### Table 1: Taper Length Criteria and Channelizing Device Spacing

<table>
<thead>
<tr>
<th>SPEED (S)</th>
<th>MINIMUM TAPER LENGTH * FOR WIDTH OF OFFSET 12 FEET (W)</th>
<th>MAXIMUM CHANNELIZING DEVICE SPACING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TANGENT MERGING SHIFTING SHOULDER TAPER TANGENT CONFLICT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ZL L L/C L/3</td>
<td></td>
</tr>
<tr>
<td>mph</td>
<td>ft</td>
<td>ft</td>
</tr>
<tr>
<td>20</td>
<td>160</td>
<td>80</td>
</tr>
<tr>
<td>25</td>
<td>250</td>
<td>125</td>
</tr>
<tr>
<td>30</td>
<td>360</td>
<td>180</td>
</tr>
<tr>
<td>35</td>
<td>490</td>
<td>245</td>
</tr>
<tr>
<td>40</td>
<td>640</td>
<td>320</td>
</tr>
<tr>
<td>45</td>
<td>1080</td>
<td>540</td>
</tr>
<tr>
<td>50</td>
<td>1200</td>
<td>600</td>
</tr>
<tr>
<td>55</td>
<td>1320</td>
<td>660</td>
</tr>
<tr>
<td>60</td>
<td>1440</td>
<td>720</td>
</tr>
<tr>
<td>65</td>
<td>1560</td>
<td>780</td>
</tr>
<tr>
<td>70</td>
<td>1680</td>
<td>840</td>
</tr>
</tbody>
</table>

* - For other offsets, use the following merging taper length formula for L:
For speed of 40 mph or less, L = W/5 - 60
For speed of 45 mph or more, L = W/5

Where: L = Taper length in feet.
W = Width of offset in feet.
S = Posted speed limit, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph

** - Use for taper and tangent sections where there are no pavement markings or where there is a conflict between existing pavement markings and channelizers (C4).

### Table 2: Longitudinal Buffer Space and Flagger Station Spacing

<table>
<thead>
<tr>
<th>SPEED (S)</th>
<th>SPEED D ***</th>
<th>-3%</th>
<th>-6%</th>
<th>-9%</th>
</tr>
</thead>
<tbody>
<tr>
<td>mph</td>
<td>ft</td>
<td>ft</td>
<td>ft</td>
<td>ft</td>
</tr>
<tr>
<td>20</td>
<td>115</td>
<td>116</td>
<td>120</td>
<td>126</td>
</tr>
<tr>
<td>25</td>
<td>155</td>
<td>158</td>
<td>165</td>
<td>173</td>
</tr>
<tr>
<td>30</td>
<td>200</td>
<td>205</td>
<td>215</td>
<td>227</td>
</tr>
<tr>
<td>35</td>
<td>290</td>
<td>271</td>
<td>287</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>305</td>
<td>315</td>
<td>333</td>
<td>354</td>
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<tr>
<td>45</td>
<td>360</td>
<td>378</td>
<td>400</td>
<td>427</td>
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<td>50</td>
<td>425</td>
<td>446</td>
<td>474</td>
<td>507</td>
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<td>495</td>
<td>520</td>
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<td>684</td>
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<td>65</td>
<td>645</td>
<td>682</td>
<td>728</td>
<td>785</td>
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<tr>
<td>70</td>
<td>730</td>
<td>771</td>
<td>825</td>
<td>891</td>
</tr>
</tbody>
</table>

** - Speed is posted speed limit, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph.
*** - Longitudinal buffer space or flagger station spacing
**** - Use on sustained downgrade steeper than -3 percent and longer than 1 mile.

### Table 3: Advance Warning Sign Spacing

<table>
<thead>
<tr>
<th>ROAD TYPE</th>
<th>DISTANCE BETWEEN SIGNS *</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>URBAN - 25 MPH OR LESS</td>
<td>100</td>
</tr>
<tr>
<td>URBAN - MORE THAN 25 MPH TO 40 MPH</td>
<td>250</td>
</tr>
<tr>
<td>URBAN - MORE THAN 40 MPH</td>
<td>350</td>
</tr>
<tr>
<td>RURAL</td>
<td>500</td>
</tr>
<tr>
<td>EXPRESSWAY</td>
<td>1000</td>
</tr>
</tbody>
</table>

** - The distances are approximate, are intended for guidance purposes only, and should be applied with engineering judgment.
The distances should be adjusted by the Engineer for field conditions.
If necessary, by increasing or decreasing the recommended distances.
**SHOULDER CLOSURE**

**NOTES:**

1. Each advance warning sign shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16" x 16" in size and shall be orange or fluorescent red-orange in color. Flashing beacons shall be placed at the locations indicated for lane closure during hours of darkness.

2. Lane closures shall not begin at top of crest vertical curve or on a horizontal curve.

3. All cones used for lane closures during the hours of darkness shall be fitted with retroreflective bands (or sleeves).

4. Portable delineators, placed at one-half the spacing indicated for traffic cones may be used instead of cones for daytime closures only.

**SIGN PANEL SIZE (Min)**

| A | 36" x 36" |

**LEGEND**

- TRAFFIC CONE
- TRAFFIC CONE (OPTIONAL TAPER)
- TEMPORARY TRAFFIC CONTROL SIGN
- PORTABLE FLASHING BEACON
NOTES:
1. Lane closures on the right side using partial median shoulder as a traffic lane shall conform to the details shown except that C201CAL and 84-2H signs shall be used.
2. At least one person shall be assigned to provide full time maintenance of traffic control devices for lane closures.
3. Each advance warning sign on each side of the roadway shall be equipped with at least two flags for daytime closure. Each flag shall be at least 18" x 18" in size and shall be orange or fluorescent red-orange in color. Flashing beacons shall be placed at the locations indicated for lane closure during hours of darkness.
4. A C20-2 END ROAD WORK sign, with minimum width of 48" x 24" as approved, shall be placed at the end of the lane closure unless the end of work area is obvious or ends within a larger project's limits.
5. Place a C30(CA) sign every 2000' throughout length of lane closure.
6. Use one flashing arrow sign for each lane closed.
7. The flashing arrow signs shall be Type L.
8. All cones used for lane closures during the hours of darkness shall be fitted with retroreflective bands (or sleeves).
9. Portable diamondors placed at one-half the spacing indicated for traffic cones may be used instead of cones for daytime closures only.
10. A minimum of 3 cones shall be placed transversely across each closed lane and shoulder at each location where there is a complete traffic lane end and every 2000' as shown on the "Lane Closure with Partial Shoulder Use" detail. Two Type II barricades may be used instead of the 3 cones. The transverse alignment of the cones or barricades on the closed shoulder may be shifted from the transverse alignment to provide access to the work.
11. The 2L tangent shown along lane lines shall be used between the 1 topers required for each closed traffic lane.
12. A minimum of Two Type I or II barricades shall be placed across each closed lane and shoulder at the location shown and every 2000' within the complete closure area. Within the complete closure area, the transverse alignment of the barricades on the closed shoulder may be shifted from the transverse alignment to provide access to the work.

LEGEND
- TRAFFIC CONE
- TRAFFIC CONE (OPTIONAL TAPER)
- TEMPORARY TRAFFIC CONTROL SIGN
- FLASHING ARROW SIGN (FAS)
- FAS SUPPORT OR TRAILER
- PORTABLE FLASHING BEACON

SIGN PANEL SIZE (Min)
A 48" x 48"
B 48" x 18"
C 48" x 30"
NOTES:

1. Each advance warning sign shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16" x 16" in size and shall be orange or fluorescent red-orange in color. Flashing beacons shall be placed of the locations indicated for lane closure during hours of darkness.

2. A C02-2 "END ROAD WORK" sign, as appropriate, shall be placed at the end of the lane closure unless the end of work area is obvious, or ends within a larger project's limits.

3. All cones used for lane closures during the hours of darkness shall be fitted with retroreflective bands (or sleeves).

4. Portable delineators, placed at one-half the spacing indicated for traffic cones, may be used instead of cones for daytime closures only.

5. Flashing arrow sign shall be either Type I or Type II.

6. Lane closures shall not begin at the top of crest vertical curve or on a horizontal curve.

7. Median lane closures shall conform to the details shown, except that C01CAJ and #4-21 signs shall be used.

8. At least one person shall be assigned to provide full time maintenance of traffic control devices for lane closure unless, otherwise directed by the engineer.

TYPICAL LANE CLOSURE

NOTES:

See Standard Plan 1150 for tables.

Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1, unless X, Y, or Z cone spacing is shown on this sheet.

All temporary warning signs shall have black legend on fluorescent orange background.

California codes are designated by (CA). Otherwise, Federal (WHTC) codes are shown.
**TYPICAL HALF ROAD CLOSURE**

**NOTES:**

1. At least one person shall be assigned to provide full time maintenance of traffic control devices for lane closure unless, otherwise directed by the Engineer.

2. Each advance warning sign in each direction of travel shall be equipped with at least two flags for daytime closure. Each flag shall be at least 10" x 10" in size and shall be orange or fluorescent red-orange in color. Flashing beacons shall be placed at all locations indicated for lane closure during hours of darkness.

3. A C20-2 "END ROAD WORK" sign, as appropriate, shall be placed at the end of the lane closure unless the end of work area is obvious, or ends within the larger project's limits.

4. All cones used for lane closures during the hours of darkness shall be fitted with retroreflective bands or sleeves.

5. Portable delineators, placed at one-half the spacing indicated for traffic cones, may be used instead of cones for daytime closures only.

6. Flashing arrow signs shall be either Type I or Type II.

7. Advisory speed will be determined by the Engineer. The W1-4P plaque will not be required when advisory speed is more than the posted or maximum speed limit.

8. The tangent (L/2) shall be used.

9. Lane closures shall not begin at the top of crest vertical curve or on a horizontal curve.

**NOTE:**

See Standard Plan 1150 for tables.

Use cone spacing X for taper segment or Z for conflict situations, as appropriate, per Table 1, unless X, Y, or Z cone spacing is shown on this sheet.

All temporary warning signs shall have black legend on fluorescent orange background.

California codes are designated by (CA). Otherwise, Federal (MUTCD) codes are shown.
NOTES:

1. Each advance warning sign in each direction of travel shall be equipped with at least two flags for daytime closure. Each flag should be at least 18" x 18" in size. Flags shall be positioned so they do not interfere with character legibility of sign. Flapping sections shall be placed at the locations indicated for temporary closure during hours of darkness.

2. A "20k Road Work" sign is per Table 2, as appropriate shall be placed at the end of the lane control unless the end of work area is obvious, or ends within a larger project's limits.

3. All cones used for lane closures during the hours of darkness shall be fitted with retroreflective bands or sleeves.

4. Portable возложеониане приезетя the same the flagging indicator for traffic control vehicles may be used instead of traffic cones during hours of darkness.

5. Additional advance warning signs may be required. Flagging warning signs shall not be placed where they will interfere with approaching traffic or obstruct view of traffic.

6. Place C30(CA) "Lane Closed" sign at 500' to 1000' intervals throughout extended work areas. They are optional at work areas less than 500'.

7. When a flagger car is used, place a "C30(CA) Traffic Control" flag at the end of the flagger station. This flag shall be placed at the intersection within traffic control area. Signs shall be clean and visible at all times. Traffic cones cannot be effectively anticipated, so at least one flagger shall be used at each intersection within traffic control area.

8. An optional C20(CA) sign may be placed below the "20k Road Work" sign.

9. Either traffic cones or barricades shall be placed on the road. Barricades shall be Type E-2, or E-3.

10. The color of the portable transverse rumble strip shall be orange. The length of orange rumble strip shall consist of a sequence of orange rumble strips a distance 36" to 48" is recommended.

11. Portable transverse rumble strips shall not be placed on sharp horizontal or vertical curves not shall they be placed through pedestrian crossings.

12. If the portable transverse rumble strips are placed out of alignment (parallel) more than 6 inches measured from one and another, they should be removed to bring the procedure.

13. Portable transverse rumble strips are not required if any of the following conditions is satisfied:
   a. Work duration predicts 5 minutes or less.
   b. Paved speed limit is below 40 miles.
   c. Traffic is of emergency nature.
   d. Work zone is in snow or icy weather conditions.

SIGN PANEL SIZE (MIN)

A 36" x 36"  
B 20" x 30"  
C 36" x 42"  
D 20" x 7"  

LEGEND


TYPICAL LANE CLOSURE WITH REVERSIBLE CONTROL
T-INTERSECTION WITH TURNING POCKETS

T-INTERSECTION WITHOUT TURNING POCKETS

NOTES:
1. Barricades shall be Type I, II, or III for closures lasting one week or less and Type IV for closures lasting longer than one week.

2. In addition to placing the C191(CA) "ROAD CLOSED AHEAD" and C30(CA) "LANE CLOSED" signs, black or orange overlay plates with the word "CLOSED" may be mounted, as directed by the Engineer, on all guide signs that refer to the closed road. The letter size on the overlay shall be the same as the guide sign.

3. Each advance C191(CA) "ROAD CLOSED AHEAD" sign shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16" x 16" in size and shall be orange or fluorescent red-orange in color. A flashing beacon shall be placed on top of the first C191(CA) sign during hours of darkness.

4. All cones used for road closures during the hours of darkness shall be fitted with retroreflective bands (or sleeves) as specified in the specifications.

5. Portable delineators, placed on one-half the spacing indicated for traffic cones, may be used instead of cones for daytime ramp closures only.

6. At least one person shall be assigned to provide full time maintenance of traffic control devices, unless otherwise directed by the Engineer.

7. A minimum of 3 cones shall be placed transversely across each closed lane and shoulder.

LEGEND
- TRAFFIC CONE
- TEMPORARY TRAFFIC CONTROL SIGN
- BARRICADES
- PORTABLE FLASHING BEACON

SIGN PANEL SIZE (in) 4 in x 4 in
4 in x 30 in
30 in x 30 in

NOTES:
See Standard Plan 1150 for tables.
Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 3. Unless X, Y, or Z cone spacing is shown on this sheet.
All temporary warning signs shall have black legend on fluorescent orange background.
California codes are designated by (CA), Otherwise, Federal (M/C/O) codes are shown.
NOTES:

1. Lane closures on the right side using partial median shoulder as a traffic lane shall conform to the details shown except that C20-CAIR and N-28A signs shall be used.

2. Each advance warning sign on each side of the roadway shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16" x 16" in size and shall be orange or fluorescent orange-red in color. Floating beacons shall be placed at the locations indicated for lane closure during hours of darkness.

3. A C20-2 "END ROAD WORK" sign, with minimum size of 48" x 24", as appropriate, shall be placed at the end of the lane closure unless the end of work area is obvious or ends within a larger project's limits.

4. For W1 dimension of 28' (Min) to 44' (Max).

5. W2 shall not be less than 20'.

6. Flags shall be used for W2 less than 20'.

7. Buffer not optional for excavation work.

8. Identify all driveways and existing roadside signs within traffic control zone if present and use cone spacing 2, Table 1.

LEGEND

- TRAFFIC CONE
- TRAFFIC CONE (OPTIONAL TAPER)
- TEMPORARY TRAFFIC CONTROL SIGN
- TYPE CD
- FAS SUPPORT OR TRAILER
- PORTABLE FLASHING BEACON
- DIRECTION OF TRAFFIC

NOTES:

See Standard Plan 1150 for tables.

Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1, unless X, Y, or Z cone spacing is shown on this sheet.

All temporary warning signs shall have black legend on fluorescent orange background.

California codes are designated by (CA). Otherwise, Federal (MUTCD) codes are shown.