SLOPE RATIOS FOR SUPERELEVATION TRANSITIONS

<table>
<thead>
<tr>
<th>SECTION</th>
<th>DESIGN SPEED, MPH</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Lane</td>
<td>55-60</td>
</tr>
<tr>
<td>4 Lane</td>
<td>55-60</td>
</tr>
<tr>
<td>6 Lane</td>
<td>55-60</td>
</tr>
<tr>
<td>8 Lane</td>
<td>55-60</td>
</tr>
</tbody>
</table>

2-LANE, 4-LANE OR 6-LANE PAVEMENT, NO MEDIAN

NOTES:

1. These details apply to both paved and grassed shoulders. For median shoulders use 0.05 in lieu of 0.06.

2. SHOULDER ON HIGH SIDE: A shoulder slope of 0.06 downward from the edge of travel way will be maintained until a 0.07 break in slope at the pavement edge is reached due to superelevation of the pavement. As the pavement superelevation increases, the 0.07 break in slope will be maintained and the shoulder flattened until the shoulder slope reaches the minimum of 0.02 downward from the edge of travel way. Any further increase in pavement superelevation will necessitate sloping the inside half of the shoulder toward the travel way and the outer half outward, both at 0.02 for superelevations 0.06-0.09 and both at 0.03 for superelevation 0.10. For shoulders with paved widths 5 feet or less see Special Shoulder Break Over Details on Sheet 2.

3. SHOULDER ON LOW SIDE: Maintain 0.06 cross slope across shoulder until pavement cross slope reaches 0.06. For pavement cross slopes greater than 0.06, shoulder to have same slope as pavement. See SHOULDER SLOPES ON SUPERELEVATION SECTION (Sheet 3).

SHOULDER CONSTRUCTION WITH SUPERELEVATION
**Super-elevation Transitions**

**High Speed Roadways**

**Super-elevation Transitions - Profile Grade**

**Profile Grade - Both Roadways**

**Crown Point - Of Curve**

**P.C. Or P.T.**

**Profile Grade - Inner Roadway**

**Crown Point - Inner Roadway**

**Outside Pavt. Edge - Outer Roadway**

**Roadways - Edges - Both**

**Outside Pavt.**

**NORMAL CROWNED SECTION**

**SECTION A-A**

**NORMAL CROWNED SECTION**

**SECTION B-B**

**SUPERELEVATION SECTION LT. & RT.**

**SECTION C-C**

**SUPERELEVATION SECTION LT.**

**PLANE INCLINED SECTION RT.**

**SECTION D-D**

**PLANE INCLINED SECTION LT.**

**SECTION E-E**

**SUPERELEVATION TRANSITION LT.**

**FULL SUPERELEVATION TRANSITION LT. & RT.**

**SECTION F-F**

**FULL SUPERELEVATION RT.**

**8-LANE PAVEMENT WITH ONE LANE SLOPED TO MEDIAN**

**Shoulder Slopes on Super-elevation Sections**

1. For shoulders with paved widths 5 feet or less, see special shoulder break over details.

2. For Concrete pavement, the first 1'-0" of the outside shoulder is cast with the outside travel lane and will have the same cross slope as the outside lane. The shoulder break over will occur at the outside edge of the outside slab.
GENERAL NOTES:
1. Obtain superelevation by rotating the plane successively about the break points of the section until the plane has attained a slope equal to that required by the Plans. Should the rotation traverse the entire section and further superelevation be required, the remaining rotation of the plane shall be about the low edge of the inside travel lane. Crown is to be removed in the auxiliary lane on the outside of the curve only when the adjoining travel lanes require positive superelevation.

2. When positive superelevation is required, continue the slope of the pavement across the gutter on the high side.

3. Place short vertical curves at all angular profile breaks within the limits of the superelevation transition.

4. The variable superelevation transition length "L" has a minimum value of 30 feet for design speeds under 40 MPH and 75 feet for design speeds of 40 MPH or greater.

5. Roadway sections having lane arrangements different from those shown, but composed of a series of planes, are superelevation in a similar manner.

ROADWAY SECTIONS

TWO TRAVEL LANES EACH DIRECTION

TWO TRAVEL LANES EACH DIRECTION WITH MEDIAN

TWO TRAVEL LANES EACH DIRECTION WITH MEDIAN AND AUXILIARY LANES

THREE TRAVEL LANES EACH DIRECTION WITH MEDIAN

DIVIDED FACILITIES

UNDIVIDED FACILITIES

SUPERELEVATION TRANSITION SECTIONS

FOR LOW SPEED HIGHWAYS

PARABOLIC SECTION

SUPERELEVATION TRANSITIONS - LOW SPEED HIGHWAYS

INDEX

000-511

1 of 2
**Example Superlevation Sections and Profiles for Low Speed Highways**

**Note:**
The sections and profiles shown are examples of superlevation transitions. Similar schemes should be used for roadways having other sections.

**Two Lanes Each Direction**

**Normal Section**

- **Line A:** Inside Travel Lane
- **Line B:** Inside Lane Line
- **Line C:** Inside Median Edge Pavement
- **Line D:** Construction
- **Line E:** Outside Median Edge Pavement
- **Line F:** Outside Lane Line
- **Line G:** Outside Travel Lane

**Profile:**

- 30 MPH: 1:100
- 40 MPH: 1:125
- 45-50 MPH: 1:150

*Note:* 1:125 may be used for 45 MPH under restricted conditions.

**Superelavation Transition "L"**

- Normal Section
- Superelevated Section

**Profile:**

- Outside Edge Outside Auxiliary Lane
- Line G (Outside Edge of Travel Lane)

- Note: Runoff rate "d" is to be applied to the outside edge of travel lane.

**Profiles for Low Speed Highways**

**Two Lanes Each Direction with Median and Auxiliary Lane**

- **Line A:** Inside Travel Lane
- **Line B:** Inside Lane Line
- **Line C:** Inside Median Edge Pavement
- **Line D:** Construction
- **Line E:** Outside Median Edge Pavement
- **Line F:** Outside Lane Line
- **Line G:** Outside Travel Lane

**Profile:**

- Outside Edge Inside Auxiliary Lane
- Line A (Outside Edge of Travel Lane)

**Normal Section**

- **Line A:** Inside Travel Lane
- **Line B:** Inside Lane Line
- **Line C:** Inside Median Edge Pavement
- **Line D:** Construction
- **Line E:** Outside Median Edge Pavement
- **Line F:** Outside Lane Line
- **Line G:** Outside Travel Lane

**Profile:**

- Outside Edge Outside Auxiliary Lane
- Line G (Outside Edge of Travel Lane)
GENERAL NOTES:

1. Taper-Type exit and entrance terminals as detailed shall not be used on ramps for which a speed of 50 MPH or greater cannot be maintained. For such ramps, parallel deceleration and acceleration lanes shall be used in place of tapers with lengths set according to AASHTO.

2. Shoulder Pavement:
   A. Concrete Pavement Projects: Where shoulder pavement adjacent to shoulder gutter is less than 6' wide, it shall be identical to the adjacent roadway pavement beginning with the transverse joint nearest the point of 6' width.
   B. Flexible Pavement Projects: Where shoulder pavement used in conjunction with shoulder gutter is less than 6' uniform width, it shall be identical to the adjacent roadway pavement.

3. For concrete pavement joint details and layouts at entrance and exit ramp terminals, see Index 350-001.

LEGEND:

\[\text{ Shoulder Pavement}\]
**TAPER - TYPE ENTRANCE**

- Shoulder Pavement
- Concrete Pavement or Flexible Pavement
- Shoulder Slope Break
- Thickness Transition
  $L=100'$ (See Detail Below)

**PARALLEL - TYPE ENTRANCE**

- Shoulder Pavement
- Concrete Pavement or Flexible Pavement
- Shoulder Slope Break
- Shoulder Gutter
- Shoulder Slope Break
- Shoulder Transition
- Shoulder Pavement Type Same as Ramp Pavement

**LEGEND:**

- Shoulder Pavement
Extend Friction Course 8" Into Shoulder

8' Shoulder Pavement

Friction Course

LEGEND:

Exclude Friction Course

Friction Course Optional