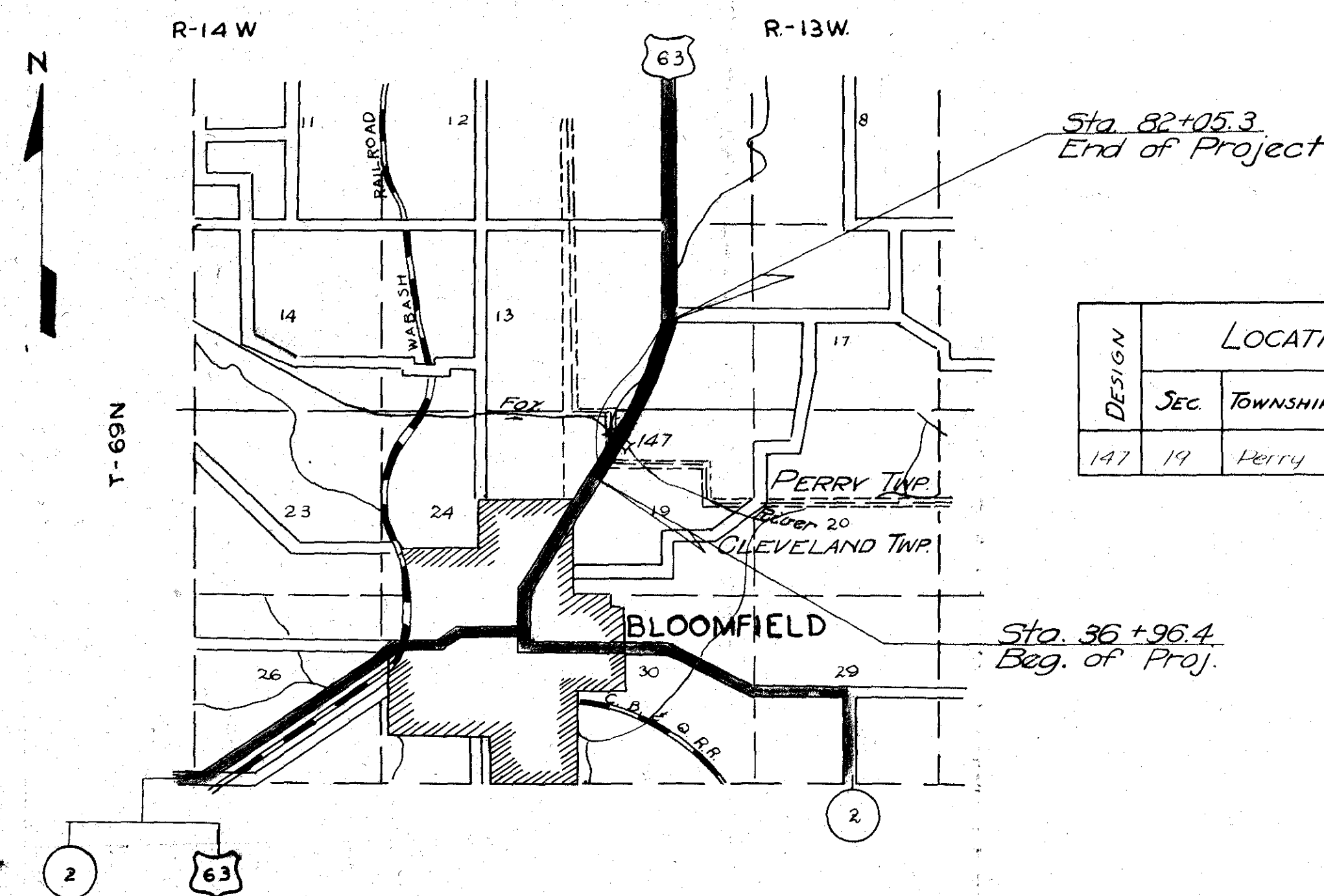


STATE OF IOWA
STATE HIGHWAY COMMISSION
 DESIGN FOR
210' X 26' CONTINUOUS I-BEAM BRIDGE
 PRIMARY ROAD SYSTEM F. PROJ. NO. 50
DAVIS COUNTY
 JANUARY 1947



DESIGN	LOCATION			DESCRIPTION	ESTIMATE OF QUANTITIES											
	SEC	TOWNSHIP	STATION		SIZE AND TYPE	CONCRETE	REINFORCING STEEL	STRUCTURAL STEEL	UNTREATED PILING	CREOSOTED PILING	EXCAVATION			EXCAV REMOVAL		
147	19	Perry	51+62	210'x26' Continuous I-Beam Bridge	385.1 CY	59660 Lbs	201650 Lbs	56 @ 25'	24 @ 40'	1400 LF	960 LF	CL I	CL II	CHAN.	CL III	REMOVAL
									1690 LF	1250 LF	197 cy	231 cy	835 cy	86 cy	4 span detour Bridge	

Specifications:
 Design: AA.3.110 (1944) with modifications as noted
 Construction: Iowa State Highway Commission Series 1937 and
 Special Provisions for Paving dated 3-17-47
 " Water proof joints dated 4-1-43
 " " constructions Div II dated 10-16-45

Mileage Summary
 Bridge at Sta. 51+62 = 213.3 ft. 004 miles

CONSTRUCTION PLAN SHOWING PROJECT AS BUILT
 THREE COPIES PREPARED

PREPARED BY Paul O. Terry RES. ENGR. Feb. 15, 1940
 THIS COPY APPROVED AND SENT TO AMES
 ONE COPY DELIVERED TO DIVISION MAINT. ENGR.
 ONE COPY DELIVERED TO DISTRICT ENGR.
 SIGNED Sam Seal DISTRICT ENGINEER

APPROVED
 [Signature Box]
 CHIEF ENGINEER
 IOWA HIGHWAY COMMISSION

RECOMMENDED FOR APPROVAL
 [Signature Box]
 DISTRICT ENGINEER
 PUBLIC ROADS ADMINISTRATION
 FEDERAL WORKS AGENCY

APPROVED
 [Signature Box]
 DIVISION ENGINEER
 PUBLIC ROADS ADMINISTRATION
 FEDERAL WORKS AGENCY

LOG OF PILING DRIVEN

Kind of Piling Treated
Type of Hammer Gravity
I. H. Comm. No. of Hammer
Gross Weight of Hammer 2250 Effective Wt. 2115 Batt.
Weight of Driving Cap (If Needed) 2180 St.
Weight of Pile (If Needed)
Formula Used
Required Penetration Full
Required Bearing 18 Ton
Was Bearing Determined Immediately Upon Completion of Driving? Yes

County Davis Proj. No. F-50(7)
Contractor P. K. Duvall, Inc.
Design No. 147 Sta. of C. L. 50+57
Foundation Number South Abutment
Description of Work and Remarks: After failing to obtain required bearing, longer piling were ordered. Still slightly under required bearing, extra piling were added.

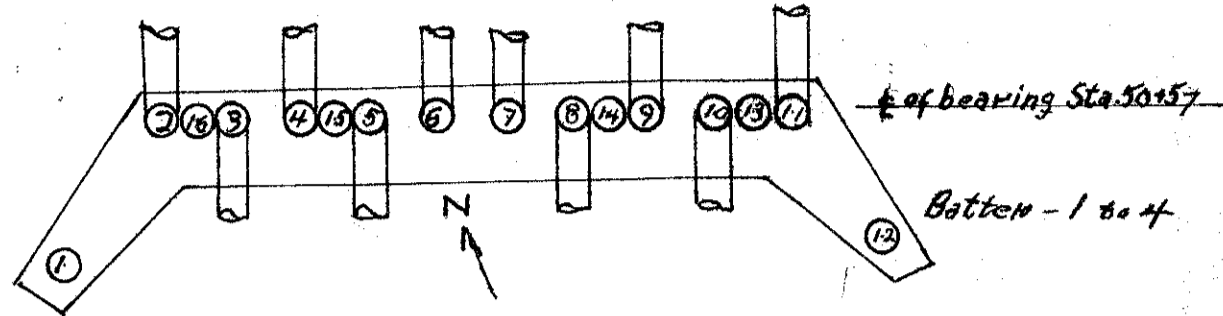


Table with columns: Pile No., Date Driven, Length in Leads, Length Cut Off, Length in Structure, Ave. Penetration Last Blow (inches), Drop in Feet, Bearing in Tons. Contains 25 rows of data for piles 1-25.

*On File Trestle Bridges give length in ground and also total length in structure.

Paul O. Terry Resident Engineer

LOG OF PILING DRIVEN

Kind of Piling Treated
Type of Hammer Gravity
I. H. Comm. No. of Hammer
Gross Weight of Hammer 2250 Effective Wt. 2180
Weight of Driving Cap (If Needed)
Weight of Pile (If Needed)
Formula Used
Required Penetration Full
Required Bearing 18 Ton
Was Bearing Determined Immediately Upon Completion of Driving? Yes

County Davis Proj. No. F-50(7)
Contractor P. K. Duvall, Inc.
Design No. 147 Sta. of C. L. 52+67
Foundation Number North Abutment
Description of Work and Remarks: Pile #3 open on top, cut off below split.

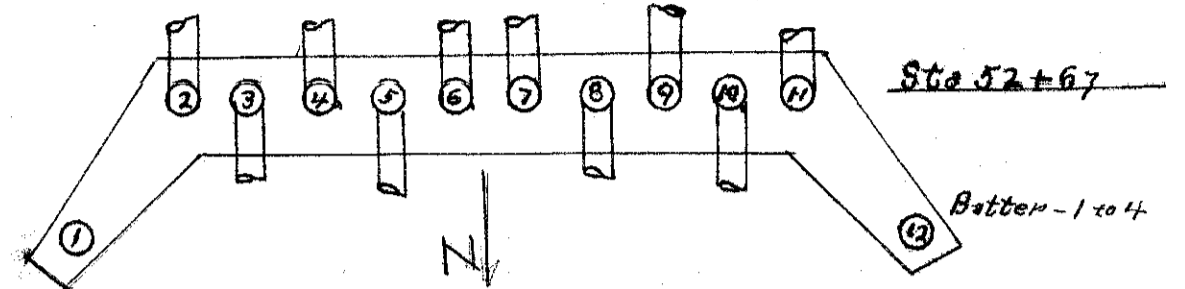


Table with columns: Pile No., Date Driven, Length in Leads, Length Cut Off, Length in Structure, Ave. Penetration Last Blow (inches), Drop in Feet, Bearing in Tons. Contains 25 rows of data for piles 1-25.

*On File Trestle Bridges give length in ground and also total length in structure.

Paul O. Terry Resident Engineer

LOG OF PILING DRIVEN

Kind of Piling Untreated
Type of Hammer Gravity
I. H. Comm. No. of Hammer
Gross Weight of Hammer 2250 Effective Wt. 2115 Batt.
Weight of Driving Cap (If Needed) 2180 St.
Weight of Pile (If Needed)
Formula Used
Required Penetration Full
Required Bearing 18 Ton
Was Bearing Determined Immediately Upon Completion of Driving? Yes

County Davis Proj. No. F-50(7)
Contractor P. K. Duvall, Inc.
Design No. 147 Sta. of C. L. 51+21.00
Foundation Number
Description of Work and Remarks: Unable to obtain bearing with 25' piling. Ordered 35' piling for the east hole. An extra piling was driven to compensate for #11 and #7 which had slipped out of position.

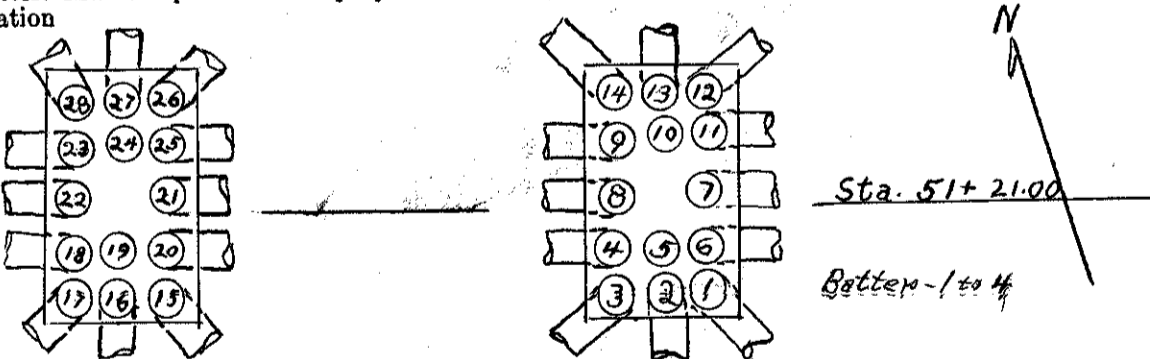


Table with columns: Pile No., Date Driven, Length in Leads, Length Cut Off, Length in Structure, Ave. Penetration Last Blow (inches), Drop in Feet, Bearing in Tons. Contains 25 rows of data for piles 1-25.

*On File Trestle Bridges give length in ground and also total length in structure.

Paul O. Terry Resident Engineer

LOG OF PILING DRIVEN

Kind of Piling Untreated
Type of Hammer Gravity
I. H. Comm. No. of Hammer
Gross Weight of Hammer 2250 Effective Wt. 2180
Weight of Driving Cap (If Needed)
Weight of Pile (If Needed)
Formula Used
Required Penetration Full
Required Bearing 18 Ton
Was Bearing Determined Immediately Upon Completion of Driving? Yes

County Davis Proj. No. F-50(7)
Contractor P. K. Duvall, Inc.
Design No. 147 Sta. of C. L. 52+03.00
Foundation Number Pier #2
Description of Work and Remarks:

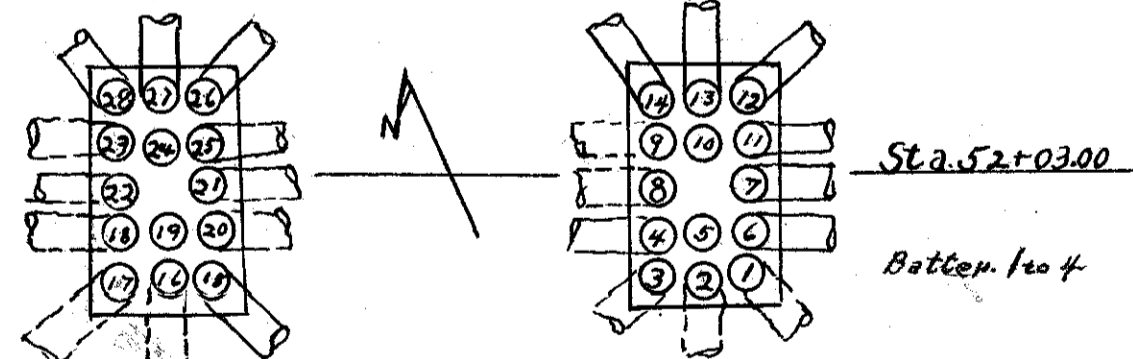
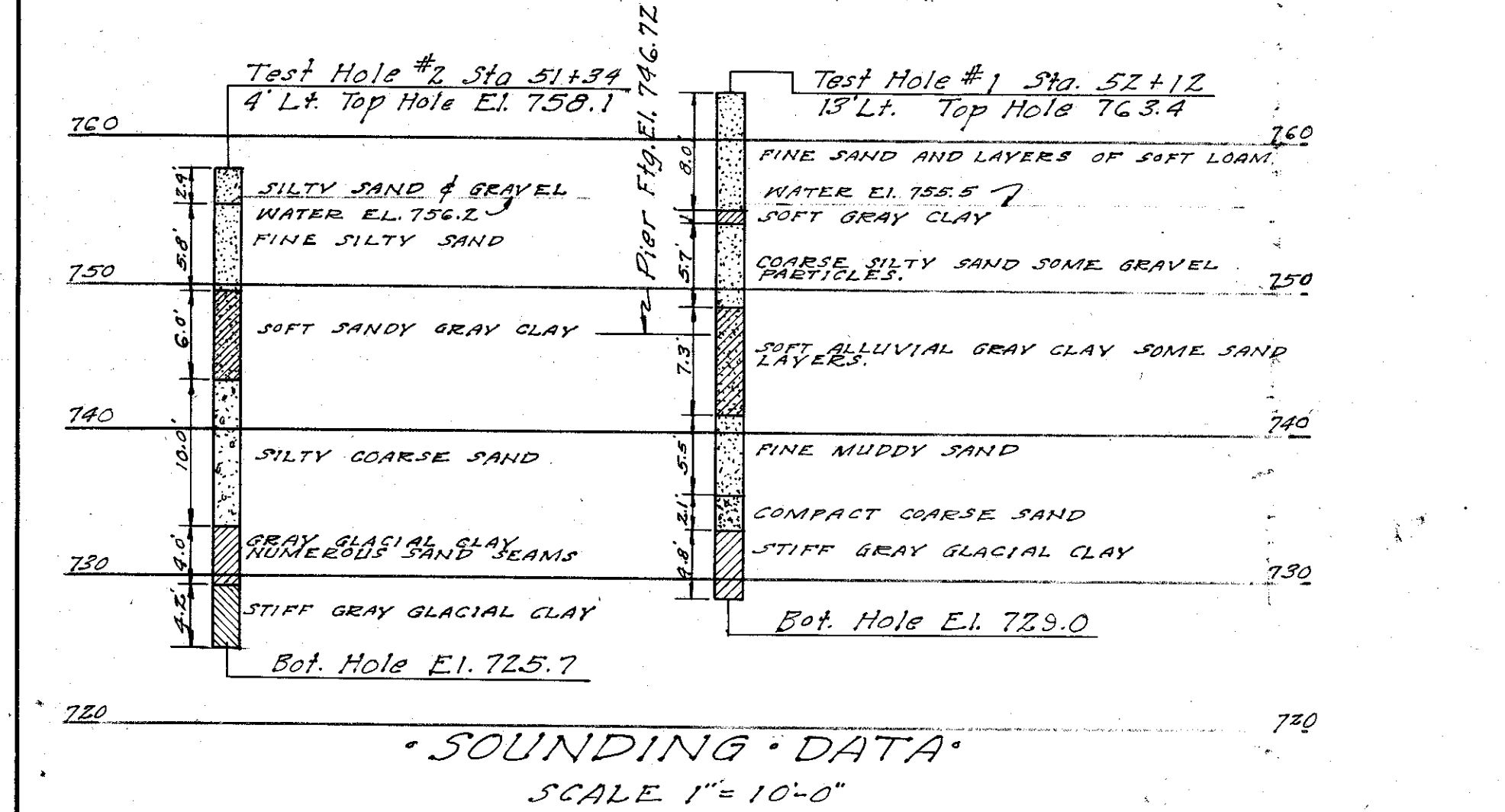
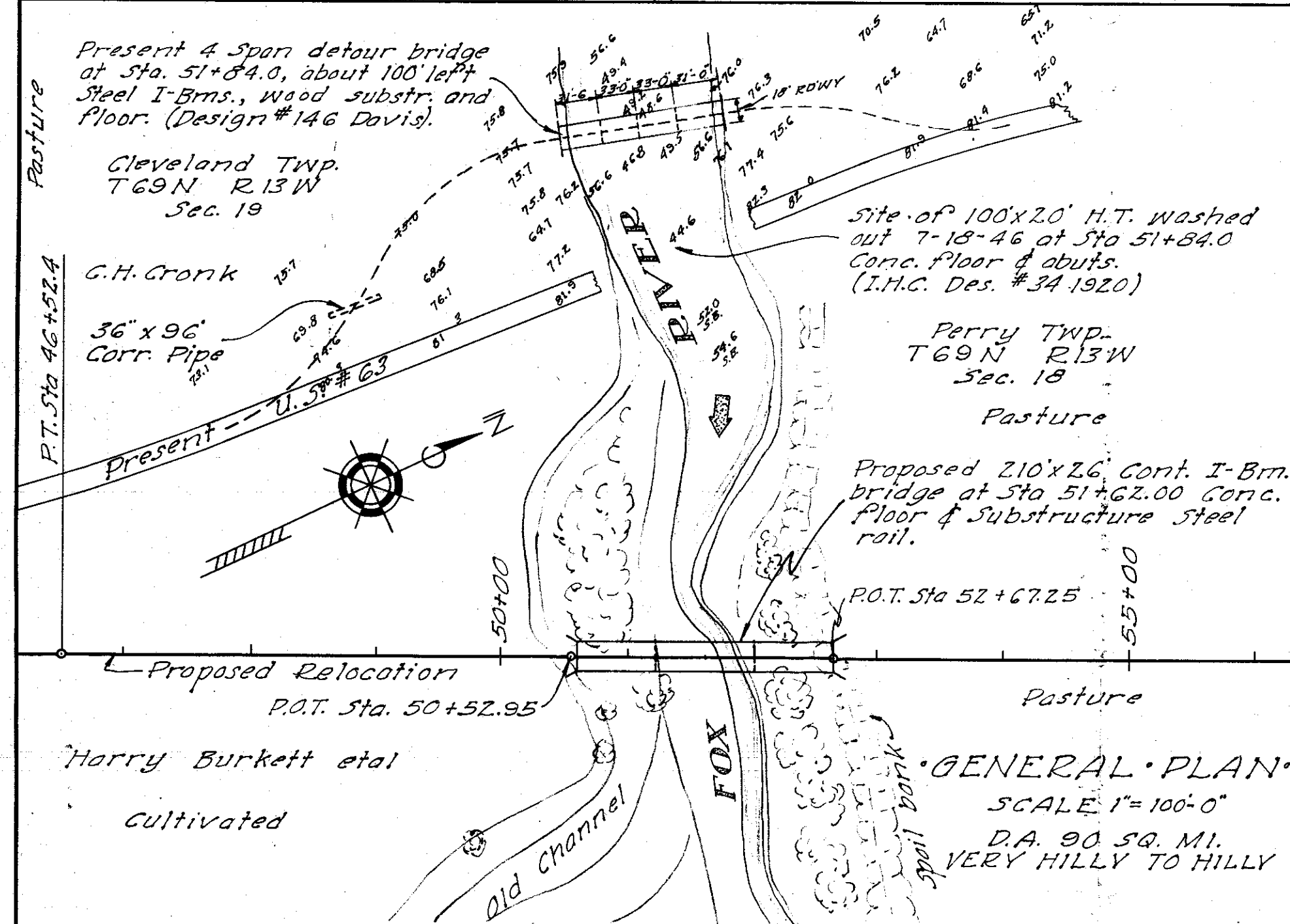
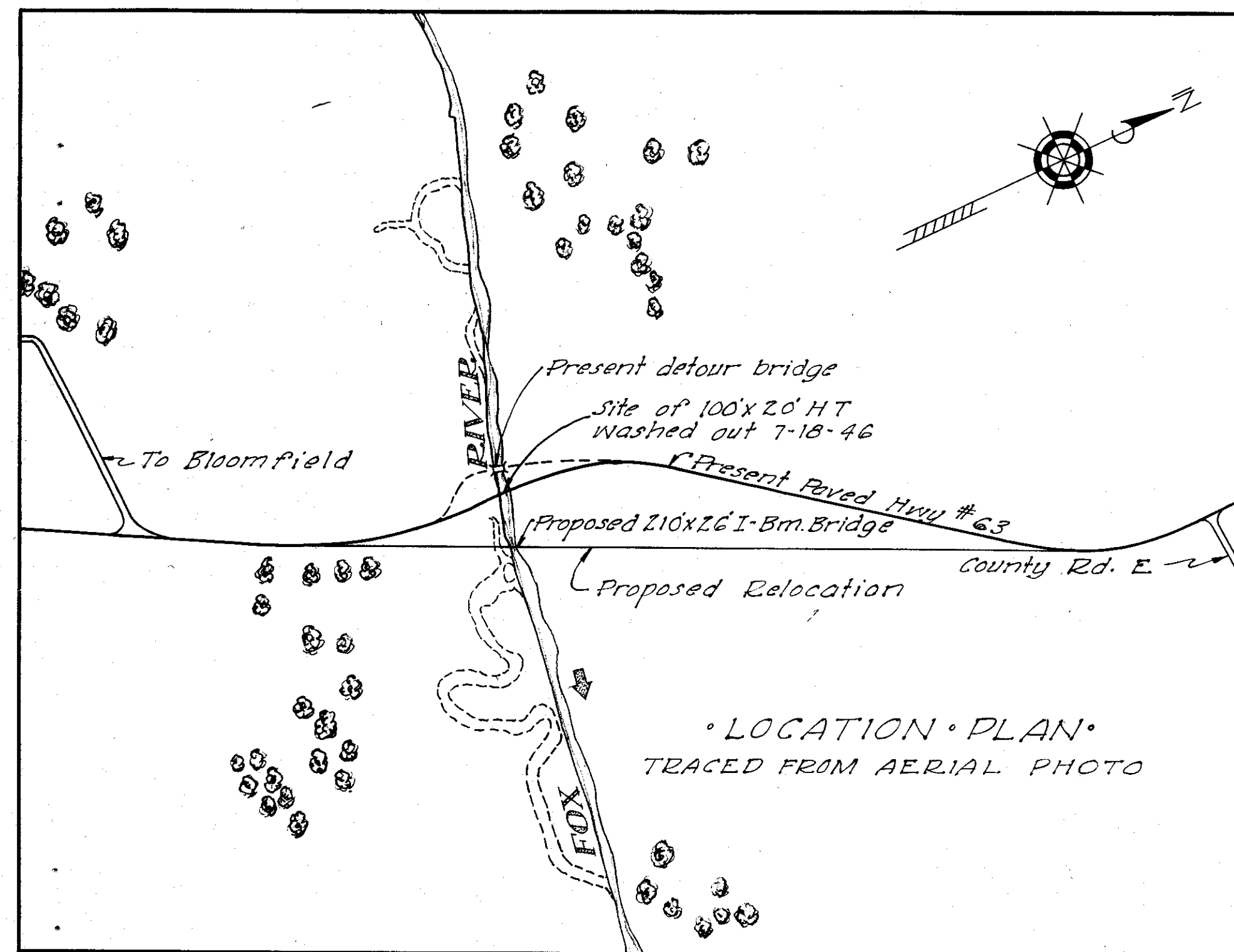


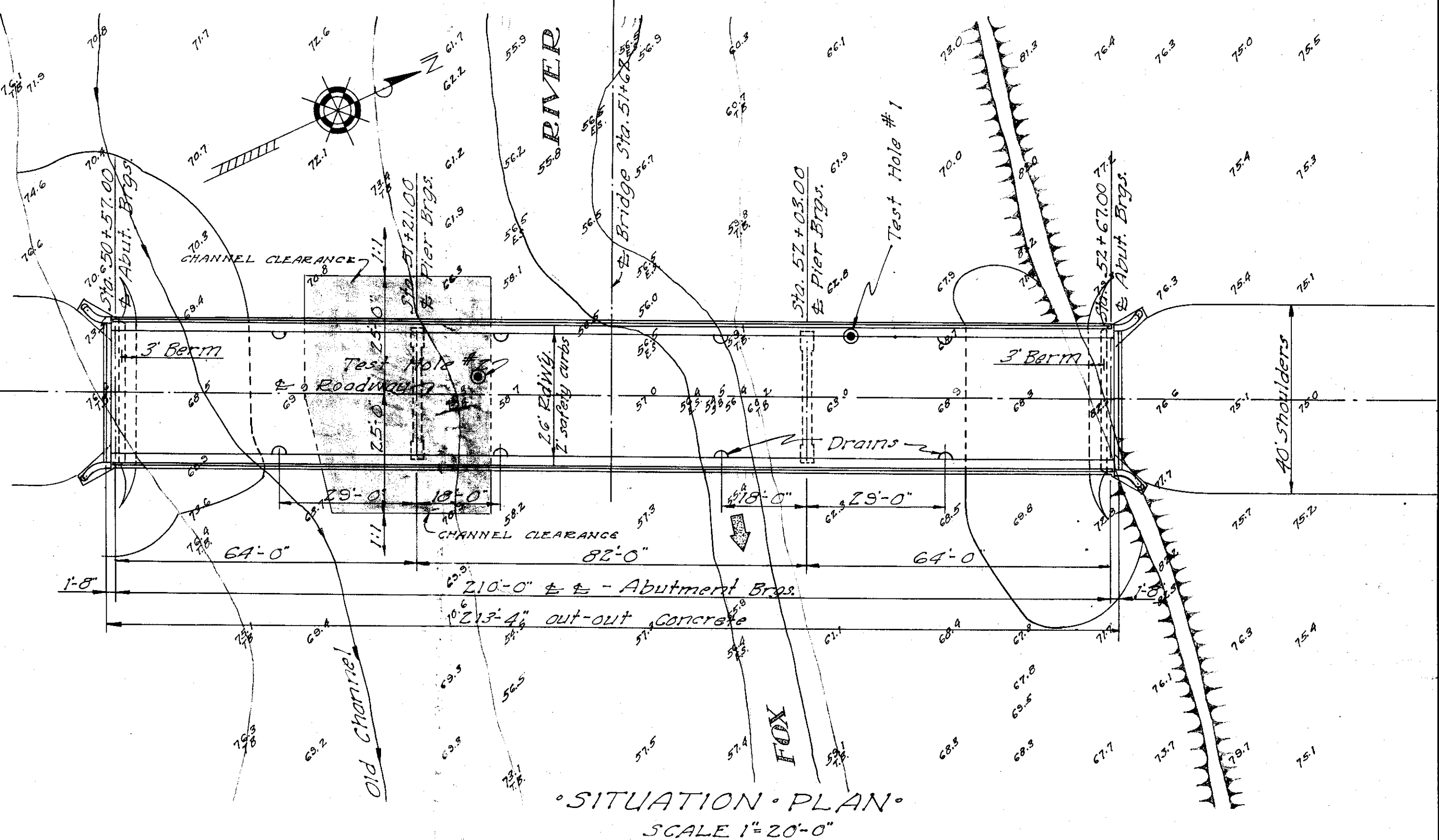
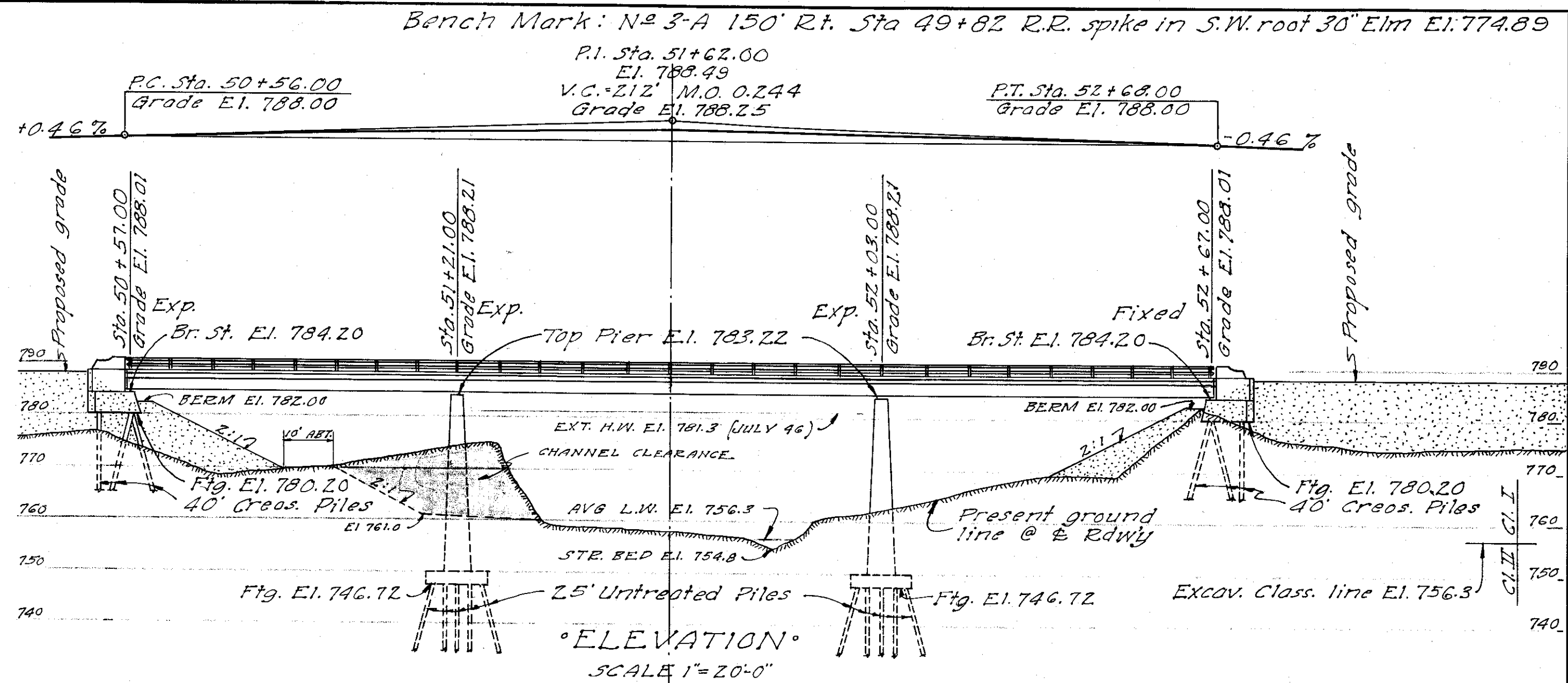
Table with columns: Pile No., Date Driven, Length in Leads, Length Cut Off, Length in Structure, Ave. Penetration Last Blow (inches), Drop in Feet, Bearing in Tons. Contains 25 rows of data for piles 1-25.

*On File Trestle Bridges give length in ground and also total length in structure.

Paul O. Terry Resident Engineer



GENERAL NOTES:
 This bridge is designed for H-20-44 loading with a allowance of 19#/' of roadway for future wearing surface.
 Approach fills are not a part of this estimate but are to be made before abutment piles are driven.
 Bridge contractor is to level off and shape berms as indicated on the Situation Plan.
 Present detour bridge (I.H.C. Design 146, Davis Co.) described on General Plan, to be removed by bridge contractor after proposed structure is in service. Material to be piled neatly within 200' of site as directed by the engineer.
 Substructure piles to be cut off 1'-0" below finished ground line or at low water.
 Removal of 100x20' High Truss bridge is not a part of this estimate.
 Bridge contractor to clear channel for a distance of 25' on each side of $\frac{1}{2}$ of roadway as shown in Plan and Elevation.
SPECIFICATIONS:
 Design: A.A.S.H.O. (1944) with modifications as noted on sheet 4.
 Construction: Iowa State Highway Commission Series 1937.
 Special Provisions for paint dated 3-17-47.
 Special Provisions for waterproof joints dated April 1, 1943.
 Special Provisions for construction projects Div'n II dated 10-16-45.



TOTAL ESTIMATED QUANTITIES			
Part	Superstr. 2 Piers	2 Abuts.	Total
Concrete Class "A"	177.2	143.4	62.0
Concrete Class "C"			2.5
Reinforcing Steel	36835	18485	4280
Structural Steel	201650		
Creasoted Piles		24 @ 90	868 LF
Untreated Piles	56 @ 25		1400 LF
Excavation Cl. I	125	95	220 cu. yd.
Excavation Cl. II	232		232 cu. yd.
Removal of Wood Detour Bridge			Lump Sum
Channel Clearance			600 cu. yd.
Excavation Cl. III			

LOCATION
 Over Fox River
 Section 19
 Perry Township
 Davis County

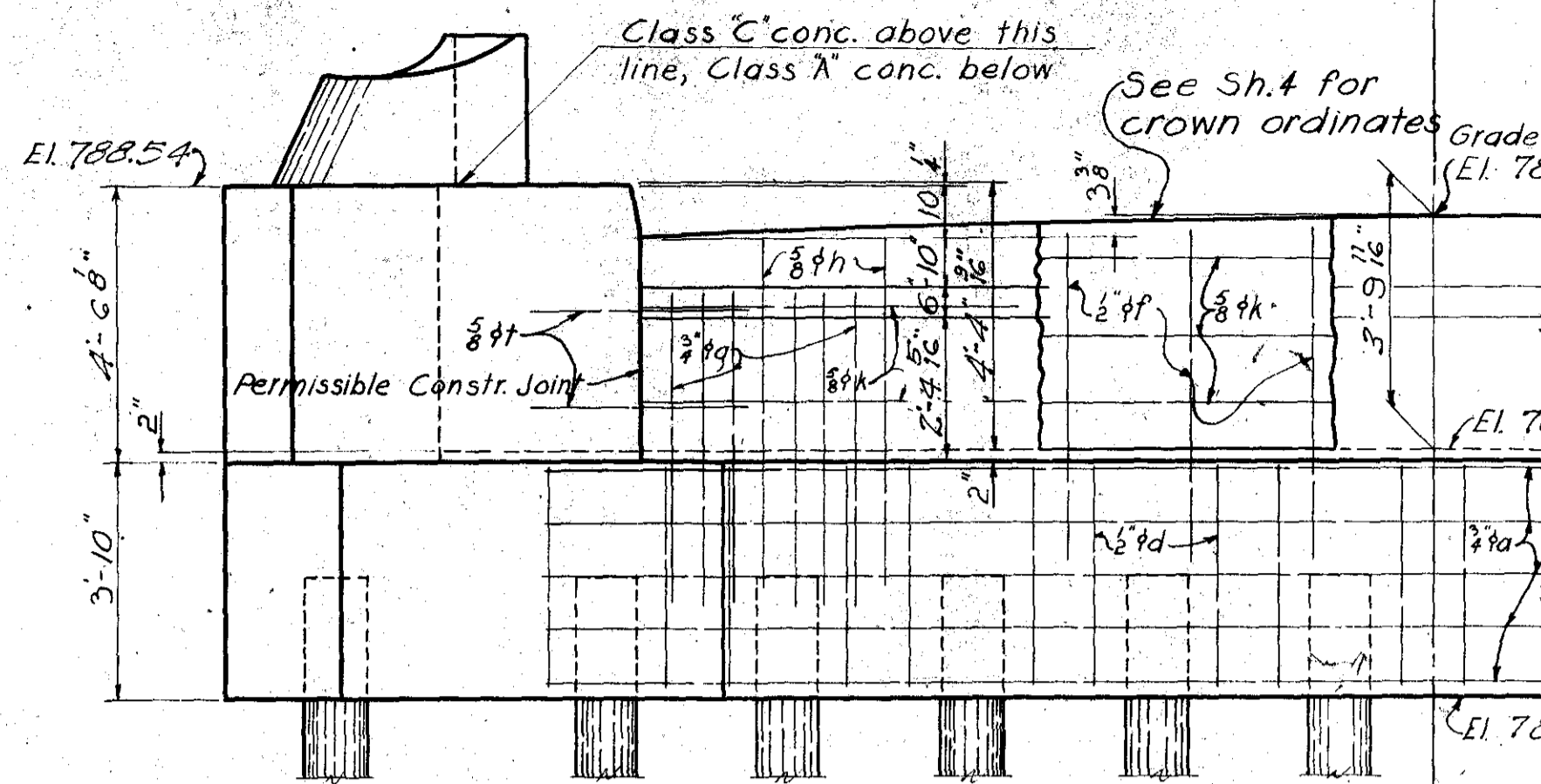
Design For
210'x26' CONTINUOUS I-BEAM BRIDGE
 82' Center Span 64' End Spans
SITUATION & GENERAL PLANS
 Station 51+62.00 Project F-50
 DAVIS COUNTY
 Iowa State Highway Commission
 January 1947 Sheet 1 of 4

Note: This design supersedes Des. 246-180' x 26' @ Sta 51+77

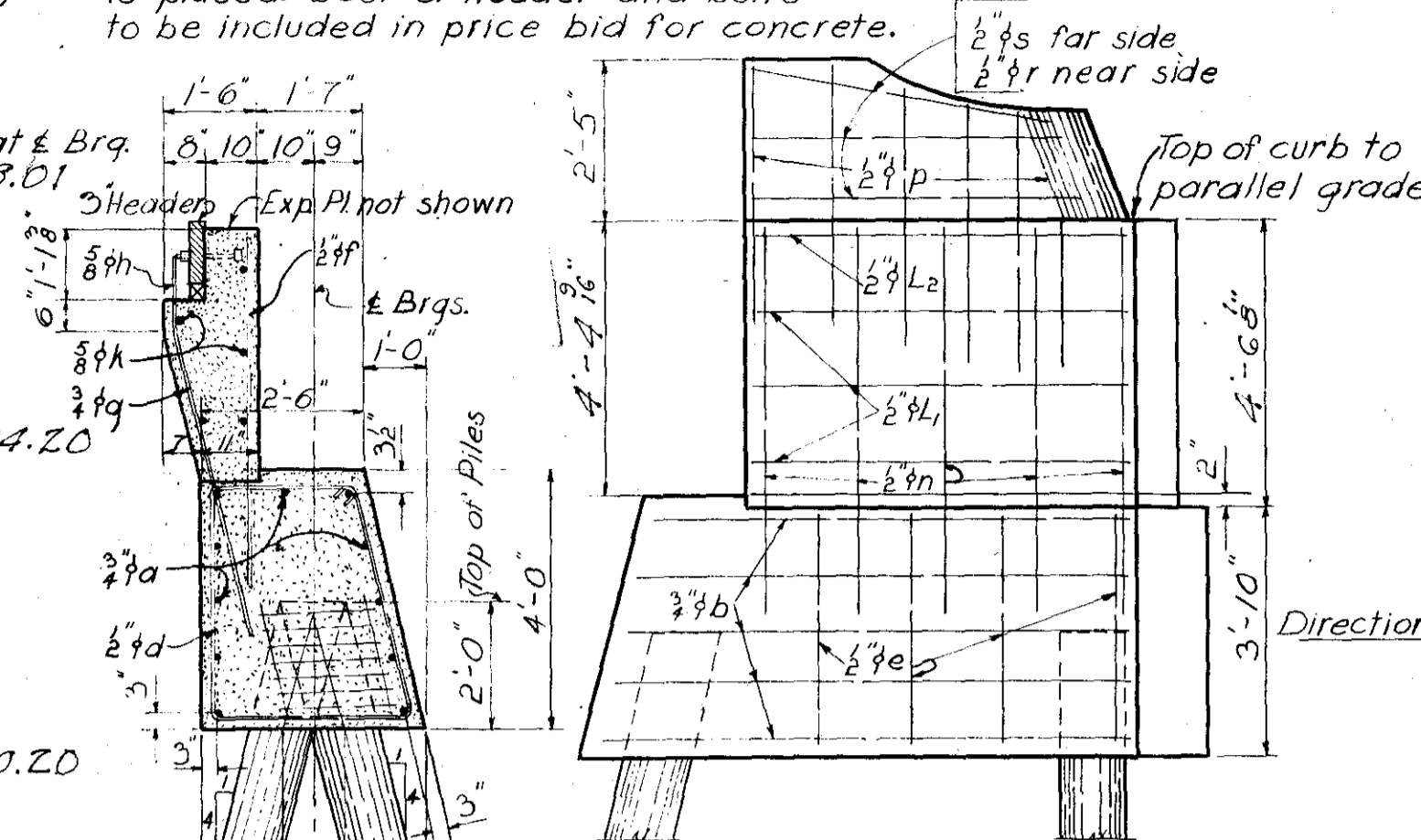
Bench Mark: No. 3-A 150' Rt. Sta. 49+82 R.R. Spike in S.W. Root 30' Elm El.=774.89

Note: 3" header cut to fit crown and secured with 2" bolts @ 3'-0". Cut bolts flush and remove header when paving is placed. Cost of header and bolts to be included in price bid for concrete.

Symm. about & Rdwy.



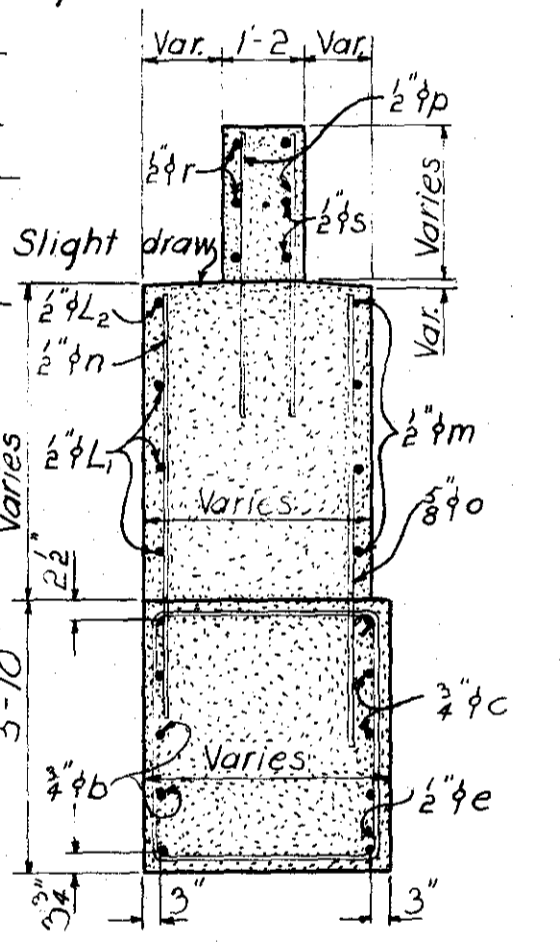
HALF ELEVATION



VIEW B-B

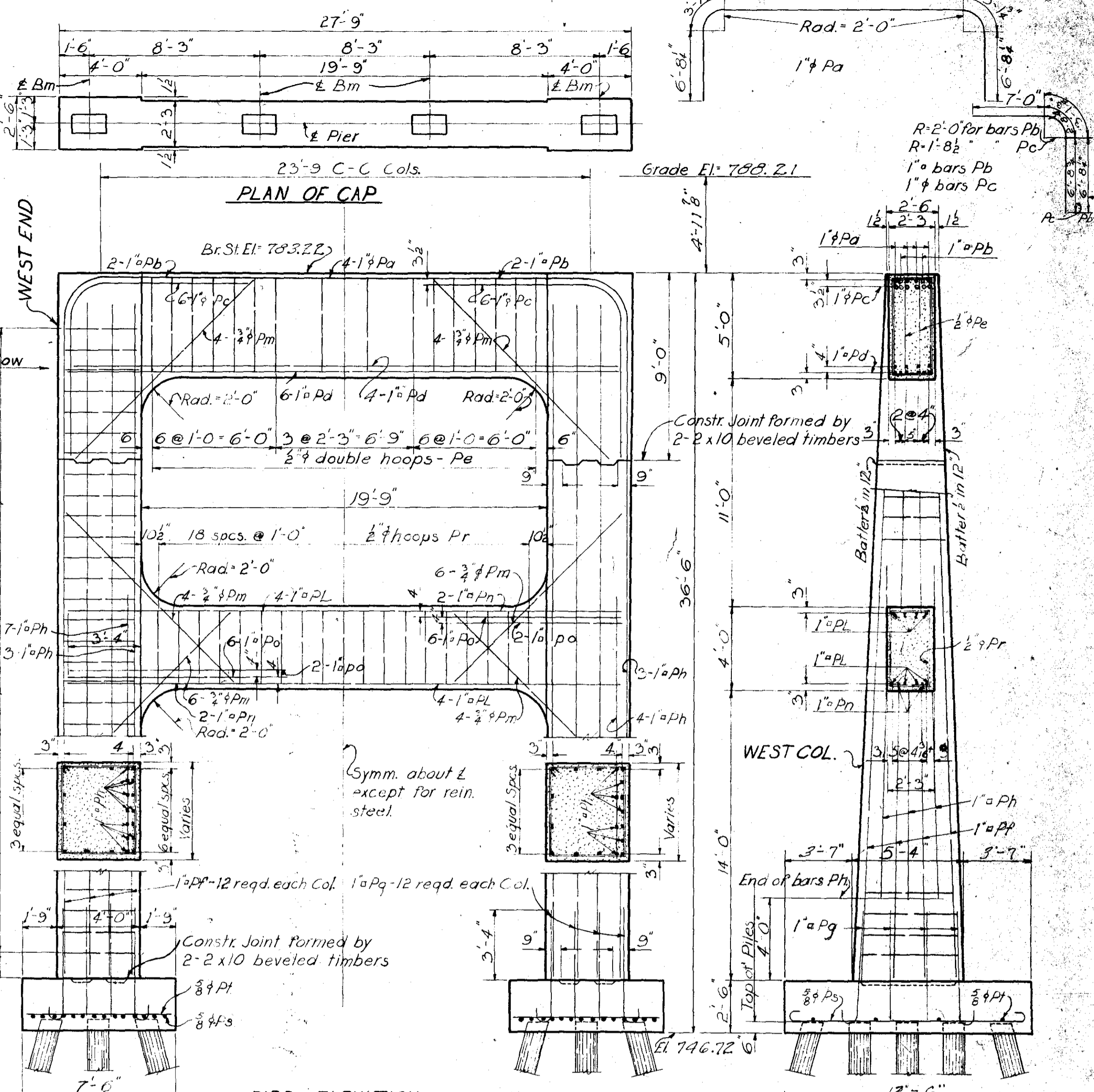
& SECTION

Spiral at top of each pile, 7 turns of 2" rod, 2" diam. 3 pitch with 2 1/2" x 0.63" L spacers punched to hold spiral.



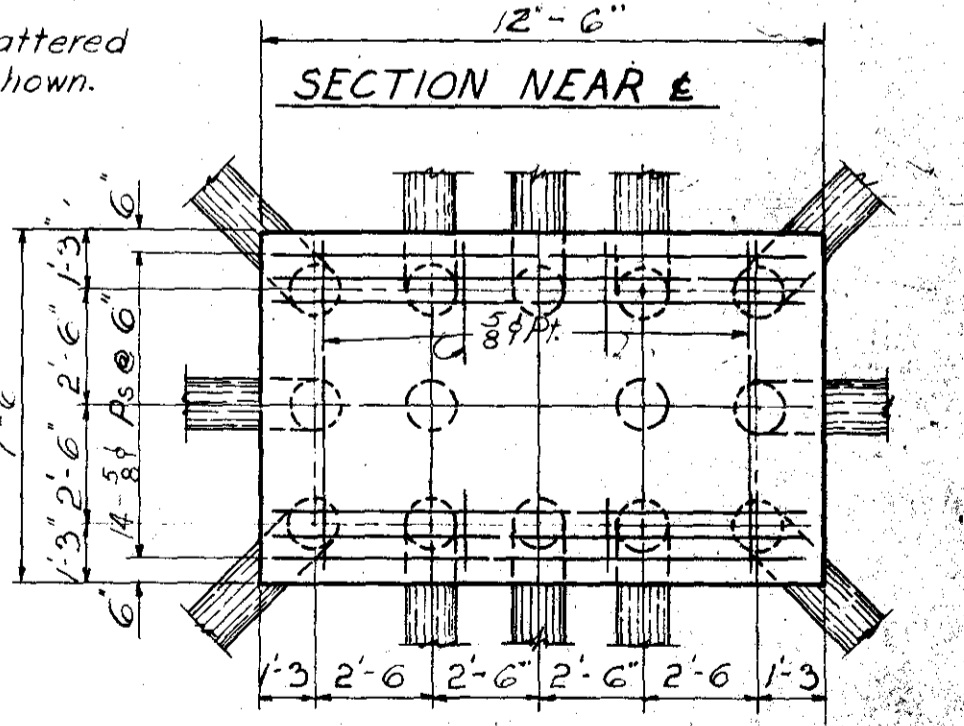
SECTION THRU WING

REINFORCING STEEL 2-PIERS						
Bar	Location	Shape	No.	Size	Length	Weight
Pa	Beam, Top Long.		8	1"	42-9	912
Pb	" " Ends		8	1"	16-10	458
Pc	" " "		24	1"	16-5	1052
Pd	" " Bott. Long.		20	1"	26-6	1802
Pe	" " Hoops		64	1/2"	12-4	527
Pf	" " Columns Vert.		48	1"	32-6	5304
Pg	" " dowels		48	1"	6-4	1030
Ph	" " Vert.		34	1"	14-3	1647
Pk	" " Hoops		124	3/8"	Varies	691
Pl	" " Diaph. Longit.		16	1"	26-5	1439
Pm	" " Beam & Strut Fillets		56	3/8"	11-6	967
Pn	" " Diaph. Longit. Ends		8	1"	12-4	336
Pol	" " " "		32	1"	10-4	1125
Pr	" " Hoops		38	1/2"	11-6	292
Ps	" " Footing Longit.		56	3/8"	13-5	783
Pt	" " Trans.		16	3/8"	7-0	117
Total=18485						



PIER ELEVATION
Scale 1/4"=1'-0"

Note: Piles to be battered 1 to 4 in direction shown.



FOOTING PLAN

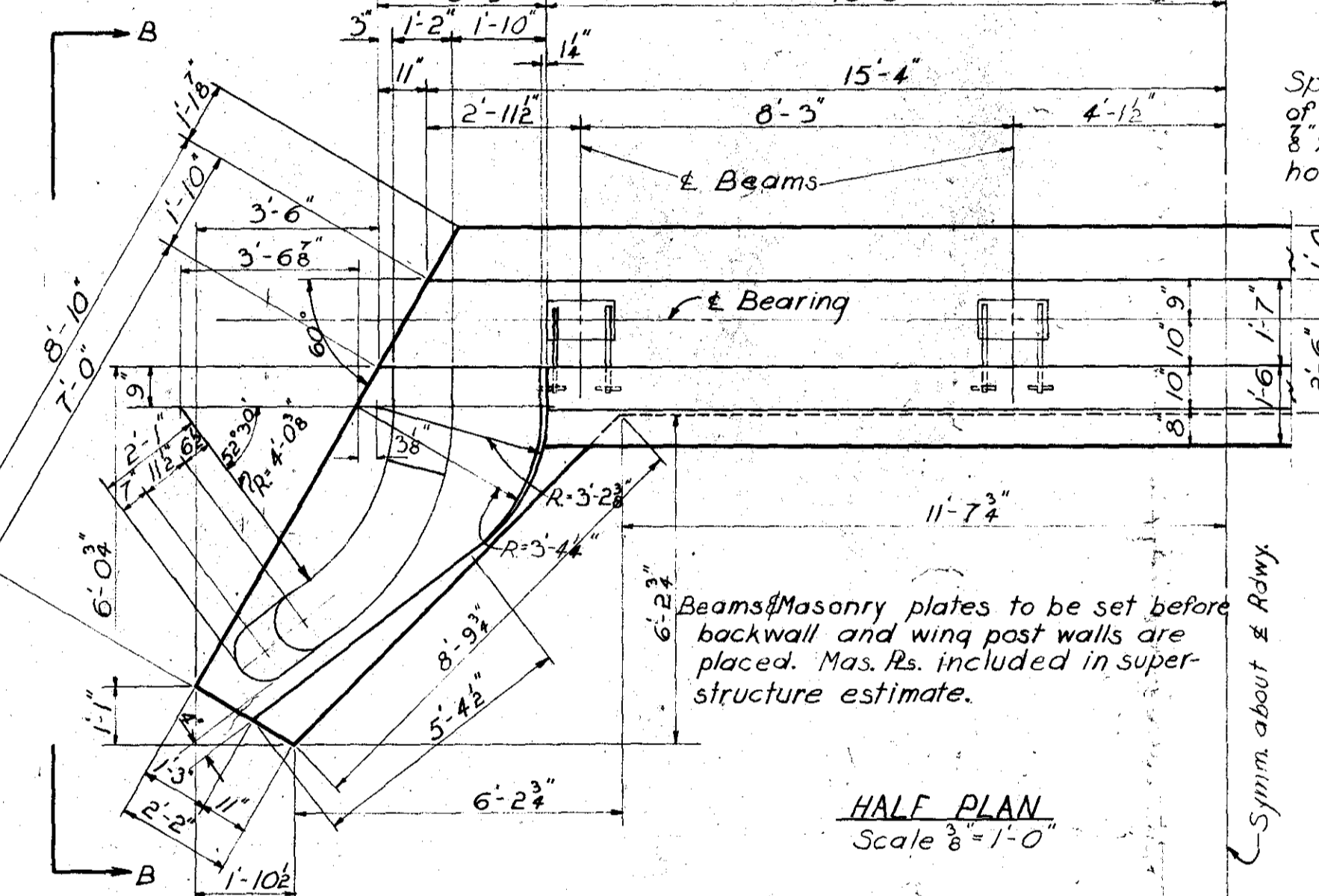
14-25 Untreated Wood Piles each Footing

REINFORCING STEEL ONE ABUT.						
Bar	Location	Shape	No.	Size	Length	Wt.
a	Footing Longit.		11	3/8"	29-0	480
b	Wing Ftg. Longit.		10	3/8"	Varies	178
c	" " "		10	3/8"	11-3	169
d	Footing Hoops		20	3/8"	13-0	174
e	Wing Ftg. "		8	3/8"	Varies	66
f	Backwall F.F.V.		13	3/8"	5-5	47
g	" " B.F.V.		39	3/8"	5-3	308
h	" " " "		12	5/8"	6-0	75
k	" " Longit.		5	3/8"	25-8	134
li	Wingwall "		6	3/8"	11-7	47
l2	" " " "		2	3/8"	9-7	13
m	" " " "		8	3/8"	9-9	52
n	" " Vert.		10	3/8"	6-0	40
o	" " " "		18	3/8"	6-5	120
p	Wing Post "		26	3/8"	4-0	70
r	" " F.F.H.		6	3/8"	5-3	21
s	" " B.F.H.		6	3/8"	6-0	24
spiral	Pile Tops		12	2"	38-6	77
spacers	" " "		24	1/2"	1-10	28
t	Backwall Ends		4	3/8"	4-2	17
Total=2140						

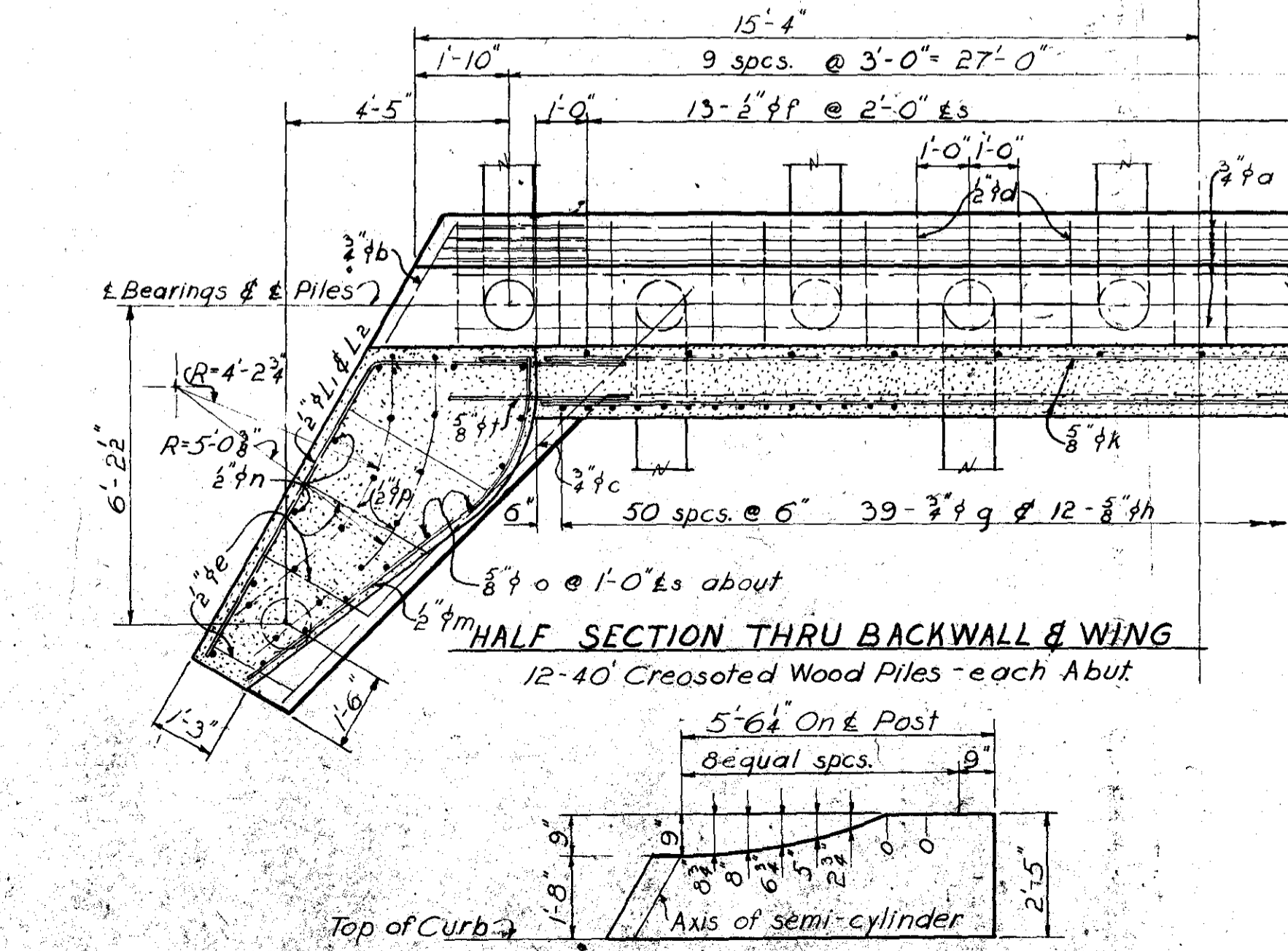
SUBSTRUCTURE NOTES:

All concrete to be Class A except as noted. All exposed corners of 90° or sharper, except vertical corners of rail posts to be filleted with a 3/4" dressed beveled strip.
Reinforcing steel to be securely wired in position before concrete is placed. Edge distance from face of concrete to & of near bar to be 2" unless noted otherwise. All hooked bars to have a standard 16 diameter hook with a bend radius of 4 diameters.
For design of Piers, ice was assumed 1'-0" thick, acting at El. 768.8 with a pressure of 250"mu" or projected area.
Standard Specifications of the Iowa State Highway Commission, Series of 1937 for Construction, plus Special Provisions listed on sheet 1.

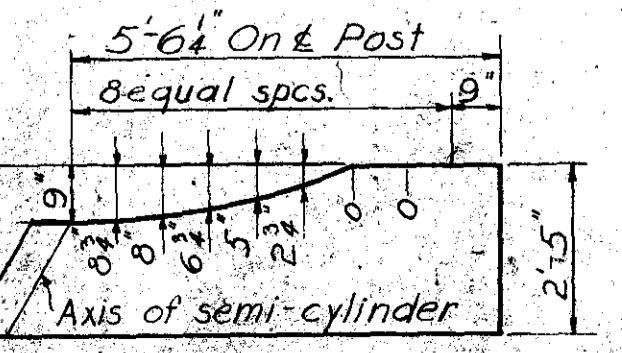
ESTIMATED QUANTITIES	
Part	2-Abuts. 2-Piers
Class A Concrete	62.0cy. 143.4cy.
Class C Concrete	2.5cy.
Reinforcing Steel	4280 lbs 18485 lbs
Creosoted Piles	24 @ 40'
Untreated Piles	56 @ 25'
Class I Excav.	95.0cy. 12.5cy.
Class II Excav.	232cy.



HALF PLAN
Scale 3/8"=1'-0"



HALF SECTION THRU BACKWALL & WING
12-40' Creosoted Wood Piles each Abut.



END POST DEVELOPED

Design For
210x26' CONTINUOUS I-BEAM BRIDGE
82' Center Span 64' End Spans
SUBSTRUCTURE DETAILS
LOCATION Over Fox River Station 51+62.00 Project F-50
Section 19 Perry Twp. DAVIS COUNTY
Davis Co. Iowa State Highway Commission
January 1947 Sheet 2 of 4

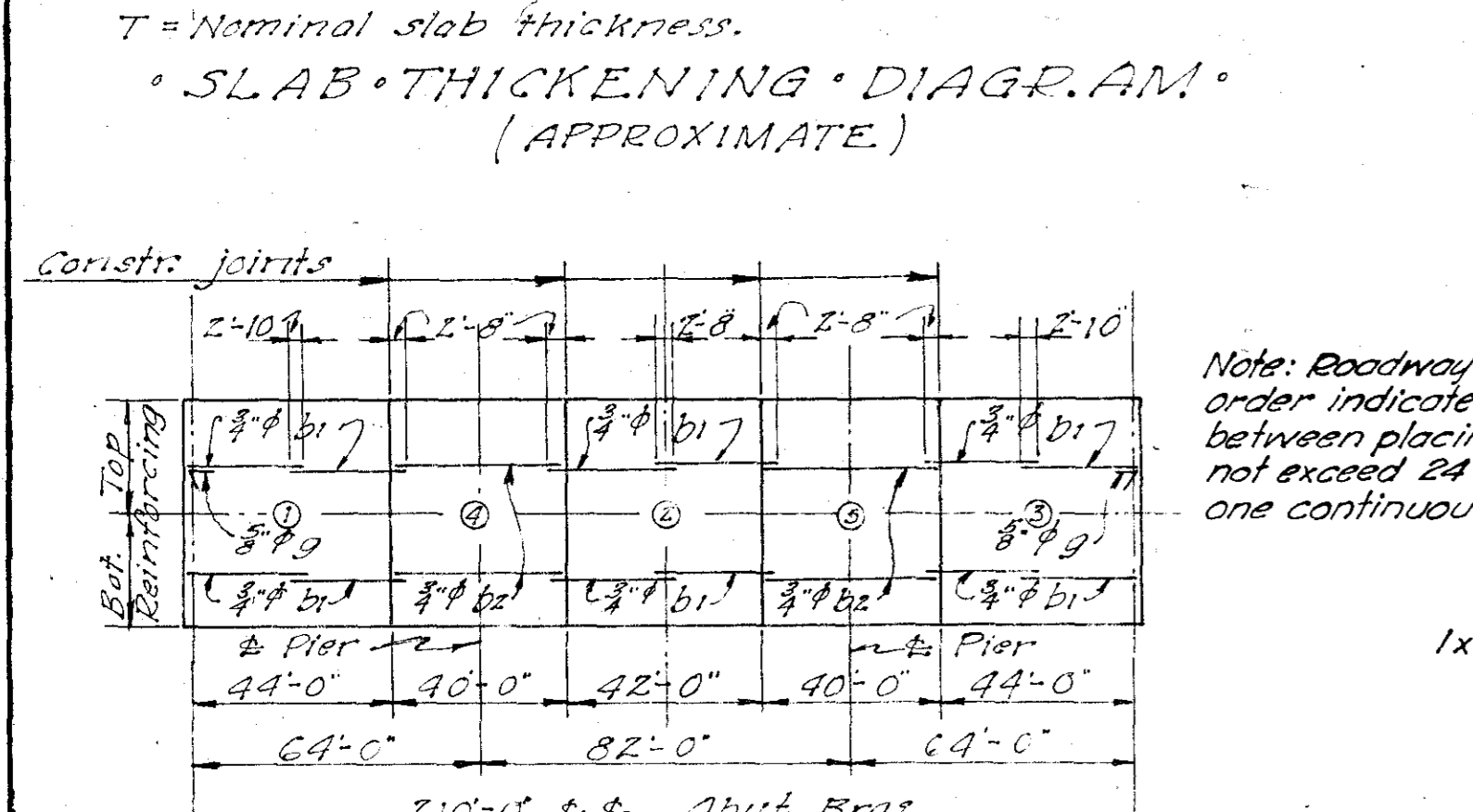
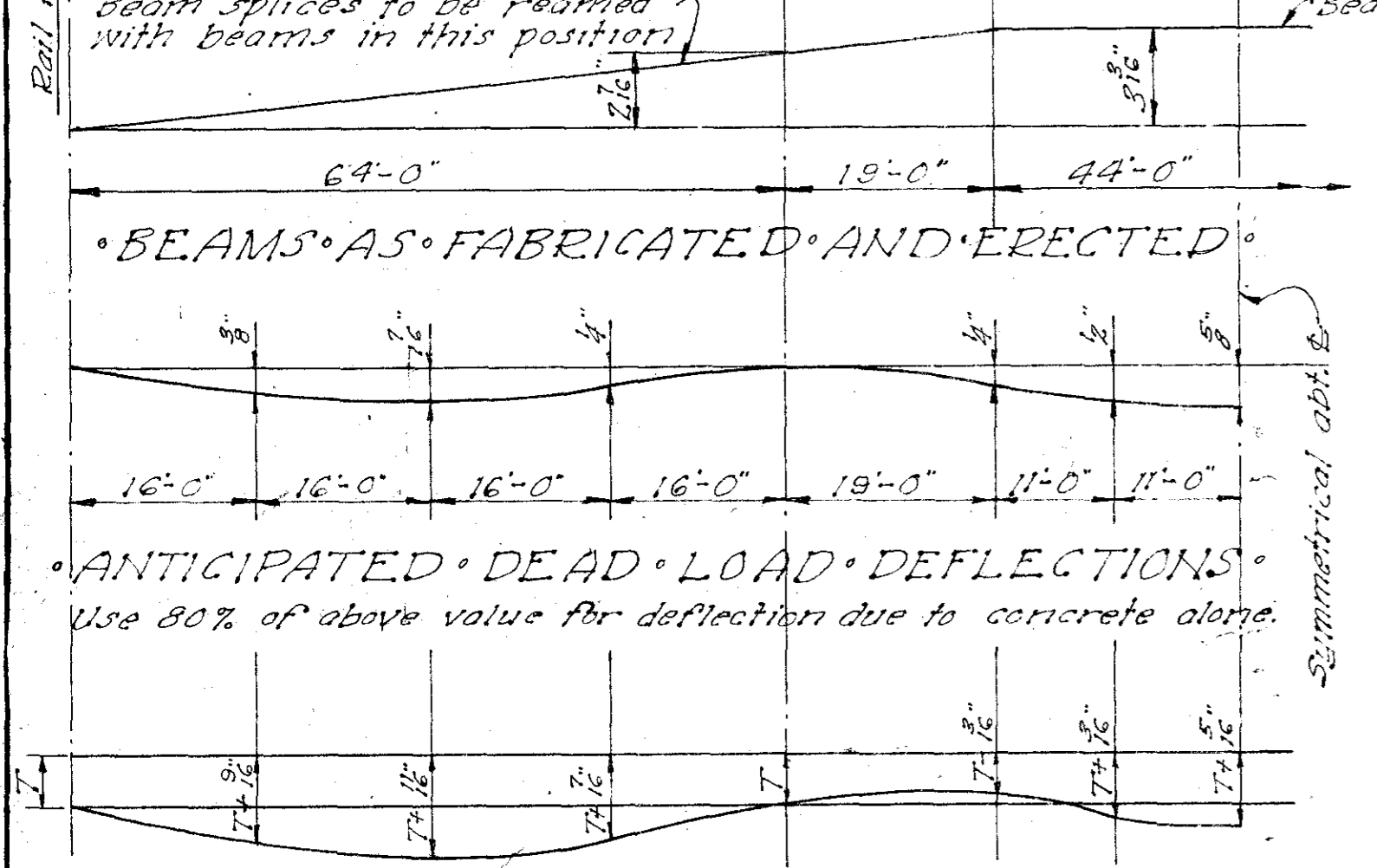
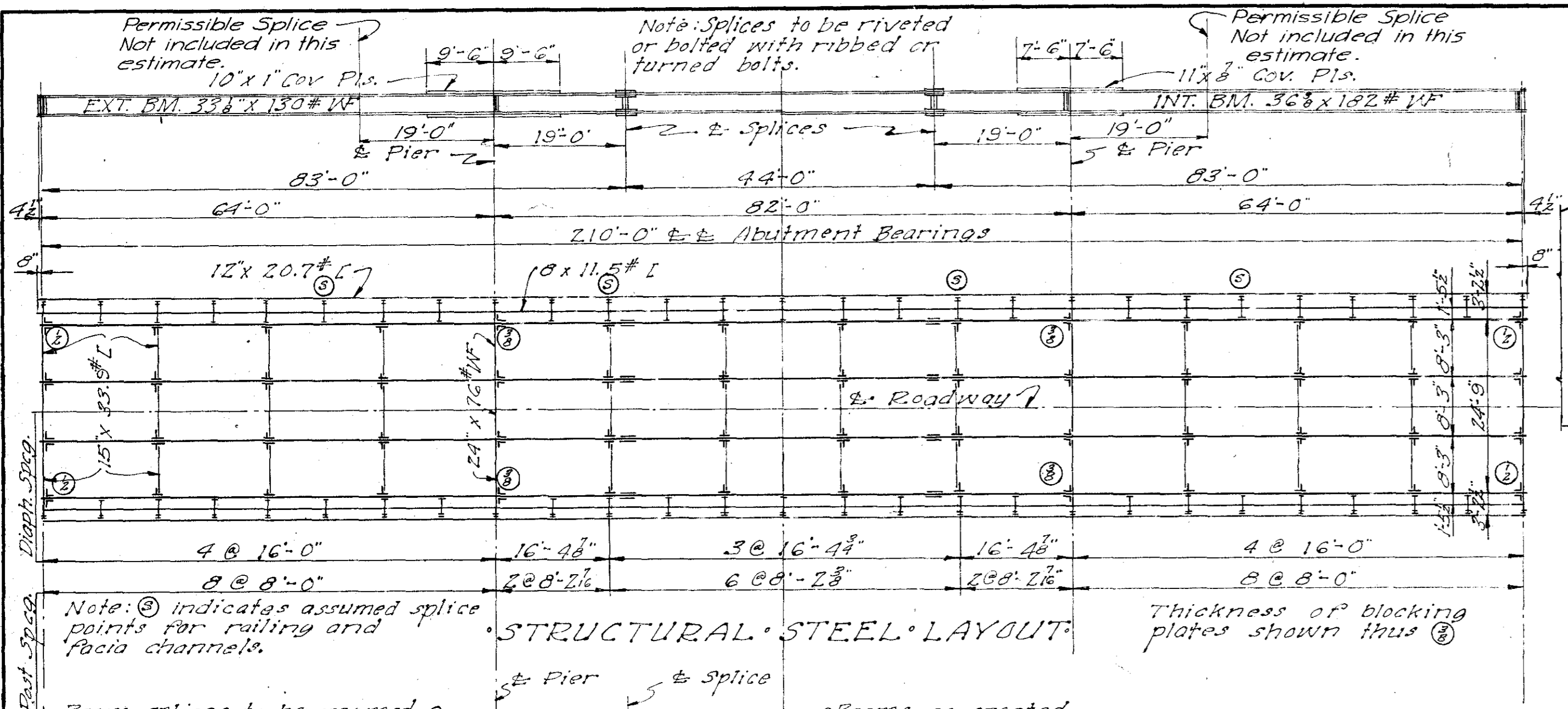
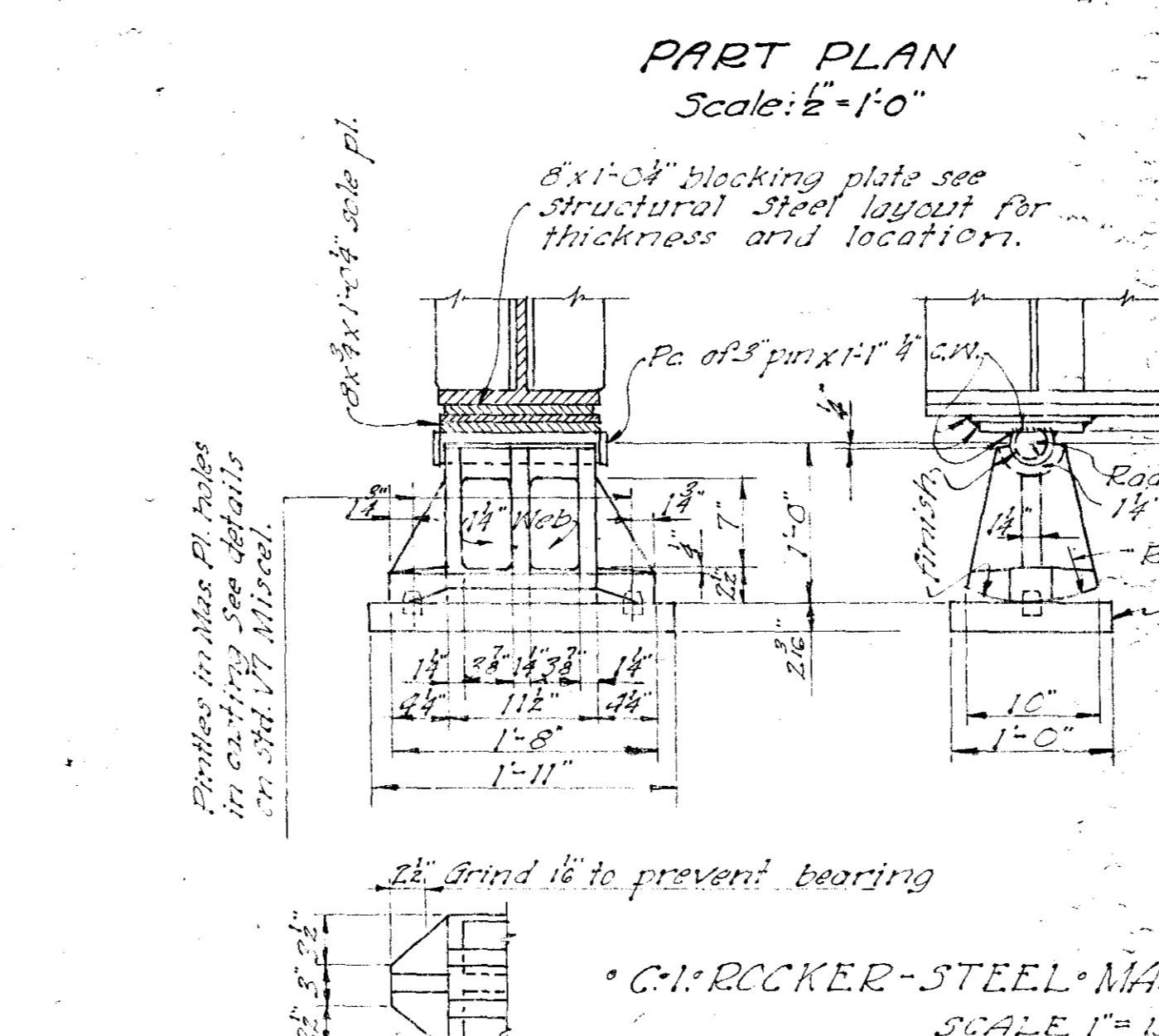
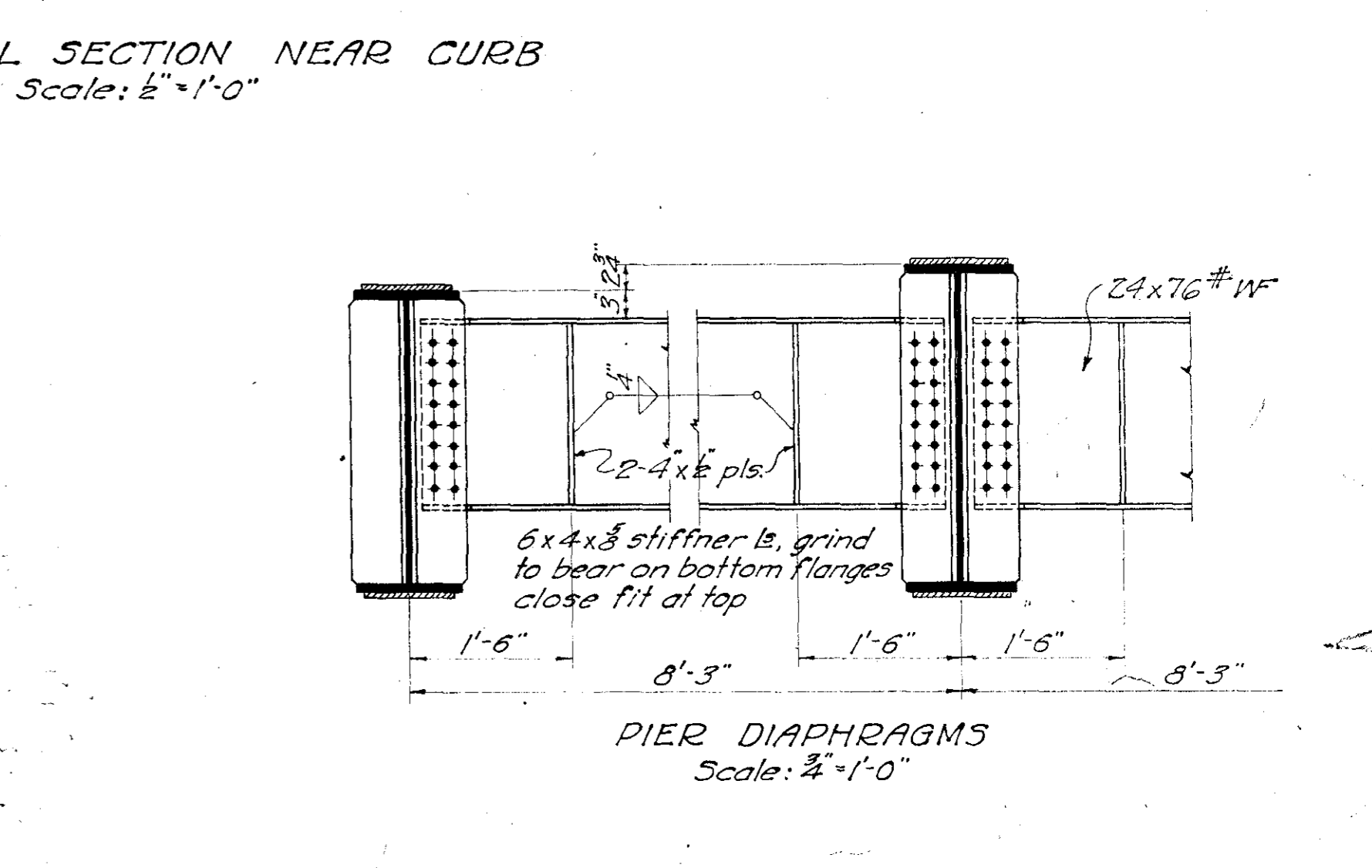
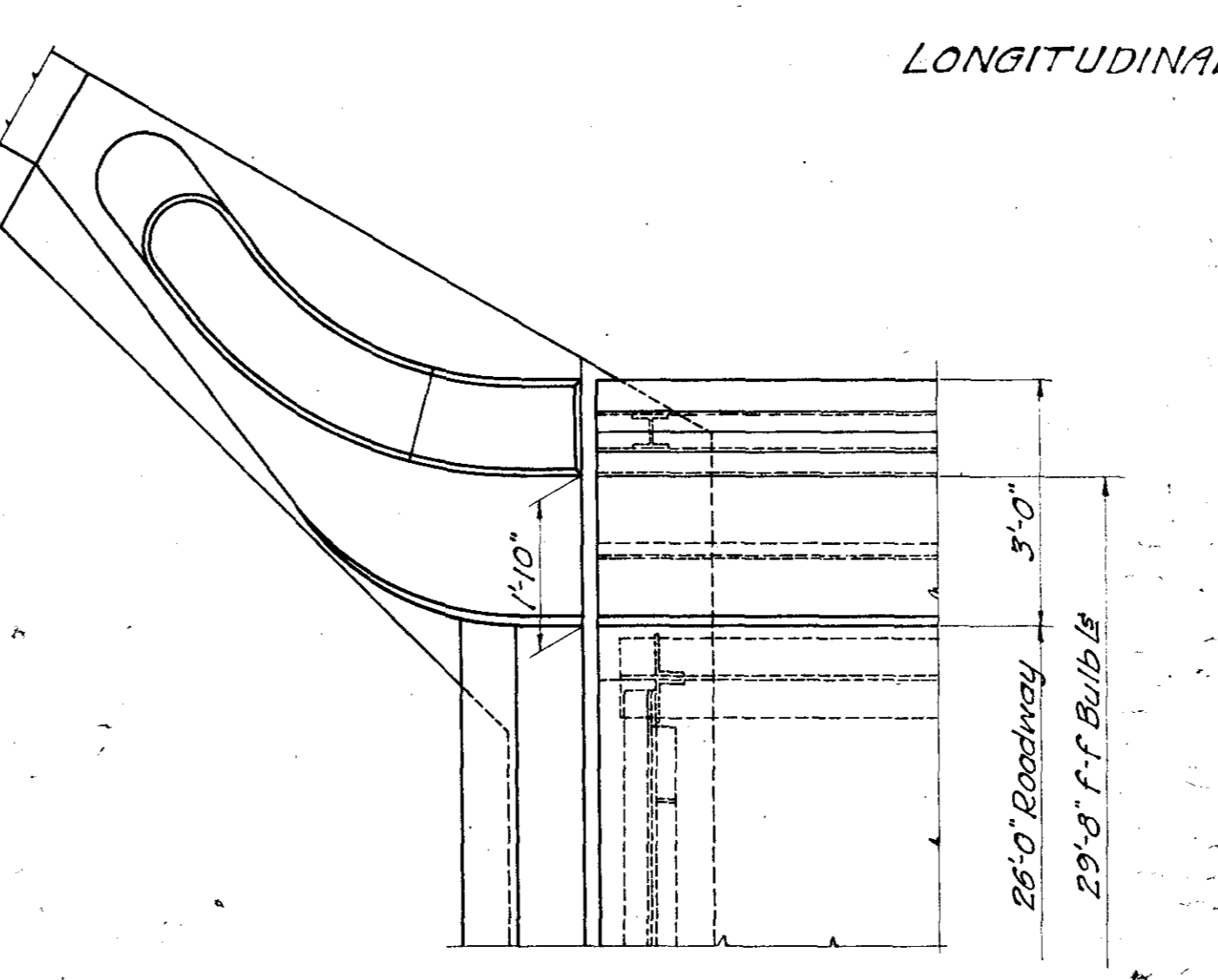
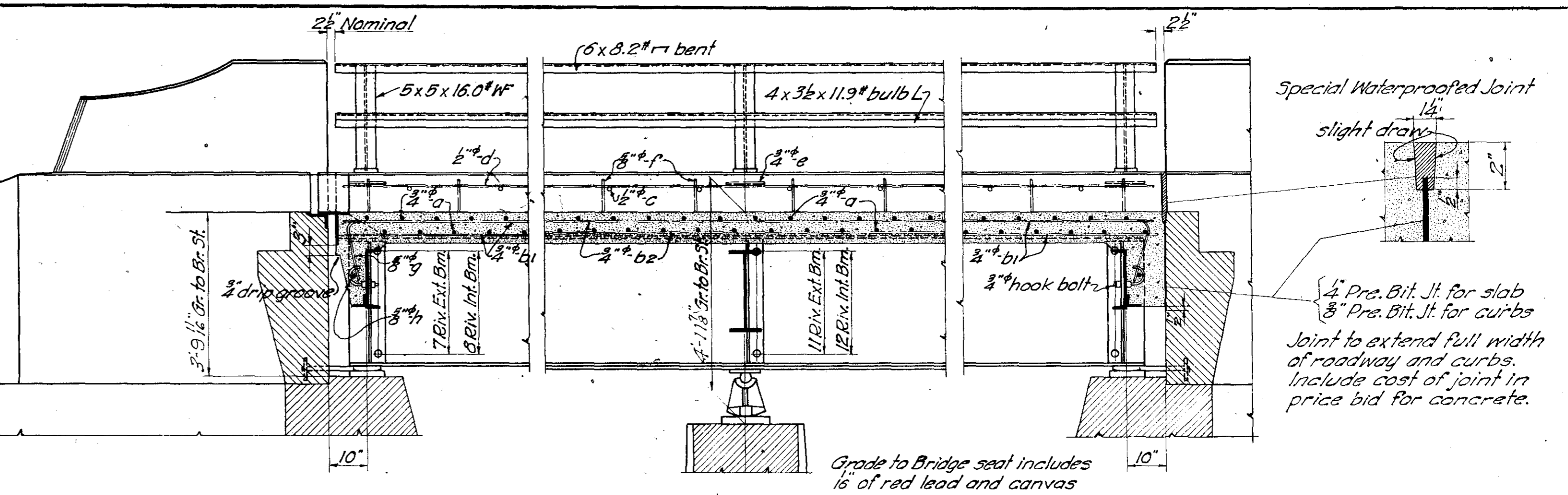
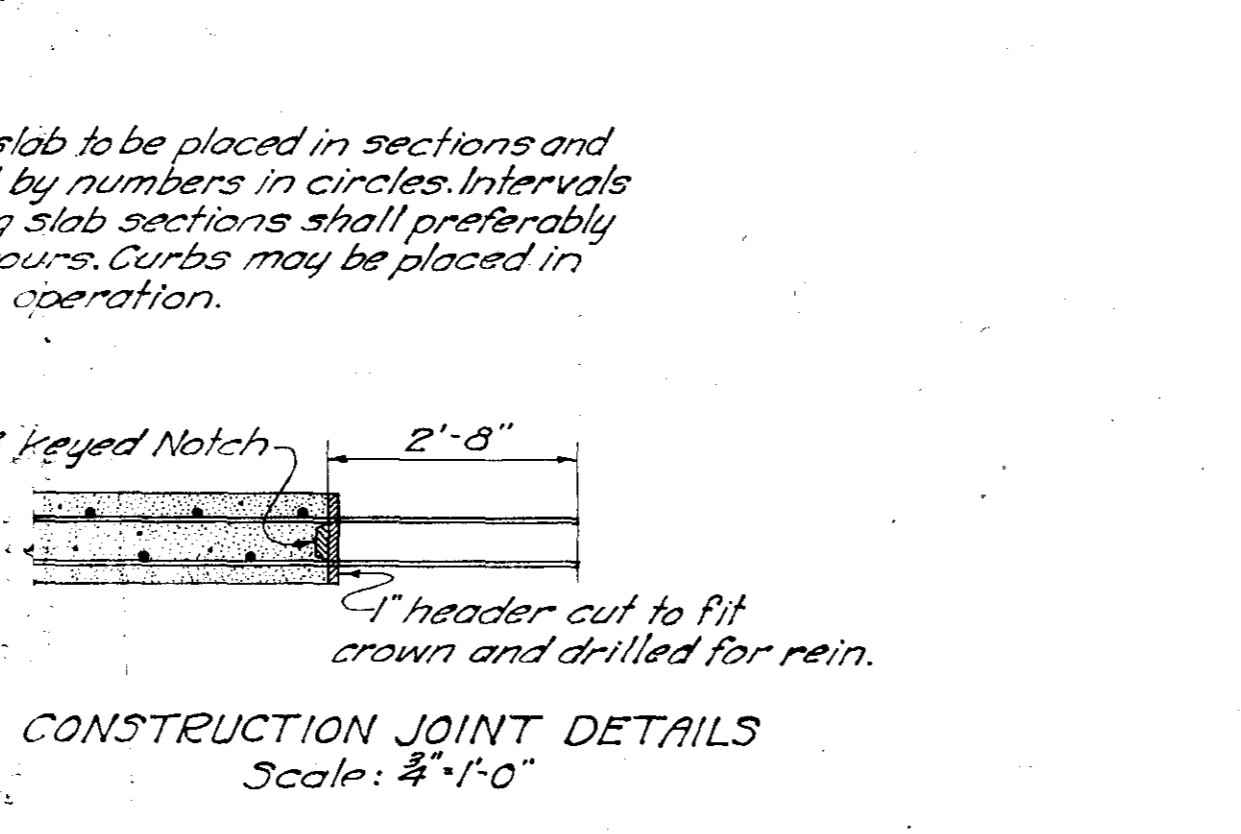
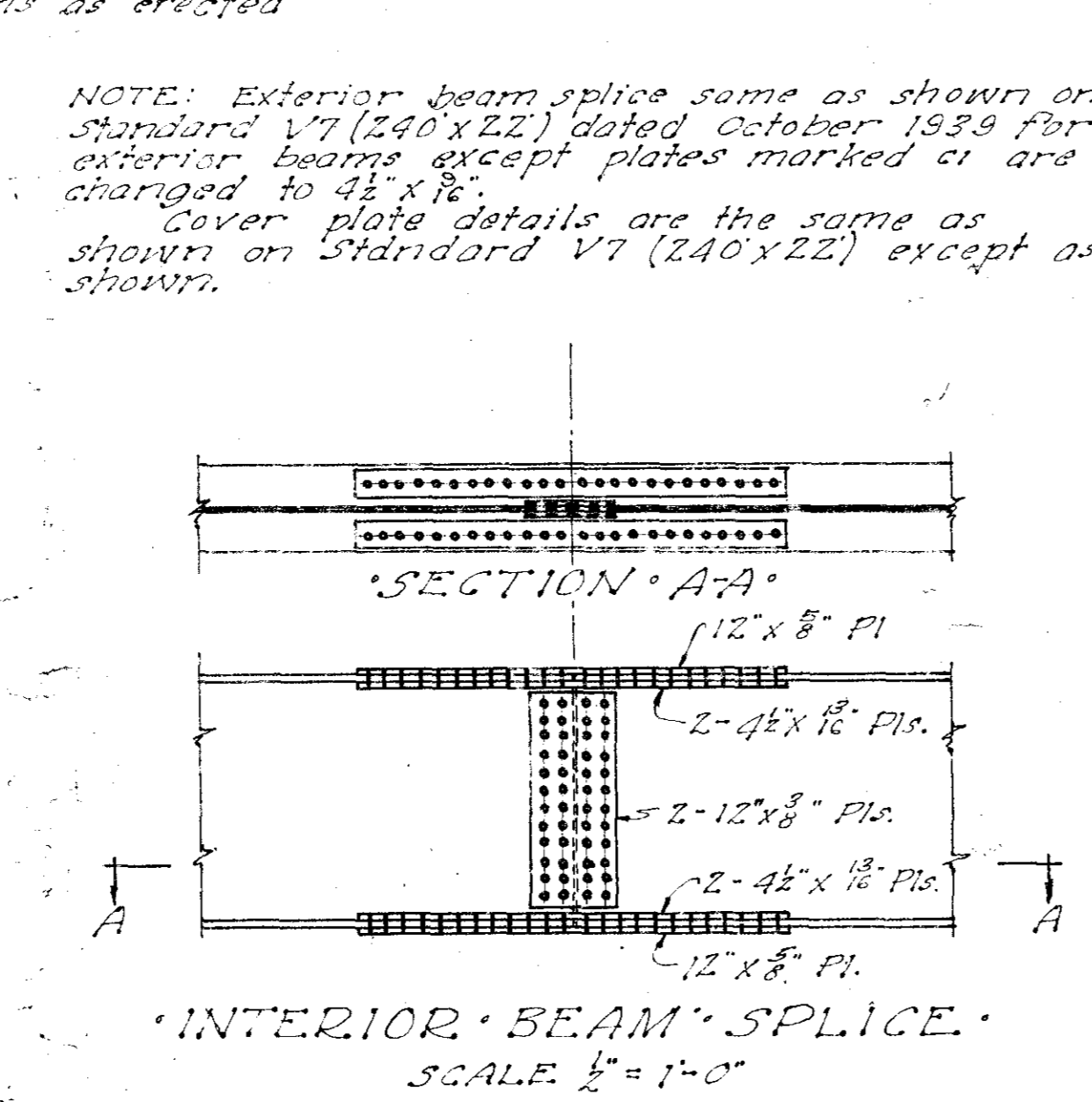


TABLE OF MOMENTS AND REACTIONS

Stress Loads	Pos. Mom. End Span		Negative Mom.		Pos. Mom. Ctr. Span		Abut. Reaction		Pier Reaction	
	Ext. Bm.	Int. Bm.	Ext. Bm.	Int. Bm.	Ext. Bm.	Int. Bm.	Ext. Bm.	Int. Bm.	Ext. Bm.	Int. Bm.
Dead Load	288.0	292.0	684.0	693.0	274.0	277.5	25.8	26.2	95.1	96.5
Live Load	241.3	418.5	297.5	516.5	260.3	452.5	11.3	36.9	38.6	67.1
Impact	69.6	110.6	78.5	136.5	68.6	119.6	5.0	9.7	10.2	17.7
Total	598.9	821.1	1060.0	1346.0	602.9	849.6	42.1	72.8	143.9	181.3
3/4 of TOTAL WITH OVERLOAD	598.0	901.0			621.0	948.0	42.0	79.7		



REINFORCING STEEL SUPERSTRUCTURE

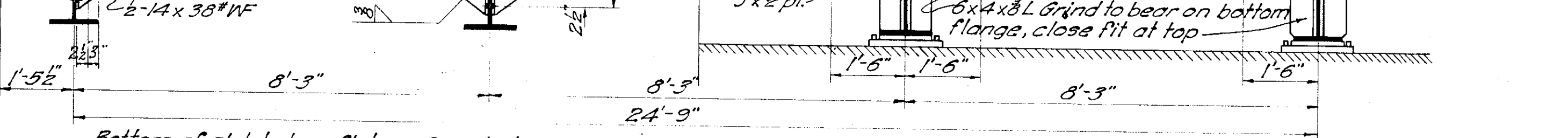
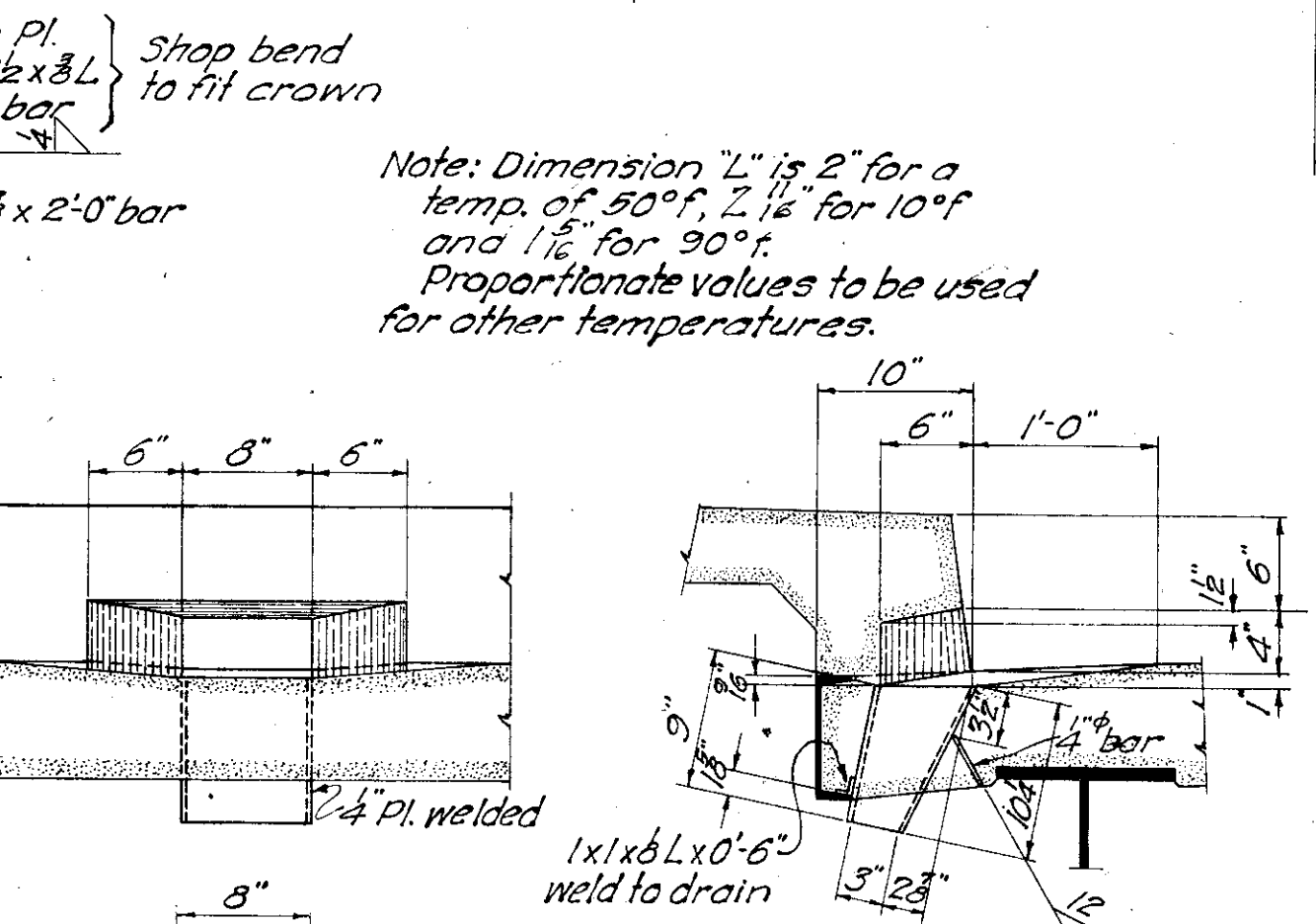
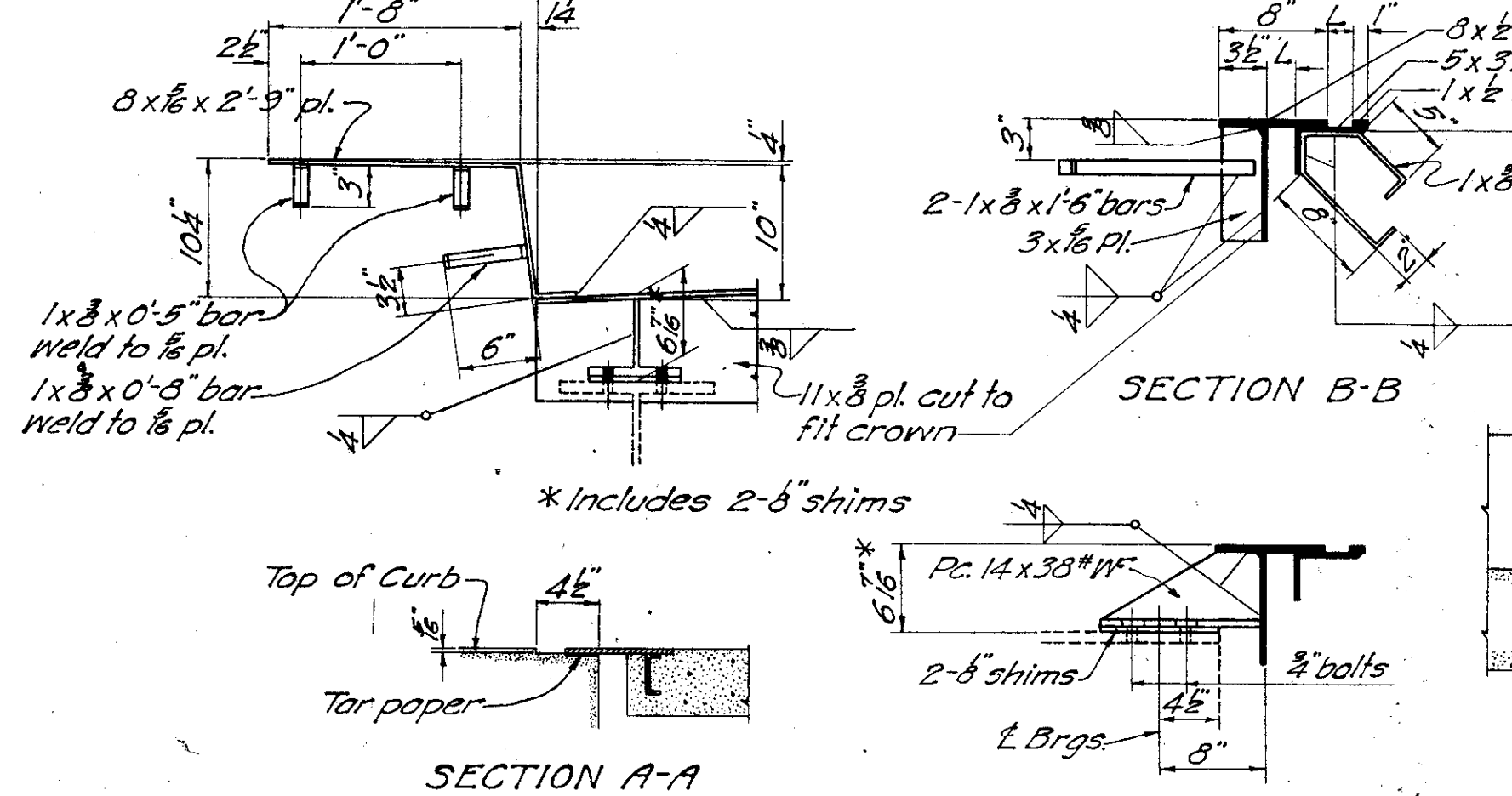
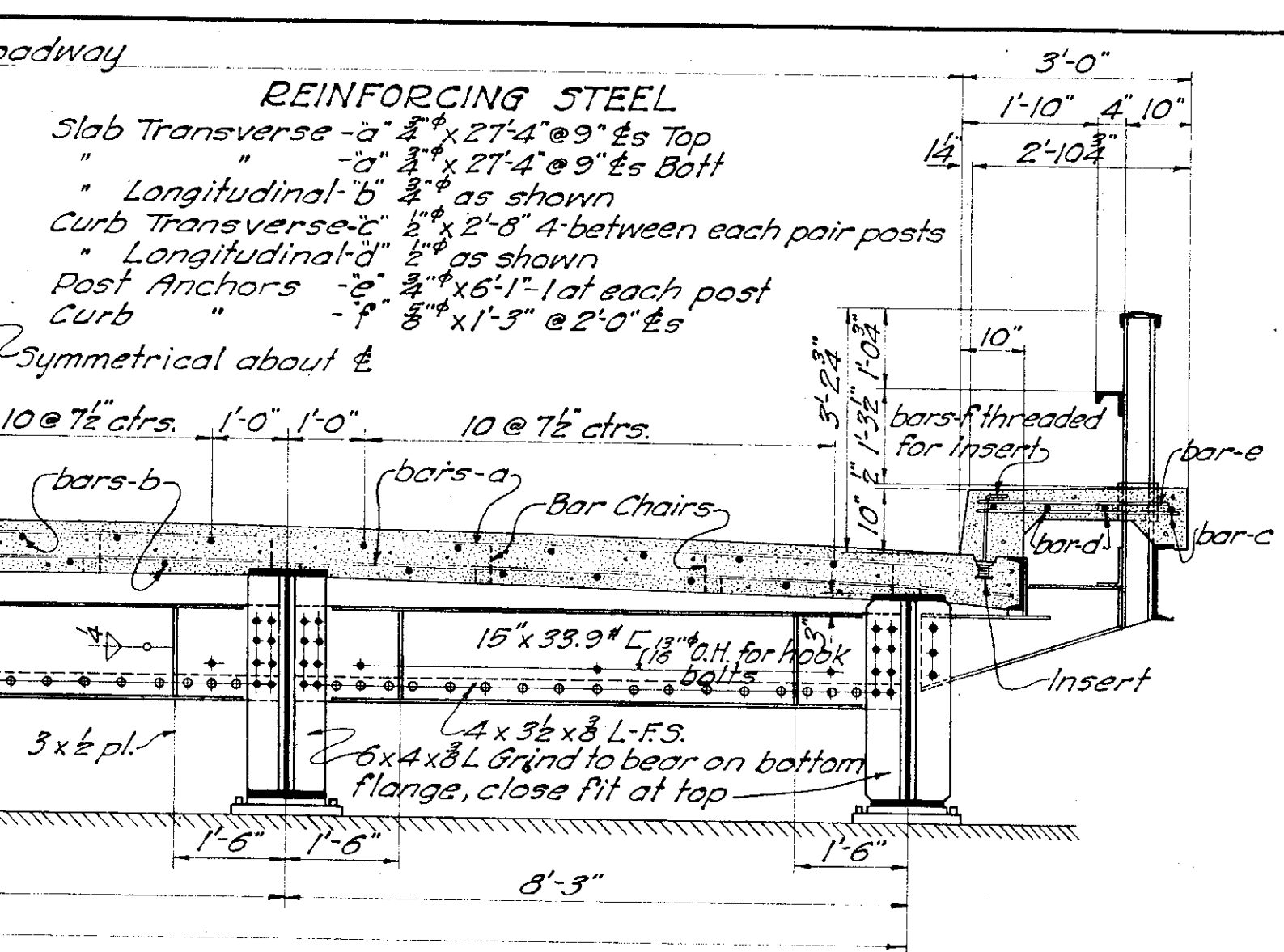
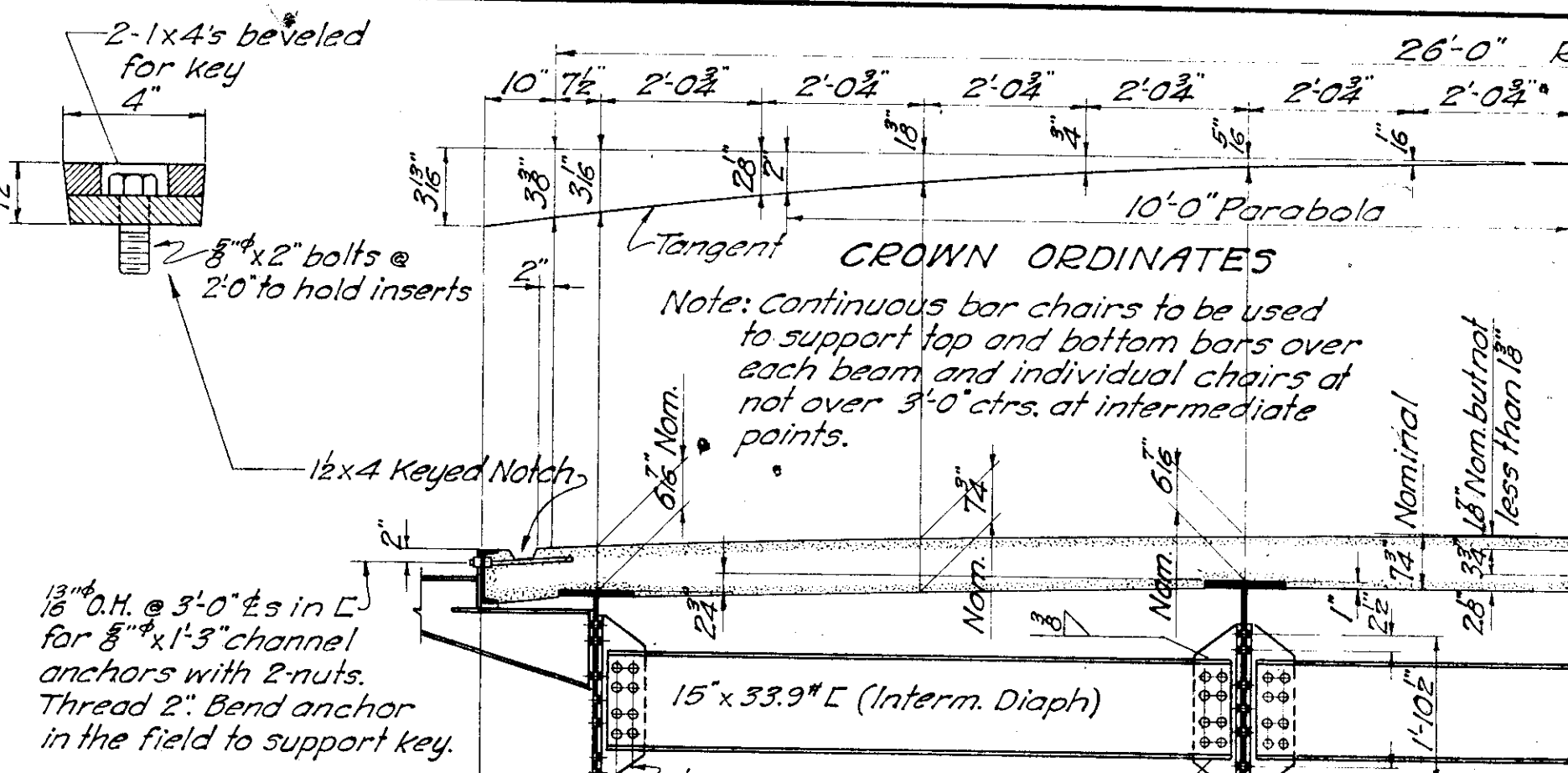
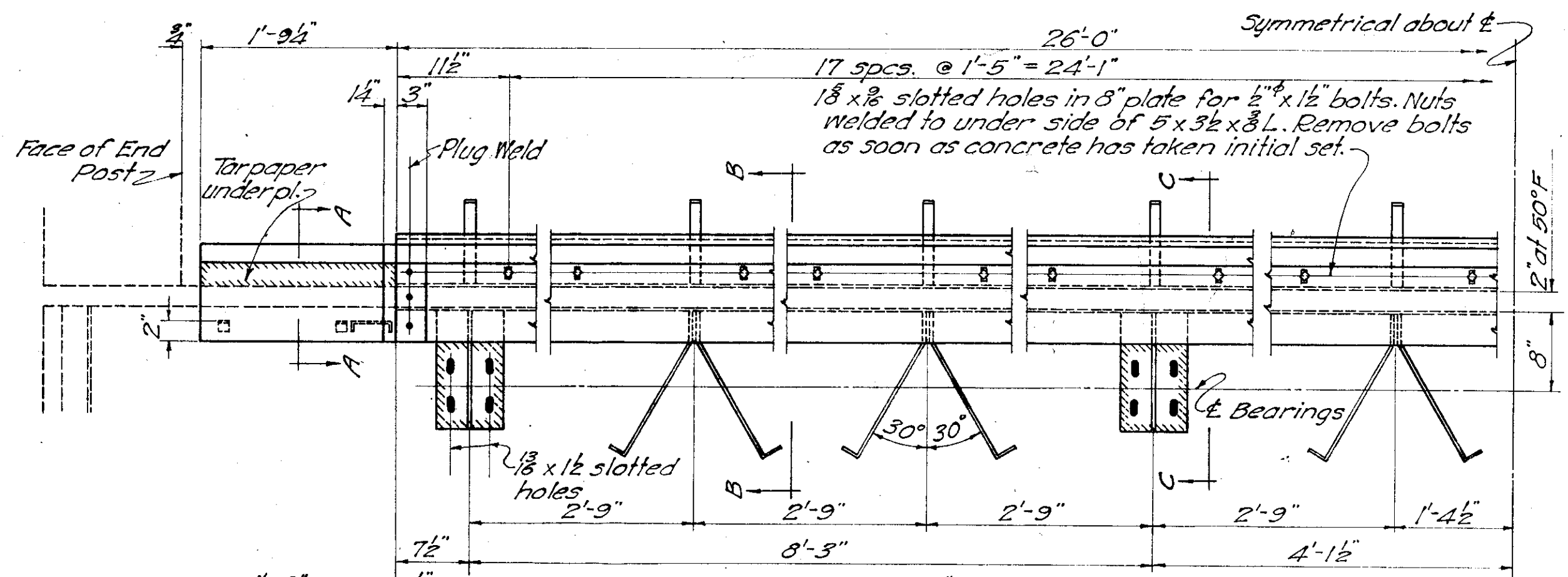
Bar	Location	Shape	No.	Size	Length	Weight
a	Slab Trans. Top & Bott.		561	3/4"	27'-4"	250.29
bi	" Longit. (1) (2) (3)		1399	3/4"	25'-0"	743.4
bz	" " (4) (5)		66	3/4"	39'-8"	39.32
c	Curb Transverse		208	5/8"	2'-8"	37.0
d	" Longit.		48	1/2"	36'-7"	11.73
e	Post Anchors		54	3/4"	6'-1"	49.3
f	Curb "		212	5/8"	1'-3"	27.6
g	End Diaph.		36	3/4"	3'-9"	14.0
h	" "		6	5/8"	7'-9"	4.8
						Total 3689.5

ESTIMATED QUANTITIES-SUPERSTRUCTURE

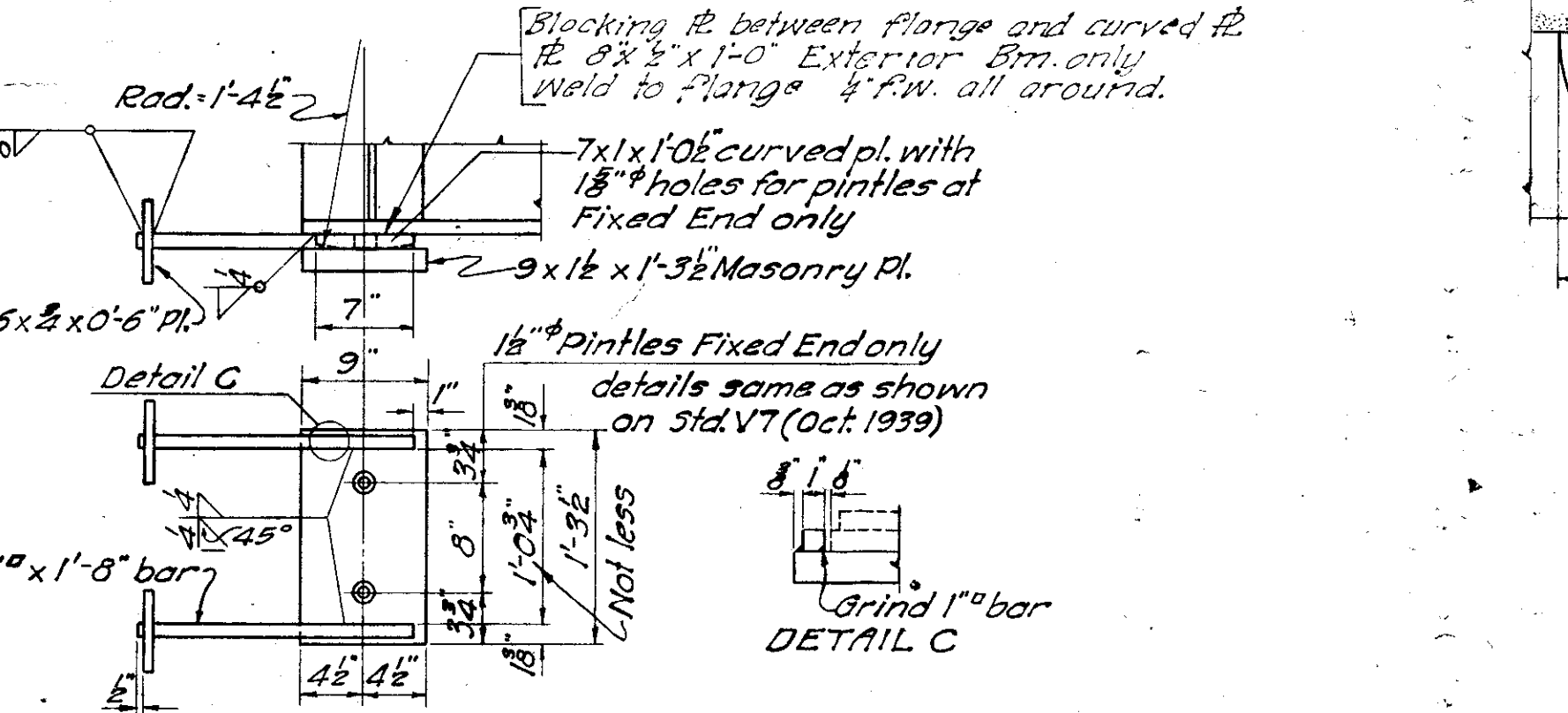
Concrete	177.2 cu yds.
Reinforcing Steel	3689.5 lbs.
Structural Steel	2016.50 lbs.

Design For
210'x26' CONTINUOUS I-BEAM BRIDGE
82 Center Span 64 End Spans
SUPERSTRUCTURE DETAILS
Station 51+62.00 Project F-50
DAVIS COUNTY
Iowa State Highway Commission
January 1947 Sheet 3 of 4

LOCATION
Over Fox River
Section 19
Perry Twp.
Davis Co.



EXPANSION PLATE DETAILS
Scale: 1"=1'-0"

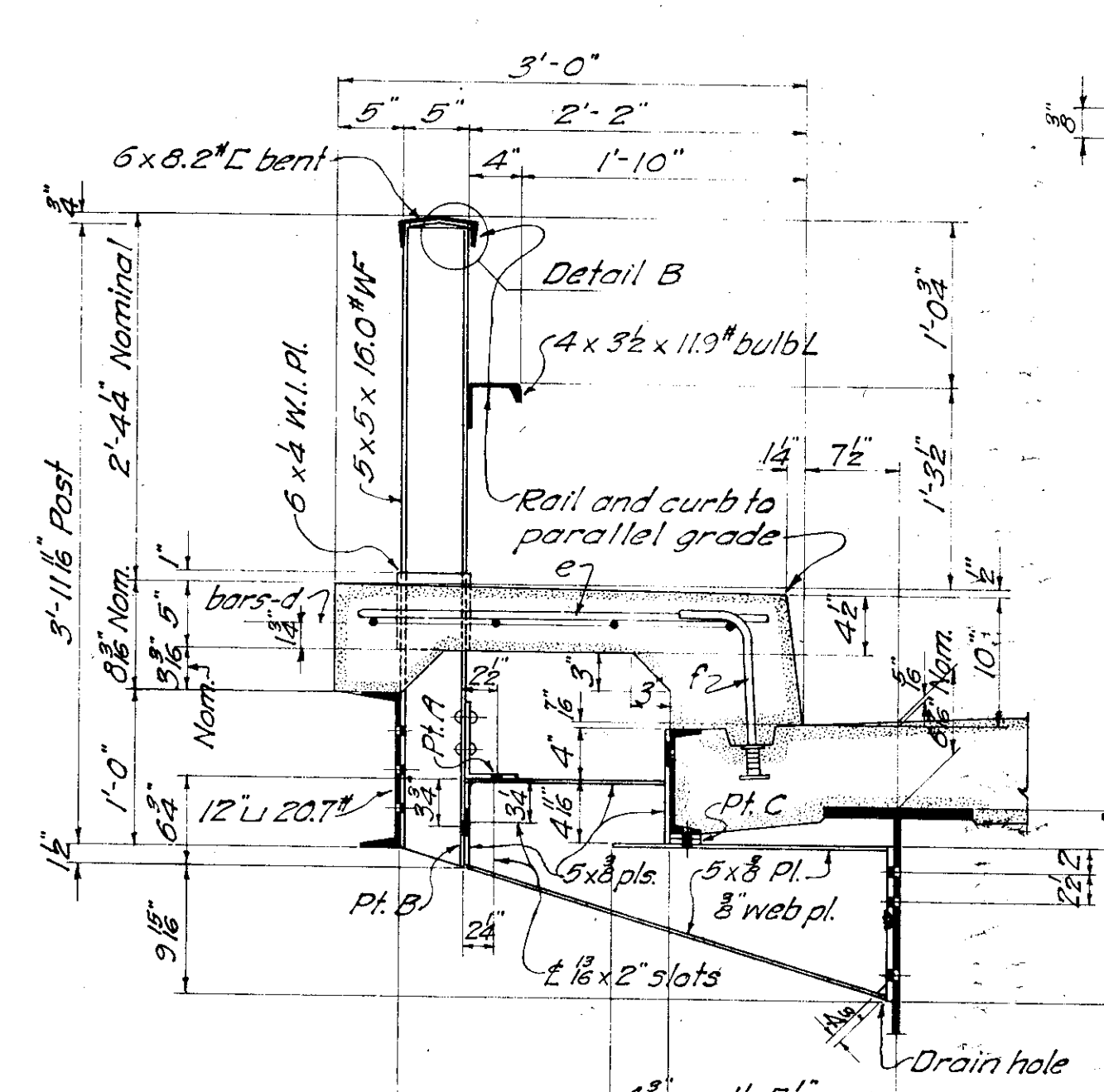


FLOOR DRAIN DETAILS
Scale: 1"=1'-0"

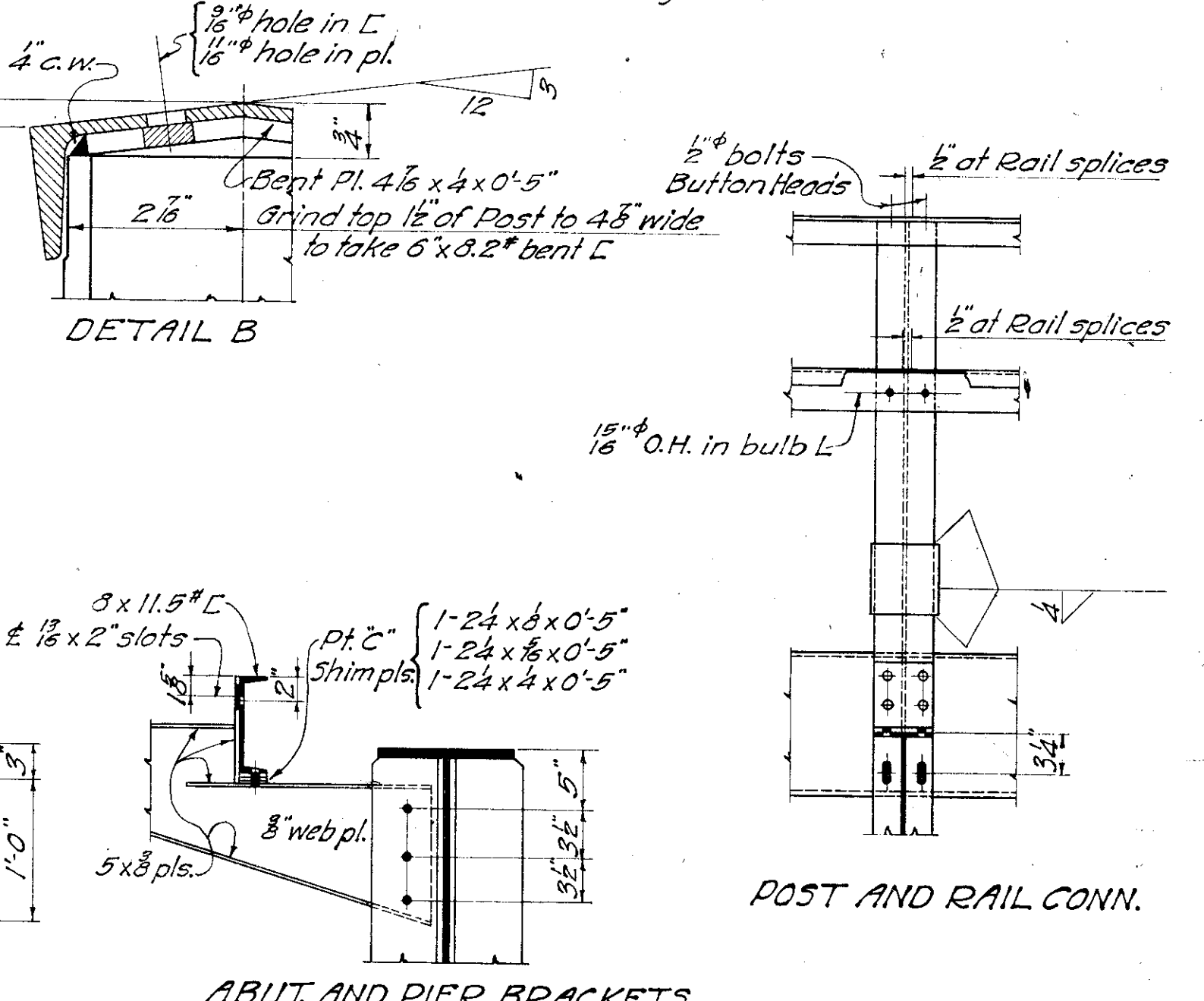


General Notes:
This bridge is designed for H-20-44 loading plus 19" per sq. ft. of roadway for future wearing surface, with the following modifications:
1. Live load moment in floor slab, 12000 # wheel load.
2. Intermediate grade reinforcing steel, allowable stress 20000 p.s.i.
3. Except for the floor 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 stress.
The floor slab as shown includes 2" of wearing surface.
Field connections may be riveted or bolted, except as noted or shown.
All open holes to be 1/2" unless noted otherwise.
All rivets and bolts to be 3/4" unless noted otherwise.
Bottom flanges of beams to be perpendicular to webs at reaction points.
Beam splices to be subpunched and reamed. Before reaming, all beams are to be assembled to proper camber for inspection, after which holes are to be reamed and all parts matchmarked.
Masonry plates to be set in red lead and canvas.
Bearing surfaces of unfinished masonry plates to be flat and true.
Forms for slab and curbs to be supported by the beams and brackets.
Shop coat of paint to be omitted on tops of top flanges of beams and on other steel surfaces in contact with concrete. Parts inaccessible after erection to be given three coats of paint in the shop.
SPECIFICATIONS:
Design: A.R.S.H.O. (1944)
Construction: Iowa State Highway Commission, Series of 1937.
Special provisions as noted on Sheet 1.

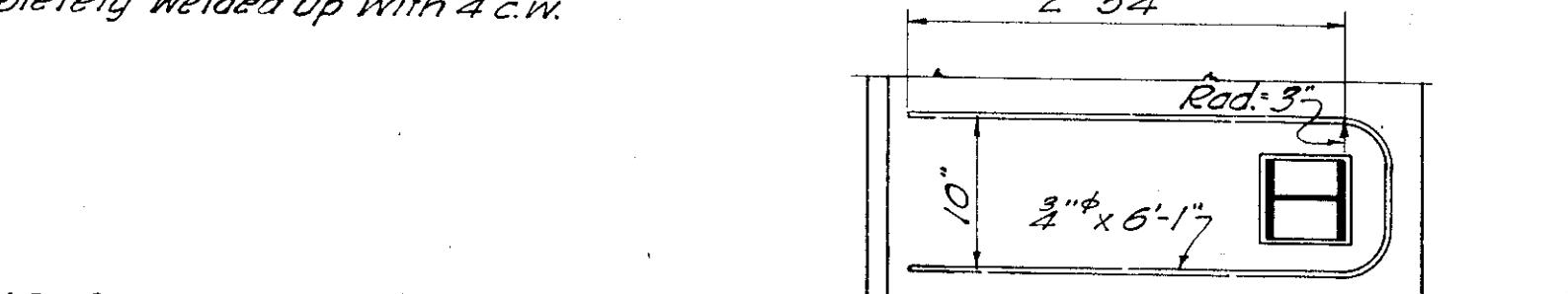
TYPICAL CROSS SECTION
Scale: 1/2"=1'-0"



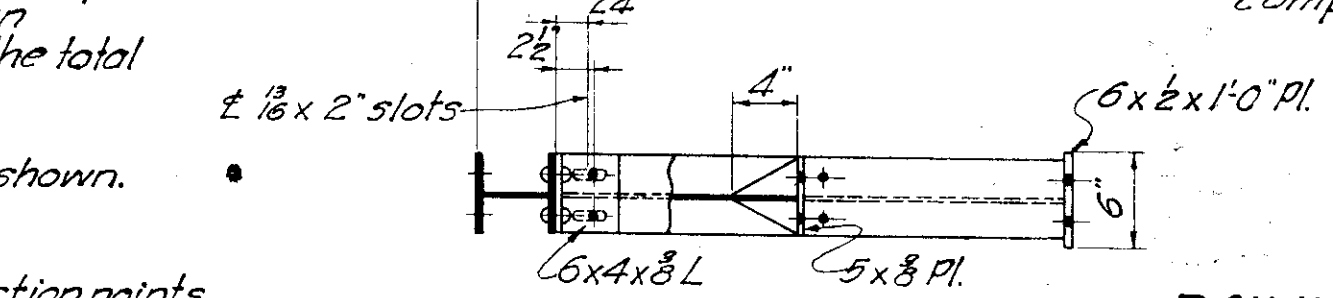
POST AND RAIL CONN.



ABUT. AND PIER BRACKETS



RAILING AND BRACKET DETAILS
Scale: 1"=1'-0"



DETAIL OF BARS-e



Design For
210' x 26' CONTINUOUS I-BEAM BRIDGE
62' Center Span 64' End Spans
SUPERSTRUCTURE DETAILS
Station 51 + 62.00 Project F-50
DAVIS COUNTY
Iowa State Highway Commission
January 1947 Sheet 4 of 4

LOCATION
Over Fox River
Section 19
Perry Twp.
Davis Co.