

FIGURE 5

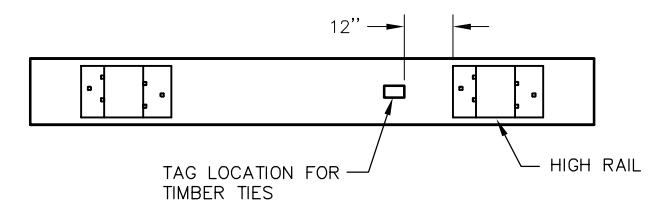
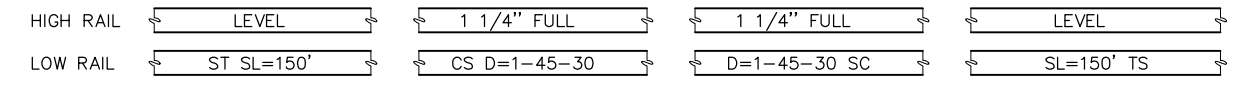
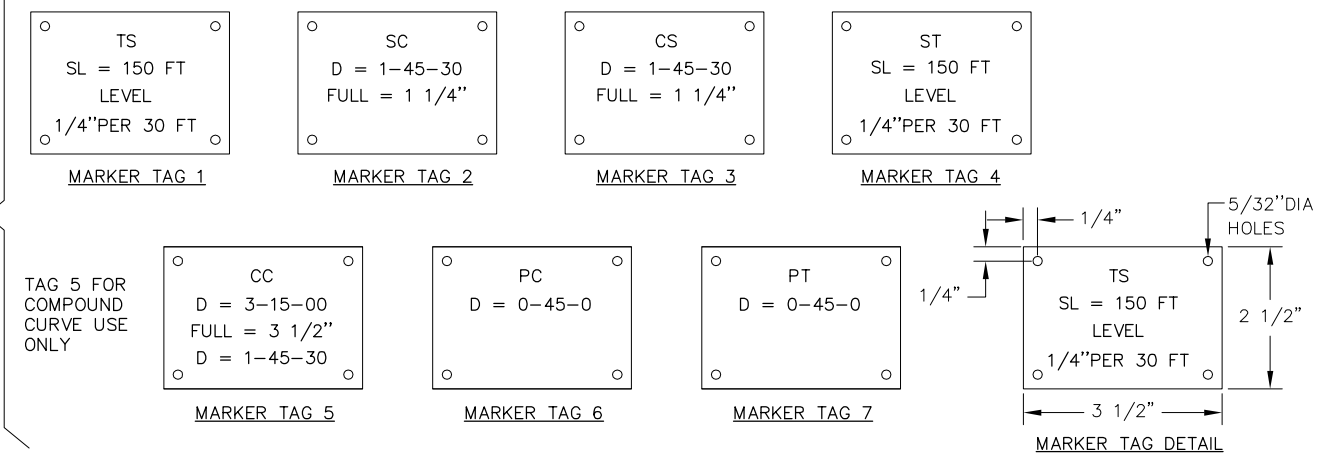


FIGURE 6

INFORMATION SHALL BE WRITTEN ON GAGE SIDE WEB OF RAIL, AND ON FIELD SIDE OF DOUBLE TRACK, WITH PERMANENT METAL MARKER OR PAINT STICK.



INFORMATION SHALL BE PLACED ON MARKER TAG ON TIE



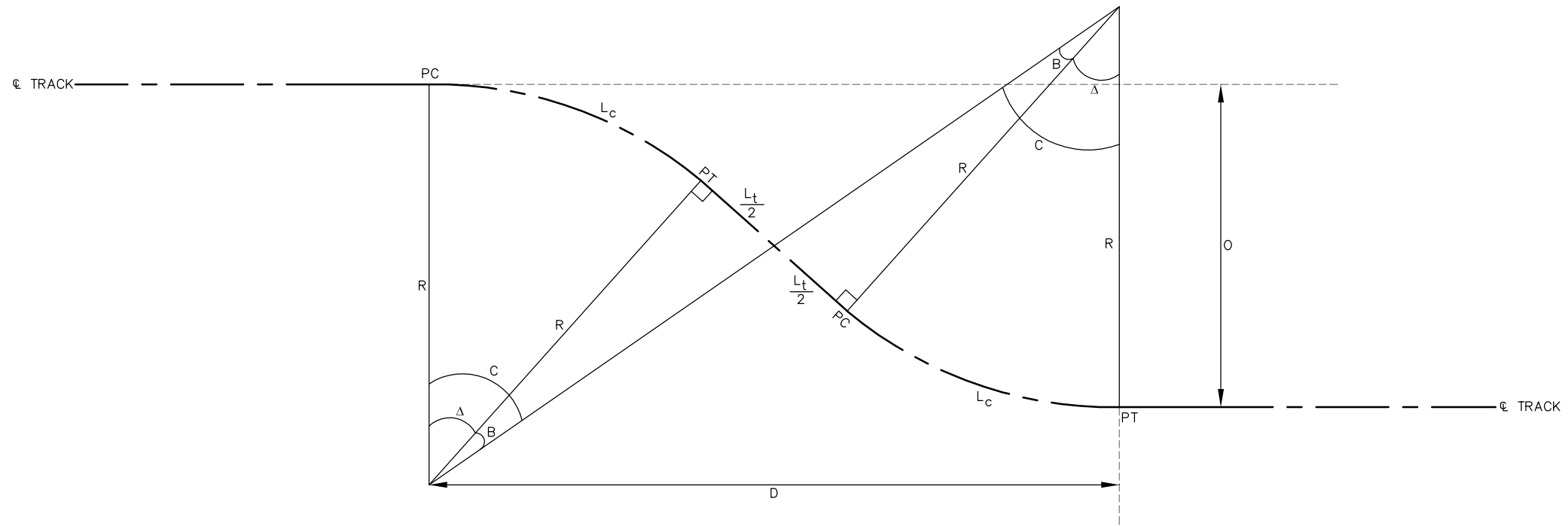
**ABBREVIATIONS**  
 TS = TANGENT TO SPIRAL  
 SC = SPIRAL TO CURVE  
 CS = CURVE TO SPIRAL  
 ST = SPIRAL TO TANGENT  
 CC = COMPOUND CURVE  
 SL = SPIRAL LENGTH  
 PC = POINT OF CURVATURE  
 PT = POINT OF TANGENCY

**NOTES:**

- EXISTING MARKER TAGS WILL BE REMOVED AND ATTACHED TO REPLACEMENT TIE BY CONTRACT OPERATOR OR CONTRACTOR. MARKER TAGS SHALL BE 16 GAGE ALUMINUM. TAGS SHALL BE STAMPED IN 1/4" INCREMENT FROM ZERO TO MAXIMUM SUPERELEVATION.
- ON COMPOUND CURVES THE PROPER ELEVATION MUST BE GIVEN TO THE CURVE OF GREATER DEGREE THROUGHOUT ITS LENGTH, UNIFORMLY REDUCING THIS ELEVATION AT THE PRESCRIBED RATE OF CHANGE UNTIL THE PROPER ELEVATION IS ATTAINED FOR THE CURVE OF LESSER DEGREE.
- TO SECURE CURVE TAGS ON:
  - CONCRETE TIES (FIGURE 5), USE ADHESIVE APPROVED BY THE ENGINEER.
  - TIMBER TIES (FIGURE 6), USE GALVANIZED 10 PENNY NAILS OR ENGINEER APPROVED EQUAL.

REV	DATE	BY	CHK	APP	DESCRIPTION

<b>PENINSULA CORRIDOR JOINT POWERS BOARD</b>		<b>STANDARD DRAWINGS</b>	CADD FILE NO.: SD-2101
APPROVED BY: <i>Bernard Anagnost</i> <i>Steph Chen</i>		TRACK GEOMETRY	REV 0 DATE 093011
ENGINEERING MANAGER      DEPUTY DIRECTOR OF ENGINEERING		CURVE MARKING DETAILS	STANDARD NO.: SD-2101
		1250 San Carlos Avenue San Carlos, CA 94070	



**EQUATIONS:**

$$D = \sqrt{L_t^2 + 4R^2} - O^2$$

$$A = C - B$$

$$B = \tan^{-1} \frac{L_t}{2R}$$

$$C = \tan^{-1} \frac{D}{2R - O}$$

$$L_c = 100\Delta / D_c$$

$$L_t = 3V$$

V = DESIGN SPEED IN MPH

$L_c$  = LENGTH OF CURVE IN FEET

$L_t$  = LENGTH OF TANGENT IN FEET

O = OFFSET DISTANCE IN FEET

PC = POINT OF CURVE

PT = POINT OF TANGENT

$\Delta$  = INTERIOR ANGLE OF CURVES IN DEGREES

B = ANGLE IN DEGREES

C = ANGLE IN DEGREES

$D_c$  = DEGREE OF CURVATURE (IN DEGREE)

D = LIMITS OF TRACK REALIGNMENT IN FEET

R = RADIUS OF CURVE IN FEET

**EXAMPLES OF CALCULATIONS:**

O	$D_c$	R	D	$L_t$	$\Delta$	$L_c$	V
0.5	0°20'	17188.76	303.28	240.00	0°04'20"	31.67	79
2.0	0°30'	11459.19	386.35	240.00	0°21'57"	73.17	79
3.0	0°40'	8594.42	400.90	240.00	0°32'11"	80.46	79
4.0	1°00'	5729.65	331.49	135.00	0°58'57"	98.26	45
5.0	1°15'	4583.73	331.47	135.00	1°13'42"	98.26	45
6.0	1°30'	3819.83	331.46	135.00	1°28'26"	98.26	45
8.0	1°45'	3274.17	350.62	135.00	1°53'15"	107.86	45
10.0	2°00'	2864.93	364.31	135.00	2°17'41"	114.74	45

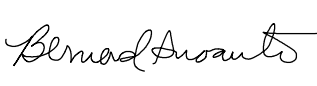

**NOTE:**


THIS DRAWING IS USED AS A QUICK REFERENCE FOR DETERMINING THE DESIGN LIMITS OF A TEMPORARY ALIGNMENT WITH NO SUPERELEVATION.

REV	DATE	BY	CHK	APP	DESCRIPTION

**PENINSULA CORRIDOR JOINT POWERS BOARD**

APPROVED BY:

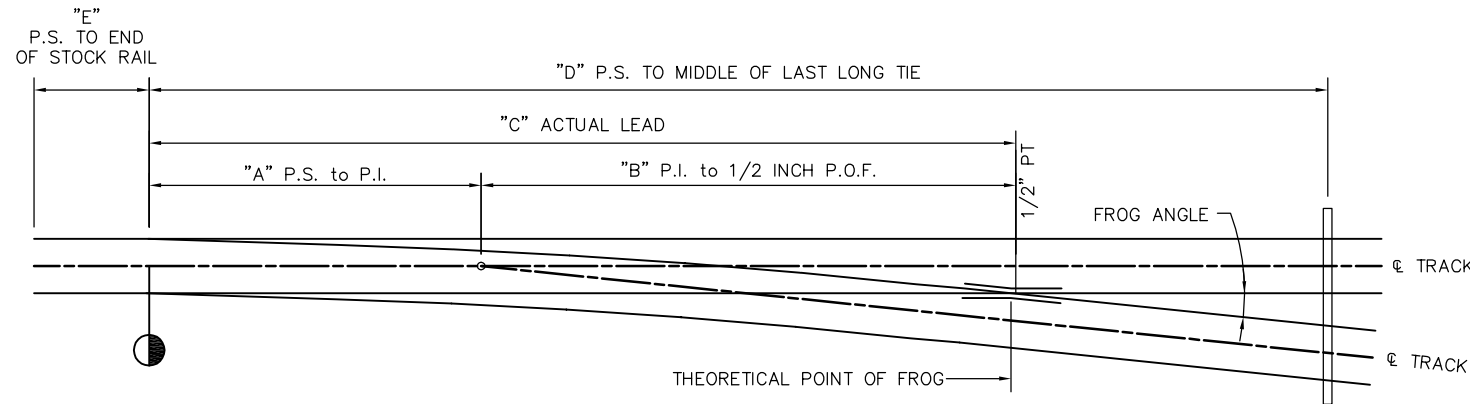


1250 San Carlos Avenue  
San Carlos, CA 94070

**STANDARD DRAWINGS**

**TRACK  
GEOMETRY  
REVERSING CURVES  
LAYOUT AND CALCULATIONS**

CADD FILE NO.: SD-2102	
REV 0	DATE 093011
TRACK	
STANDARD NO.: SD-2102	



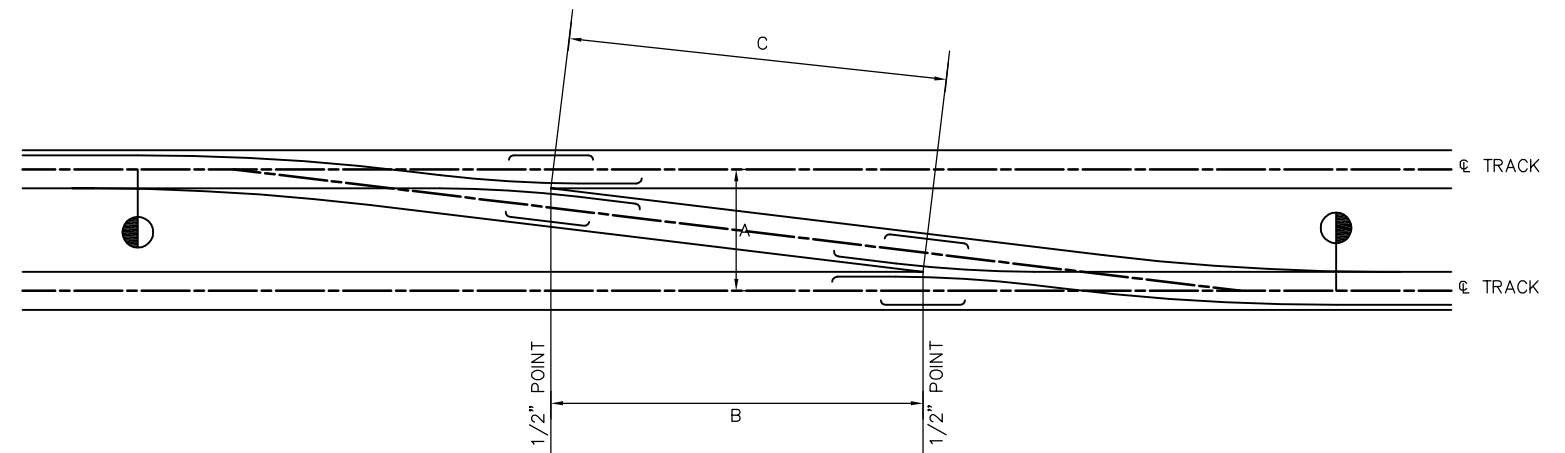
TYPICAL TURNOUT LAYOUT

TABLE 1: TURNOUT DATA

TURNOUT NO.	FROG ANGLE	FROG TYPE	A	B	C	D	E		TRACK STANDARD DRAWING NUMBER
							STRAIGHT SIDE	TURNOUT SIDE	
8	7°09'10"	RBM	30'-0"	38'-0"	68'-0"	91'-4 1/2"	7'-3"	13'-3"	SD-2401
10	5°43'29"	SPRING	32'-9 5/8"	47'-6"	80'-3 5/8"	115'-11 5/8"	14'-4"	8'-4"	SD-2501 TO SD-2504
14	4°05'27"	SPRING	44'-6 3/8"	66'-6"	111'-0 3/8"	162'-11 1/4"	14'-6 3/8"	8'-6 3/8"	SD-2601 TO SD-2604
20	2°51'51"	SPRING	72'-4"	95'-0"	167'-4"	239'-8 1/4"	14'-8"	8'-4"	SD-2701 TO SD-2704

TABLE 2: PASSENGER SPEED THROUGH TURNOUT

TURNOUT NO.	SWITCHPOINTS LENGTHS	OPERATING SPEED
8	16' - 6"	10 MPH
10	21' - 6"	25 MPH
14	29' - 0"	35 MPH
20	47' - 0"	50 MPH






TYPICAL CROSSOVER LAYOUT

TABLE 3: CROSSOVER DATA

DISTANCE BETWEEN CENTERLINE OF TRACKS	DISTANCE BETWEEN 1/2 INCH FROG POINTS								
	NO. 8 FROG		NO. 10 FROG		NO. 14 FROG		NO. 20 FROG		
	A	B	C	B	C	B	C	B	C
13'-0"	27'-7 1/8"	28'-4 7/8"	34'-8 1/8"	35'-3 7/8"	48'-9 1/4"	49'-2 3/4"	69'-10 1/16"	70'-1 15/16"	
14'-0"	35'-6 3/4"	36'-5 1/4"	44'-7 13/16"	45'-4 3/16"	62'-9"	63'-3"	89'-9 15/16"	90'-2 1/8"	
15'-0"	43'-6 3/8"	44'-5 5/8"	54'-7 9/16"	55'-4 1/2"	76'-8 13/16"	77'-3 3/16"	109'-9 3/4"	110'-2 1/4"	
16'-0"	51'-6"	52'-6"	64'-7 1/4"	65'-4 13/16"	90'-8 9/16"	91'-3 7/16"	129'-9 5/8"	130'-2 3/8"	
17'-0"	59'-5 5/8"	60'-6 3/8"	74'-6 15/16"	75'-5 1/16"	104'-8 3/8"	105'-3 5/8"	149'-9 1/2"	150'-2 9/16"	
18'-0"	67'-5 1/4"	68'-6 3/4"	84'-6 5/8"	85'-5 3/8"	118'-8 3/16"	119'-3 13/16"	169'-9 5/16"	170'-2 11/16"	
19'-0"	75'-4 7/8"	76'-7 1/8"	94'-6 5/16"	95'-5 11/16"	132'-7 15/16"	133'-4 1/16"	189'-9 3/16"	190'-2 7/8"	
20'-0"	83'-4 1/2"	84'-7 1/2"	104'-6 1/16"	105'-6"	146'-7 3/4"	147'-4 1/4"	209'-9 1/16"	210'-3"	
DIFFERENCE PER FOOT CHANGE	7'-11 5/8"	8'-0 3/8"	9'-11 11/16"	10'-0 5/16"	13'-11 13/16"	14'-0 3/16"	19'-11 7/8"	20'-0 1/8"	

REV	DATE	BY	CHK	APP	DESCRIPTION	REV	DATE	BY	CHK	APP	DESCRIPTION

<b>PENINSULA CORRIDOR JOINT POWERS BOARD</b>		<b>STANDARD DRAWINGS</b>		CADD FILE NO.: SD-2103	
APPROVED BY:		 1250 San Carlos Avenue San Carlos, CA 94070		REV: 0 DATE: 093011	
 ENGINEERING MANAGER				 DEPUTY DIRECTOR OF ENGINEERING	
TRACK TURNOUTS AND DERAILS STANDARD TURNOUT AND CROSSOVER DATA				STANDARD NO.: SD-2103	