**METROLINK (S.C.R.R.A.)**

**ENGINEERING STANDARDS**

**NO. 8 DOUBLE SLIP CROSSING**

---

### BILL OF MATERIAL

<table>
<thead>
<tr>
<th>QTY.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

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### BILL OF SWITCH TIES

<table>
<thead>
<tr>
<th>PIECES</th>
<th>SIDE LENGTH</th>
<th>BOARD FEET</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

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**FOR MAINTENANCE ONLY**

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FOR MAINTENANCE ONLY

COLLECTIVE DRILLING FROM END OF GUARD BAR MARKED "X"

ASSEMBLED 13'-0" GUARD RAIL

SCALE: 1" = 1'-0"

TYPICAL PLATE DETAIL

TYPICAL PLATE PUNCHING DETAIL

NOTES:
1. GUARD RAIL DETAILS TO CORRESPOND WITH GUARD RAIL DETAIL ON SIDE VIEW.
2. GUARD RAIL DETAILS TO BE CONSULTED IN CONJUNCTION WITH "SPECIFICATIONS FOR SPECIAL TRACKWORK" AND "RECOMMENDATIONS FOR SPECIAL TRACKWORK" RECOMMENDED FOR USE.
3. GUARD RAIL SEAT TO BE 1" DIA.
4. RAIL SEAT TO BE 1" DEEP
5. GUARD FACE SIDE TO BE STRAIGHT AT 14°

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

ENGINEERING STANDARDS

GUARD RAIL DETAILS
13'-0" LONG
FOR MAINTENANCE ONLY

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

136 LB 23'-3½" STRAIGHT SWITCH POINT
MADE FROM 40'-7" LONG RAIL
NO 8 DOUBLE SLIP CROSSING

NOTES:

1. Switch rails to be made from rail with plate end.
2. Reillustration of the existing rail of straight switch points of rail.
3. Rivets shall be ordinary sizes, made for left hand switch points.
4. Use bending, V-shaping, or any other method of bending for end hardening.
5. Only those rails with plate end may be considered, with any other methods.
6. Rivets shall be used in switch points, and switch points to be finished with manganese steel plates of switch points.
7. All switch points to be furnished with manganese steel plates of switch points.
8. Switch points to be furnished with manganese steel plates of switch points.
9. Switch points to be furnished with manganese steel plates of switch points.
10. All switch points to be furnished with manganese steel plates of switch points.

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

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

136 LB 23'-3½" STRAIGHT SWITCH POINT
MADE FROM 40'-7" LONG RAIL
NO 8 DOUBLE SLIP CROSSING
NOTES:

1. Switch points to be made from new, hot-rolled or annealed rail.
2. Replacement points must be made from the same rail stock material and shall not be thinner than the original.
3. See Fig. 6 for the location of the base of the switch point and of the base of the switch point itself.
4. See Fig. 7 for the location of the switch point base and of the base of the switch point itself.
5. All dimensions are shown as nominal. All dimensions shall be checked by the user before use.
6. All dimensions are shown as nominal. All dimensions shall be checked by the user before use.
7. All dimensions are shown as nominal. All dimensions shall be checked by the user before use.
8. All dimensions are shown as nominal. All dimensions shall be checked by the user before use.
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11. All dimensions are shown as nominal. All dimensions shall be checked by the user before use.
12. All dimensions are shown as nominal. All dimensions shall be checked by the user before use.

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FOR MAINTENANCE ONLY
NOTE: APPLY BASKET TO ROD AT LOCATION "A" OR "B" AS ORDERED

ROD #1A ~ BASKET LOCATION "A"
ROD #1B ~ BASKET LOCATION "B"

STAMP RODS WITH "RESP. ROD. #, 136RE, #8 DSS"

INSULATION MATERIAL CONSISTS OF:
- H.T. MACH. SQ. HD. BOLTS
- M.I. BASKET E-2455 WITH FIBRE CHANNEL C-1 & M.I. SLEEVE E-1983
- (ROD #1A) BASKET LOCATION "A"
- (ROD #1B) BASKET LOCATION "B"

HEX JAM NUTS 1" THREAD
SPECIAL NUTS (3811-H-2)
B.S. WHITWORTH THREADS

HOLES
- 1" DIA. HOLES IN RODS
- 5/32" DIA. HOLES (1) EACH REQUIRED PER SLIP SWITCH
- WITH HUCKED INSULATED SPLICE
- INSULATED HEAD ROD NO. 1 FOR END POINTS
- WITH CLIPS & BASKET ATTACHED

CLIPS WITH WEB BOLTS "A"
SEE HB-549 FOR TYPE "SMJ"

DEBURR ALL HOLES.
BREAK ALL SHARP CORNERS.
ROD SPACING = 18".
REINF. = 1" D " BOTH SIDES (SLOT 1/" STK. SIDE).
PT. = 0" SAMSON.
"E" DIST. = 1".
THROW AT POINT = 4" MIN. ~ 4 1/4" MAX.
GAGE = 4'-8 1/4".

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UserName=> carlosa
Date Plotted: 10/5/2011 2:38:30 PM
Plot Driver=> S:\Plot Drivers\pdf.plt
FileName=> S:\V8EngStds\2000\Turnouts\Maintenance Only Standards\ES2901-13.dgn
METROLINK (S.C.R.R.A.)
ENGINEERING STANDARDS
NO. 10 DOUBLE SLIP CROSSING

BILL OF MATERIAL

<table>
<thead>
<tr>
<th>QTY.</th>
<th>DESCRIPTION</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>No. 10 DOUBLE SLIP CROSSING</td>
</tr>
<tr>
<td>24</td>
<td>10'-6&quot; U-69 GUARD RAIL WITH PLATES</td>
</tr>
<tr>
<td>32</td>
<td>10'-0&quot; U-69 GUARD RAIL WITH PLATES</td>
</tr>
<tr>
<td>12</td>
<td>7'-6&quot; U-69 GUARD RAIL WITH PLATES</td>
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<tr>
<td>8</td>
<td>5'-6&quot; U-69 GUARD RAIL WITH PLATES</td>
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<tr>
<td>4</td>
<td>3'-6&quot; U-69 GUARD RAIL WITH PLATES</td>
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<tr>
<td>4</td>
<td>1'-6&quot; U-69 GUARD RAIL WITH PLATES</td>
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<tr>
<td>4</td>
<td>1'-0&quot; U-69 GUARD RAIL WITH PLATES</td>
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<tr>
<td>1</td>
<td>CHUTE WALL FASTENERS MOUNTED 2'-0&quot;</td>
</tr>
</tbody>
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SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY

ENGINEERING STANDARDS

NO. 10 136 LB. DOUBLE SLIP CROSSING

WITH MOVEABLE POINT FROG

BILL OF MATERIAL AND GENERAL NOTES

NOTES:
1. ENTER DOUBLE SLIP CROSSING TO BE EXPANDED FROM THE US HEAD HARDENED RAIL.
2. CROSSING DETAILS FOR ALL CROSSINGS ARE TO BE ITEMS OF ES2902-01 THRU ES2902-20
3. CROSSING DETAILS ARE TO BE ITEMS OF ES2902-01 THRU ES2902-20
4. CROSSING DETAILS ARE TO BE ITEMS OF ES2902-01 THRU ES2902-20
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19. CROSSING DETAILS ARE TO BE ITEMS OF ES2902-01 THRU ES2902-20
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SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY

ENGINEERING STANDARDS

NO. 10 136 LB. DOUBLE SLIP CROSSING

WITH MOVEABLE POINT FROG

BILL OF MATERIAL AND GENERAL NOTES

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SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY

ENGINEERING STANDARDS

NO. 10 136 LB. DOUBLE SLIP CROSSING

WITH MOVEABLE POINT FROG

BILL OF MATERIAL AND GENERAL NOTES

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19. CROSSING DETAILS ARE TO BE ITEMS OF ES2902-01 THRU ES2902-20
20. CROSSING DETAILS ARE TO BE ITEMS OF ES2902-01 THRU ES2902-20
CROSSING DATA

REFERENCE DRAWING

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SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY

CROSSING GEOMETRY AND CROSSING DATA

NO. 10, 136 LB. DOUBLE SLIP CROSSING

ENGINEERING STANDARDS

METROLINK.
COLLECTIVE DRILLING FROM END OF GUARD BAR MARKED "X"

FOR MAINTENANCE ONLY

NOTES:
1. GUARD RAIL SECTION U.I.C. 33 (U69) UIC 860.0 GRADE 90A
2. GUARD RAIL CURTAIN AND SPRING HOOK STEEL FOR AREMA SPECIFICATIONS
3. GUARD RAIL, CURTAIN AND SPRING HOOK STEEL PER AREMA SPECIFICATIONS
4. GUARD RAIL BOLT AND NUT PER AREMA SPECIFICATIONS
5. GUARD RAIL BOLT AND NUT PER AREMA SPECIFICATIONS

TYPICAL PLATE PUNCHING DETAIL

TYPICAL PLATE DETAIL

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

ENGINEERING STANDARDS
GUARD RAIL DETAILS 16'-0" LONG FOR
NO. 10, 136 LB. DOUBLE SLIP CROSSING

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DIRECTOR OF ENGINEERING AND CONSTRUCTION
ENGINEERING STANDARDS

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STANDARD
SHEET

SCALE:
CADD FILE:
ENG.
DES.
DATE
REV.
DESCRIPTION

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DATE:
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SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY

WEB SIDE
**10 DOUBLE SLIP CROSSING**

**FOR MAINTENANCE ONLY**

**REFERENCE DRAWING:**
LAYOUT - NO. 10 DOUBLE SLIP CROSSING - 136 LB.  
ES2902-02

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

**ENGINEERING STANDARDS**
CENTER SECTION LAYOUT  
NO. 10, 136 LB. DOUBLE SLIP CROSSING  
ES2902-06
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ENGINEERING STANDARDS

136 LB. 22"-8½" STRAIGHT SWITCH POINT FOR
NO. 10, 136 LB. DOUBLE SLIP CROSSING

NOTES:

1. SWITCH POINTS TO BE MADE FROM NEW HIGH STRENGTH RAIL.
2. METAL IDENTIFICATION TAG SHOWING HAND OF SWITCH POINT, WEIGHT OF RAIL, H.S., AND MANUFACTURER CAN SUBSTITUTE (RIGHT HAND STRAIGHT OUTSIDE END POINT) FOR 2½" HUCK FASTENERS, BOLT PART NO. C-50-LR-BR2416 AND COLLAR PART NO. L3-2-R-24G FOR 2½" RIVETS. AND FOR 2½" STOP BOLTS USE HUCK FASTENERS.
3. METAL IDENTIFICATION TAG SHOWING HAND OF SWITCH POINT, WEIGHT OF RAIL, H.S., AND MANUFACTURER CAN SUBSTITUTE (RIGHT HAND STRAIGHT OUTSIDE END POINT) FOR 2½" RIVETS. AND FOR 2½" STOP BOLTS USE HUCK FASTENERS.
4. SWITCH ANGLE 1°-44'-11" END OF BOTTOM PLANING.
5. METAL IDENTIFICATION TAG SHOWING (1) DESIGN LENGTH OF SWITCH, (2) IN PARENTHESIS, FULL HEAD CONTOUR.
6. RAIL AND SHALL RUN OUT AT THE END OF THE TOP PLANING, WHERE THE SWITCH POINT HAS BURNT EDGE.
7. SWING ARMS AND 2½" RIVETS.
8. SIDE PLANING FIGURED ON GAGE LINE 1" BELOW TO OF RAIL.
9. LEFT HAND STRAIGHT OUTSIDE END POINT SWEEP SHARP CORNER AROUND THE ENTIRE PERIPHERY AT HEEL END OF SWITCH POINT RAIL, BREAK SHARP CORNER AROUND THE ENTIRE PERIPHERY BY SLIGHTLY GRINDING. ALSO, "DO NOT" END HARDEN RAIL END.
10. SWITCH POINT IDENTIFICATION TAG

C★ 3 ½" DIA. (MIN.) Ø 1½" RAD.

TOP VIEW SWITCH POINT

SIDE VIEW SWITCH POINT

END VIEW OF POINT

DRAWN BY: A. CARLOS

ENGINEERING STANDARDS

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

SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY

DIRECTOR OF ENGINEERING AND CONSTRUCTION
ASSISTANT DIRECTOR: STANDARDS & DESIGN

939-638-3424  Fax: 939-638-2000

SCALE: 1" = 1'-0"

S:\Plot Drivers\pdf.plt

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STOCK RAILS SHOWN ARE FOR "RIGHT HAND TURNOUT"

STOCK RAILS SHOWN ARE FOR "LEFT HAND TURNOUT"

NOTE:
1. Bend angle in bent stock rails to be as follows:

<table>
<thead>
<tr>
<th>Stock Rail</th>
<th>Bend Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1°-44'-11&quot; or 1&quot; in 2'-9&quot;</td>
</tr>
</tbody>
</table>

OUTSIDE SLIP RAIL - 20'-7¾" LONG

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

UNDERCUT STOCK RAILS FOR
22'-6½" SWITCH POINTS FOR
NO. 10, 136 LB. DOUBLE SLIP CROSSING
For Maintenance Only

Insulated Slide Gage Plate GP-1
7/8" x 4" x 6" - WELDED STOP (For Switch Gage Plates)
1 1/4" DIA. FLAT WASHER WITH HEAD HUCK BOLT (TYP.)

Insulated Slide Gage Plate GP-2
7/8" x 4"x 6" - WELDED STOP (For Frog Gage Plates)
1 1/4" DIA. FLAT WASHER WITH HEAD HUCK BOLT (TYP.)

Insulated Slide Gage Plate GP-3
7/8" x 4" x 6" - WELDED STOP (For Switch Gage Plates)
1 1/4" DIA. FLAT WASHER WITH HEAD HUCK BOLT (TYP.)

Insulated Slide Gage Plate GP-4
7/8" x 4" x 6" - WELDED STOP (For Frog Gage Plates)
1 1/4" DIA. FLAT WASHER WITH HEAD HUCK BOLT (TYP.)

Reference Drawings
- AASHTO Multi Course Slip Crossing - USE IN - SHEET No. 2902-01

Notes:
1. It is to be made of mild steel plate.
2. The plates as shown are for a 136 lb. Double Slip Crossing.
3. The plates shown shall be made of mild steel and shall be made to the dimensions provided.
4. The plates shown shall be made of mild steel and shall be made to the dimensions provided.
5. The plates shown shall be made of mild steel and shall be made to the dimensions provided.
6. The plates shown shall be made of mild steel and shall be made to the dimensions provided.

Date Plotted: 11/13/2011
UserName: carlosa

Metrolink
Southern California Regional Rail Authority
One Gateway Plaza, 12th Floor, L.A., CA 90012

Engineering Standards
Insulated Gage Plate Details
DS-GP-1, DS-GP-2, DS-GP-3 and DS-GP-4
No. 10, 136 lb. Double Slip Crossing
SLIP SWITCH

INSULATED SPLICE, (2) EACH REQUIRED PER
CLIPS AND BOLTS ATTACHED WITH HUCKED
INSULATED SPREAD RODS NO. 2 OR 3 WITH
(4) HUCK COLLARS LC2R-24G.
(4) 1/4" HUCK BOLTS C50LR-BR24-36.
(1) STEEL CHANNEL ST-568.
(1) STEEL SPLICE PLATE ST-684.
(4) FIBRE BUSHINGS B-11.
(2) FIBRE ANGLE PLATE AP-34.
(1) FIBRE CHANNEL C-1.

CONSISTS OF:
INSULATION MATERIAL
SWITCH INFORMATION

PLAN

NOTE:
FIT "N" CLIP MUST BE ADDED TO ROD
ALONG BOTH SIDES OF BOTTOM CLIPS

C.L. = 1" x 2½" x 3'-1" (APPROX.)

ELEVATION

ADJACENT RODS ROD NO. 2 OR 3 WITH
CLIPS ARE ATTACHED ALONG ROD
INSULATED SPACE TO ENSURE REQUIRED PER
SEP SWITCH
RAN ROOD WITH RES NO. 136 L.B. DOUBLE SLIP CROSSING

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DIRECTOR OF ENGINEERING AND CONSTRUCTION
ENGINEERING STANDARDS

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

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ENGINEERING STANDARDS

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STANDARD SHEET
SCALE:
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ENG.
DES.
DATE
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DESCRIPTION
DRAWN BY:
DATE:
FOR NON-SCRRA APPROVED USES:
WESTERN WORLD CONTRACTOR:
...
FOR MAINTENANCE ONLY

NO. 4 HEAD ROD

FOR MOVEABLE CENTER POINTS

ROLLING HEADLOCK 7" LONG

DETAIL OF SERRATIONS

NOTE:
- DEBURR ALL HOLES.
- BOTH SIDES OF BOTTOM OF CLIPS.
- TYPE "M" CLIP MUST BE WELDED TO ROD ALONG W/O 1" SPACING WASHERS & 1" HEX NUTS.

INSULATION MATERIAL
- INSULATED HEAD ROD NO. 4
- FOR MOVEABLE CENTER POINTS

SWITCH INFORMATION

ENGINEERING STANDARDS

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

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REVISION
SHEET
ENGINEERING STANDARDS

FOR NON-SCRRA APPROVED USES:
ALL RIGHTS RESERVED.
NOTES:
1. The permissible variations in straightening of rails, frogs and switches is limited to the normal straightening limits of rail centers, and dimensions of track degradation (i.e., rail center and dimensions of track degradation) are not allowed. When changeable, straightening limits of rail centers and dimensions of track degradation must be observed. Changes in straightening limits of rail centers and dimensions of track degradation must be made in accordance with the applicable standards.
2. Any change to the dimensions of rail centers and dimensions of track degradation must be made in accordance with the applicable standards.
3. All rails shown must be cut to fit the layout and dimensions shown on the layout. These rails must be cut to fit the layout and dimensions shown on the layout, with the exception of dimension "A". All changes made to the layout and dimensions must be made in accordance with the applicable standards.
4. Any change to the dimensions of rail centers and dimensions of track degradation must be made in accordance with the applicable standards.
5. All rails shown must be cut to fit the layout and dimensions shown on the layout. These rails must be cut to fit the layout and dimensions shown on the layout, with the exception of dimension "A". All changes made to the layout and dimensions must be made in accordance with the applicable standards.
6. Any change to the dimensions of rail centers and dimensions of track degradation must be made in accordance with the applicable standards.
7. All rails shown must be cut to fit the layout and dimensions shown on the layout. These rails must be cut to fit the layout and dimensions shown on the layout, with the exception of dimension "A". All changes made to the layout and dimensions must be made in accordance with the applicable standards.
8. Any change to the dimensions of rail centers and dimensions of track degradation must be made in accordance with the applicable standards.
9. All rails shown must be cut to fit the layout and dimensions shown on the layout. These rails must be cut to fit the layout and dimensions shown on the layout, with the exception of dimension "A". All changes made to the layout and dimensions must be made in accordance with the applicable standards.
10. Any change to the dimensions of rail centers and dimensions of track degradation must be made in accordance with the applicable standards.

DETAIL "A"

1. All rails shown must be cut to fit the layout and dimensions shown on the layout. These rails must be cut to fit the layout and dimensions shown on the layout, with the exception of dimension "A". All changes made to the layout and dimensions must be made in accordance with the applicable standards.

21'-2" LONG ADHESIVE BONDED PREFABRICATED MITRE CUT INSULATED RAIL JOINT ASSEMBLY
See Note 21 in Note 1 for Cutting of Rails for Welding in the Field.

38'-8" LONG ADHESIVE BONDED PREFABRICATED MITRE CUT INSULATED RAIL JOINT ASSEMBLY
See Note 38 in Note 1 for Cutting of Rails for Welding in the Field.
### BILL OF MATERIAL FOR LATERAL TURNOUT

<table>
<thead>
<tr>
<th>QTY.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**BILL OF SWITCH TIES FOR TURNOUT**

<table>
<thead>
<tr>
<th>PIECES</th>
<th>SIZE</th>
<th>LENGTH</th>
<th>BOARD FEET</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
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</tr>
<tr>
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<td>6'</td>
<td>6'</td>
<td>6.00</td>
</tr>
<tr>
<td>6</td>
<td>6'</td>
<td>6'</td>
<td>6.00</td>
</tr>
<tr>
<td>4</td>
<td>6'</td>
<td>6'</td>
<td>2.40</td>
</tr>
<tr>
<td>4</td>
<td>8'</td>
<td>8'</td>
<td>32.00</td>
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<td>2</td>
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<td>10'</td>
<td>20.00</td>
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<td>12'</td>
<td>12'</td>
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</tr>
<tr>
<td>8</td>
<td>13'</td>
<td>13'</td>
<td>78.00</td>
</tr>
</tbody>
</table>

**TOTAL**

| PIECES | 144.00 |

---

**FOR MAINTENANCE ONLY**

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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. R.H. RBM FROG TURNOUT
BILL OF MATERIALS

---

**CARLOS**
NOTE:
FOR NO. 8 FROG AND PLATE LOCATIONS SEE SHEET 6.
COLLECTIVE DRILLING FROM END OF GUARD BAR MARKED "X"

ASSEMBLED 13'-0" GUARD RAIL

FOR MAINTENANCE ONLY

NOTES:
1. GUARD RAIL SECTION UIC 33, (U69) UIC 860.0 GRADE 90A (GUARD FACE RAIL SEAT CAN'T 1:40 DEEP)
2. GUARD RAIL PLATES WITH BRACE WELDMENTS AND GUARD RAIL PLATES WITH BASE PLATE, BRACKET & SHIMS - MILD STEEL PER AREMA SPECIFICATION M7.
5. GUARD RAIL BOLT AND NUT TO BE SECURITY LOCKNUT. WELDING PER ANSI AWS D1.1-92 OR LATEST REVISION. WORKMANSHIP AND TOLERANCES PER AREMA SPECIFICATIONS.
6. GUARD RAIL BOLT AND NUT TO BE SECURITY LOCKNUT. WELDING PER ANSI AWS D1.1-92 OR LATEST REVISION. WORKMANSHIP AND TOLERANCES PER AREMA SPECIFICATIONS.
7. GUARD RAIL BOLT AND NUT TO BE SECURITY LOCKNUT. WELDING PER ANSI AWS D1.1-92 OR LATEST REVISION. WORKMANSHIP AND TOLERANCES PER AREMA SPECIFICATIONS.
8. GUARD RAIL BOLT AND NUT TO BE SECURITY LOCKNUT. WELDING PER ANSI AWS D1.1-92 OR LATEST REVISION. WORKMANSHIP AND TOLERANCES PER AREMA SPECIFICATIONS.
## Notes:

1. Information on dimensions noted must take into account the need for proper fastener spacing and the installation of fasteners in the Stock Rails.
2. Stock Rails are to be made of High Strength Rail with Ends Hand Straight or Curved as per current A.R.M. Plan No. 1005.
3. For Stock Rails, Lengths B, C & D for No. 136 lb. Rail are as follows:

<table>
<thead>
<tr>
<th>Stock Rail</th>
<th>Stock Rail</th>
<th>Stock Rail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock Rail</td>
<td>Stock Rail</td>
<td>Stock Rail</td>
</tr>
</tbody>
</table>

5. Bend Angle in BENT ANGLE IN BENT STOCK RAIL TO BE AS FOLLOWS:

<table>
<thead>
<tr>
<th>Bend Angle</th>
<th>Bend Angle</th>
<th>Bend Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>45°</td>
<td>45°</td>
<td>45°</td>
</tr>
</tbody>
</table>

6. For Maintenance Only

### Lengths B, C & D for No. 136 lb. Rail

<table>
<thead>
<tr>
<th>Stock Rail</th>
<th>Stock Rail</th>
<th>Stock Rail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock Rail</td>
<td>Stock Rail</td>
<td>Stock Rail</td>
</tr>
</tbody>
</table>

### Section “A - A”

**For Maintenance Only**

**Engineering Standards**

**No. 8 Straight or Curved Undercut Stock Rails**

**Southern California Regional Rail Authority**

**One Gateway Plaza, 12th Floor, L.A., CA 90012**

**Date Plotted:** 10/5/2011

**Plot Driver:** S:\Plot Drivers\pdf.plt

**FileName:** s:\V8EngStds\2000\Turnouts\Maintenance Only Standards\ES2911-10.dgn

**Drawn By:** A. Carlos

**Date:** 10/5/2011

**Plot Time:** 2:38:46 PM

**User Name:** carlosa
FOR MAINTENANCE ONLY
FOR MAINTENANCE ONLY

US&S M23-A SWITCH MACHINE MUST BE FURNISHED WITH FINISHED MOUNTING LUGS.

NOTE:
SEE SHEET NO. 15 FOR NOTES.
FOR MAINTENANCE ONLY
NOTES:

1. FROG IS SECURED IN THE PROPER LOCATION ON THE TIE WITH PROPER ALIGNMENT.

2. GUARD RAIL PLATES SHALL BE INSTALLED AND WELDED TO THE FROG GAGE PLATES OPERATED TURNOUT. FOR A LEFT HAND TURNOUT PLATES ARE TO BE OPPOSITE.

3. THE PLATES AS SHOWN ARE FOR A 136 LB., NO. 8, RIGHT HAND, HAND PLATES TO BE MADE OF MILD ROLLED STEEL.

4. FROG PLATE FCP-1, FP-4 AND FP-7 ARE TO BE WELDED TO THE FROG GAGE PLATE IN THE FIELD WITH A 3 PASS 3/8" + FILLET WELD CONTINUOUS ON BOTH ENDS OF THE PLATE. PLATES ARE TO BE WELDED ONLY AFTER THE GAGE PLATE AND THE GUARD RAIL PLATE AND NO. 8 INSULATED GAGE PLATE DETAILS AS SHOWN

5. HEAD OF HUCK BOLT RECESSED 3/8" MAX.

6. 1" DIA. HUCK BOLT WITH BUSHINGS, PORTEC #127-07547-01

7. PURCHASE PART NO. GPI52P05

8. FLUSH HEAD HUCK BOLTS COUNTERSINK HOLES IN STEEL PLATE FOR 90° OR FIBERGLASS REINFORCED THERMOSET RESIN.

9. INSULATION AT GAGE PLATES

10. DETAIL OF INSULATION BLOCK

11. POLYESTER COATED STEEL CORE INSULATION BLOCK

12. PURCHASE PART NO. GPI52P05

13. 4" X 8" X 7/8" INSULATION PER DETAIL "A"

14. STEEL PLATE 4" X 8" X 3/4"

FOR MAINTENANCE ONLY
### Crossover Data Table

| A   | B     | C     | D     | E     | F     | G     | H     | I     | J     | K     | L     |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 13  | 132.84| 59.80 | 45.20 | 222.64| 223.56| 224.37| 225.39| 226.32| 226.71| 227.34| 228.07| 228.39|
| 14  | 162.40| 65.60 | 50.96 | 254.70| 255.62| 256.50| 257.42| 258.34| 259.03| 259.66| 260.31| 260.63|
| 15  | 182.14| 71.40 | 56.16 | 286.70| 287.60| 288.50| 289.40| 290.30| 290.90| 291.50| 292.01| 292.41|
| 16  | 201.68| 77.20 | 61.36 | 318.70| 319.60| 320.50| 321.40| 322.30| 322.90| 323.50| 324.00| 324.40|
| 17  | 221.24| 83.00 | 66.56 | 350.70| 351.60| 352.50| 353.40| 354.30| 354.90| 355.50| 356.00| 356.40|
| 18  | 240.80| 88.80 | 71.76 | 382.70| 383.60| 384.50| 385.40| 386.30| 386.90| 387.50| 388.00| 388.40|
| 19  | 260.36| 94.60 | 76.96 | 414.70| 415.60| 416.50| 417.40| 418.30| 418.90| 419.50| 420.00| 420.40|
| 20  | 280.92| 100.40| 82.16 | 446.70| 447.60| 448.50| 449.40| 450.30| 450.90| 451.50| 452.00| 452.40|
| 21  | 301.48| 106.20| 87.36 | 478.70| 479.60| 480.50| 481.40| 482.30| 482.90| 483.50| 484.00| 484.40|
| 22  | 321.94| 112.00| 92.56 | 510.70| 511.60| 512.50| 513.40| 514.30| 514.90| 515.50| 516.00| 516.40|
| 23  | 342.40| 117.80| 97.76 | 542.70| 543.60| 544.50| 545.40| 546.30| 546.90| 547.50| 548.00| 548.40|

### Crossover Layout

**FOR MAINTENANCE ONLY**

**METROLINK.**

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

ENGINEERING STANDARDS

NO. 10 136 LB. R.H. RBM. FROG

TURNOUT AND CROSSOVER

GENERAL NOTES AND DATA

NOTES:

1. TURNOUT AND CROSSOVER LAYOUTS AND GENERAL NOTES MUST BE ADHERED TO THE ES2921 SERIES FOR NON-SCRRA APPROVED USES.
2. LOCATION OF INSULATED JOINTS IS DETERMINED BY DRAWING NUMBER ES2921-02.
3. GENERAL NOTES AND DATA MUST BE ADHERED TO THE ES2921 SERIES FOR NON-SCRRA APPROVED USES.
No. 10 Railbound Manganese Steel Frog

Notes:
1. Frogs must be ground to the shape of the rail head and the entire bottom section of casting.
2. NO. 10 RAIBOUND MANGANESE STEEL FROG

For Maintenance Only

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

Engineering Standards
NO. 10 136 LB. R.H. RBM FROG
Layout
ASSEMBLED 16'-0" GUARD RAIL

COLLECTIVE DRILLING FROM END OF GUARD BAR MARKED "X"

FOR MAINTENANCE ONLY

TYPICAL PLATE DETAIL

TYPICAL PLATE PUNCHING DETAIL

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

GUARD RAIL DETAILS

NOTES:
1. GUARD FACE SECTION - UIC 33; (U69) - UIC 860.0 GRADE 90A
2. GUARD RAIL BOLT AND NUT PER AREMA SPECIFICATION M7.
3. GUARD FACE SECTION BEYOND RAIL SEAT PER AREMA SPECIFICATION M8.
4. FOR SPECIAL TRACKWORK WORKMANSHIP AND TOLERANCES PER AREMA SPECIFICATION.
5. GUARD RAIL BOLT AND NUT TO BE SECURITY LOCKNUT.
6. GUARD RAIL BOLT AND NUT TO BE SECURITY LOCKNUT.
7. GUARD RAIL BOLT AND NUT TO BE SECURITY LOCKNUT.

SCALE: 1" = 1'-0"
NOTES:
1. INFORMATION OR DIMENSIONS NOTED HEREIN TO BE EXAMINED BY FIELD FORCES FOR CORRECT ORDERING OF REPLACEMENT STOCK RAILS
2. UNDERCUT STOCK RAILS TO BE MADE OF HIGH STRENGTH RAIL WITH ENDS BEVELED PER CURRENT AREMA PLAN NO. 10
3. FOR STOCK RAIL UNDERCUT LENGTH "B" PER SECTION "A-A" LENGTH "C" AND LENGTH "D" FOR NEW SAMSON SWITCH INSTALLATIONS OR REPLACEMENT ORDERS SEE TABLE BELOW

LENGTHS B, C, & D FOR 136 LB. RAIL

<table>
<thead>
<tr>
<th>Stock No.</th>
<th>STOCK RAIL LENGTH</th>
<th>BEND ANGLE</th>
<th>FOR REPLACEMENT ORDERS ONLY</th>
<th>FOR FIRST INSTALLATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 STR</td>
<td>12'-0&quot;</td>
<td>1'-0&quot;</td>
<td>NONE</td>
<td>10'-0&quot;</td>
</tr>
<tr>
<td>10 STR</td>
<td>12'-0&quot;</td>
<td>1'-0&quot;</td>
<td>NONE</td>
<td>10'-0&quot;</td>
</tr>
</tbody>
</table>

4. BEND ANGLE IN BENT STOCK RAIL TO BE AS FOLLOWS:

<table>
<thead>
<tr>
<th>Stock Length</th>
<th>BEND ANGLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>10'-0&quot;</td>
<td>&quot;A&quot;</td>
</tr>
</tbody>
</table>

STOCK RAILS SHOWN ARE FOR "RIGHT HAND TURNOUT"

STOCK RAILS SHOWN ARE FOR "LEFT HAND TURNOUT"
**FOR MAINTENANCE ONLY**

**METROLINK.**

**ENGINEERING STANDARDS**

**NO. 10 EXTENSION PLATE AND DAP TIE DETAILS**

FOR M-23A SWITCH MACHINE

---

**SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY**

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

---

**NOTE:**

See sheet 15 for notes.

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NOTES:

1. PLATES TO BE MADE OF MILD ROLLED STEEL.
2. THE PLATES AS SHOWN ARE FOR A LEFT HAND TURNOUT. PLATES ARE TO BE ADJUSTED AS NEEDED TO THE REVERSE.
3. THE GAGE PLATES IN THE FIELD WITH A 3 PASS FILLET WELD CONTINUOUS ON BOTH ENDS OF THE PLATE. PLATES ARE TO BE BASED ON THE GAGE PLATE AND THE FROG IS SECURED IN THE PROPER LOCATION ON THE TIE AND HARRISON ADJACENT TO THE TIE AS SHOWN.
4. THE PLATES AS SHOWN ARE FOR A 136 LB., NO. 10, RIGHT HAND, HAND OPERATED TURNOUT. FOR A LEFT HAND TURNOUT, PLATES ARE TO BE OPPOSITE.

GUARD RAIL PLATES ARE TO BE INSTALLED AND WELDED TO THE FROG BASE PLATES FP-1, FP-4 AND FP-7 ARE TO BE WELDED TO THE FROG WITH PROPER ALIGNMENT.

THE TIE WITH PROPER ALIGNMENT. THE GAGE PLATE AND THE FROG IS SECURED IN THE PROPER LOCATION ON BOTH ENDS OF THE PLATE. PLATES ARE TO BE WELDED ONLY AFTER GAGE PLATES IN THE FIELD WITH A 3 PASS FILLET WELD CONTINUOUS ON BOTH ENDS OF THE PLATE. PLATES ARE TO BE INSTALLED AND WELDED TO THE FROG WITH PROPER ALIGNMENT.

The tie with proper alignment.

THE TIE WITH PROPER ALIGNMENT. THE GAGE PLATE AND THE FROG IS SECURED IN THE PROPER LOCATION ON BOTH ENDS OF THE PLATE. PLATES ARE TO BE WELDED ONLY AFTER GAGE PLATES IN THE FIELD WITH A 3 PASS FILLET WELD CONTINUOUS ON BOTH ENDS OF THE PLATE.

GUARD RAIL PLATES ARE TO BE INSTALLED AND WELDED TO THE FROG BASE PLATES FP-1, FP-4 AND FP-7 ARE TO BE WELDED TO THE FROG WITH PROPER ALIGNMENT.
NOTES:

1. TURNOUTS TO BE CONSTRUCTED FROM 15.60 LB R.H. INSULATED PLATE RAIL AND 15.60 LB L.H. SWITCH RAIL.

2. LOCATION OF INSULATED JOINTS IS DETERMINED BY DRAWING VARIOUS EQUATIONS.

3. NOT TO INCLUDE ANY MATERIALS WHICH ARE NOT SPECIFIED IN THESE STANDARDS. THESE MATERIALS SHOULD BE INCLUDED IN THE SUBMITTED SHOP DRAWINGS.

4. TURNOUT AND CROSSOVER LAYOUTS AND ALL MATERIALS LISTED IN THE BILL OF MATERIALS INCLUDING MATERIALS FOR LOCATION OF INSULATED AND COMPROMISE JOINTS FOR NO. 8 TURNOUT AND CROSSOVER, SEE DRAWING SHEET ES2922-01.

5. TURNOUT AND CROSSOVER INSTALLATIONS MUST BE ADJUSTED TO SCRRA NEUTRAL RAIL TEMPERATURE. RUNG RAIL, CLOSURE RAIL AND CROSSOVER RAIL IDENTIFICATION ON SHEET ES2922-02 MUST ALSO BE FIELD WELDED.

6. FIELD WELDS, RUNNING RAIL, AND CLOSURE RAIL IDENTIFICATION ON SHEET ES2922-02 MUST BE FIELD WELDED.

7. FOR COMPLETION OF TURNOUT INSTALLATIONS, RUNNING RAIL MUST BE ADJUSTED TO SCRRA NEUTRAL RAIL TEMPERATURE. RUNG RAIL, CLOSURE RAIL AND CROSSOVER RAIL IDENTIFICATION ON SHEET ES2922-02 MUST BE FIELD WELDED.

8. ALL CROSSOVERS SHALL BE MAINTAINED ACCORDING TO SPECIFICATIONS NO. 2482-2 AND PER ES2922-08.

9. ALL CROSSOVERS SHALL BE MAINTAINED ACCORDING TO SPECIFICATIONS NO. 2482-2 AND PER ES2922-08.

10. ALL CROSSOVERS SHALL BE MAINTAINED ACCORDING TO SPECIFICATIONS NO. 2482-2 AND PER ES2922-08.

11. ALL CROSSOVERS SHALL BE MAINTAINED ACCORDING TO SPECIFICATIONS NO. 2482-2 AND PER ES2922-08.

FOR MAINTENANCE ONLY
### Right Hand Crossover

#### Bill of Switch Ties

<table>
<thead>
<tr>
<th>PIECES</th>
<th>SIZE</th>
<th>LENGTH</th>
<th>BOARD FEET</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>12' x 12' x 8' 5/8&quot;</td>
<td>4.94</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>12' x 12' x 8' 5/8&quot;</td>
<td>5.92</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>12' x 12' x 8' 5/8&quot;</td>
<td>4.78</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>12' x 12' x 8' 5/8&quot;</td>
<td>0.955</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>12' x 12' x 8' 5/8&quot;</td>
<td>0.955</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>12' x 12' x 8' 5/8&quot;</td>
<td>0.955</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>12' x 12' x 8' 5/8&quot;</td>
<td>18.60</td>
<td></td>
</tr>
</tbody>
</table>

#### Bill of Material

<table>
<thead>
<tr>
<th>QTY.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>&quot;PANDROL&quot;, OR EQUAL, SCREW SPIKES 15/16&quot; DIA. X 6&quot; No. 5760</td>
</tr>
<tr>
<td>1</td>
<td>&quot;PANDROL&quot;, OR EQUAL, E-CLIPS TYPE E-2055 (GALVANIZED)</td>
</tr>
<tr>
<td>1</td>
<td>&quot;PANDROL&quot;, OR EQUAL, E-CLIPS TYPE E-2063 (GALVANIZED)</td>
</tr>
</tbody>
</table>

---

**FOR MAINTENANCE ONLY**

**METROLINK**

**ENGINEERING STANDARDS**

**NO. 10 136 LB R.H. SR FROG CROSSOVER LAYOUT BILL OF MATERIALS**
NOTES:

1. No. 3 point of frog.
2. Note: Do not use for new construction for others.
3. Spring rail frog full length plan not shown. Other materials not shown.
4. Springs installed not shown. See Section 3 for details.
5. Plate for fixed center and fixed number when to be shown on
   2" opening.) Regular bolt with thimble to be used instead of shoulder bolt.
6. Rivets and screws. See note 3 above. An alternative design for
   Plate clip should be altered in order to meet proper installation of shoe.
7. Headlock. Horn and cast steel to be 1" diameter, heat treated
   with "spring washer and beveled head lock.
8. Holes in plates for screw spikes are drilled 1" dia.
   Shoulders must meet approved design specification.

FROG PLATES ARE DESIGNED TO BE INSTALLED PERPENDICULAR TO MAIN TRACK.
ANY CONSTRUCTION DETAILS NOT SHOWN SHALL BE IN ACCORDANCE WITH CURRENT
SPRING, RAILS SECTION, DATE MADE AND MFG'S SERIAL NO. IF ANY.

INDEX:

Full spring rail frog

NOTE:

On spring rail frog, bonds to be installed on top deck for the
          3" throw of frog. Bonds to be installed on rigid wing rail side.

INSTALLATION OF FROG FIELD WELDS:

Bonds to be installed with field welds on main track (straight side)
          No. 3 point of frog. The plates should be cut at a 5°-43'-29" angle
          (shown with retarder mechanism).

DRAWINGS MUST BE APPROVED BY SCRRA DIRECTOR OF ENGINEERING.
FROG SHOWN IS PER NOTE 3 ABOVE, IF ANOTHER SPRING RAIL FROG IS USED, SHOP
MANUFACTURER MAY SUBMIT ALTERNATE DESIGN FOR TOE BLOCK FOR APPROVAL PRIOR
TO INSTALLATION OF THE BONDS. BONDS AS SHOWN HEREON, THE PLATE CLIP SHOULD BE ALTERED TO PERMIT
WHEN A PLATE CLIP ON SPRING RAIL FROGS INTERFERES WITH APPLICATION OF
END OF RAIL.

DISTANCE BETWEEN TERMINALS IS SHOWN AS 1". THIS DIMENSION MAY
BE DECREASED, WHEN NECESSARY, DUE TO LIMITED DISTANCE FROM BOLT TO
DISTANCE BETWEEN TERMINALS IS SHOWN AS 1". THIS DIMENSION MAY
BE DECREASED, WHEN NECESSARY, DUE TO LIMITED DISTANCE FROM BOLT TO

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FOR MAINTENANCE ONLY

SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY
ENGINEERING STANDARDS
NO. 10 136 LB. R.H. SR FROG
LAYOUT

METROLINK.
NOTES:
1. INFORMATION OR ERRONEOUS NOTES DEPICTED IN THIS SHEET ARE TO BE CORRECTED ON FIELD ONLY.
2. KNOWN LENGTHS UNDERCUT STOCK RAILS TO BE USED ARE CURRENT PLAN NO. 1005.
3. FOR MKT RAIL UNDERCUT LENGTHS PER SECTION "A-A" LENGTH "A" AND "B" IN "HEEL OF SWITCH POINT"
FOR NEW SAMSON SWITCH INSTALLATIONS 15\°" IN "HEEL OF SWITCH POINT"
4. BEND ANGLE IN BENT STOCK RAIL TO BE AS FOLLOWS:

<table>
<thead>
<tr>
<th>Sw. Length</th>
<th>BEND ANGLE</th>
<th>V (Vertex Dist.)</th>
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STOCK RAILS SHOWN ARE FOR "RIGHT HAND TURNOUT:"

STOCK RAILS SHOWN ARE FOR "LEFT HAND TURNOUT:"

FOR MAINTENANCE ONLY
TURNOUT PLATES - P-16 THRU P-18 & P-29

NOTES:
1. ERECT TO BE MADE OF AN ALLOY STEEL.
2. ERECT PLATE TO BE PLANTED UNDER PLATE NO. 1 AND THE PANDROL TYPE WELD TO BE FABRICATED FROM PRESSED STEEL MATERIAL.
3. THE PIZED STEEL TYPE MUST BE COMPLETED TO THE PLATE NO. 1 AND THE PANDROL TYPE WELD TO BE FABRICATED FROM PRESSED STEEL MATERIAL.
4. THE PIZED STEEL TYPE MUST BE COMPLETED TO THE PLATE NO. 1 AND THE PANDROL TYPE WELD TO BE FABRICATED FROM PRESSED STEEL MATERIAL.
5. THE PIZED STEEL TYPE MUST BE COMPLETED TO THE PLATE NO. 1 AND THE PANDROL TYPE WELD TO BE FABRICATED FROM PRESSED STEEL MATERIAL.
6. THE PIZED STEEL TYPE MUST BE COMPLETED TO THE PLATE NO. 1 AND THE PANDROL TYPE WELD TO BE FABRICATED FROM PRESSED STEEL MATERIAL.

R.S. STOP PLATE FOR ADJUSTABLE RAIL BRACE TO BE SET FLUSH WITH BASE OF RAIL OR SHOULDER OF MILLED PLATE AS SHOWN AND WELD WITH 3 PASS "F" SHOULDER WELD, SEE NOTE 4. THE PANDROL TYPE WELD ON PRESSED STEEL SHOULDER, MADE FROM PRESSED STEEL MATERIAL.

DIMENSIONS:
- DIM "A" = 15"
- DIM "B" = 20"
- DIM "C" = 8"
- DIM "D" = 4"
- DIM "E" = 6"
- DIM "F" = 2"
- DIM "G" = 1" x 4" x 6" - FLAT - W/ PANDROL CLIPS

FOR MAINTENANCE ONLY

METROLINK ENGINEERING STANDARDS

NO. 10 TURNOUT AND SWITCH PLATE DETAILS

SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY
NOTES:

1. GUARD RAIL PLATES ARE TO BE INSTALLED AND WELDED TO THE INSULATION PER DETAIL "A" in the proper location on the tie with proper alignment.

2. HAND OPERATED TURNOUT. FOR A LEFT HAND TURNOUT, PLATES TO BE MADE OF MILD ROLLED STEEL.

3.ഫ് x 8" - FLAT - W/ INSULATION (1 PC. REQ'D AS SHOWN)

4. WELD, SEE NOTE 4

3 PASS $" + FILLET MODEL OF SWITCH POINTING TO POINT PAINT MARK ARROW (TYP.)

1" DIA.

FOR MAINTENANCE ONLY

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

NO. 10 INSULATED GAGE PLATE DETAILS

INSULATED FROG CAGE PLATE - FG-1P
3$f" x 8" - FLAT - W/ INSULATION (1 PC. REQ'D AS SHOWN)

INSULATED FROG CAGE PLATE - FG-2P
3$f" x 8" - FLAT - W/ INSULATION (1 PC. REQ'D AS SHOWN)

INSULATED FROG CAGE PLATE - FG-3P
3$f" x 8" - FLAT - W/ INSULATION (1 PC. REQ'D AS SHOWN)
### BILL OF MATERIAL FOR LATERAL TURNOUT

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### FOR MAINTENANCE ONLY
COLLECTIVE DRILLING FROM END OF GUARD BAR MARKED "X"

ASSEMBLED 19'-0" GUARD RAIL

SCALE: 1" = 1'-0"

FOR MAINTENANCE ONLY

TYPICAL PLATE DETAIL

TYPICAL PLATE PUNCHING DETAIL

FLARE DETAIL

1. GUARD RAIL SECTION USE 25° CURVATURE BASE PLATE Wedge FACE:mm FOR BOLT.
2. UNDER FABRICATE AND SAND WELD STEEL FOR ADEQUATE
3. SPECIFICATION OF ALL STEEL AND WELDING PROCEDURES FOR ADEQUATE SPECIFICATION.
4. GUARD RAIL PLATES TO BE WELDED TO BASE PLATE BASE PLATE, USE SECURITY LOCKNUTS.
5. WELDING TO MEET AREMA SPECIFICATIONS.

SECURITY LOCKNUT WITH '" THICK FLAT WASHER AND (16) GRADE 8 BOLTS - " x 3" LG.

(12) 2" THICK
(24) 2" THICK
(12) 2½" THICK
(48) ADJUSTMENT SHIMS

E RpL. GUARD FACE TOP

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

ENGINEERING STANDARDS

NO. 14 136 LB. R.H. RBM. FROG
GUARD RAIL DETAILS
FOR MAINTENANCE ONLY

REPORT NO. 14 SPLIT SWITCH POINT DETAILS

SCALE: 1" = 1'-0"

NOTES:

1. SW. PT. IDENTIFICATION TAG TO BE FASTENED HERE (SEE NOTE 8)

2. GAGE LINES TO BE USED ACROSS THE TOP AND BOTTOM OF THE Stock Rail AND "STOP" GAGE LINE OF WEB FACE.

3. SPACER BLOCK IN LOCATION SHOWN.

4. 3" DIA. HOLES PEENED NOTE 5 APPLIES TO THESE FOUR BOLT HOLES

5. FOR LEFT HAND TURNOUT, SW. RAIL MAY BE RIGHT HAND TURNOUT SHOWN.

6. SW. POINTS FOR TURNOUT SIDE MAY BE FURNISHED WITH ALLOY STEEL TIP.

7. RIVETS (SEE NOTE 11)

8. ALL BURRS AT EDGE OF BOLT HOLE TO BE CAREFULLY REMOVED BY GRINDING BEFORE PEENING.

9. LATCHING BOLT TO BE EFFECTIVE, TOP PLANING WHERE THE SW. POINT HAS FULL HEAD CONTOUR.

10. TOP VIEW OF SW. PT.

11. FOR SWITCH RODS NO. 1, 2, 3, AND 4 COMPLETE WITH BOLTS WILL NOT BE USED.

ENGINEERING STANDARDS

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

NO. 14 SPLIT SWITCH POINT DETAILS
Extension Plate

14" x 5½" x 7" 2 places
2½" dia. & .37" deep at bottom, 2¼ diameter C-bore
2 places .81" x 1.19" square slot

Top View

This shall be made of Douglas fir or gum and treated after framing.

Dap Tie

(2 pcs. required at each)

US&S M-23A Switch machine must be furnished with finished mounting lugs.
TURNOUT PLATES - P-25 AND P-26

SEE SHEET NO. ES2931-15 FOR DIMENSION TABLE AND NOTES

FOR MAINTENANCE ONLY

METROLINK
SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY
ONE GATEWAY PLAZA, 12TH FLOOR, L.A. CA 9002

ENGINEERING STANDARDS
NO. 14 TURNOUT AND FROG PLATE DETAILS

END DETAIL - BOTH ENDS
SCALE: NONE
WELDING SPECIFICATIONS:

1. When field welding shoulders or stops to rail, the shoulder/weld line must be chamfered to a minimum of 120° with a V-groove and face welded with a 2-pass process. The weld shall be on both sides of the weld line.

2. Check tack welds for correct size.

3. Start with the face side of the weld, followed by the side edge of the rail and the shoulder area. Use a continuous weld with a 1-pass process. The weld shall be uniform and free of defects.

4. When welding steel shoulders, stop or plates to press plates use one of the following electrodes:

   A. C. WIRE, WELDING "E", NR-203, 1% NICKEL
   B. ELECTRODES, "H", WELDING SPEC. 7018XLM.

5. Welding start with one gage plate. Place Pandrol shoulders tight against Base of rail.

6. The 1" x 6" stops must be set flush against the shoulder. When field welding shoulders or stops to gage plates, the gage plates shall be welded on three sides only. The shoulder shall be machined out to provide a clear rail seat dimension as called for.

7. 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.

8. The pressed steel shoulder must be carefully welded to the plate. See weld specifications.

9. The plates as shown are for a 136 lb., No. 14, Right Hand, Machine of the rail seat must be machined out to provide a clear rail seat dimension as called for. May be used upon approval from Pandrol International or approved alternate meeting Pandrol's design specifications. Minimum ..." WELD ALONG BEVELED GROOVE OF THE SHOULDER.

10. The pressed steel shoulder, made of mild steel, to be purchased and hand of turnout (R.H. or L.H.) and operated turnout.

11. Each plate to be plainly stamped with plate no. and 136 (weight of rail) and 16 1/4" (vertical dimension).

12. When welding pressed steel shoulders, stops or plates to gage plates meet one of the following:

   A. CARLOS
   B. THE 1" X 6" STOPS MUST BE SET FLUSH AGAINST THE SHOULDER.

13. The plates shall be welded on three sides only and weld in place while simultaneously controlling correct gage. See weld specifications.

14. Start with one gage plate. Place Pandrol shoulders tight against base of rail.

15. 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.

FOR MAINTENANCE ONLY
FOR MAINTENANCE ONLY

NOTES:
1. Since the permissible variation in standard lengths of rail, points, and switches varies, all lengths shown for expansion joints and points were computed using lengths of rail shown.
2. The lengths shown for expansion joints are to be used in all cases except where compromise joints are required. The minimum allowable lengths of expansion joints are shown in parenthesis. Compromise joints can be used in a "progressive" manner and comprise three sections and require the minimum distance between the center of the expansion joint and the rail end shall be increased. Compromise joints are required in the crossover track and are placed in accordance with the heavier rail. The heavier rail shall be replaced when the heavier rail is the same rail shall be replaced when the heavier rail is the lighter rail.
3. In order to make the clearance and ensure that the rail lengths in the field it is necessary to cut rails ends to provide 3'-6" for the field. IN ADDITION TO NOTE 1, NO ALLOWANCE HAS BEEN MADE IN THE RAIL LENGTHS TO PROVIDE GAPS FOR EXPANSION JOINTS. IN ADDITION TO NOTE 1, NO ALLOWANCE HAS BEEN MADE IN THE RAIL LENGTHS TO PROVIDE GAPS FOR EXPANSION JOINTS.
4. IN ADDITION TO NOTE 1, NO ALLOWANCE HAS BEEN MADE IN THE RAIL LENGTHS TO PROVIDE GAPS FOR EXPANSION JOINTS. IN ADDITION TO NOTE 1, NO ALLOWANCE HAS BEEN MADE IN THE RAIL LENGTHS TO PROVIDE GAPS FOR EXPANSION JOINTS.
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**BILL OF MATERIAL FOR LATERAL TURNOUT**

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**BILL OF MATERIAL FOR HELPER ASSEMBLY**

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**BILL OF SWITCH TIES FOR TURNOUT**

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**FOR MAINTENANCE ONLY**

**METROLINK.**

SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY

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

ENGINEERING STANDARDS

NO. 20 136 LB. R.H. RBM FROG TURNOUT

BILL OF MATERIALS
FOR MAINTENANCE ONLY

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

ENGINEERING STANDARDS

NO. 20 136 L.B. R.H. RBM FROG
GAGE PLATE DETAILS

Sheet: 7 OF 15

S:\Plot Drivers\pdf.plt

5'-2"

1ƒ"

1'-1œ"

6ˆ"

5'-6"

4  "

4'-9"

3'-5"

2'-1"
FOR MAINTENANCE ONLY

NOTES:
1. GUARD RAIL DETAIL AS SHOWN IS PROPOSED FOR SCRRA APPROVAL.
2. BASE PLATE BRACKET AND GUARD RAIL STEEL TO MEET AREMA SPECIFICATIONS. GUARD RAIL STEEL TO MEET AND ALSO PER WORK SPECIFICATIONS.
3. GUARD RAIL STEEL TO BE SECURITY LOCKNUT.
4. GUARD RAIL DETAIL AS SHOWN IS FOR SCRRA APPROVAL.
5. GUARD RAIL DETAIL AS SHOWN IS FOR SCRRA APPROVAL.

TYPICAL PLATE DETAIL

TYPICAL PLATE DETAIL
FOR MAINTENANCE ONLY

NO. 20 EXTENSIONS PLATE AND DAP TIE DETAILS

DAP TIE
(2 PCS. REQ'D. AS SHOWN)

US&S M23-A SWITCH MACHINE MUST BE FURNISHED
WITH FINISHED MOUNTING LUGS.

TIES SHALL BE MADE OF DOUGLAS FIR OR GUM AND TREATED AFTER FRAMING.

NOTE: 3⁄4" DIA. &

MACHINE

SWITCH

US&S M23-A SWITCH MACHINE MUST BE FURNISHED ON DETAILED DRAWING.

EXTENSION PLATE
(2 PCS. REQ'D. AS SHOWN)

NOTE: M23-A SWITCH MACHINE MUST BE FURNISHED ON DETAILED DRAWING.

TOP VIEW

SIDE VIEW

THIS SHALL BE MADE OF DOUGLAS FIR OR GUM AND TREATED AFTER FRAMING.
### Bill of Material for Lateral Turnout

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### Bill of Material for Helper Assembly

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### Bill of Switch Ties for Turnout

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**FOR MAINTENANCE ONLY**

**METROLINK**

**ENGINEERING STANDARDS**

NO. 24, 136 LB. RH RBM FROG TURNOUT

BILL OF MATERIALS
NOTE:
1. The 3/8" bolts are for a left hand frog, the 7/8" bolts are for a right hand frog.
2. The frog plates are to be welded to the tie, the tie plates are to be welded to the frog plates.
3. The frog plates are to be welded to the gage plates in accordance with the specifications.
4. The gage plates are to be stamped with the manufacturer's name and year of manufacture.
5. The frog plates are to be bolted to the gage plates with the bolts in the correct position.
6. The frog plates are to be painted with the manufacturer's name and year of manufacture.
7. The frog plates are to be stamped with the manufacturer's name and year of manufacture.
8. The frog plates are to be bolted to the gage plates with the bolts in the correct position.
9. The frog plates are to be painted with the manufacturer's name and year of manufacture.
10. The frog plates are to be stamped with the manufacturer's name and year of manufacture.
INSTRUCTIONS FOR WELDING
GUARD RAILS TO GAGE PLATES

1. GUARD RAILS PLATE SHOULD BE LOCATED IN THE FIELD.
2. WATER PROOF MOLD MADE FROM THE RIGHT HAND RAIL PLATE WILL BE USED.
3. GUARD RAILS WELDED TO GUARD RAIL PLATE WILL BE IN A LOCATION WHERE THE FIELD PLATE IS CORRECTLY WELDED.
4. GUARD RAILS WELDED TO GUARD RAIL PLATE WILL BE IN A LOCATION WHERE THE FIELD PLATE IS CORRECTLY WELDED.
5. GUARD RAILS WELDED TO GUARD RAIL PLATE WILL BE IN A LOCATION WHERE THE FIELD PLATE IS CORRECTLY WELDED.
6. GUARD RAILS WELDED TO GUARD RAIL PLATE WILL BE IN A LOCATION WHERE THE FIELD PLATE IS CORRECTLY WELDED.

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6. GUARD RAILS WELDED TO GUARD RAIL PLATE WILL BE IN A LOCATION WHERE THE FIELD PLATE IS CORRECTLY WELDED.

FOR MAINTENANCE ONLY
COLLECTIVE DRILLING FROM END OF GUARD BAR MARKED "X"

ASSEMBLED 26'-0" GUARD RAIL

NOTES:
1. GUARD RAIL SECTION UIC 33/UIC 860 GRADE 90A
3. BASE PLATE, BRACKET AND SHIMS MILD STEEL PER AREMA SPECIFICATION M7.
4. GUARD RAIL SEAT CAN'T 1:40
5. GUARD FACE DEEP 3'-3" FLARE DETAIL

FOR MAINTENANCE ONLY
FOR MAINTENANCE ONLY

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

ENGINEERING STANDARDS

NO. 24 SWITCH ROD MISCELLANEOUS DETAILS
LATCH & GAUGE PLATE
DRILLED IN BOTH
1" DIA. HOLES

NOTE: 2" DIA. &
MACHINE
SWITCH
TRACK

TIES SHALL BE MADE OF DOUGLAS FIR OR GUM AND TREATED AFTER FRAMING.

US&S M23-A SWITCH MACHINE MUST BE FURNISHED
WITH FINISHED MOUNTING LUGS.

FOR MAINTENANCE ONLY

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

ENG. DATE
REV.
DESCRIPTION
DRAWN BY:
DATE:
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US&S M23-A SWITCH MACHINE MUST BE FURNISHED WITH FINISHED MOUNTING LUGS.