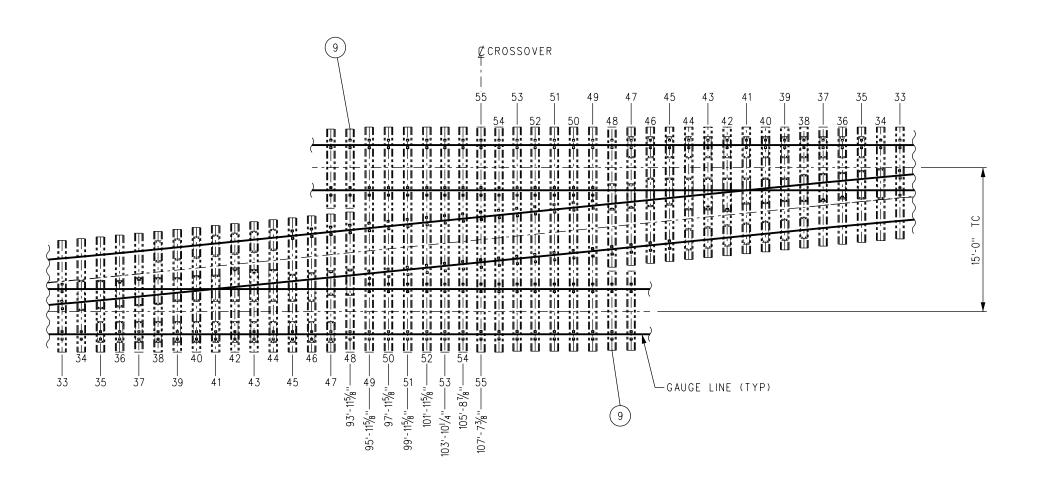
		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	LH TURNOUT TIES (0-48)	
2	2	TIE NO 49 - LENGTH = $23'-5\frac{1}{2}$ "	
3	2	TIE NO 50 - LENGTH = $23'-5\frac{1}{2}$ "	
4	2	TIE NO 51 - LENGTH = $23'-5\frac{1}{2}$ "	
5	2	TIE NO 52 - LENGTH = 23'-51/2"	
6	2	TIE NO 53 - LENGTH = $23'-5\frac{1}{2}$ "	
7	2	TIE NO 54 - LENGTH = $23'-5\frac{1}{2}$ "	
8	1	TIE NO 55 - LENGTH = $23'-5\frac{1}{2}$ "	
9	2	8'-3" 1:80 CANT CONCRETE TIE	



- 1. ALL SWITCH TIES ARE FLAT (NON-CANTED), EXCEPT 1:80 TRANSITION TIES AND STANDARD 8'-3" TIES CANTED 1:40. ALL LENGTHS SHALL INCLUDE 1'-9" FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES AND STANDARD TIE PER SCRRA ENGINEERING STANDARDS.

 2. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

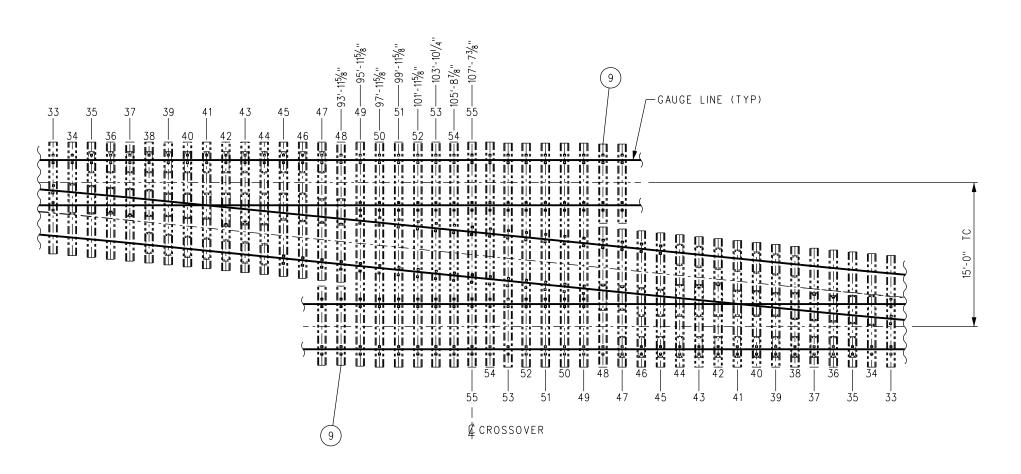
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ENGINEERING STANDARDS	STANDARD 2817	
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TIE LAYOUT PLAN	REVISION SHEET	l
NO 10 - LH CROSSOVER 15' TRACK CENTERS	- 1 OF 1	İ
THE TO - ET CHOSSOVER IS TRACK CENTERS	CADD FILE:	İ
	FS2817_01	ĺ

		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	RH TURNOUT TIES (0-48)	
2	2	TIE NO 49 - LENGTH = $23'-5\frac{1}{2}$ "	
3	2	TIE NO 50 - LENGTH = 23'-5 ¹ / ₂ "	
4	2	TIE NO 51 - LENGTH = $23'-5\frac{1}{2}$ "	
5	2	TIE NO 52 - LENGTH = 23'-51/2"	
6	2	TIE NO 53 - LENGTH = 23'-51/2"	
7	2	TIE NO 54 - LENGTH = $23'-5\frac{1}{2}$ "	
8	1	TIE NO 55 - LENGTH = $23'-5\frac{1}{2}$ "	
9	2	8'-3" 1:80 CANT CONCRETE TIE	



- 1. ALL SWITCH TIES ARE FLAT (NON-CANTED), EXCEPT 1:80 TRANSITION TIES AND STANDARD 8'-3" TIES CANTED 1:40. ALL LENGTHS SHALL INCLUDE 1'-9" FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES AND STANDARD TIE PER SCRRA ENGINEERING STANDARDS.

 2. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

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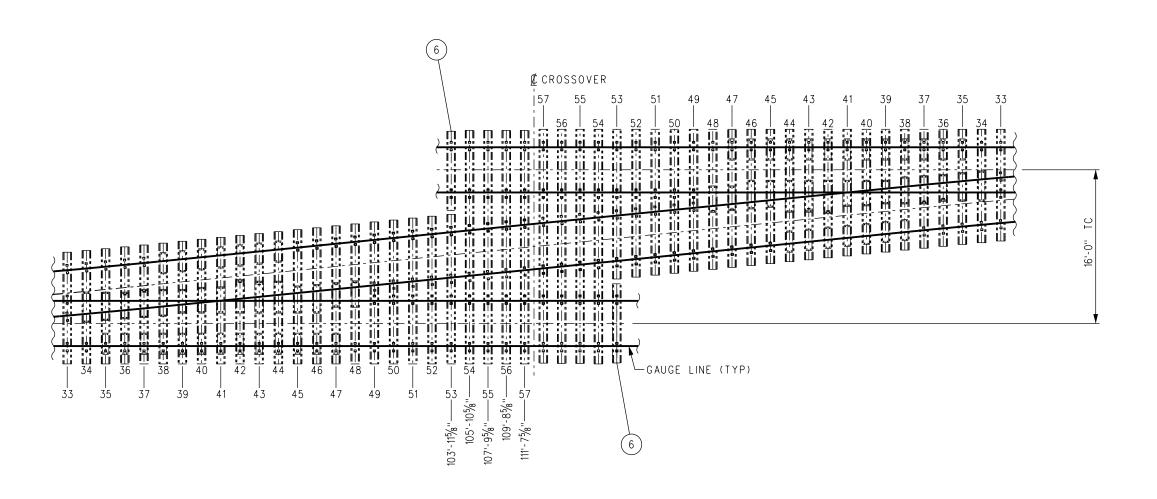
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|SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY

ENGINEERING STANDARDS	STANDARD 2817
TIE LAYOUT PLAN NO 10 – RH CROSSOVER 15' TRACK CENTERS	SCALE: NTS REVISION SHEET 1 OF 1 CADD FILE: FS2817-02

		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	LH TURNOUT TIES (0-53)	
2	2	TIE NO 54 - LENGTH = 24'-51/2"	
3	2	TIE NO 55 - LENGTH = 24'-51/2"	
4	2	TIE NO 56 - LENGTH = 24'-5½"	
5	2	TIE NO 57 - LENGTH = 24'-51/2"	
6	2	8'-3" 1:80 CANT CONCRETE TIE	



- 1. ALL SWITCH TIES ARE FLAT (NON-CANTED), EXCEPT 1:80 TRANSITION TIES AND STANDARD 8'-3" TIES CANTED 1:40. ALL LENGTHS SHALL INCLUDE 1'-9" FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES AND STANDARD TIE PER SCRRA ENGINEERING STANDARDS.

 2. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

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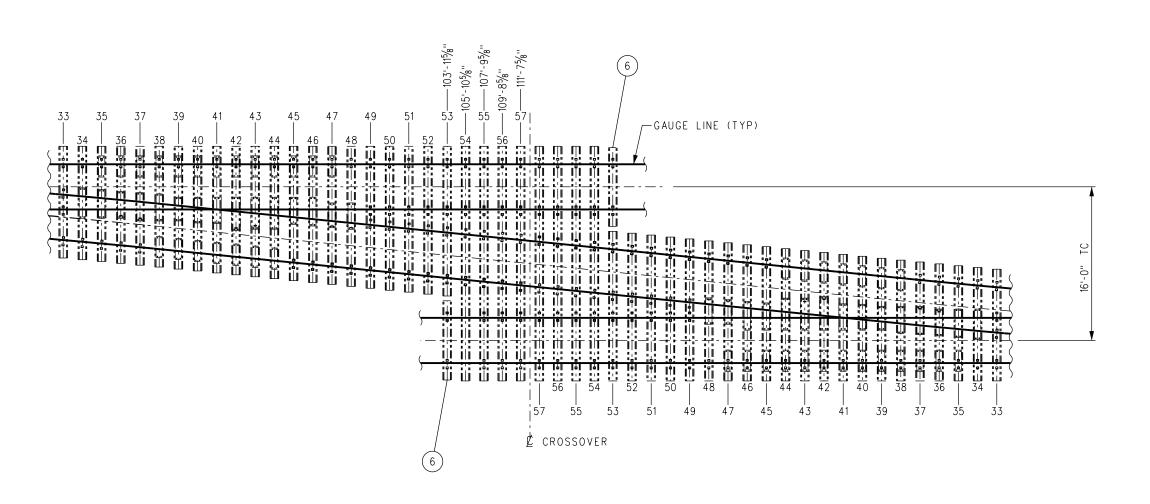
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|SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY

ENGINEERING STANDARDS	STANDARD 2817
TIE LAYOUT PLAN NO 10 – LH CROSSOVER 16' TRACK CENTERS	REVISION SHEET - 1 OF 1 CADD FILE: FS2817-03

		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	RH TURNOUT TIES (0-53)	
2	2	TIE NO 54 - LENGTH = 24'-5 ¹ / ₂ "	
3	2	TIE NO 55 - LENGTH = 24'-51/2"	
4	2	TIE NO 56 - LENGTH = 24'-51/2"	
5	2	TIE NO 57 - LENGTH = 24'-5 ¹ / ₂ "	
6	2	8'-3" 1:80 CANT CONCRETE TIE	



- 1. ALL SWITCH TIES ARE FLAT (NON-CANTED), EXCEPT 1:80 TRANSITION TIES AND STANDARD 8'-3" TIES CANTED 1:40. ALL LENGTHS SHALL INCLUDE 1'-9" FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES AND STANDARD TIE PER SCRRA ENGINEERING STANDARDS
- 2. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

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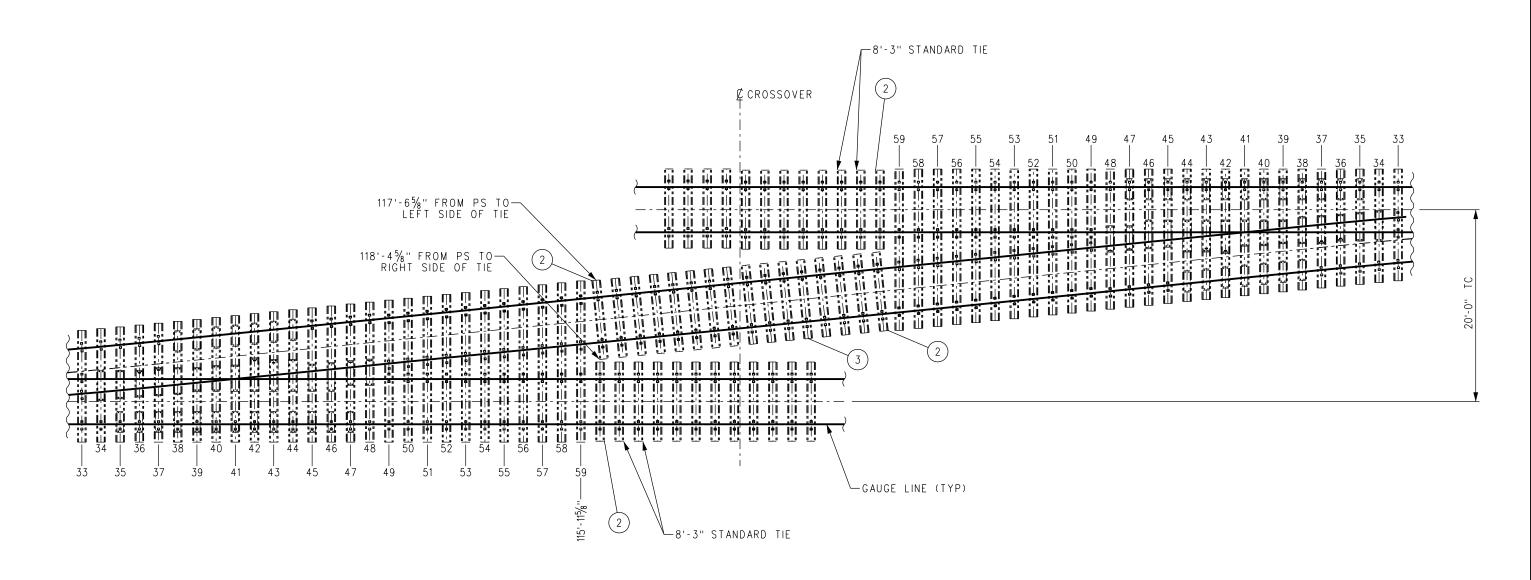
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ENGINEERING STANDARDS	2817
TIE LAYOUT PLAN NO 10 – RH CROSSOVER 16' TRACK CENTERS	REVISION SHEET 1 OF 1 CADD FILE: ES2817-04

		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	LH TURNOUT TIES (0-59)	
2	4	8'-3" 1:80 CANT CONCRETE TIE	
3	14	8'-3" 1:40 CANT STANDARD TIE (FOR CROSSOVER CONNECTION)	



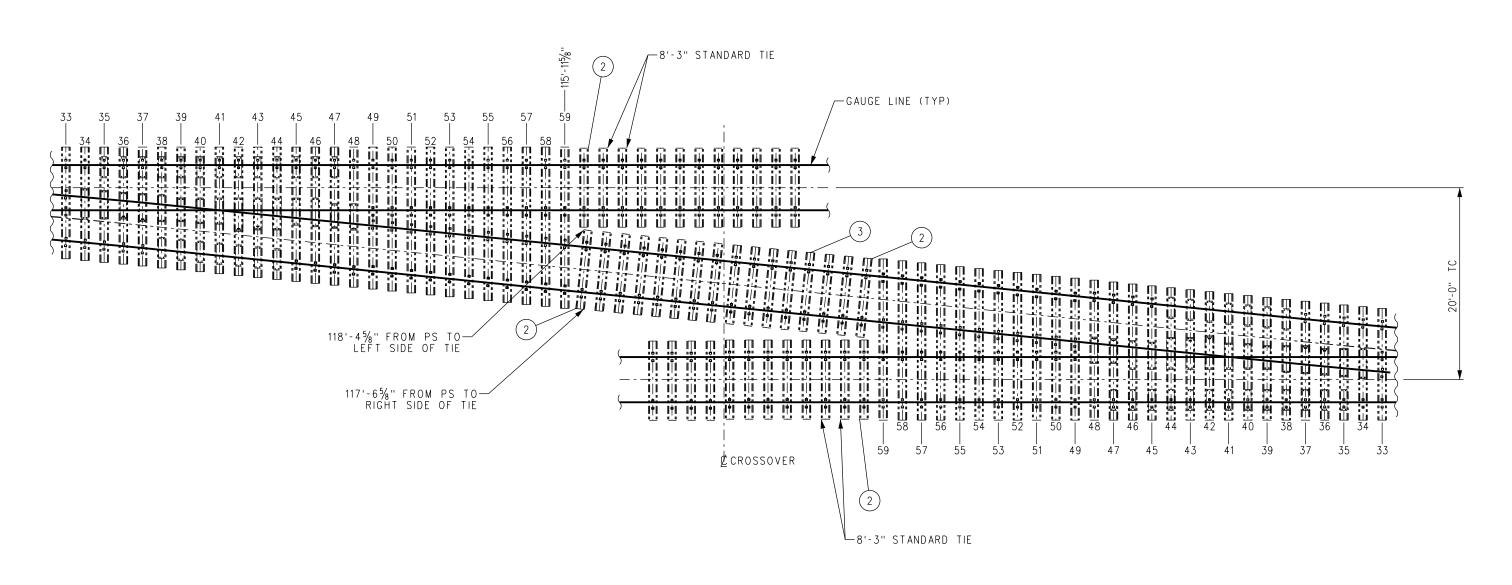
- 1. ALL SWITCH TIES ARE FLAT (NON-CANTED), EXCEPT 1:80 TRANSITION TIES AND STANDARD 8'-3" TIES CANTED 1:40. ALL LENGTHS SHALL INCLUDE 1'-9" FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES
 AND STANDARD TIE PER SCRRA ENGINEERING STANDARDS.

 2. 14 STANDARD TIES AT APPROXIMATELY 2'-O" TRACK CENTERS IN CROSSOVER CONNECTION.

 3. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

			DRAWN BY: HDR DATE: 03/31/201	SCRRA ENGINEERING STANDARDS ARE INTENDED FOR SCRRA APPROVED USES ONLY.		ENGINEERING STANDARDS	STANDARD
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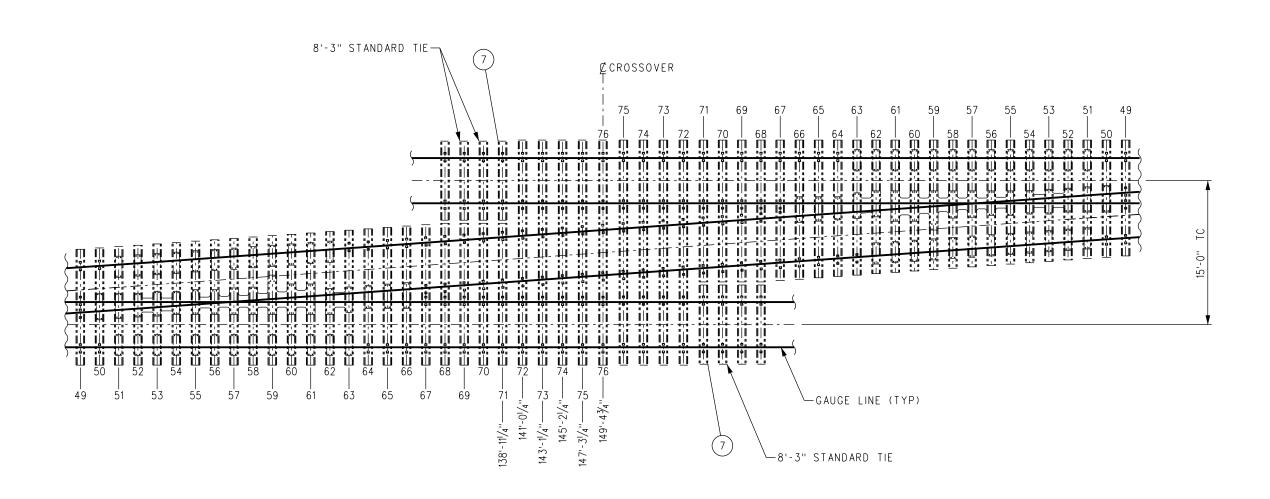
		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	RH TURNOUT TIES (0-59)	
2	4	8'-3" 1:80 CANT CONCRETE TIE	
3	14	8'-3" 1:40 CANT STANDARD TIE (FOR CROSSOVER CONNECTION)	



- 1. ALL SWITCH TIES ARE FLAT (NON-CANTED), EXCEPT 1:80 TRANSITION TIES
 AND STANDARD 8'-3" TIES CANTED 1:40. ALL LENGTHS SHALL INCLUDE 1'-9"
 FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES
 AND STANDARD TIE PER SCRRA ENGINEERING STANDARDS.
 2. 14 STANDARD TIES AT APPROXIMATELY 2'-0" TRACK CENTERS IN CROSSOVER CONNECTION.
 3. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

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		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	LH TURNOUT TIES (0-71)	
2	2	TIE NO 72 - LENGTH = 23'-51/2"	
3	2	TIE NO 73 - LENGTH = 23'-51/2"	
4	2	TIE NO 74 - LENGTH = 23'-51/2"	
5	2	TIE NO 75 - LENGTH = 23'-51/2"	
6	1	TIE NO 76 - LENGTH = 23'-5 1/2"	
7	2	8'-3" 1:80 CANT CONCRETE TIE	



- 1. ALL SWITCH TIES ARE FLAT (NON-CANTED), EXCEPT 1:80 TRANSITION TIES AND STANDARD 8'-3" TIES CANTED 1:40. ALL LENGTHS SHALL INCLUDE 1'-9" FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES AND STANDARD TIE PER SCRRA ENGINEERING STANDARDS.

 2. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

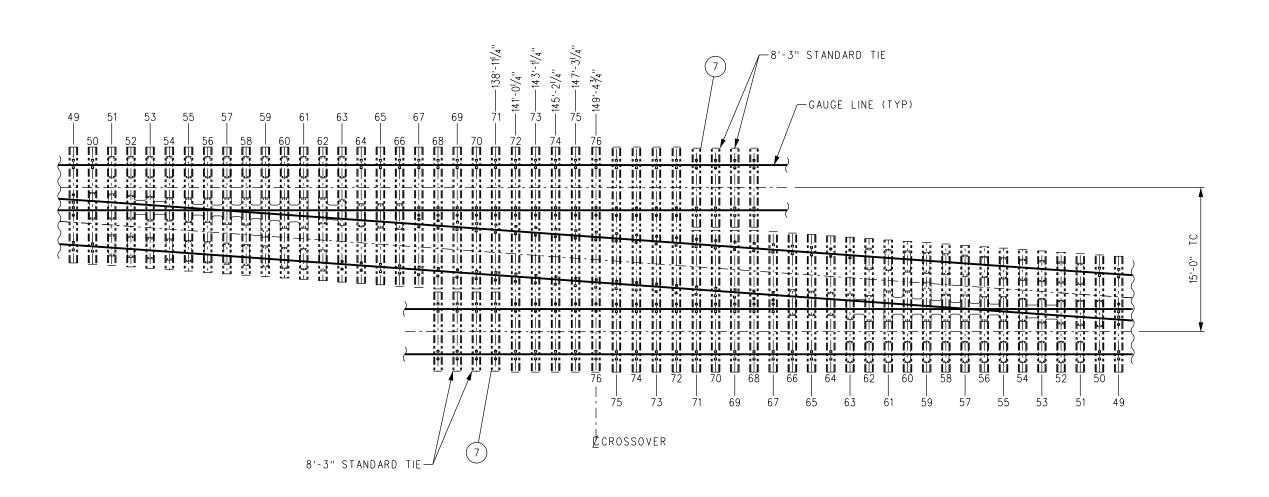
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ENGINEERING STANDARDS	STANDARD 2818
TIE LAYOUT PLAN NO 14 – LH CROSSOVER 15' TRACK CENTERS	SCALE: NTS REVISION SHEET 1 OF 1 CADD FILE: FS2818_01

		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	RH TURNOUT TIES (0-71)	
2	2	TIE NO 72 - LENGTH = 23'-51/2"	
3	2	TIE NO 73 - LENGTH = 23'-51/2"	
4	2	TIE NO 74 - LENGTH = 23'-51/2"	
5	2	TIE NO 75 - LENGTH = 23'-51/2"	
6	1	TIE NO 76 - LENGTH = 23'-51/2"	
7	2	8'-3" 1:80 CANT CONCRETE TIE	



- 1. ALL SWITCH TIES ARE FLAT (NON-CANTED), EXCEPT 1:80 TRANSITION TIES AND STANDARD 8'-3" TIES CANTED 1:40. ALL LENGTHS SHALL INCLUDE 1'-9"
 FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES
 AND STANDARD TIE PER SCRRA ENGINEERING STANDARDS.

 2. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

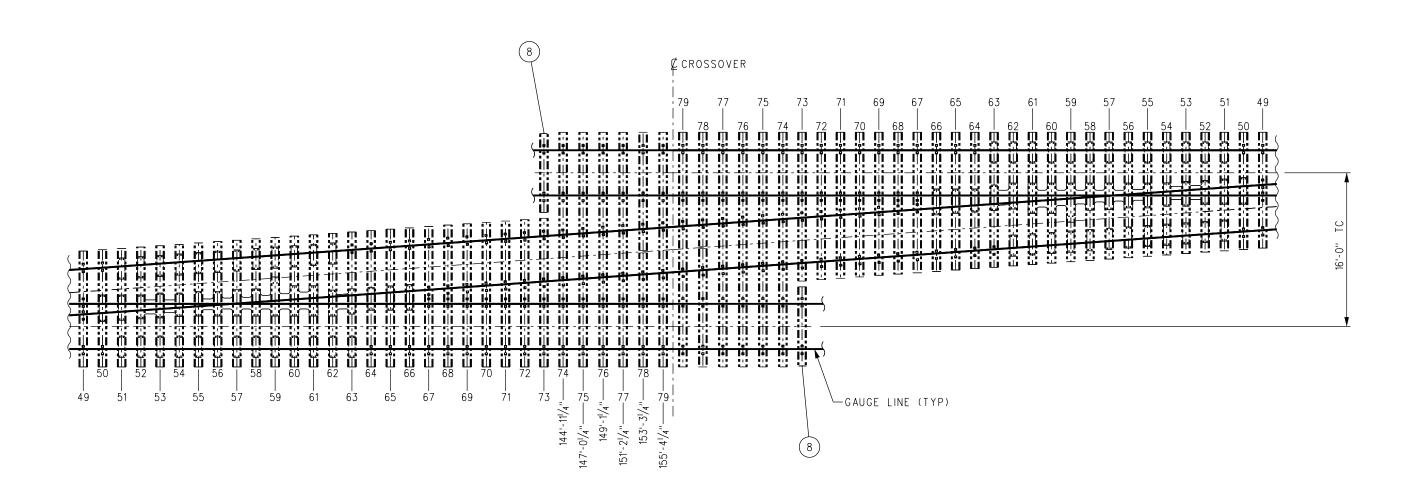
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ENGINEERING STANDARDS	STANDARD 2818
TIE LAYOUT PLAN NO 14 – RH CROSSOVER 15' TRACK CENTERS	SCALE: NTS REVISION SHEET 1 OF 1 CADD FILE: ES2818_02

		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	LH TURNOUT TIES (0-73)	
2	2	TIE NO 74 - LENGTH = 24'-5 ¹ / ₂ "	
3	2	TIE NO 75 - LENGTH = 24'-51/2"	
4	2	TIE NO 76 - LENGTH = 24'-51/2"	
5	2	TIE NO 77 - LENGTH = 24'-51/2"	
6	2	TIE NO 78 - LENGTH = 24'-5½"	
7	2	TIE NO 79 - LENGTH = 24'-51/2"	
8	2	8'-3" 1:80 CANT CONCRETE TIE	



- 1. ALL SWITCH TIES ARE FLAT (NON-CANTED), EXCEPT 1:80 TRANSITION TIES AND STANDARD 8'-3" TIES CANTED 1:40. ALL LENGTHS SHALL INCLUDE 1'-9" FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES AND STANDARD TIE PER SCRRA ENGINEERING STANDARDS.

 2. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

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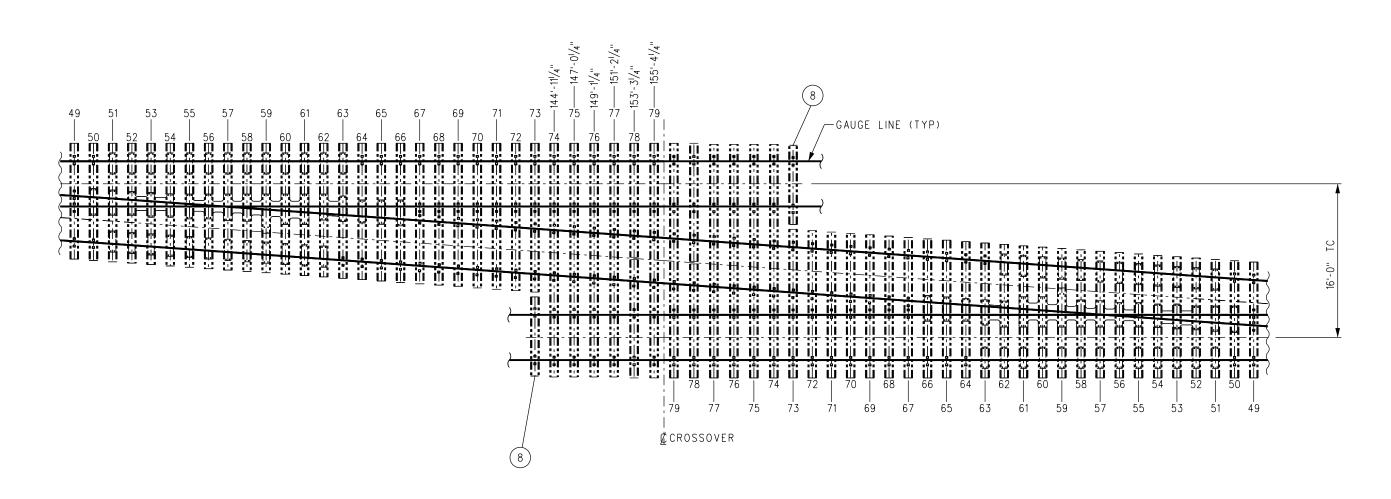
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ENGINEERING STANDARDS	standard 2818
TIE LAYOUT PLAN NO. 14 – LH. CROSSOVER, 16' TRACK, CENTERS	REVISION SHEET - 1 OF 1 CADD FILE:

		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	RH TURNOUT TIES (0-73)	
2	2	TIE NO 74 - LENGTH = 24'-51/2"	
3	2	TIE NO 75 - LENGTH = 24'-51/2"	
4	2	TIE NO 76 - LENGTH = 24'-51/2"	
5	2	TIE NO 77 - LENGTH = 24'-51/2"	
6	2	TIE NO 78 - LENGTH = 24'-51/2"	
7	2	TIE NO 79 - LENGTH = 24'-51/2"	
8	2	8'-3" 1:80 CANT CONCRETE TIE	



- 1. ALL SWITCH TIES ARE FLAT (NON-CANTED), EXCEPT 1:80 TRANSITION TIES AND STANDARD 8'-3" TIES CANTED 1:40. ALL LENGTHS SHALL INCLUDE 1'-9" FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES AND STANDARD TIE PER SCRRA ENGINEERING STANDARDS.

 2. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

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SCRRA ENGINEERING STANDARDS ARE INTENDED FOR SCRRA APPROVED USES ONLY.
FOR NON-SCRRA APPROVED USES.
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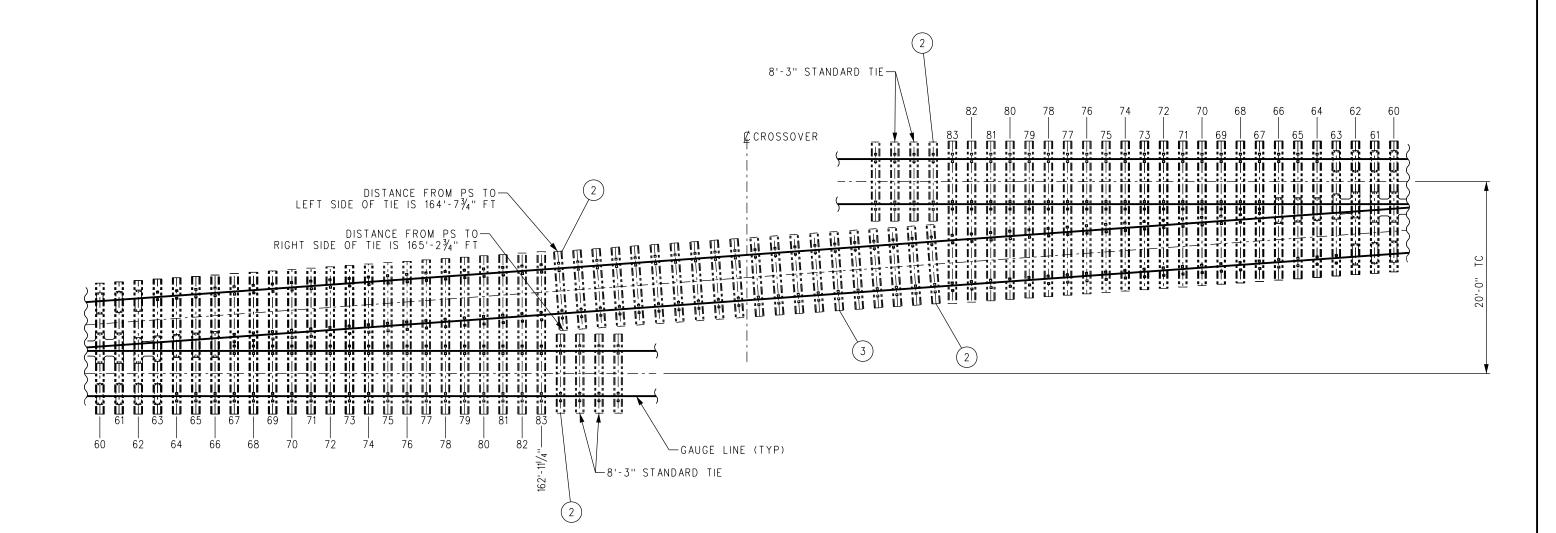
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SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY

ENGINEERING STANDARDS	STANDARD 2818
TIE LAYOUT PLAN NO 14 – RH CROSSOVER 16' TRACK CENTERS	SCALE: NTS REVISION SHEET 1 OF 1 CADD FILE: FS2818-04

	BILL OF MATERIAL							
ITEM	QTY	DESCRIPTION	SCRRA PART NO					
1	2	LH TURNOUT TIES (0-83)						
2	4	8'-3" 1:80 CANT CONCRETE TIE						
3	18	8'-3" 1:40 CANT STANDARD TIE (FOR CROSSOVER CONNECTION)						



- 1. ALL SWITCH TIES ARE FLAT (NON-CANTED), EXCEPT 1:80 TRANSITION TIES AND STANDARD 8'-3" TIES CANTED 1:40. ALL LENGTHS SHALL INCLUDE 1'-9" FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES AND STANDARD TIE PER SCRRA ENGINEERING STANDARDS.

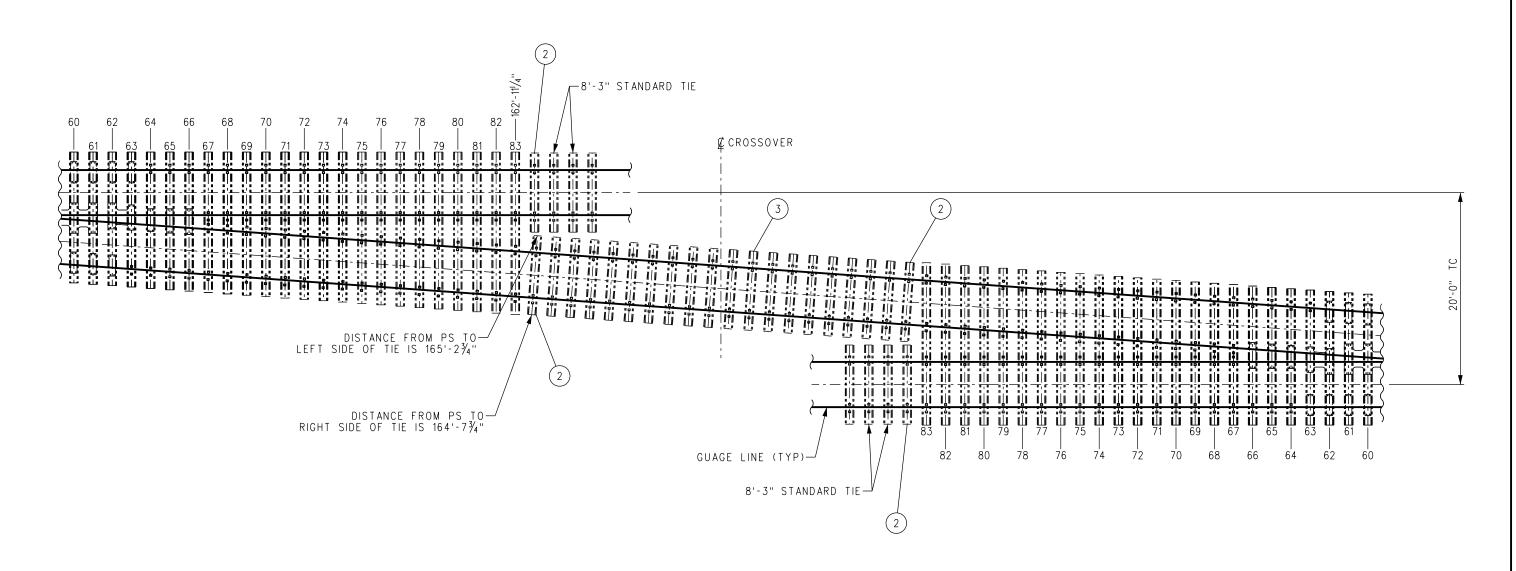
 2. 18 STANDARD TIES AT APPROXIMATELY 2'-0" TIE CENTERS ON CROSSOVER CONNECTION.

 3. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

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						ASSISTANT DIRECTOR: ST	I AND ARDS & DESIGN	TI	HIC INFORMATION AGREEC THAT IT ACCUMES ALL LIARDLITY ARISING FROM CITCH	SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY	NO 14 – LH CROS
	Х	XX-XX-XX	REVISION	XX X	₹	11) 100 -	Daran	U:	SE. NO PART OF THESE STANDARDS SHOULD BE REPRODUCED OR DISTRIBUTED IN NY FORM OR BY ANY MEANS WITHOUT THE PRIOR WRITTEN PERMISSION OF SCRA ILL DIGHTS DESCRIVED		NO 14 - LA CRO
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ENGINEERING STANDARDS	2818
TIE LAYOUT PLAN NO 14 – LH CROSSOVER 20' TRACK CENTERS	REVISION SHEET - 1 OF 1 CADD FILE: ES2818-05

ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	RH TURNOUT TIES (0-83)	
2	4	8'-3" 1:80 CANT CONCRETE TIE	
3	18	8'-3" 1:40 CANT STANDARD TIE (FOR CROSSOVER CONNECTION)	



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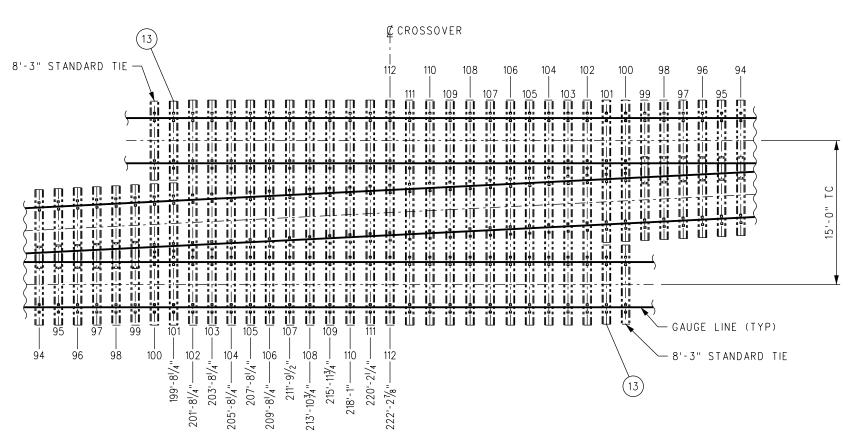
- ALL SWITCH TIES ARE FLAT (NON-CANTED), EXCEPT 1:80 TRANSITION TIES
 AND STANDARD 8'-3" TIES CANTED 1:40. ALL LENGTHS SHALL INCLUDE 1'-9"
 FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES
 AND STANDARD TIE PER SCRRA ENGINEERING STANDARDS.
 18 STANDARD TIES AT APPROXIMATELY 2'-0" TIE CENTERS ON CROSSOVER CONNECTION.
 DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

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				DRAWN BY: HDR DATE: 03/31/2011	SCRRA ENGINEERING STANDARDS ARE INTENDED FOR SCRRA APPROVED USES ONLY.		ENGINEERING STANDARDS
				1	SCRRA SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF	METROLINIK	ENGINEERING STANDARDS
				$1 \qquad 0 \qquad 0 \qquad 0$	THE DATA OR INFORMATION CONTAINED HEREIN. THE SELECTION AND USE OF THESE STANDARDS IS THE SOLE RESPONSIBILITY OF THE USER AND SHOULD NOT BE USED.	METRULINK	
				/ Varesh D. P. Gle	WITHOUT CONSULTING A REGISTERED PROFESSIONAL ENGINEER. ALL WARRANTIES		TIE LAYOUT PLAN
				ASSISTANT DIRECTOR: STANDARDS & DESIGN	AND REPRESENTATIONS OF ANY KIND ARE DISCLAIMED. ANYONE MAKING USE OF THIS INFORMATION AGREES THAT IT ASSUMES ALL LIABILITY ARISING FROM SUCH	SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY	
	XX-XX-XX	REVISION	XX XX	william Daran	MILISE NO PART OF THESE STANDARDS SHOULD BE REPRODUCED OR DISTRIBUTED IN	ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012	NO 14 – RH CROSSOVER 20' TRACK CENTERS
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		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	LH TURNOUT TIES (0-101)	
2	2	TIE NO 102 - LENGTH = 23'-51/2"	
3	2	TIE NO 103 - LENGTH = 23'-51/2"	
4	2	TIE NO 104 - LENGTH = 23'-51/2"	
5	2	TIE NO 105 - LENGTH = 23'-51/2"	
6	2	TIE NO 106 - LENGTH = 23'-51/2"	
7	2	TIE NO 107 - LENGTH = 23'-51/2"	
8	2	TIE NO 108 - LENGTH = 23'-51/2"	
9	2	TIE NO 109 - LENGTH = 23'-51/2"	
10	2	TIE NO 110 - LENGTH = 23'-51/2"	
11	2	TIE NO 111 - LENGTH = 23'-51/2"	
12	1	TIE NO 112 - LENGTH = 23'-51/2"	
13	2	8'-3" 1:80 CANT CONCRETE TIE	



- 1. ALL SWITCH TIES ARE FLAT (NON-CANTED), EXCEPT 1:80 TRANSITION TIES AND STANDARD 8'-3" TIES CANTED 1:40. ALL LENGTHS SHALL INCLUDE 1'-9" FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES AND STANDARD TIE PER SCRRA ENGINEERING STANDARDS.

 2. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

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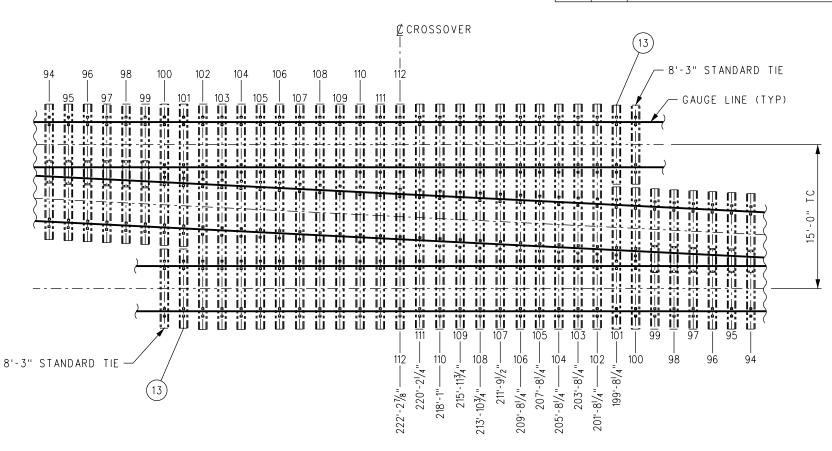
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	ENGI	NEERING	STANDARDS	STANDARD	2819
NO	20 – LH	TIE LAYOUT CROSSOVER	PLAN 15' TRACK CENTERS	CADD FILE:	NTS OF 1

		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	RH TURNOUT TIES (0-101)	
2	2	TIE NO 102 - LENGTH = 23'-51/2"	
3	2	TIE NO 103 - LENGTH = 23'-51/2"	
4	2	TIE NO 104 - LENGTH = 23'-51/2"	
5	2	TIE NO 105 - LENGTH = 23'-51/2"	
6	2	TIE NO 106 - LENGTH = 23'-51/2"	
7	2	TIE NO 107 - LENGTH = 23'-51/2"	
8	2	TIE NO 108 - LENGTH = 23'-51/2"	
9	2	TIE NO 109 - LENGTH = 23'-51/2"	
10	2	TIE NO 110 - LENGTH = 23'-51/2"	
11	2	TIE NO 111 - LENGTH = 23'-51/2"	
12	1	TIE NO 112 - LENGTH = 23'-51/2"	
13	2	8'-3" 1:80 CANT CONCRETE TIE	



- 1. ALL SWITCH TIES ARE FLAT (NON-CANTED), EXCEPT 1:80 TRANSITION TIES AND STANDARD 8'-3" TIES CANTED 1:40. ALL LENGTHS SHALL INCLUDE 1'-9" FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES AND STANDARD TIE PER SCRRA ENGINEERING STANDARDS.

 2. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

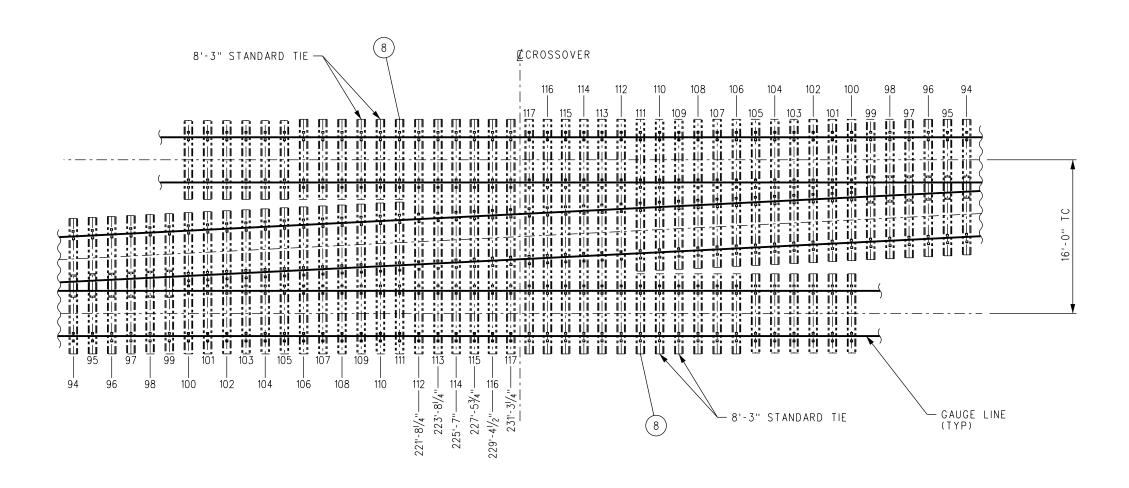
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ENGINEERING STANDARDS	STANDARD 2819
TIE LAYOUT PLAN NO 20 - RH CROSSOVER 15' TRACK CENTERS	SCALE: NTS REVISION SHEET 1 OF 1 CADD FILE: FS2810_02

		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	LH TURNOUT TIES (0-111)	
2	2	TIE NO 112 - LENGTH = 24'-5 <mark>1/</mark> 2"	
3	2	TIE NO 113 - LENGTH = 24'-51/2"	
4	2	TIE NO 114 - LENGTH = 24'-5 ¹ / ₂ "	
5	2	TIE NO 115 - LENGTH = 24'-51/2"	
6	2	TIE NO 116 - LENGTH = 24'-51/2"	
7	2	TIE NO 117 - LENGTH = 24'-5 ¹ / ₂ "	
8	2	8'-3" 1:80 CANT CONCRETE TIE	



- 1. ALL SWITCH TIES ARE FLAT (NON-CANTED), EXCEPT 1:80 TRANSITION TIES AND STANDARD 8'-3" TIES CANTED 1:40. ALL LENGTHS SHALL INCLUDE 1'-9" FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES AND STANDARD TIE PER SCRRA ENGINEERING STANDARDS.

 2. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

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RRA ENGINEERING STANDARDS ARE INTENDED FOR SCRRA APPROVED USES ONLY. CREAR AND RESIDENT STANDARDS ARE INTENDED FOR SCREAA APPROVED USES ONLY.

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ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

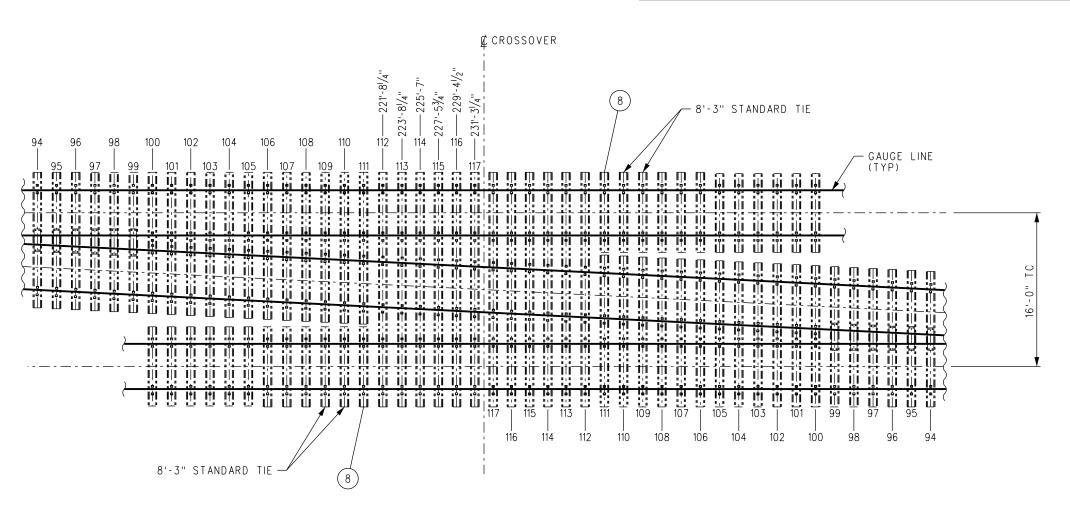
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SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY

ENGINEERING STANDARDS	standard 2819
TIE LAYOUT PLAN NO 20 – LH CROSSOVER 16' TRACK CENTERS	SCALE: NTS REVISION SHEET 1 OF 1 CADD FILE: FS2819-03

		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	RH TURNOUT TIES (0-111)	
2	2	TIE NO 112 - LENGTH = 24'-51/2"	
3	2	TIE NO 113 - LENGTH = 24'-51/2"	
4	2	TIE NO 114 - LENGTH = 24'-51/2"	
5	2	TIE NO 115 - LENGTH = 24'-51/2"	
6	2	TIE NO 116 - LENGTH = 24'-5 ¹ / ₂ "	
7	2	TIE NO 117 - LENGTH = 24'-51/2"	
8	2	8'-3" 1:80 CANT CONCRETE TIE	



- 1. ALL SWITCH TIES ARE FLAT (NON-CANTED), EXCEPT 1:80 TRANSITION TIES AND STANDARD 8'-3" TIES CANTED 1:40. ALL LENGTHS SHALL INCLUDE 1'-9" FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES AND STANDARD TIE PER SCRRA ENGINEERING STANDARDS.

 2. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

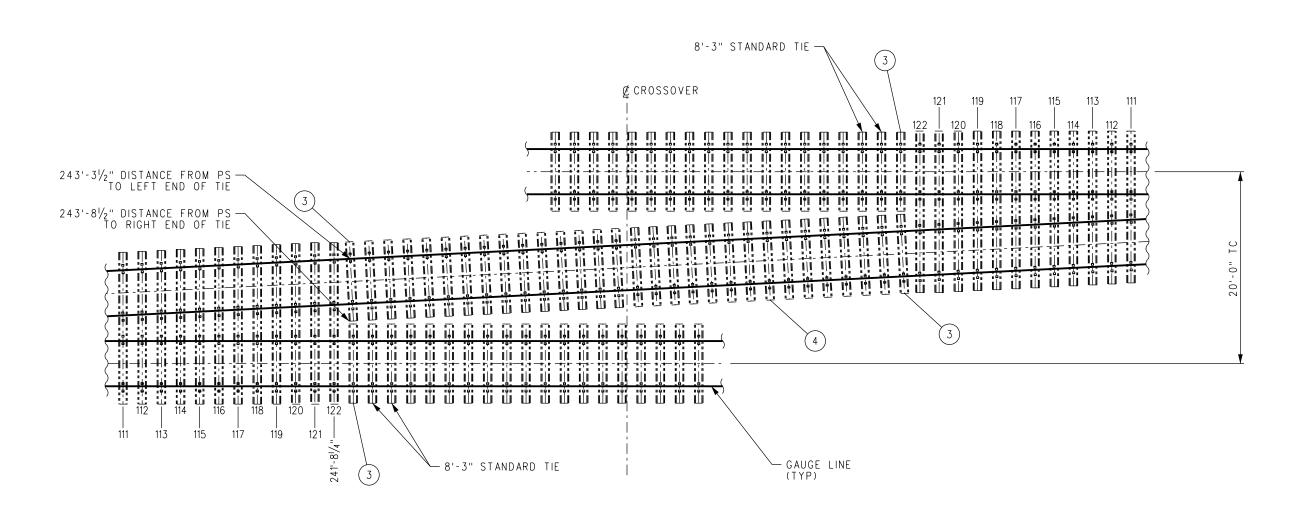
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ENGINEERING STANDARDS	STANDARD 2819
	scale: NTS
TIE LAYOUT PLAN	REVISION SHEET
NO 20 - RH CROSSOVER 16' TRACK CENTERS	_ 1 OF 1
	CADD FILE: FS2819_04

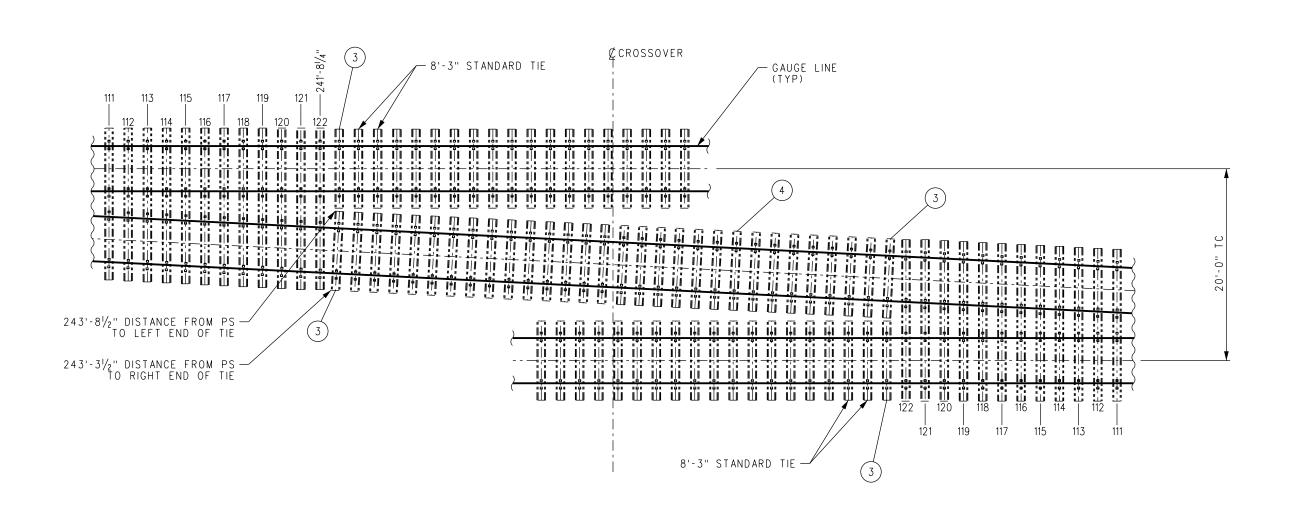
	BILL OF MATERIAL								
ITEM	QTY	DESCRIPTION	SCRRA PART NO						
1	2	LH TURNOUT TIES (0-121)							
2	2	TIE NO 122 - LENGTH = 16'-10"							
3	4	8'-3" 1:80 CANT CONCRETE TIE							
4	28	8'-3" 1:40 CANT STANDARD TIE (FOR CROSSOVER CONNECTION)							



- ALL SWITCH TIES ARE FLAT (NON-CANTED), EXCEPT 1:80 TRANSITION TIES AND STANDARD 8'-3" TIES CANTED 1:40. ALL LENGTHS SHALL INCLUDE 1'-9" FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES
- AND STANDARD TIE PER SCRRA ENGINEERING STANDARDS.
 2. 28 STANDARD TIES AT APPROXIMATELY 2'-0" TRACK CENTER IN CROSSOVER CONNECTION.
 3. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

				DRAWN BY: HDR DATE: 03/31/2011	SCRRA ENGINEERING STANDARDS ARE INTENDED FOR SCRRA APPROVED USES ONLY.		ENGINEERING STANDARDS	STANDARD
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					WITHOUT CONSULTING A REGISTERED PROFESSIONAL ENGINEER. ALL WARRANTIES		TIE LAYOUT PLAN	REVISION SHEET
					AND REPRESENTATIONS OF ANY KIND ARE DISCLAIMED. ANYONE MAKING USE OF THIS INFORMATION AGREES THAT IT ASSUMES ALL LIABILITY ARISING FROM SUCH	SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY		1 OF 1
х	xx-xx-xx	RE VISION XX	XX		MIICE NO DADT OF THESE STANDADOS SHOULD BE DEPONDUCED OD DISTDIRUTED IN		NO 20 – LH CROSSOVER 20'TRACK CENTERS	CADD FILE:
REV	. DATE	DESCRIPTION DES.	ENG.		ANY FORM OR BY ANY MEANS WITHOUT THE PRIOR WRITTEN PERMISSION OF SCRRA.	ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012		ES2819-05

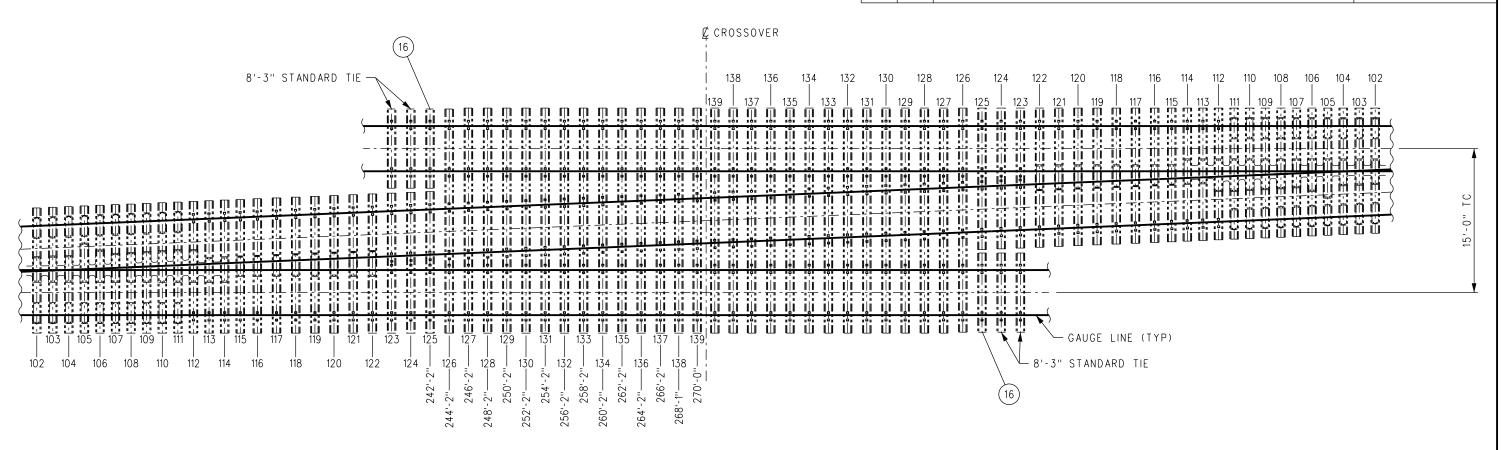
		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	RH TURNOUT TIES (0-121)	
2	2	TIE NO 122 - LENGTH = 16'-10"	
3	4	8'-3" 1:80 CANT CONCRETE TIE	
4	28	8'-3" 1:40 CANT STANDARD TIE (FOR CROSSOVER CONNECTION)	



- 1. ALL SWITCH TIES ARE FLAT (NON-CANTED), EXCEPT 1:80 TRANSITION TIES
 AND STANDARD 8'-3" TIES CANTED 1:40. ALL LENGTHS SHALL INCLUDE 1'-9"
 FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES
 AND STANDARD TIE PER SCRRA ENGINEERING STANDARDS.
 2. 28 STANDARD TIES AT APPROXIMATELY 2'-0" TRACK CENTER IN CROSSOVER CONNECTION.
 3. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

			DRAWN BY: HDR DATE: 03/31/201	SCRRA ENGINEERING STANDARDS ARE INTENDED FOR SCRRA APPROVED USES ONLY.		ENGINEERING STANDARDS	STANDARD
				SCRRA SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF		ENGINEETIING STANDARDS	2819
				THE DATA OR INFORMATION CONTAINED HEREIN. THE SELECTION AND USE OF THESE STANDARDS IS THE SOLE RESPONSIBILITY OF THE USER AND SHOULD NOT BE USED.	METROLINK.		SCALE:
			Varen D. Vige	WITHOUT CONSULTING A REGISTERED PROFESSIONAL ENGINEER. ALL WARRANTIES		TIE LAYOUT PLAN	REVISION SHEET
				AND REPRESENTATIONS OF ANY KIND ARE DISCLAIMED. ANYONE MAKING USE OF THIS INFORMATION AGREES THAT IT ASSUMES ALL LIABILITY ARISING FROM SUCH	SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY		- 1 OF 1
Х	xx-xx-xx	REVISION XX XX	11 Illiam Daras	MISE NO PART OF THESE STANDARDS SHOULD BE REPRODUCED OR DISTRIBUTED IN		NO 20 – RH CROSSOVER 20'TRACK CENTERS	CADD FILE:
REV	DATE	DESCRIPTION DES. ENG.	DIRECTOR OF ENGINEERING AND CONSTRUCTION	ANY FORM OR BY ANY MEANS WITHOUT THE PRIOR WRITTEN PERMISSION OF SCRRA. ALL RIGHTS RESERVED.	ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012		ES2819-06

		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	LH TURNOUT TIES (0-125)	
2	2	TIE NO 126 - LENGTH = 23'-51/2"	
3	2	TIE NO 127 - LENGTH = 23'-51/2"	
4	2	TIE NO 128 - LENGTH = 23'-51/2"	
5	2	TIE NO 129 - LENGTH = 23'-51/2"	
6	2	TIE NO 130 - LENGTH = 23'-51/2"	
7	2	TIE NO 131 - LENGTH = 23'-51/2"	
8	2	TIE NO 132 - LENGTH = 23'-51/2"	
9	2	TIE NO 133 - LENGTH = 23'-51/2"	
10	2	TIE NO 134 - LENGTH = 23'-51/2"	
11	2	TIE NO 135 - LENGTH = 23'-51/2"	
12	2	TIE NO 136 - LENGTH = 23'-51/2"	
13	2	TIE NO 137 - LENGTH = 23'-51/2"	
14	2	TIE NO 138 - LENGTH = 23'-51/2"	
15	2	TIE NO 139 - LENGTH = 23'-51/2"	
16	2	8'-3" 1:80 CANT CONCRETE TIE	



- ALL SWITCH TIES ARE FLAT (NON-CANTED), EXCEPT 1:80 TRANSITION TIES AND STANDARD 8'-3" TIES CANTED 1:40. ALL LENGTHS SHALL INCLUDE 1'-9" FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES AND STANDARD TIE PER SCRRA ENGINEERING STANDARDS.
 DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

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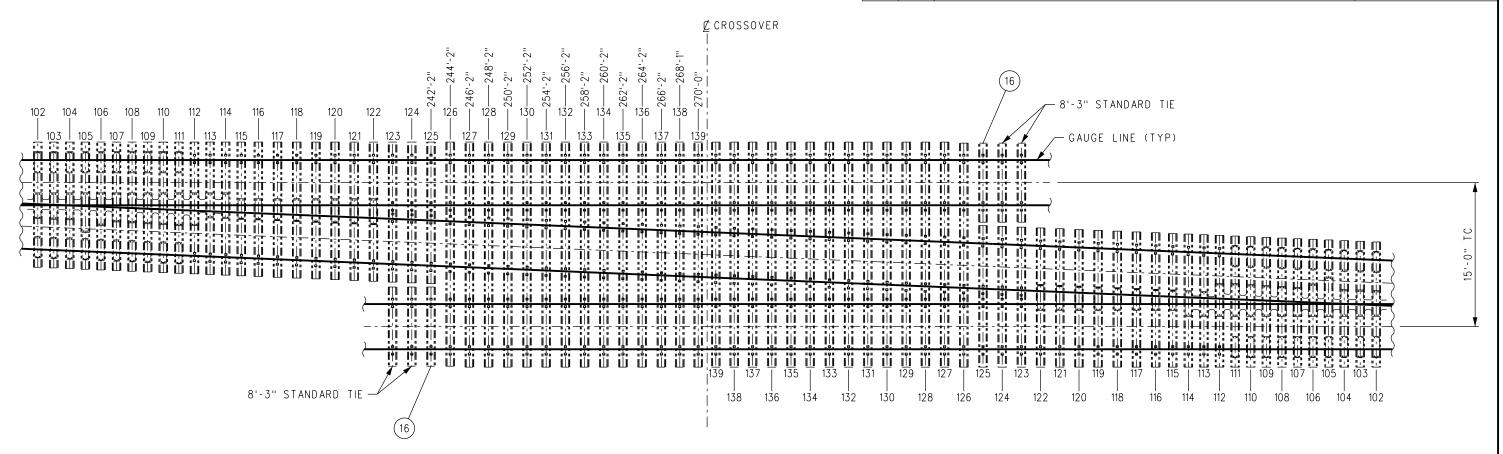
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TIE LAYOUT PLAN NO 24 - LH CROSSOVER 15' TRACK CENTERS

		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	RH TURNOUT TIES (0-125)	
2	2	TIE NO 126 - LENGTH = 23'-51/2"	
3	2	TIE NO 127 - LENGTH = 23'-51/2"	
4	2	TIE NO 128 - LENGTH = 23'-51/2"	
5	2	TIE NO 129 - LENGTH = 23'-51/2"	
6	2	TIE NO 130 - LENGTH = 23'-51/2"	
7	2	TIE NO 131 - LENGTH = 23'-51/2"	
8	2	TIE NO 132 - LENGTH = 23'-51/2"	
9	2	TIE NO 133 - LENGTH = 23'-51/2"	
10	2	TIE NO 134 - LENGTH = 23'-51/2"	
11	2	TIE NO 135 - LENGTH = 23'-51/2"	
12	2	TIE NO 136 - LENGTH = 23'-51/2"	
13	2	TIE NO 137 - LENGTH = 23'-51/2"	
14	2	TIE NO 138 - LENGTH = 23'-51/2"	
15	2	TIE NO 139 - LENGTH = 23'-51/2"	
16	2	8'-3" 1:80 CANT CONCRETE TIE	



- 1. ALL SWITCH TIES ARE FLAT (NON-CANTED), EXCEPT 1:80 TRANSITION TIES AND STANDARD 8'-3" TIES CANTED 1:40. ALL LENGTHS SHALL INCLUDE 1'-9" FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES AND STANDARD TIE PER SCRRA ENGINEERING STANDARDS.

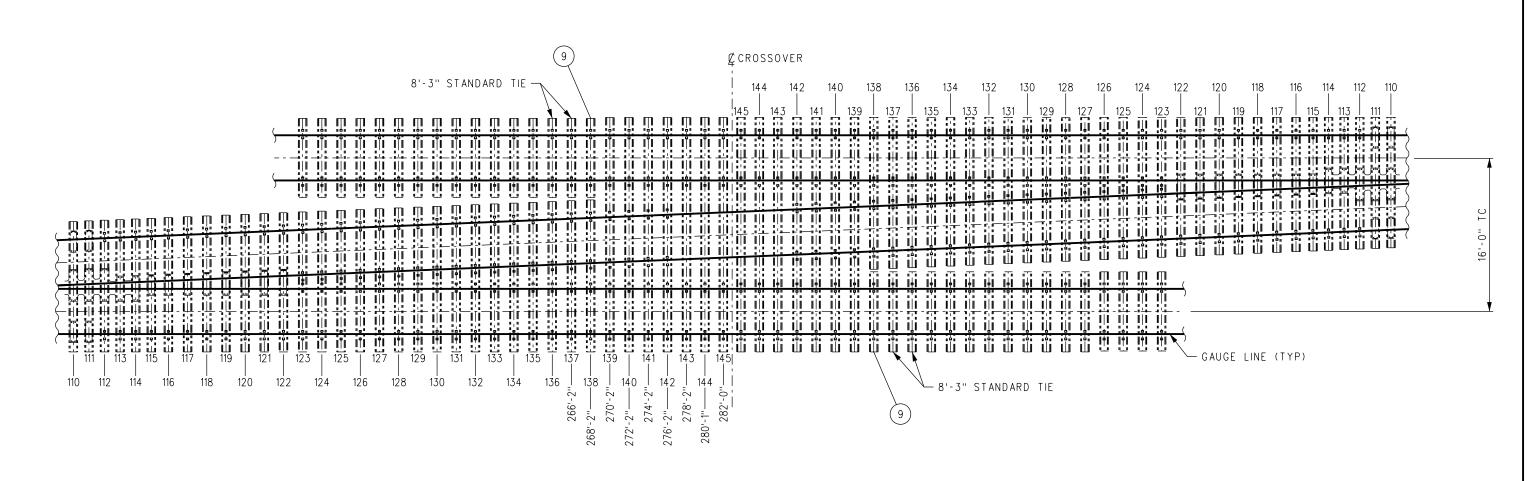
 2. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

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ENGINEERING STANDARDS	standard 2820
	SCALE: NTS
NO 24 - BH CBOSSOVER 15' TBACK CENTERS	REVISION SHEET - 1 OF 1 CADD FILE:
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BILL OF MATERIAL						
ITEM	QTY	DESCRIPTION	SCRRA PART NO			
1	2	LH TURNOUT TIES (0-138)				
2	2	TIE NO 139 - LENGTH = 24'-51/2"				
3	2	TIE NO 140 - LENGTH = 24'-51/2"				
4	2	TIE NO 141 - LENGTH = 24'-51/2"				
5	2	TIE NO 142 - LENGTH = 24'-51/2"				
6	2	TIE NO 143 - LENGTH = 24'-51/2"				
7	2	TIE NO 144 - LENGTH = 24'-51/2"				
8	2	TIE NO 145 - LENGTH = 24'-51/2"				
9	2	8'-3" 1:80 CANT CONCRETE TIE				



- ALL SWITCH TIES ARE FLAT (NON-CANTED), EXCEPT 1:80 TRANSITION TIES AND STANDARD 8'-3" TIES CANTED 1:40. ALL LENGTHS SHALL INCLUDE 1'-9" FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES AND STANDARD TIE PER SCRRA ENGINEERING STANDARDS.
 DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

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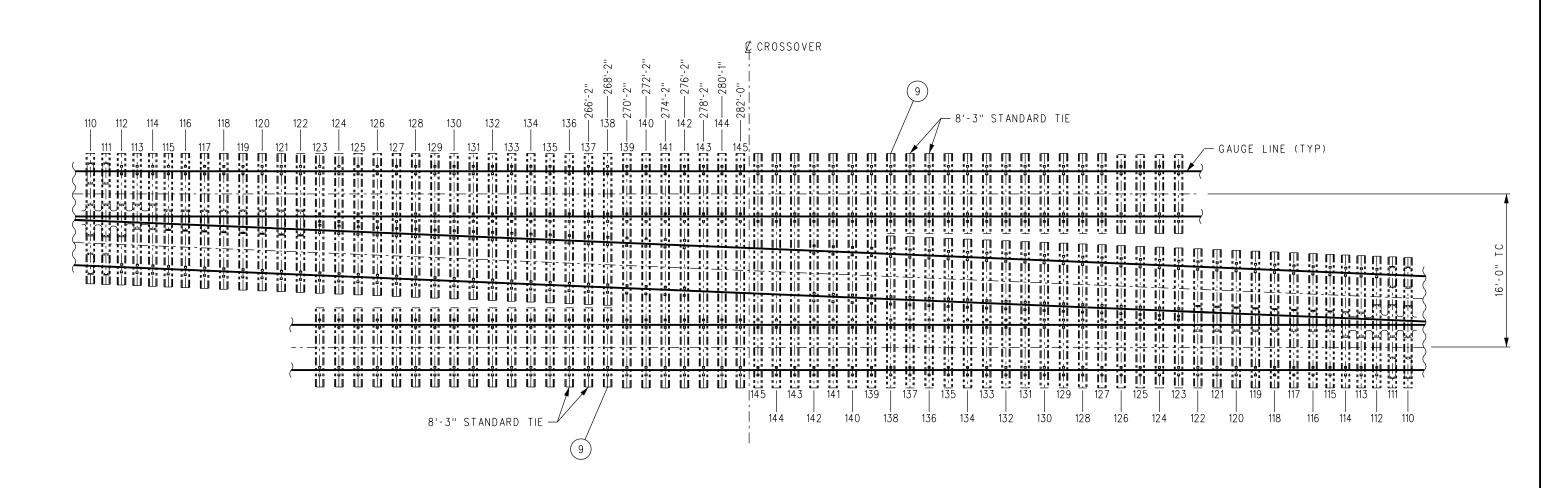
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SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY

ENGINEERING STANDARDS	standard 2820
TIE LAYOUT PLAN NO 24 – LH CROSSOVER 16' TRACK CENTERS	REVISION SHEET - 1 OF 1 CADD FILE: F\$2820-03

		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	RH TURNOUT TIES (0-138)	
2	2	TIE NO 139 - LENGTH = 24'-5½"	
3	2	TIE NO 140 - LENGTH = 24'-51/2"	
4	2	TIE NO 141 - LENGTH = 24'-5½"	
5	2	TIE NO 142 - LENGTH = 24'-51/2"	
6	2	TIE NO 143 - LENGTH = 24'-51/2"	
7	2	TIE NO 144 - LENGTH = 24'-51/2"	
8	2	TIE NO 145 - LENGTH = 24'-51/2"	
9	2	8'-3" 1:80 CANT CONCRETE TIE	



- 1. ALL SWITCH TIES ARE FLAT (NON-CANTED), EXCEPT 1:80 TRANSITION TIES AND STANDARD 8'-3" TIES CANTED 1:40. ALL LENGTHS SHALL INCLUDE 1'-9" FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES AND STANDARD TIE PER SCRRA ENGINEERING STANDARDS.

 2. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

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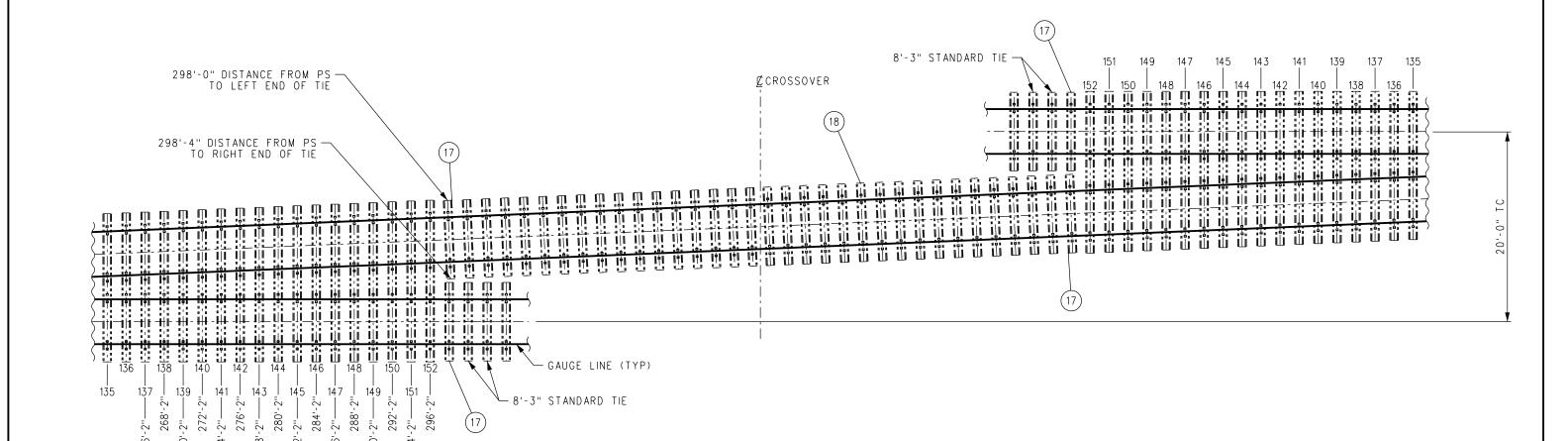
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NON-SCRRA APPROVED USES.
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ENGINEERING STANDARDS	standard 2820	
TIE LAYOUT PLAN NO. 24 - BH CROSSOVER 16' TRACK CENTERS	SCALE: NTS REVISION SHEET 1 OF 1 CADD FILE: FS2820-04	

	BILL OF MATERIAL					BILL OF MATERIAL				
ITEM	QTY	DESCRIPTION	SCRRA PART NO	ITEM	QTY	DESCRIPTION	SCRRA PART NO			
1	2	LH TURNOUT TIES (0-137)		10	2	TIE NO 146 - LENGTH = 16'-6"				
2	2	TIE NO 138 - LENGTH = 15'-10"		11	2	TIE NO 147 - LENGTH = 16'-7"				
3	2	TIE NO 139 - LENGTH = 15'-11"		12	2	TIE NO 148 - LENGTH = 16'-8"				
4	2	TIE NO 140 - LENGTH = 16'-0"		13	2	TIE NO 149 - LENGTH = 16'-9"				
5	2	TIE NO 141 - LENGTH = 16'-1"		14	2	TIE NO 150 - LENGTH = 16'-10"				
6	2	TIE NO 142 - LENGTH = 16'-2"		15	2	TIE NO 151 - LENGTH = 16'-11"				
7	2	TIE NO 143 - LENGTH = 16'-3"		16	2	TIE NO 152 - LENGTH = 17'-0"				
8	2	TIE NO 144 - LENGTH = 16'-4"		17	4	8'-3" 1:80 CANT CONCRETE TIE				
9	2	TIE NO 145 - LENGTH = 16'-5"		18	32	8'-3" 1:40 CANT STANDARD TIE (FOR CROSSOVER CONNECTION)				



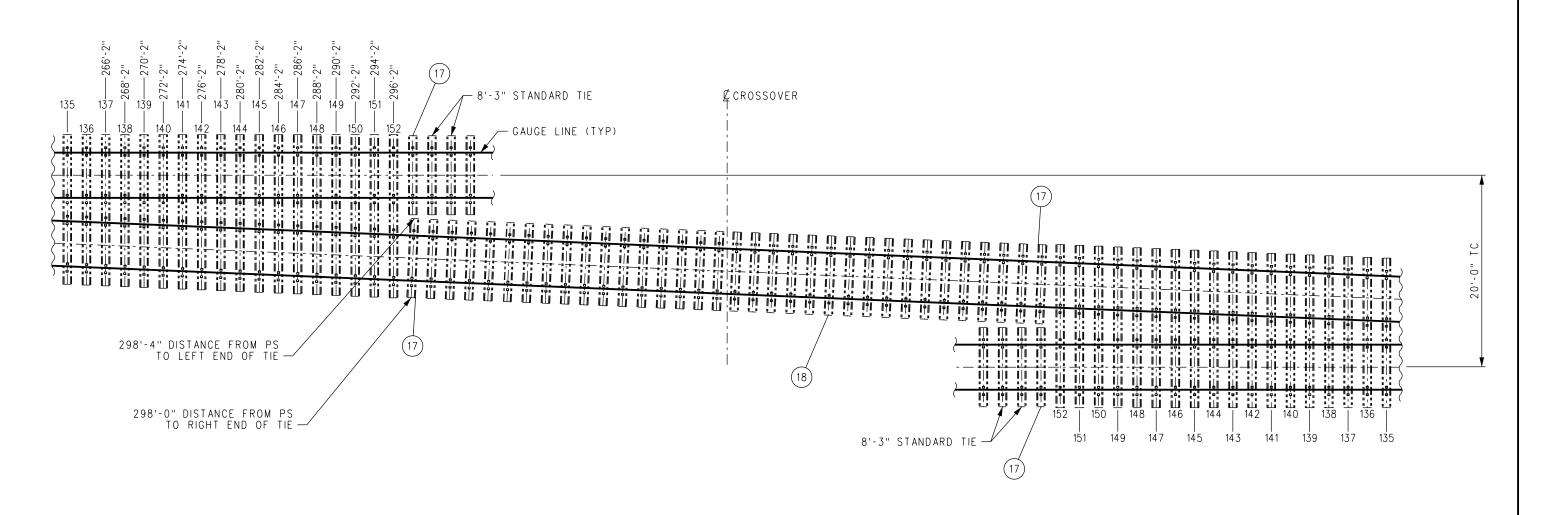
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 FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES
 AND STANDARD TIE PER SCRRA ENGINEERING STANDARDS.
 2. 32 STANDARD TIES AT APPROXIMATELY 2'-0" TIE CENTERS ON CROSSOVER CONNECTION.

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3. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

		DRAWN BY: HDR DATE: 03/31/2011	SCRRA ENGINEERING STANDARDS ARE INTENDED FOR SCRRA APPROVED USES ONLY. FOR NON-SCRRA APPROVED USES. SCRRA SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF		ENGINEERING STANDARDS	STANDARD 2820
X XX-XX-XX REV. DATE	REVISION XX XX DESCRIPTION DES. ENG.	Nareh D. Poll ASSISIANT DIRECTOR STANDARDS & DESIGN Willow Davan	THE DATA OR INFORMATION CONTAINED HEREIN. THE SELECTION AND USE OF THESE STANDARDS IS THE SOLE RESPONSIBILITY OF THE USER AND SHOULD NOT BE USED WITHOUT CONSULTING A REGISTERED PROFESSIONAL ENGINEER. ALL WARRANTES AND REPRESENTATIONS OF ANY KIND ARE DISCLAIMED. ANYONE MAKING USE OF THIS INFORMATION AGREES THAT IT ASSUMES ALL LIABILITY ANSING FROM SUCH LICE NO DAD OF THESE CANDADORS CHUILD RE PERPONULFED NO DISCIPILIFIED IN	SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012	TIE LAYOUT PLAN NO 24 – LH CROSSOVER 20' TRACK CENTERS	REVISION SHEET 1 OF 1 CADD FILE: ES2820-05

	BILL OF MATERIAL					BILL OF MATERIAL					
ITEM	QTY	DESCRIPTION	SCRRA PART NO	ITEM	QTY	DESCRIPTION	SCRRA PART NO				
1	2	RH TURNOUT TIES (0-137)		10	2	TIE NO 146 - LENGTH = 16'-6"					
2	2	TIE NO 138 - LENGTH = 15'-10"		11	2	TIE NO 147 - LENGTH = 16'-7"					
3	2	TIE NO 139 - LENGTH = 15'-11"		12	2	TIE NO 148 - LENGTH = 16'-8"					
4	2	TIE NO 140 - LENGTH = 16'-0"		13	2	TIE NO 149 - LENGTH = 16'-9"					
5	2	TIE NO 141 - LENGTH = 16'-1"		14	2	TIE NO 150 - LENGTH = 16'-10"					
6	2	TIE NO 142 - LENGTH = 16'-2"		15	2	TIE NO 151 - LENGTH = 16'-11"					
7	2	TIE NO 143 - LENGTH = 16'-3"		16	2	TIE NO 152 - LENGTH = 17'-0"					
8	2	TIE NO 144 - LENGTH = 16'-4"		17	4	8'-3" 1:80 CANT CONCRETE TIE					
9	2	TIE NO 145 - LENGTH = 16'-5"		18	32	8'-3" 1:40 CANT STANDARD TIE (FOR CROSSOVER CONNECTION)					



- 1. ALL SWITCH TIES ARE FLAT (NON-CANTED), EXCEPT 1:80 TRANSITION TIES AND STANDARD 8'-3" TIES CANTED 1:40. ALL LENGTHS SHALL INCLUDE 1'-9" FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES AND STANDARD TIE PER SCRRA ENGINEERING STANDARDS.

 2. 32 STANDARD TIES AT APPROXIMATELY 2'-0" TIE CENTERS ON CROSSOVER CONNECTION.

 3. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

				DRAWN BY: HDR DATE: 03/31/2011	SCRRA ENGINEERING STANDARDS ARE INTENDED FOR SCRRA APPROVED USES ONLY.		ENGINEERING STANDARDS	STANDARD
				/	SCRRA SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF	MFTROI INK	ENGINEERING STANDARDS	2820
				0/100	THE DATA OR INFORMATION CONTAINED HEREIN. THE SELECTION AND USE OF THESE STANDARDS IS THE SOLE RESPONSIBILITY OF THE USER AND SHOULD NOT BE USED.	METROLINK		SCALE:
				/ Varet D. Ville	WITHOUT CONSULTING A REGISTERED PROFESSIONAL ENGINEER. ALL WARRANTIES		TIE LAYOUT PLAN	REVISION SHEET
				ASSISIANT DIRECTOR: STANDARDS & DESIGN	AND REPRESENTATIONS OF ANY KIND ARE DISCLAIMED. ANYONE MAKING USE OF THIS INFORMATION AGREES THAT IT ASSUMES ALL LIABILITY ARISING FROM SUCH	SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY		1 OF 1
×	xx-xx-xx	RE VISION XX	XX		MIICE NO DADT OF THESE STANDADOS SHOULD BE DEDDODUCED OD DISTDIRUTED IN		NO 24 – RH CROSSOVER 20'TRACK CENTERS	CADD FILE:
REV	. DATE	DESCRIPTION DES.	ENG.	70070	ANY FORM OR BY ANY MEANS WITHOUT THE PRIOR WRITTEN PERMISSION OF SCRRA.	ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012		ES2820-06