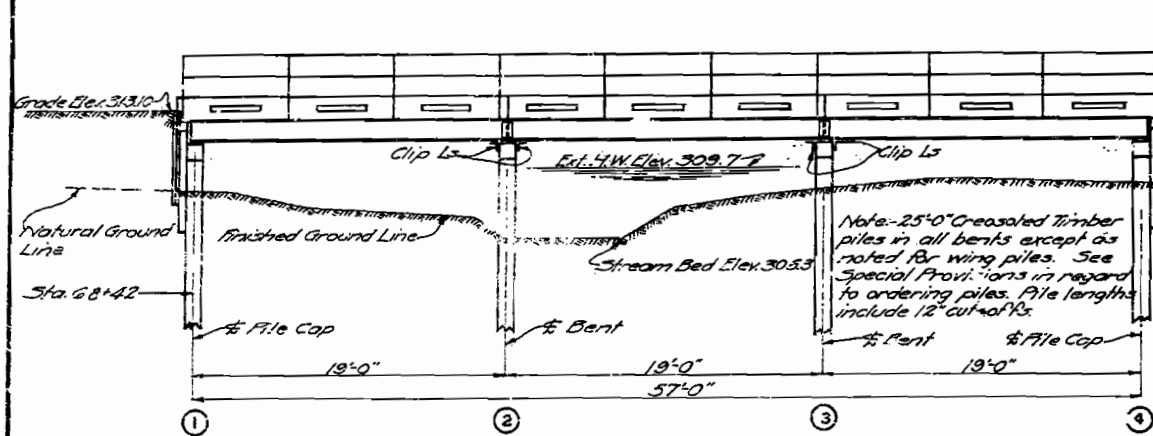


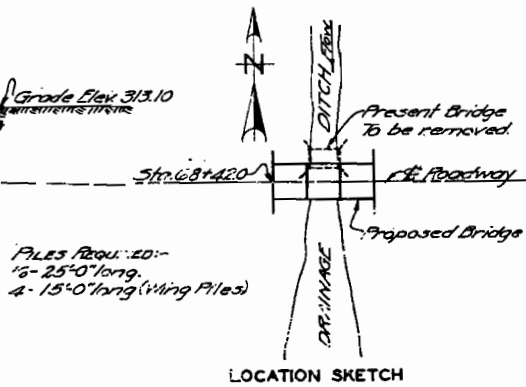
# MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SITS
5	MO.	5J-51	19		

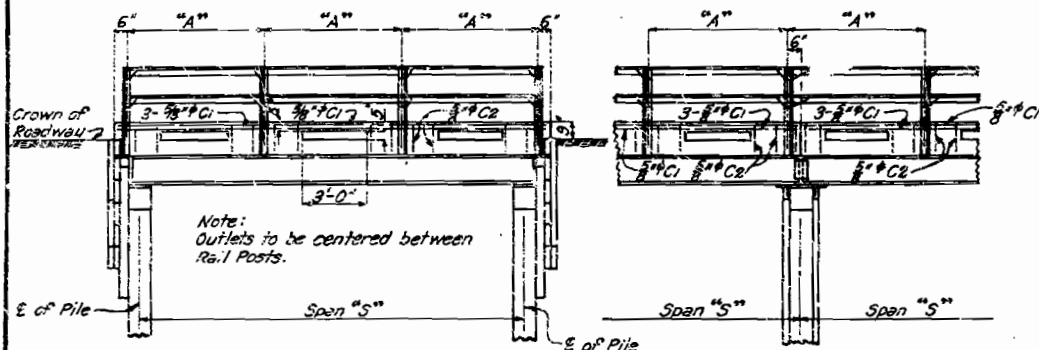
3-19'0" I-Beam Spans



GENERAL ELEVATION

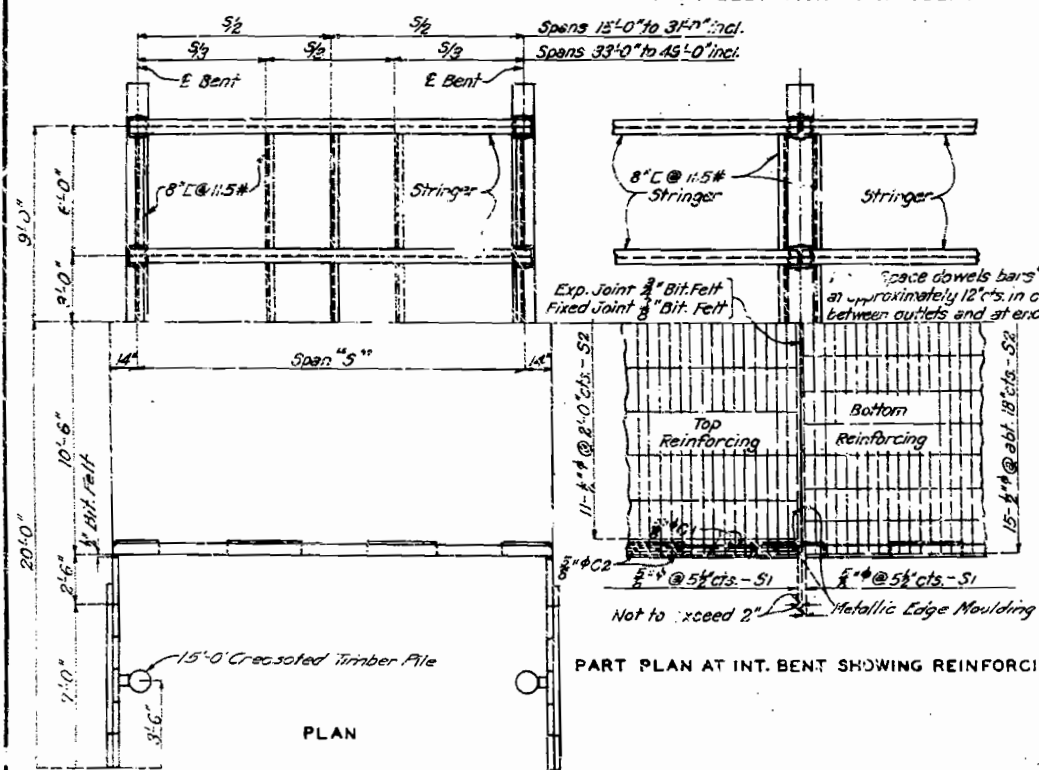


D.M. Elev. 309.32. Nail in roof of 30" Black Oak 6" Left of Sta. 67+6.5.



ELEVATION

PART ELEVATION AT INT. BENT



PLAN

PART PLAN AT INT. BENT SHOWING REINFORCING

HANDRAIL SPACING					
"A" DIMENSIONS					
SPAN "S"	NO. PANELS	SINGLE SPAN	1ST END SPAN	ALL INT. SPANS	LAST END SPAN
15'-0"	3	5'-5" abt.	5'-0" abt.	5'-0"	5'-4" abt.
17'-0"	3	6'-1" abt.	5'-8" abt.	5'-8"	6'-0" abt.
19'-0"	3	6'-4" abt.	6'-4" abt.	6'-4"	6'-8" abt.
21'-0"	4	5'-7" abt.	5'-3" abt.	5'-3"	5'-8" abt.
23'-0"	4	6'-1" abt.	5'-9" abt.	5'-9"	6'-0" abt.
25'-0"	4	6'-7" abt.	6'-3" abt.	6'-3"	6'-6" abt.
27'-0"	5	5'-8" abt.	5'-5" abt.	5'-5"	5'-7" abt.
29'-0"	5	6'-0" abt.	5'-10" abt.	5'-10"	6'-0" abt.
31'-0"	5	6'-5" abt.	6'-2" abt.	6'-2"	6'-5" abt.
33'-0"	6	5'-8" abt.	5'-6" abt.	5'-6"	5'-8" abt.
35'-0"	6	6'-0" abt.	5'-10" abt.	5'-10"	6'-0" abt.
37'-0"	6	6'-4" abt.	6'-2" abt.	6'-2"	6'-4" abt.
39'-0"	7	5'-9" abt.	5'-7" abt.	5'-7"	5'-9" abt.
41'-0"	7	6'-0" abt.	5'-10" abt.	5'-10"	6'-0" abt.
43'-0"	7	6'-4" abt.	6'-2" abt.	6'-2"	6'-4" abt.
45'-0"	8	5'-9" abt.	5'-7" abt.	5'-7"	5'-9" abt.
47'-0"	8	6'-0" abt.	5'-10" abt.	5'-10"	6'-0" abt.
49'-0"	8	6'-3" abt.	6'-1" abt.	6'-1"	6'-3" abt.

DEFLECTION	
SPANS "S"	DEFLECTION
15'-0"	1/4"
17'-0"	1/4"
19'-0"	1/4"
21'-0"	1/4"
23'-0"	1/4"
25'-0"	1/4"
27'-0"	1/4"
29'-0"	1/4"
31'-0"	1/4"
33'-0"	1/4"
35'-0"	1/4"
37'-0"	1/4"
39'-0"	1/4"
41'-0"	1/4"
43'-0"	1/4"
45'-0"	1/4"
47'-0"	1/4"
49'-0"	1/4"

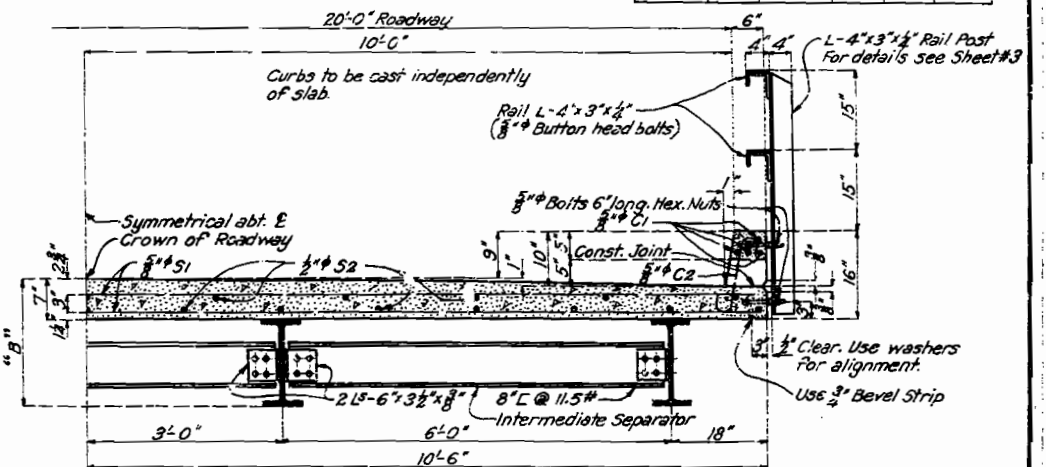
Note: Floor slab to be brought to grade and dead load deflection taken care of by increasing slab thickness. Depth of slab at outside face of curb to be kept uniform and bottom surface of slab warped between curb and outside beam to obtain required thickness at beam. Payment will be allowed for additional concrete required for thickening slab. This additional concrete is included in "Estimated Quantities."

DEFLECTION DIAGRAM

DIMENSION "B"	
SPAN "S"	"B"
15'-0"	20"
17'-0"	21"
19'-0"	22"
21'-0"	23"
23'-0"	23"
25'-0"	24"
27'-0"	24"
29'-0"	24"
31'-0"	24"
33'-0"	24"
35'-0"	24"
37'-0"	24"
39'-0"	24"
41'-0"	24"
43'-0"	24"
45'-0"	24"
47'-0"	24"
49'-0"	24"

Note: Top of channel separators at ends of each I-Beam Span to be flush with bottom of floor slab as shown in section thru end bent at E.

Note: Depth of outside stringers will in some cases be a fraction of an inch less than that of inside stringers and in order to keep bottom of slab horizontal it will be necessary to launch slab down to top of outside stringers.



HALF SECTION THRU SPAN

TABLE OF STRINGERS					
SPA. "S"	PER PLANS		PERMISSIBLE SUBSTITUTIONS		
	CARNEGIE BEAMS	STANDARD I-BEAMS	BETHLEHEM BEAMS		
	Inside	Outside	Inside	Outside	
15'-0"	14" @ 30"	14" @ 30"	12" @ 35"	14" @ 30"	14" @ 30"
17'-0"	14" @ 33"	14" @ 33"	12" @ 35"	14" @ 33"	14" @ 33"
19'-0"	14" @ 37"	14" @ 37"	12" @ 35"	14" @ 37"	14" @ 37"
21'-0"	16" @ 30"	16" @ 30"	12" @ 35"	16" @ 30"	16" @ 30"
23'-0"	16" @ 33"	16" @ 33"	12" @ 35"	16" @ 33"	16" @ 33"
25'-0"	16" @ 37"	16" @ 37"	12" @ 35"	16" @ 37"	16" @ 37"
27'-0"	18" @ 30"	18" @ 30"	12" @ 35"	18" @ 30"	18" @ 30"
29'-0"	18" @ 33"	18" @ 33"	12" @ 35"	18" @ 33"	18" @ 33"
31'-0"	18" @ 37"	18" @ 37"	12" @ 35"	18" @ 37"	18" @ 37"
33'-0"	20" @ 30"	20" @ 30"	12" @ 35"	20" @ 30"	20" @ 30"
35'-0"	20" @ 33"	20" @ 33"	12" @ 35"	20" @ 33"	20" @ 33"
37'-0"	20" @ 37"	20" @ 37"	12" @ 35"	20" @ 37"	20" @ 37"
39'-0"	22" @ 30"	22" @ 30"	12" @ 35"	22" @ 30"	22" @ 30"
41'-0"	22" @ 33"	22" @ 33"	12" @ 35"	22" @ 33"	22" @ 33"
43'-0"	22" @ 37"	22" @ 37"	12" @ 35"	22" @ 37"	22" @ 37"
45'-0"	24" @ 30"	24" @ 30"	12" @ 35"	24" @ 30"	24" @ 30"
47'-0"	24" @ 33"	24" @ 33"	12" @ 35"	24" @ 33"	24" @ 33"
49'-0"	24" @ 37"	24" @ 37"	12" @ 35"	24" @ 37"	24" @ 37"

GENERAL NOTES:

Loading: One 10 Ton Truck, 80% of weight on rear axle, 30% impact, 14'-0" wheel base, 6'-0" gage, 10' fire. All concrete to be 1:2:3 mix. Exposed edges to be beveled 3/4" where no other bevel is noted. All piling to be driven to full penetration. All timbers to be creosoted Douglas Fir of the West Coast Region, Close-grained, natural grade, or creosoted Southern Yellow Pine, Dense Structural Square Edge and Round Grade, or creosoted California Redwood, Prime Structural Grade. All timber rough sawn except as noted in timber bill for pile caps. Slight variations in sawing to be in accordance with grading rules. All treated timbers to be cut to lengths, shaped and bored as shown before treating. Blocking plank on all bents 6" long and are to be fitted and cut in the field. Field holes for drift pins shall be field bored 3/4". Unless otherwise noted all other field holes in timber shall be field bored 3/4". When bolts with countersunk heads are indicated on plans cut washers shall be used under heads. 0.5 washers shall be used under heads of all other bolts and under nuts of all bolts. Number of bolts, drift pins, nails and washers given exact; no allowance made for excess. Cost of substructure hardware to be included in price bid for timber in place. I-Beams with fastenings, spacers, handrail, handrail posts with fastenings, clip angles and cap plate on end bent with fastenings will be paid for as structural steel. Cost of metallic edge moulding will be included in unit bid price for concrete. Rivets 3/8", holes 1/2", except in handrail where rivets shall be 5/8", holes 3/4". Turned bolts 3/4", holes subpunched and reamed to driving fit. Field connections, except handrail, shall be turned bolts. Field connections for handrail shall be 3/4" button head bolts, 1/2" holes. Detail shop drawings shall be submitted to the State Highway Department in duplicate and shall be approved before steel is fabricated. Where bituminous felt is used in expansion or partition joints in concrete stitch felt in vertical joint securely to one face of concrete with copper wire. See Special Provisions in regard to permissible substitution of beams. Paint: Shop, none; Field, contact surfaces one coat red lead. No other paint to be applied by Contractor. All paint required will be furnished by the Missouri State Highway Department.

ESTIMATED QUANTITIES			
ITEM	SUPERSTR.	SUBSTR.	TOTAL
Bridge Excavation Class 1	Cu. Yds.		
Bridge Excavation Class 2	Cu. Yds.		
Concrete 1:2:4 mix "B"	Cu. Yds.		
Concrete 1:2:3 mix "X"	Cu. Yds.	27.4	27.4
Fabricated Structural Steel	Lbs.	14,410	14,410
Reinforcing Steel	Lbs.	7,300	7,300
Creosoted Timber Piles	Lin. Ft.	440	440
Creosoted Timber Pile Cutoffs	Lin. Ft.	20	20
Timber (See Special Provisions) F.B.M.		2072	2072

Note: Bridge excavation will be allowed for end bents within horizontal limits shown and noted on "Half Plan of End Bent" sheet # 2. This excavation will be computed from existing ground line to bottom and of 6"x6" backing supports.

## BRIDGE OVER DRAINAGE DITCH

STATE ROAD FROM GLENNVILLE TO MALDEN

ABOUT 9 MILES EAST OF QULIN

PROJECT NO. 5J-51 STA. 68+42

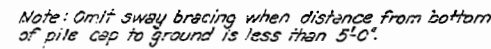
DUNKLIN COUNTY

SUBMITTED BY M.R. Sax DATE 5/12/32

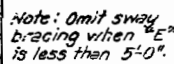
APPROVED BY T.H. Cutler DATE 5/12/32

CHIEF ENGINEER

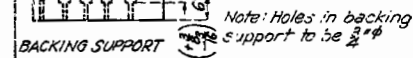
FED. ROAD DIST NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.	SJ-51	19		



Note: Any irregularity in alignment of piling in end bents to be corrected by fang or a surbrace of the 6"x6" backing support, by varying the thickness of the backing support such as to place the surface of the backing in true plane and eliminate any strain on the backing plank. Splice in backing plank to be made at center of 6"x6" backing support and to be alternated on the two intermediate supports.



Backing plank to supports; 3-30d at each support at splices,  
3-30d each side of splice.  
Pieces at ends of backwall to backing plank; 4-30d to  
each backing plank.



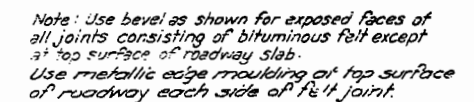
BACKING SUPPORT  $\left( \frac{1}{2} \right)$  support to be  $\frac{3}{4} = \phi$

*Note: Reinforcing bars in each span to be billed and tagged separately*

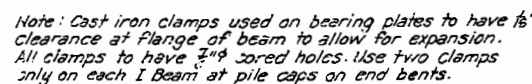
\* 2 Washers plus washers for fill required for alignment of railposts.

Note: Pile caps to be classified as beams and stringers  
All other timber to be classified as joist and plank.

§ Omit when "E" is less than 5'-0".



SUBMITTED BY W.R. Sax DATE 5/12/33  
BRIDGE ENGINEER  
APPROVED BY T.H. Cutler DATE 5/12/32  
CHIEF ENGINEER



Note:- This drawing is not to scale.  
Follow dimensions.

Designed Nov. 1929 By F.W.H.  
 Drawn Dec. 1930 By P.J.G.  
 Traced Dec. 1931 By P.J.G.  
 Checked Dec. 1931 By J.H.M.

Assembled Apr. 1932 By H.D.-C.A.F.  
 Checked Apr. 1932 By J.H.M.

Sheet No. 2 of 3.

S-375



FED. ROAD DIST. NO.	STATF	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.	57-51	19		

SPAN "S"	NO.	SIZE	SINGLE SPAN		END SPAN		11:1 SPAN		"C"	"O"	"E"
			"A"	"B"	"A"	"B"	"A"	"B"			
15'-0"	4	14" C.B. @ 30"	15'-9"	6'-8"	15'-4"	6'-6"	14'-11"	6'-4"	5'-8"	2'-2"	2'-2"
17'-0"	4	14" C.B. @ 33"	17'-9"	7'-8"	17'-4"	7'-6"	16'-11"	7'-4"	5'-9"	2'-2"	2'-2"
19'-0"	4	16" C.B. @ 37"	19'-9"	8'-8"	19'-5"	9'-6"	18'-11"	8'-4"	6'-8"	2'-2"	2'-2"
21'-0"	2	16" C.B. @ 37"	21'-9"	9'-8"	21'-4"	9'-6"	20'-11"	9'-4"	6'-8"	2'-2"	2'-2"
	2	16" C.B. @ 40"	21'-9"	9'-8"	21'-4"	9'-6"	20'-11"	9'-4"	6'-8"	2'-2"	2'-2"
23'-0"	2	15" C.B. @ 40"	23'-9"	10'-8"	23'-4"	10'-6"	22'-11"	10'-4"	6'-8"	2'-2"	2'-2"
	2	16" C.B. @ 45"	23'-9"	10'-8"	23'-4"	10'-6"	22'-11"	10'-4"	6'-8"	2'-2"	2'-2"
25'-0"	4	18" C.B. @ 47"	25'-9"	11'-8"	25'-4"	11'-6"	24'-11"	11'-4"	7'-8"	3'-2"	2'-2"
27'-0"	2	18" C.B. @ 47"	27'-9"	12'-8"	27'-4"	12'-6"	26'-11"	12'-4"	7'-8"	3'-2"	2'-2"
	2	18" C.B. @ 52"	27'-9"	12'-8"	27'-4"	12'-6"	26'-11"	12'-4"	7'-8"	3'-2"	2'-2"
29'-0"	4	20" C.B. @ 55"	29'-9"	13'-8"	29'-4"	13'-6"	28'-11"	13'-4"	8'-8"	3'-2"	2'-2"
31'-0"	4	21" C.B. @ 55"	31'-9"	14'-8"	31'-4"	14'-6"	30'-11"	14'-4"	9'-8"	3'-2"	2'-2"
33'-0"	2	21" C.B. @ 58"	33'-9"	15'-8"	33'-4"	15'-6"	32'-11"	15'-4"	9'-8"	3'-2"	2'-2"
	2	21" C.B. @ 62"	33'-9"	15'-8"	33'-4"	15'-6"	32'-11"	15'-4"	9'-8"	3'-2"	2'-2"
35'-0"	2	21" C.B. @ 62"	35'-9"	16'-8"	35'-4"	16'-6"	34'-11"	16'-4"	9'-8"	3'-2"	2'-2"
	2	21" C.B. @ 67"	35'-9"	16'-8"	35'-4"	16'-6"	34'-11"	16'-4"	9'-8"	3'-2"	2'-2"
37'-0"	4	24" C.B. @ 70"	37'-9"	17'-8"	37'-4"	17'-6"	36'-11"	17'-4"	10'-8"	4'-2"	—
39'-0"	2	24" C.B. @ 70"	39'-9"	18'-8"	39'-4"	18'-6"	38'-11"	18'-4"	10'-8"	4'-2"	—
	2	24" C.B. @ 74"	39'-9"	18'-8"	39'-4"	18'-6"	38'-11"	18'-4"	10'-8"	4'-2"	—
41'-0"	2	24" C.B. @ 74"	41'-9"	19'-8"	41'-4"	19'-6"	40'-11"	19'-4"	11'-8"	4'-2"	—
	2	24" C.B. @ 81"	41'-9"	19'-8"	41'-4"	19'-6"	40'-11"	19'-4"	11'-8"	4'-2"	—
43'-0"	2	24" C.B. @ 81"	43'-9"	20'-8"	43'-4"	20'-6"	42'-11"	20'-4"	12'-8"	4'-2"	—
	2	21" C.B. @ 85"	43'-9"	20'-8"	43'-4"	20'-6"	42'-11"	20'-4"	12'-8"	4'-2"	—
45'-0"	4	27" C.B. @ 85"	45'-9"	21'-8"	45'-4"	21'-6"	44'-11"	21'-4"	12'-8"	4'-2"	—
47'-0"	4	27" C.B. @ 85"	47'-9"	22'-8"	47'-4"	22'-6"	46'-11"	22'-4"	12'-8"	4'-2"	—
	2	27" C.B. @ 91"	47'-9"	22'-8"	47'-4"	22'-6"	46'-11"	22'-4"	12'-8"	4'-2"	—
49'-0"	4	27" C.B. @ 91"	49'-9"	23'-8"	49'-4"	23'-6"	48'-11"	23'-4"	12'-8"	4'-2"	—

**SPANS 15'-0" to 13'-0" INCL.**

**SPANS 15'-0" to 19'-0" INCL.**

**SPANS 21'-0" to 25'-0" INCL.**

**SPANS 21'-0" to 25'-0" INCL.**

**SPANS 27'-0" to 31'-0" INCL.**

**SPANS 27'-0" to 31'-0" INCL.**

**SPANS 33'-0" to 37'-0" INCL.**

**SPANS 33'-0" to 37'-0" INCL.**

**SPANS 39'-0" to 43'-0" INCL.**

**SPANS 39'-0" to 43'-0" INCL.**

**SPANS 45'-0" to 49'-0" INCL.**

**SPANS 45'-0" to 49'-0" INCL.**

**SINGLE SPANS**

**THREE EQUAL SPANS**

**SKETCHES SHOWING LOCATION OF HANDRAIL POSTS**

**HANDRAIL POST RP1**

**HANDRAIL POST RP2**

**HANDRAIL POST RP3**

**STRINGER CLIP ANGLE**

**METALLIC EDGE Moulding**

**BRIDGE OVER DRAINAGE DITCH**

**STATE ROAD FROM GLENNONVILLE TO MALDEN**

**ABOUT 9 MILES EAST OF QULIN**

**PROJECT NO. S.J.-S.**

**STA. 68 + 42**

SUBMITTED BY W.R. Sack DATE 5/12/32  
BRIDGE ENGINEER  
APPROVED BY T.H. Cutler DATE 5/12/32  
CHIEF ENGINEER

Sheet No. 3 of 3

S-375

24" For 1st End Span & Single Span.

IL- 4"x3"x $\frac{1}{2}$ "

RA1R, RA2R, RA3R, RA4R

RA1R, RA2R, RA3R, RA4R

24"

DETAIL OF RAIL ANGLES RA1<sub>R</sub> TO RA4<sub>R</sub> INCL.

Open holes  $\frac{11}{16}$ " ctsk. near side

Pl. 8"x $\frac{1}{2}$ "x21'-0"

12 Spcs. @ 20" Staggered

21'-0"

END BENT CAP PLATE

SPAN "S"	NO. PLATES	STRINGER	AT END BENTS				AT INT. BENTS				
			THICK.	"F"	"G"	"H"	THICK.	"I"	"J"	"K"	"Q"
15'-0"	4	All	3"	10"	11"	12"	3"	10"	11"	12"	2"
17'-0"	4	"	3"	10"	11"	12"	1"	10"	11"	12"	2"
19'-0"	4	"	3"	10"	12"	12"	1"	10"	12"	12"	2"
21'-0"	2	Inside	3"	10"	12"	12"	1"	10"	12"	12"	2"
	2	Outside	3"	10"	12"	12"	1"	10"	12"	12"	2"
23'-0"	4	All	3"	10"	12"	12"	1"	10"	12"	12"	3"
25'-0"	4	"	3"	10"	12"	12"	1"	12"	12"	12"	3"
27'-0"	4	"	3"	10"	12"	12"	1"	12"	12"	12"	3"
29'-0"	4	"	3"	10"	12"	12"	1"	12"	12"	12"	3"
31'-0"	4	"	3"	10"	13"	12"	12"	12"	14"	24"	3"
33'-0"	4	"	3"	11"	13"	12"	12"	12"	14"	24"	3"
35'-0"	4	"	3"	11"	13"	12"	12"	12"	15"	24"	3"
37'-0"	4	"	3"	12"	13"	12"	12"	12"	15"	24"	3"
39'-0"	4	"	3"	12"	13"	12"	12"	12"	15"	24"	3"
41'-0"	4	"	3"	12"	13"	12"	12"	12"	15"	24"	3"
43'-0"	2	Outside	3"	12"	14"	12"	12"	12"	15"	24"	3"
	2	Inside	3"	12"	14"	12"	12"	12"	15"	12"	3"
45'-0"	4	"	3"	12"	14"	12"	12"	12"	16"	24"	3"
47'-0"	4	"	3"	12"	14"	12"	12"	12"	18"	34"	3"
49'-0"	4	"	3"	12"	14"	12"	12"	2"	18"	34"	3"

Designed Nov. 1929 By F.W.H.  
 Drawn Dec. 1930 By P.J.G.  
 Traced Dec. 1931 By R.J.G.  
 Checked Dec. 1931 By J.M.  
 Assembled Apr. 1932 By H.D.-C.A.F.  
 Checked Apr 1932 By J.M.

The image contains two sets of technical drawings for splice plates, each with a 'FIXED' and an 'EXPANSION' detail. The drawings show the layout of reinforcement bars and the placement of splice plates.

**Left Set (Spans 15'-0" to 31'-0" incl.):**

- FIXED:** Shows a grid of reinforcement bars. Dimensions include a total width of 6' 6" (split into 1 1/2', 4', and 1 1/2') and a total height of 15' 0" (split into 12 3/4' and 2 1/4'). Spacing is 24" @ 2 1/2'.
- EXPANSION:** Shows a similar grid. Dimensions include a total width of 7' 6" (split into 1 1/2', 4', and 2 1/2') and a total height of 15' 0" (split into 12 3/4' and 2 1/4'). Spacing is 24" @ 2 1/2'.

**Right Set (Spans 33'-0" to 49'-0" incl.):**

- FIXED:** Shows a grid of reinforcement bars. Dimensions include a total width of 6' 6" (split into 1 1/2', 4', and 1 1/2') and a total height of 17' 6" (split into 14' 5" and 3' 1" - 15"). Spacing is 24" @ 3' - 15".
- EXPANSION:** Shows a similar grid. Dimensions include a total width of 7' 6" (split into 1 1/2', 4', and 2 1/2') and a total height of 17' 6" (split into 14' 5" and 3' 1" - 15"). Spacing is 24" @ 3' - 15".

**Labels and Notes:**

- Grind Pl. to bear:** Indicated at the top of the splice plate areas.
- Spans 15'-0" to 31'-0" incl. & 17'-0" to 31'-0" incl.:** Associated with the left set of drawings.
- Spans 33'-0" to 49'-0" incl.:** Associated with the right set of drawings.