

C.S.
1107

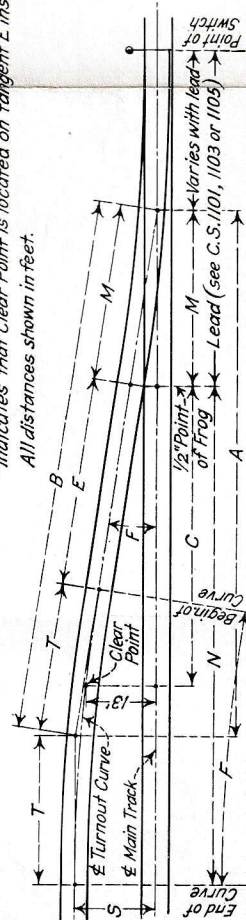
Frog No	Deg. of Curve	T	M	S = 13 Ft.			S = 14 Ft.			Frog No	
				A	B	C	A	B	C		
6	1°00'	43.48	28.50	77.46	78.54	6.56	92.44	92.44	83.42	66.17	6
7	9°00'	45.52	33.25	90.54	91.47	12.70	102.81	102.81	97.50	74.13	7
8	8°00'	44.80	36.00	103.39	104.40	29.11	119.39	119.39	111.56	80.56	8
9	7°00'	42.75	42.75	116.64	117.36	29.11	119.39	119.39	125.61	87.95	9
10	6°00'	47.77	47.50	129.68	130.33	35.06	129.95	129.95	140.35	96.28	10
12	4°30'	53.07	57.00	156.79	156.27	46.20	151.80	151.80	167.71	113.38	12
14	3°00'	68.21	66.50	181.77	182.23	47.52	183.48	183.48	195.75	135.74	14
20	1°30'	95.50	95.00	258.84	260.16	69.66	260.34	260.34	279.83	193.04	20

Frog No	Deg. of Curve	T	M	S = 15 Ft.			S = 16 Ft.			S = 17 Ft.			Frog No	
				A	B	C	A	B	C	A	B	C		
6	1°00'	43.48	28.50	89.38	90.63	18.65	104.36	104.36	95.33	96.67	24.69	110.31	54.48	6
7	9°00'	45.52	33.25	104.47	105.54	26.77	116.74	116.74	111.43	112.57	33.80	123.70	61.39	7
8	8°00'	44.80	36.00	119.53	120.47	37.67	126.33	126.33	127.50	128.50	45.70	134.30	68.83	8
9	7°00'	42.75	42.75	134.58	135.42	47.17	137.33	137.33	143.55	144.44	56.19	146.30	76.32	9
10	6°00'	47.77	47.50	149.63	150.38	55.11	149.90	149.90	159.50	160.40	65.13	159.87	84.28	10
12	4°30'	53.07	57.00	179.69	180.31	70.24	175.76	175.76	191.66	192.33	82.26	187.73	100.44	12
14	3°00'	68.21	66.50	209.73	210.27	75.56	211.44	211.44	223.71	224.28	89.57	225.42	118.52	14
20	1°30'	95.50	95.00	299.82	300.19	109.69	300.32	300.32	319.80	320.20	129.70	320.30	169.11	20

Frog No	Deg. of Curve	T	M	S = 18 Ft.			S = 19 Ft.			S = 20 Ft.			Frog No	
				A	B	C	A	B	C	A	B	C		
6	1°00'	43.48	28.50	107.25	108.75	36.77	122.23	122.23	101.51	113.21	42.81	128.19	49.24	6
7	9°00'	45.52	33.25	125.36	126.64	47.87	137.63	137.63	132.32	133.68	54.91	144.59	57.30	7
8	8°00'	44.80	36.00	143.44	144.56	61.76	150.24	150.24	151.40	152.59	69.79	158.20	65.59	8
9	7°00'	42.75	42.75	161.50	162.50	74.25	164.25	164.25	170.47	171.53	83.28	173.22	73.89	9
10	6°00'	47.77	47.50	179.55	180.45	85.18	179.82	179.82	189.53	190.48	95.21	189.80	82.18	10
12	4°30'	53.07	57.00	215.62	216.37	106.30	211.69	211.69	227.60	228.39	118.32	223.67	108.73	12
14	3°00'	68.21	66.50	251.68	252.32	117.61	253.39	253.39	265.66	266.34	131.63	267.37	135.27	14
20	1°30'	95.50	95.00	359.78	360.23	169.73	360.28	360.28	364.84	379.77	189.74	380.27	164.84	20

Frog No	F = Frog Angle
6	9°31'38"
7	8°10'16"
8	7°09'10"
9	6°21'35"
10	5°43'29"
12	4°46'19"
14	4°05'27"
20	2°51'51"

* Indicates that Clear Point is located on tangent E instead of on curve.
All distances shown in feet.



SOUTHERN PACIFIC LINES
COMM ON STANDARD
DATA FOR TURNOUT CURVES
NO SCALE
ADOPTED MAR. 1, 1937
REVISED JULY 7, 1945

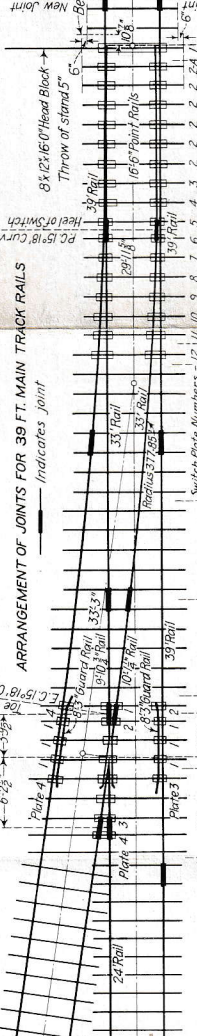
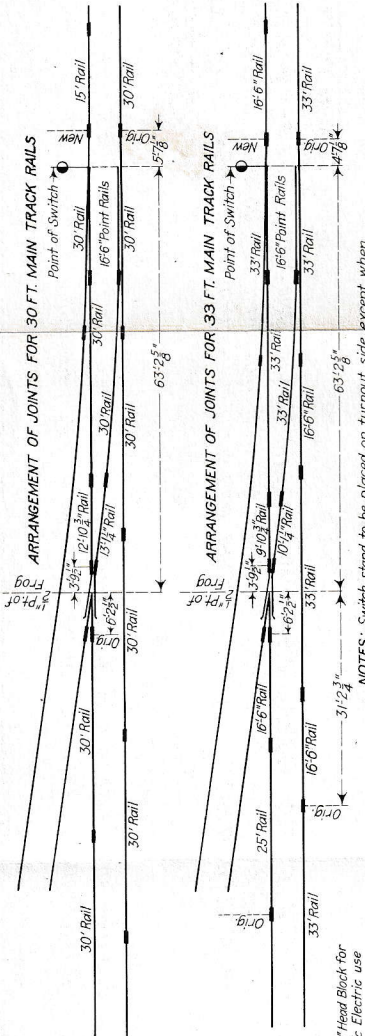
LIST No 7-B
LIST OF SWITCH TIES
SHOWING LENGTHS

Size 7x9 with 90" for heavier
Size 7x8 with less than 90"
rail section, except where
7x9 cross ties are standard.

Number of Ties	Length
1	9'-0"
2	10'-0"
3	11'-0"
4	12'-0"
5	13'-0"
6	14'-0"
7	15'-0"
8	16'-0" (8x12 H.B.)
9	17'-0"
10	18'-0"
11	19'-0"
12	20'-0"
13	21'-0"
14	22'-0"
15	23'-0"
16	24'-0"
17	25'-0"
18	26'-0"
19	27'-0"
20	28'-0"
21	29'-0"
22	30'-0"
23	31'-0"
24	32'-0"
25	33'-0"
26	34'-0"
27	35'-0"
28	36'-0"
29	37'-0"
30	38'-0"
31	39'-0"
32	40'-0"
33	41'-0"
34	42'-0"
35	43'-0"
36	44'-0"
37	45'-0"
38	46'-0"
39	47'-0"
40	48'-0"
41	49'-0"
42	50'-0"
43	51'-0"
44	52'-0"
45	53'-0"
46	54'-0"
47	55'-0"
48	56'-0"
49	57'-0"
50	58'-0"
51	59'-0"
52	60'-0"
53	61'-0"
54	62'-0"
55	63'-0"
56	64'-0"
57	65'-0"
58	66'-0"
59	67'-0"
60	68'-0"
61	69'-0"
62	70'-0"
63	71'-0"
64	72'-0"
65	73'-0"
66	74'-0"
67	75'-0"
68	76'-0"
69	77'-0"
70	78'-0"
71	79'-0"
72	80'-0"
73	81'-0"
74	82'-0"
75	83'-0"
76	84'-0"
77	85'-0"
78	86'-0"
79	87'-0"
80	88'-0"
81	89'-0"
82	90'-0"
83	91'-0"
84	92'-0"
85	93'-0"
86	94'-0"
87	95'-0"
88	96'-0"
89	97'-0"
90	98'-0"
91	99'-0"
92	100'-0"
93	101'-0"
94	102'-0"
95	103'-0"
96	104'-0"
97	105'-0"
98	106'-0"
99	107'-0"
100	108'-0"
101	109'-0"
102	110'-0"
103	111'-0"
104	112'-0"
105	113'-0"
106	114'-0"
107	115'-0"
108	116'-0"
109	117'-0"
110	118'-0"
111	119'-0"
112	120'-0"
113	121'-0"
114	122'-0"
115	123'-0"
116	124'-0"
117	125'-0"
118	126'-0"
119	127'-0"
120	128'-0"

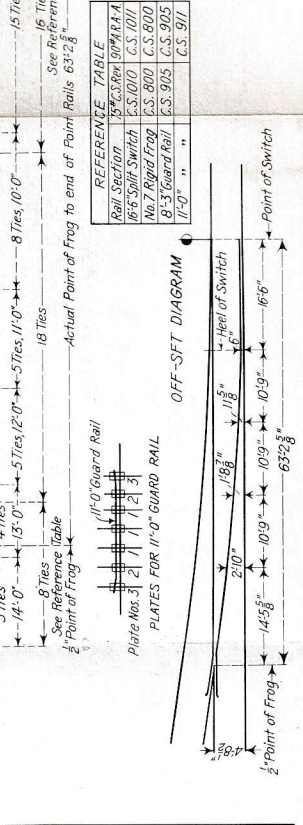
Note: 8'x10" Head Block for Pacific Electric use

NOTES: Switch stand to be placed on turnout side except when otherwise authorized lead may be varied to suit rail on hand.
Specifications for switches should specify whether insulated or non-insulated switch, if power operated, state type of switch machine.
For crossover data see C.S. 1100.
For location of guard rails see C.S. 900.



TURNOUT DATA

Number	7
Angle	8°10'16"
Length on straight track	10'-0"
Toe "	3'-9 1/2"
" " turnout "	3'-9 1/2"
Length of points	16'-6"
Heel spread	6"
Angle	1°30'51"
Lead	63'-2 3/8"
Lead	15'-18"
Curve	6°30'25"
Radius	375.50'
Radius of curved rail	371.85'
Straight closure	42'-11 1/8"
Curved "	43'-1 5/8"



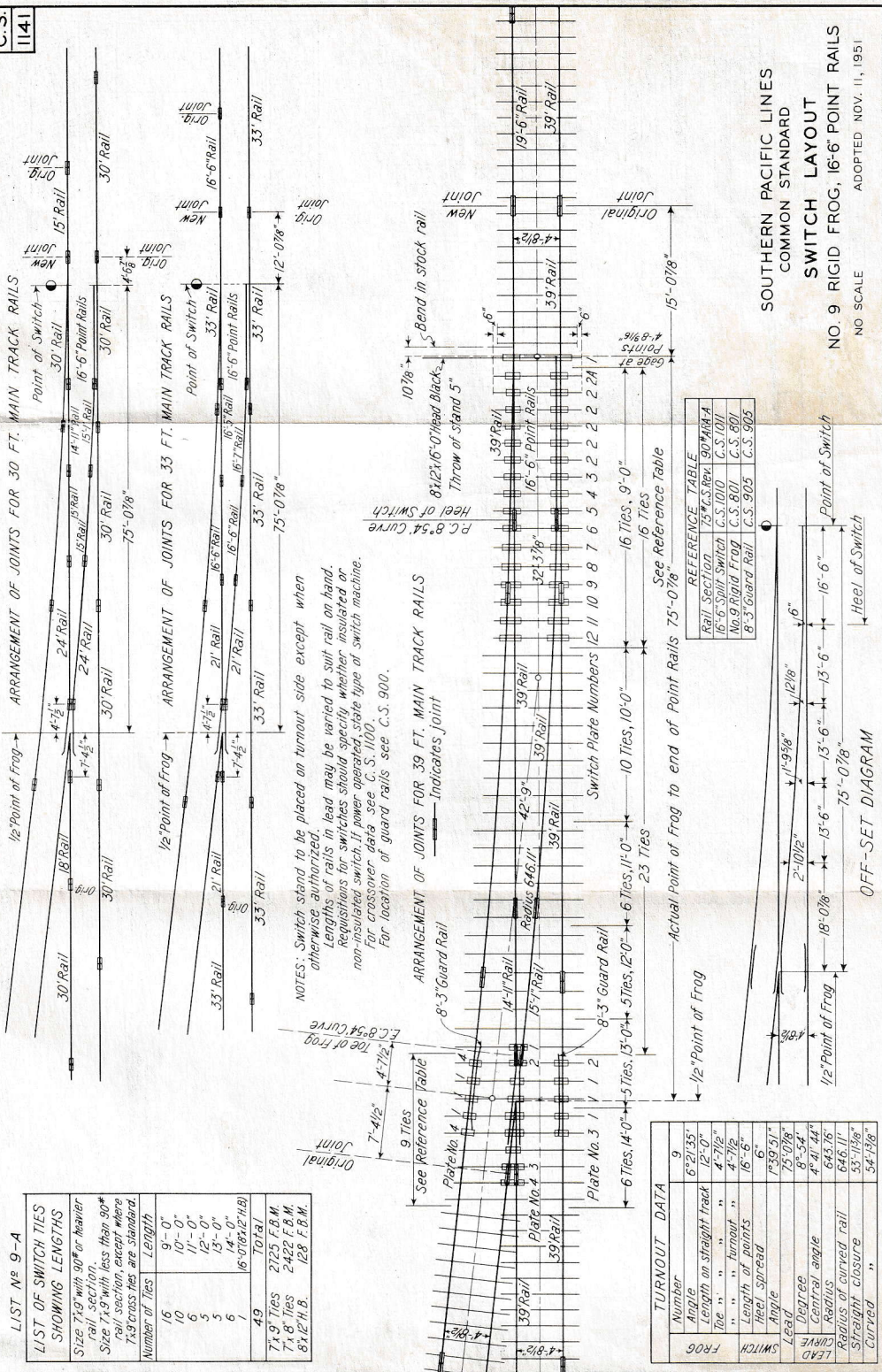
REFERENCE TABLE

Rail Section	15" C.S. Rail	30" M.A.R.A.
16 1/2" Shift Switch	C.S. 1010	C.S. 1017
No. 7 Rigid Frog	C.S. 800	C.S. 800
8'-3" Guard Rail	C.S. 905	C.S. 905
11'-0" "	"	C.S. 911

SOUTHERN PACIFIC LINES
COMMON STANDARD
SWITCH LAYOUT

NO. 7 RIGID FROG 16 FT. 6 IN. POINT RAILS
NO SCALE
ADOPTED: DEC. 1913
REVISED: NOV. 7, 1951

C.S.
1141



LIST NO 9-A
LIST OF SWITCH TIES
SHOWING LENGTHS

Size: 7/8" with 90° or heavier
at 6" with less than 90°
Size: 1" with less than 90°
Size: 1 1/8" section except where
7/8" cross ties are standard

Number of Ties	Length
16	9'-0"
10	10'-0"
6	11'-0"
5	12'-0"
5	13'-0"
5	14'-0"
49	16'-0" (18 1/2" H.B.)
Total	
7" 9" Ties	2125 F.B.M.
7" 8" Ties	2422 F.B.M.
8" 12" H.B.	128 F.B.M.

NOTES: Switch stand to be placed on turnout side except when otherwise authorized.
Lengths of rails in lead may be varied to suit rail on hand.
Requirements for switches should specify whether insulated or non-insulated switch. If power operated, state type of switch machine.
For crossover data see C.S. 1100.
For location of guard rails see C.S. 900.

TURNOUT DATA

Number	9
Angle	6°21'35"
Length on straight track	12'-0"
Toe "	4'-7 1/2"
" " turnout "	4'-7 1/2"
Length of points	16'-6"
heel spread	6
Lead	1°39'51"
Lead angle	75°-07 1/8"
Lead	8'-3 1/4"
Central angle	4°41'44"
Radius	645.16
Radius of curved rail	646.16
Straight closure	34.18"
Curved "	34.13 1/8"

REFERENCE TABLE

Rail Section	75" C.S. Rev.	90" ARA-A
16'-6" Splice Switch	C.S. 1010	C.S. 1011
No. 9 Rigid Frog	C.S. 801	C.S. 801
8'-3" Guard Rail	C.S. 905	C.S. 905

SOUTHERN PACIFIC LINES
COMMON STANDARD
SWITCH LAYOUT
NO. 9 RIGID FROG, 16'-6" POINT RAILS
NO SCALE
ADOPTED NOV. 11, 1951

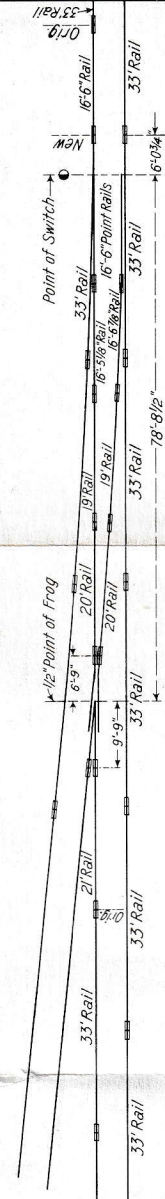
ARRANGEMENT OF JOINTS FOR 33 FT. MAIN TRACK RAILS

C.S.
1151

LIST NO. 10-C
LIST OF SWITCH TIES SHOWING LENGTHS.
Size 7x9 with 90" or heavier rail section.
Size 7x8 with ties than 90" rail section,
except where 7x9 cross ties are standard.

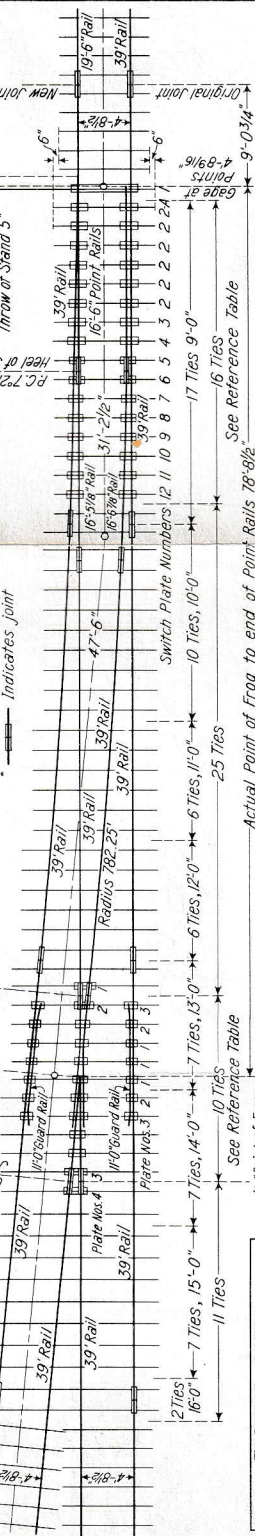
MAX. LENGTH OF TIE 16'-0" MIN. LENGTH OF TIE 14'-0"

No. of Ties	Length	No. of Ties	Length
17	9'-0"	17	9'-0"
10	10'-0"	10	10'-0"
6	12'-0"	6	12'-0"
6	13'-0"	6	13'-0"
7	14'-0"	7	14'-0"
7	15'-0"	7	15'-0"
2	16'-0"	2	16'-0"
63	Total	54	Total
71.9 Ties	376.4 F.B.M.	71.9 Ties	3045 F.B.M.
71.8 Ties	3346 F.B.M.	71.8 Ties	2707 F.B.M.
81.2 Ties	128 F.B.M.	81.2 Ties	128 F.B.M.



NOTES: Switch stand to be placed on turnout side except when otherwise authorized.
Lengths of rails in lead may be varied to suit rail on hand.
Position of rails in lead may be interchanged when joints approximately opposite each other are not required in connection with signal work.
Ties exceeding 14'-0" in length may be omitted beyond joint at heel of frog, depending upon local conditions of maintenance and operation.
Requirements for switches should specify whether insulated or non-insulated switch. If power operated, state type of switch machine.
For crossover data see C.S. 1100.
For location of guard rails see C.S. 900.

ARRANGEMENT OF JOINTS FOR 39 FT. MAIN TRACK RAILS

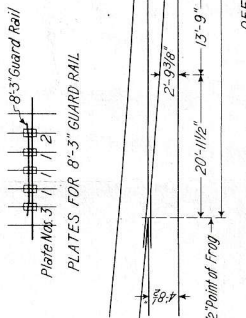


TURNOUT DATA

Number	10
Angle	5°45'29"
Length on straight track	16'-6"
Toe "	6'-9"
" " turnout "	6'-9"
Length of points "	16'-6"
Heel spread	6'-"
Angle	1°39'51"
Lead	78'-8 1/2"
Lead	7°21'
Curve	4°03'38"
Radius	779.90'
Radius of curved rail	782.25'
Straight closure	56'5 1/2"
Curved "	56'-7 1/2"

REFERENCE TABLE

Rail Section	75% C.S. Req. 90" A.R.A. 4
16'-6" Split Switch	C.S. 1010
No. 10 Rigid Frog	C.S. 801
11'-0" Guard Rail	C.S. 911
8'-3" "	C.S. 905

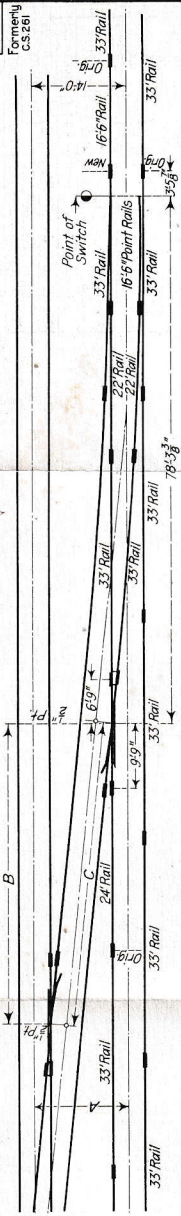


SOUTHERN PACIFIC LINES
COMMON STANDARD
SWITCH LAYOUT
No. 10 RIGID FROG, 16'-6" POINT RAILS
NO SCALE
ADOPTED NOV. 11, 1951

OFF-SET DIAGRAM

C.S.
1156
Formerly
C.S. 561

ARRANGEMENT OF JOINTS FOR 33 FT. MAIN TRACK RAILS
AND LAYOUT FOR CROSSOVERS



NOTES: Switch stand to be placed on turnout side except when otherwise authorized.
Lengths of rails in lead may be varied to suit rail on hand.
Position of rails in lead may be interchanged when joints approximately opposite each other are not required in connection with signal work.
K. 1410' in length may be omitted beyond joint at heel of frog, depending upon local conditions of maintenance and operation.
Requirements for switches should specify whether insulated or non-insulated switch, if power operated, state type of switch machine.
For crossover data see C.S. 1100.
For location of guard rails see C.S. 900.

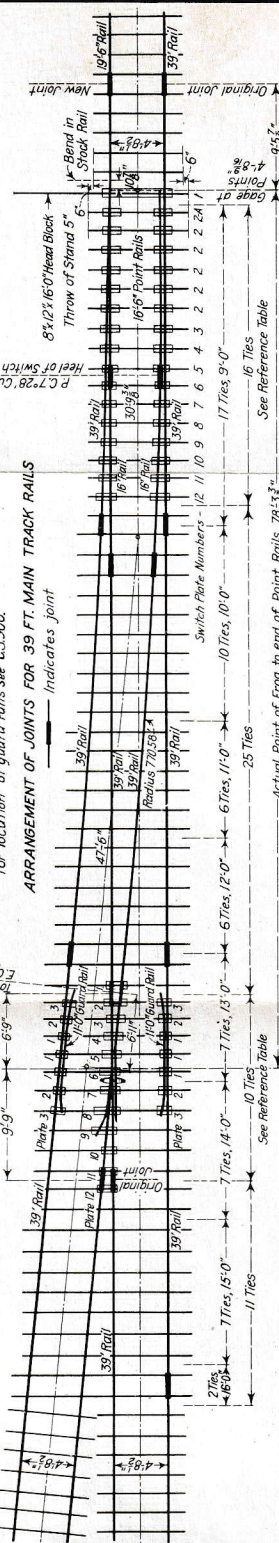
NOTE: 8x12" Head Block for Pacific Electric use

LIST No. 10-C

LIST OF SWITCH TIES SHOWING LENGTHS
Size 7x9" with 90° or heavier rail section.
Size 7x8" with less than 90° rail section,
except where 7x9" cross ties are standard.

MAX. LENGTH OF TIE 16'0"		MAX. LENGTH OF TIE 14'0"	
No. of Ties	Length	No. of Ties	Length
17	9'-0"	17	9'-0"
16	10'-0"	16	11'-0"
6	12'-0"	6	12'-0"
7	13'-0"	7	13'-0"
7	14'-0"	7	14'-0"
2	15'-0"	1	16'-0"
Total		Total	
63		54	

Ties	Total	F.B.M.
7x9" Ties	3764	3045 F.B.M.
7x8" Ties	3346	2707 F.B.M.
8x12" H.B.	128	128 F.B.M.

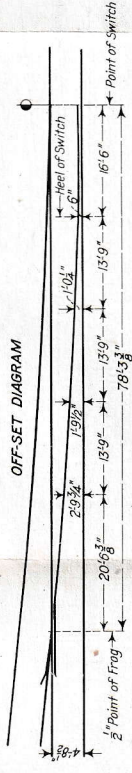
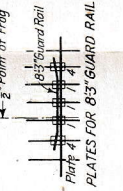


TURNOUT DATA

Number	10
Angle	5°45'29"
Length on straight track	16'-6"
Toe "	6'-9"
" " turnout "	6'-11"
Length of points	16'-6"
Heel spread	6"
Lead	1'39"-51"
Lead	7'85"-9"
Curve	4°03'38"
Radius	768'-23"
Radius of curved rail	770'-58"
Straight closure	55'-03/8"
Curved "	55'-03/8"

REFERENCE TABLE

Rail Section	76" C.S. Rev.	90" M.R.A.-A	110" P.R.E.	130" P.S.
16'6" Split Switch	C.S. 1010	C.S. 1011	C.S. 1012	C.S. 1013
16'0" Sp. Rail Frog	C.S. 805	C.S. 810	C.S. 811	C.S. 813
11'0" Guard Rail	C.S. 911	C.S. 911	C.S. 911	C.S. 911
8'3" " "	C.S. 905	C.S. 905	C.S. 905	C.S. 911



SOUTHERN PACIFIC LINES
COMMON STANDARD
SWITCH LAYOUT
NO. 10 SPRING RAIL FROG
16 FT. 6 IN. POINT RAILS
NO SCALE
ADOPTED: AUG. 1910
REVISED: APRIL 22, 1948

LIST NR 10-C

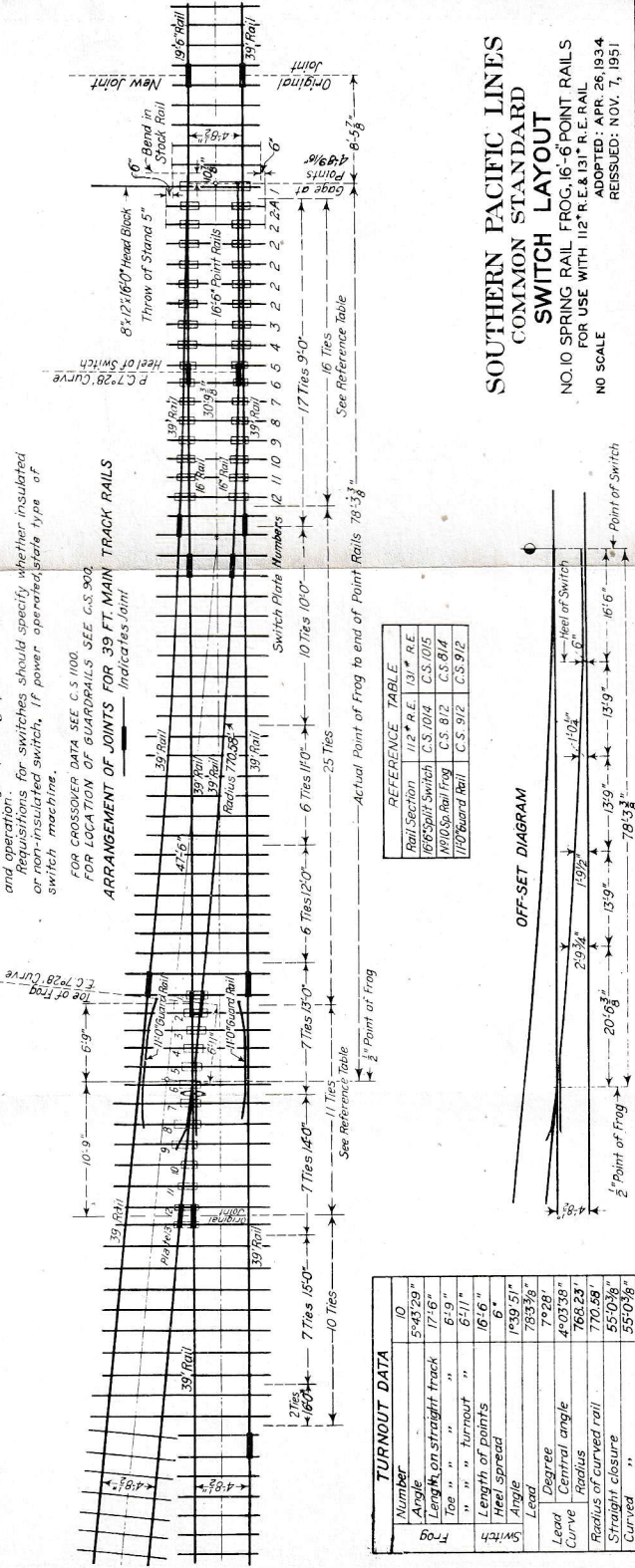
LIST OF SWITCH TIES SHOWING LENGTHS		
MAXIMUM LENGTH OF TIE	MAX. LENGTH OF TIE 140°	MAX. LENGTH OF TIE 120°
No. of Ties	Length	No. of Ties
17	9'-0"	17
10	10'-0"	10
6	11'-0"	6
6	12'-0"	6
7	13'-0"	7
7	14'-0"	7
2	15'-0"	1
63	16'-0"	54
Total		304

NOTES: Switch stave to be placed on turnout side except when otherwise authorized.
 Lengths of rails in lead may be varied to suit rail on hand.
 Position of rails in lead may be interchanged when joints approximately opposite each other are not required in connection with signal work.
 Ties exceeding 140° in length may be omitted beyond joint at heel of frog, depending upon local conditions of maintenance and operation.
 Radii for switches should specify whether insulated or non-insulated switch, if power operated, state type of switch machine.

FOR CROSSOVER DATA SEE C.S. 1100
 FOR LOCATION OF GUARDRAILS SEE C.S. 902

ARRANGEMENT OF JOINTS FOR 39 FT. MAIN TRACK RAILS

Indicates Joint



TURNOUT DATA	
Number	10
Angle	5°43'29"
Length on straight track	17'-6"
Toe	6'-9"
" " turnout	6'-11"
Length of points	16'-6"
Heel spread	6"
Lead	1'39.51"
Angle	7°28'
Curve	4°03'58"
Radius of curved rail	766.23'
Straight closure	55'0.38"
Curved "	55'0.38"

REFERENCE TABLE	
Rail Section	112 R.E. 131 R.E.
16'6" Split Switch	C.S. 1014 C.S. 1015
16'10" Sp. Rail Frog	C.S. 812 C.S. 814
17'0" Board Rail	C.S. 912 C.S. 912

OFF-SET DIAGRAM



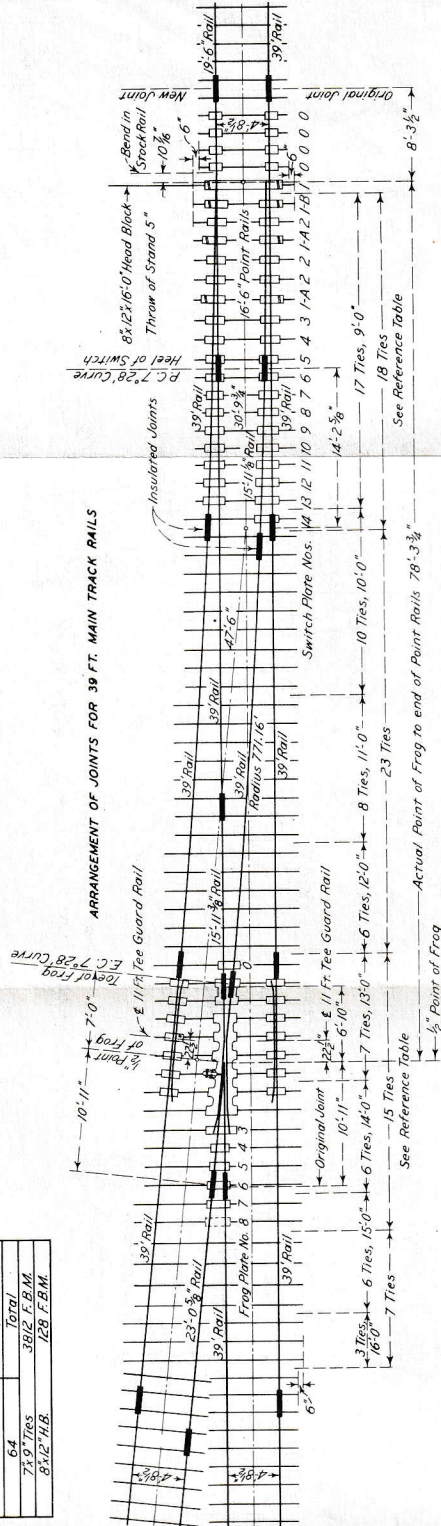
SOUTHERN PACIFIC LINES
 COMMON STANDARD
 SWITCH LAYOUT
 NO. 10 SPRING RAIL FROG 16'-6" POINT RAILS
 FOR USE WITH 112 R.E. & 131 R.E. RAIL
 NO SCALE
 ADOPTED: APR. 26, 1934
 REISSUED: NOV. 7, 1951

C.S.
1159

NOTES: Switch stand to be placed on turnout side except when otherwise authorized.
 Lengths of rails in lead may be varied to suit rail on hand.
 Position of rails in lead may be interchanged when joints approximately opposite each other are not required in connection with signal work.
 Requirements for switches should specify whether insulated or non-insulated switch. If power operated, state type of switch machine.
 Frog plate No. 8 on 12" frog rail, or as shown on drawing C.S. 1100.
 For cross-over, see drawing C.S. 1100.
 Closure rails behind heel of switch points to be drilled for anti-creeper straps when required.

LIST NO. 10-D

NUMBER OF TIES	LENGTH OF TIES
17	9'-0"
10	10'-0"
8	11'-0"
6	12'-0"
7	13'-0"
6	14'-0"
6	15'-0"
3	16'-0"
Total	
64	3812 F.B.M.
7 1/2 Ties	428 F.B.M.
8 1/2 Ties	428 F.B.M.



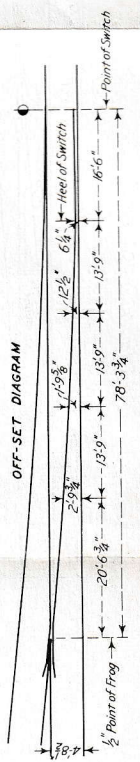
REFERENCE TABLE

Rail Section	1/3" H.F.	1/2" R.E.	1/2" H.F.
16'-6" Split Switch	C.S. 1016	C.S. 1009	C.S. 1017
" " Without Heel Block	C.S. 1018	C.S. 809	C.S. 1019
No. 10 Spring Rail Frog	C.S. 818	C.S. 809	C.S. 819
Adjustable Rail Brace and Plates	C.S. 1002	C.S. 1002	C.S. 1002
17'-0" Tee Guard Rail	C.S. 912	C.S. 912	C.S. 912

TURNOUT DATA

Number	10
Angle	5°43'20"
Length on straight track	71'-0"
Tee " " " "	6'-10"
" " " " " "	9'-0"
Length of points	16'-0"
Heel spread	14'-0"
Lead	78'-3 1/4"
Degree	7'-2 1/2"
Central angle	4°00'23"
Radius	768.81
Radius of curved rail	771.16
Straight closure	54'-7 1/4"
Curved " "	54'-7 1/4"

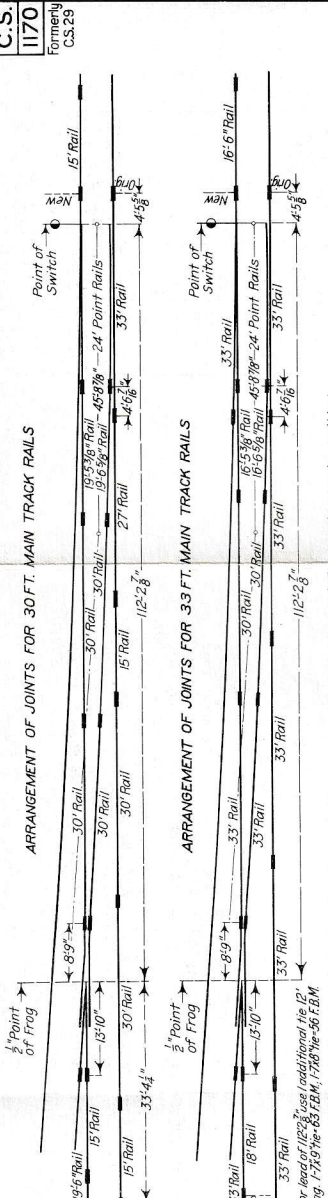
SOUTHERN PACIFIC LINES
 COMMON STANDARD
 SWITCH LAYOUT
 NO. 10 SPRING RAIL FROG
 AND 16'-6" POINT RAILS
 FOR USE WITH 113" H.F., 115" R.E. & 132" H.F. RAIL
 NO SCALE
 ADOPTED: JULY 8, 1949
 REVISED: OCT. 10, 1950



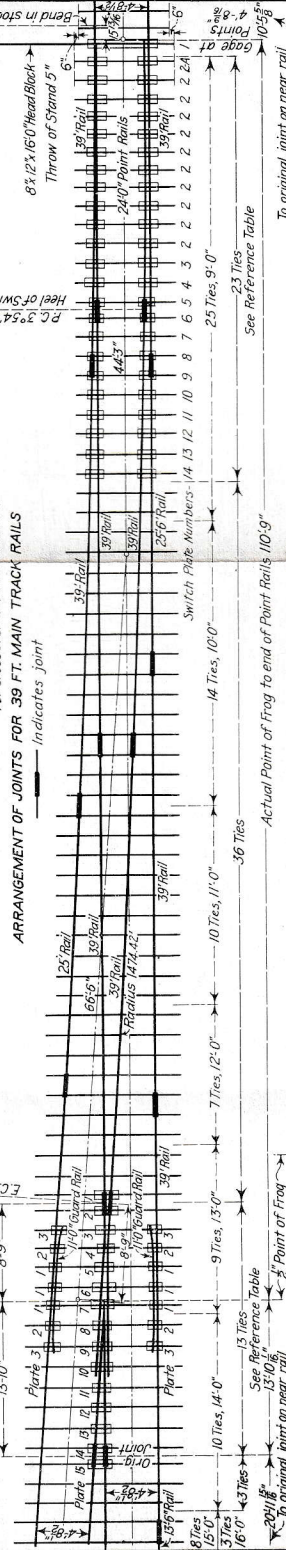
LIST OF SWITCH TIES SHOWING LENGTHS
 Size 7x9 with 90° or heavier rail section.
 Size 7x8 with less than 90° rail section,
 except where 7x9 cross ties are standard.

MAX. LENGTH OF TIE 16'0"		MAX. LENGTH OF TIE 14'0"	
No. of Ties	Length	No. of Ties	Length
2-5	9'-0"	2-5	9'-0"
4	10'-0"	1-4	10'-0"
7	11'-0"	1-0	11'-0"
9	12'-0"	7	12'-0"
10	13'-0"	9	13'-0"
3	14'-0"	10	14'-0"
8	15'-0"	1	16'-0" (6x12 H.B.)
8-7	16'-0" (12x18)		
Total		76	

7x9 Ties 5166 F.B.M. 7x9 Ties 4284 F.B.M.
 7x8 Ties 4392 F.B.M. 7x8 Ties 3808 F.B.M.
 8x12 H.B. 128 F.B.M. 8x12 H.B. 128 F.B.M.



NOTES: Switch stand to be placed on turnout side except when otherwise authorized.
 Lengths of rails in lead may be varied to suit rail on hand; rails in lead may be interchanged when points are approximately opposite each other are not required in connection with signal work.
 Ties exceeding 14'0" in length may be omitted beyond joint at heel of frog, depending upon local conditions or requirements. The contractor should specify whether insulated or non-insulated switch, if power operated, state type of switch machine.
 For location of guard rails see C.S. 900.
 For crossover data see C.S. 1100.

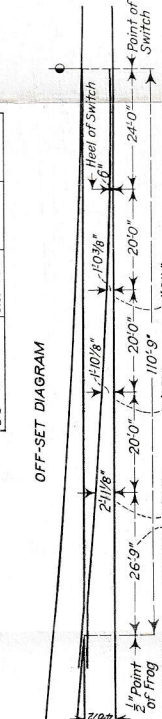


TURNOUT DATA

Number	14
Angle	49° 27'
Length on straight track	22'-7"
Toe "	8'-9"
" " " turnout "	8'-9"
Length at points	24'-0"
Lead spread	6"
Angle	9° 08' 38"
Lead	3'-5 1/4"
Curve radius	2965.49'
Radius of curved rail	1472.07'
Straight closure	78'-0"
Curved "	78'-1 1/8"

REFERENCE TABLE

Rail Section	90° A.R.A.-A.	110° R.L.	130° P.S.
24'-0" Spill Switch	C.S. 1020	C.S. 1021	C.S. 1022
10'-4" R.B. Main Frog	C.S. 837	C.S. 837	C.S. 837
11'-0" Guard Rail	C.S. 911	C.S. 911	C.S. 911
8'3" "	C.S. 905		



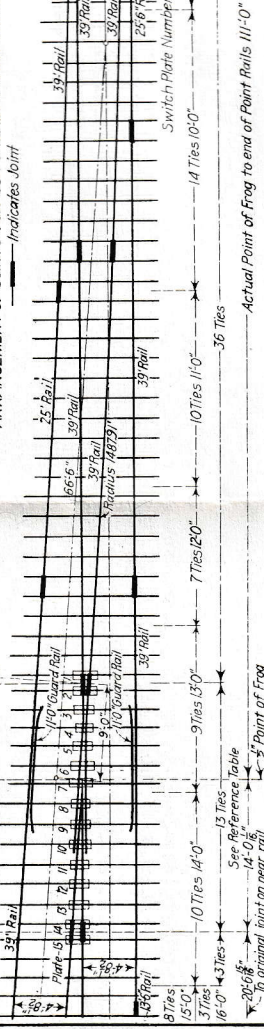
SOUTHERN PACIFIC LINES
COMMON STANDARD
SWITCH LAYOUT
 NO. 14 R.B. MANG. FROG 24 FT. POINT RAILS
 FOR USE WITH 90° A.R.A.-A. 110° R.L. & 130° P.S. RAIL
 NO SCALE
 ADOPTED: DEC. 1894
 REVISED: NOV. 11, 1931

LIST NR 14-A

LIST OF SWITCH TIES SHOWING LENGTH			
PRIMARY MAIN LINE SIZE 7"x9"			
MAX LENGTH OF TIE 80" MAX LENGTH OF TIE 140"			
No. of Ties	Length	No. of Ties	Length
25	9'-0"	25	9'-0"
14	10'-0"	14	10'-0"
10	11'-0"	10	11'-0"
7	12'-0"	7	12'-0"
9	13'-0"	9	13'-0"
10	14'-0"	10	14'-0"
3	15'-0"	1	16'-0"
87	Total	76	Total
7x9 Ties	5166 F.B.M.	7x9 Ties	4284 F.B.M.
8x12 H.B.	128 F.B.M.	8x12 H.B.	128 F.B.M.

NOTES: Switch stand to be placed on turnout side except when otherwise authorized.
Lengths of rails in lead may be varied to suit rail joints or rails in lead may be interchanged while joints approximately opposite each other are not required in connection with signal work.
Ties exceeding 14'0" in length may be omitted beyond joint at heel of frog depending upon local conditions or for switches should specify whether insulated or non-insulated switch, if power operated, state type of switch machine.
For crossover data see C.S.1100.
For location of turnout see C.S.900.

ARRANGEMENT OF JOINTS FOR 39 FT. MAIN TRACK RAILS



TURNOUT DATA	
Number	14
Angle	105.27°
Length on straight track	24.35 - 11.8
Toe "	9'-0"
" " " Turnout "	9'-0"
Length of points	24'-0"
heel spread	1'08.58"
Lead	11'0.9"
Curve	3921'
Radius of curve	2951.49'
Radius of curve and rail	1485.56'
Straight closure	14.875'
Curved "	78.114'

REFERENCE TABLE	
Rail Section	112-lb. R.E. 131-lb. R.E.
	24-0" Sp.H. Switch C.S. 1023 G.S. 1024
	110-lb. B. Mang. Frog C.S. 837 C.S. 837
	110" Guard Rail C.S. 912 C.S. 912

OFF-SET DIAGRAM



SOUTHERN PACIFIC LINES
COMMON STANDARD
SWITCH LAYOUT
24 FT. POINT RAILS
NO. 14 R.B. MANG. FROG
FOR USE WITH 112 & 131-lb. R.E. RAIL
NO SCALE.
ADOPTED MAR. 30, 1934.
REVISED NOV. 11, 1931.

Plate No. 30

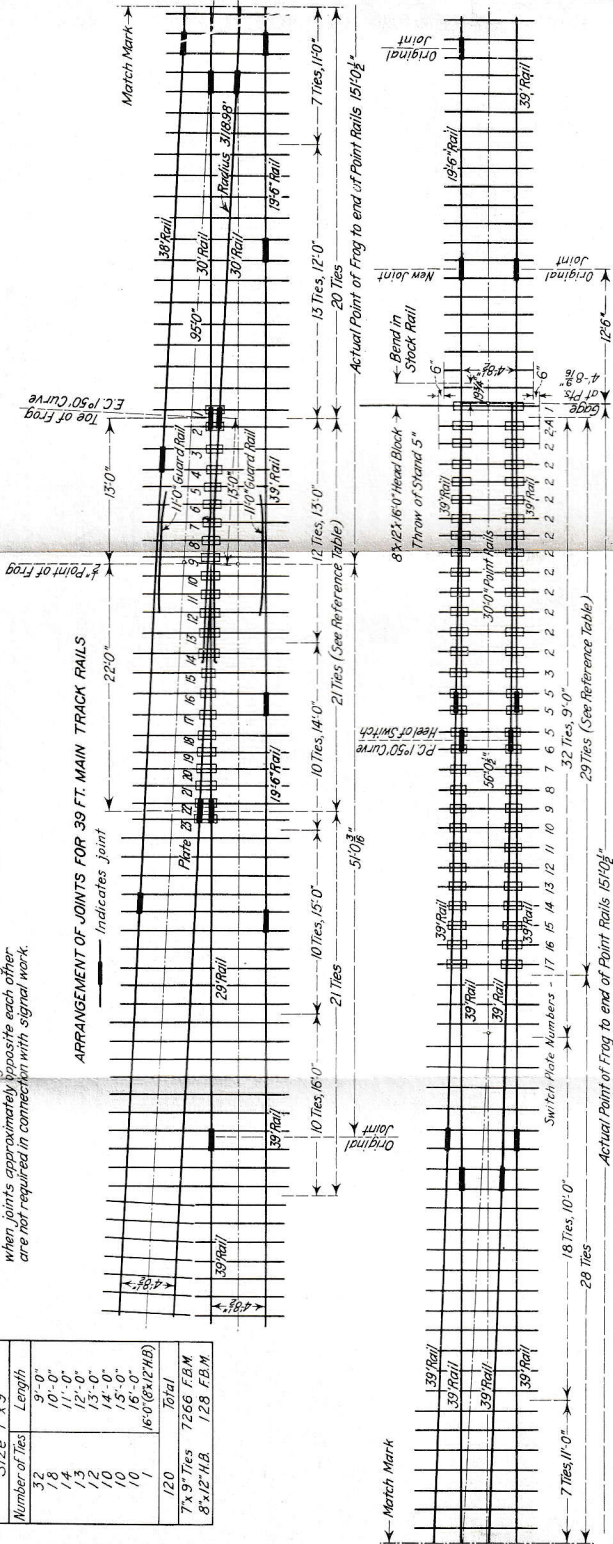
LIST No. 20-A

Number of Ties	Length
32	9'-0"
18	10'-0"
14	11'-0"
13	12'-0"
12	13'-0"
10	14'-0"
10	15'-0"
10	16'-0" (ex. 12 H.B.)
120	Total
7x9 Ties	7266 F.B.M.
8x12 H.B.	128 F.B.M.

NOTES: Switch stand to be placed on turnout side except when otherwise authorized.
 Lengths of rails in lead may be varied to suit rail on hand.
 Position of rails in lead may be interchanged when the spacing may be changed.
 Where required in connection with signal work.

Requirements for switches should specify whether insulated or non-insulated switch, if power operated, state type of switch machine.
 For location of guard rails see C.S. 900.
 For crossover data see C.S. 100.

ARRANGEMENT OF JOINTS FOR 39 FT. MAIN TRACK RAILS



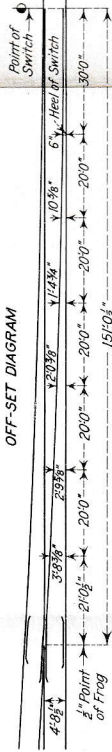
TURNOUT DATA

Number	20
Angle	2°-57'-31"
Length on straight track	35'-0"
Toe "	15'-0"
" " " Turnout "	15'-0"
Length of points	30'-0"
Lead Spread	0°-8'-45"
Lead	15'-4'-0"
Curve	1°-55'-55"
Radius	3116.65'
Radius of curved rail	3118.98'
Straight closure	108'-0 1/2"
Curved "	108'-0 1/2"

REFERENCE TABLE

Rail Section	11/2 1/2 H.B. 13/16 R.E.
3600 Split Switch	C.S. 1032 C.S. 7033
1800 R.R. Main Trg	C.S. 839 C.S. 839
1750 Guard Rail	C.S. 912 C.S. 912

OFF-SET DIAGRAM



SOUTHERN PACIFIC LINES
 COMMON STANDARD
SWITCH LAYOUT
 No 20 R.B. MANG. FROG
 30 FT. POINT RAILS
 FOR USE WITH 112 & 131-H. R.E. RAIL
 NO SCALE
 ADOPTED MAR 30, 1934
 REVISED APRIL 22, 1948

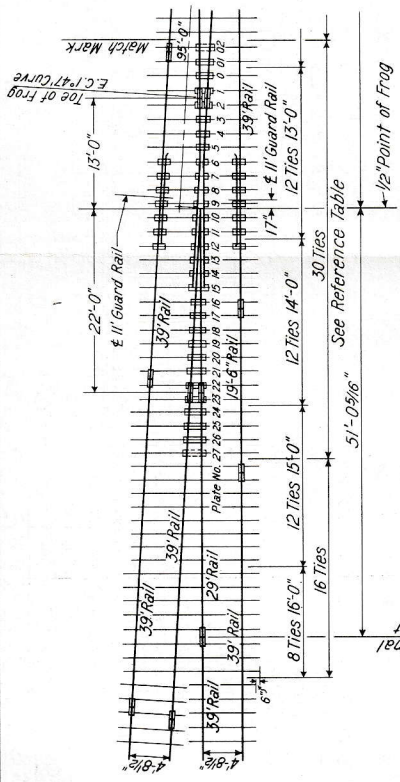
C.S. 1191

C.S.
1192

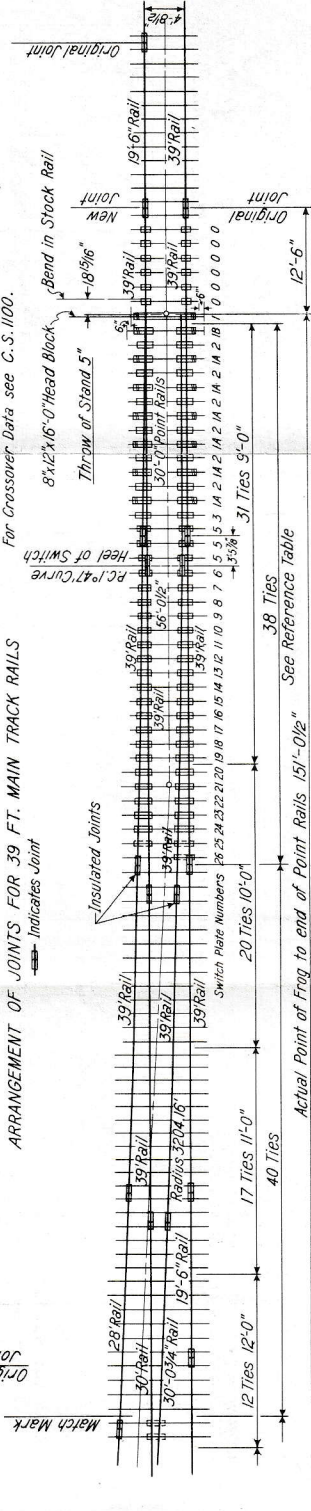
LIST No. 20-B
LIST OF SWITCH TIES SHOWING LENGTHS
PRIMARY MAIN LINE SIZE 7'3"

NUMBER OF TIES	LENGTH OF TIES
31	9'-0"
17	11'-0"
12	12'-0"
12	13'-0"
12	14'-0"
12	15'-0"
8	16'-0"
1	16'-0" (18" x 12" H.B.)
125	TOTAL
7'4 3/4" TIES	7571 F.B.M.
8' x 12" H.B.	128 F.B.M.

Notes:
Switch stand to be placed on turnout side except when otherwise authorized.
Lengths of rails in lead may be varied to suit rail on hand.
Position of rails in lead may be interchanged when joints approximately opposite each other are not required in connection with signal work.
Closure rails behind heel of switch points to be drilled for anti-creep struts when required.
Requisitions for switches should specify whether insulated or non-insulated switch. If power operated, state type of switch machine.
Frog Plates Nos. 02 & 21 for 132-10, H.F. Rail only.
Switch Plates Nos. 25 & 26 for 132-10, H.F. Rail only.
For Crossover data see C.S. 1100.



ARRANGEMENT OF JOINTS FOR 39 FT. MAIN TRACK RAILS



REFERENCE TABLE

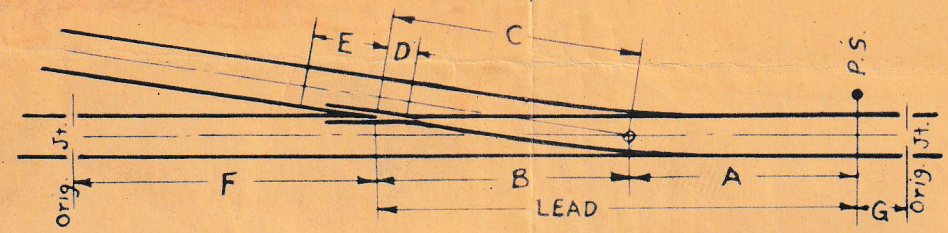
Rail Section	115-16 H.F.	115-16 R.E.	132-16 H.F.
	C.S. 1032A	C.S. 1038	C.S. 1032B
30'-0" Split Switch	C.S. 1036	C.S. 1038	C.S. 1037
No. 20 R.R. Mang. Frog	C.S. 659	C.S. 839	C.S. 839
1/2" Toe Guard Rail	C.S. 912	C.S. 916	C.S. 916
Adj. Rail Brace	C.S. 1002	C.S. 1002	C.S. 1002

TURNOUT DATA

Number	20
Angle	2° 51' 51"
Length on Straight Track	35'-0"
Toe Length on Straight Track	15'-0"
" " " Turnout "	15'-0"
Length of Points	30'-0"
Heel Spread	6 1/4"
Angle (1/2" then point)	0° 56' 42"
Lead	197'-0 1/2"
Lead	197'-0 1/2"
Central Angle	1° 44' 09"
Radius of Curved Rail	3304 ft.
Radius of Curved Rail	3304 ft.
Straight Closure	108'-0 1/2"
Curved Closure	108'-1 1/2"

SOUTHERN PACIFIC LINES
COMMON STANDARD
SWITCH LAYOUT

No. 20 R.B. MANG. FROG 30 FT. POINT RAILS
FOR USE WITH 115-16 H.F., 115-16 R.E. & 132-16 H.F. RAIL
NO SCALE
ADOPTED OCT. 10, 1950
REVISED NOV. 11, 1951



FROG NO.	POINT RAILS	ANGLE	LEAD	CURVE	SWITCH ANGLE	A	B	C	D	E	G	F		
												30 RAILS	33 RAILS	35 RAILS
6-R	10'	9°31'38"	49.41	20°10'	2°23'17"	20.91	28.50	28.50	3.50	5.50	12.60	38.53	26.52	35.52
6-R	15'	9°31'38"	56.91	20°53'	1°35'31"	28.41	28.50	28.50	3.50	5.50	7.10	23.52	22.02	33.52
7-R	10'	8°10'16"	54.22	14°35'	2°23'17"	20.97	33.25	33.25	3.79	6.21	7.08	6.21	24.22	36.22
7-R	15'	8°10'16"	62.72	15°09'	1°35'31"	29.47	33.25	33.25	3.79	6.21	3.58	6.21	6.21	31.22
7-R	16.5'	8°10'16"	63.22	15°18'	1°39'51"	29.97	33.67	33.25	3.79	6.21	4.08	24.22	27.22	30.22
7-M	16.5'	8°10'16"	63.64	15°53'	1°39'51"	30.39	33.25	33.25	4.71	7.29	3.58			30.31
7½	16.5'	7°40'	66.32	14°00'	1°39'51"	30.57	35.76	35.76	3.79	6.21	10.00			
8M	16.5'	7°09'10"	69.02	11°49'	1°39'51"	31.02	38.00	38.00	5.08	7.92	20.58			7.92
9R	15'	6°21'35"	73.57	9°03'	1°35'31"	30.82	42.76	42.75	4.63	7.38	16.57	25.39	28.39	7.38
9S	15'	6°21'35"	70.70	10°35'	1°35'31"	27.95	42.75	42.75	6.17	8.83	9.49	26.85	34.85	56.36
9M	16.5'	6°21'35"	75.07	9°27'	1°39'51"	32.32	42.75	42.75	6.13	9.17	13.28			9.17
9R	16.5'	6°21'35"	75.07	8°54'	1°39'51"	32.32	42.75	42.75	4.63	7.38	15.07	25.39	28.39	7.38
9S	16.5'	6°21'35"	72.20	9°56'	1°39'51"	29.45	42.75	42.75	6.17	8.83	7.99	26.85	34.85	56.36
10R	15'	5°43'29"	77.21	7°49'	1°35'31"	29.71	47.50	47.50	6.75	9.75	10.56	22.77	30.77	9.76
10S	15'	5°43'29"	78.20	7°26'	1°35'31"	30.70	47.50	47.50	6.17	8.83	16.49	23.85	29.85	41.85
10R	16.5'	5°43'29"	78.71	7°21'	1°39'51"	31.21	47.50	47.50	6.75	9.75	9.06	22.77	30.77	9.76
10M	16.5'	5°43'29"	78.71	7°21'	1°39'51"	31.21	47.50	47.50	6.75	9.75	9.06			9.76
10M ¹¹² / ₁₃₁	16.5'	5°43'29"	78.71	7°21'	1°39'51"	31.21	47.50	47.50	6.75	10.75	8.06			10.76
10S	16.5'	5°43'29"	78.28	7°28'	1°39'51"	30.78	47.50	47.50	6.75	9.75	9.49	22.77	33.77	9.76
10S ¹¹² / ₁₃₁	16.5'	5°43'29"	78.28	7°28'	1°39'51"	30.78	47.50	47.50	6.75	10.75	8.49	23.77	34.77	10.76
12S	15'	4°46'19"	87.61	5°04'	1°35'31"	30.61	57.00	57.00	6.58	9.92	8.99	35.43	22.93	39.93
12S	16.5'	4°46'19"	89.28	4°46'	1°39'51"	32.28	57.00	57.00	6.75	9.75	7.49	35.27	22.76	39.76
12M	16.5'	4°46'19"	89.16	4°46'	1°39'51"	32.16	57.00	57.00	6.75	12.00	5.36			42.02
12M ¹¹² / ₁₃₁	16.5'	4°46'19"	90.16	4°56'	1°39'51"	33.16	57.00	57.00	7.75	13.00	5.36			41.02
12	24'	4°46'19"	101.91	5°10'	1°10'53"	44.91	57.00	57.00	7.00	9.25	8.51			
14M	24'	4°05'27"	110.75	3°54'	1°08'38"	44.25	66.50	66.50	8.75	13.83	10.47			15.33
14M ¹¹² / ₁₃₁	24'	4°05'27"	111.00	3°51'	1°08'38"	44.50	66.50	66.50	9.00	14.00	10.47			54.09
14M ¹³¹ / ₁₃₁	24'	4°05'27"	111.00	3°51'	1°08'38"	44.50	66.50	66.50	9.00	15.00	10.47			54.09
20M	30'	2°51'51"	151.50	1°48'	0°54'55"	56.50	95.00	95.00	10.50	18.50	12.54			50.52
20M ¹¹² / ₁₃₁	30'	2°51'51"	151.04	1°50'	0°54'55"	56.04	95.00	95.00	13.00	22.00	12.50			51.02

R = RIGID FROGS - CS-1103 M = RAIL BOUND MANGANESE FROGS - CS-1101
 S = SPRING RAIL FROGS - CS-1105

