

THE WESTERN PACIFIC RAILROAD CO.

# STANDARD PLANS

OFFICE OF CHIEF ENGINEER

## TURNOUTS

#5½	Turnout	85#	B.R.Frog	10'-0"	Pts.	S-114A
#5½	Turnout	85#	B.R.Frog	15'-0"	Pts.	S-223
#7	Turnout	85#	B.R.Frog	15'-0"	Pts.	S-96
#7	Turnout	85#	S.G.Frog	15'-0"	Pts.	S-99
#8	Turnout	Girder Rail	250'	Rad.Switch		S-11
#8	Turnout	Girder Rail	400'	Rad.Switch		S-9
#8½	Turnout	85#	B.R.Frog	16'-6"	Pts.	S-93
#8½	Turnout	85#	S.G.Frog	16'-6"	Pts.	S-93A
#10	Turnout	85#	S.R.Frog	16'-6"	Pts.	S-92
#10	Turnout	85#	S.G.Frog	16'-6"	Pts.	S-224
#10	Turnout	100#	S.R.Frog	16'-6"	Pts.	S-73
#10	Turnout	100#	RBM Frog	16'-6"	Pts.	S-73
#10	Turnout	112#	S.R.Frog	16'-6"	Pts.	S-73
#10	Turnout	112#	RBM Frog	16'-6"	Pts.	S-73
#10	Turnout	115#	S.R.Frog	16'-6"	Pts.	S-73
#10	Turnout	115#	RBM Frog	16'-6"	Pts.	S-73
#10	Turnout	119#	S.R.Frog	16'-6"	Pts.	S-73
#10	Turnout	119#	RBM Frog	16'-6"	Pts.	S-73
#10	Turnout	132#	S.R.Frog	16'-6"	Pts.	S-73
#10	Turnout	132#	RBM Frog	16'-6"	Pts.	S-73
#10	Turnout	136#	S.R.Frog	16'-6"	Pts.	S-73
#10	Turnout	136#	RBM Frog	16'-6"	Pts.	S-73
#14	Turnout	115#	S.R.Frog	24'-0"	Pts.	S-206
#14	Turnout	115#	RBM Frog	24'-0"	Pts.	S-208
#14	Turnout	119#	RBM Frog	24'-0"	Pts.	S-208
#14	Turnout	132#	RBM Frog	24'-0"	Pts.	S-208
#14	Turnout	136#	RBM Frog	24'-0"	Pts.	S-208

## FROGS

#5½	85#	Bolted Rigid Frog	S-152
#7	85#	Bolted Rigid Frog	S-151
#8½	85#	Bolted Rigid Frog	S-150
#7	85#	Self-Guarded Manganese Frog	S-191
#8½	85#	Self-Guarded Manganese Frog	S-190
#10	85#	Self-Guarded Manganese Frog	S-198
#10	85#	Spring Rail Frog	S-117
#10	100#	Spring Rail Frog	S-120
#10	112#	Spring Rail Frog	S-110
#10	115#	Spring Rail Frog	S-205
#10	119#	Spring Rail Frog	S-205
#10	132#	Spring Rail Frog	S-214
#10	136#	Spring Rail Frog	S-214
#14	115#	Spring Rail Frog	S-202
#7	100#	Railbound Manganese Frog	S-138
#8½	112#	Railbound Manganese Frog	S-135
#10	100#	Railbound Manganese Frog	S-137
#10	112#	Railbound Manganese Frog	S-136
#10	115#	Railbound Manganese Frog	S-136
#10	119#	Railbound Manganese Frog	S-136
#10	132#	Railbound Manganese Frog	
#10	136#	Railbound Manganese Frog	
#14	112#	Railbound Manganese Frog	S-133
#14	115#	Railbound Manganese Frog	S-133
#14	119#	Railbound Manganese Frog	S-133
#14	132#	Railbound Manganese Frog	S-212
#14	136#	Railbound Manganese Frog	S-212

TURNOUTS FROGS

## SWITCHES

10'-0"	Split Switch	85#	S-154
15'-0"	Split Switch	85#	S-153
16'-6"	Split Switch	85#	S-116
16'-6"	Split Switch	100#	S-121
16'-6"	Split Switch	112#	S-109
16'-6"	Split Switch	115#	S-207
16'-6"	Split Switch	119#	S-207
16'-6"	Split Switch	132#	S-215
16'-6"	Split Switch	136#	S-215
24'-0"	Split Switch	115#	S-203
24'-0"	Split Switch	119#	S-203
24'-0"	Split Switch	132#	S-213
24'-0"	Split Switch	136#	S-213
Switch Point Derail		85#	S-91
Switch Point Guard		85#	S-199
Switch Point Guard		112#	S-20
Switch Point Guard		115#	S-20
Switch Point Lock			S-129

## GUARD RAILS

85#	8'-3"	Guard Rail	S-31
85#	11'-0"	Guard Rail	S-30
100#	11'-0"	Guard Rail	S-119
112#	11'-0"	Guard Rail	S-108
115#	11'-0"	Guard Rail	S-108A
115#	13'-0"	Guard Rail	S-204
119#	11'-0"	Guard Rail	S-108A
119#	13'-0"	Guard Rail	S-204
132#	11'-0"	Guard Rail	S-216
132#	13'-0"	Guard Rail	S-217
136#	11'-0"	Guard Rail	S-216
136#	13'-0"	Guard Rail	S-217
Guard Rail for Tunnels & Bridges			S-60
Guard Rail for Curves - 85#			S-105
Guard Rail for Curves - 115#			S-189

## SWITCH STANDS

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Parallel Ground Throw Switch Stand	S-142
Jack-knife Switch Stand	S-167
Jack-knife Switch Stand Box & Cover	S-168
Connecting Rods for Switch Stands	S-141
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## ROADBED, BALLAST, RIGHT-OF-WAY

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Superelevation Tables	S-43
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Flags, Slow, Resume Speed	S-25

## MISCELLANEOUS

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Tie Plate Shims	S-159
Paint Standards	S-195
Flags, Red Warning	S-25A
Flags, Slow, Resume Speed	S-25

C.E.  
S-114A

**SWITCH TIE LIST**

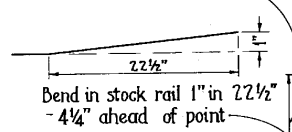
	Pieces 7'x9"														Total Number Pieces	Total Feet B.M.			
	9'x12"	16'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"			14'-6"	15'-0"	15'-6"
Double Headblock	0	5	4	3	2	2	3	1	2	2	2	1	2	1	4	1	2	37	2262.8
Single Headblock	1	6	4	3	2	2	3	1	2	2	2	1	2	1	2	1	2	37	2293.9

When single headblock is used place the 9'x12'x16'-0" tie under end of switch points.

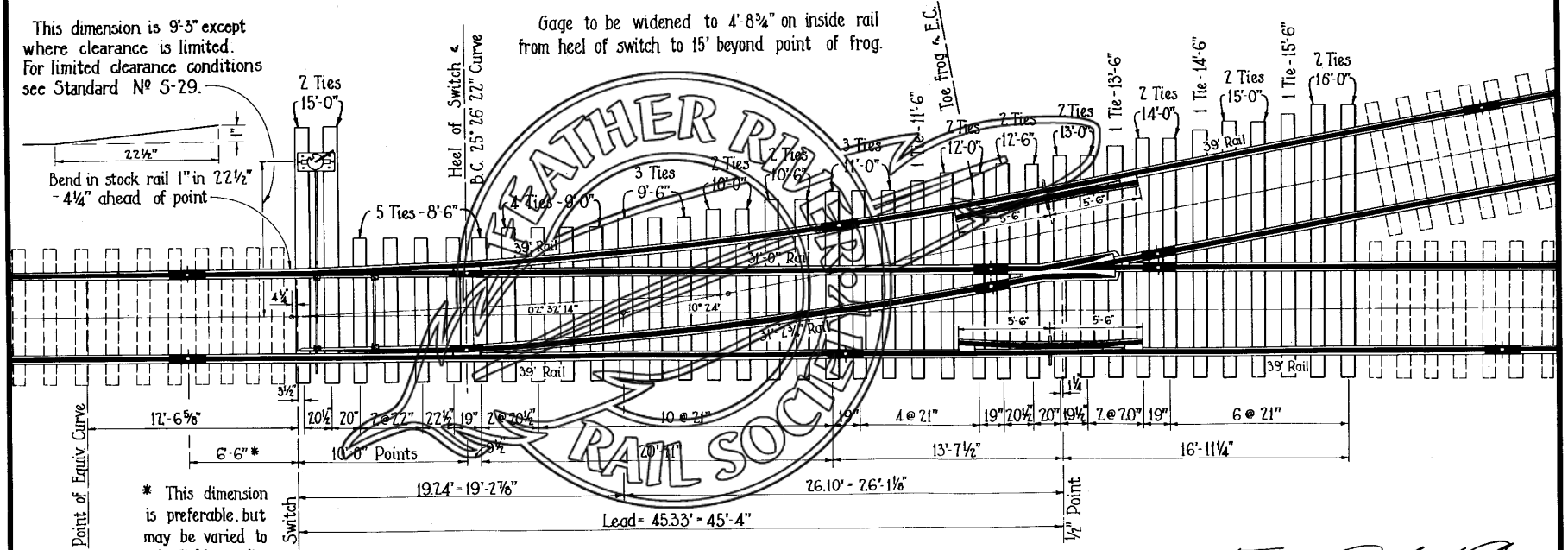
FROG ANGLE ..... 10° 24'  
 DEGREE OF TURNOUT CURVE... 25° 26' 22"  
 LEAD ..... 45'-4"  
 CLOSURE RAILS ..... 1-31'-0" & 1-31'-2 3/4"

Note: Other lengths may be used for closure rails, but minimum length should be 15'-0".

This dimension is 9'-3" except where clearance is limited. For limited clearance conditions see Standard No 5-29.

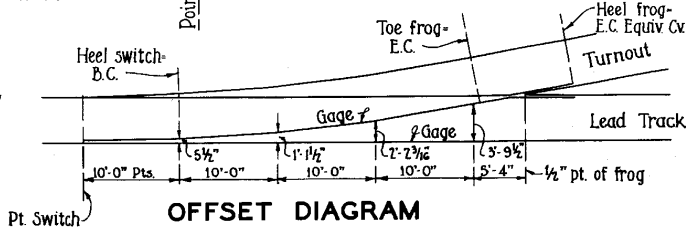


Gage to be widened to 4'-8 1/2" on inside rail from heel of switch to 15' beyond point of frog.



\* This dimension is preferable, but may be varied to suit field conditions.

Equiv. Cv.  
 $\Delta = 10^\circ 24'$   
 $R = 349.258'$   
 $T = 31.785'$   
 $L = 63.395'$   
 $D = 16^\circ 25' 08''$



**OFFSET DIAGRAM**

REFERENCES	
No 5 1/2 Bolted Rigid Frog	S-152A
10'-0" Split Switch	S-154A
11'-0" Guard Rail	S-30
Connecting Rods	S-141
Application of Switch Stands	S-29

Approved: *Fram A. Woodard*  
 Chief Engineer

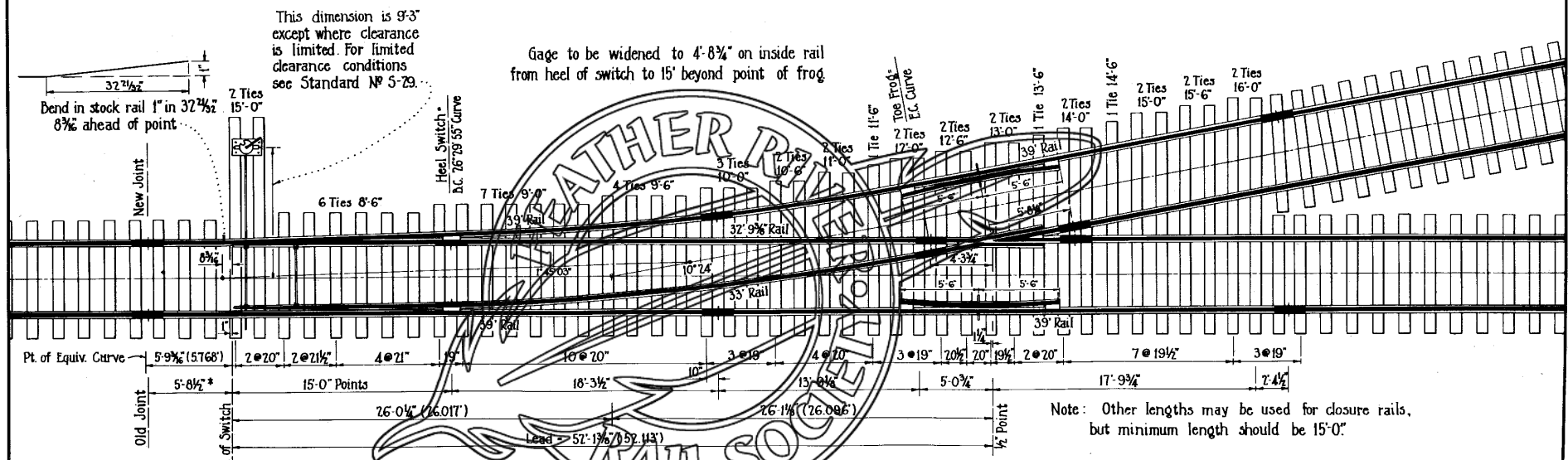
**THE WESTERN PACIFIC RAILROAD CO.**  
 STANDARD  
**NO 5 1/2 TURNOUT COMPLETE**  
 FOR USE WITH 85 LB. 39 FT. RAIL  
 10'-0" POINTS

NO SCALE ADOPTED: January 21, 1955

FROG ANGLE ..... 10° 24'  
DEGREE OF TURNOUT CURVE ..... 26° 29' 55"  
LEAD ..... 52'-1 1/8"

	SWITCH TIE LIST															Total Number Pieces	Total Feet D.M.		
	Pieces 7"x9"																		
	9"x12"	16'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	15'-6"	16'-0"	
Double Headblock	0	6	7	4	3	2	2	1	2	2	2	1	2	1	4	2	2	43	2575.1
Single Headblock	1	7	7	4	3	2	2	1	2	2	2	1	2	1	2	2	2	43	2606.2

When single headblock is used place the 9"x12"x16'-0" tie under end of switch points.



This dimension is 9'-3" except where clearance is limited. For limited clearance conditions see Standard No 5-29.

Gage to be widened to 4'-8 3/4" on inside rail from heel of switch to 15' beyond point of frog.

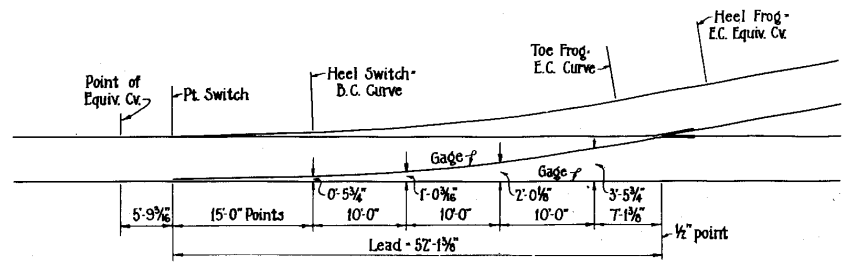
Note: Other lengths may be used for closure rails, but minimum length should be 15'-0".

\* This dimension is preferable, but may be varied to suit existing field conditions.

REFERENCE	
11'-0" Guard Rail	5-30
No 5 1/2 Bolted Rigid Frog	5-152A
15'-0" Split Switch	5-153A
Connecting Rods	5-141
Application of Switch Stands	5-29

Approved: *Frank R. McCall*  
Chief Engineer

Equiv. Curve  
Δ = 10° 24'  
R = 349.258'  
T = 31.785'  
L = 63.395'  
D = 16° 25' 08"



OFFSET DIAGRAM

THE WESTERN PACIFIC RAILROAD CO.  
STANDARD  
**No 5 1/2 TURNOUT COMPLETE**  
FOR USE WITH 85 LB. 39 FT. RAIL  
15'-0" POINTS

NO SCALE ADOPTED: January 21, 1955

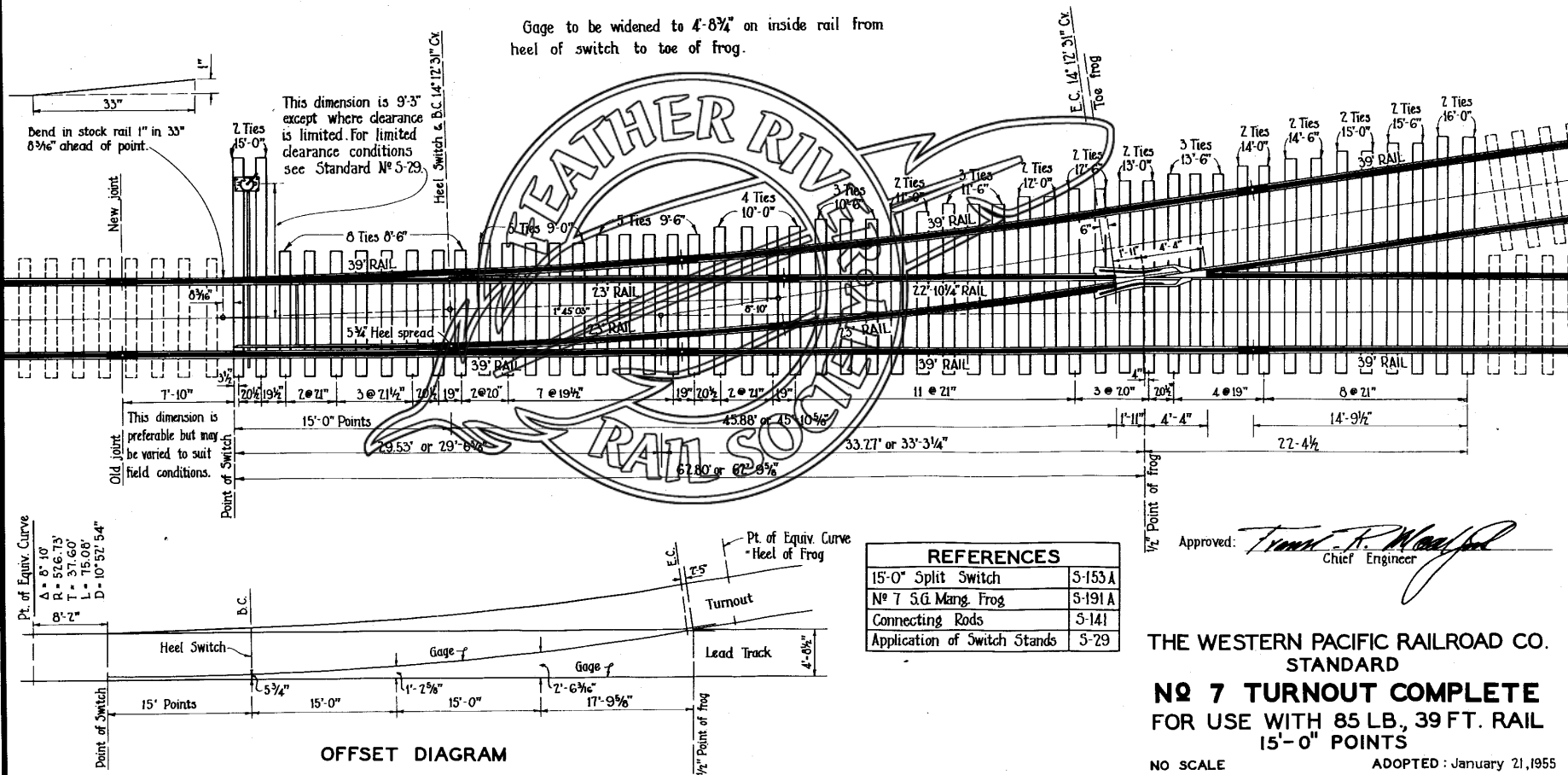
**SWITCH TIE LIST**

Pieces 7"x9"														Total Number Pieces	Total Feet D.M.		
8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	15'-6"	16'-0"	51	3066

FROG ANGLE ..... 8° 10'  
 DEGREE OF TURNOUT CURVE ..... 14° 12' 31"  
 LEAD ..... 62'-9 5/8"  
 CLOSURE RAILS ..... 3-23' & 1-22'-10 1/4"  
 Other lengths may be used for closure rails but  
 minimum length should be 15'-0".

C.E.  
 S-99

Gage to be widened to 4'-8 3/4" on inside rail from  
 heel of switch to toe of frog.



**OFFSET DIAGRAM**

REFERENCES	
15'-0" Split Switch	S-153A
No 7 S.G. Mang. Frog	S-191A
Connecting Rods	S-141
Application of Switch Stands	S-29

Approved: *Frank R. M...*  
 Chief Engineer

**THE WESTERN PACIFIC RAILROAD CO.**  
**STANDARD**  
**No 7 TURNOUT COMPLETE**  
**FOR USE WITH 85 LB., 39 FT. RAIL**  
**15'-0" POINTS**

NO SCALE ADOPTED: January 21, 1955

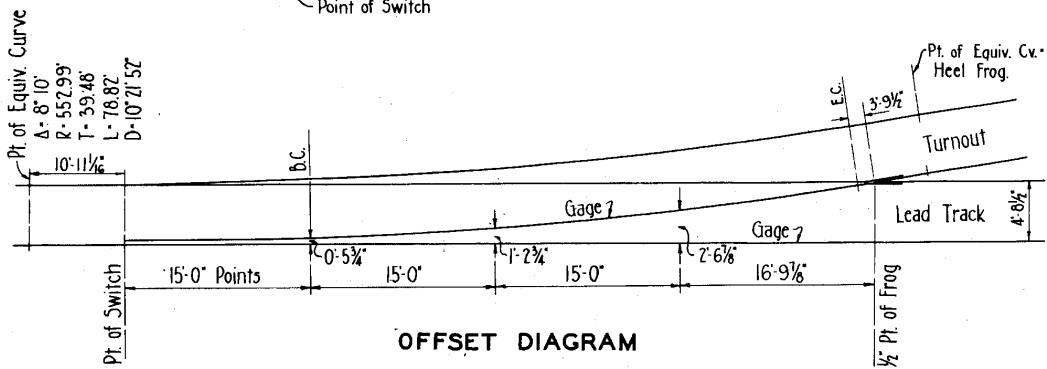
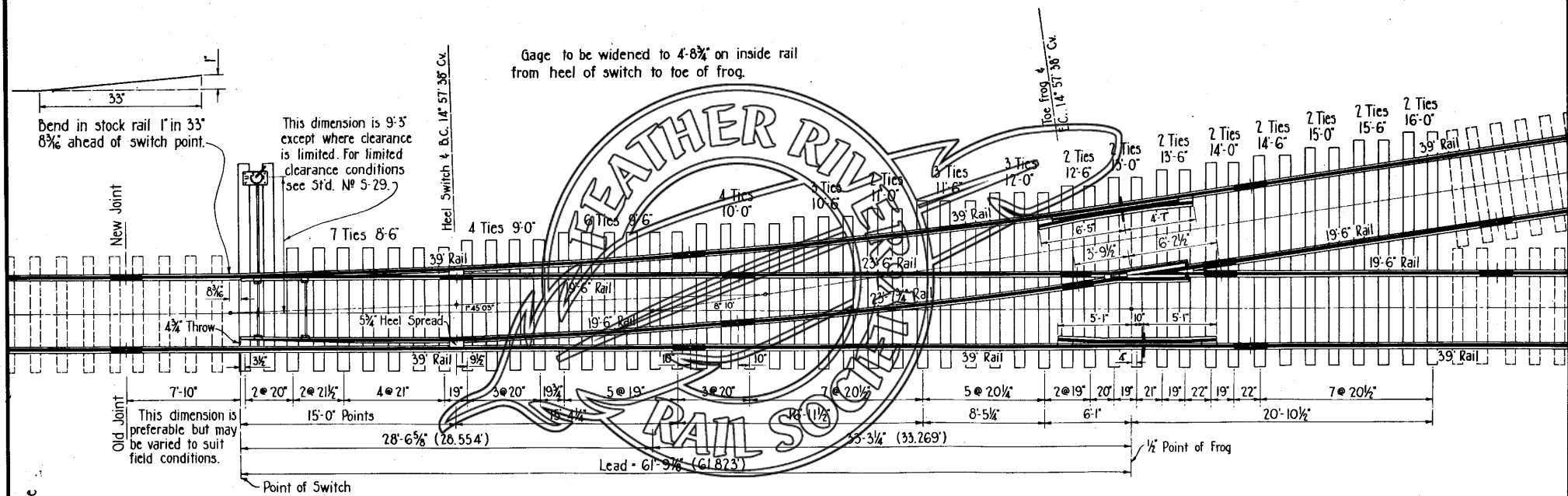
**SWITCH TIE LIST**

Pieces 7x9'													Total Number Pieces	Total Feet D. M.			
8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	15'-6"	16'-0"	50	3016 <sup>1</sup>

Frog Angle \_\_\_\_\_ 8° 10'  
 Degree of Turnout Curve \_\_\_\_\_ 14° 57' 38"  
 Lead \_\_\_\_\_ 61'-9 3/4"  
 Closure Rails \_\_\_\_\_ 2-19'-6" : 1-23'-6" : 1-23'-7 1/4"

C. E.  
 S-96

Other lengths may be used for closure rails but minimum length should be 15'-0"



**OFFSET DIAGRAM**

REFERENCES	
15'-0" Split Switch	S-153A
No. 7 Bolted Rigid Frog	S-151
11'-0" 85 Lb. Guard Rail	S-30
Application of Switch Stands	S-29
Connecting Rods	S-141

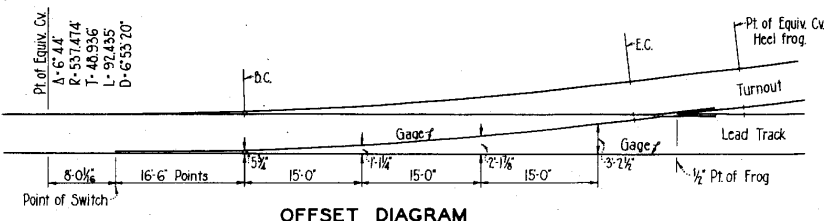
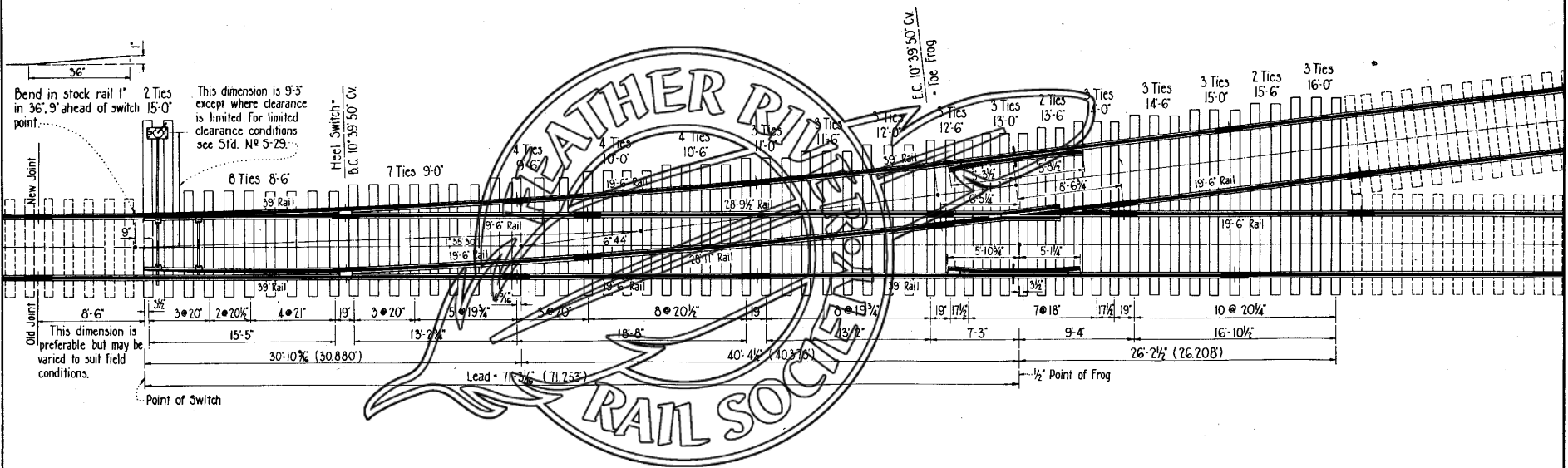
Approved: *Frank A. [Signature]*  
 Chief Engineer

**THE WESTERN PACIFIC RAILROAD CO.**  
**STANDARD**  
**NO. 7 TURNOUT COMPLETE**  
**FOR USE WITH 85 LB., 39 FT. RAIL**  
**15'-0" POINTS, BOLTED RIGID FROG**  
 NO SCALE  
 ADOPTED: Feb. 1, 1937  
 REVISED: Jan. 17, 1956



FROG ANGLE 6' 44"  
 DEGREE OF TURNOUT CURVE 10' 39' 50"  
 LEAD 71' 3 1/8"  
 CLOSURE RAILS 2'-19'-6", 1'-28'-9 1/2", 1'-28'-11"  
 Other lengths may be used for closure rails but minimum length should be 15'-0".

SWITCH TIE LIST															Total Number Pieces	Total Feet D.M.	
Pieces 7x9'																	
8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	15'-6"	16'-0"	60	3661 9/16



OFFSET DIAGRAM

REFERENCES	
16'-6" Split Switch	S-116A
Nº 8 1/2 Bolted Rigid Frog	S-150
11'-0" 85 Lb. Guard Rail	S-30
Connecting Rods	S-141
Application of Switch Stands	S-29

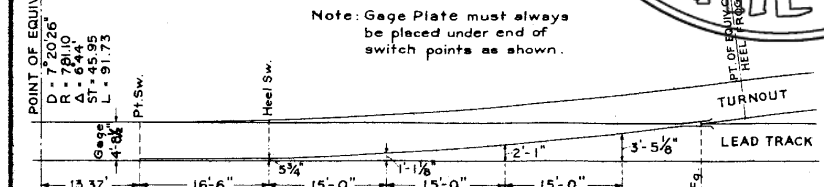
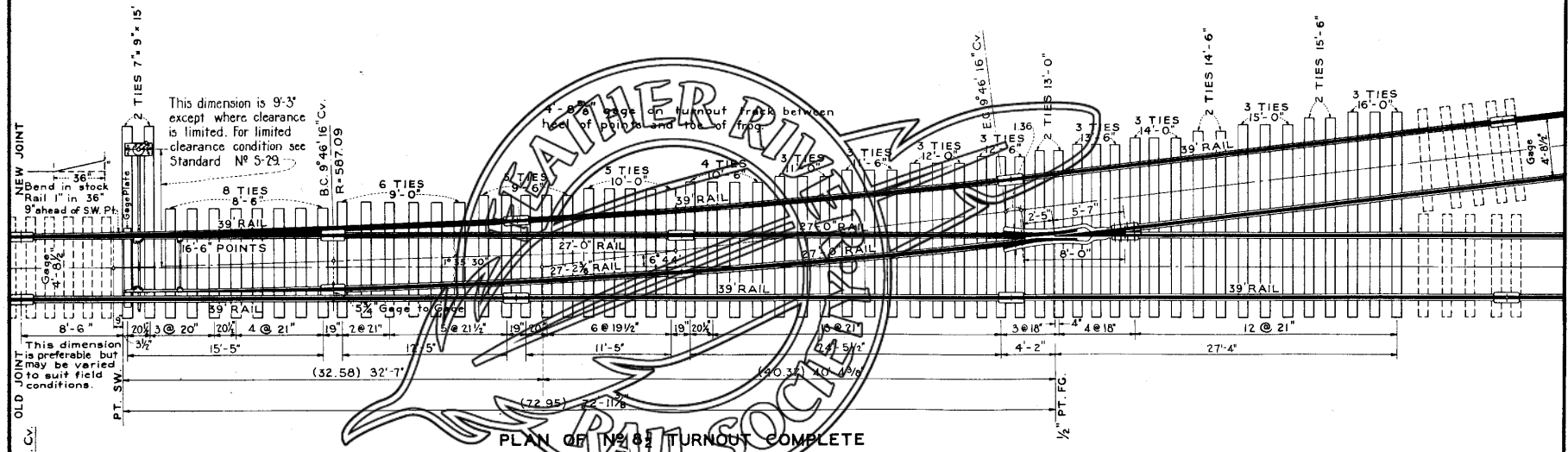
Approved *Fram A. Ward*  
 Chief Engineer

THE WESTERN PACIFIC RAILROAD CO.  
 STANDARD  
**Nº 8 1/2 TURNOUT COMPLETE**  
 FOR USE WITH 85 LB., 39' RAIL  
 16'-6" POINTS, BOLTED RIGID FROG

NO SCALE  
 ADOPTED: Nov. 1, 1944  
 REVISED: Jan. 17, 1956

SWITCH TIE LIST													TOTAL	TOTAL			
PIECES 7" X 9"													NUMBER	FEET			
8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	15'-6"	16'-0"	PIECES	F. B. M.
8	6	5	5	4	3	3	3	3	2	3	3	2	5	2	3	60	3643.5

FROG ANGLE ..... 6° 44'  
 DEGREE OF TURNOUT CURVE ..... 9° 46' 16"  
 LEAD ..... 72' 11 5/8"  
 Note: Other lengths may be used for closure rails, but minimum length should be 15'-0".



**OFFSET DIAGRAM 16'-6" POINTS**  
 Offsets shown are at right angles to lead track

REFERENCES	
16'-6" Split Switch	S-116A
No. 8 1/2 S.G. Mang. Frog	S-190
Connecting Rods	S-141
Application of Switch Stands	S-29

APPROVED *Frank A. Macfarland*  
 Chief Engineer

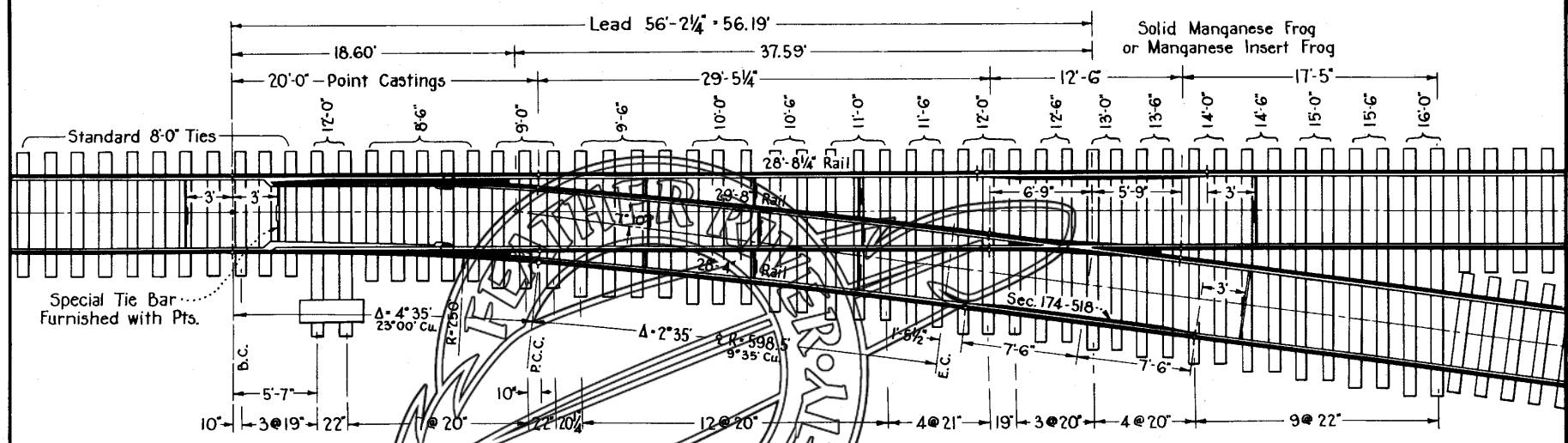
THE WESTERN PACIFIC RAILROAD CO.  
 STANDARD  
**No. 8 1/2 TURNOUT COMPLETE**  
 FOR USE WITH C. F. & I. SEC. 850-39' RAIL  
 SELF GUARDED FROG - 16'-6" POINTS

NO SCALE ADOPTED : January 21, 1955

SWITCH TIE LIST														TOTAL NUMBER PIECES	TOTAL FEET B.M.		
Pieces 7"x9"																	
8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	15'-6"	16'-0"		
5	3	4	3	2	3	2	5	2	2	2	2	2	2	2	2	43	2638'

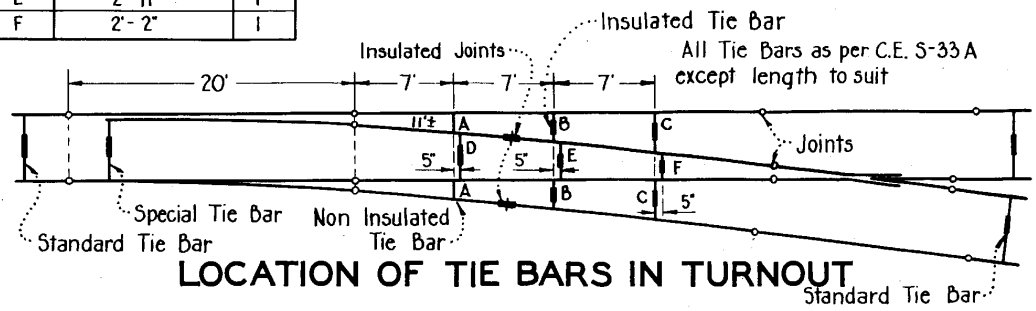
FROG ANGLE 7° 10'  
 DEGREE OF TURNOUT CURVE 9° 35'  
 LEAD 56'-2 1/4"

C.E.  
S-11



I SET SWITCH TIE BARS		
BAR	OVERALL LENGTH	NO.
A	1'-9"	2
B	2'-5"	2
C	3'-2"	2
D	3'-8"	1
E	2'-11"	1
F	2'-2"	1

PLAN OF NO. 8 GIRDER RAIL TURNOUT



LOCATION OF TIE BARS IN TURNOUT

Approved: *Frank T. Wadsworth*  
 Chief Engineer

THE WESTERN PACIFIC RAILROAD CO.  
 STANDARD  
**NO. 8 GIRDER RAIL  
 TURNOUT**  
 WITH 250' RADIUS SWITCH

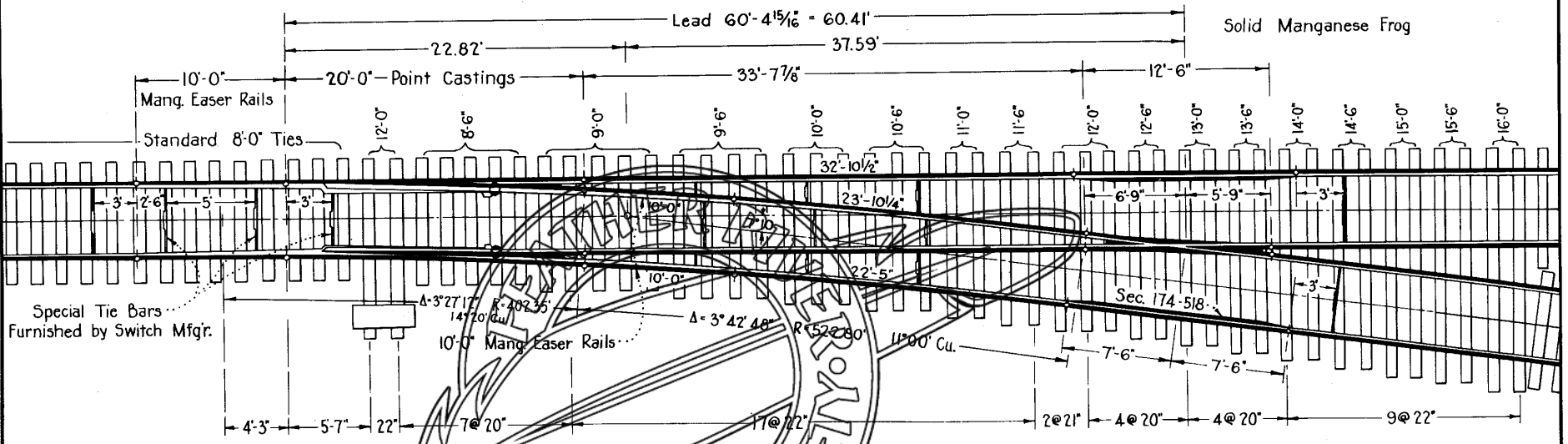
NO SCALE

ADOPTED: Feb. 2, 1938  
 REVISED: April 8, 1955

C. E.  
S-9

FROG ANGLE \_\_\_\_\_ 7° 10'  
DEGREE OF TURNOUT CURVE 11° 00'  
LEAD \_\_\_\_\_ 60'-4 15/16"

SWITCH TIE LIST														TOTAL NUMBER PIECES	TOTAL FEET B.M.
Pieces 7"x9"															
8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	15'-6"	16'-0"
5	5	4	3	3	2	2	5	2	2	2	2	2	2	2	2
														45	2730.9

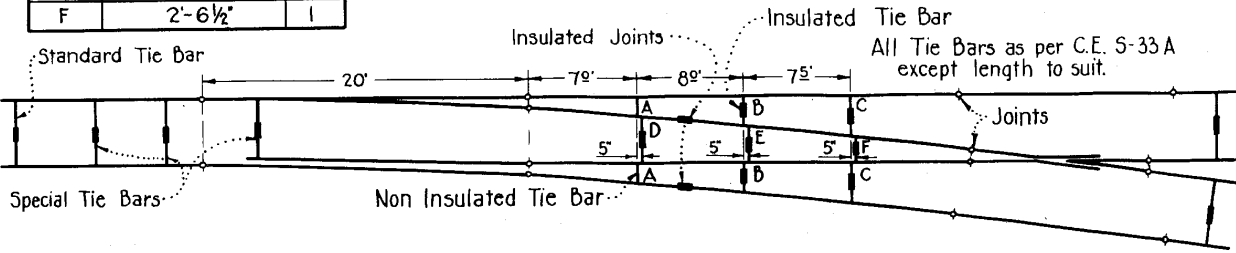


I SET SWITCH TIE BARS		
BAR	OVERALL LENGTH	NO.
A	1'-11 1/2"	2
B	2'-3"	2
C	3'-0"	2
D	4'-1"	1
E	3'-3"	1
F	2'-6 1/2"	1

PLAN OF NO 8 GIRDER RAIL TURNOUT

Approved: *Frank A. McLaughlin*  
Chief Engineer

THE WESTERN PACIFIC RAILROAD CO.  
STANDARD  
**NO 8 GIRDER RAIL  
TURNOUT**  
WITH 400' RADIUS SWITCH



LOCATION OF TIE BARS IN TURNOUT

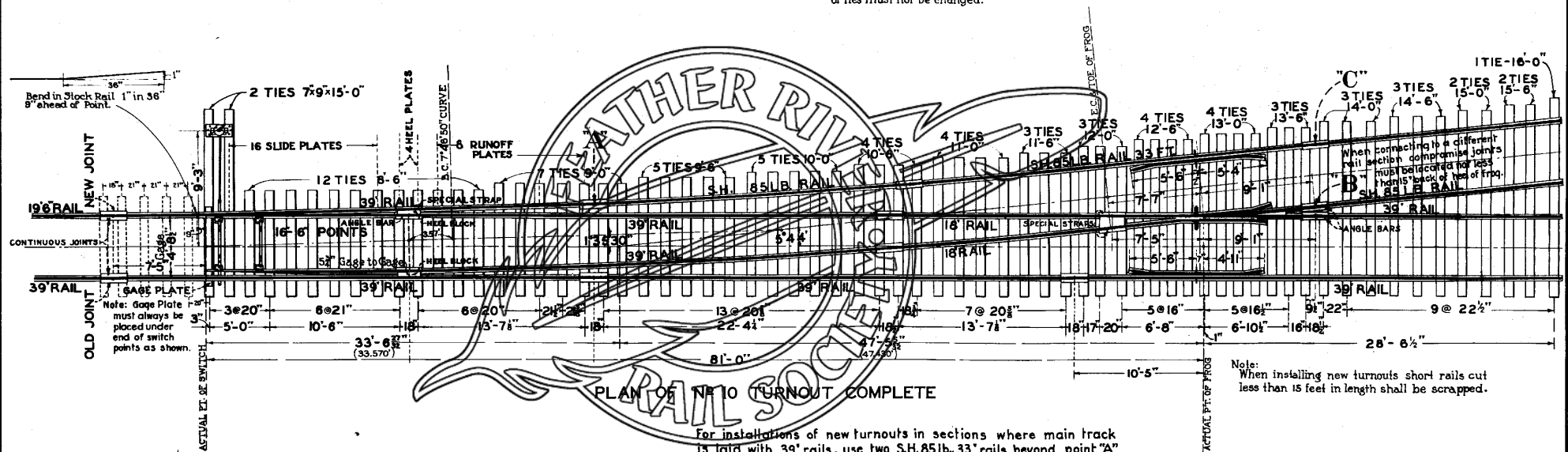
NO SCALE  
ADOPTED: Feb. 12, 1938  
REVISED: April 8, 1955

LIST OF TIES

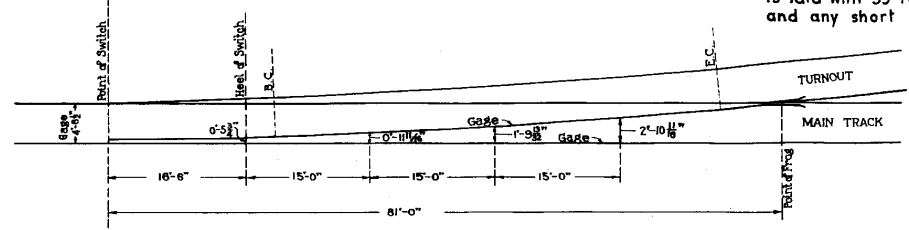
PIECES 7' X 9"											TOTAL NUMBER PIECES	TOTAL F.B.M.					
8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"							
12	7	5	10	4	4	3	3	4	4	3	3	3	2	2	1	65	3801

FROG ANGLE ..... 5° 44'  
 DEGREE OF TURNOUT CURVE ..... 7° 46' 50"  
 LEAD ..... 81'-0"  
 CLOSURE RAILS ..... 2-18' & 2-39'  
 ALTERNATE CLOSURE RAILS MAY BE USED AS FOLLOWS:-  
 2-26' & 2-31'  
 2-27' & 2-30'  
 2-28' & 2-29'  
 2-25' & 2-32'

Note: When alternate closure rails are used it will be necessary to change tie spacing to fit. However the number and length of ties must not be changed.



APPROVED: *J.M. Williams*  
 CHIEF ENGINEER



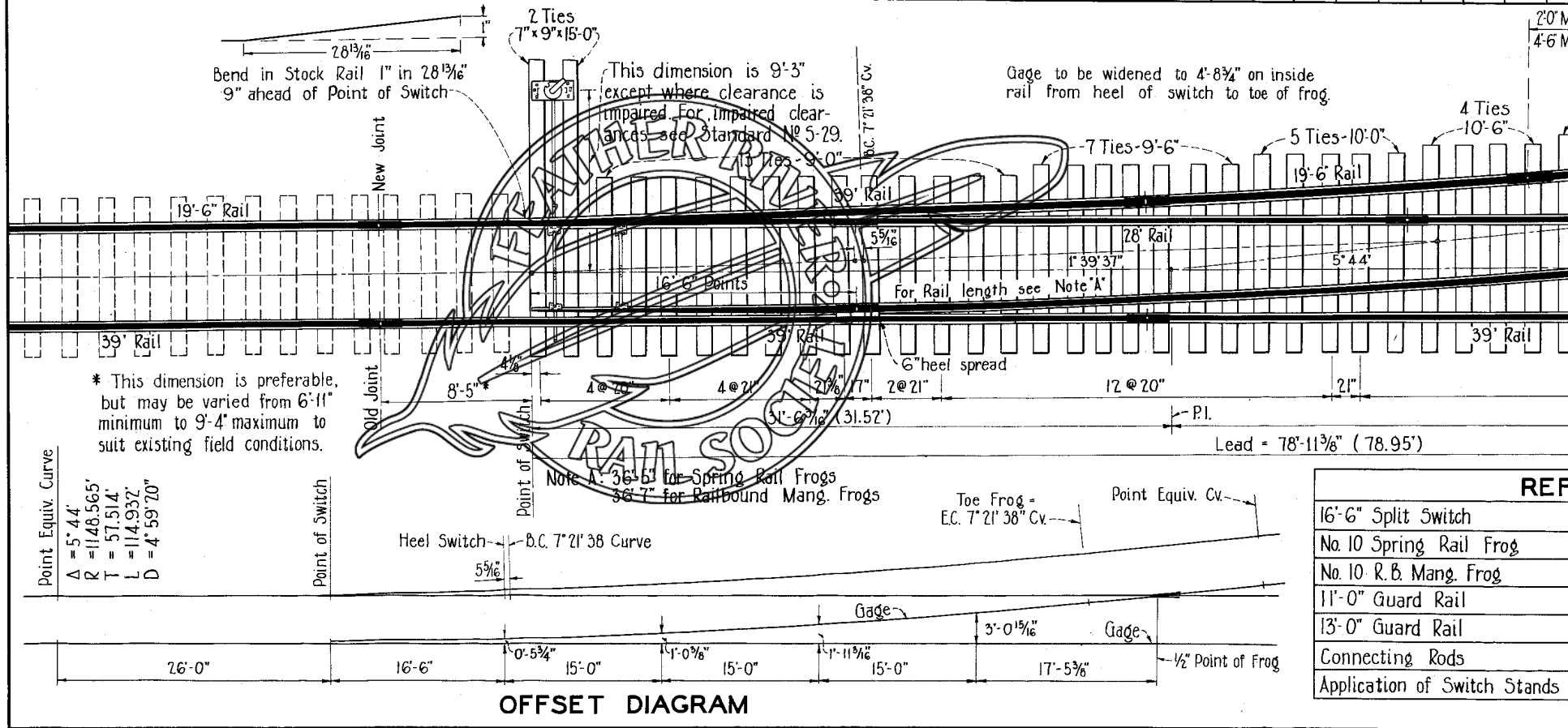
Equivalent Curve  
 A - 5° 44'  
 R - 1128.595  
 T - 56.514  
 L - 117.933  
 D - 5° 04' 40"

THE WESTERN PACIFIC RAILROAD CO.  
 STANDARD  
 No. 10 TURNOUT COMPLETE  
 FOR USE WITH C.F.&I. SEC. 850-39' RAIL

NO SCALE

ADOPTED MARCH 1, 1934  
 REVISED FEB. 25, 1938  
 REVISED DEC. 1, 1949. - AUG. 15, 1957

7" x 9"																
9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	15'-6"	16'-0"	16'-6"	17'-0"
13	7	5	4	3	3	3	3	3	4	3	3	5	3	4	4	3

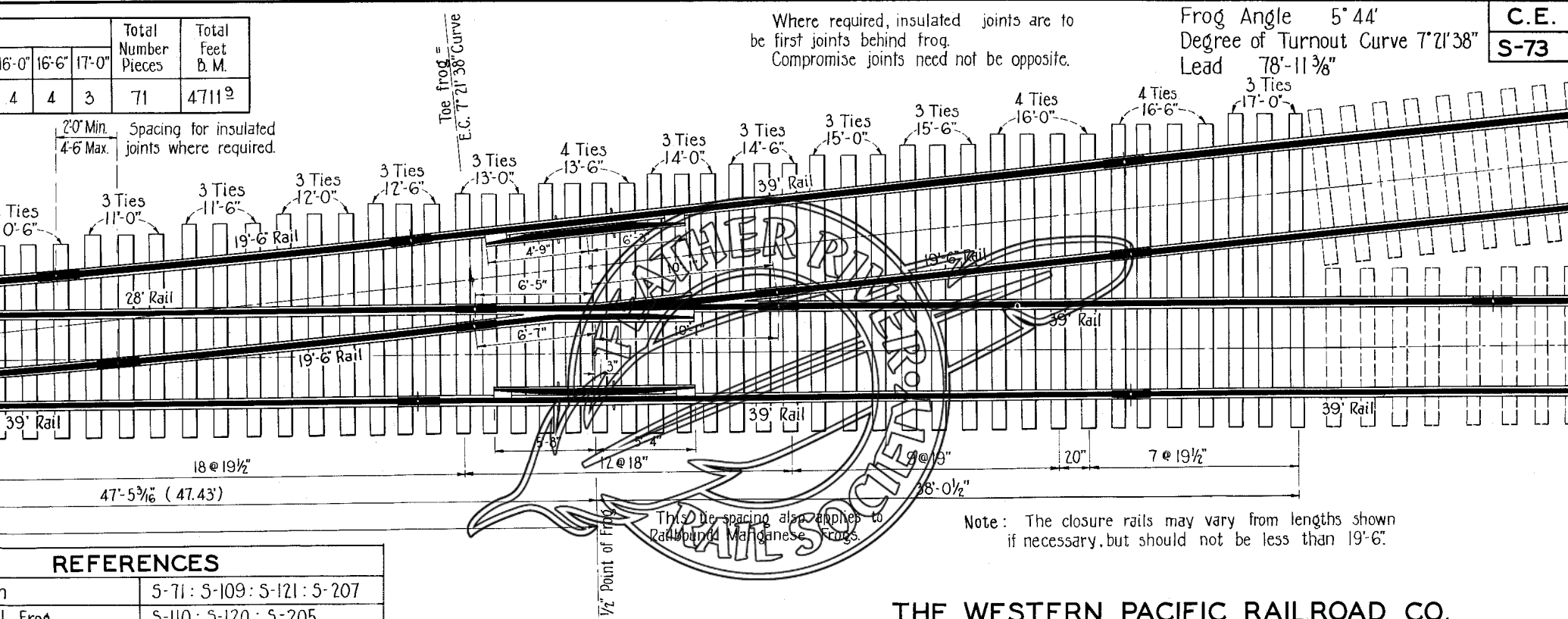


**OFFSET DIAGRAM**

REF
16'-6" Split Switch
No. 10 Spring Rail Frog
No. 10 R.B. Mang. Frog
11'-0" Guard Rail
13'-0" Guard Rail
Connecting Rods
Application of Switch Stands

16'-0"	16'-6"	17'-0"	Total Number Pieces	Total Feet B. M.
4	4	3	71	4711 <sup>9</sup> / <sub>16</sub>

2'-0" Min.  
4'-6" Max. Spacing for insulated joints where required.



Where required, insulated joints are to be first joints behind frog. Compromise joints need not be opposite.

Frog Angle 5° 44'  
Degree of Turnout Curve 7° 21' 38"  
Lead 78'-11 3/8"

C.E.  
S-73

### REFERENCES

n	5-71 : 5-109 : 5-121 : 5-207
l Frog	5-110 : 5-120 : 5-205
Frog	5-136 : 5-137
	5-70 : 5-108 : 5-119
	5-204
	5-141
Switch Stands	5-29

Approved: *Frank R. Woodford*  
Chief Engineer

THE WESTERN PACIFIC RAILROAD CO.  
STANDARD  
**No 10 TURNOUT COMPLETE**  
SPRING RAIL AND R. B. MANG. FROGS  
RAIL 100 LBS. AND HEAVIER

No Scale

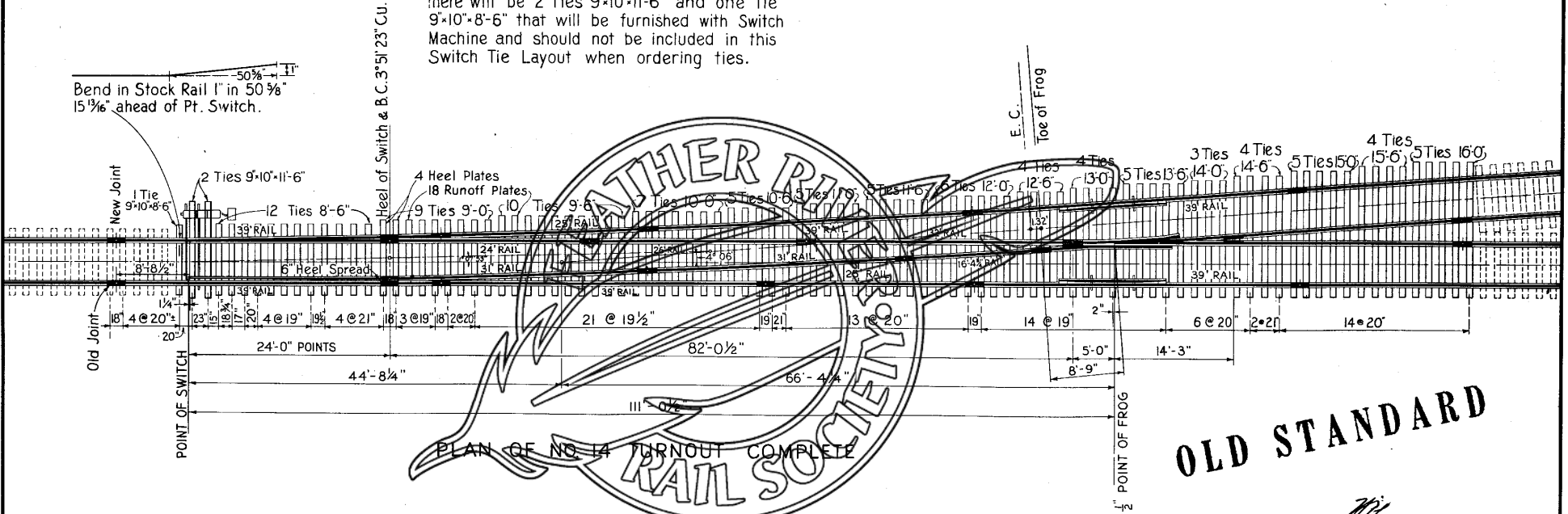
39 FOOT RAILS

Adopted: Jan. 21, 1955  
Revised: Apr. 1, 1957

PIECES 7x9															TOTAL	TOTAL	
8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	15'-6"	16'-0"	NUMBER	B.M.
12	9	10	7	5	5	6	4	4	5	3	4	5	4	5	93	5623.4	

FROG ANGLE ..... 4° 06'  
 DEGREE OF TURNOUT CURVE ..... 3° 51' 23"  
 LEAD ..... 111'-0½"  
 CLOSURE RAILS 1-24', 1-26', 2-31', 1-32' & 1-16'-4"  
 Note: Closure Rails may be of various lengths, but minimum should be 15ft.

Note: In addition to the above List of Ties there will be 2 Ties 9'x10'x11'-6" and one Tie 9'x10'x8'-6" that will be furnished with Switch Machine and should not be included in this Switch Tie Layout when ordering ties.



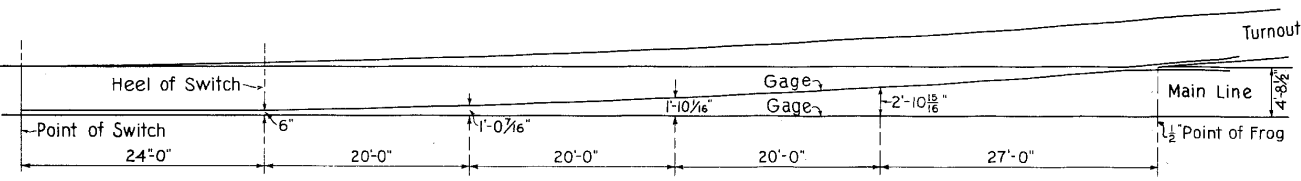
**OLD STANDARD**

Approved *[Signature]*  
 CHIEF ENGINEER

Approved *[Signature]*  
 VICE-PRESIDENT AND GENERAL MANAGER

THE WESTERN PACIFIC RAILROAD CO.  
 STANDARD  
 NO. 14 TURNOUT COMPLETE  
 FOR USE WITH 115 L.B. R. E. RAIL

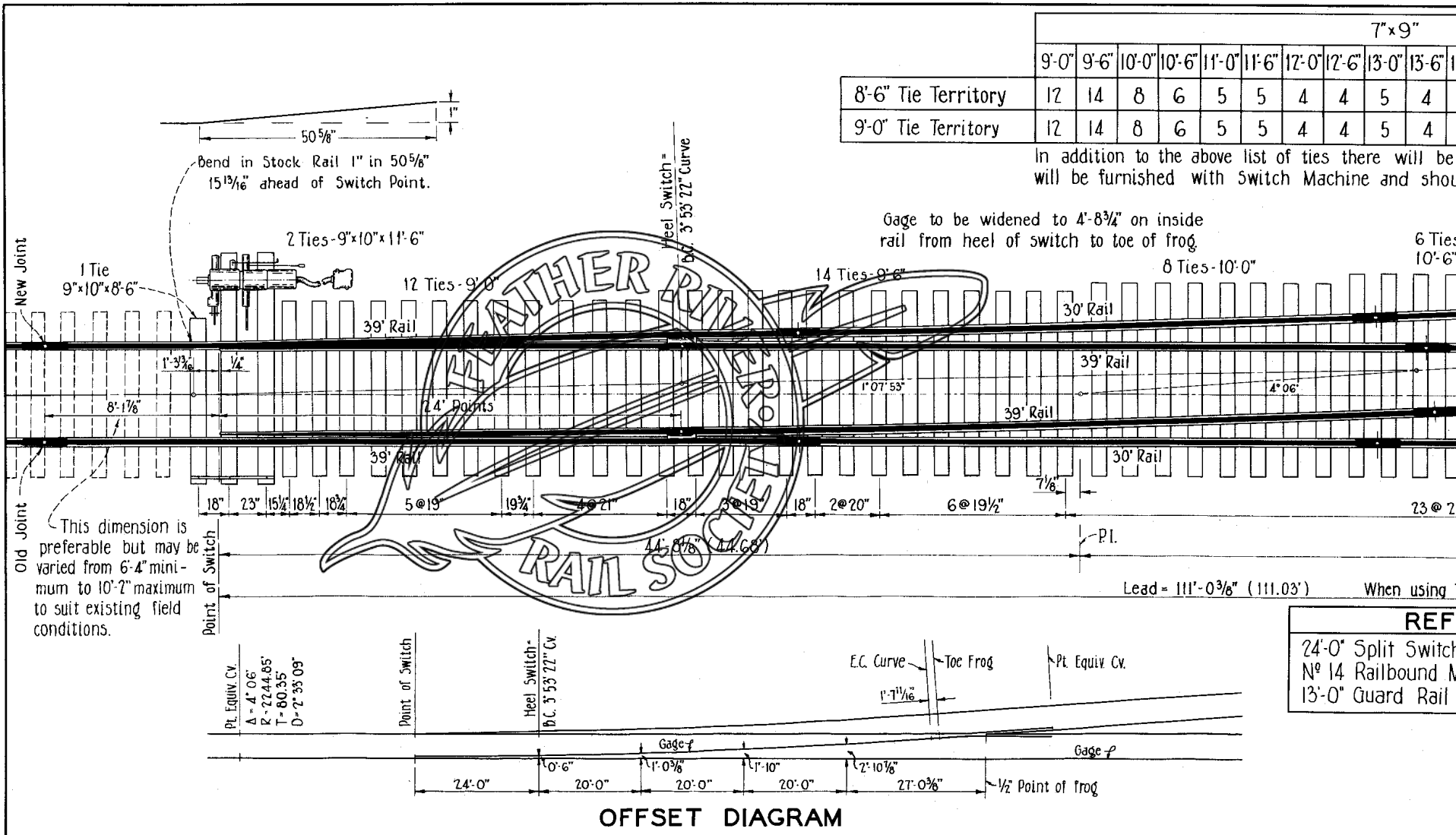
No Scale      Adopted      Sept. 1, 1948  
 Revised      Apr. 7, 1949

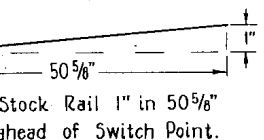


OFFSET DIAGRAM



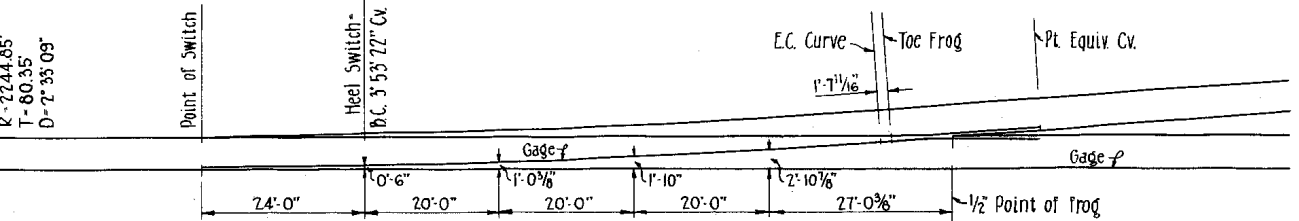
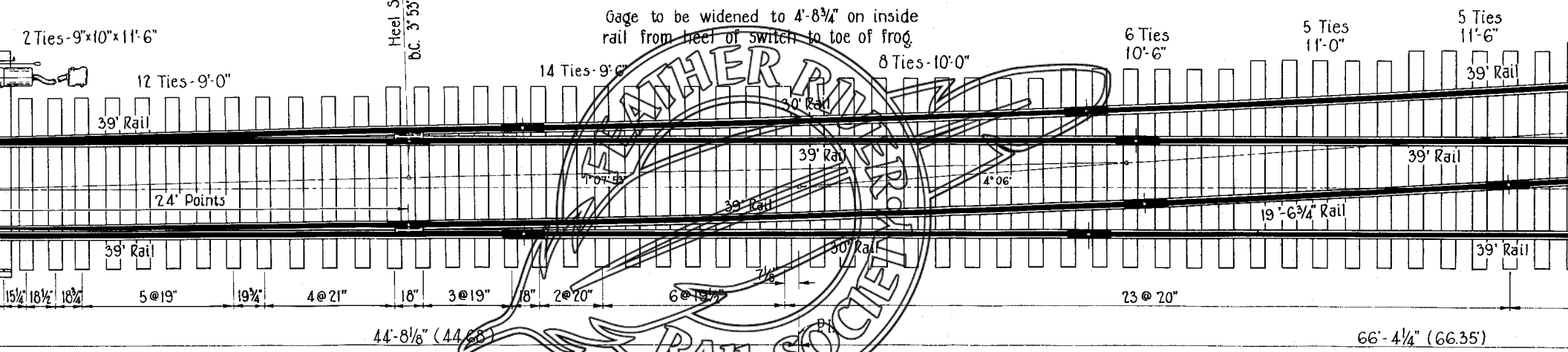
5-56: Add welded rail note.  
 7-56: Change Sw. Pt. Loc. 4 ties, correct rail lengths, refs.  
 1-57: Change dates, title, equiv. Cv., remove above. Film. Lead note added.





	7"x9"															Total Number Pieces	Total Feet B.M.		
	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	15'-6"	16'-0"			16'-6"	17'-0"
8'-6" Tie Territory	12	14	8	6	5	5	4	4	5	4	4	5	3	4	4	4	0	91	566
9'-0" Tie Territory	12	14	8	6	5	5	4	4	5	4	4	5	3	4	4	4	4	95	602

In addition to the above list of ties there will be 2 ties 9"x10"x11'-6" tie and 1 tie 9"x10"x8'-6" tie will be furnished with Switch Machine and should not be included when ordering ties.



**OFFSET DIAGRAM**

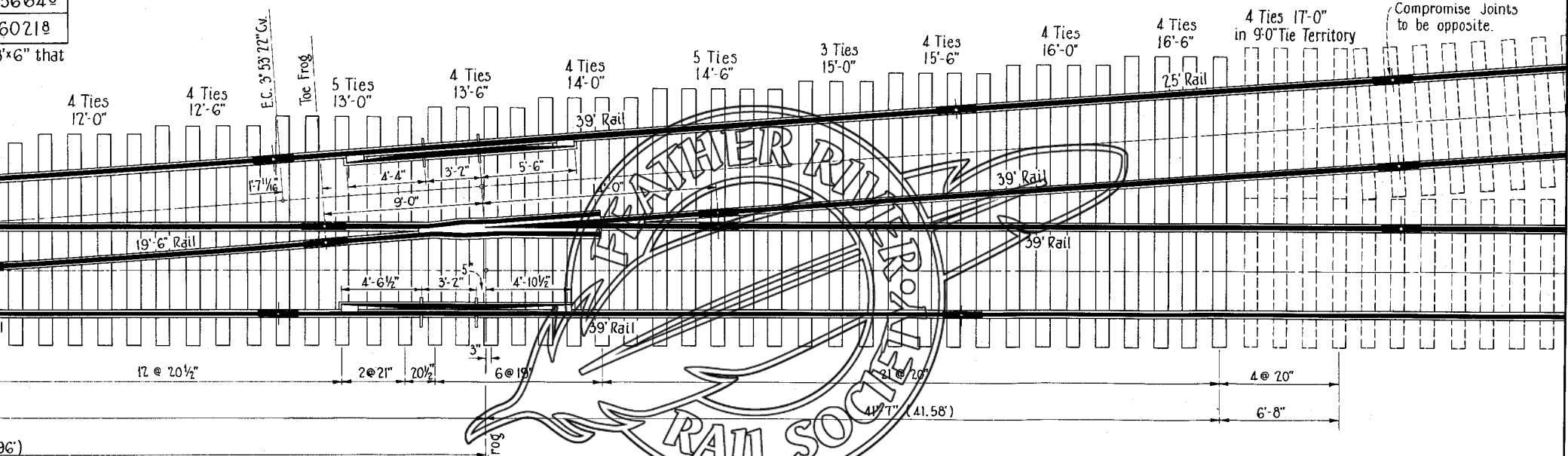
REFERENCES	
24'-0" Split Switch	S-203, S-213
Nº 14 Railbound Mang. Frog	S-133, S-212
13'-0" Guard Rail	S-204, S-217

The straight lengths. The lengths show should be 19

Total  
Feet  
B.M.  
5664<sup>8</sup>  
6021<sup>8</sup>  
"x6" that

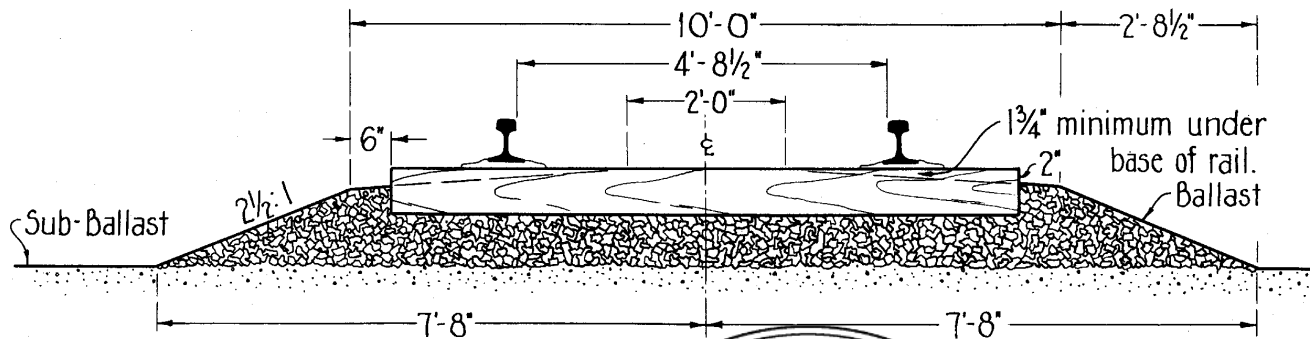
Frog Angle 4° 06'  
Degree of Turnout Curve 3° 53' 22"  
Lead 111'-0<sup>3</sup>/<sub>8</sub>"

C.E.
S-208

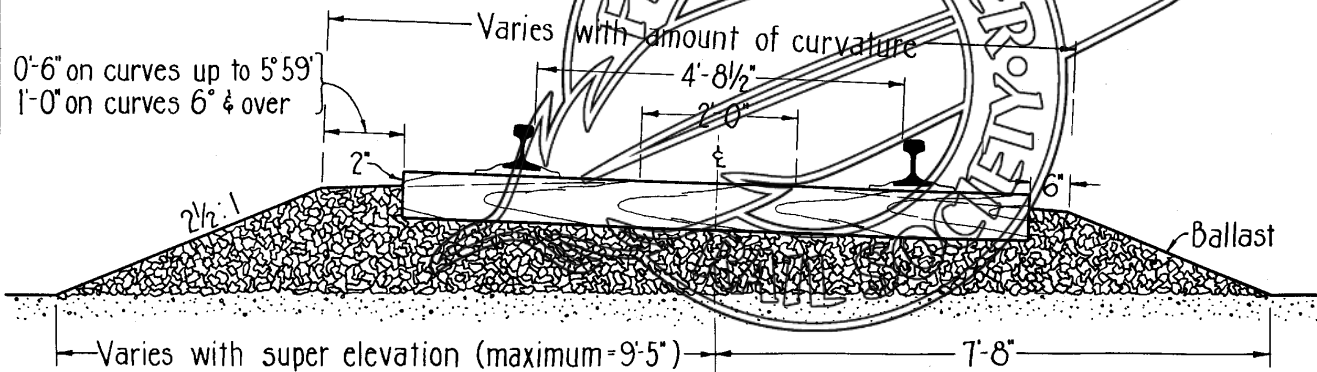


### NOTES

These dimensions are based on a minimum of 8" ballast under the tie and 7"x9" ties 9'-0" long.



### SECTION FOR USE ON TANGENTS



### SECTION FOR USE ON CURVES

Approved: *Frank R. McLaughlin*  
Chief Engineer

THE WESTERN PACIFIC RAILROAD CO.  
STANDARD

## BALLAST SECTION FOR MAIN LINES

NO SCALE

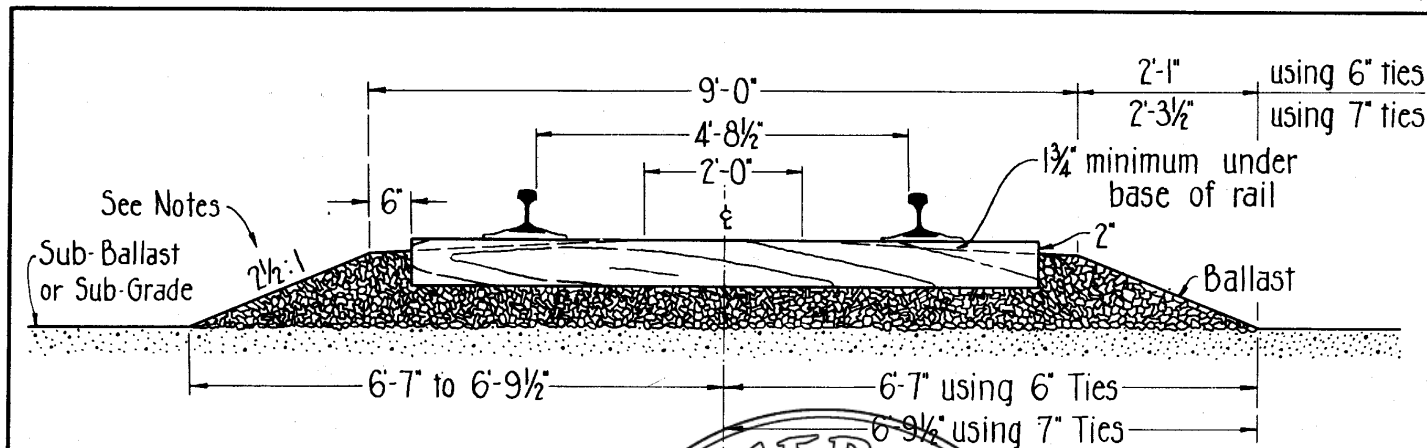
ADOPTED : Oct. 19, 1955  
Revised : Jan. 31, 1957

For Main Line Roadbed Sections see C.E. S-42.

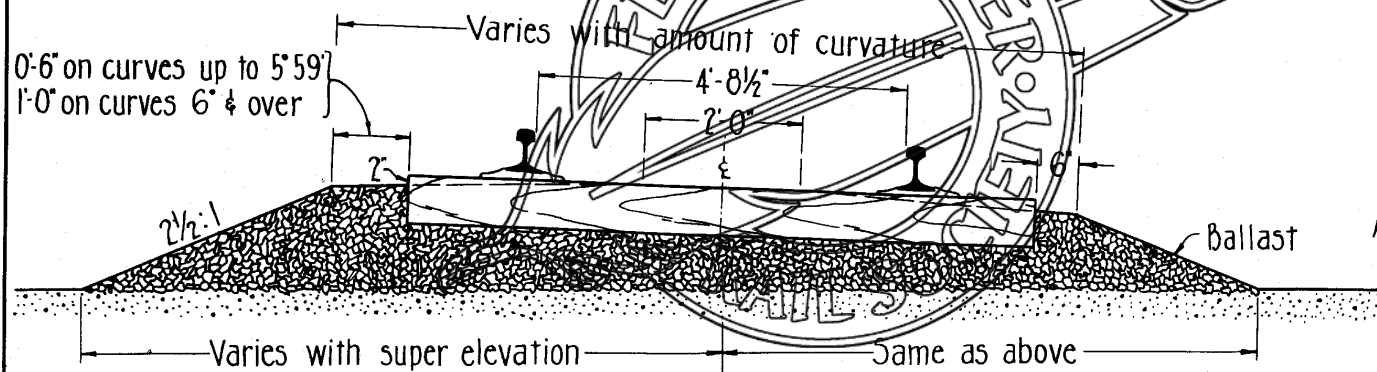
### NOTES

These dimensions are based on a minimum of 6" ballast under the tie and 6x8" or 7x8" ties, 8'-0" long.

Where ballast material will stand at steeper slopes than 2½:1 slopes may be steepened to 2:1.



**SECTION FOR USE ON TANGENTS**



**SECTION FOR USE ON CURVES**

Approved: *Frank R. Wainwright*  
Chief Engineer

THE WESTERN PACIFIC RAILROAD CO.  
STANDARD

## BALLAST SECTION FOR BRANCH LINES AND IMPORTANT SECONDARY TRACKS

NO SCALE

ADOPTED: Oct. 19, 1955

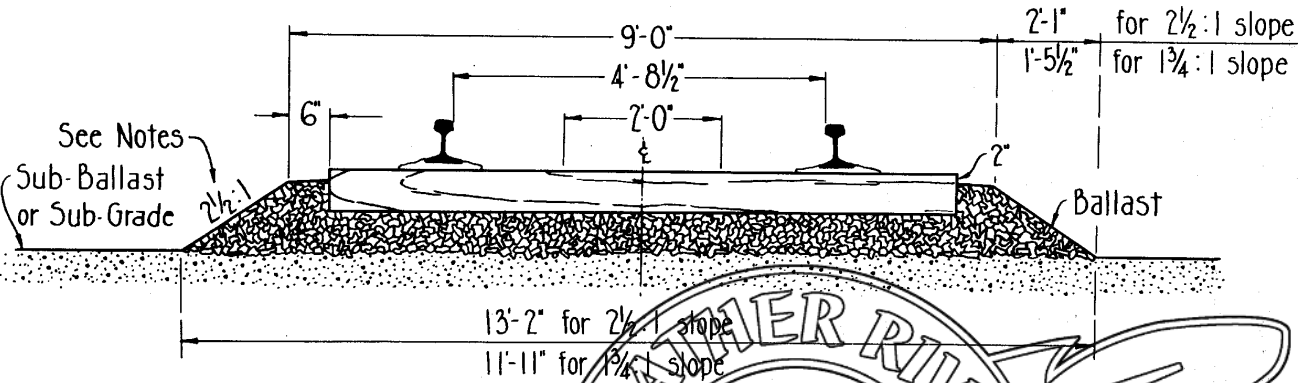
For Roadbed Sections see C.E. 5-42, 42A, 42B, 42C.

**NOTES**

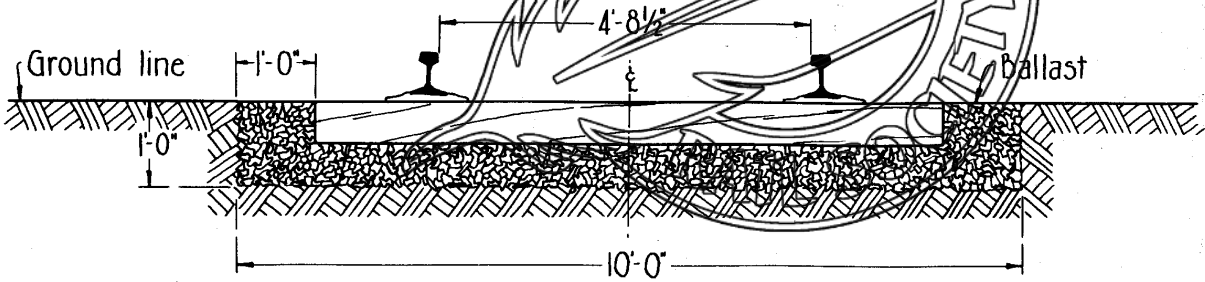
These dimensions are based on a minimum of 6" ballast under the tie and 6"x8" ties 8'-0" long.

Special attention must be given to provide drainage of trench section.

Where ballast material will stand at steeper slopes than 2½:1 slopes may be steepened to 2:1 or to 1¾:1.



**STANDARD SECTION**



**TRENCH SECTION**

Approved: *Fram P. Woolford*  
Chief Engineer

THE WESTERN PACIFIC RAILROAD CO.  
STANDARD

**BALLAST SECTIONS**

FOR INDUSTRIAL AND YARD TRACKS

NO SCALE

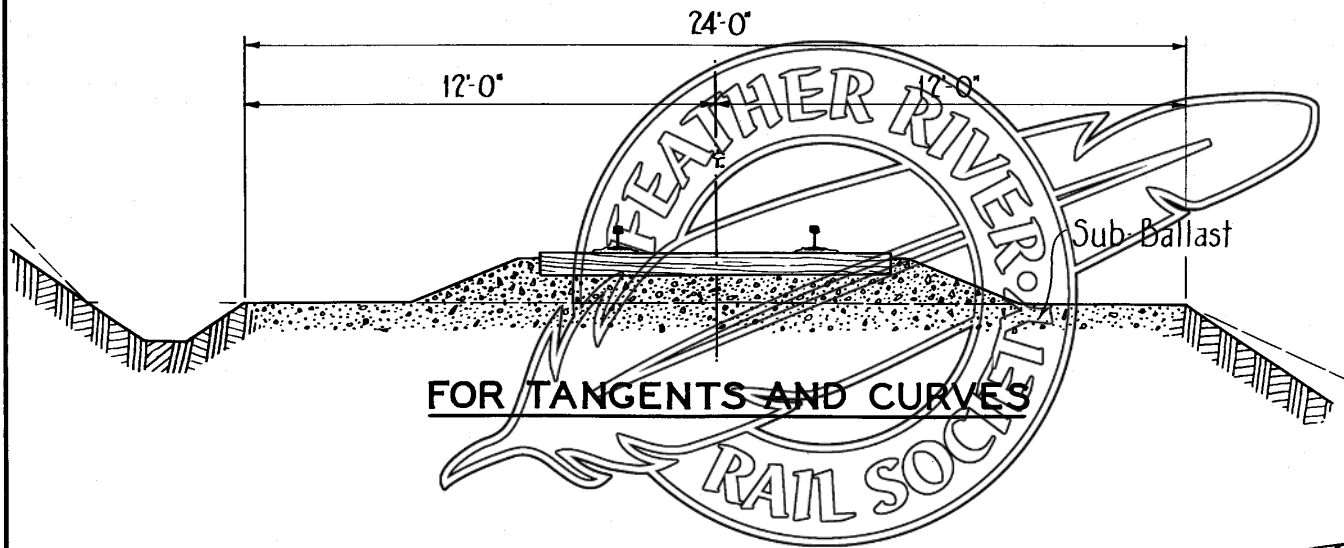
ADOPTED: Oct. 19, 1955

For Roadbed Sections see C.E. S-42A, 42B, 42C.

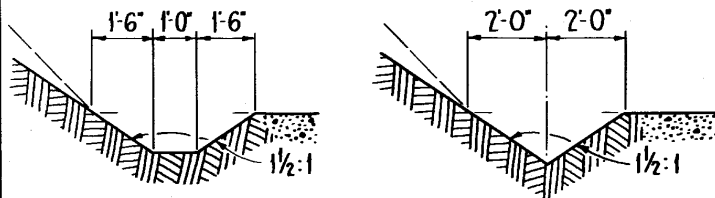
C. E.
S-42

**NOTES**

Side slopes may vary to suit material.  
 Either of the two ditch types shown  
 may be used.  
 Minimum ditch grade to be 0.2%.



Approved: *Frank R. Woodford*  
 Chief Engineer



**ALTERNATE DITCH TYPES**

THE WESTERN PACIFIC RAILROAD CO.  
 STANDARD

**MINIMUM ROADBED SECTION**  
 MAIN LINE AND BRANCH LINES

SCALE:  $\frac{1}{4}'' = 1'-0''$

ADOPTED: Feb. 1, 1958

**NOTES**

Undercut one foot in rock cuts to place Selected Material Sub-Ballast. In cuts through clay or other unsuitable material Selected Material Sub-Ballast to be two feet. Selected Material Sub-Ballast to be two feet thick on all fills. Suitability of sub-grade to be as directed by the Chief Engineer.

Selected Material for Sub-Ballast shall be as directed by the Chief Engineer.

Minimum ditch grade shall be 0.2%.

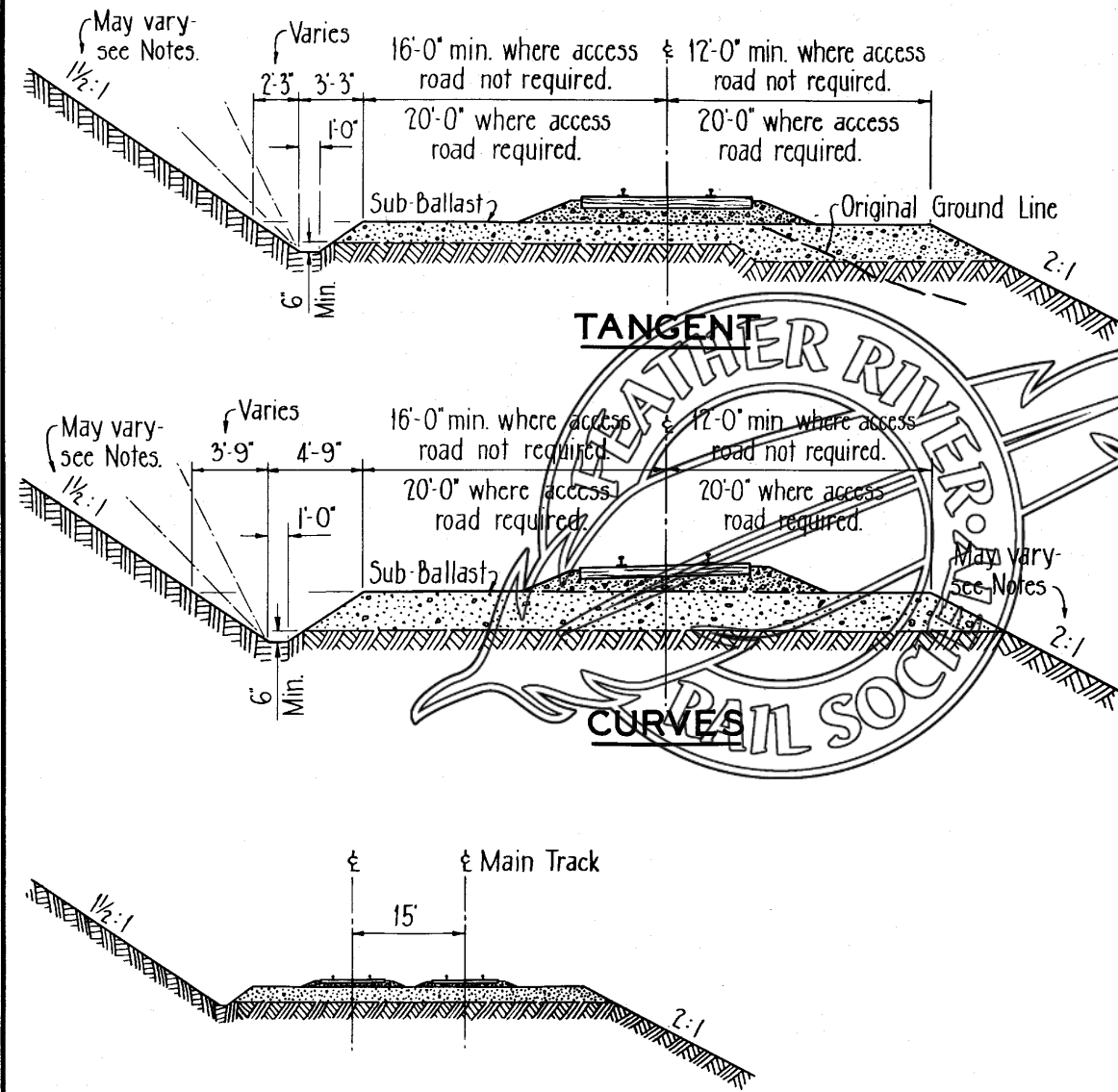
The Main Track and any other track shall be 15' centers minimum. All other tracks shall be 14' centers.

Cut slopes may vary to suit material. Maximum cut slope to be 1/2:1.

Fill slopes may vary to suit material. Maximum fill slope to be 1 1/2:1.

Widen fill shoulder 6" for each 15' of fill. Amount of widening to be determined by difference in elevation between toe and shoulder.

Need for and location of access road to be as determined by the Chief Engineer.



Approved: *Frank R. Woolford*  
Chief Engineer

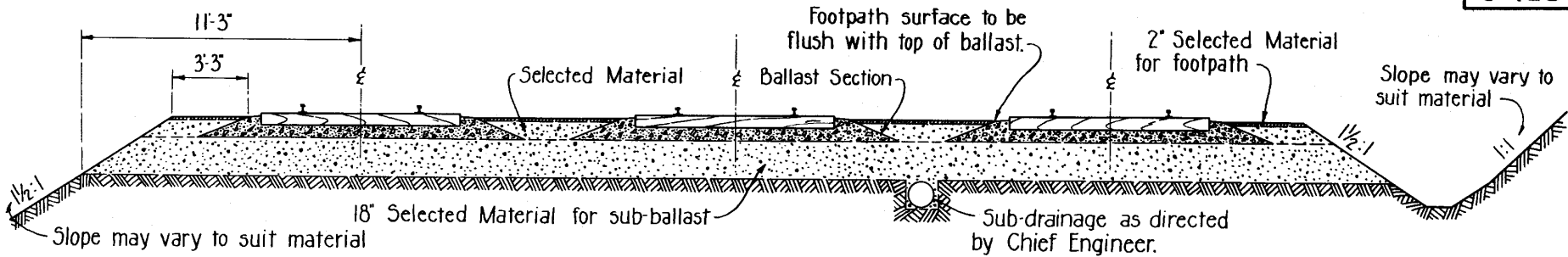
THE WESTERN PACIFIC RAILROAD CO.  
STANDARD

**ROADBED SECTIONS**  
MAIN LINE AND BRANCH LINES

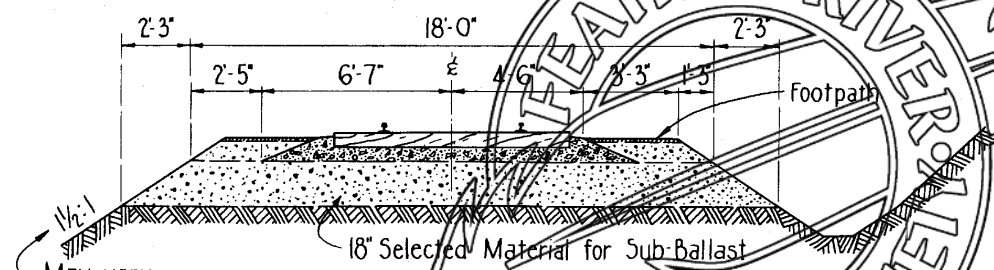
NO SCALE

ADOPTED: Feb. 1, 1958





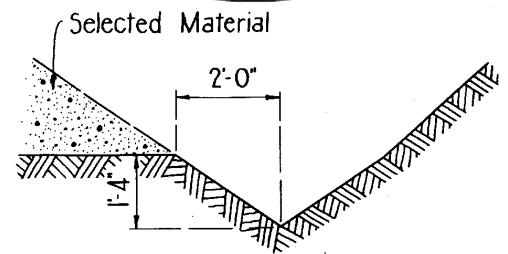
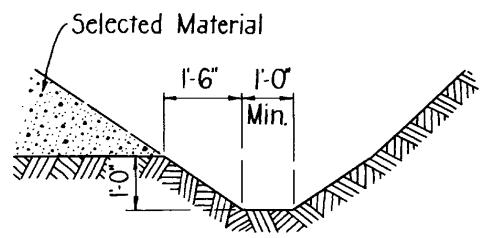
**SECTION FOR USE ON YARD TRACKS**



**SINGLE YARD TRACK**

**NOTES**

Selected Material shall be as directed by the Chief Engineer.  
 Minimum ditch grade shall be 0.1%.  
 Cut and Fill slopes may vary to suit material.  
 Maximum cut slope to be 1/2:1. Maximum fill slope to be 1 1/2:1.  
 The Main Track and any other track shall be 15' centers minimum. All other tracks shall be 14' centers.



**ALTERNATE DITCH TYPES**

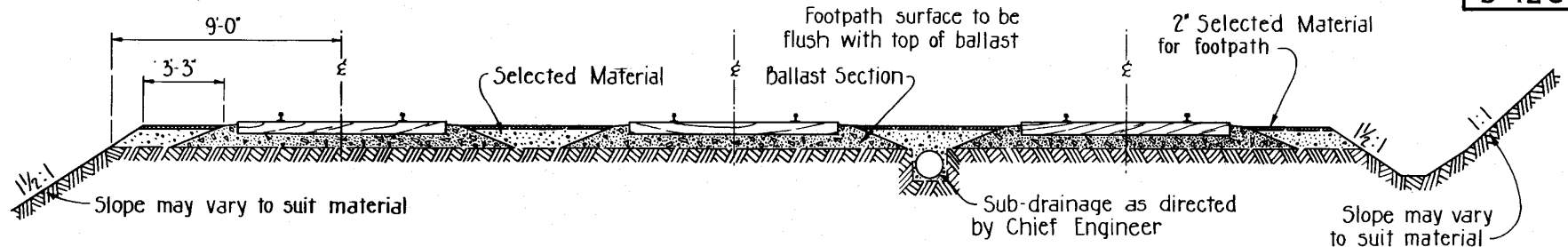
Approved: *Frank R. Wood*  
Chief Engineer

THE WESTERN PACIFIC RAILROAD CO.  
STANDARD

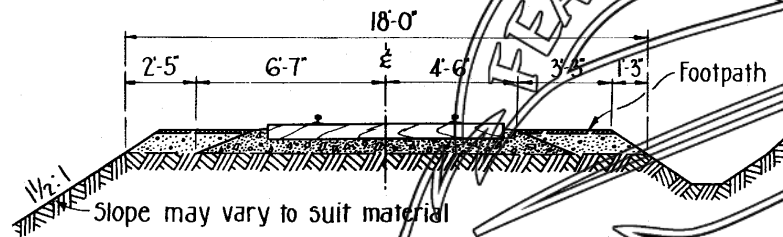
**ROADBED SECTIONS**  
YARD TRACKS WITH SELECTED MATERIAL SUB-BALLAST

NO SCALE

ADOPTED: Feb. 1, 1958



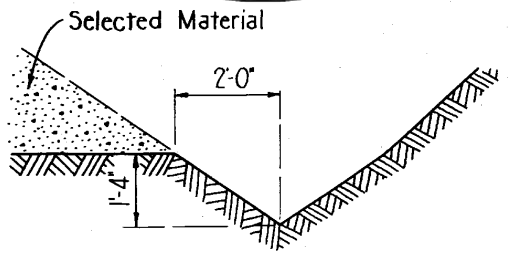
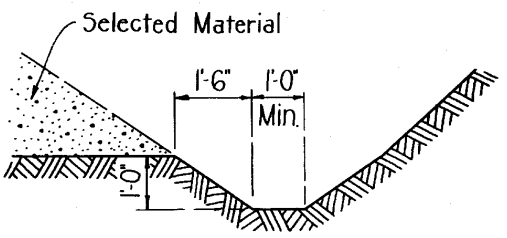
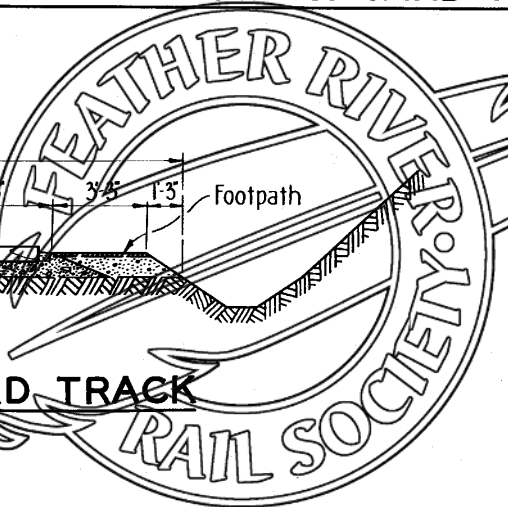
**SECTION FOR USE ON YARD TRACKS**



**SINGLE YARD TRACK**

**NOTES**

- Selected Material shall be as directed by the Chief Engineer.
- Minimum ditch grade shall be 0.1%.
- Cut and Fill slopes may vary to suit material. Maximum cut slope to be 1/2:1. Maximum fill slope to be 1 1/2:1.
- The Main Track and any other track shall be 15' centers minimum. All other tracks shall be 14' centers.



**ALTERNATE DITCH TYPES**

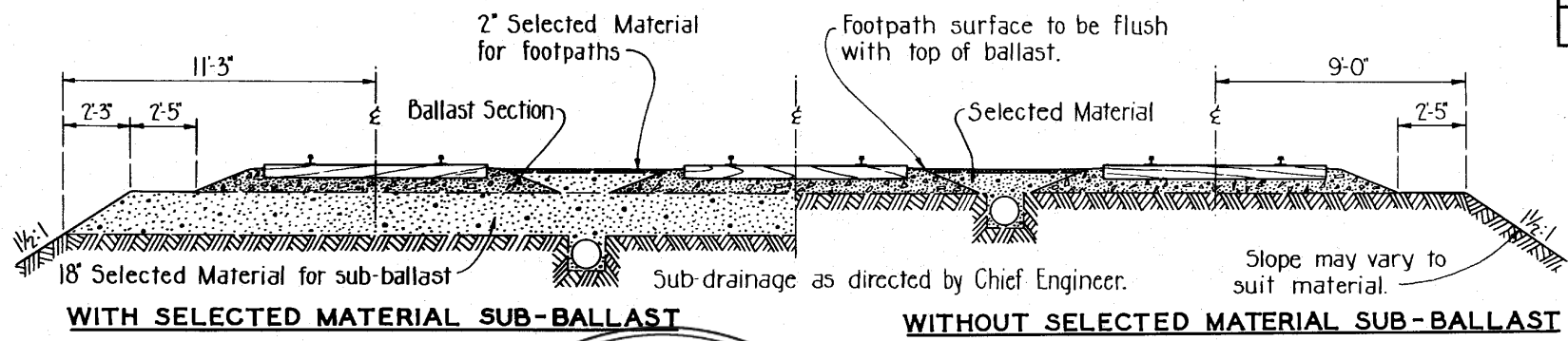
Approved: Frank A. Macford  
Chief Engineer

THE WESTERN PACIFIC RAILROAD CO.  
STANDARD

**ROADBED SECTIONS**  
YARD TRACKS WITHOUT  
SELECTED MATERIAL SUB-BALLAST

NO SCALE

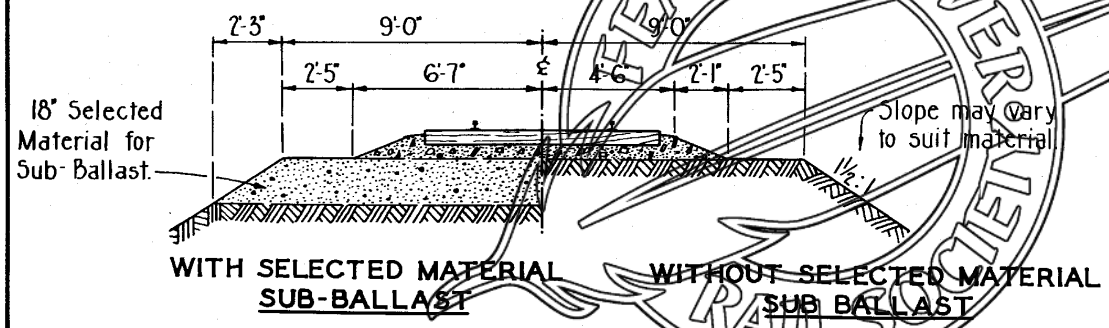
ADOPTED: Feb. 1, 1958



**SECTION FOR USE ON INDUSTRIAL TRACKS**

**NOTES**

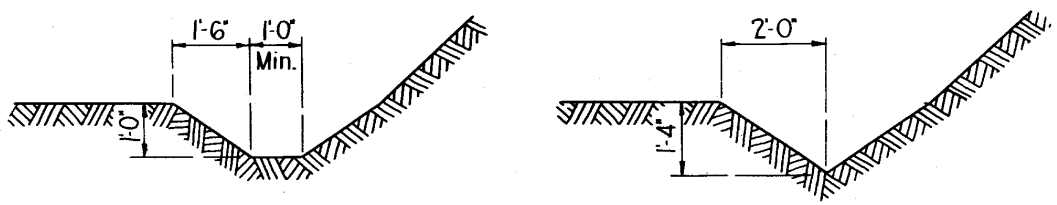
- Selected Material shall be as directed by the Chief Engineer.
- Minimum ditch grade shall be 0.1%.
- Cut and Fill slopes may vary to suit material.
- Maximum cut slope to be 1/2:1. Maximum fill slope to be 1 1/2:1.
- Track centers shall be 14' minimum.



**SINGLE INDUSTRIAL TRACK**

Approved: *Frank R. Weaver*  
Chief Engineer

THE WESTERN PACIFIC RAILROAD CO.  
STANDARD  
**ROADBED SECTIONS**  
INDUSTRIAL TRACKS



**ALTERNATE DITCH TYPES**

NO SCALE

ADOPTED: Feb. 1, 1958

C. E.

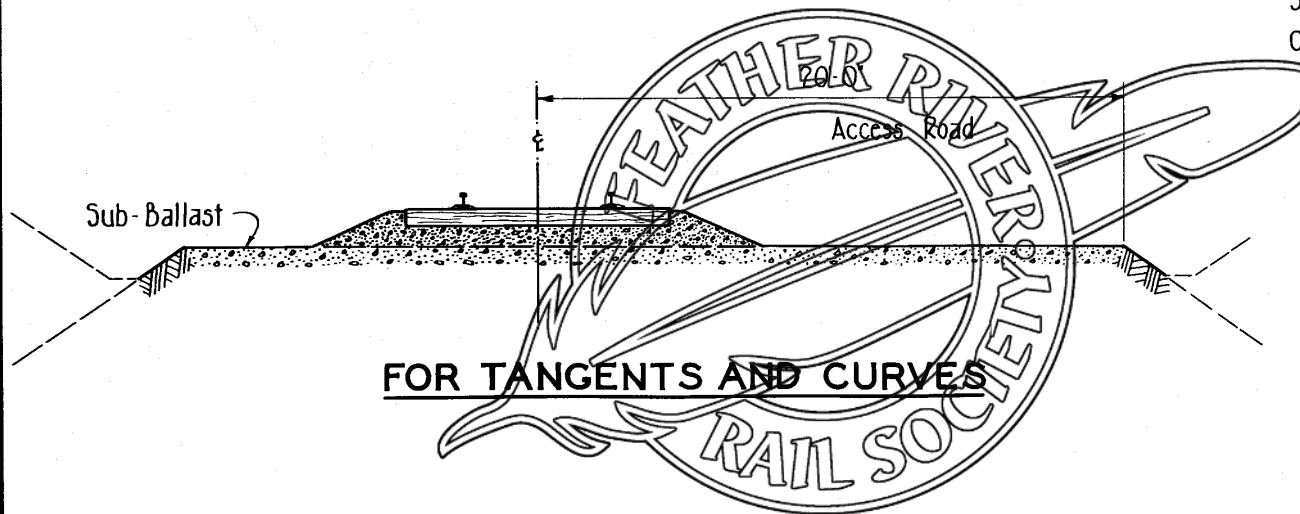
S-42E

### NOTES

Fill to be widened on one side only unless otherwise directed by the Chief Engineer.

Both cut and fill slopes may vary to suit material.

Standard ditch sections as per S-42 shall be maintained when widening in cut.



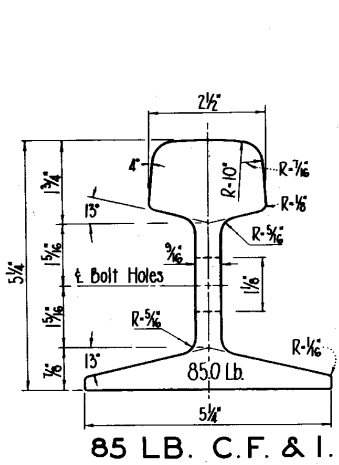
Approved: *Frank A. Maxwell*  
Chief Engineer

THE WESTERN PACIFIC RAILROAD CO.  
STANDARD

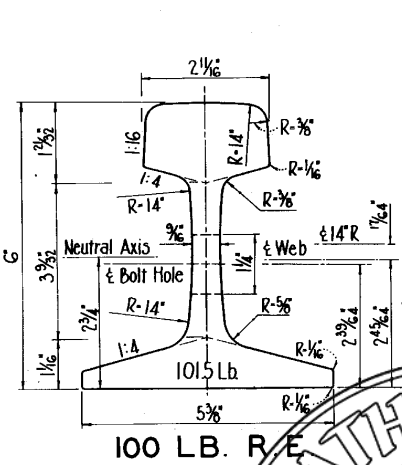
## ROADBED WIDENING TO PROVIDE ACCESS ROAD

SCALE:  $\frac{1}{8}'' = 1'-0''$

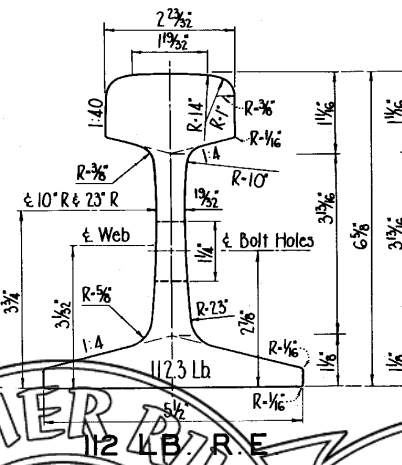
ADOPTED: Feb. 1, 1958



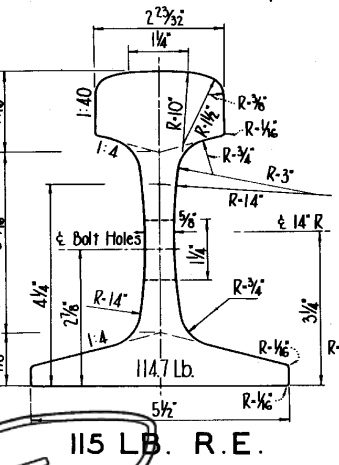
85 LB. C.F. & I.



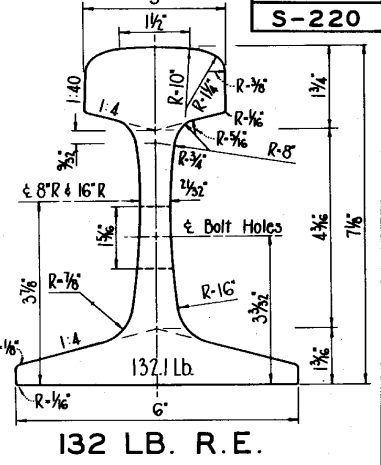
100 LB. R.E.



112 LB. R.E.



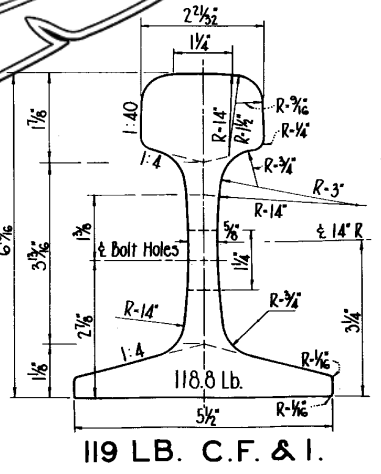
115 LB. R.E.



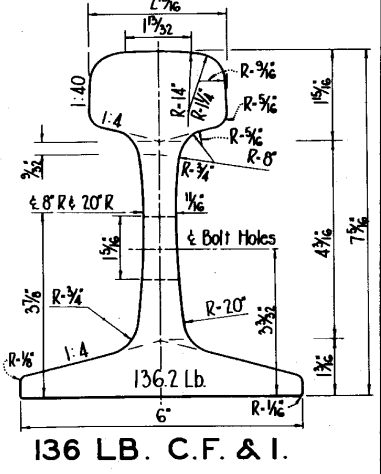
132 LB. R.E.

**ELEMENTS OF RAIL SECTIONS**

PROPERTIES	85 LB.	100 LB.	112 LB.	115 LB.	119 LB.	132 LB.	136 LB.
Area : Head (Sq. In.)	3.81-45.7%	3.80-38.2%	3.95-36.9%	3.91-34.8%	4.32-37.1%	4.42-34.1%	4.86-36.4%
Area : Web (Sq. In.)	1.51-18.0%	2.25-22.6%	2.71-25.1%	3.05-27.1%	3.04-26.1%	3.66-28.5%	3.62-27.1%
Area : Base (Sq. In.)	3.03-36.3%	3.90-39.2%	4.29-39.0%	4.29-38.1%	4.29-36.8%	4.87-37.6%	4.87-36.5%
Area : Total (Sq. In.)	8.35-100%	9.95-100%	11.01-100%	11.25-100%	11.65-100%	12.95-100%	13.35-100%
Moment of Inertia	29.80	49.00	65.5	65.6	71.4	88.2	94.9
Section Modulus : Head	15.10	18.1	18.1	18.0	19.4	22.5	23.9
Section Modulus : Base	17.80	21.0	22.0	22.0	22.9	27.6	28.3
Gross Tons per Track Mile	133.57	159.48	176.47	180.24	186.7	207.58	214.0
Net Tons per Track Mile	149.60	178.62	197.65	201.87	209.1	232.50	239.7

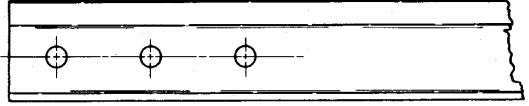


119 LB. C.F. & I.



136 LB. C.F. & I.

2 1/2"	6 1/2"	6 1/2"	115 lb. & 119 lb.
2 5/8"	6"	6"	132 lb. & 136 lb.
2 1/2"	6 1/2"		112 lb., 115 lb. & 119 lb.
2 1/2"	5 1/2"		100 lb.
2 3/8"	6"		85 lb.



DRILLING OF RAIL

Approved: *Frank R. Wood*  
Chief Engineer

THE WESTERN PACIFIC RAILROAD COMPANY  
**STANDARD RAIL SECTIONS**

NO SCALE

ADOPTED : Oct. 15, 1954

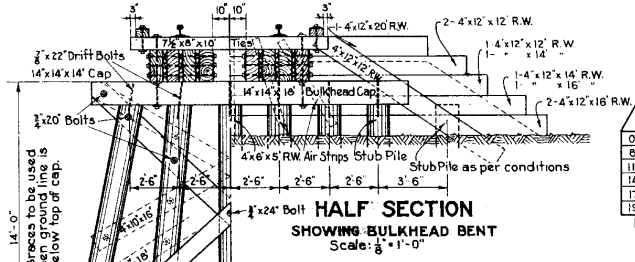
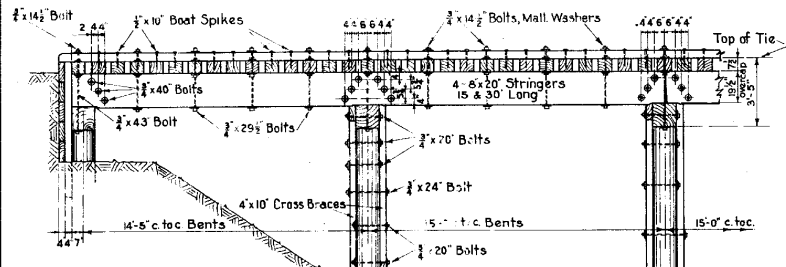
## THE WESTERN PACIFIC RAILROAD COMPANY TUNNEL LIST

C. E.  
S-64

Office of Chief Engineer.

San Francisco, Calif. June 1, 1939

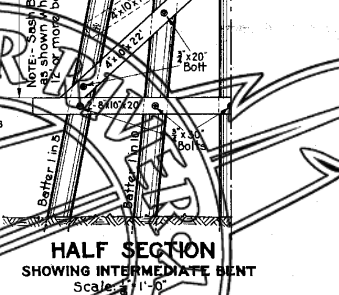
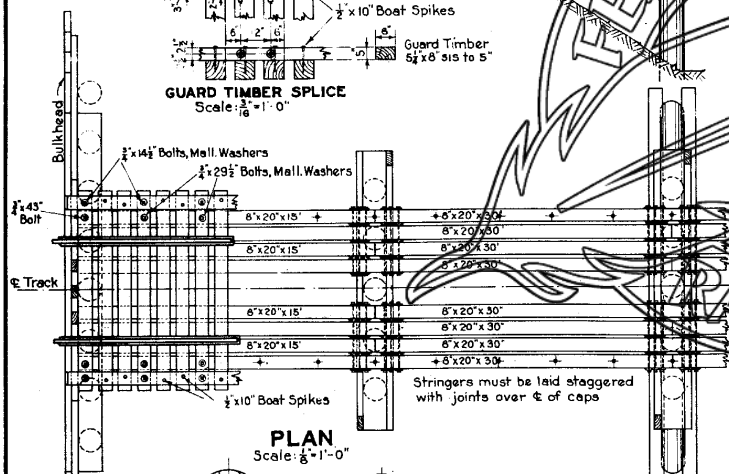
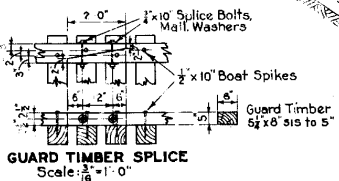
NO.	M. P. WEST PORTAL	ENGINEERS STATION		BETWEEN STATIONS		ALIGNMENT	LENGTH LIN. FT.	TIMBER LINED LIN. FT.	CONCRETE LINED LIN. FT.	CONCRETE INVERT LIN. FT.	NOT LINED LIN. FT.	CONC. SILLS LIN. FT.	TYPE OF PORTAL		HEIGHT ABOVE TOP OF LOW RAIL	WIDTH AT		DATE OF LAST REVISION	
		WEST PORTAL	EAST PORTAL	S.F. FRT. DEPOT	25 <sup>TH</sup> ST. SLIP								WEST	EAST		TOP OF RAIL	TOP OF RAIL		SPRING LINE
A	—	33+75.0	50+00.0	S.F. FRT. DEPOT	25 <sup>TH</sup> ST. SLIP	Tangent	1625	1625				303 <sup>2</sup>	TIMBER	TIMBER	20.9	16.4	17.0	1/1/54	
1	32.12	441+43.5	398+22.6	NILES	SUNOL	Tangent	4320 <sup>2</sup>		4320 <sup>2</sup>			7190 <sup>2</sup>	CONCRETE	CONCRETE	20.37	15.7	16.0	1/15/58	
2	33.39	373+58.5	369+51.2	"	"	726 Sp. to 6°20' C.R. - 181 <sup>3</sup> Tan.	407 <sup>3</sup>		407 <sup>3</sup>				"	"	21.1	15.8	16.8	"	
3	57.67	63+43.4	67+58.1	ALTAMONT	MIDWAY	158 <sup>5</sup> Sp. - 254 <sup>6</sup> 6'00" C.R.	414 <sup>7</sup>	414 <sup>7</sup>					TIMBER	TIMBER	20.6	16.3	16.9	"	
4	207.19	120+80.5	128+92.3	OROVILLE	QUARTZ	320 8'0" C.R. - 140 7'50" C.R. - 352 8'02" C.R.	811 <sup>8</sup>		480 <sup>7</sup>		3311		CONC.	CONC.	21.0	16.0	16.5	"	
5	222.98	954+11.4	963+15.7	LAS PLUMAS	BERRY CR.	49 Sp. - 793 8'00" C.R. - 42 Sp. - 20 9'53" C.R.	904 <sup>8</sup>	721 <sup>8</sup>		182 <sup>5</sup>		0	TIMBER	TIMBER	20.4	15.8	16.4	1/1/54	
6	224.70	1046+12.2	1049+57.6	BERRY CR.	BLINZIG	Tangent	3454	182 <sup>8</sup>		1634	3464		"	"	20.9	16.1	16.9	"	
7	226.34	1131+62.7	1135+80.6	"	"	23 5'50" C.L. - 187 Sp.	417 <sup>9</sup>	70 <sup>8</sup>		3477	119 <sup>6</sup>		"	"	20.9	16.1	17.0	"	
8	226.90	1161+29.3	1163+55.4	"	"	160 Sp. - 66 6'15" C.R.	2261	140 <sup>7</sup>		854	164 <sup>6</sup>		"	"	20.7	16.2	16.9	"	
9	236.37	865+53.7	860+25.9	POE	PULGA	76 Sp. to 3°30' C.R. - 390 0'30" C.R. - 62 1'00" C.R.	551 <sup>8</sup>		551	Gunite	496 <sup>6</sup>	1103 <sup>6</sup>	CONC.	CONC.	22.8	16.1	16.8	1/1/54	
10	237.01	831+49.8	829+18.0	"	"	160 0'30" C.R. - 72 Sp.	231 <sup>8</sup>	170 <sup>8</sup>		61 <sup>8</sup>	0	TIMBER	TIMBER	20.4	16.0	16.9	"		
11	237.33	814+58.1	812+34.3	"	"	1°45' C.L.	223 <sup>8</sup>	97 <sup>8</sup>		126 <sup>5</sup>	189 <sup>3</sup>		"	"	20.4	16.2	16.8	"	
12	237.69	795+72.0	795+20.6	"	"	4°05' C.L. (Rock Shed)	514	514					"	"	22.5	16.3	16.7	"	
13	244.92	415+07.4	413+11.5	CRESTA	MERLIN	97 Sp. to 9°30' C.R. - 99 Tan.	195 <sup>8</sup>	195 <sup>8</sup>			371 <sup>7</sup>		"	"	21.0	16.1	16.9	10/27/50	
14	246.25	344+55.9	342+11.0	"	"	67 8'02" C.L. - 200 8'00" C.L. - 387 7'56" C.L.	244 <sup>8</sup>	244 <sup>8</sup>			365 <sup>7</sup>		"	"	21.0	16.2	16.8	1/1/54	
15	250.11	141+73.7	110+55.9	ROCK CR.	TOBIN	153 2'55" C.L. - 150 <sup>8</sup> 0'19" C.L. - 700 6' R Sp. 76 5' 11" C.R.	317 <sup>8</sup>		317 <sup>8</sup>				CONC.	CONC.				1/25/57	
16	257.43	650+67.9	644+67.0	CAMP RODGERS	BELDEN	748 8'00" C.R. - 208 8'00" C.R. - 158 8'00" C.R. - 67 8'00" C.R.	600 <sup>8</sup>	442 <sup>8</sup>		158 <sup>8</sup>	0		"	"	20.8	16.0	16.7	"	
17	257.85	628+68.0	625+78.5	"	"	10'00" C.R.	374 <sup>8</sup>		100 <sup>8</sup>		22 <sup>8</sup>	0	CONC.	CONC.	20.5	16.2	16.7	1/1/54	
18	258.08	616+84.1	615+34.0	"	"	158 2' Sp. to 10'00" C.L.	150 <sup>8</sup>			150 <sup>8</sup>			ROCK	ROCK	19.9	16.2	17.1	"	
19	258.16	612+60.0	610+96.0	"	"	84 10'00" C.L. - 100' Sp.	164 <sup>8</sup>			164 <sup>8</sup>			"	"	21.0	20.0	17.5	"	
20	258.32	604+16.5	601+25.0	"	"	10'00" C.R.	291 <sup>8</sup>			291 <sup>8</sup>			"	"	22.0	20.0	20.0	"	
21	258.85	576+10.0	572+05.0	"	"	347 10'00" C.R. - 62 <sup>3</sup> Sp.	405 <sup>8</sup>			405 <sup>8</sup>			"	"	22.0	20.0	19.7	"	
22	259.55	539+33.0	536+26.9	"	"	218 8'00" C.R. - 55 <sup>3</sup> Sp.	306 <sup>8</sup>			306 <sup>8</sup>			CONC.	CONC.	19.8	16.3	16.5	4/5/56	
23	262.87	364+70.8	352+13.1	BELDEN	RICH	8'00" C.R.	1251 <sup>8</sup>		1251 <sup>8</sup>			506 <sup>8</sup>	CONC.	CONC.	20.7	16.0	16.1	2/1/56	
24	263.89	310+66.2	304+50.1	"	"	39 <sup>8</sup> Sp. - 577 10'00" C.R.	616 <sup>8</sup>		616 <sup>8</sup>			512 <sup>8</sup>	CONC.	CONC.	20.7	16.0	16.1	3/28/57	
25	265.20	241+66.5	239+80.1	RICH	VIRGLIA	10'00" C.R.	106 <sup>8</sup>	77 <sup>8</sup>		109 <sup>8</sup>	61		TIMBER	TIMBER	20.6	16.1	16.9	2A/56	
26	271.58	658+89.2	654+50.6	VIRGLIA	TWIN	Tangent	438 <sup>8</sup>	438 <sup>8</sup>			73 <sup>8</sup>		"	"	20.7	16.1	17.0	"	
27	274.42	295+97.0	292+32.6	PAXTON	KEDDIE	347 <sup>8</sup> Sp. - 174 9'00" C.R.	364 <sup>8</sup>	282 <sup>8</sup>		564 <sup>8</sup>	CONC.	CONC.	20.9	15.8	16.5	"	"		
28	278.96	267+44.0	261+34.4	"	"	10'00" C.R.	608 <sup>8</sup>	525 <sup>8</sup>		82 <sup>8</sup>			"	"	20.8	16.0	16.5	"	
29	279.19	255+73.3	249+85.5	"	"	Tangent	587 <sup>8</sup>			587 <sup>8</sup>			"	"	20.9	16.0	16.4	9/15/56	
30	279.55	235+95.8	230+58.3	"	"	313 10'00" C.R. - 166 <sup>8</sup> Sp. - 55 <sup>3</sup> Tan.	537 <sup>8</sup>			537 <sup>8</sup>			"	"	20.9	16.0	16.5	8/2/56	
31	280.06	207+77.3	200+90.0	"	"	407 10'00" C.R. - 120 <sup>8</sup> Sp. - 159 <sup>8</sup> Tan.	687 <sup>8</sup>			687 <sup>8</sup>			"	"	21.0	16.0	17.0	1/1/54	
32	280.37	192+43.1	186+47.9	"	"	242 Tan. - 42 <sup>8</sup> Sp. - 270 3'00" C.R.	596 <sup>8</sup>			596 <sup>8</sup>			"	"	20.1	16.0	16.6	5/24/56	
33	283.06	50+51.5	38+80.0	KEDDIE	SERRA	644 <sup>8</sup> 7'00" C.L. - 175 <sup>8</sup> Sp. - 352 <sup>3</sup> Tan.	1270 <sup>8</sup>			1152 <sup>8</sup>		118 <sup>8</sup>	TIMBER	ROCK	20.2	16.1	15.9	10/1/55	
34	283.71	16+43.8	13+39.2	"	"	107 6'00" C.L. - 17 <sup>8</sup> Sp. - 126 <sup>3</sup> Tan.	304 <sup>8</sup>			304 <sup>8</sup>			CONC.	CONC.	21.2	16.1	16.7	1/1/54	
35	297.18	77+73.5	1328+132	SPG. GARDEN	SLOAT	105 Sp. to 3'00" C.R. - 7118 Tan. - 152 <sup>8</sup> Sp. - 65 <sup>3</sup> C.L.	7343 <sup>7</sup>			7343 <sup>7</sup>			"	"	20.9	16.1	16.4	"	
36	316.00	1283+77.7	1276+150	CLIO	MABIE	623 <sup>8</sup> Tan. - 198 <sup>8</sup> Sp. to 8'10" C.R.	762 <sup>7</sup>	666 <sup>7</sup>		96 <sup>8</sup>			"	"	21.4	16.2	16.7	10/27/50	
37	340.34	293 W. + 0+61 E	59+407	CHILCOOT	RENO JCT.	5982 <sup>8</sup> Tan. - 19 <sup>8</sup> Sp. to 3'00" C.L.	6001 <sup>7</sup>		4509 <sup>8</sup>		1492 <sup>7</sup>	3954 <sup>8</sup>	"	"	20.2	16.1	16.2	10/1/55	
38	628.73	2005+69.4	2000+38.1	CLURO	PALISADE	43 <sup>8</sup> Sp. - 82 <sup>8</sup> 4'30" C.L. - 400 <sup>8</sup> 4'00" C.L.	531 <sup>8</sup>	531 <sup>8</sup>				80 <sup>8</sup>	TIMBER	TIMBER	20.2	16.1	16.6	"	
39	635.37	1654+04.2	1644+23.5	"	"	790 <sup>8</sup> Tan. - 204 <sup>8</sup> Sp. - 66 <sup>8</sup> 5'06" C.R.	1080 <sup>1</sup>		1080 <sup>1</sup>			608 <sup>8</sup>	CONC.	CONC.	20.7	15.6	16.5	12/14/57	
40	636.80	1578+97.0	1575+75.0	PALISADE	CARLIN	16 4'36" C.R. - 209 <sup>8</sup> Sp.	322 <sup>8</sup>		21 <sup>8</sup>		301 <sup>8</sup>	0	CONC.	ROCK	20.3	16.2	16.5	12/14/57	
41	649.24	922+94.4	899+52.6	CARLIN	TONKA	85 <sup>8</sup> Sp. to 3'00" C.R. - 2256 <sup>8</sup> Tan.	2341 <sup>8</sup>	2341 <sup>8</sup>				888 <sup>8</sup>	TIMBER	TIMBER	20.8	16.2	16.8	10/1/55	
42	650.71	844+67.2	833+95.5	TONKA	HUNTER	230 <sup>8</sup> Sp. to 4'10" C.R. - 932 <sup>8</sup> Tan.	1071 <sup>7</sup>	1071 <sup>7</sup>				1724 <sup>8</sup>	"	"	20.6	16.1	16.9	"	
43	753.69	1430+81.9	1374+06.0	HOGAN	LUKE	42 <sup>8</sup> Sp. to 5'02" C.L. - 563 <sup>8</sup> Tan.	5675 <sup>9</sup>	1133 <sup>9</sup>		4542 <sup>8</sup>		2336 <sup>8</sup>	"	ROCK	20.0	16.1	14.9	1/1/54	
KEDDIE - BIEBER LINE																			
NC-1	—	2116+94.3	2110+06.4	EAST LEG - KEDDIE WYE		84 <sup>8</sup> Tan. - 200 Sp. - 268 <sup>8</sup> 10" C. - 94 <sup>8</sup> Sp.	685 <sup>8</sup>		685 <sup>8</sup>				CONC.	CONC.	22.5	18	18	1/1/54	
NC-2	0.97	2070+23.7	2064+35.4	KEDDIE	MOCCASIN	22 <sup>8</sup> Sp. - 478 <sup>8</sup> 10'00" C.R. - 87 <sup>8</sup> Sp.	588 <sup>8</sup>	477 <sup>8</sup>	110 <sup>8</sup>	78 <sup>8</sup>		955 <sup>8</sup>	TIMBER	"	"	18	18	"	
NC-3	2.61	1983+49.7	1977+28.7	"	"	97 Sp. - 354 <sup>8</sup> 10'00" C.R. - 200 Sp. - 57 <sup>8</sup> Tan.	621 <sup>8</sup>	166 <sup>8</sup>	454 <sup>8</sup>	30 <sup>8</sup>		323 <sup>8</sup>	CONC.	"	"	17.0	17.57	"	
NC-4	3.39	1942+09.3	1937+39.1	"	"	10'00" C.R.	470 <sup>8</sup>	3981	72 <sup>8</sup>	72 <sup>8</sup>		322 <sup>8</sup>	TIMBER	"	"	18.0	18	"	
NC-5	3.71	1925+28.4	1922+49.7	"	"	Tangent	278 <sup>7</sup>	278 <sup>7</sup>				0	"	TIMBER	"	17	17	"	
NC-6	21.03	1009+36.7	998+33.7	MOHALA	ALMANOR	252 <sup>8</sup> Tan. 255 Sp. - 179 10'12" C.R. - 416 3'10" C.R.	1103 <sup>8</sup>			1103 <sup>8</sup>			CONC.	CONC.	"	17.32	17.32	1/1/54	
NC-7		BY-PASSED	1954	"	"	"							"	"				10/1/54	
NC-8		BY-PASSED	1954	"	"	"							"	"				10/1/54	
NC-9		DAYLIGHTED	1953	DIXIE	PIT RIVER	"							"	"				1/1/54	
Note: Curves are shown as R (right) or L (left) facing east from San Francisco.							52,666 <sup>4</sup>	12,756 <sup>6</sup>	30,157 <sup>1</sup>	1,283 <sup>3</sup>	9,152 <sup>1</sup>	28,138 <sup>5</sup>	Totals						



**BILL OF MATERIAL BENTS 0 TO 20 FT.**

Height of Bent	2" x 20" Drift Bolts	1 1/2" x 14" Cap	4 x 6 x 5 R.W. Air Strps	Stub Pile	4 x 6 x 5 R.W. Air Strps	Stub Pile	1 1/2" x 14" Cap	2" x 20" Drift Bolts	1 1/2" x 14" Cap	4 x 6 x 5 R.W. Air Strps	Stub Pile	1 1/2" x 14" Cap	2" x 20" Drift Bolts	1 1/2" x 14" Cap	4 x 6 x 5 R.W. Air Strps	Stub Pile	1 1/2" x 14" Cap	2" x 20" Drift Bolts
0 to 7	25	11	1	2	0	0	2	7	5	4	2	0	0	2	7	5	4	2
8 to 10	25	11	2	2	10	1	2	7	5	26	13	10	1	2	7	5	26	13
11 to 13	25	11	2	2	10	1	2	7	5	36	18	2	2	10	1	2	7	5
14 to 16	25	11	2	2	10	1	2	7	5	36	18	2	2	10	1	2	7	5
17 to 18	25	11	2	2	10	1	2	7	5	36	18	2	2	10	1	2	7	5
19 to 20	25	11	2	2	10	1	2	7	5	36	18	2	2	10	1	2	7	5

Bolts in this list to be threaded 3" minimum



**BILL OF MATERIAL FOR DECKS (Caps not incl.)**

Span	2" x 20" Drift Bolts	1 1/2" x 14" Cap	4 x 6 x 5 R.W. Air Strps	Stub Pile	1 1/2" x 14" Cap	2" x 20" Drift Bolts	1 1/2" x 14" Cap	4 x 6 x 5 R.W. Air Strps	Stub Pile	1 1/2" x 14" Cap	2" x 20" Drift Bolts	1 1/2" x 14" Cap	4 x 6 x 5 R.W. Air Strps	Stub Pile	1 1/2" x 14" Cap	2" x 20" Drift Bolts	1 1/2" x 14" Cap	4 x 6 x 5 R.W. Air Strps	Stub Pile					
0 to 7	18	0	10	2	0	0	4	6	2	10	20	12	6	12	64	32	36	0	0	4	11	9	3	60
8 to 10	20	2	10	2	10	2	10	40	22	16	24	124	62	72	0	0	7	22	9	6	1	6	60	60
11 to 13	24	4	12	2	10	2	10	60	32	24	36	184	92	106	4	8	10	33	9	1	6	60	60	60
14 to 16	28	6	12	2	10	2	10	80	42	32	48	224	122	144	6	12	13	44	9	12	80	60	60	60
17 to 18	32	8	12	2	10	2	10	100	52	40	60	304	152	180	8	16	15	55	9	15	80	60	60	60
19 to 20	36	10	12	2	10	2	10	120	62	48	72	364	182	216	10	20	18	66	9	18	80	60	60	60
21 to 22	40	12	12	2	10	2	10	140	72	56	84	424	212	252	12	24	21	77	9	21	60	60	60	60
23 to 24	44	14	12	2	10	2	10	160	82	64	96	484	242	288	14	28	24	88	9	24	60	60	60	60
25 to 26	48	16	12	2	10	2	10	180	92	72	108	544	272	324	16	32	26	99	9	27	60	60	60	60
27 to 28	52	18	12	2	10	2	10	200	102	80	120	604	302	360	18	36	28	110	9	30	60	60	60	60
29 to 30	56	20	12	2	10	2	10	220	112	88	132	664	332	396	20	40	32	121	9	33	60	60	60	60
31 to 32	60	22	12	2	10	2	10	240	122	96	144	724	362	432	22	44	34	132	9	36	60	60	60	60
33 to 34	64	24	12	2	10	2	10	260	132	104	156	784	392	468	24	48	37	143	9	39	60	60	60	60
35 to 36	68	26	12	2	10	2	10	280	142	112	168	844	422	504	26	52	40	154	9	42	60	60	60	60
37 to 38	72	28	12	2	10	2	10	300	152	120	180	904	452	540	28	56	43	165	9	45	60	60	60	60

**NOTES:-**

The center line of piles produced should intersect at a point 25 feet above cut-off.

All bents over 7 feet in height must be cross braced.

All bolts to be put tight and held with Alligator Nut Locks.

Bents to have sash braces as shown when ground line is 12 feet or more below top of cap.

When caps and stringers are dapped caps shall be true and level.

All piling shall be crossbraced as per W.P. Spec. #103.

Wood bearing on wood shall have bearing surfaces painted with Standard Wood Preserving Paint.

Ties, guard timbers, tops of caps and stringers shall be given one coat of Standard Fire Resisting Paint before placing and tops of ties, guard timbers, caps and stringers shall have a second coat after placing.

Super-elevation on curves to be provided for in cut-offs, with top of lower rail maintained at established grade.

All timber to be Douglas Fir except as noted.

When ordering timber be governed by West Coast Lumbermen's Association Standard Grading and Dressing Rules No.10, effective July 1, 1934:-

Stringers to be Select Structural Grade, see paragraph 218

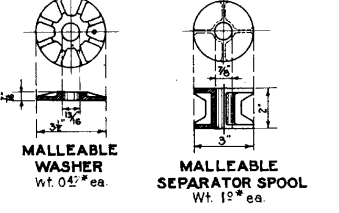
Cross Braces to be " " " " " " 214

Ties, Caps, Sashes to be " " " " " " 210

Guard Rail to be No. 1 Dimension, " " " " " 195

APPROVED: *J.M. Williams* CHIEF ENGINEER

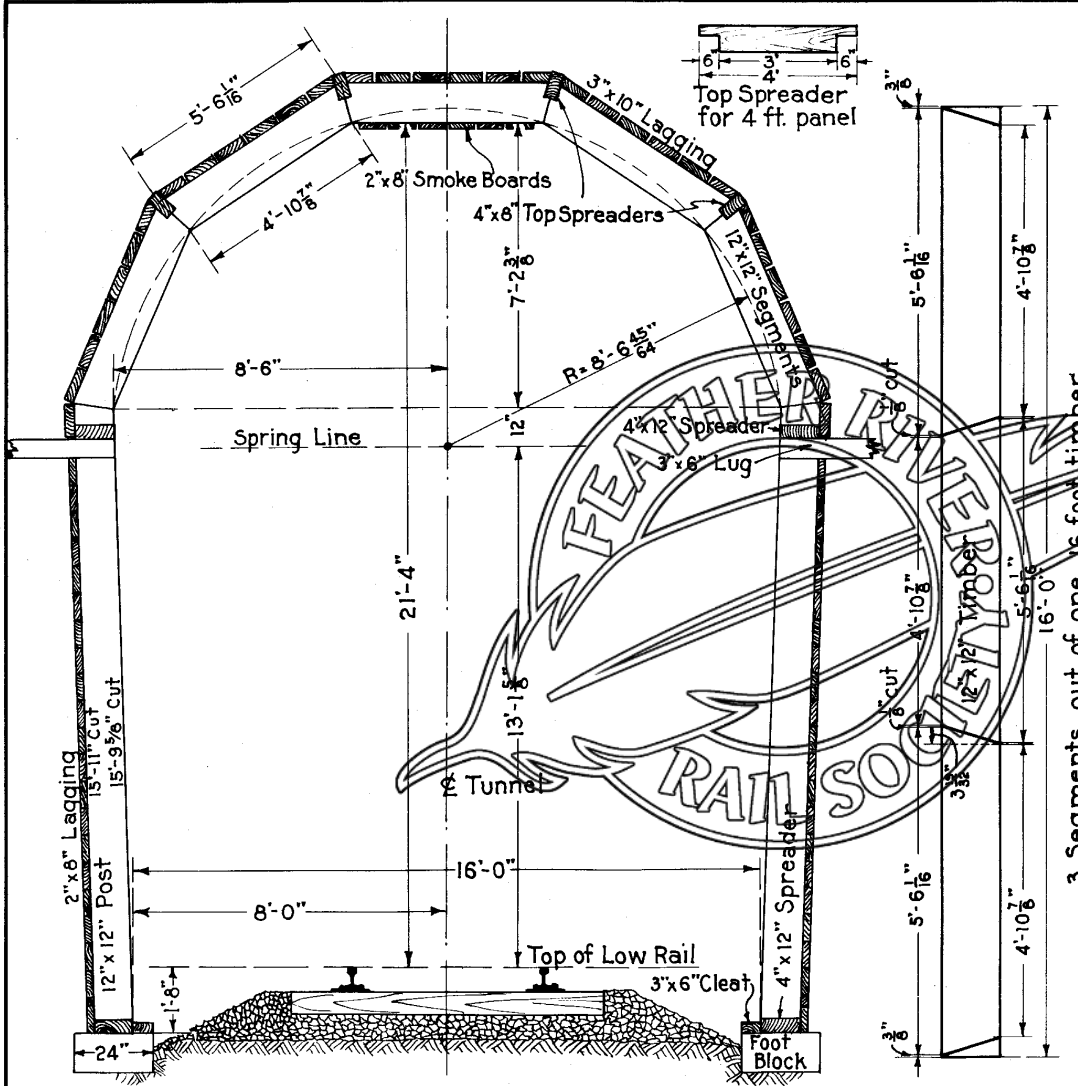
APPROVED: *E.W. Mason* VICE PRESIDENT AND GENERAL MANAGER



**THE WESTERN PACIFIC RAILROAD CO. STANDARD**

**PILE TRESTLE FOR MAIN LINE 15' SPAN - 8"x20" STRINGERS - 5 PILE BENTS**

Scales as noted  
Adopted June 1, 1932  
Revised Apr. 1, 1933 - May 22, 1933  
Mer. 24, 1936 - Apr. 28, 1936



Material for 3 sets (Any spacing)		
11 Pcs.	12"x12"x16'-0"	Posts & Segments
2 Pcs.	12"x12"x 6'-0"	Foot Blocks
12 Lin.ft.		Dowels
3 Pcs.	3"x6"x12'-0"	Lugs & cleats

Material for 1-4 ft. Panel (Bet. sets)		
11 Pcs.	3"x10"x12'-0"	Top Lagging
15 Pcs.	2"x8"x12'-0"	Side Lagging
1 Pc.	4"x12"x12'-0"	Spreaders
2 Pcs.	2"x8"x12'-0"	Smoke boards
1 Pc.	4"x8"x16'-0"	Top Spreaders

Miscellaneous		
50 Pcs.	2"x4"x1'-2"	Wedges for 1 set
4 Pcs.	4"x6"x18'-0"	Crown Bars- 3 sets

Note: For other than 4 ft. panels, it will be necessary to modify above quantities of lagging, spreaders and smoke boards to fit spacing of tunnel sets.

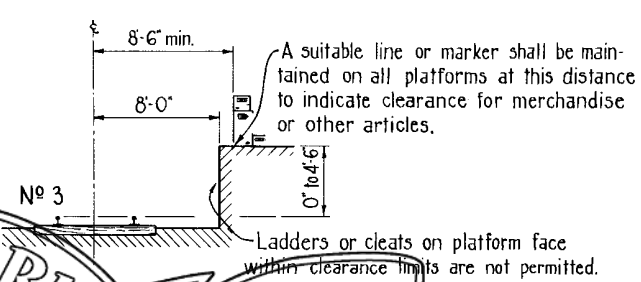
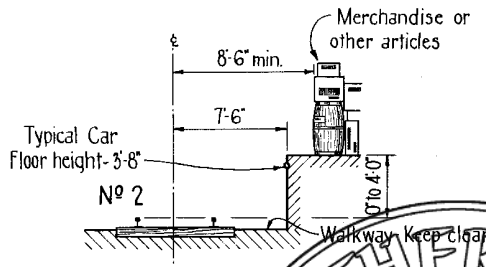
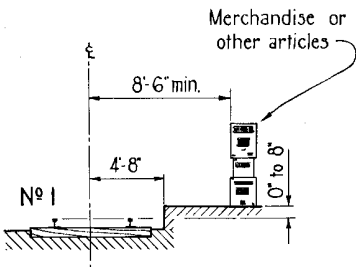
TABLE OF OFFSETS FROM THE TUNNEL TO THE TRACK	
Degree of Curve	Offset
Tangent	0"
1°	2"
2°	3"
3°	4"
4°	5"
5°	6"
6° to 10°	6"

APPROVED: *J.M. Williams*  
CHIEF ENGINEER

APPROVED: *E.W. Mason*  
VICE PRESIDENT AND GENERAL MANAGER.

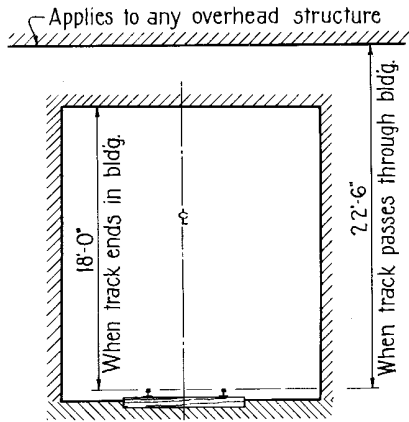
THE WESTERN PACIFIC RAILROAD CO.  
STANDARD  
TUNNEL TIMBER SET  
MAIN LINE  
SAN FRANCISCO TO SALT LAKE CITY  
NO SCALE ADOPTED JAN. 30, 1940



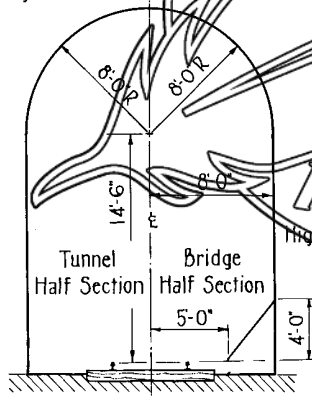


### PLATFORM CLEARANCES

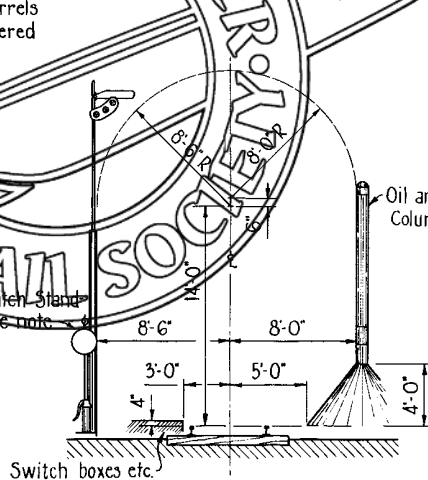
Fences for cattle guards and water barrels and hand rails on trestles are not covered by these clearances.



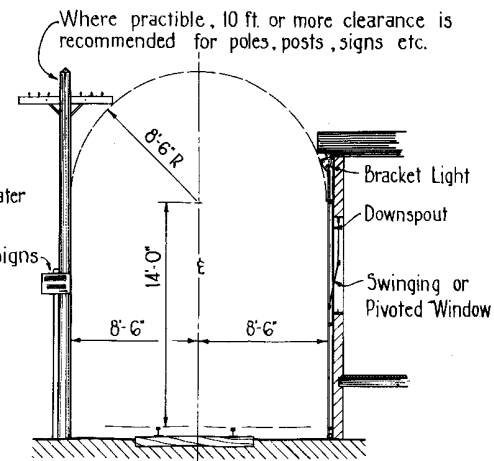
### OVERHEAD CLEARANCES BUILDINGS



### TUNNEL & BRIDGE CLEARANCES



### SIDE CLEARANCES GENERAL



### OVERHEAD CLEARANCES

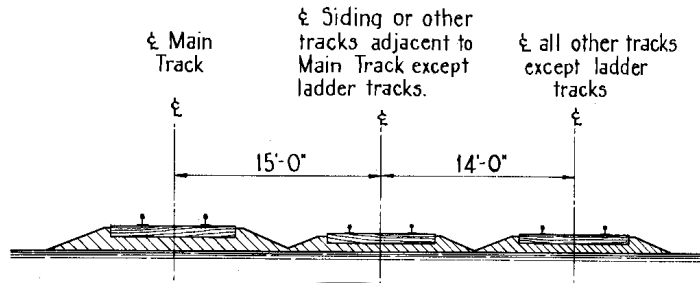
Low switch stands 6 feet or less in height are not permitted between tracks. Clearance reduced to 6'-0" if actually not obscured by structure. When clearance is obscured by structure, legal clearance with structure shall be reduced to 7'-6". Trolley poles of single or double main lines shall be 8'-3" from track centerline. These clearances apply to cranes in delivery.

### PLATFORM CLEARANCES

Platform No. 3 to be used primarily for loading and unloading refrigerator cars. Platforms No. 1 and No. 2 or Platform No. 3 may be combined provided platform is level from track centerline of track and is level from track centerline of form No. 2 or No. 3. Loading platforms and supports shall have a side clearance of 7'-8". Hand railings for stairs, either on or off the platform, that project above platform shall have a 8'-6" clearance from track centerline.

### PLATFORM CLEARANCES

Platform N° 3 to be used principally for loading and unloading refrigerator cars.  
 Platforms N° 1 and N° 2 or Platforms N° 1 and N° 3 may be combined provided platform N° 1 starts 4'-8" from centerline of track and is level from that point to the face of platform N° 2 or N° 3.  
 Icing platforms and supports shall have a minimum side clearance of 7'-8".  
 Hand railings for stairs, either at end of platform or in wells, that project above platform floor must have 8'-6" clearance from track centerline.



### TRACK CENTERS

No tracks shall be set at less than 14'-0" centers, except parallel team house and industry tracks which may be set at 13'-0" centers.  
 The centerline of any ladder track, parallel to any other track, including other ladder tracks, shall have a minimum clearance of 20'-0" with such track.

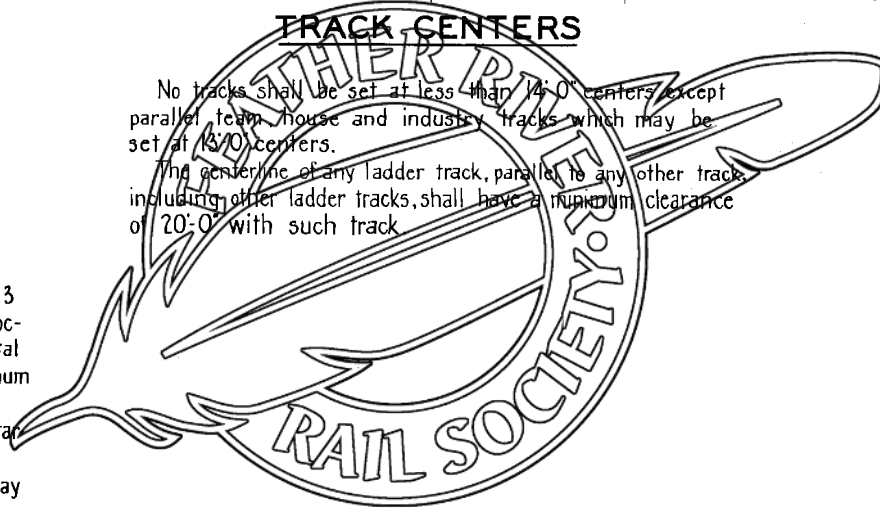
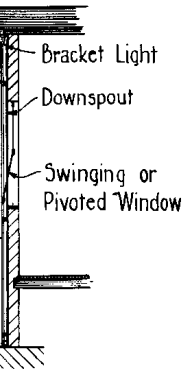
### NOTES

All side clearances shown apply to tangent track. For curved track one foot additional clearance is required. Where space is limited this may be amended on authority of the Chief Engineer.  
 The centerline of any track constructed in and along a public street shall be at least 10 feet from the property line, or if the street has a lawfully established curb line, such track shall be at least 10 feet from such curb line.

### OVERHEAD & SIDE CLEARANCES

Low switch stands or block signals 3 feet or less in height above top of rail, located between tracks, may have horizontal clearance reduced from 8'-6" to a minimum of 6'-0" if actually necessary.  
 When clear vision of switch stand target is obscured by trolley poles set at legal clearance switch stand clearance may be reduced to 7'-6".  
 Trolley poles of bracket construction, on single or double main track, may be set at 8'-3" from track centerline.  
 These clearances do not apply to mail cranes in delivery position.

Clearance is  
 signs etc.



Approved: *Frank R. Woodford*  
 Chief Engineer

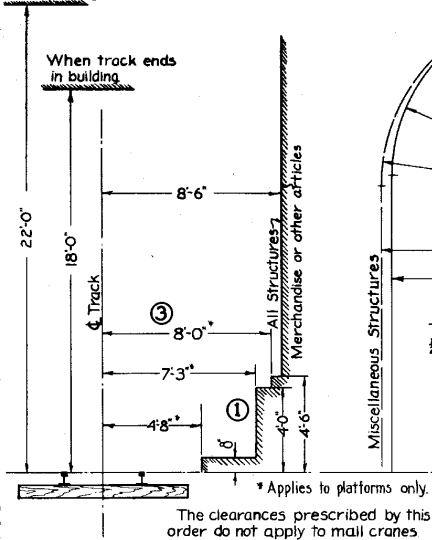
THE WESTERN PACIFIC RAILROAD COMPANY  
 STANDARD  
**MINIMUM CLEARANCES**  
 CALIFORNIA

NO SCALE

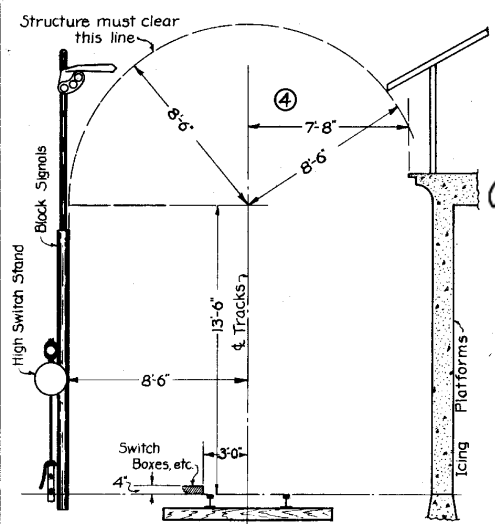
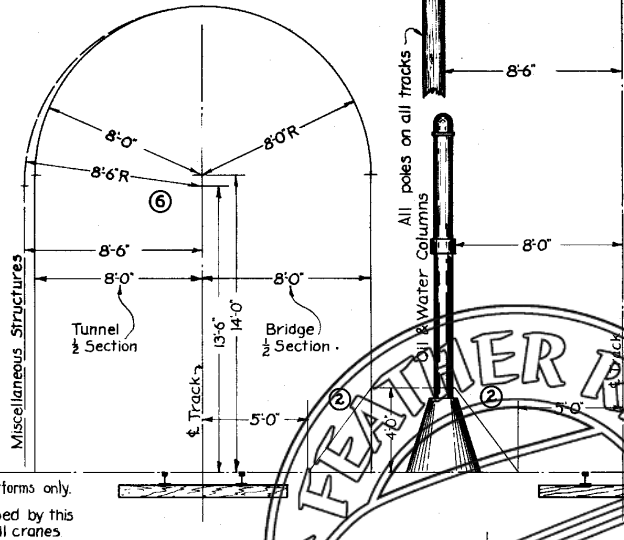
ADOPTED: Feb. 1, 1948  
 Redrawn: Aug. 15, 1957

Reference: P.U.C. General Order N° 26 D, Effective 2-1-48

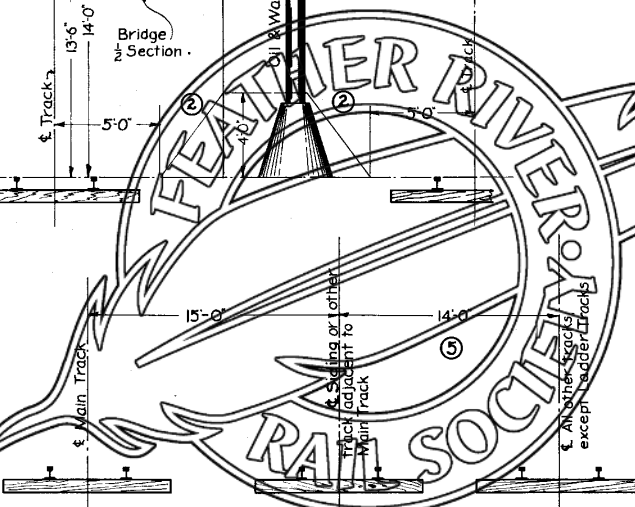
When track passes thru building or under any overhead structure.



All poles adjacent to any track shall have a minimum side clearance of 8'-6" from the center line of said track.



Note: Low switch stands or block signals 3 feet or less in height above top of rail, located between tracks may have horizontal clearance reduced from 8'-6" to a minimum of 6'-0" if actually necessary.



ADDITIONS AND EXCEPTIONS

- ① Stepped Platforms not permitted.
- ② Governs hand rails, water barrels, refuge platforms on bridges or trestles, water or oil columns, block signals, cattle guards and cattle chutes provided minimum clearance for such hand rails is 7'-6" and for fences of cattle guards is 6'-9".
- ③ Used principally for loading and unloading refrigerator cars or other cars in lieu thereof.
- ④ Where practicable, tracks adjacent to icing platforms should have 7'-8" clearance. Note: Existing platforms used for loading or unloading refrigerator cars, and existing icing platforms heretofore constructed, may be extended at the existing clearance, provided that such clearance shall not be less than 6'-6" from the center line of track, but no switching or storing of ordinary freight cars is permitted on such tracks.
- ⑤ Team tracks may be set at 11'-6" centers provided standard clearances are maintained on opposite side of each track. Minimum clearance between center lines of parallel house or industry tracks shall be 13'-0". Existing tracks may be maintained, reconstructed, or extended at centers in existence as of the effective date of this order.
- ⑥ Overhead and side clearances do not apply to engine houses. In shops and buildings in which freight cars are moved for repairs, doorways shall have minimum side clearance of 7'-8".
- ⑦ Ladder tracks parallel to any other track shall have a clearance of not less than 20 feet from center line of such other track.
- ⑧ Aumble line or marker shall be maintained on all platforms, except passenger platforms, at a distance of 8'-6" from center line of track, to indicate minimum clearance for merchandise and other articles placed thereon.

Log railways may be erected and maintained with impaired clearance when adjacent to tracks operated exclusively for logging purposes.  
Where railroads cross above public roads, highways, and streets, the minimum overhead clearance shall be 14 feet and the minimum width of opening for a single span shall be 20 feet, or for two or more spans shall be 12 feet for each opening.  
Where public roads, highways, and streets cross above railroad tracks, minimum standard clearances prevail, except that at time of installations of crossings, the minimum overhead clearance of 23 feet above the top of rail, shall be observed.

APPROVED: *A. Miller*  
CHIEF ENGINEER.

GENERAL INSTRUCTIONS

For curved track one foot additional clearance is required. When space is limited side clearance may remain the same for curves not over 12 degrees; for curves over 12 degrees add 1/4 inch to standard clearances for each degree of curve. Where track contains superelevation, minimum side clearances shall be increased as necessary to give the equivalent clearances based on tangent track. Posts, pipes, signs, and other small obstructions, where practicable, 10'-0" or more clearance is recommended. Hand rails other than on bridges and trestles to be not less than 8'-6" from center line unless authorized by General Manager. No tracks to be less than 13'-0" centers unless authorized by General Manager.

THE WESTERN PACIFIC RAILROAD CO.  
STANDARD  
MINIMUM CLEARANCES  
AS PRESCRIBED BY THE  
PUBLIC SERVICE COMMISSION OF NEVADA

CASE 1159 EFFECTIVE JUNE 2, 1947  
NO SCALE REVISED NOV. 12, 1948  
NOV. 16, 1955



THE WESTERN PACIFIC RAILROAD COMPANY

ELEVATION OF OUTER RAIL ON CURVES  
OROVILLE TO PORTOLA

&  
ARNOLD TO MILE POST 785

TABLE

Degree of Curve	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°
Elevation of Outer Rail in inches	1/2"	1"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	4 1/2"	5"

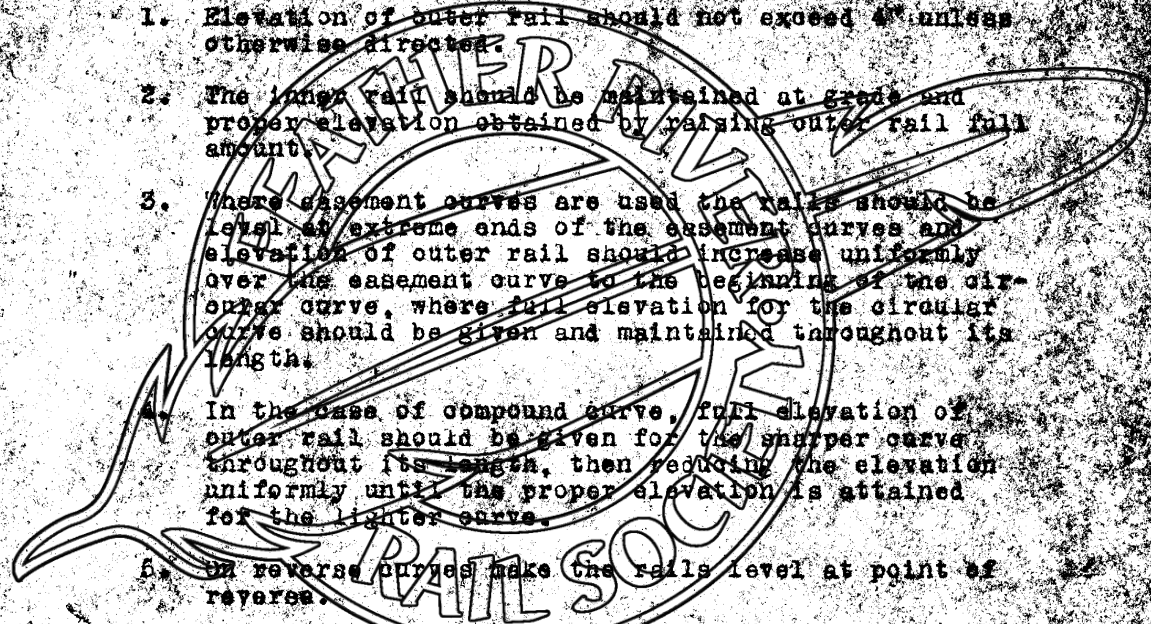
1. Elevation of outer rail should not exceed 4" unless otherwise directed.
2. The inner rail should be maintained at grade and proper elevation obtained by raising outer rail full amount.
3. Where easement curves are used the rails should be level at extreme ends of the easement curves and elevation of outer rail should increase uniformly over the easement curve to the beginning of the circular curve, where full elevation for the circular curve should be given and maintained throughout its length.
4. In the case of compound curve, full elevation of outer rail should be given for the sharper curve throughout its length, then reducing the elevation uniformly until the proper elevation is attained for the lighter curve.
5. On reverse curves make the rails level at point of reversal.
6. The proper elevation of the outer rail required at points on curves according to above table can be obtained by use of a cord 39 feet in length. Tie a knot in the exact middle of the cord and stretch the cord tightly between points on the inner face of the outer rail and measure the distance between the cord and the inner face of the rail at the knot. This distance, (middle ordinate) will be the correct elevation at the knot. This method is applicable to all curves and aids in maintaining true alignment, as all ordinates should be equal on full centered portions of curve, and ordinates must decrease uniformly on easement curves from full elevation to zero at tangent point.

Approved:

Approved:

Vice-President

*Handwritten notes:*  
 Checked by D-43  
 Date: Jan 2, 1943  
 This has been corrected



THE WESTERN PACIFIC RAILROAD COMPANY

ELEVATION OF OUTER RAIL ON CURVES  
OROVILLE TO PORTOLA

&  
ARNOLD TO MILE POST 785

TABLE

Degree of Curve	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°
Elevation of Outer Rail in inches	$\frac{1}{2}$ "	1"	1 $\frac{1}{2}$ "	1 $\frac{3}{4}$ "	2"	2 $\frac{1}{2}$ "	3"	3 $\frac{1}{2}$ "	3 $\frac{3}{4}$ "	4"

1. Elevation of outer rail should not exceed 4" unless otherwise directed.

2. The proper elevation should be obtained at grade and proper elevation obtained on curves by outer rail full amount.

3. When easement curves are used, the elevation should be given at the extreme ends of the easement curves and the elevation of outer rail should increase uniformly over the easement curve to the elevation of the circular curve, where full elevation of the circular curve should be given and maintained throughout its length.

In the case of compound curve, full elevation of outer rail should be given for the sharper curve throughout its length, then gradually the elevation uniformly until the proper elevation is attained for the flatter curve.

5. All reverse curves shall be level at point of reverse.

6. The proper elevation of the outer rail required at points on curves according to above table can be obtained by use of a cord 39 feet in length. Tie a knot in the exact middle of the cord and stretch the cord tightly between points on the inner face of the outer rail and measure the distance between the cord and the inner face of the rail at the knot. This distance (middle ordinate) will be the correct elevation at the knot. This method is applicable to all curves and aids in maintaining true alignment, as all ordinates should be equal on full centered portions of curve, and ordinates must decrease uniformly on easement curves from full elevation to zero at tangent point.

Approved:

*J. M. Williams*  
Chief Engineer

Approved:

*E. W. Mason*  
Vice-President & General Manager



*30  
The proper elevation of the outer rail should be obtained at grade and proper elevation obtained on curves by outer rail full amount.*

TABLE OF TRAIN SPEEDS, IN MILES PER HOUR, ON CURVES OF GIVEN DEGREES AND WITH GIVEN SUPER-ELEVATIONS IN INCHES OF CURVE

Degrees of Curves	Kinds of Speeds	Super-Elevations in Inches							
		0	1	2	3	4	5	6	7
1°00'	Equi.	--	39	53	67	78	87	95	102
	Comf.	68	78	87	95	103	111	118	124
	Safe.	90	98	106	113	120	126	132	138
	Over.	136	171	176	181	185	190	193	199
2°00'	Equi.	--	38	52	66	75	83	89	95
	Comf.	48	55	62	68	75	80	85	89
	Safe.	64	70	75	80	85	89	93	98
	Over.	117	131	134	138	141	144	147	150
3°00'	Equi.	--	36	50	64	71	78	83	88
	Comf.	59	65	70	75	80	84	88	92
	Safe.	52	57	61	65	69	73	76	80
	Over.	96	99	102	104	107	110	112	115
4°00'	Equi.	--	34	48	62	68	74	79	83
	Comf.	54	59	64	68	72	75	79	82
	Safe.	46	49	53	56	60	63	66	69
	Over.	83	85	88	90	93	95	97	100
5°00'	Equi.	--	32	46	60	66	71	76	80
	Comf.	50	55	60	64	68	71	74	77
	Safe.	40	44	47	51	54	56	59	62
	Over.	74	76	79	81	83	85	87	89
6°00'	Equi.	--	30	44	58	64	69	74	78
	Comf.	48	52	56	60	64	67	70	73
	Safe.	37	40	43	46	49	51	54	56
	Over.	63	65	67	70	72	74	76	78
7°00'	Equi.	--	28	42	56	62	67	72	76
	Comf.	46	50	54	58	62	65	68	71
	Safe.	34	37	40	43	45	48	50	52
	Over.	63	65	66	68	70	72	74	75
8°00'	Equi.	--	26	40	54	60	65	70	74
	Comf.	44	48	52	56	60	63	66	69
	Safe.	32	35	37	40	42	45	47	49
	Over.	59	60	62	64	66	67	69	71
9°00'	Equi.	--	24	38	52	58	63	68	72
	Comf.	42	46	50	54	58	61	64	67
	Safe.	30	33	35	38	40	42	44	46
	Over.	55	57	59	60	62	63	65	66
10°00'	Equi.	--	22	36	50	56	61	66	70
	Comf.	40	44	48	52	56	59	62	65
	Safe.	29	31	34	36	38	40	42	44
	Over.	53	54	56	57	59	60	62	63

INSTRUCTIONS FOR SUPERELEVATION TABLE

Instructions: - This super-elevation table is used as a basis of the super-elevation of curves on Western Pacific lines. Each curve is considered independently and super-elevation fixed after investigation of speeds of passenger and freight trains in both directions, full consideration being given to sharpness of curves and grades. This table is to be used for information only.

The Engineer of R.R. will consult with Superintendents regarding speeds and super-elevation on various districts and then, jointly, with Vice-President and General Manager fix the speed and super-elevation to be used on each curve.

"Equi." denotes equilibrium speeds obtained by applying centrifugal formula  $E = .0007 V^2 D$  in which resultant passes through center of track.

"Comf." denotes the 3-inch unbalanced elevations shown in the readings "..." and represent comfortable speeds for passenger trains. These speeds, in general, are the maximum speeds allowable.

"Safe" denotes maximum theoretically safe speeds; that is, speeds at which the resultants pass through the edge of the middle third of the track, assuming center of gravity 84 inches above top of rail.

"Over." denotes overturning speeds in which the resultant passes through the gage line.

The maximum super-elevation allowable on Western Pacific lines will vary from 4-1/2 inches to 6 inches, depending on grades and curvature.

THE WESTERN PACIFIC RAILROAD CO.  
SUPERELEVATION TABLE

JAN. 2, 1930.

Note: For use in General Office only.

Degree of Curve	ESTABLISHED SUPER-ELEVATIONS IN INCHES FOR NORMAL CONDITIONS												
	0	$\frac{1}{4}$	1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6
	Maximum Speed in Miles Per Hour												
0°30'	75	90	98										
1°00'	63	68	73	77	82								
1°30'	53	57	61	65	69	73	77						
2°00'	43	46	50	53	57	60	63	65	68	70			
2°30'	38	41	44	47	50	53	56	58	61	63	66	68	70
3°00'	34	37	40	42	45	47	50	52	55	57	59	61	63
3°30'	31	34	37	39	42	44	46	48	51	52	54	56	58
4°00'	29	31	34	36	39	41	43	45	47	48	50	52	54
4°30'	27	29	32	34	36	38	40	42	44	45	47	49	51
5°00'	25	27	30	32	34	36	38	39	41	43	45	46	48
5°30'	24	26	28	30	32	34	36	37	39	41	42	44	45
6°00'	23	25	27	29	31	32	34	35	37	38	40	42	43
6°30'	22	24	26	27	29	30	32	34	35	37	38	40	41
7°00'	21	23	25	26	28	29	31	33	34	36	37	38	39
7°30'	20	22	24	25	27	28	30	31	33	34	35	36	38
8°00'	19	21	23	24	26	27	29	30	32	33	34	35	37
8°30'	18	20	22	23	25	26	28	29	31	32	33	34	35
9°00'	18	19	21	22	24	26	27	29	30	31	32	33	34
9°30'	17	18	20	21	23	25	26	28	29	30	31	32	33
10°00'	16	18	20	21	23	24	25	27	29	30	30	31	32
10°30'	16	17	19	20	22	23	25	26	28	29	29		
11°00'	15	17	19	20	22	23	24	25	27	28	29		
11°30'	15	16	18	19	21	22	23	24	26	27	28		
12°00'	15	16	18	19	20	21	23	24	25	26	27		
14°00'	13	15	16	17	18	20	21						
16°00'	12	13	15	16	17	18	19						
18°00'	11	12	13	15	16								
20°00'	10	11	12	13	15								

Note: Speeds shown on right of heavy line are for information only.

C.E.  
S-43

ENGINEERING DEPARTMENT DATA  
ON MAXIMUM STEAM TRAIN SPEEDS

This table is to be used for information purposes only in determining speeds to be officially authorized on curves.

The Engineer of M. of W. & S. will consult with Superintendents regarding speeds and super-elevation on various districts, and then, jointly with the Vice-President & General Manager, fix the super-elevation to be used for each curve and shown on "Curve List." Each curve is considered independently and super-elevation established after investigation of speeds of passenger and freight trains in both directions, full consideration being given to location, sharpness of curves, & grades.

The maximum super-elevation allowable on Western Pacific lines will vary from 4 inches to 6 inches.

This Speed Table of established maximum speeds for normal conditions is based on A.R.E.A. comfortable speeds, less 5 miles per hour. Under no circumstances should actual speed exceed, by more than 5 miles per hour, the speed specified in this Table. Superintendent should take up with Engineer M of W & S for consideration, any curve where the established super-elevation as shown on the curve list appears to require revision, covering the situation in the meantime, with temporary slow orders or otherwise, as his judgement indicates necessary.

THE WESTERN PACIFIC RAILROAD COMPANY

SPEED TABLE FOR CURVES

JANUARY 11, 1937



TABLE OF TRAIN SPEEDS, IN MILES PER HOUR, ON CURVES OF GIVEN DEGREES AND WITH GIVEN SUPERELEVATIONS IN INCHES OF OUTER RAIL

Degrees of Curves	Kinds of Speeds	Super-Elevations in Inches							
		0	1	2	3	4	5	6	7
		Speeds in Miles Per Hour							
1°00'	Equi.	--	39	55	67	78	87	95	102
	Comf.	68	78	87	96	103	111	118	124
	Safe.	90	99	106	113	120	126	132	138
	Over.	166	171	176	181	185	190	195	199
2°00'	Equi.	--	23	39	48	55	62	67	73
	Comf.	48	55	62	68	73	78	83	88
	Safe.	64	70	75	80	85	89	93	98
	Over.	117	121	124	128	131	134	138	141
3°00'	Equi.	--	23	32	39	45	50	55	59
	Comf.	39	45	50	55	60	64	68	72
	Safe.	52	57	61	65	69	73	76	80
	Over.	96	99	102	105	108	112	115	117
4°00'	Equi.	--	19	23	28	31	35	38	40
	Comf.	34	39	44	47	52	55	59	62
	Safe.	45	49	53	57	60	63	66	69
	Over.	83	85	88	91	95	97	100	102
5°00'	Equi.	--	17	25	30	35	39	43	46
	Comf.	30	35	39	45	46	50	53	56
	Safe.	40	44	47	51	54	57	59	62
	Over.	74	76	78	81	83	85	87	89
6°00'	Equi.	--	16	22	27	32	36	39	42
	Comf.	28	32	36	39	42	45	48	51
	Safe.	37	40	43	46	49	51	54	56
	Over.	68	70	72	74	76	78	80	81
7°00'	Equi.	--	15	21	26	30	34	37	40
	Comf.	26	30	33	36	39	42	45	47
	Safe.	34	37	40	43	45	48	50	52
	Over.	63	65	66	68	70	72	74	75
8°00'	Equi.	--	14	20	24	28	31	34	36
	Comf.	24	28	31	34	37	39	42	44
	Safe.	32	33	37	40	42	45	47	49
	Over.	59	60	62	64	66	67	69	71
9°00'	Equi.	--	13	18	22	26	29	32	34
	Comf.	23	26	29	32	35	37	39	41
	Safe.	30	33	35	38	40	42	44	46
	Over.	55	57	59	60	62	63	65	66
10°00'	Equi.	--	12	17	21	25	28	30	33
	Comf.	21	25	28	30	33	35	37	39
	Safe.	29	31	34	36	38	40	42	44
	Over.	53	54	56	57	59	60	62	63

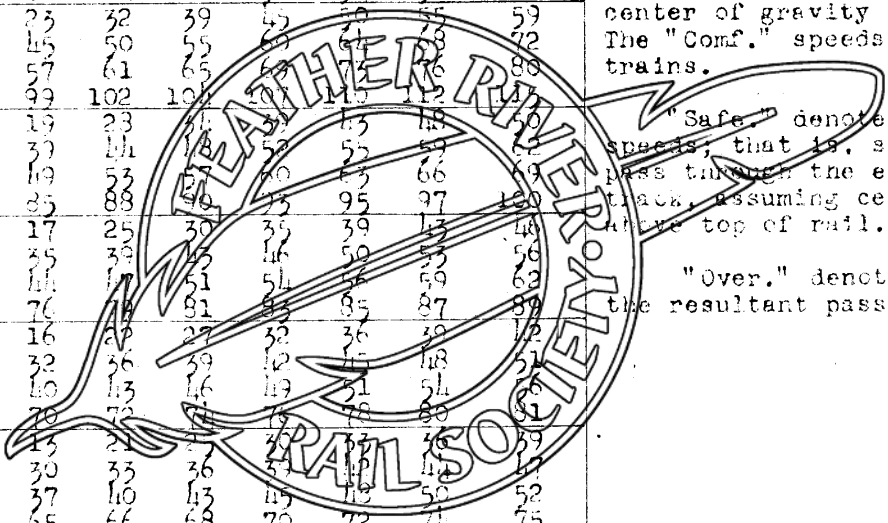
THIS SUPER-ELEVATION TABLE IS FROM THE 1929 A.R.E.A. MANUAL AND IS FOR INFORMATION OF ENGINEERING DEPARTMENT ONLY

"Equi." denotes equilibrium speeds obtained by applying centrifugal formula  $E = .00066 V^2 D$  in which resultant passes through center of track.

"Comf." denotes the 3-inch unbalanced elevations in which the resultant passes approximately 4-1/2 inches outside the center of track, assuming center of gravity is 8 1/2 inches above top of rail. The "Comf." speeds should not be exceeded by steam trains.

"Safe." denotes maximum theoretically safe speeds, that is, speeds at which the resultants pass through the edge of the middle third of the track, assuming center of gravity is 8 1/2 inches above top of rail.

"Over." denotes overturning speeds in which the resultant passes through the gage line.



THE WESTERN PACIFIC RAILROAD COMPANY  
A.R.E.A. SUPER-ELEVATION TABLE

JAN. 2, 1930  
Revised Jan. 11, 1937.

THE WESTERN PACIFIC RAILROAD COMPANY

C.E.  
S-43-B

RATE OF RUNOFF IN INCHES PER SECOND IN TERMS OF INCHES PER 100 FEET FOR VARIOUS SPEEDS

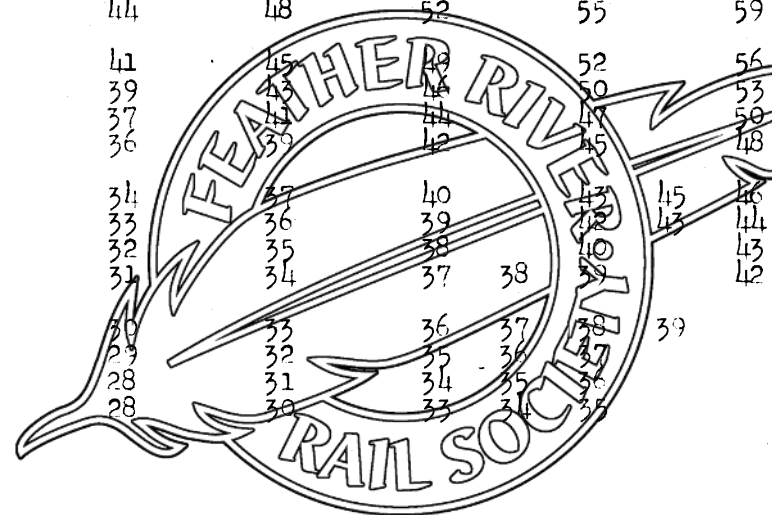
Speed M.P.H.	Speed in Feet per Second	Rate of Runoff in Inches per Second										
		2.20"	2.02"	1.83"	1.76"	1.65"	1.47"	1.32"	1.28"	1.17"	1.10"	1.00"
		Rate of Runoff in Inches per 100 Feet										
120	176.0	1.25	1.15	1.04	1.00	0.94	0.84	0.75	0.73	0.66	0.63	0.57
115	168.7	1.30	1.20	1.09	1.04	0.98	0.87	0.78	0.75	0.69	0.65	0.59
110	161.3	1.36	1.25	1.13	1.09	1.02	0.91	0.82	0.79	0.73	0.68	0.62
105	154.0	1.43	1.31	1.19	1.14	1.07	0.95	0.86	0.83	0.75	0.71	0.65
100	146.7	1.50	1.38	1.25	1.20	1.12	1.00	0.90	0.87	0.80	0.75	0.68
95	139.3	1.58	1.45	1.31	1.25	1.18	1.06	0.95	0.92	0.84	0.79	0.72
90	132.0	1.67	1.53	1.39	1.33	1.25	1.11	1.00	0.97	0.89	0.83	0.75
85	124.7	1.76	1.62	1.47	1.41	1.32	1.18	1.06	1.03	0.94	0.88	0.80
80	117.3	1.88	1.72	1.56	1.50	1.41	1.25	1.13	1.09	1.00	0.94	0.85
75	110.0	2.00	1.84	1.66	1.60	1.50	1.34	1.20	1.16	1.06	1.00	0.91
70	102.7	2.14	1.97	1.78	1.71	1.61	1.43	1.30	1.25	1.14	1.07	0.97
65	95.3	2.31	2.12	1.98	1.85	1.73	1.54	1.39	1.34	1.23	1.15	1.05
60	88.0	2.50	2.30	2.08	2.00	1.88	1.67	1.50	1.45	1.33	1.25	1.14
55	80.7	2.72	2.50	2.27	2.18	2.04	1.82	1.64	1.59	1.45	1.36	1.24
50	73.3	3.00	2.76	2.50	2.40	2.25	2.00	1.80	1.75	1.60	1.50	1.36
45	66.0		3.06	2.77	2.67	2.50	2.23	2.00	1.94	1.77	1.67	1.52
40	58.7				3.00	2.81	2.50	2.25	2.18	2.00	1.87	1.70

Note: For information of Engineering Department only. January 11, 1937.

C.E.  
S-43-C

ESTABLISHED SUPER-ELEVATION IN INCHES FOR NORMAL CONDITIONS  
 0 1/2 1 1 2 2 3 3 4 4 5 5 6  
 Maximum Speed in Miles Per Hour

0°30'	95	100	100									
1°00'		75	80	85	90	95						
1°30'		65	70	74	75	80						
2°00'		55	58	62	65	68		73				
2°30'		49		55		61		66		71		75
3°00'		45		50		55		60		64		68
3°30'				47		51		56		60		63
4°00'				44		48		52		55		59
4°30'				41		45		49		52		56
5°00'				39		43		47		50		53
5°30'				37		41		44		47		50
6°00'				36		39		42		45		48
6°30'				34		37		40		43	45	48
7°00'				33		36		39		42	43	44
7°30'				32		35		38		41		43
8°00'				31		34		37	38	40		42
8°30'				30		33		36	37	38	39	
9°00'				29		32		35	36	37		
9°30'				28		31		34	35	36		
10°00'				28		30		33	34	35		



ENGINEERING DEPARTMENT DATA  
 ON MAXIMUM DIESEL TRAIN SPEEDS

This table is to be used for information purposes only in determining speeds to be officially authorized on curves.

The Engineer of M. of W. and S., will consult with Superintendents regarding speeds and super-elevation on various districts, and then, jointly with the Vice-President & General Manager, fix the super-elevation to be used for each curve and shown on the "Curve List." Each curve is considered independently and super-elevation established after investigation of speeds of Diesel trains in both directions, full consideration being given to location, sharpness of curves, and grades.

The maximum super-elevation allowable on Western Pacific lines will vary from 4 inches to 6 inches.

This Speed Table of established maximum speeds for normal conditions is based on A.R.E.A. comfortable speeds. Under no circumstances should actual speed exceed the speed specified in this Table. Superintendent should take up with Engineer of M. of W. and S. for consideration any curve where the established super-elevation as shown on the curve list appears to require revision, covering the situation in the meantime with temporary slow orders or otherwise, as his judgement indicates necessary.

THE WESTERN PACIFIC RAILROAD COMPANY  
 SPEED TABLE FOR CURVES  
 OCTOBER 7, 1937