

**NOTE:**

1. SEE COVER SHEET FOR NOTES, BILL OF MATERIAL AND DRAWING INDEX.

**CROSSING DATA**

BETWEEN THEORETICAL POINTS OF END FROGS	75'-5 <sup>3</sup> / <sub>4</sub> "	ANGLE OF CROSSING	7° -09' -10"
BETWEEN THEORETICAL POINTS OF END FROG & CENTER FROG	37'-9 <sup>3</sup> / <sub>4</sub> "	DEGREE OF CURVATURE	8° -26' -53"
FROM INSIDE SWITCH POINTS TO THEORETICAL POINT END FROG	10'-0 <sup>1</sup> / <sub>4</sub> "	GAUGE LINE RADIUS	678.8314'
FROM THEORETICAL POINT OF CENTER FROG TO HEEL JOINT	7'-6 <sup>1</sup> / <sub>16</sub> "	THROW AT END PT	4" MIN, 4 <sup>1</sup> / <sub>2</sub> " MAX
LENGTH OF INSIDE SAMSON STOCK RAILS	SEE ABOVE	GAUGE ON STRAIGHT TRACK	4'-8 <sup>1</sup> / <sub>2</sub> "
LENGTH OF OUTSIDE SAMSON STOCK RAILS	31'-2 <sup>7</sup> / <sub>16</sub> "	GAUGE ON CURVED TRACK	4'-8 <sup>5</sup> / <sub>8</sub> "
LENGTH OF FROG FROM THEORETICAL POINT TO TOE	6'-8"	GAUGE ON SWITCH PT	4'-8 <sup>1</sup> / <sub>2</sub> "
LENGTH OF FROG FROM THEORETICAL POINT TO HEEL	11'-4"	SWITCH ANGLE	1° -14' -04"
LENGTH OF OUTSIDE SAMSON END SWITCH POINTS (0" SAMSON)	23'-3 <sup>3</sup> / <sub>16</sub> "	HEEL SPREAD OUTSIDE SWITCH POINTS 6 <sup>1</sup> / <sub>32</sub> " BC, 10 <sup>13</sup> / <sub>16</sub> " AC	-
LENGTH OF INSIDE SAMSON END SWITCH POINTS (0" SAMSON)	27'-8 <sup>7</sup> / <sub>8</sub> "	HEEL SPREAD INSIDE SWITCH POINTS 7 <sup>3</sup> / <sub>16</sub> " BC, 14" AC	-

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

DRAWN BY: A. CARLOS DATE: 03/31/2011  
 Assistant Director: Standards & Design  
 Director of Engineering and Construction

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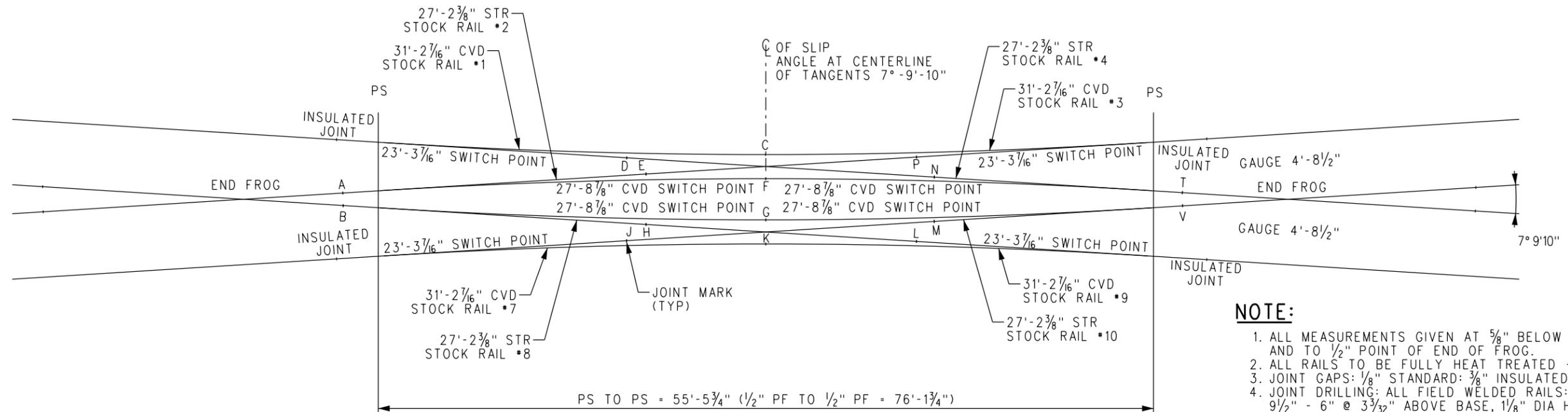
**METROLINK**  
 SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
 ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

**ENGINEERING STANDARDS**  
 NO 8 136 LB RE DOUBLE SLIP CROSSING  
 WITH SOLID MANGANESE FROG  
 LAYOUT AND CROSSING DATA

STANDARD	2840
SCALE	NTS
REVISION SHEET	1 OF 2
CADD FILE	ES2840-02



CROSSING DATA			
BETWEEN THEORETICAL POINTS OF END FROGS	75'-5 <sup>3</sup> / <sub>4</sub> "	ANGLE OF CROSSING	7° -09' -10"
BETWEEN THEORETICAL POINTS OF END FROG & CENTER FROG	37'-9 <sup>3</sup> / <sub>4</sub> "	DEGREE OF CURVATURE	8° -26' -53"
FROM INSIDE SWITCH POINTS TO THEORETICAL POINT END FROG	10'-0 <sup>1</sup> / <sub>4</sub> "	GAUGE LINE RADIUS	678.8314'
FROM THEORETICAL POINT OF CENTER FROG TO HEEL JOINT	7'-6 <sup>1</sup> / <sub>16</sub> "	THROW AT END PT	4" MIN, 4 <sup>1</sup> / <sub>2</sub> " MAX
LENGTH OF INSIDE SAMSON STOCK RAILS	27'-2 <sup>3</sup> / <sub>8</sub> "	GAUGE ON STRAIGHT TRACK	4'-8 <sup>1</sup> / <sub>2</sub> "
LENGTH OF OUTSIDE SAMSON STOCK RAILS	31'-2 <sup>7</sup> / <sub>16</sub> "	GAUGE ON CURVED TRACK	4'-8 <sup>5</sup> / <sub>8</sub> "
LENGTH OF FROG FROM THEORETICAL POINT TO TOE	6'-8"	GAUGE ON SWITCH PT	4'-8 <sup>1</sup> / <sub>2</sub> "
LENGTH OF FROG FROM THEORETICAL POINT TO HEEL	11'-4"	SWITCH ANGLE	1° -14' -04"
LENGTH OF OUTSIDE SAMSON END SWITCH POINTS (0" SAMSON)	23'-3 <sup>7</sup> / <sub>16</sub> "	HEEL SPREAD OUTSIDE SWITCH POINTS 6 <sup>1</sup> / <sub>32</sub> " BC, 10 <sup>13</sup> / <sub>16</sub> " AC	-
LENGTH OF INSIDE SAMSON END SWITCH POINTS (0" SAMSON)	27'-8 <sup>7</sup> / <sub>8</sub> "	HEEL SPREAD INSIDE SWITCH POINTS 7 <sup>3</sup> / <sub>16</sub> " BC, 14" AC	-



**CROSSING DATA**

**NOTE:**

1. ALL MEASUREMENTS GIVEN AT 5/8" BELOW TOP OF RAIL AND TO 1/2" POINT OF END OF FROG.
2. ALL RAILS TO BE FULLY HEAT TREATED - BRINELL 341-388.
3. JOINT GAPS: 1/8" STANDARD; 3/8" INSULATED.
4. JOINT DRILLING: ALL FIELD WELDED RAILS: 9/2" - 6" @ 3 3/32" ABOVE BASE, 1/8" DIA HOLES.
5. ALL INSULATED JOINT RAILS: 3 1/2" - 6" - 6" @ 3 3/32" ABOVE BASE, 1/4" DIA HOLES.
6. PROPER LOCATION OF EDGE OF PLATES TO BE MARKED WITH WHITE PAINT ON OUTER FLANGE OF RAIL.
7. MATCH MARK ALL RAIL ENDS AS SHOWN.
8. ENTIRE CROSSOVER TO BE FULLY SHOP/FLOOR ASSEMBLED INCLUDING END FROGS AND HF GUARD RAILS.

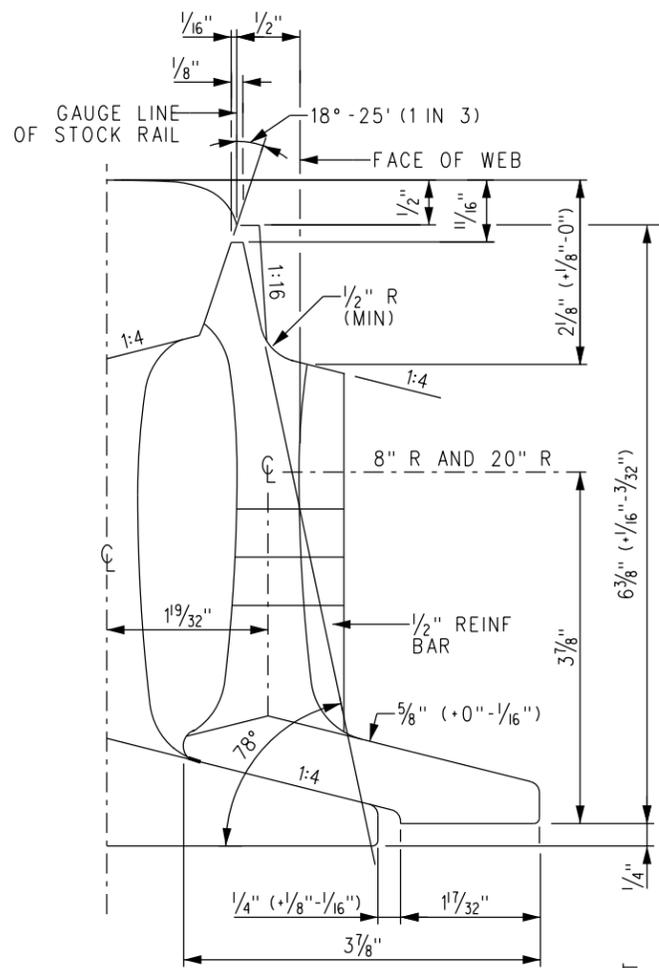
**SPECIFICATIONS:**

1. CROSSING TYPE - NO 8 DOUBLE SLIP, GENERALLY PER AREMA PLAN. RAIL: 136 LB RE HEAT TREATED.
2. FROG - NO 8 RAIL BOUND MANGANESE FROG, 136 LB RE, 18'-0" LONG WITH PANDROL PLATES - MANGANESE CASTING TO BE EXPLOSIVE HARDENED.
3. SWITCH POINTS - 27'-8 7/8" & 23'-3 7/16" LONG, CURVED AND STRAIGHT, SAMSON PLANING AREMA DETAIL 5100. CURVED POINTS TO BE EQUIPPED WITH REPLACEABLE MANGANESE INSERTS PER 2840-11 & 2840-12.
4. CLIPS AND RODS - VERTICAL RODS WITH "SMJ" CLIPS.
5. ADJUSTABLE BRACES - BOLTLESS WITH SPRING CLIPS.
6. GUARD RAILS - U-69 SECTION 13'-0" RAISED GUARD RAIL WITH BRACES AND PLATES.
7. GAUGE PLATES - TO BE FURNISHED INSTALLED.

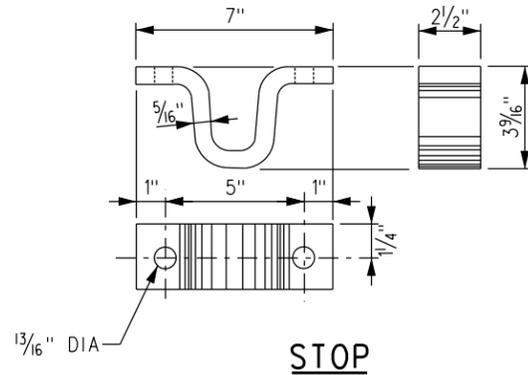
**REFERENCE DRAWING**

LAYOUT - NO 8, DOUBLE SLIP CROSSING - 136 LB ----- SHEET NO 2840-02

DRAWN BY: A. CARLOS		DATE: 03/31/2011		SCRR ENGINEERING STANDARDS ARE INTENDED FOR SCRR APPROVED USES ONLY. FOR NON-SCRR APPROVED USES, SCRR SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THE DATA OR INFORMATION CONTAINED HEREIN. THE SELECTION AND USE OF THESE STANDARDS IS THE SOLE RESPONSIBILITY OF THE USER AND SHOULD NOT BE USED WITHOUT CONSULTING A REGISTERED PROFESSIONAL ENGINEER. ALL WARRANTIES AND REPRESENTATIONS OF ANY KIND ARE DISCLAIMED. ANYONE MAKING USE OF THIS INFORMATION AGREES THAT IT ASSUMES ALL LIABILITY ARISING FROM SUCH USE. NO PART OF THESE STANDARDS SHOULD BE REPRODUCED OR DISTRIBUTED IN ANY FORM OR BY ANY MEANS WITHOUT THE PRIOR WRITTEN PERMISSION OF SCRR. ALL RIGHTS RESERVED.		<p>SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012</p>		ENGINEERING STANDARDS		STANDARD
<p>ASSISTANT DIRECTOR: STANDARDS &amp; DESIGN</p>		<p>DIRECTOR OF ENGINEERING AND CONSTRUCTION</p>		CROSSING GEOMETRY AND CROSSING DATA NO 8 136 LB RE DOUBLE SLIP CROSSING				2840		
REV.	DATE	DESCRIPTION	DES.	ENG.	SCALE: NTS				REVISION SHEET	1 OF 1
X	XX-XX-XX		XX	XX					CADD FILE:	ES2840-04



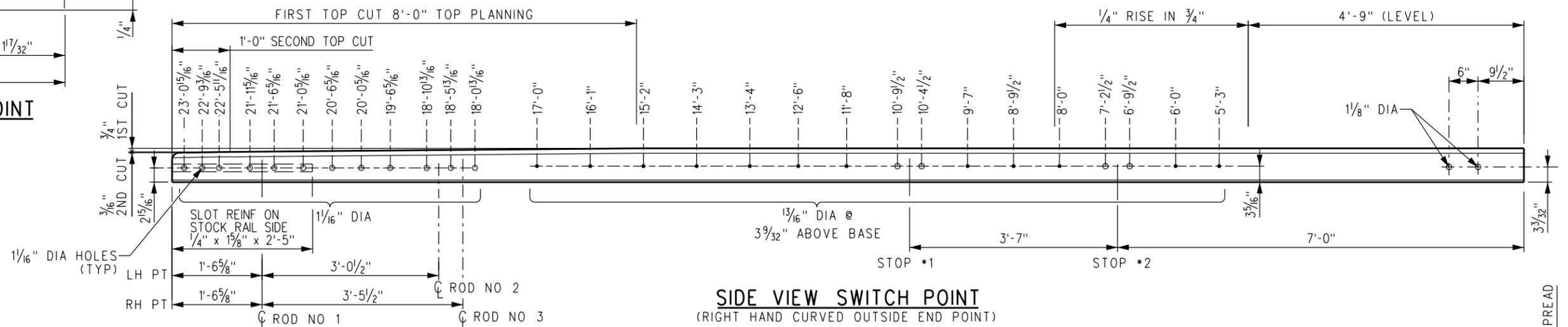
END VIEW OF POINT



STOP

NOTES:

- SWITCH POINTS TO BE MADE FROM NEW HEAD HARDENED RAIL.
- METAL IDENTIFICATION TAG SHOWING HAND OF SWITCH POINT, WEIGHT OF RAIL, MANUFACTURER AND WHEN MADE, TO BE FASTENED TO SWITCH POINT AT LOCATION SHOWN.
- RIGHT HAND TURNOUT SHOWN. MAKE OPPOSITE HAND FOR LEFT HAND SWITCH POINTS.
- SIDE PLANING FIGURED ON GAUGE LINE 5/8" BELOW TOP OF RAIL.
- MATERIAL AND WORKMANSHIP, ALSO ANY CONSTRUCTION DETAILS NOT SHOWN, SHALL BE PER CURRENT AREMA "MANUAL AND PORTFOLIO", UNLESS OTHERWISE SPECIFIED ON THIS PLAN.
- IN ORDER TO ELIMINATE STRESS RAISERS, MANUFACTURER SHALL PEEN THE EDGES OF THE BOLT HOLES AS INDICATED AT THE HEEL OF THE SWITCH POINT AND AT THE HEEL END OF THE SWITCH POINT. USING AIR HAMMER WITH SUITABLE HEAD AND FINISHING WITH DRIFT PIN. BRAND ON RAIL AT EDGE OF BOLT HOLE TO BE CAREFULLY REMOVED BY GRINDING BEFORE PEENING.
- THE CONTOUR PLANING SHALL BE ON THE GAUGE SIDE BEGINNING AT A DISTANCE OF 3'-0" FROM THE POINT OF SWITCH AND SHALL BE SHAPED TO THE CONTOUR OF A NEW 136 LB RE AND SHALL RUN OUT AT THE END OF THE TOP PLANING, WHERE THE SWITCH POINT HAS FULL HEAD CONTOUR.
- METAL IDENTIFICATION TAG SHOWING (1) DESIGN LENGTH OF SWITCH, (2) IN PARENTHESIS, THE ACTUAL LENGTH OF SWITCH POINT RAIL AND (3) THE TURNOUT NUMBER. MARK TAG THUS: 16'-6" (40'-0") NO 8. TAG TO BE FASTENED TO SWITCH POINT, ON GAUGE SIDE OF RAIL AT HEEL SPACER BLOCK IN LOCATION SHOWN.
- AT HEEL END OF SWITCH POINT RAIL, BREAK SHARP CORNER AROUND THE ENTIRE PERIPHERY BY SLIGHTLY GRINDING. ALSO, "DO NOT" END HARDEN RAIL END.
- NON - INTERLOCKED AND INTERLOCKED SWITCH POINTS ARE MADE THE SAME.
- UNLESS SWITCH POINT ORDER SPECIFICALLY CALLS FOR USE OF 3/4" RIVETS AND 3/4" STOP BOLTS, MANUFACTURER CAN SUBSTITUTE 3/4" HUCK FASTENERS, BOLT PART NO C-50-LR-BR2416 AND COLLAR PART NO L3-2-24G FOR 3/4" RIVETS. FOR 3/4" STOP BOLTS USE HUCK FASTENERS, BOLT PART NO C-50-LR-BR2424 AND COLLAR PART NO L3-2-R-24G.
- TURNOUTS ARE TO BE FINISHED WITH MANGANESE STEEL INSERT ON THE REVERSE POINT (TURNOUT SIDE) AND A PLAIN SWITCH POINT ON THE NORMAL POINT (STRAIGHT SIDE). REPLACEMENT POINTS MUST SPECIFY WHETHER PLAIN POINT OR MANGANESE STEEL INSERT ARE TO BE FURNISHED.



SIDE VIEW SWITCH POINT  
(RIGHT HAND CURVED OUTSIDE END POINT)

LUG BOLTS 1" x 5" LG, 4 5/8" TO CENTERLINE OF COTTER, WITH 2 NUTS. 3/8" SPRING WASHER AND 1/4" x 1/2" COTTER (HEAVY SQ NUTS)

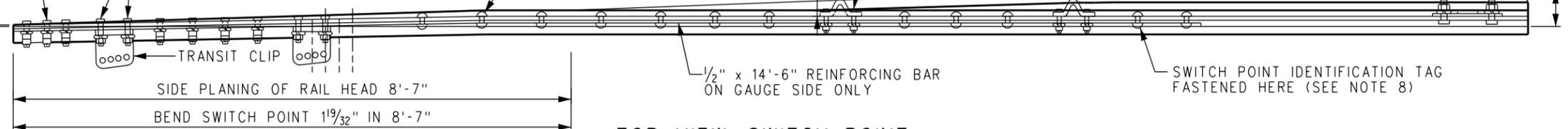
TRANSIT CLIP BOLTS: 1" x 1/4" LG, 3 3/8" TO CENTERLINE OF COTTER, WITH 3/8" SPRING WASHER AND 1/4" x 1/2" COTTER (HEAVY HEX NUTS)

3/4" RIVETS (TYP) SEE NOTE 11

STOP BOLTS 3/4" x 3 1/2", 3/4" TO CENTERLINE OF COTTER, WITH 1/4" SPRING WASHER AND 3/16" x 1/4" COTTER (HEAVY SQ NUTS), (SEE NOTE 11)

END OF BOTTOM PLANING. SWITCH ANGLE 1°-44'-11"

1/4" POINT CHAMFERED TO 1/8" IN 2'-0" AT 1/16" BELOW TOP OF STOCK RAIL. CHAMFER ANGLE 78°00', ROUND TO 1/2" R AND GRIND TO SHARP EDGE. REMOVE ALL BURRS.



TOP VIEW SWITCH POINT

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

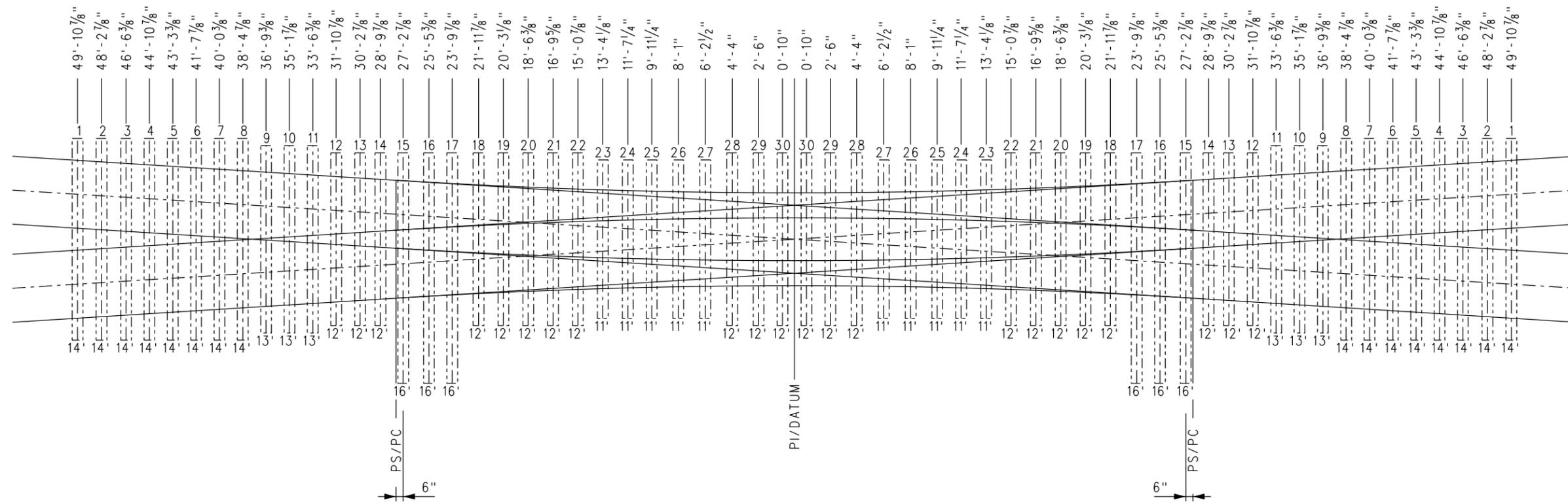
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SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS  
136 LB RE 23'-3 7/16" STRAIGHT SWITCH POINT  
MADE FROM 40'-0" LONG RAIL  
NO 8 DOUBLE SLIP CROSSING

STANDARD	2840
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2840-11





BILL OF SWITCH TIES			
PIECES	SIZE	LENGTH	BOARD FEET
10	7"x9"	11'-0"	577.5
22	7"x9"	12'-0"	1386.0
6	7"x9"	13'-0"	409.5
16	7"x9"	14'-0"	1176.0
0	7"x9"	15'-0"	0
6	7"x9"	16'-0"	504.0
<b>TOTAL</b>		<b>TOTAL</b>	
60		4053	

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

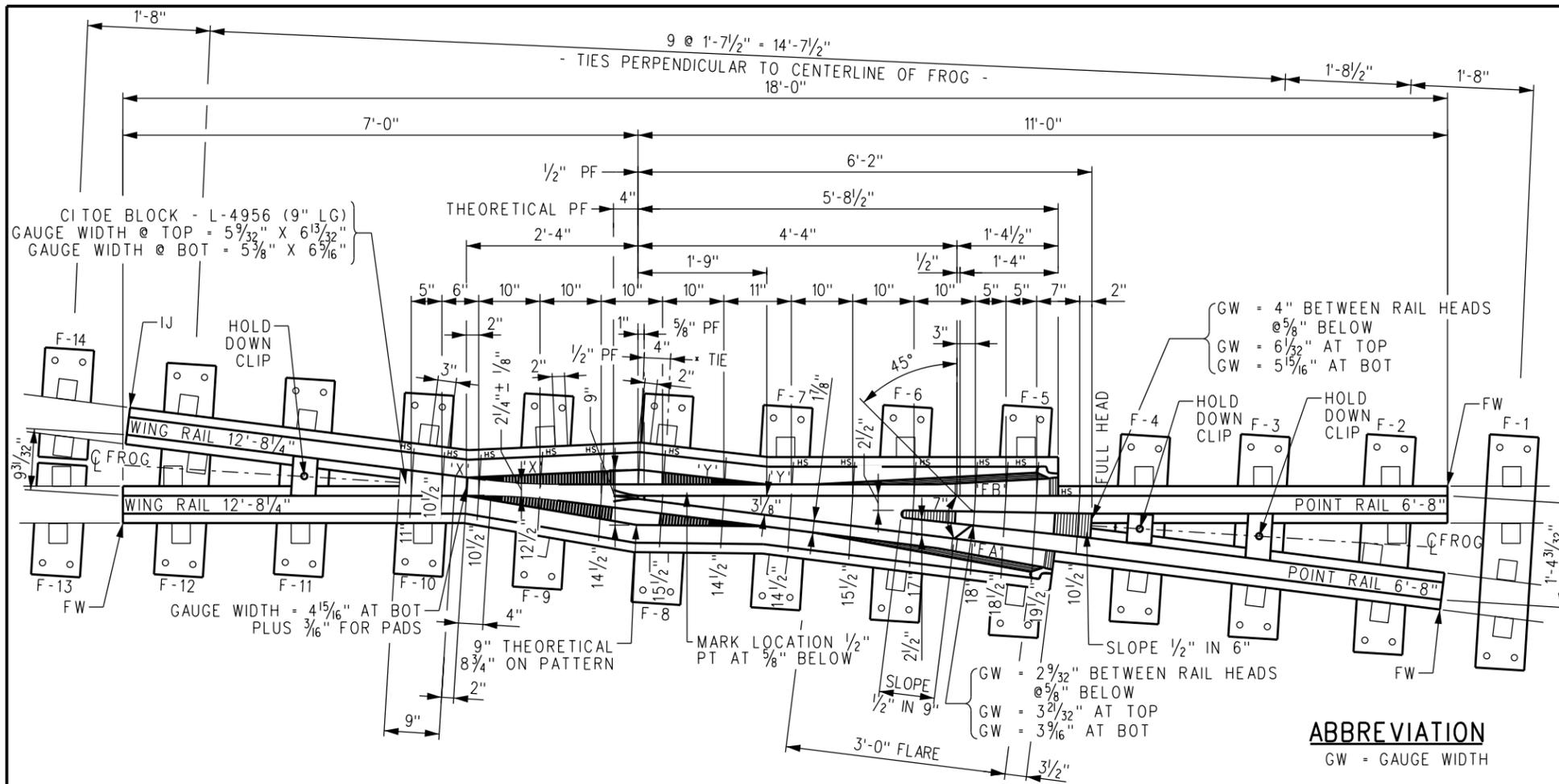
DRAWN BY: *Nareh D. Papp* HDR DATE: 03/31/2011  
 ASSISTANT DIRECTOR: STANDARDS & DESIGN  
*William Davan*  
 DIRECTOR OF ENGINEERING AND CONSTRUCTION

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

ENGINEERING STANDARDS  
 NO 8 136 LB RE DOUBLE SLIP CROSSING  
 TIMBER TIE LAYOUT

STANDARD	2840
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2840-30



**NOTES:**

1. FROG ANGLE 7° - 09' - 10".
2. RAIL USED TO FABRICATE FROG IS TO BE 136 LB HEAD HARDENED.
3. RAIL BOUND MANGANESE FROG PER CURRENT AREMA PLAN NO 775, 1012 AN M2.7 WITH EXPLOSIVE HARDENED MANGANESE HIGH INTEGRITY CASTING PER CURRENT AREMA SPECIFICATIONS AND MODIFIED FOR ARM LENGTHS AND PLATES WITH "PANDROL" FASTENERS.
4. ALL FROG PLATES SHALL BE STAMPED IN 1/2" CHARACTERS TO INDICATE MFG, FROG NO, RH, RAIL SECTION AND PLATE NUMBER. MARK TO BE STAMPED ON SAME END OF ALL FROG PLATES.
5. FOR DETAILS OF FROG GAUGE PLATES SEE SHEET ES2840-47. FOR DETAILS OF FROG PLATES F-1 THRU F-4 SEE SHEET ES2840-48.
6. WORKMANSHIP AND MATERIALS SHALL BE PER CURRENT AREMA "SPECIFICATIONS FOR SPECIAL TRACKWORK", EXCEPT AS OTHERWISE SPECIFIED.
7. ANY CONSTRUCTION DETAILS NOT SHOWN SHALL BE IN ACCORDANCE WITH CURRENT AREMA RECOMMENDED PRACTICE.
8. FROG PLATES ARE DESIGNED TO BE INSTALLED PERPENDICULAR TO MAIN TRACK.
9. BODY BOLTS, 1 3/8" DIA, H.T.C.S. - PER AREMA SPECIFICATIONS.
10. TOE AND HEEL BLOCKS AND BOLTS PER AREMA SPECIFICATIONS.
11. PLATES TO BE MADE OF MILD ROLLED STEEL.
12. THE PLATES AS SHOWN ARE FOR A 136 LB, NO 8, DOUBLE SLIP CROSSING.
13. THE "PANDROL" TYPE, OR APPROVED EQUAL, WELD - ON PRESSED STEEL SHOULDER, MADE OF MILD STEEL AND MEETING "PANDROL'S" DESIGN SPECIFICATIONS SHALL BE USED. THE PRESSED STEEL SHOULDER MUST BE CAREFULLY WELDED TO ALL PLATES WITH A MINIMUM 2 PASS 3/8" + FILLET WELD ALONG BEVELED GROOVES OF THE SHOULDER. ANY WELD PROJECTING BEYOND THE VERTICAL FACE OF THE SHOULDER IN THE AREA OF THE BASE OF RAIL SEAT MUST BE MACHINED OUT TO PROVIDE A CLEAR RAIL SEAT DIMENSION AS CALLED FOR.
14. MANUFACTURER OF FROG PLATES SHALL USE COMPLETED FROG TO VERIFY LOCATION OF ADJUSTABLE CLAMPS ON FROG PLATES F-1, F-2 AND F-3 TO INSURE PROPER FIT. FROG PLATES WILL BE WELDED TO THE GAUGE PLATES IN THE FIELD WITH A 3 PASS 1/2" + FILLET WELD. PLATES WILL BE WELDED ONLY AFTER THE GAUGE PLATES ARE SECURED IN THE PROPER LOCATION ON THE TIE WITH THE FROG IN PLACE AT PROPER ALIGNMENT.
15. GUARD RAIL PLATES ARE TO BE INSTALLED AND WELDED TO THE FROG GAUGE PLATES IN THE FIELD WITH A 3 PASS 1/2" + FILLET WELD CONTINUOUS ON BOTH ENDS OF THE PLATE. PLATES ARE TO BE WELDED ONLY AFTER THE GAUGE PLATE AND THE FROG IS SECURED IN THE PROPER LOCATION ON THE TIE WITH PROPER ALIGNMENT.
16. IDENTIFICATION TAG WITH RAISED METAL CHARACTERS TO BE APPLIED WHICH WILL STATE WEIGHT OF RAIL, FROG NO, MANUFACTURER AND YEAR MANUFACTURED.

**ABBREVIATION**  
GW = GAUGE WIDTH

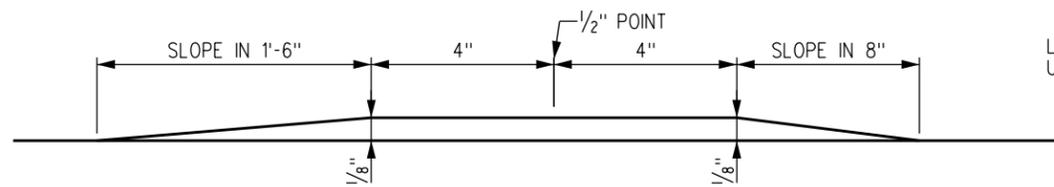
**NO 8 RAILBOUND MANGANESE FROG  
18'-0" LONG WITH PLATES**

**REFERENCE DRAWINGS**

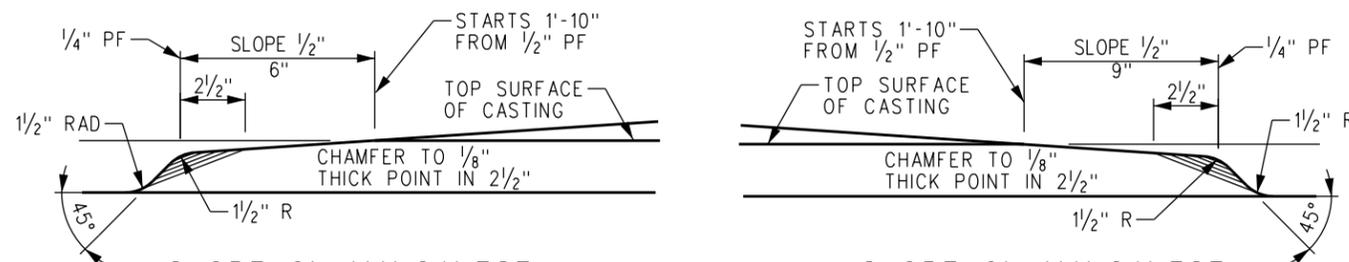
LAYOUT - NO 8, DOUBLE SLIP CROSSING - 136 LB ----- NO 2840-02  
U-69 GUARD RAIL - 136 LB ----- NO 2840-60

**WELDING OF GAUGE PLATE & GUARD RAIL:**

1. POSITION GAUGE PLATES AT DESIGNATED TIE LOCATIONS AND ANCHOR IN PLACE.
2. CHECK TRACK FOR CORRECT GAUGE.
3. STARTING WITH ONE GAUGE PLATE, PLACE FROG PLATES WITH ADJUSTABLE BRACES AND SECURE TO FROG AND GUARD RAIL WITH "PANDROL" CLIPS.
4. RECHECK TRACK GAUGE AND CORRECT IF NECESSARY.
5. CAREFULLY WELD FROG PLATE AND GUARD RAIL PLATE TO FROG GAUGE PLATES WITH 3 PASS 1/2" + FILLET WELD. FOR WELDING USE THE FOLLOWING:  
A. ELECTRODE, 5/32", WELDING SPEC 7018XLM.  
B. ELECTRODE, 3/16", WELDING SPEC 7018XLM.  
C. WIRE, 3/32", NR203, 1% NICKEL FLUX CORE.  
OTHER WIRE OR ELECTRODES MEETING SPECIFICATIONS AS CALLED FOR AND APPROVED BY SCRR A DIRECTOR OF ENGINEERING.

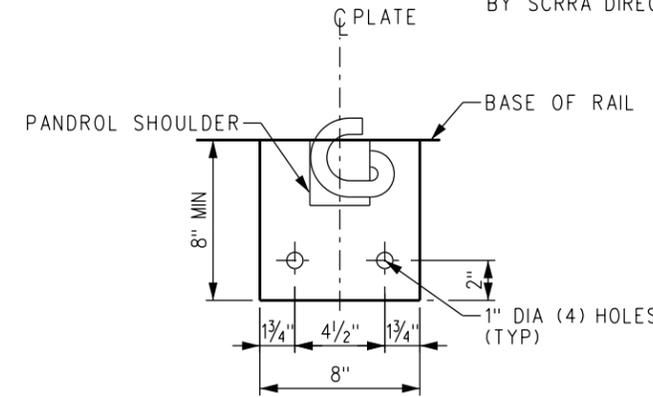


**DETAIL OF WING WHEEL RISER**

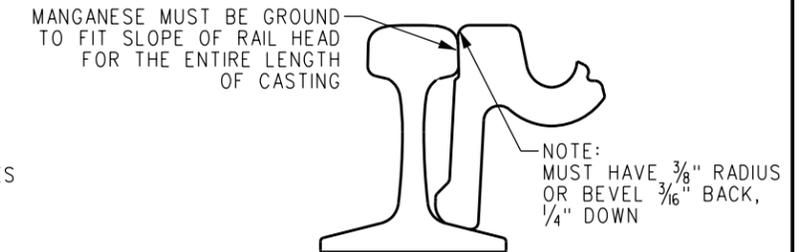


**SLOPE ON MANGANESE  
AT SECTION "X" - "X" ON WING RAIL**

**SLOPE ON MANGANESE  
AT SECTION "Y" - "Y" ON WING RAIL**



**TYPICAL PLATE PUNCHING DETAIL**



**DETAIL OF FROG  
CASTING / RAIL FIT**

REV.	DATE	DESCRIPTION	DES.	ENG.
X	XX-XX-XX	REVISION	XX	XX
DRAWN BY: A. CARLOS DATE: 03/31/2011 Assistant Director: Standards & Design Director of Engineering and Construction				

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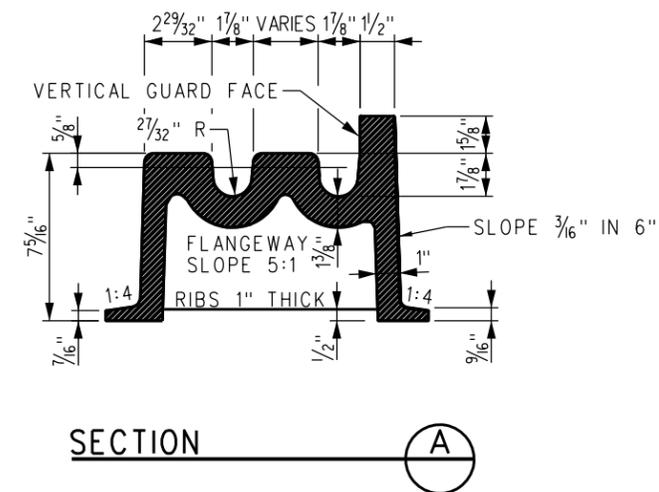
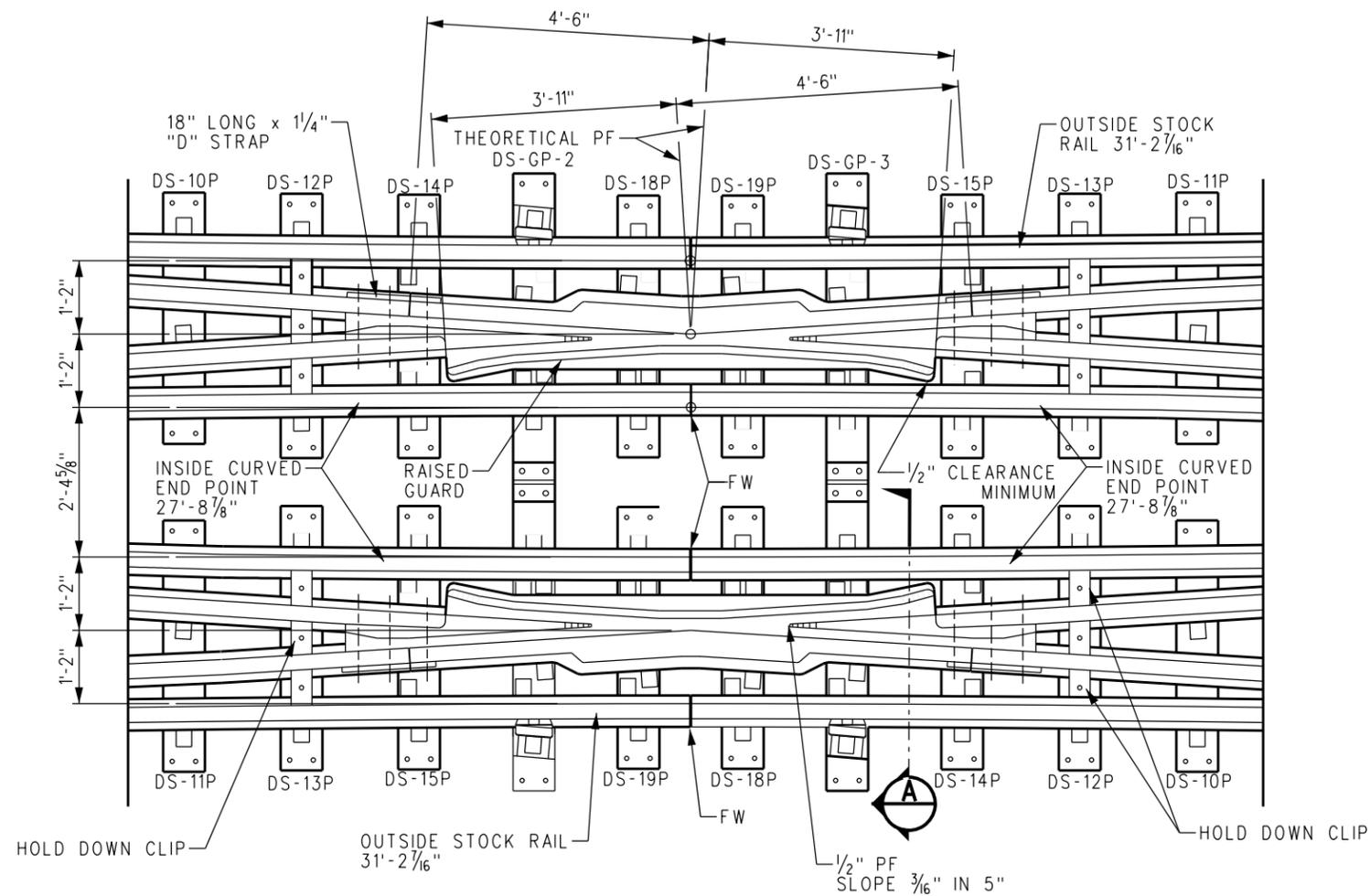
**METROLINK**  
SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

**ENGINEERING STANDARDS**  
NO 8 RAILBOUND MANGANESE STEEL FROG WITH PANDROLIZED PLATES FOR A 136 LB RE DOUBLE SLIP CROSSING

STANDARD	2840
SCALE	NTS
REVISION	SHEET 1 OF 1
CADD FILE	ES2840-40

**NOTES:**

1. HOLD DOWN CLIPS TO BE INSTALLED IN THE FIELD.
2. SOLID CAST MANGANESE STEEL CENTER FROGS PER CURRENT AREMA SPECIFICATIONS MODIFIED FOR USE WITH "PANDROL" TYPE FASTENERS.



**NO 8 DOUBLE SLIP CROSSING  
CENTER SECTION LAYOUT**

FROG ANGLE 7° - 09' - 10"  
FLANGEWAY 1 7/8" WIDE, 1 7/8" DEEP

REV.	DATE	DESCRIPTION	DES.	ENG.
X	XX-XX-XX	REVISION	XX	XX
DRAWN BY: A. CARLOS DATE: 03/31/2011 Assistant Director: Standards & Design Director of Engineering and Construction				

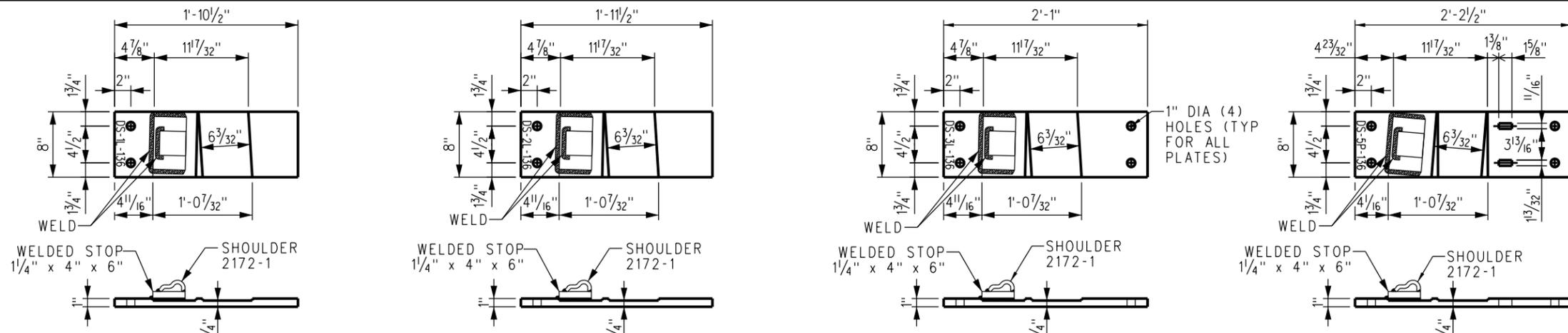
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**METROLINK**  
SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS  
NO 8 DOUBLE SLIP CROSSING  
CENTER SECTION LAYOUT  
136 LB RE RAIL

STANDARD	2840
SCALE	NTS
REVISION SHEET	1 OF 1
CADD FILE	ES2840-41





**NOTES:**

1. PLATES TO BE MADE OF MILD ROLLED STEEL.
2. EACH PLATE TO BE PLAINLY STAMPED WITH PLATE NO AND 136 (WEIGHT OF RAIL) & HAND OF TURNOUT (RH OR LH)
3. THE PANDROL TYPE, OR APPROVED EQUAL, WELD - ON PRESSED STEEL SHOULDER, MADE FROM MILD STEEL, AND MEETING PANDROL'S DESIGN SPECIFICATIONS, SHALL BE USED.
4. THE PRESSED STEEL SHOULDER MUST BE CAREFULLY WELDED TO THE PLATE. ANY WELD PROJECTING BEYOND THE VERTICAL FACE OF SHOULDER IN THE AREA OF THE RAIL SEAT MUST BE MACHINED OUT TO PROVIDE A CLEAR RAIL SEAT DIMENSION AS CALLED FOR.
5. THE PLATES AS SHOWN ARE FOR A 136 LB, NO 8 DOUBLE SLIP CROSSING.
6. HOLES IN PLATES ARE 1" IN DIA UNLESS OTHERWISE NOTED.

**BRACE PLATE - DS-1L**

1" x 8" x 1'-10 1/2"  
MILLED W/ADJ RAIL BRACE

**BRACE PLATE - DS-2L**

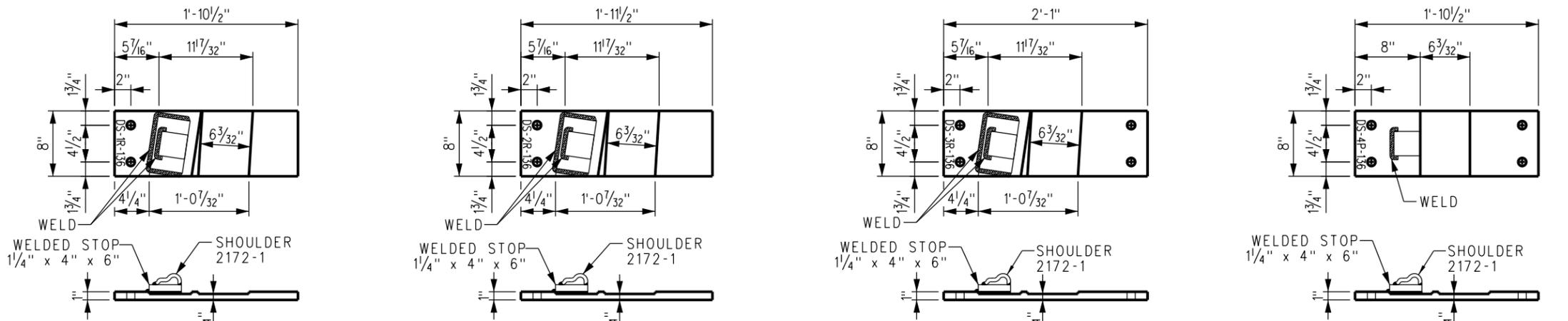
1" x 8" x 1'-11 1/2"  
MILLED W/ADJ RAIL BRACE

**BRACE PLATE - DS-3L**

1" x 8" x 2'-1"  
MILLED W/ADJ RAIL BRACE

**BRACE SLIDE PLATE - DS-5P**

1" x 8" x 2'-2 1/2"  
MILLED W/ADJ RAIL BRACE



**BRACE PLATE - DS-1R**

1" x 8" x 1'-10 1/2"  
MILLED W/ADJ RAIL BRACE

**BRACE PLATE - DS-2R**

1" x 8" x 1'-11 1/2"  
MILLED W/ADJ RAIL BRACE

**BRACE PLATE - DS-3R**

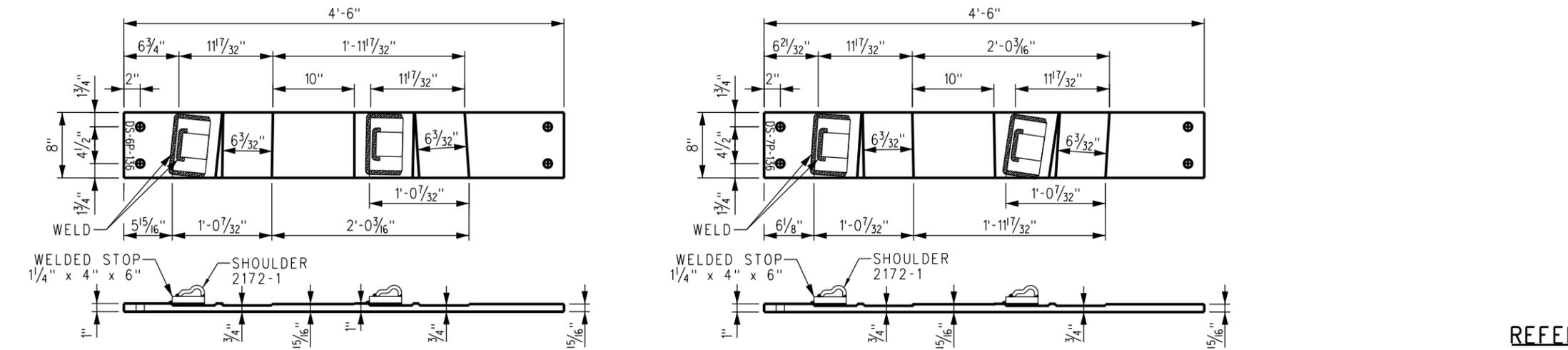
1" x 8" x 2'-1"  
MILLED W/ADJ RAIL BRACE

**SLIDE PLATE - DS-4P**

1" x 8" x 1'-10 1/2"  
MILLED W/ADJ RAIL BRACE

**WELDING SPECIFICATIONS:**

1. SET PRESSED STEEL SHOULDER FLUSH AGAINST LINE OF BASE OF RAIL OR SHOULDER OF MILLED PLATE AS SHOWN AND WELD WITH 2 - PASS 3/8" + WELD.
2. STOP PLATE FOR ADJUSTABLE RAIL BRACE TO BE SET FLUSH WITH SHOULDER OF MILLED PLATE AS SHOWN AND WELD WITH 3 - PASS 1/2" + FILLET WELD.
3. SHOULDERS AND STOPS ARE TO BE CAREFULLY WELDED TO PLATE. NO WELD SHALL PROJECT BEYOND THE VERTICAL EDGE OF THE UNWELDED FOURTH SIDE OF THE STOP PLATE OR VERTICAL FACE OF SHOULDER IN THE AREA OF THE RAIL SEAT. ANY WELD PROJECTING BEYOND THE FACE OF THE STOP OR SHOULDER MUST BE MACHINED OFF TO PROVIDE CLEAR DIMENSION CALLED FOR.
4. FOR WELDING PRESSED STEEL SHOULDERS OR PLATE STOPS FOR ADJUSTABLE USE THE FOLLOWING:
  - A. ELECTRODE 1/8", WELDING SPEC. 7018XLM.
  - B. ELECTRODE 3/16", WELDING SPEC. 7018XLM.
  - C. WIRE, WELDING 3/32", NR203, 1/2" NICKEL FLUX CORE. OTHER WIRE OR ELECTRODES MEETING SPECIFICATIONS AS CALLED FOR, APPROVED BY DIRECTOR OF ENGINEERING, MAY BE USED.



**BRACE PLATE - DS-6P**

1" x 8" x 4'-6"  
MILLED W/ADJ RAIL BRACE

**BRACE PLATE - DS-7P**

1" x 8" x 4'-6"  
MILLED W/ADJ RAIL BRACE

**REFERENCE DRAWINGS**

LAYOUT - NO 8, DOUBLE SLIP CROSSING - 136 LB ----- SHEET NO 2840-02

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

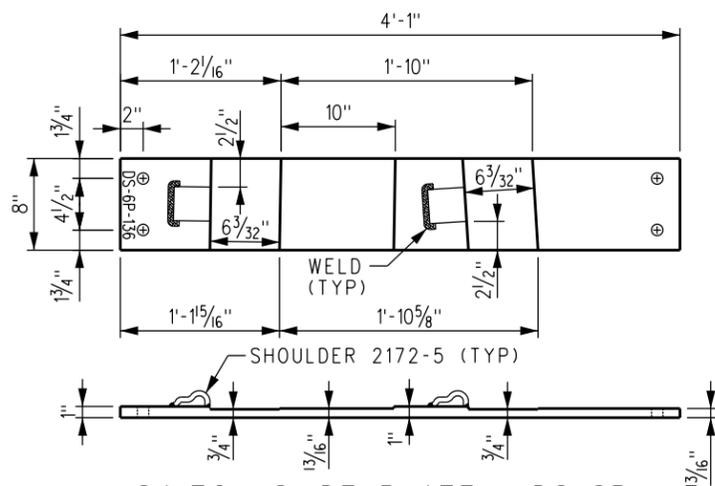
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ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS

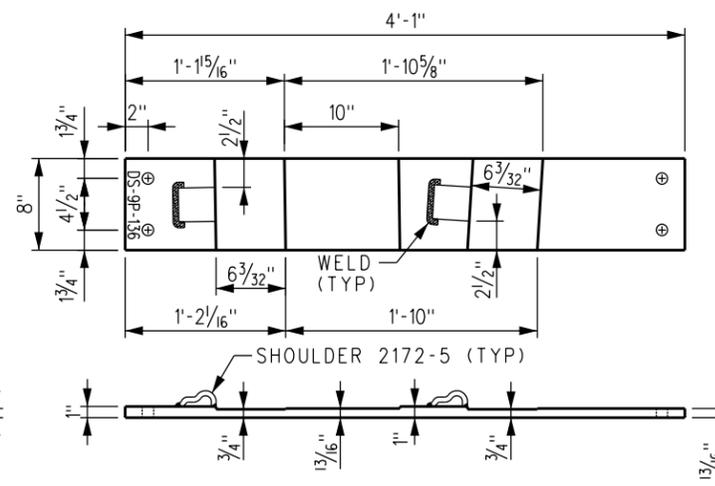
BRACE PLATE AND SLIDE PLATE DETAILS  
NO 8 136 LB RE DOUBLE SLIP CROSSING

STANDARD	2840
SCALE	NTS
REVISION SHEET	1 OF 1
CADD FILE	ES2840-45



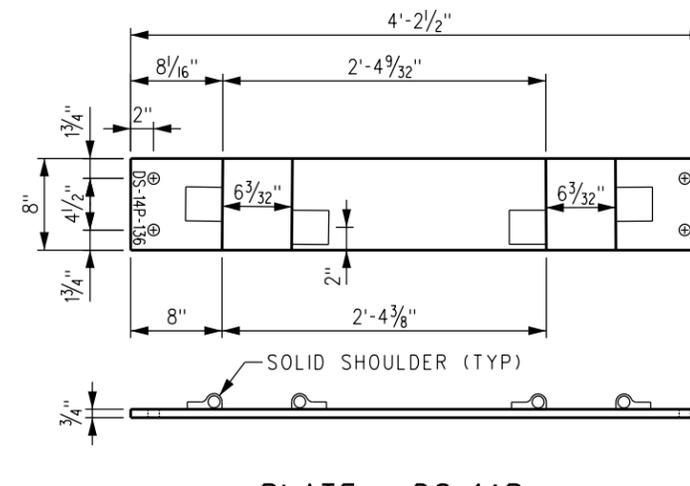
**SWITCH SLIDE PLATE - DS-8P**

1" x 8" x 4'-1" - MILLED - W/ADJ RAIL BRACE



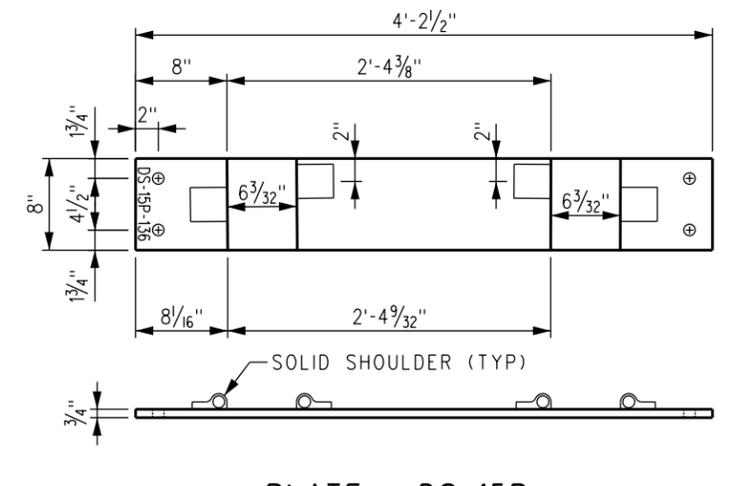
**SWITCH SLIDE PLATE - DS-9P**

1" x 8" x 4'-1" - MILLED - W/ADJ RAIL BRACE



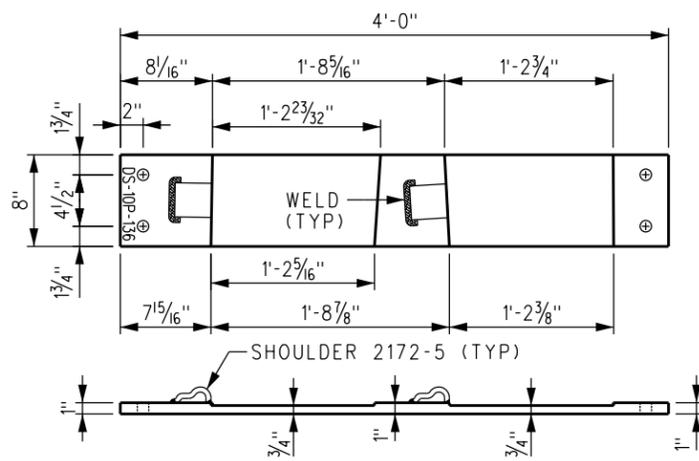
**PLATE - DS-14P**

3/4" x 8" x 4'-2 1/2" - FLAT



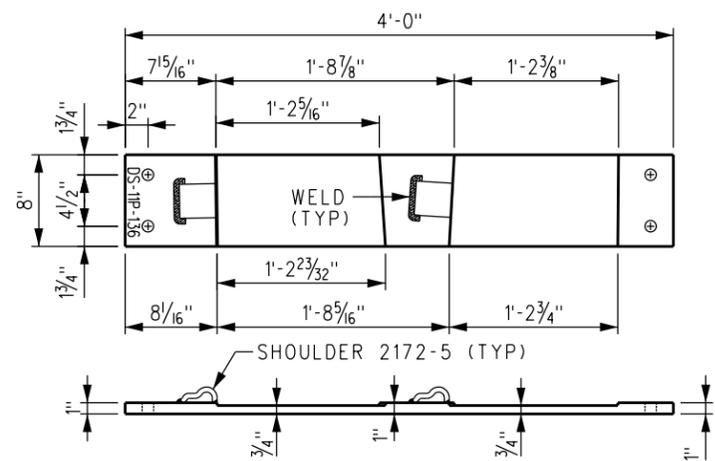
**PLATE - DS-15P**

3/4" x 8" x 4'-2 1/2" - FLAT



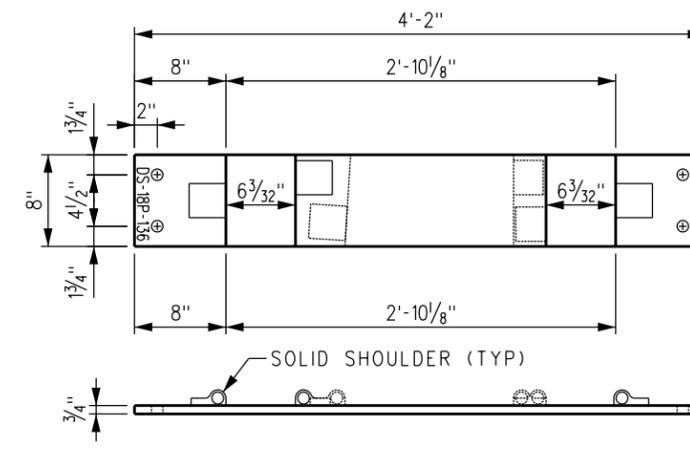
**SWITCH SLIDE PLATE - DS-10P**

1" x 8" x 4'-0" - MILLED - W/ADJ RAIL BRACE



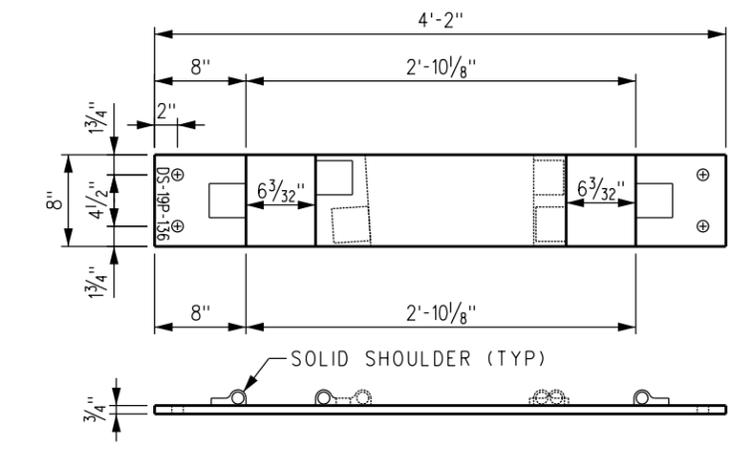
**SWITCH SLIDE PLATE - DS-11P**

1" x 8" x 4'-0" - MILLED - W/ADJ RAIL BRACE



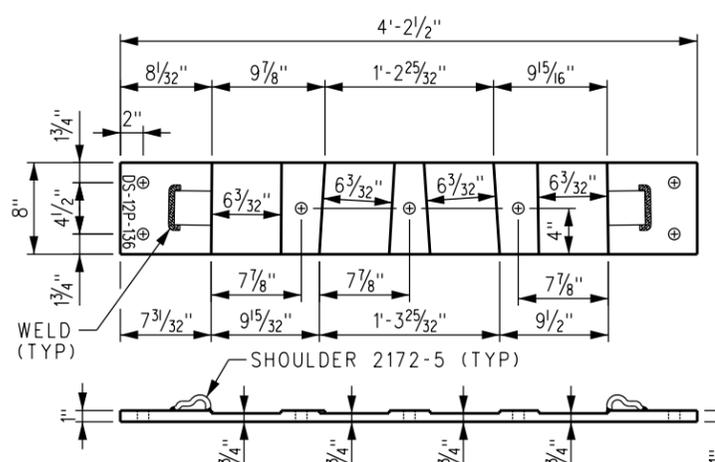
**PLATE - DS-18P**

3/4" x 8" x 4'-2" - FLAT



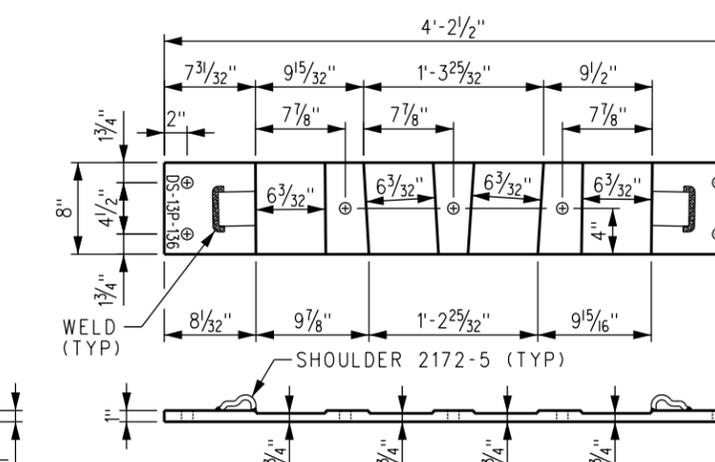
**PLATE - DS-19P**

3/4" x 8" x 4'-2" - FLAT



**SWITCH HEEL PLATE - DS-12P**

1" x 8" x 4'-2 1/2" - MILLED - W/ADJ RAIL BRACE



**SWITCH HEEL PLATE - DS-13P**

1" x 8" x 4'-2 1/2" - MILLED - W/ADJ RAIL BRACE

**NOTES:**

1. STAMP PLATE WITH PROPER PLATE NUMBER AND WEIGHT OF RAIL.
2. ALL WELDS ARE 1/2" FILLET WELDS UNLESS OTHERWISE NOTED.
3. HOLES IN PLATES ARE 1" IN DIA UNLESS OTHERWISE NOTED.

**REFERENCE DRAWINGS**

LAYOUT - NO 8, DOUBLE SLIP CROSSING - 136 LB ----- SHEET NO 2840-02

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

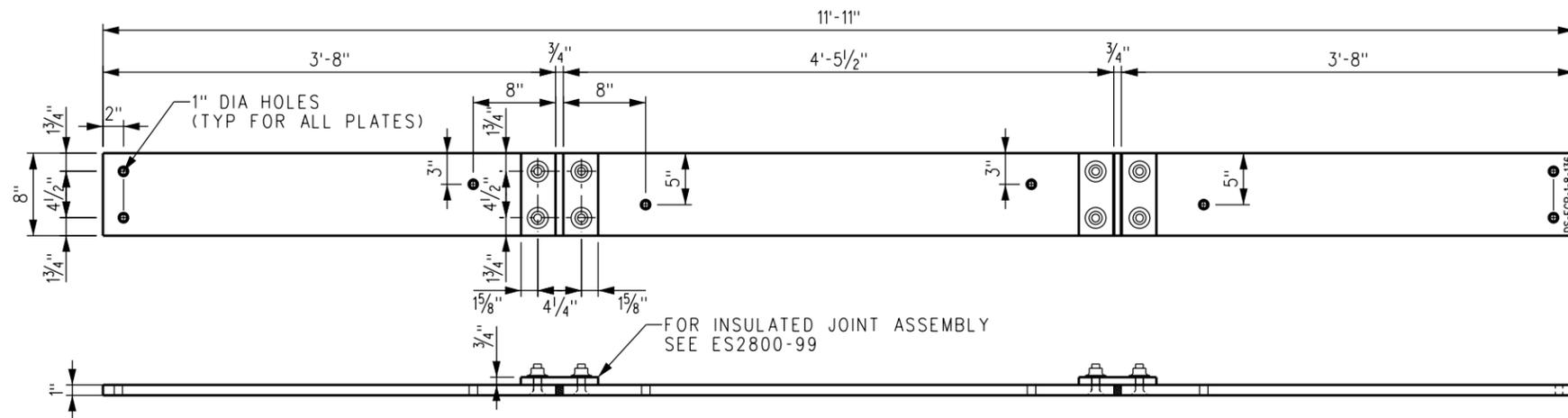
DRAWN BY: A. CARLOS DATE: 03/31/2011  
*Nareh D. Papp*  
 ASSISTANT DIRECTOR: STANDARDS & DESIGN  
*William D. Davis*  
 DIRECTOR OF ENGINEERING AND CONSTRUCTION

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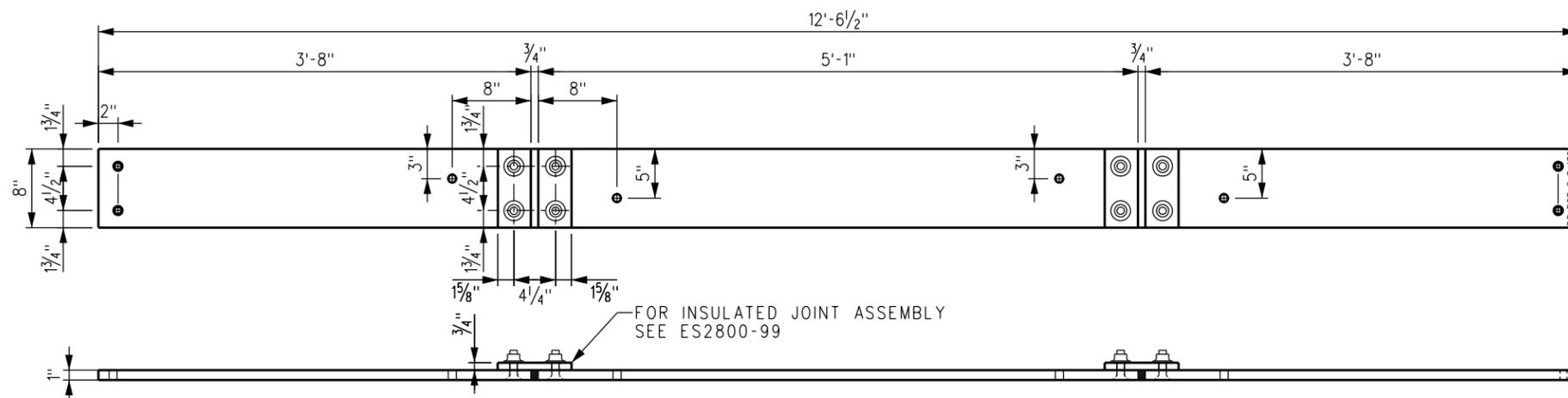
ENGINEERING STANDARDS  
 SWITCH SLIDE PLATE AND  
 SWITCH HEEL PLATE DETAILS  
 NO 8 136 LB RE DOUBLE SLIP CROSSING

STANDARD	2840
SCALE	NTS
REVISION	SHEET 1 OF 1
CADD FILE	ES2840-46



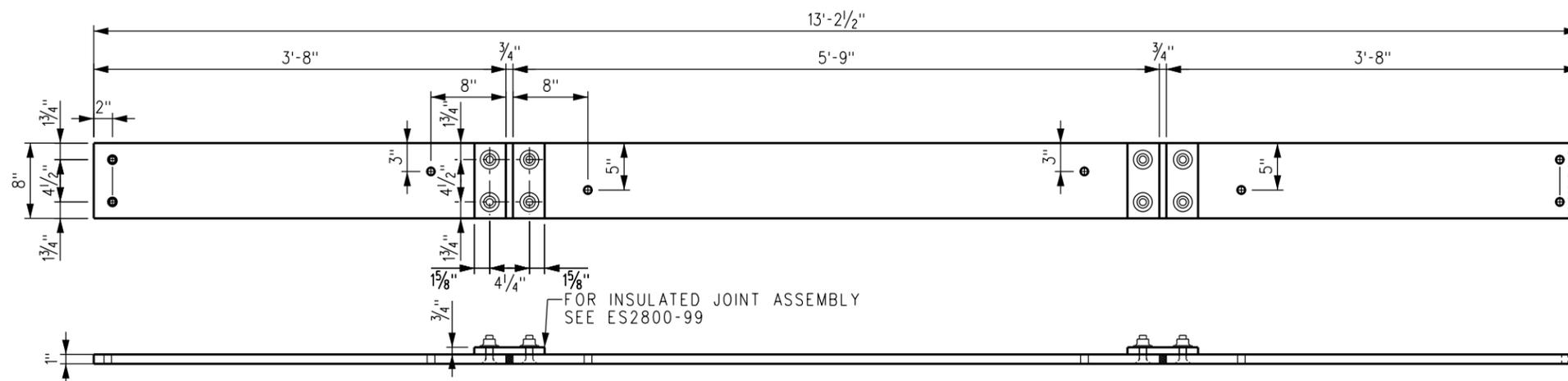
**INSULATED FROG GAUGE PLATE DS-FGP-1**

1" x 8" - FLAT



**INSULATED FROG GAUGE PLATE DS-FGP-2**

1" x 8" - FLAT



**INSULATED FROG GAUGE PLATE DS-FGP-3**

1" x 8" - FLAT

**REFERENCE DRAWINGS**

LAYOUT - NO 8, DOUBLE SLIP CROSSING - 136 LB ----- SHEET NO 2840-02

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

DRAWN BY: A. CARLOS DATE: 03/31/2011  
*Nareh D. Pappas*  
 ASSISTANT DIRECTOR- STANDARDS & DESIGN  
*William D. Davis*  
 DIRECTOR OF ENGINEERING AND CONSTRUCTION

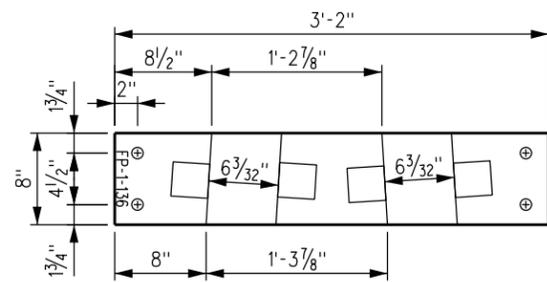
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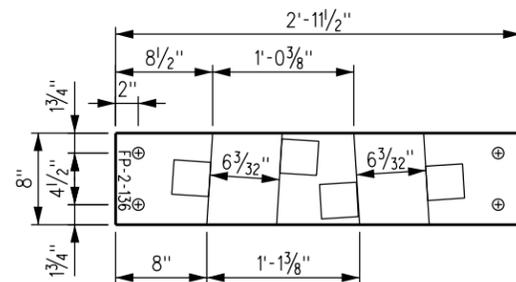
SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
 ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS  
 DETAILS  
 INSULATED FROG GAUGE PLATES  
 NO 8 136 LB RE DOUBLE SLIP CROSSING

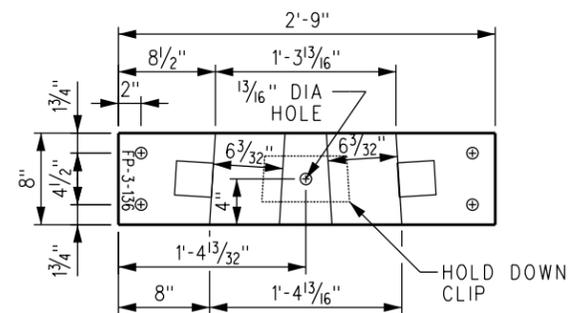
STANDARD	2840
SCALE:	NTS
REVISION SHEET	1 OF 1
CADD FILE:	ES2840-47



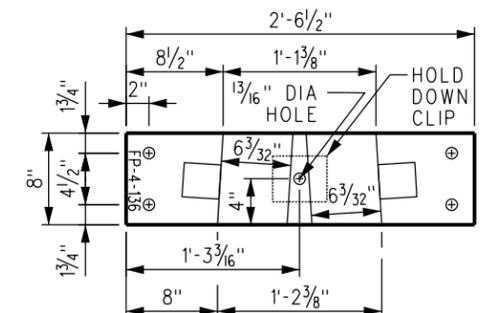
**FROG PLATE - F-1**  
3/4" x 8" x 3'-2" - FLAT



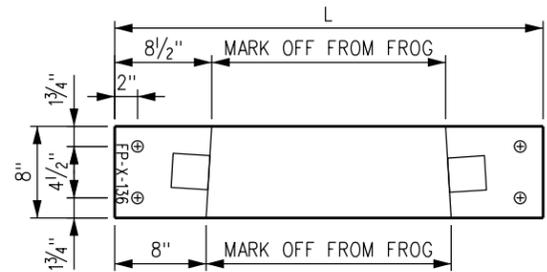
**FROG PLATE - F-2**  
3/4" x 8" x 2'-11 1/2" - FLAT



**FROG PLATE - F-3**  
3/4" x 8" x 2'-9" - FLAT

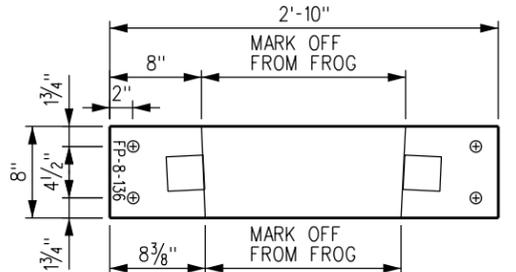


**FROG PLATE - F-4**  
3/4" x 8" x 2'-6 1/2" - FLAT

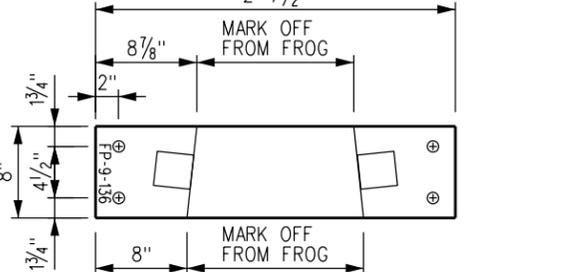


**FROG PLATE - F-5, F-6 AND F-7**  
3/4" x 8" x L - FLAT (SEE TABLE FOR LENGTHS)

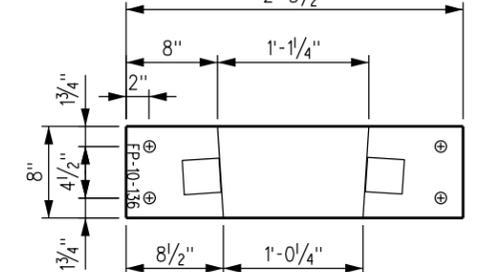
DIMENSION TABLE		
PLATE	L	NO REQ'D
F-5	3'-1 1/2"	1
F-6	2'-11"	1
F-7	2'-9"	1



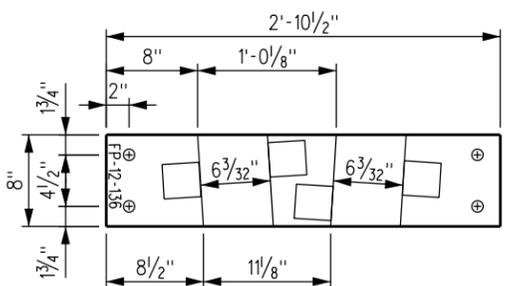
**FROG PLATE - F-8**  
3/4" x 8" x 2'-10" - FLAT



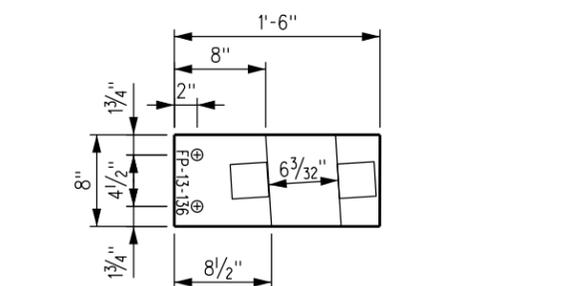
**FROG PLATE - F-9**  
3/4" x 8" x 2'-7 1/2" - FLAT



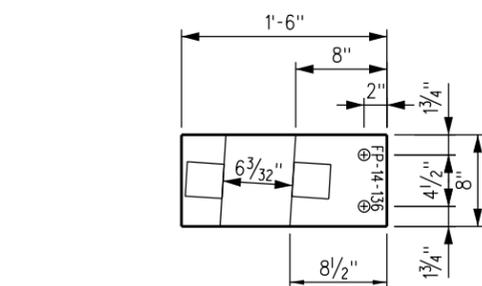
**FROG PLATE - F-10**  
3/4" x 8" x 2'-5 1/2" - FLAT



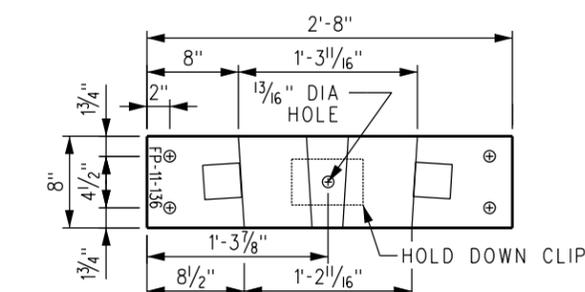
**FROG PLATE - F-12**  
3/4" x 8" x 2'-10 1/2" - FLAT



**FROG PLATE - F-13**  
3/4" x 8" x 1'-6" - FLAT



**FROG PLATE - F-14**  
3/4" x 8" x 1'-6" - FLAT



**FROG PLATE - F-11**  
3/4" x 8" x 2'-8" - FLAT

**NOTES:**

1. STAMP PLATE WITH PROPER PLATE NUMBER AND WEIGHT OF RAIL.
2. HOLES IN PLATES ARE 1" IN DIA UNLESS OTHERWISE NOTED.

**REFERENCE DRAWINGS**

LAYOUT - NO 8, DOUBLE SLIP CROSSING - 136 LB ----- SHEET NO 2840-02

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

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

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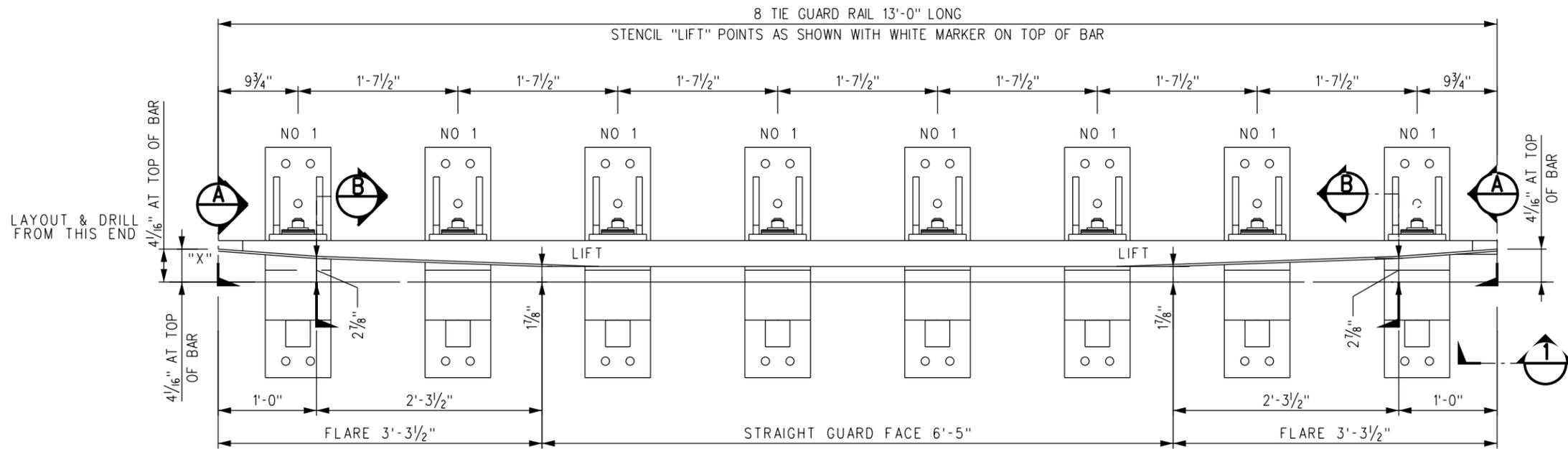
SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY  
 ONE GATEWAY PLAZA, 12TH FLOOR, L. A., CA. 90012

ENGINEERING STANDARDS  
 FROG PLATE DETAILS  
 NO 8 136 LB RE DOUBLE SLIP CROSSING

STANDARD	2840
SCALE	NTS
REVISION SHEET	1 OF 1
CADD FILE	ES2840-48





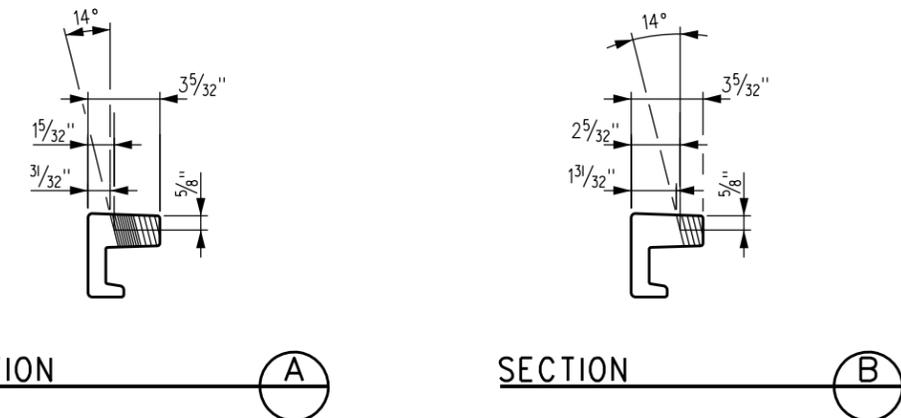


- NOTES:**
1. GUARD RAIL SECTION UIC 33, (U69) UIC 860.0 GRADE 90A (GUARD FACE BRINELL 319 MIN).
  2. BASE PLATE, BRACKET AND SHIMS MADE FROM MILD STEEL PER AREMA SPECIFICATION M7.
  3. GUARD RAIL BOLT AND NUT PER AREMA SPECIFICATION M11 EXCEPT BOLT TO BE GRADE 8 AND NUT TO BE SECURITY LOCKNUT.
  4. WORKMANSHIP AND TOLERANCES PER AREMA "SPECIFICATIONS FOR SPECIAL TRACKWORK".
  5. WELDING PER ANSI \ AWS D1.1-92 OR LATEST REVISION.

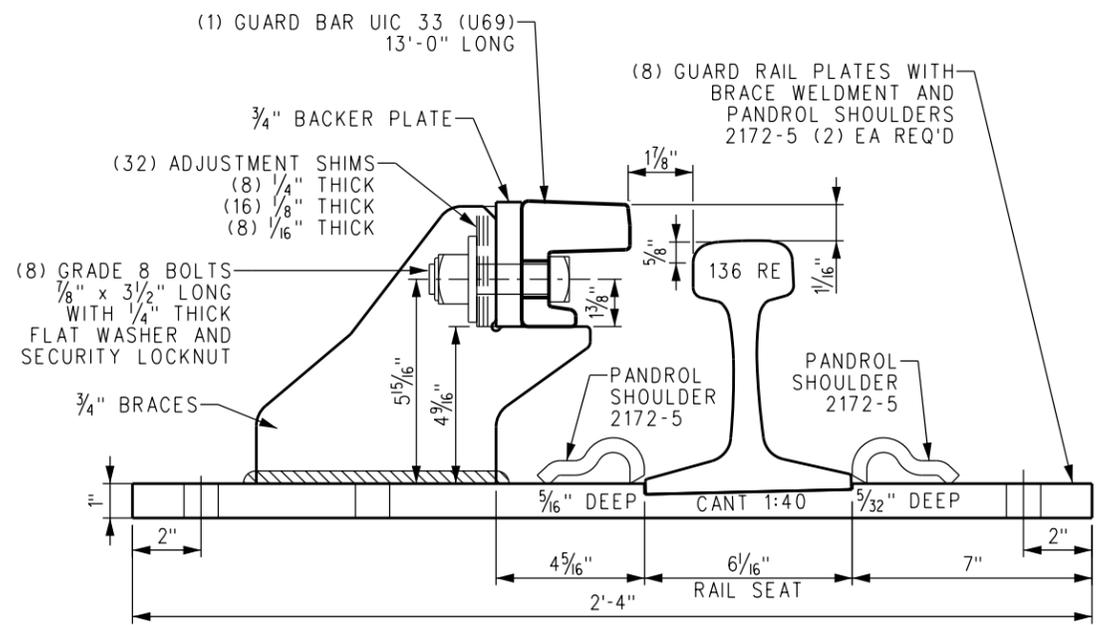
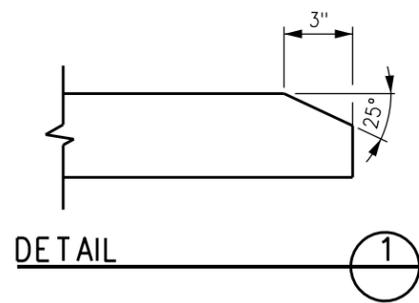
**COLLECTIVE DRILLING FROM END OF GUARD BAR MARKED "X"**

"X" 9 3/4" x 2'-5 1/4" x 4'-0 3/4" x 5'-8 1/4" x 7'-3 3/4" x 8'-11 1/4" x 10'-6 3/4" x 12'-2 1/4"

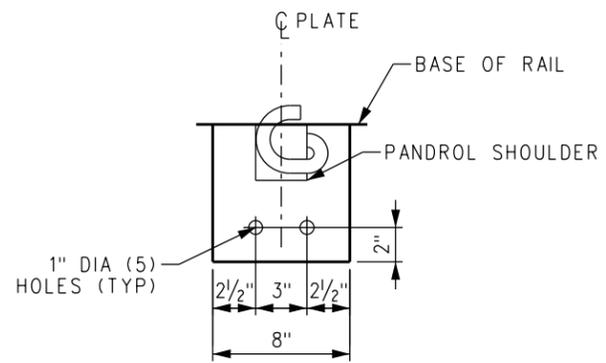
HOLES 1" DIA - 1 3/8" ABOVE BASE



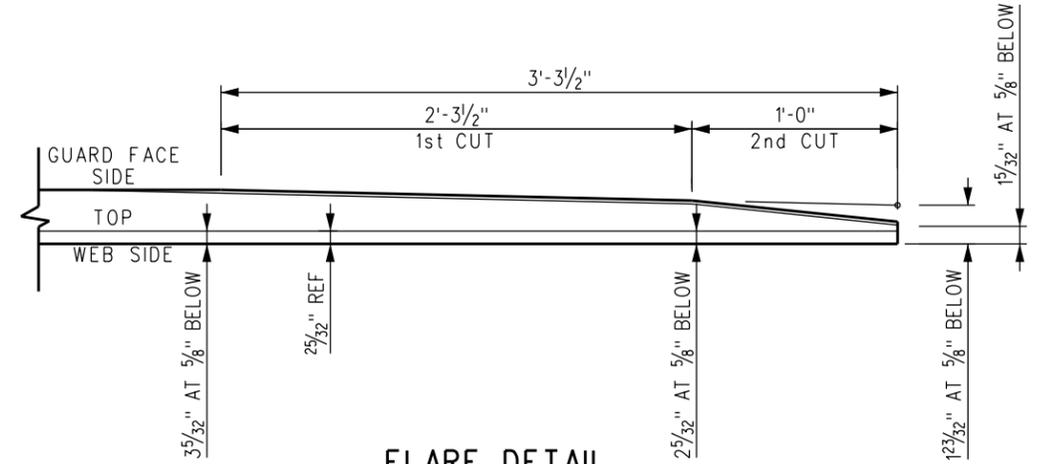
**ASSEMBLED 13'-0" GUARD RAIL**



**TYPICAL PLATE DETAIL**



**TYPICAL PLATE PUNCHING DETAIL**



**FLARE DETAIL**

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

DRAWN BY: A. CARLOS DATE: 03/31/2011

*Nareh D. Papp*  
ASSISTANT DIRECTOR: STANDARDS & DESIGN

*William Dacan*  
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		STANDARD
GUARD RAIL DETAILS 13'-0" LONG		2840
SCALE:	NTS	
REVISION	SHEET	1 OF 1
CADD FILE:	ES2840-60	