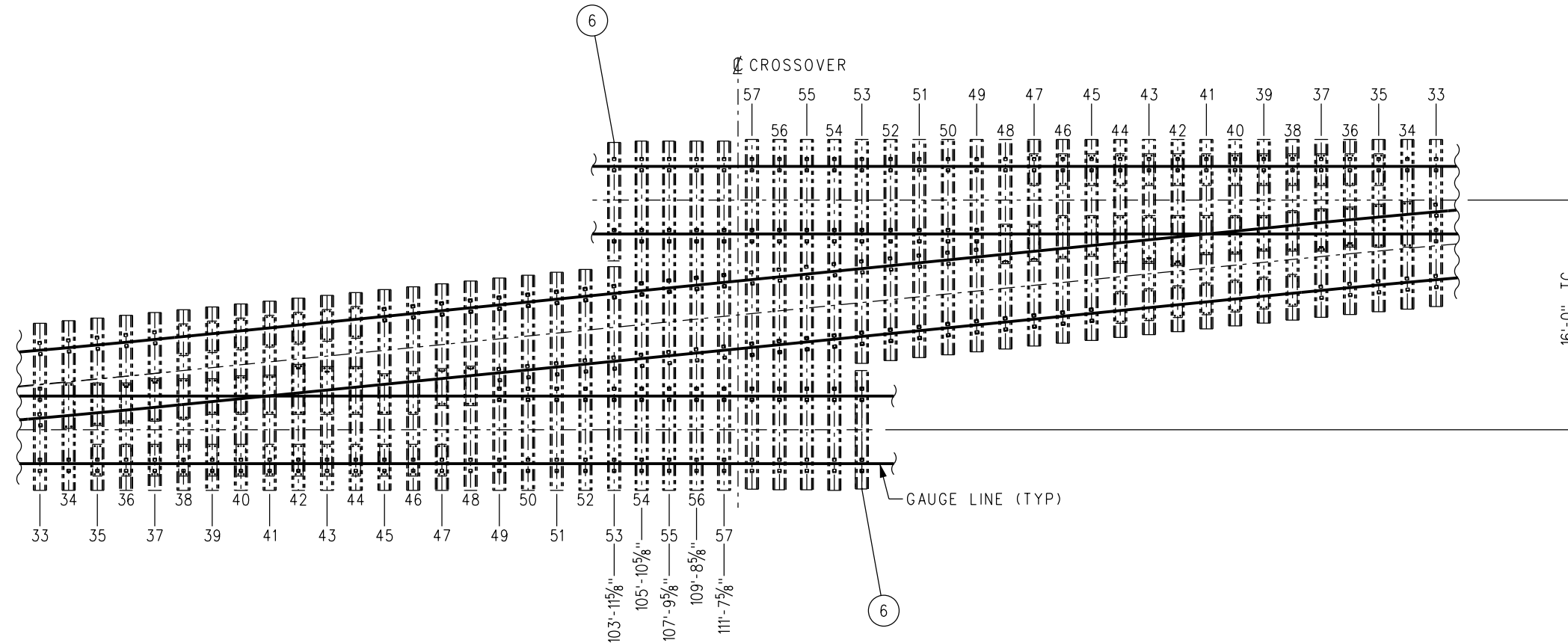






BILL OF MATERIAL

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



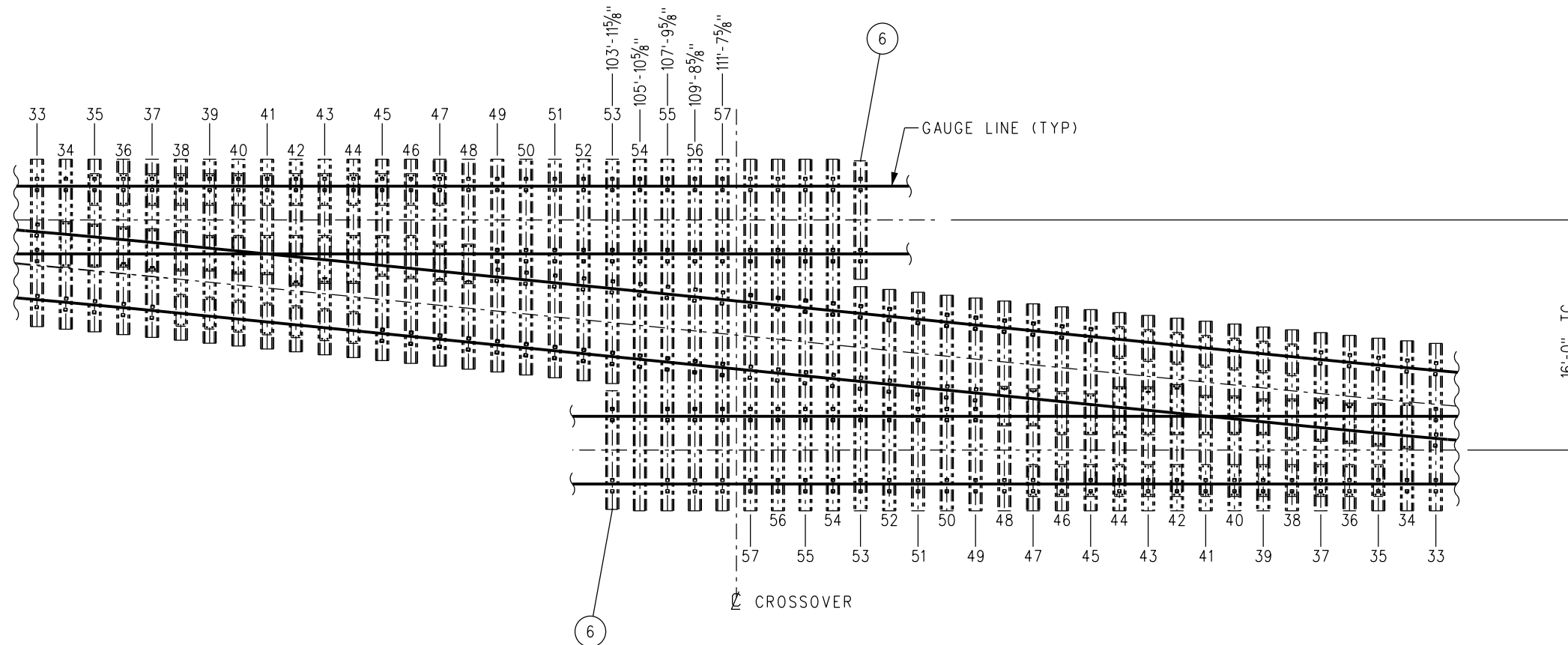
**NOTES:**

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.

DRAWN BY: <i>Nareh D. Papp</i>		HDR: <i>Willson Dava</i>	DATE: 03/31/2011	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.	SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012	ENGINEERING STANDARDS		STANDARD 2817
ASSISTANT DIRECTOR: STANDARDS & DESIGN DIRECTOR OF ENGINEERING AND CONSTRUCTION						TIE LAYOUT PLAN NO 10 - LH CROSSOVER 16' TRACK CENTERS		SCALE: NTS
REV.	DATE	DESCRIPTION	DES.	ENG.			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 1/2"	
3	2	TIE NO 55 - LENGTH = 24'-5 1/2"	
4	2	TIE NO 56 - LENGTH = 24'-5 1/2"	
5	2	TIE NO 57 - LENGTH = 24'-5 1/2"	
6	2	8'-3" 1:80 CANT CONCRETE TIE	



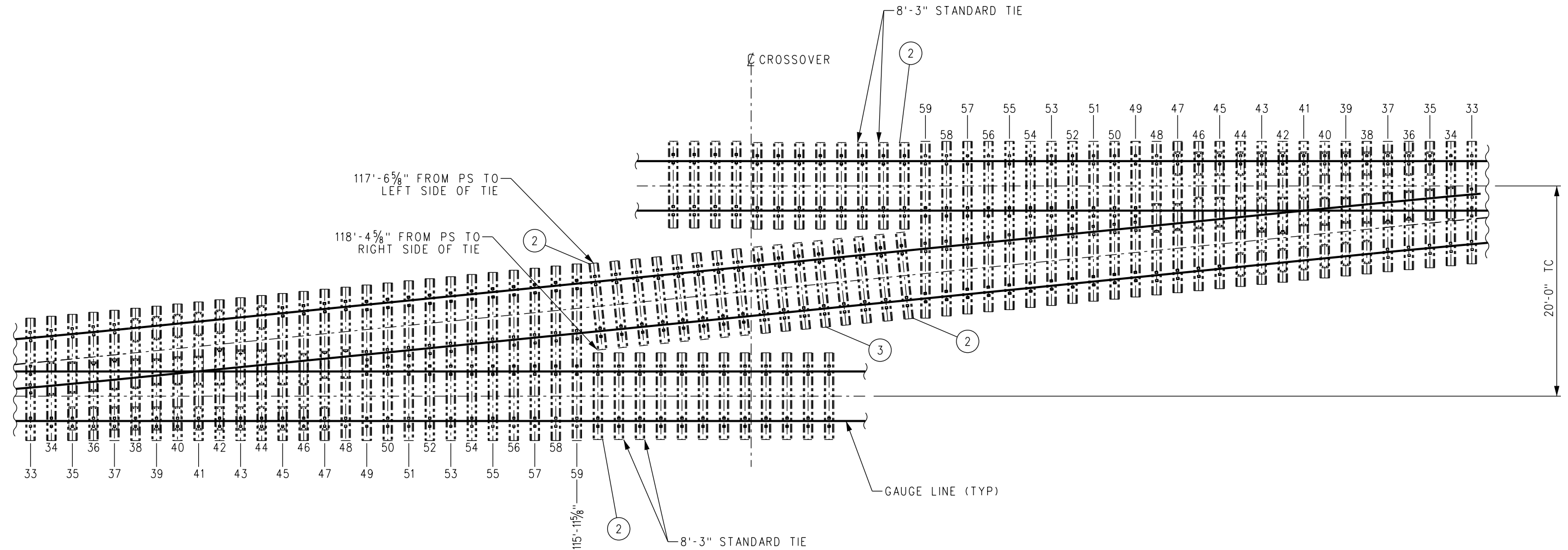
NOTES:

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

DRAWN BY: <i>Nareh D. Papp</i>		HDR: <i>Wilson Dava</i>	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 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.	SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012	ENGINEERING STANDARDS		STANDARD 2817
REVISION XX XX REV. DATE DESCRIPTION DES. ENG.		ASSISTANT DIRECTOR: STANDARDS & DESIGN DIRECTOR OF ENGINEERING AND CONSTRUCTION				TIE LAYOUT PLAN NO 10 - RH CROSSOVER 16' TRACK CENTERS		SCALE: NTS

BILL OF MATERIAL

ITEM	QTY	DESCRIPTION	SCRR 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:**

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. 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.

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

DRAWN BY: *Nareh D. Papp* HDR DATE: 03/31/2011  
 ASSISTANT DIRECTOR: STANDARDS & DESIGN

*William D. Davis*  
 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

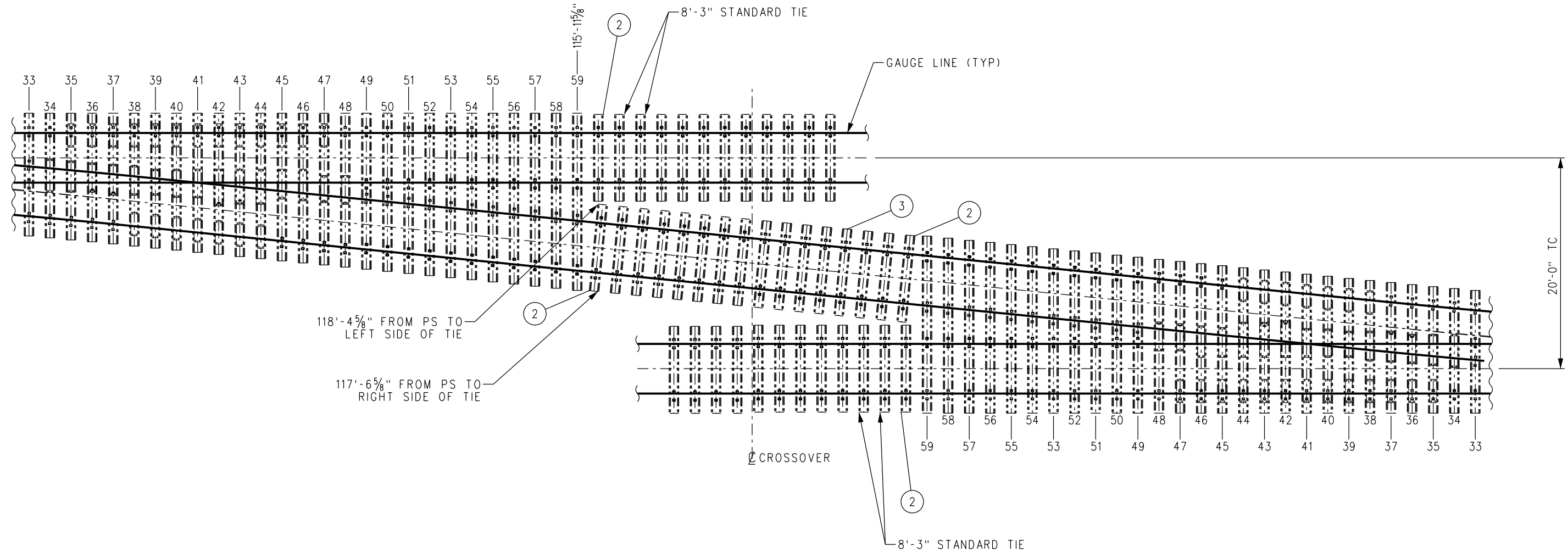
ENGINEERING STANDARDS

TIE LAYOUT PLAN  
 NO 10 - LH CROSSOVER 20' TRACK CENTERS

STANDARD	2817
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2817-05

BILL OF MATERIAL

ITEM	QTY	DESCRIPTION	SCRR 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:**

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. 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.

DRAWN BY: <i>Nareh D. Papp</i>		HDR: <i>Wilson Dava</i>	DATE: 03/31/2011
REVISION		DES.	ENG.
X	XX-XX-XX	XX	XX
REV.	DATE	DESCRIPTION	DES. ENG.

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

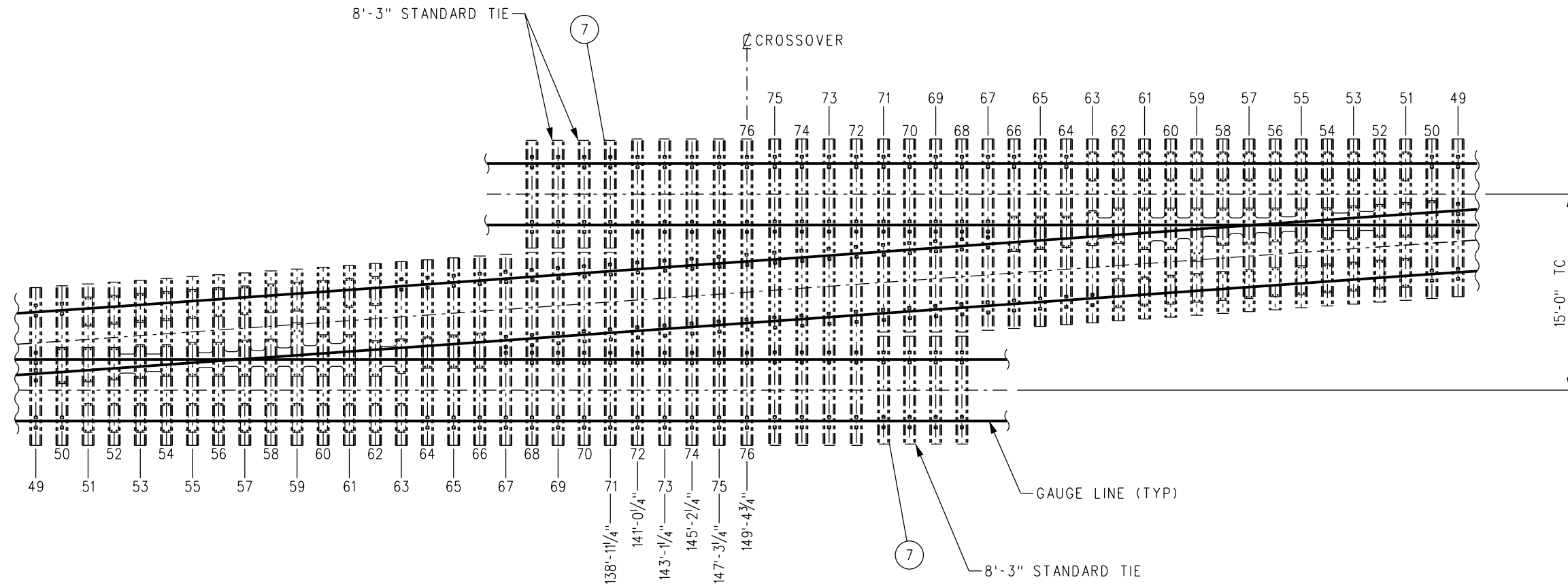
ENGINEERING STANDARDS

TIE LAYOUT PLAN  
NO 10 - RH CROSSOVER 20' TRACK CENTERS

STANDARD	2817
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2817-06

BILL OF MATERIAL

ITEM	QTY	DESCRIPTION	SCRR PART NO
1	2	LH TURNOUT TIES (0-71)	
2	2	TIE NO 72 - LENGTH = 23'-5 1/2"	
3	2	TIE NO 73 - LENGTH = 23'-5 1/2"	
4	2	TIE NO 74 - LENGTH = 23'-5 1/2"	
5	2	TIE NO 75 - LENGTH = 23'-5 1/2"	
6	1	TIE NO 76 - LENGTH = 23'-5 1/2"	
7	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: <i>Nareh D. Papp</i>		HDR: <i>Willson Dava</i>	DATE: 03/31/2011
REVISION		DES.	ENG.
X	XX-XX-XX	XX	XX
REV.	DATE	DESCRIPTION	DES. ENG.

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

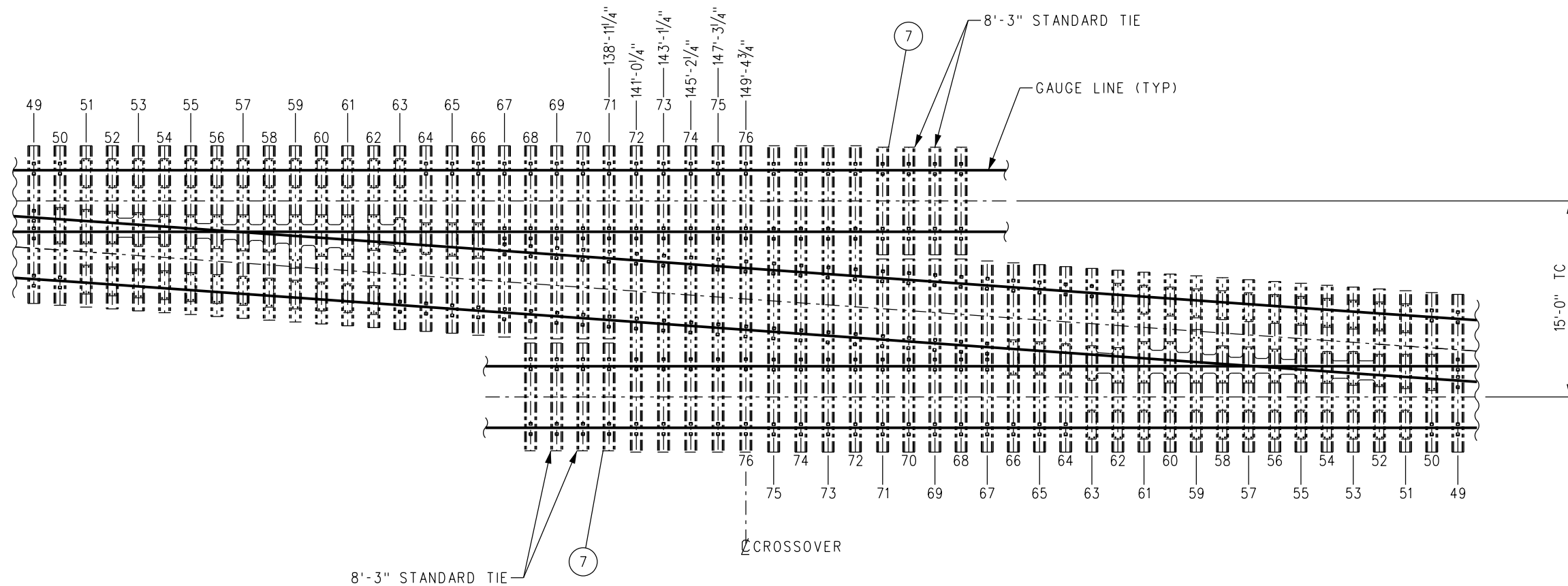
ENGINEERING STANDARDS

TIE LAYOUT PLAN  
NO 14 - LH CROSSOVER 15' TRACK CENTERS

STANDARD	2818
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2818-01

BILL OF MATERIAL

ITEM	QTY	DESCRIPTION	SCRR 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'-5 1/2"	
4	2	TIE NO 74 - LENGTH = 23'-5 1/2"	
5	2	TIE NO 75 - LENGTH = 23'-5 1/2"	
6	1	TIE NO 76 - LENGTH = 23'-5 1/2"	
7	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: <i>Nareh D. Papp</i>		HDR: _____		DATE: 03/31/2011	
REVISION		DES.		ENG.	
X	XX-XX-XX	XX	XX		
REV.	DATE	DESCRIPTION	DES.	ENG.	

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 14 - RH CROSSOVER 15' TRACK CENTERS

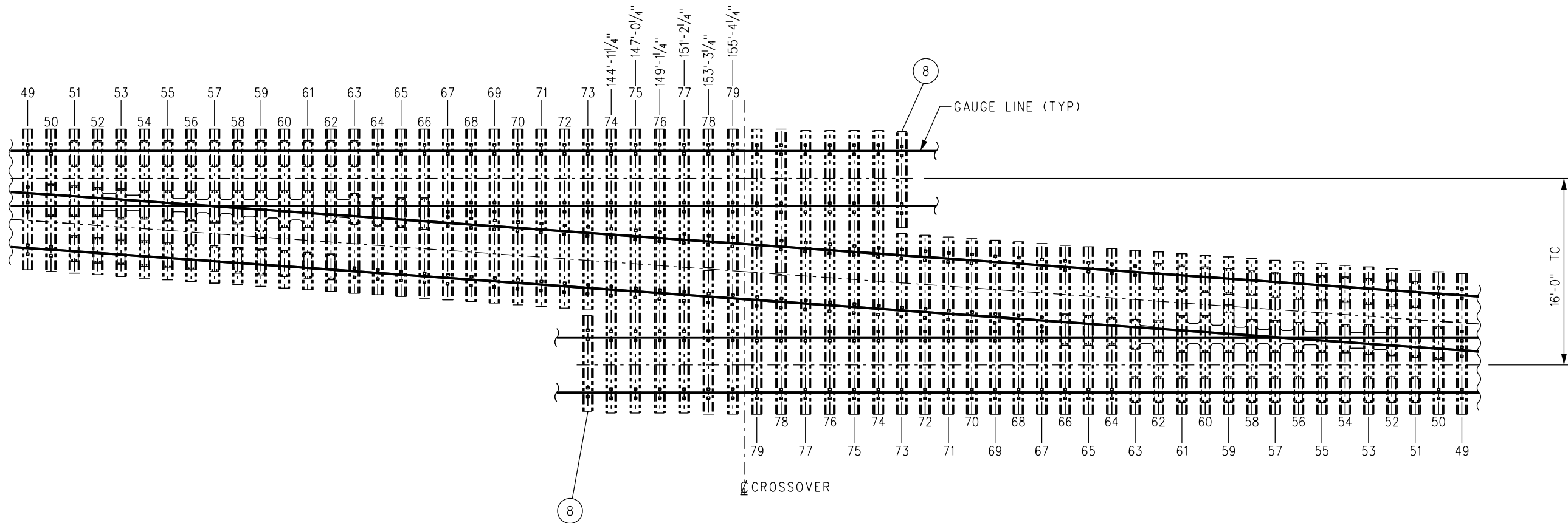
STANDARD	2818
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2818-02





BILL OF MATERIAL

ITEM	QTY	DESCRIPTION	SCRR PART NO
1	2	RH TURNOUT TIES (0-73)	
2	2	TIE NO 74 - LENGTH = 24'-5 1/2"	
3	2	TIE NO 75 - LENGTH = 24'-5 1/2"	
4	2	TIE NO 76 - LENGTH = 24'-5 1/2"	
5	2	TIE NO 77 - LENGTH = 24'-5 1/2"	
6	2	TIE NO 78 - LENGTH = 24'-5 1/2"	
7	2	TIE NO 79 - LENGTH = 24'-5 1/2"	
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: <i>Nareh D. Papp</i>		HDR: <i>Wilson Dava</i>		DATE: 03/31/2011	
ASSISTANT DIRECTOR: STANDARDS & DESIGN		DIRECTOR OF ENGINEERING AND CONSTRUCTION			
XX	XX-XX-XX	REVISION	XX	XX	
REV.	DATE	DESCRIPTION	DES.	ENG.	

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

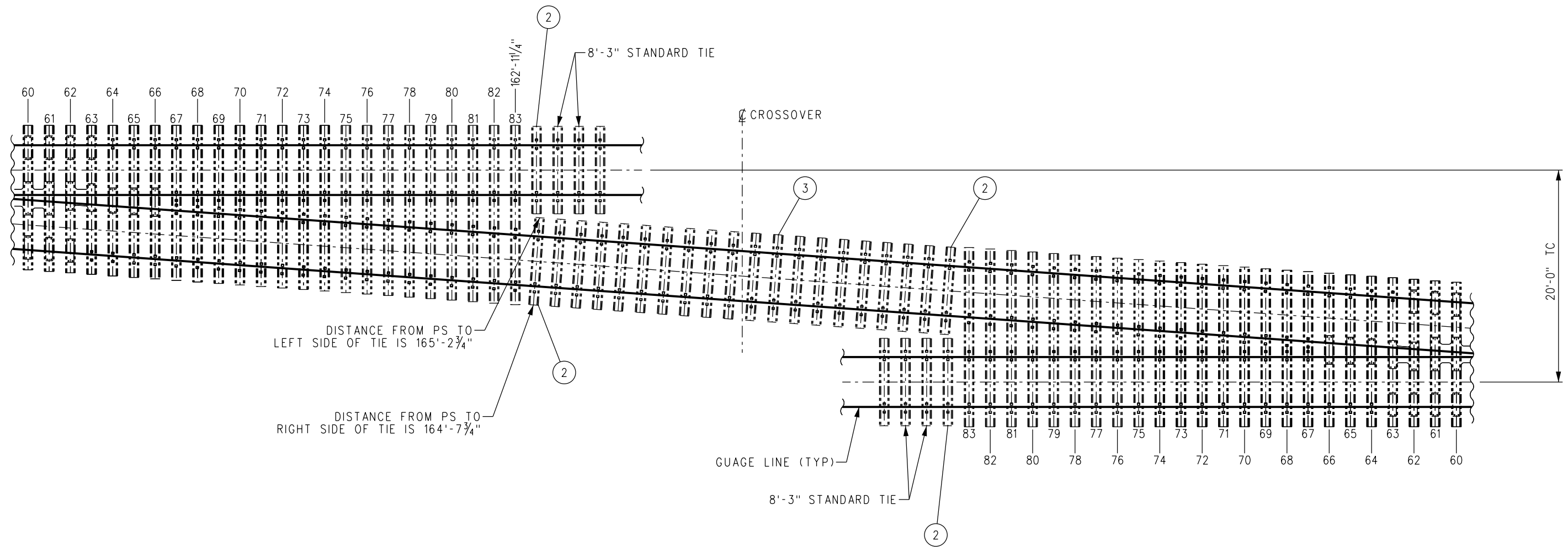
TIE LAYOUT PLAN  
NO 14 - RH CROSSOVER 16' TRACK CENTERS

STANDARD	2818
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2818-04



BILL OF MATERIAL

ITEM	QTY	DESCRIPTION	SCRR 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 SCRR 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: <i>Nareh D. Papp</i>		HDR: <i>Wilson Dava</i>	DATE: 03/31/2011
REVISION		DES.	ENG.
X	XX-XX-XX	XX	XX
REV.	DATE	DESCRIPTION	DES. ENG.

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

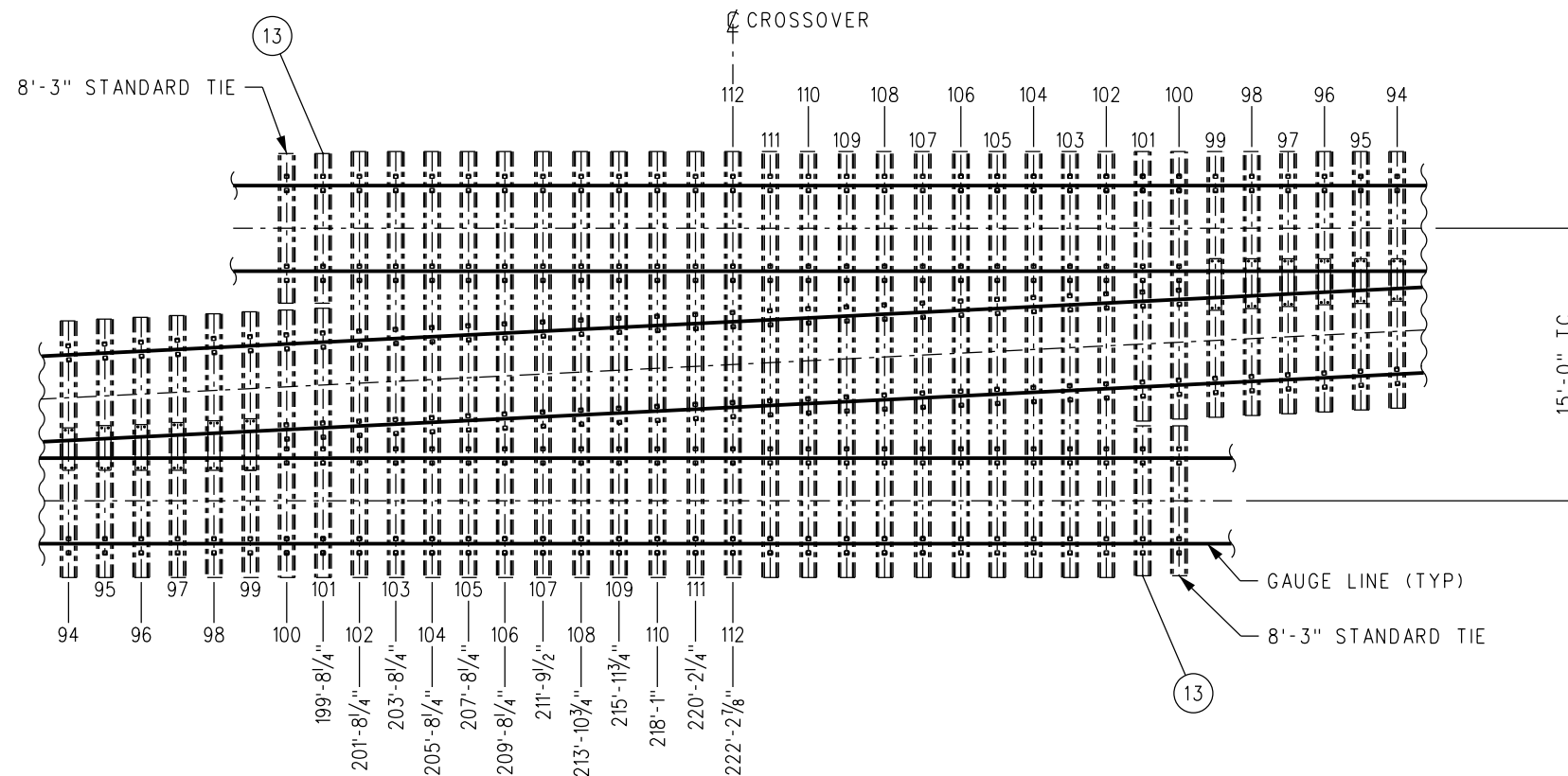
ENGINEERING STANDARDS

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

STANDARD	2818
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'-5 1/2"	
3	2	TIE NO 103 - LENGTH = 23'-5 1/2"	
4	2	TIE NO 104 - LENGTH = 23'-5 1/2"	
5	2	TIE NO 105 - LENGTH = 23'-5 1/2"	
6	2	TIE NO 106 - LENGTH = 23'-5 1/2"	
7	2	TIE NO 107 - LENGTH = 23'-5 1/2"	
8	2	TIE NO 108 - LENGTH = 23'-5 1/2"	
9	2	TIE NO 109 - LENGTH = 23'-5 1/2"	
10	2	TIE NO 110 - LENGTH = 23'-5 1/2"	
11	2	TIE NO 111 - LENGTH = 23'-5 1/2"	
12	1	TIE NO 112 - LENGTH = 23'-5 1/2"	
13	2	8'-3" 1:80 CANT CONCRETE TIE	



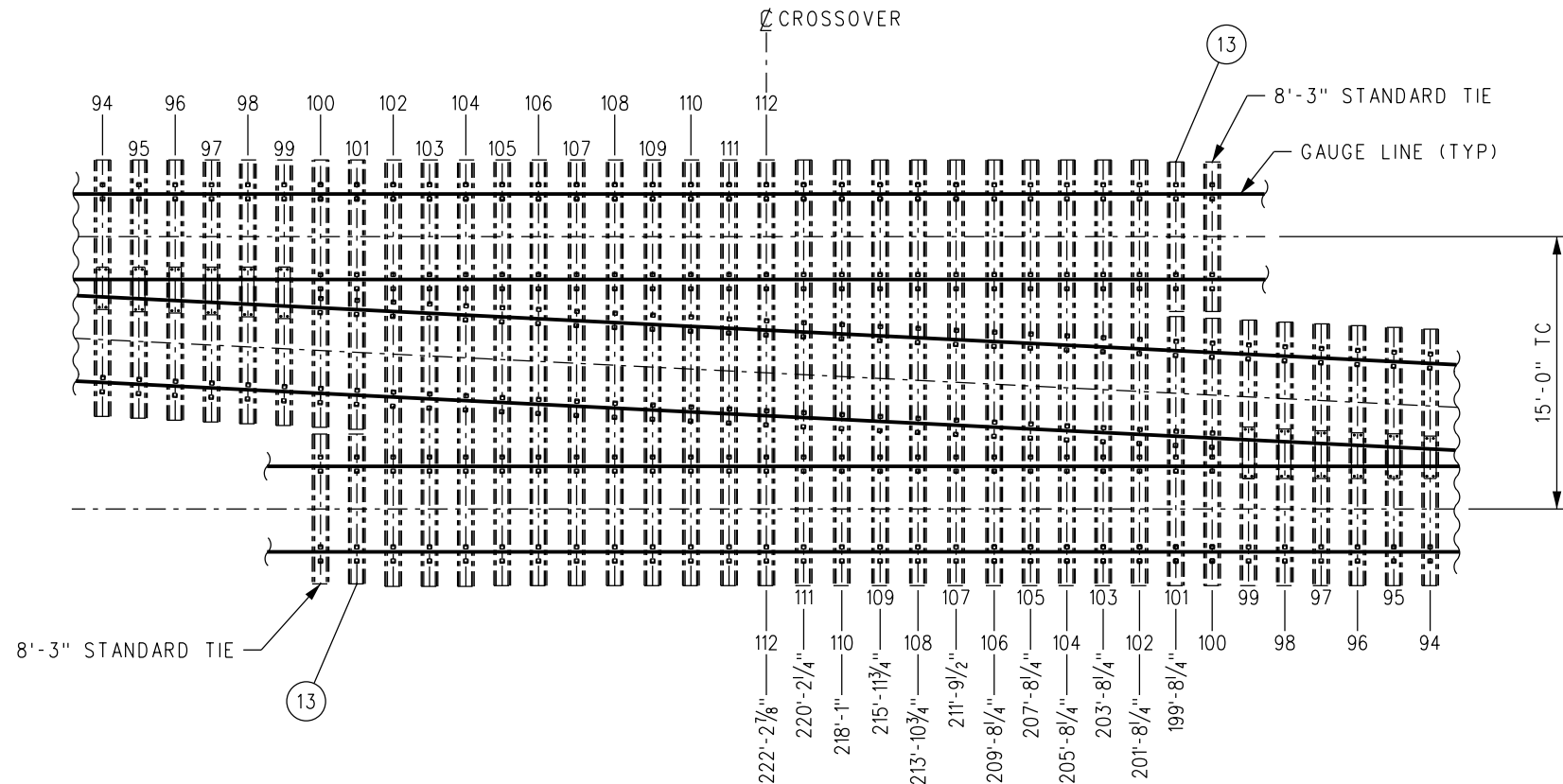
**NOTES:**

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: <i>Nareh D. Papp</i>		HDR: <i>Nareh D. Papp</i>	DATE: 03/31/2011	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.	SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012	ENGINEERING STANDARDS		STANDARD 2819
ASSISTANT DIRECTOR: STANDARDS & DESIGN <i>William D. Dava</i> DIRECTOR OF ENGINEERING AND CONSTRUCTION						TIE LAYOUT PLAN NO 20 - LH CROSSOVER 15' TRACK CENTERS		SCALE: NTS
REV.	DATE	DESCRIPTION	DES.	ENG.			CADD FILE: ES2819-01	

BILL OF MATERIAL

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



**NOTES:**

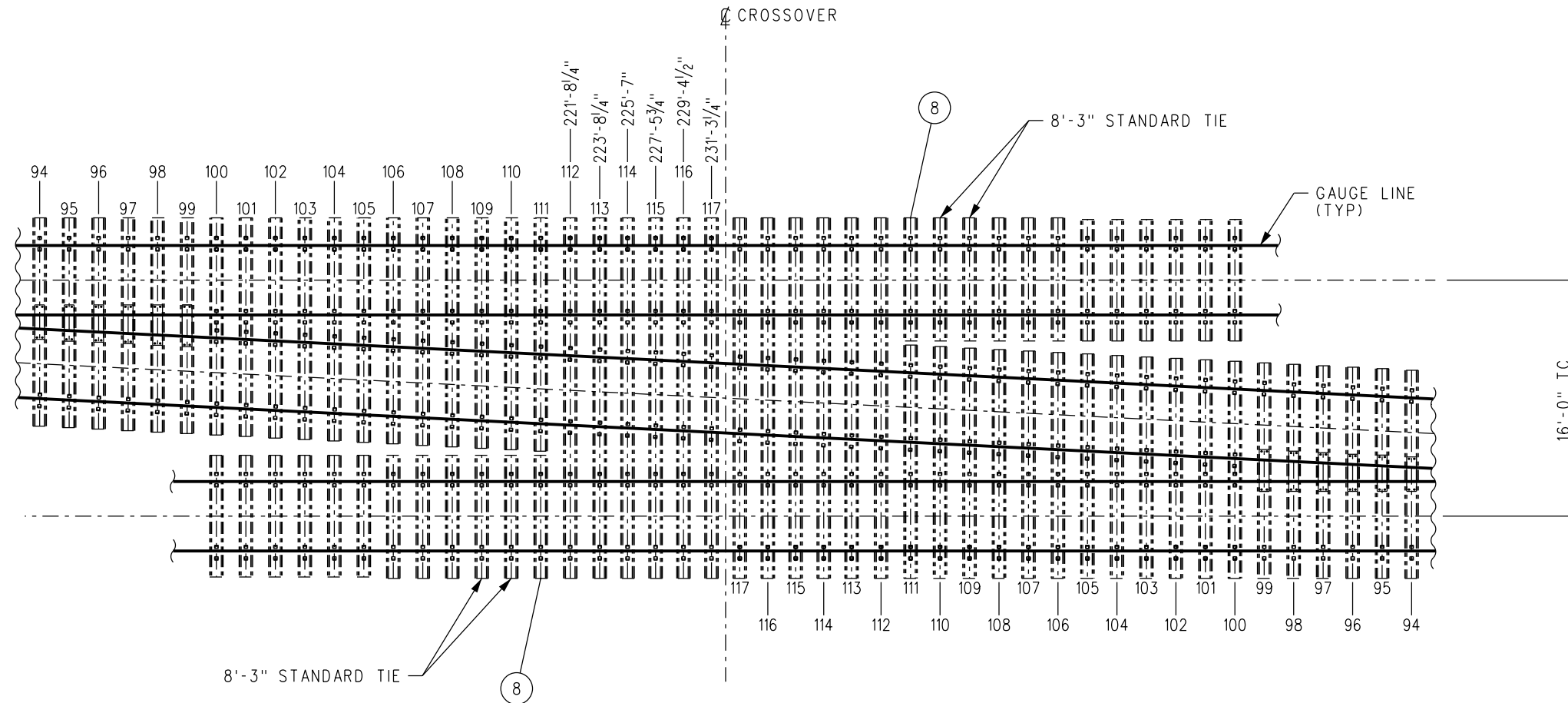
- ALL SWITCH TIES ARE FLAT (NON-CANTED), EXCEPT 1:80 TRANSITION TIES AND STANDARD 8'-3" TIES CANTED 1:40. ALL LENGTHS SHALL INCLUDE 1'-9" FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED. TRANSITION TIES AND STANDARD TIE PER SCRR ENGINEERING STANDARDS.
- DISTANCES INDICATED AT EACH TIE ARE MEASURED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

DRAWN BY: <i>Nareh D. Papp</i>		HDR: <i>Wilson Dava</i>	DATE: 03/31/2011	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.	<p>SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012</p>	ENGINEERING STANDARDS	STANDARD 2819
REVISION: X XX-XX-XX REV. DATE DESCRIPTION DES. ENG.		ASSISTANT DIRECTOR: STANDARDS & DESIGN DIRECTOR OF ENGINEERING AND CONSTRUCTION		TIE LAYOUT PLAN NO 20 - RH CROSSOVER 15' TRACK CENTERS		SCALE: NTS SHEET: 1 OF 1 CADD FILE: ES2819-02	



BILL OF MATERIAL

ITEM	QTY	DESCRIPTION	SCRR PART NO
1	2	RH TURNOUT TIES (0-111)	
2	2	TIE NO 112 - LENGTH = 24'-5 1/2"	
3	2	TIE NO 113 - LENGTH = 24'-5 1/2"	
4	2	TIE NO 114 - LENGTH = 24'-5 1/2"	
5	2	TIE NO 115 - LENGTH = 24'-5 1/2"	
6	2	TIE NO 116 - LENGTH = 24'-5 1/2"	
7	2	TIE NO 117 - LENGTH = 24'-5 1/2"	
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 SCRR ENGINEERING STANDARDS.
- DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

DRAWN BY: <i>Nareh D. Papp</i>		HDR: _____	DATE: 03/31/2011
REVISION		XX	XX
REV.	DATE	DESCRIPTION	DES. ENG.

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

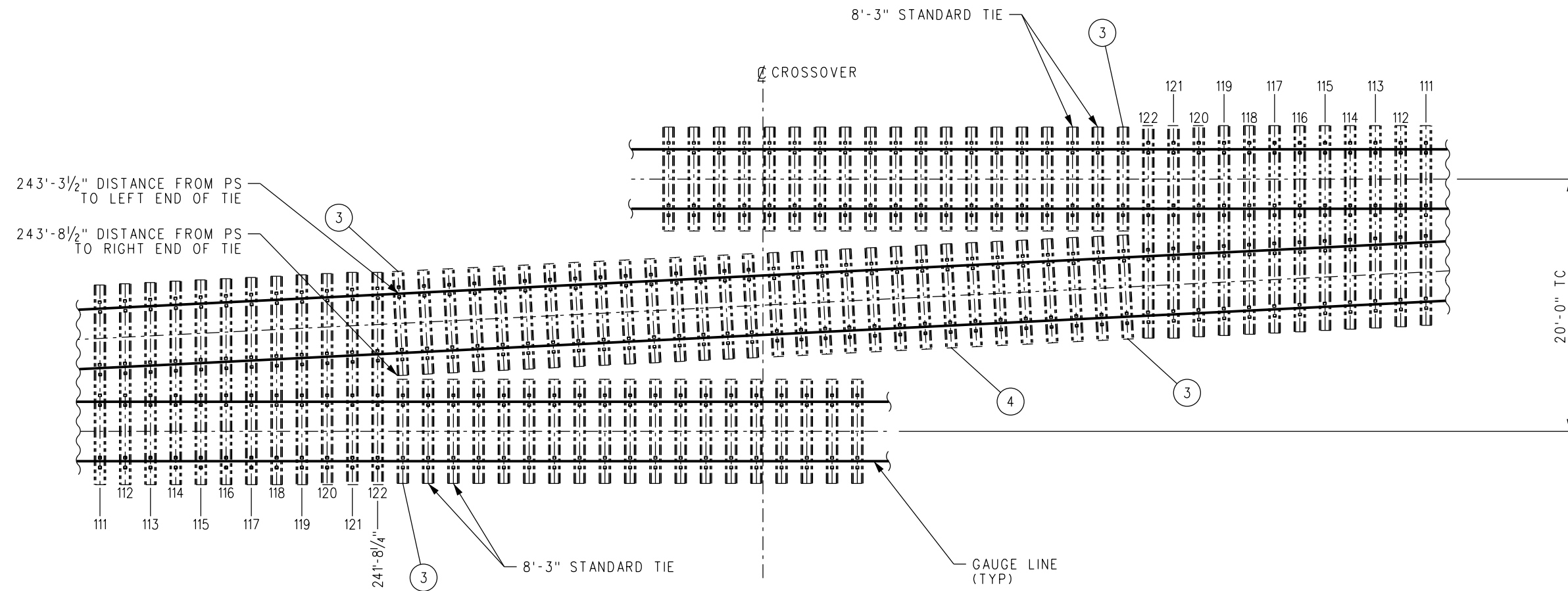
TIE LAYOUT PLAN  
NO 20 - RH CROSSOVER 16' TRACK CENTERS

STANDARD	2819
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2819-04



BILL OF MATERIAL

ITEM	QTY	DESCRIPTION	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)	



**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 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: <i>Nareh D. Papp</i>		HDR: <i>Nareh D. Papp</i>	DATE: 03/31/2011
REVISION		DES.	ENG.
X	XX-XX-XX	XX	XX
REV.	DATE	DESCRIPTION	DES. ENG.

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.



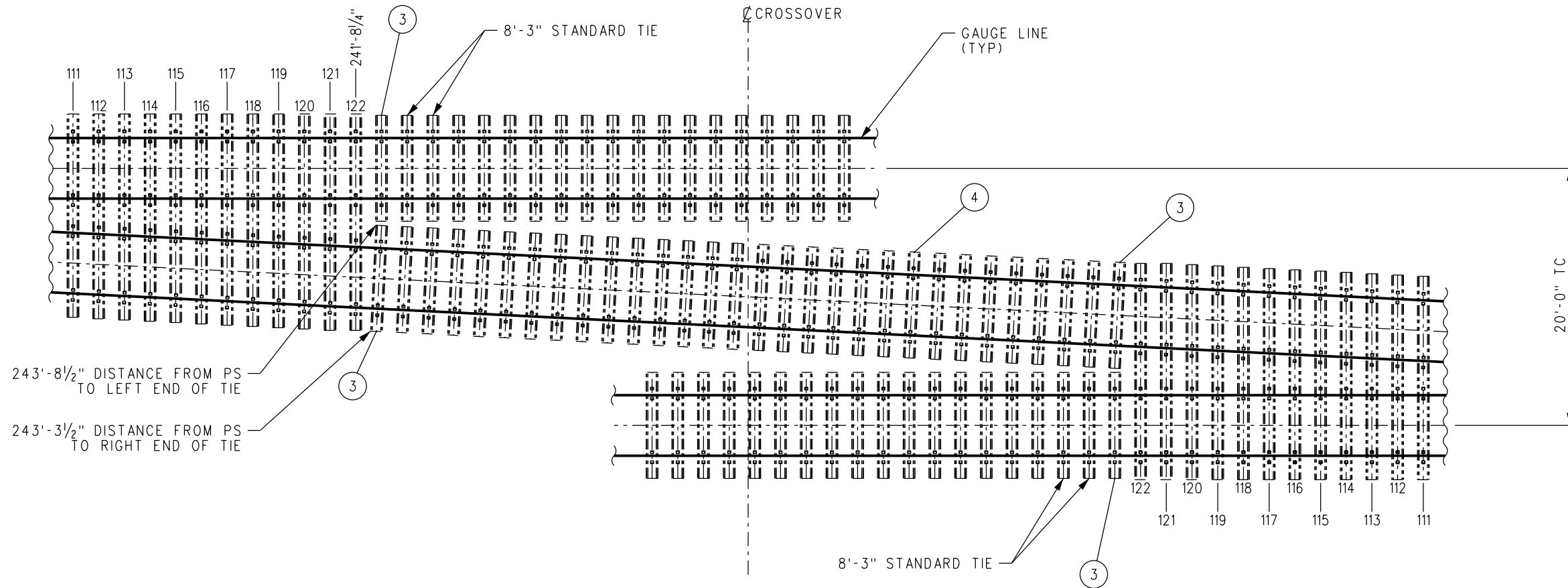
**METROLINK**  
SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS  
TIE LAYOUT PLAN  
NO 20 - LH CROSSOVER 20' TRACK CENTERS

STANDARD	2819
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2819-05

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:**

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. 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: <i>Narek D. Bze</i>		HDR: <i>Wilton Davis</i>	DATE: 03/31/2011
REVISION		XX	XX
REV.	DATE	DESCRIPTION	DES. ENG.

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.



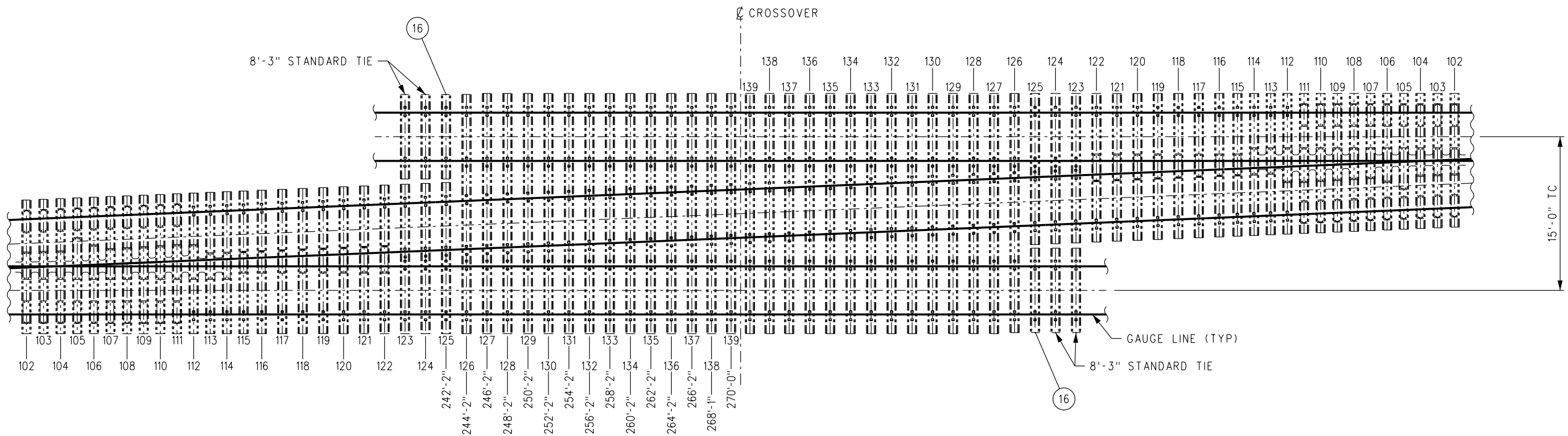
**METROLINK**  
SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS  
TIE LAYOUT PLAN  
NO 20 - RH CROSSOVER 20' TRACK CENTERS

STANDARD	2819
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2819-06

BILL OF MATERIAL

ITEM	QTY	DESCRIPTION	SCRR PART NO
1	2	LH TURNOUT TIES (0-125)	
2	2	TIE NO 126 - LENGTH = 23'-5 1/2"	
3	2	TIE NO 127 - LENGTH = 23'-5 1/2"	
4	2	TIE NO 128 - LENGTH = 23'-5 1/2"	
5	2	TIE NO 129 - LENGTH = 23'-5 1/2"	
6	2	TIE NO 130 - LENGTH = 23'-5 1/2"	
7	2	TIE NO 131 - LENGTH = 23'-5 1/2"	
8	2	TIE NO 132 - LENGTH = 23'-5 1/2"	
9	2	TIE NO 133 - LENGTH = 23'-5 1/2"	
10	2	TIE NO 134 - LENGTH = 23'-5 1/2"	
11	2	TIE NO 135 - LENGTH = 23'-5 1/2"	
12	2	TIE NO 136 - LENGTH = 23'-5 1/2"	
13	2	TIE NO 137 - LENGTH = 23'-5 1/2"	
14	2	TIE NO 138 - LENGTH = 23'-5 1/2"	
15	2	TIE NO 139 - LENGTH = 23'-5 1/2"	
16	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: <i>Nareh D. Papp</i>		HDR: <i>Standards &amp; Design</i>		DATE: 03/31/2011	
REVISION		DES.		ENG.	
X	XX-XX-XX	XX	XX		
REV.	DATE	DESCRIPTION	DES.	ENG.	

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

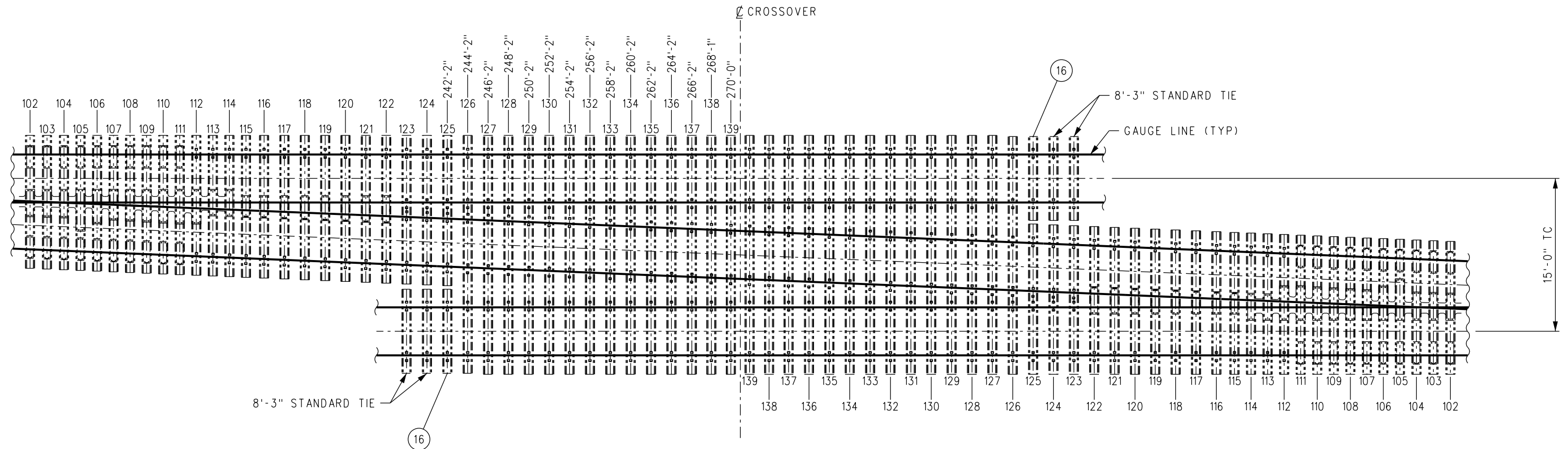
ENGINEERING STANDARDS

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

STANDARD	2820
SCALE	NTS
REVISION SHEET	1 OF 1
CADD FILE	ES2820-01

BILL OF MATERIAL

ITEM	QTY	DESCRIPTION	SCRR PART NO
1	2	RH TURNOUT TIES (0-125)	
2	2	TIE NO 126 - LENGTH = 23'-5 1/2"	
3	2	TIE NO 127 - LENGTH = 23'-5 1/2"	
4	2	TIE NO 128 - LENGTH = 23'-5 1/2"	
5	2	TIE NO 129 - LENGTH = 23'-5 1/2"	
6	2	TIE NO 130 - LENGTH = 23'-5 1/2"	
7	2	TIE NO 131 - LENGTH = 23'-5 1/2"	
8	2	TIE NO 132 - LENGTH = 23'-5 1/2"	
9	2	TIE NO 133 - LENGTH = 23'-5 1/2"	
10	2	TIE NO 134 - LENGTH = 23'-5 1/2"	
11	2	TIE NO 135 - LENGTH = 23'-5 1/2"	
12	2	TIE NO 136 - LENGTH = 23'-5 1/2"	
13	2	TIE NO 137 - LENGTH = 23'-5 1/2"	
14	2	TIE NO 138 - LENGTH = 23'-5 1/2"	
15	2	TIE NO 139 - LENGTH = 23'-5 1/2"	
16	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: <i>Nareh D. Papp</i>		HDR: <i>Willson Dava</i>		DATE: 03/31/2011	
ASSISTANT DIRECTOR: STANDARDS & DESIGN		DIRECTOR OF ENGINEERING AND CONSTRUCTION			
XX-XX-XX	REVISION	XX	XX		
REV.	DATE	DESCRIPTION	DES.	ENG.	

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

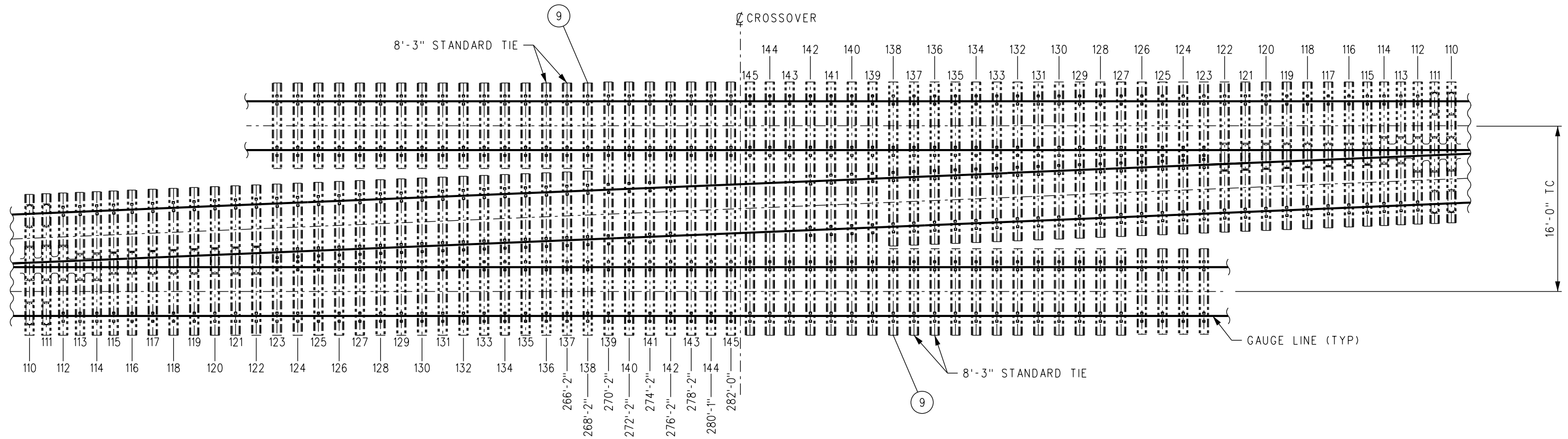
ENGINEERING STANDARDS

TIE LAYOUT PLAN  
NO 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'-5 1/2"	
3	2	TIE NO 140 - LENGTH = 24'-5 1/2"	
4	2	TIE NO 141 - LENGTH = 24'-5 1/2"	
5	2	TIE NO 142 - LENGTH = 24'-5 1/2"	
6	2	TIE NO 143 - LENGTH = 24'-5 1/2"	
7	2	TIE NO 144 - LENGTH = 24'-5 1/2"	
8	2	TIE NO 145 - LENGTH = 24'-5 1/2"	
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.

DRAWN BY: <i>Nareh D. Papp</i>		HDR:	DATE: 03/31/2011
REVISION		DES.	ENG.
X	XX-XX-XX	XX	XX
REV.	DATE	DESCRIPTION	DES. ENG.

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.

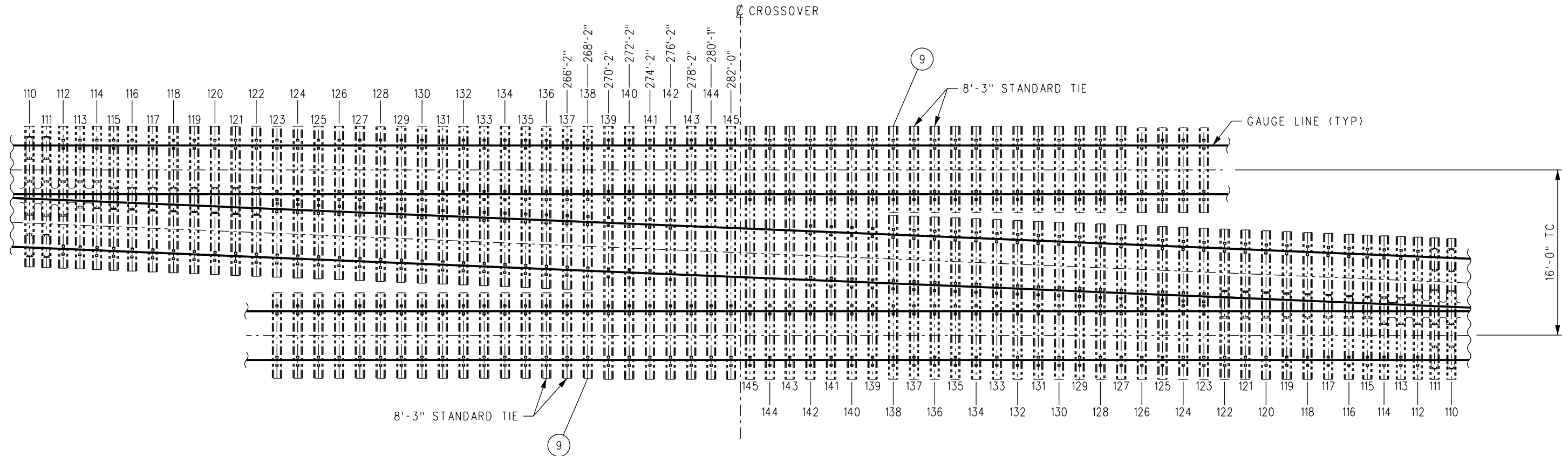
**METROLINK**  
SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS  
TIE LAYOUT PLAN  
NO 24 - LH CROSSOVER 16' TRACK CENTERS

STANDARD	2820
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2820-03

BILL OF MATERIAL

ITEM	QTY	DESCRIPTION	SCRRRA PART NO
1	2	RH TURNOUT TIES (0-138)	
2	2	TIE NO 139 - LENGTH = 24'-5 1/2"	
3	2	TIE NO 140 - LENGTH = 24'-5 1/2"	
4	2	TIE NO 141 - LENGTH = 24'-5 1/2"	
5	2	TIE NO 142 - LENGTH = 24'-5 1/2"	
6	2	TIE NO 143 - LENGTH = 24'-5 1/2"	
7	2	TIE NO 144 - LENGTH = 24'-5 1/2"	
8	2	TIE NO 145 - LENGTH = 24'-5 1/2"	
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 SCRRRA ENGINEERING STANDARDS.
2. DISTANCES INDICATED AT EACH TIE ARE MEASURED FROM THE POINT OF SWITCH.

DRAWN BY: <i>Nareh D. Papp</i>		HDR: <i>Wilson Dava</i>	DATE: 03/31/2011
REVISION		DES.	ENG.
X	XX-XX-XX	XX	XX
REV.	DATE	DESCRIPTION	DES. ENG.

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.



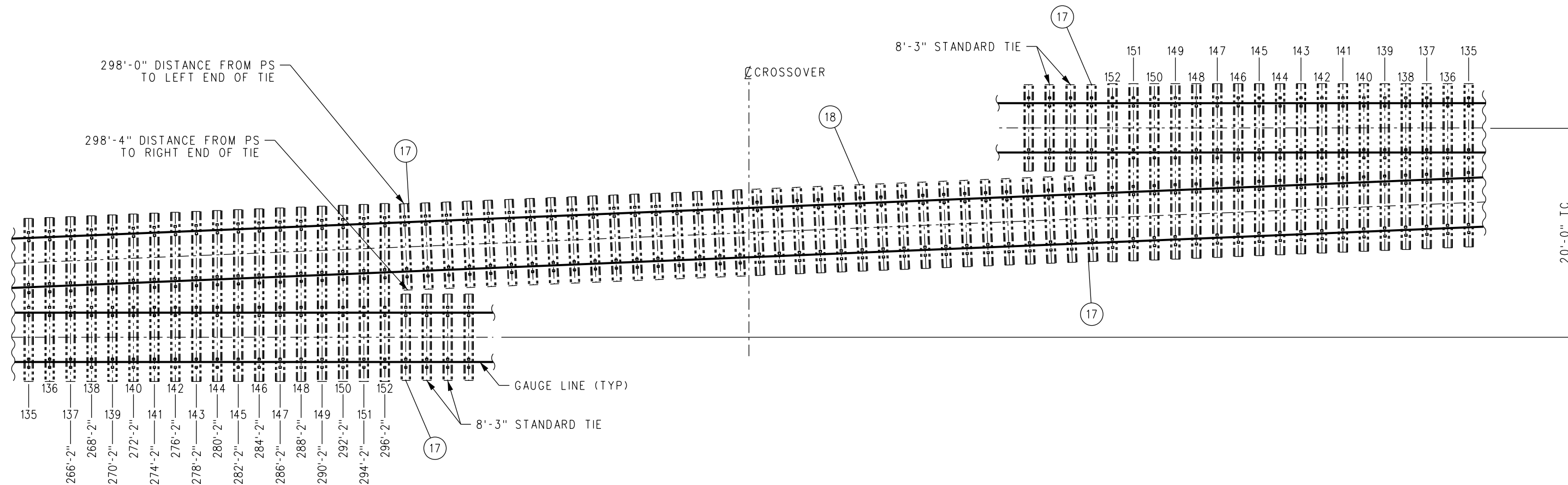
**METROLINK**  
SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS

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

STANDARD	2820
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2820-04

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)	



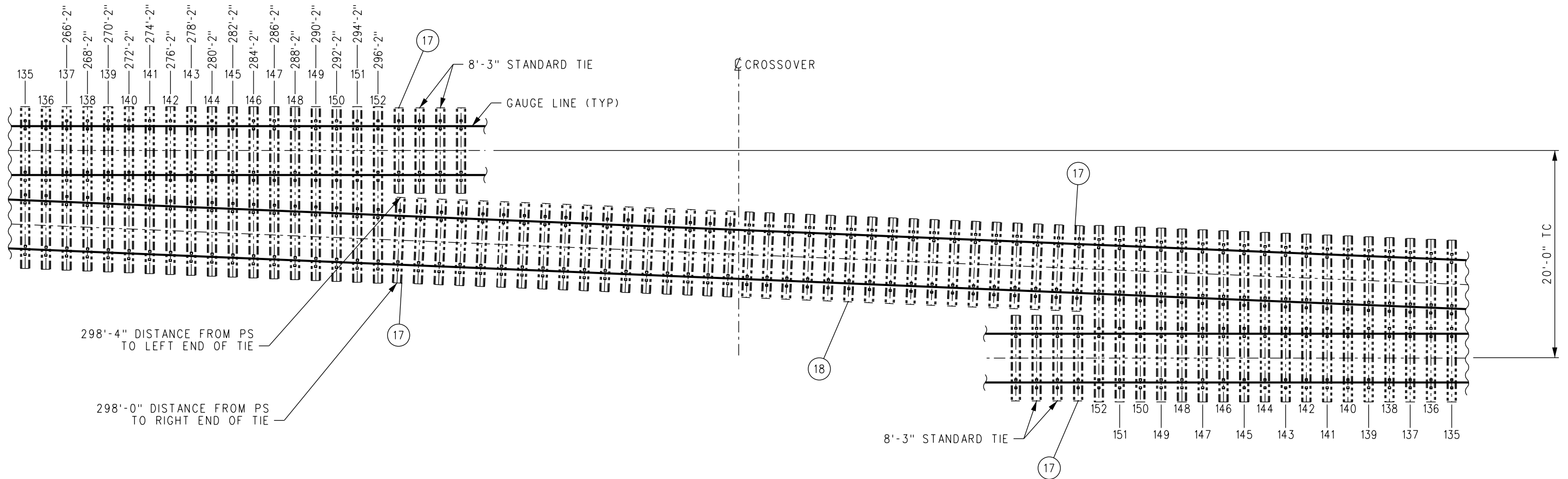
**NOTES:**

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. 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: <i>Nareh D. Papp</i>		HDR: <i>Nareh D. Papp</i>	DATE: 03/31/2011	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.		ENGINEERING STANDARDS		STANDARD 2820	
ASSISTANT DIRECTOR: STANDARDS & DESIGN <i>William D. Davis</i> DIRECTOR OF ENGINEERING AND CONSTRUCTION						SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012		TIE LAYOUT PLAN NO 24 - LH CROSSOVER 20' TRACK CENTERS	
REV.	DATE	DESCRIPTION	DES.	ENG.					

BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	SCRR PART NO
1	2	RH TURNOUT TIES (0-137)	
2	2	TIE NO 138 - LENGTH = 15'-10"	
3	2	TIE NO 139 - LENGTH = 15'-11"	
4	2	TIE NO 140 - LENGTH = 16'-0"	
5	2	TIE NO 141 - LENGTH = 16'-1"	
6	2	TIE NO 142 - LENGTH = 16'-2"	
7	2	TIE NO 143 - LENGTH = 16'-3"	
8	2	TIE NO 144 - LENGTH = 16'-4"	
9	2	TIE NO 145 - LENGTH = 16'-5"	

BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	SCRR PART NO
10	2	TIE NO 146 - LENGTH = 16'-6"	
11	2	TIE NO 147 - LENGTH = 16'-7"	
12	2	TIE NO 148 - LENGTH = 16'-8"	
13	2	TIE NO 149 - LENGTH = 16'-9"	
14	2	TIE NO 150 - LENGTH = 16'-10"	
15	2	TIE NO 151 - LENGTH = 16'-11"	
16	2	TIE NO 152 - LENGTH = 17'-0"	
17	4	8'-3" 1:80 CANT CONCRETE TIE	
18	32	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 SCRR 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: <i>Nareh D. Papp</i>		HDR: <i>Willson Dava</i>	DATE: 03/31/2011
REVISION		XX	XX
REV.	DATE	DESCRIPTION	DES. ENG.

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 24 - RH CROSSOVER 20' TRACK CENTERS

STANDARD	2820
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2820-06