

Appendix 8

Curve Alignment Reference Form

CURVE ALIGNMENT REFERENCE FORM

WORK DIRECTION

TRACK ID:		TYPE OF FASTENERS
	(LOW TO HIGH MP)	
MILEPOST BEGIN:		Rail Anchors
	(HIGH TO LOW MP)	
MILEPOST END:		Pandrol Platers
DEGREE OF CURVE:		Other
TEAM NAME:		

DATE:					
RAIL TEMPERATURE:					
RECORDER:					
		MEASUREMENT 1 BEFORE WORK	MEASUREMENT 2 AFTER WORK	MEASUREMENT 3 FOLLOW UP	MEASUREMENT 4 FOLLOW UP
No.	DESCRIPTION				

NOTES:

References should be marked fixed objects or wood stakes if practicable. Number reference points in sequence in the direction of work. In "Description", note TS, SC, CS, ST, and identify reference.

Measure from the field side of the near rail to the face of fixed object or stake. References should be spaced no more than:

- 100 feet on curves 9 degrees and above
- 200 feet on 9 degree to 4 degree curves
- 400 feet on 4 degree to 2 degree curves
- 800 feet on 2 degree to 1 degree curves

Reference stakes must be clear of maintenance activities, walking areas, and tie ends.

Appendix 9

CWR Rail Adjustment Chart Example

C=12 X0.000065LT C=CHANGE IN LENGTH IN INCHES LENGTH OF RAIL IN FEET T=CHANGE IN TEMPERATURE IN DEGREES																
CHANGE IN RAIL LENGTH TO CHANGE IN TEMPERATURE																
CHANGE IN TEMPERATURE IN DEGREES FAHRENHEIT																
LENGTH OF RAIL - FEET	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
100	0	0-1/8	0-1/8	0-1/8	0-1/4	0-1/4	0-1/4	0-1/4	0-3/8	0-3/8	0-3/8	0-1/2	0-1/2	0-1/2	0-5/8	0-5/8
200	0-1/8	0-1/8	0-1/4	0-3/8	0-1/2	0-1/2	0-1/2	0-5/8	0-3/4	0-3/4	0-7/8	0-7/8	1	1-1/8	1-1/8	1-1/4
300	0-1/8	0-1/4	0-3/8	0-1/2	0-5/8	0-3/4	0-7/8	1	1	1-1/8	1-1/4	1-3/8	1-1/2	1-5/8	1-3/4	1-7/8
400	0-1/8	0-3/8	0-1/2	0-5/8	0-3/4	1	1-1/8	1-1/4	1-3/8	1-1/2	1-3/4	1-7/8	2	2-1/8	2-3/8	2-1/2
500	0-1/4	0-3/8	0-5/8	0-3/4	1	1-1/8	1-3/8	1-1/2	1-3/4	2	2-1/8	2-3/8	2-1/2	2-3/4	2-7/8	3-1/8
600	0-1/4	0-1/2	0-3/4	0-7/8	1-1/8	1-3/8	1-5/8	1-7/8	2-1/8	2-3/8	2-5/8	2-3/4	3	3-1/4	3-1/2	3-3/4
700	0-1/4	0-1/2	0-7/8	1-1/8	1-3/8	1-5/8	1-7/8	2-1/8	2-1/2	2-3/4	3	3-1/4	3-1/2	3-7/8	4-1/8	4-3/8
800	0-3/8	0-5/8	1	1-1/4	1-1/2	1-7/8	2-1/8	2-1/2	2-3/4	3-1/8	3-3/8	3-3/4	4	4-3/8	4-5/8	5
900	0-3/8	0-3/4	1	1-3/8	1-3/4	2-1/8	2-1/2	2-3/4	3-1/8	3-1/2	3-7/8	4-1/4	4-5/8	4-7/8	5-1/4	5-5/8
1000	0-3/8	0-3/4	1-1/8	1-1/2	2	2-3/8	2-3/4	3-1/8	3-1/2	3-7/8	4-1/4	4-5/8	5-1/8	5-1/2	5-7/8	6-1/4
1100	0-3/8	0-7/8	1-1/4	1-3/4	2-1/8	2-5/8	3	3-3/8	3-7/8	4-1/4	4-3/4	5-1/8	5-5/8	6	6-3/8	6-7/8
1200	0-1/2	0-7/8	1-3/8	1-7/8	2-3/8	2-3/4	3-1/4	3-3/4	4-1/4	4-5/8	5-1/8	5-5/8	6-1/8	6-1/2	7	7-1/2
1300	0-1/2	1	1-1/2	2	2-1/2	3	3-1/2	4	4-5/8	5-1/8	5-5/8	6-1/8	6-5/8	7-1/8	7-5/8	8-1/8
1400	0-1/2	1-1/8	1-5/8	2-1/8	2-3/4	3-1/4	3-7/8	4-3/8	4-7/8	5-1/2	6	6-1/2	7-1/8	7-5/8	8-1/4	8-3/4
1440	0-1/2	1-1/8	1-5/8	2-1/4	2-3/4	3-3/8	3-7/8	4-1/2	5	5-5/8	6-1/8	6-3/4	7-1/4	7-7/8	8-3/8	9
1500	0-5/8	1-1/8	1-3/4	2-3/8	2-7/8	3-1/2	4-1/8	4-5/8	5-1/4	5-7/8	6-3/8	7	7-5/8	8-1/4	8-3/4	9-3/8
1600	0-5/8	1-1/4	1-7/8	2-2/1	3-1/8	3-3/4	4-3/8	5	5-5/8	6-1/4	6-7/8	7-1/2	8-1/8	8-3/4	9-3/8	10
All continuous welded rail with a rail temperature below the rail installation safe range will be adjusted.																
Example: When laying a rail 1300 feet long, with a rail temperature of 45°F. Reference the desired rail neutral temperature for the area in which it will be installed (in this example we will use 100°F).																
The desired Temperature = 100°F The Rail Temperature = 45°F																
The difference between the two = 55°F																
Cross-reference the line with 1300' with the column with 55° = 5-5/8 inches																
Divide the rail length into four equal parts (325') and place a plate/base reference marks (make sure the plate is secured to prevent movement). Expand the rail making sure that the required amount is achieved at each station (1-13/32" per station).																
Station 1 = 1-13/32", Station 2 = 2-13/16", Station 3 = 4-7/32", Station 4 = 5-5/8"																
Be sure that the rail is headed, or expanded evenly throughout its length. Also, allow for weld additions or consumption when calculating cuts. Record all information on the proper form(s).																

Appendix 10

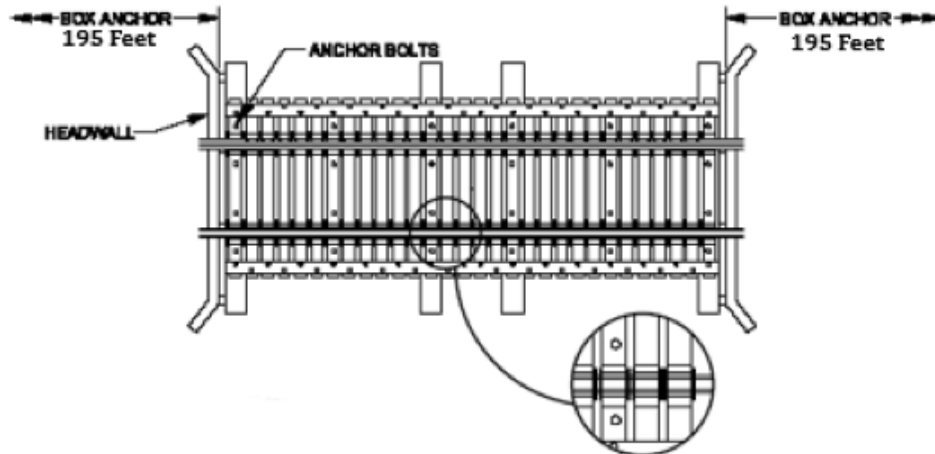
Geographic Desired Rail Neutral Temperature

State/RR	Desired Rail Neutral Temperature
Alabama – ABS, AUTR, BHRR	110°
Arkansas – ARS	110°
Florida – JXPT	110°
Georgia – SVHO	110°
Idaho – BVRR, EIRR	100°
Illinois – DREI, CERR	100°
Indiana – GDLK	100°
Kansas – KAW, KORR, SKOL	105°
Louisiana – BRSR, LAS	115°
Michigan – AA, GDLK	100°
Mississippi - MSR	110°
Missouri – ARS	105°
New Mexico – TXNR	115°
New York – ITHA	95°
North Carolina – BLU	100°
Ohio – AA, KNWA	100°
Oklahoma – SLWC, SKOL	110°
Oregon – PCC	100°
South Dakota - RWRR	100°
Texas – AWRR, LBWR, PVS, TIBR, TXNR	115°
West Virginia – KNWA	100°
Washington – PCC	100°
Wisconsin – WSOR	100°

Appendix 11

OPEN DECK BRIDGES

Engineering Instruction 06-20



When installing CWR, follow these bridge anchoring requirements:

1. Ballast deck bridges should be anchored with the same pattern as in section 2.1 and 2.2.
2. Open deck bridges- should be anchored according to Engineering Instruction 06-20.
 - a. Solid box anchors every tie across open-deck bridges and 195 feet each side of bridge headwalls.
 - b. On open-deck steel bridges 150 feet long or less, apply anchors to all ties fastened to the steel structure.
3. Installation should be completed at $\pm 20^{\circ}$ F rail neutral temperature. (See Appendix 10 for rail neutral temperature by geographical region).