Two-Lane, Two-Way Roads

A road consisting of two opposing lanes of undivided traffic.

Two-Lane Two-Way

Pages 41-72

***Drawings Not To Scale**

TWO-LANE, TWO-WAY ROADS				
Intermediate Volume UP to 1500 ADT	**MOBILE 15 Minutes or Less**	**SHORT DURATION 1 Hour or Less**	**SHORT TERM 12 Hours or Less**	**INTERMEDIATE TERM 3 Days or Less**
Debris Removal in Lane	9			
Flagger Control	22*		14*	
STOP Sign Control	12			
Work in Center of Road	23*			
All ADTs	**MOBILE 15 Minutes or Less**	**SHORT DURATION 1 Hour or Less**	**SHORT TERM 12 Hours or Less**	**INTERMEDIATE TERM 3 Days or Less**
Work Vehicle Parked on Shoulder	4		6	
Work on Shoulder	7		6	
Work off Shoulder	6			
Work off Roadway	8			
Shoulder or Parking Lane Closure	6			
Partial Shoulder Closure for Trailer Mounted Devices	5			
Lane Closure	10	11*	15*	
Moving Work Spaces	16*			
Near Intersection	19*, 20*			
Pilot Car Operation	17, 18*			
Flagging Crossroads and Blind Curves	18*			
Automated Flagger Assistance Device (AFAD)	21*			
Portable Signal Control	21			
Work in Center of Road	24*			
Lane Shift	25			
Turn Lane Closures	29, 30			
Temporary Road Closure (15 minute intervals)	27*			
Temporary Road Closure	28			
Sidewalk Closure	85, 86			
Gravel Road Maintenance	26			
Crossroad and Confirmation Signing	31			

See Low Volume Roads section for ADTs less than 400

* This layout may be used for nighttime operations only if the flagging stations are occupied and illuminated with portable lights.

NOTES

1. The Work Vehicle should be pulled over as far off the roadway as possible, and shall display and operate a 360-degree flashing beacon.

WORK VEHICLE PARKED ON SHOULDER

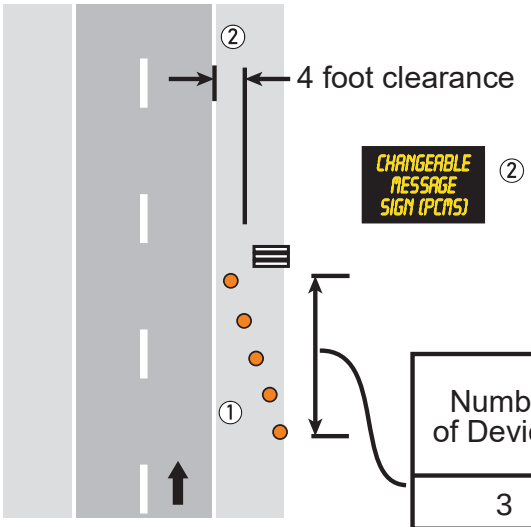
1 HOUR or LESS **LAYOUT 4**

NOTES:

① Drums shall be used in the shoulder taper regardless of the location on the shoulder or the width of the shoulder, when device in place for more than one hour.

② Trailer-mounted traffic control devices should be placed at least 4 feet from the traveled lane. If a 4-foot clearance cannot be met, then the taper length shall be doubled.

3. This layout maybe used for PCMS placement 7 days prior to work beginning.



Number of Devices	Taper Length (feet)	Speed Limit (mph)
3	50	≤ 40
5	100	≥ 45

TRAILER-MOUNTED DEVICES ON SHOULDER
PARTIAL SHOULDER CLOSURE
MORE THAN 1 HOUR **LAYOUT 5**

NOTES:

(1) The ROAD WORK AHEAD sign may be omitted for short term daylight operations if a vehicle is displaying and operating a 360-degree flashing beacon and:
   a. The distance from curb face to the work space is at least 2 feet, or
   b. The distance from the edge of the roadway to the work space is at least 15 feet.

(2) This ROAD WORK AHEAD sign shall be installed on two-lane, two-way roads if traffic control devices are installed for a work space in the opposite shoulder.

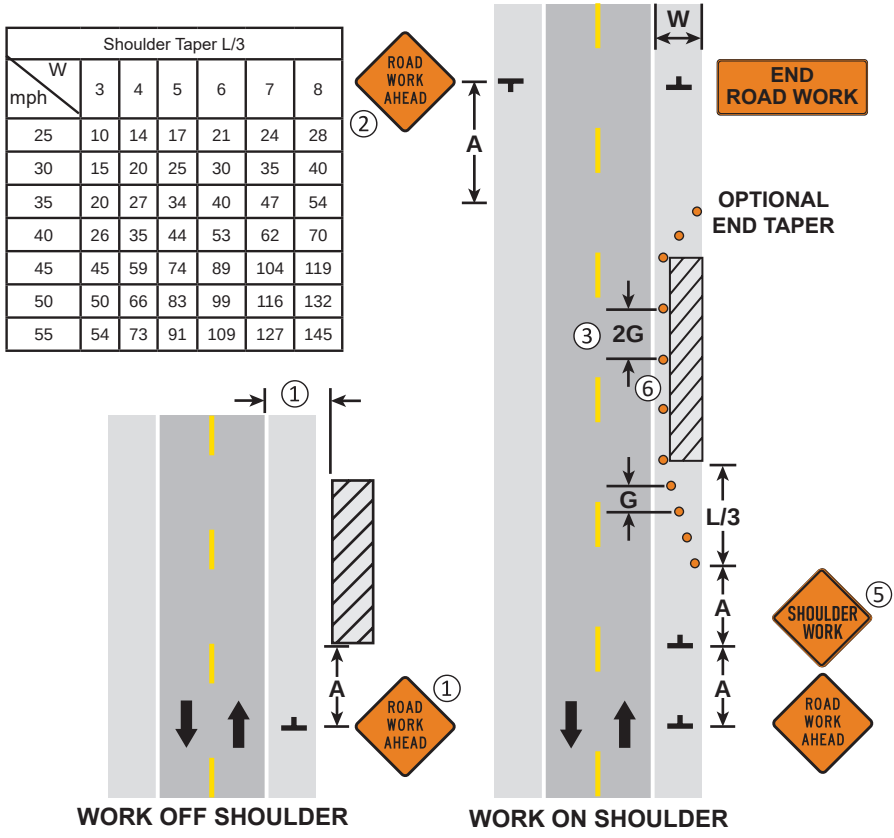
(3) If this layout is used to close a parking lane that is normally open to vehicle travel during the time of day the closure will be in effect, the lane shall be considered a traveled lane and not a parking lane. Layout 39 shall be used to provide traffic control for the lane closure.

4. If this layout is used to close a parking lane, channelizer spacing may be reduced from 2G to G in high volume areas.

(5) Change SHOULDER WORK sign to ROAD NARROWS sign if work encroaches the live lane.

6. ROAD WORK AHEAD and END ROAD WORK signs are not required if the work area is within a larger work zone where these signs are already present.

Shoulder Taper L/3						
W / mph	3	4	5	6	7	8
25	10	14	17	21	24	28
30	15	20	25	30	35	40
35	20	27	34	40	47	54
40	26	35	44	53	62	70
45	45	59	74	89	104	119
50	50	66	83	99	116	132
55	54	73	91	109	127	145

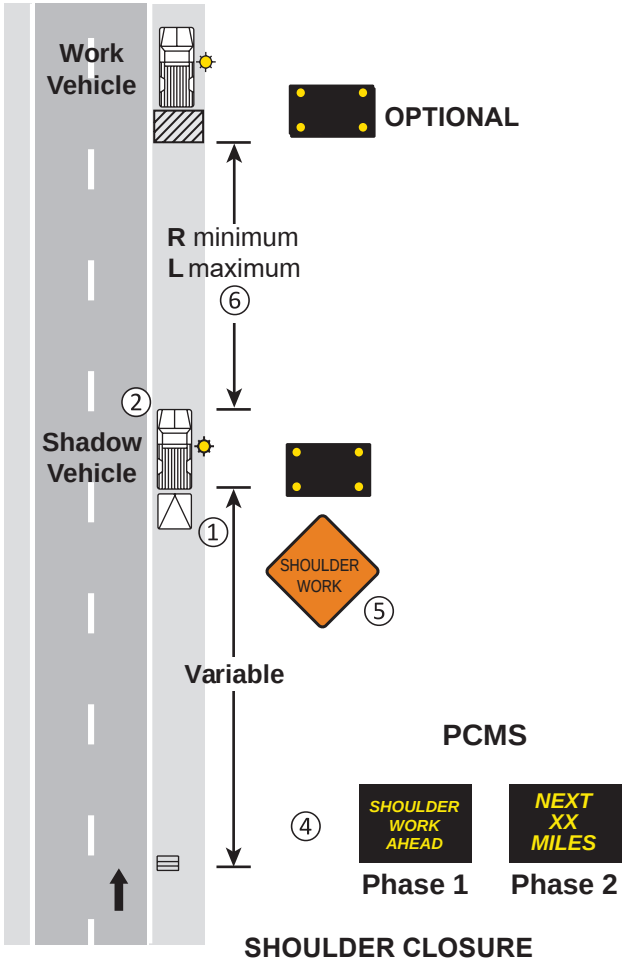


SHOULDER AND PARKING LANE CLOSURE
WORK ON or NEAR SHOULDER

3 DAYS or LESS **LAYOUT 6**

NOTES:

1. Any Shadow Vehicle or Protection Vehicle operating totally or partially in a traffic lane shall be equipped with a TMA.
2. The Shadow Vehicle or Protection Vehicle may encroach into the traffic lane when the shoulder is too narrow to drive on. If the Work and Shadow Vehicle do not encroach into the traffic lanes, the Shadow Vehicle is optional at 40 mph or less.
3. Any vehicle not displaying an Arrow Board shall display high-intensity rotating, flashing, oscillating, or strobe lights.
4. The PCMS shall be used for nighttime operations.
5. When the PCMS is used, the SHOULDER WORK sign becomes optional.
6. The distance between the work area and the Shadow Vehicle should be adjusted between R and L based on traffic volume and sight distance.
7. Sign Placement should be on same side work is on. Sign Placement should be on same side work is on.

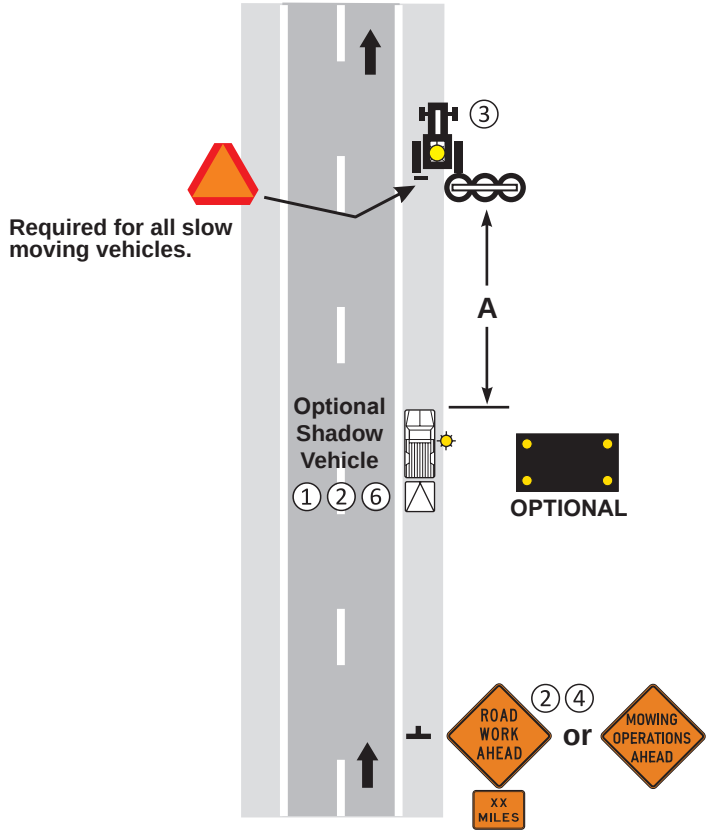


SHOULDER CLOSURE
MOBILE AND SHORT DURATION

1 HOUR or LESS **LAYOUT 7**

NOTES:

1. A Shadow Vehicle may be used on roadways where Decision Sight Distance (D) is frequently restricted and the equipment consistently encroaches within 3 feet of the traffic lane.
2. On roadways of less than 400 ADT, the Shadow Vehicle and ROAD WORK AHEAD sign may be omitted.
3. The vehicle should be as far off the roadway as possible, and shall display and operate a 360-degree flashing beacon.
4. The ROAD WORK AHEAD sign may be omitted when there is an adequate approach Decision Sight Distance (D) to the equipment along the majority of the route.
5. When advance warning signs are used, the signs should be no more than 3 miles from the equipment. The location of the signs should be determined by the sources of traffic, such as major cross roads. If the distance is 1 mile or greater, a XX MILES distance plaque should be used and placed directly below or on the lower side of the warning sign nearest traffic.
6. The Shadow Vehicle shall be equipped with a TMA if it encroaches into the traffic lane.



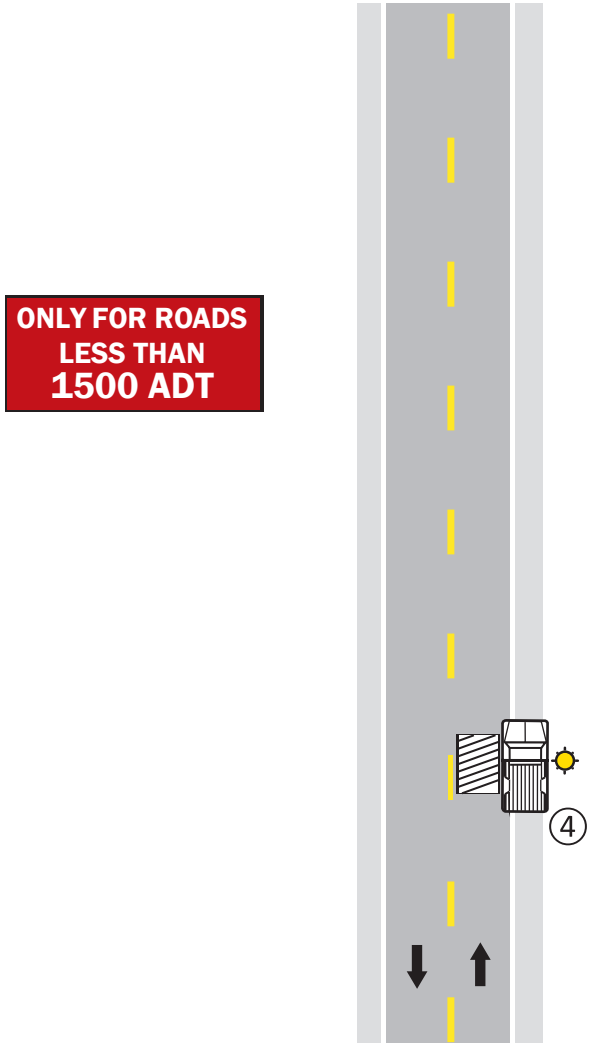
WORK OFF ROADWAY
MOBILE OPERATIONS HAVING LITTLE or NO INTERFERENCE WITH TRAFFIC

15 MINUTES or LESS **LAYOUT 8**

NOTES:

1. If the approach sight distance is restricted, a spotter should be used.
2. If the visibility is poor or the operation does not move at least the Decision Sight Distance (D) every 15 minutes, the appropriate stationary layout should be used.
3. This layout may be used for nighttime operations only in locations where the posted speed limit is 40 mph or less.

④ The slow moving or stopped Work Vehicle should keep the traffic lane as wide as possible by using the shoulder space whenever possible.



DEBRIS REMOVAL IN LANE
TWO-LANE, TWO-WAY ROAD

15 MINUTES or LESS **LAYOUT 9**

NOTES:

1. Use Layout 11 under any of the following conditions:
   - If the work space is not visible for at least the Decision Sight Distance (D),
   - The motorists cannot see beyond the work space, or
   - Traffic volumes do not allow passage.

(2) Any Shadow Vehicle or Protection Vehicle operating totally or partially in a traffic lane shall be equipped with a TMA.

3. If the work space does not move at least the Decision Sight Distance (D) every 15 minutes, the appropriate stationary layout should be used.

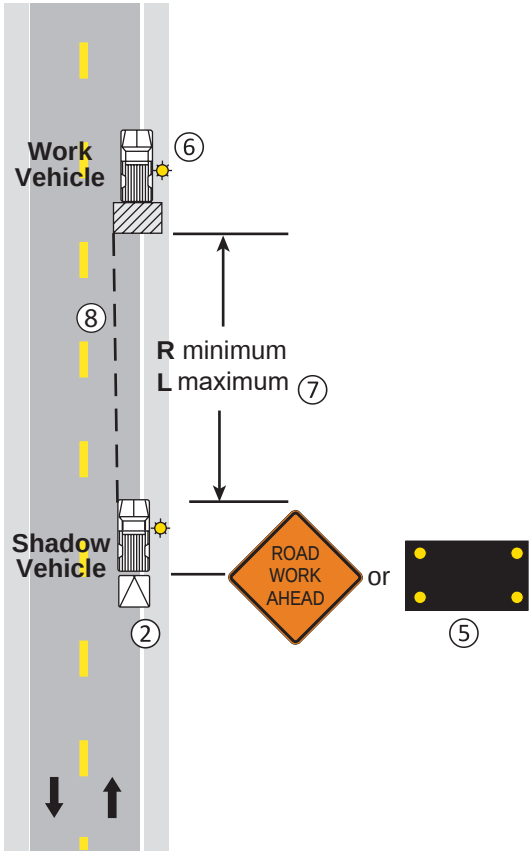
4. This layout may be used for nighttime operations only in locations where the posted speed limit is 40 mph or less.

(5) For nighttime operations, the Arrow Board shall be used.

(6) The slow moving or stopped Work Vehicle and Shadow Vehicle should keep the traffic lane as wide as possible by using the shoulder space whenever practical.

(7) The distance between the work area and the Shadow Vehicle should be adjusted between R and L based on traffic volume and sight distance.

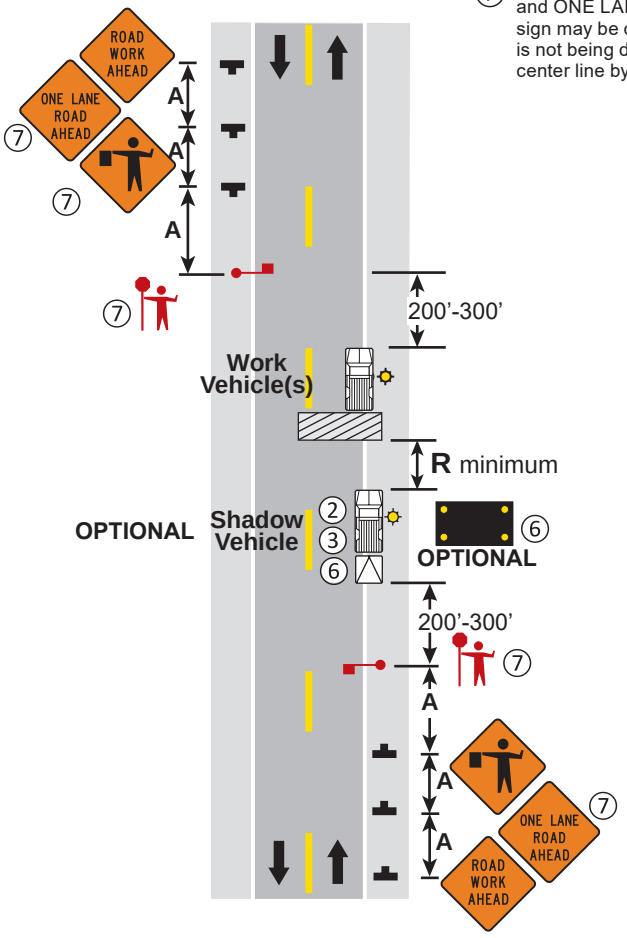
(8) Line left side of shadow vehicle with edge of work area.



LANE CLOSURE WITH RANDOM WORK AREAS
TWO-LANE, TWO-WAY ROAD
15 MINUTES or LESS **LAYOUT 10**

NOTES:

1. The advance warning signs should be moved or reset after each major road intersection or after 3500 feet, whichever comes first.
2. Any Shadow Vehicle or Protection Vehicle operating totally or partially in a traffic lane shall be equipped with a TMA.
3. The slow moving or stopped Work Vehicle(s) and Shadow Vehicle should keep the traffic lane as wide as possible by using the shoulder space whenever practical.
4. If the work area does not move at least the Decision Sight Distance (D) every 15 minutes, the appropriate stationary layout should be used.
5. This layout may be used for nighttime operations only in locations where the posted speed limit is 40 mph or less.
6. The Shadow Vehicle with Arrow Board shall be used during nighttime operations.
7. The Flagger, Flagger Ahead sign, and ONE LANE ROAD AHEAD sign may be omitted when traffic is not being directed over the center line by the flagger.

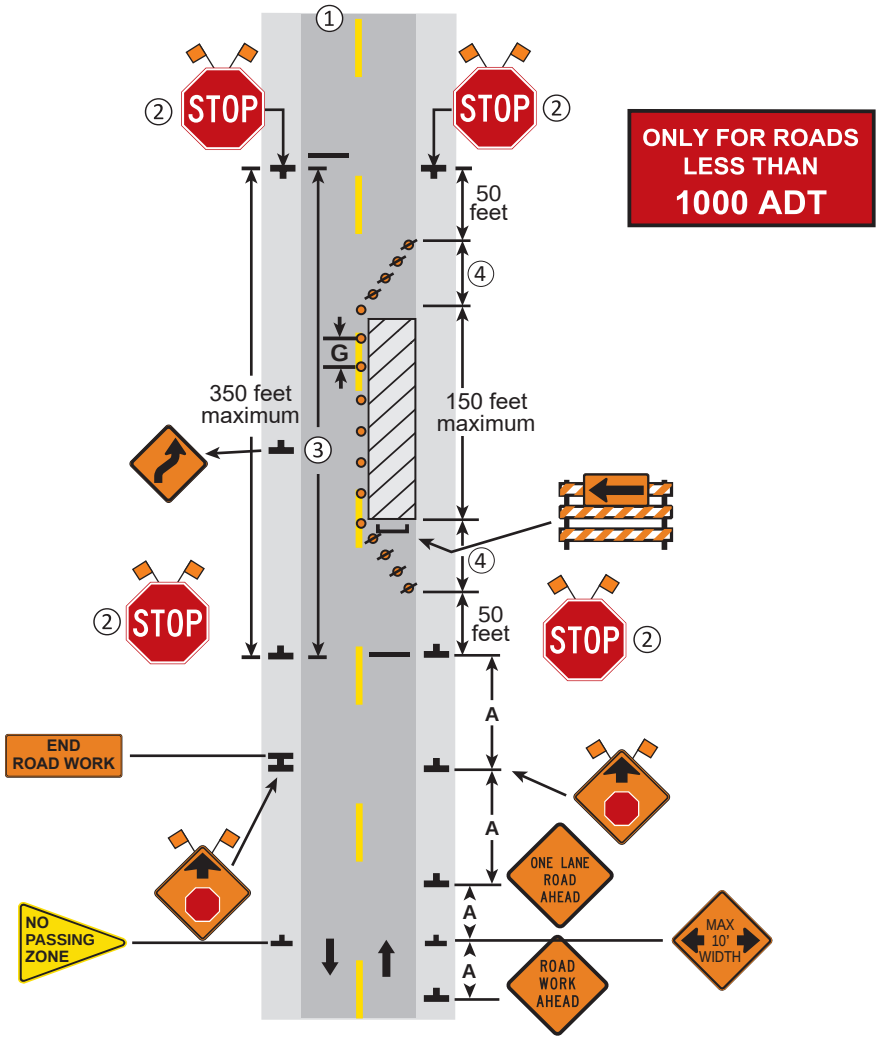


LANE CLOSURE WITH A MOVING WORK AREA
TWO-LANE, TWO-WAY ROAD

1 HOUR or LESS **LAYOUT 11**

NOTES:

1. Approach signs are the same in both directions.
2. STOP signs shall be 36 x 36 inches.
3. If adequate sight distance is not available to recognize a stopped vehicle or traffic volume restricts vehicles from taking turns through the open lane, use Layout 15 or 22.
4. The two-way taper should be 50 feet in length using 5 equally spaced channelizing devices.
5. END ROAD WORK sign should be placed 500 feet past work area.
6. When available width is less than 16 feet a Max Width (W12-52) sign should be used with a posted width 1 foot less than available width.



LANE CLOSURE WITH STOP SIGNS
TWO-LANE, TWO-WAY ROAD

3 DAYS or LESS **LAYOUT 12**

NOTES:

- The first advance warning sign should typically be located in advance of the anticipated traffic backup or queue.
- When a side road or ramp intersects the facility on which the work is being performed, additional traffic controls shall be provided.

FLAGGING

- When the flagging operation is not in effect, remove temporary portable rumble strips prior to covering or removing all advance signing.

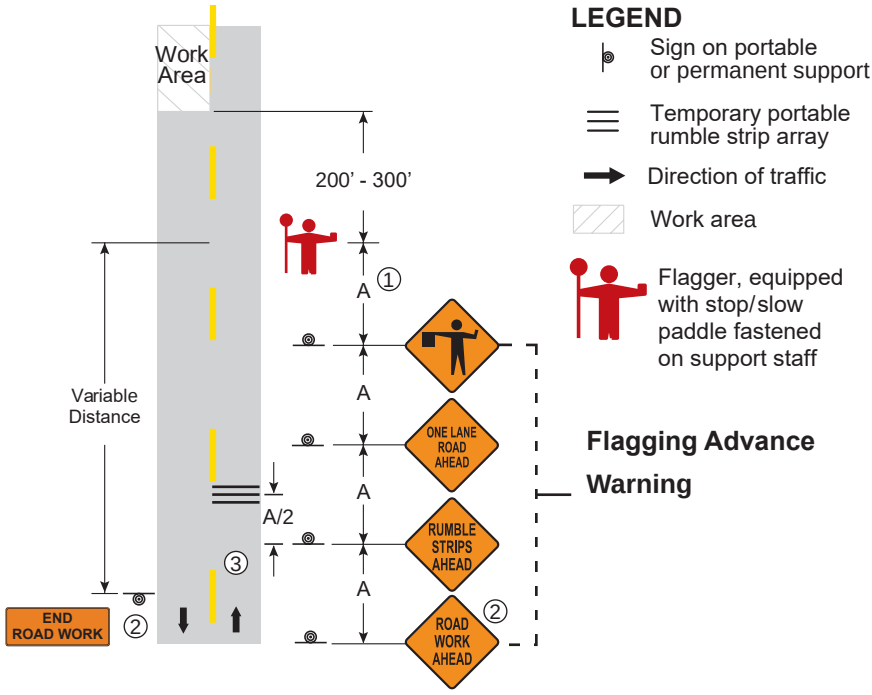
(1) For moving work operations, post additional W20-7a flagger signs at approximately 3,500' intervals in the moving work operation.

(2) Sign not required if flagging operation occurs within a signed road work zone area.
- The Flagger may be equipped with an air horn.
- STOP/SLOW paddle sign size is minimum of 18" x 18"

TEMPORARY PORTABLE RUMBLE STRIPS

- Utilize temporary portable rumble strips on all flagging operations that last longer than 60 minutes.

(3) Each temporary portable rumble strip array consists of three rumble strips places perpendicular to the direction of travel according to manufacturers recommendation, placed transverse across the lane at locations shown.
- Only use temporary portable rumble strips from the approved products list.
- Place advance signing prior to installing temporary portable rumble strips.
- Do not install temporary portable rumble strips on gravel, milled surfaces, or asphalt that has been paved for less than 12 hours.
- Temporary portable rumble strips are not required on roadways with posted speed limits of 35 mph or less.

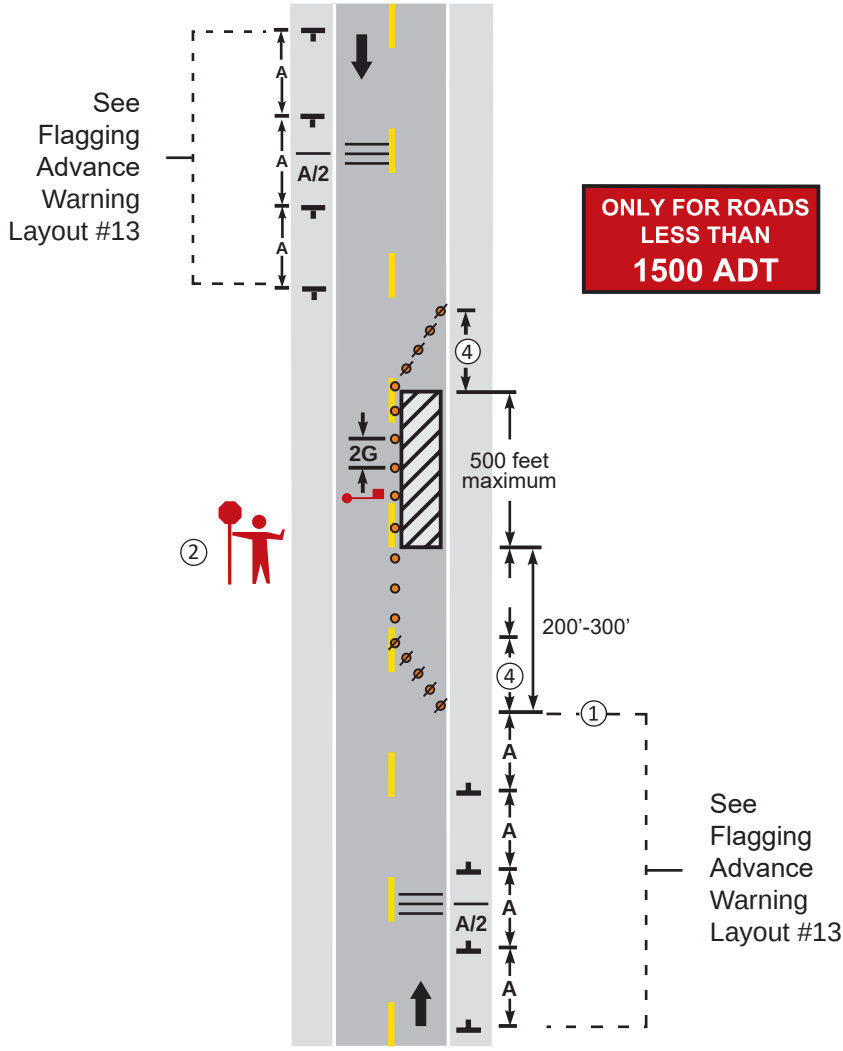


GENERAL FLAGGING NOTES

12 HOURS or LESS **LAYOUT 13**

NOTES:

1. The approach sight distance to the flagger shall be at least the Decision Sight Distance (D).
2. If the flagger's ability to see oncoming motorists beyond the work space is less than the Decision Sight Distance (D), two flaggers shall be used.
3. If the work space must be left unattended at night use Layout 12.
4. The two-way taper should be 50 feet in length and using 5 equally spaced channelizing devices.
5. END ROAD WORK sign should be placed 500 feet past work area.

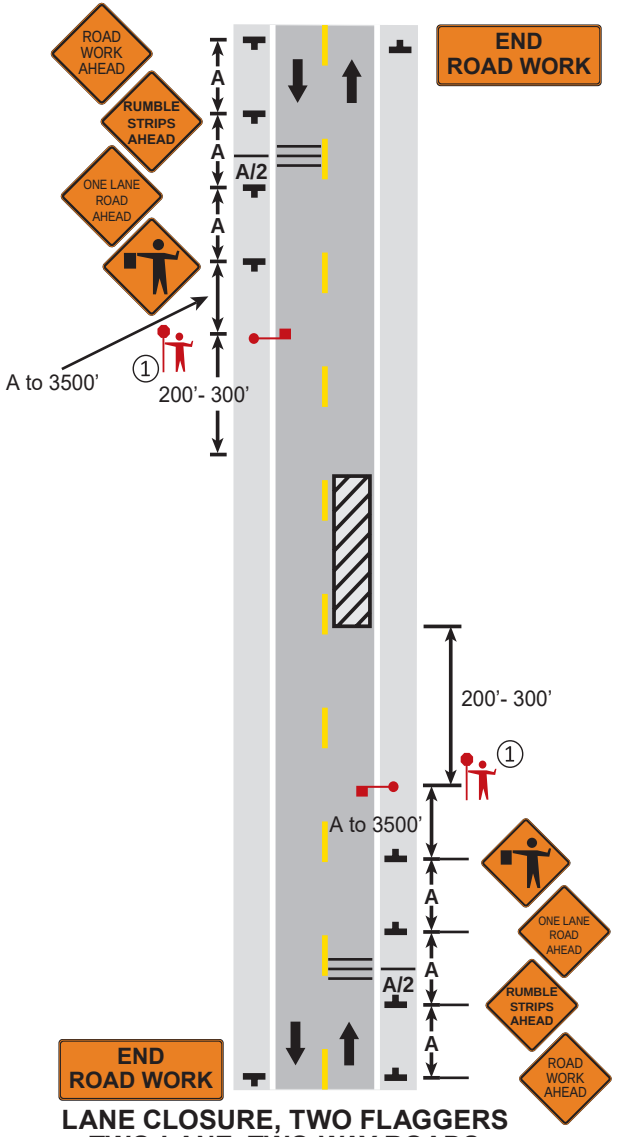


LANE CLOSURE, ONE FLAGGER, TWO-LANE, TWO-WAY ROADS

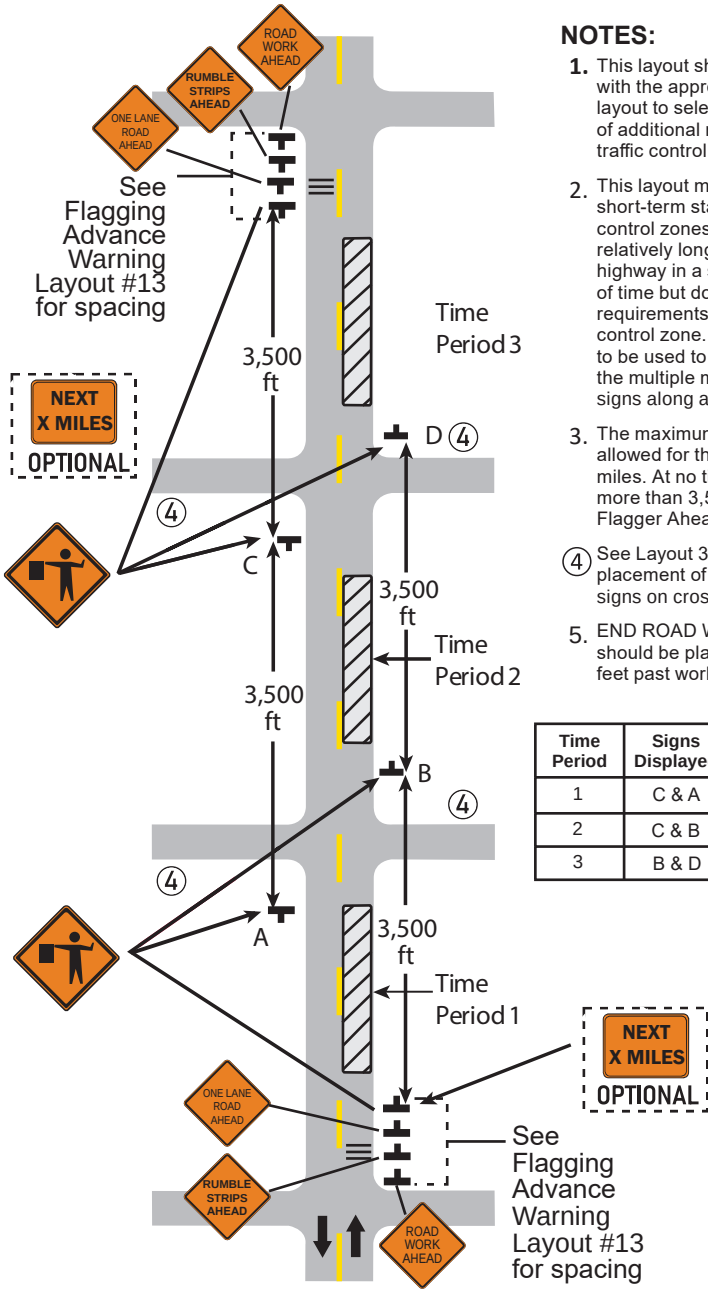
12 HOURS or LESS **LAYOUT 14**

NOTES:

1. The approach sight distance to the flagger shall be at least the Decision Sight Distance (D).
2. The two-way taper should be 50 feet in length using 5 equally spaced channelizing devices, if used.
3. If anticipating operational problems, the use of a Pilot Car (see Layout 17) may improve operations and safety. If space between flaggers exceeds two miles, use a pilot car.
4. END ROAD WORK sign should be placed 500 feet past work area.



LANE CLOSURE, TWO FLAGGERS
TWO-LANE, TWO-WAY ROADS



NOTES:

1. This layout shall be used with the appropriate flagger layout to select the location of additional required traffic control devices.
2. This layout may be used for short-term stationary traffic control zones that cover a relatively long segment of highway in a short period of time but do not meet the requirements for a mobile traffic control zone. It is intended to be used to eliminate the multiple movement of signs along a corridor.
3. The maximum distance allowed for this layout is 3 miles. At no time will there be more than 3,500 feet between Flagger Ahead signs.

④ See Layout 32 for required placement of advance warning signs on crossroads.

5. END ROAD WORK sign should be placed 500 feet past work area.

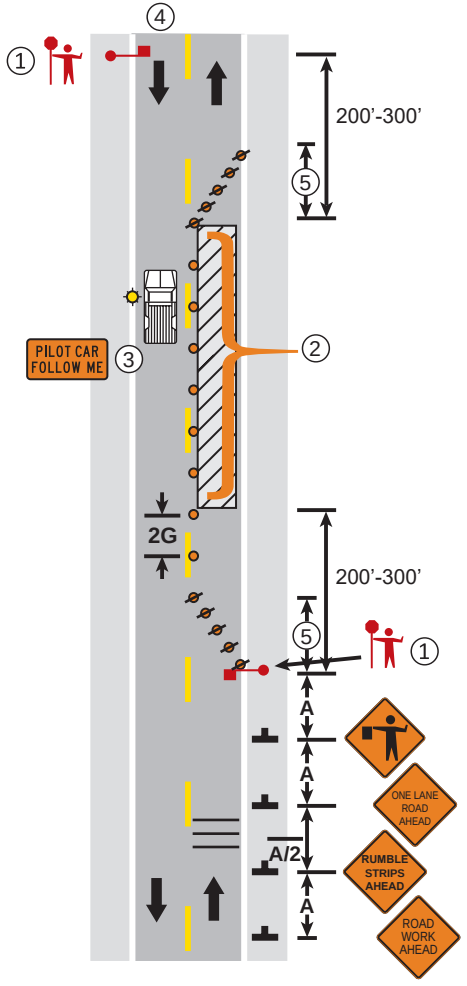
Time Period	Signs Displayed	Signs Not Displayed
1	C & A	B & D
2	C & B	A & D
3	B & D	A & C

MOVING WORK SPACES

12 HOURS or LESS **LAYOUT 16**

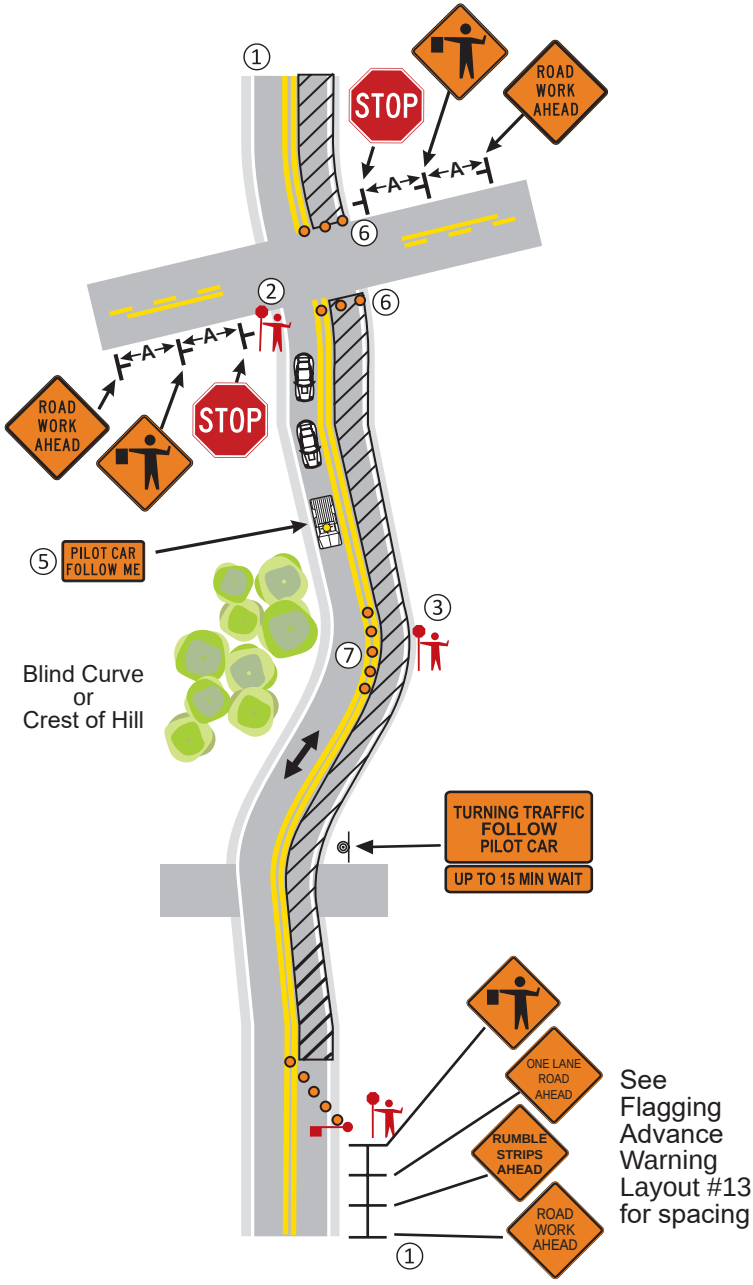
NOTES:

1. The approach sight distance to the flagger shall be at least the Decision Sight Distance (D).
2. Channelizing devices along the edge of the work space may be omitted.
3. Pilot Cars should lead traffic through the work zone at a reasonable speed. See the Flagging Handbook for additional guidance.
4. Advance warning signs are the same for both directions approaching the work area.
5. The two-way taper should be 50 feet in length using 5 equally spaced channelizing devices, if used.
6. See Layout 18 for additional considerations if there are crossroads.
7. END ROAD WORK sign should be placed 500 feet past work area.



LANE CLOSURE, PILOT CAR METHOD
TWO-LANE, TWO-WAY ROADS

12 HOURS or LESS **LAYOUT 17**



FLAGGING CROSSROADS AND BLIND CURVES
PILOT CAR OPERATIONS

12 HOURS or LESS **LAYOUT 18**

NOTES:

(1) See Layout 13 for advance signing and flagger setup.
Approach signs are the same in both directions.

(2) When a flagger is positioned at an intersection, they:
- Shall have 2-way communications with the Pilot Car,
- Should use hand signals with a flag or flashlight with red glow cone to control traffic movements rather than the typical STOP/SLOW paddle in order to avoid displaying the SLOW paddle to the opposite approach, and
- May need additional flaggers to direct traffic when the crossroad consistently has multiple vehicles per direction waiting each Pilot Car cycle.

(3) A flagger may be placed at a blind curve, crest of a hill, or other site obstruction where traffic might enter from other driveways or entrances to warn the Pilot Car that there may be oncoming traffic. When used, the flagger:
- Shall be located to clearly see traffic from both directions,
- Shall not be positioned in the open traffic lane,
- Shall have 2-way communications with the Pilot Car,
- Shall have a flagger paddle; and
- Should have a means to warn an errant driver such as an air horn.

4. Consider distributing brochures to local businesses and residents detailing Pilot Car operations.

(5) PILOT CAR FOLLOW ME sign shall be mounted on the Pilot Car.

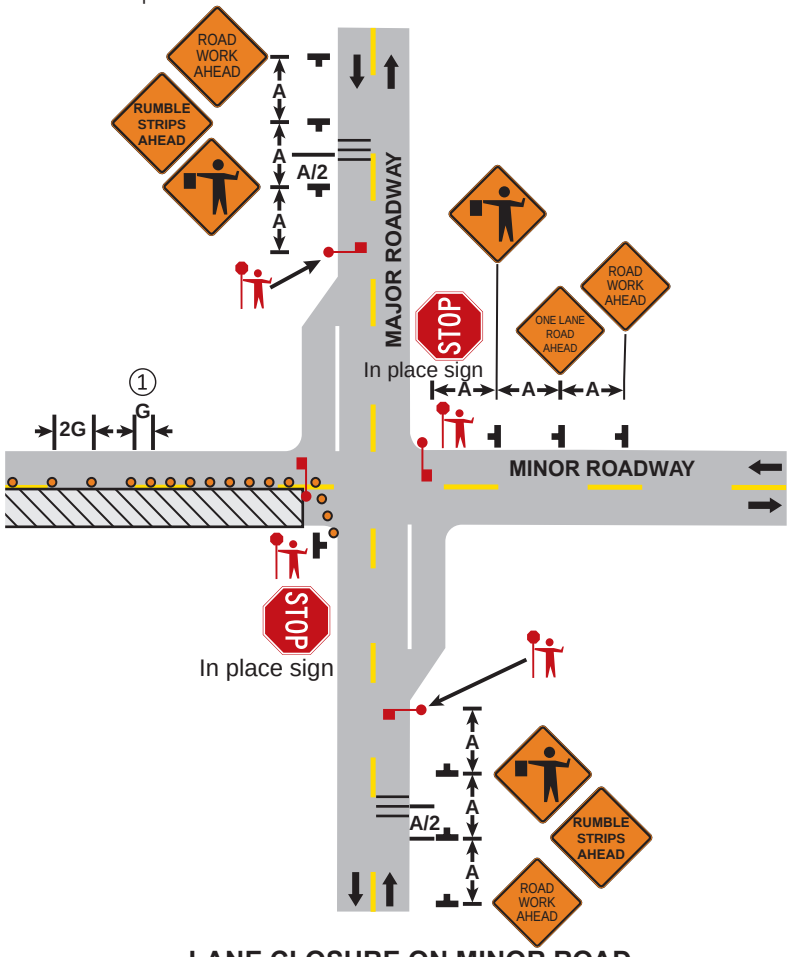
(6) Channelizers should be placed near intersections and flagging stations.

(7) Channelizers are optional with Pilot Car operations.

8. END ROAD WORK sign should be placed 500 feet past work area.

NOTES:

1. The spacing between devices should be reduced to **G** or less when the work space is within 300 feet of the intersection. This will help keep motorists from entering into the work space near the intersection.
2. When the traffic volume of the minor roadway exceeds 1500 ADT or turning movements cause unsafe operations, the following steps should be considered:
   a. Restrict vehicle turns from the major roadway with flagging, signing,and/or closing the turn lanes; or
   b. Completely close a leg of the minor roadway until the work space has left the area near the intersection.
3. END ROAD WORK sign should be placed 500 feet past work area.
4. When available width is less than 16 feet a Max Width (W12-52) sign should be used with a posted width 1 foot less than available width.

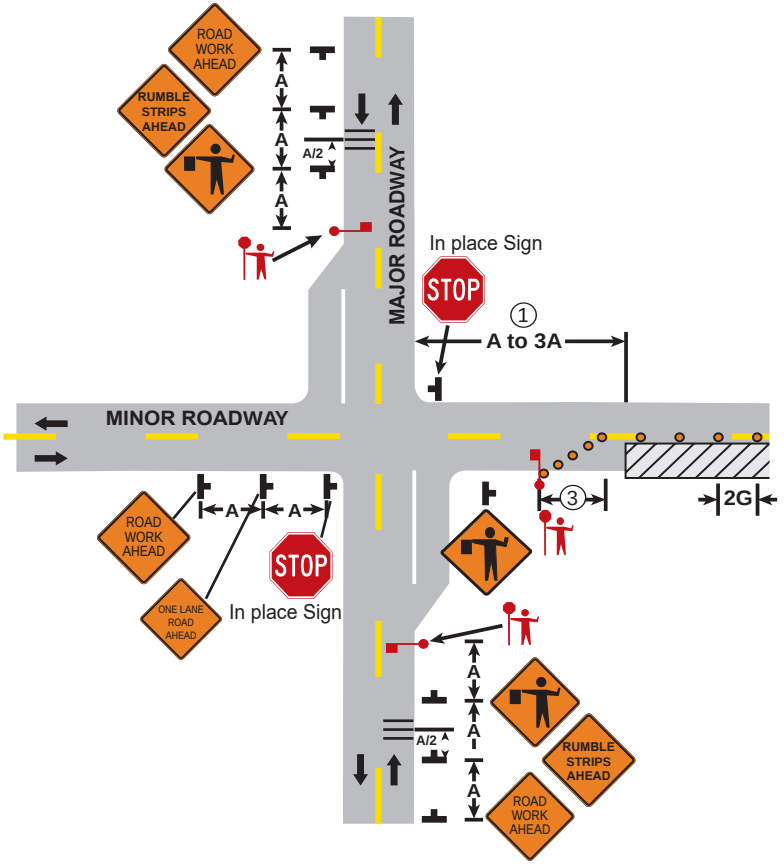


LANE CLOSURE ON MINOR ROAD
BEFORE INTERSECTION OF MAJOR ROAD
TWO-LANE, TWO-WAY ROAD

12 HOURS or LESS **LAYOUT 19**

NOTES:

1. When the work space is located between A and 3A beyond a controlled intersection, the normal sign and buffer spacing in the approach area may be reduced during daylight operations. The Flagger Ahead sign should be centered between the flagger station and the intersection.
2. When the traffic volume of the minor roadway exceeds 1500 ADT or turning movements cause unsafe operations, the following steps should be considered:
   a. Restrict vehicle turns from the major roadway with flagging, signing, and/or closing the turn lanes; or
   b. Completely close a leg of the minor roadway until the work space has left the area near the intersection.
3. The two-way taper should be 50 feet in length using 5 equally spaced channelizing devices.
4. END ROAD WORK sign should be placed 500 feet past work area.
5. When available width is less than 16 feet a Max Width (W12-52) sign should be used with a posted width 1 foot less than available width.

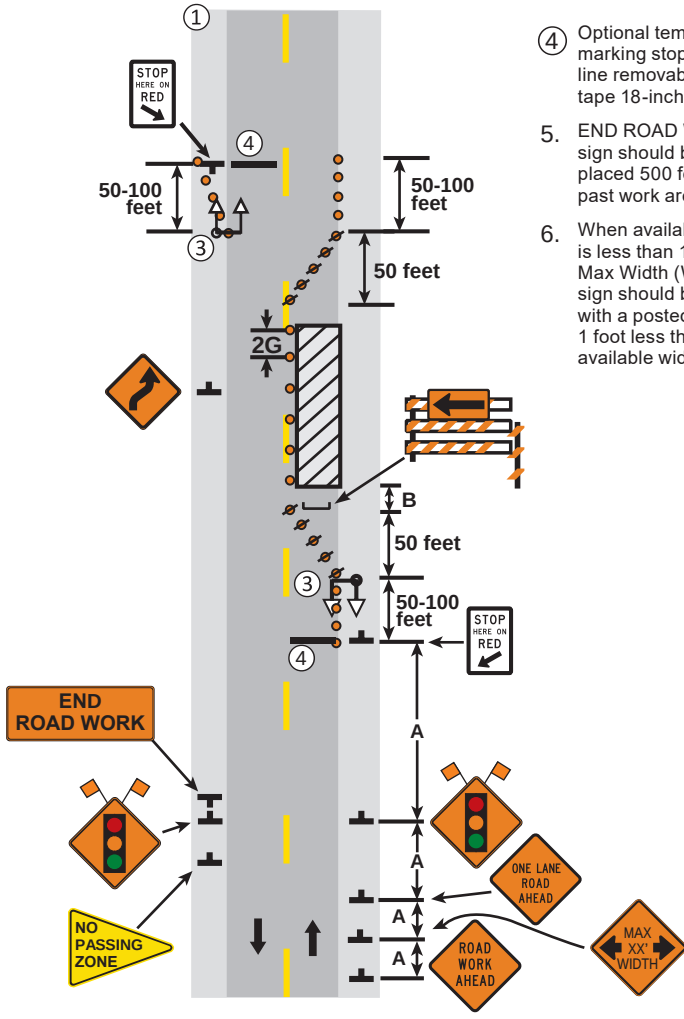


LANE CLOSURE ON MINOR ROAD BEYOND INTERSECTION OF MAJOR ROAD TWO-LANE, TWO-WAY ROAD

12 HOURS or LESS **LAYOUT 20**

NOTES:

1. Approach signs are the same in both directions.
2. Signal timing and signal head locations shall be established by qualified personnel and approved by the road authority.
3. Two signal heads shall be installed per approach. The first shall be installed on the right shoulder. The second signal head may be installed on either the left shoulder or mounted overhead on the same structure as the first signal head.
4. Optional temporary marking stop line removable tape 18-inch.
5. END ROAD WORK sign should be placed 500 feet past work area.
6. When available width is less than 16 feet a Max Width (W12-52) sign should be used with a posted width 1 foot less than available width.



LANE CLOSURE WITH PORTABLE SIGNALS
TWO-LANE, TWO-WAY ROAD

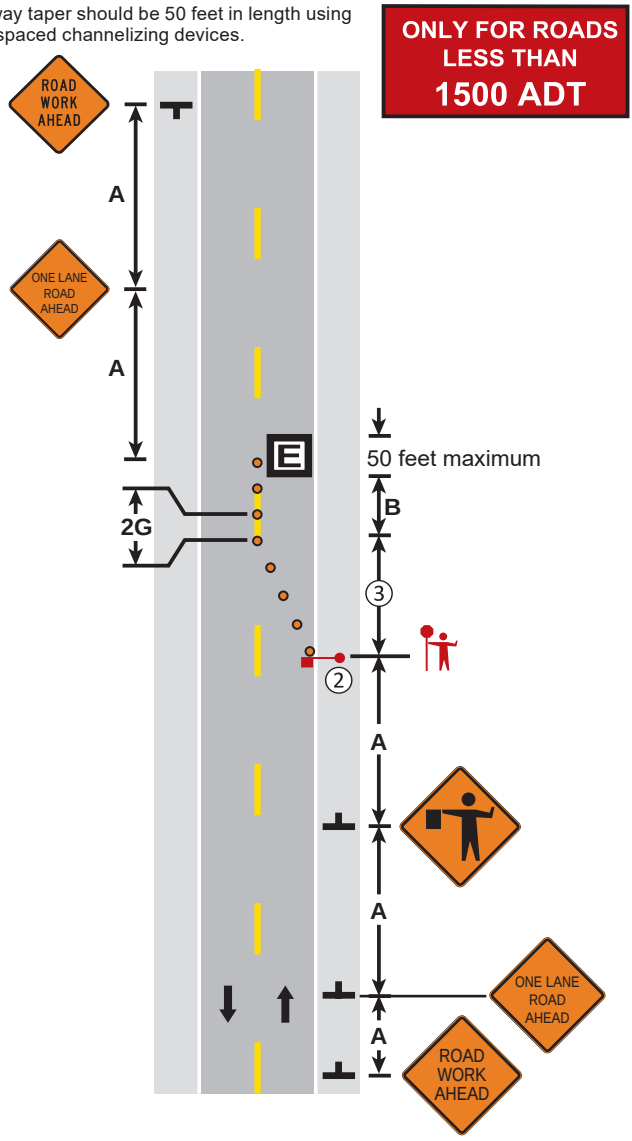
12 HOURS or LESS **LAYOUT 21**

NOTES

1. Additional Work Vehicles shall be parked off of the roadway. Do not obstruct the shoulder in the work area.

(2) The Flagger and Flagger Ahead sign may be omitted when traffic volumes do not restrict the ability of traffic to regulate itself through the length of the work space.

(3) The two-way taper should be 50 feet in length using 5 equally spaced channelizing devices.

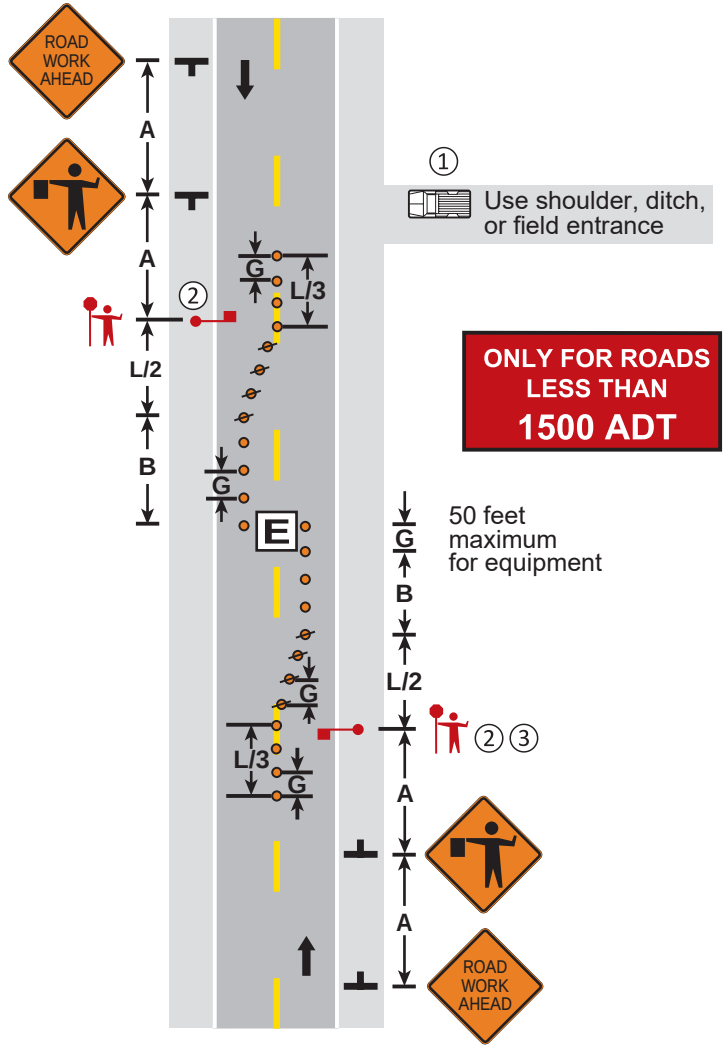


EQUIPMENT IN TRAFFIC LANE
TWO-LANE, TWO-WAY ROAD

1 HOUR or LESS **LAYOUT 22**

NOTES:

1. The Work Vehicle shall be parked off of the roadway. Do not obstruct the shoulder in the work areas.
2. The Flaggers and the Flagger Ahead signs may be omitted if the posted speed limit is 40 mph or less and there is at least 10 feet of drivable surface outside of the channelizing devices.
3. The flagger shall be visible for at least the Decision Sight Distance (D).
4. Flaggers are used for set up only. Remove Flagger Ahead signs when not flagging.
5. When available width is less than 16 feet a Max Width (W12-52) sign should be used with a posted width 1 foot less than available width.

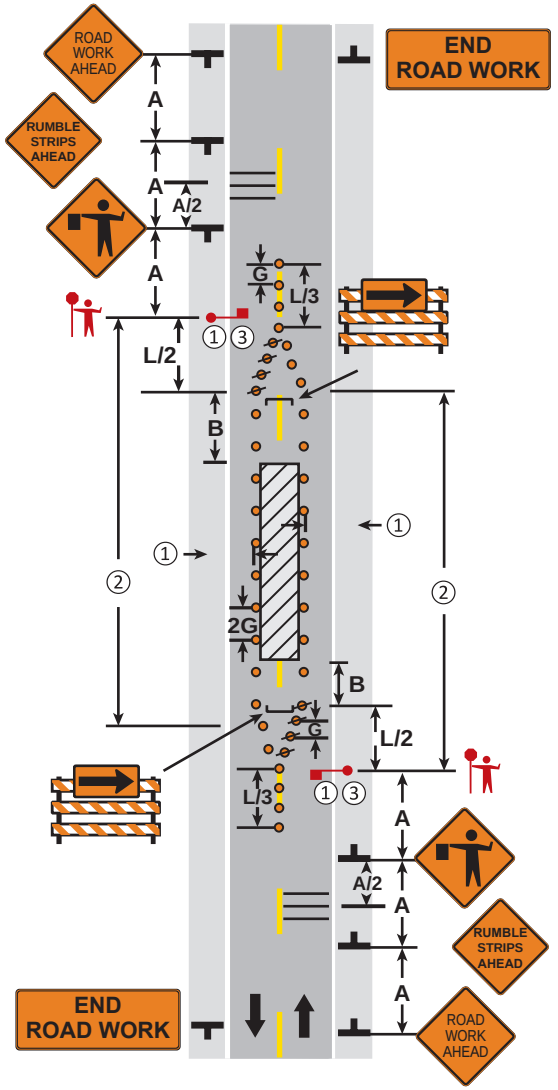


EQUIPMENT ON CENTERLINE
TWO-LANE, TWO-WAY ROAD

1 HOUR or LESS **LAYOUT 23**

NOTES:

1. The Flaggers and the Flagger Ahead signs may be omitted if the posted speed limit is 40 mph or less and there is at least 10 feet of drivable surface outside of the channelizing devices
2. Parking and stopping should be prohibited along the work area and tapers.
3. The flagger shall be visible for at least the Decision Sight Distance (D).
4. END ROAD WORK sign should be placed 500 feet past work area.
5. When available width is less than 16 feet a Max Width (W12-52) sign should be used with a posted width 1 foot less than available width.

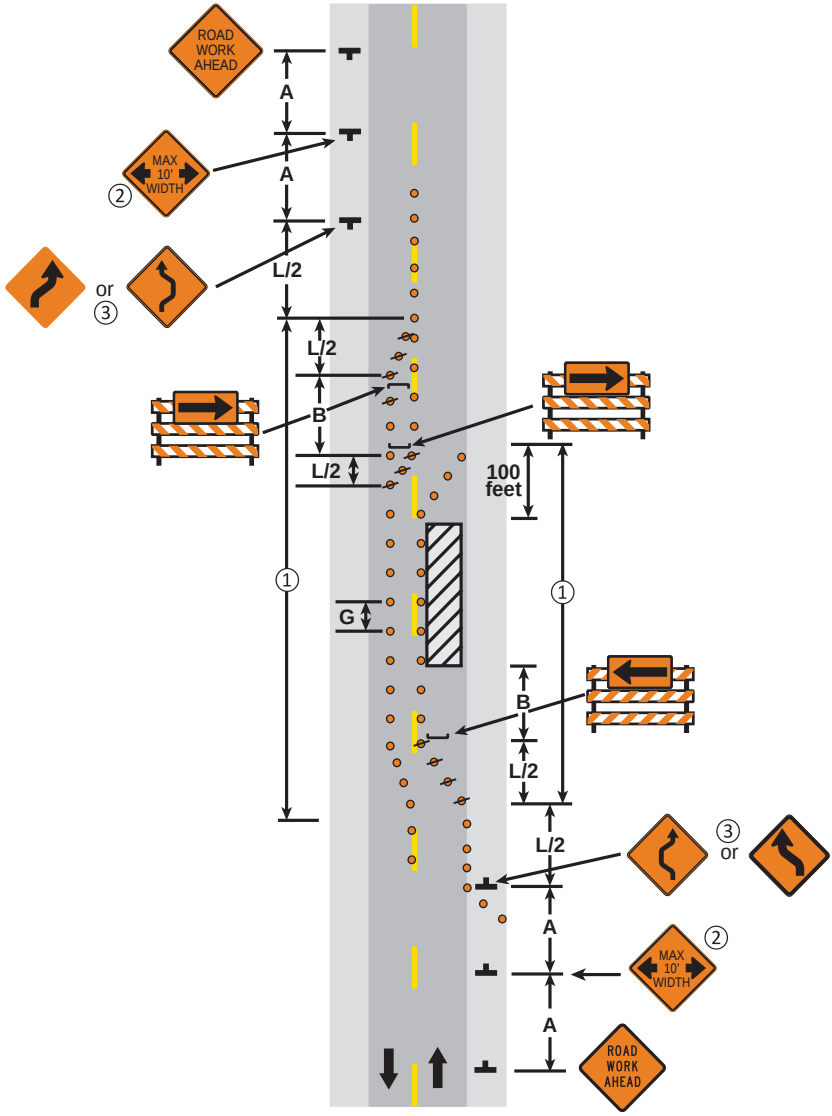


WORK SPACE IN CENTER OF ROAD
TWO-LANE, TWO-WAY ROAD

12 HOUR or LESS **LAYOUT 24**

NOTES:

1. Parking and stopping should be prohibited along the work area and tapers.
2. When available width is less than 16 feet, a Max Width (W12-52) sign should be used with a posted width 1 foot less than available width.
3. If tangent length of activity area is 600 feet or less, use the Double Reverse Curve sign.
4. END ROAD WORK sign should be placed 500 feet past work area.



WORK SPACE OCCUPIES ONE HALF OF ROAD
TWO-LANE, TWO-WAY ROAD

3 DAYS or LESS **LAYOUT 25**

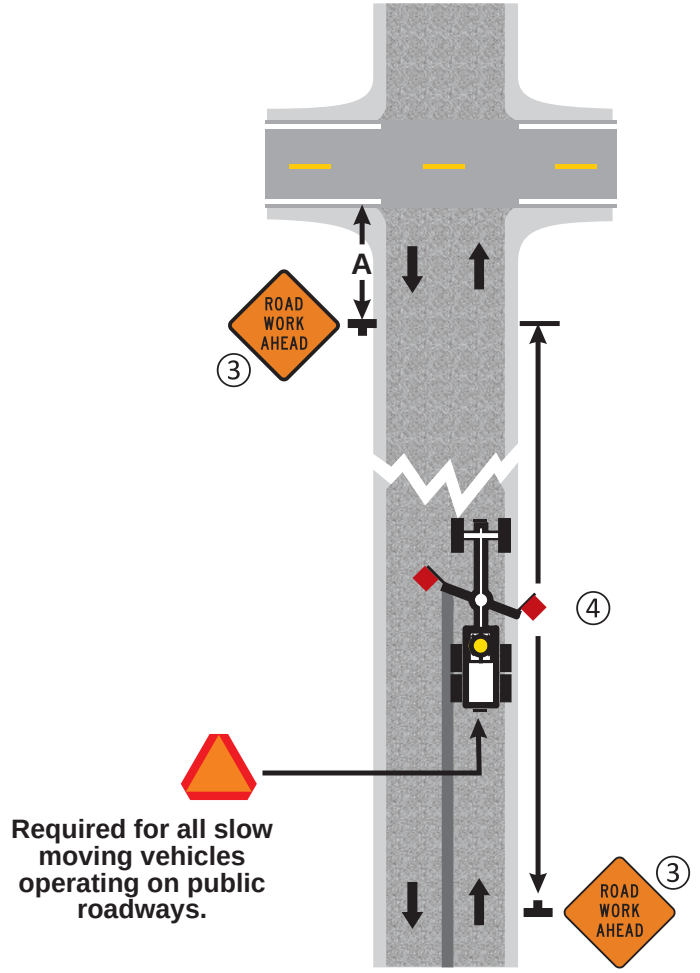
NOTES:

1. Motor Graders shall be equipped with operating vehicle warning lights visible for 360 degrees.
2. Motor Grader blade end(s) may be marked with red or orange flags to provide additional warning and make the equipment more visible to passing vehicles.

③ The ROAD WORK AHEAD signs may be omitted when there is an adequate approach Decision Sight Distance (D) to the Motor Grader along the majority of the route.

④ When advance warning signs are used, the signs should be no more than 3 miles from the Work Vehicle. The location of the signs should be determined by the sources of traffic, such as major cross roads.

5. END ROAD WORK sign should be placed 500 feet past work area.

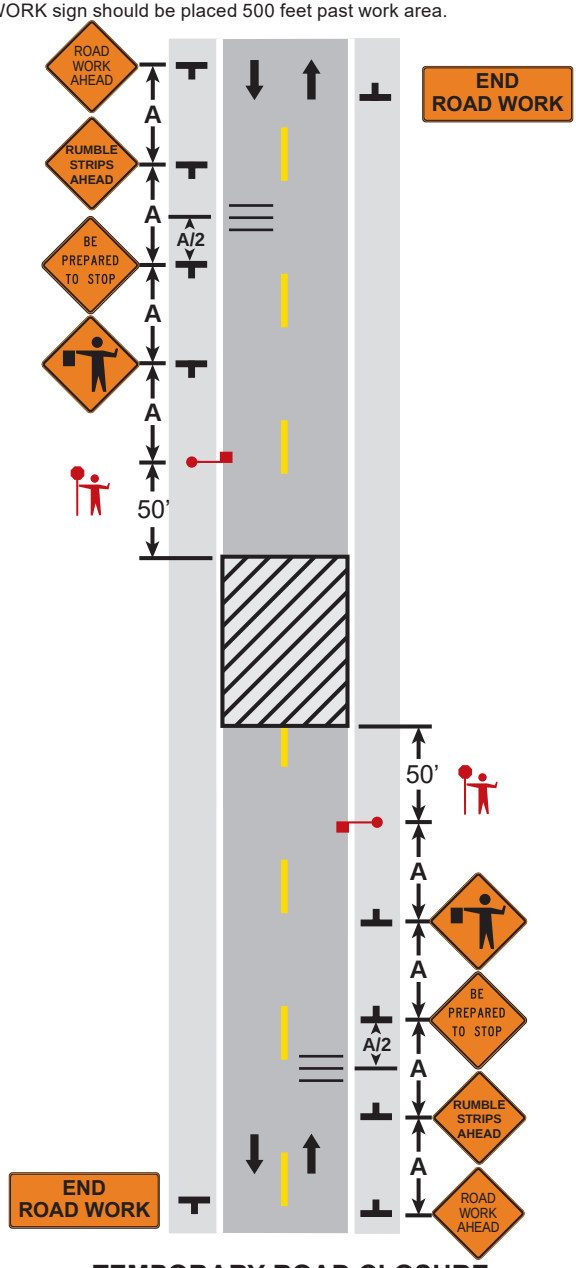


GRAVEL ROAD MAINTENANCE
GRADING OPERATIONS
TWO-LANE, TWO-WAY ROAD

12 HOURS or LESS **LAYOUT 26**

NOTES:

1. Traffic should not be stopped for intervals of greater than 15 minutes.
2. END ROAD WORK sign should be placed 500 feet past work area.

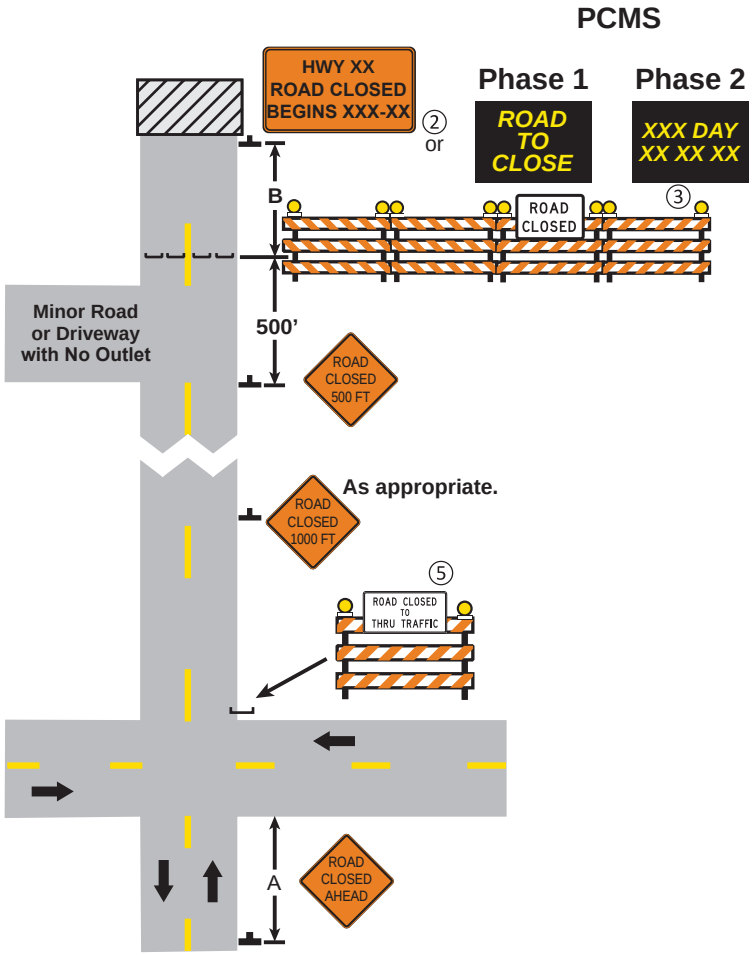


TEMPORARY ROAD CLOSURE
TWO-LANE, TWO-WAY ROAD

12 HOURS or LESS **LAYOUT 27**

NOTES:

1. The road authority shall be contacted prior to closure. The road authority may provide requirements related to sign placement, detours, emergency services, etc.
2. A Road Closure Notice sign or PCMS should be installed 7 days in advance as required by the road authority.
3. Install Type III barricade at the last driveway or intersection beyond which there is no public access. Barricade shall span the entire roadway including traversable shoulders.
4. Road user safety and usability must be maintained up to the full closure.
5. ROAD CLOSED TO THRU TRAFFIC barricade assembly may be placed on the center line; stripes on barricade shall slope downward toward the appropriate traffic direction (for both directions of the roadway).
6. NO OUTLET sign shall be used only when there are no outlets and there are no alternate through routes past this point.



ROAD CLOSURE

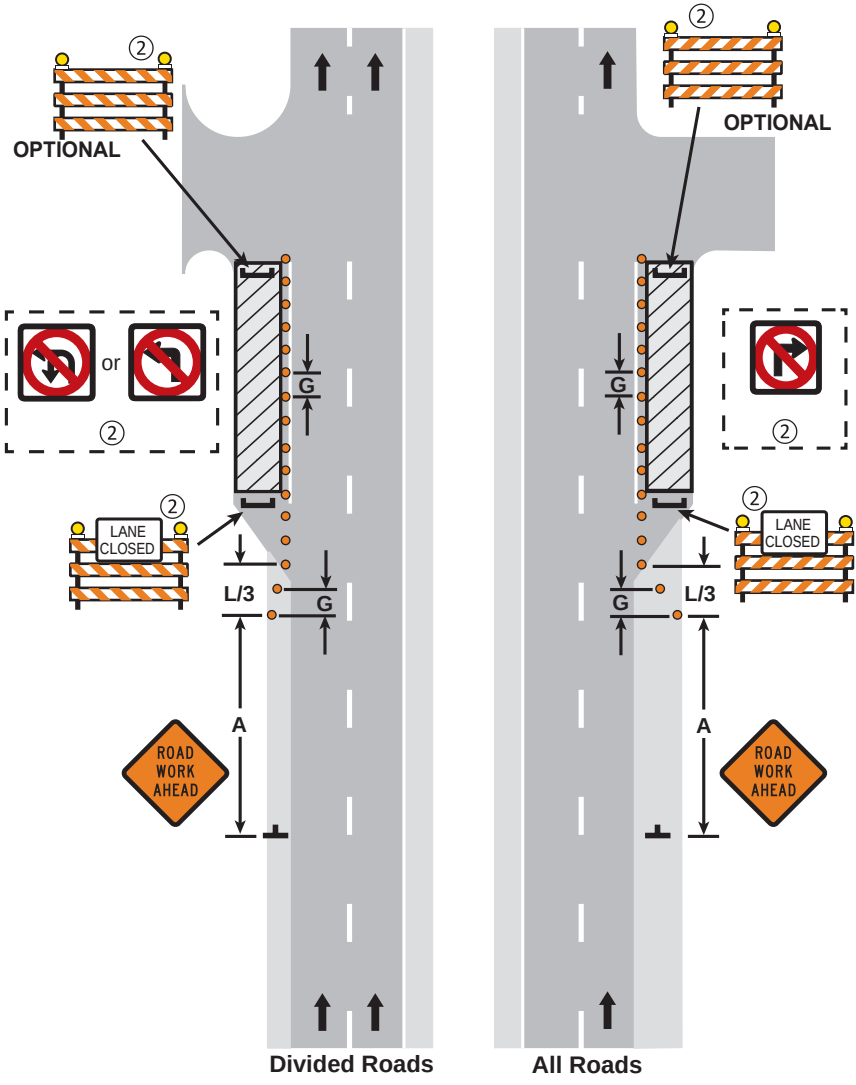
3 DAYS or LESS **LAYOUT 28**

NOTES:

1. Contact the appropriate road authority for signal timing modifications before beginning work at any signalized intersection.

② Signs are required if turns are prohibited.

3. END ROAD WORK sign should be placed 500 feet past work area.



TURN LANE CLOSURES

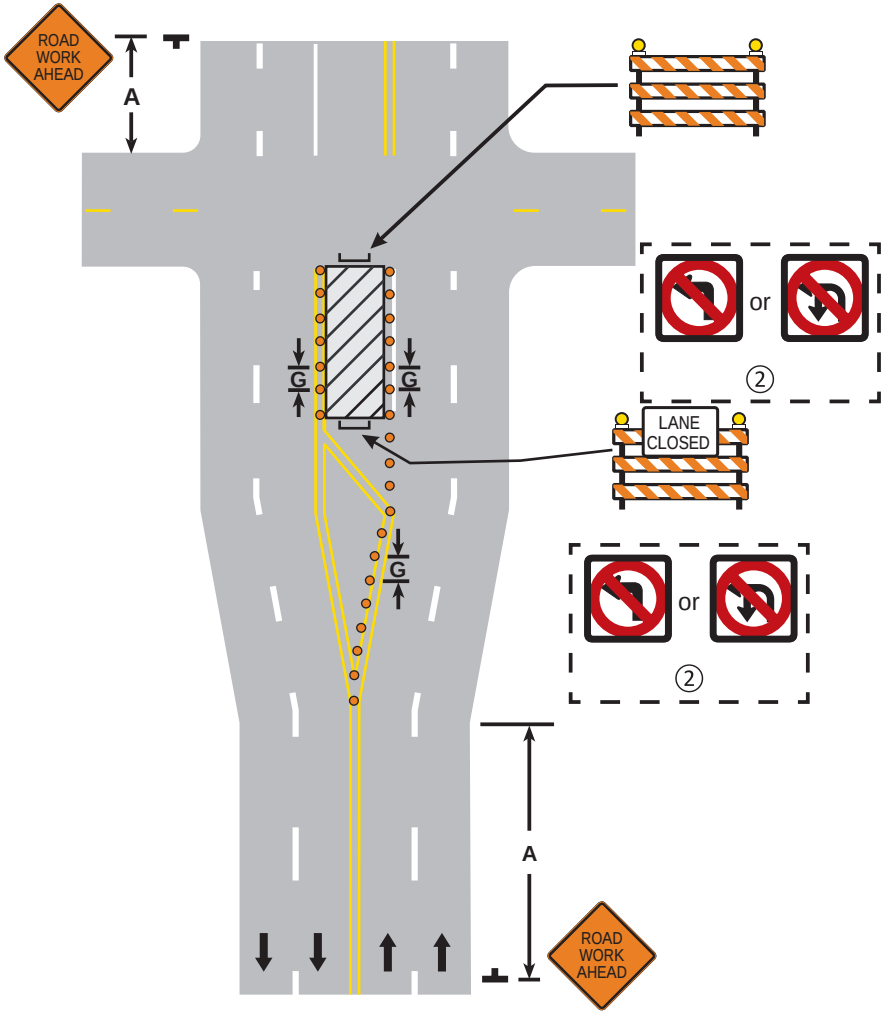
3 DAYS or LESS **LAYOUT 29**

NOTES:

1. Contact the appropriate road authority for signal timing modifications before beginning work at any signalized intersection.

② Signs are required if turns are prohibited.

3. END ROAD WORK sign should be placed 500 feet past work area.



LEFT TURN LANE CLOSURE
TWO-LANE, TWO WAY or MULTI-LANE UNDIVIDED ROAD

3 DAYS or LESS **LAYOUT 30**

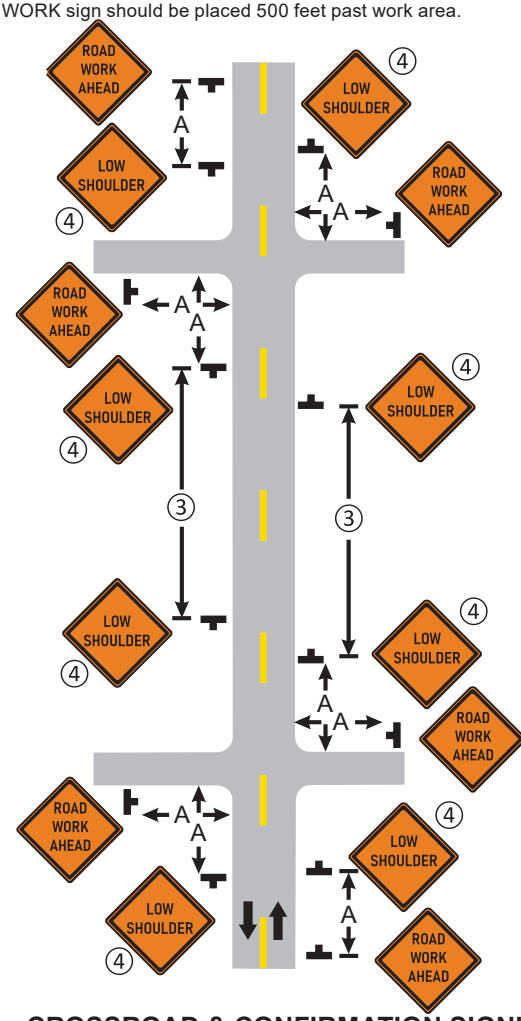
NOTES:

1. This layout should be used for those stationary temporary traffic control zones that extend over a relatively long segment of roadway.
2. The appropriate layout shall be used for the active work space (such as resurfacing operations, area of paving, etc).

(3) Confirmation signing for a continuous condition should be placed after every intersection and approximately 1 mile spacing.

(4) Use the appropriate advance warning sign for the roadway condition, i.e. GROOVED PAVEMENT, LOOSE GRAVEL, ROUGH ROAD. See Drop Off Signing on Figure 5.

5. Delineate raised structures (manhole covers, etc.)
6. END ROAD WORK sign should be placed 500 feet past work area.



CROSSROAD & CONFIRMATION SIGNING
TRAFFIC CONTROL ZONE

3 DAYS or LESS **LAYOUT 31**