

**SCRR NO 20 TURNOUT  
BILL OF MATERIALS & DRAWING NUMBERS**

FROG NUMBER  
HAND  
WSM OR RBM  
CONCRETE OR TIMBER TIES  
HST OR STANDARD TIES  
POWER OR MANUAL  
ML OR TO SIDE SW MACHINE OPERATION

NO 20			
LH		RH	
WSM		WSM	
CONCRETE		CONCRETE	
HST		HST	
POWER		POWER	
MLSIDE	TOSIDE	MLSIDE	TOSIDE

TURNOUT LAYOUT	DRAWING NO	2806-01	2806-03	2806-02	2806-04
SWITCH PACK	DRAWING NO	2806-11	2806-13	2806-12	2806-14
CONCRETE TIE LAYOUT	DRAWING NO	2806-31	2806-31	2806-30	2806-30
HOLLOW STEEL TIE LAYOUT	DRAWING NO	2806-33	2806-35	2806-32	2806-34
FROG PACK	DRAWING NO	2806-41	2806-41	2806-42	2806-42
GUARD RAIL MAINLINE	DRAWING NO	2800-50	2800-50	2800-50	2800-50
GUARD RAIL TURNOUT	DRAWING NO	2806-61	2806-61	2806-62	2806-62
INSULATED RAIL ASSEMBLY	LENGTH	78'-0 <sup>3</sup> / <sub>4</sub> "			
INSULATED RAIL ASSEMBLY	LENGTH	78'-2"	78'-2"	78'-2"	78'-2"
RAIL	LENGTH	2@30'-0"	2@30'-0"	2@30'-0"	2@30'-0"
RAIL	LENGTH	2@57'-6"	2@57'-6"	2@57'-6"	2@57'-6"
RAIL	LENGTH	2@77'-6"	2@77'-6"	2@77'-6"	2@77'-6"
RAIL	LENGTH	78'-0"	78'-0"	78'-0"	78'-0"
RAIL	LENGTH	78'-1 <sup>1</sup> / <sub>4</sub> "			
TIE SCREWS CONCRETE	ES2356	QUANTITY	492	492	492
TIE SCREWS TIMBER	ES2355	QUANTITY	-	-	-
WASHER FLAT	ES2356	QUANTITY	492	492	492
SPRING WASHER DOUBLE COIL	ES2356	QUANTITY	492	492	492
TIE PLATE PANDROL	ES2454	QUANTITY	-	-	-
E-CLIP PANDROL E2055	ES2362	QUANTITY	500	500	500
INSULATOR PANDROL NYLON HD10	-	QUANTITY	500	500	500
PANDROL JOINT CLIP E2063	ES2361	QUANTITY	8	8	8
INSULATION PANDROL NYLON 6790	-	QUANTITY	8	8	8
TIE PAD PANDROL 69935R	-	QUANTITY	254	254	254
SHIM TO REDUCE PLATE FLEXURE	-	QUANTITY	246	246	246

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

DRAWN BY: *Nareh D. Bae*  
HDR: *Nareh D. Bae*  
DATE: 03/31/2011  
ASSISTANT DIRECTOR: STANDARDS & DESIGN  
*William Davan*  
DIRECTOR OF ENGINEERING AND CONSTRUCTION

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

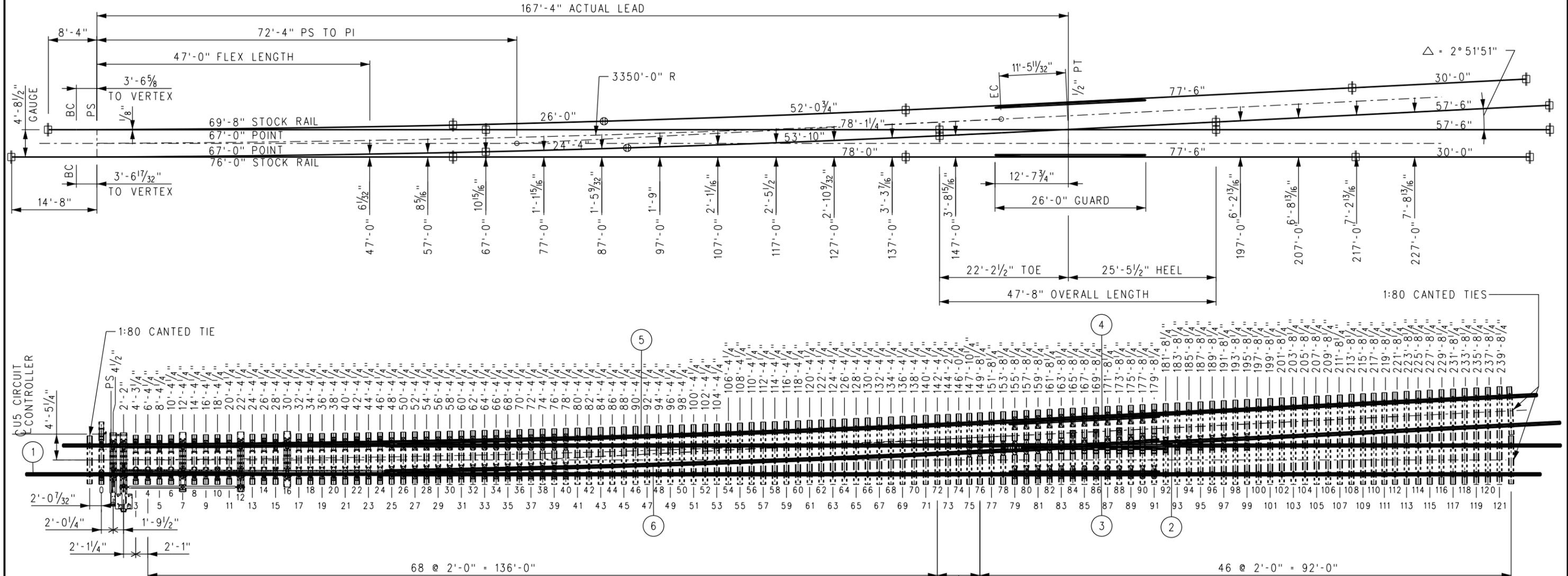
**ENGINEERING STANDARDS**

NO 20 TURNOUT

STANDARD	2800
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2800-20

BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	DWG NO
1	1	SWITCH PACK, NO 20-136 LB RE MODIFIED TANGENTIAL, LH, HST	ES2806-11
2	1	FROG PACK, NO 20-136 LB RE WSM, LH	ES2806-41
3	1	GUARD RAIL ASSEMBLY BOLTLESS, 26'-0" LG, 136 LB RE RAISED 1", STRAIGHT	ES2800-50
4	1	GUARD RAIL ASSEMBLY BOLTLESS, 26'-0" LG, 136 LB RE RAISED 1", LH	ES2806-61
5	1	INSULATED RAIL ASSEMBLY, 78'-0 3/4" C/W BONDED INSULATED JOINT	-
6	1	INSULATED RAIL ASSEMBLY, 78'-2" C/W BONDED INSULATED JOINT	-
7	2	DRILLED RAIL, 136 LB RE, 30'-0" LONG	-
8	2	DRILLED RAIL, 136 LB RE, 57'-6" LONG	-
9	2	DRILLED RAIL, 136 LB RE, 77'-6" LONG	-
10	1	DRILLED RAIL, 136 LB RE, 78'-0" LONG	-
11	1	DRILLED RAIL, 136 LB RE, 78'-1 1/4" LONG	-

BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	DWG NO
12	492	TIE SCREW, CONCRETE 7/8" DIA x 6" HEX HEAD	-
13	492	WASHER FLAT 7/8" TYPE A NARROW 15/16" x 1 3/4" x 0.134"	-
14	492	SPRING WASHER, DOUBLE COIL (FE6)	-
15	1	CONCRETE TIE SET, 0-121 + (3) 1:80 TIES, PLATE PADS, PIM INSERTS, LH	-
16	500	CLIP PANDROL E2055	-
17	500	INSULATOR PANDROL FEATURES BASE HOLDOWN NYLON HD-10	-
18	8	CLIP PANDROL E2063	-
19	8	INSULATION, PANDROL NYLON 6790	-
20	254	TIE PAD PANDROL 6993SR	-
21	246	SHIM, TO REDUCE PLATE FLEXURE	-



- NOTES:**
- ALL RAILS SHALL HAVE IDENTIFICATION COLOR CODE PAINTED ON WEB, CLEAR OF JOINT AREA.
  - RAIL LENGTHS ALLOW 1/8" GAP BETWEEN RAIL JOINTS FOR WELDING.
  - GUARD RAILS ARE RAISED 1" AND FORM A 1/8" FLANGEWAY.
  - SWITCH MACHINE AND MACHINE PLATE (NIC) MUST BE COORDINATED WITH SCRR.
  - ALL LENGTHS SHALL INCLUDE 1'-9" FROM TIE ENDS TO RAIL CENTERLINE, EXCEPT AS NOTED AND 1:80 CANTED TIES.
  - TIGHTEN TIE SCREW WITH DOUBLE COIL SPRING WASHER IN PLACE.
  - SCHWIHAG ROLLERS TO BE INSTALLED AND ADJUSTED IN THE FIELD.
  - ⊕ = INSULATED JOINT    ⊕ = WELDED JOINT

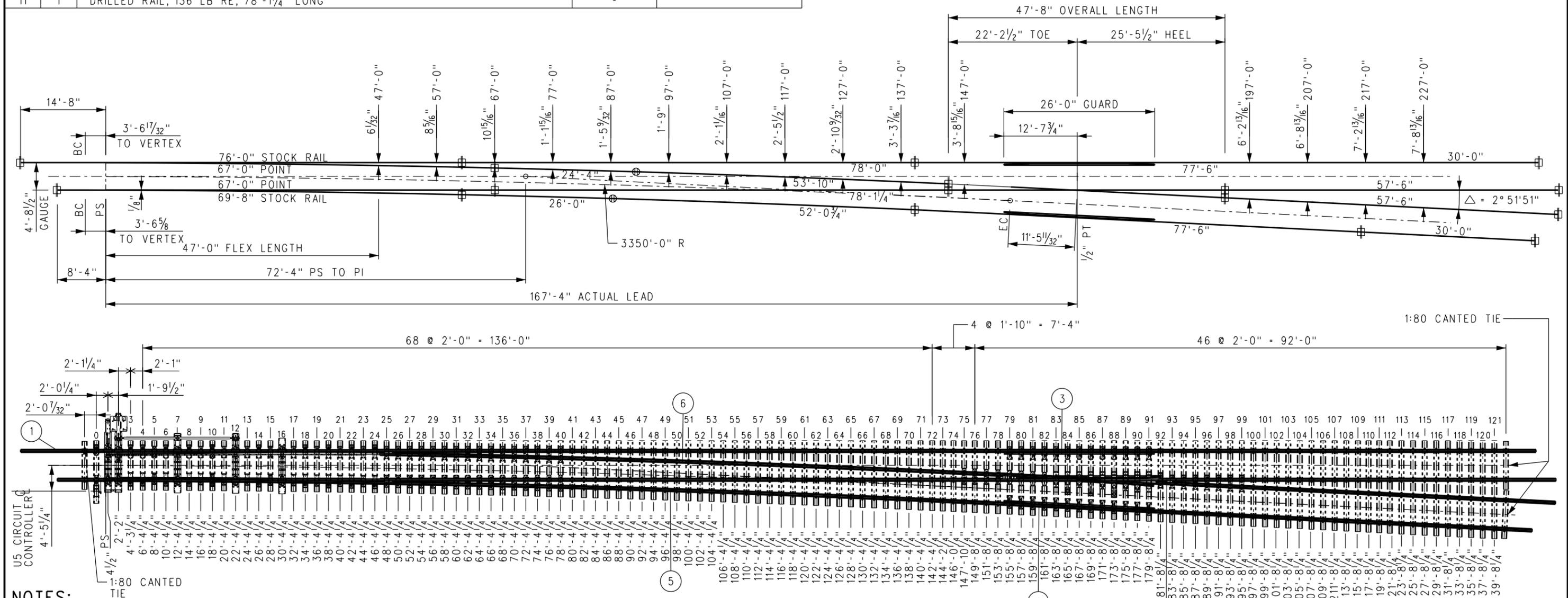
**TURNOUT DATA:**

FROG NO 20	△ = 2° 51' 51"	SWITCH LENGTH OF POINTS:	47'-0" / 67'-0"	ACTUAL LEAD:	167'-4"
TOE LENGTH:	22'-2 1/2"	VERTEX DISTANCE:	VARIABLE PER SIDE	CLOSURE AREA:	
HEEL LENGTH:	25'-5 1/2"	ENTRY ANGLE:	0° 11' 55"	CENTERLINE RADIUS:	3350'-0"
TOTAL LENGTH:	47'-8"	THICKNESS AT POINT:	1/8"	DEGREE OF CURVE:	1° 42' 37"
		THROW AT ROD #1:	4 3/4"	DESIGN SPEEDS:	
				50 MPH PASSENGER @ 3" UNBALANCE	
				40 MPH FREIGHT @ 2" UNBALANCE	

DRAWN BY: <i>Narek D. Papp</i> HDR DATE: 03/31/2011		<p>SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY ONE GATEWAY PLAZA, 12TH FLOOR, L.A., CA. 90012</p>	ENGINEERING STANDARDS		STANDARD: 2806									
<p>ASSISTANT DIRECTOR: STANDARDS &amp; DESIGN</p> <p><i>William Davan</i> DIRECTOR OF ENGINEERING AND CONSTRUCTION</p>			TURNOUT LAYOUT		SCALE: NTS									
<table border="1"> <tr><td>REV.</td><td>DATE</td><td>DESCRIPTION</td><td>DES.</td><td>ENG.</td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>		REV.	DATE	DESCRIPTION	DES.	ENG.						NO 20-136 LB RE LH WSM FROG TURNOUT HST, SWITCH MACHINE ON MAINLINE SIDE		REVISION SHEET: 1 OF 1
REV.	DATE	DESCRIPTION	DES.	ENG.										
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BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	DWG NO
1	1	SWITCH PACK, NO 20-136 LB RE MODIFIED TANGENTIAL, RH, HST	ES2806-12
2	1	FROG PACK, NO 20-136 LB RE WSM, RH	ES2806-42
3	1	GUARD RAIL ASSEMBLY BOLTLESS, 26'-0" LG, 136 LB RE RAISED 1", STRAIGHT	ES2800-50
4	1	GUARD RAIL ASSEMBLY BOLTLESS, 26'-0" LG, 136 LB RE RAISED 1", RH	ES2806-62
5	1	INSULATED RAIL ASSEMBLY, 78'-0 3/4" C/W BONDED INSULATED JOINT	-
6	1	INSULATED RAIL ASSEMBLY, 78'-2" C/W BONDED INSULATED JOINT	-
7	2	DRILLED RAIL, 136 LB RE, 30'-0" LONG	-
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BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	DWG NO
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13	492	WASHER FLAT 7/8" TYPE A NARROW 15/16" x 1 3/4" x 0.134"	-
14	492	SPRING WASHER, DOUBLE COIL (FE6)	-
15	1	CONCRETE TIE SET, 0-121 + (3) 1:80 TIES, PLATE PADS, PIM INSERTS, RH	-
16	500	CLIP PANDROL E2055	-
17	500	INSULATOR PANDROL FEATURES BASE HOLDOWN NYLON HD-10	-
18	8	CLIP PANDROL E2063	-
19	8	INSULATION, PANDROL NYLON 6790	-
20	254	TIE PAD PANDROL 6993SR	-
21	246	SHIM, TO REDUCE PLATE FLEXURE	-



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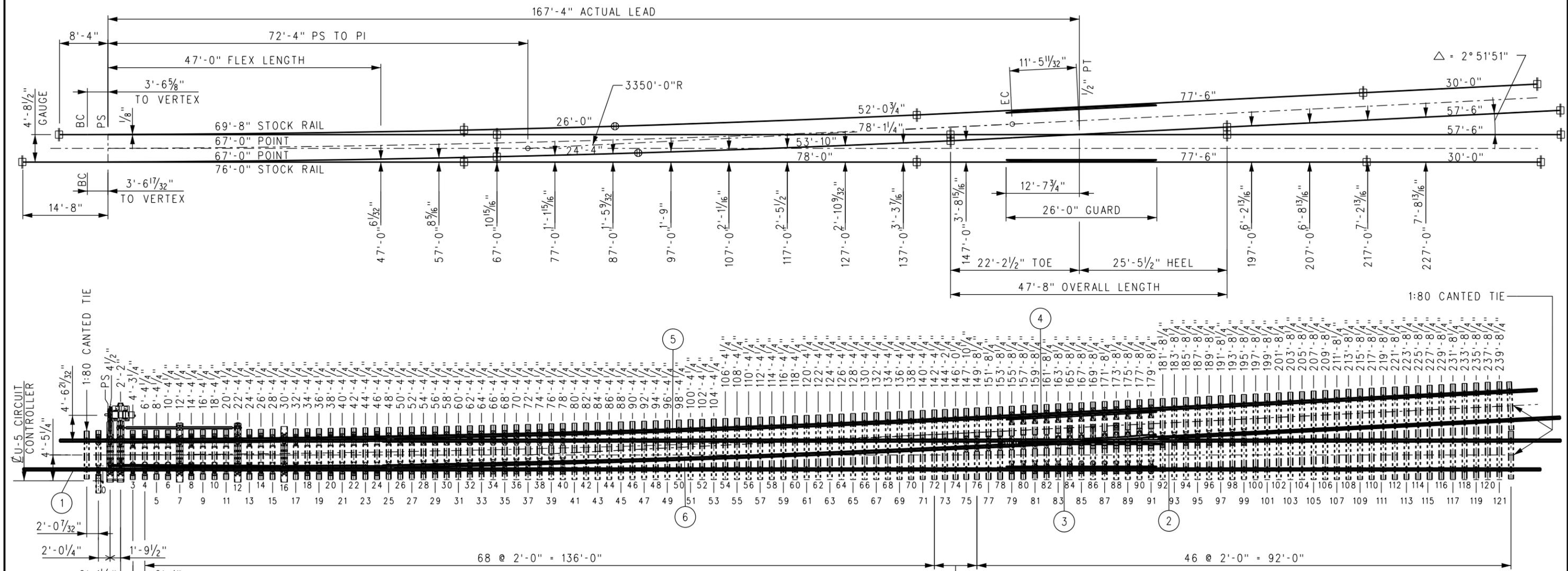
**TURNOUT DATA:**

FROG NO 20	Δ = 2° 51' 51"	SWITCH LENGTH OF POINTS:	47'-0" / 67'-0"	ACTUAL LEAD:	167'-4"
TOE LENGTH:	22'-2 1/2"	VERTEX DISTANCE:	VARIABLE PER SIDE	CLOSURE AREA:	
HEEL LENGTH:	25'-5 1/2"	ENTRY ANGLE:	0° 11' 55"	CENTERLINE RADIUS:	3350'-0"
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DRAWN BY: <i>Nareh D. Papp</i> HDR DATE: 03/31/2011		<p>SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012</p>	ENGINEERING STANDARDS		STANDARD: 2806
<p>ASSISTANT DIRECTOR: STANDARDS &amp; DESIGN</p> <p><i>William Davan</i> DIRECTOR OF ENGINEERING AND CONSTRUCTION</p>			TURNOUT LAYOUT		SCALE: NTS
<p>REVISION: XX XX</p> <p>REV. DATE DESCRIPTION DES. ENG.</p>		NO 20-136 LB RE RH WSM FROG TURNOUT HST, SWITCH MACHINE ON MAINLINE SIDE		REVISION SHEET: 1 OF 1	CADD FILE: ES2806-02

BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	DWG NO
1	1	SWITCH PACK, NO 20-136 LB RE MODIFIED TANGENTIAL, LH, HST	ES2806-13
2	1	FROG PACK, NO 20-136 LB RE WSM, LH	ES2806-41
3	1	GUARD RAIL ASSEMBLY BOLTLESS, 26'-0" LG, 136 LB RE RAISED 1", STRAIGHT	ES2800-50
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BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	DWG NO
12	492	TIE SCREW, CONCRETE 7/8" DIA x 6" HEX HEAD	-
13	492	WASHER FLAT 7/8" TYPE A NARROW 1 5/16" x 1 3/4" x 0.134"	-
14	492	SPRING WASHER, DOUBLE COIL (FE6)	-
15	1	CONCRETE TIE SET, 0-121 + (3) 1:80 TIES, PLATE PADS, LH	-
16	500	CLIP PANDROL E2055	-
17	500	INSULATOR PANDROL FEATURES BASE HOLDOWN NYLON HD-10	-
18	8	CLIP PANDROL E2063	-
19	8	INSULATION, PANDROL NYLON 6790	-
20	254	TIE PAD PANDROL 6993SR	-
21	246	SHIM, TO REDUCE PLATE FLEXURE	-



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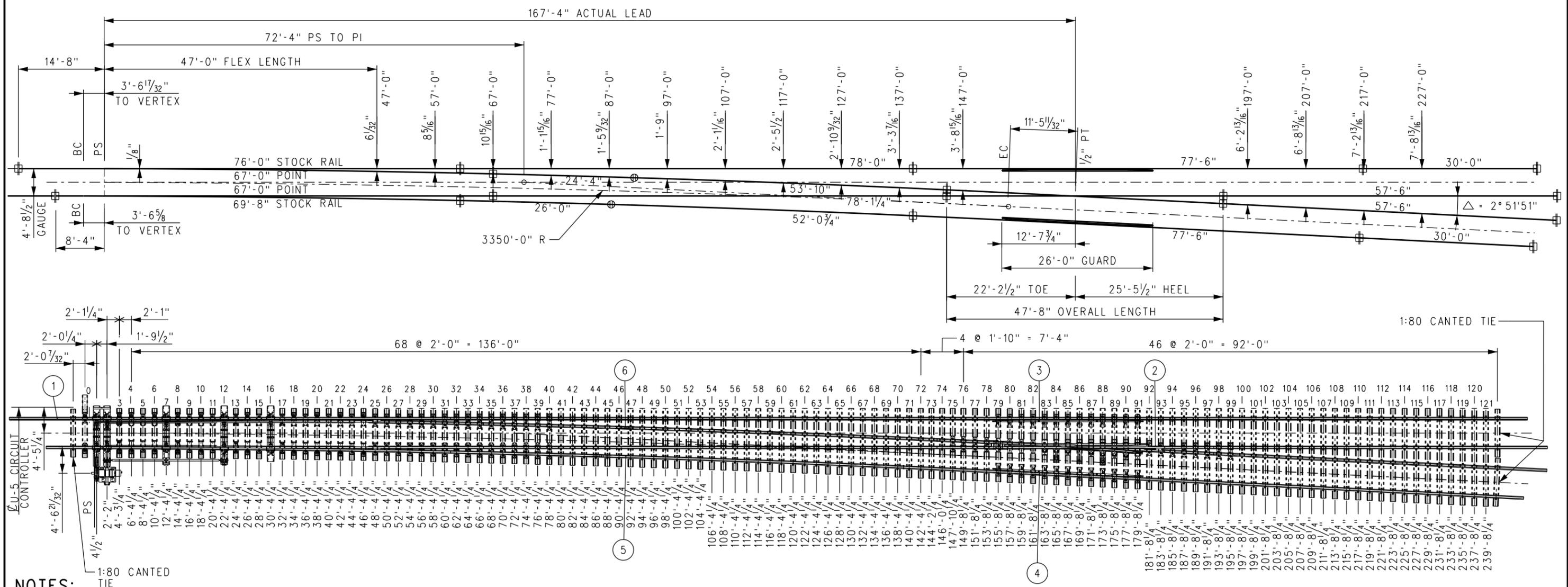
**TURNOUT DATA:**

FROG NO 20	Δ = 2° 51' 51"	SWITCH LENGTH OF POINTS:	47'-0" / 67'-0"	ACTUAL LEAD:	167'-4"
TOE LENGTH:	22'-2 1/2"	VERTEX DISTANCE:	VARIES PER SIDE	CLOSURE AREA	
HEEL LENGTH:	25'-5 1/2"	ENTRY ANGLE:	0° 11' 55"	CENTERLINE RADIUS:	3350'-0"
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DRAWN BY: <i>Nareh D. Papp</i> 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 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 TURNOUT LAYOUT NO 20-136 LB RE LH WSM FROG TURNOUT HST, SWITCH MACHINE ON TURNOUT SIDE	STANDARD: 2806 SCALE: NTS REVISION SHEET: 1 OF 1 CADD FILE: ES2806-03
ASSISTANT DIRECTOR: STANDARDS & DESIGN <i>William Davan</i> DIRECTOR OF ENGINEERING AND CONSTRUCTION					

BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	DWG NO
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**TURNOUT DATA:**

FROG NO 20	Δ = 2° 51' 51"	SWITCH LENGTH OF POINTS: 47'-0" / 67'-0"	ACTUAL LEAD: 167'-4"
TOE LENGTH: 22'-2 1/2"	HEEL LENGTH: 25'-5 1/2"	VERTEX DISTANCE: VARIES PER SIDE	CLOSURE AREA CENTERLINE RADIUS: 3350'-0"
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		THROW AT ROD *1: 4 3/4"	50 MPH PASSENGER @ 3" UNBALANCE
			40 MPH FREIGHT @ 2" UNBALANCE

DRAWN BY:	HDR:	DATE:	03/31/2011
 ASSISTANT DIRECTOR: STANDARDS & DESIGN			
 DIRECTOR OF ENGINEERING AND CONSTRUCTION			
REV.	DATE	DESCRIPTION	DES. ENG.
X	XX-XX-XX	REVISION	XX XX

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

ENGINEERING STANDARDS		STANDARD	2806
TURNOUT LAYOUT		SCALE:	NTS
NO 20-136 LB RE RH WSM FROG TURNOUT HST, SWITCH MACHINE ON TURNOUT SIDE		REVISION SHEET	1 OF 1
		CADD FILE:	ES2806-04



BILL OF MATERIAL

ITEM	QTY	DESCRIPTION	DWG NO	SCRR PART NO
1	1	HOLLOW SWITCH TIE & RODDING ASSEMBLY	ES2806-32	
2	1	SAMSON POINT, 67'-0" LONG, DOUBLE REINFORCED, UR MANG TIP, LH	ES2806-21	
3	1	SAMSON POINT, 67'-0" LONG, DOUBLE REINFORCED, UR MANG TIP, RH	ES2806-22	
4	1	SAMSON STOCK RAIL, 76'-0" LONG, STRAIGHT, LH	ES2806-25	
5	1	SAMSON STOCK RAIL, 69'-8" LONG, CURVED, RH	ES2806-26	
6	1	SWITCH HEEL BLOCK, 136 LB RE, UNIFORM RISER, LH	-	
7	1	SWITCH HEEL BLOCK, 136 LB RE, UNIFORM RISER, RH	-	
8	2	SWITCH PLATE (BP1C-136)	ES2800-80	
9	16	SWITCH PLATE (BP2C-136)	ES2800-80	
10	14	SWITCH PLATE (P4C-136)	ES2800-80	
11	4	SWITCH ROLLER PLATE (RP-1-136) SCHWIHAG	ES2800-96	
12	4	SWITCH ROLLER PLATE (RP-2-136) SCHWIHAG	ES2800-97	
13	1	SWITCH PLATE (20-25RLC)	ES2806-85	
14	1	SWITCH PLATE (20-25RRC)	ES2806-85	
15	1	SWITCH PLATE (20-26RLC)	ES2806-85	
16	1	SWITCH PLATE (20-26RRC)	ES2806-85	
17	1	SWITCH PLATE (20-27RLC)	ES2806-85	
18	1	SWITCH PLATE (20-27RRC)	ES2806-85	
19	1	SWITCH PLATE (20-28RLC)	ES2806-86	
20	1	SWITCH PLATE (20-28RRC)	ES2806-86	
21	1	SWITCH PLATE (20-29RLC)	ES2806-86	
22	1	SWITCH PLATE (20-29RRC)	ES2806-86	

BILL OF MATERIAL

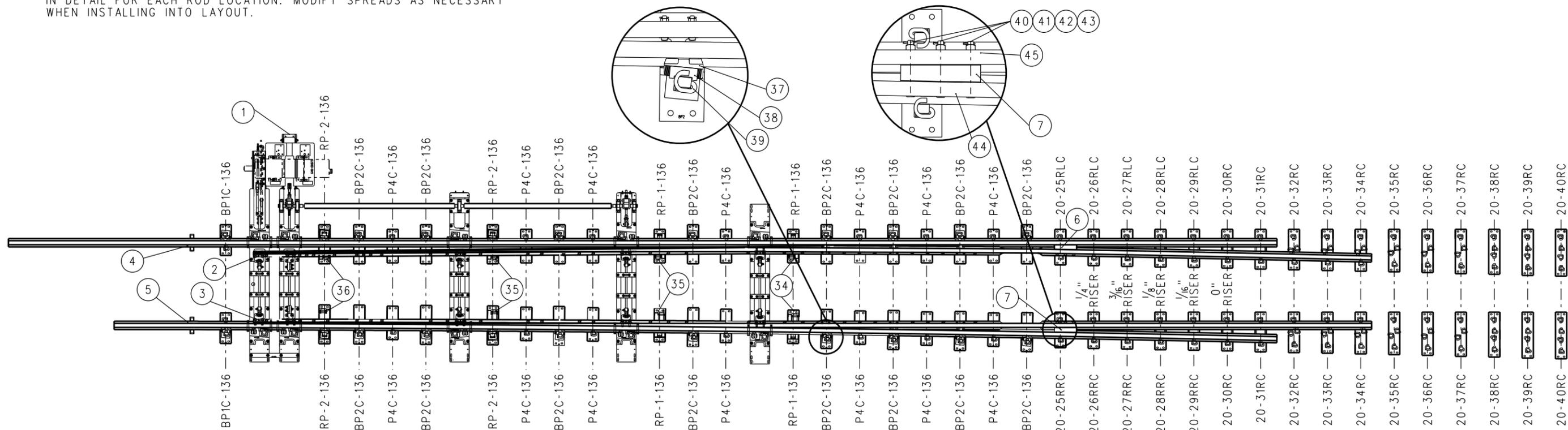
ITEM	QTY	DESCRIPTION	DWG NO	SCRR PART NO
23	2	SWITCH PLATE (20-30RC)	ES2806-86	
24	2	SWITCH PLATE (20-31RC)	ES2806-86	
25	2	SWITCH PLATE (20-32RC)	ES2806-87	
26	2	SWITCH PLATE (20-33RC)	ES2806-87	
27	2	SWITCH PLATE (20-34RC)	ES2806-87	
28	2	SWITCH PLATE (20-35RC)	ES2806-87	
29	2	SWITCH PLATE (20-36RC)	ES2806-87	
30	2	SWITCH PLATE (20-37RC)	ES2806-87	
31	2	SWITCH PLATE (20-38RC)	ES2806-88	
32	2	SWITCH PLATE (20-39RC)	ES2806-88	
33	2	SWITCH PLATE (20-40RC)	ES2806-88	
34	2	ROLLER SCHWIHAG, SINGLE	-	
35	4	ROLLER SCHWIHAG, DOUBLE	-	
36	2	ROLLER SCHWIHAG, TRIPLE	-	
37	22	BRACE, BOLTLESS, 136 LB RE 'SUREFIT'	-	
38	22	SERRATED WASHER FOR BOLTLESS BRACE	-	
39	142	CLIP, PANDROL, E2055	-	
40	6	BOLT, 1/8" DIA x 10 1/2" LONG, SQUARE HEAD, DRILLED @ 10/16", GR 5	-	
41	6	SPRING WASHER FOR 1/8" DIA BOLT	-	
42	6	NUT, 1/8" DIA HEAVY SQUARE, GR 5	-	
43	6	COTTER PIN, 1/4" DIA x 2 1/4" LONG	-	
44	2	FISH PLATE, 3-HOLE, 1/2" D-BAR x 16" LONG, HEADLOCKED	-	
45	2	FISH PLATE, 3-HOLE, 1/2" D-BAR x 16" LONG	-	

NOTES:

- SEE DRAWING ES2806-30 FOR TIE LOCATION DIMENSIONS.
- SWITCH RODS SHALL BE PREADJUSTED TO DIMENSIONS SHOWN IN DETAIL FOR EACH ROD LOCATION. MODIFY SPREADS AS NECESSARY WHEN INSTALLING INTO LAYOUT.

TYPICAL BOLTLESS BRACE ASSEMBLY

TYPICAL SWITCH HEEL ASSEMBLY



DRAWN BY: <i>Narek D. Pape</i>		HDR: <i>Willson Davan</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.

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

ENGINEERING STANDARDS

NO 20-136 LB RE RH SWITCH PACK,  
HOLLOW STEEL TIES,  
SWITCH MACHINE ON MAINLINE SIDE

STANDARD	2806
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2806-12

BILL OF MATERIAL

ITEM	QTY	DESCRIPTION	DWG NO	SCRR PART NO
1	1	HOLLOW SWITCH TIE & RODDING ASSEMBLY	ES2806-35	
2	1	SAMSON POINT, 67'-0" LONG, DOUBLE REINFORCED, UR MANG TIP, LH	ES2806-21	
3	1	SAMSON POINT, 67'-0" LONG, DOUBLE REINFORCED, UR MANG TIP, RH	ES2806-22	
4	1	SAMSON STOCK RAIL, 69'-8" LONG, CURVED, LH	ES2806-23	
5	1	SAMSON STOCK RAIL, 76'-0" LONG, STRAIGHT, RH	ES2806-24	
6	1	SWITCH HEEL BLOCK, 136 LB RE, UNIFORM RISER, LH	-	
7	1	SWITCH HEEL BLOCK, 136 LB RE, UNIFORM RISER, RH	-	
8	2	SWITCH PLATE (BP1C-136)	ES2800-80	
9	16	SWITCH PLATE (BP2C-136)	ES2800-80	
10	14	SWITCH PLATE (P4C-136)	ES2800-80	
11	4	SWITCH ROLLER PLATE (RP-1-136) SCHWIHAG	ES2800-96	
12	4	SWITCH ROLLER PLATE (RP-2-136) SCHWIHAG	ES2800-97	
13	1	SWITCH PLATE (20-25LLC)	ES2806-81	
14	1	SWITCH PLATE (20-25LRC)	ES2806-81	
15	1	SWITCH PLATE (20-26LLC)	ES2806-81	
16	1	SWITCH PLATE (20-26LRC)	ES2806-81	
17	1	SWITCH PLATE (20-27LLC)	ES2806-81	
18	1	SWITCH PLATE (20-27LRC)	ES2806-81	
19	1	SWITCH PLATE (20-28LLC)	ES2806-82	
20	1	SWITCH PLATE (20-28LRC)	ES2806-82	
21	1	SWITCH PLATE (20-29LLC)	ES2806-82	
22	1	SWITCH PLATE (20-29LRC)	ES2806-82	

BILL OF MATERIAL

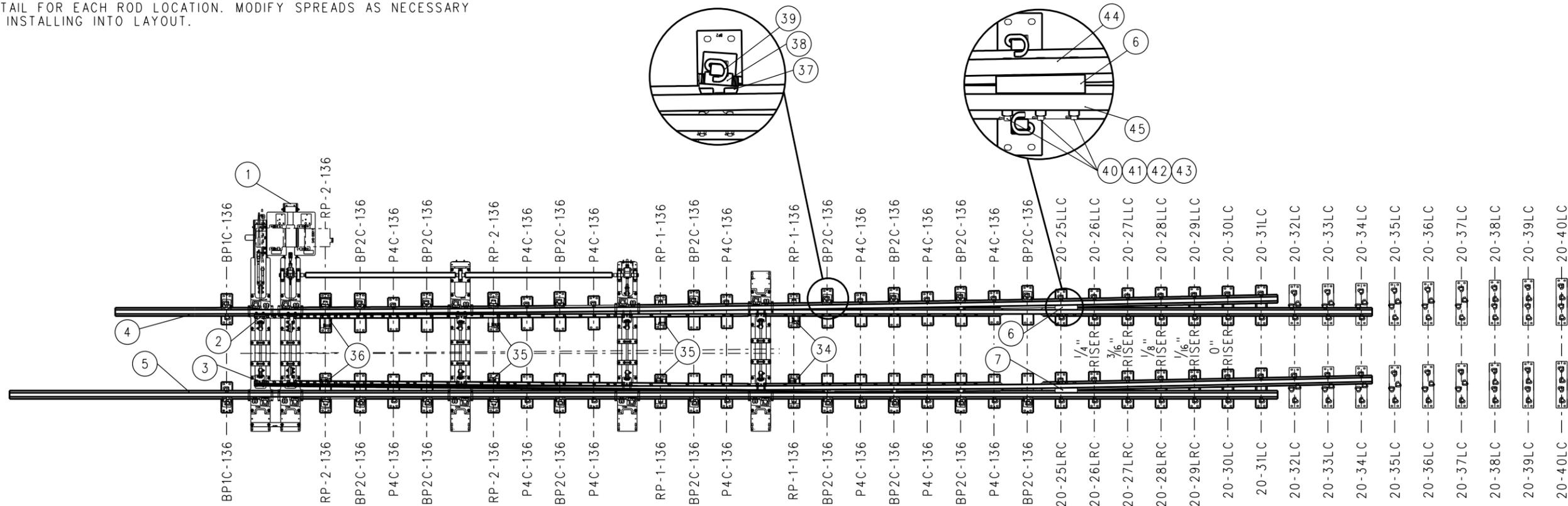
ITEM	QTY	DESCRIPTION	DWG NO	SCRR PART NO
23	2	SWITCH PLATE (20-30LC)	ES2806-82	
24	2	SWITCH PLATE (20-31LC)	ES2806-82	
25	2	SWITCH PLATE (20-32LC)	ES2806-83	
26	2	SWITCH PLATE (20-33LC)	ES2806-83	
27	2	SWITCH PLATE (20-34LC)	ES2806-83	
28	2	SWITCH PLATE (20-35LC)	ES2806-83	
29	2	SWITCH PLATE (20-36LC)	ES2806-83	
30	2	SWITCH PLATE (20-37LC)	ES2806-83	
31	2	SWITCH PLATE (20-38LC)	ES2806-84	
32	2	SWITCH PLATE (20-39LC)	ES2806-84	
33	2	SWITCH PLATE (20-40LC)	ES2806-84	
34	2	ROLLER SCHWIHAG, SINGLE	-	
35	4	ROLLER SCHWIHAG, DOUBLE	-	
36	2	ROLLER SCHWIHAG, TRIPLE	-	
37	22	BRACE, BOLTLESS, 136 LB RE 'SUREFIT'	-	
38	22	SERRATED WASHER FOR BOLTLESS BRACE	-	
39	142	CLIP, PANDROL, E2055	-	
40	6	BOLT, 1 1/8" DIA x 10 1/2" LONG, SQUARE HEAD, DRILLED @ 10 1/16", GR 5	-	
41	6	SPRING WASHER FOR 1 1/8" DIA BOLT	-	
42	6	NUT, 1 1/8" DIA HEAVY SQUARE, GR 5	-	
43	6	COTTER PIN, 1/4" DIA x 2 1/4" LONG	-	
44	2	FISH PLATE, 3-HOLE, 1/2" D-BAR x 16" LONG, HEADLOCKED	-	
45	2	FISH PLATE, 3-HOLE, 1/2" D-BAR x 16" LONG	-	

NOTES:

- SEE DRAWING ES2806-31 FOR TIE LOCATION DIMENSIONS.
- SWITCH RODS SHALL BE PREADJUSTED TO DIMENSIONS SHOWN IN DETAIL FOR EACH ROD LOCATION. MODIFY SPREADS AS NECESSARY WHEN INSTALLING INTO LAYOUT.

TYPICAL BOLTLESS BRACE ASSEMBLY

TYPICAL SWITCH HEEL ASSEMBLY



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

DRAWN BY: *Nareh D. Papp* HDR DATE: 03/31/2011  
 ASSISTANT DIRECTOR: STANDARDS & DESIGN  
*William Davan*  
 DIRECTOR OF ENGINEERING AND CONSTRUCTION

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ENGINEERING STANDARDS  
 NO 20-136 LB RE LH SWITCH PACK, HOLLOW STEEL TIES, SWITCH MACHINE ON TURNOUT SIDE

STANDARD	2806
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2806-13

BILL OF MATERIAL

ITEM	QTY	DESCRIPTION	DWG NO	SCRR PART NO
1	1	HOLLOW SWITCH TIE & RODDING ASSEMBLY	ES2806-34	
2	1	SAMSON POINT, 67'-0" LONG, DOUBLE REINFORCED, UR MANG TIP, LH	ES2806-21	
3	1	SAMSON POINT, 67'-0" LONG DOUBLE REINFORCED, UR MANG TIP, RH	ES2806-22	
4	1	SAMSON STOCK RAIL, 76'-0" LONG, STRAIGHT, LH	ES2806-25	
5	1	SAMSON STOCK RAIL, 69'-8" LONG, CURVED, RH	ES2806-26	
6	1	SWITCH HEEL BLOCK, 136 LB RE, UNIFORM RISER, LH	-	
7	1	SWITCH HEEL BLOCK, 136 LB RE, UNIFORM RISER, RH	-	
8	2	SWITCH PLATE (BP1C-136)	ES2800-80	
9	16	SWITCH PLATE (BP2C-136)	ES2800-80	
10	14	SWITCH PLATE (P4C-136)	ES2800-80	
11	4	SWITCH ROLLER PLATE (RP-1-136) SCHWIHAG	ES2800-96	
12	4	SWITCH ROLLER PLATE (RP-2-136) SCHWIHAG	ES2800-97	
13	1	SWITCH PLATE (20-25RLC)	ES2806-85	
14	1	SWITCH PLATE (20-25RRC)	ES2806-85	
15	1	SWITCH PLATE (20-26RLC)	ES2806-85	
16	1	SWITCH PLATE (20-26RRC)	ES2806-85	
17	1	SWITCH PLATE (20-27RLC)	ES2806-85	
18	1	SWITCH PLATE (20-27RRC)	ES2806-85	
19	1	SWITCH PLATE (20-28RLC)	ES2806-86	
20	1	SWITCH PLATE (20-28RRC)	ES2806-86	
21	1	SWITCH PLATE (20-29RLC)	ES2806-86	
22	1	SWITCH PLATE (20-29RRC)	ES2806-86	

BILL OF MATERIAL

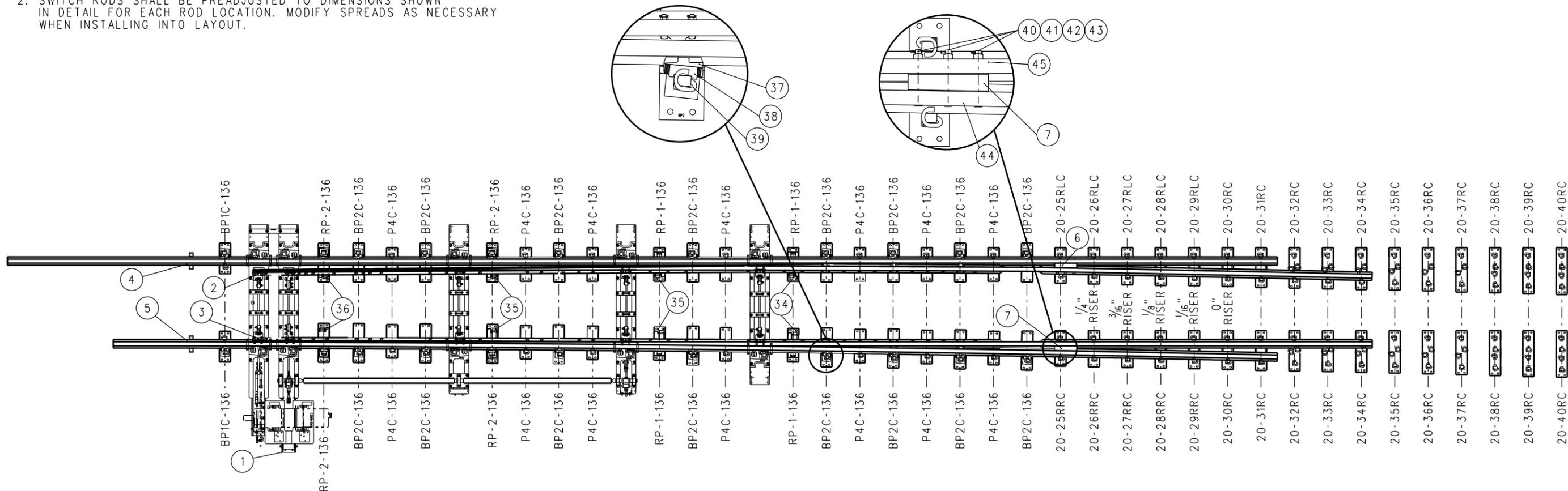
ITEM	QTY	DESCRIPTION	DWG NO	SCRR PART NO
23	2	SWITCH PLATE (20-30RC)	ES2806-86	
24	2	SWITCH PLATE (20-31RC)	ES2806-86	
25	2	SWITCH PLATE (20-32RC)	ES2806-87	
26	2	SWITCH PLATE (20-33RC)	ES2806-87	
27	2	SWITCH PLATE (20-34RC)	ES2806-87	
28	2	SWITCH PLATE (20-35RC)	ES2806-87	
29	2	SWITCH PLATE (20-36RC)	ES2806-87	
30	2	SWITCH PLATE (20-37RC)	ES2806-87	
31	2	SWITCH PLATE (20-38RC)	ES2806-88	
32	2	SWITCH PLATE (20-39RC)	ES2806-88	
33	2	SWITCH PLATE (20-40RC)	ES2806-88	
34	2	ROLLER SCHWIHAG, SINGLE	-	
35	4	ROLLER SCHWIHAG, DOUBLE	-	
36	2	ROLLER SCHWIHAG, TRIPLE	-	
37	22	BRACE, BOLTLESS, 136 LB RE 'SUREFIT'	-	
38	22	SERRATED WASHER FOR BOLTLESS BRACE	-	
39	142	CLIP, PANDROL, E2055	-	
40	6	BOLT, 1/8" DIA x 10 1/2" LONG, SQUARE HEAD, DRILLED @ 10 1/16", GR 5	-	
41	6	SPRING WASHER FOR 1/8" DIA BOLT	-	
42	6	NUT, 1/8" DIA HEAVY SQUARE, GR 5	-	
43	6	COTTER PIN, 1/4" DIA x 2 1/4" LONG	-	
44	2	FISH PLATE, 3-HOLE, 1/2" D-BAR x 16" LONG, HEADLOCKED	-	
45	2	FISH PLATE, 3-HOLE, 1/2" D-BAR x 16" LONG	-	

NOTES:

- SEE DRAWING ES2806-30 FOR TIE LOCATION DIMENSIONS.
- SWITCH RODS SHALL BE PREADJUSTED TO DIMENSIONS SHOWN IN DETAIL FOR EACH ROD LOCATION. MODIFY SPREADS AS NECESSARY WHEN INSTALLING INTO LAYOUT.

TYPICAL BOLTLESS BRACE ASSEMBLY

TYPICAL SWITCH HEEL ASSEMBLY



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

DRAWN BY: *Narek D. Pape* HDR DATE: 03/31/2011  
 ASSISTANT DIRECTOR: STANDARDS & DESIGN  
*William Davan*  
 DIRECTOR OF ENGINEERING AND CONSTRUCTION

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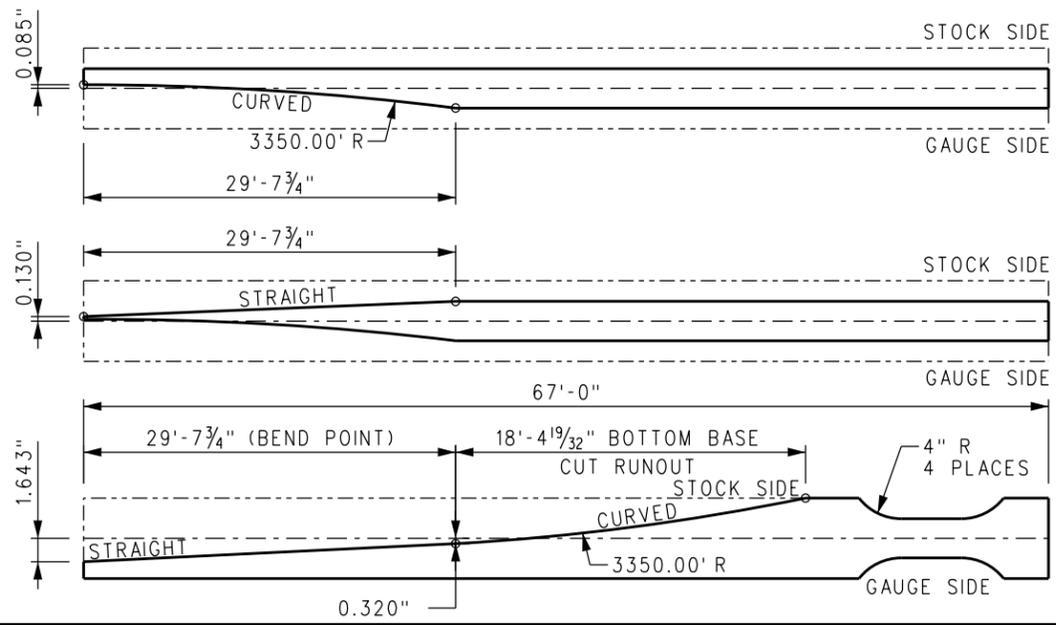
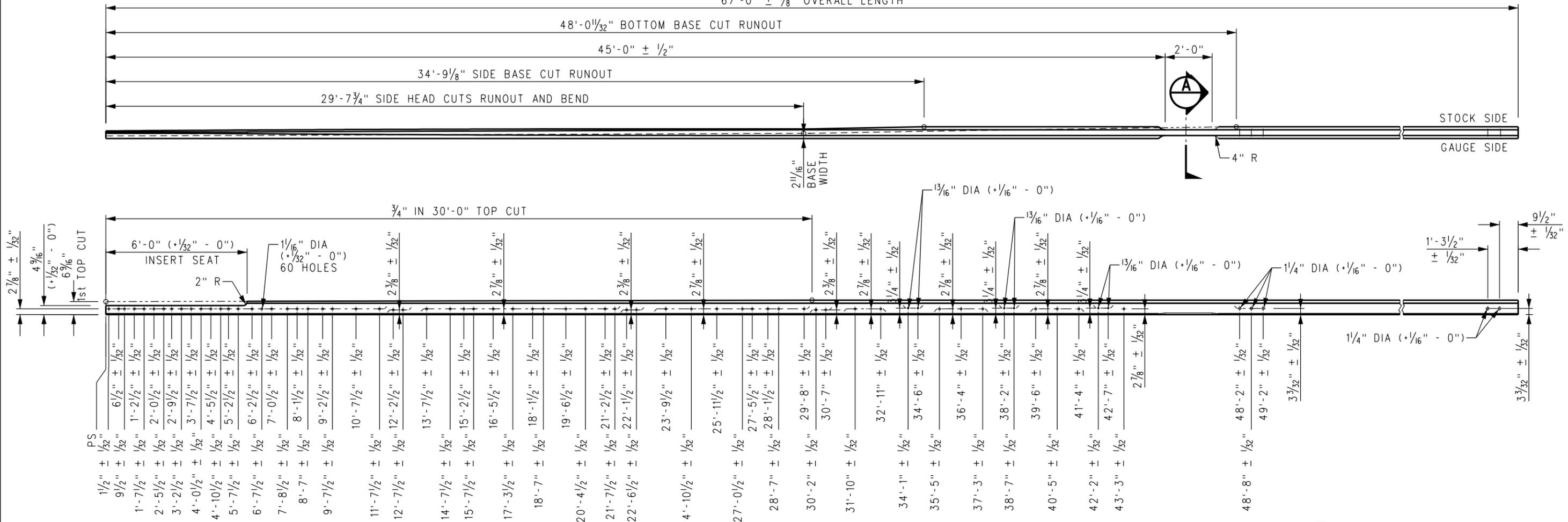
**METROLINK**  
 SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
 ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS  
 NO 20-136 LB RE RH SWITCH PACK,  
 HOLLOW STEEL TIES,  
 SWITCH MACHINE ON TURNOUT SIDE

STANDARD	2806
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2806-14

ITEM	QTY	DESCRIPTION	SCRR PART NO
1	1	RAIL, 136 LB RE x 67'-0" LONG	

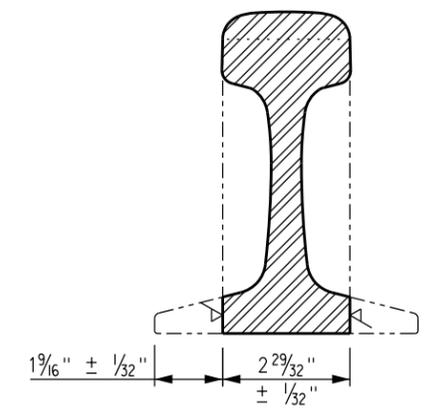
67'-0" ± 1/8" OVERALL LENGTH



GAUGE SIDE HEAD CUT:  
DIMENSIONS @ 6 1/16" AT RAIL BEND  
STRAIGHT WEB, TOP VIEW

STOCK SIDE HEAD CUT:  
DIMENSIONS @ 6 1/16" AT RAIL BEND  
STRAIGHT WEB, TOP VIEW

UNDERSIDE BASE CUT:  
DIMENSIONS @ BASE.  
STRAIGHT WEB, TOP VIEW



HALF SIZE (A)

**NOTES:**

1. MACHINE SIDE HEAD CUTS BEFORE REMOVING HEAD AND WEB AREA SHOWN FOR MANGANESE TIP.
2. POINT TO BE MACHINED STRAIGHT.
3. ALL HOLES SHALL BE CHAMFERED WITH 1/8" R EDGES.

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

DRAWN BY: HDR DATE: 03/31/2011  
*Nareh D. Papp*  
 ASSISTANT DIRECTOR: STANDARDS & DESIGN  
*William Davan*  
 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  
 SWITCH POINT ASSEMBLY, 136 LB RE SAMSON, LH  
 NO 20 LH /RH TURNOUT  
 67'-0" OVERALL LENGTH MANGANESE TIP

STANDARD	2806
SCALE	NTS
REVISION SHEET	1 OF 1
CADD FILE	ES2806-21

ITEM	QTY	DESCRIPTION	SCRRRA PART NO
1	1	RAIL, 136 LB RE x 67'-0" LONG	

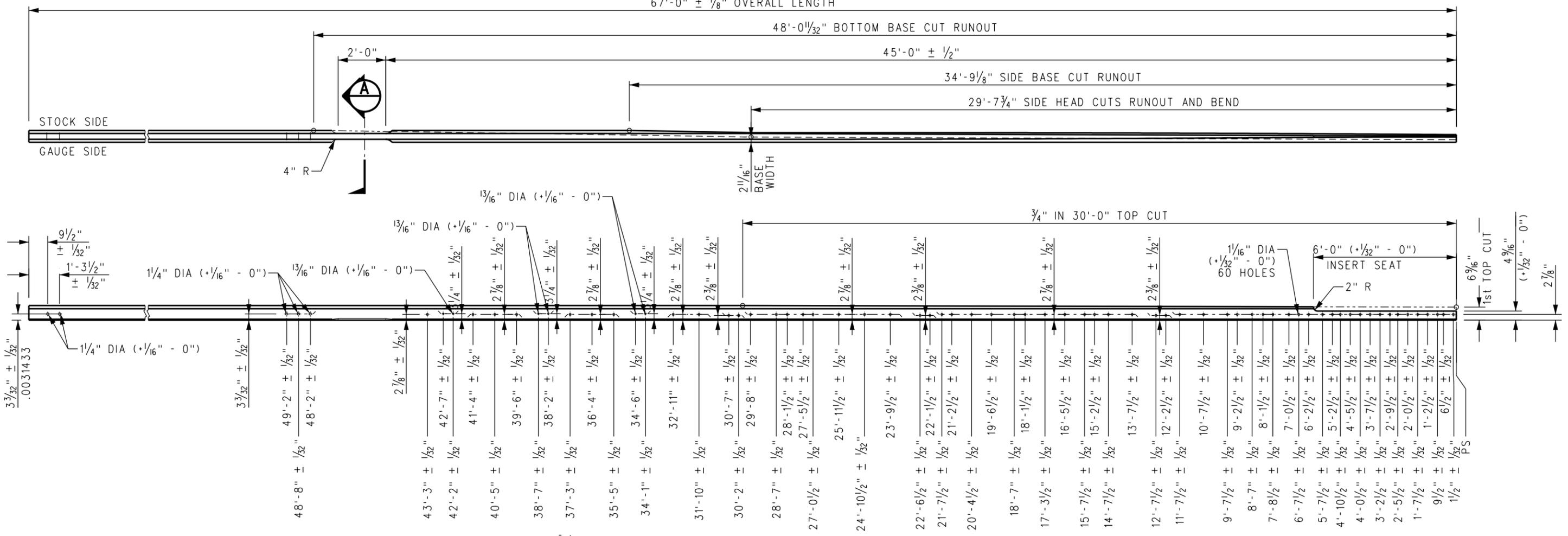
67'-0" ± 1/8" OVERALL LENGTH

48'-0 1/32" BOTTOM BASE CUT RUNOUT

45'-0" ± 1/2"

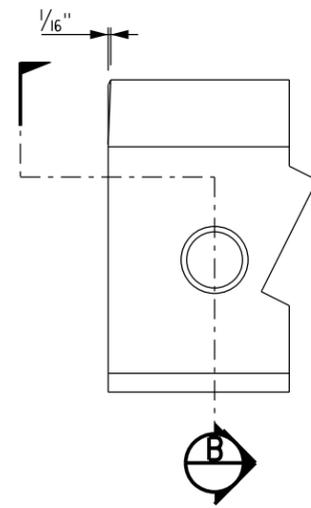
34'-9 1/8" SIDE BASE CUT RUNOUT

29'-7 3/4" SIDE HEAD CUTS RUNOUT AND BEND

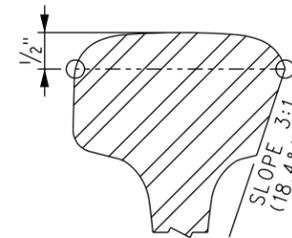


BILL OF MATERIAL

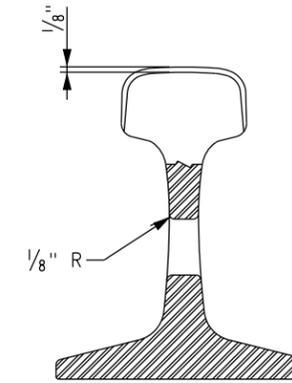
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	1	RAIL, 136 LB RE 69'-8" LONG	



**RAIL END/HOLE BEVELING DETAIL**  
RAIL HEAD ONLY - NOT BASE

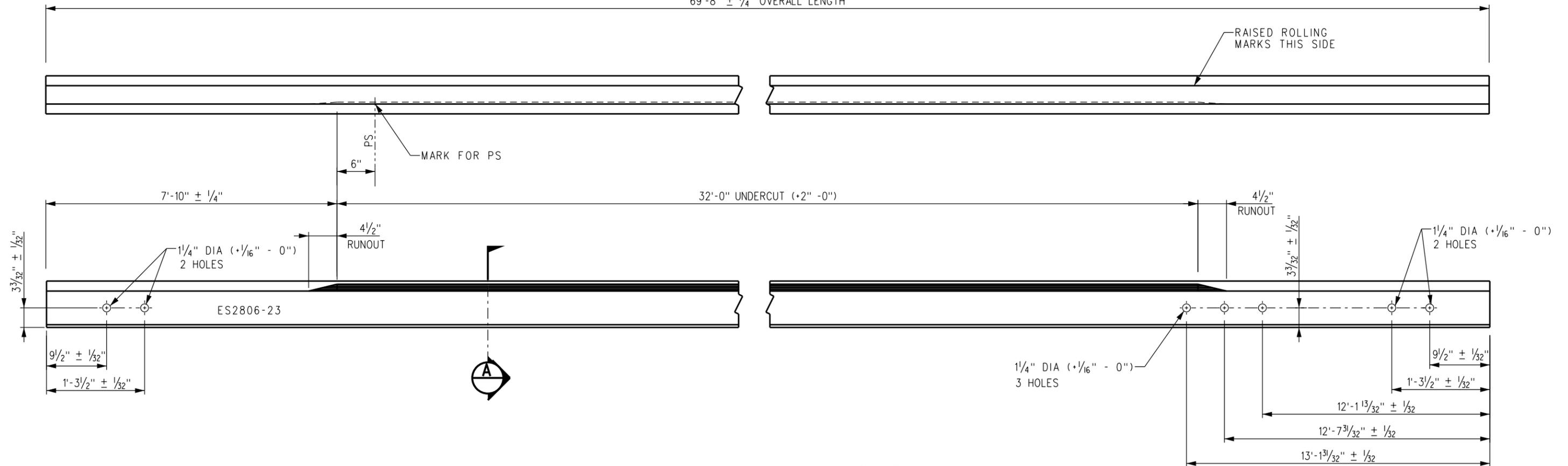


**PARTIAL SECTION A**



**SECTION B**

69'-8" ± 1/4" OVERALL LENGTH



**NOTES:**

1. ALL BURNING METHODS PROHIBITED.
2. ALL BOLT HOLES TO BE BEVELED PER DETAIL.
3. POINT OF SWITCH TO BE MARKED ON GAUGE SIDE OF WEB WITH A WHITE LINE USING WATERPROOF MARKER OR PAINT.
4. WRITE SCRRA ES NUMBER ON WEB OF RAIL WITH WATERPROOF MARKER OR PAINT.

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

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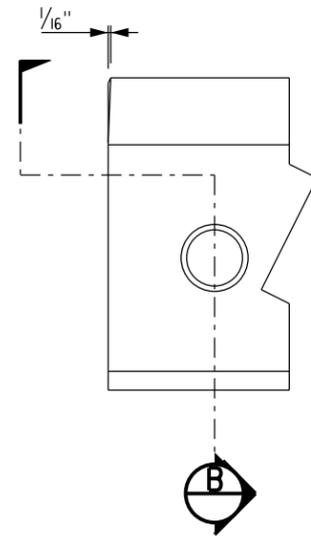
**METROLINK**  
SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

**ENGINEERING STANDARDS**  
SAMSON STOCK RAIL, LH  
136 LB RE 69'-8" LONG  
FOR NO 20 136 LB RE LH SWITCH PACK

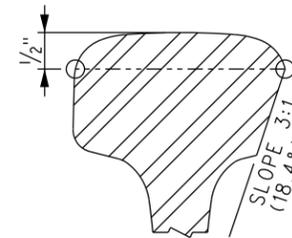
STANDARD	2806
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2806-23

BILL OF MATERIAL

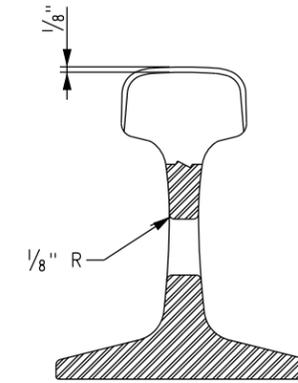
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	1	RAIL, 136 LB RE 76'-0" LONG	



**RAIL END/HOLE BEVELING DETAIL**  
RAIL HEAD ONLY - NOT BASE

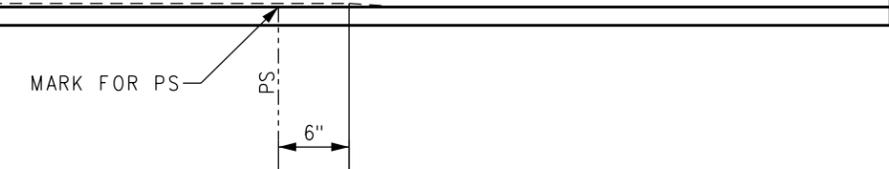
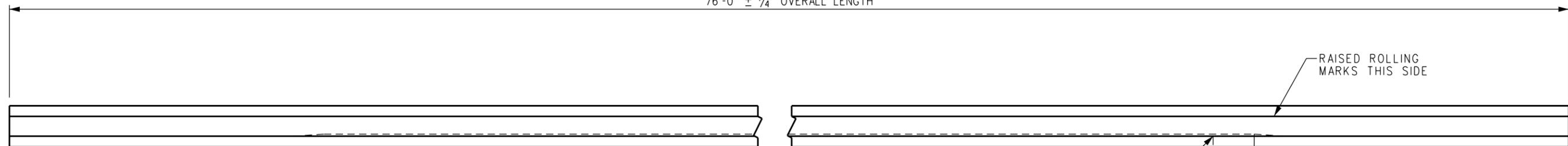


**PARTIAL SECTION A**



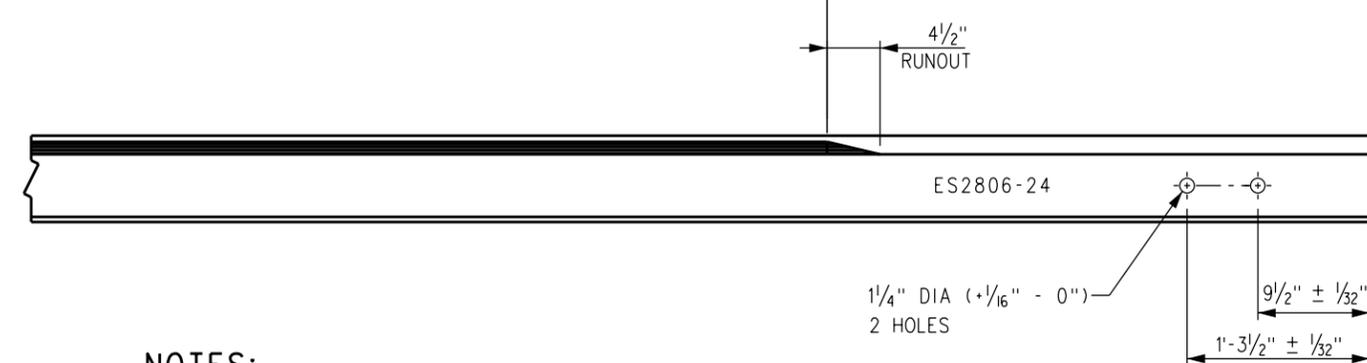
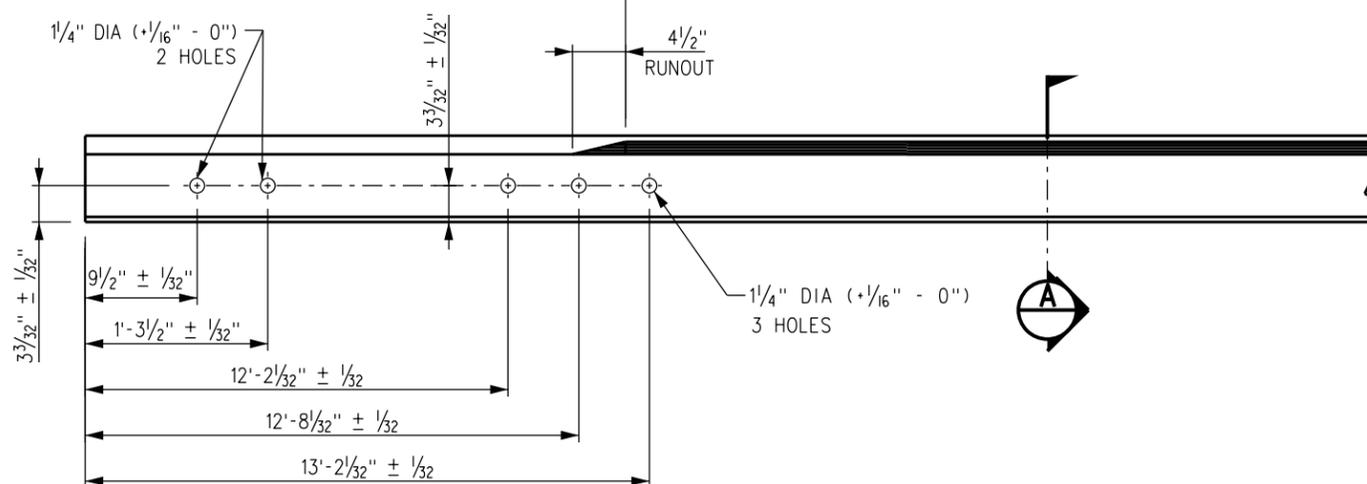
**SECTION B**

76'-0" ± 1/4" OVERALL LENGTH



32'-0" UNDERCUT (+2" -0")

14'-2" ± 1/4"



**NOTES:**

1. ALL BURNING METHODS PROHIBITED.
2. ALL BOLT HOLES TO BE BEVELED PER DETAIL.
3. POINT OF SWITCH TO BE MARKED ON GAUGE SIDE OF WEB WITH A WHITE LINE USING WATERPROOF MARKER OR PAINT.
4. WRITE SCRRA ES NUMBER ON WEB OF RAIL WITH WATERPROOF MARKER OR PAINT.

DRAWN BY: <i>Nareh D. Papp</i>		HDR: <i>Wilson Dacan</i>		DATE: 03/31/2011	
ASSISTANT DIRECTOR: STANDARDS & DESIGN		DIRECTOR OF ENGINEERING AND CONSTRUCTION			
X	XX-XX-XX	REVISION	XX	XX	
REV.	DATE	DESCRIPTION	DES.	ENG.	

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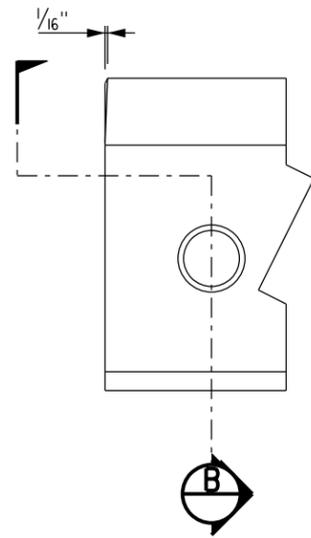
**METROLINK**  
SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

**ENGINEERING STANDARDS**  
SAMSON STOCK RAIL, RH  
136 LB RE 76'-0" LONG  
FOR NO 20 136 LB RE LH SWITCH PACK

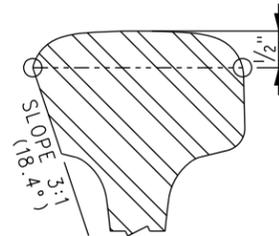
STANDARD	2806
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2806-24

BILL OF MATERIAL

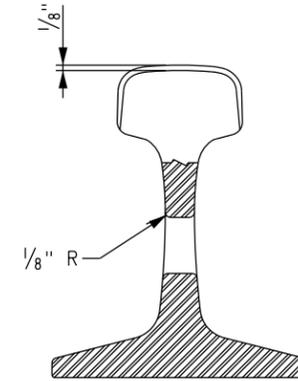
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	1	RAIL, 136 LB RE 76'-0" LONG	



**RAIL END/HOLE BEVELING DETAILS**  
RAIL HEAD ONLY - NOT BASE

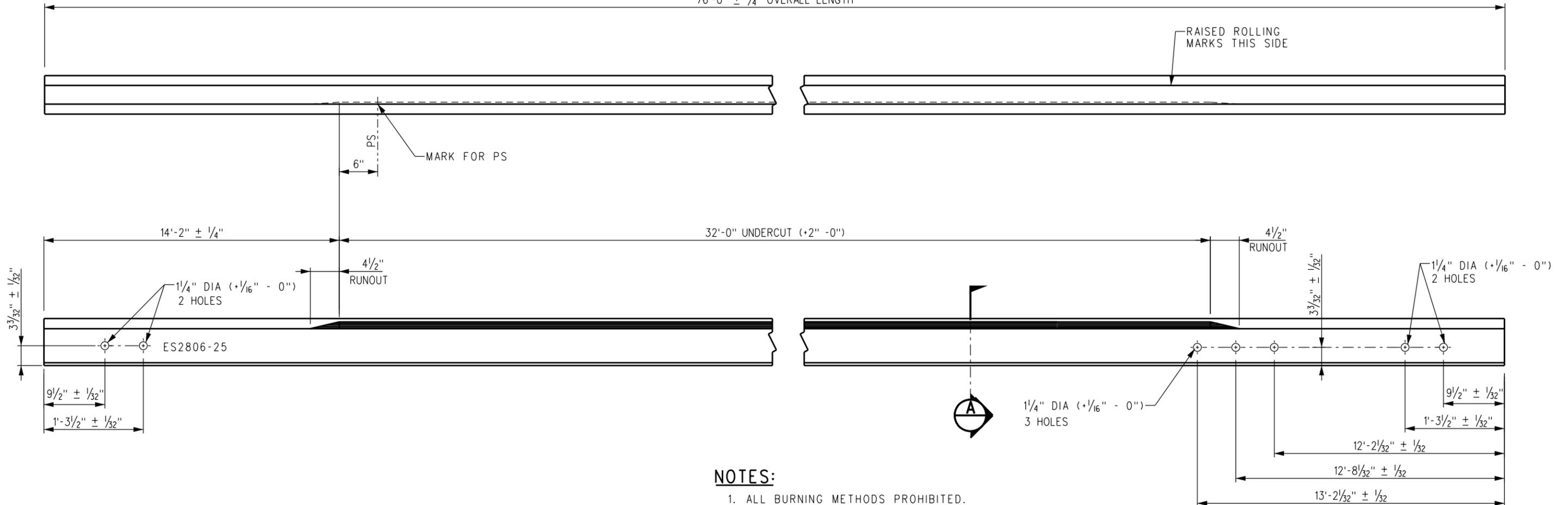


**PARTIAL SECTION A**



**SECTION B**

76'-0" ± 1/4" OVERALL LENGTH



**NOTES:**

1. ALL BURNING METHODS PROHIBITED.
2. ALL BOLT HOLES TO BE BEVELED PER DETAIL.
3. POINT OF SWITCH TO BE MARKED ON GAUGE SIDE OF WEB WITH A WHITE LINE USING WATERPROOF MARKER OR PAINT.
4. WRITE SCRRA ES NUMBER ON WEB OF RAIL WITH WATERPROOF MARKER OR PAINT.

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 Dava*  
 DIRECTOR OF ENGINEERING AND CONSTRUCTION

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.

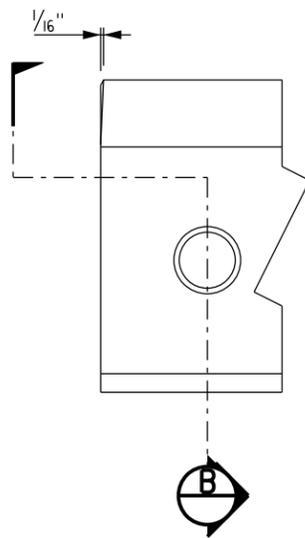
**METROLINK**  
 SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
 ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

**ENGINEERING STANDARDS**  
 SAMSON STOCK RAIL, LH  
 136 LB RE 76'-0" LONG  
 FOR NO 20 136 LB RE RH SWITCH PACK

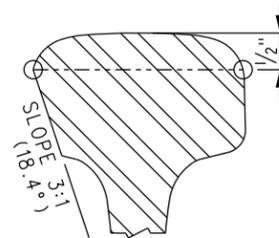
STANDARD	2806
SCALE	NTS
REVISION SHEET	1 OF 1
CADD FILE	ES2806-25

BILL OF MATERIAL

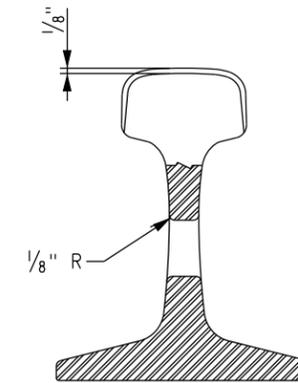
ITEM	QTY	DESCRIPTION	SCRRA PART NO
1	1	RAIL, 136 LB RE 69'-8" LONG	



**RAIL END/HOLE BEVELING DETAILS**  
RAIL HEAD ONLY - NOT BASE

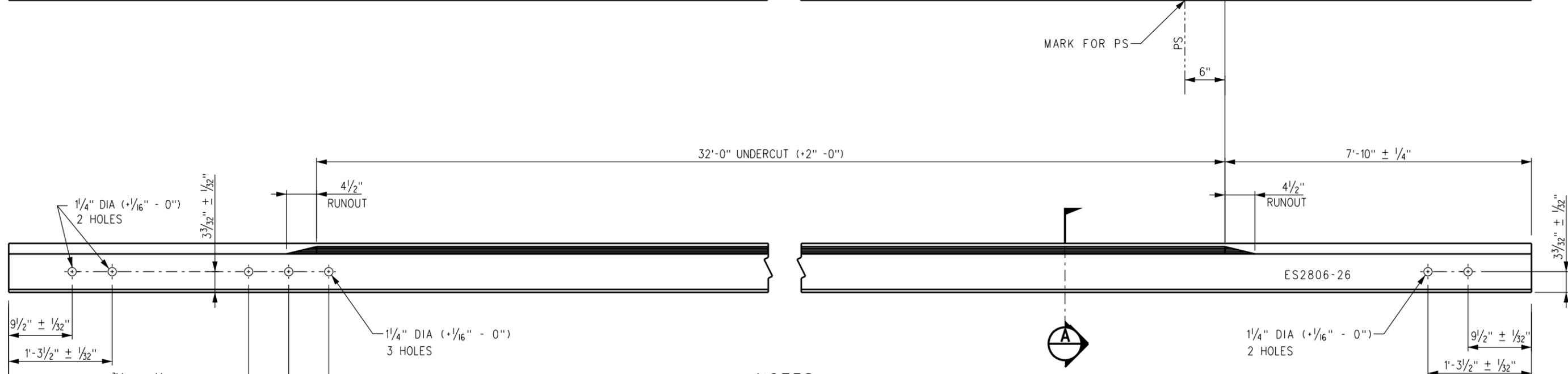
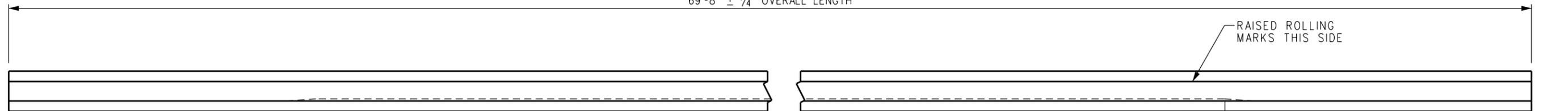


**PARTIAL SECTION A**



**SECTION B**

69'-8" ± 1/4" OVERALL LENGTH



**NOTES:**

1. ALL BURNING METHODS PROHIBITED.
2. ALL BOLT HOLES TO BE BEVELED PER DETAIL.
3. POINT OF SWITCH TO BE MARKED ON GAUGE SIDE OF WEB WITH A WHITE LINE USING WATERPROOF MARKER OR PAINT.
4. WRITE SCRRA ES NUMBER ON WEB OF RAIL WITH WATERPROOF MARKER OR PAINT.

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			
REVISION	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

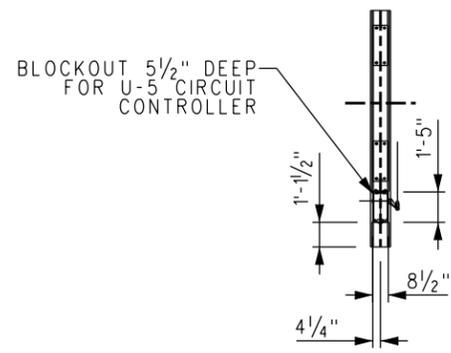
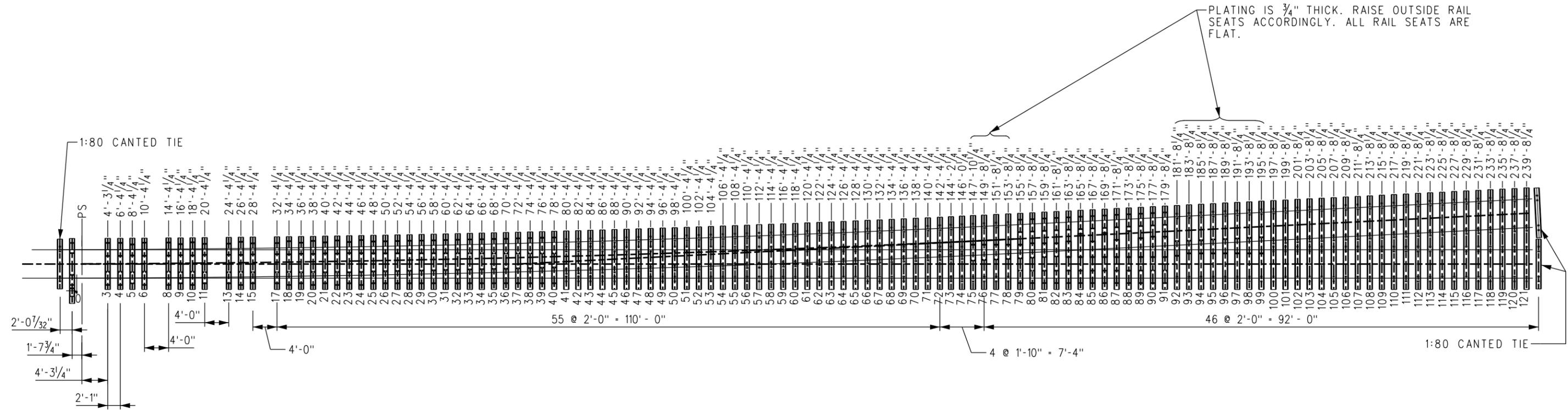
**ENGINEERING STANDARDS**  
SAMSON STOCK RAIL, RH  
136 LB RE 69'-8" LONG  
FOR NO 20 136 LB RE RH SWITCH PACK

STANDARD	2806
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2806-26



BILL OF MATERIALS

ITEM	QTY	DESCRIPTION	DWG NO
1	5	TIES 1,2,7,12 AND 16, POWER SWITCH MACHINE ON MAINLINE SIDE FOR LH TURNOUT (HOLLOW STEEL)	ES2806-33
2	5	TIES 1,2,7,12 AND 16, POWER SWITCH MACHINE ON TURNOUT SIDE FOR LH TURNOUT (HOLLOW STEEL)	ES2806-35



TIE #0 BLOCKOUT DETAIL

NOTES:

1. SET TO INCLUDE TIES 0, 3 THROUGH 6, 8 THROUGH 11, 13 THROUGH 15 AND 17 THROUGH 121, THREE 1:80 CANTED TIES, PLATE TIE PADS AND RIM INSERTS.
2. TIE LENGTHS ARE DETERMINED BY ADDING 1'-10 7/16" FROM RAIL GAUGE LINE (OR 1'-9" FROM RAIL CENTERLINE) PER SIDE AT THE CENTERLINE OF EACH TIE LOCATION.
3. ALL TIES ARE FLAT (NON-CANTED) EXCEPT 1:80 CANTED TIES.
4. TRANSITION TIES (QUANTITY 3) SHALL INCORPORATE 1:80 CANTED RAIL SEATS AND USE 4'-8 1/2" BETWEEN STRAIGHT RAIL SEAT GAUGES. LENGTH SHALL BE 8'-3".
5. THIS DRAWING SHOWS TIE "0" PLACEMENT FOR SWITCH MACHINE ON LH/TURNOUT SIDE. USE OPPOSITE HAND FOR SWITCH MACHINE ON RH/MAINLINE SIDE.
6. SEE BILL OF MATERIALS ABOVE FOR TIES 1, 2, 7, 12 AND 16.

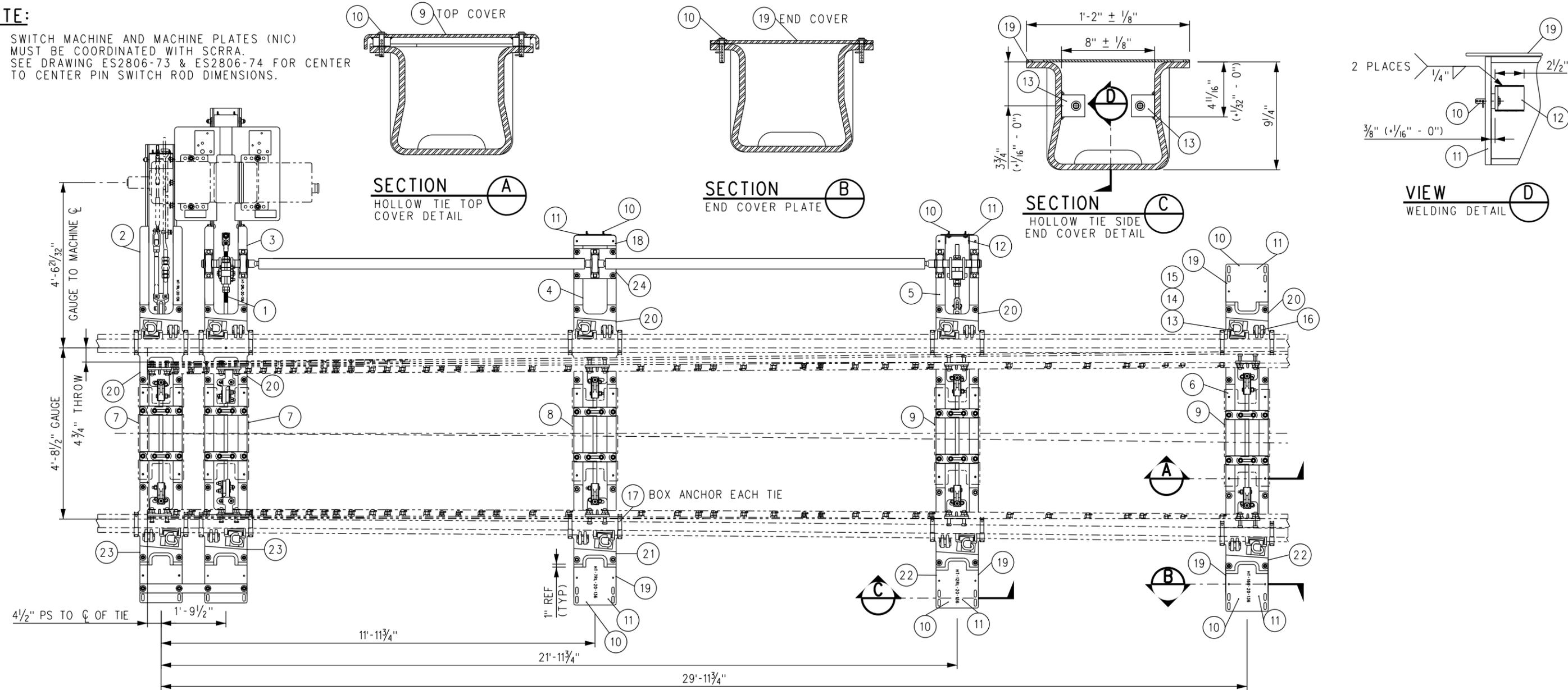
DRAWN BY: <i>Nareh D. Papp</i> HDR DATE: 03/31/2011		<p>SCRR ENGINEERING STANDARDS ARE INTENDED FOR SCRR APPROVED USES ONLY. FOR NON-SCRR APPROVED USES SCRR SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THE DATA OR INFORMATION CONTAINED HEREIN. THE SELECTION AND USE OF THESE STANDARDS 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>	<p>SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012</p>	<p>ENGINEERING STANDARDS</p> <p>CONCRETE TIE LAYOUT NO 20-136 LB RE SPRING FROG TURNOUT, LH</p>	STANDARD 2806
<p>ASSISTANT DIRECTOR: STANDARDS &amp; DESIGN</p> <p><i>William Dava</i> DIRECTOR OF ENGINEERING AND CONSTRUCTION</p>					SCALE: NTS
REV. DATE	DESCRIPTION	DES. ENG.	REVISION SHEET	1 OF 1	CADD FILE: ES2806-31

BILL OF MATERIAL				BILL OF MATERIAL					
ITEM	QTY	DESCRIPTION	DWG NO	SCRR PART NO	ITEM	QTY	DESCRIPTION	DWG NO	SCRR PART NO
1	1	RODDING ASSEMBLY FOR NO 20-136 LB RE, SWITCH MACHINE ON RH SIDE	ES2806-71		13	10	LV BRACE FOR 136 LB RE	-	
2	1	HOLLOW TIE ASSEMBLY (HT-1LR-20-136)	-		14	10	SERRATED WASHER FOR LV BRACE	-	
3	1	HOLLOW TIE ASSEMBLY (HT-2LR-20-136)	-		15	10	CLIP, PANDROL, E2055	-	
4	1	HOLLOW TIE ASSEMBLY (HT-7LR-20-136)	-		16	10	CLIP, SAFELOK, AB2000	-	
5	1	HOLLOW TIE ASSEMBLY (HT-12LR-20-136)	-		17	20	RAIL ANCHOR, UNIT DRIVE-ON TYPE 5	-	
6	1	HOLLOW TIE ASSEMBLY (HT-16L-20-136)	-		18	1	STEEL COVER PLATE FOR HST TIE, SHORT TOP VERSION	-	
7*	2	COVER PLATE NO 1, HOLLOW SWITCH TIE	-		19	4	STEEL COVER PLATE FOR HST TIE, TOP END	-	
8*	1	COVER PLATE NO 2, HOLLOW SWITCH TIE	-		20	5	HST SWITCH PLATE HTP-206-STR	ES2800-90	
9*	2	COVER PLATE NO 3, HOLLOW SWITCH TIE	-		21	1	HST SWITCH PLATE HTP-208-R	ES2800-92	
10	42	PUSH PIN ASSEMBLY FOR HST COVERS	-		22	2	HST SWITCH PLATE HTP-200-R	ES2800-93	
11	6	STEEL SIDE END COVER PLATE ASSEMBLY FOR HST TIE	-		23	2	HST SWITCH PLATE HTP-301-R	ES2800-91	
12	12	COVER SUPPORT BRACKET	-		24	1	PILLOW BLOCK MOUNTING PLATE	-	

\* COVER PLATES SHOWN TRANSPARENT FOR CLARITY

**NOTE:**

- SWITCH MACHINE AND MACHINE PLATES (NIC) MUST BE COORDINATED WITH SCRR.
- SEE DRAWING ES2806-73 & ES2806-74 FOR CENTER TO CENTER PIN SWITCH ROD DIMENSIONS.



DRAWN BY: <i>Narek D. Papp</i> HDR DATE: 03/31/2011		<p>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>	<p><b>METROLINK</b> SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012</p>	ENGINEERING STANDARDS		STANDARD 2806
<p>ASSISTANT DIRECTOR: STANDARDS &amp; DESIGN <i>William Davan</i> DIRECTOR OF ENGINEERING AND CONSTRUCTION</p>				<p>HOLLOW STEEL TIE LAYOUT SWITCH MACHINE ON MAINLINE SIDE NO 20-136 LB RE RH</p>		SCALE: NTS
REV. DATE	DESCRIPTION	DES. ENG.	CADD FILE: ES2806-32			

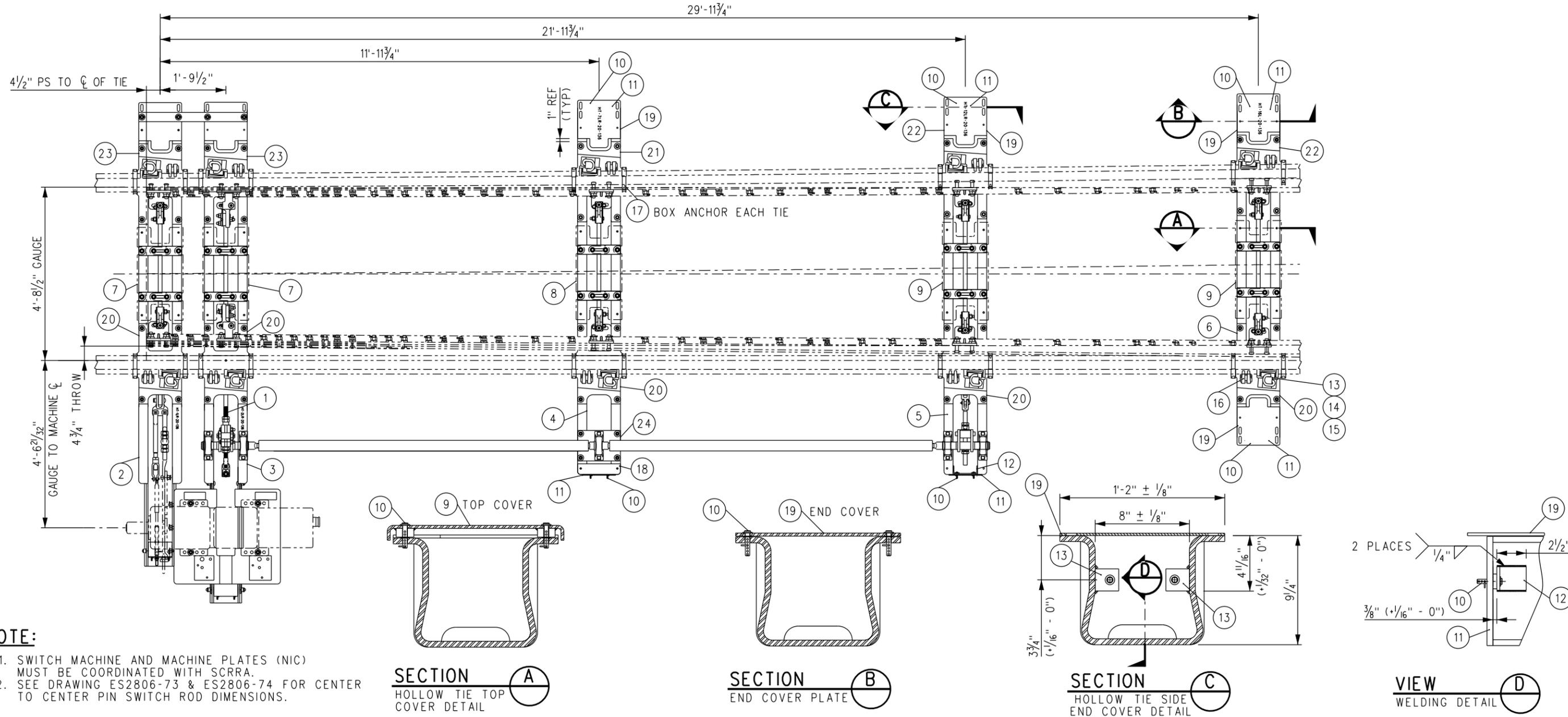
BILL OF MATERIAL

ITEM	QTY	DESCRIPTION	DWG NO	SCRRRA PART NO
1	1	RODDING ASSEMBLY FOR NO 20-136 LB RE, SWITCH MACHINE ON RH SIDE	ES2806-72	
2	1	HOLLOW TIE ASSEMBLY (HT-1LR-20-136)	-	
3	1	HOLLOW TIE ASSEMBLY (HT-2LR-20-136)	-	
4	1	HOLLOW TIE ASSEMBLY (HT-7LR-20-136)	-	
5	1	HOLLOW TIE ASSEMBLY (HT-12LR-20-136)	-	
6	1	HOLLOW TIE ASSEMBLY (HT-16LR-20-136)	-	
7*	2	COVER PLATE NO 1, HOLLOW SWITCH TIE	-	
8*	1	COVER PLATE NO 2, HOLLOW SWITCH TIE	-	
9*	2	COVER PLATE NO 3, HOLLOW SWITCH TIE	-	
10	42	PUSH PIN ASSEMBLY FOR HST COVERS	-	
11	6	STEEL SIDE END COVER PLATE ASSEMBLY FOR HST TIE	-	
12	12	COVER SUPPORT BRACKET	-	

BILL OF MATERIAL

ITEM	QTY	DESCRIPTION	DWG NO	SCRRRA PART NO
13	10	LV BRACE FOR 136 LB RE	-	
14	10	SERRATED WASHER FOR LV BRACE	-	
15	10	CLIP, PANDROL, E2055	-	
16	10	CLIP, SAFELOK, AB2000	-	
17	20	RAIL ANCHOR, UNIT DRIVE-ON TYPE 5	-	
18	1	STEEL COVER PLATE FOR HST TIE, SHORT TOP VERSION	-	
19	4	STEEL COVER PLATE FOR HST TIE, TOP END	-	
20	5	HST SWITCH PLATE HTP-206-STR	ES2800-90	
21	1	HST SWITCH PLATE HTP-208-L	ES2800-92	
22	2	HST SWITCH PLATE HTP-200-L	ES2800-93	
23	2	HST SWITCH PLATE HTP-300-L	ES2800-91	
24	1	PILLOW BLOCK MOUNTING PLATE	-	

\* COVER PLATES SHOWN TRANSPARENT FOR CLARITY



- NOTE:**
1. SWITCH MACHINE AND MACHINE PLATES (NIC) MUST BE COORDINATED WITH SCRRRA.
  2. SEE DRAWING ES2806-73 & ES2806-74 FOR CENTER TO CENTER PIN SWITCH ROD DIMENSIONS.

SECTION A  
HOLLOW TIE TOP COVER DETAIL

SECTION B  
END COVER PLATE

SECTION C  
HOLLOW TIE SIDE END COVER DETAIL

VIEW D  
WELDING DETAIL

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

DRAWN BY: *Narek D. Pape* HDR DATE: 03/31/2011  
 ASSISTANT DIRECTOR: STANDARDS & DESIGN  
*William Davan*  
 DIRECTOR OF ENGINEERING AND CONSTRUCTION

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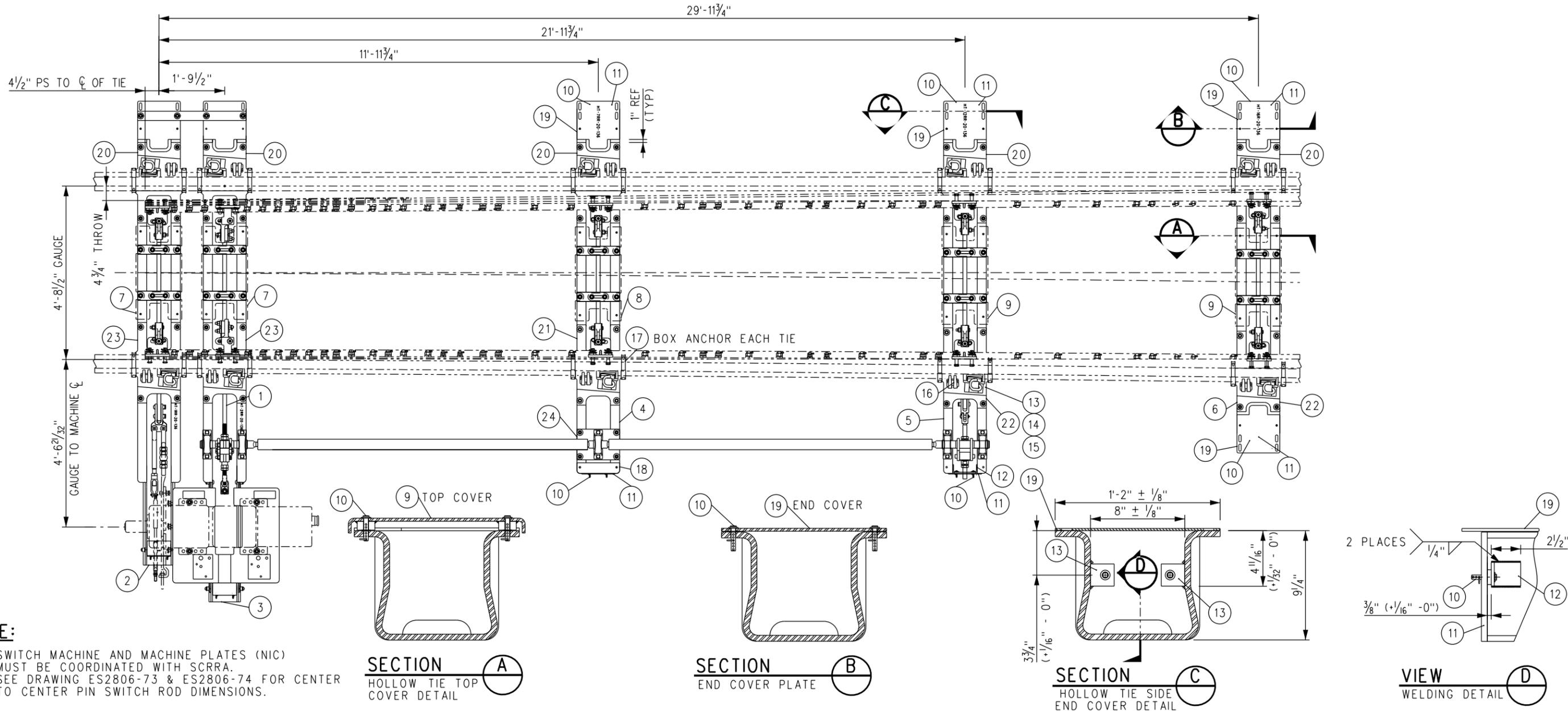
**METROLINK**  
 SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
 ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS  
 HOLLOW STEEL TIE LAYOUT  
 SWITCH MACHINE ON MAINLINE SIDE  
 NO 20-136 LB RE LH

STANDARD	2806
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2806-33

BILL OF MATERIAL				BILL OF MATERIAL					
ITEM	QTY	DESCRIPTION	DWG NO	SCRRA PART NO	ITEM	QTY	DESCRIPTION	DWG NO	SCRRA PART NO
1	1	RODDING ASSEMBLY FOR NO 20-136 LB RE, SWITCH MACHINE ON RH SIDE	ES2806-72		13	10	LV BRACE FOR 136 LB RE	-	
2	1	HOLLOW TIE ASSEMBLY (HT-1RR-20-136)	-		14	10	SERRATED WASHER FOR LV BRACE	-	
3	1	HOLLOW TIE ASSEMBLY (HT-2RR-20-136)	-		15	10	CLIP, PANDROL, E2055	-	
4	1	HOLLOW TIE ASSEMBLY (HT-7RR-20-136)	-		16	10	CLIP, SAFELOK, AB2000	-	
5	1	HOLLOW TIE ASSEMBLY (HT-12RR-20-136)	-		17	20	RAIL ANCHOR, UNIT DRIVE-ON TYPE 5	-	
6	1	HOLLOW TIE ASSEMBLY (HT-16R-20-136)	-		18	1	STEEL COVER PLATE FOR HST TIE, SHORT TOP VERSION	-	
7*	2	COVER PLATE NO 1, HOLLOW SWITCH TIE	-		19	4	STEEL COVER PLATE FOR HST TIE, TOP END	-	
8*	1	COVER PLATE NO 2, HOLLOW SWITCH TIE	-		20	5	HST SWITCH PLATE HTP-206-STR	ES2800-90	
9*	2	COVER PLATE NO 3, HOLLOW SWITCH TIE	-		21	1	HST SWITCH PLATE HTP-208-R	ES2800-92	
10	42	PUSH PIN ASSEMBLY FOR HST COVERS	-		22	2	HST SWITCH PLATE HTP-200-R	ES2800-93	
11	6	STEEL SIDE END COVER PLATE ASSEMBLY FOR HST TIE	-		23	2	HST SWITCH PLATE HTP-301-R	ES2800-91	
12	12	COVER SUPPORT BRACKET	-		24	1	PILLOW BLOCK MOUNTING PLATE	-	

\* COVER PLATES SHOWN TRANSPARENT FOR CLARITY



- NOTE:**
1. SWITCH MACHINE AND MACHINE PLATES (NIC) MUST BE COORDINATED WITH SCRRA.
  2. SEE DRAWING ES2806-73 & ES2806-74 FOR CENTER TO CENTER PIN SWITCH ROD DIMENSIONS.

**SECTION A**  
HOLLOW TIE TOP COVER DETAIL

**SECTION B**  
END COVER PLATE

**SECTION C**  
HOLLOW TIE SIDE END COVER DETAIL

**VIEW D**  
WELDING DETAIL

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.		ENGINEERING STANDARDS		STANDARD: 2806
ASSISTANT DIRECTOR: STANDARDS & DESIGN DIRECTOR OF ENGINEERING AND CONSTRUCTION		SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012				HOLLOW STEEL TIE LAYOUT SWITCH MACHINE ON TURNOUT SIDE NO 20-136 LB RE RH		SCALE: NTS

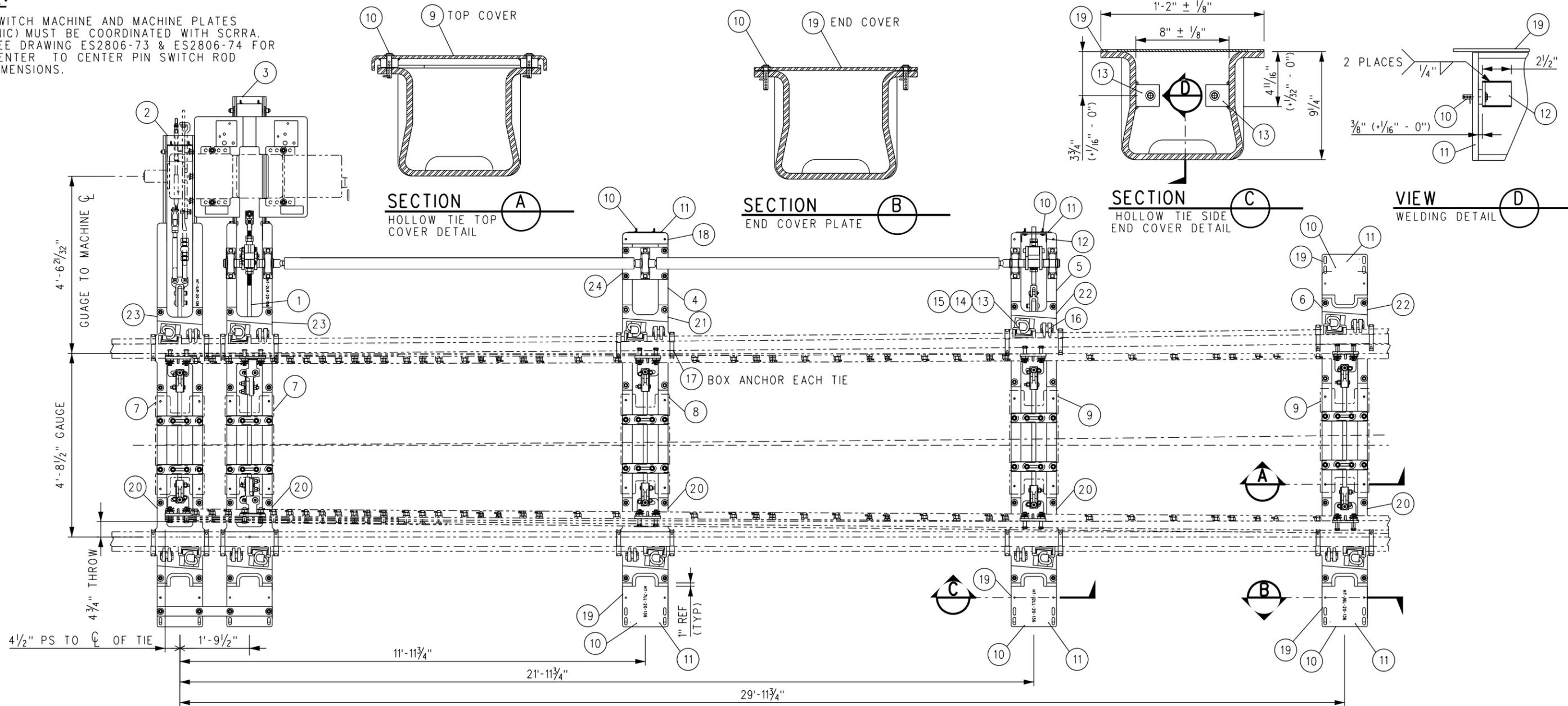
BILL OF MATERIAL				
ITEM	QTY	DESCRIPTION	DWG NO	SCRR PART NO
1	1	RODDING ASSEMBLY FOR NO 20-136 LB RE, SWITCH MACHINE ON LH SIDE	ES2806-71	
2	1	HOLLOW TIE ASSEMBLY (HT-1LL-20-136)	-	
3	1	HOLLOW TIE ASSEMBLY (HT-2LL-20-136)	-	
4	1	HOLLOW TIE ASSEMBLY (HT-7LL-20-136)	-	
5	1	HOLLOW TIE ASSEMBLY (HT-12LL-20-136)	-	
6	1	HOLLOW TIE ASSEMBLY (HT-16L-20-136)	-	
7*	2	COVER PLATE NO 1, HOLLOW SWITCH TIE	-	
8*	1	COVER PLATE NO 2, HOLLOW SWITCH TIE	-	
9*	2	COVER PLATE NO 3, HOLLOW SWITCH TIE	-	
10	42	PUSH PIN ASSEMBLY FOR HST COVERS	-	
11	6	STEEL SIDE END COVER PLATE ASSEMBLY FOR HST TIE	-	
12	12	COVER SUPPORT BRACKET	-	

BILL OF MATERIAL				
ITEM	QTY	DESCRIPTION	DWG NO	SCRR PART NO
13	10	LV BRACE FOR 136 LB RE	-	
14	10	SERRATED WASHER FOR LV BRACE	-	
15	10	CLIP, PANDROL, E2055	-	
16	10	CLIP, SAFELOK, AB2000	-	
17	20	RAIL ANCHOR, UNIT DRIVE-ON TYPE 5	-	
18	1	STEEL COVER PLATE FOR HST TIE, SHORT TOP VERSION	-	
19	4	STEEL COVER PLATE FOR HST TIE, TOP END	-	
20	5	HST SWITCH PLATE HTP-206-STR	ES2800-90	
21	1	HST SWITCH PLATE HTP-208-L	ES2800-92	
22	2	HST SWITCH PLATE HTP-200-L	ES2800-93	
23	2	HST SWITCH PLATE HTP-300-L	ES2800-91	
24	1	PILLOW BLOCK MOUNTING PLATE	-	

**NOTE:**

1. SWITCH MACHINE AND MACHINE PLATES (NIC) MUST BE COORDINATED WITH SCRR.
2. SEE DRAWING ES2806-73 & ES2806-74 FOR CENTER TO CENTER PIN SWITCH ROD DIMENSIONS.

\* COVER PLATES SHOWN TRANSPARENT FOR CLARITY



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

DRAWN BY: *Narek D. Pape*  
 HDR DATE: 03/31/2011  
 ASSISTANT DIRECTOR: STANDARDS & DESIGN  
*William Davan*  
 DIRECTOR OF ENGINEERING AND CONSTRUCTION

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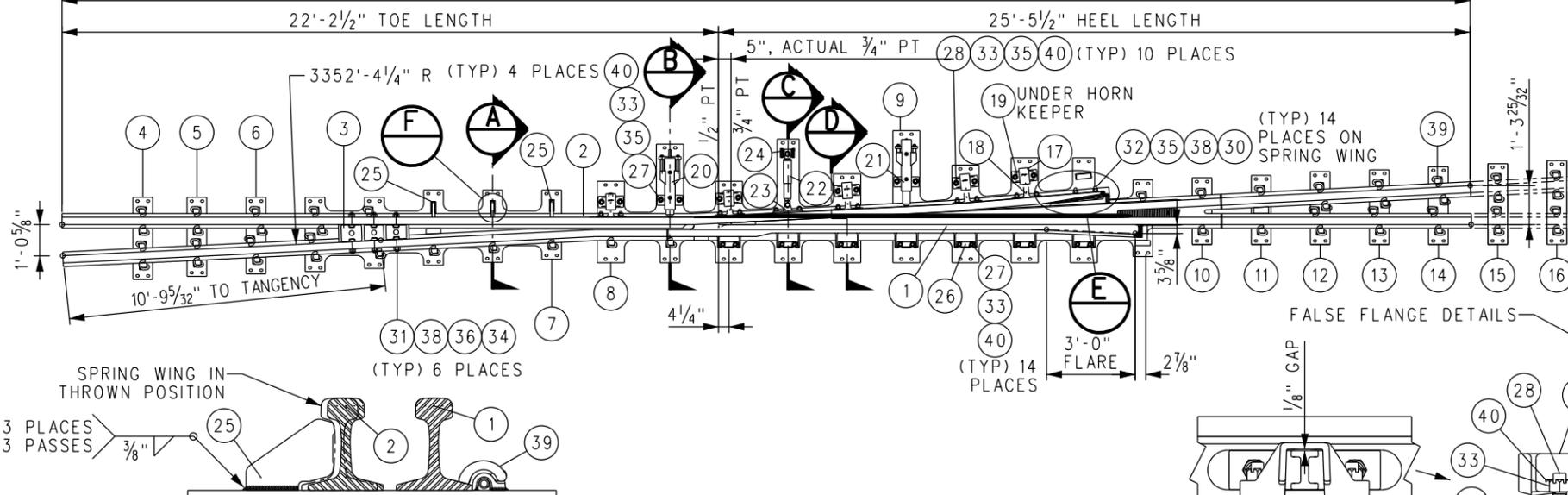
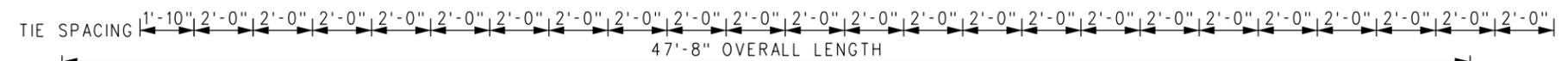
**METROLINK**  
 SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
 ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS  
 HOLLOW STEEL TIE LAYOUT  
 SWITCH MACHINE ON TURNOUT SIDE  
 NO 20-136 LB RE LH

STANDARD	2806
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2806-35

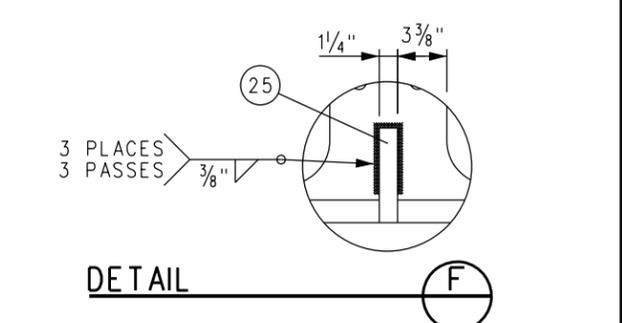
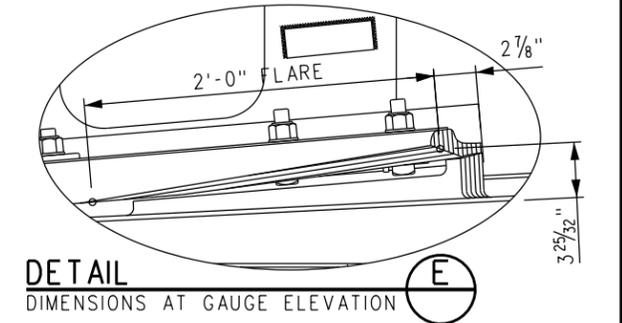
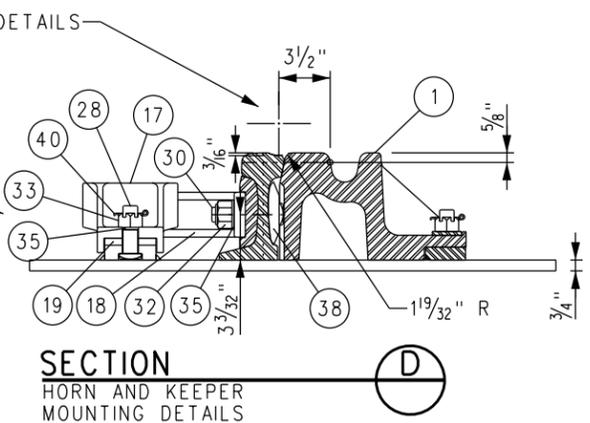
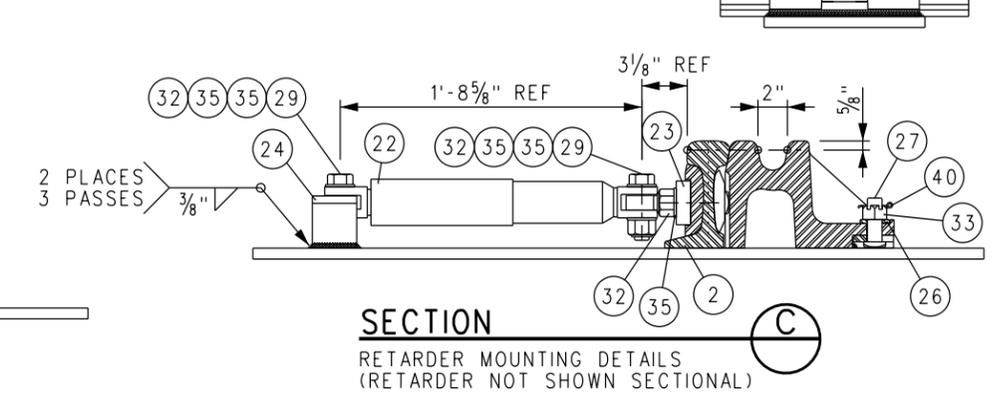
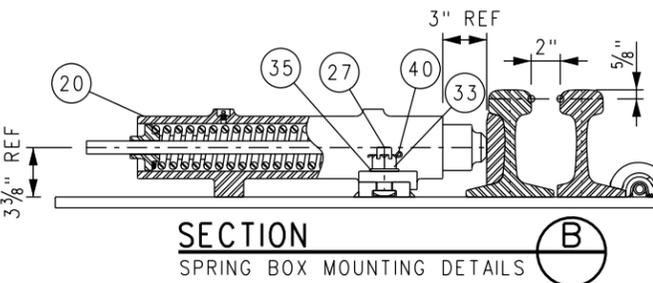
BILL OF MATERIAL				
ITEM	QTY	DESCRIPTION	DWG NO	SCRR PART NO
1	1	NO 20-136 LB RE SPRING FROG, LH POINT ASSEMBLY	-	
2	1	SPRING WING RAIL, NO 20-136 LB RE, LH, C/W D-BAR	-	
3	1	TOE BLOCK, NO 20-136 LB RE WSM	-	
4	1	FROG PLATE (SF20-136-75LC)	ES2806-43	
5	1	FROG PLATE (SF20-136-76LC)	ES2806-43	
6	1	FROG PLATE (SF20-136-77LC)	ES2806-43	
7	1	FROG PLATE (SF20-136-78LC)	ES2806-45	
8	1	FROG PLATE (SF20-136-83LC)	ES2806-47	
9	1	FROG PLATE (SF20-136-88LC)	ES2806-49	
10	1	FROG PLATE (SF20-136-93LC)	ES2806-51	
11	1	FROG PLATE (SF20-136-94LC)	ES2806-51	
12	1	FROG PLATE (SF20-136-95LC)	ES2806-51	
13	1	FROG PLATE (SF20-136-96LC)	ES2806-53	
14	1	FROG PLATE (SF20-136-97LC)	ES2806-53	
15	1	FROG PLATE (SF20-136-98LC)	ES2806-55	
16	1	FROG PLATE (SF20-136-99LC)	ES2806-55	
17	5	HORN KEEPER, REVERSIBLE	-	
18	5	HOLD-DOWN HORN	-	
19	5	WEAR PLATE FOR REVERSIBLE HORN KEEPER	-	
20	1	SPRING BOX ASSEMBLY, WITH 3" MAXIMUM PLUNGER TRAVEL	-	

BILL OF MATERIAL				
ITEM	QTY	DESCRIPTION	DWG NO	SCRR PART NO
21	1	SPRING BOX ASSEMBLY, WITH 5/2" MAXIMUM PLUNGER TRAVEL	-	
22	1	RETARDER TIMING DEVICE (ENIDINE P/N SP22917)	-	
23	1	RETARDER BRACKET FOR SPRING FROGS	-	
24	1	RETARDER PLATE BRACKET FOR FROG	-	
25	3	FLAT RAIL BRACE FOR NON D-BAR APPLICATIONS	-	
26	7	WASHER, BOLT CAPTURE STYLE, 1/4" THICK	-	
27	18	BOLT, 1" DIA x 3" LONG, THIN SQUARE HEAD, DRILLED @ 2 1/2", GR 5	-	
28	10	BOLT, 1" DIA x 3 1/2" LONG, THIN SQUARE HEAD, DRILLED @ 2 1/16", GR 5	-	
29	2	BOLT, 1" DIA x 4 1/8" LONG, HEAVY HEX HEAD, GR 8	-	
30	14	BOLT, 1" DIA x 4 1/2" LONG, SQUARE HEAD, GR 5	-	
31	6	BOLT, 1 3/8" DIA x 5 1/2" LONG, SQUARE HEAD, GR 8	-	
32	16	SECURITY LOCK NUT, 1" DIA, HEX (SH521), GR 5	-	
33	28	NUT, 1" DIA HEAVY HEX, SLOTTED, GR 5	-	
34	6	SECURITY LOCK NUT, 1 3/8" DIA HEX (SH530), GR 8	-	
35	32	FLAT WASHER, FOR 1" DIA x 5/32" THICK, HARDENED	-	
36	6	FLAT WASHER, FOR 1 3/8" DIA x 1/4" THICK, HARDENED	-	
37	6	TAIL WASHER, FLAT (837K)	-	
38	14	HEADLOCK WASHER, FLAT (837P)	-	
39	48	CLIP, PANDROL, E2055	-	
40	28	COTTER PIN, 1/4" DIA x 2" LONG	-	



**NOTES:**

- RETARDER CLOSING TIME RANGES FROM 1 TO 3 MINUTES.
- SPRING BOX LOAD IS 300 LB/IN.
- SPRING WING SHALL BE THROWN TO A 1/8" FLANGWAY AT THE 3/4" POINT TO DETERMINE THE SPRING WING THROWN POSITION.
- FLAT RAIL BRACES (ITEM NO 25) SHALL BE WELDED WHERE SHOWN, UP AGAINST SPRING WING WHEN FULLY THROWN.
- RAIL END DRILLING SHALL BE @ 9" AND 1'-3 1/2", 3 3/32" ABOVE RAIL BASE, 1 5/16" DIA AT ALL 4 RAIL ENDS. ALL RAIL HOLE EDGES SHALL BE ROUNDED WITH A 1/8" R.
- RETARDER BRACKET (ITEM NO 23) SHALL BE WELDED AS SHOWN.
- FROG SHALL BE CONSTRUCTED TO TOLERANCES GIVEN ON LATEST AREMA PLAN 1010, PERMISSIBLE VARIATIONS IN COMPLETED FROGS.
- INSERT TO BE EXPLOSIVE DEPTH HARDENED TO 352 BRINELL PER AREMA.
- NAME TAG TO BE AFFIXED TO RIGID WING RAIL NEAR 1/2" PT WITH INFORMATION SHOWN.
- SCRR WILL CONSIDER A TAPERED HEEL SPRING OF SAME ALIGNMENT AND DIMENSIONS TO REPLACE WSM.



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 Davan*  
 DIRECTOR OF ENGINEERING AND CONSTRUCTION

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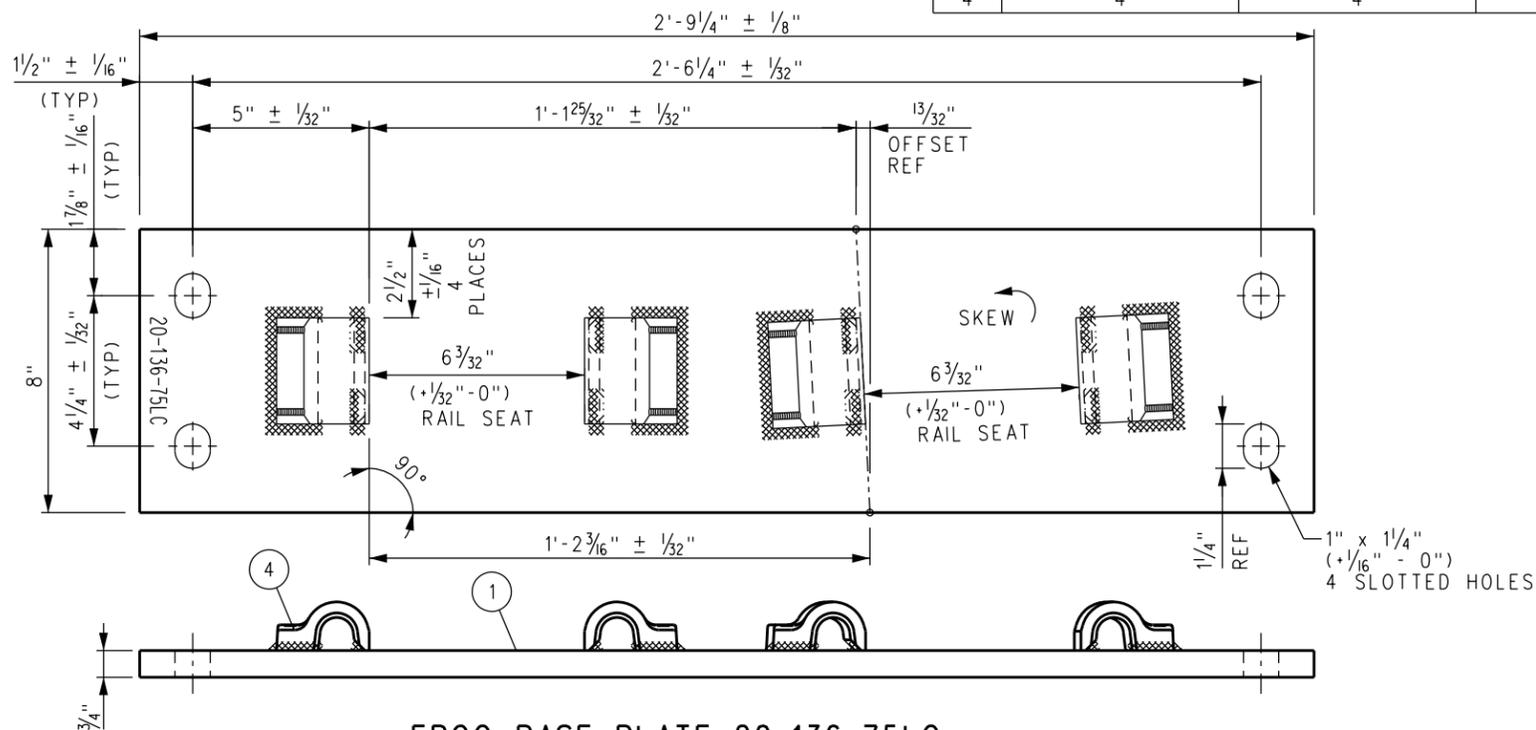
ENGINEERING STANDARDS  
 NO 20 WSM FROG LH  
 FROG ASSEMBLY PLAN VIEW AND FROG PACK  
 CONCRETE TIES-136 LB RE RAIL

STANDARD	2806
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2806-41

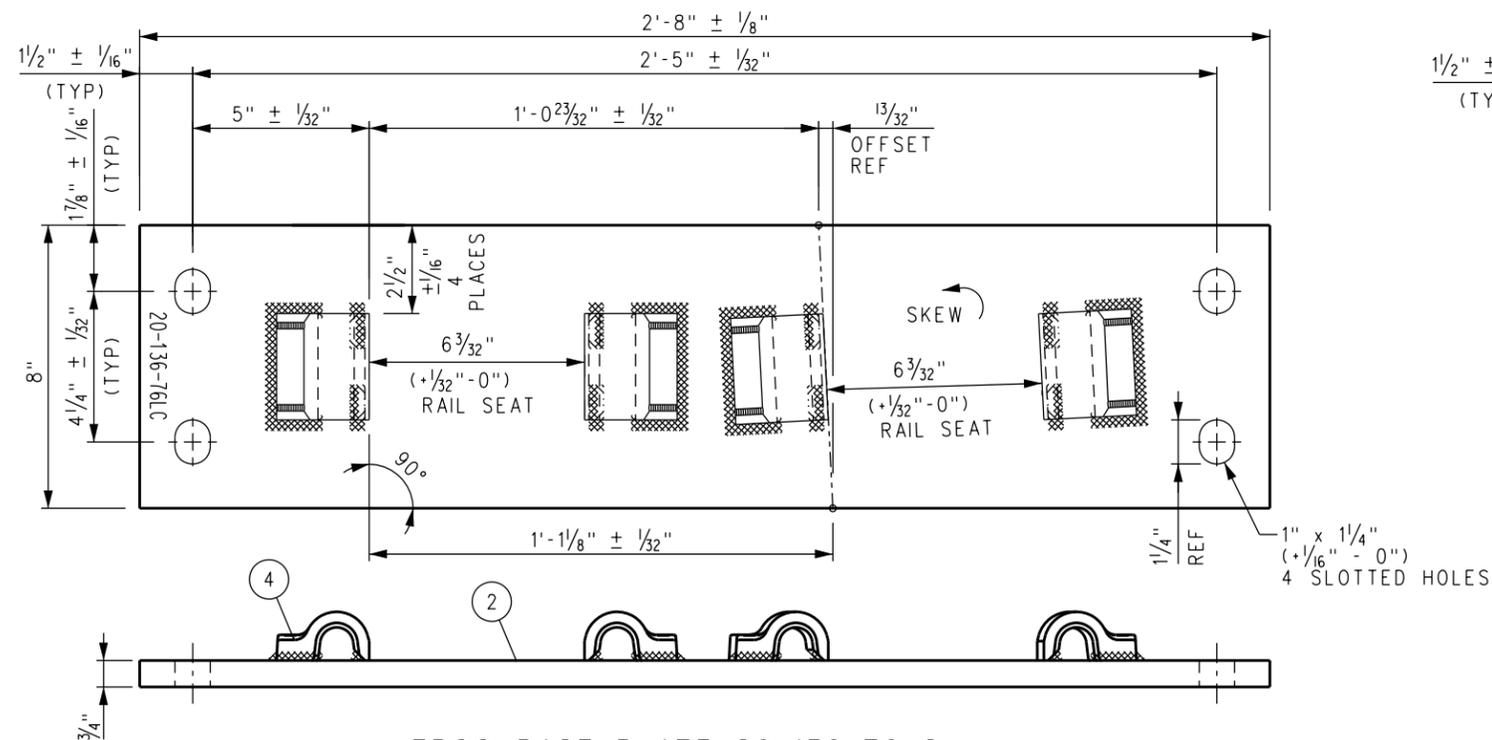


BILL OF MATERIAL

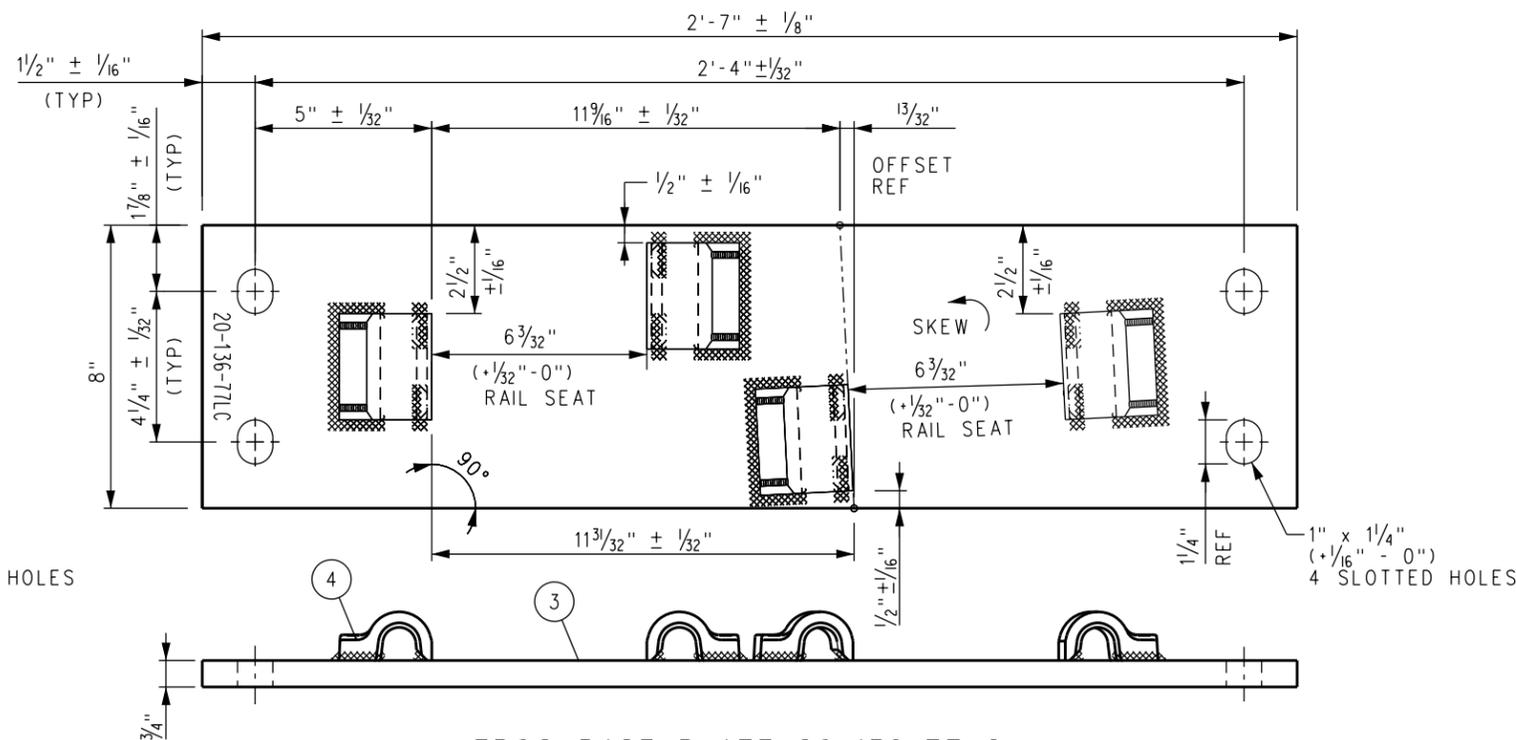
ITEM	QTY FOR 20-75LC	QTY FOR 20-76LC	QTY FOR 20-77LC	DESCRIPTION	DWG NO	SCRR PART NO
1	1	0	0	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-9 1/4" LONG	-	
2	0	1	0	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-8" LONG	-	
3	0	0	1	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-7" LONG	-	
4	4	4	4	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 1	-	



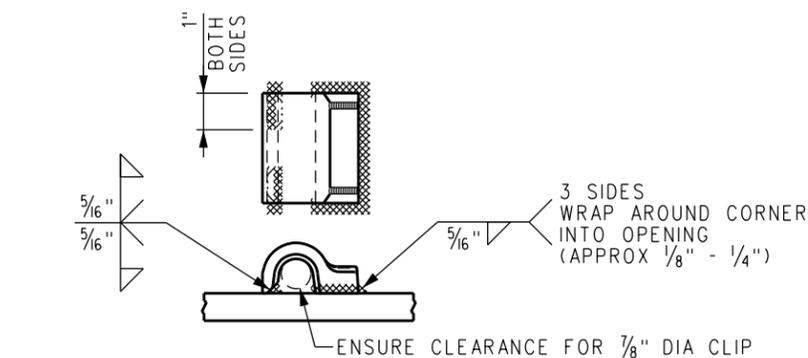
FROG BASE PLATE 20-136-75LC



FROG BASE PLATE 20-136-76LC



FROG BASE PLATE 20-136-77LC



FORGED SHOULDER WELDING DETAIL

NOTES:

1. I.D. CHARACTERS TO BE 1/2" MINIMUM HEIGHT CLEARLY STAMPED AS SHOWN.
2. WELDS TO BE DRESSED FLUSH WITH SHOULDER & NOT TO PROTRUDE INTO RAIL SEAT.
3. SLOTTED HOLE CENTERS ARE INDICATED ON DRAWING.

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

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

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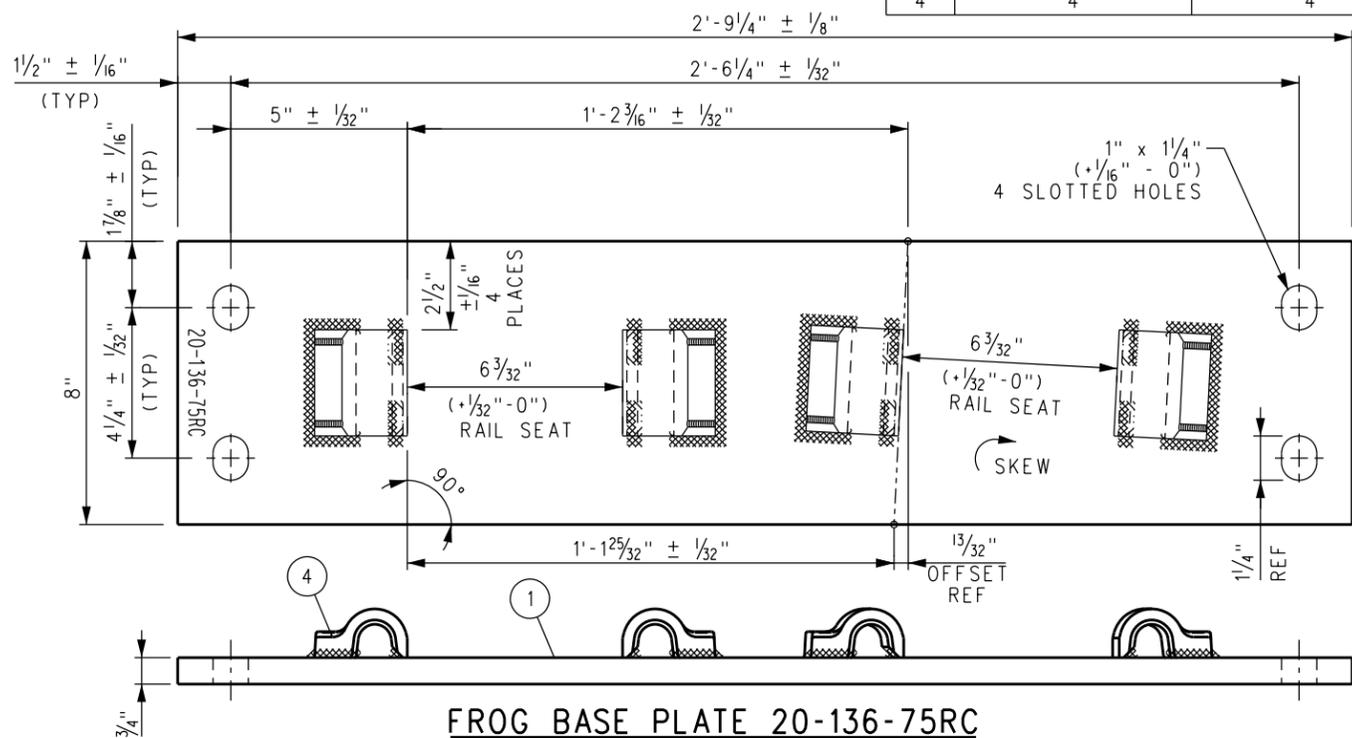
**METROLINK**  
 SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
 ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS  
 NO 20 WSM FROG LH  
 FROG BASE PLATES 20-75LC, 20-76LC AND 20-77LC  
 CONCRETE TIES-136 LB RE RAIL

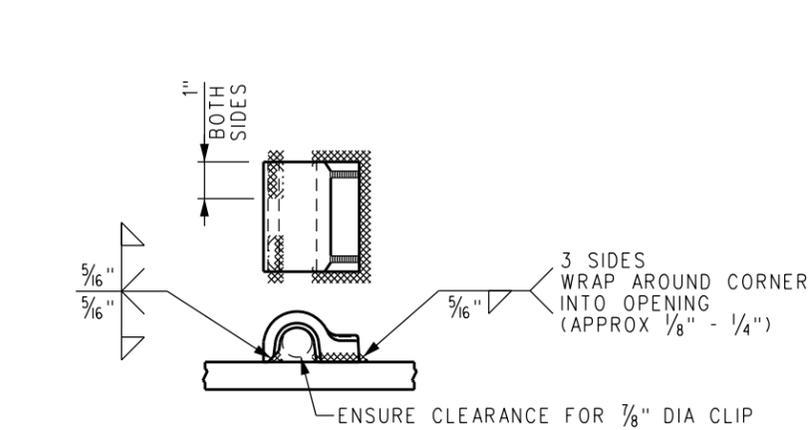
STANDARD	2806
SCALE	NTS
REVISION	SHEET
-	1 OF 1
CADD FILE	ES2806-43

BILL OF MATERIAL

ITEM	QTY FOR 20-75RC	QTY FOR 20-76RC	QTY FOR 20-77RC	DESCRIPTION	DWG NO	SCRR PART NO
1	1	0	0	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-9 1/4" LONG	-	
2	0	1	0	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-8" LONG	-	
3	0	0	1	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-7" LONG	-	
4	4	4	4	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 1	-	



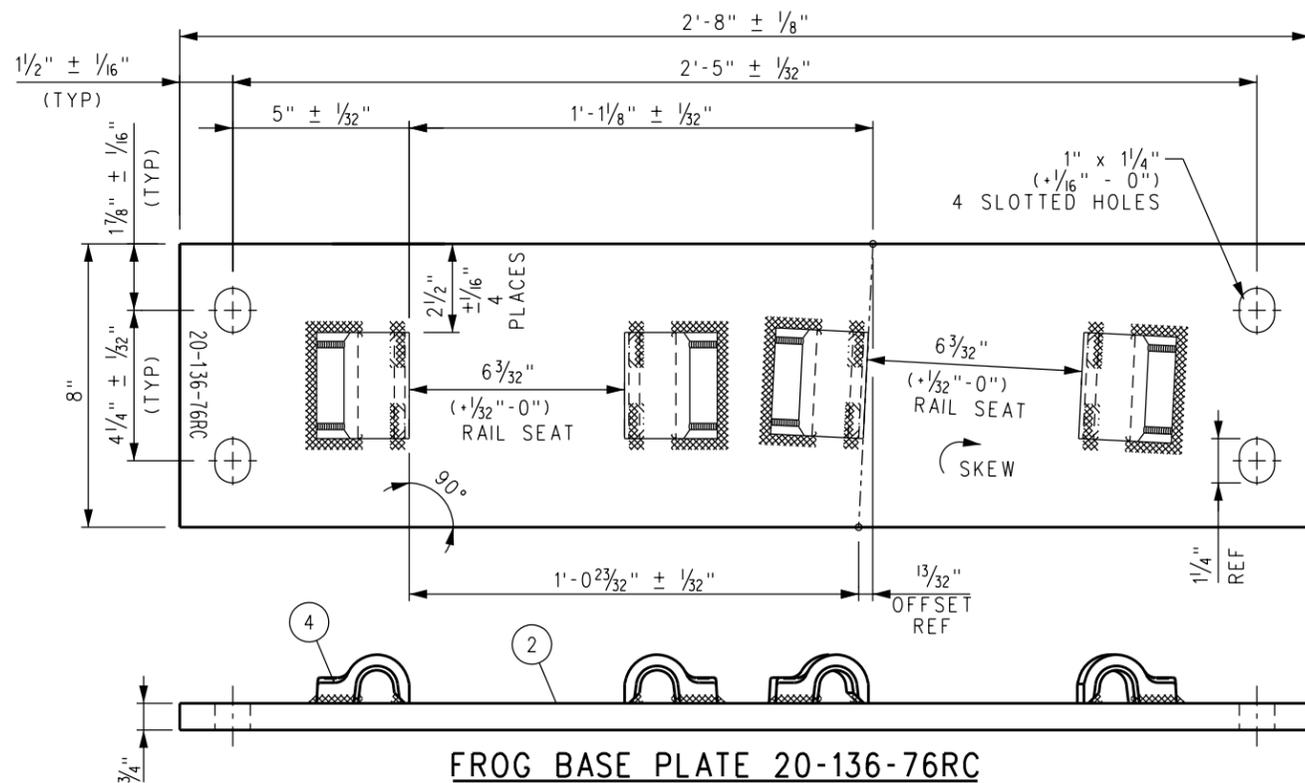
FROG BASE PLATE 20-136-75RC



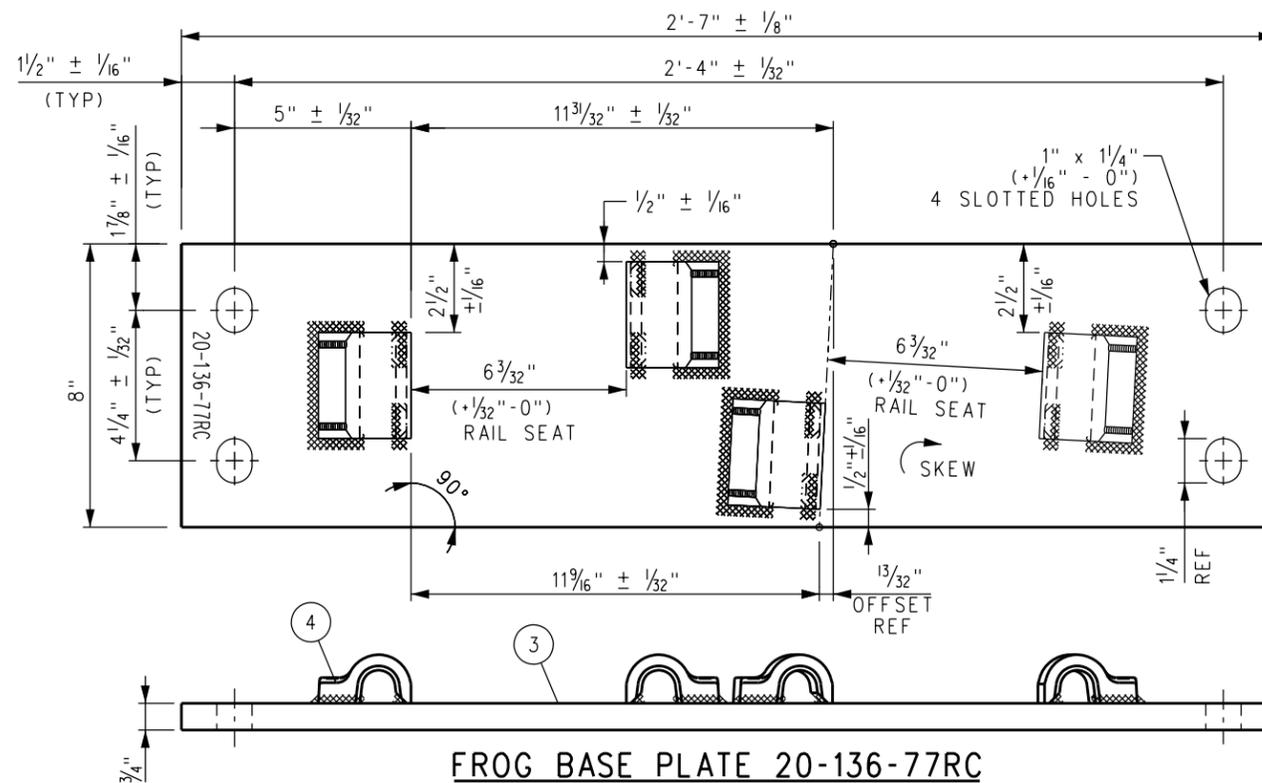
FORGED SHOULDER WELDING DETAIL

NOTES:

1. I.D. CHARACTERS TO BE 1/2" MINIMUM HEIGHT CLEARLY STAMPED AS SHOWN.
2. WELDS TO BE DRESSED FLUSH WITH SHOULDER & NOT TO PROTRUDE INTO RAIL SEAT.
3. SLOTTED HOLE CENTERS ARE INDICATED ON DRAWING.



FROG BASE PLATE 20-136-76RC



FROG BASE PLATE 20-136-77RC

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

DRAWN BY: *Narek D. Pape* HDR DATE: 03/31/2011  
 ASSISTANT DIRECTOR: STANDARDS & DESIGN  
*William Davan*  
 DIRECTOR OF ENGINEERING AND CONSTRUCTION

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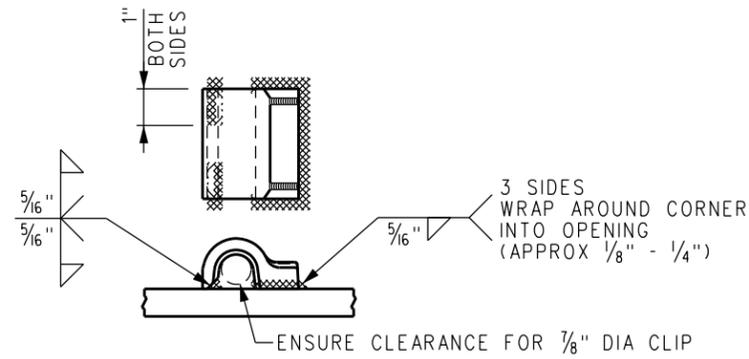


SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
 ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS	
NO 20 WSM FROG RH FROG BASE PLATES 20-75RC, 20-76RC AND 20-77RC CONCRETE TIES-136 LB RE RAIL	

STANDARD	2806
SCALE:	NTS
REVISION	SHEET
-	1 OF 1
CADD FILE:	ES2806-44

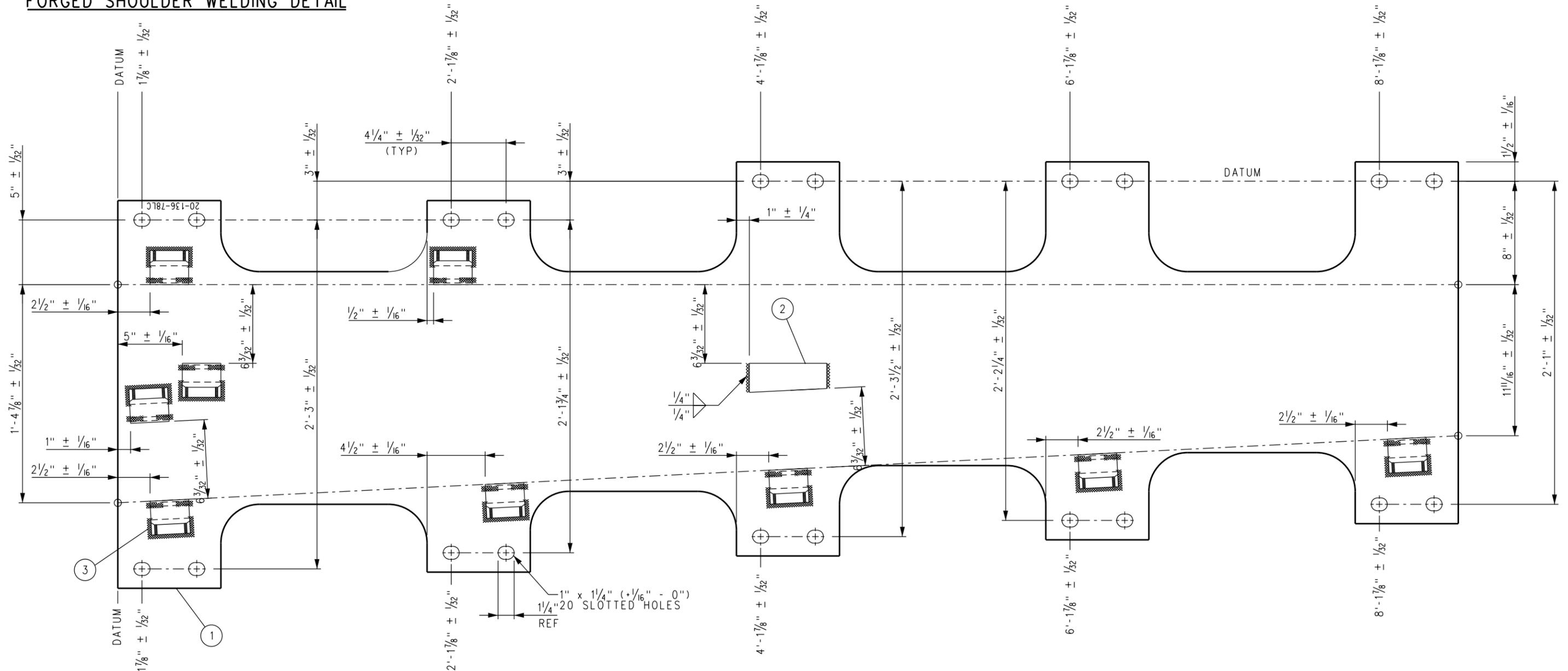
ITEM	QTY	DESCRIPTION	DWG NO	SCRR PART NO
1	1	BURNED PLATE, ASTM A36, 3/4" THICK	-	
2	1	BURNED STOP, 1/2" THICK, TAPERED 1 5/16" TO 2 1/4", 6" LONG	-	
3	9	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 1	-	



**NOTES:**

1. I.D. CHARACTERS TO BE 1/2" MINIMUM HEIGHT CLEARLY STAMPED AS SHOWN.
2. WELDS TO BE DRESSED FLUSH WITH SHOULDER & NOT TO PROTRUDE INTO RAIL SEAT.
3. SLOTTED HOLE CENTERS ARE INDICATED ON DRAWING.

**FORGED SHOULDER WELDING DETAIL**



**FROG BASE PLATE 20-136-78LC**

DRAWN BY: <i>Nareh D. Papp</i>		HDR: <i>Willson Davan</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.	

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

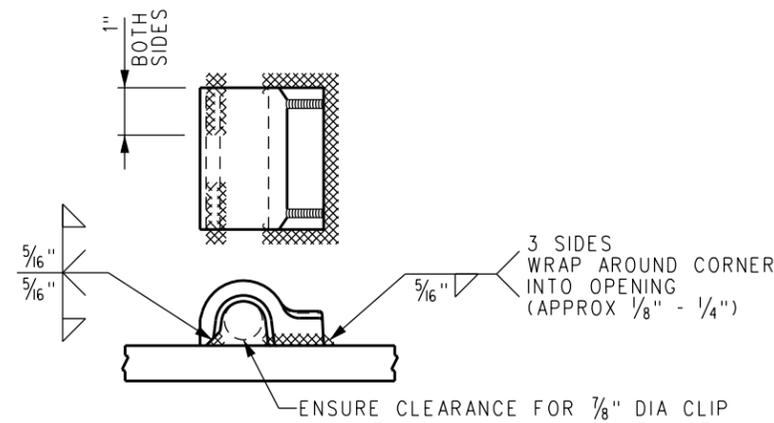
ENGINEERING STANDARDS

NO 20 WSM FROG LH  
FROG BASE PLATE 20-78LC  
CONCRETE TIES-136 LB RE RAIL

STANDARD	2806
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2806-45

BILL OF MATERIAL

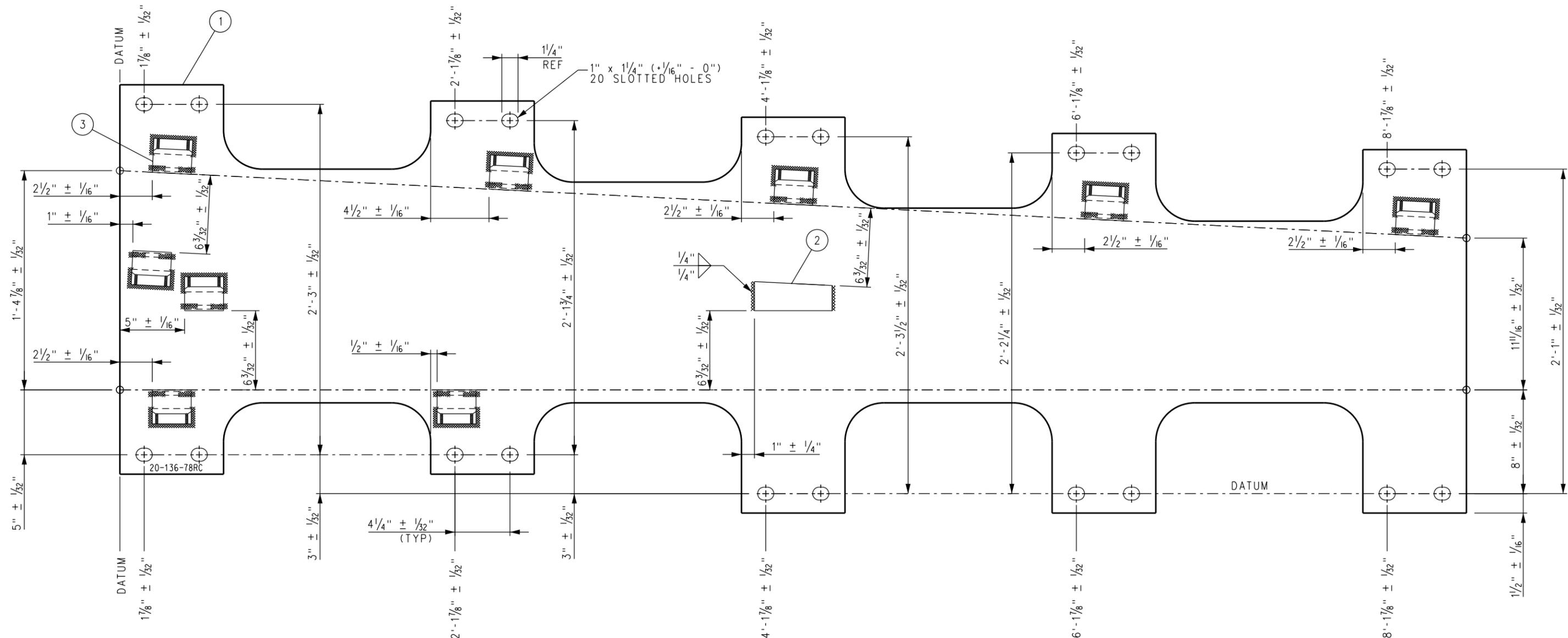
ITEM	QTY	DESCRIPTION	DWG NO	SCRR PART NO
1	1	BURNED PLATE, ASTM A36, 3/4" THICK	-	
2	1	BURNED STOP, 1/2" THICK, TAPERED 1 5/16" TO 2 1/4", 6" LONG	-	
3	9	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 1	-	



**FORGED SHOULDER WELDING DETAIL**

**NOTES:**

1. I.D. CHARACTERS TO BE 1/2" MINIMUM HEIGHT CLEARLY STAMPED AS SHOWN.
2. WELDS TO BE DRESSED FLUSH WITH SHOULDER & NOT TO PROTRUDE INTO RAIL SEAT.
3. SLOTTED HOLE CENTERS ARE INDICATED ON DRAWING.



**FROG BASE PLATE 20-136-78RC**

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

DRAWN BY: HDR DATE: 03/31/2011  
*Nareh D. Papp*  
 ASSISTANT DIRECTOR: STANDARDS & DESIGN  
*William Dava*  
 DIRECTOR OF ENGINEERING AND CONSTRUCTION

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

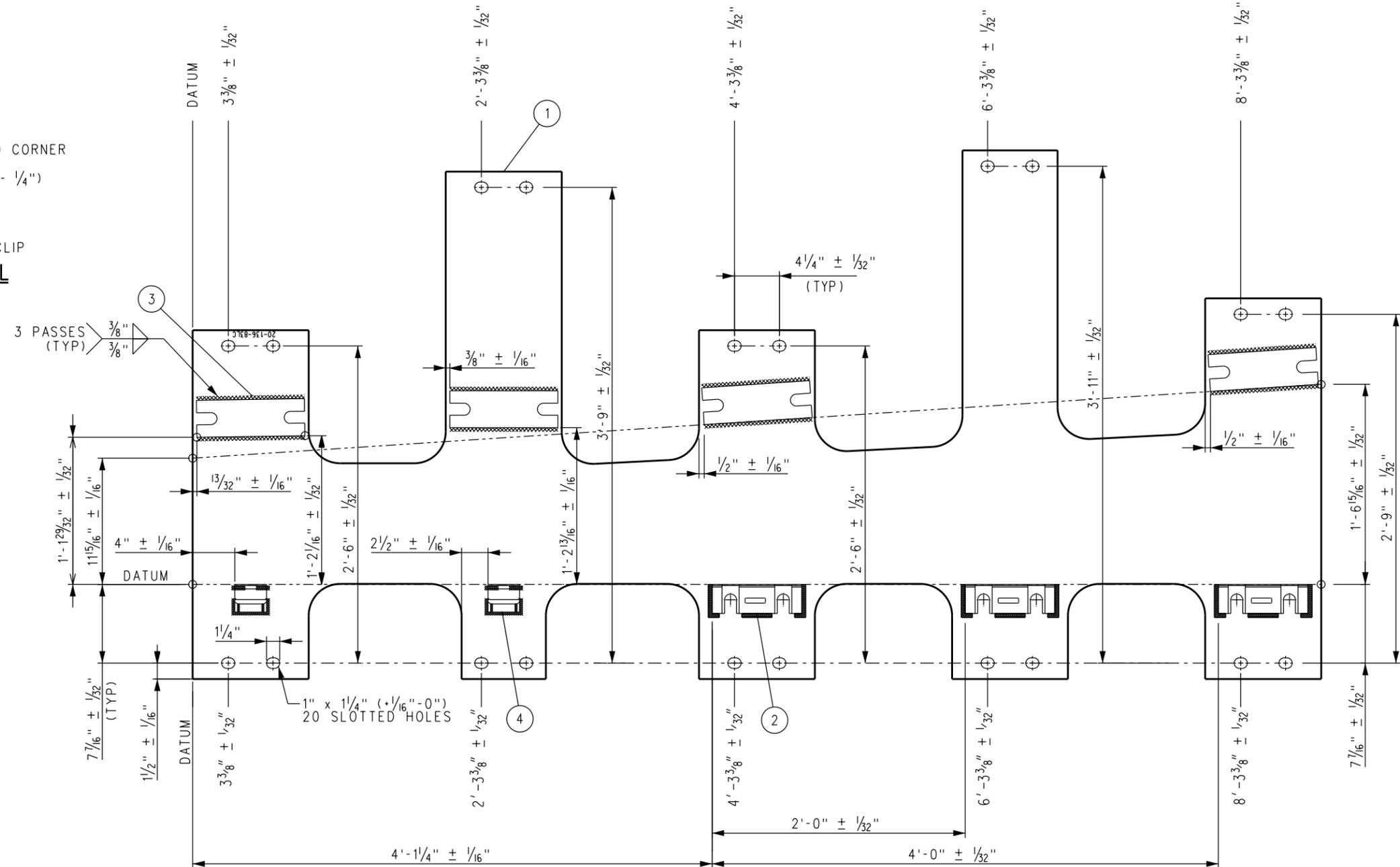
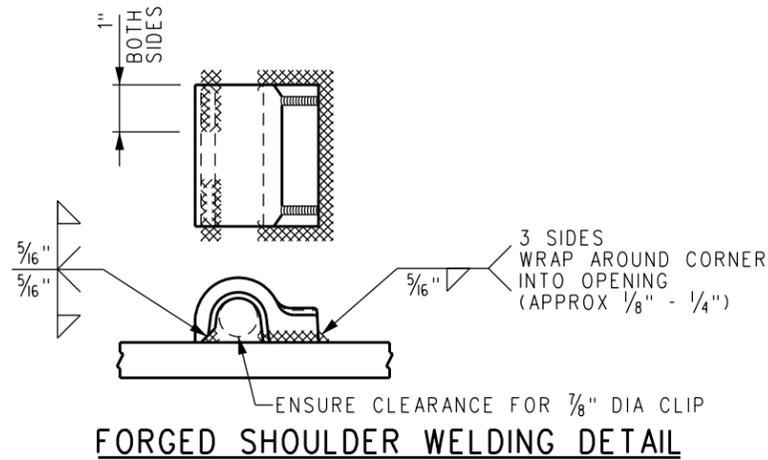
ENGINEERING STANDARDS  
 NO 20 WSM FROG RH  
 FROG BASE PLATE 20-78RC  
 CONCRETE TIES-136 LB RE RAIL

STANDARD	2806
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2806-46

ITEM	QTY	DESCRIPTION	DWG NO	SCRR PART NO
1	1	BURNED PLATE, ASTM A36, 3/4" THICK	-	-
2	3	CAPTURE BLOCK FOR PLATE CLIP	-	-
3	4	CAPTURE BLOCK FOR HORN KEEPER	-	-
4	2	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 1	-	-

**NOTES:**

1. I.D. CHARACTERS TO BE 1/2" MINIMUM HEIGHT CLEARLY STAMPED AS SHOWN.
2. WELDS TO BE DRESSED FLUSH WITH SHOULDER & NOT TO PROTRUDE INTO RAIL SEAT.
3. OPENINGS IN BOLT CAPTURE BLOCKS SHALL BE FREE OF WELD AND SPATTER.
4. SLOTTED HOLE CENTERS ARE INDICATED ON DRAWING.



**FROG BASE PLATE 20-136-83LC**

DRAWN BY: <i>Narek D. Bze</i>		HDR: <i>Willson Davan</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  
NO 20 WSM FROG LH  
FROG BASE PLATE 20-83LC  
CONCRETE TIES-136 LB RE RAIL

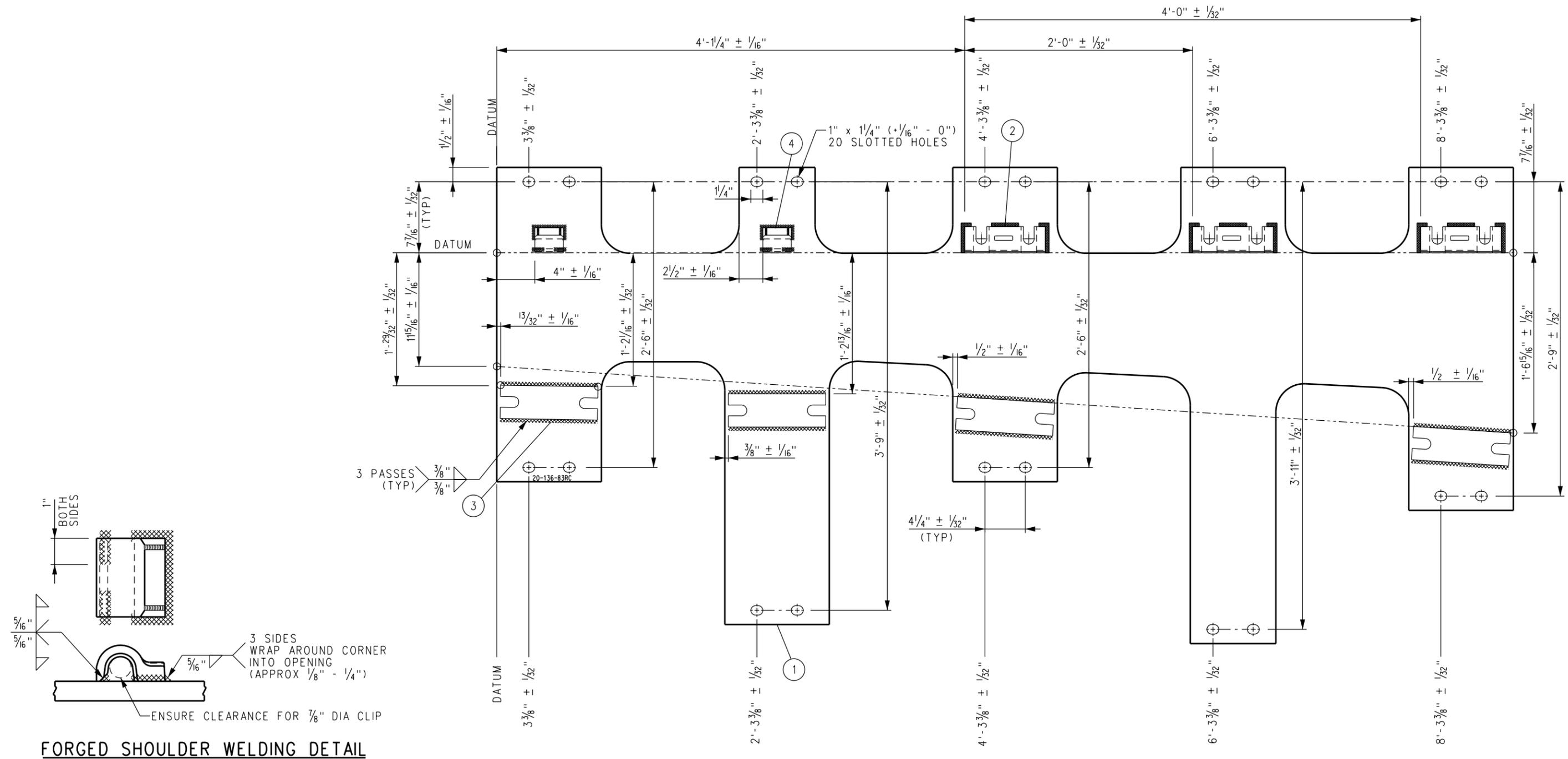
STANDARD	2806
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2806-47

**NOTES:**

1. I.D. CHARACTERS TO BE 1/2" MINIMUM HEIGHT CLEARLY STAMPED AS SHOWN.
2. WELDS TO BE DRESSED FLUSH WITH SHOULDER & NOT TO PROTRUDE INTO RAIL SEAT.
3. OPENINGS IN BOLT CAPTURE BLOCKS SHALL BE FREE OF WELD AND SPATTER.
4. SLOTTED HOLE CENTERS ARE INDICATED ON DRAWING.

BILL OF MATERIAL

ITEM	QTY	DESCRIPTION	DWG NO	SCRRRA PART NO
1	1	BURNED PLATE, ASTM A36, 3/4" THICK	-	
2	3	CAPTURE BLOCK FOR PLATE CLIP	-	
3	4	CAPTURE BLOCK FOR HORN KEEPER	-	
4	2	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 1	-	



**FROG BASE PLATE 20-136-83RC**

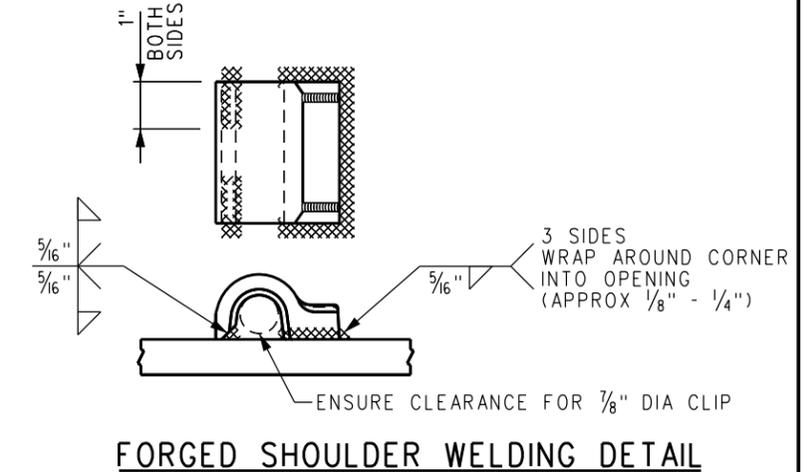
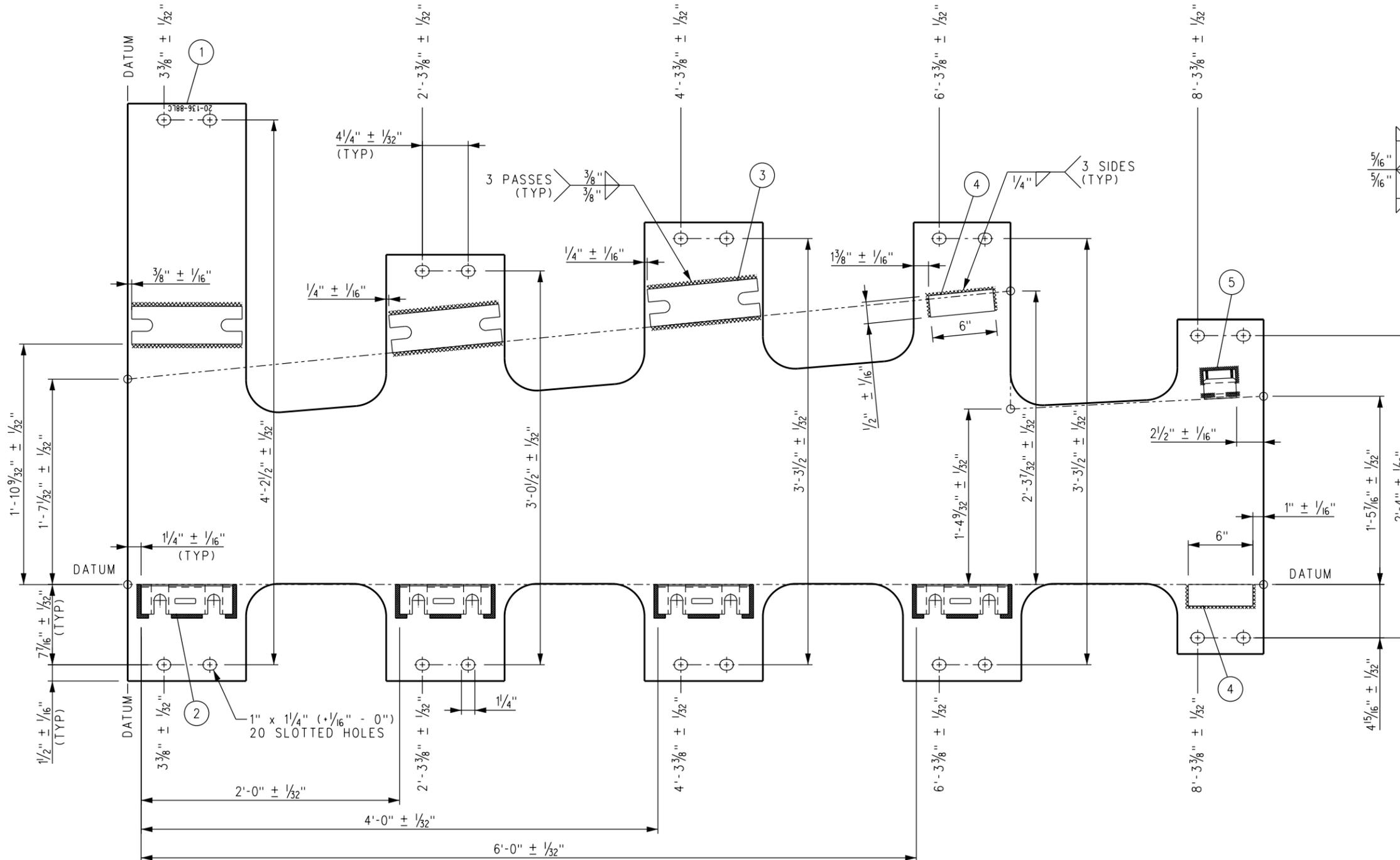
DRAWN BY: <i>Naresh D. Patel</i> HDR DATE: 03/31/2011 ASSISTANT DIRECTOR: STANDARDS & DESIGN		SCRRRA ENGINEERING STANDARDS ARE INTENDED FOR SCRRRA APPROVED USES ONLY. FOR NON-SCRRRA APPROVED USES, SCRRRA SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THE DATA OR INFORMATION CONTAINED HEREIN. 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.	<p><b>METROLINK</b> SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012</p>	ENGINEERING STANDARDS NO 20 WSM FROG RH FROG BASE PLATE 20-83RC CONCRETE TIES-136 LB RE RAIL		STANDARD 2806 SCALE: NTS REVISION SHEET 1 OF 1 CADD FILE: ES2806-48
REV. DATE DESCRIPTION DES. ENG.	X XX-XX-XX REVISION XX XX REV. DATE DESCRIPTION DES. ENG.			DIRECTOR OF ENGINEERING AND CONSTRUCTION <i>William Davan</i>		

**NOTES:**

1. I.D. CHARACTERS TO BE 1/2" MINIMUM HEIGHT CLEARLY STAMPED AS SHOWN.
2. WELDS TO BE DRESSED FLUSH WITH SHOULDER AND NOT TO PROTRUDE INTO RAIL SEAT.
3. OPENINGS IN BOLT CAPTURE BLOCKS SHALL BE FREE OF WELD AND SPATTER.
4. SLOTTED HOLE CENTERS ARE INDICATED ON DRAWING.

**BILL OF MATERIAL**

ITEM	QTY	DESCRIPTION	DWG NO	SCRRRA PART NO
1	1	BURNED PLATE, ASTM A36, 3/4" THICK	-	
2	4	CAPTURE BLOCK FOR PLATE CLIP	-	
3	3	CAPTURE BLOCK FOR HORN KEEPER	-	
4	2	FLAT BAR, ASTM A36, 1/2" THICK x 2" x 6" LONG	-	
5	1	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 1	-	



**FROG BASE PLATE 20-136-88LC**

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

DRAWN BY: HDR DATE: 03/31/2011  
*Narek D. Pape*  
 ASSISTANT DIRECTOR: STANDARDS & DESIGN  
*William Davan*  
 DIRECTOR OF ENGINEERING AND CONSTRUCTION

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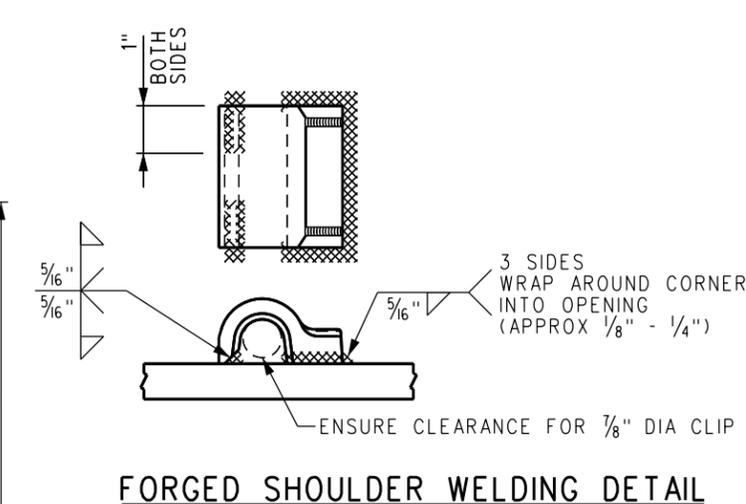
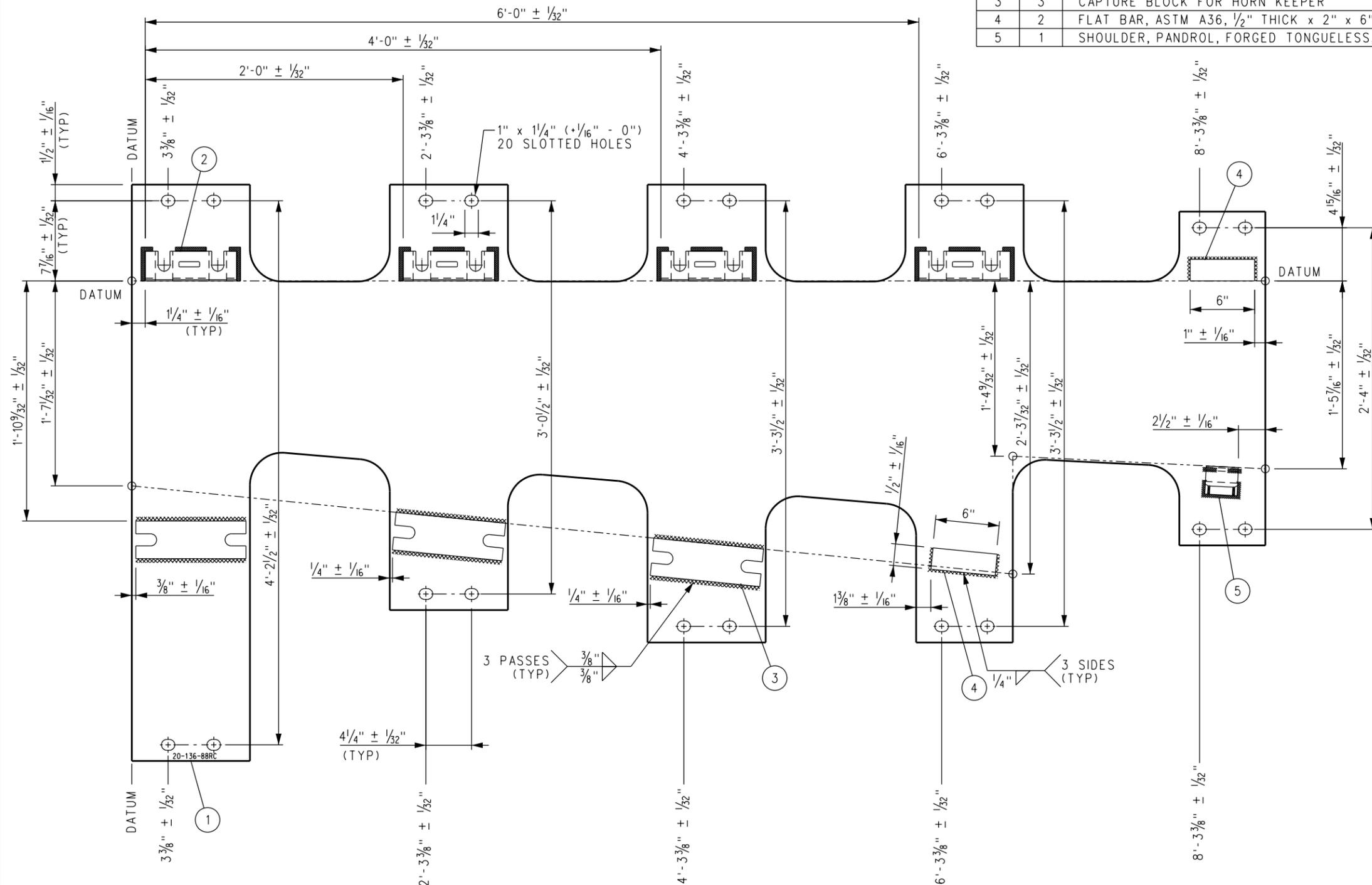
**METROLINK**  
 SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
 ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS  
 NO 20 WSM FROG LH  
 FROG BASE PLATE 20-88LC  
 CONCRETE TIES-136 LB RE RAIL

STANDARD	2806
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2806-49

BILL OF MATERIAL

ITEM	QTY	DESCRIPTION	DWG NO	SCRR PART NO
1	1	BURNED PLATE, 3/4" THICK	-	
2	4	CAPTURE BLOCK FOR PLATE CLIP	-	
3	3	CAPTURE BLOCK FOR HORN KEEPER	-	
4	2	FLAT BAR, ASTM A36, 1/2" THICK x 2" x 6" LONG	-	
5	1	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 1	-	



**FROG BASE PLATE 20-136-88RC**

**NOTES:**

1. I.D. CHARACTERS TO BE 1/2" MINIMUM HEIGHT CLEARLY STAMPED AS SHOWN.
2. WELDS TO BE DRESSED FLUSH WITH SHOULDER AND NOT TO PROTRUDE INTO RAIL SEAT.
3. OPENINGS IN BOLT CAPTURE BLOCKS SHALL BE FREE OF WELD AND SPATTER.
4. SLOTTED HOLE CENTERS ARE INDICATED ON DRAWING.

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 Davan*  
 DIRECTOR OF ENGINEERING AND CONSTRUCTION

SCRR ENGINEERING STANDARDS ARE INTENDED FOR SCRR APPROVED USES ONLY.  
 FOR NON-SCRR APPROVED USES  
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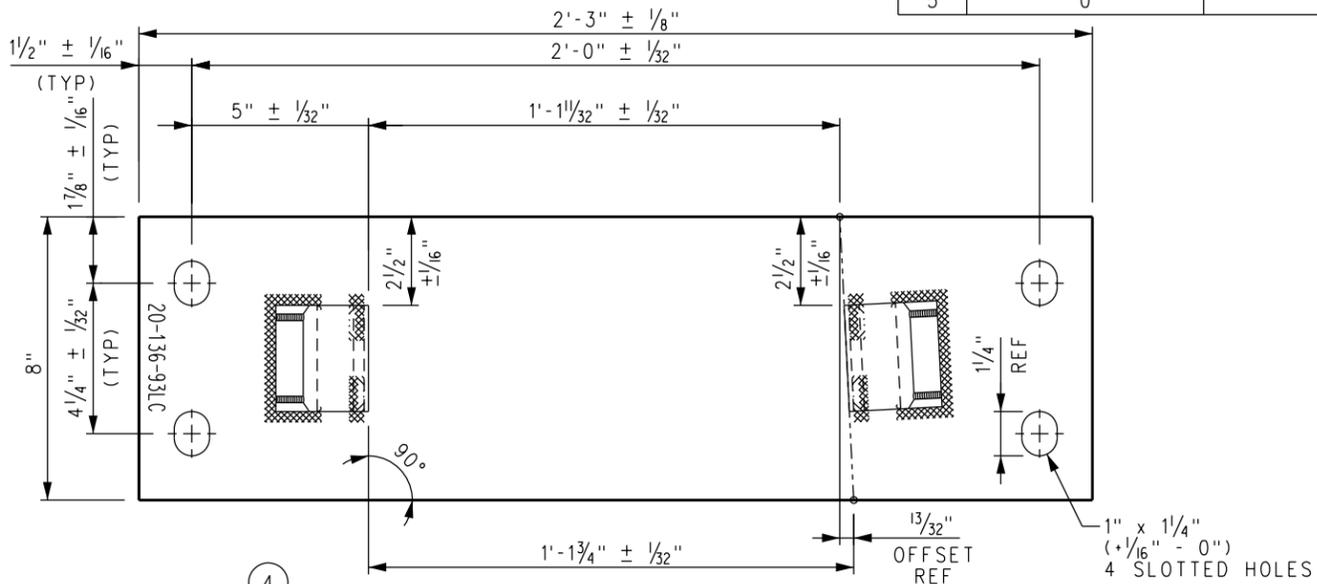
  
 SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
 ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS  
 NO 20 WSM FROG RH  
 FROG BASE PLATE 20-88RC  
 CONCRETE TIES-136 LB RE RAIL

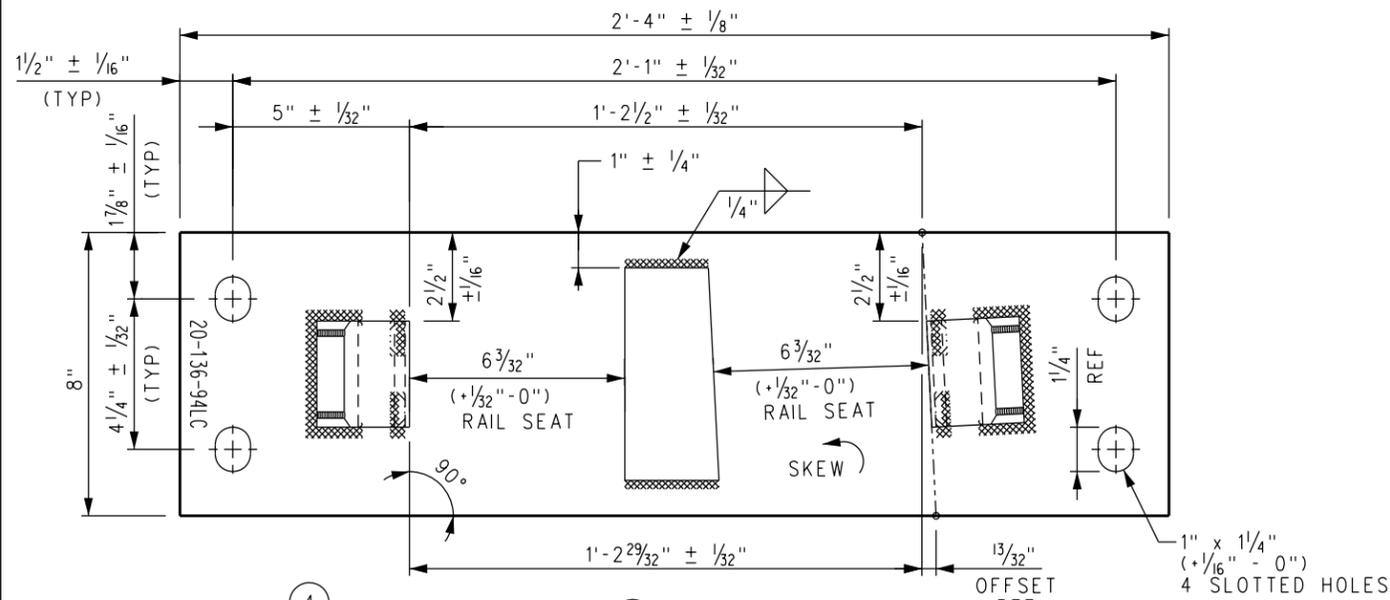
STANDARD	2806
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2806-50

BILL OF MATERIAL

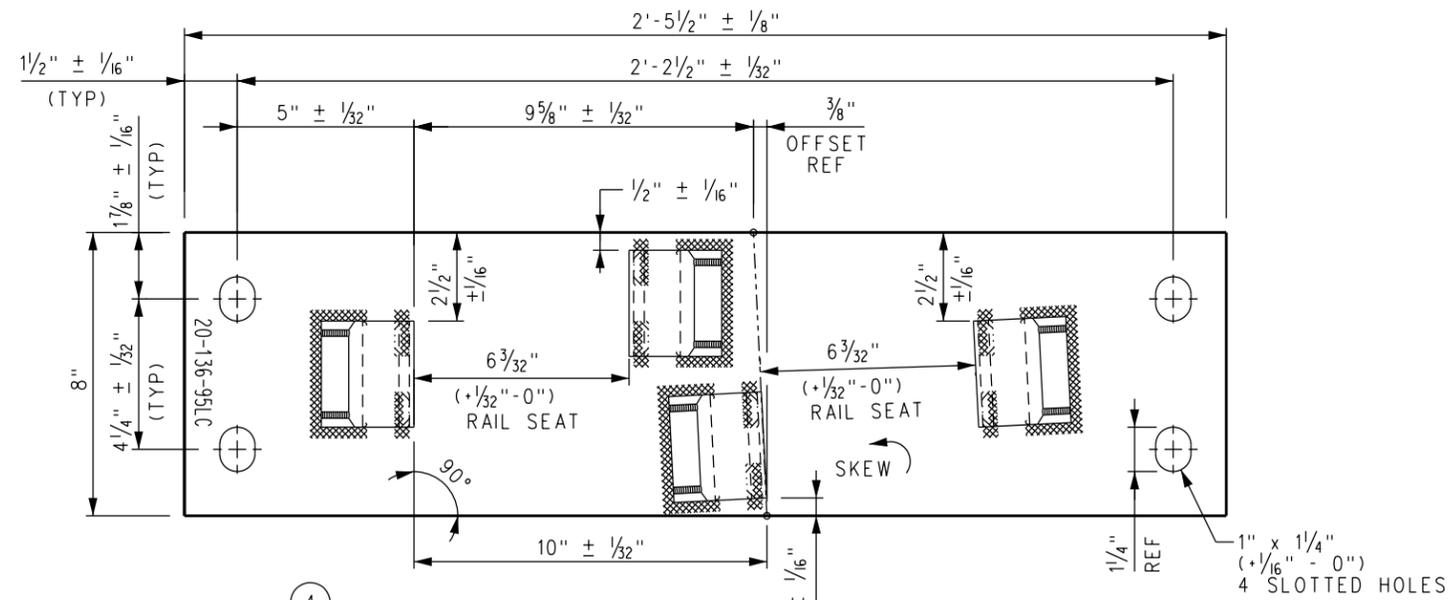
ITEM	QTY FOR 20-93LC	QTY FOR 20-94LC	QTY FOR 20-95LC	DESCRIPTION	DWG NO	SCRR PART NO
1	1	0	0	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-3" LONG	-	
2	0	1	0	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-4" LONG	-	
3	0	0	1	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-5 1/2" LONG	-	
4	2	2	4	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 1	-	
5	0	1	0	BURNED STOP, 1/2" THICK, TAPERED 2 3/8" TO 2 2/32", 6" LONG	-	



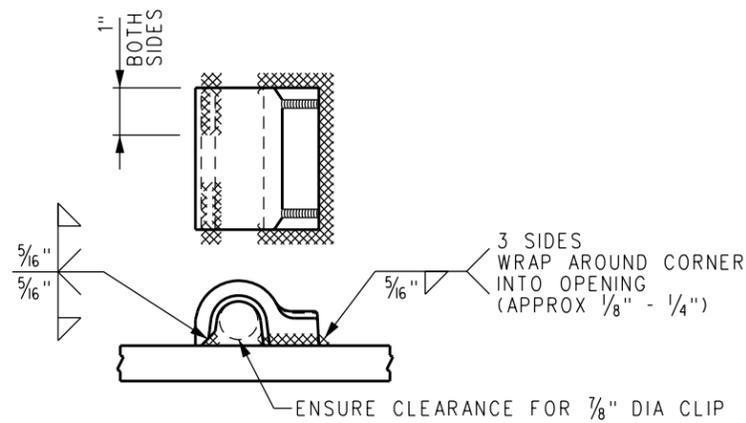
FROG BASE PLATE 20-136-93LC



FROG BASE PLATE 20-136-94LC



FROG BASE PLATE 20-136-95LC



FORGED SHOULDER WELDING DETAIL

NOTES:

1. I.D. CHARACTERS TO BE 1/2" MINIMUM HEIGHT CLEARLY STAMPED AS SHOWN.
2. WELDS TO BE DRESSED FLUSH WITH SHOULDER & NOT TO PROTRUDE INTO RAIL SEAT.
3. SLOTTED HOLE CENTERS ARE INDICATED ON DRAWING.

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

DRAWN BY: *Narek D. Pape* HDR DATE: 03/31/2011  
 ASSISTANT DIRECTOR: STANDARDS & DESIGN  
*William Davan*  
 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.

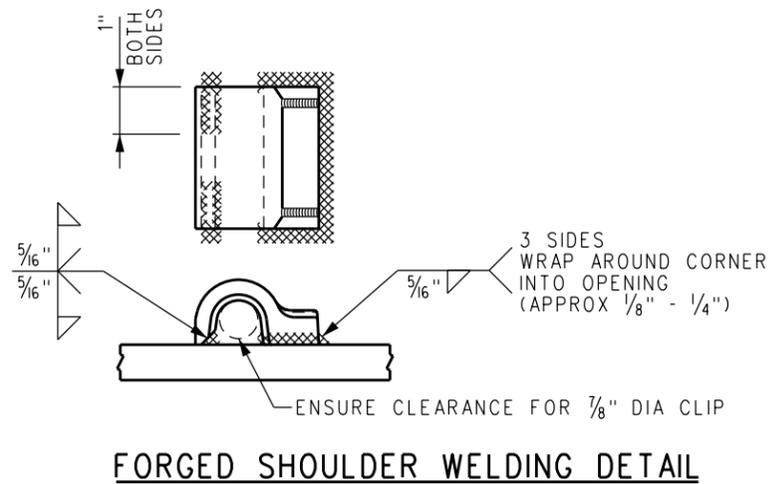
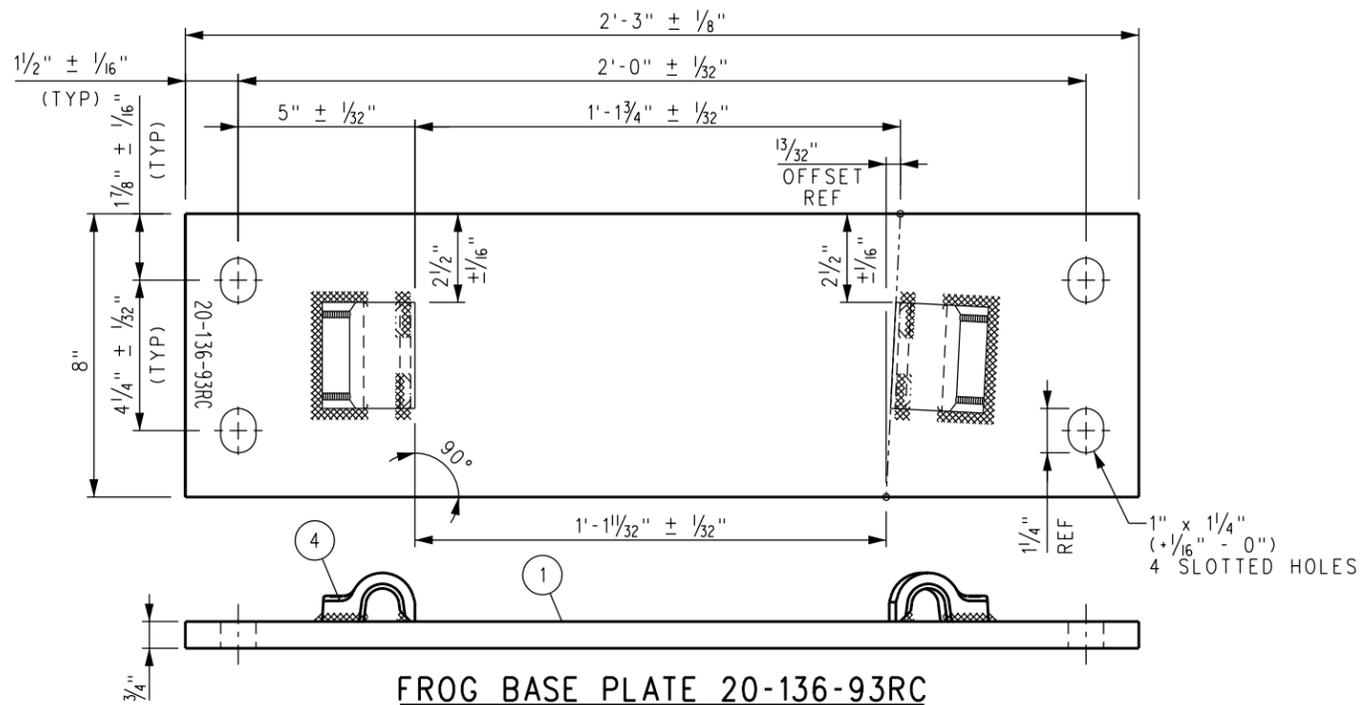
**METROLINK**  
 SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
 ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS  
 NO 20 WSM FROG LH  
 FROG BASE PLATES 20-93LC, 20-94LC AND 20-95LC  
 CONCRETE TIES-136 LB RE RAIL

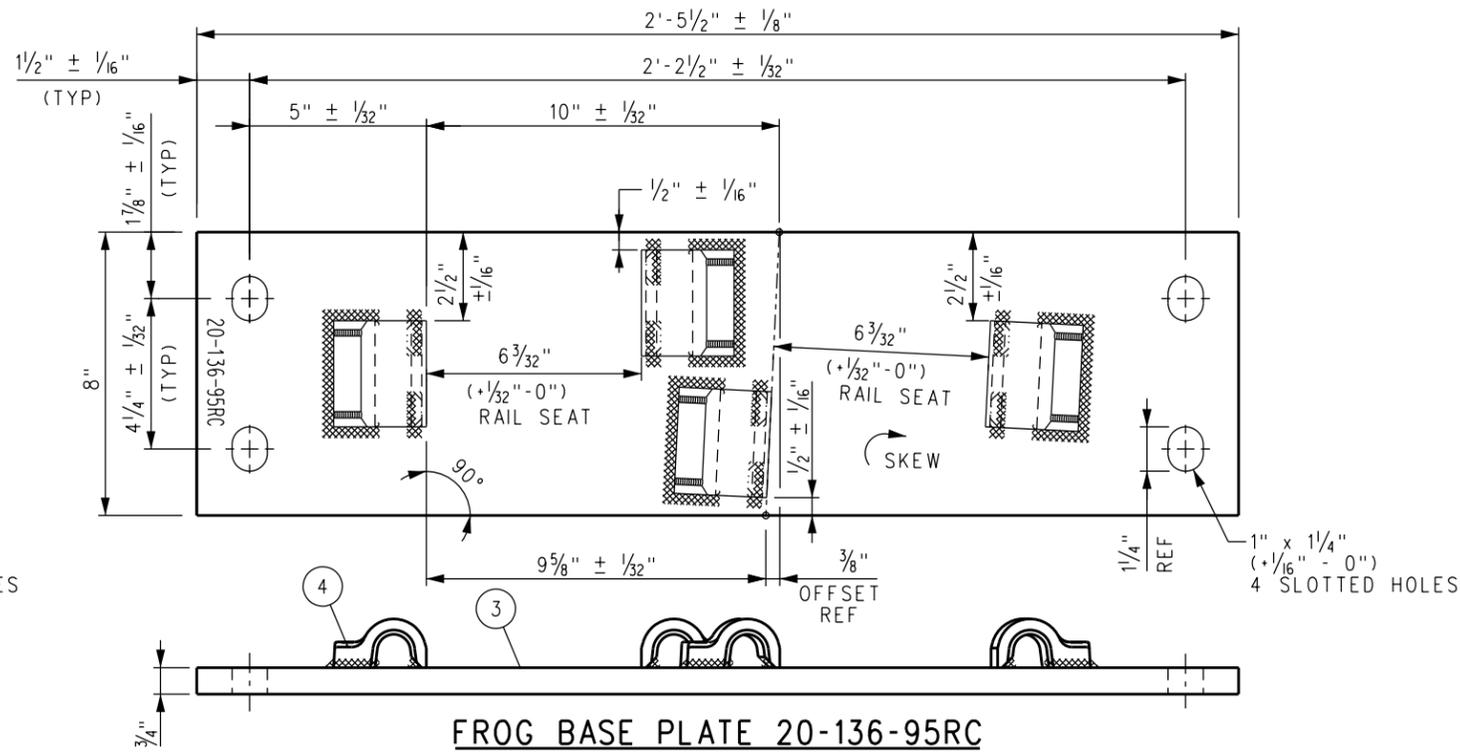
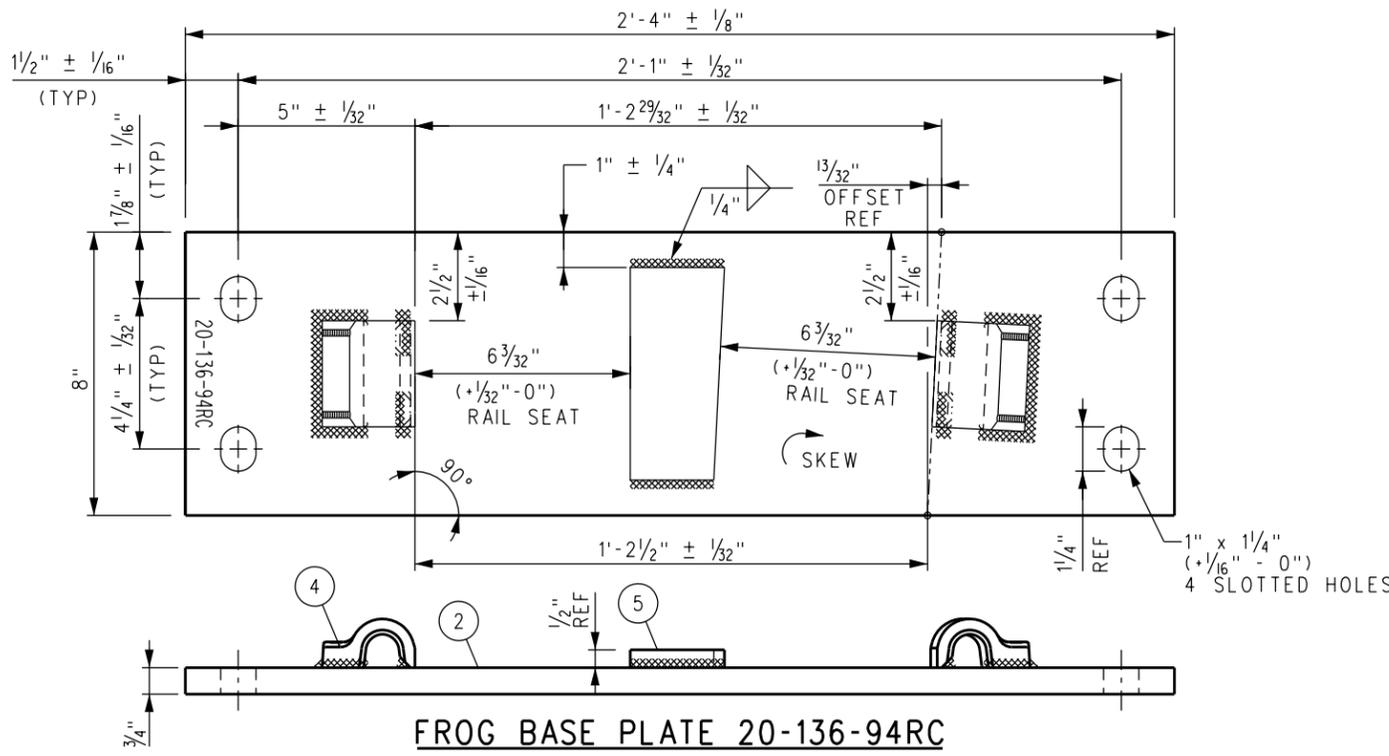
STANDARD	2806
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2806-51

BILL OF MATERIAL

ITEM	QTY FOR 20-93RC	QTY FOR 20-94RC	QTY FOR 20-95RC	DESCRIPTION	DWG NO	SCRR PART NO
1	1	0	0	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-3" LONG	-	
2	0	1	0	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-4" LONG	-	
3	0	0	1	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-5 1/2" LONG	-	
4	2	2	4	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 1	-	
5	0	1	0	BURNED STOP, 1/2" THICK, TAPERED 2 3/8" TO 2 21/32", 6" LONG	-	



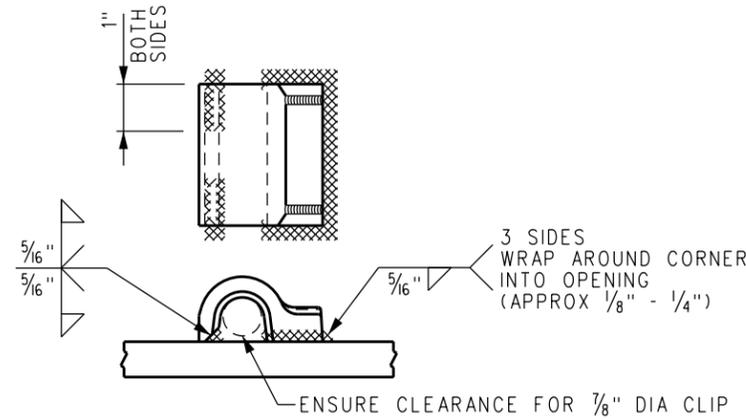
- NOTES:**
1. I.D. CHARACTERS TO BE 1/2" MINIMUM HEIGHT CLEARLY STAMPED AS SHOWN.
  2. WELDS TO BE DRESSED FLUSH WITH SHOULDER & NOT TO PROTRUDE INTO RAIL SEAT.
  3. SLOTTED HOLE CENTERS ARE INDICATED ON DRAWING.



DRAWN BY: <i>Nareh D. Papp</i> HDR DATE: 03/31/2011		<p>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>	<p>ENGINEERING STANDARDS</p> <p>NO 20 WSM FROG RH</p> <p>FROG BASE PLATES 20-93RC, 20-94RC AND 20-95RC</p> <p>CONCRETE TIES-136 LB RE RAIL</p>		<p>STANDARD 2806</p> <p>SCALE: NTS</p> <p>REVISION SHEET 1 OF 1</p> <p>CADD FILE: ES2806-52</p>
<p>ASSISTANT DIRECTOR: STANDARDS &amp; DESIGN</p> <p><i>William Davan</i></p> <p>DIRECTOR OF ENGINEERING AND CONSTRUCTION</p>			<p>SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY</p> <p>ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012</p>		

BILL OF MATERIAL

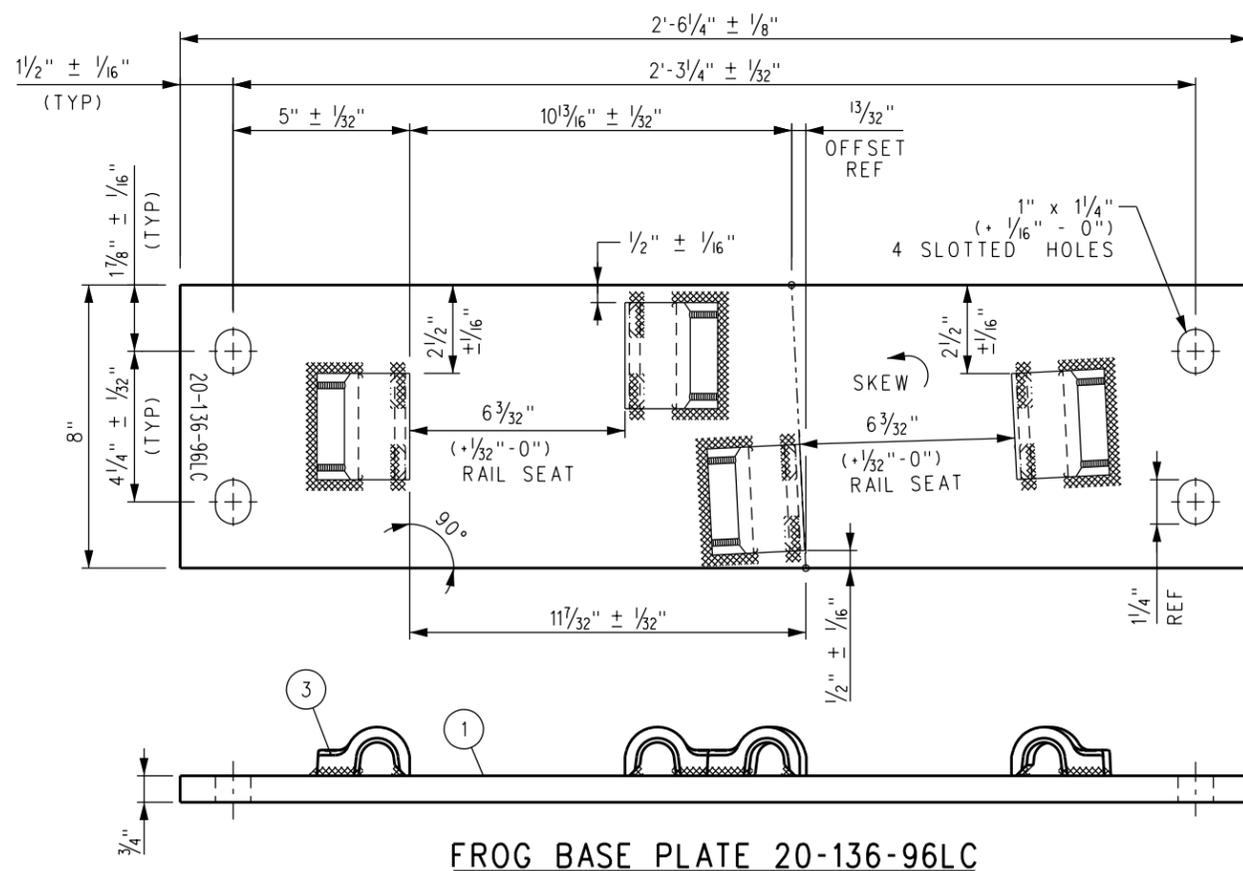
ITEM	QTY FOR 20-96LC	QTY FOR 20-97LC	DESCRIPTION	DWG NO	SCRR PART NO
1	1	0	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-6 1/4" LONG	-	
2	0	1	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-7 1/2" LONG	-	
3	4	4	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 1	-	



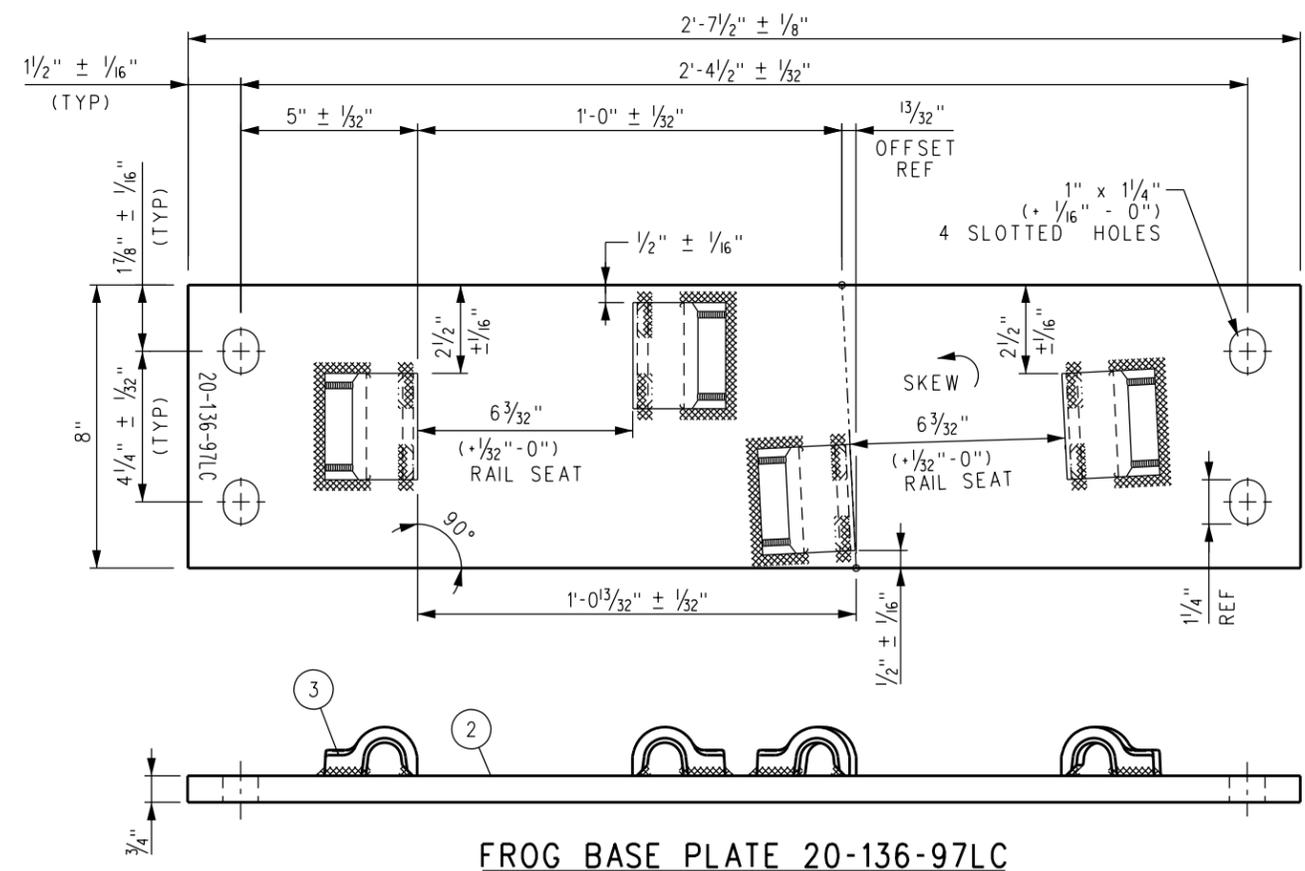
**FORGED SHOULDER WELDING DETAIL**

**NOTES:**

1. I.D. CHARACTERS TO BE 1/2" MINIMUM HEIGHT CLEARLY STAMPED AS SHOWN.
2. WELDS TO BE DRESSED FLUSH WITH SHOULDER & NOT TO PROTRUDE INTO RAIL SEAT.
3. SLOTTED HOLE CENTERS ARE INDICATED ON DRAWING.



**FROG BASE PLATE 20-136-96LC**



**FROG BASE PLATE 20-136-97LC**

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  
 DIRECTOR OF ENGINEERING AND CONSTRUCTION

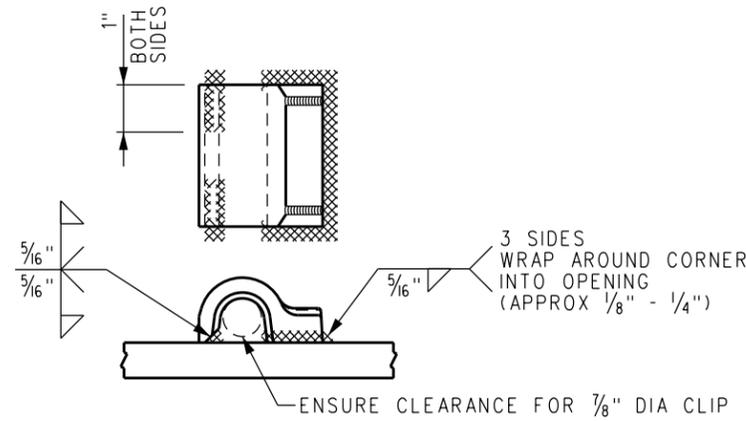
**METROLINK**  
 SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
 ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS  
 NO 20 WSM FROG LH  
 FROG BASE PLATES 20-96LC AND 20-97LC  
 CONCRETE TIES-136 LB RE RAIL

STANDARD	2806
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2806-53

BILL OF MATERIAL

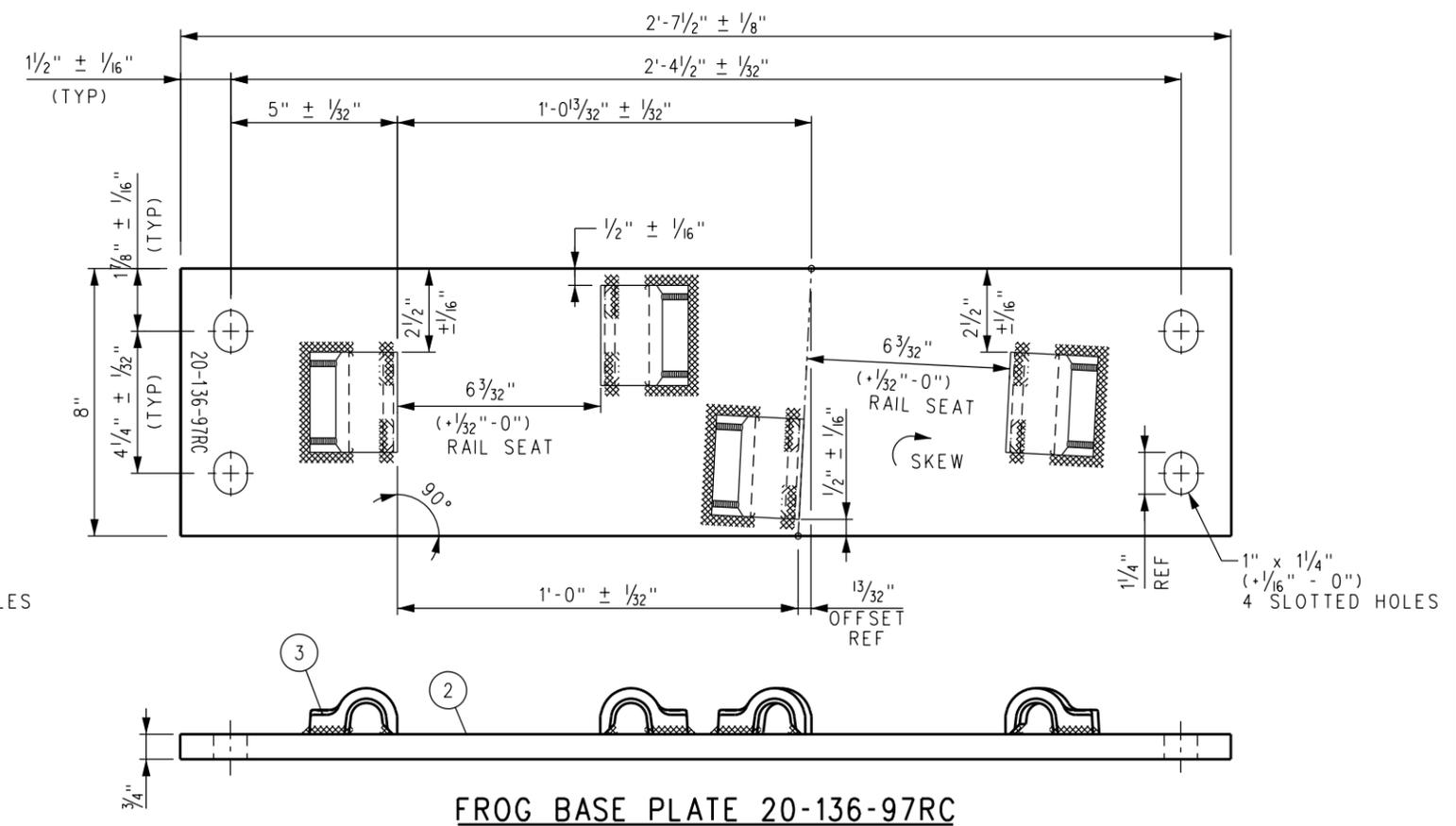
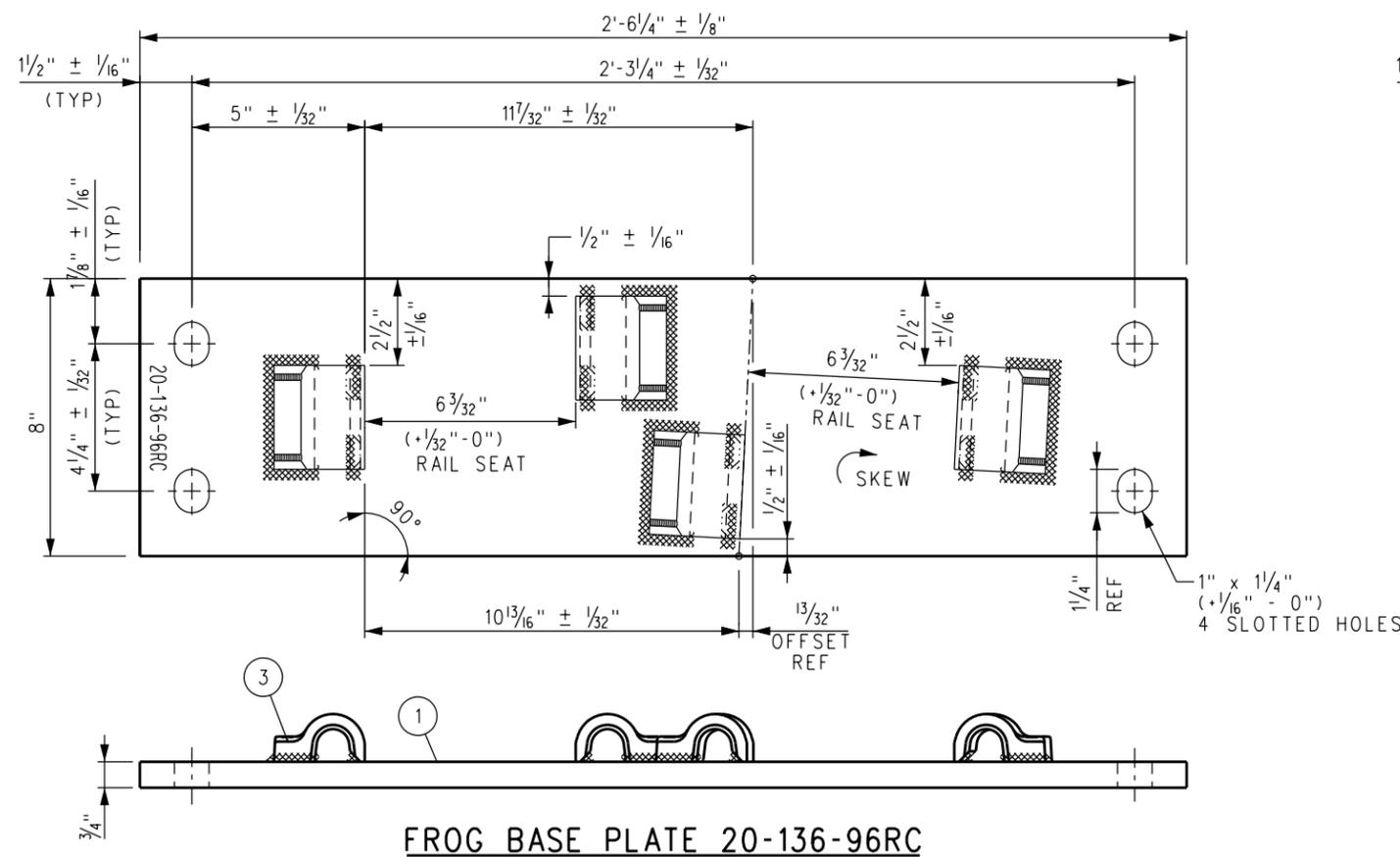
ITEM	QTY FOR 20-96RC	QTY FOR 20-97RC	DESCRIPTION	DWG NO	SCRR PART NO
1	1	0	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-6 1/4" LONG	-	
2	0	1	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-7 1/2" LONG	-	
3	4	4	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 1	-	



**FORGED SHOULDER WELDING DETAIL**

**NOTES:**

1. I.D. CHARACTERS TO BE 1/2" MINIMUM HEIGHT CLEARLY STAMPED AS SHOWN.
2. WELDS TO BE DRESSED FLUSH WITH SHOULDER & NOT TO PROTRUDE INTO RAIL SEAT.
3. SLOTTED HOLE CENTERS ARE INDICATED ON DRAWING.



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

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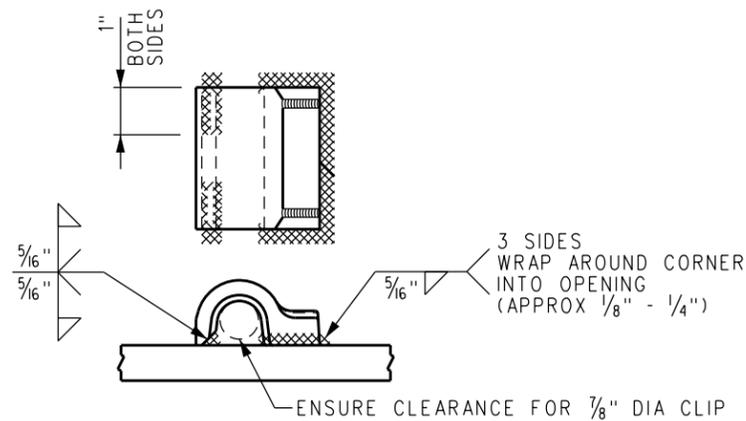
**METROLINK**  
SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS  
NO 20 WSM FROG RH  
FROG BASE PLATES 20-96RC AND 20-97RC  
CONCRETE TIES-136 LB RE RAIL

STANDARD	2806
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2806-54

BILL OF MATERIAL

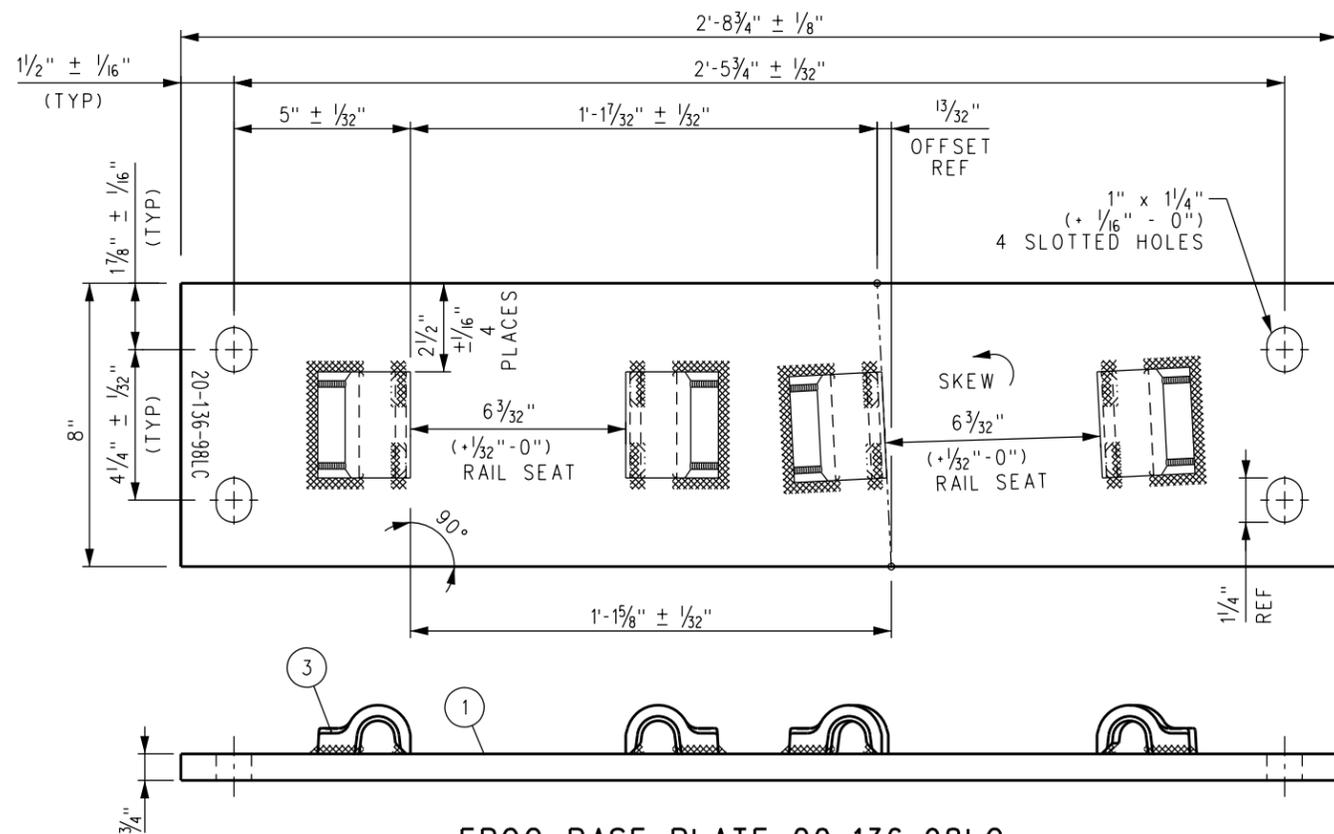
ITEM	QTY FOR 20-98LC	QTY FOR 20-99LC	DESCRIPTION	DWG NO	SCRR PART NO
1	1	0	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-8 3/4" LONG	-	
2	0	1	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-10" LONG	-	
3	4	4	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 1	-	



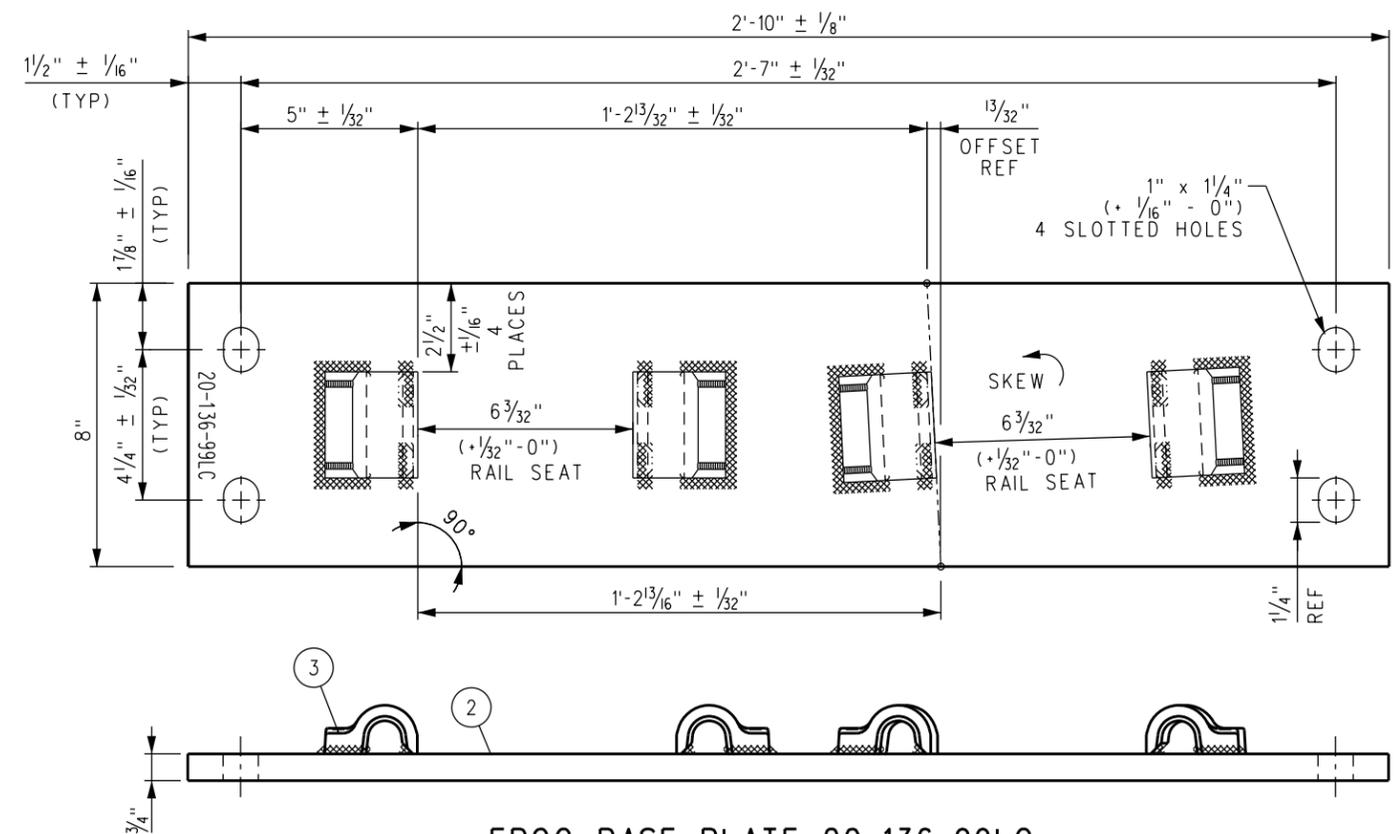
**FORGED SHOULDER WELDING DETAIL**

**NOTES:**

1. I.D. CHARACTERS TO BE 1/2" MINIMUM HEIGHT CLEARLY STAMPED AS SHOWN.
2. WELDS TO BE DRESSED FLUSH WITH SHOULDER & NOT TO PROTRUDE INTO RAIL SEAT.
3. SLOTTED HOLE CENTERS ARE INDICATED ON DRAWING.



**FROG BASE PLATE 20-136-98LC**



**FROG BASE PLATE 20-136-99LC**

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

DRAWN BY: *Narek D. Pape* HDR DATE: 03/31/2011  
 ASSISTANT DIRECTOR: STANDARDS & DESIGN  
*William Davan*  
 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.

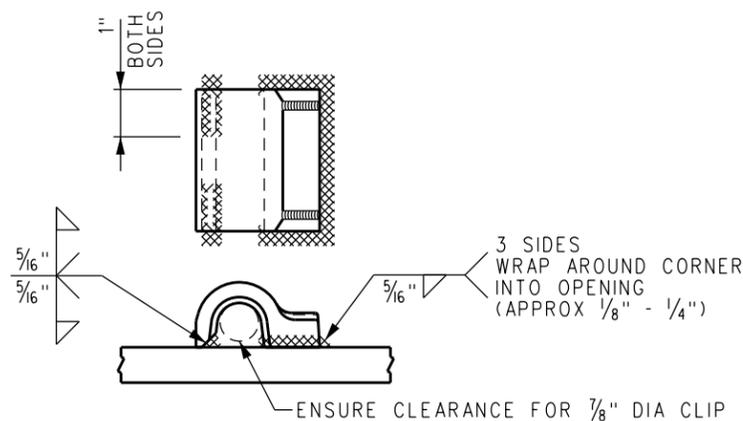
**METROLINK**  
 SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
 ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS  
 NO 20 WSM FROG LH  
 FROG BASE PLATES 20-98LC AND 20-99LC  
 CONCRETE TIES-136 LB RE RAIL

STANDARD	2806
SCALE	NTS
REVISION SHEET	1 OF 1
CADD FILE	ES2806-55

BILL OF MATERIAL

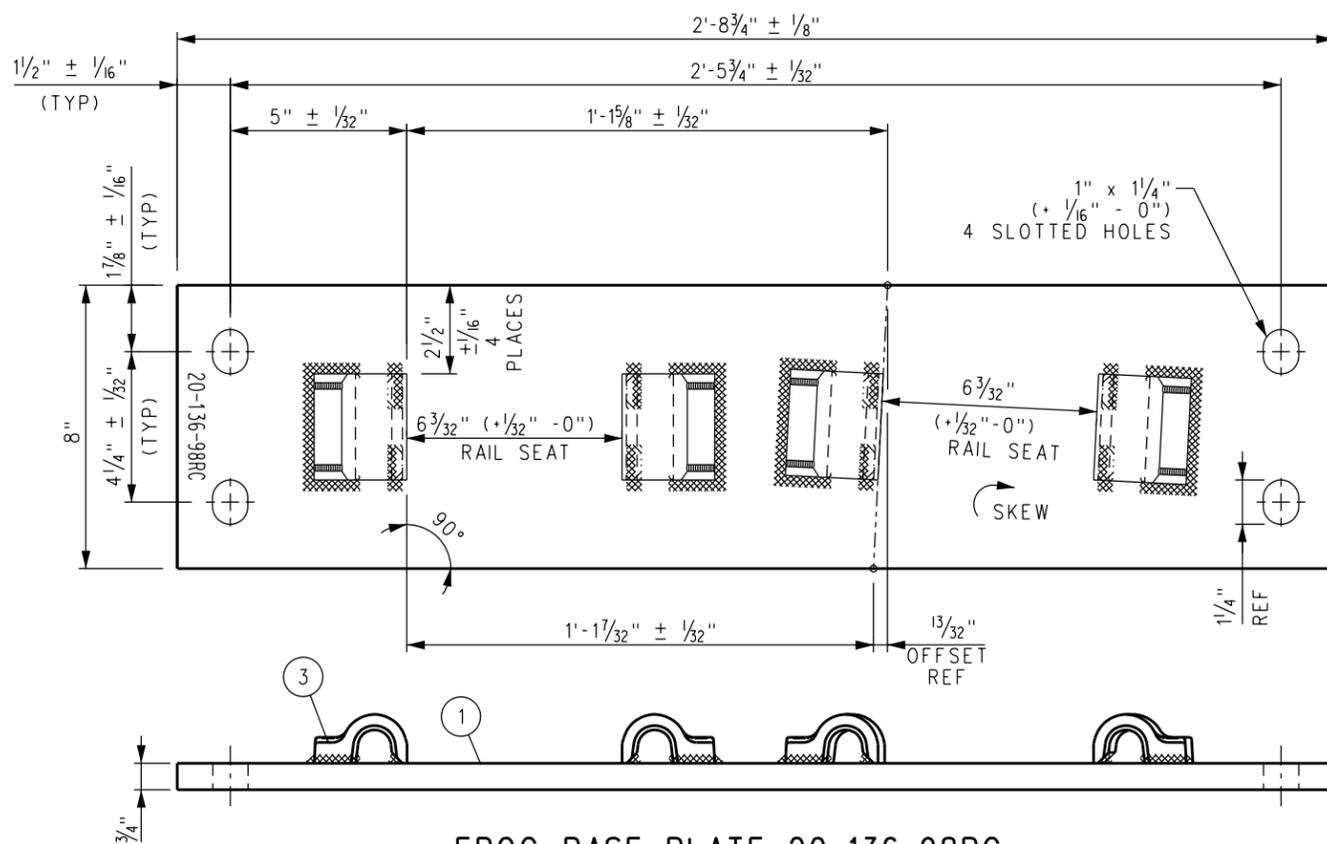
ITEM	QTY FOR 20-98RC	QTY FOR 20-99RC	DESCRIPTION	DWG NO	SCRR PART NO
1	1	0	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-8 3/4" LONG	-	
2	0	1	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-10" LONG	-	
3	4	4	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 1	-	



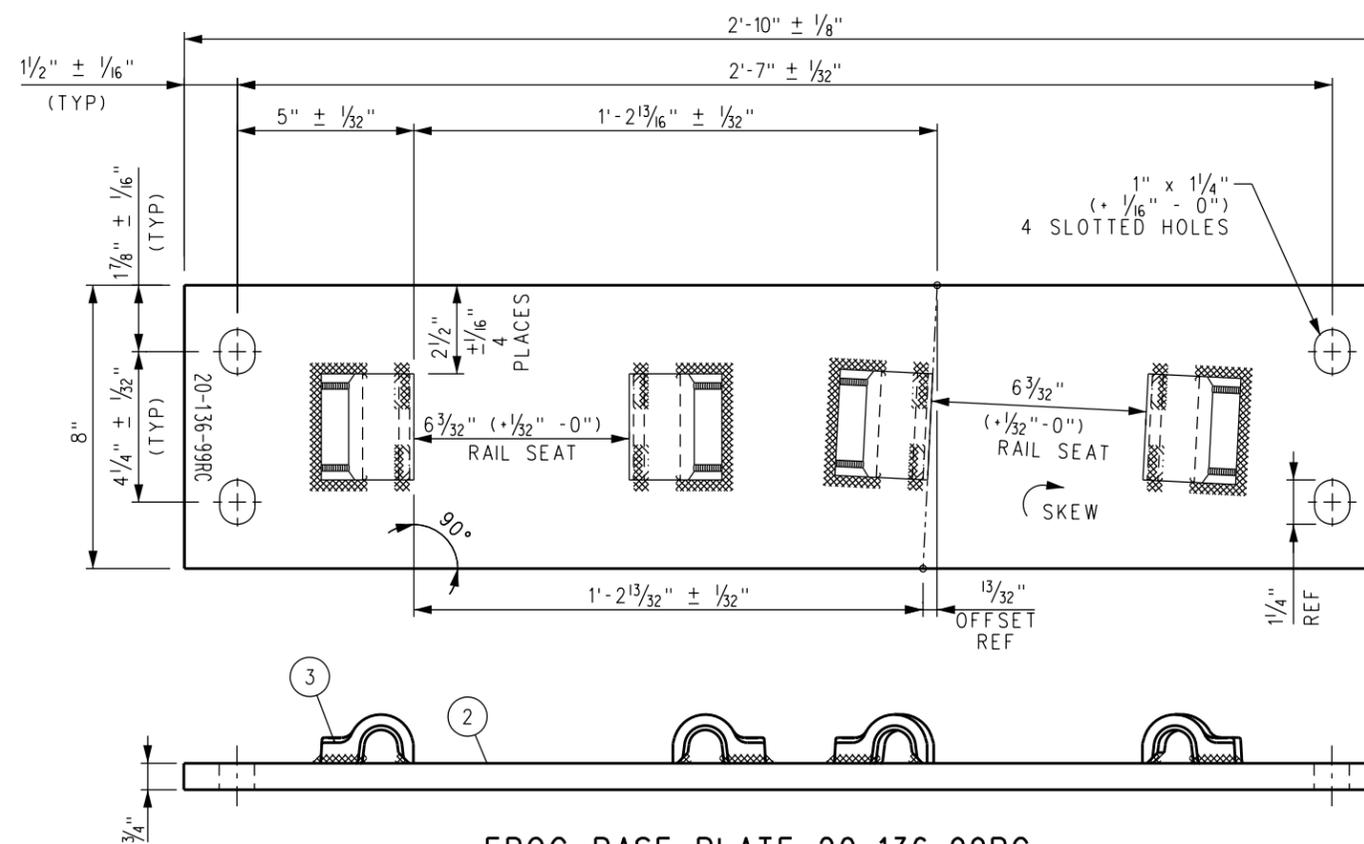
**FORGED SHOULDER WELDING DETAIL**

**NOTES:**

1. I.D. CHARACTERS TO BE 1/2" MINIMUM HEIGHT CLEARLY STAMPED AS SHOWN.
2. WELDS TO BE DRESSED FLUSH WITH SHOULDER & NOT TO PROTRUDE INTO RAIL SEAT.
3. SLOTTED HOLE CENTERS ARE INDICATED ON DRAWING.



**FROG BASE PLATE 20-136-98RC**



**FROG BASE PLATE 20-136-99RC**

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

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  
 NO 20 WSM FROG RH  
 FROG BASE PLATES 20-98RC AND 20-99RC  
 CONCRETE TIES-136 LB RE RAIL

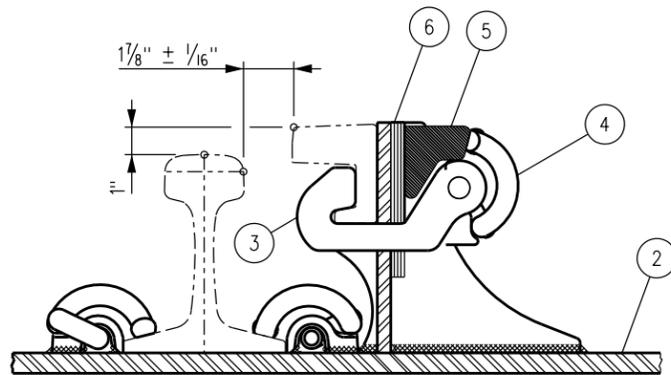
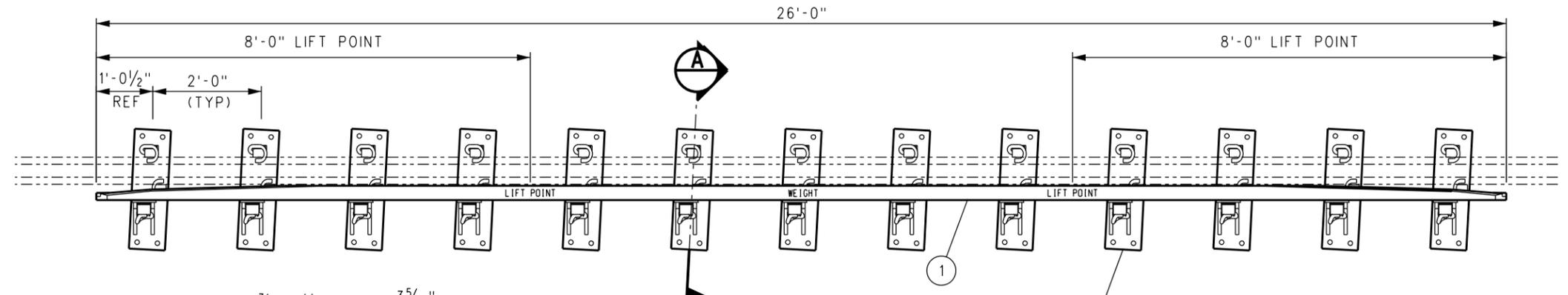
STANDARD	2806
SCALE	NTS
REVISION SHEET	1 OF 1
CADD FILE	ES2806-56

**NOTES:**

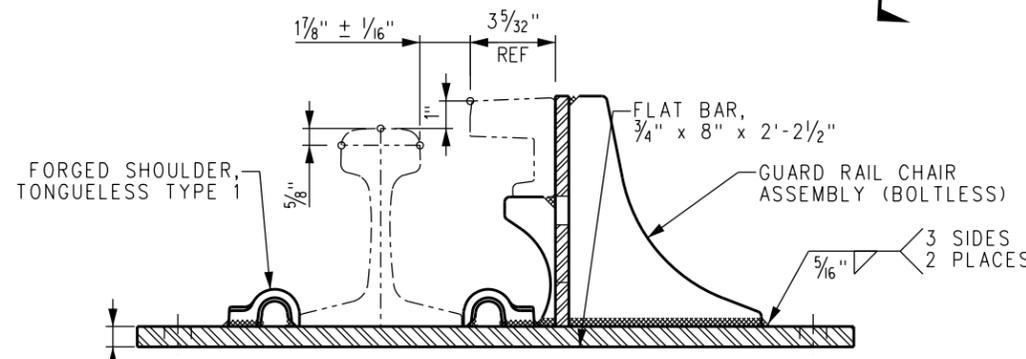
1. PLATE SPACING IS SET FOR SHIPPING ONLY. FINAL PLATE SPACING IS TO BE DETERMINED BY TIE SPACING AT TIME OF INSTALLATION.
2. PANDROL SPRING CLIPS (E2055) TO BE INCLUDED IN ASSEMBLY.
3. LIFT POINTS AND WEIGHT OF ASSEMBLY TO BE MARKED ON HEAD OF WEAR BAR WITH WHITE PAINT.
4. PLATE IS TO BE STAMPED WITH PLATE I.D. WITH 1/2" HIGH CHARACTERS AS SHOWN.
5. GRIND AWAY CORNER OF PANDROL SHOULDER TO CLEAR FOOT OF CHAIR ASSEMBLY.
6. SEE ES2800-50 FOR STRAIGHT SIDE GUARD RAIL.

**BILL OF MATERIAL**

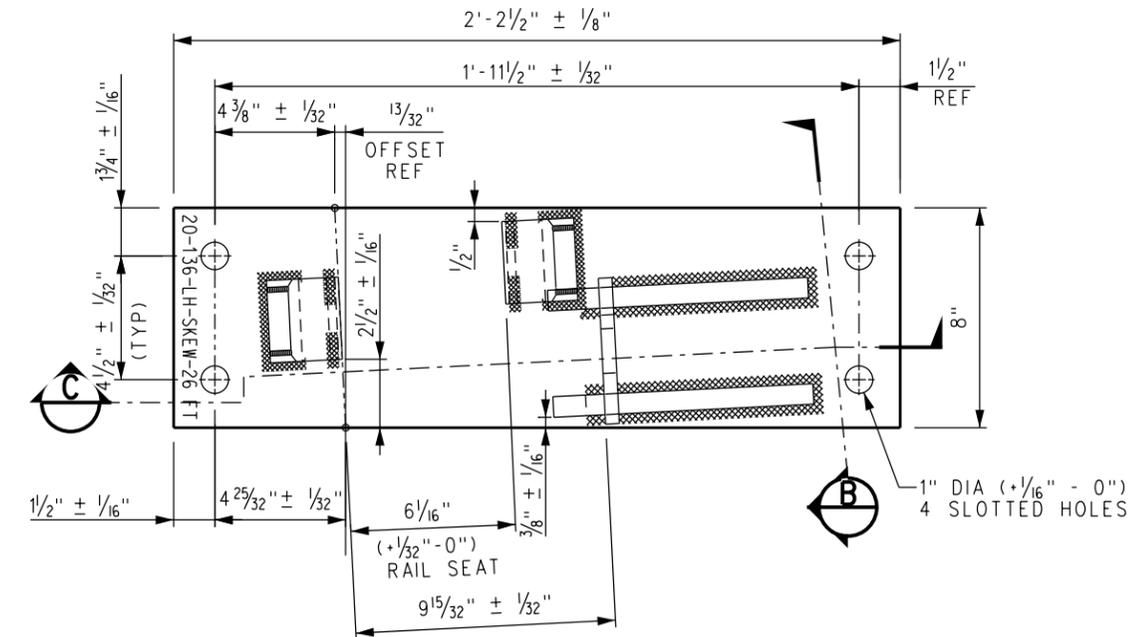
ITEM	QTY	DESCRIPTION	DWG NO	SCRR PART NO
1	1	GUARD BAR, UIC33 1200 SERIES x 26'-0" LONG	-	
2	13	GUARD RAIL PLATE ASSEMBLY, RAISED 1", LH SKEWED	-	
3	13	H-CLAMP	-	
4	39	CLIP, PANDROL, E2055	-	
5	13	LOCKING BLOCK	-	
6	52	SHIM, 1/8" x 3" x 6"	-	



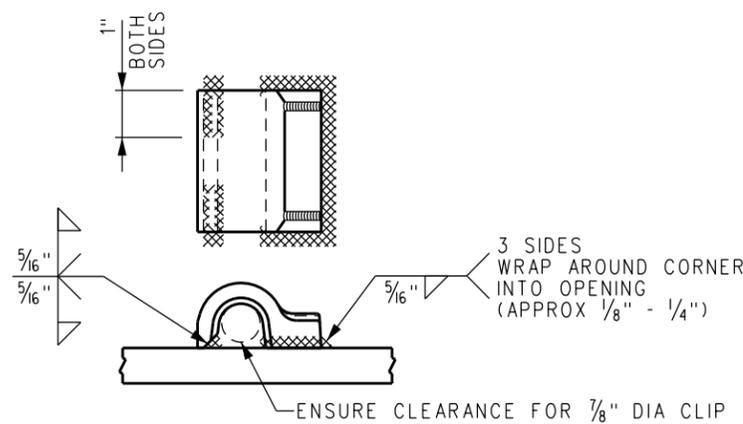
**PARTIAL SECTION A**  
GUARD RAIL HARDWARE ASSEMBLY



**SECTION C**



**GUARD RAIL PLATE ASSEMBLY**



**FORGED SHOULDER WELDING DETAIL**

**VIEW B**

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 Dava*  
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**

NO 20 GUARD RAIL ASSEMBLY, LH SKEWED WITH PLATES  
26'-0" LONG, BOLTLESS, RAISED 1"  
CONCRETE TIES-136 LB RE RAIL, 1-7/8" FLANGEWAY

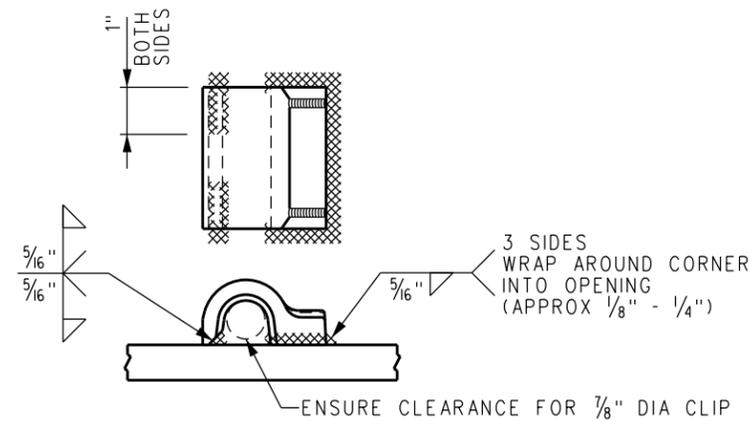
STANDARD	2806
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2806-61

BILL OF MATERIAL

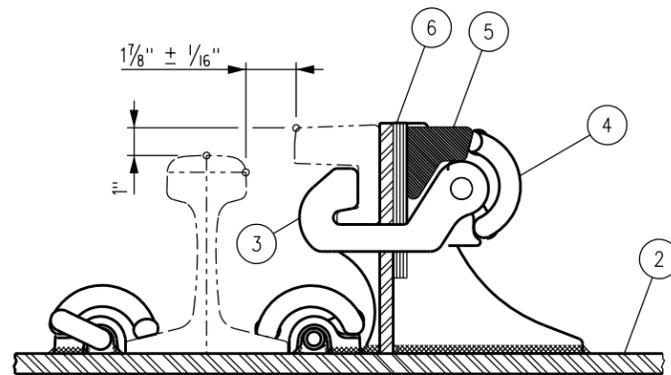
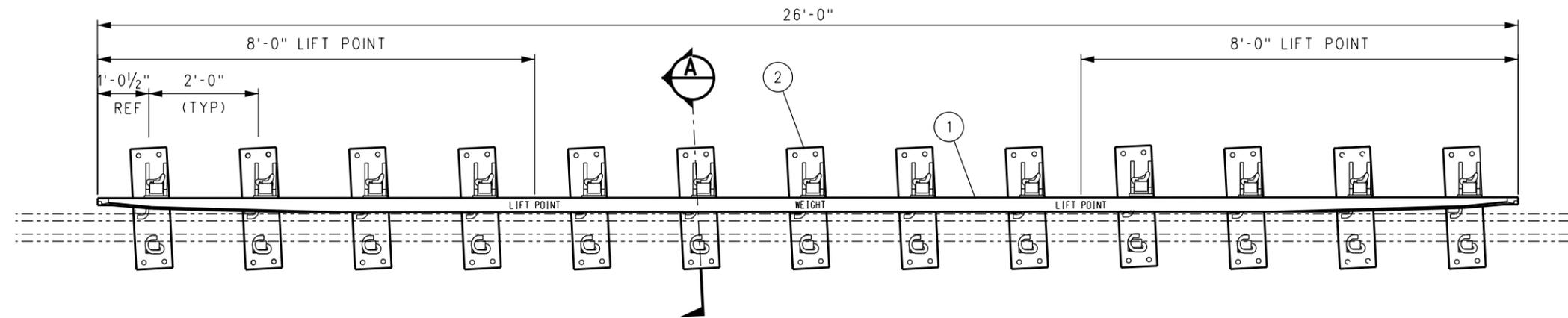
ITEM	QTY	DESCRIPTION	DWG NO	SCRRRA PART NO
1	1	GUARD BAR, UIC33 1200 SERIES x 26'-0" LONG	-	
2	13	GUARD RAIL PLATE ASSEMBLY, RAISED 1", RH SKEWED	-	
3	13	H-CLAMP	-	
4	39	CLIP, PANDROL, E2055	-	
5	13	LOCKING BLOCK	-	
6	52	SHIM, 1/8" x 3" x 6"	-	

NOTES:

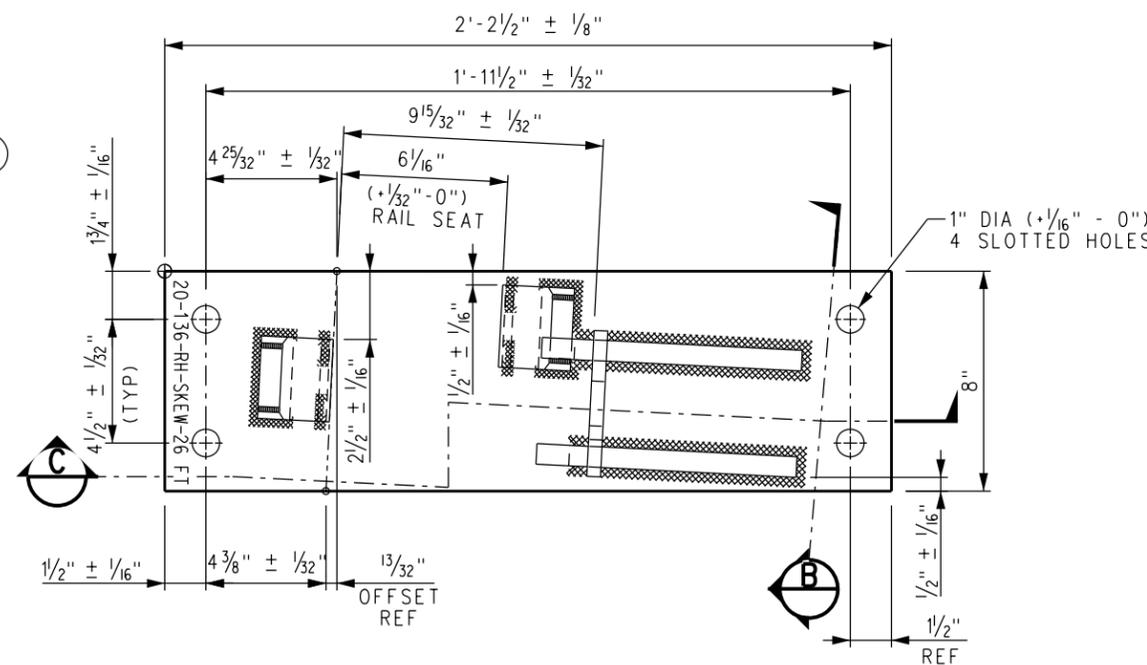
1. PLATE SPACING IS SET FOR SHIPPING ONLY. FINAL PLATE SPACING IS TO BE DETERMINED BY TIE SPACING AT TIME OF INSTALLATION.
2. PANDROL SPRING CLIPS (E2055) TO BE INCLUDED IN ASSEMBLY.
3. LIFT POINTS AND WEIGHT OF ASSEMBLY TO BE MARKED ON HEAD OF WEAR BAR WITH WHITE PAINT.
4. PLATE IS TO BE STAMPED WITH PLATE I.D. WITH 1/2" HIGH CHARACTERS AS SHOWN.
5. GRIND AWAY CORNER OF PANDROL SHOULDER TO CLEAR FOOT OF CHAIR ASSEMBLY.
6. SEE ES2800-50 FOR STRAIGHT SIDE GUARD RAIL.



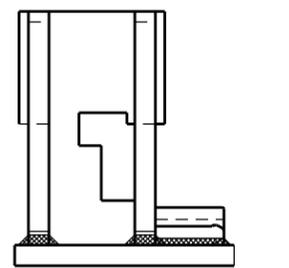
FORGED SHOULDER WELDING DETAIL



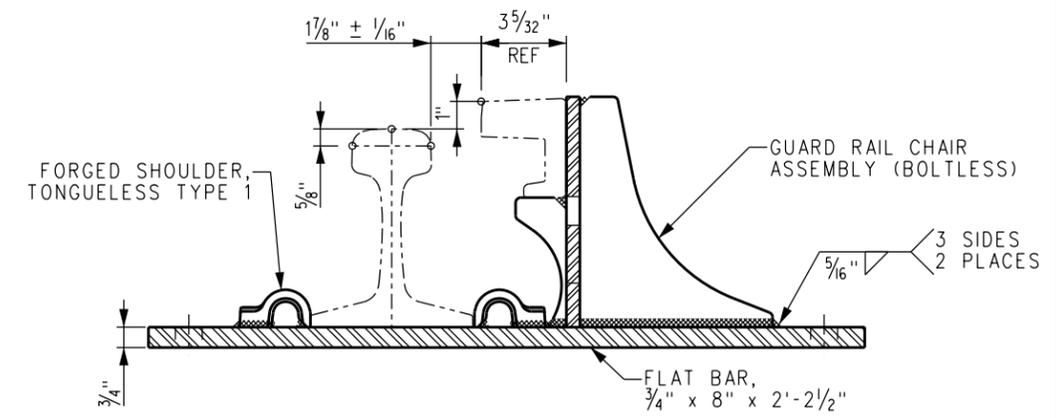
PARTIAL SECTION A  
GUARD RAIL HARDWARE ASSEMBLY



GUARD RAIL PLATE ASSEMBLY



VIEW B



SECTION C

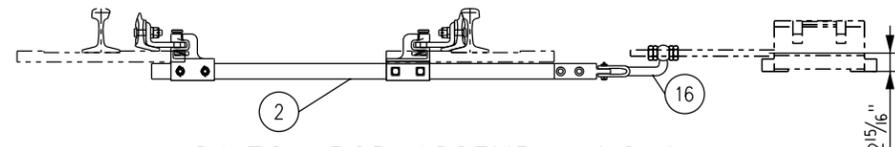
DRAWN BY: <i>Narek D. Papp</i>		HDR: <i>Willson Davan</i>	DATE: 03/31/2011
ASSISTANT DIRECTOR: STANDARDS & DESIGN		DIRECTOR OF ENGINEERING AND CONSTRUCTION	
REVISION	XX XX	DES.	ENG.
REV. DATE	DESCRIPTION	DES.	ENG.

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

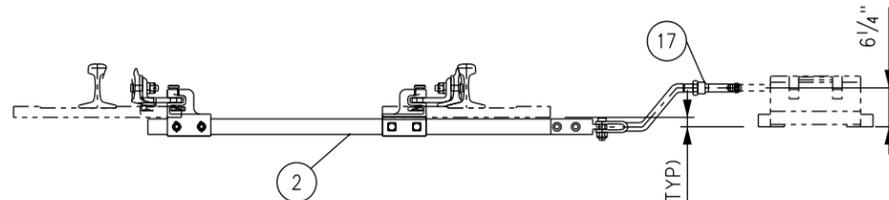
ENGINEERING STANDARDS  
NO 20 GUARD RAIL ASSEMBLY,  
RH SKEWED WITH PLATES  
26'-0" LONG, BOLTLESS, RAISED 1"  
CONCRETE TIES-136 LB RE RAIL, 1-7/8" FLANGEWAY

STANDARD	2806
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2806-62



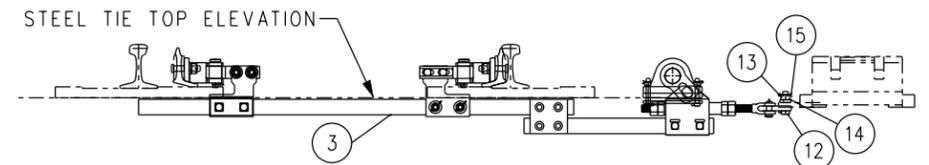
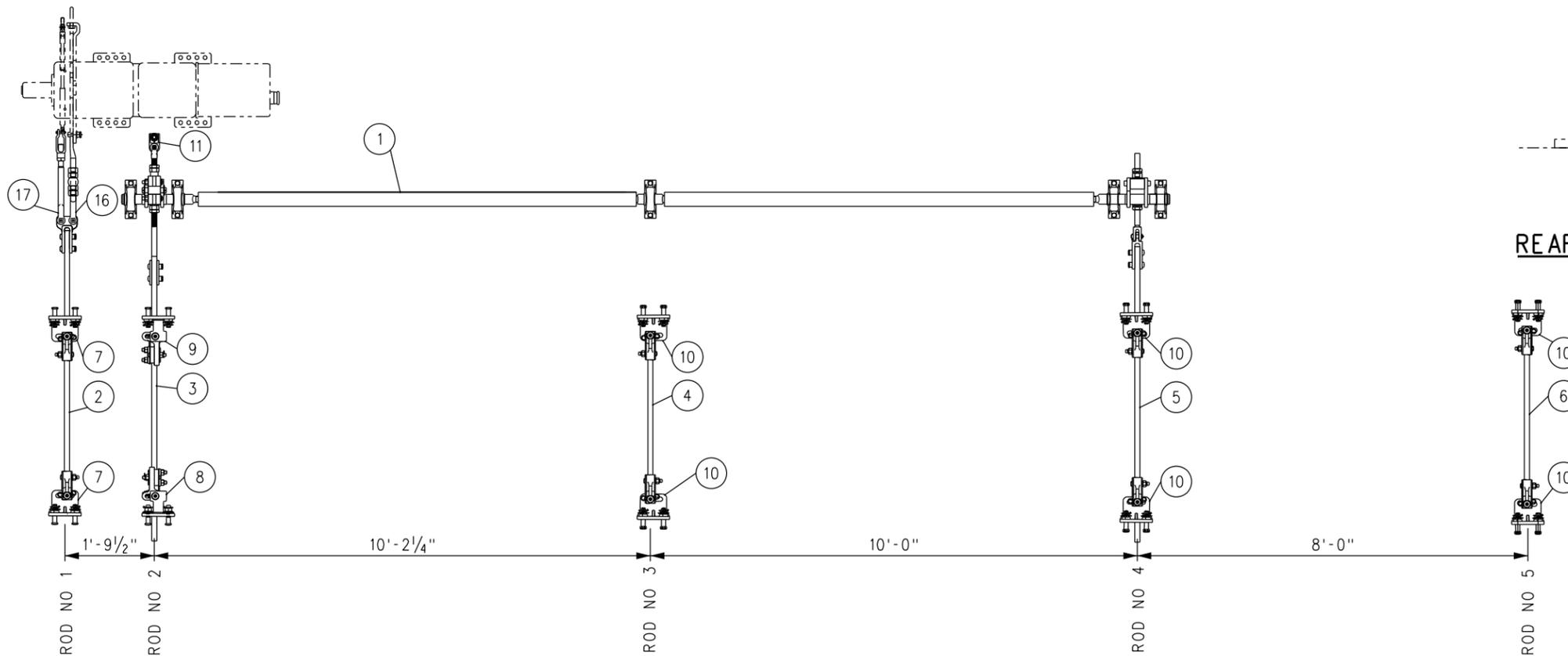
**SWITCH ROD ASSEMBLY NO 1**

LOCK ROD CONNECTION SHOWN  
(VIEW FROM HEEL TOWARDS PS)



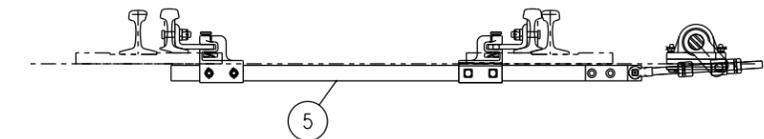
**SWITCH ROD ASSEMBLY NO 1**

POINT DETECTOR ROD CONNECTION SHOWN  
(VIEW FROM HEEL TOWARDS PS)



**DRIVE ROD (ROD NO 2) ASSEMBLY**

FRONT HELPER ROD CRANK ATTACHES TO BASKET  
(VIEW FROM HEEL TOWARDS PS)



**REAR HELPER (ROD NO 4) DRIVE ROD ASSEMBLY**

REAR HELPER ROD CRANK ATTACHES TO ROD PIN

BILL OF MATERIAL				
ITEM	QTY	DESCRIPTION	DWG NO	SCRR PART NO
1	1	ROTARY ASSIST ASSEMBLY FOR NO 20-136 LB RE TURNOUT	-	
2	1	SWITCH ROD NO 1, FOR POINT DETECTOR/LOCK ROD, (20-136-1)	ES2806-73	
3	1	SWITCH ROD NO 2, DRIVE, C/W BASKET (20-136-2)	ES2806-73	
4	1	SWITCH ROD NO 3, THROW, (20-136-3)	ES2806-73	
5	1	SWITCH ROD NO 4, THROW, (20-136-4)	ES2806-74	
6	1	SWITCH ROD NO 5, THROW, (20-136-5)	ES2806-74	
7	2	ROD POINT BRACKET, DETECTOR/LOCK ROD, HOLES AT 2 7/8" ARB*	-	
8	1	ROD POINT BRACKET, THROW ROD, ANTI-ROLL, HOLES AT 2 7/8" ARB*, LH	-	
9	1	ROD POINT BRACKET, THROW ROD, ANTI-ROLL, HOLES AT 2 7/8" ARB*, RH	-	
10	6	ROD POINT BRACKET, HOLES AT 2 3/8" ARB* C/W SQUARE BOLTS	-	
11	1	DROP LUG FOR US&S M23 SWITCH MACHINE DRIVE BAR	-	
12	1	BOLT, 7/8" DIA x 3" LONG, DRILLED 2 9/16" BELOW HEAD, HEAVY HEX, GR 5	-	
13	1	NUT, 7/8" DIA SLOTTED HEAVY HEX, GR 8	-	
14	1	SPRING WASHER, 7/8" DIA	-	
15	1	COTTER PIN, 3/16" DIA x 1 3/4" LONG	-	
16	1	LOCK ROD, FOR M23 SWITCH MACHINE, HST	-	
17	1	DETECTOR ROD, FOR M23 SWITCH MACHINE, HST	-	

ARB\* - ABOVE RAIL BASE

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

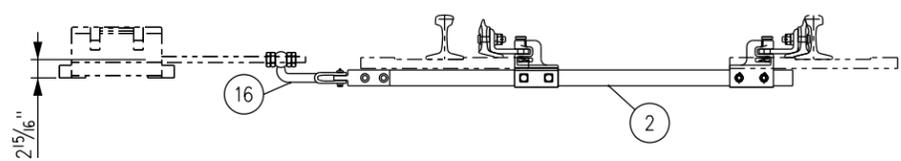
DRAWN BY: *Narek D. Bpe* HDR DATE: 03/31/2011  
 ASSISTANT DIRECTOR: STANDARDS & DESIGN  
*William Davan*  
 DIRECTOR OF ENGINEERING AND CONSTRUCTION

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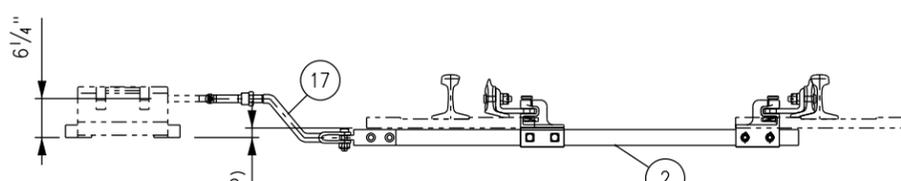
SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS  
 HOLLOW STEEL TIE RODDING ASSEMBLY  
 SWITCH MACHINE ON LEFT HAND SIDE  
 NO 20-136 LB RE SPRING FROG TURNOUT

STANDARD	2806
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2806-71



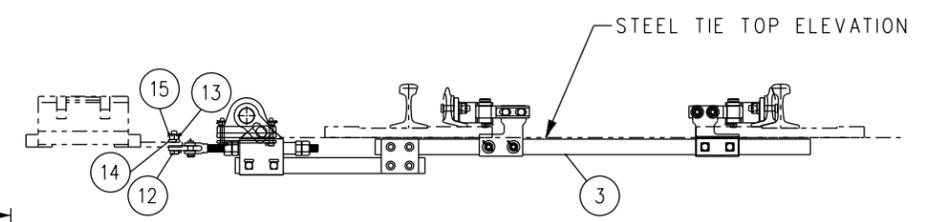
**SWITCH ROD ASSEMBLY NO 1**  
 LOCK ROD CONNECTION SHOWN  
 (VIEW FROM HEEL TOWARDS PS)



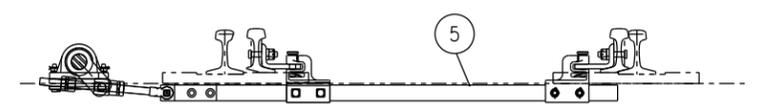
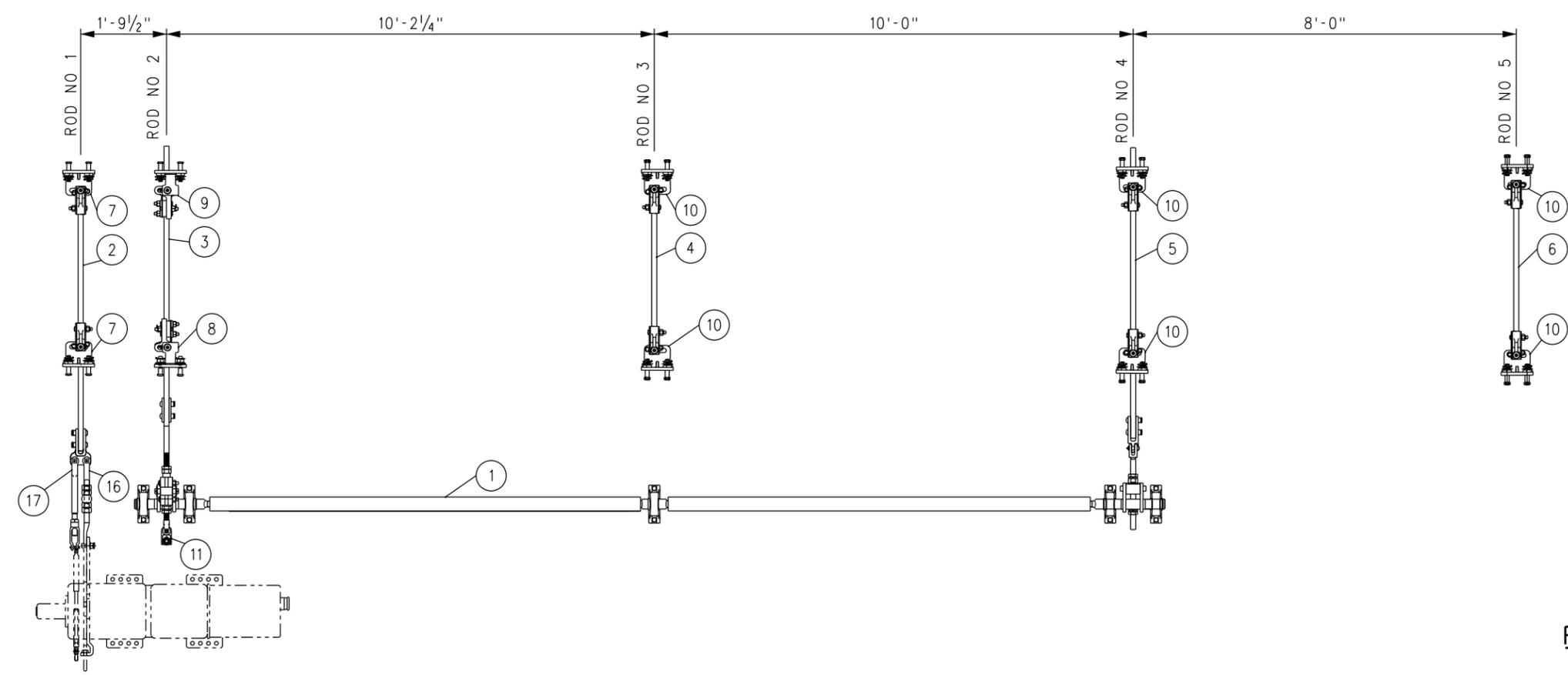
**SWITCH ROD ASSEMBLY NO 1**  
 POINT DETECTOR ROD CONNECTION SHOWN  
 (VIEW FROM HEEL TOWARDS PS)

BILL OF MATERIAL				
ITEM	QTY	DESCRIPTION	DWG NO	SCRRRA PART NO
1	1	ROTARY ASSIST ASSEMBLY FOR NO 20-136 LB RE TURNOUT	-	
2	1	SWITCH ROD NO 1, FOR POINT DETECTOR/LOCK ROD, (20-136-1)	ES2806-73	
3	1	SWITCH ROD NO 2, DRIVE, C/W BASKET (20-136-2)	ES2806-73	
4	1	SWITCH ROD NO 3, THROW, (20-136-3)	ES2806-73	
5	1	SWITCH ROD NO 4, THROW, (20-136-4)	ES2806-74	
6	1	SWITCH ROD NO 5, THROW, (20-136-5)	ES2806-74	
7	2	ROD POINT BRACKET, DETECTOR/LOCK ROD, HOLES AT 2 7/8" ARB*	-	
8	1	ROD POINT BRACKET, THROW ROD, ANTI-ROLL, HOLES AT 2 7/8" ARB, LH	-	
9	1	ROD POINT BRACKET, THROW ROD, ANTI-ROLL, HOLES AT 2 7/8" ARB, RH	-	
10	6	ROD POINT BRACKET, HOLES AT 2 3/8" ARB* C/W SQUARE BOLTS	-	
11	1	DROP LUG FOR US&S M23 SWITCH MACHINE DRIVE BAR	-	
12	1	BOLT, 7/8" DIA x 3" LONG, DRILLED 2 9/16" BELOW HEAD, HEAVY HEX, GR 5	-	
13	1	NUT, 7/8" DIA SLOTTED HEAVY HEX, GR 8	-	
14	1	SPRING WASHER, 7/8" DIA	-	
15	1	COTTER PIN, 3/16" DIA x 1 3/4" LONG	-	
16	1	LOCK ROD, FOR M23 SWITCH MACHINE, HST	-	
17	1	DETECTOR ROD, FOR M23 SWITCH MACHINE, HST	-	

ARB\* - ABOVE RAIL BASE



**DRIVE ROD (ROD NO 2) ASSEMBLY**  
 FRONT HELPER ROD CRANK ATTACHES TO BASKET  
 (VIEW FROM HEEL TOWARDS PS)



**REAR HELPER (ROD NO 4) DRIVE ROD ASSEMBLY**  
 REAR HELPER ROD CRANK ATTACHES TO ROD PIN

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

DRAWN BY: *Narek D. Pape* HDR DATE: 03/31/2011  
 ASSISTANT DIRECTOR: STANDARDS & DESIGN  
*William Davan*  
 DIRECTOR OF ENGINEERING AND CONSTRUCTION

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

ENGINEERING STANDARDS  
 HOLLOW STEEL TIE RODDING ASSEMBLY  
 SWITCH MACHINE ON RIGHT HAND SIDE  
 NO 20-136 LB RE SPRING FROG TURNOUT

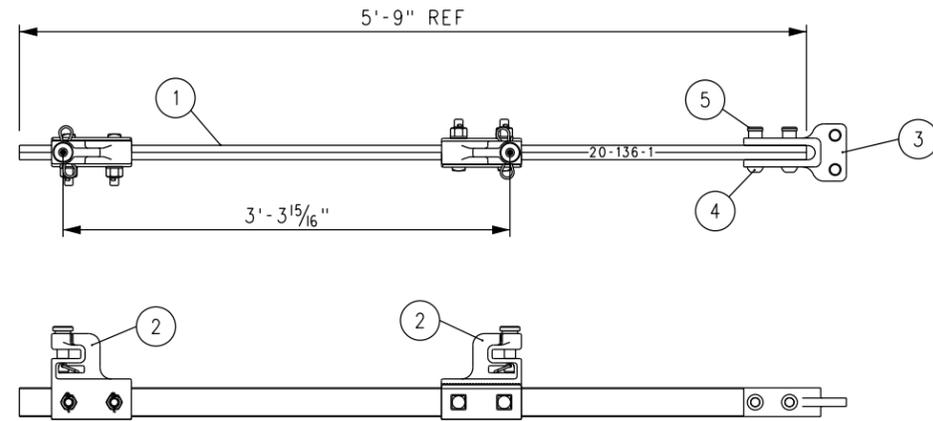
STANDARD	2806
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2806-72

BILL OF MATERIALS FOR SWITCH ROD 20-136-1

ITEM	QTY	DESCRIPTION	DWG NO	SCRRRA PART NO
1	1	SWITCH ROD 20-136-1	-	
2	2	SWITCH CLIP ASSEMBLY, ADJUSTABLE, FOR HOLLOW TIE COMPOSITE RODS	-	
3	1	CONNECTOR LUG FOR POINT DETECTOR/LOCK RODS	-	
4	2	HUCK BOLT, 3/4" DIA (C50LR-BR24-36)	-	
5	2	HUCK COLLAR, 3/4" DIA (LC-2R24B)	-	

**NOTES:**

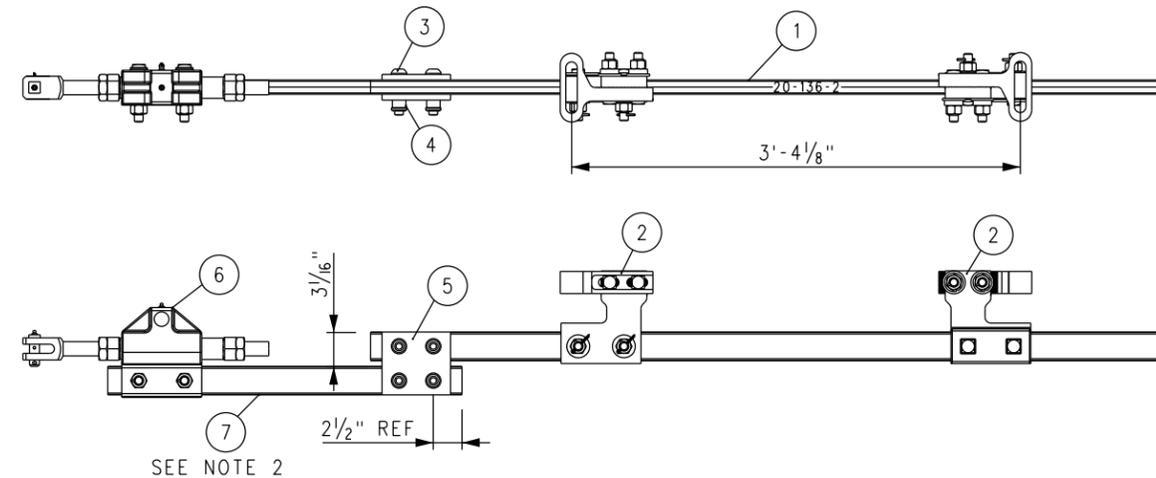
1. ROD IDENTIFICATION TO BE ENGRAVED ON ROD CLEARLY AS SHOWN, 3/8" MIN HEIGHT.
2. SWITCH RODS MUST BE PARALLEL WITHIN 1/16" OVER LENGTH OF 1-B ROD.



**SWITCH ROD ASSEMBLY 20-136-1**

BILL OF MATERIALS FOR SWITCH ROD 20-136-2

ITEM	QTY	DESCRIPTION	DWG NO	SCRRRA PART NO
1	1	BLUE ROD, PULTRUDED COMPOSITE, 1/4" x 2 1/2" x 5'-10" LONG, 20-136-2	-	
2	2	CLIP/LUG ASSEMBLY, HST SWITCH, ANTI-ROLLOVER DESIGN, LH	-	
3	4	HUCK BOLT, 3/4" DIA (C50LR-BR24-36)	-	
4	4	HUCK COLLAR, 3/4" DIA (LC-2R24B)	-	
5	2	SPLICE PLATE, FOR BLUE ROD BASKET ASSEMBLY RODS	-	
6	1	BASKET/ROD ASSEMBLY FOR HST WITH ROTARY ASSIST	-	
7	1	BLUE ROD, PULTRUDED COMPOSITE, 1/4" x 2 1/2" x 2'-7" LONG, 1-B	-	



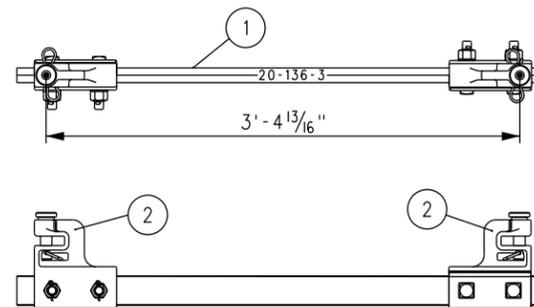
**SWITCH ROD ASSEMBLY 20-136-2**

BILL OF MATERIALS FOR SWITCH ROD 20-136-3

ITEM	QTY	DESCRIPTION	DWG NO	SCRRRA PART NO
1	1	SWITCH ROD 20-136-3	-	
2	2	SWITCH CLIP ASSEMBLY, ADJUSTABLE, FOR HOLLOW TIE	-	

NOTE: CENTER TO CENTER PIN DIMENSION REQUIRED FOR 4 3/4" THROW

ROD #	C-C PIN DIMENSION
1	3'-3 15/16"
2	3'-4 1/8"
3	3'-4 13/16"
4	3'-5 7/8"
5	3'-7"



**SWITCH ROD ASSEMBLY 20-136-3**

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

DRAWN BY: *Nareh D. Papp* HDR DATE: 03/31/2011  
 ASSISTANT DIRECTOR: STANDARDS & DESIGN  
*William Dacan*  
 DIRECTOR OF ENGINEERING AND CONSTRUCTION

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ENGINEERING STANDARDS  
 HOLLOW STEEL TIE SWITCH RODS  
 20-1, 20-2 AND 20-3  
 NO 20-136 LB RE

STANDARD	2806
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2806-73

BILL OF MATERIALS FOR SWITCH ROD 20-136-4

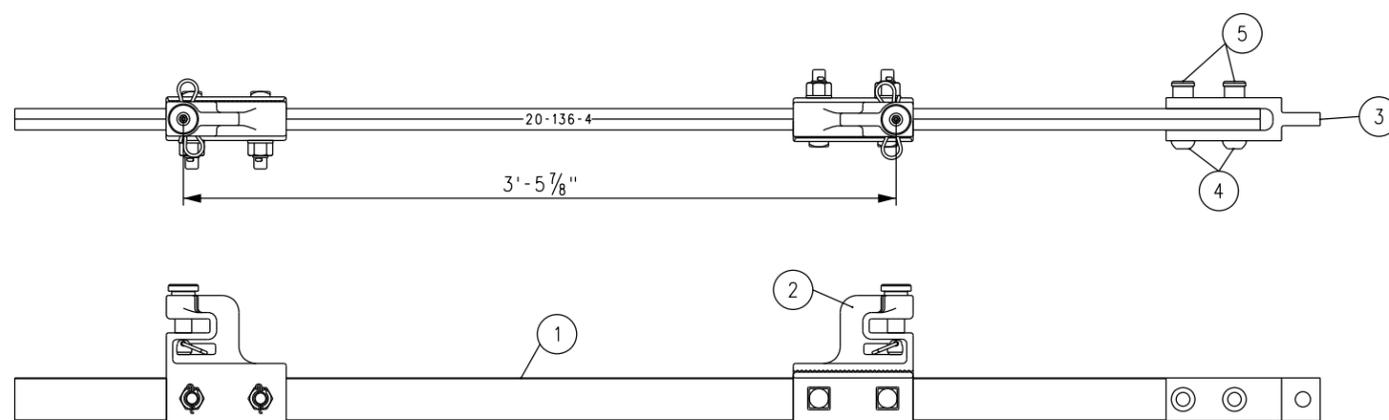
ITEM	QTY	DESCRIPTION	DWG NO	SCRRRA PART NO
1	1	SWITCH ROD 20-136-4	-	
2	2	SWITCH CLIP ASSEMBLY, ADJUSTABLE, FOR HOLLOW TIES	-	
3	1	CONNECTOR LUG FOR REAR DRIVE ROD	-	
4	2	HUCK BOLT, 3/4" DIA (C50LR-BR24-36)	-	
5	2	HUCK COLLAR, 3/4" DIA (LC-2R24B)	-	

BILL OF MATERIALS FOR SWITCH ROD 20-136-5

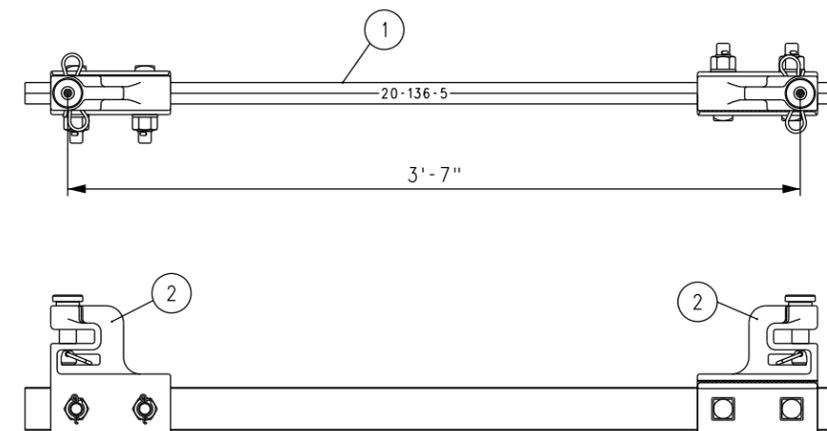
ITEM	QTY	DESCRIPTION	DWG NO	SCRRRA PART NO
1	1	SWITCH ROD 20-136-5	-	
2	2	SWITCH CLIP ASSEMBLY, ADJUSTABLE, FOR HOLLOW TIES	-	

**NOTE:**

1. ROD IDENTIFICATION TO BE ENGRAVED ON ROD CLEARLY AS SHOWN, 3/8" MIN HEIGHT.



**SWITCH ROD ASSEMBLY 20-136-4**



**SWITCH ROD ASSEMBLY 20-136-5**

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

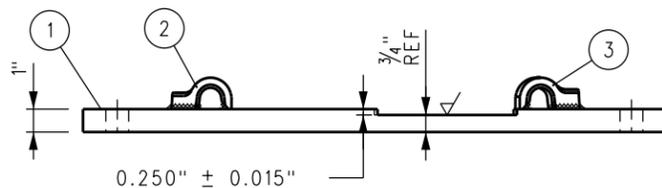
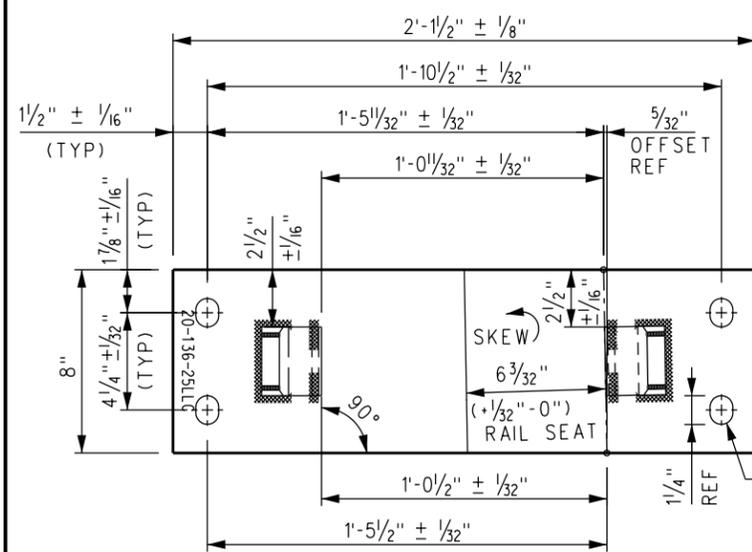
DRAWN BY: *Nareh D. Papp*  
 HDR DATE: 03/31/2011  
 ASSISTANT DIRECTOR: STANDARDS & DESIGN  
*William Dava*  
 DIRECTOR OF ENGINEERING AND CONSTRUCTION

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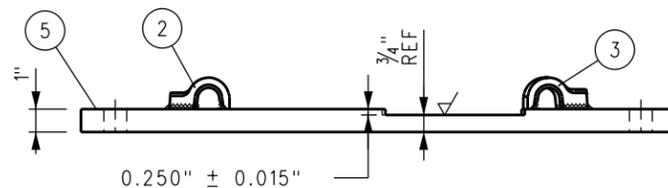
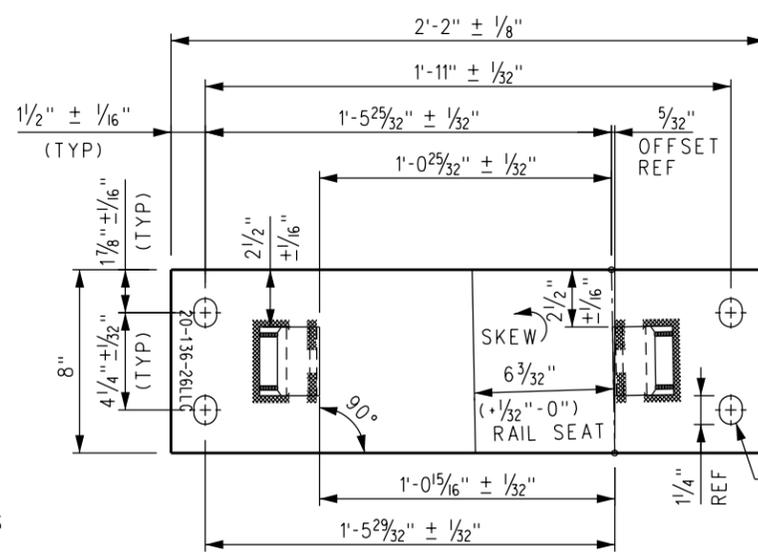


ENGINEERING STANDARDS  
 HOLLOW STEEL TIE SWITCH RODS 20-4 AND 20-5  
 NO 20-136 LB RE

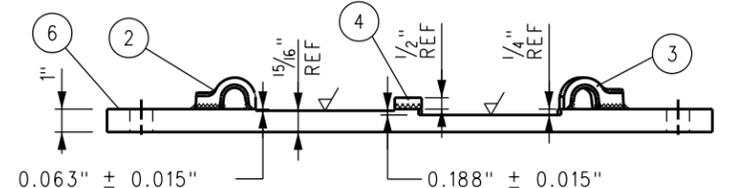
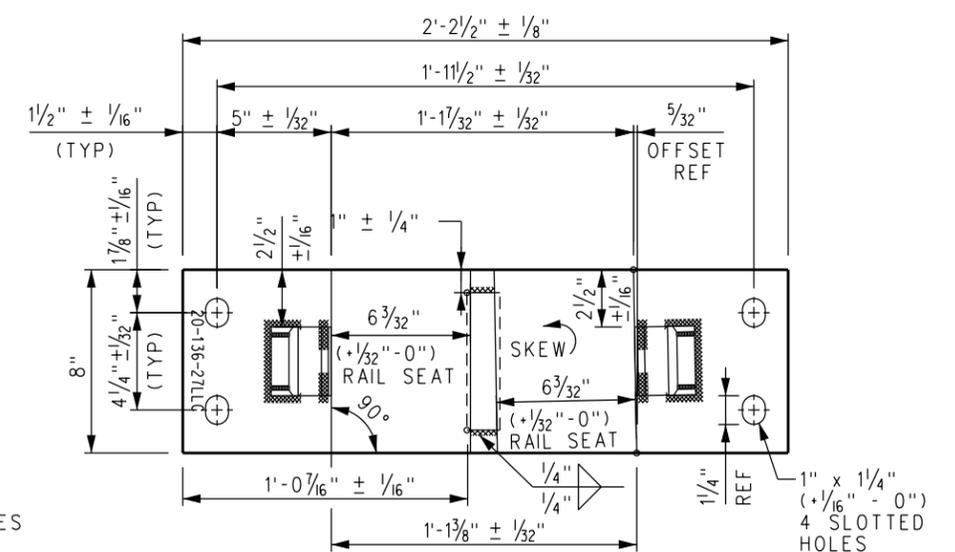
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SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2806-74



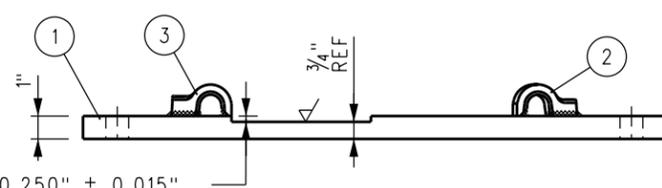
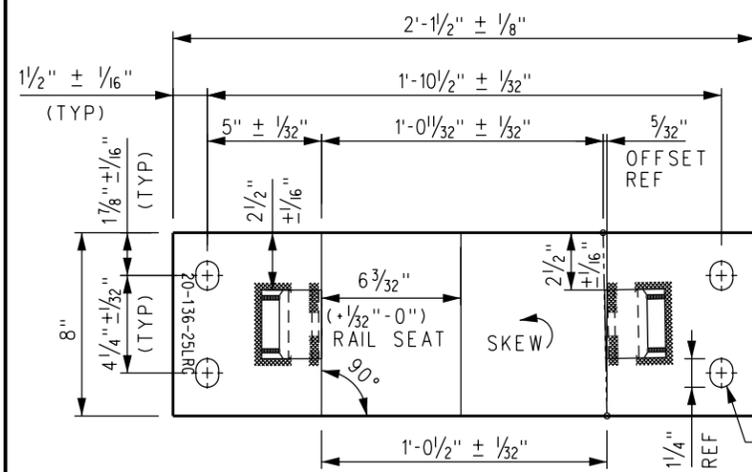
**SWITCH PLATE P20-136-25LLC**



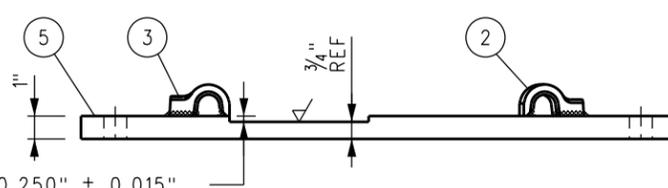
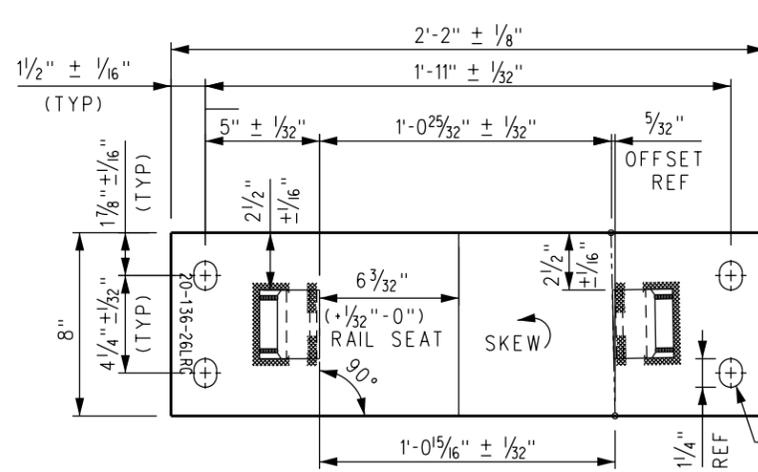
**SWITCH PLATE P20-136-26LLC**



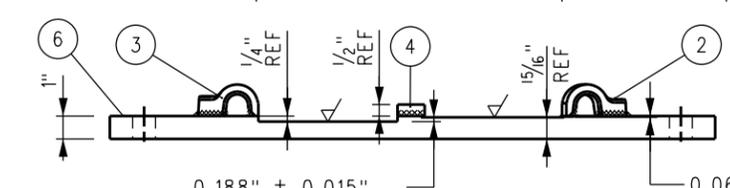
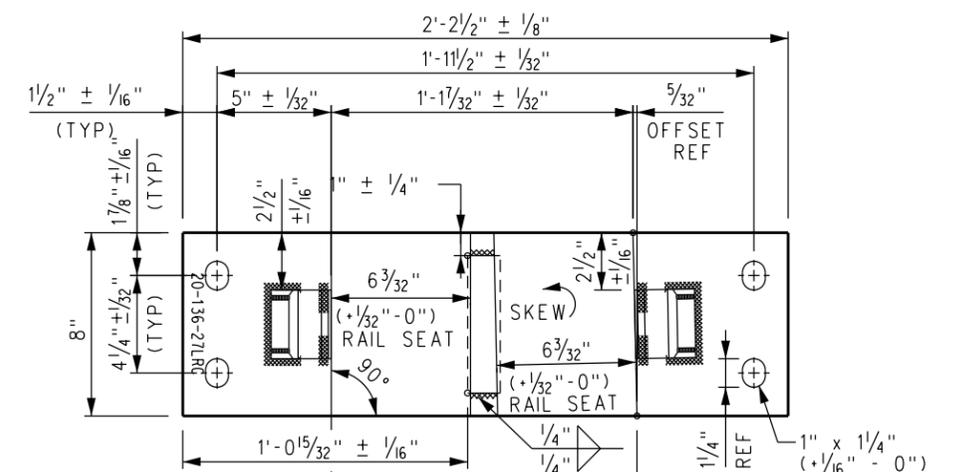
**SWITCH PLATE P20-136-27LLC**



**SWITCH PLATE P20-136-25LRC**



**SWITCH PLATE P20-136-26LRC**



**SWITCH PLATE P20-136-27LRC**

BILL OF MATERIALS	
ITEM	DESCRIPTION
1	FLAT BAR, ASTM A36, 1" x 8" x 2'-1/2"
2	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 1
3	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 5

BILL OF MATERIALS	
ITEM	DESCRIPTION
4	FLAT BAR, ASTM A36, 1/2" x 6" x 1 7/16"
5	FLAT BAR, ASTM A36, 1" x 8" x 2'-2"
6	FLAT BAR, ASTM A36, 1" x 8" x 2'-2 1/2"

**NOTES:**

- I.D. CHARACTERS TO BE 1/2" MINIMUM HEIGHT CLEARLY STAMPED AS SHOWN.
- WELDS TO BE DRESSED FLUSH WITH SHOULDER & NOT TO PROTRUDE INTO RAIL SEAT.
- SLOTTED HOLE CENTERS ARE INDICATED ON DRAWING.

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

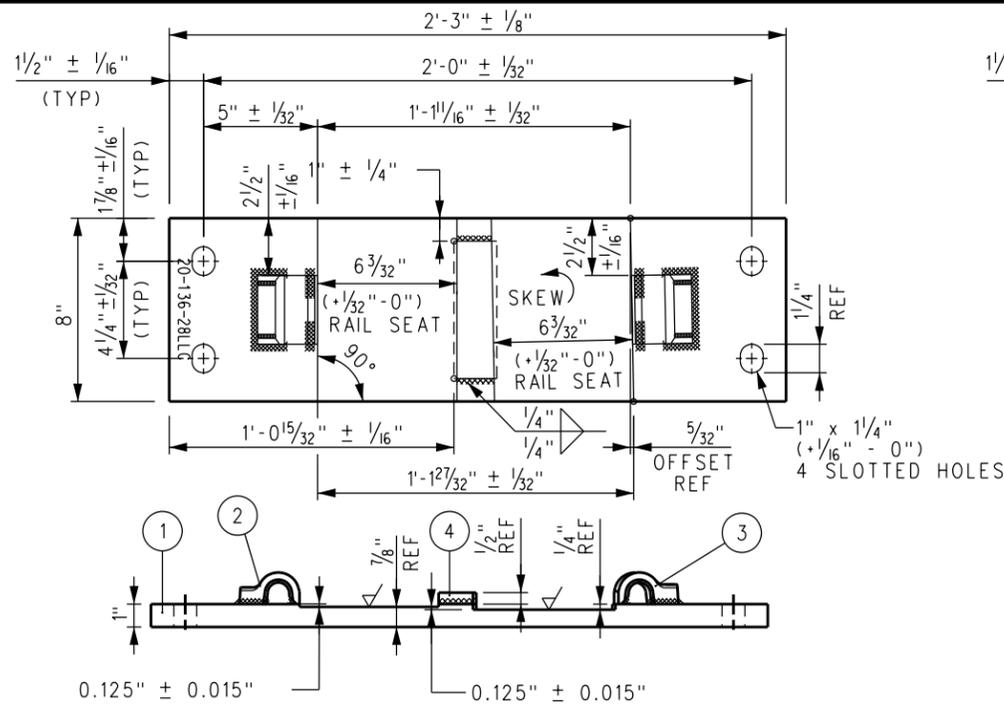
DRAWN BY: *Narex D. Pae* HDR DATE: 03/31/2011  
 ASSISTANT DIRECTOR: STANDARDS & DESIGN  
 DIRECTOR OF ENGINEERING AND CONSTRUCTION

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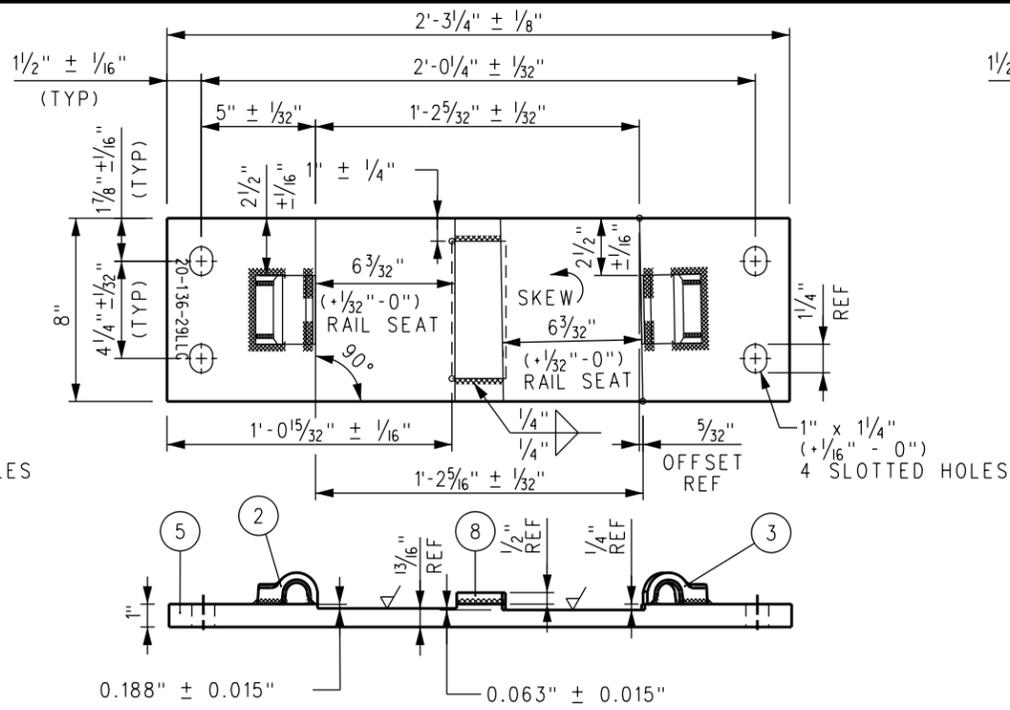
**METROLINK**  
 SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
 ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS  
 SWITCH PLATES  
 (20-25LLC /LRC THROUGH 20-27LLC /LRC)  
 FOR NO 20 136 LB RE LH CONCRETE TIE TURNOUT

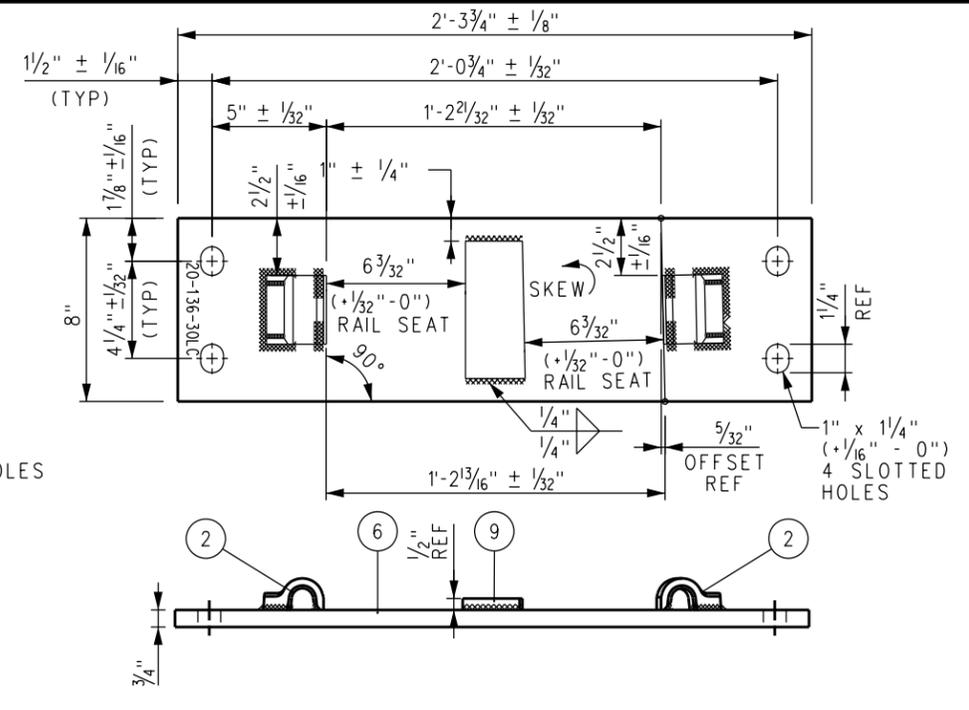
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SCALE	NTS
REVISION SHEET	1 OF 1
CADD FILE	ES2806-81



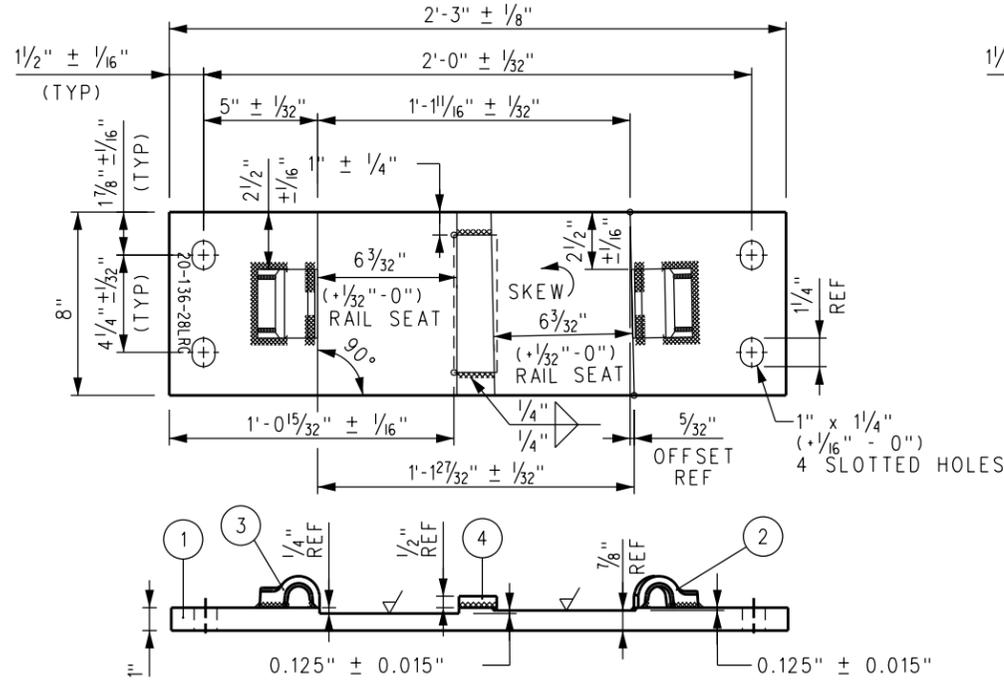
SWITCH PLATE P20-136-28LLC



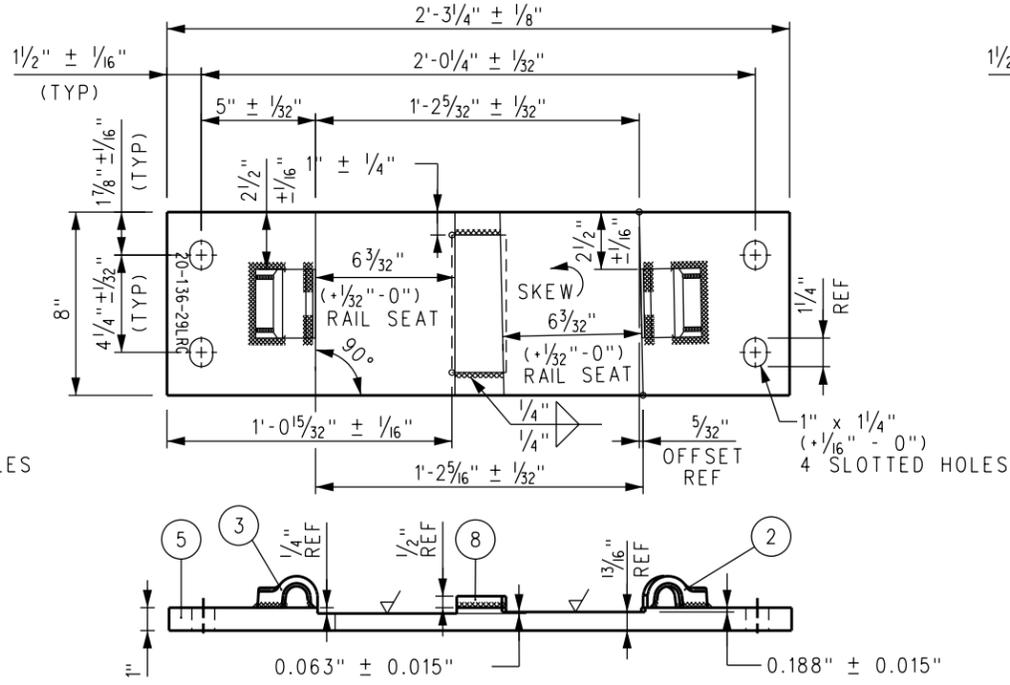
SWITCH PLATE P20-136-29LLC



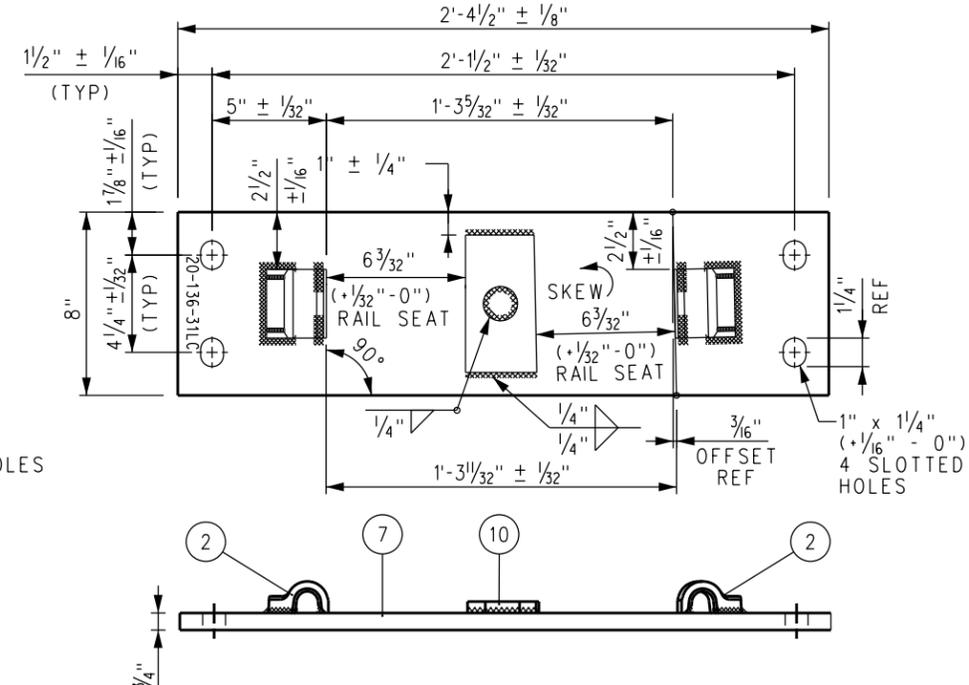
SWITCH PLATE P20-136-30LC



SWITCH PLATE P20-136-28LRC



SWITCH PLATE P20-136-29LRC



SWITCH PLATE P20-136-31LC

BILL OF MATERIALS	
ITEM	DESCRIPTION
1	FLAT BAR, ASTM A36, 1" x 8" x 2'-3"
2	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 1
3	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 5
4	FLAT BAR, ASTM A36, 1/2" x 6" x 1 1/8"
5	FLAT BAR, ASTM A36, 1" x 8" x 2'-3 1/4"

BILL OF MATERIALS	
ITEM	DESCRIPTION
6	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-3 3/4"
7	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-4 1/2"
8	FLAT BAR, ASTM A36, 1/2" x 6" x 2 3/8"
9	BURNED STOP, 1/2" THICK, TAPERED 2 5/8" TO 2 1/2", OVER 6"
10	BURNED STOP, 1/2" THICK, TAPERED 3" TO 3 1/8", OVER 6"

**NOTES:**

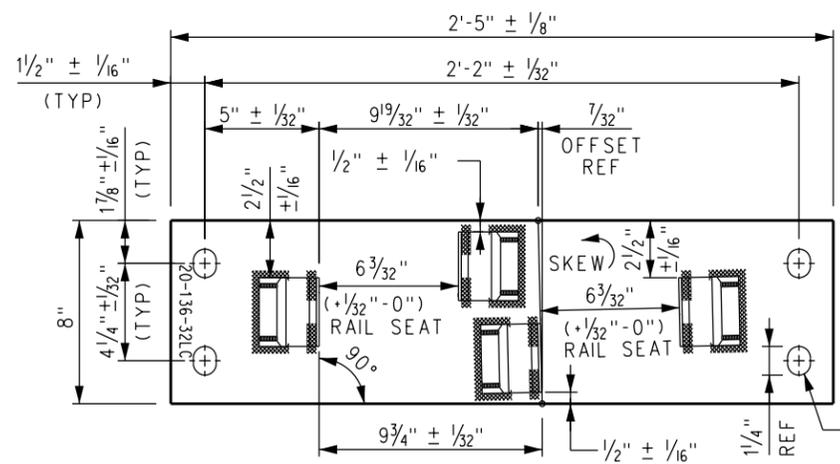
- I.D. CHARACTERS TO BE 1/2" MINIMUM HEIGHT CLEARLY STAMPED AS SHOWN.
- WELDS TO BE DRESSED FLUSH WITH SHOULDER & NOT TO PROTRUDE INTO RAIL SEAT.
- SLOTTED HOLE CENTERS ARE INDICATED ON DRAWING.

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.

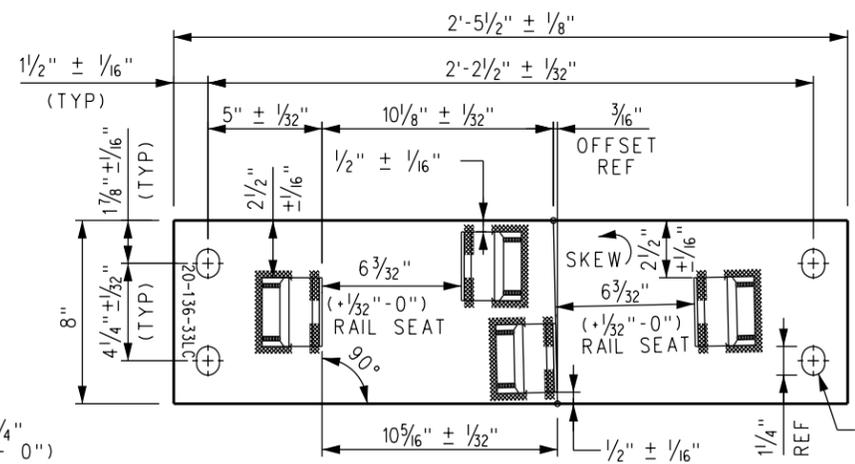


**ENGINEERING STANDARDS**  
SWITCH PLATES  
(20-28LLC /LRC THROUGH 29LLC /LRC)  
(20-30LC THROUGH 20-31LC)  
FOR NO 20 136 LB RE LH CONCRETE TIE TURNOUT

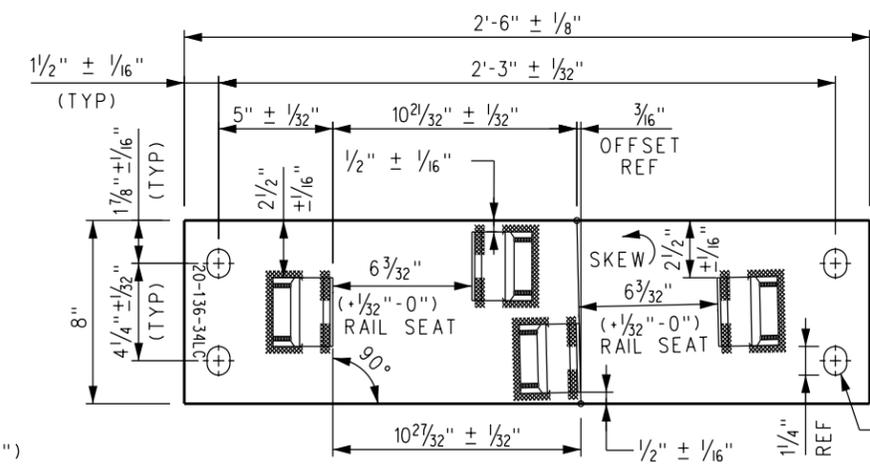
STANDARD 2806  
SCALE: NTS  
REVISION SHEET 1 OF 1  
CADD FILE: ES2806-82



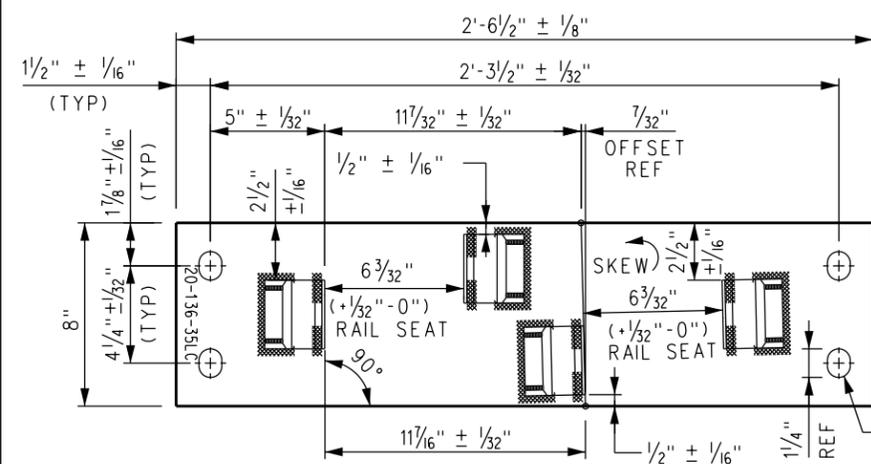
SWITCH PLATE P20-136-32LC



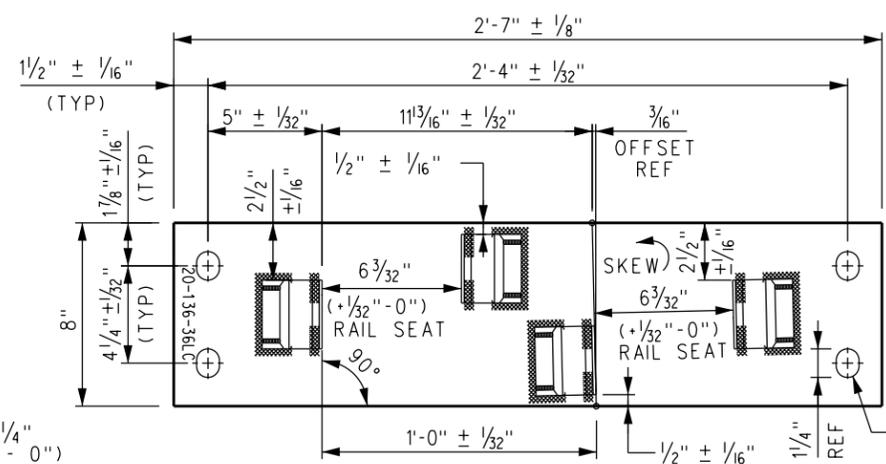
SWITCH PLATE P20-136-33LC



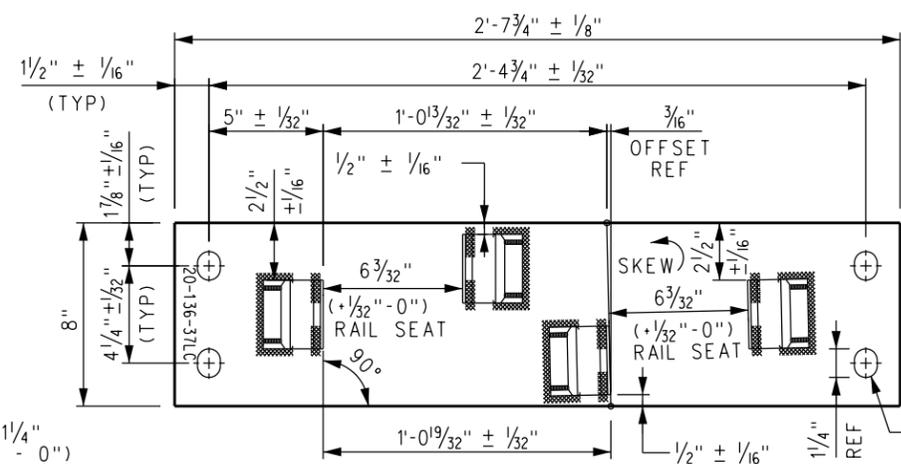
SWITCH PLATE P20-136-34LC



SWITCH PLATE P20-136-35LC



SWITCH PLATE P20-136-36LC



SWITCH PLATE P20-136-37LC

BILL OF MATERIALS	
ITEM	DESCRIPTION
1	FLAT BAR, ASTM A36, $\frac{3}{4}'' \times 8'' \times 2'-5''$
2	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 1
3	FLAT BAR, ASTM A36, $\frac{3}{4}'' \times 8'' \times 2'-5\frac{1}{2}''$
4	FLAT BAR, ASTM A36, $\frac{3}{4}'' \times 8'' \times 2'-6''$

BILL OF MATERIALS	
ITEM	DESCRIPTION
5	FLAT BAR, ASTM A36, $\frac{3}{4}'' \times 8'' \times 2'-6\frac{1}{2}''$
6	FLAT BAR, ASTM A36, $\frac{3}{4}'' \times 8'' \times 2'-7''$
7	FLAT BAR, ASTM A36, $\frac{3}{4}'' \times 8'' \times 2'-7\frac{3}{4}''$

NOTES:

- I.D. CHARACTERS TO BE  $\frac{1}{2}''$  MINIMUM HEIGHT CLEARLY STAMPED AS SHOWN.
- WELDS TO BE DRESSED FLUSH WITH SHOULDER & NOT TO PROTRUDE INTO RAIL SEAT.
- SLOTTED HOLE CENTERS ARE INDICATED ON DRAWING.

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

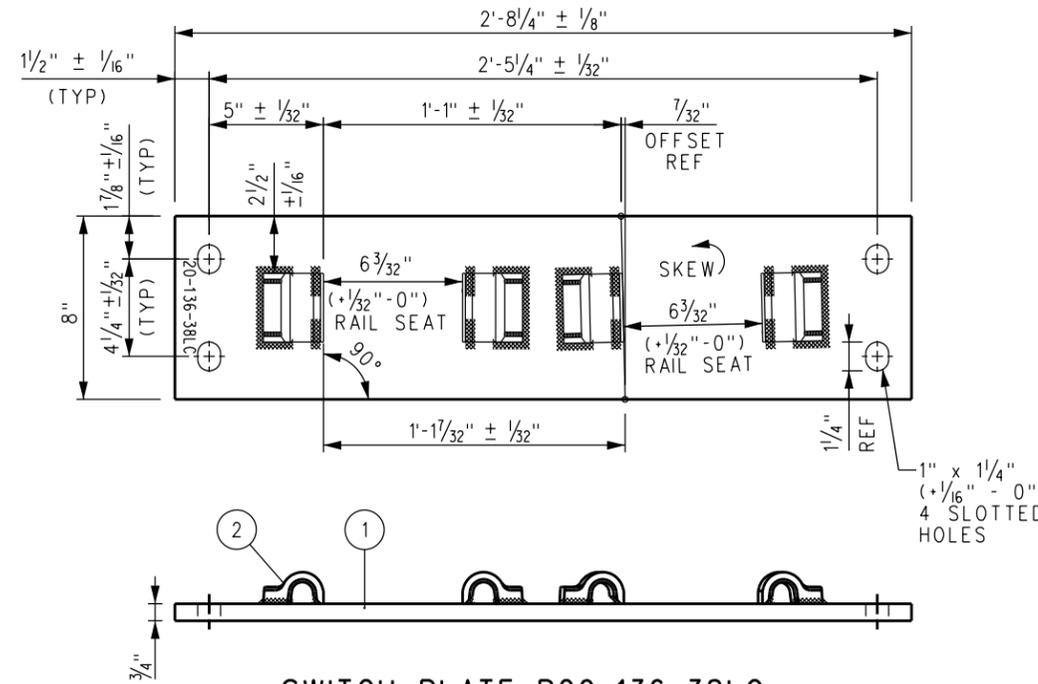
DRAWN BY: *Nareh D. Pape* HDR DATE: 03/31/2011  
 ASSISTANT DIRECTOR: STANDARDS & DESIGN  
*William D. Dwan*  
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**METROLINK**  
 SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
 ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS  
 SWITCH PLATES (20-32LC THROUGH 20-37LC)  
 FOR NO 20 136 LB RE LH CONCRETE TIE TURNOUT

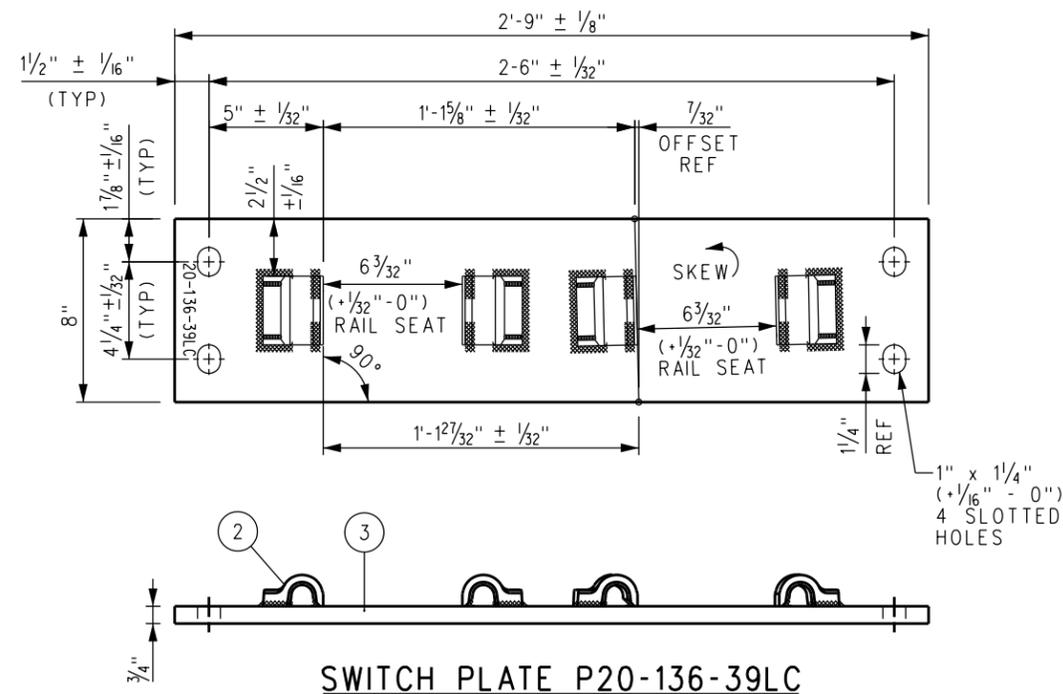
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REVISION SHEET	1 OF 1
CADD FILE	ES2806-83



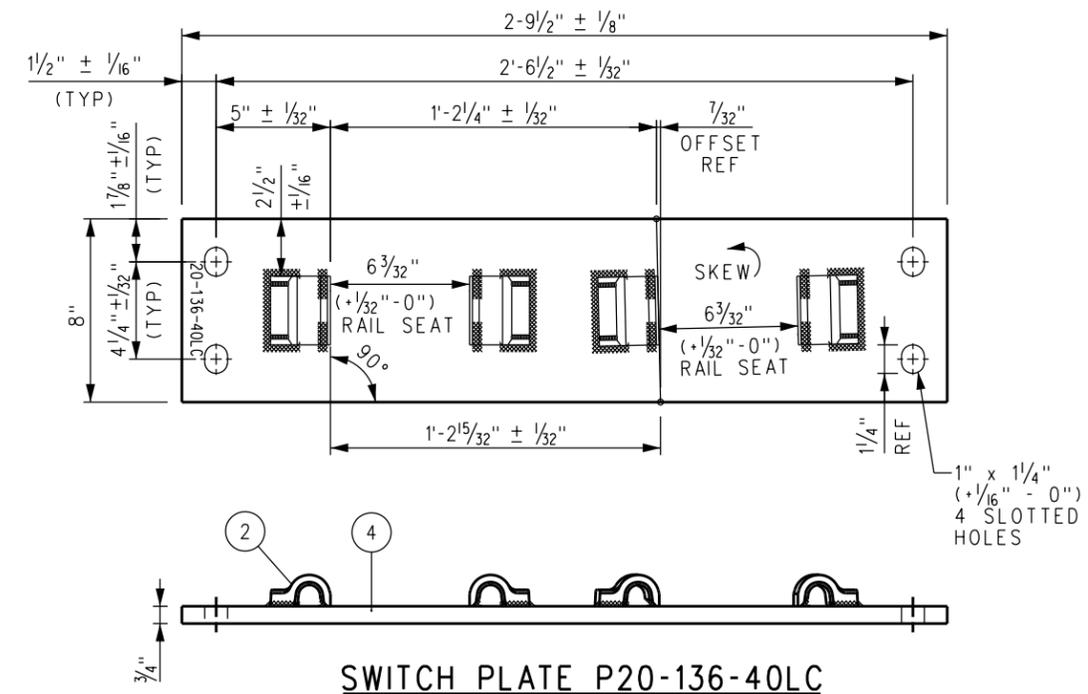
**NOTES:**

1. I.D. CHARACTERS TO BE 1/2" MINIMUM HEIGHT CLEARLY STAMPED AS SHOWN.
2. WELDS TO BE DRESSED FLUSH WITH SHOULDER & NOT TO PROTRUDE INTO RAIL SEAT.
3. SLOTTED HOLE CENTERS ARE INDICATED ON DRAWING.

**SWITCH PLATE P20-136-38LC**



**SWITCH PLATE P20-136-39LC**



**SWITCH PLATE P20-136-40LC**

BILL OF MATERIALS	
ITEM	DESCRIPTION
1	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-8 1/4"
2	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 1

BILL OF MATERIALS	
ITEM	DESCRIPTION
3	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-9"
4	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-9 1/2"

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

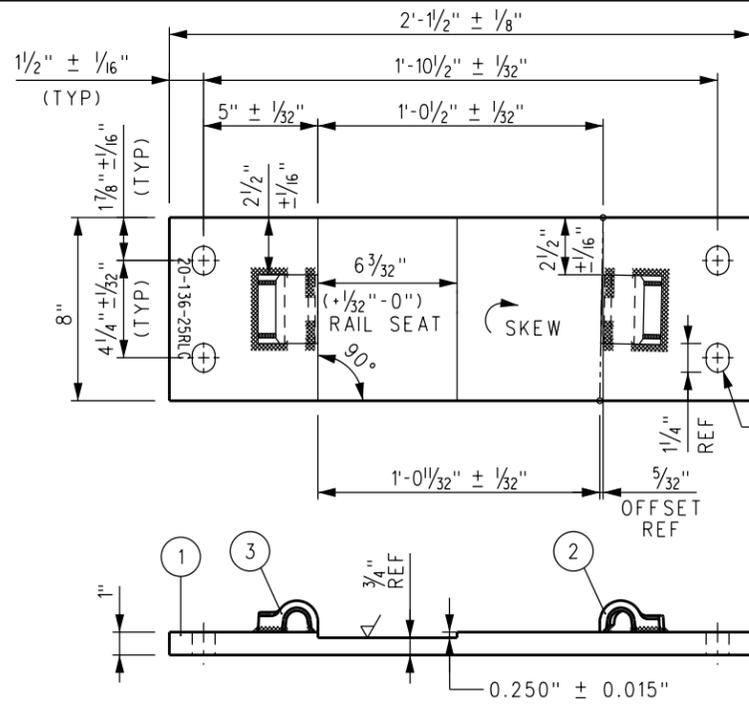
DRAWN BY: *Nareh D. Papp* HDR DATE: 03/31/2011  
 ASSISTANT DIRECTOR: STANDARDS & DESIGN  
*William D. Davis*  
 DIRECTOR OF ENGINEERING AND CONSTRUCTION

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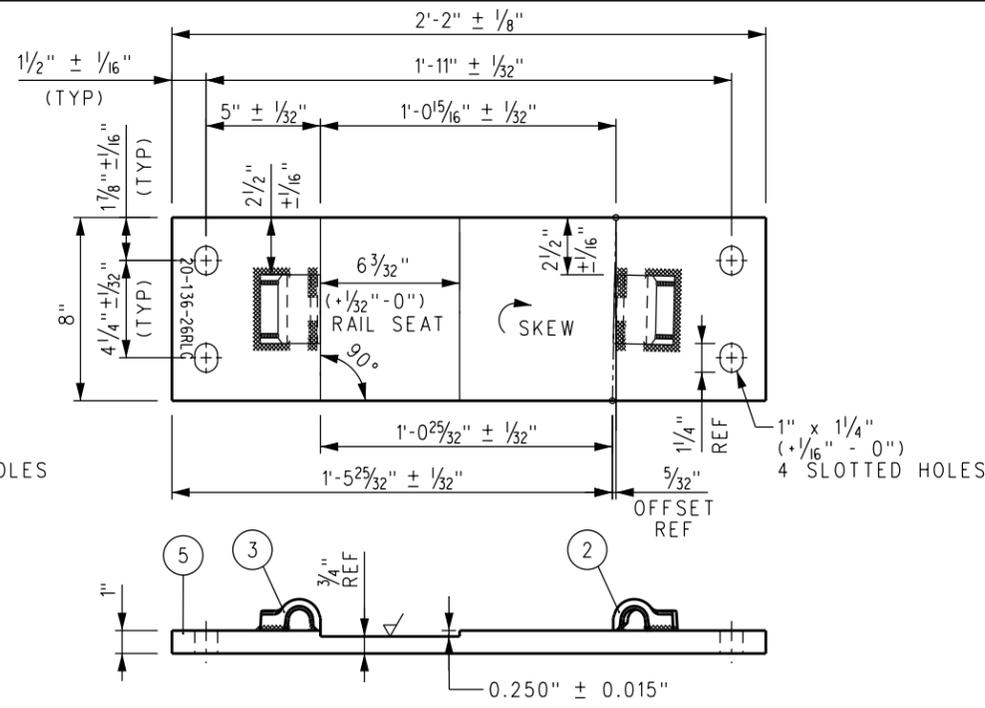
**METROLINK**  
 SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
 ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS  
 SWITCH PLATES (20-38LC THROUGH 20-40LC)  
 FOR NO 20 136 LB RE LH CONCRETE TIE TURNOUT

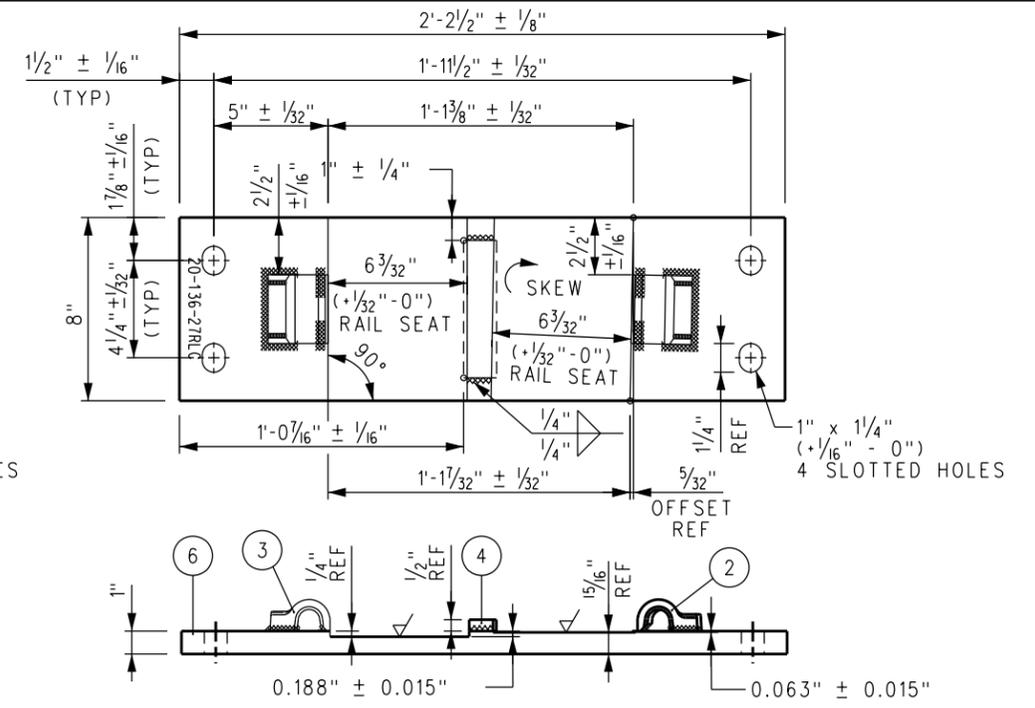
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REVISION SHEET	1 OF 1
CADD FILE	ES2806-84



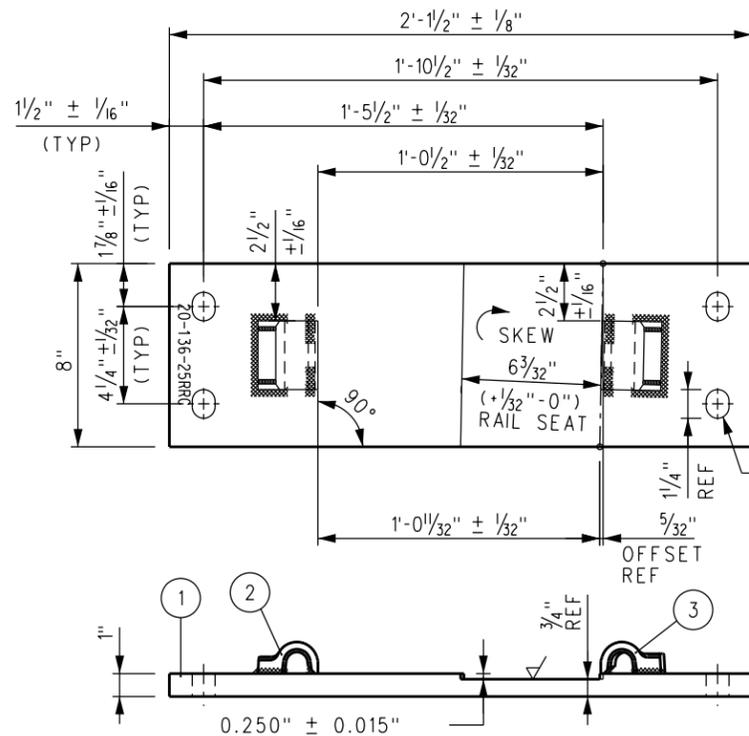
**SWITCH PLATE P20-136-25RLC**



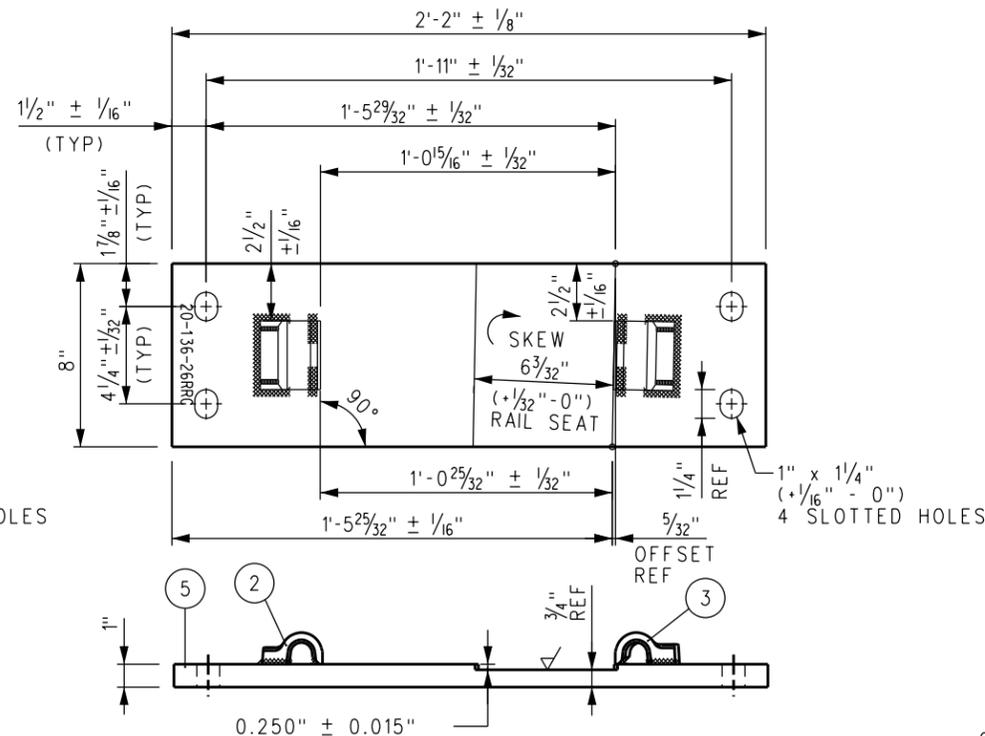
**SWITCH PLATE P20-136-26RLC**



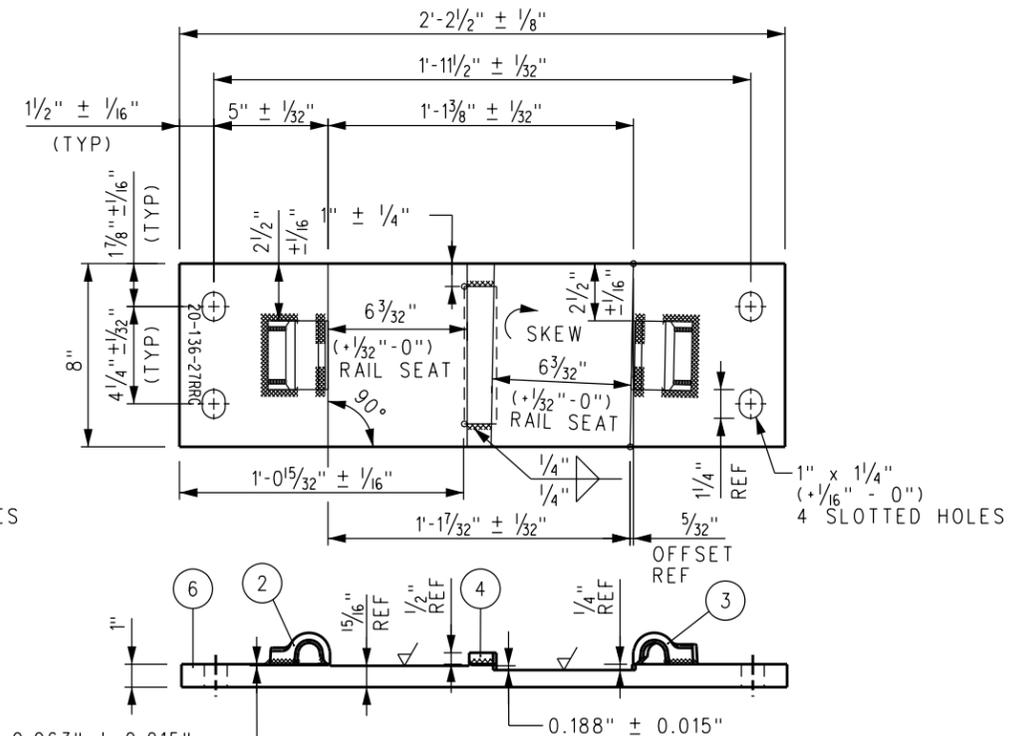
**SWITCH PLATE P20-136-27RLC**



**SWITCH PLATE P20-136-25RRC**



**SWITCH PLATE P20-136-26RRC**



**SWITCH PLATE P20-136-27RRC**

BILL OF MATERIALS	
ITEM	DESCRIPTION
1	FLAT BAR, ASTM A36, 1" x 8" x 2'-1 1/2"
2	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 1
3	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 5

BILL OF MATERIALS	
ITEM	DESCRIPTION
4	FLAT BAR, ASTM A36, 1/2" x 6" x 1 1/16"
5	FLAT BAR, ASTM A36, 1" x 8" x 2'-2"
6	FLAT BAR, ASTM A36, 1" x 8" x 2'-2 1/2"

**NOTES:**

1. I.D. CHARACTERS TO BE 1/2" MINIMUM HEIGHT CLEARLY STAMPED AS SHOWN.
2. WELDS TO BE DRESSED FLUSH WITH SHOULDER & NOT TO PROTRUDE INTO RAIL SEAT.
3. SLOTTED HOLE CENTERS ARE INDICATED ON DRAWING.

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

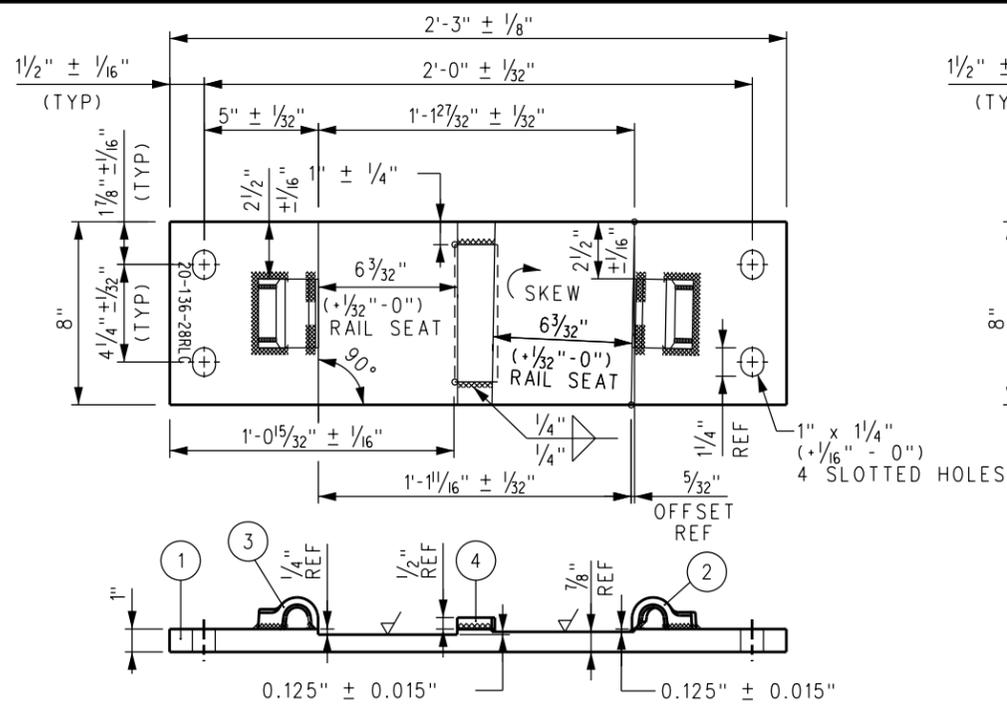
DRAWN BY: *Nareh D. Papp* HDR DATE: 03/31/2011  
 ASSISTANT DIRECTOR: STANDARDS & DESIGN  
 DIRECTOR OF ENGINEERING AND CONSTRUCTION

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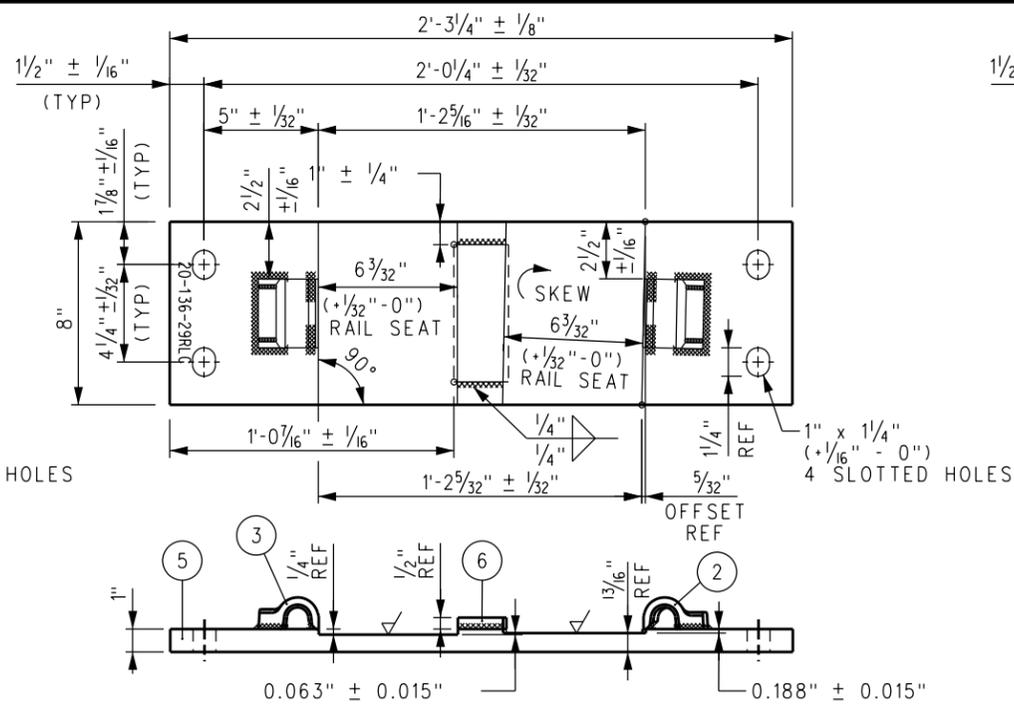


SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
 ONE GATEWAY PLAZA, 12TH FLOOR, L.A., CA. 90012

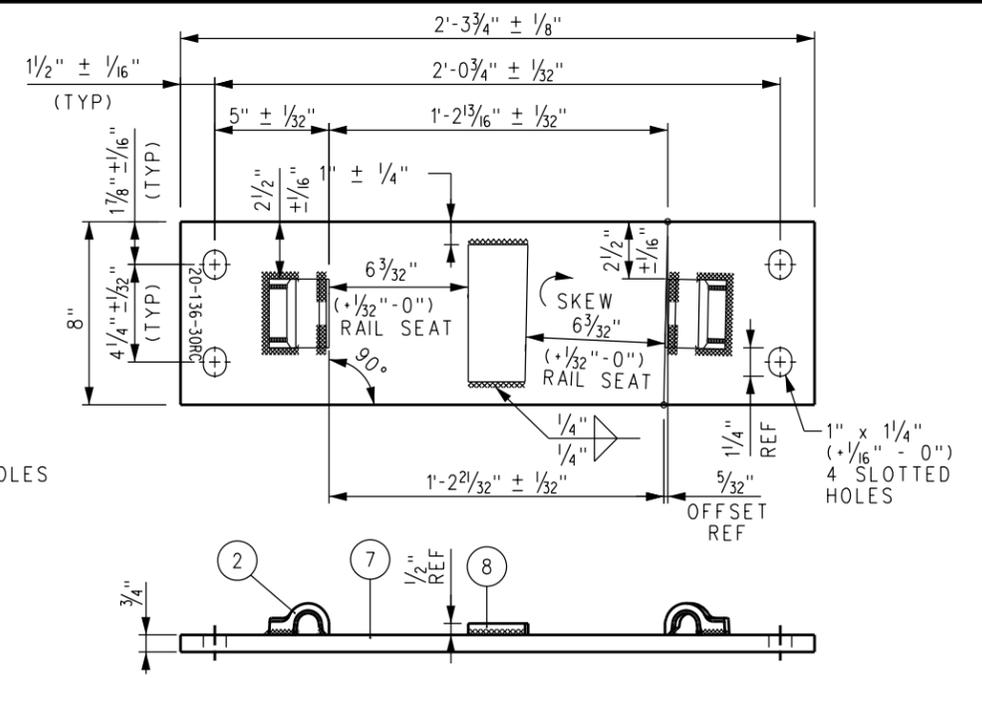
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SWITCH PLATES		SCALE:	NTS
FOR NO 20 136 LB RE RH CONCRETE TIE TURNOUT		REVISION SHEET	1 OF 1
CADD FILE:		ES2806-85	



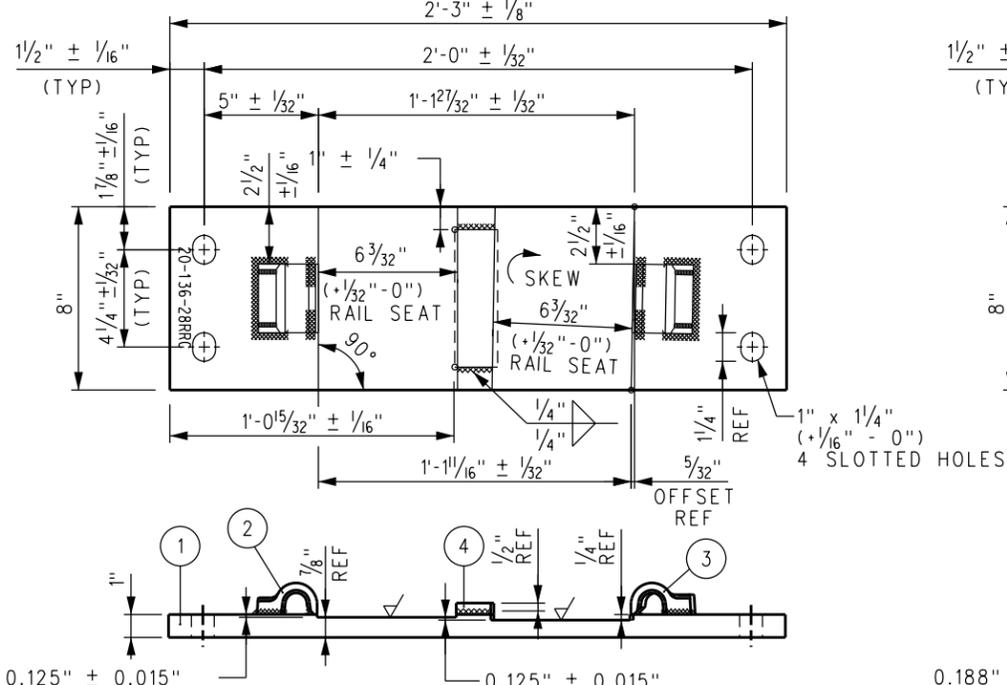
SWITCH PLATE P20-136-28RLC



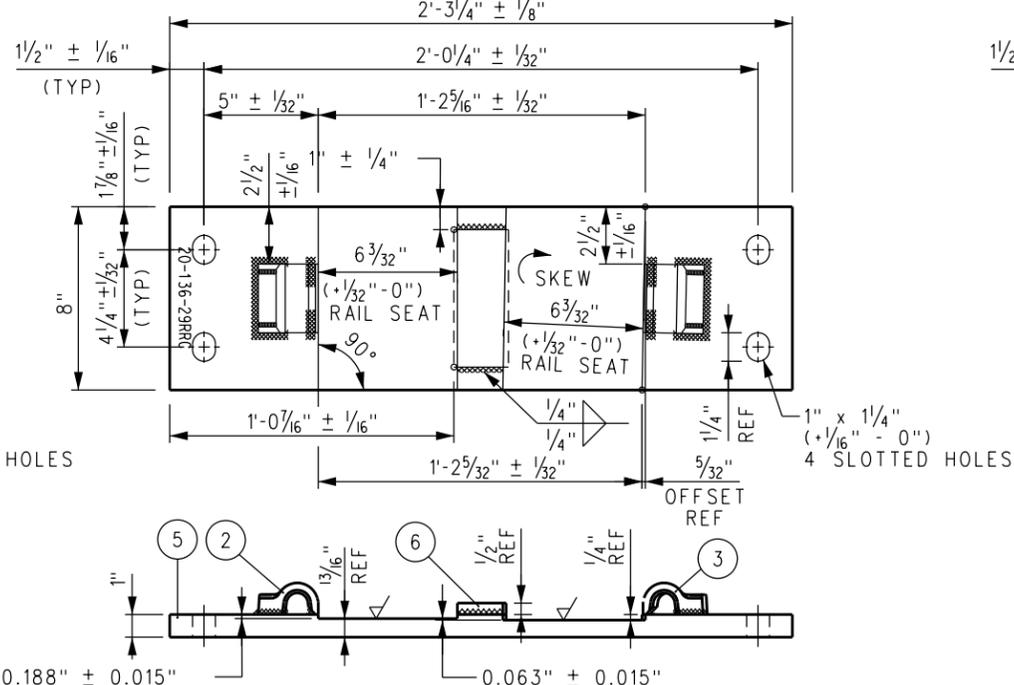
SWITCH PLATE P20-136-29RLC



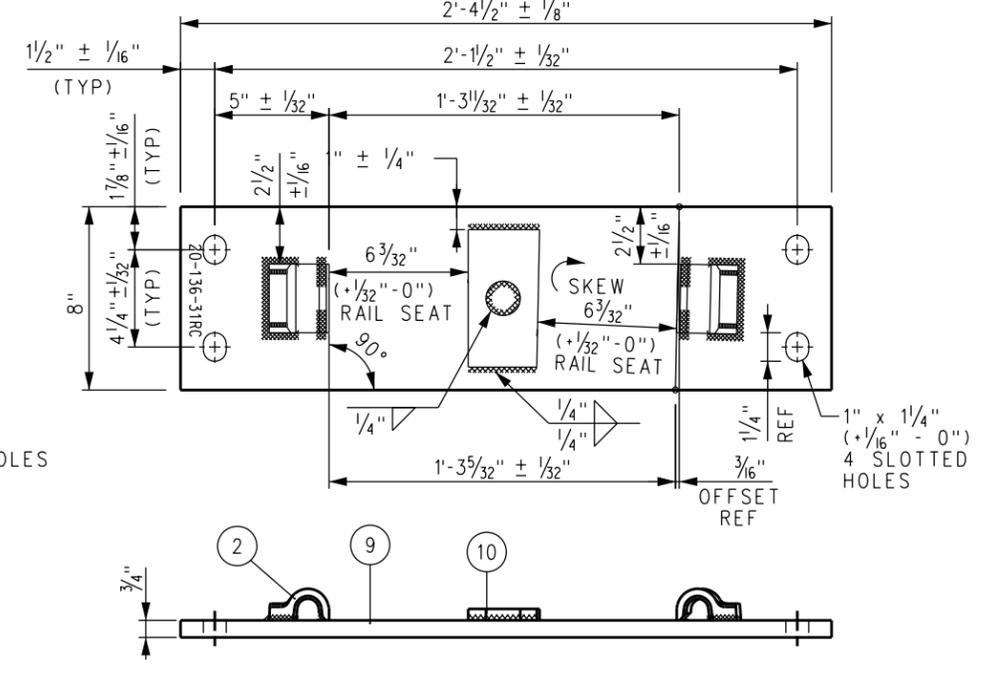
SWITCH PLATE P20-136-30RC



SWITCH PLATE P20-136-28RRC



SWITCH PLATE P20-136-29RRC



SWITCH PLATE P20-136-31RC

BILL OF MATERIALS	
ITEM	DESCRIPTION
1	FLAT BAR, ASTM A36, 1" x 8" x 2'-3"
2	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 1
3	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 5
4	FLAT BAR, ASTM A36, 1/2" x 6" x 1 1/8"
5	FLAT BAR, ASTM A36, 1" x 8" x 2'-3 1/4"

BILL OF MATERIALS	
ITEM	DESCRIPTION
6	FLAT BAR, ASTM A36, 1/2" x 6" x 2 3/8"
7	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-3 3/4"
8	BURNED STOP, 1/2" THICK, TAPERED 2 5/8" TO 2 1/2", OVER 6"
9	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-4 1/2"
10	BURNED STOP, 1/2" THICK, TAPERED 3" TO 3 1/8", OVER 6"

**NOTES:**

- I.D. CHARACTERS TO BE 1/2" MINIMUM HEIGHT CLEARLY STAMPED AS SHOWN.
- WELDS TO BE DRESSED FLUSH WITH SHOULDER & NOT TO PROTRUDE INTO RAIL SEAT.
- SLOTTED HOLE CENTERS ARE INDICATED ON DRAWING.

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

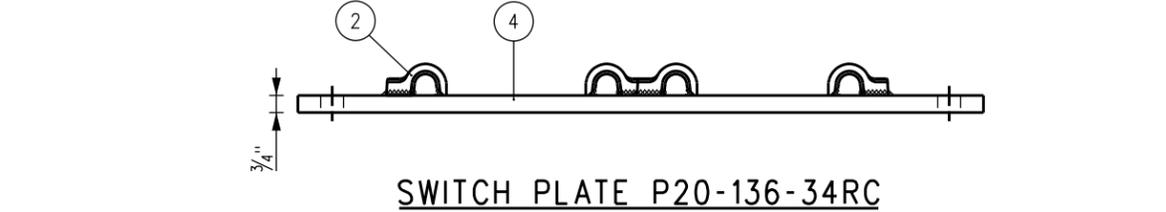
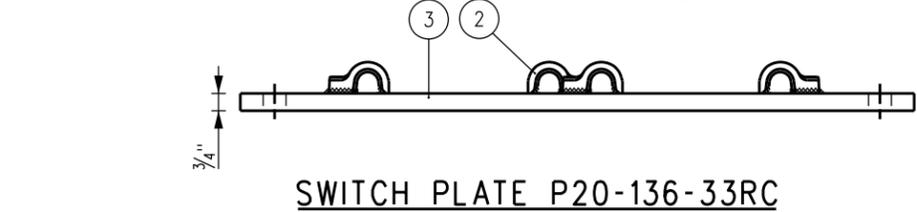
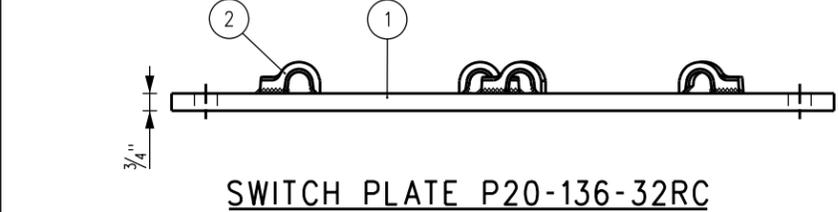
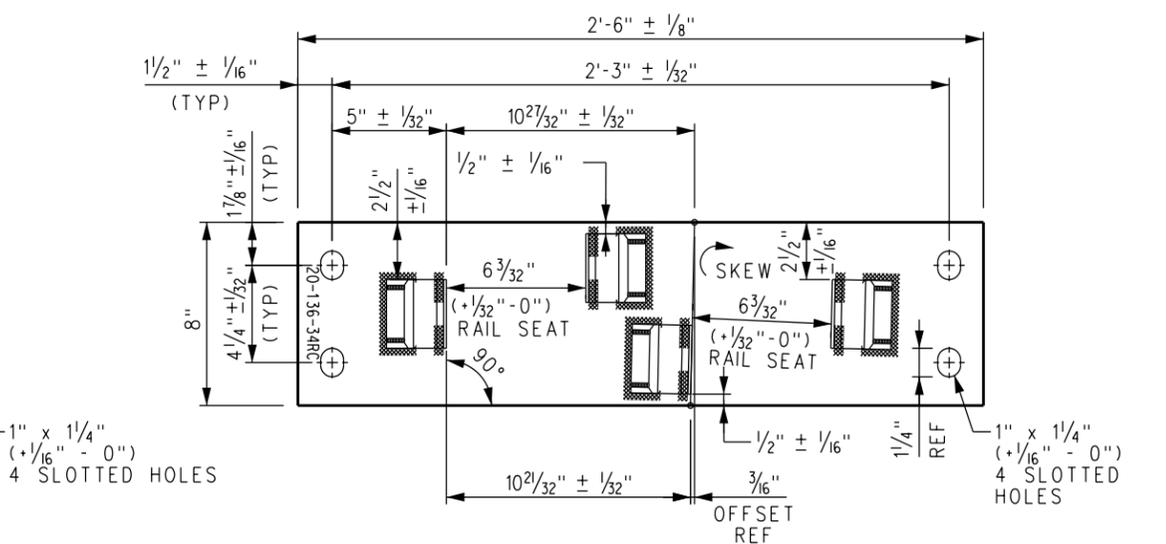
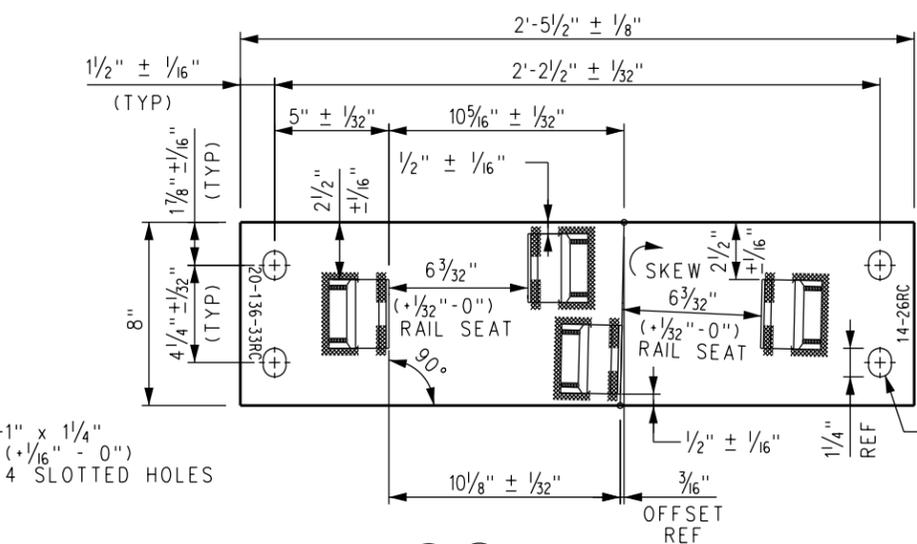
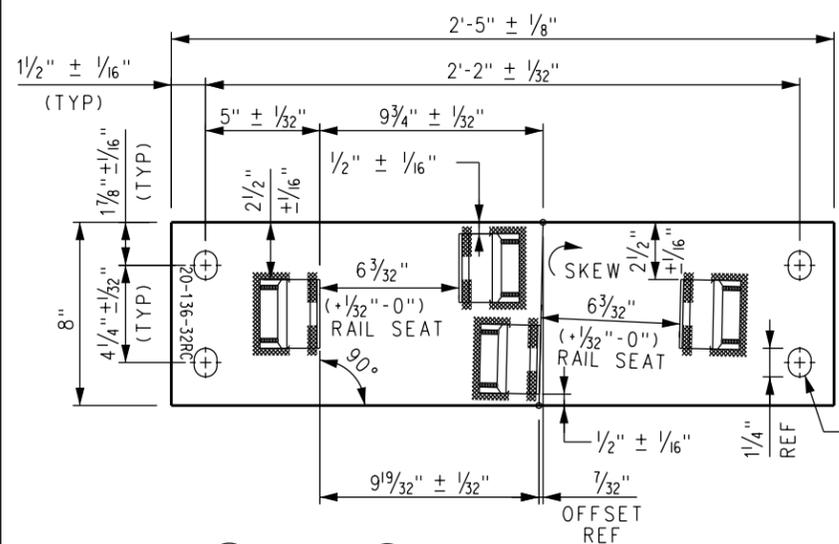
DRAWN BY: *Nareh D. Papp* HDR DATE: 03/31/2011  
 ASSISTANT DIRECTOR: STANDARDS & DESIGN  
 DIRECTOR OF ENGINEERING AND CONSTRUCTION

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

ENGINEERING STANDARDS  
 SWITCH PLATES  
 (20-28RLC /RRC THROUGH 20-29RLC /RRC)  
 (20-30RC THROUGH 20-31RC)  
 FOR NO 20 136 LB RE RH CONCRETE TIE TURNOUT

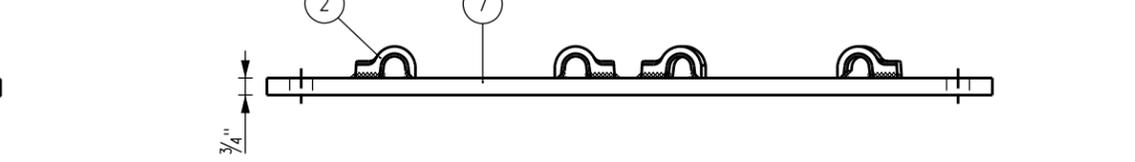
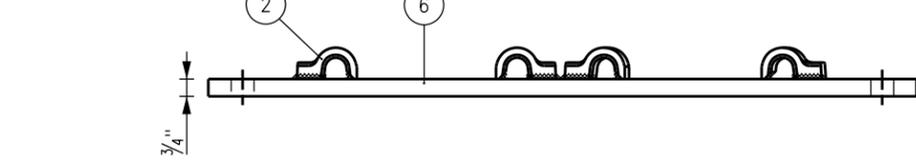
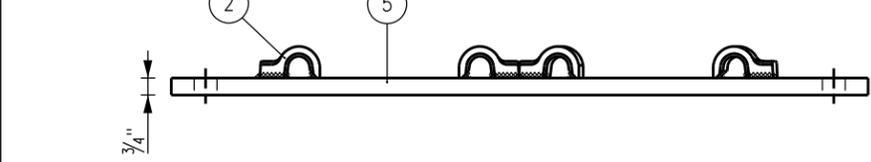
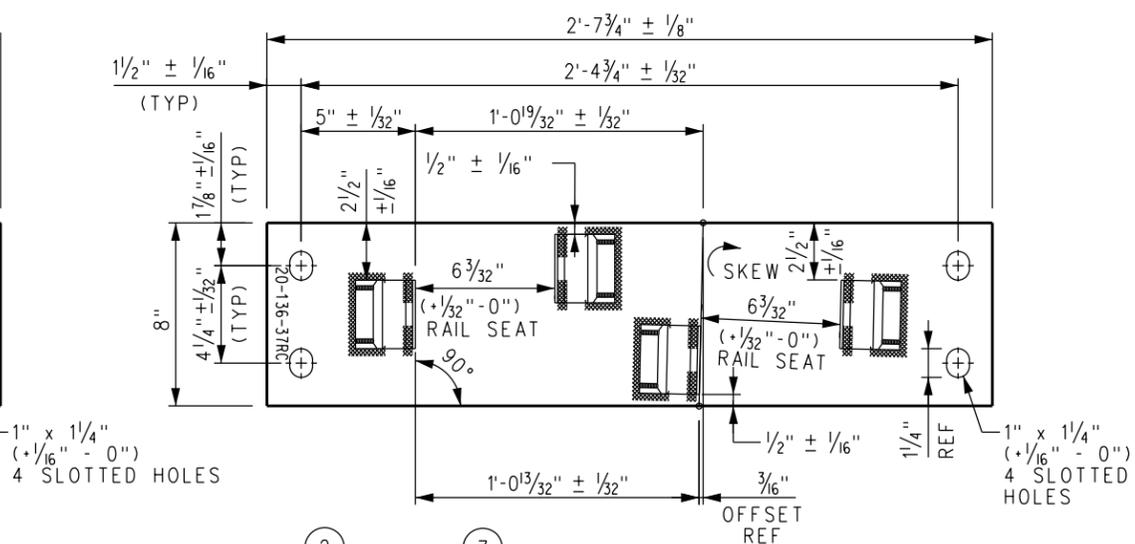
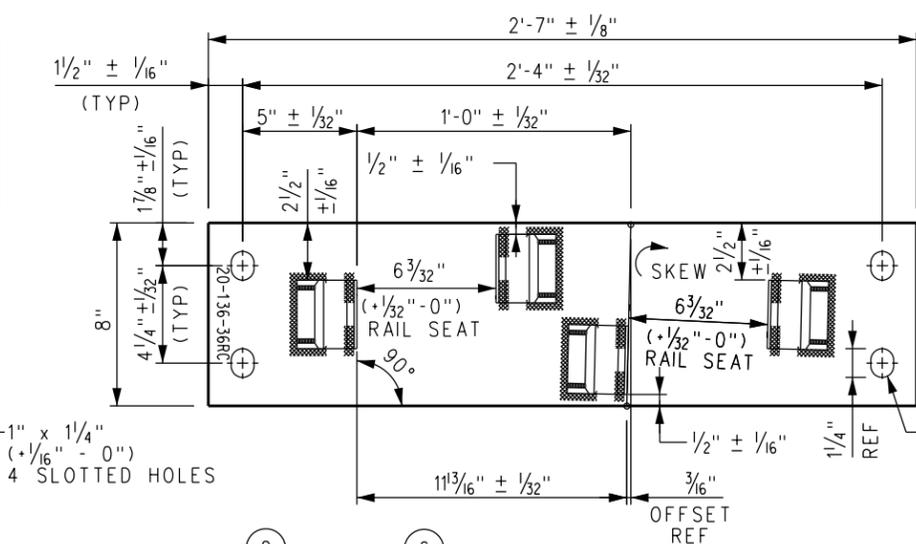
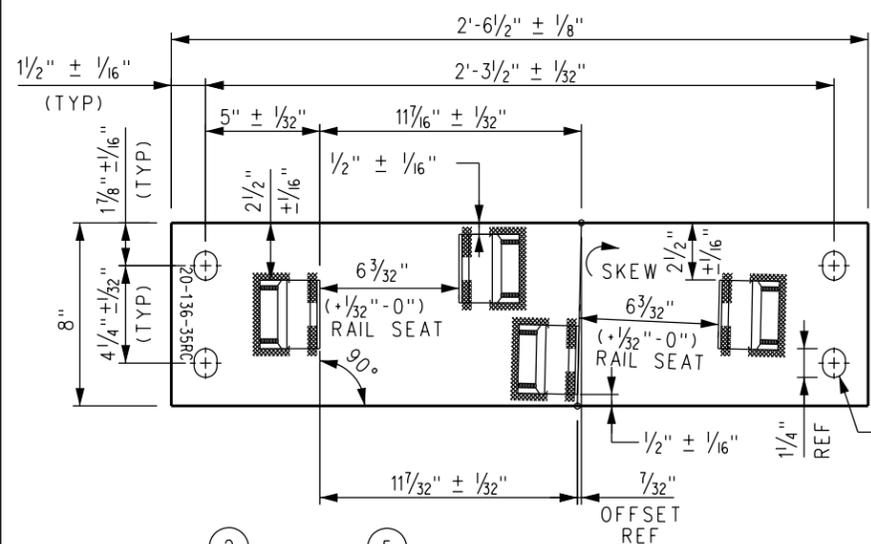
STANDARD	2806
SCALE	NTS
REVISION SHEET	1 OF 1
CADD FILE	ES2806-86



SWITCH PLATE P20-136-32RC

SWITCH PLATE P20-136-33RC

SWITCH PLATE P20-136-34RC



SWITCH PLATE P20-136-35RC

SWITCH PLATE P20-136-36RC

SWITCH PLATE P20-136-37RC

BILL OF MATERIALS	
ITEM	DESCRIPTION
1	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-5"
2	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 1
3	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-5 1/2"
4	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-6"

BILL OF MATERIALS	
ITEM	DESCRIPTION
5	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-6 1/2"
6	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-7"
7	FLAT BAR, ASTM A36, 3/4" x 8" x 2'-7 3/4"

**NOTES:**

- I.D. CHARACTERS TO BE 1/2" MINIMUM HEIGHT CLEARLY STAMPED AS SHOWN.
- WELDS TO BE DRESSED FLUSH WITH SHOULDER & NOT TO PROTRUDE INTO RAIL SEAT.
- SLOTTED HOLE CENTERS ARE INDICATED ON DRAWING.

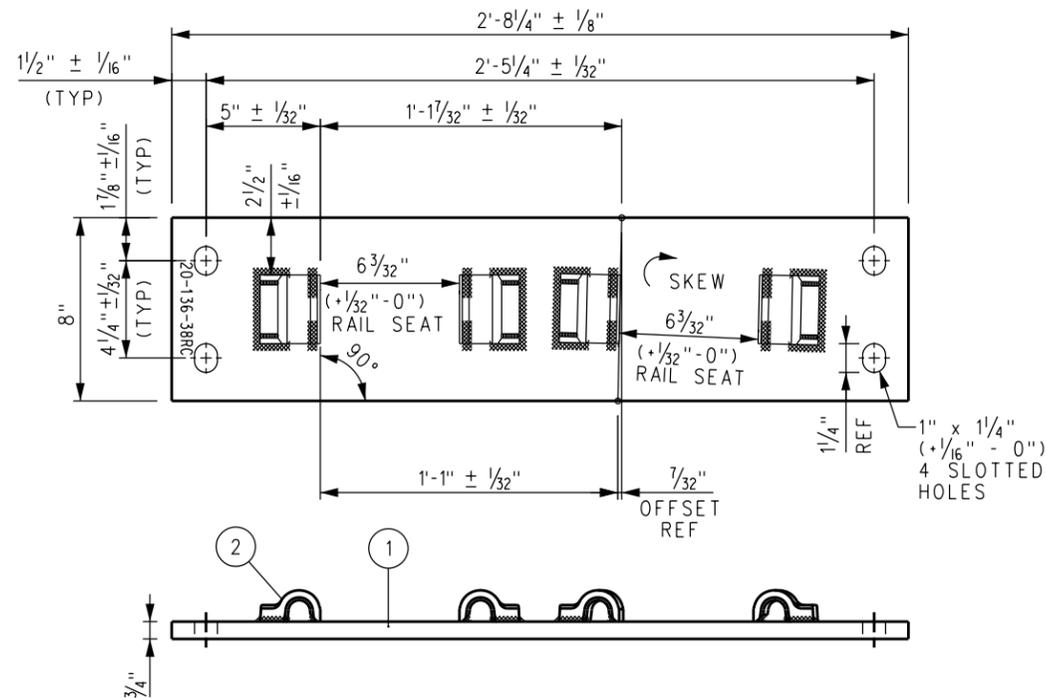
REV.	DATE	DESCRIPTION	DES.	ENG.
X	XX-XX-XX	REVISION	XX	XX

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ENGINEERING STANDARDS  
SWITCH PLATES (20-32RC THROUGH 20-37RC)  
FOR NO 20 136 LB RE RH CONCRETE TIE TURNOUT

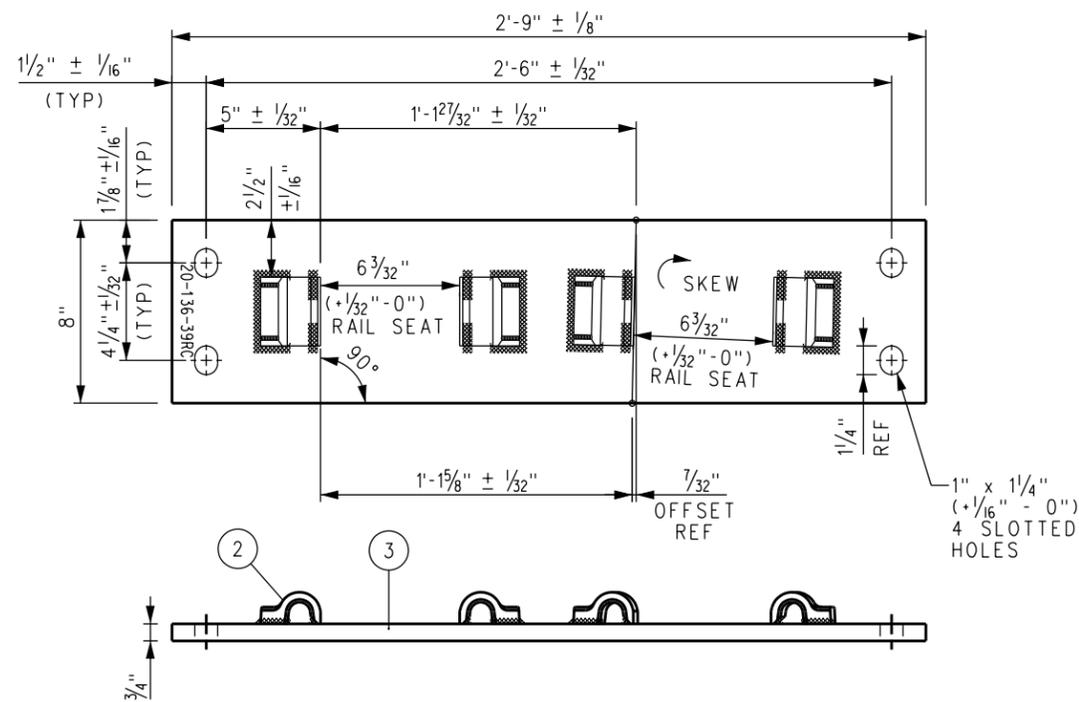
STANDARD	2806
SCALE	NTS
REVISION SHEET	1 OF 1
CADD FILE	ES2806-87



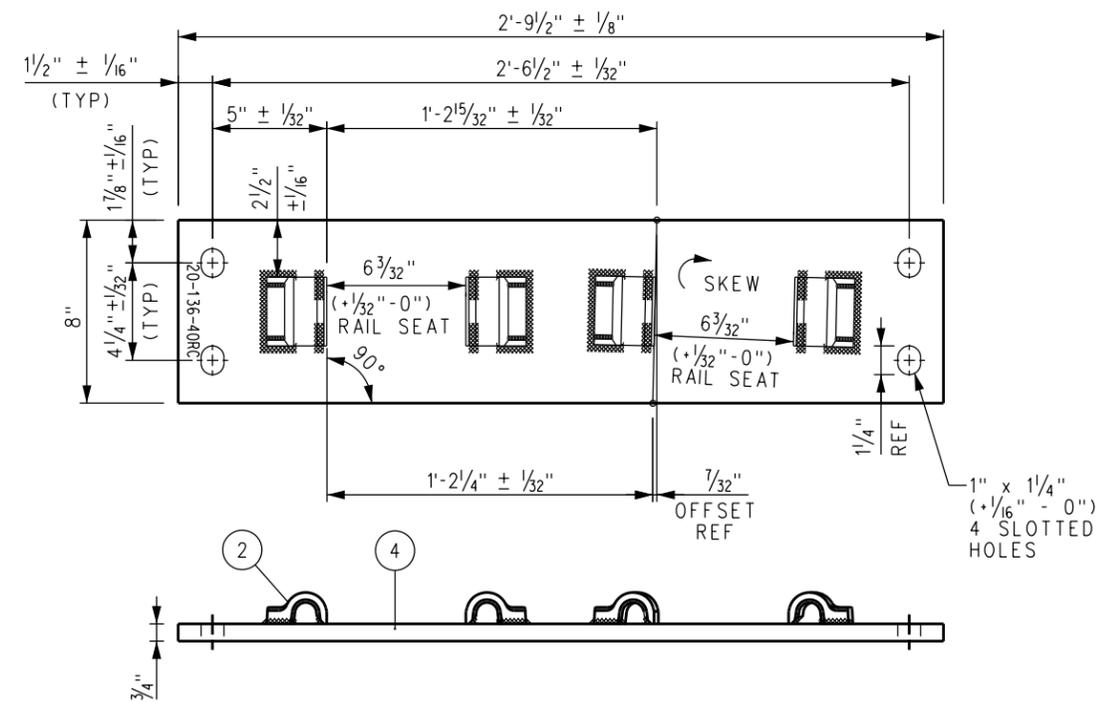
**NOTES:**

1. I.D. CHARACTERS TO BE  $\frac{1}{2}''$  MINIMUM HEIGHT CLEARLY STAMPED AS SHOWN.
2. WELDS TO BE DRESSED FLUSH WITH SHOULDER & NOT TO PROTRUDE INTO RAIL SEAT.
3. SLOTTED HOLE CENTERS ARE INDICATED ON DRAWING.

**SWITCH PLATE P20-136-38RC**



**SWITCH PLATE P20-136-39RC**



**SWITCH PLATE P20-136-40RC**

BILL OF MATERIALS	
ITEM	DESCRIPTION
1	FLAT BAR, ASTM A36, $\frac{3}{4}'' \times 8'' \times 2'-8\frac{1}{4}''$
2	SHOULDER, PANDROL, FORGED TONGUELESS, TYPE 1

BILL OF MATERIALS	
ITEM	DESCRIPTION
3	FLAT BAR, ASTM A36, $\frac{3}{4}'' \times 8'' \times 2'-9''$
4	FLAT BAR, ASTM A36, $\frac{3}{4}'' \times 8'' \times 2'-9\frac{1}{2}''$

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

DRAWN BY: HDR DATE: 03/31/2011  
*Narek D. Pape*  
 ASSISTANT DIRECTOR: STANDARDS & DESIGN  
*William D. Davis*  
 DIRECTOR OF ENGINEERING AND CONSTRUCTION

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ENGINEERING STANDARDS  
 SWITCH PLATES (20-38RC THROUGH 20-40RC)  
 FOR NO 20 136 LB RE RH CONCRETE TIE TURNOUT

STANDARD	2806
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2806-88