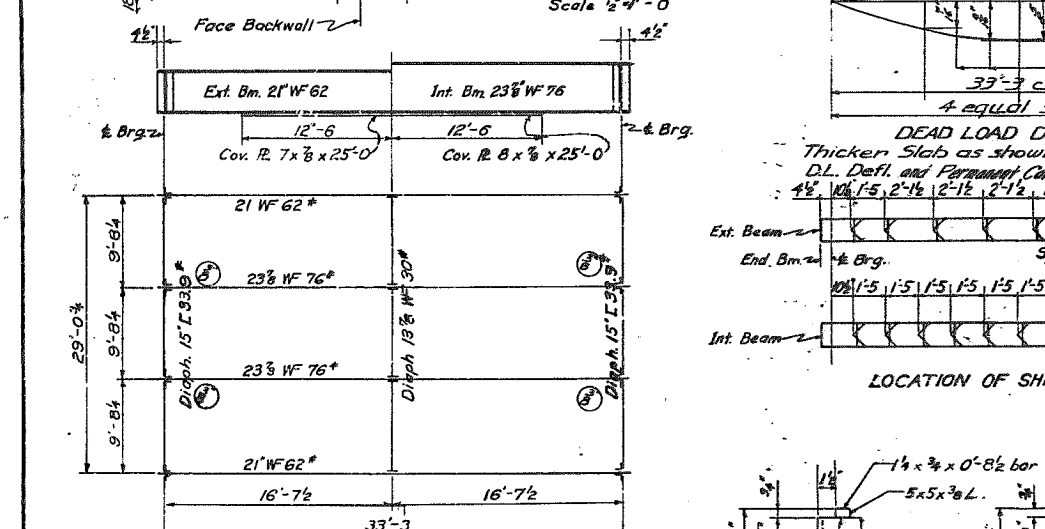
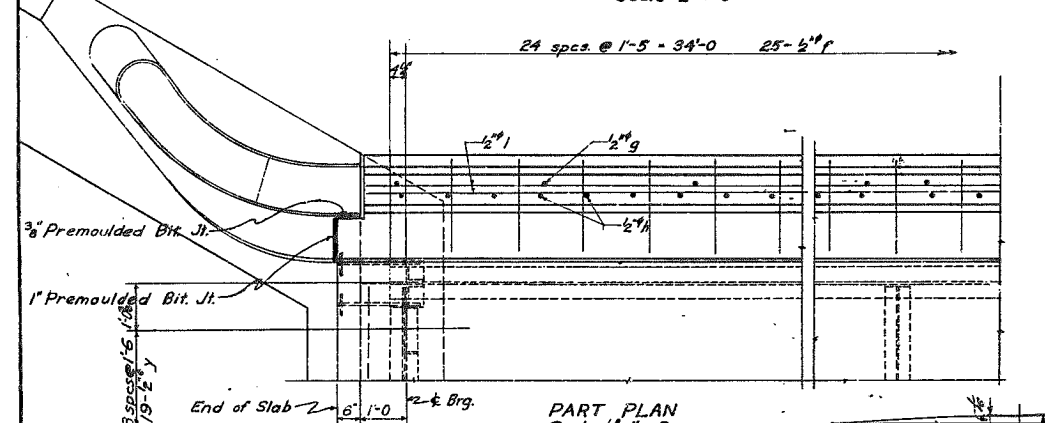
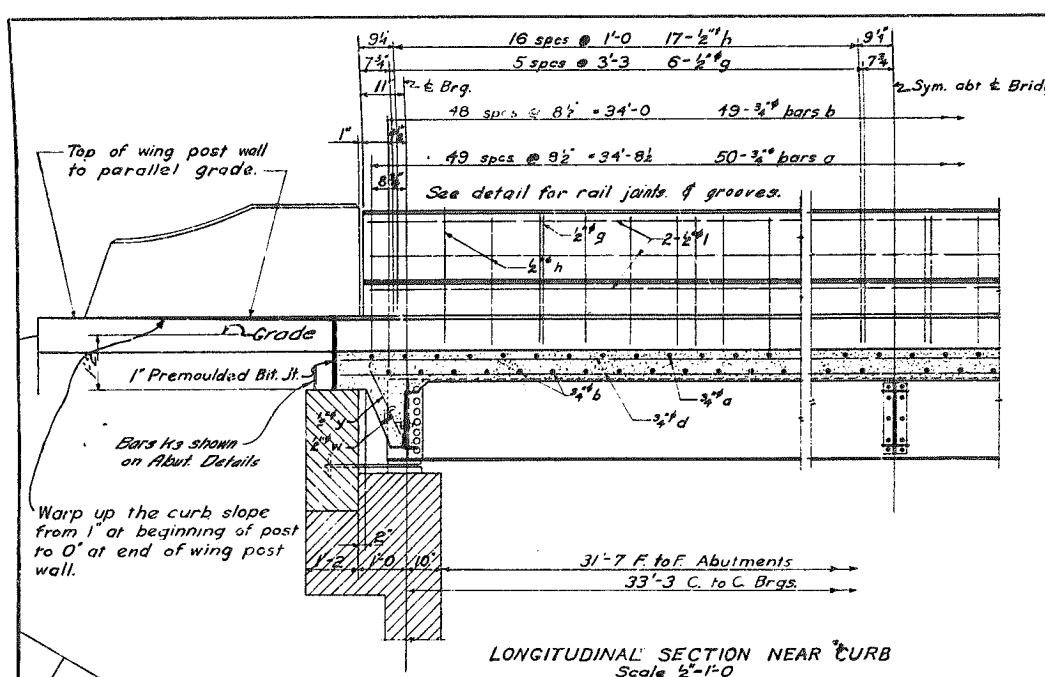
Location
Sections 19
Valley Twp.
Pottawattomie County

PART SECTION C-C

Design 3645 - 1/2" x 1/2" x 1/2"

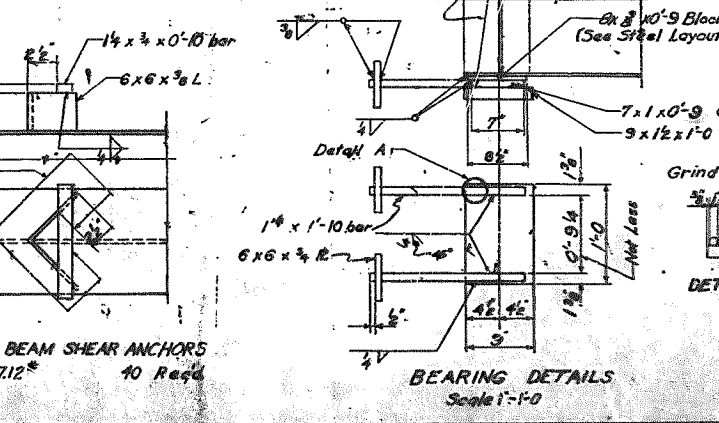
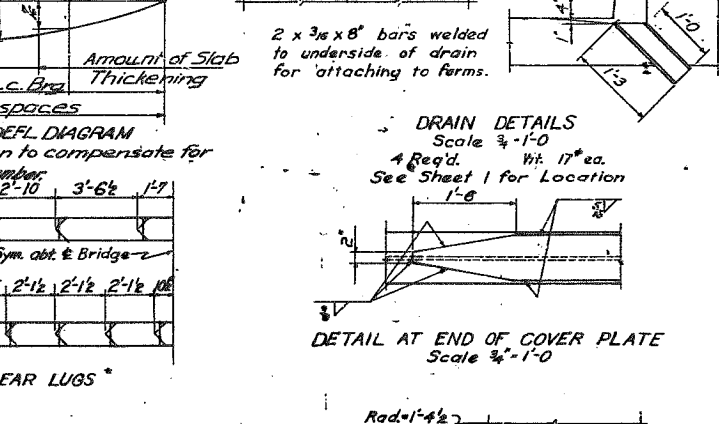
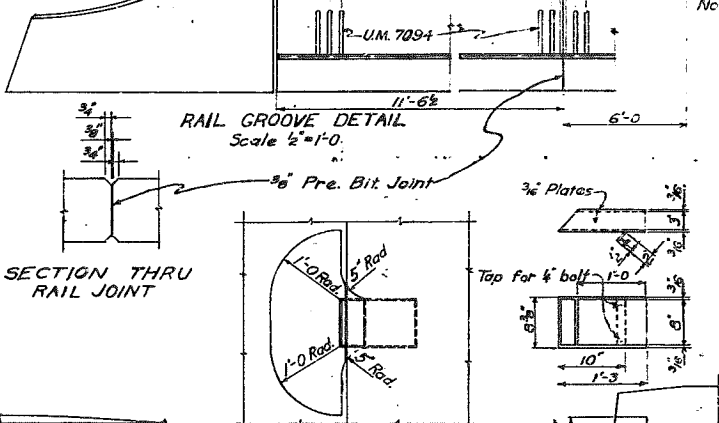
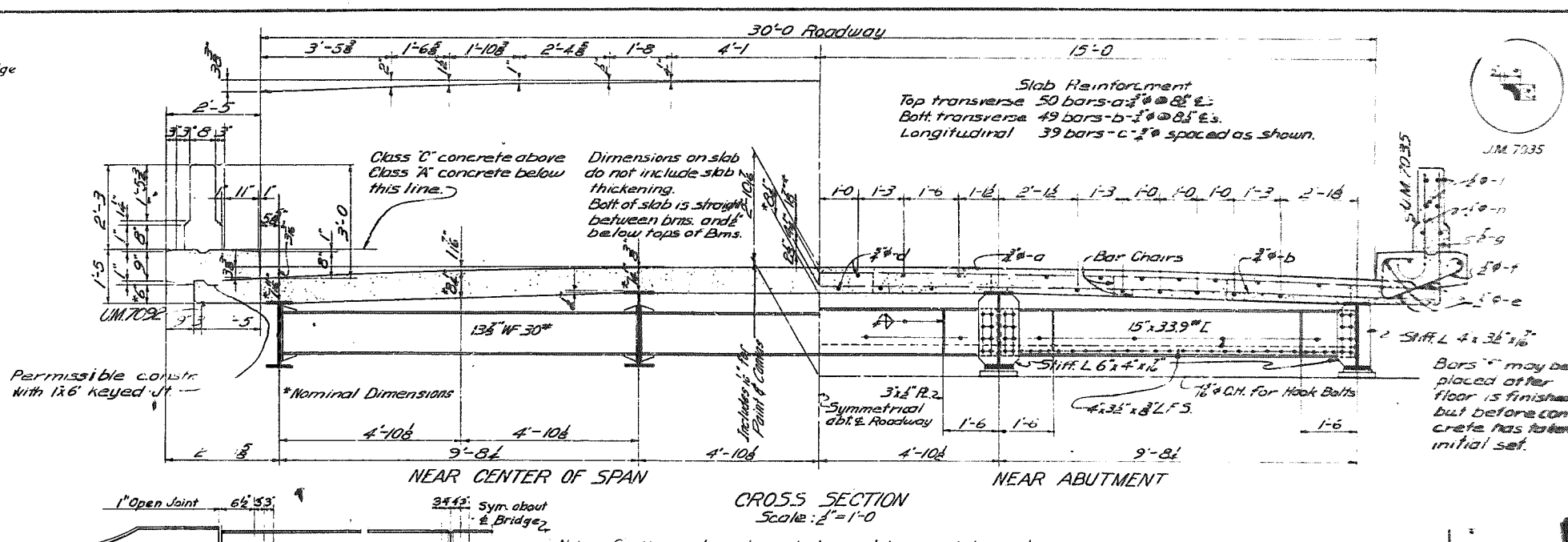
Design 4350 Portland County File No. 1672

Detailed by R.D.H. C-10



Figures encircled thus (3) indicate thickness of blocking plate at that point.

Loading	Moment		Normal Stress		Overhead Stress	
	Ext. Bm.	Int. Bm.	Ext. Bm.	Int. Bm.	Ext. Bm.	Int. Bm.
Rail and Wearing Surf.	60,110	19,360	2,200	540	2,200	540
Slab, Curb and Beam	153,600	43,960	6,550	6,770	6,550	6,770
L.L. + 33% Impact	203,270	363,980	7,450	10,290	14,300	20,580
Totals	416,980	593,100	16,200	17,600	25,050	27,890



Notes: Continuous bar chairs to be used to support top and bottom bars over each beam and individual bar chairs at not over 3'-0" centers. Stiffener angles to be ground to bear on bottom flange with close fit at top. Bottom of slab to be 1/2" below top flange of beam.

Mk.	Location	Shape	Size	No.	Lth.	Wt.
a	Slab, top, transv.	3/4"	50	33'-0"	2478	
b	Slab, bott, transv.	3/4"	49	33'-0"	2429	
d	Slab, long, top & bott.	3/4"	39	35'-11"	2104	
e	Curb long.	1/2"	10	34'-9"	232	
f	Curb, transv.	Detail	50	4'-10"	161	
g	Rail vertical	1/2"	24	2'-10"	45	
h	Rail vertical	Detail	68	3'-9"	170	
i	Rail horizontal	1/2"	36	11'-4"	272	
w	End diaphragm	1/2"	6	9'-4"	37	
y	End diaphragm	1/2"	36	3'-9"	95	
	Total				8023	

General Notes:
This bridge is designed for H-20-44 loading plus 10 lbs. per sq. ft. of roadway for future wearing surface, with the following modifications:
1. Intermediate grade reinforcing steel, allowable stress 20,000 p.s.i.
2. Except for the floor slab, this bridge is designed so that an increase in the live load and impact by 100% will not increase the total unit stress to more than 150% of the specification stresses.
The floor slab as shown includes 1/2" of wearing surface. Field connections bolted. All bolts to be 3/4", and all open holes 1 1/2". Shop rivets to be 3/4". Masonry plates to be set in point and canvas. Bearing surfaces of unfinished masonry plates to be flat and true.
Forms for slab and curbs to be supported by the beams.
Moments due to live load, impact, future wearing surface and rail are resisted by composite action between beam and slab. Shear anchors are used to insure this composite action.
Determination of shear lug spacing:
1. Maximum value with doubled LL { 6x6 L 52,700
2. Max. Spacing 4'-0" { 5x5 L 44,000
SPEC. Design: A.A.S.H.O. (1949) H-20-44 loading
Construction: Iowa State Highway Commission, Series of 1948.

ESTIMATED QUANTITIES

Class A Concrete	406 C.Y.
Class C Concrete	4.6 C.Y.
Reinforcing Steel	8023 lbs.
Structural Steel	16,955 lbs.

Design For
32' x 30' I-BEAM BRIDGE
Concrete Floor, Substructure & Rail
SUPERSTRUCTURE DETAILS
Sta. 205+05.00 Project F-254(4)
POTTAWATTAMIE COUNTY
Iowa State Highway Commission
Sept. 1950 Sheet 3 of 3