ENGINEERING STANDARDS

NO. 10 STANDARD TURNOUT
133 LB UP DESIGN

NOTES:

FOR MAINTENANCE ONLY
**FOR MAINTENANCE ONLY**

<table>
<thead>
<tr>
<th>QTY</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>140</td>
<td>16&quot; TIE PLATES</td>
</tr>
<tr>
<td>840</td>
<td>SPIKES</td>
</tr>
</tbody>
</table>

16'-6" Switch Layouts Used With a No. 10 Turnout Have Different Turnout Plate Arrangements Than Those Used With a No. 7 Or No. 9 Turnout.

Install Insulated Joints Where Indicated Only When Requiring By Signal Circuits. All Insulated Joints Are To Be Suspended. The Location Of Insulated Joints On Crossover Rails As Shown Are Based On A Minimum 13' Track Centers. Where Track Centers Are Greater, Crossover Rails Are To Be Extended, But Insulated Joints Must Not Be Staggered Over 4'-6".

All Switch Rods And Gauge Plates To Be Furnished With Switch Package. 22E, 38E, 1003ARS, Or 1004ARS Switch Stands To Be Used On All Yard Turnouts. A Minimum 1/2" Gap Must Be Maintained Between The Ends Of Metal Tie Plates Located Beyond The Center Of Insulated Joints In The Switch Heel Area To Provide Proper Track Circuit Separation.

For Spring Switch Installations, Replace Roller Plates With Switch Plate No. 3, Use Rods Per STD DWG 2172, And Points Per STD DWG 1605.

Mainline Crossover Installations Must Have Both Main Line And Side Track At Cross Level With Each Other And For 1500' In Advance Of Each Switch. Mainline Turnout Installations Must Have Both Tracks At Cross Level With Each Other And For 500' Beyond The Signal Location.

Coach Screws Required To Fasten Frog, Gauge Plates And Guard Rails To Ties.

Reference The Following Associated STD DWGs:

- Switch Plan: See STD DWG 1600
- All Rail Spring: See STD DWG 3350
- RBM Spring Frog: See STD DWG 3305
- RBM Frog: See STD DWG 3110
- Frog Gauge Plates: See STD DWG 3015
- Frog Guard Rails: See STD DWG 4005
- For Guard Rail Settings: See STD DWG 4008
- Stock Rail Details: See STD DWG 1410
- Switch Gauge Plates: See STD DWG 1687
- Machine Gauge Plates: See STD DWG 1685
- Safebox Clip: See STD DWG 0433
- Coach Screws: See STD DWG 0431
- Insulated Joint-Plug Rail: See STD DWG 0903
- Switch Plates: See STD DWG 1625
- Turnout Gauge Plates: See STD DWG 1672

**THEORETICAL TURNOUT DESIGN DATA TABLE AS FURNISHED**

<table>
<thead>
<tr>
<th>Number</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angle</td>
<td>5° - 43° - 29'</td>
</tr>
<tr>
<td>Toe Length</td>
<td>13 - 15'</td>
</tr>
<tr>
<td>Heel Length</td>
<td>14 - 2&quot;</td>
</tr>
<tr>
<td>Total Length</td>
<td>20 - 3'</td>
</tr>
</tbody>
</table>

- Length Of Switch (Points): 16' 0"  
- Heel Spread: 5 1/4"  
- Straight Stock Rail: 54' 3"  
- Bent Stock Rail: 38' 3"  
- Heel Angle: 1° - 44° - 11"  
- Thickness At Point: 1/4"  
- Angle At Point: 1° - 44° - 11"  
- Radius (Closure Curve): 752 864 122'  
- Vortex Distance: 8 1/4"  
- Thickness At Point: 1/4"  
- Angle At Point: 1° - 44° - 11"  
- Radius (Closure Curve): None  
- Vortex Distance: 8 1/4"  
- Actual Lead: 50 3 3/8"  
- Radius Of Centerline: 745 750 046 568'  

- Central Angle: 3° - 59° - 18'  
- Degree Of Curve: 7° - 38° - 31'

**NOTES:**

- New Installation Of Turnout Requires A Minimum Of 6" Of Clean Ballast Under The Ties.
- All Rail To Be Head Harden.
- This Plan Is Based On 133 Lb. R.E. Material, But May Also Be Used On 115 Lb. Slight Differences Will Occur In Frog And Switch Plate Designations, Frog And Switch Tie Centers, Frog Lengths, Etc.

All Adjustable Rail Braces Shown Are Symbolic Illustrations Only. Actual Rail Braces Employed Are Dependent On The Manufacturer.

- 16'-6" Turnout
- 26'-0" Boltless Adjustable Guard Rail
- 15'-0" Boltless Adjustable Guard Rail
- 26'-0" Boltless Adjustable Guard Rail

**ALTERNATE LAYOUT WITH RBM FROG**

- *Includes clips and coach screws*
- **28'-0" Spring Frog Used On New Installation**

**UNION PACIFIC RAILROAD**

**ENGINEERING STANDARDS**

**NO. 10 STANDARD TURNOUT 133 LB UP DESIGN**
FOR MAINTENANCE ONLY

LAYOUT ARRANGEMENT FOR PARALLEL TRACKS WITH LEFT HAND SIGNALS

WHERE TRACK CENTERS ARE 20’ OR GREATER, SIGNAL MAY BE LOCATED ON EITHER SIDE OF THE MAIN TRACK.

7’ 30” OR 6’ 00” CURVE TO HAVE 3/4” SUPERELEVATION WITH RUN OFF AT THE RATE OF 1” IN 44’-0”. ON 13’ TO 16’ TRACK CENTERS, THE TANGENT LENGTH BETWEEN THE LAST LONG SWITCH TIE AND THE P.C. OF THE REVERSE CURVE IS INSUFFICIENT TO ACCOMMODATE THIS RUN-OFF RATE. FOR THESE TRACK CENTERS, SUPERELEVATION WILL BEGIN AT THE LAST LONG SWITCH TIE BEHIND THE FROG AND RUN INTO THE CURVE AT THE RATE OF 1” IN 44’-0” UNTIL THE FULL SPECIFIED SUPERELEVATION IS REACHED.

NOTES:

ENGINEERING STANDARDS

UNION PACIFIC RAILROAD

NO. 10 STANDARD TURNOUT
133 LB UP DESIGN

TABLE OF VARIABLE DIMENSIONS BASED ON TRACK CENTERS (A)

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>13’</td>
<td>130.33’</td>
<td>51.48’</td>
<td>200.70’</td>
<td>129.68’</td>
</tr>
<tr>
<td>14’</td>
<td>140.35’</td>
<td>51.96’</td>
<td>176.52’</td>
<td>139.65’</td>
</tr>
<tr>
<td>15’</td>
<td>150.38’</td>
<td>61.98’</td>
<td>168.41’</td>
<td>149.63’</td>
</tr>
<tr>
<td>16’</td>
<td>160.40’</td>
<td>72.01’</td>
<td>164.53’</td>
<td>159.60’</td>
</tr>
<tr>
<td>17’</td>
<td>170.43’</td>
<td>82.04’</td>
<td>162.82’</td>
<td>169.58’</td>
</tr>
<tr>
<td>18’</td>
<td>180.45’</td>
<td>92.06’</td>
<td>162.48’</td>
<td>179.55’</td>
</tr>
<tr>
<td>19’</td>
<td>190.48’</td>
<td>102.09’</td>
<td>162.48’</td>
<td>189.53’</td>
</tr>
<tr>
<td>20’</td>
<td>200.50’</td>
<td>112.11’</td>
<td>162.48’</td>
<td>199.50’</td>
</tr>
</tbody>
</table>

FOR 13’ TRK CTRS

CV = 7’ 30”
\( \Delta = 5’ 43.29” \)
T = 38.22’
L = 76.33’

FOR 14’ OR GREATER TRK CTRS

CV = 6’ 00’
\( \Delta = 5’ 43.29” \)
T = 47.77’
L = 95.41’

"A" TRACK CENTERS

"B" P.I. TO P.I. DISTANCE
"C" TANGENT LENGTH
6.88’

"D" PT. OF SW. TO CLEARANCE PT
"E" MAIN TRACK P.I. TO P.I. DISTANCE

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