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### GENERAL NOTES:

1. Use this Index for all work zones.
2. See the Plans for Work Zone Speed.

### CLEAR ZONE WIDTHS FOR WORK ZONES

<table>
<thead>
<tr>
<th>Work Zone Speed (mph)</th>
<th>Min. Speed (mph)</th>
<th>Min. Length (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 40</td>
<td>≤ 40</td>
<td>1 - 45</td>
</tr>
<tr>
<td>≥ 45</td>
<td>≤ 45</td>
<td>1 - 45</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Where W = width of offset in feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>S = speed in mph</td>
</tr>
</tbody>
</table>

### TAPER LENGTH "L" (FEET)

<table>
<thead>
<tr>
<th>Work Zone Speed (mph)</th>
<th>Min. Length (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 40</td>
<td>1 - 45</td>
</tr>
<tr>
<td>≥ 45</td>
<td>1 - 45</td>
</tr>
</tbody>
</table>

### BUFFER LENGTH "U" (FEET)

<table>
<thead>
<tr>
<th>Work Zone Speed (mph)</th>
<th>Minimum Length (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 40</td>
<td>30</td>
</tr>
<tr>
<td>≥ 45</td>
<td>35</td>
</tr>
</tbody>
</table>

### WORK ZONE SIGN DISTANCE "X"

<table>
<thead>
<tr>
<th>Road Type</th>
<th>Min. Spacing (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Articulated and Collectors with Work Zone Speed ≤ 40 mph</td>
<td>200</td>
</tr>
<tr>
<td>Articulated and Collectors with Work Zone Speed &gt; 40 mph</td>
<td>500</td>
</tr>
<tr>
<td>Limited Access Roadways</td>
<td>1,500</td>
</tr>
</tbody>
</table>

Note: When using MUTCD Typical Applications, use the above values for all MUTCD "A", "B", and "C" distances before signs.
DROP-OFF NOTES:
1. When drop-offs occur within the clear zone due to construction or maintenance activities, protection devices are required (See Table 1). A drop-off is defined as a drop in elevation, parallel to the adjacent travel lanes, greater than 3 inches with slope (A/B) steeper than 1:4. In superelevated sections, the algebraic difference in slopes should not exceed 0.25 (See Drop-off Condition Details).

2. Optionally, mitigate drop-offs by placing slopes of optional base material per Specifications Section 285. Slopes shallower than 1:4 may be required to avoid algebraic difference in slopes greater than 0.25. Include the cost for the placement and removal of the material in Maintenance of Traffic. Use of this treatment in lieu of a temporary barrier is not eligible for CSIP consideration. Conduct daily inspections for deficiencies related to erosion, excessive slopes, rutting or other adverse conditions. Repair any deficiencies immediately.

4. For setback distance, refer to the Index or Approved Products List (APL) drawing of the selected barrier.

5. For Conditions 2 and 3 provided in Table 1, any drop-off condition that is created and restored within the same work period will not be subject to the use of temporary barriers. However, channelizing devices will be required.

6. When permanent curb heights are ≥ 6", no channelizing device will be required. For curb heights < 6", see Table 1.

MANHOLE/CROSSWALK/JOINT DROP-OFF NOTES:
1. Construct temporary asphalt apron for manholes extending 1" or more above the travel lane and crosswalks having an uneven surface greater than ¼".

2. Construct temporary asphalt apron for manholes extending 1" or more above the pedestrian way when the total drop-off is greater than 60".

3. A pedestrian way drop-off is defined as either:
   a. A drop in elevation greater than 10" that is closer than 2' from the edge of the pedestrian way;
   b. A drop in elevation greater than 3" with slope (A/B) steeper than 1:4 (See Drop-off Condition Details).

4. When drop-offs occur within the clear zone due to construction or maintenance activities, protection devices are required (See Table 1). A drop-off is defined as a drop in elevation, parallel to the adjacent travel lanes, greater than 3 inches with slope (A/B) steeper than 1:4. In superelevated sections, the algebraic difference in slopes should not exceed 0.25 (See Drop-off Condition Details).

5. Optionally, mitigate drop-offs by placing slopes of optional base material per Specifications Section 285. Slopes shallower than 1:4 may be required to avoid algebraic difference in slopes greater than 0.25. Include the cost for the placement and removal of the material in Maintenance of Traffic. Use of this treatment in lieu of a temporary barrier is not eligible for CSIP consideration. Conduct daily inspections for deficiencies related to erosion, excessive slopes, rutting or other adverse conditions. Repair any deficiencies immediately.

6. For condition 2 and 3 provided in Table 1, any drop-off condition that is created and restored within the same work period will not be subject to the use of temporary barriers. However, channelizing devices will be required.

For conditions 1 and 3 provided in Table 1, any drop-off condition that is created and restored within the same work period will not be subject to the use of temporary barriers. However, channelizing devices will be required.

7. When permanent curb heights are ≥ 6", no channelizing device will be required. For curb heights < 6", see Table 1.

Table 1

<table>
<thead>
<tr>
<th>Condition</th>
<th>C (inches)</th>
<th>D (feet)</th>
<th>Device Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&gt;3</td>
<td>2 - 12</td>
<td>Temporary Barrier</td>
</tr>
<tr>
<td>2</td>
<td>&gt;3 to ≤5</td>
<td>12 - 25</td>
<td>Channelizing Device</td>
</tr>
<tr>
<td>3</td>
<td>&gt;5</td>
<td>2 - 25</td>
<td>Temporary Barrier</td>
</tr>
<tr>
<td>4</td>
<td>Removal of Bridge or Retaining Wall Barrier</td>
<td>Temporary Barrier</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Removal of portions of Bridge Deck</td>
<td>Temporary Barrier</td>
<td></td>
</tr>
</tbody>
</table>

Note: Do not allow any drop-off conditions greater than 3 inches within two feet of the edge of traveled way.

MILLING & RESURFACING NOTES:
1. Whenever there is a difference in elevation between adjacent travel lanes, place "Uneven Lane" signs (WB-13) at intervals of 0.5 miles or less.

2. If D is 1.5" or less, no drop-off treatment is required.

3. If the slope of the drop-off is greater than 1:4 (not to exceed 1:1), place a 6" white solid line on each side of the drop-off. Additionally, place "Stay In Your Lane" signs (MOT-1-06) as a supplement to the "Uneven Lane" signs (WB-13). This condition may be used for distances of three miles or less.

MILLING & RESURFACING LANE DROP-OFF TREATMENT DETAIL

MANHOLE/CROSSWALK/JOINT DROP-OFF TREATMENT DETAIL

PEDESTRIAN WAY DROP-OFF NOTES:
1. A pedestrian way drop-off is defined as either:
   a. A drop in elevation greater than 10" that is closer than 2' from the edge of the pedestrian way;
   b. A slope steeper than 1:2 that begins closer than 2' from the edge of the pedestrian way when the total drop-off is greater than 60".

2. Protect any drop-off adjacent to a pedestrian way with pedestrian longitudinal channelizing devices, temporary barrier wall, or approved handrail.
NOTES:
1. Use this detail when work disrupts a business entrance for greater than one entire calendar day.

2. For single business entrances, place one 24"x36" business sign with the business name at each affected driveway entrance. Logos may be provided by the business owners. Alternatively, a sign with the message "Business Entrance" (see Index 700-102) may be used when approved by the Engineer.

3. When two or more businesses share a common driveway entrance, place a 24"x36" with the message "Business Entrance" (see Index 700-102) at the common driveway entrance.

SYMBOLS:
- Channelizing Device (See Sheet B)
- Lane Identification and Direction of Traffic
- Work Zone Sign

TYPICAL PCMS DISPLAY:
With speed reduction:
Message 1: WORKERS PRESENT AHEAD
Message 2: SPEED REDUCED NEXT XX MI

Without speed reduction:
Message 1: WORKERS PRESENT AHEAD
Message 2: NEXT XX MILES

NOTES:
1. $X = \text{Work Zone Sign Spacing}$

2. When called for in the Plans, use this detail in accordance with the Plans and Standard Plans. Place the speed reduction signs (W3-5 and R2-1) in advance of the "Road Work Ahead" sign (W20-1F) as shown.

3. Do not use this detail in conjunction with the Motorist Awareness System.

4. For speed reductions greater than 10 MPH, reduce speed in 10 MPH increments of $X$.

5. Place additional "Speed Limit" signs (R2-1) at intervals of no less than one mile for rural conditions and 1,000 feet for urban conditions.

6. For undivided roadways, omit the signs shown in the median.

MOTORIST AWARENESS SYSTEM

NOTES:
1. $X = \text{Work Zone Sign Spacing}$

2. When called for in the Plans, use the Motorist Awareness System (MAS) in accordance with the Plans, and Standard Plans, Indexes 102-45, 102-50, 102-55, and 102-60. When using this detail with the Indexes, place the MAS devices (i.e., PCMS, PRS, and RDSU) in advance of the "Road Work Ahead" sign (W20-1F) as shown.

3. For a posted speed of 65 mph or greater, display speed with a ten mph reduction. For a posted speed of 60 mph, display a reduced speed of 55 mph. Use posted speed as the work zone speed.

4. Use the PCMS in the median for roadways with three lanes or less in the same direction of traffic.
**SIGN ATTACHMENT DETAILS**

- **Sign Panel**: 5/8" Thick Aluminum
- **Sign Panel**: Aluminum Z 1½x13½x0.09
- **Sign Post**: 4 lb/ft U-Channel
- **Sign Post**: 6" Min. 6" Max (Typ.) (At A Post)
- **Cutting Edge**: For Base Post Only
- **Stub Height**: 4" Max
- **Steel U-Channel Posts**: Bottom Of Sign
- **Steel U-Channel Posts**: Sign Post Or Base Post
- **Flat Washer**: Steel Hex Nut
- **Lock Washer**: (¾" Nominal Size)
- **Steel U-Channel Post**: 500 FT
- **Work Zone**: 500 FT
- **ROADWORK**: 500 FT
- **Roadway**: 2 Posts - Flushed Shoulder
- **Roadway**: 2 Posts - Curb and Gutter
- **Roadway**: 3 Posts - Flushed Shoulder

**NOTES:**

1. Do not install bolts closer than 1" to cutting edge of Base Post.
2. Soil plates are not required for posts installed in asphalt pavement, shoulder pavement, sidewalk, or existing rock with a minimum cumulative depth of 2.
3. Use 3 lb/ft posts for Clear Height up to 10 and 4 lb/ft posts for Clear Height up to 12.
4. For diamond warning signs with supplement plaque (up to 5 ft³ in area), use 4 lb/ft sign posts.
BORDER
W=4"
TH=0.25"
IN=0.75"

PROJECT INFORMATION SIGN DETAIL FOR
WORK ZONE SPEED OF 50 MPH OR GREATER

PROJECT INFORMATION SIGN DETAIL FOR
WORK ZONE SPEED OF 45 MPH OR LESS

NOTES:
1. Road designation should be the most common designation (i.e., I-Interstate, SR-State Road, or US).
2. Italic text on signs indicates variable information that is specific to the project.
3. See Sheet 4 for the Typical Foundation Detail and the Sign Attachment Details.
4. Under "Questions or Comments", use the project website, or a telephone number for those projects without websites.

PROJECT INFORMATION SIGNS
PLACEMENT OF PAVEMENT MARKINGS

RPM PLACEMENT ON TWO-LANE ROADWAYS

RPM PLACEMENT ON MULTILANE ROADWAYS
(Lane Shift Shown, Other Multilane Typical Applications Similar)

NOTES:
1. Install RPMs as a supplement to:
   a. All lane lines
   b. Edge lines in transitions (e.g., merges, diversions, lane shifts)
   c. Edge lines of gore areas
2. Extend pavement marking and 5' RPM spacing by 100' in each direction
   for all transitions regardless of the line type.
3. Place RPMs in accordance with this detail and Index 706-001.

SYMBOLS:
- Work Space
- Lane Identification and Direction of Traffic

WORK ZONE PAVEMENT MARKINGS

RPM PLACEMENT IN WORK ZONES

PLACEMENT OF PAVEMENT MARKINGS
Use Temporary Raised Rumble Strips in accordance with the Plans and Specification 102.
NOTE:
For pedestrian longitudinal channelizing device requirements, see Specification 990.
NOTES:
1. As determined by the Engineer, use a flagger, shoulder closure, or lane closure to accommodate a significant amount of work vehicle ingress and egress.
2. This Index may be applied to the medians of divided roadways.

SYMBOLS:

APPLIES TO TWO-LANE AND MULTILANE ROADWAYS
SYMBOLS:
- Work Space
- Channelizing Device (See Index 102-000)
- Work Zone Sign
- Lane Identification and Direction of Traffic

NOTES:
1. L = Taper Length
   X = Work Zone Sign Distance
   See Index 102-000 for "L" and "X" values.
2. For incidental work (e.g., mowing or litter removal), only the Road Work Ahead sign is required.
3. As determined by the Engineer, use a flagger or lane closure to accommodate a significant amount of work vehicle ingress and egress.
4. For work less than two feet from the traveled way and work zone speed greater than 45 MPH, use a lane closure.
5. This Index may be applied to the medians of divided roadways.
6. The "Speeding Fines Doubled When Workers Present" signs (MOT-13-06) and "End Road Work" signs (G20-2) along with associated work zone sign distances may be omitted when the temporary condition is in place for 24 hours or less.
7. Temporary pavement markings may be omitted when the temporary condition is in place for 24 hours or less.

APPLIES TO TWO-LANE AND MULTILANE ROADWAYS
GENERAL NOTES:
1. Vehicle-mounted signs shall be mounted with the bottom of the sign at a minimum height of 48 inches above the pavement. Vehicle mounted changeable message signs may be used in lieu of truck mounted static signs. Changeable message signs shall flash alternately to read “Left or Right Lane” or “Two Left or Two Right Lanes”, “Closed Ahead”, and the arrow symbol. Arrow boards shall not be use with truck mounted changeable message signs. Sign legends shall be covered or turned from view when work is not in progress.

2. For multilane roadways with curb and no paved shoulder, omit the shadow vehicle that would have been used on the paved shoulder. In such instances, the warning sign should be mounted on the shadow vehicle farthest from the work vehicle.

3. Minimize the longitudinal spacing between vehicles to deter road users from driving in between.

4. Use inverted plan of the illustrations for work on left side of roadways.

5. Ensure that all vehicles in the mobile operation convey have functional two-way communication.

6. If the speed of the mobile operation exceeds the existing posted speed limit on limited access roadways and one half the existing posted speed limit on other roadways, the Engineer may delete requirements for shadow vehicles and attenuators. In such situations, mount arrow board and sign on the work vehicle.

SYMBOLS:
- ![Lane Identification and Direction of Traffic](image)
- ![Truck/Trailer Mounted Attenuator (TMA)](image)
- ![Work Vehicle With Warning Lights](image)
- ![Shadow (S) Vehicle With Warning Lights And Arrow Board](image)

APPLIES TO TWO-LANE AND MULTILANE ROADWAYS
SYMBOLS:
- Lane Identification and Direction of Traffic
- Truck/Trailer Mounted Attenuator (TMA)
- Work Vehicle With Warning Lights
- Shadow (S) Vehicle With Warning Lights And Arrow Board

WORK IN TRAVELED WAY - MULTILANE ROADWAY, SINGLE LANE CLOSURE

WORK IN TRAVELED WAY - MULTILANE ROADWAY, DOUBLE LANE CLOSURE

WORK IN TRAVELED WAY - MULTILANE ROADWAY, TRIPLE LANE CLOSURE
**SYMBOLS:**
- Work Space
- Work Zone Sign
- Lane Identification and Direction of Traffic
- Traffic Control Officer

**NOTES:**
1. \( U = \) Buffer Length
   \( X = \) Work Zone Sign Distance
   See Index 102-000 for \( U \) and \( X \) values.

2. Do not use this Index for limited access roadways.

3. Use this Index for temporary daytime road closures of 5 minutes or less.

4. Optionally, use "Flagger Ahead" sign with symbol (W20-7) instead of "Flagger Ahead" sign with text (W20-7A).

**APPLIES TO TWO-LANE AND MULTILANE ROADWAYS**
NOTES:
1. \( L = \text{Taper Length} \)
\( U = \text{Buffer Length} \)
\( X = \text{Work Zone Sign Distance} \)

See Index 102-000 for "L", "U", "X", and channelizing device spacing values.

2. Optionally, use "Flagger Ahead" sign with symbol (W20-7) instead of "Flagger Ahead" sign with text (W20-1A).

3. Use temporary raised rumble strips in accordance with the Plans. If temporary raised rumble strips are not used, omit "Rumble Strips Ahead" signs (MOT-18-10) and associated work zone sign distance. See Index 102-000 for temporary raised rumble strip details.

4. The "Speeding Fines Doubled When Workers Present" signs (MOT-13-06) and "End Road Work" signs (G20-2), along with associated work zone sign distances, may be omitted when the work zone will be in place for 24 hours or less.

SYMBOLS:
- Work Space
- Channelizing Device (See Index 102-000)
- Work Zone Sign
- Lane Identification and Direction of Traffic
- Flagger

Temporary Raised Rumble Strip Set
(See Note 3)

W20-1F
MOT-13-06
(See Note 4)
MOT-18-10
(See Note 3)
W20-4
W20-7A
(See Note 2)

250'  X  X  X  X  X  X  X  X  50'-100'  50'-100'

Temporary Raised Rumble Strip Set
(See Note 3)

W20-1A
(See Note 2)
MOT-18-10
(See Note 3)
MOT-13-06
(See Note 4)
W20-4
W20-7A
(See Note 2)
GENERAL NOTES:

1. \( L = \) Taper Length
\( U = \) Buffer Length
\( X = \) Work Zone Sign Distance

See Index 102-000 for "L", "U", "X", and channelizing device spacing values.

2. Optionally, use "Signal Ahead" signs with symbols (W3-3) instead of "Signal Ahead" signs with text (W3-3A).

3. Use temporary raised rumble strips in accordance with the Plans. If temporary raised rumble strips are not used, omit "Rumble Strips Ahead" signs (MOT-18-10) and associated work zone sign distance. See Index 102-000 for temporary raised rumble strip details.

4. The "Speeding Fines Doubled When Workers Present" signs (MOT-13-06) and "End Road Work" signs (W20-2), along with associated work zone sign distances, may be omitted when the work zone will be in place for 24 hours or less. The "Speeding Fines Doubled When Workers Present" signs (MOT-13-06) and "End Road Work" signs (W20-2), along with associated work zone sign distances, may be omitted when the work zone will be in place for 24 hours or less.

5. For the maximum distance between temporary traffic signals, do not exceed the distance at which the temporary traffic signals can safely communicate. When the distance temporary traffic signals is greater than 0.25 miles, use a combination of a pilot vehicle and manually-controlled temporary traffic signals.

6. Monitor temporary traffic signals by having one or more workers present during operation. In the event of a temporary traffic signal failure, use flaggers to control traffic.

SYMBOLS:

- Work Space
- Channelizing Device (See Index 102-000)
- Lane Identification and Direction of Traffic
- Temporary Traffic Signal
- Work Zone Sign
- Flagger

SIDE ROAD INTERSECTING THE WORK ZONE
Lane Identification and Direction of Traffic
Temporary Traffic Signal
Work Zone Sign
Flagger

SYMBOLS:

NOTES:
1. $X$ = Work Zone Sign Distance
   See Index 102-000 for "X" values.
2. Optionally, use "Signal Ahead" signs with symbols (W3-3) instead of "Signal Ahead" signs with text (W3-3A).
3. The "End Road Work" signs (G20-2) may be omitted when the work zone is in place for 24 hours or less.
4. Optionally, use temporary traffic signals for control of the haul road.

(Two-Lane Roadway Shown, Multilane Roadway Similar)
DESCRIPTION:

REV 11/01/19

SYMBOLS:

- Work Zone Sign
- Channelizing Device
- Work Space
- Lane Identification and Direction of Traffic

NOTES:

1. L = Taper Length
   U = Buffer Length
   X = Work Zone Sign Distance
   R = Radius of Curve
   See Index 102-000 for “L”, “U”, “X”, and channelizing device spacing values. See Plans for “R” values.

2. If the tangent distance “T” is less than 600’, then, for each direction, use a “Double Reverse Curve” sign (W24-1) instead of the first “Reverse Curve” sign (W1-4) and omit the second “Reverse Curve” sign.

3. If the temporary paved shoulder matches the width of the existing paved shoulder, omit taper and channelizing devices from the paved shoulder.

WORK ZONE SIGN

LANE IDENTIFICATION AND DIRECTION OF TRAFFIC

TYPE III BARRICADE
NOTES:
1. L = Taper Length
   U = Buffer Length
   X = Work Zone Sign Distance
   See Index 102-000 for "L", "U", "X", and channelizing device spacing values.

2. Use temporary raised rumble strips in accordance with the Plans. If temporary raised rumble strips are not used, omit "Rumble Strips Ahead" signs (G20-18-10) and associated work zone sign distance. See Index 102-000 for temporary raised rumble strip details.

3. If the paved shoulder is less than 4' in width, omit the taper and channelizing devices from the paved shoulder.

4. The "Speeding Fines Doubled When Workers Present" signs (MOT-13-06) and "End Road Work" signs (G20-2), along with associated work zone sign distances, may be omitted when the work zone will be in place for 24 hours or less.

5. Use inverted plan of the illustrations for work on left side of roadways.

6. Temporary pavement markings may be omitted when the temporary condition is in place for 24 hours or less.
MULTI LANE ROADWAY, MULTIPLE LANE CLOSURES

NOTES:

1. L = Taper Length
   U = Buffer Length
   X = Work Zone Sign Distance
   See Index 102-000 for "L", "U", "X", and channelizing device spacing values.

2. Use temporary raised rumble strips in accordance with the Plans. If temporary raised rumble strips are not used, omit "Rumble Strips Ahead" signs (MOT-18-10) and associated work zone sign distance. See Index 102-000 for temporary raised rumble strip details.

3. If the paved shoulder is less than 4' in width, omit taper and channelizing devices from the paved shoulder.

4. The "Speeding Fines Doubled When Workers Present" signs (MOT-13-06) and "End Road Work" signs (MOT-19-2), along with associated work zone sign distances, may be omitted when the work zone condition will be in place for 24 hours or less.

5. Use inverted plan of the illustrations for work on left side of roadways.

6. Temporary pavement markings may be omitted when the temporary condition is in place for 24 hours or less.

SYMBOLS:

\[\begin{array}{c}
\text{Work Space} \\
\text{Channelizing Device (See Index 102-000)} \\
\text{Work Zone Sign} \\
\text{Lane Identification and Direction of Traffic} \\
\text{Arrow Board}
\end{array}\]

\[
\begin{align*}
\text{Temporary Raised Rumble Strip Set} & \quad (\text{See Note 2}) \\
\text{Speeding Fines Doubled When Workers Present} & \quad (\text{See Note 2}) \\
\text{Rumble Strips Ahead} & \quad (\text{See Note 2}) \\
\text{Foot/Lane Closed Ahead} & \quad (\text{See Note 2}) \\
\text{End Road Work} & \quad (\text{See Note 4})
\end{align*}
\]

\[
\begin{align*}
\text{W20-1F} & \quad (\text{See Note 4}) \\
\text{MOT-17-06} & \quad (\text{See Note 4}) \\
\text{W20-5AR} & \quad (\text{See Note 4}) \\
\text{W4-2} & \quad (\text{See Note 4})
\end{align*}
\]

\[
\begin{align*}
\text{Arrow Board Message: Merge}
\end{align*}
\]

\[
\begin{align*}
\text{Arrow Board Message: Merge}
\end{align*}
\]
NOTES:

1. \( L = \) Taper Length.
\( U = \) Buffer Length.
\( X = \) Work Zone Sign Distance.

See Index 102-000 for \( U, L, X, \) and channelizing device spacing values.

2. Use temporary raised rumble strips in accordance with the Plans. If temporary raised rumble strips are not used, omit "Rumble Strips Ahead" signs (MOT-18-10) and associated work zone sign distance. See Index 102-000 for temporary raised rumble strip details.

3. If the paved shoulder is less than 4' in width, omit taper and channelizing devices from the paved shoulder.

4. The "Speeding Fines Doubled When Workers Present" signs (MOT-13-06) and "End Road Work" signs (G20-2) along with associated work zone sign distances, may be omitted when the work zone will be in place for 24 hours or less.

5. Use inverted plan of the illustrations for work on left of roadways.

6. Temporary pavement markings may be omitted when the temporary condition is in place for 24 hours or less.
NOTES:

1. L = Taper Length
   U = Buffer Length
   X = Work Zone Sign Distance
   See Index 102-000 for "L", "U", "X", and channelizing device spacing values.

2. If the tangent distance "T" is less than 600', then use "Double Reverse Curve" signs (W24-1A) instead of the first pair of "Reverse Curve" signs (W1-4B) and omit the second pair of "Reverse Curve" signs.

3. Use temporary raised rumble strips in accordance with the Plans. If temporary raised rumble strips are not used, omit "Rumble Strips Ahead" signs (MOT-18-10) and associated work zone sign distance. See Index 102-000 for temporary raised rumble strip details.

4. If the paved shoulder is less than 4' in width, omit taper and channelizing devices from the paved shoulder.

5. The "Speeding Fines Doubled When Workers Present" signs (MOT-13-06) and "End Road Work" signs (G20-2), along with associated work zone sign distances, may be omitted when the work zone will be in place for 24 hours or less.

6. Temporary pavement markings may be omitted when the temporary condition is in place for 24 hours or less.
DESCRIPTION:

Revision of Standard Plans FY 2020-21

Sheet Index

NOTES:

SYMBOLS:

- Work Zone Sign
- Channelizing Device (See Index 102-000)
- Work Space
- Crash Cushion
- Type III Barricade

TEMPORARY DIVERSION FOR ROADWAYS WITH WORK ZONE SPEED OF 50 MPH OR GREATER

1. L = Taper Length
   U = Buffer Length
   X = Work Zone Sign Distance
   R = Radius of Curve

   See Index 102-000 for "L", "U", "X", channelizing device spacing values. See Plans for "R" values.

2. If the tangent distance "T" is less than 600', then use "Double Reverse Curve" signs (W24-1A) instead of the first pair of "Reverse Curve" signs (W1-4B) and omit the second pair of "Reverse Curve" signs.

3. If the paved shoulder is less than 4' in width, omit the taper and channelizing devices shown on the paved shoulder.
TEMPORARY DIVERSION FOR ROADWAYS WITH WORK ZONE SPEED OF 45 MPH OR LESS

NOTES:
1. L = Taper Length
   U = Buffer Length
   X = Work Zone Sign Distance
   R = Radius of Curve
   See Index 102-000 for "L", "U", "X", channelizing device spacing values. See Plans for "R" values.

2. If the tangent distance "T" is less than 600', then use "Double Reverse Curve" signs (W24-1A) instead of the first pair of "Reverse Curve" signs (W1-4B) and omit the second pair of "Reverse Curve" signs.

3. If the paved shoulder is less than 4' in width, omit the taper and channelizing devices shown on the paved shoulder.
### LENGTH OF ACCESS LANES

<table>
<thead>
<tr>
<th>Grade</th>
<th>D (feet)</th>
<th>D' (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2% or less</td>
<td>590</td>
<td>1540</td>
</tr>
<tr>
<td>3 to 4% Upgrade</td>
<td>530</td>
<td>2310</td>
</tr>
<tr>
<td>3 to 4% Downgrade</td>
<td>710</td>
<td>925</td>
</tr>
</tbody>
</table>

### SYMBOLS:

- **D Work Zone Sign**
- **Arrow Lane Identification and Direction of Traffic**

### NOTES:

1. **X = Work Zone Sign Distance**
   
   See Index 102-000 for "X" value.

2. Locate temporary openings in areas having adequate sight distance.

3. Do not locate temporary openings within 1.5 miles of interchanges, nor within 2000 feet of the acceleration-deceleration lanes at rest areas, median openings, other access openings, or other highway service areas.

4. Do not remove existing guardrail or barrier for temporary openings.

5. Use mitered end sections for any end sections within the clear zone.

6. Match cross slope of existing shoulder for widening.

7. Provide 2' of unpaved shoulder outside of the widening.
NOTES:
1. P = Traffic Pacing Length
   For "P" value, see Traffic Pacing Length table or calculate using Formulas.
2. Use the Plans for traffic pacing restrictions.
3. Do not exceed work duration of 30 minutes or traffic pacing length of 10 miles.
4. Coordinate with the traffic control officer supervisor to provide the correct number of traffic control officers for each traffic pacing operation.
5. Ensure that the necessary equipment is properly positioned for the work before requesting that the traffic control officer supervisor initiate the traffic pacing operation.
6. If workers or equipment are within the traveled way during the traffic pacing operation, use a truck- or trailer-mounted attenuator with portable changeable message sign to protect the work.
7. Maintain communications with all police vehicles throughout the traffic pacing.
8. Where feasible, do not pace traffic past the last available existing egress until the work has been completed.
9. When more than one traffic pacing operation is required in a calendar day, allow sufficient time between pacing operations to permit traffic to return to normal speed and flow.
10. For work durations of less than five minutes (e.g., moving large vehicles across the roadway), portable changeable message signs and truck-mounted attenuators are not required. Use traffic pacing length values from the five minute column of the table.

SYMBOLS:
- Work Space
- Lane Identification and Direction of Traffic
- Portable Changeable Message Sign (PCMS)
- Traffic Control Officer

TYPICAL PCMS DISPLAY:
One week prior to pacing operation:
Message 1: EXPECT DELAYS ON
Message 2: ROAD WORK TONIGHT
During day of pacing operation:
Message 1: SLOW TRAFFIC AHEAD
Message 2: BE PREPARED TO STOP

DESCRIPTION:
10/31/19

TRAFFIC PACING LENGTH "P"

<table>
<thead>
<tr>
<th>Pacing Speed (mph)</th>
<th>Work Zone Speed (mph)</th>
<th>Work Duration (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>2.3</td>
<td>40</td>
</tr>
<tr>
<td>55</td>
<td>2.5</td>
<td>45</td>
</tr>
<tr>
<td>50</td>
<td>2.8</td>
<td>60</td>
</tr>
<tr>
<td>60</td>
<td>2.5</td>
<td>75</td>
</tr>
<tr>
<td>60</td>
<td>2.5</td>
<td>10</td>
</tr>
<tr>
<td>65</td>
<td>2.3</td>
<td>-</td>
</tr>
<tr>
<td>70</td>
<td>2.3</td>
<td>-</td>
</tr>
<tr>
<td>80</td>
<td>2.3</td>
<td>-</td>
</tr>
</tbody>
</table>

Notes: (1) All lengths in the above table are in miles.
(2) For work durations with no values shown above, calculate length using a reduced pacing speed, but not less than 20 mph.

FORMULAS:

\[ P = \frac{W}{60} \left( \frac{S_p - S_w}{S_p} \right) \]

\[ P_w = \text{distance paced vehicles travel while work is performed} \]

\[ P_c = \text{distance paced vehicles must travel before the vehicles at regulatory speed have cleared the work zone} \]

\[ P_f = \frac{W}{60} \left( \frac{S_p - S_w}{S_p} \right) \]

\[ W = \text{Width (in feet)} \]

10 mph. length using a reduced pacing speed, but not less than 20 mph.

50
55
60
65
70
80
90
100
10 mph.

Traffic Pacing Length (miles) = \( \frac{P}{S} \)

Traffic Pacing (mph) = \( \frac{S}{60} \)

Speed (mph)

Work Zone

Traffic Pacing Length (miles)
SYMBOLS:
- Work Zone Sign
- Lane Identification and Direction of Traffic
- Pedestrian Longitudinal Channelizing Device (LCD)

NOTES:
1. Cover or deactivate pedestrian traffic signal display(s) controlling closed crosswalks.
2. Place pedestrian LCDs across the full width of the closed sidewalk.
3. "Sidewalk Closed" signs (R9-XX) may be mounted on pedestrian LCDs in accordance with the manufacturer's instructions.
TEMPORARY PEDESTRIAN WAY

TEMPORARY PEDESTRIAN WAY DIVERTING TRAFFIC INTO THE TRAVELED WAY
(Temporary Barrier Shown, Low Profile Barrier Similar)

NOTES:
1. L = Faser Length
U = Buffer Length
X = Work Zone Sign Distance
See Index 102-000 for "L", "U", "X", channelizing device spacing values.

2. Provide a 5' wide temporary pedestrian way with a maximum cross-slope of 0.03, except where space restrictions warrant a minimum width of 4'. Provide a 5' x 5' passing space for temporary pedestrian ways less than 5' in width at intervals not to exceed 200'.

3. When temporary pedestrian ways require curb ramps, meet the requirements of Index 522-002. Detectable warnings are not required for curb ramps diverting pedestrian traffic into a closed lane.

4. Use temporary raised rumble strips in accordance with the Plans. If temporary raised rumble strips are not used, omit "Rumble Strips Ahead" signs (MOT-18-10) and associated work zone sign distance. See Index 102-000 for temporary raised rumble strip details.

5. The "Speeding Fines Doubled When Workers Present" signs (MOT-13-06) and "End Road Work" signs (G20-2), along with associated work zone sign distances, may be omitted when the work zone will be in place for 24 hours or less.

SYMBOLS:
- Work Space
- Channelizing Device (See Index 102-000)
- Work Zone Sign
- Lane Identification and Direction of Traffic
- Arrow Board
- Crash Cushion
- Pedestrian Longitudinal Channelizing Device (LCD)
- Temporary Pedestrian Way
GENERAL NOTES:

1. Temporary barrier systems may be any of the following:

A. Type K Temporary Concrete Barrier System (Index 102-110) installed as either Free-Standing or Anchored

B. Proprietary Temporary Barrier Systems on the Approved Product List (APL)
   a. Concrete Barrier (Free-Standing or Anchored)
   b. Steel Barrier (Anchored)
   c. Water Filled Filled Barrier (Free-Standing)

2. Where existing flexible pavement is not present, construct a minimum 2" thick temporary Asphalt Pad using Miscellaneous Asphalt Pavement in accordance with Specification 339 with the exception that the use of a pre-emergent herbicide is not required.

3. For Barrier Delineators, see Specification 102. Mount on top of temporary barriers. Color must match adjacent longitudinal pavement marking.

4. Remove all grass debris, loose dirt, and sand from the pavement, bridge deck, or asphalt pad surface within the barrier footprint just prior to placement of the temporary barrier.

5. Ensure the setback distance is clear of any grass, construction debris, stockpiled materials, equipment, and objects.

6. Transitions are required between Type K Barrier and free-standing, anchored, back-filled materials, equipment, and objects.

7. Anchoring (Bolting) of temporary barrier or crash cushions is not permitted on bridge superstructures that contain post-tensioned tendons within the concrete deck (top flange of concrete box girders) or on bridge superstructures consisting of longitudinally prestressed, transversely post-tensioned, solid or voided concrete slab units.

8. Anchor abutting segments of temporary barrier terminated with a Crash Cushion as shown in Index 102-110 or the APL.

9. The requirements of this Index do not apply to Temporary Low Profile Barrier, See Index 102-120.

10. Setback requirements below cover most Temporary Barrier options. Provide additional setback distance for APL products that require additional setback (deflection) space.

INSTALLATION DATA

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>LATERAL OFFSET</th>
<th>SETBACK DISTANCE</th>
<th>PAVEMENT/ASPHALT WIDTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anchored</td>
<td>2&quot; Min*</td>
<td>2&quot; Min*</td>
<td>1&quot; Min</td>
</tr>
<tr>
<td>Free-standing</td>
<td>2&quot; Min</td>
<td>4&quot; Min</td>
<td>4&quot; Min</td>
</tr>
</tbody>
</table>

* For Bridge Decks see Index 102-110 or APL.
APPROACH SHOULDER BARRIER TRANSITION ON UNDIVIDED FACILITIES

APPROACH SHOULDER BARRIER TRANSITION ON DIVIDED FACILITIES

MEDIAN BARRIER TRANSITION
DEPARTURE SHOULDER BARRIER TRANSITION ON UNDIVIDED FACILITIES

DEPARTURE (TRAILING) SHOULDER BARRIER TRANSITION ON DIVIDED FACILITIES
GENERAL NOTES:
1. Meet the requirements of Index 102-100.
2. For fabrication details see Sheets 15 thru 17.
3. HANDLING: Do not lift or move the Barrier Units by using Bars 6D that extend from the ends of the units. Approximate weight of one unit equals 2.7 tons.
4. CONNECTION PIN ASSEMBLY: Use steel for Connection Pin and Top Plate assemblies in accordance with ASTM A36 or ASTM A709 Grade 36. Nondestructive testing of welds is not required. At the Contractor's option, a ½" diameter hole may be provided at the bottom of the Connection Pin, as shown, for the installation of a vandal resistance bolt.
5. CONNECTION PIN INSTALLATION: Initially set Barrier Units by using a 3½" wooden block between ends of adjacent units. Install Connection Pin between adjacent Barrier Units as shown, then pull newly placed Barrier Unit away from adjacent Barrier Unit to remove slack between Connection Pin and Bars 6D (except as shown on Sheet 2). Do not use Barrier Units unconnected.
6. USE OF CONNECTION PINS AND STAKES: Connection pins and stakes may be reused if they have the structural integrity of new pins.
7. REMOVAL OF BOLTS, STAKES AND KEEPER PINS: Upon removal or relocation of Barrier Units, remove all Anchor Bolts and completely fill the remaining holes in bridge decks, approach slabs and roadway rigid pavements that are to remain with Magnesium Ammonium Phosphate Concrete in accordance with Specification 930 or with an Epoxy Resin Compound, Type F or Q, in accordance with Specification 926. If a flexible pavement is present and is to remain, completely fill the remaining holes in the flexible pavement with hot or cold patch asphalt material.
8. Type K Anchored to Free-Standing transitions: use the 3-3-2-1 Anchorage Transition Detail when transitioning Free-Standing and Anchored Units or when connecting Free-Standing runs to Crash Cushions, as shown in this Index.

NOTES FOR THRIE-BEAM GUARDRAIL SPLICE INSTALLATIONS:
1. THRIE-BEAM GUARDRAIL: Provide Thrie-Beam Guardrail for splices meeting the requirements of specification 967 and as follows: Two panels per splice (one panel per side of Class B (10 Gauge), or Four panels per splice (two nested panels per side) of Class A (12 Gauge). Use a 12-6" guardrail panel. Provide and install all other associated metallic guardrail components (Terminal Connectors, Shoulder Bolts, Hex Bolts and Nuts, Filler Plates, etc.) in accordance with Index 536-001. Install four Guardrail Anchor Bolts at each end of each splice in any of the standard seven anchor bolt holes in the Thrie-Beam Terminal Connector. At reinforcing steel, rebar is to be encased when drilling holes for Guardrail Anchor Bolts in Type K Barrier Units, shift Thrie-Beam Terminal Connector so as to clear reinforcing steel within the given tolerances or select a different bolt hole to use. Do not drill or cut through reinforcing steel within Type K Barrier Units. Drilling or cutting through reinforcing steel within permanent concrete traffic railings is permitted.
2. GUARDRAIL OFFSET BLOCKS: Provide and install timber Offset Blocks meeting the requirements of Specification 967. Field trim Offset Blocks as required for proper fit. Utilize Offset Blocks as shown and required in order to prevent bending or kinking of Thrie-Beam Guardrail panels.
3. CONCRETE FOR FILLING TAPERED TRAFFIC RAILING TOES: Provide concrete for filling tapered toes of Traffic Railings as shown meeting the material requirements of Specification 346, any Class, or a commercially available pre-bagged concrete mix (3000 psi minimum compressive strength). Sampling, testing, evaluation and certification of the concrete shall be in accordance with Specification 346 is not required. Saturate with water the surfaces upon and against which the concrete fill will be placed prior to placing concrete. Place and finish concrete fill using forms or by hand methods to the general configurations shown as to provide a smooth shape transition between the Type K Barrier and the adjacent traffic railing. A low water content is desirable if placing and finishing concrete by hand methods. Cure the concrete fill by application of a curing compound, or by covering with a wet tarp or burlap for a minimum of 24 hours. Completely remove the concrete fill upon relocation or removal of the Type K Temporary Concrete Barrier.
4. CONNECTION PIN INSTALLATION: Initially set Barrier Units by using a 3½" wooden block between ends of adjacent units. Install Connection Pin between adjacent Barrier Units as shown, then pull newly placed Barrier Unit away from adjacent Barrier Unit to remove slack between Connection Pin and Bars 6D (except as shown on Sheet 2). Do not use Barrier Units unconnected.
5. USE OF CONNECTION PINS AND STAKES: Connection pins and stakes may be reused if they have the structural integrity of new pins.
6. REMOVAL OF BOLTS, STAKES AND KEEPER PINS: Upon removal or relocation of Barrier Units, remove all Anchor Bolts and completely fill the remaining holes in bridge decks, approach slabs and roadway rigid pavements that are to remain with Magnesium Ammonium Phosphate Concrete in accordance with Specification 930 or with an Epoxy Resin Compound, Type F or Q, in accordance with Specification 926. If a flexible pavement is present and is to remain, completely fill the remaining holes in the flexible pavement with hot or cold patch asphalt material.
7. Type K Anchored to Free-Standing transitions: use the 3-3-2-1 Anchorage Transition Detail when transitioning Free-Standing and Anchored Units or when connecting Free-Standing runs to Crash Cushions, as shown in this Index.

NOTES FOR THRIE-BEAM GUARDRAIL SPLICE INSTALLATIONS:
1. THRIE-BEAM GUARDRAIL: Provide Thrie-Beam Guardrail for splices meeting the requirements of specification 967 and as follows: Two panels per splice (one panel per side of Class B (10 Gauge), or Four panels per splice (two nested panels per side) of Class A (12 Gauge). Use a 12-6" guardrail panel. Provide and install all other associated metallic guardrail components (Terminal Connectors, Shoulder Bolts, Hex Bolts and Nuts, Filler Plates, etc.) in accordance with Index 536-001. Install four Guardrail Anchor Bolts at each end of each splice in any of the standard seven anchor bolt holes in the Thrie-Beam Terminal Connector. At reinforcing steel, rebar is to be encased when drilling holes for Guardrail Anchor Bolts in Type K Barrier Units, shift Thrie-Beam Terminal Connector so as to clear reinforcing steel within the given tolerances or select a different bolt hole to use. Do not drill or cut through reinforcing steel within Type K Barrier Units. Drilling or cutting through reinforcing steel within permanent concrete traffic railings is permitted.
2. GUARDRAIL OFFSET BLOCKS: Provide and install timber Offset Blocks meeting the requirements of Specification 967. Field trim Offset Blocks as required for proper fit. Utilize Offset Blocks as shown and required in order to prevent bending or kinking of Thrie-Beam Guardrail panels.
3. CONCRETE FOR FILLING TAPERED TRAFFIC RAILING TOES: Provide concrete for filling tapered toes of Traffic Railings as shown meeting the material requirements of Specification 346, any Class, or a commercially available pre-bagged concrete mix (3000 psi minimum compressive strength). Sampling, testing, evaluation and certification of the concrete shall be in accordance with Specification 346 is not required. Saturate with water the surfaces upon and against which the concrete fill will be placed prior to placing concrete. Place and finish concrete fill using forms or by hand methods to the general configurations shown as to provide a smooth shape transition between the Type K Barrier and the adjacent traffic railing. A low water content is desirable if placing and finishing concrete by hand methods. Cure the concrete fill by application of a curing compound, or by covering with a wet tarp or burlap for a minimum of 24 hours. Completely remove the concrete fill upon relocation or removal of the Type K Temporary Concrete Barrier.
ADHESIVE-BONDING MATERIAL SYSTEMS: When using Adhesive Bonding Material Systems for Anchor Bolts, use Type HSHV in accordance with ASTM F 1554 Grade 36 or ASTM A 709 Grade 36.

ANCHOR BOLTS, NUTS AND WASHERS: When using Adhesive-Bonded Anchor Bolts, use fully threaded rods in accordance with ASTM F 1554 Grade 36 or ASTM A 709 Grade 36. Install nuts in accordance with ASTM A 963 or ASTM A 194. Install Flat Washers in accordance with ASTM F 436 and Plate Washers in accordance with ASTM A 36 or ASTM A 563.

LIMITATION OF USE: This installation technique can only be used on rigid pavement and concrete bridge decks as shown. Anchor Bolts must not be installed on both sides of the Barrier Units. Do not bolt down Barrier Units across bridge fingers or modular expansion joints.

NOTES FOR BOLTED INSTALLATIONS:
- Bridge deck shown, approach slab or rigid pavement similar; installation adjacent to drop-off shown, median transition installation similar.
- Anchor Bolts must not be installed on both sides of the Barrier Units. Do not bolt down Barrier Units across bridge fingers or modular expansion joints.
- Install three (3) Anchor Bolts per Barrier Unit on the traffic side of the Barrier Units as shown, except for Transition Installations.
- For the number and positions of Anchor Bolts required in Transition Installations see Sheets 8 and 9 and Index 102-100.
- Uninstall three (3) Anchor Bolts per Barrier Unit on the traffic side of the Barrier Units as shown, except for Transition Installations.
- Drilling through deck reinforcing steel to install Anchor Bolts is not permitted. Unless otherwise shown in the Plans, all Anchor Bolts must be installed with the proposed production installation method at a location approved by the Engineer.
- Do not drill into or otherwise damage the tops of supporting beams or girders, bridge deck expansion joints or drains. Install Anchor Bolts and Nuts so that the maximum extension beyond the Face of the Anchor Bolts is 3/8". Snug tighten the Nuts on the Anchor Bolts. For through bolted installations, snug tighten the double Nuts on the underside of the deck against each other to minimize the potential for loosening.
- Omit one (1) Anchor Bolt within a single Barrier Unit if a conflict exists between the Anchor Bolt location and a bridge deck expansion Joint or drain. The adjacent Barrier Units must each be installed with the standard three (3) Anchor Bolts.
- Omit one (1) Anchor Bolt within a single Barrier Unit as shown in the Treatment at Bridge Deck Expansion Joint Schematic if the Barrier Unit straddles a bridge deck expansion Joint. The adjacent Barrier Units must each be installed with the standard three (3) Anchor Bolts.

ADHESIVE BONDING MATERIAL SYSTEMS: When using Adhesive Bonding Material Systems for Anchor Bolts, use Type HSHV in accordance with ASTM F 1554 Grade 36 or ASTM A 709 Grade 36. Prior to installation of the Barrier Units in the Plan locations, install a demonstration Barrier Unit using the proposed production installation method, at a location approved by the Engineer. In lieu of the production test requirements of Specification 416, install six (6) Adhesive-Bonded Anchor Bolts in the demonstration Barrier Unit and test each Anchor Bolt with a 29,800 pound tensile proof load. Install and test additional demonstration Barrier Units when requested by the Engineer. Remove the demonstration Barrier Unit prior to testing the Anchor Bolts. Remove the test Anchor Bolts after testing as directed by the Engineer.

ANCHORED INSTALLATIONS - BOLTED

TREATMENT AT BRIDGE DECK EXPANSION JOINT SCHEMATIC

**To accommodate movement at Expansion Joint, set Barrier Units with 3/8" gap at locations shown.**
**NOTES FOR STAKED INSTALLATIONS:**

**LIMITATION OF USE:** This installation technique can only be used on flexible pavement or an Asphalt Pad as shown. Stakes must not be installed on both sides of the Barrier units.

**STAKES:** Provide steel for Stake assemblies in accordance with ASTM A 36 or ASTM A 309 Grade 36. Weld in accordance with the American Welding Society Structural Welding Code (Steel) AWS/AMSE D1.1 (current edition). Welding metal are E60FX or E70XX. Nondestructive testing of welds is not required.

Install three (3) Stakes on the traffic side of the Barrier Units as shown, except for Transition Installations. For the number and positions of stakes required in Transition Installations see Sheets 4, 5 and 6 and Index 102-100. Install Stakes so that the Stop Plate is snug against the bottom of the Anchor Blockout.

**BURIED UTILITIES:** Prior to installation of Stakes verify locations of all adjacent Buried Utilities, drainage structures, pipes, etc. If conflicts between Stake locations and buried elements exist, a maximum of two (2) Stakes within a single Barrier Unit may be omitted if the adjacent Barrier units are installed with the standard three (3) Stakes.

**FREE-STANDING INSTALLATION**

1. For Bridge Decks only, use Keeper Pins that are 1\(\frac{1}{8}\)" diameter, smooth steel bar in accordance with ASTM A36 or ASTM A309 Grade 36. As directed by the Engineer, in order to limit vibration induced translation of the Barrier Units, install one (1) Keeper Pin per Barrier Unit as shown.

2. If traffic is on both sides of the Barrier (i.e. Median Installation), alternate Keeper Pin locations from side to side of Barrier Units along the length of the installation. If traffic is on only one side of the barrier install keeper pins on the traffic side as shown.

3. Do not drill into or otherwise damage bridge deck expansion joints or drains.

**FREE-STANDING INSTALLATION - STAKED**
FLOWABLE FILL BACK-FILL ROADSIDE INSTALLATIONS

TYPICAL SECTION
ADJACENT TO RETAINING WALL WITH FLOWABLE FILL BACK-FILL

FLOWABLE FILL: Provide Excavatable Flowable Fill in accordance with Specification 121.

TYPICAL SECTION
ADJACENT TO RETAINING WALL WITH SOIL BACK-FILL

SOIL BACK-FILL MATERIAL: Provide Back-Fill Material consisting of any available clean soil. Compact Back-Fill Material until the soil mass is firm and unyielding. Provide erosion control as specified in the Plans. If none is specified in the Plans, provide erosion control as required to maintain the integrity of the Back Fill embankment.

GEOTEXTILE FABRIC: Provide Type D-5 Geotextile Fabric in accordance with Specification 985 to contain Back Fill Material behind Barrier Units. Geotextile Fabric may be continuous over the length and height of the installation or may be individual pieces as required to cover the Lift / Drain Slots and open vertical joints between Barrier Units.
PARTIAL PLAN VIEW AT MEDIAN TRAFFIC RAILING

Cross References:
See Sheet 10 for Section A-A, Section B-B and Section C-C.

32" F Shape Traffic Railing (shown);
32" New Jersey Shape and 42" F Shape Traffic Railings and 8' or 14' Traffic Railing / Noise Walls (similar)

PARTIAL PLAN VIEW AT SHOULDER TRAFFIC RAILING

32" F Shape Traffic Railing (shown);
32" New Jersey Shape and 42" F Shape Traffic Railings and 8' or 14' Traffic Railing / Noise Walls (similar)

PARTIAL ELEVATION VIEW - FLORIDA CORRAL TRAFFIC RAILING

* See Three-Beam Guardrail Positioning Detail, Sheet 10 and Notes for Three-Beam Guardrail Splice Installations, Sheet 1:
Anchored Type K Barrier

PARTIAL ELEVATION VIEW - VERTICAL SHAPE TRAFFIC RAILINGS

Approach Transition Splice Detail for Florida Corral and Vertical Shape Traffic Railings

For Florida Corral and Vertical Shape Traffic Railings

Approach Transition Splice Detail for F and New Jersey Shape Traffic Railings and 8' & 14' Traffic Railing / Noise Walls (Concrete Barrier Wall Similar)
PARTIAL PLAN VIEW

Free-standing Type K Barrier shown; Anchored
Barrier Similar, See Plans For Specific Requirements

Cross References:
See Sheet 10 for Section A-A, Section B-B and Section C-C.

PARTIAL ELEVATION VIEW

TRAILING END SPLICE DETAIL
FOR F AND NEW JERSEY SHAPE TRAFFIC RAILINGS
AND 8' & 14' TRAFFIC RAILING / NOISE WALLS

PARTIAL PLAN VIEW

Free-standing Type K Barrier shown; Anchored
Barrier Similar, See Plans For Specific Requirements

Cross References:
See Sheet 10 for Section A-A, Section B-B and Section C-C.

PARTIAL ELEVATION VIEW

TRAILING END SPLICE DETAIL
FOR FLORIDA CORRAL AND VERTICAL SHAPE TRAFFIC RAILINGS

Cross References:
See Sheet 10 for Section A-A, Section B-B and Section C-C.
TYPE K TEMPORARY CONCRETE BARRIER SYSTEM

TRAILING END SPLICE DETAIL
FOR 32" F AND NEW JERSEY SHAPE TRAFFIC RAILINGS
WITH RAILING TRANSITION AND END POST

PARTIAL ELEVATION VIEW

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PARTIAL PLAN VIEW

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APPROACH TRANSITION SPLICE DETAIL
FOR 32" F AND NEW JERSEY SHAPE TRAFFIC RAILINGS
WITH RAILING TRANSITION AND END POST

PARTIAL ELEVATION VIEW

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PARTIAL PLAN VIEW
**SECTION A-A**
32" F Shape Median Traffic Railing (shown), Median Concrete Barrier Wall (similar)

**SECTION A-A**
32" F Shape Traffic Railing (shown), 42" Traffic Railing and 8' & 14' Traffic Railing / Noise Walls (similar)

**SECTION A-A**
32" New Jersey Shape Concrete Barrier Wall (shown), 32" New Jersey Shape Traffic Railing & other Narrow Traffic Railings (similar)

**SECTION A-A**
32" & 42" Vertical Shape Traffic Railing (shown), Florida Corral Traffic Railing (similar)

**SECTION B-B**
Adjacent to Shoulder Traffic Railings

**SECTION C-C**
Adjacent to 32" F or New Jersey Shape Median Traffic Railing or Median Concrete Barrier Wall

**SECTION D-D**
32" F or New Jersey Shape Traffic Railing, Railing Transition & End Post

**SECTION E-E**
32" New Jersey Shape Traffic Railing (shown), 32" F Shape Traffic Railing (similar)

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**THREE-BEAM GUARDRAIL POSITIONING DETAIL**

* Shift Three-Beam Guardrail Splice beyond Open Joint 7'-9" Min. (as shown) when 3" Min. dimension can not be obtained.

* 1'-0" ± 1"
DESCRIPTION:

APPROACH TRANSITION FROM FREE-STANDING PROPRIETARY TEMPORARY BARRIERS TO ANCHORED TYPE K TEMPORARY CONCRETE BARRIERS

APPROACH AND TRAILING END TRANSITIONS FROM FREE-STANDING TYPE K TEMPORARY CONCRETE BARRIERS TO FREE-STANDING PROPRIETARY TEMPORARY BARRIERS

TRAILING END TRANSITION FROM ANCHORED TYPE K TEMPORARY CONCRETE BARRIERS TO FREE-STANDING PROPRIETARY TEMPORARY BARRIERS

LEGEND:

+ NOTE:
Where Barrier is located within Clear Zone of opposing traffic, Approach Transition is required.

TYPE K-PROPRIETARY TEMPORARY CONCRETE BARRIER TRANSITIONS
**DESCRIPTION:**

**NOTE:**
Where Barrier is located within Clear Zone of opposing traffic, Approach Transition is required.

**LEGEND:**

- Dot indicates number and position of Bolts or Stakes

**APPROACH TRANSITION FROM FREE-STANDING PROPRIETARY TEMPORARY BARRIERS TO BACK-FILLED TYPE K TEMPORARY CONCRETE BARRIERS**

**TRAILING END TRANSITION FROM BACK-FILLED TYPE K TEMPORARY CONCRETE BARRIERS TO FREE-STANDING PROPRIETARY TEMPORARY BARRIERS**

**MEDIAN APPROACH AND TRAILING END TRANSITIONS FROM FREE-STANDING TYPE K TEMPORARY CONCRETE BARRIERS TO FREE-STANDING PROPRIETARY TEMPORARY BARRIERS**

**TYPE K-PROPRIETARY TEMPORARY CONCRETE BARRIER TRANSITIONS**
NOTE:
When subjected to reverse direction hits, construct Transition Panels from Temporary Barrier to Crash Cushions; for additional details refer to the applicable crash cushion drawings on the API.

LEGEND:

- Dot indicates number and position of Bolts or Stakes

**UNIDIRECTIONAL - SEPARATED TRAFFIC**

**BIDIRECTIONAL - SEPARATED TRAFFIC**

**TWO-WAY TRAFFIC WITH CRASH CUSHION LOCATED OUTSIDE OPPOSING LANE CLEAR ZONE OR ONE-WAY TRAFFIC**

**TWO-WAY TRAFFIC WITH CRASH CUSHION LOCATED WITHIN OPPOSING LANE CLEAR ZONE**

**END TREATMENT WHEN SHIELDED BY A CRASH CUSHION**

**SHIELDING ENDS WITH REDIRECTIVE CRASH CUSHIONS (REDIRECTIVE OPTION)**
FABRICATION NOTES:

In order to maintain crashworthiness of the Barrier System, do not substitute different grades, sizes, shapes or types of reinforcing steel for those shown for constructing Type K Barrier Units. Also, do not substitute different type, size, length or material grade anchor bolts, nuts, washers, adhesives, connector pins, stakes, keeper pins, or guardrail components for installing Type K Barrier Units.

FABRICATION PREQUALIFICATIONS:

A. The Concrete Plant that meets the requirements:
   a. Specification 450 for prestressed concrete
   b. Specification 105 for precast.

CONCRETE:

A. Construct Barrier units with Class IV concrete in accordance with Specification 346.
B. Specification 346-10 is not applicable.
C. Barrier Units represented by concrete acceptance strength tests which fall below 3000 psi will be rejected.

REINFORCING STEEL:

A. Use only steel reinforcing that meet ASTM A 615, Grade 60, with the exception of Bars 6D1, 6D2 and 6D3.
B. Bars 6D1, 6D2 and 6D3 use steel reinforcing that meets ASTM A 706, with the exception that a 2½” diameter pin must be used for the 180 degree bend test.
C. After steel reinforcing fabrication, hot dip galvanized in accordance with Specification 962 or coated with a cold galvanizing compound in accordance with Specification 962, all or part of Bars 6D1, 6D2 and 6D3 may be galvanized or coated.
D. The minimum limit of galvanizing or coating is shown in the Bending Diagrams.
E. In the Fabricator's option, the entire length of Bars 6D may be galvanized or coated.
F. Install Bars 6D within ½ of the plan dimensions.
G. Correct placement of Bars 6D is critical for proper fit up and performance of individual Barrier Units.
H. At the option of the Fabricator, Deformed Welded Wire Fabric in accordance with Specification 931 and the details shown on Sheet 15 may be utilized in lieu of Bars 4A and 5B.
I. All dimensions in the Bending Diagrams are out to out.
J. Install all reinforcing steel with a 2” minimum cover, except as noted.

LIFTING SLEEVE ASSEMBLY:

A. Inclusion of the Lifting Sleeve Assemblies is optional.
B. Specification 562 for stationary metal forms or stationary timber forms with a form liner.
C. Specified concrete acceptance strength at the time of delivery of 4000 psi as per the General Surface Finish.
D. Use stationary metal forms or stationary timber forms with a form liner.

SURFACE FINISH:

A. Construct Barrier units in accordance with Specifications 400 and 521.
B. Finish the top and sides of the Barrier Units with a General Surface Finish.
C. Finish the bottom of the Barrier Units to a dense uniform surface by floating in lieu of the General Surface Finish.
D. Use stationary metal forms or stationary timber forms with a form liner.

MARKING:

A. Permanently mark the top left end of each Barrier Unit by the use of an embedded and anchored metallic plate with letters and figures a minimum of 0.5” tall.
B. Ink stamps are not allowed.
C. Permanently mark with the following information:
   - Type K
   - Fabricator's name or symbol
   - Date of manufacture (day, month and year)
PLAN VIEW

ELEVATION VIEW

SECTION THRU LIFT/DRAIN SLOT

ESTIMATED TEMPORARY CONCRETE BARRIER QUANTITIES

ITEM | UNIT | QUANTITY
--- | --- | ---
Concrete | CT | 1.29
Reinforcing Steel | LB | 218

The above quantities are for one Barrier Unit.

MARKED END (see note)

SECTION D-D
(Reinforcement not shown for clarity)

* Measured from end of Barrier Unit to outside edge of Bars 6D.

SECTION A-A, SECTION B-B and Cross References:
For Section A-A, Section B-B and Section C-C see Sheet 16.
FIELD TRIM D19.7 TO CLEAR DRAIN SLOT BY 2".

NOTES:

1. Place 2 - No. 5 Bars (12'-3" long) in bottom of Welded Wire Reinforcement cage as shown.
2. Match D17.2 spacing to Bars 4A in the Elevation View, Sheet 15.
3. Field trim D17.2 to clear drain slot by 2".

MATCH D17.2 SPACING TO BARS 4A IN THE ELEVATION VIEW, SHEET 15.

FIELD TRIM D17.2 TO CLEAR DRAIN SLOT BY 2".

NOTES:

1. Place 2 - No. 5 Bars (12'-3" long) in bottom of Welded Wire Reinforcement cage as shown.
2. Match D17.2 spacing to Bars 4A in the Elevation View, Sheet 15.
3. Field trim D17.2 to clear drain slot by 2".

FIELD TRIM D17.2 TO CLEAR DRAIN SLOT BY 2".

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1. Place 2 - No. 5 Bars (12'-3" long) in bottom of Welded Wire Reinforcement cage as shown.
2. Match D17.2 spacing to Bars 4A in the Elevation View, Sheet 15.
3. Field trim D17.2 to clear drain slot by 2".

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NOTES:

1. Place 2 - No. 5 Bars (12'-3" long) in bottom of Welded Wire Reinforcement cage as shown.
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3. Field trim D17.2 to clear drain slot by 2".

FIELD TRIM D17.2 TO CLEAR DRAIN SLOT BY 2".
GENERAL NOTES

1. Pursuant to 35 United States Code, Chapter 18, also known as the Bayh Dole Act of 1980, the non mountable curb was developed through federal funding. The Portable Temporary Low Profile Barrier For Roadside Safety is a licensed design by the University Of Florida. Any infringement on the rights of the designer shall be the sole responsibility of the user.

2. This Index is provided by the Florida Department Of Transportation solely for use by the Department and its assignees. The purpose for this Index is to indicate the approval of the barrier on the State highway System; to provide sufficient pictorials for identifying the barrier unit; and, to provide general installation geometry for the barrier.

3. This legally mandated relationship is unique to federally funded University patents that Department contractors use on Contracts. Pursuant to federal law, the University may pursue royalties for valid patents. Only those barrier units cast by producers licensed by the University Of Florida will be allowed for installation on the State Highway System in Florida. Barrier wall units shall conform to Specification 571 and shall be produced in Department-approved plants with quality control plans for precasting concrete barrier walls. Each barrier wall unit shall be permanently marked with an identification that is traceable to the manufacturer, the producing precast concrete plant and the date of production. This permanent identification mark will serve as certification that the unit has been manufactured in accordance with University drawings and specifications, and the approved quality control program.

4. The low profile barrier is to be installed only with hardware and accessories furnished by the licensed barrier producer. Units shall be used for no purpose other than as interconnected segments in a run of barrier. Low profile barrier wall units shall maintain firm contact with adjoining units. Nuts on tensioning rods shall be installed snug tight.

5. The low profile barrier is applicable for work zone speeds of 45 mph or less.

6. The low profile barrier is to be installed only with hardware and accessories furnished by the licensed barrier producer. Units shall be used for no purpose other than as interconnected segments in a run of barrier. Low profile barrier wall units shall maintain firm contact with adjoining units. Nuts on tensioning rods shall be installed snug tight.

7. Tubular markers shall be orange in color and installed along the run of barrier at the ends and at 30' centers on tangents and 25' centers on radii. The markers shall be fixed to the top of the barrier by an adhesive or other method approved by the engineer. Approach end units shall be marked with a Type 1 object marker. The cost of the tubular markers and Type 1 object marker shall be included in the cost of the low profile barrier.

8. Information regarding licensing, shop drawings, specifications, quality control and certification of compliance can be obtained from the University Of Florida: Office of Technology Licensing, P.O. Box 115500, Gainesville, Florida, 32611-5500. Telephone: 352-392-8929, Fax: 352-392-6600. Reference UF#61552.

9. The Portable Temporary Low Profile Barrier For Roadside Safety is a licensed design by the University Of Florida. The 'Portable Temporary Low Profile Barrier For Roadside Safety' is a licensed design by the University Of Florida. The non mountable curb was developed through federal funding. Pursuant to 35 United States Code, Chapter 18, also known as the Bayh Dole Act of 1980, the non mountable curb was developed through federal funding. The Portable Temporary Low Profile Barrier For Roadside Safety is a licensed design by the University Of Florida. Any infringement on the rights of the designer shall be the sole responsibility of the user.

10. Setback distance shall be kept clear of any grass, construction debris, stockpiled materials, equipment, and objects.
PORTABLE TEMPORARY LOW PROFILE BARRIER FOR ROADSIDE SAFETY

PORTABLE TEMPORARY LOW PROFILE BARRIER FOR ROADSIDE SAFETY

DESCRIPTION:

PORTABLE TEMPORARY LOW PROFILE BARRIER FOR ROADSIDE SAFETY

LIMITATION OF USE: This installation technique can only be used on flexible or rigid pavement.

ASPHALT PAD: Where existing pavement is not present, construct 2" Asphalt Pad using miscellaneous asphalt pavement in accordance with Specification 339 with the exception that the use of a pre-emergent herbicide is not required. Payment for asphalt pad will be included in the cost of the barrier.

Notes:

OFFSET LATERAL DISTANCE

SETBACK DISTANCE AT DROP-OFFS

PLAN VIEW OF APPROACH END OFFSET
PORTABLE TEMPORARY LOW PROFILE BARRIER FOR ROADSIDE SAFETY

MAXIMUM CURVATURE ● MINIMUM RADIUS

See Inset A

Inset B

Inset A

Inset B

CONVEX CURVATURE

CONCAVE CURVATURE
Flare Falls Within The Clear Zone Of Opposing Traffic

Type I Object Marker To Be Installed When Trailing End Located Outside The Clear Zone Of Opposing Traffic

* Trailing End Flares Are Not Required When Barrier Located Outside The Clear Zone Of Opposing Traffic

Type I Object Marker To Be Installed When Trailing End Flare Falls Within The Clear Zone Of Opposing Traffic

BARRIER OPENINGS AT DRIVEWAYS

LEGEND

| Type I Object Marker |
Flare Falls Within The Clear Zone Of Opposing Traffic

Type I Object Marker To Be Installed When Trailing End Located Outside The Clear Zone Of Opposing Traffic

* Trailing End Flares Are Not Required When Barrier Located Outside The Clear Zone Of Opposing Traffic

Type I Object Marker To Be Installed When Flare Falls Within The Clear Zone Of Opposing Traffic

LEGEND

| Type I Object Marker |

**BARRIER OPENINGS AT DRIVEWAYS**

**PORTABLE TEMPORARY LOW PROFILE BARRIER FOR ROADSIDE SAFETY**