

# DESIGN CRITERIA & GUIDELINES FOR MAIN TRACKS AND DETOURS

## Vertical Alignment:

1. Proposed grades (g) should not be greater than exceed one percent (1%).
2. Proposed rate of change (r) of vertical curves should comply with the following:
  - A. Sag vertical curves (r) = 0.05
  - B. Summit (crest) vertical curves (r) = 0.10

$$r = \frac{g_1 - g_2}{L \text{ (stations)}}$$

## Horizontal Alignment:

1. All horizontal curves should include spirals of correct length and the appropriate and proper superelevation on the proposed curves (reference NS plan 7-2).
2. All reverse curvature must include a minimum of 220 feet of tangent track between spirals of reverse curves.

## INFORMATION TO BE SHOWN ON PLANS

The proposed alignment should show stationing for all PI, TS, SC, CS and ST.

1. PI - Point of intersection
2. TS - Tangent to spiral
3. SC - Spiral to curve
4. CS - Curve to spiral
5. ST - Spiral to tangent

The following data should be shown on all horizontal curves:

1. The design speed in miles per hour (MPH).
2. The station of the PI
3. I - Angle at the intersection of the tangents
4. D - Degree of curve of the central circular curve
5. R - Radius of curve of the central circular curve
6. L - Length of the spiral
7.  $\Delta$  - Central angle of the whole spiral
8. SE - Superelevation (in inches)
9. Lc - Length of the circular curve
10. Ts - Distance from the TS to PI

All horizontal curves distances should be calculated using the chord definition.

A typical roadbed section should be shown on the plans in compliance with Norfolk Southern Plans 1-19, 1-20, or 1-21.

Existing and proposed top of rail profile should be shown at 100' stations and at other locations, such as point of switches, etc.

Cross-sections:

1. Cross-sections should be shown at a maximum of 100' intervals and should be taken perpendicular to the centerline of the main track and extend to the right of way or construction limits, whichever is greater. A cross-section should be shown at all drainage structures, and other special circumstances that require sections at less than 100' intervals. Information included on each section should show top of rail elevation, existing and proposed groundline elevation points, and the horizontal distances from the centerline of the main track to each elevation point. Also each cross-section should show the proposed and existing right of way line.
2. Also, cross-sections should be taken at all drainage culverts and structures, and other special circumstances (i.e. abrupt change in topography, soil condition, etc.). Cross-sections on drainage structures should include the invert flow line elevations on both ends of the structures.

The proposed and existing right of way should be shown on the plans of the proposed alignment or relocation.

The horizontal alignment for existing tracks should be shown for a minimum of 500' beyond the construction limits of the proposal.

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