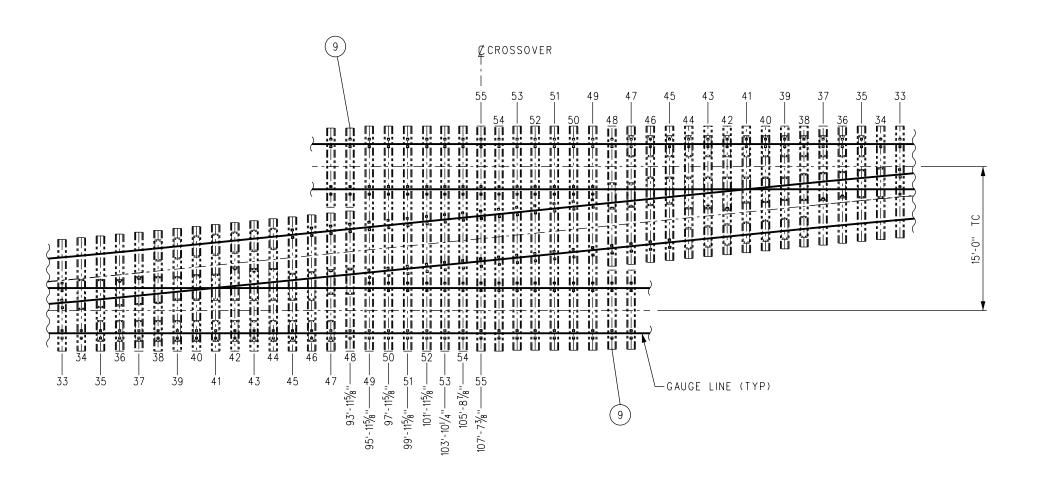
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Updating the contents of the manual is a continued process, and revisions/replacements are issued periodically. Questions, comments, and proposed recommendations for changes may be sent to SCRRA at 279 E. Arrow Highway, Suite A, San Dimas, CA 91773.

	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.

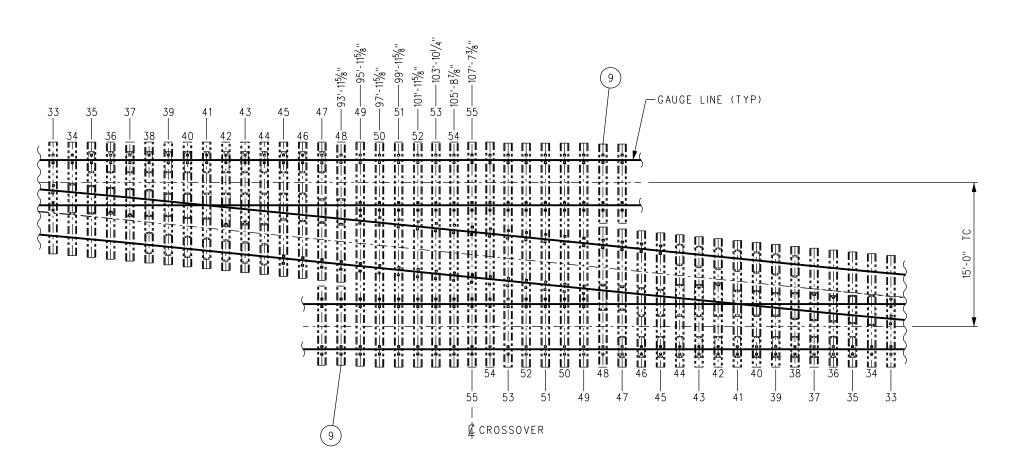
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ENGINEERING STANDARDS	STANDARD 2817
TIE LAYOUT PLAN NO 10 – LH CROSSOVER 15' TRACK CENTERS	SCALE:  NTS  REVISION SHEET  - 1 OF 1  CADD FILE:  FS2817-01

	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 <sup>1</sup> / <sub>2</sub> "				
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.

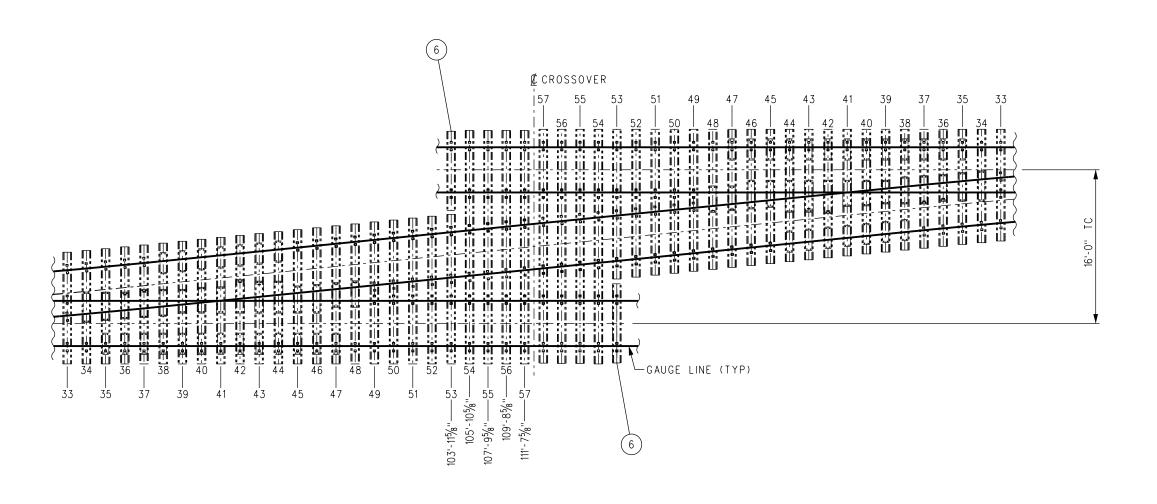
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ENGINEERING STANDARDS	2817	
TIE LAYOUT BLAN	SCALE:  NTS  REVISION SHEET  1 OF 1  CADD FILE: ES2817-02	

	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'-51/2"					
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.

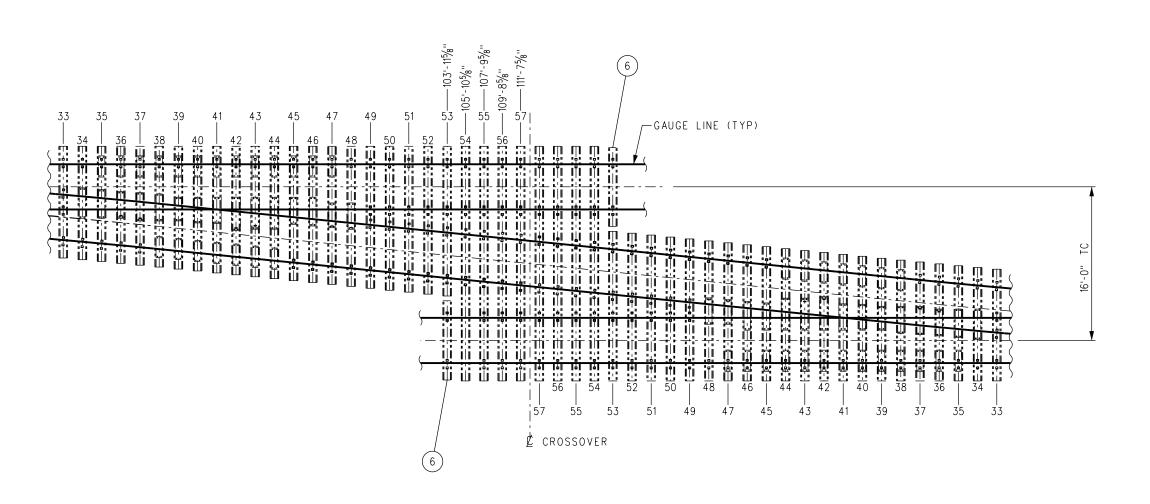
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ENGINEERING STANDARDS	2817	
TIE LAYOUT PLAN NO 10 – LH CROSSOVER 16' TRACK CENTERS	SCALE:  NTS  REVISION SHEET  1 OF 1  CADD FILE: ES2817-03	

		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	RH TURNOUT TIES (0-53)	
2	2	TIE NO 54 - LENGTH = 24'-5 <sup>1</sup> / <sub>2</sub> "	
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 <sup>1</sup> / <sub>2</sub> "	
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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ENGINEERING STANDARDS	STANDARD 2817
TIE LAYOUT PLAN NO 10 – RH CROSSOVER 16' TRACK CENTERS	REVISION SHEET  - 1 OF 1  CADD FILE:  FS2817-04

		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)	

**STANDARDS** 

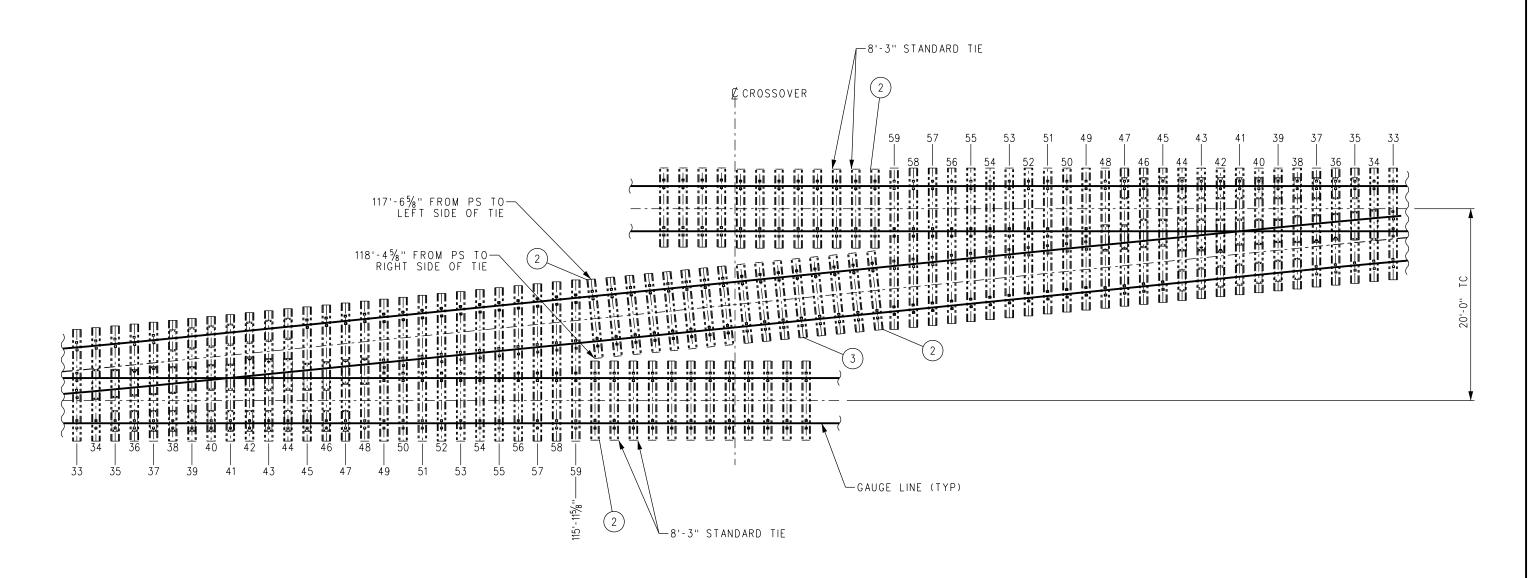
20' TRACK CENTERS

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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.

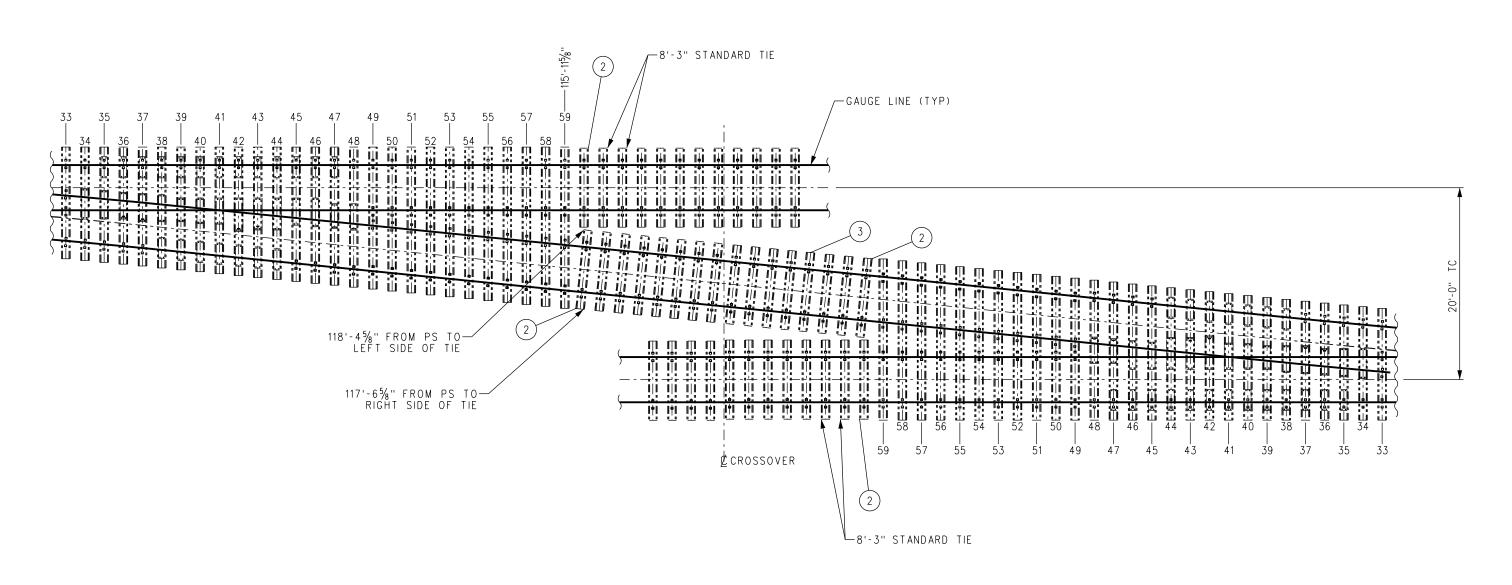
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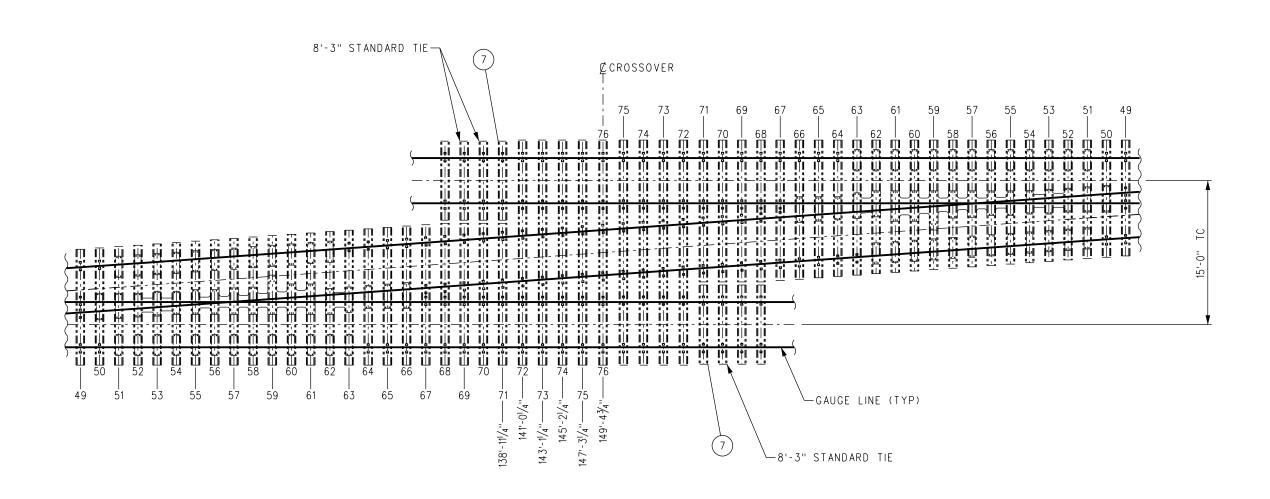
		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	RH TURNOUT TIES (0-59)	
2	4	8'-3" 1:80 CANT CONCRETE TIE	
3	14	8'-3" 1:40 CANT STANDARD TIE (FOR CROSSOVER CONNECTION)	



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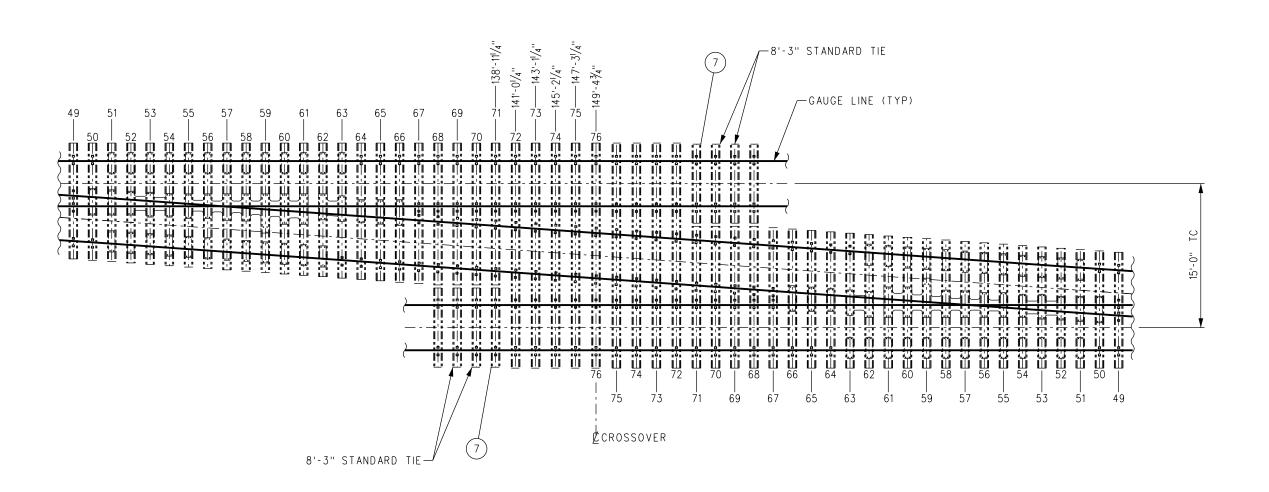
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ENGINEERING STANDARDS	standard 2818
TIE LAYOUT PLAN NO. 14 – LH. CROSSOVER, 15' TRACK, CENTERS	SCALE:  NTS  REVISION SHEET  1 OF 1  CADD FILE:  FS2818_01

		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	RH TURNOUT TIES (0-71)	
2	2	TIE NO 72 - LENGTH = 23'-5 1/2"	
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'-5 <sup>1</sup> / <sub>2</sub> "	
6	1	TIE NO 76 - LENGTH = 23'-51/2"	
7	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.

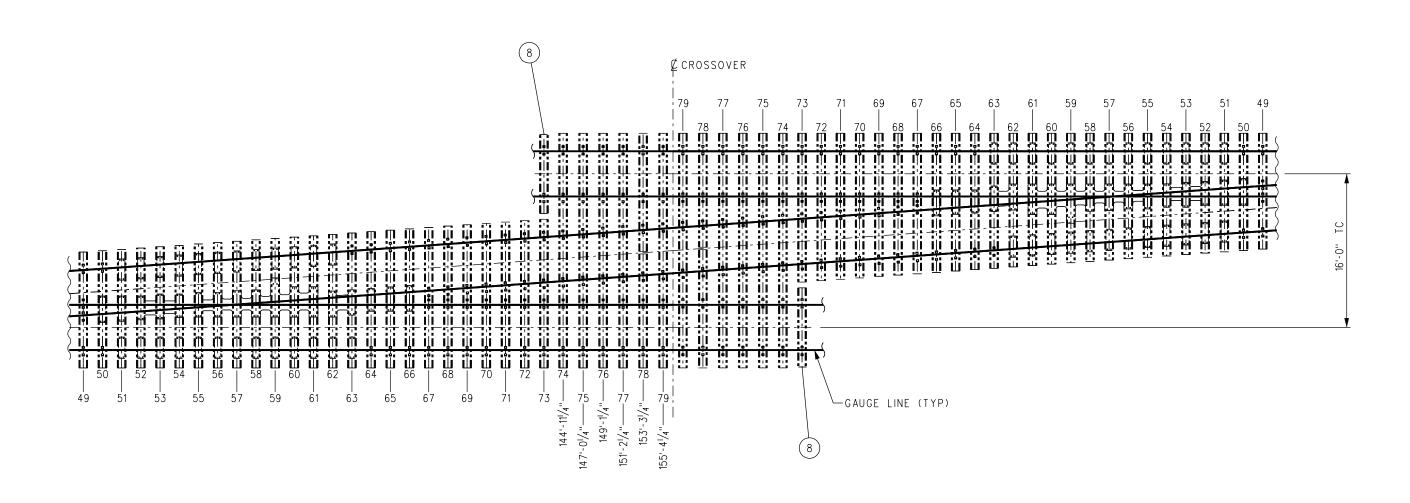
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ENGINEERING STANDARDS	STANDARD 2818
TIE LAYOUT PLAN NO 14 – RH CROSSOVER 15' TRACK CENTERS	SCALE:  NTS  REVISION SHEET  1 OF 1  CADD FILE:  FS2818-02

		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	LH 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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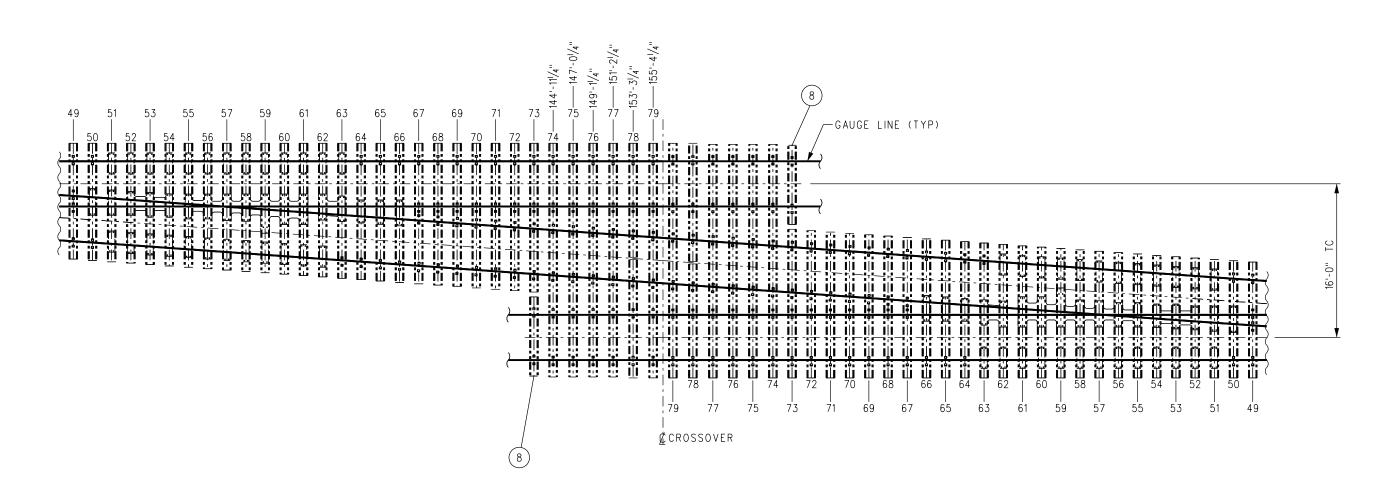
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ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012 GHTS RESERVED.

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ENGINEERING STANDARDS	standard 2818
TIE LAYOUT PLAN NO 14 – LH CROSSOVER 16' TRACK CENTERS	SCALE:  NTS  REVISION SHEET  1 OF 1  CADD FILE:  ES2818 03

		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	RH TURNOUT TIES (0-73)	
2	2	TIE NO 74 - LENGTH = 24'-5 <sup>1</sup> / <sub>2</sub> "	
3	2	TIE NO 75 - LENGTH = 24'-51/2"	
4	2	TIE NO 76 - LENGTH = 24'-5½"	
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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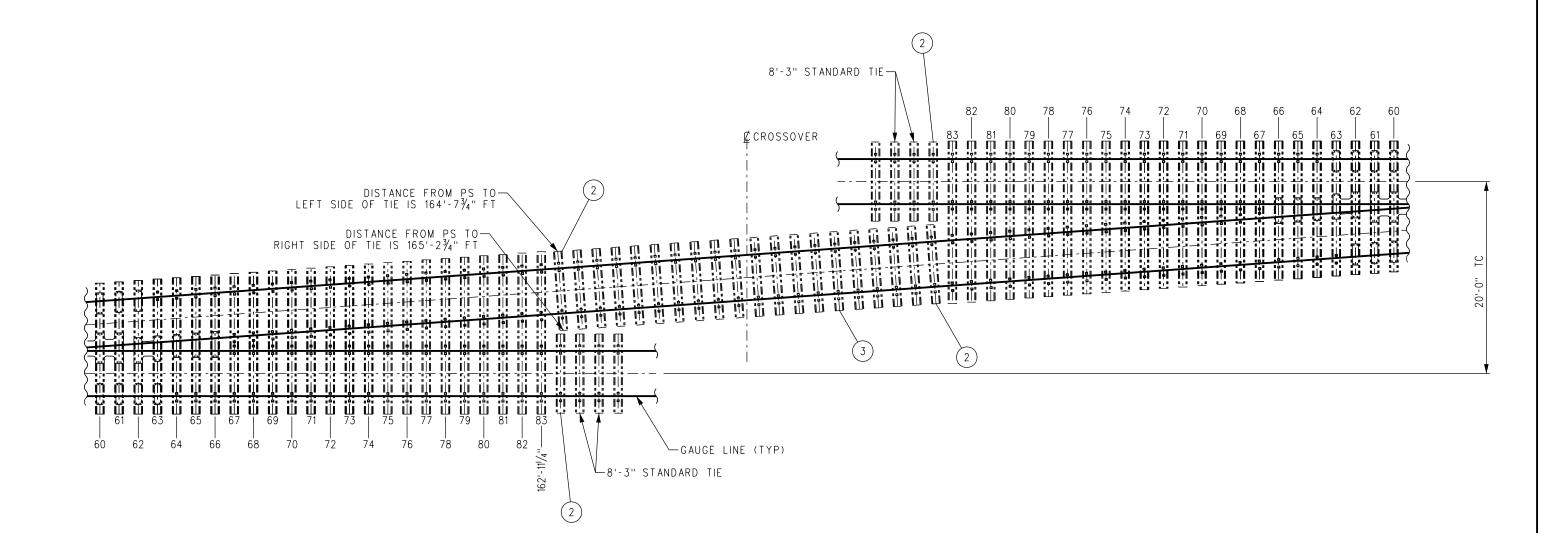
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FOR NON-SCRRA APPROVED USES.
SCRRA SHALL NO IDE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF
THE DATA OR INFORMATION CONTAINED HERRIN. THE SELECTION AND USE OF THESE
STANDARDS IS THE SOLE RESPONSIBILITY OF THE USER AND SHOULD NOT BE USED
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USE. NO PART OF THESE STANDARDS SHOULD BE REPRODUCED OR DISTRIBUTED IN
ANY FORM OR BY ANY MEANS WITHOUT THE PRIOR WRITTEN PERMISSION OF SCRRA.

ALL RIGHTS RESERVED.

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TIE LAYOUT NO 14 – RH CROSSOVER		SCALE:  NTS  REVISION SHEET  1 OF 1  CADD FILE: ES2818-04

	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.

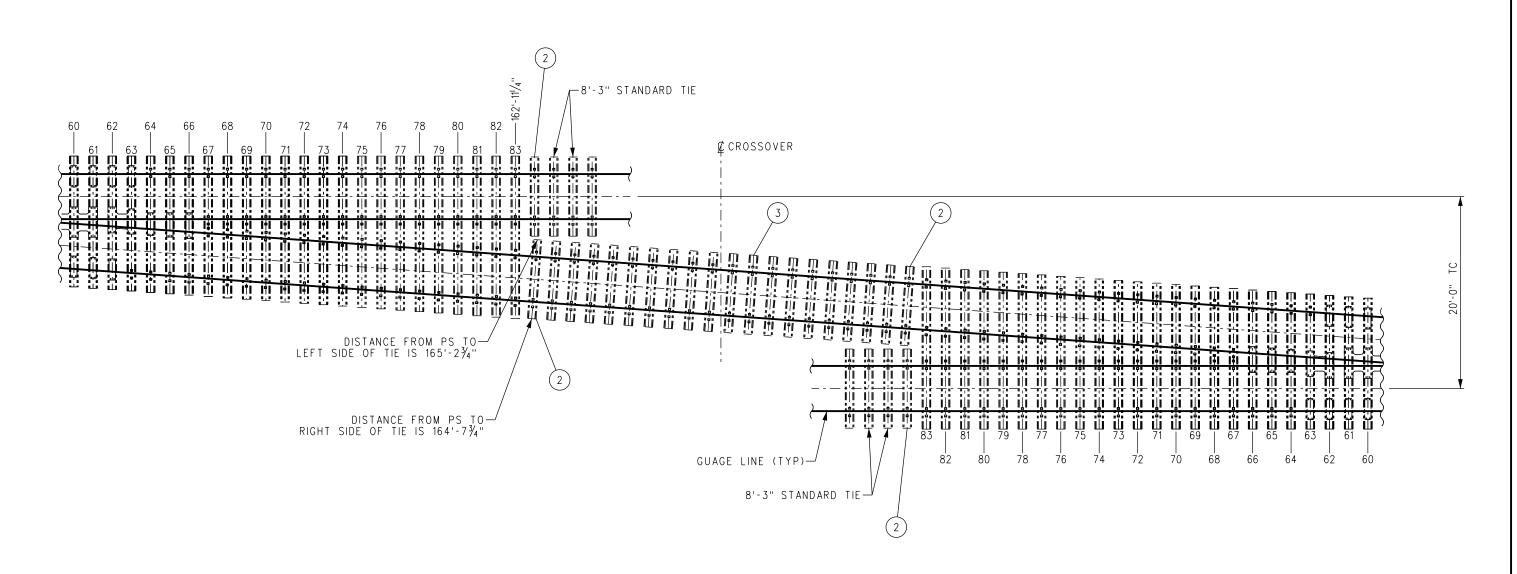
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REV.	DATE	DESCRIPTION	DES.	ENG.	DIRECTOR OF ENGINEER	$\overline{}$	CTION	ANY FORM OR BY ANY MEANS WITHOUT THE PRIOR WRITTEN PERMISSION OF SCRRA.	ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

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TIE LAYOUT PLAN NO 14 - LH CROSSOVER 20' TRACK CENTERS

ENGINEERING STANDARDS

	BILL OF MATERIAL							
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)						



- 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.

  18 STANDARD TIES AT APPROXIMATELY 2'-0" TIE CENTERS ON CROSSOVER CONNECTION.
- 2. 18 STANDARD TIES AT APPROXIMATELY 2'-U" THE CENTERS ON CROSSOLER 3. DISTANCES INDICATED AT EACH THE ARE MEASURED FROM THE POINT OF SWITCH.

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INFORMATION CONTAINED HEREIN. THE SELECTION AND USE OF THESE

IS THE SOLE RESPONSIBILITY OF THE USER AND SHOULD NOT BE USED

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SENTATIONS OF ANY KIND ARE DISCLAIMED. ANYONE MAKING USE OF

ANTION AGREES THAT IT ASSUMES ALL LIABILITY ARISING FROM SUCH

RT OF THESE STANDARDS SHOULD BE REPRODUCED OR DISTRIBUTED IN

ONE BY ANY MEANS WITHOUT THE PRIOR WRITTEN PERMISSION OF SCRRA.

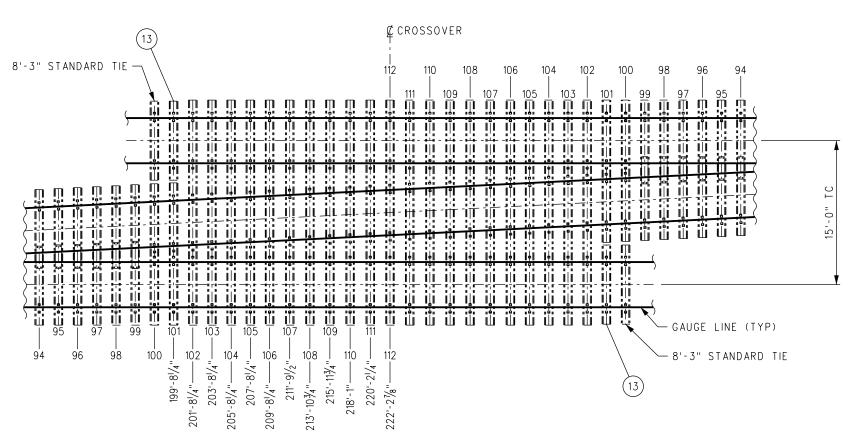
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ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

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ENGINEERING STANDARDS	STANDARD 2818	
	SCALE:	
TIE LAYOUT PLAN NO 14 – RH CROSSOVER 20' TRACK CENTERS	REVISION SHEET  - 1 OF 1	
THE THE ORIGINAL ZO THE ORIGINAL TO	CADD FILE: FS2818_06	

		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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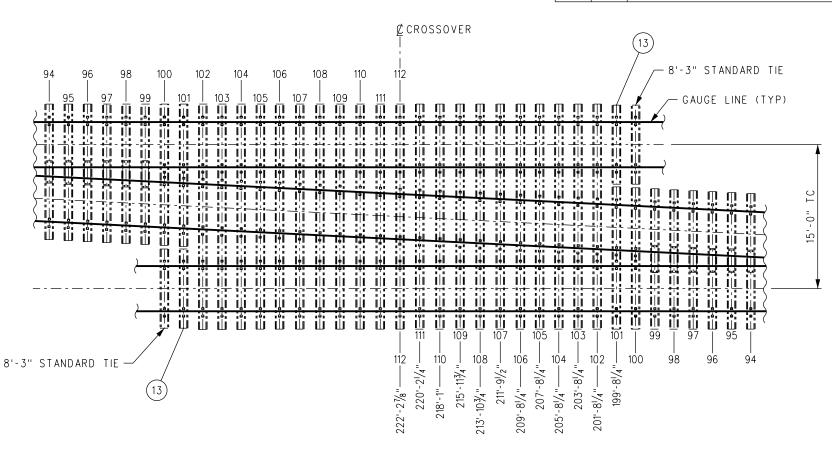
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$NO^{-2}$	20 — LH	CROSSOVER	15' TRACK CENTERS	CADD FILE:	1011
					S2810_01

		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'-5 1/2"	
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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ALL RIGHTS RESERVED.

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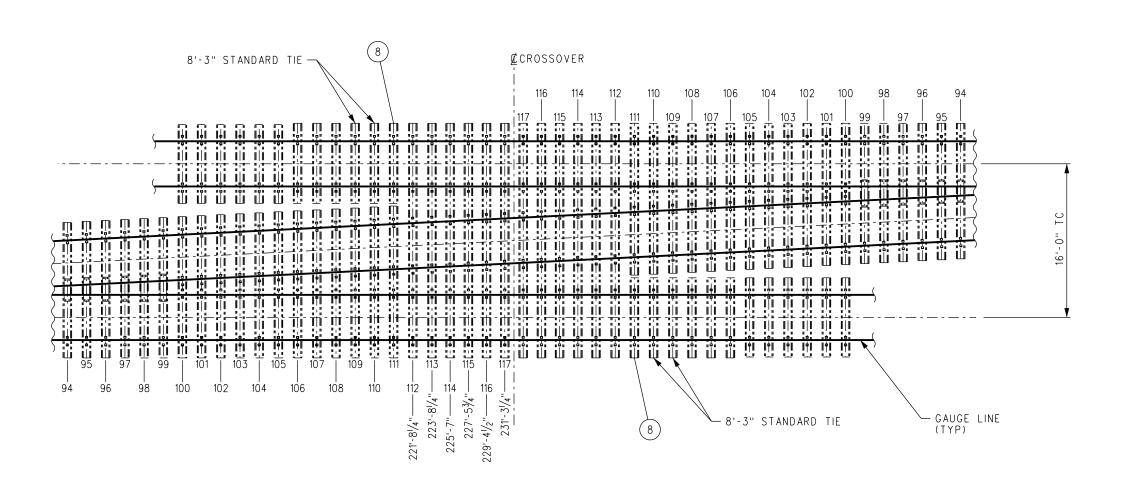
TIE LAYOUT PLAN NO 20 - RH CROSSOVER 15' TRACK CENTERS

ENGINEERING STANDARDS

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1 OF

		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	LH TURNOUT TIES (0-111)	
2	2	TIE NO 112 - LENGTH = 24'-51/2"	
3	2	TIE NO 113 - LENGTH = 24'-5 <sup>1</sup> / <sub>2</sub> "	
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'-51/2"	
7	2	TIE NO 117 - LENGTH = 24'-5 <sup>1</sup> / <sub>2</sub> "	
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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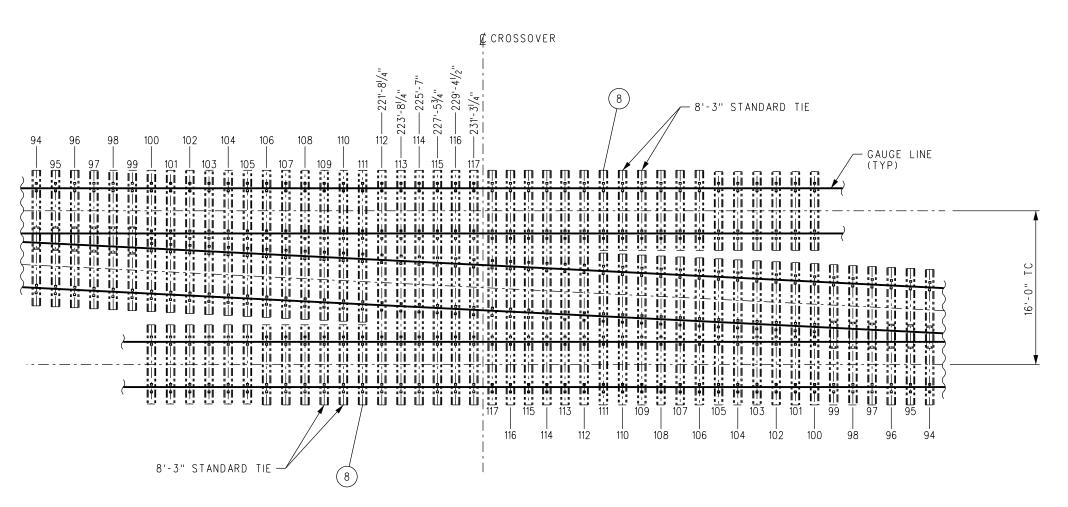
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ENGINEERING STANDARDS	STANDARD 2819
TIE LAYOUT PLAN NO 20 – LH CROSSOVER 16' TRACK CENTERS	SCALE:  NTS  REVISION SHEET  1 OF 1  CADD FILE: ES2819-03

	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'-51/2"						
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.

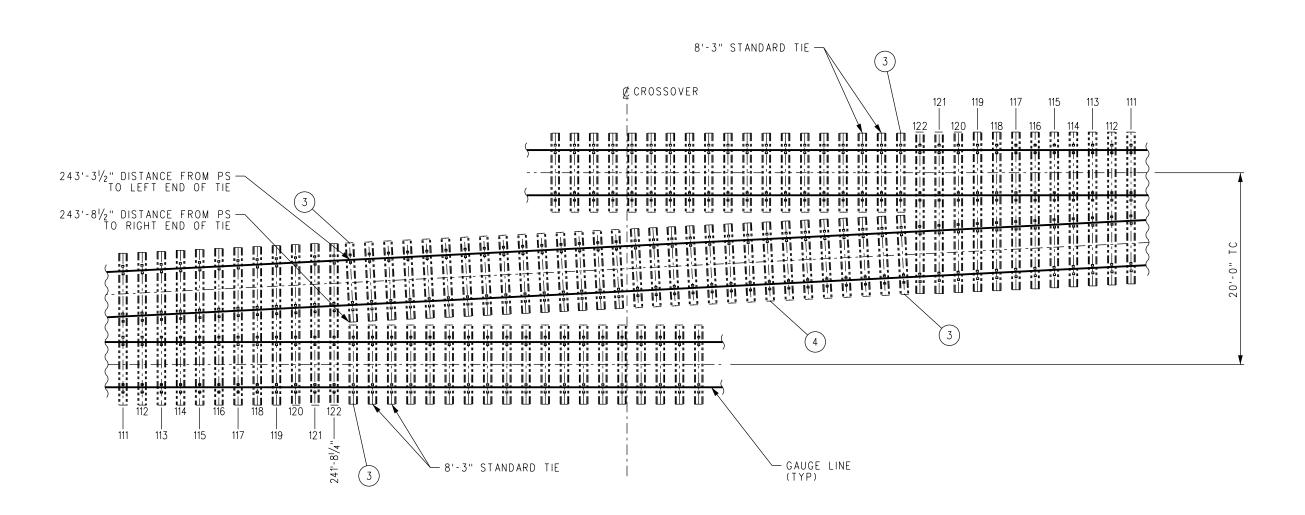
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ENGINEERING STANDARDS	STANDARD 2819
TIE LAYOUT PLAN NO 20 – RH CROSSOVER 16' TRACK CENTERS	REVISION SHEET  - 1 OF 1  CADD FILE: FS2819-04

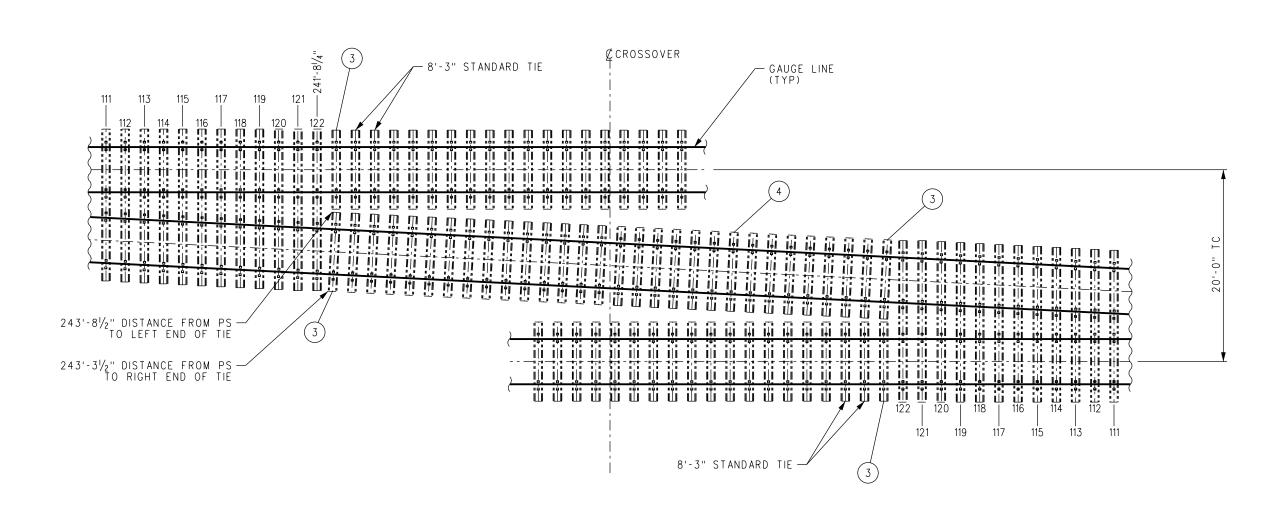
		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	LH TURNOUT TIES (0-121)	
2	2	TIE NO 122 - LENGTH = 16'-10"	
3	4	8'-3" 1:80 CANT CONCRETE TIE	
4	28	8'-3" 1:40 CANT STANDARD TIE (FOR CROSSOVER CONNECTION)	



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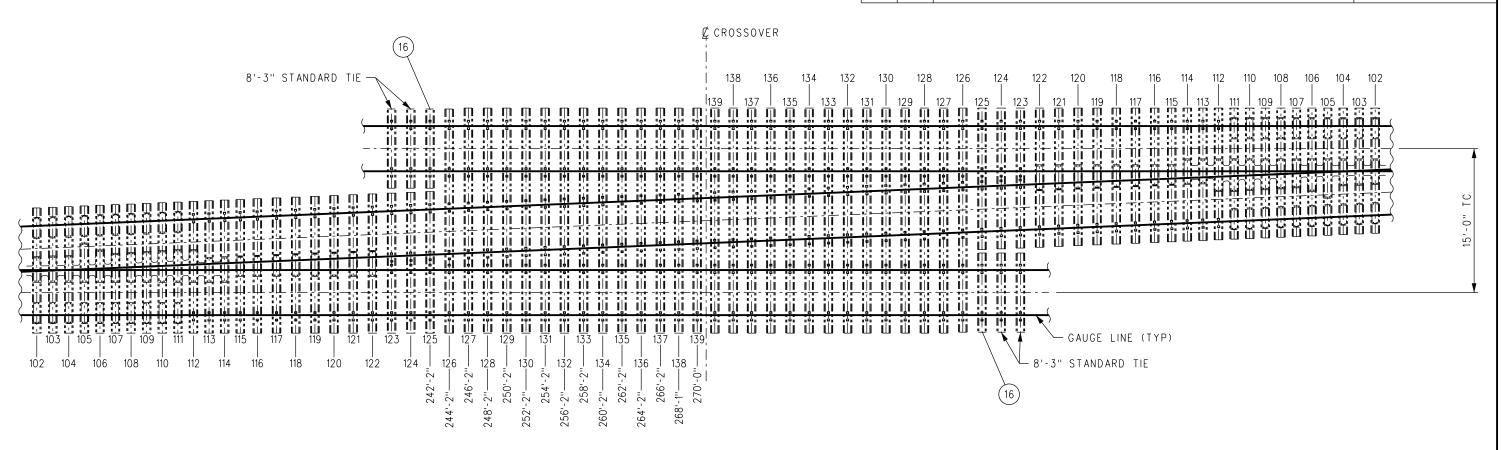
		BILL OF MATERIAL	
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	RH TURNOUT TIES (0-121)	
2	2	TIE NO 122 - LENGTH = 16'-10"	
3	4	8'-3" 1:80 CANT CONCRETE TIE	
4	28	8'-3" 1:40 CANT STANDARD TIE (FOR CROSSOVER CONNECTION)	



- 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"
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  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
					SCRRA SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF		ENGINEERING STANDARDS	2819
			$\Box$	0/	THE DATA OR INFORMATION CONTAINED HEREIN. THE SELECTION AND USE OF THESE	<b>METROLINK</b>		SCALE:
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$\vdash$	+		-		AND DEDDECENTATIONS OF ANY KIND ADE DISCLAIMED ANYONE MAKING LISE OF	COLITIEDAL CALIFORNIA DECICALAL DAIL ALITHODITY	TIE LAYOUT PLAN	REVISION SHEET
			-	ASSISTANT BIRECTON STANDARDS & BESIGN	THIS INFORMATION AGREES THAT IT ASSUMES ALL LIABILITY ARISING FROM SUCH	SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY	NO 20 - RH CROSSOVER 20'TRACK CENTERS	_ 1 OF 1
Х	xx-xx-xx	REVISION XX	XX	u Jelliam Darae-	THE NO DADE OF THESE STANDADES SHOULD BE DEDDOODIED OF DISTRICT IN		NO 20 - HIT CHOSSOVER 20 HACK CENTERS	CADD FILE:
REV	. DATE	DESCRIPTION DES.	ENG.	DIRECTOR OF ENGINEERING AND CONSTRUCTION	ANT FURM OR BY ANY MEANS WITHOUT THE PRIOR WRITTEN PERMISSION OF SERRA.	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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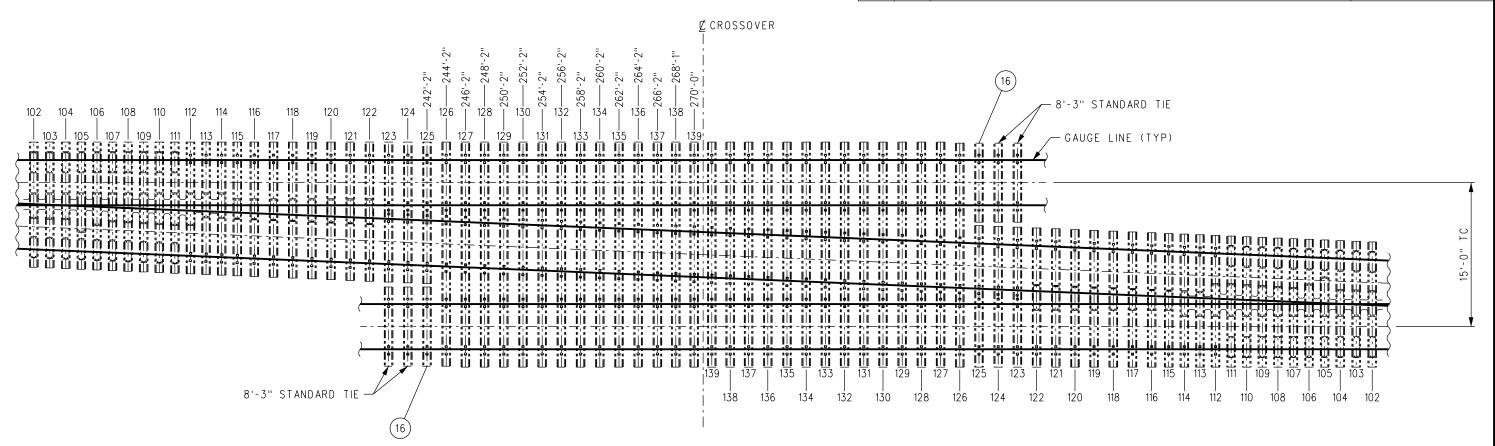
SCRRA ENGINEERING STANDARDS ARE INTENDED FOR SCRRA APPROVED USES ONLY.
FOR NON-SCRRA APPROVED USES.
SCRRA SHALL NO IB ER RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF
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STANDARDS IS THE SOLE RESPONSIBILITY OF THE USER AND SHOULD NOT BE USED
WITHOUT CONSULTING A REGISTERED PROFESSIONAL ENGINEER. ALL WARRANTIES
AND REPRESENTATIONS OF ANY KIND ARE DISCLAMED. ANYONE MAKING USE OF
THIS INFORMATION AGREES THAT IT ASSUMES ALL LIABILITY ARRISING FROM SUCH
USE. NO PART OF THESE STANDARDS SHOULD BE REPRODUCED OR DISTRIBUTED IN
ANY FORM OR BY ANY MEANS WITHOUT THE PRIOR WRITTEN PERMISSION OF SCRRA.

ALL RIGHTS RESERVED.

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	ENGI	NEERING	STANDA	ARDS	STANDARD	2820
					SCALE:	NTS
NIO	24 _ I H	TIE LAYOUT CROSSOVER			REVISION —	SHEET 1 OF 1
110	Z-7 LIT	CHOOOCVEH	15 THACK	OLIVILIO	CADD FILE:	ES2820-01

		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.

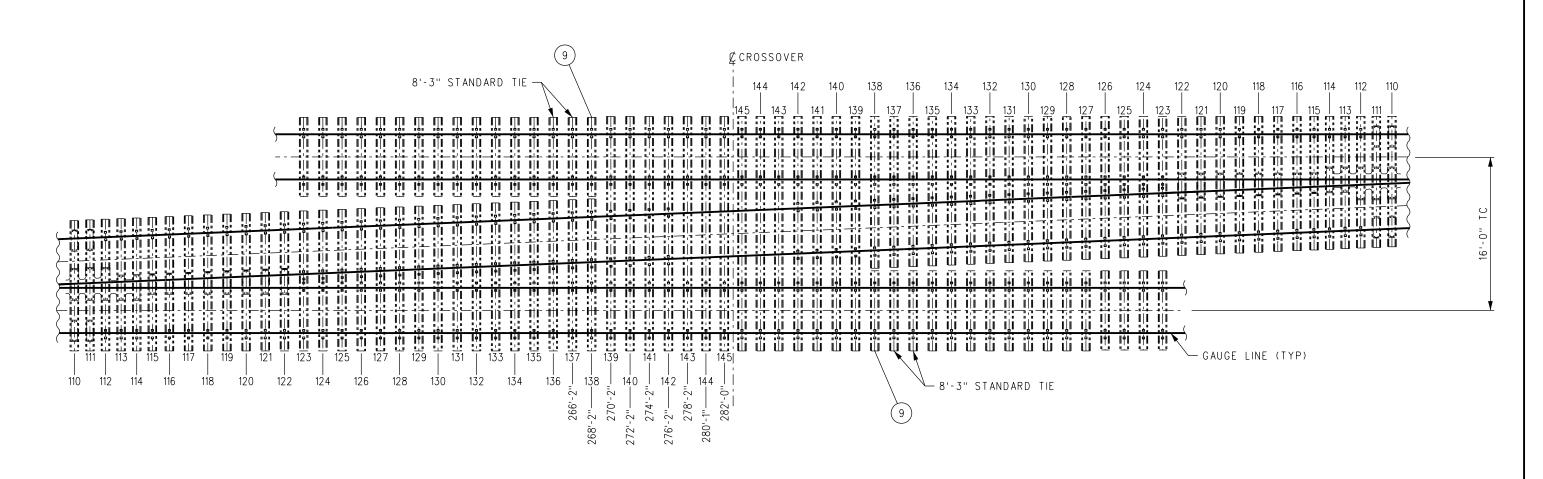
  2. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

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ITATIONS OF ANY KIND ARE DISCLAIMED. ANYONE MAKING USE OF TION AGREES THAT IT ASSUMES ALL LIABILITY ARISING FROM SUCH OF THESE STANDARDS SHOULD BE REPRODUCED OR DISTRIBUTED IN BY ANY MEANS WITHOUT THE PRIOR WRITTEN PERMISSION OF SCRRA. ESERVED.	SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS NTS TIE LAYOUT PLAN 1 OF NO 24 - RH CROSSOVER 15' TRACK CENTERS ES2820-02

		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	



- 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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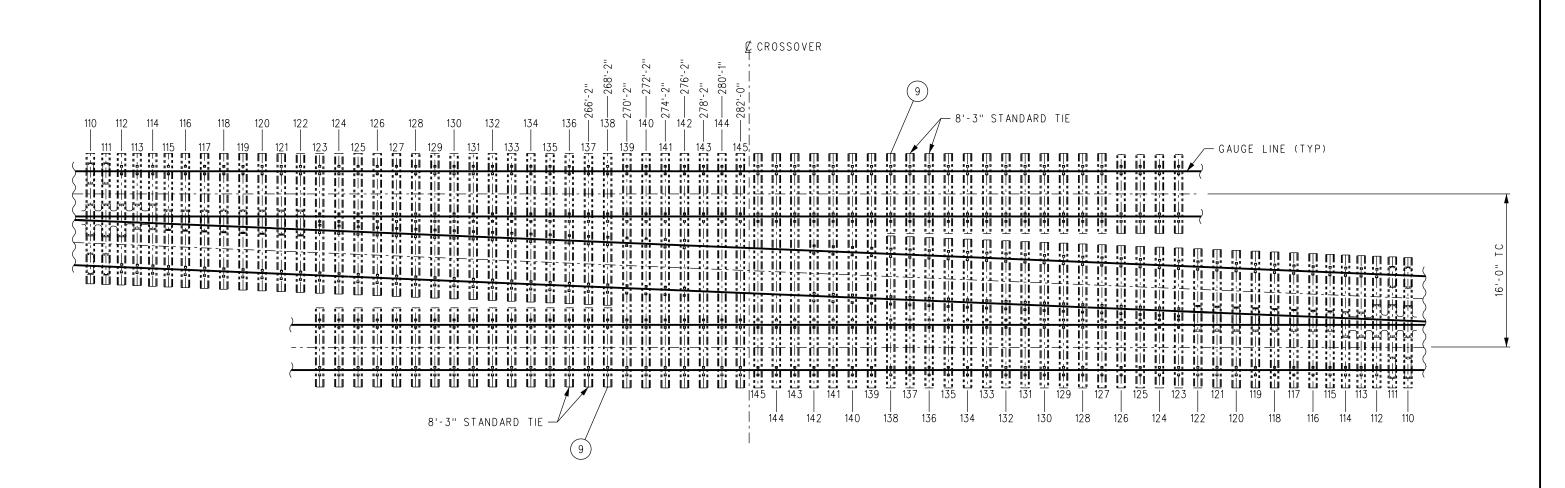
OR NON-SCRRA APPROVED USES:

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ENGINEERING STANDARDS	standard 2820
	scale: NTS
TIE LAYOUT PLAN NO 24 – LH CROSSOVER 16' TRACK CENTERS	REVISION SHEET  - 1 OF 1
THO 24 ETT OTTOGGOVERT TO THE MOTOR GENTLETO	CADD FILE: FS2820_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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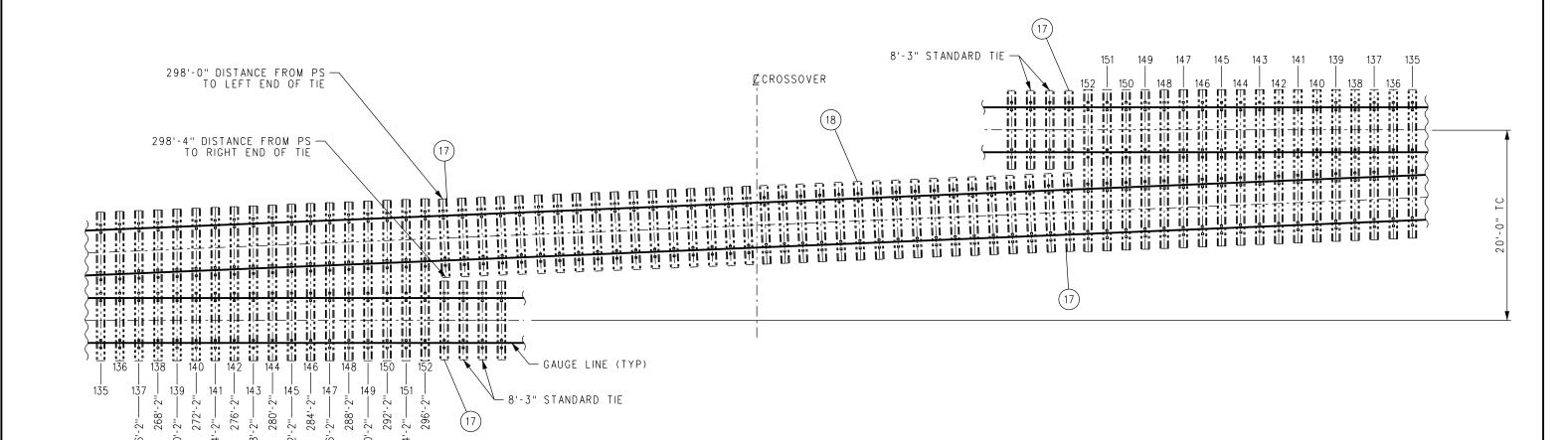
CONSULTING A REGISTERED PROFESSIONAL ENGINEER. ALL WARRANTIES	<b>METROLINK</b> <sub>®</sub>
ART OF THESE STANDARDS SHOULD BE REPRODUCED OR DISTRIBUTED IN	SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY
OR BY ANY MEANS WITHOUT THE PRIOR WRITTEN PERMISSION OF SCRRA. S RESERVED.	ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

TIE LAYOUT PLAN NO 24 - RH CROSSOVER 16' TRACK CENTERS

ENGINEERING STANDARDS

NTS 1 OF -ES2820-04

		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)				



- 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.
						/		FOR NON-SCRRA APPROVED USES: SCRRA SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF
						$1 \qquad 1 \qquad 1$	2 800	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.
						/ Vareth		WITHOUT CONSULTING A REGISTERED PROFESSIONAL ENGINEER. ALL WARRANTIES
						ASSISIANT DIRECTOR:		AND REPRESENTATIONS OF ANY KIND ARE DISCLAIMED. ANYONE MAKING USE OF THIS INFORMATION AGREES THAT IT ASSUMES ALL LIABILITY ARISING FROM SUCH
Х	<b>\</b>	XX-XX-XX	REVISION	XX	XX	u) eller	1 200	USE. NO PART OF THESE STANDARDS SHOULD BE REPRODUCED OR DISTRIBUTED IN ANY FORM OR BY ANY MEANS WITHOUT THE PRIOR WRITTEN PERMISSION OF SCRRA.
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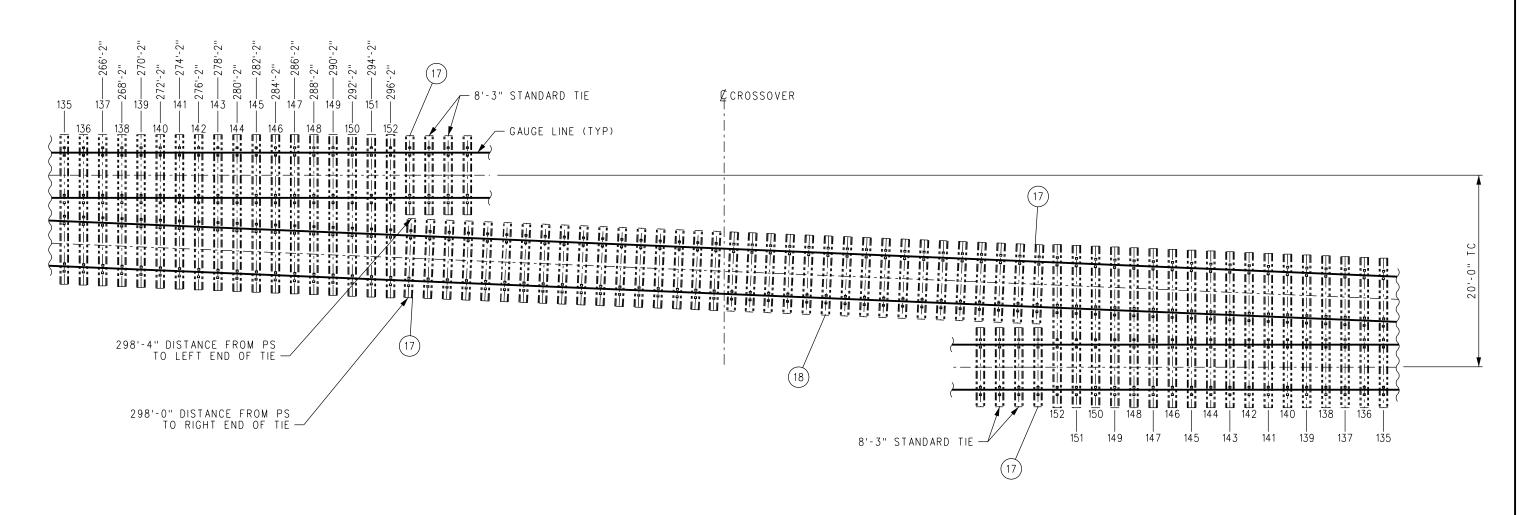
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JCH JCH	SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY	

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

ENGINEERING STANDARDS	2820
TIF LAYOUT PLAN	SCALE: NTS REVISION ISHEET
NO 24 – LH CROSSOVER 20' TRACK CENTERS	- 1 OF 1
	ES2820-05

'-2"— 276'-

		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.

			C	RAWN 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	LINGINEERING STANDARDS	2820
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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	NO 24 - RH CROSSOVER 20' TRACK CENTERS	- 1 OF 1
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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		ES2820-06