

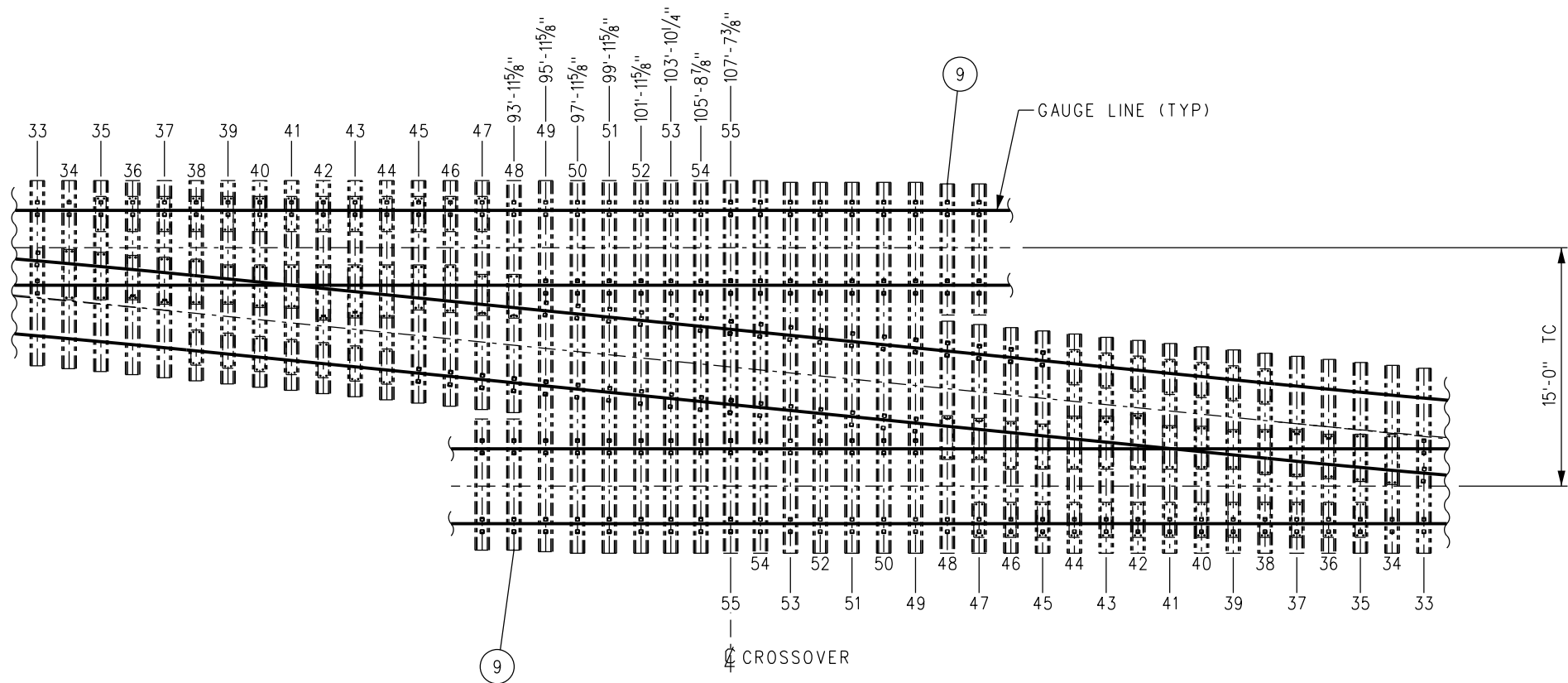
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BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	SCRR PART NO
1	2	RH TURNOUT TIES (0-48)	
2	2	TIE NO 49 - LENGTH = 23'-5½"	
3	2	TIE NO 50 - LENGTH = 23'-5½"	
4	2	TIE NO 51 - LENGTH = 23'-5½"	
5	2	TIE NO 52 - LENGTH = 23'-5½"	
6	2	TIE NO 53 - LENGTH = 23'-5½"	
7	2	TIE NO 54 - LENGTH = 23'-5½"	
8	1	TIE NO 55 - LENGTH = 23'-5½"	
9	2	8'-3" 1:80 CANT CONCRETE TIE	



NOTES:

- 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 SCRR ENGINEERING STANDARDS.
- 2. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

X	XX-XX-XX	REVISION	XX	XX	
REV.	DATE	DESCRIPTION	DES.	ENG.	

DRAWN BY: HDR DATE: 03/31/2011


ASSISTANT DIRECTOR: STANDARDS & DESIGN


DIRECTOR OF ENGINEERING AND CONSTRUCTION

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**METROLINK**
SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY
ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS

TIE LAYOUT PLAN
NO 10 – RH CROSSOVER 15' TRACK CENTERS

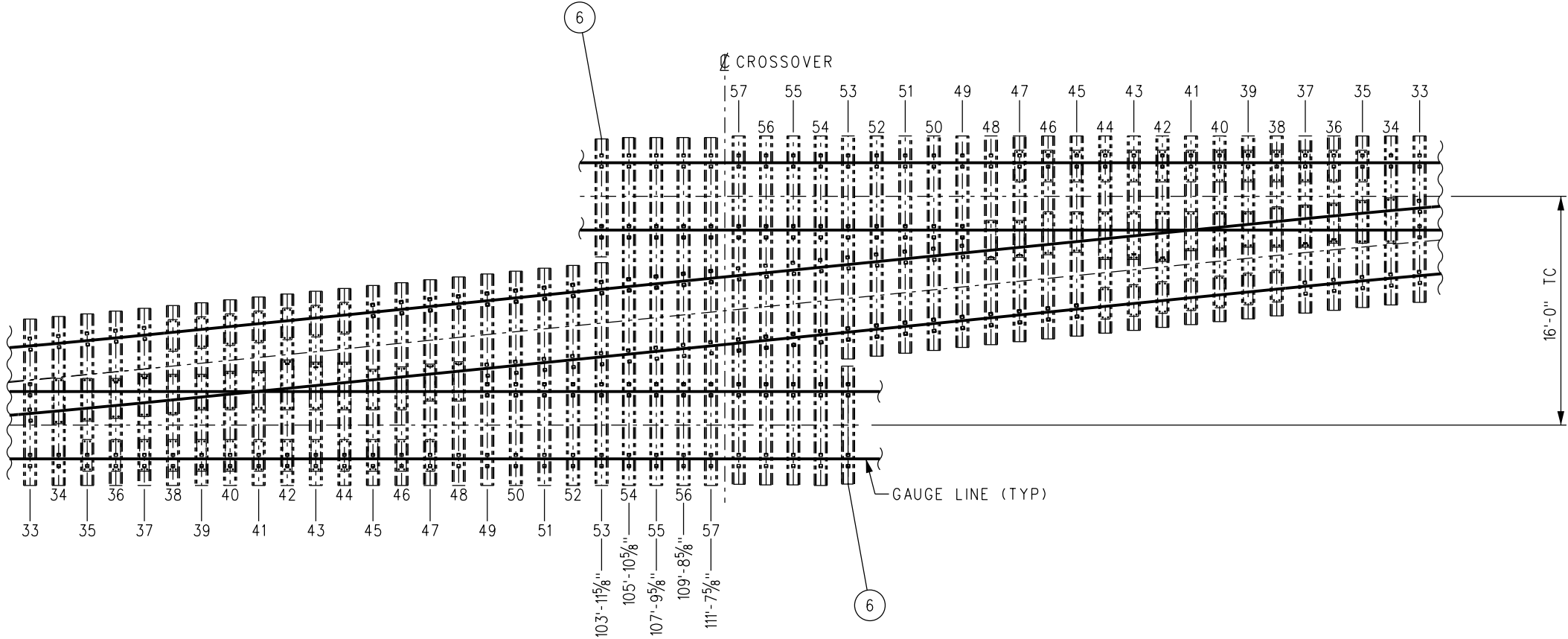
STANDARD 2817

SCALE: NTS

REVISION SHEET
- 1 OF 1

CADD FILE:
ES2817-02

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



NOTES:

- 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 SCRR ENGINEERING STANDARDS.
- 2. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

X	XX-XX-XX	REVISION	XX	XX	
REV.	DATE	DESCRIPTION	DES.	ENG.	

DRAWN BY: HDR DATE: 03/31/2011


ASSISTANT DIRECTOR: STANDARDS & DESIGN


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

ENGINEERING STANDARDS

TIE LAYOUT PLAN
NO 10 – LH CROSSOVER 16' TRACK CENTERS

STANDARD 2817
SCALE: NTS
REVISION SHEET
- 1 OF 1
CADD FILE: ES2817-03

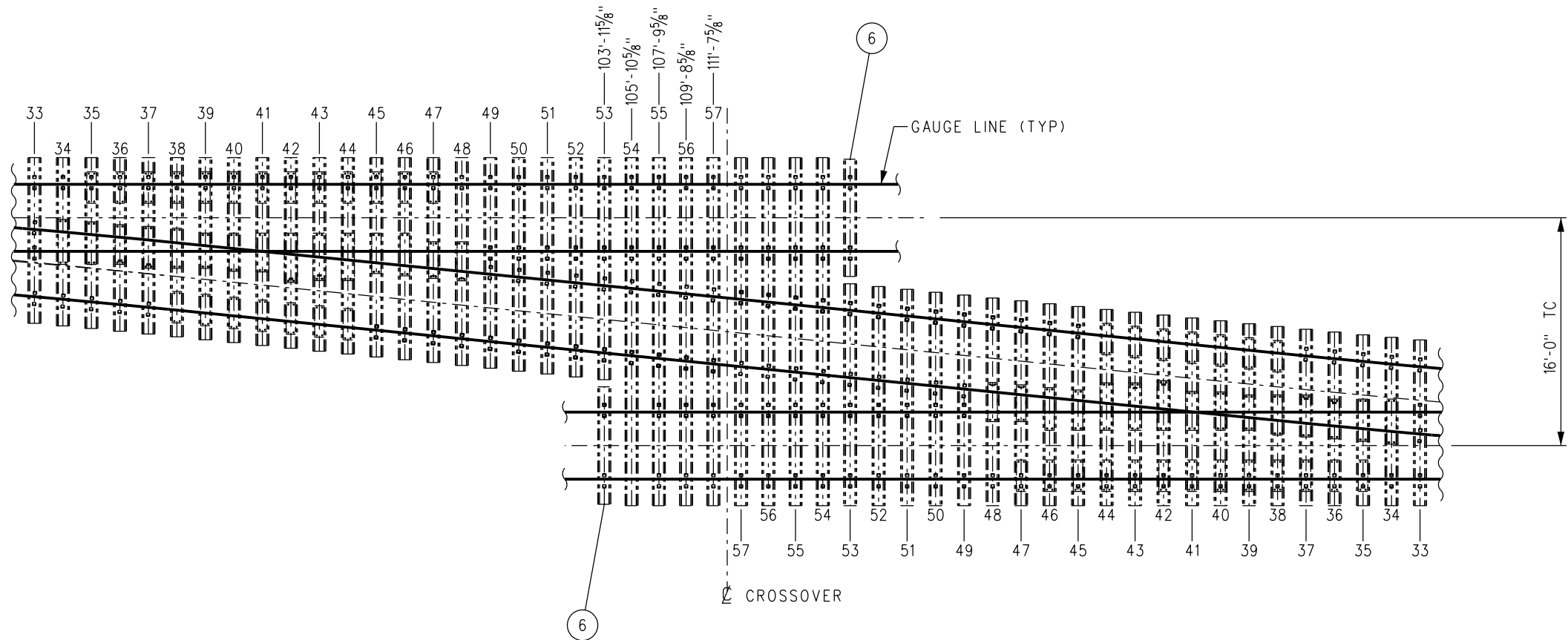
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BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	SCRRRA PART NO
1	2	RH TURNOUT TIES (0-53)	
2	2	TIE NO 54 - LENGTH = 24'-5½"	
3	2	TIE NO 55 - LENGTH = 24'-5½"	
4	2	TIE NO 56 - LENGTH = 24'-5½"	
5	2	TIE NO 57 - LENGTH = 24'-5½"	
6	2	8'-3" 1:80 CANT CONCRETE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

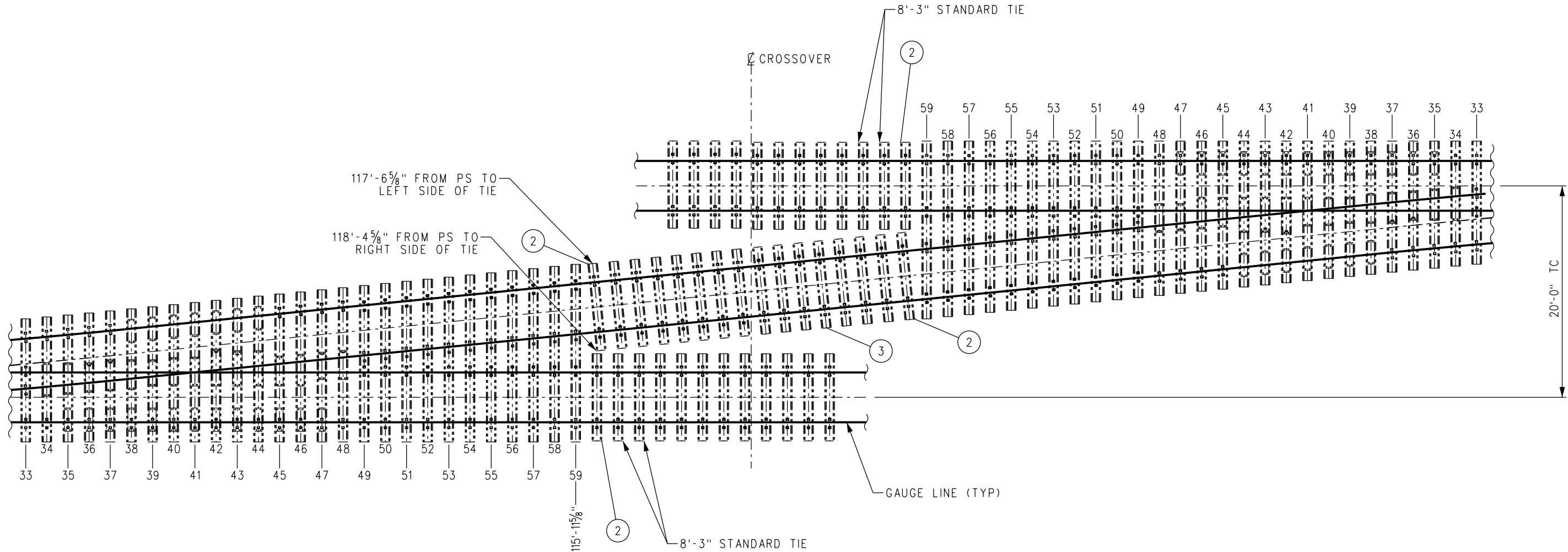


NOTES:

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

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

BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	SCRRRA 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)	

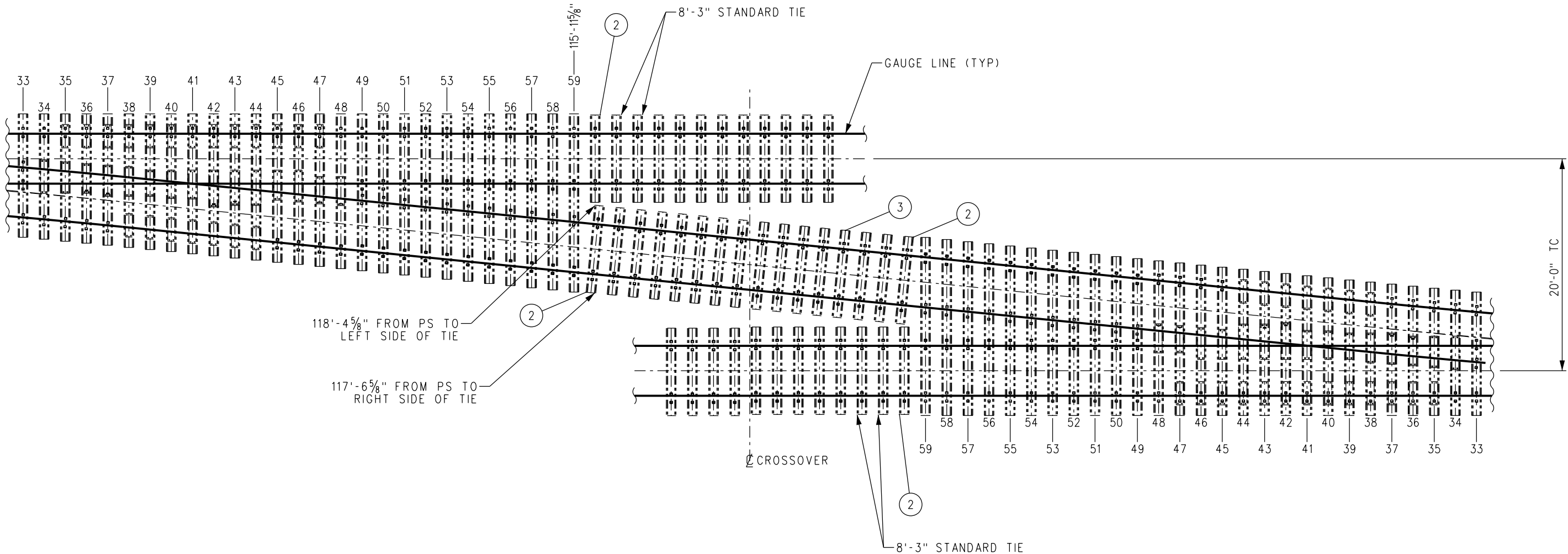


NOTES:

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- 14 STANDARD TIES AT APPROXIMATELY 2'-0" TRACK CENTERS IN CROSSOVER CONNECTION.
- DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

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				<div> ASSISTANT DIRECTOR: STANDARDS & DESIGN</div>					TIE LAYOUT PLAN		SCALE: NTS							
				<div> DIRECTOR OF ENGINEERING AND CONSTRUCTION</div>					NO 10 – LH CROSSOVER 20' TRACK CENTERS		REVISION SHEET 1 OF 1							
											CADD FILE: ES2817-05							
X	XX-XX-XX	REVISION	XX	XX														
REV.	DATE	DESCRIPTION	DES.	ENG.														

BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	SCRRRA 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)	

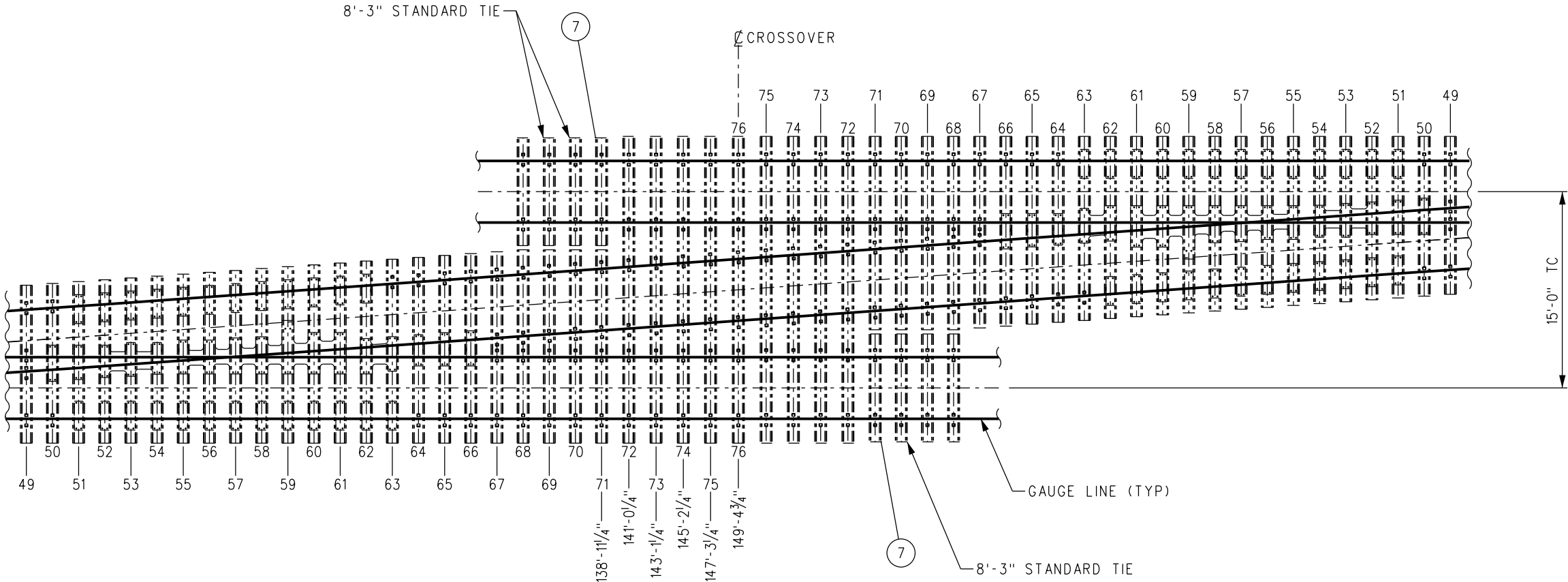


NOTES:

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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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								SCALE: NTS			
								TIE LAYOUT PLAN		REVISION SHEET 1 OF 1	
								NO 10 – RH CROSSOVER 20' TRACK CENTERS		CADD FILE: ES2817-06	

BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	2	LH TURNOUT TIES (0-71)	
2	2	TIE NO 72 - LENGTH = 23'-5½"	
3	2	TIE NO 73 - LENGTH = 23'-5½"	
4	2	TIE NO 74 - LENGTH = 23'-5½"	
5	2	TIE NO 75 - LENGTH = 23'-5½"	
6	1	TIE NO 76 - LENGTH = 23'-5½"	
7	2	8'-3" 1:80 CANT CONCRETE TIE	

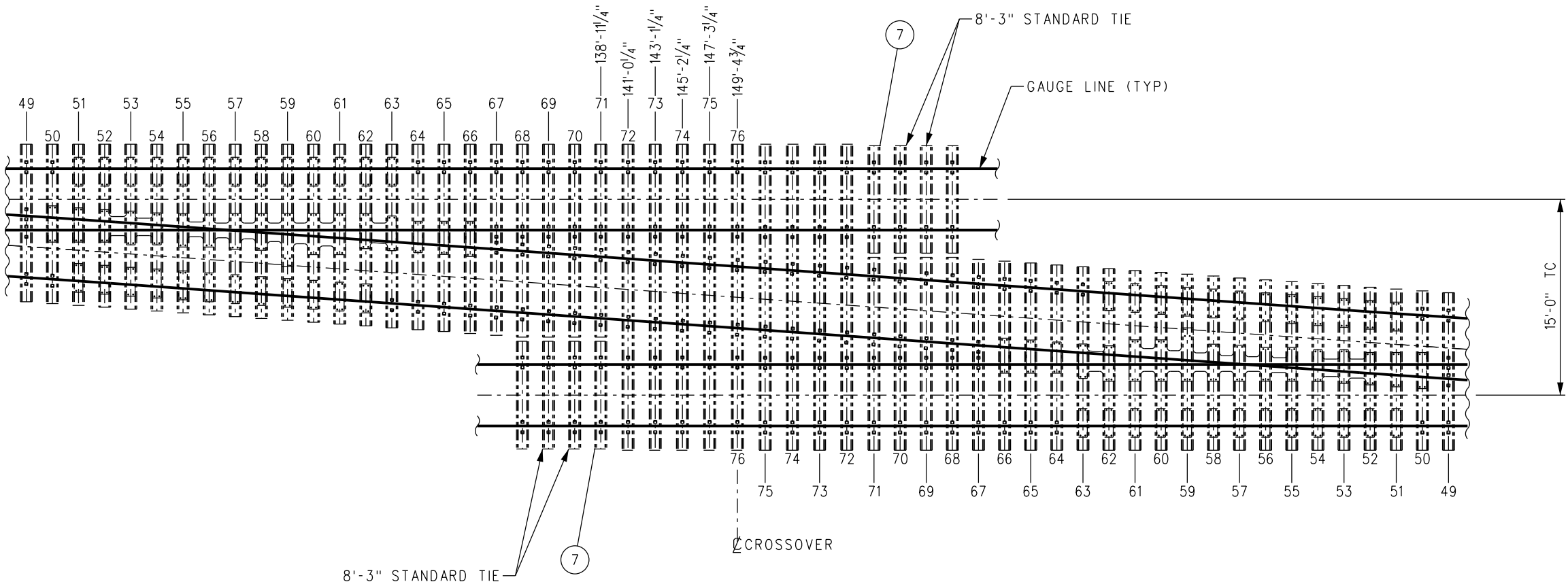


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				DRAWN BY: HDR DATE: 03/31/2011		<div>SCRRRA ENGINEERING STANDARDS ARE INTENDED FOR SCRRRA APPROVED USES ONLY. FOR NON-SCRRRA APPROVED USES, SCRRRA SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THE DATA OR INFORMATION CONTAINED HEREIN. 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 WARRANTIES AND REPRESENTATIONS OF ANY KIND ARE DISCLAIMED. ANYONE MAKING USE OF THIS INFORMATION AGREES THAT IT ASSUMES ALL LIABILITY ARISING 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 SCRRRA. ALL RIGHTS RESERVED.</div> <div> METROLINK[®]</div> <div>SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012</div>	ENGINEERING STANDARDS		STANDARD 2818		
							SCALE: NTS				
							TIE LAYOUT PLAN		REVISION SHEET 1 OF 1		
							NO 14 – LH CROSSOVER 15' TRACK CENTERS		CADD FILE: ES2818-01		
X	XX-XX-XX	REVISION	XX	XX							
REV.	DATE	DESCRIPTION	DES.	ENG.							

BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	SCRR PART NO
1	2	RH TURNOUT TIES (0-71)	
2	2	TIE NO 72 - LENGTH = 23'-5½"	
3	2	TIE NO 73 - LENGTH = 23'-5½"	
4	2	TIE NO 74 - LENGTH = 23'-5½"	
5	2	TIE NO 75 - LENGTH = 23'-5½"	
6	1	TIE NO 76 - LENGTH = 23'-5½"	
7	2	8'-3" 1:80 CANT CONCRETE TIE	

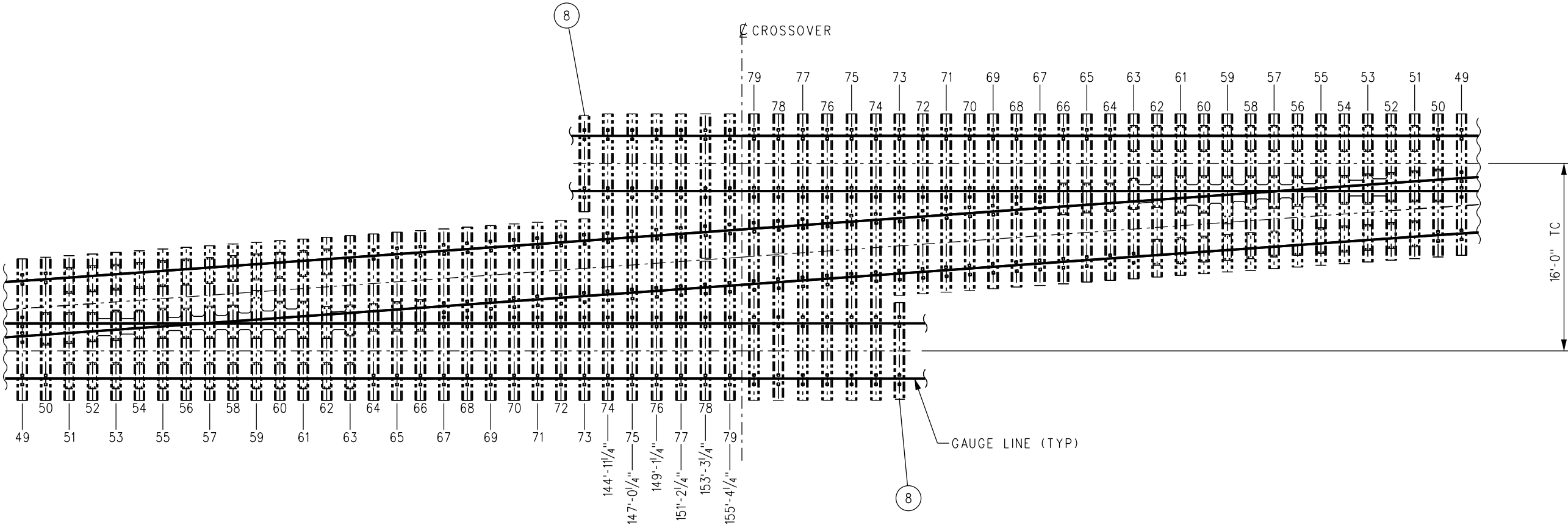


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BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	SCRR PART NO
1	2	LH TURNOUT TIES (0-73)	
2	2	TIE NO 74 - LENGTH = 24'-5½"	
3	2	TIE NO 75 - LENGTH = 24'-5½"	
4	2	TIE NO 76 - LENGTH = 24'-5½"	
5	2	TIE NO 77 - LENGTH = 24'-5½"	
6	2	TIE NO 78 - LENGTH = 24'-5½"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

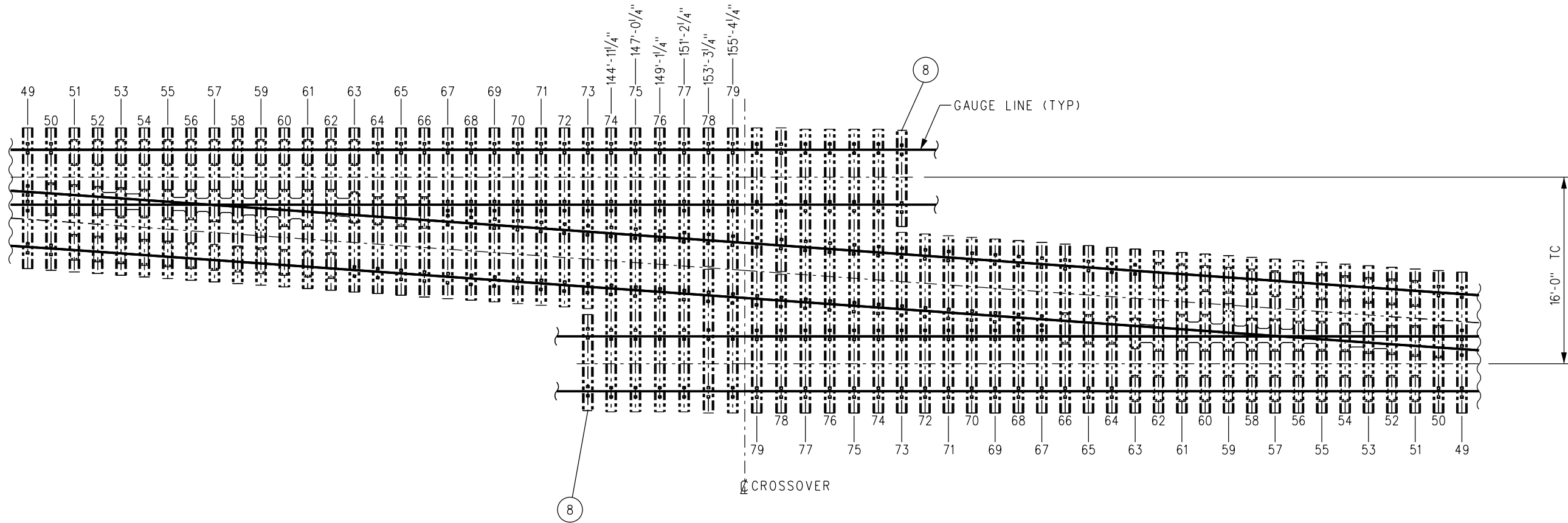


NOTES:

- 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 SCRRRA ENGINEERING STANDARDS.
- DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

				DRAWN BY: HDR DATE: 03/31/2011		<div>SCRRRA ENGINEERING STANDARDS ARE INTENDED FOR SCRRRA APPROVED USES ONLY. FOR NON-SCRRRA APPROVED USES, SCRRRA SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF 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 WARRANTIES AND REPRESENTATIONS OF ANY KIND ARE DISCLAIMED. ANYONE MAKING USE OF THIS INFORMATION AGREES THAT IT ASSUMES ALL LIABILITY ARISING 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 SCRRRA. ALL RIGHTS RESERVED.</div>	<div> METROLINK SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012</div>	ENGINEERING STANDARDS		STANDARD 2818			
										SCALE: NTS			
										TIE LAYOUT PLAN		REVISION SHEET 1 OF 1	
										NO 14 – LH CROSSOVER 16' TRACK CENTERS		CADD FILE: ES2818-03	

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

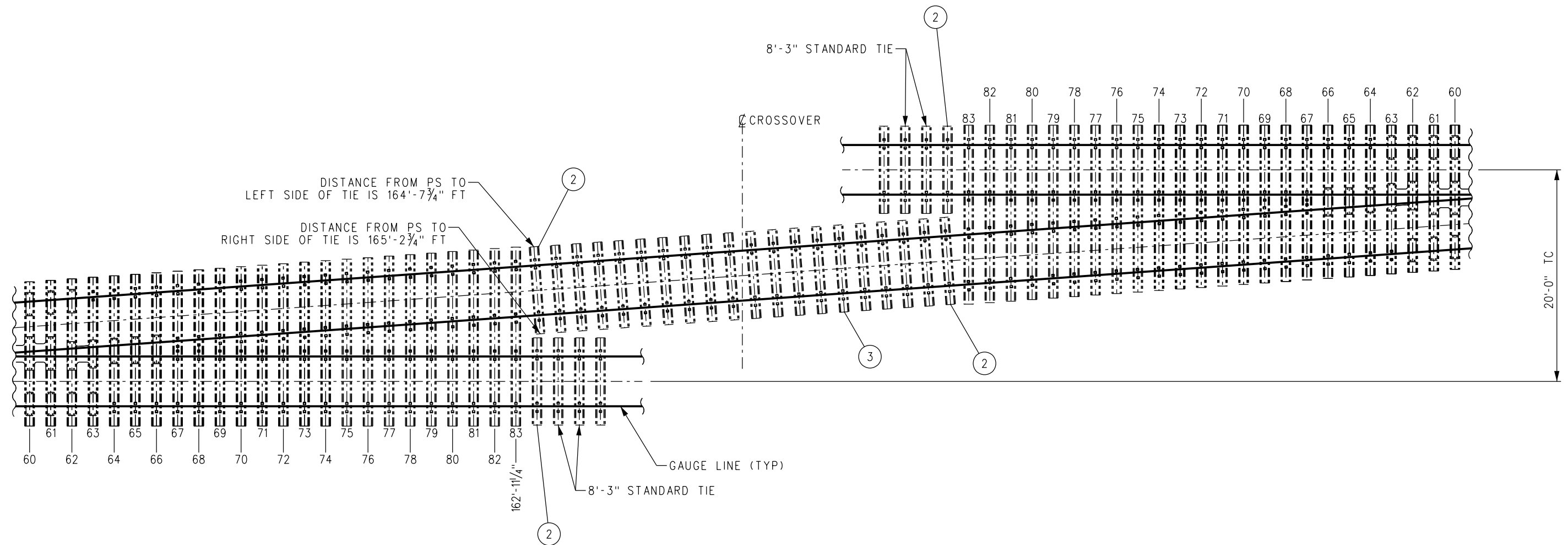


NOTES:

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

				DRAWN BY: HDR DATE: 03/31/2011		<div>SCRR ENGINEERING STANDARDS ARE INTENDED FOR SCRR APPROVED USES ONLY. FOR NON-SCRR APPROVED USES, SCRR SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF 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 WARRANTIES AND REPRESENTATIONS OF ANY KIND ARE DISCLAIMED. ANYONE MAKING USE OF THIS INFORMATION AGREES THAT IT ASSUMES ALL LIABILITY ARISING 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 SCRR. ALL RIGHTS RESERVED.</div>	<div> METROLINK SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012</div>	ENGINEERING STANDARDS		STANDARD 2818			
										SCALE: NTS			
										TIE LAYOUT PLAN		REVISION SHEET 1 OF 1	
										NO 14 – RH CROSSOVER 16' TRACK CENTERS		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)	

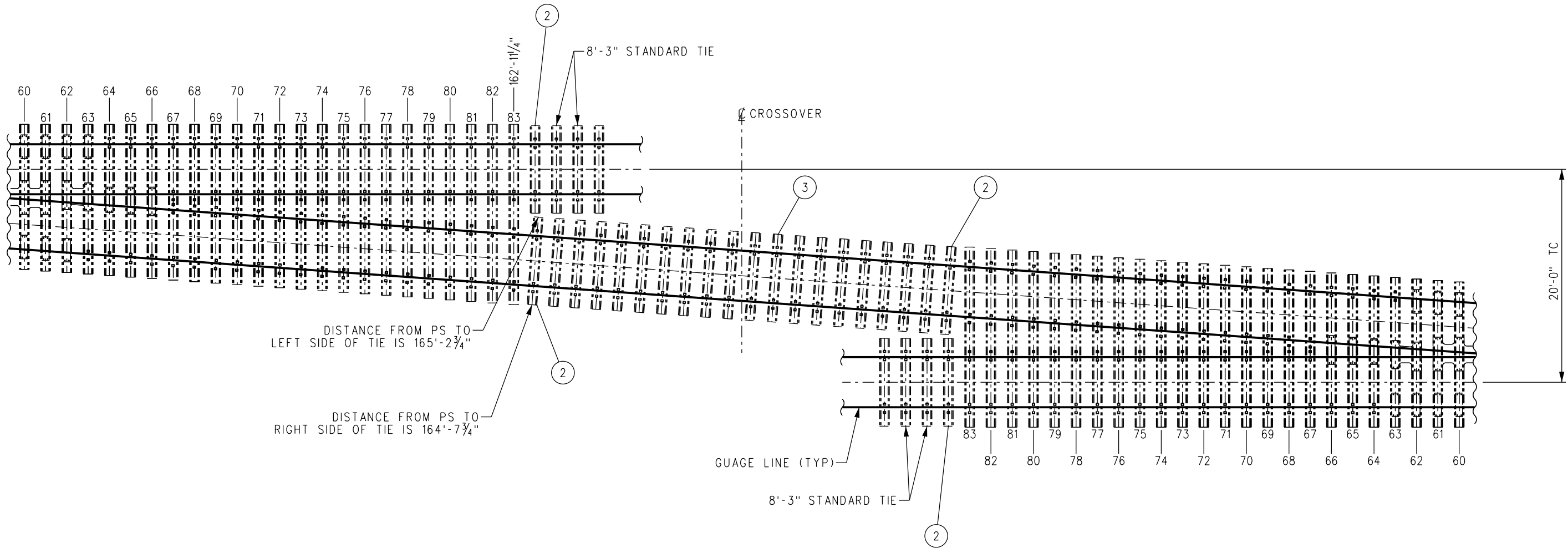


NOTES:

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 SCRRRA 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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BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	SCRRRA 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)	

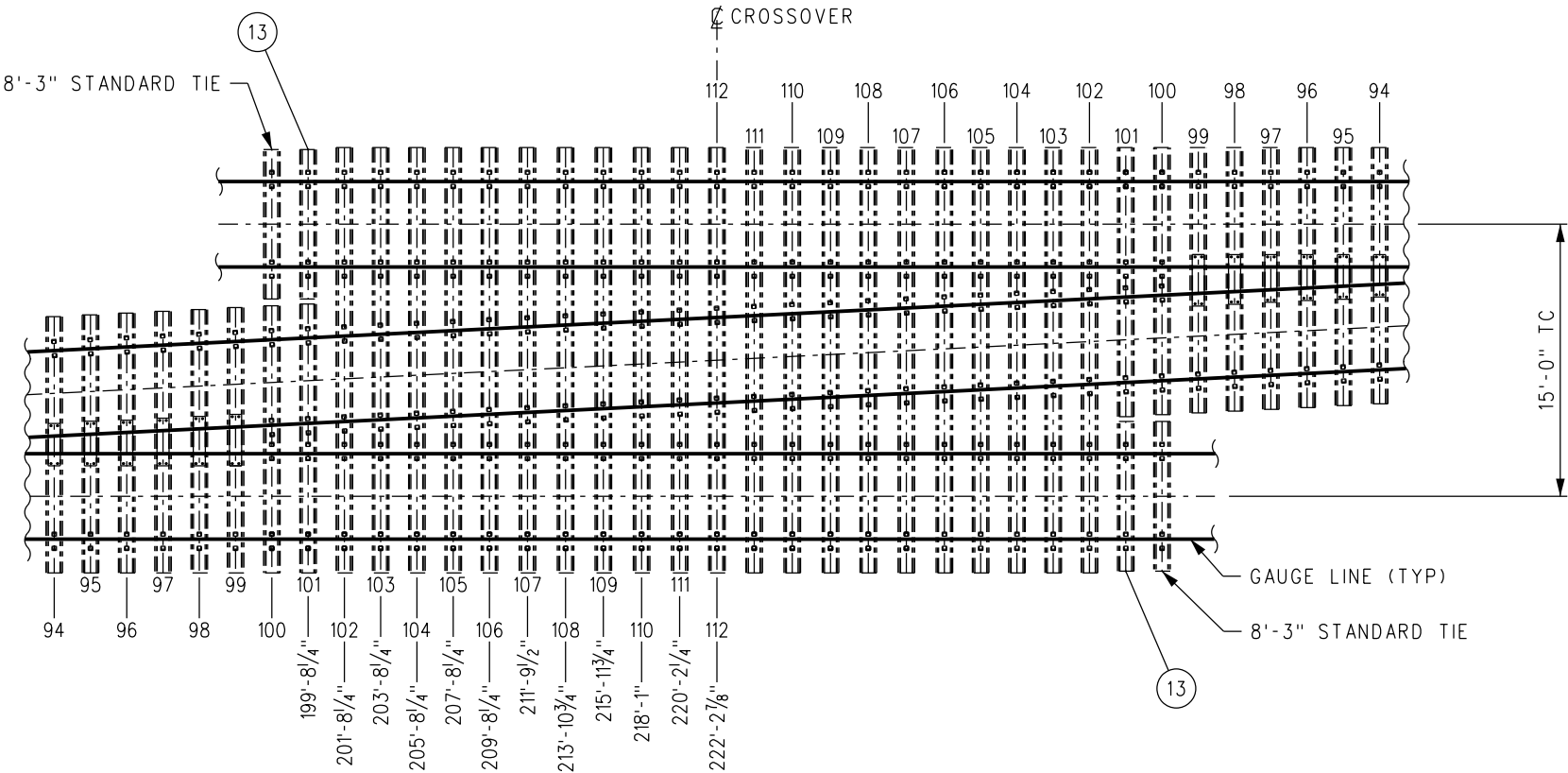


NOTES:

- 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 SCRRRA 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.

				DRAWN BY: HDR DATE: 03/31/2011		SCRRRA ENGINEERING STANDARDS ARE INTENDED FOR SCRRRA APPROVED USES ONLY. FOR NON-SCRRRA APPROVED USES, SCRRRA SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF 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 WARRANTIES AND REPRESENTATIONS OF ANY KIND ARE DISCLAIMED. ANYONE MAKING USE OF THIS INFORMATION AGREES THAT IT ASSUMES ALL LIABILITY ARISING 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 SCRRRA. ALL RIGHTS RESERVED.	 METROLINK SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012	ENGINEERING STANDARDS		STANDARD
X	XX-XX-XX	REVISION	XX	XX				TIE LAYOUT PLAN NO 14 – RH CROSSOVER 20' TRACK CENTERS		2818
REV.	DATE	DESCRIPTION	DES.	ENG.						SCALE: NTS
										REVISION SHEET
										1 OF 1
										CADD FILE: ES2818-06

BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	SCRR PART NO
1	2	LH TURNOUT TIES (0-101)	
2	2	TIE NO 102 - LENGTH = 23'-5½"	
3	2	TIE NO 103 - LENGTH = 23'-5½"	
4	2	TIE NO 104 - LENGTH = 23'-5½"	
5	2	TIE NO 105 - LENGTH = 23'-5½"	
6	2	TIE NO 106 - LENGTH = 23'-5½"	
7	2	TIE NO 107 - LENGTH = 23'-5½"	
8	2	TIE NO 108 - LENGTH = 23'-5½"	
9	2	TIE NO 109 - LENGTH = 23'-5½"	
10	2	TIE NO 110 - LENGTH = 23'-5½"	
11	2	TIE NO 111 - LENGTH = 23'-5½"	
12	1	TIE NO 112 - LENGTH = 23'-5½"	
13	2	8'-3" 1:80 CANT CONCRETE TIE	

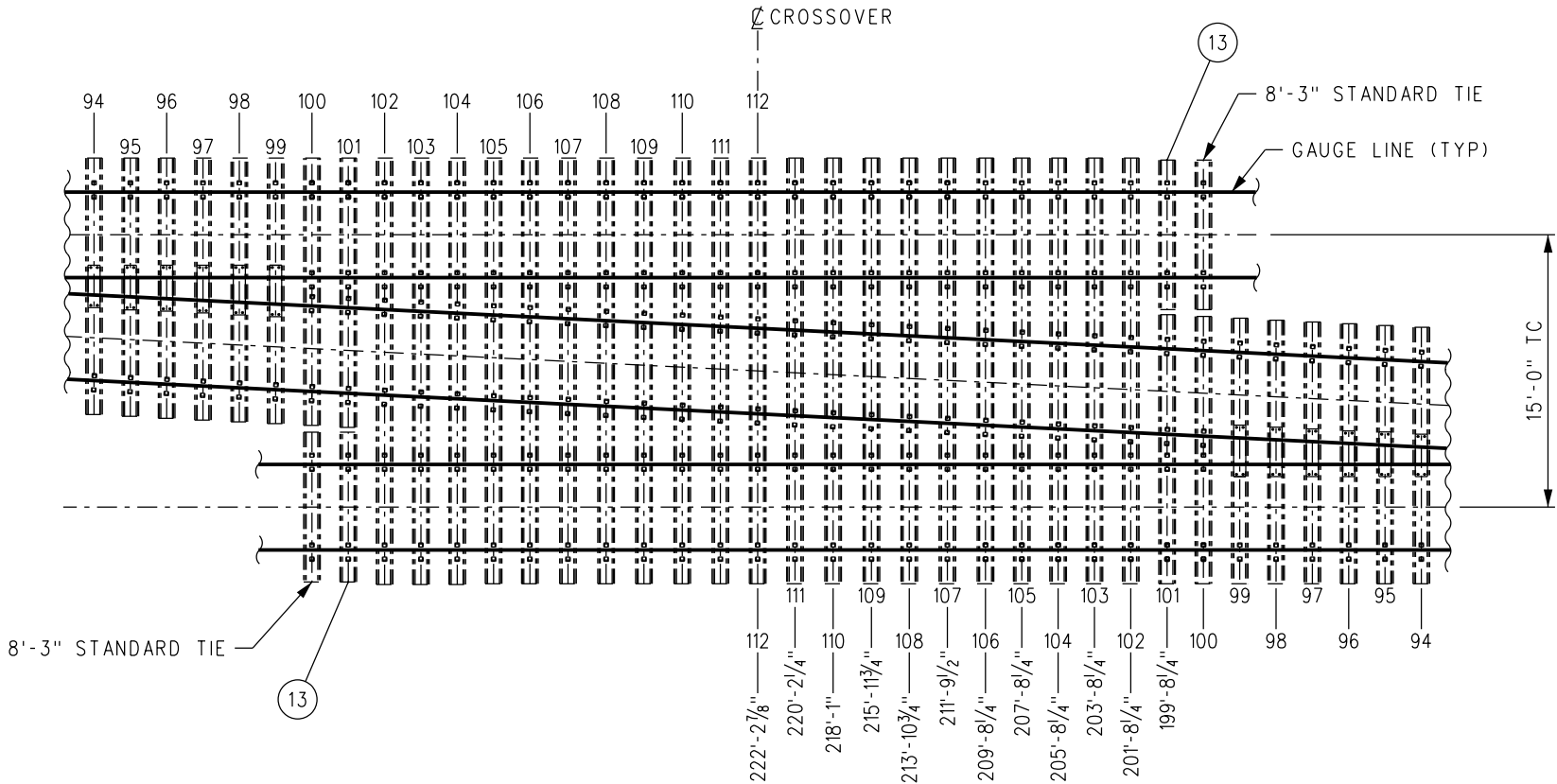


NOTES:

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

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BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	SCRR PART NO
1	2	RH TURNOUT TIES (0-101)	
2	2	TIE NO 102 - LENGTH = 23'-5½"	
3	2	TIE NO 103 - LENGTH = 23'-5½"	
4	2	TIE NO 104 - LENGTH = 23'-5½"	
5	2	TIE NO 105 - LENGTH = 23'-5½"	
6	2	TIE NO 106 - LENGTH = 23'-5½"	
7	2	TIE NO 107 - LENGTH = 23'-5½"	
8	2	TIE NO 108 - LENGTH = 23'-5½"	
9	2	TIE NO 109 - LENGTH = 23'-5½"	
10	2	TIE NO 110 - LENGTH = 23'-5½"	
11	2	TIE NO 111 - LENGTH = 23'-5½"	
12	1	TIE NO 112 - LENGTH = 23'-5½"	
13	2	8'-3" 1:80 CANT CONCRETE TIE	

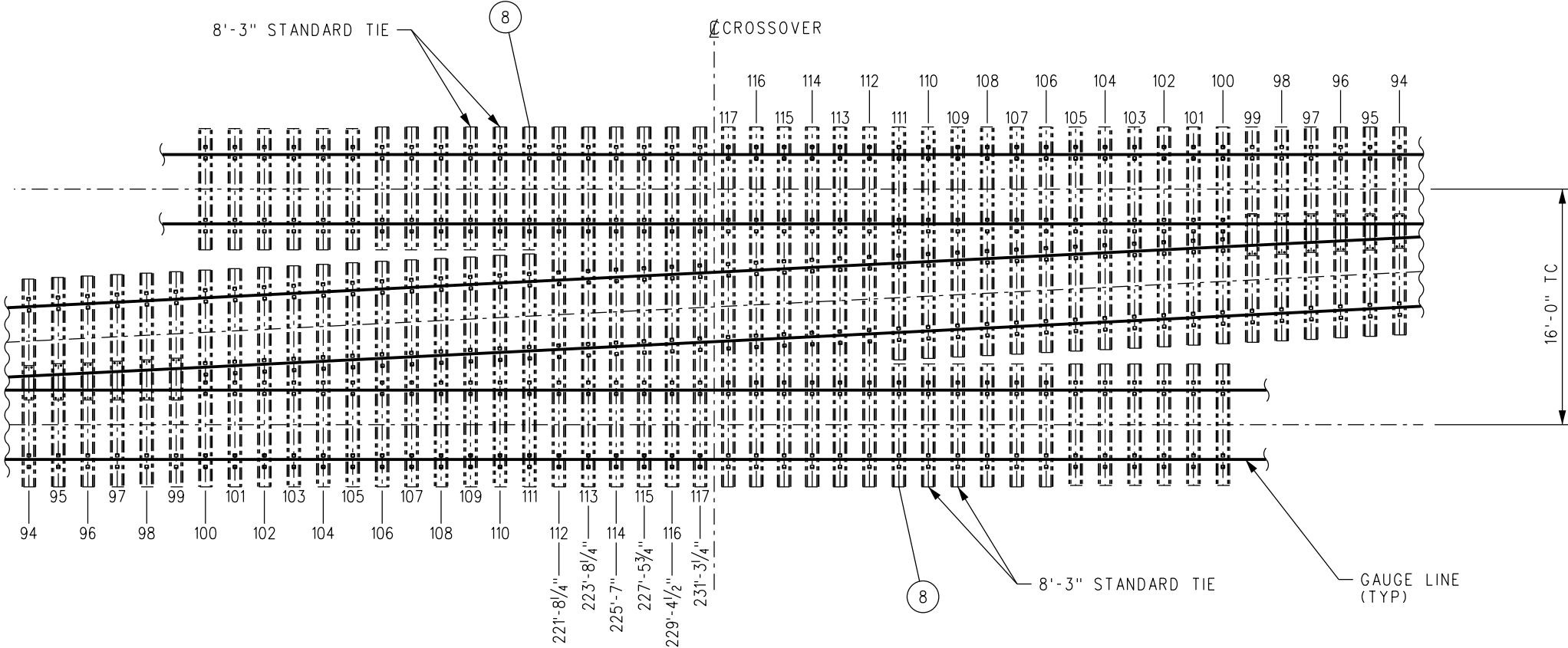


NOTES:

- 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 SCRR ENGINEERING STANDARDS.
- 2. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

				DRAWN BY: HDR DATE: 03/31/2011		<div>SCRR ENGINEERING STANDARDS ARE INTENDED FOR SCRR APPROVED USES ONLY. FOR NON-SCRR APPROVED USES, SCRR SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF 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 WARRANTIES AND REPRESENTATIONS OF ANY KIND ARE DISCLAIMED. ANYONE MAKING USE OF THIS INFORMATION AGREES THAT IT ASSUMES ALL LIABILITY ARISING 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 SCRR. ALL RIGHTS RESERVED.</div> <div> METROLINK SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012</div>		ENGINEERING STANDARDS		STANDARD 2819		
				<div> ASSISTANT DIRECTOR: STANDARDS & DESIGN</div>						TIE LAYOUT PLAN		SCALE: NTS
				<div> DIRECTOR OF ENGINEERING AND CONSTRUCTION</div>						NO 20 – RH CROSSOVER 15' TRACK CENTERS		REVISION SHEET 1 OF 1
												CADD FILE: ES2819-02
X	XX-XX-XX	REVISION	XX	XX								
REV.	DATE	DESCRIPTION	DES.	ENG.								

BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	SCRR PART NO
1	2	LH TURNOUT TIES (0-111)	
2	2	TIE NO 112 - LENGTH = 24'-5½"	
3	2	TIE NO 113 - LENGTH = 24'-5½"	
4	2	TIE NO 114 - LENGTH = 24'-5½"	
5	2	TIE NO 115 - LENGTH = 24'-5½"	
6	2	TIE NO 116 - LENGTH = 24'-5½"	
7	2	TIE NO 117 - LENGTH = 24'-5½"	
8	2	8'-3" 1:80 CANT CONCRETE TIE	

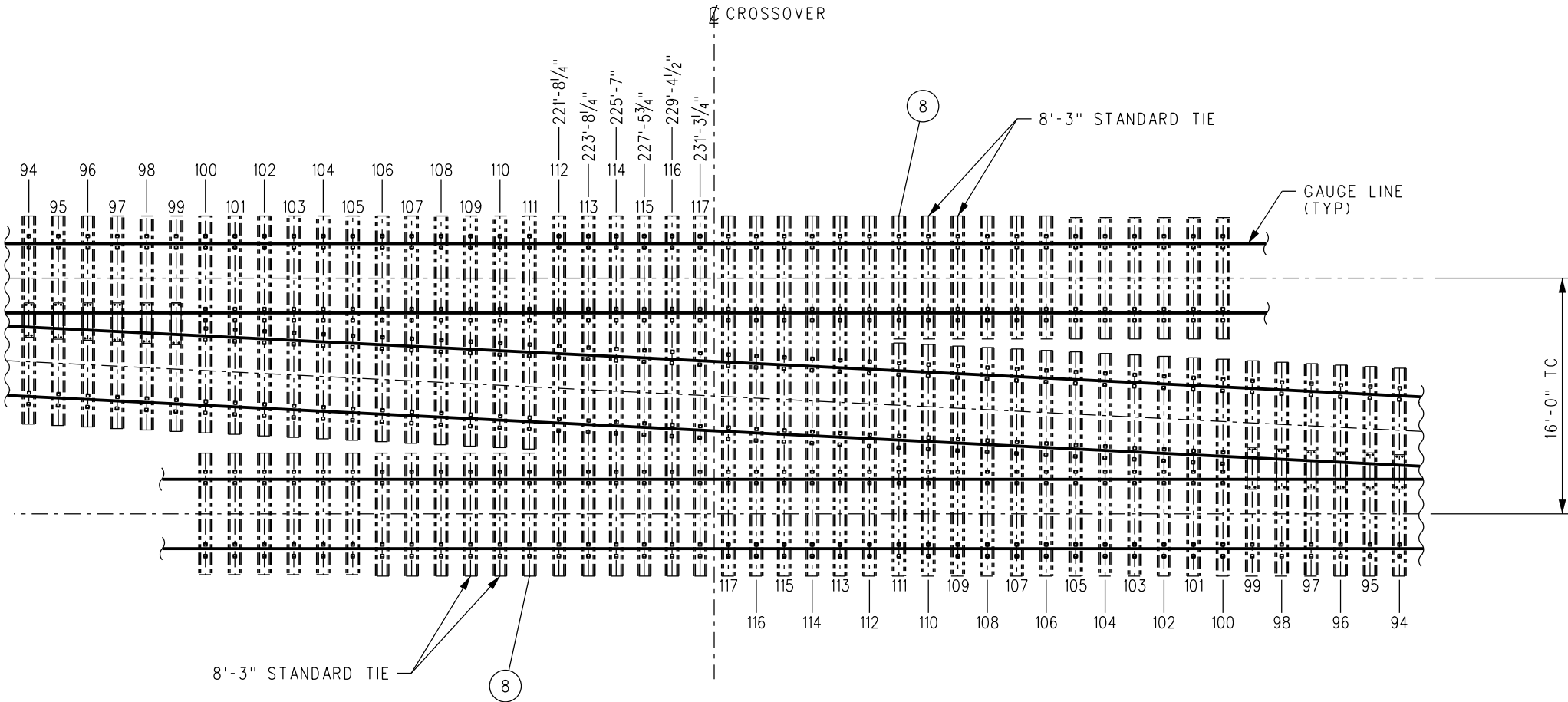


NOTES:

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

				DRAWN BY: HDR DATE: 03/31/2011		<div>SCRR ENGINEERING STANDARDS ARE INTENDED FOR SCRR APPROVED USES ONLY. FOR NON-SCRR APPROVED USES, SCRR SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF 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 WARRANTIES AND REPRESENTATIONS OF ANY KIND ARE DISCLAIMED. ANYONE MAKING USE OF THIS INFORMATION AGREES THAT IT ASSUMES ALL LIABILITY ARISING 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 SCRR. ALL RIGHTS RESERVED.</div>	<div>METROLINK SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012</div>	ENGINEERING STANDARDS		STANDARD		
										2819		
										SCALE: NTS		
										REVISION SHEET - 1 OF 1 CADD FILE: ES2819-03		

BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	SCRR PART NO
1	2	RH TURNOUT TIES (0-111)	
2	2	TIE NO 112 - LENGTH = 24'-5½"	
3	2	TIE NO 113 - LENGTH = 24'-5½"	
4	2	TIE NO 114 - LENGTH = 24'-5½"	
5	2	TIE NO 115 - LENGTH = 24'-5½"	
6	2	TIE NO 116 - LENGTH = 24'-5½"	
7	2	TIE NO 117 - LENGTH = 24'-5½"	
8	2	8'-3" 1:80 CANT CONCRETE TIE	



NOTES:

- 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 SCRR ENGINEERING STANDARDS.
- 2. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

X	XX-XX-XX	REVISION	XX	XX	
REV.	DATE	DESCRIPTION	DES.	ENG.	

DRAWN BY: HDR DATE: 03/31/2011


ASSISTANT DIRECTOR: STANDARDS & DESIGN


DIRECTOR OF ENGINEERING AND CONSTRUCTION

SCRR ENGINEERING STANDARDS ARE INTENDED FOR SCRR APPROVED USES ONLY. FOR NON-SCRR APPROVED USES, SCRR SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF 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 WARRANTIES AND REPRESENTATIONS OF ANY KIND ARE DISCLAIMED. ANYONE MAKING USE OF THIS INFORMATION AGREES THAT IT ASSUMES ALL LIABILITY ARISING 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 SCRR. ALL RIGHTS RESERVED.

**METROLINK**
SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY
ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS

TIE LAYOUT PLAN
NO 20 – RH CROSSOVER 16' TRACK CENTERS

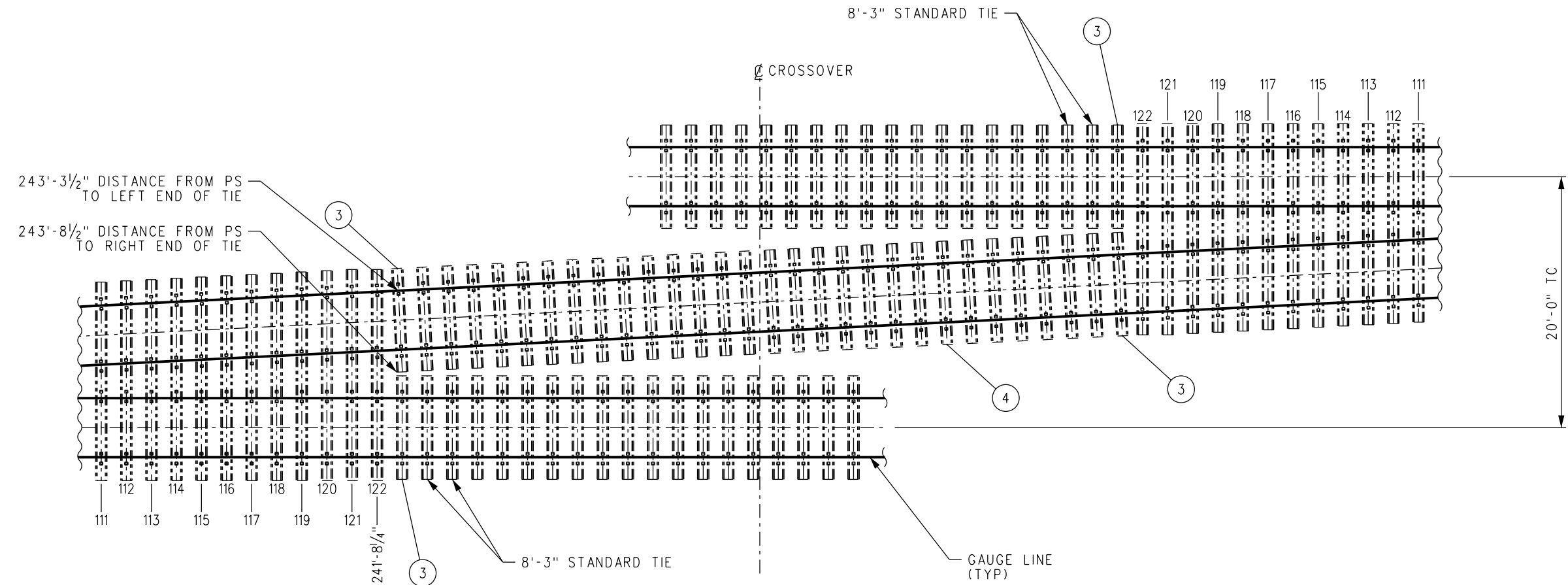
STANDARD 2819

SCALE: NTS

REVISION SHEET
- 1 OF 1

CADD FILE: ES2819-04

	BILL OF MATERIAL			
	ITEM	QTY	DESCRIPTION	SCRR 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)	

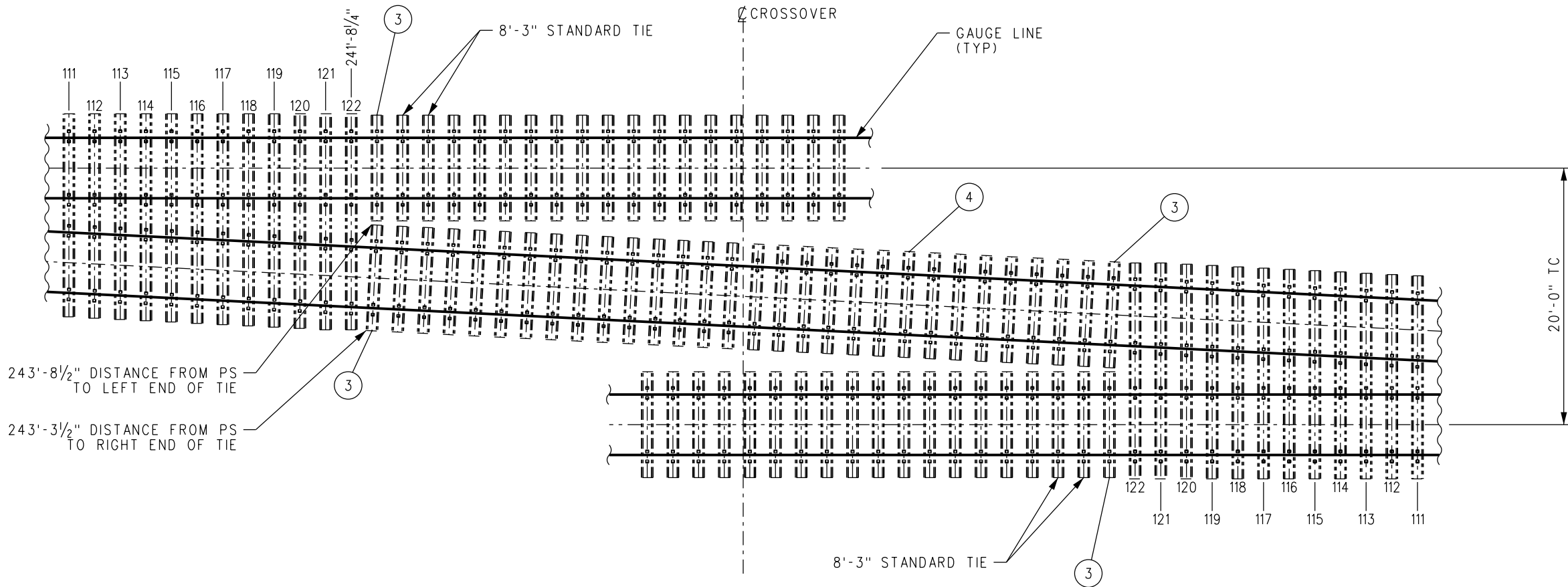


NOTES:

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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		<div>SCRR ENGINEERING STANDARDS ARE INTENDED FOR SCRR APPROVED USES ONLY. FOR NON-SCRR APPROVED USES: SCRR SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF 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 WARRANTIES AND REPRESENTATIONS OF ANY KIND ARE DISCLAIMED. ANYONE MAKING USE OF THIS INFORMATION AGREES THAT IT ASSUMES ALL LIABILITY ARISING 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 SCRR. ALL RIGHTS RESERVED.</div>	 METROLINK®		ENGINEERING STANDARDS		STANDARD
									2819		
									SCALE: NTS		
									REVISION SHEET		
X	XX-XX-XX	REVISION	XX	XX					1 OF 1		
REV.	DATE	DESCRIPTION	DES.	ENG.					CADD FILE: ES2819-05		
				<div> ASSISTANT DIRECTOR: STANDARDS & DESIGN</div> <div> DIRECTOR OF ENGINEERING AND CONSTRUCTION</div>		SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012		TIE LAYOUT PLAN NO 20 - LH CROSSOVER 20' TRACK CENTERS			

BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	SCRR 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)	

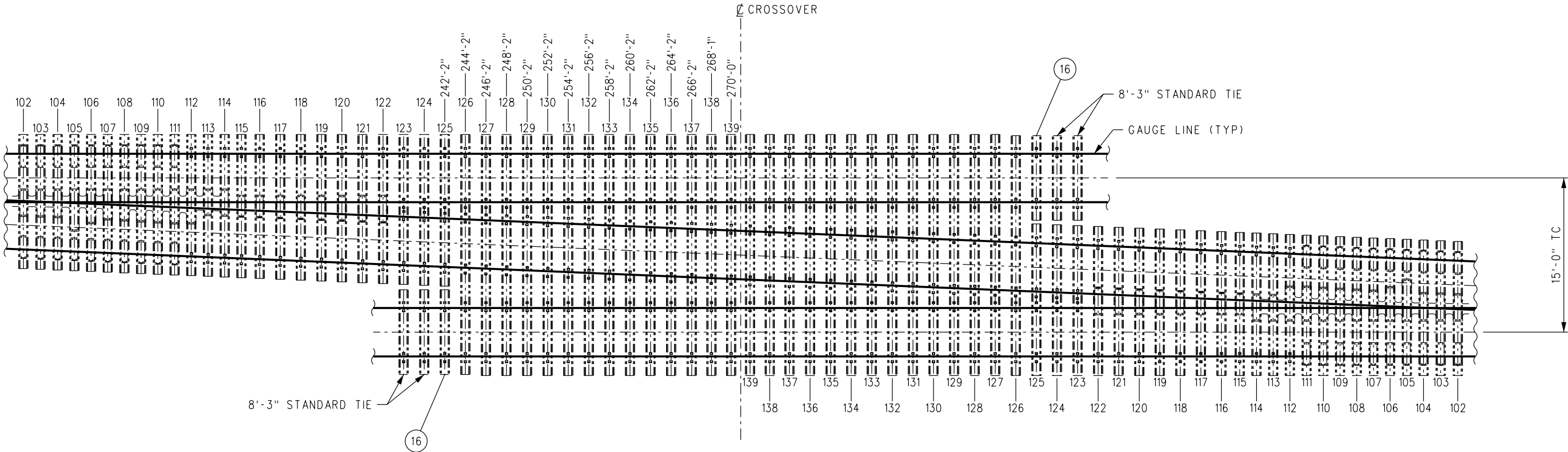


NOTES:

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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.

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BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	SCRR PART NO
1	2	RH TURNOUT TIES (0-125)	
2	2	TIE NO 126 - LENGTH = 23'-5½"	
3	2	TIE NO 127 - LENGTH = 23'-5½"	
4	2	TIE NO 128 - LENGTH = 23'-5½"	
5	2	TIE NO 129 - LENGTH = 23'-5½"	
6	2	TIE NO 130 - LENGTH = 23'-5½"	
7	2	TIE NO 131 - LENGTH = 23'-5½"	
8	2	TIE NO 132 - LENGTH = 23'-5½"	
9	2	TIE NO 133 - LENGTH = 23'-5½"	
10	2	TIE NO 134 - LENGTH = 23'-5½"	
11	2	TIE NO 135 - LENGTH = 23'-5½"	
12	2	TIE NO 136 - LENGTH = 23'-5½"	
13	2	TIE NO 137 - LENGTH = 23'-5½"	
14	2	TIE NO 138 - LENGTH = 23'-5½"	
15	2	TIE NO 139 - LENGTH = 23'-5½"	
16	2	8'-3" 1:80 CANT CONCRETE TIE	



NOTES:

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

X	XX-XX-XX	REVISION	XX	XX	
REV.	DATE	DESCRIPTION	DES.	ENG.	

DRAWN BY: HDR DATE: 03/31/2011


ASSISTANT DIRECTOR: STANDARDS & DESIGN


DIRECTOR OF ENGINEERING AND CONSTRUCTION

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**METROLINK**[®]

SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY
ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS

TIE LAYOUT PLAN
NO 24 – RH CROSSOVER 15' TRACK CENTERS

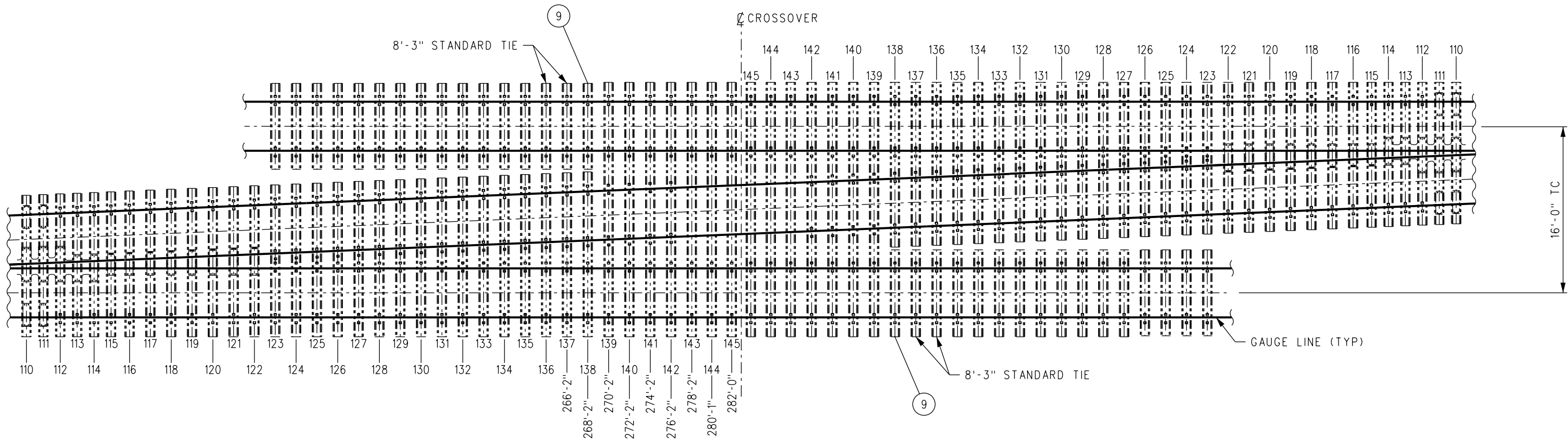
STANDARD 2820

SCALE: NTS

REVISION SHEET 1 OF 1

CADD FILE: ES2820-02

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

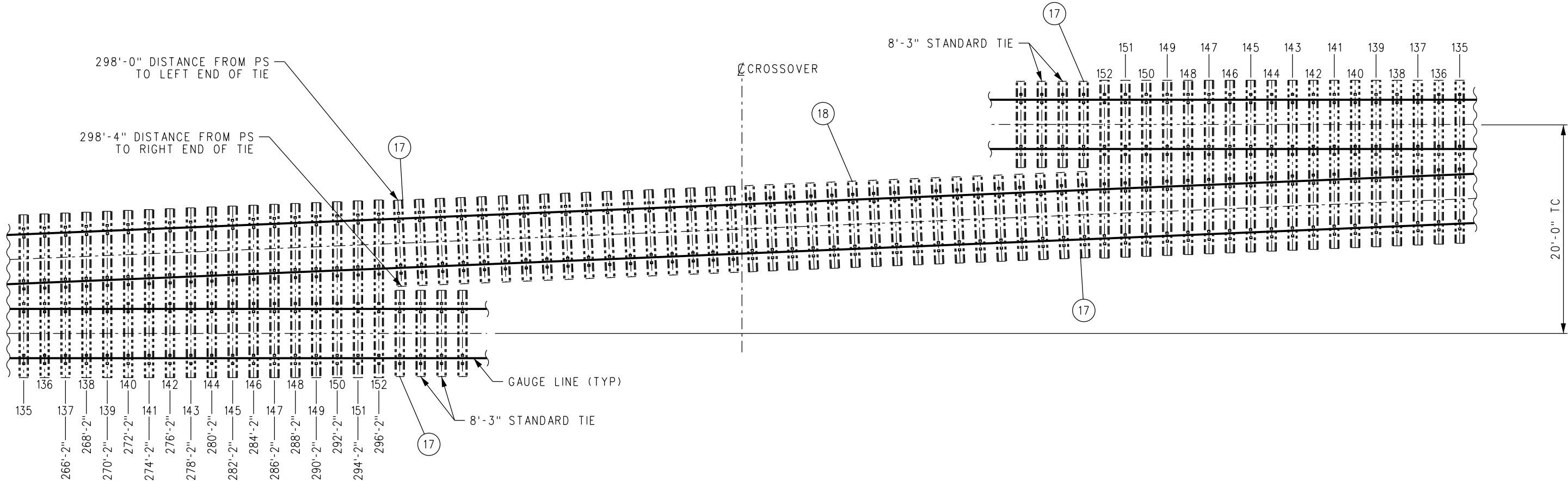


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								SCALE: NTS					
								TIE LAYOUT PLAN		REVISION SHEET 1 OF 1			
								NO 24 – LH CROSSOVER 16' TRACK CENTERS		CADD FILE: ES2820-03			

BILL OF MATERIAL				BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	SCRR PART NO	ITEM	QTY	DESCRIPTION	SCRR 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)	

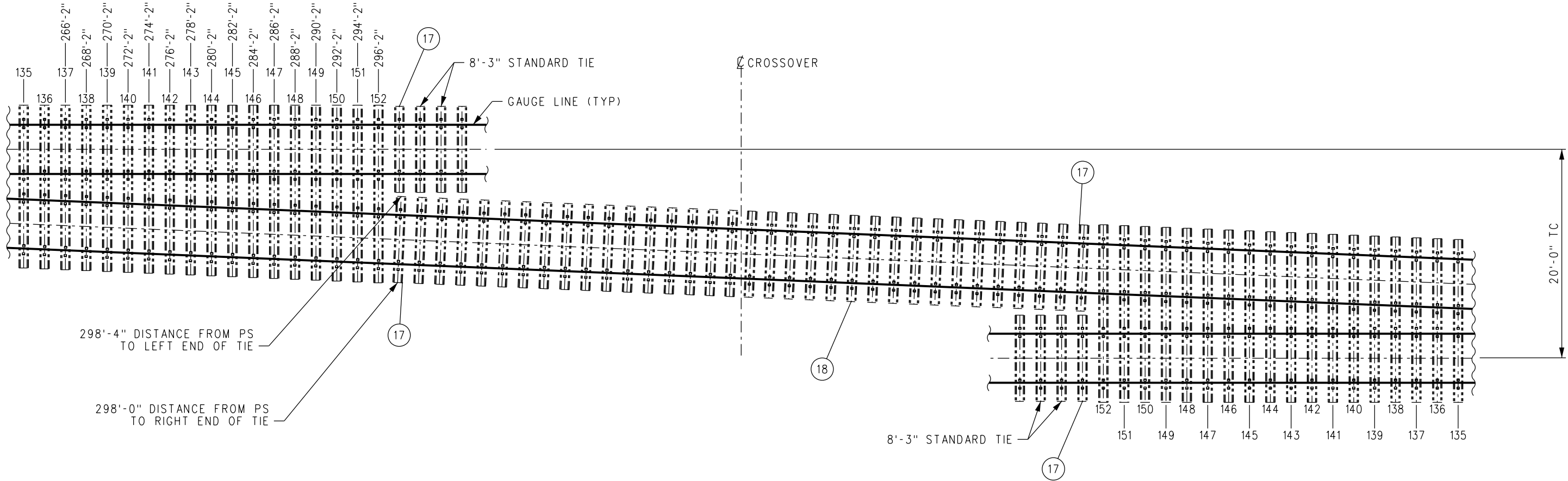


NOTES:

- 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 SCRR ENGINEERING STANDARDS.
- 32 STANDARD TIES AT APPROXIMATELY 2'-0" TIE CENTERS ON CROSSOVER CONNECTION.
- DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

				DRAWN BY: HDR DATE: 03/31/2011		<div>SCRR ENGINEERING STANDARDS ARE INTENDED FOR SCRR APPROVED USES ONLY. FOR NON-SCRR APPROVED USES, SCRR SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF 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 WARRANTIES AND REPRESENTATIONS OF ANY KIND ARE DISCLAIMED. ANYONE MAKING USE OF THIS INFORMATION AGREES THAT IT ASSUMES ALL LIABILITY ARISING 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 SCRR. ALL RIGHTS RESERVED.</div>	<div>METROLINK®</div> <div>SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY</div> <div>ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012</div>	ENGINEERING STANDARDS		STANDARD		
				<div><div></div><div>ASSISTANT DIRECTOR: STANDARDS & DESIGN</div><div></div><div>DIRECTOR OF ENGINEERING AND CONSTRUCTION</div></div>				TIE LAYOUT PLAN		2820		
								NO 24 – LH CROSSOVER 20' TRACK CENTERS		SCALE: NTS		
										REVISION SHEET		
X	XX-XX-XX	REVISION	XX	XX				1 OF 1		CADD FILE:		
REV.	DATE	DESCRIPTION	DES.	ENG.					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)	



NOTES:

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

				DRAWN BY: HDR DATE: 03/31/2011		<div>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 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 WARRANTIES AND REPRESENTATIONS OF ANY KIND ARE DISCLAIMED. ANYONE MAKING USE OF THIS INFORMATION AGREES THAT IT ASSUMES ALL LIABILITY ARISING 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.</div>	<div>METROLINK[®] SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012</div>	ENGINEERING STANDARDS		STANDARD		
										2820		
										SCALE: NTS		
										REVISION SHEET		
X	XX-XX-XX	REVISION	XX	XX						1 OF 1		
REV.	DATE	DESCRIPTION	DES.	ENG.						CADD FILE: ES2820-06		