South Carolina



Flagger's Handbook

— 2026 —

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Policy Update

SCDOT has adopted new practices for some items that are not yet reflected in this handbook or other manuals. The following items may be considered at the Engineer's discretion. These items are expected to be reflected in updates of future drawings.

On multilane routes:
Portable plastic drums are acceptable for use as the traffic control device in the transition area (merging taper) of lane closures in place of Type II Barricades. Type II Barricades are still permissible for use in this application. Do not use Type II Barricades and portable plastic drums together in the same taper or in multiple tapers in the same travel direction (when applicable for closing more than one lane).

R4-7 ("keep right") and R4-8 ("keep left") signs may be omitted in the transition area (merging taper) of lane closures.

R4-1 ("do not pass") signs may be omitted in the advance warning area for lane closures. Spacing adjustments of the remaining signs, excluding those that provide a specific distance, may be considered.

R4-1 ("do not pass") signs may be added along the activity area when traffic in that direction is reduced to a single open lane.

During Nighttime Flagging Operations: All flaggers shall wear properly retroreflectorized hard hats and high visibility safety apparel consisting of a safety vest and safety pants that meet the ANSI/ISEA 107 Performance Class 3 requirements.

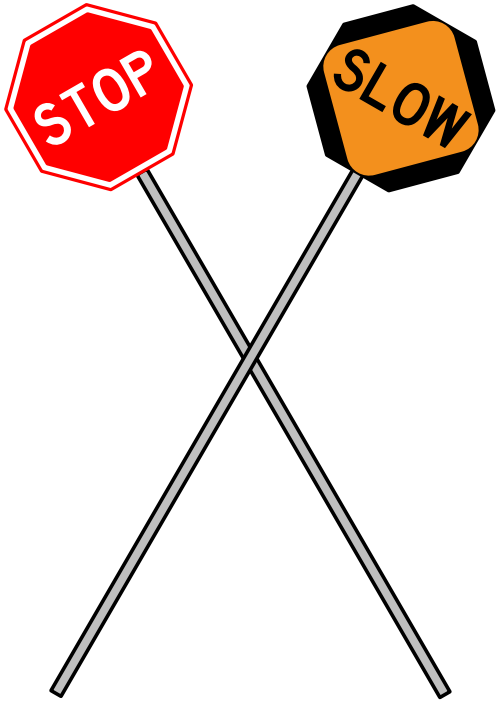
Introduction

You have been chosen to be a Flagger because your supervisor feels you are physically able, mentally alert, and capable of giving directions to the road users.

Because you are an important part of all Maintenance, Construction, and Utility Operations, you need to know this guide so well that it becomes second nature.

Your fellow workers and the road users depend upon your alertness and ability to control traffic with your STOP/SLOW paddle.

You have an important job, and it should be carried out with authority and dignity.



Basic Functions

- To protect the lives of workers.
- To guide traffic safely through the Work Activity Area.
- To avoid unreasonable delays to road users.
- To communicate effectively with road users.
- To answer questions courteously and intelligently.

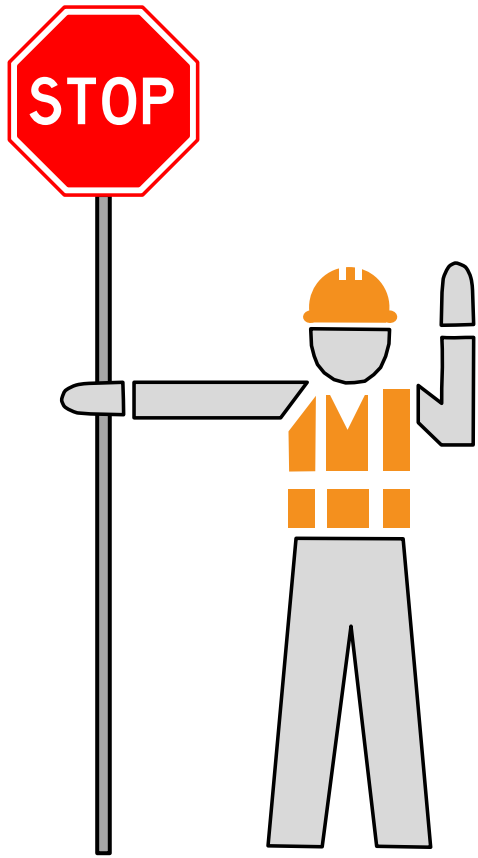
Courtesy is important.
Your actions reflect on you and your employer.

Appearance

- All Flaggers should maintain a clean, neat appearance.
- Flaggers shall not report to work shirtless or wearing shorts.
- Safe and appropriate footwear should be worn.
- Radios, cell phones, and books are not permitted.

To assure road user respect, your appearance is critical.





Your safety,
the safety of your crew,
and the safety of the motoring
public are more important than
any Construction, Maintenance, or
Utility Operation being performed.

Definitions

Approach Lane – Traffic approaches an intersection or a specific location in this travel lane.

Approach Taper – This is a One-Lane, Two-Way Taper placed in the travel lane where the work activity takes place. This taper precedes the Buffer Space and the Work Activity Area.

Automated Flagger Assistance Devices (AFADs) – These are mechanically operated temporary traffic control devices that function under the same operational principles as traditional Flagging.

Buffer Space – This area is located between the downstream end of the Approach Taper and the nearest limits of the Work Activity Area and may provide some recovery space for an errant vehicle.

Closed Lane Flagger – This Flagger is stationed adjacent to the first traffic control device in the Approach Taper and controls traffic that requires relocation from the travel lane being closed to traffic.

Departure Lane – Traffic departs from an intersection or a specific location in this travel lane.

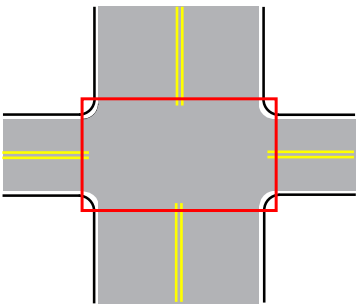
Downstream Taper – This taper, placed in the travel lane where the work activity is to take place, follows the Work Activity Area and serves as the Termination Area for the closure of the travel lane.

Flagger – A person who ensures the safety of workers and road users by using clear, positive directions to actively control the flow of road users into and/or through a temporary traffic control zone.

Flagging Operation – A stationary traffic control setup to temporarily control the flow of traffic when two opposing directions of traffic must share a common travel lane on a two-lane, two-way roadway.

Flagger Station – This is the specific location of the Flagger.

Limits of the Intersection (Physical Area of an Intersection) – The limits of or physical area within an intersection are defined by the location of stop bars when present. When stop bars are absent, the limits of or physical area within an intersection is defined by the location points where the corner radii between adjacent roadway approaches tie to the edge of pavement or the edge of travel lane adjacent to the edge of pavement of each roadway approach.



Limits of the Work Activity Area – This is the boundary of the Work Activity Area first encountered from either direction, by road users passing by the Work Activity Area in the adjacent travel lane open to traffic and controlled by the Flaggers.

Mainline Approach – This is an approach to the Work Activity Area on the roadway where the Work Activity Area is located.

Multiple Flaggers Flagging Operation – A Flagging Operation controlled by two or more Flaggers.

Open Lane Flagger – This Flagger is stationed 100' beyond the last traffic control device in the Downstream Taper furthest away from the Work Activity Area and controls traffic operating in the travel lane remaining open to traffic.

Side Road(s) – A road that intersects the roadway on which the Work Activity Area is located.

Side Road Flagger – This Flagger is stationed on an intersecting Side Road and controls the side road traffic entering into the roadway where the Work Activity Area is located.

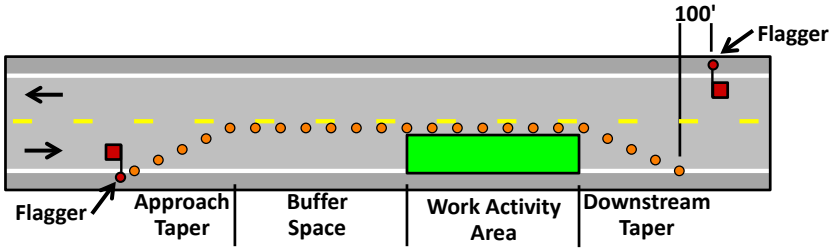
Single Flagger Flagging Operation – A Flagging Operation controlled by one Flagger.

Temporary Traffic Control (TTC) Zones – An area of a highway where road user conditions are changed because of a Work Zone, an Incident Zone, or a Planned Special Event through the use of traffic control devices, uniformed Law Enforcement Officers (LEOs), or other authorized personnel.

Traffic Control Devices (TCDs) – Signs, signals, pavement markings, and other devices placed along highways and streets to provide for the safe and efficient movement of all road users.

Work Activity Area – Personnel, materials, equipment, Work Vehicles, etc. are present within this area to conduct the work.

Work Zone – An area of a highway with Construction, Maintenance, or Utility work activities and that is typically marked by signs, channelizing devices, barriers, pavement markings, and/or Work Vehicles. It extends from the first warning sign or high-intensity rotating, flashing, oscillating, or strobe lights on a vehicle to the END ROAD WORK sign or the last traffic control device.



Flagging Requirements

A Flagging Operation may be necessary during a Lane Closure on a two-lane, two-way roadway, an Intermittent Ramp Closure, or an intermittent encroachment of equipment onto a portion of the roadway. All Flagging Operations shall have the appropriate signing, equipment, and trained personnel.

Flagger Signs

Install all essential signs in advance of each Flagger Station. All Flaggers shall conduct themselves and the operation as directed by the Manual on Uniform Traffic Control Devices (MUTCD) and the SCDOT Flagger's Handbook, latest editions.



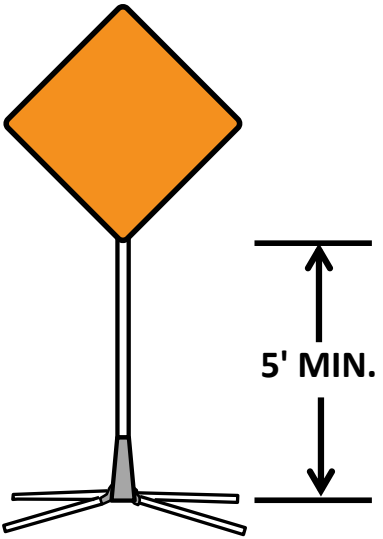




Erect all necessary signs prior to beginning the operation and immediately remove or cover these signs upon ending the operation.

During Flagging Operations, the minimum mounting height of ALL signs mounted on portable sign supports is 5' from the bottom edge of the sign to the ground or surface on which the sign support is located.

Maintain the proper array of Advance Warning Signs in place for each approach at all times that a Flagging Operation is in place and active.



Arrow Board



An arrow board SHALL operate in the “Four Corner” Caution Mode when located within or between the limits of the Advance Warning Sign arrays specific to a Flagging Operation.

Flagger Station

Station the Flagger controlling traffic operating in the travel lane closed to traffic, the Closed Lane Flagger, adjacent to the first TCD in the Approach Taper.

Station the Flagger controlling traffic in the travel lane that remains open to two-way traffic, the Open Lane Flagger, 100’ beyond the last TCD in the Downstream Taper furthest away from the Work Activity Area.

Flagger Stations shall be located such that approaching road users will have sufficient distance to stop at an intended stopping point. For the Stopping Sight Distance as determined by the posted regulatory speed limit of the roadway use Table 1. These distances may be increased for downgrades and other conditions that affect stopping distance.

Table 1. Stopping Sight Distance

Stopping Sight Distance	
Speed	**Distance**
20 MPH	115’
25 MPH	155’
30 MPH	200’
35 MPH	250’
40 MPH	305’
45 MPH	360’
50 MPH	425’
55 MPH	495’
60 MPH	570’
65 MPH	645’
70 MPH	730’
75 MPH	820’

Nighttime Flagging

Utilize portable plastic drums or 42” oversized traffic cones during Nighttime Flagging Operations. In the event that portable plastic drums or 42” oversized traffic cones are not utilized in a Daytime Flagging Operation and the Flagging Operation extends into the nighttime hours, replace all 28” or 36” standard traffic cones with either portable plastic drums or 42” oversized traffic cones. Reflectorize all portable plastic drums and all traffic cones with Type IV or higher flexible microprismatic retroreflective sheeting unless otherwise directed by SCDOT.

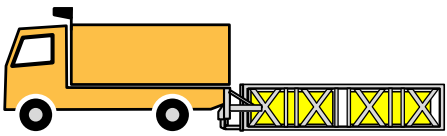
Lane Closure Restrictions

Lane Closures for Flagging Operations are restricted to a maximum distance of 2 miles. Minimize the distance of the Lane Closure to only the area(s) where the work activities are to take place. However, an increased distance in addition to the actual Work Activity Area, not to exceed the 2mile maximum length, may be included in the Lane Closure to provide adequate Stopping Sight Distance of the Flagger Station to approaching road users.

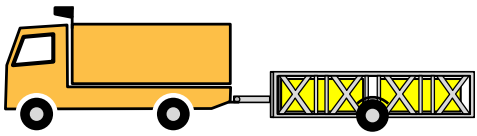
In the event work that requires Flagging Operations is being conducted at 2 different locations at the same time, separate the 2 locations by no less than 2 miles from the last TCD in the Downstream Taper of the first Lane Closure to the first TCD in the Approach Taper of the second Lane Closure encountered by a road user.

Truck Mounted Attenuator (TMA)

A truck mounted attenuator (TMA) is an energy absorbing device attached to or towed behind the truck that is used as a shield to prevent errant vehicles from entering the TTC Zone. In Flagging Operations a TMA is recommended but not required; however, when utilizing a TMA, locate the TMA approximately 100’ in advance of the Work Activity Area.



Direct Mounted TMA



Trailer Towed TMA

Changeable Message Sign (CMS)

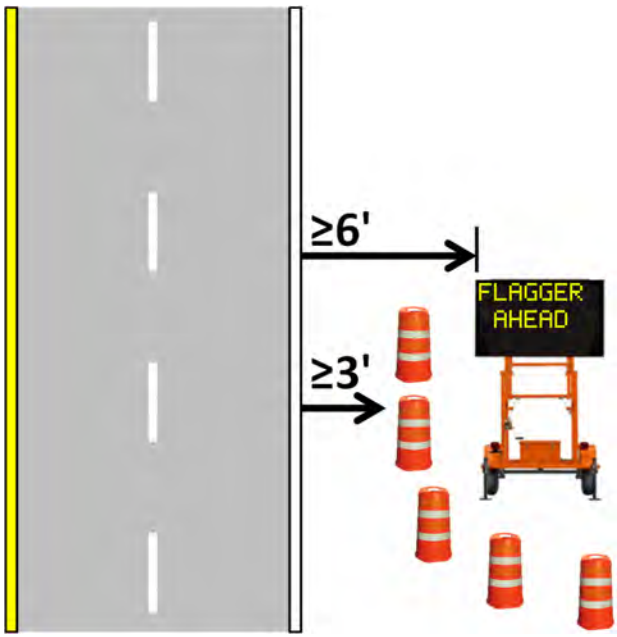
A CMS should provide clear and legible messages from a distance of 1,000’ and should be visible halfamile under both day and night conditions. The sign panel should be approximately 76” vertically and 113” horizontally. A CMS shall remain stationary when operating.

The CMS should be placed on the shoulder of the roadway not less than 6’ from the edge of the sign to the near edge of the adjacent travel lane when space is available. When the space of 6’ or rightofway is unavailable, place the CMS at the greatest possible distance from the near edge of the adjacent lane.

Supplement the sign location with not less than 5 portable plastic drums placed between the sign and the adjacent travel lane for delineation of the sign location. Do not use standard traffic cones or 42” oversized cones as a substitute for the portable plastic drums.

Install and maintain the drums not closer than 3’ from the near edge of the adjacent travel lane. The spacing between the portable plastic drums is approximately 3’ to 5’.

When non-operational for more than 72 hours, remove completely from the roadway.

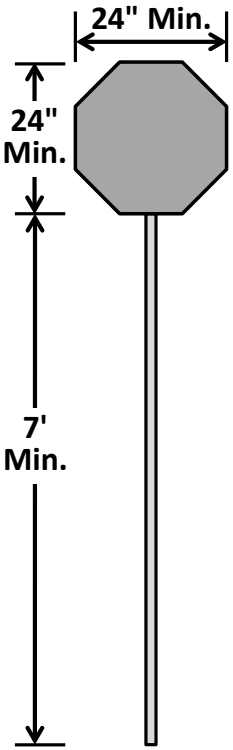


Equipment

The STOP/SLOW paddle is the main TCD for a Flagger. The octagonal shape sign made of rigid material should be at least 24” x 24” with 8” high letters and should be mounted on a rigid handle at least 7’ long.

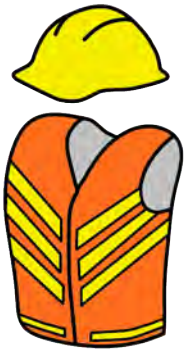
A flashing STOP/SLOW paddle may be used. If a flashing STOP/SLOW paddle is used, it shall comply with the requirements of Section 6D.02 of the MUTCD, latest edition.

Reflectorize the STOP face of the paddle with a red Type III high intensity retroreflective sheeting. Reflectorize the SLOW face of the paddle with a fluorescent orange retroreflective sheeting.









Flaggers shall wear an approved safety vest, shirt, or coat. The background color of personal protective apparel shall be fluorescent orange-red, fluorescent yellow-green, or a combination of the two as defined by the ANSI/ISEA 107 Standard, latest revision. A brightly colored hat will also make you more visible (hard hats with 360-degree retroreflective strips may be required by your agency).

A warning device, such as an air horn, is recommended for use by Flaggers during Daytime or Nighttime Flagging.

Proper signs need to be in place before Flagging begins and removed after flagging ends.

Nighttime Flagging Operations have specific requirements. (See Pages 19 and 26-27 for details.)

Flags should be used only in emergency situations. (See Page 74 for details.)

Time Durations for Stopped Traffic

Flagging Operations are utilized to direct traffic around work activities and maintain continuous traffic flow; therefore, stopped traffic shall not be required to stop for time durations greater than those listed in Table 2.

Table 2. Traffic Stopped Time Durations for Flagging Operations

Length of Closure	Maximum Time Duration for Stopped Traffic
1 Mile or Less	5 Minutes
1 to 2 Miles	7½ Minutes

If the work activities require traffic to be stopped for periods greater than 5 minutes to 7½ minutes as stated in Table 2, consider:

- conducting work activities during times of lowest traffic volumes such as during the hours of darkness;
- alternate work methods (such as a pilot car operation); or
- a complete road closure with Detour installations.

TCD Spacing Intervals for Flagging Operations

Delineate the tangent area of the Lane Closure with the necessary TCDs to provide delineation of and to minimize encroachment by road users into the closed travel lane. TCDs are installed at spacing intervals based on the posted regulatory speed limit of the roadway prior to beginning any work. Use Table 3 to determine the spacing intervals between the TCDs.

Table 3. Traffic Control Device Spacing Intervals for Flagging Operations

Speed Limit	Spacing Intervals
35 MPH or Less	25’
40 MPH or Greater	50’

Install the Advance Warning Signs at spacing intervals based on the posted regulatory speed limit of the roadway prior to the work beginning. Use Table 4 to determine the spacing intervals between the signs.

Table 4. Advance Warning Sign Placement Intervals

Speed Limit	Spacing Intervals
Low-Speed 35 MPH or Less	200’
Intermediate-Speed 40 MPH – 50 MPH	350’
High-Speed 55 MPH or Greater	500’

The Advance Warning Sign placement intervals indicated on a traffic control plan are for normal conditions. Adjustments to the spacing intervals between the signs may be necessary due to existing signs, driveways, intersecting roads, etc.

Buffer Space

The minimum distance requirements for the Buffer Space are based upon the posted regulatory speed limit of the roadway prior to beginning the work. Use Table 5 to determine the appropriate length of the Buffer Space.

Table 5. Minimum Distance Requirements for a Buffer Space in a Flagging Operation

Speed Limit	Spacing Intervals
Low-Speed 35 MPH or Less	**200'**
Intermediate-Speed 40 MPH – 50 MPH	**300'**
High-Speed 55 MPH or Greater	**400'**

The lengths of a Buffer Space indicated above are for normal conditions. Adjustments to increase or decrease the length of a Buffer Space may be necessary due to vertical and horizontal curves that may obstruct sight distance, driveways, intersecting roadways, etc.

When using a TMA, the length of the Buffer Space is measured from the downstream end of the Approach Taper to the back of the TMA. When not using a TMA, the length of the Buffer Space is measured from the downstream end of the Approach Taper to the beginning of the Work Activity Area.

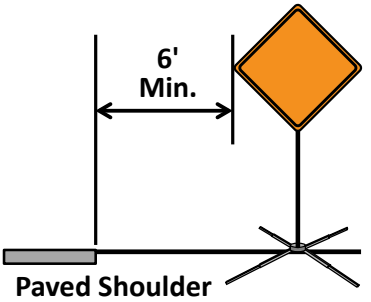
The presence of personnel, tools, materials, equipment, Work Vehicles, etc. within the limits of the Buffer Space is PROHIBITED.

Sign Placement

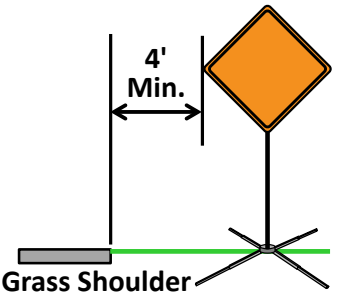
Install and maintain the proper array of Advance Warning Signs for each Mainline Approach of a Flagging Operation prior to initiation of the operation and remove or cover all signs immediately upon termination of the operation.

Measure all Advance Warning Sign locations for each Mainline Approach from the location of the adjacent Flagger Station.

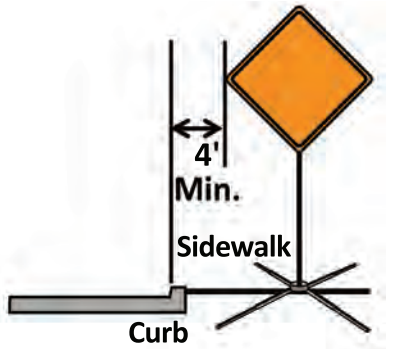
Install the Advance Warning Signs at spacing intervals (see Table 4) based on the posted regulatory speed limit of the roadway prior to beginning any work. The Advance Warning Sign Placement Intervals indicated are for normal conditions. Adjustments to these spacing intervals may be necessary due to existing signs, driveways, intersecting roadways, horizontal and/or vertical roadway alignments or other sight distance restrictions.



The Flagger Station should be positioned the same distance from the “Flagger” sign (W20-7-48) as the spacing interval between the Advance Warning Signs. The Flagger Station should never be more than 500’ from the “Flagger” sign of the array of Advance Warning Signs.



Install Advance Warning Signs with the lateral offsets depicted on this page. Where sidewalks are present maintain a minimum 4’ sidewalk width. Do not place signs within bike lanes if they are otherwise open to travel on the approach to the flagger station.



Sign Removal

Remove the Flagger sign and all signs associated with the Flagging Operation when active Flagging is not being performed.

Always ensure that all signs are removed from the job site at the end of the work shift.

Leaving signs in place when Flagging Operations are not being performed diminishes the credibility of the signs.

Flagger Communication

To be effective, Flaggers must always be able to communicate with one another. Communication can be maintained by:

- **Visual Contact –** effective when Flaggers are close enough so that they can read each other's STOP/SLOW paddles and see each other's "all clear" signals.
- **Two-Way Radio –** the best means of communication, even when there is visual contact.

Only after the "all clear" signal comes from the other Flagger should you release traffic. If in doubt, stop all traffic!

Location of Flagger Station

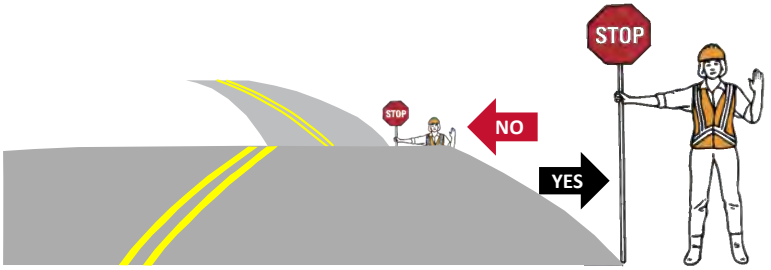
Always stand alone in a highly visible location away from other workers and Work Vehicles.

A typical Flagger Station is on the shoulder of the road.

Never stand in the path of oncoming traffic.
Do not stand inside any obstacle.
Always allow for a quick getaway.

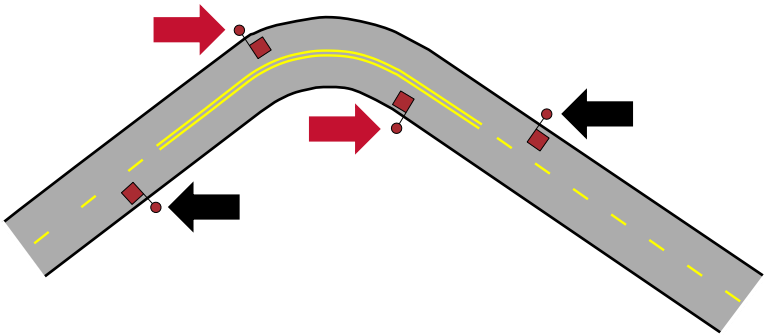
On Hills

When Flagging near a hill, take a position in advance of the hill. Make sure you are visible to approaching traffic. Never take a position over the crest of a hill.



On Curves

When Flagging near curves, always make sure you are visible to approaching traffic. Your Flagger Station should be well in advance of the curve. Never take a position around a curve.



Communication between Flaggers is critical. The best way to maintain communication is two-way radios; however, visual contact may be used.

Daytime Flagging Signals

Slowing Traffic

Stand on the shoulder facing traffic.

With the SLOW sign showing, slowly raise and lower the left arm with the palm facing down.



To slow traffic

Stopping Traffic

Stand in a safe position on the shoulder facing traffic. Never stand in the path of oncoming traffic, and never turn your back on traffic.

Hold the paddle away from your body with the STOP sign facing traffic and the sign on or near the edge of the pavement. Raise your free hand with the palm exposed to the approaching vehicle and make eye contact with the driver.

When preparing to present the STOP side of the STOP/SLOW paddle to approaching traffic, change to the STOP when the approaching vehicle has plenty of distance to gradually stop. Avoid screeching halts.



To stop traffic

Releasing Traffic – Closed Lane

Standing on the shoulder of the closed lane with your paddle turned to STOP, you must wait for an "all clear" signal from the other Flagger before you release the stopped traffic.

Once the "all clear" is received you may release the stopped traffic by turning the paddle to show the SLOW sign. Then with your free arm, signal drivers to proceed into the open lane. Be direct and point to the open lane.

Releasing Traffic – Open Lane

Standing on the shoulder of the open lane with your paddle turned to STOP, you must wait for an "all clear" signal from the other Flagger before you release the stopped traffic.

Once the "all clear" is received, take a step or 2 back from the edge of the pavement and turn the paddle to SLOW. Then with your free arm, signal drivers to proceed into the open lane. Be direct and point to the open lane.



To release traffic (applies to closed and open lanes)

"All Clear" Signal

When two Flaggers are used, they must always be able to communicate with one another. This can be done by keeping visual contact or using radios.

If visual contact is possible, then the "all clear" signal can be given by lifting your hardhat. When you give this signal, you are telling the other Flagger that you have completely stopped traffic and that it is clear for the other direction to be released.

Walking Into the Road

After you have stopped the first vehicle, you will remain on the shoulder of the road. This is your typical Flagger Station. If additional vehicles arrive and they cannot clearly see your STOP paddle, then you may walk out to the center of the roadway so the additional traffic can see the STOP paddle.

Do not cross the center line and remember to watch out for traffic that may be coming from behind you.

When releasing traffic, move back to the shoulder with the paddle remaining on STOP. Then, once on the shoulder, turn the paddle to SLOW and motion traffic to proceed.

Nighttime Flagging Signals

Stopping Traffic

To stop vehicles, stand on the shoulder and face traffic with the STOP sign in the right hand and flashlight with glowcone in the left hand.

Slowly wave the glowcone back and forth in front of your body. Don't let the arc extend beyond the base of the staff.



To stop traffic

Releasing Traffic

To release traffic, turn the paddle to SLOW, then point from the driver to the open lane with the glowcone and hold in that position.

Do not wave the glowcone when releasing traffic since this may confuse the driver.



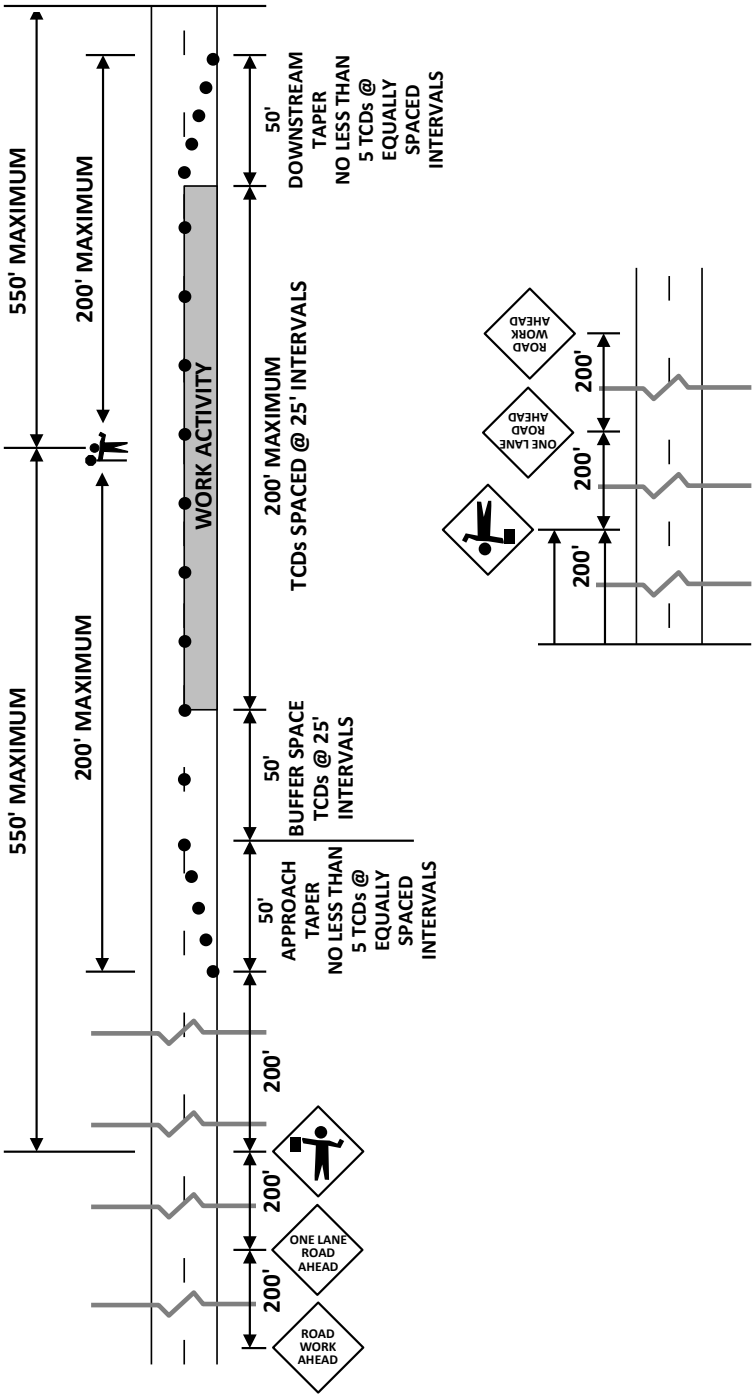
To release traffic

Flagging Operations – Single Flagger

Single Flagger – Low-Volume Roads – Drawing 1

1. Install and conduct Single Flagger Operations as specified by the MUTCD and the SCDOT Flagger's Handbook, latest editions.
2. Lane Closures controlled by a Single Flagger Operation are restricted to low-volume, low-speed (≤ 35 MPH) routes during DAYTIME hours ONLY, except during Emergency Operations.
3. The Flagger must be positioned to be visible to approaching traffic from both directions.
4. Flagging Operations shall direct traffic around the work activities and maintain continuous traffic flow.
5. The Flagger should stand on the shoulder directly opposite the work area and direct traffic with the STOP/SLOW paddle.
6. Stopped traffic shall not be required to stop for time durations greater than 5 minutes.
7. The Work Activity Area of a Lane Closure controlled by a Single Flagger Operation is restricted to a maximum distance of 200'.
8. Station the Flagger at a location no further than 200' from the first TCD in the Approach Taper and no further than 200' from the last TCD in the Downstream Taper.
9. Conduct the work in such a manner to avoid encroaching into the adjacent travel lane open to traffic.
10. Measure all Advance Warning Sign locations from the beginning of the tapers.
11. Install the Advance Warning Signs for a Single Flagger Operation at a spacing interval of 200'.

Drawing 1. Single Flagger – Low-Volume, Low-Speed Roadways (≤ 35 MPH)



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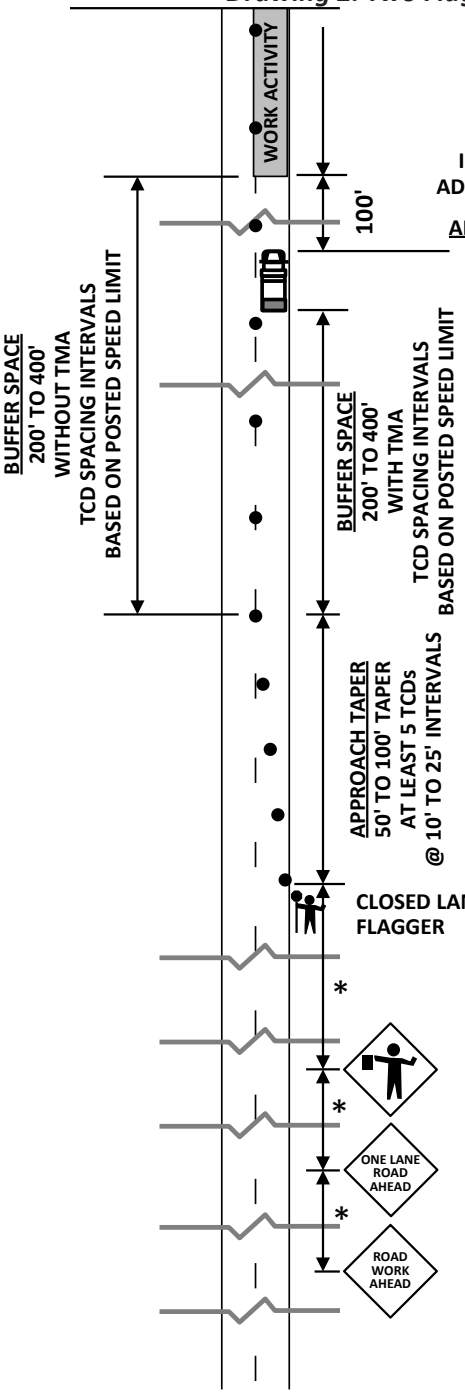
Flagging Operations – Two Flaggers

This operation uses a Flagger on each end of the Work Zone to control traffic flow. This is the most common Flagging Operation. One Flagger should be designated as the Lead Flagger for coordinating the operation.

Daytime Flagging – Drawing 2

1. This Drawing applies to Flagging Operations conducted during DAYTIME hours ONLY.
2. The BE PREPARED TO STOP sign may be added to the sign series and will be located between the “Flagger” sign and the ONE LANE ROAD AHEAD sign. If used, then the spacing of all four signs in the series will be spaced at equal intervals based on speed.

Drawing 2. Two Flagger – Daytime

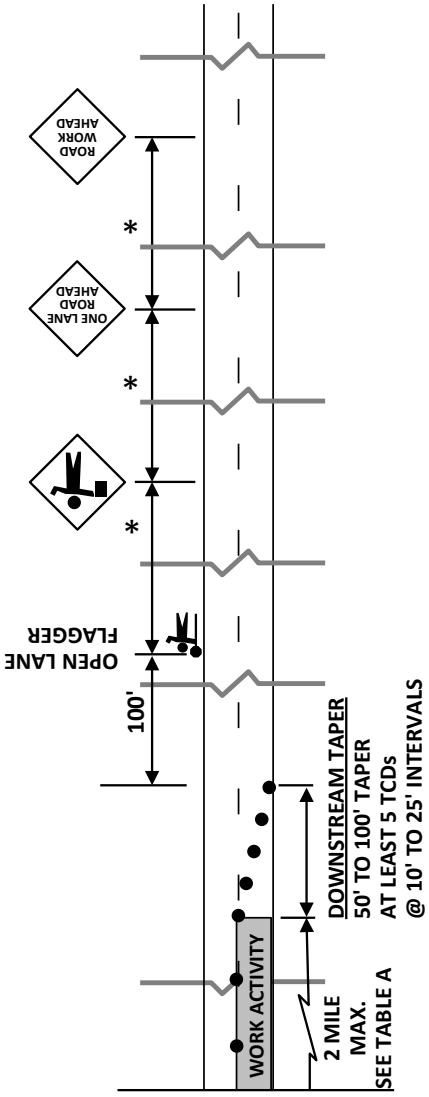


A. TRAFFIC CONTROL DEVICE SPACING INTERVALS: WORK ACTIVITY AREA	
LOW-SPEED 35 MPH OR LESS	25 FT
INTERMEDIATE-SPEED 40 MPH OR GREATER	50 FT

B. SIGN PLACEMENT INTERVALS, *	
LOW-SPEED 35 MPH OR LESS	200 FT
INTERMEDIATE-SPEED 40 MPH – 50 MPH	350 FT
HIGH-SPEED 55 MPH OR GREATER	500 FT

C. BUFFER SPACE DISTANCES	
LOW-SPEED 35 MPH OR LESS	200 FT
INTERMEDIATE-SPEED 40 MPH – 50 MPH	300 FT
HIGH-SPEED 55 MPH OR GREATER	400 FT

Drawing 2. Two Flagger – Daytime (cont.)



Nighttime Flagging – Drawing 3

1. Nighttime Flagging procedures are generally the same as Daytime Flagging except for some equipment changes. A flashlight with a red or orange-red glowcone and a retroreflectorized STOP/SLOW paddle are required for Nighttime Flagging.
2. To make the road user more aware of the upcoming Flagging Operation, flares can be used and Type B High-Intensity Flashing Warning Lights can be placed on the Advance Warning Signs.



3. During Nighttime Flagging Operations, a minimum of 2 flaggers is required. Ensure the Flaggers wear properly retroreflectorized hard hats and high visibility safety apparel consisting of a safety vest and safety pants that meet the ANSI/ISEA 107 Performance Class 3 requirements.
4. During Nighttime Flagging Operations, illuminate each Flagger Station with any combination of portable lights, standard electric lights, existing street lights, etc., that provide a minimum illumination level of 108 lux or 10 footcandles.
5. Supplement each array of Advance Warning Signs on each Mainline Approach with a trailer mounted changeable message sign (CMS). These CMSs are not required on the Side Roads intersecting the roadway where the Work Activity Area is located.
6. These CMSs are not required during Daytime Flagging Operations or during unplanned Nighttime Emergency Operations.
7. Install the CMS in advance of the ROAD WORK AEAD sign (W20-1-48-A) on each Mainline Approach in accordance with the Advance Warning Sign Spacing Intervals (Table 4) based on the posted regulatory speed limit of the roadway prior to beginning any work.



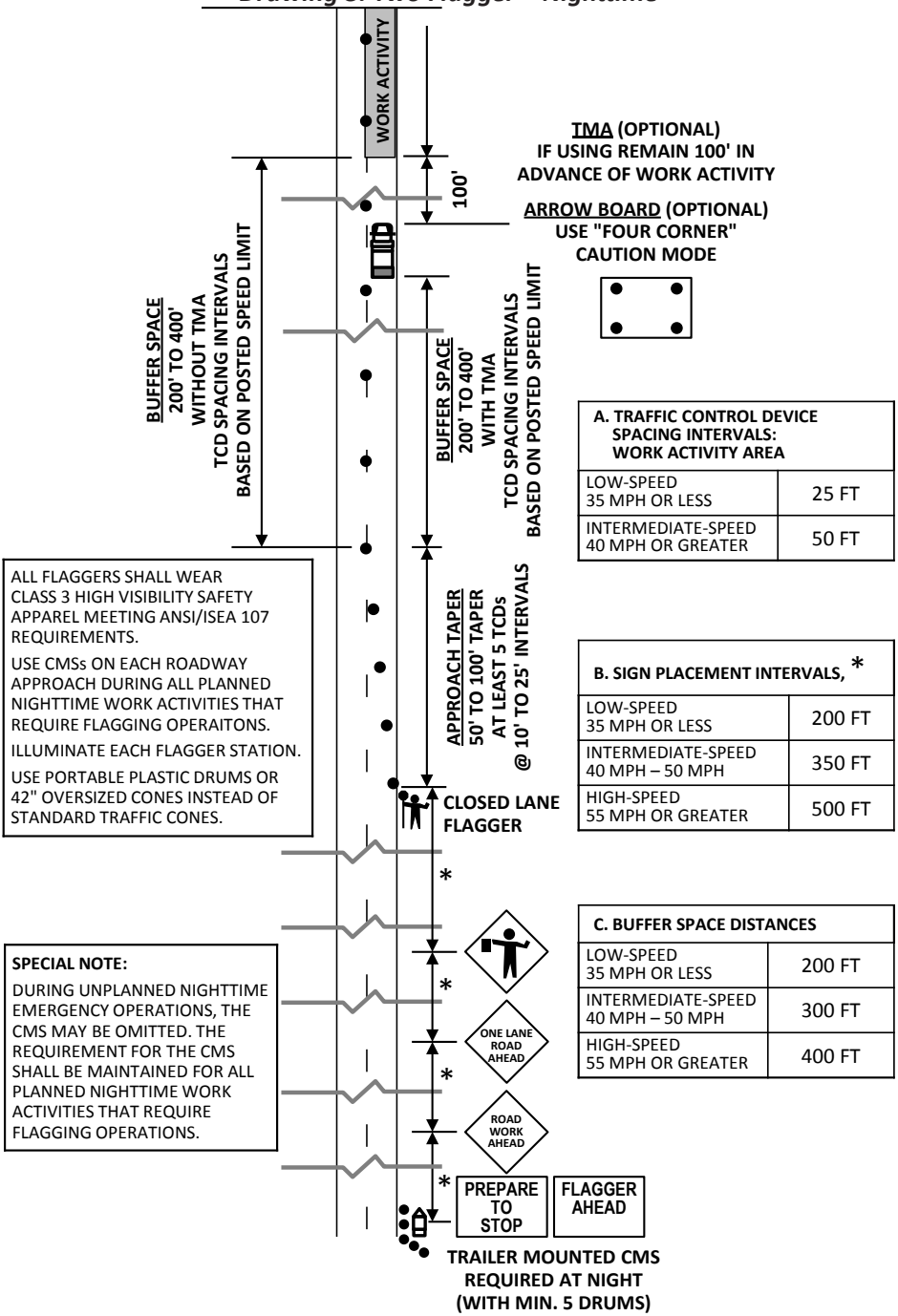
8. The messages should be PREPARE TO STOP and FLAGGER AHEAD. A truck mounted CMS is not an acceptable alternative to a trailer mounted CMS during Nighttime Flagging Operations.





9. Visibility is the key to a safer Flagging Work Zone at night. The better the Flagger can be seen by road users the less likelihood of an accident.

Drawing 3. Two Flagger – Nighttime



ALL FLAGGERS SHALL WEAR CLASS 3 HIGH VISIBILITY SAFETY APPAREL MEETING ANSI/ISEA 107 REQUIREMENTS.

USE CMSs ON EACH ROADWAY APPROACH DURING ALL PLANNED NIGHTTIME WORK ACTIVITIES THAT REQUIRE FLAGGING OPERAITONS.

ILLUMINATE EACH FLAGGER STATION.

USE PORTABLE PLASTIC DRUMS OR 42" OVERSIZED CONES INSTEAD OF STANDARD TRAFFIC CONES.

SPECIAL NOTE:

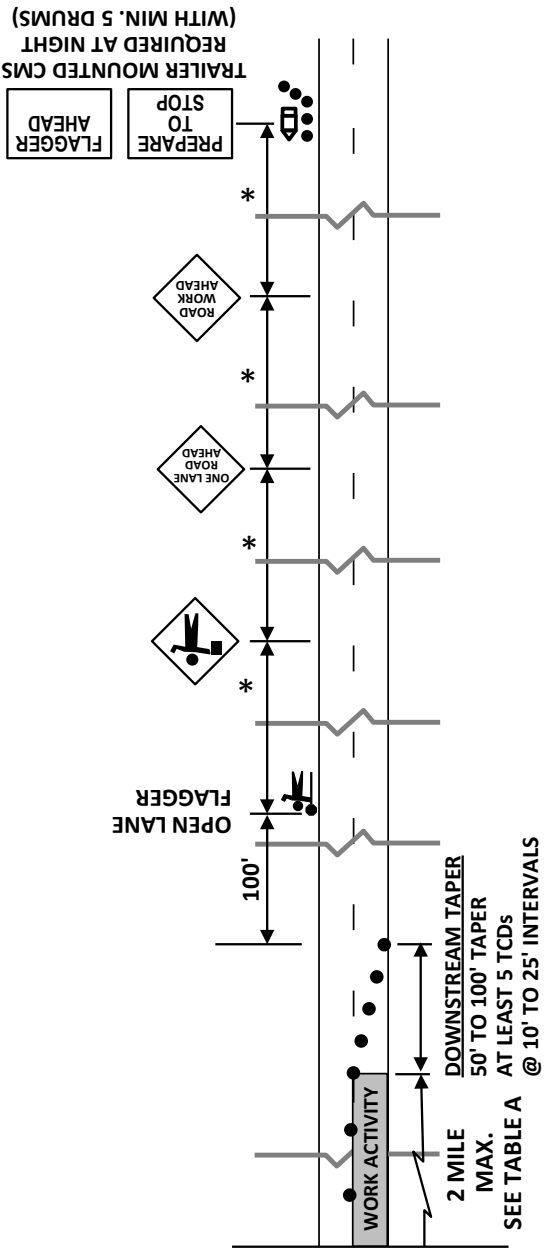
DURING UNPLANNED NIGHTTIME EMERGENCY OPERATIONS, THE CMS MAY BE OMITTED. THE REQUIREMENT FOR THE CMS SHALL BE MAINTAINED FOR ALL PLANNED NIGHTTIME WORK ACTIVITIES THAT REQUIRE FLAGGING OPERATIONS.

A. TRAFFIC CONTROL DEVICE SPACING INTERVALS: WORK ACTIVITY AREA	
LOW-SPEED 35 MPH OR LESS	25 FT
INTERMEDIATE-SPEED 40 MPH OR GREATER	50 FT

B. SIGN PLACEMENT INTERVALS, *	
LOW-SPEED 35 MPH OR LESS	200 FT
INTERMEDIATE-SPEED 40 MPH – 50 MPH	350 FT
HIGH-SPEED 55 MPH OR GREATER	500 FT

C. BUFFER SPACE DISTANCES	
LOW-SPEED 35 MPH OR LESS	200 FT
INTERMEDIATE-SPEED 40 MPH – 50 MPH	300 FT
HIGH-SPEED 55 MPH OR GREATER	400 FT

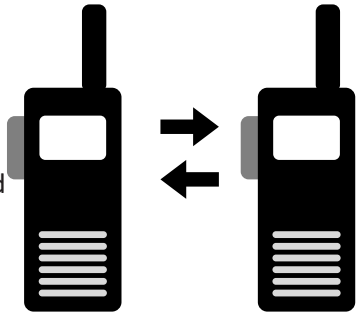
Drawing 3. Two Flagger – Nighttime (cont.)



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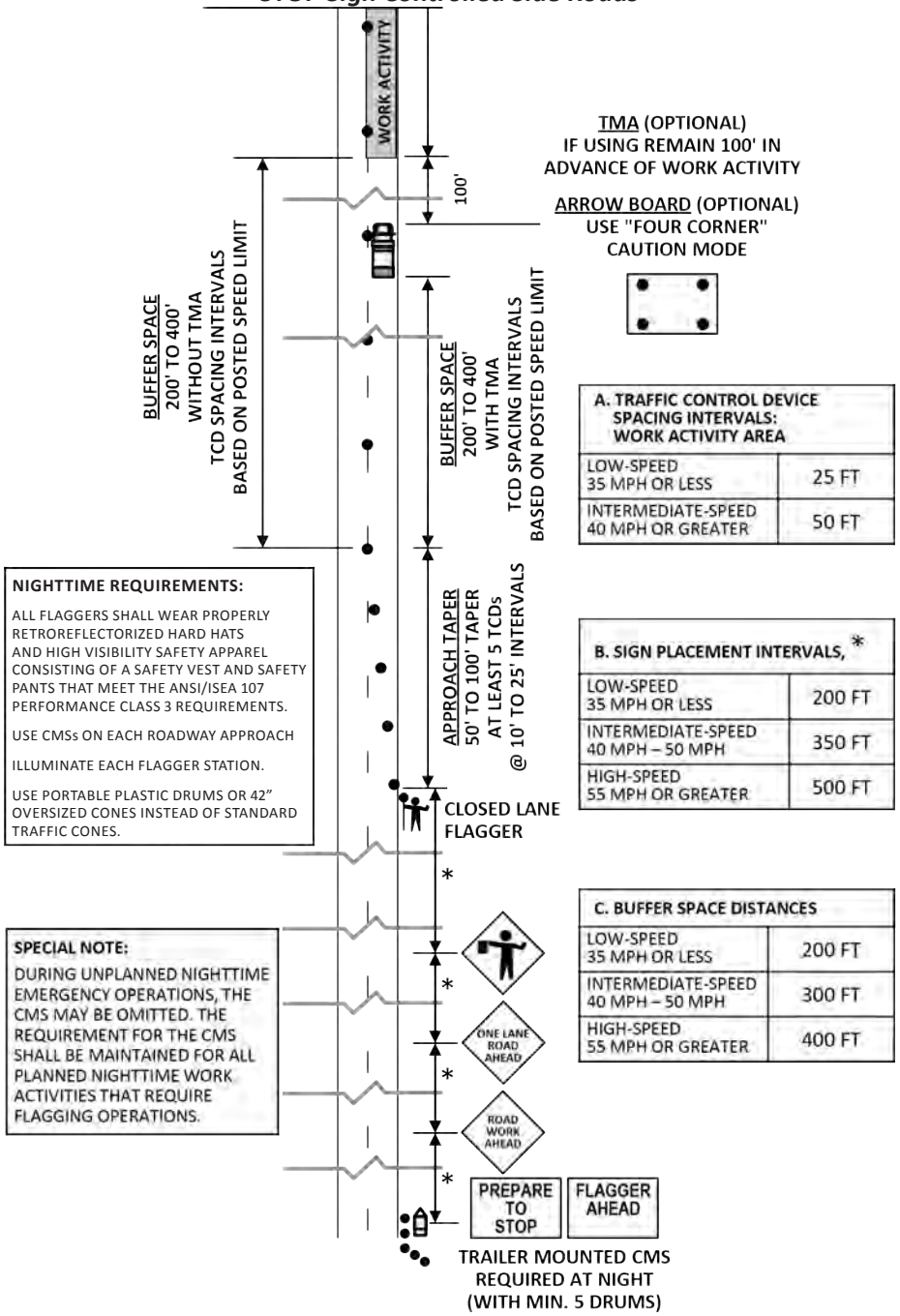
Flagging Operations – Multiple Flaggers – Intersections

STOP Sign Controlled Side Roads – Drawing 4



1. Utilize Side Road Flaggers to control traffic from intersecting Side Roads.
2. Clear communication by radio or other effective method between Side Road Flaggers, Open Lane Flagger, and Closed Lane Flagger is required.
3. Maintain Side Road Flaggers in place for the duration that any portion of the Lane Closure may encroach upon the Limits of the Intersection.
4. When the Work Zone proceeds through an intersection with a "stop sign controlled" side road, do not allow the Approach Taper or Downstream Taper of the Lane Closure to encroach upon the Limits of the Intersection.
5. When the Work Zone proceeds through a "stop sign controlled" intersection, continue the work operations through the intersection to a specific location point within the Departure Lane no less than 300' to 500' beyond the Limits of the Intersection to allow the work train and all portions of the Lane Closure to clear the intersection.

Drawing 4. Multiple Flaggers – Intersections, STOP Sign Controlled Side Roads



A. TRAFFIC CONTROL DEVICE SPACING INTERVALS: WORK ACTIVITY AREA	
LOW-SPEED 35 MPH OR LESS	25 FT
INTERMEDIATE-SPEED 40 MPH OR GREATER	50 FT

B. SIGN PLACEMENT INTERVALS, *	
LOW-SPEED 35 MPH OR LESS	200 FT
INTERMEDIATE-SPEED 40 MPH – 50 MPH	350 FT
HIGH-SPEED 55 MPH OR GREATER	500 FT

C. BUFFER SPACE DISTANCES	
LOW-SPEED 35 MPH OR LESS	200 FT
INTERMEDIATE-SPEED 40 MPH – 50 MPH	300 FT
HIGH-SPEED 55 MPH OR GREATER	400 FT

NIGHTTIME REQUIREMENTS:

ALL FLAGGERS SHALL WEAR PROPERLY RETROREFLECTORIZED HARD HATS AND HIGH VISIBILITY SAFETY APPAREL CONSISTING OF A SAFETY VEST AND SAFETY PANTS THAT MEET THE ANSI/ISEA 107 PERFORMANCE CLASS 3 REQUIREMENTS.

USE CMSs ON EACH ROADWAY APPROACH

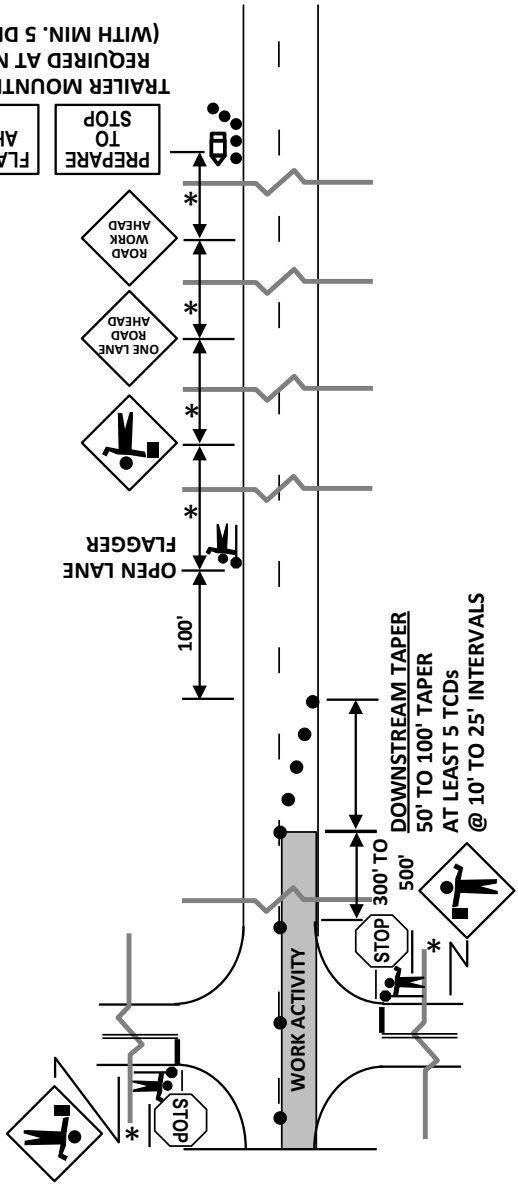
ILLUMINATE EACH FLAGGER STATION.

USE PORTABLE PLASTIC DRUMS OR 42" OVERSIZED CONES INSTEAD OF STANDARD TRAFFIC CONES.

SPECIAL NOTE:

DURING UNPLANNED NIGHTTIME EMERGENCY OPERATIONS, THE CMS MAY BE OMITTED. THE REQUIREMENT FOR THE CMS SHALL BE MAINTAINED FOR ALL PLANNED NIGHTTIME WORK ACTIVITIES THAT REQUIRE FLAGGING OPERATIONS.

Drawing 4. Multiple Flaggers – Intersections, STOP Sign Controlled Side Roads (cont.)

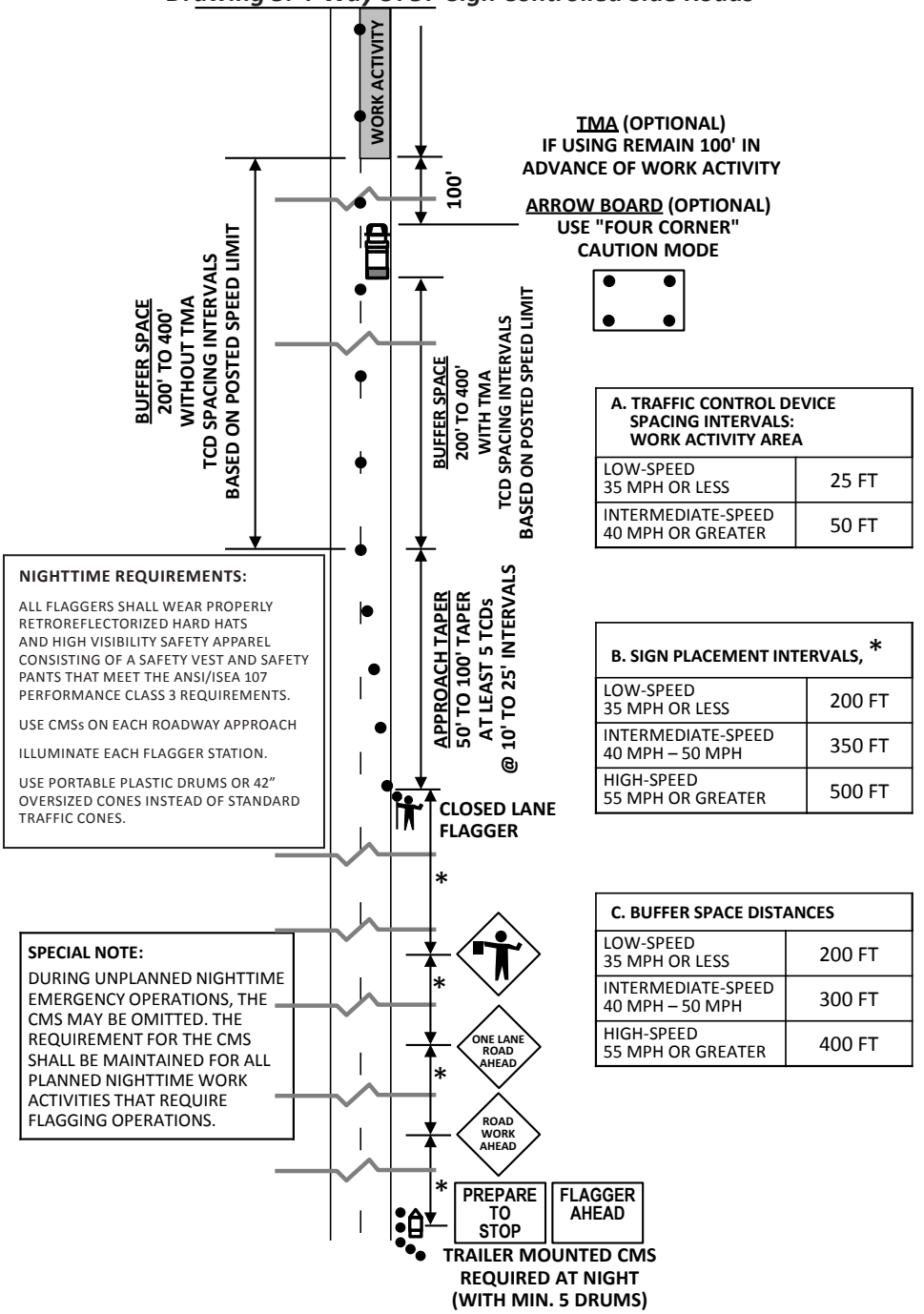


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4-Way STOP Sign Controlled Intersection – Drawing 5

1. Utilize Side Road Flaggers to control the traffic from the intersecting Side Roads.
2. Clear communication by radio or other effective method between Side Road Flaggers, Open Lane Flagger, and Closed Lane Flagger is required.
3. Maintain Side Road Flaggers in place for the duration that any portion of the Lane Closure may encroach upon the Limits of the Intersection.
4. When the Work Zone proceeds through a “4-Way STOP sign controlled” intersection, do not allow the Approach Taper or Downstream Taper of the Lane Closure to encroach upon the Limits of the Intersection.
5. Only the Buffer Space or Work Activity Area of the Lane Closure may encroach upon the Limits of the Intersection.
6. When the Work Zone proceeds through a “4-Way STOP sign controlled” intersection, continue the work operations through the intersection to a specific location point within the Departure Lane no less than 300’ to 500’ beyond the Limits of the Intersection to allow the work train and all portions of the Lane Closure to clear the intersection.

Drawing 5. 4-Way STOP Sign Controlled Side Roads



NIGHTTIME REQUIREMENTS:

ALL FLAGGERS SHALL WEAR PROPERLY RETROREFLECTORIZED HARD HATS AND HIGH VISIBILITY SAFETY APPAREL CONSISTING OF A SAFETY VEST AND SAFETY PANTS THAT MEET THE ANSI/ISEA 107 PERFORMANCE CLASS 3 REQUIREMENTS.

USE CMSs ON EACH ROADWAY APPROACH

ILLUMINATE EACH FLAGGER STATION.

USE PORTABLE PLASTIC DRUMS OR 42" OVERSIZED CONES INSTEAD OF STANDARD TRAFFIC CONES.

SPECIAL NOTE:

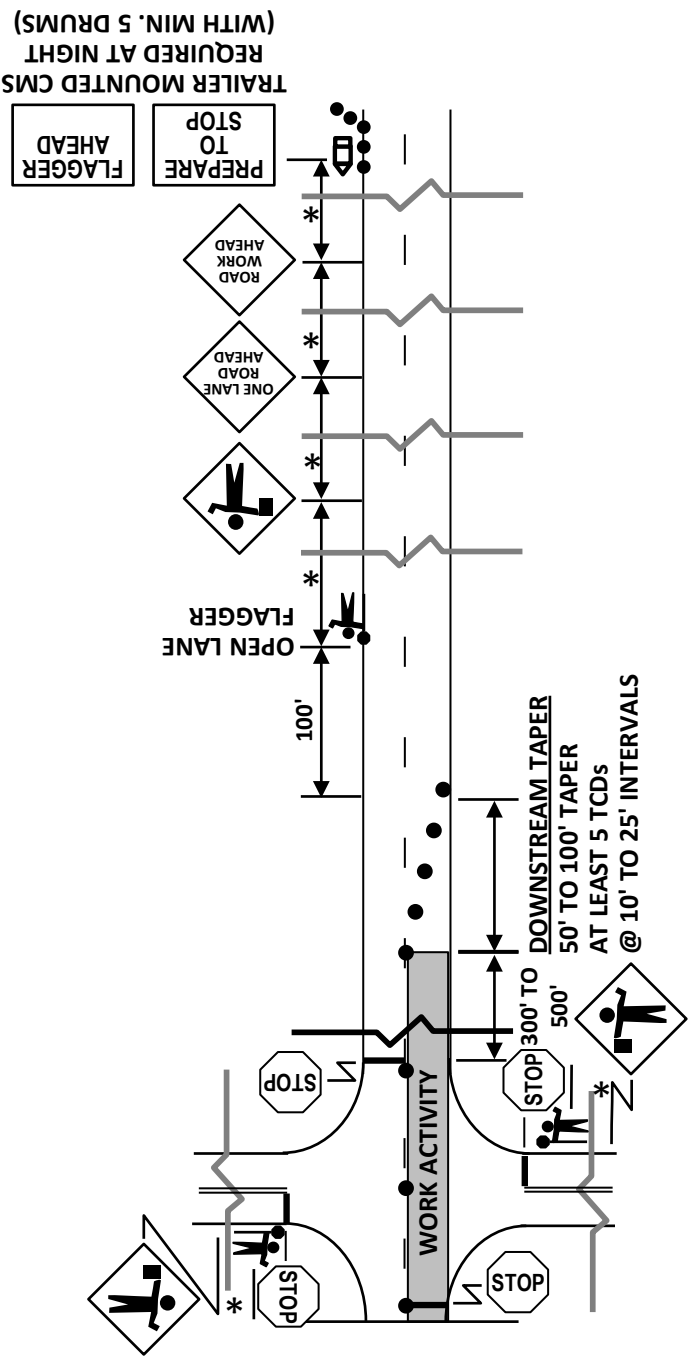
DURING UNPLANNED NIGHTTIME EMERGENCY OPERATIONS, THE CMS MAY BE OMITTED. THE REQUIREMENT FOR THE CMS SHALL BE MAINTAINED FOR ALL PLANNED NIGHTTIME WORK ACTIVITIES THAT REQUIRE FLAGGING OPERATIONS.

A. TRAFFIC CONTROL DEVICE SPACING INTERVALS: WORK ACTIVITY AREA	
LOW-SPEED 35 MPH OR LESS	25 FT
INTERMEDIATE-SPEED 40 MPH OR GREATER	50 FT

B. SIGN PLACEMENT INTERVALS, *	
LOW-SPEED 35 MPH OR LESS	200 FT
INTERMEDIATE-SPEED 40 MPH – 50 MPH	350 FT
HIGH-SPEED 55 MPH OR GREATER	500 FT

C. BUFFER SPACE DISTANCES	
LOW-SPEED 35 MPH OR LESS	200 FT
INTERMEDIATE-SPEED 40 MPH – 50 MPH	300 FT
HIGH-SPEED 55 MPH OR GREATER	400 FT

Drawing 5. 4-Way STOP Sign Controlled Side Roads (cont.)



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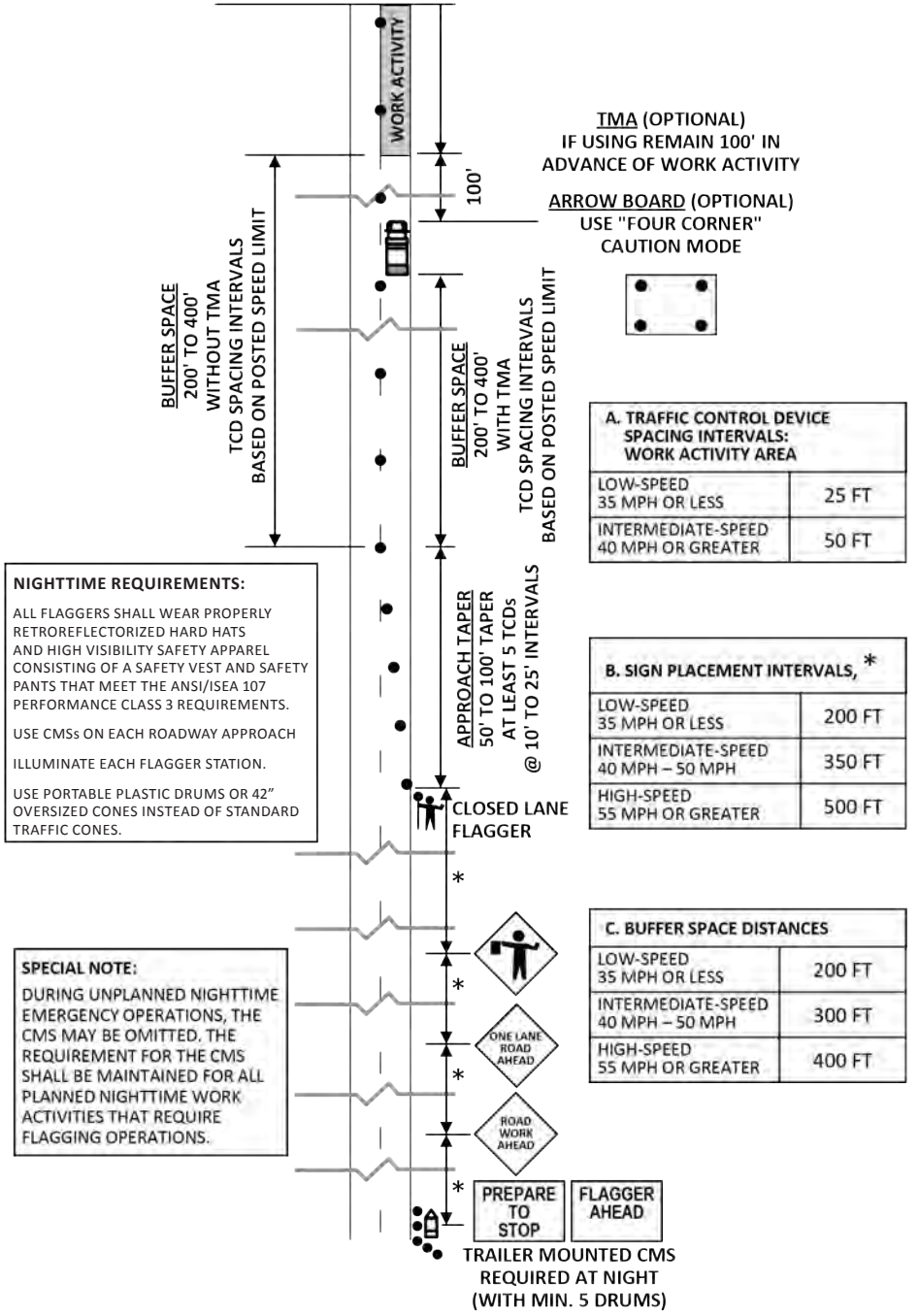
Traffic Signal Controlled Intersection, Law Enforcement Officers (LEOs) – Drawing 6

1. When the Work Zone proceeds through or encroaches upon the Limits of the Intersection of a “traffic signal controlled” intersection, engage a LEO to control and direct all traffic entering and passing through the intersection.
2. When a LEO is present to control the traffic entering and passing through the intersection, the traffic signal may or may not be placed on “normal flashing operations”.



3. Clear communication by radio or other effective method between the LEO, the Open Lane Flagger, and the Closed Lane Flagger is recommended to ensure safe and efficient control of all traffic approaching the intersection.
4. Upon clearance of the Limits of the Intersection by the work train that will permit the location of the subsequent Flagger Station to be no less than 200’ past the Limits of the Intersection, ensure the traffic signal is returned to normal operational status and is operating in accordance with all operational functions prior to initiation of the “normal flashing operations”.
5. When the Work Zone proceeds through a “traffic signal controlled” intersection, do not allow the Approach Taper or the Downstream Taper of the Lane Closure to encroach upon the Limits of the Intersection.
6. Only the Buffer Space or the Work Activity Area of the Lane Closure may encroach upon the Limits of the Intersection.
7. When the Work Zone proceeds through a “traffic signal controlled” intersection, continue the work operations through the intersection to a specific location point within the Departure Lane no less than 300’ to 500’ beyond the Limit of the Intersection to allow the work train and all portions of the Lane Closure to clear the intersection.

Drawing 6. Traffic Signal Controlled Intersections (Law Enforcement Officers)



A. TRAFFIC CONTROL DEVICE SPACING INTERVALS: WORK ACTIVITY AREA	
LOW-SPEED 35 MPH OR LESS	25 FT
INTERMEDIATE-SPEED 40 MPH OR GREATER	50 FT

B. SIGN PLACEMENT INTERVALS, *	
LOW-SPEED 35 MPH OR LESS	200 FT
INTERMEDIATE-SPEED 40 MPH – 50 MPH	350 FT
HIGH-SPEED 55 MPH OR GREATER	500 FT

C. BUFFER SPACE DISTANCES	
LOW-SPEED 35 MPH OR LESS	200 FT
INTERMEDIATE-SPEED 40 MPH – 50 MPH	300 FT
HIGH-SPEED 55 MPH OR GREATER	400 FT

NIGHTTIME REQUIREMENTS:

ALL FLAGGERS SHALL WEAR PROPERLY RETROREFLECTORIZED HARD HATS AND HIGH VISIBILITY SAFETY APPAREL CONSISTING OF A SAFETY VEST AND SAFETY PANTS THAT MEET THE ANSI/ISEA 107 PERFORMANCE CLASS 3 REQUIREMENTS.

USE CMSs ON EACH ROADWAY APPROACH

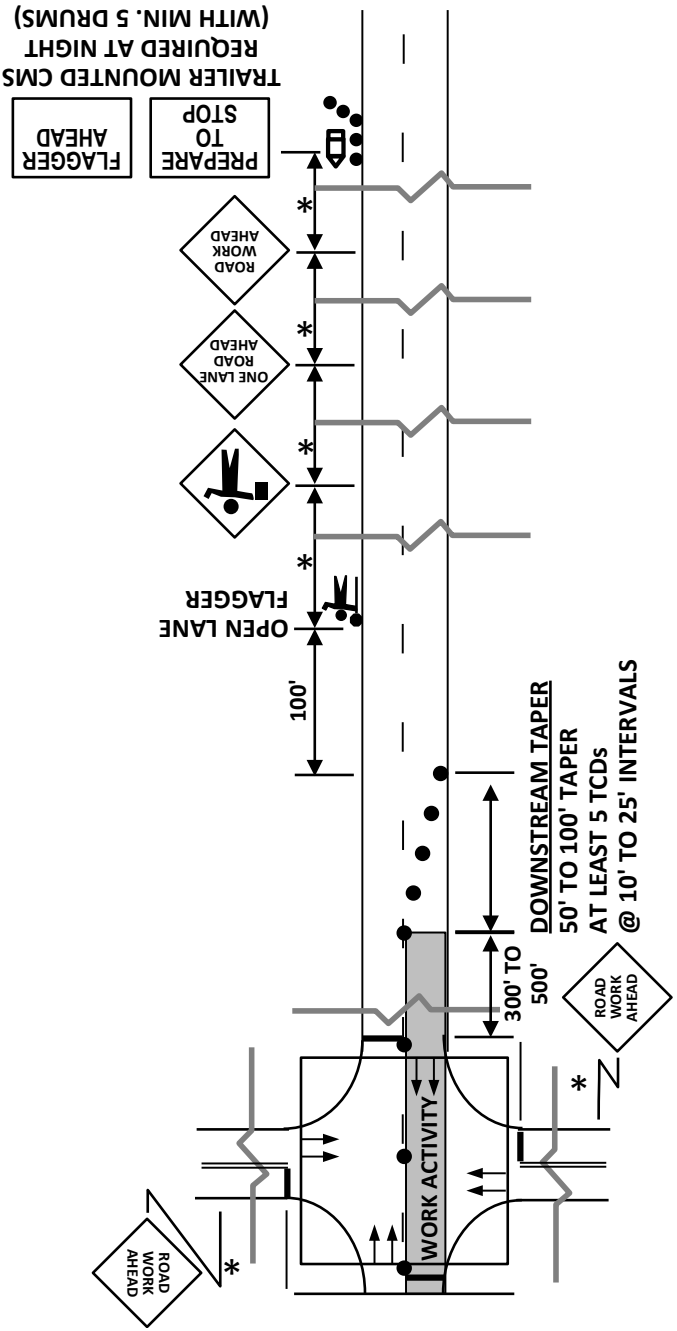
ILLUMINATE EACH FLAGGER STATION.

USE PORTABLE PLASTIC DRUMS OR 42" OVERSIZED CONES INSTEAD OF STANDARD TRAFFIC CONES.

SPECIAL NOTE:

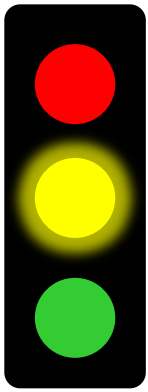
DURING UNPLANNED NIGHTTIME EMERGENCY OPERATIONS, THE CMS MAY BE OMITTED. THE REQUIREMENT FOR THE CMS SHALL BE MAINTAINED FOR ALL PLANNED NIGHTTIME WORK ACTIVITIES THAT REQUIRE FLAGGING OPERATIONS.

Drawing 6. Traffic Signal Controlled Intersections (Law Enforcement Officers)



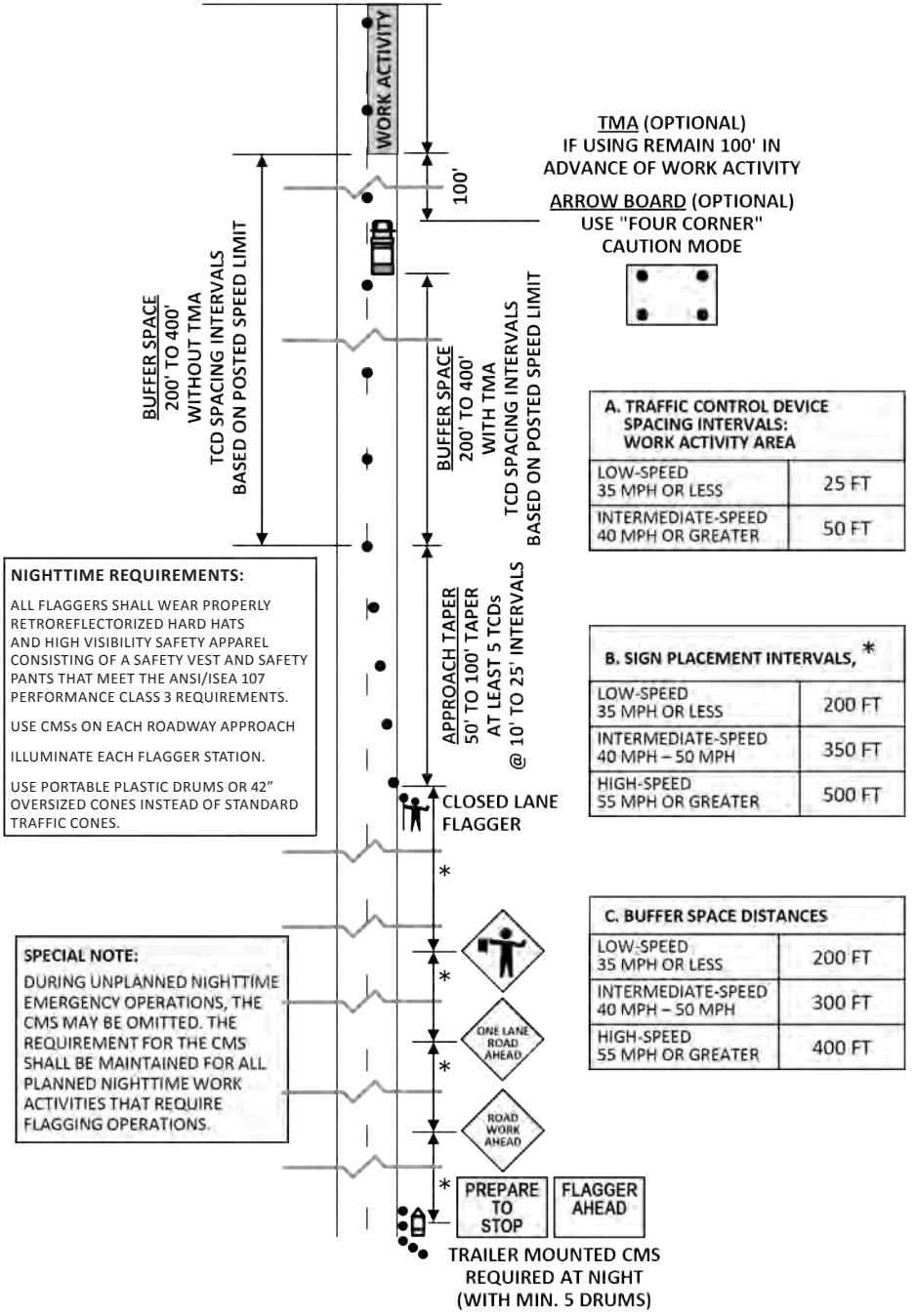
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Traffic Signal Controlled Intersection – Flaggers – Drawing 7



1. When the Work Zone proceeds through or encroaches upon the Limits of the Intersection of a “traffic signal controlled” intersection, place the traffic signal on “normal flashing operations”.
2. Utilize Side Road Flaggers on Side Road approaches of the intersection to control traffic from Side Roads.
3. Clear communication by radio or other effective method between the Side Road Flaggers, the Open Lane Flagger, and the Closed Lane Flagger is required.
4. Upon clearance of the Limits of the Intersection by the work train and all portions of the Lane Closure, ensure that the traffic signal is returned to normal operational status and is operating in accordance with all operational functions prior to initiation of “normal flashing operations”.
5. When the Work Zone proceeds through a “traffic signal controlled” intersection, do not allow the Approach Taper or the Downstream Taper of the Lane Closure to encroach upon the Limits of the Intersection.
6. Only the Buffer Space or the Work Activity Area of the Lane Closure may encroach upon the Limits of the Intersection.
7. When the Work Zone proceeds through a “traffic signal controlled” intersection, continue the work operations through the intersection to a specific location point within the Departure Lane no less than 300’ to 500’ beyond the Limits of the Intersection to allow the work train and all portions of the Lane Closure to clear the intersection.

Drawing 7. Traffic Signal Controlled Intersections (Flaggers)



NIGHTTIME REQUIREMENTS:

ALL FLAGGERS SHALL WEAR PROPERLY RETROREFLECTORIZED HARD HATS AND HIGH VISIBILITY SAFETY APPAREL CONSISTING OF A SAFETY VEST AND SAFETY PANTS THAT MEET THE ANSI/ISEA 107 PERFORMANCE CLASS 3 REQUIREMENTS.

USE CMSs ON EACH ROADWAY APPROACH

ILLUMINATE EACH FLAGGER STATION.

USE PORTABLE PLASTIC DRUMS OR 42" OVERSIZED CONES INSTEAD OF STANDARD TRAFFIC CONES.

SPECIAL NOTE:

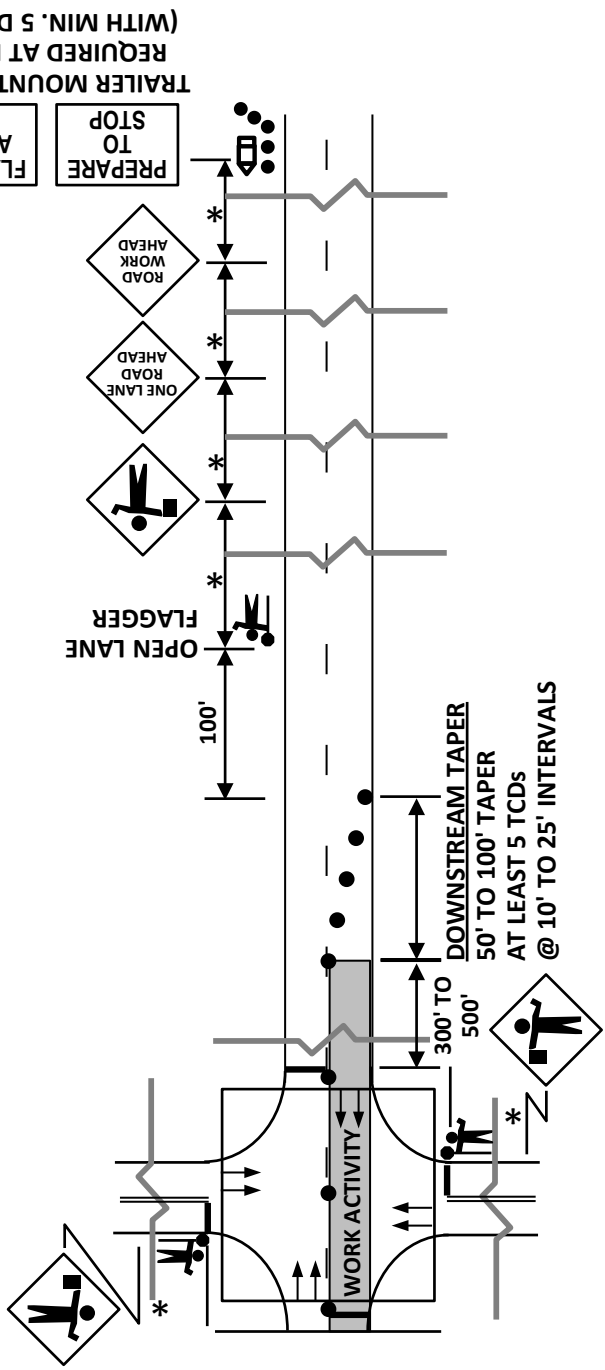
DURING UNPLANNED NIGHTTIME EMERGENCY OPERATIONS, THE CMS MAY BE OMITTED. THE REQUIREMENT FOR THE CMS SHALL BE MAINTAINED FOR ALL PLANNED NIGHTTIME WORK ACTIVITIES THAT REQUIRE FLAGGING OPERATIONS.

A. TRAFFIC CONTROL DEVICE SPACING INTERVALS: WORK ACTIVITY AREA	
LOW-SPEED 35 MPH OR LESS	25 FT
INTERMEDIATE-SPEED 40 MPH OR GREATER	50 FT

B. SIGN PLACEMENT INTERVALS, *	
LOW-SPEED 35 MPH OR LESS	200 FT
INTERMEDIATE-SPEED 40 MPH – 50 MPH	350 FT
HIGH-SPEED 55 MPH OR GREATER	500 FT

C. BUFFER SPACE DISTANCES	
LOW-SPEED 35 MPH OR LESS	200 FT
INTERMEDIATE-SPEED 40 MPH – 50 MPH	300 FT
HIGH-SPEED 55 MPH OR GREATER	400 FT

Drawing 7. Traffic Signal Controlled Intersections (Flaggers) (cont.)



Work Activity Area Beginning at an Intersection with a Two-Lane, Two-Way Roadway Departure Lane – Drawing 8

1. Install, maintain and conduct Multiple Flagger Flagging Operations for a Work Zone that begins at an intersection and is present within the travel lane of a two-lane, two-way roadway departing from the intersection as illustrated by this drawing. Install and maintain all Advance Warning Signs and TCDs as illustrated.
2. Convert this traffic control setup to a standard Multiple Flagger Flagging Operation setup in compliance with Drawing 2 for a Work Activity Area located in the Departure Lane of a two-lane, two-way road intersecting an adjacent two-lane, two-way road when the Limits of the Work Activity Area nearest the intersection progress beyond a minimum distance interval away from the intersection as specified in Table 6. The Limits of the Work Activity Area nearest to the adjacent intersection must be located at a specific location point no less than the cumulative distance from the intersection as specified by the "Total Distance Required for Conversion" in Table 6.
3. Sufficient Buffer Space may be unavailable when conducting work activities contiguous to the intersection.
4. Install the Buffer Space immediately as the Limits of the Work Activity Area nearest the intersection move away from the intersection.
5. As sufficient space becomes available, install and maintain the required Buffer Space based upon the posted regulatory speed limit of the roadway.
6. On each roadway approach intersecting the roadway where the work activities are being conducted, install Multiple Flagger Flagging Operations to control all traffic approaching the intersection from those roads.
7. Station Flaggers controlling traffic from these roads immediately adjacent to the intersection as illustrated in Drawing 8.
8. No less than 1 Flagger is required on each approach to control traffic flow.

9. On the roadway where the work is being conducted, station the Open Lane Flagger controlling traffic approaching the Work Activity Area and intersection, 100’ beyond the last TCD in the Downstream Taper furthest away from the Work Activity Area as illustrated in Drawing 8.
10. On each roadway approach the intersecting roadway where the work activities are being conducted, measure the Advance Warning Sign locations from each Flagger Station at the intersection.
11. On the roadway where the work is being conducted, measure the Advance Warning Sign locations from the Open Lane Flagger Station located 100’ beyond the last TCD in the Downstream Taper.
12. When conducting Nighttime Flagging Operations in accordance with Drawing 8, supplement the Advance Warning Sign array on each approach to the intersection with a trailer mounted CMS. The messages should be PREPARE TO STOP, FLAGGER AHEAD.
13. During a Nighttime Flagging Operation scenario where the Work Activity Area begins at an intersection as illustrated in Drawing 8, utilization of a trailer mounted CMS to supplement the Advance Warning Sign array on each leg of the intersection is required.
14. Install, operate, and maintain trailer mounted CMSs as illustrated in Drawing 8.

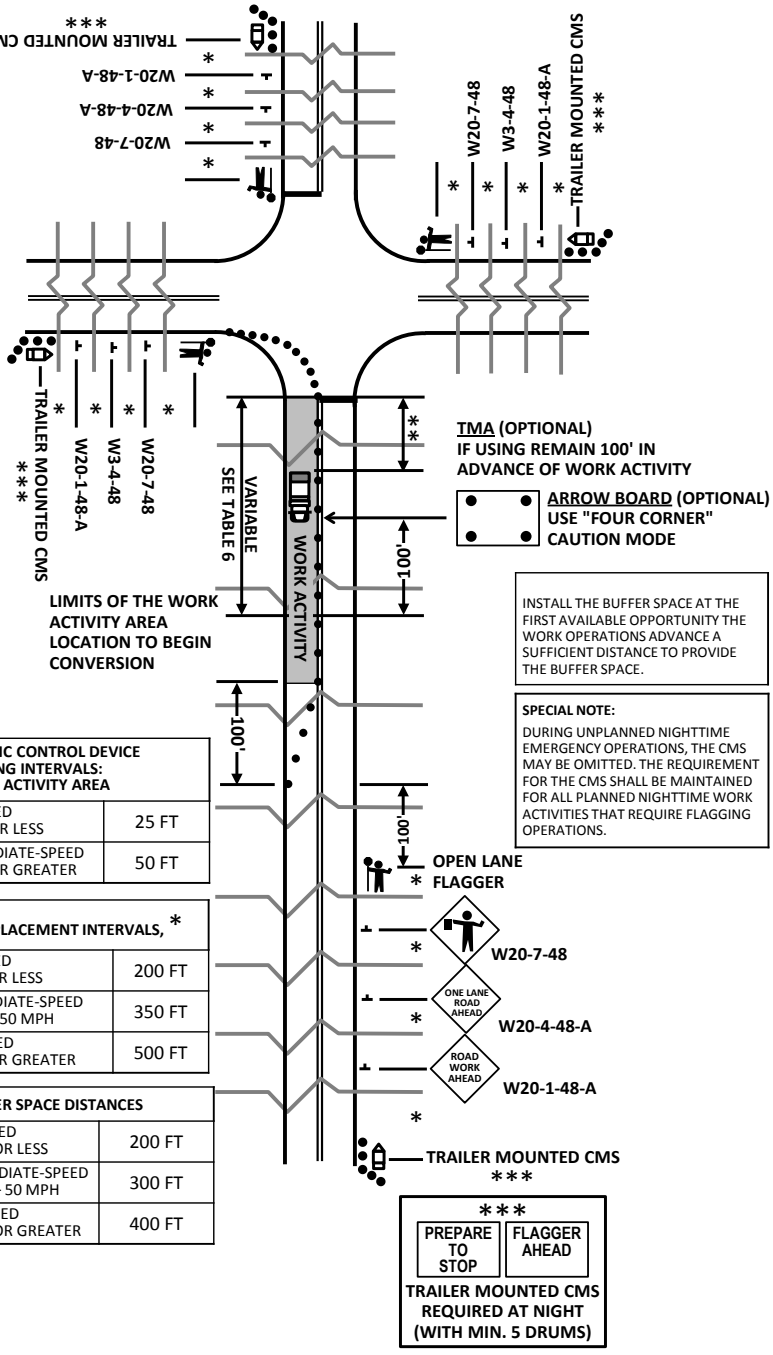
Table 6. Departure Lane from the Intersection Minimum Distance Intervals from Intersection Required for Conversion to Standard Multiple Flagger Flagging Operation Installation (see Drawing 8)

- The "Total Distance Required for Conversion" distances are calculated based upon the posted regulatory speed limit of the road prior to beginning the work.

	Low-Speed 35 MPH or Less	Intermediate-Speed 40 MPH – 50 MPH	High-Speed 55 MPH or Greater
Daytime	Space for stopped Traffic to Queue 100' Min.	Space for stopped Traffic to Queue 100' Min.	Space for stopped Traffic to Queue 100' Min.
	Advance Warning Sign Placement Intervals Interval / Total 200' / 600'	Advance Warning Sign Placement Intervals Interval / Total 200' / 600'	Advance Warning Sign Placement Intervals Interval / Total 200' / 600'
	Approach Taper 100'	Approach Taper 100'	Approach Taper 100'
	Buffer Space 200'	Buffer Space 300'	Buffer Space 400'
	Total Distance Required for Conversion 1000'	**Total Distance Required for Conversion 1550'**	**Total Distance Required for Conversion 2100'**
Nighttime	CMS Placement Interval 200'	CMS Placement Interval 200'	CMS Placement Interval 200'
	Total Distance Required for Conversion 1200'	**Total Distance Required for Conversion 1900'**	**Total Distance Required for Conversion 2600'**

- The distance intervals required for a TMA, including the length of the vehicle and the associated 100-foot Roll-Ahead Distance, are not included in these calculations since this device is optional. However, when a TMA is utilized, add an additional 125' to the total distance required for conversion to compensate for the 100' Roll-Ahead Distance and the approximate length of the vehicle and the attenuator.
- The total distances for Nighttime Operations are increased due to the requirement for inclusion of a trailer mounted CMS.
- The distance intervals required for a Downstream Taper vary from 50' to 100'. The maximum distance of 100' is utilized for these scenarios.

Drawing 8. Work Activity Area Beginning at an Intersection with a Two-Lane, Two-Way Roadway Departure Lane



A. TRAFFIC CONTROL DEVICE SPACING INTERVALS: WORK ACTIVITY AREA	
LOW-SPEED 35 MPH OR LESS	25 FT
INTERMEDIATE-SPEED 40 MPH OR GREATER	50 FT

B. SIGN PLACEMENT INTERVALS, *	
LOW-SPEED 35 MPH OR LESS	200 FT
INTERMEDIATE-SPEED 40 MPH – 50 MPH	350 FT
HIGH-SPEED 55 MPH OR GREATER	500 FT

C. BUFFER SPACE DISTANCES	
LOW-SPEED 35 MPH OR LESS	200 FT
INTERMEDIATE-SPEED 40 MPH – 50 MPH	300 FT
HIGH-SPEED 55 MPH OR GREATER	400 FT

Work Activity Area Terminating at an Intersection with a Two-Lane, Two-Way Roadway Approach Lane – Drawing 9

1. Install, maintain and conduct Multiple Flagger Flagging Operations for a Work Zone that ends at an intersection and is present within the travel lane of a two-lane, two-way roadway approaching the intersection as illustrated by this drawing. Install and maintain all Advance Warning signs and TCDs as illustrated.
2. Convert a standard Multiple Flagger Flagging Operation setup installed per Drawing 2 for a Work Activity Area located in the Approach Lane of a two-lane, two-way road when the Limits of the Work Activity Area nearest the intersection encroach upon a specific location that will not permit the required distances for the traffic to queue, proper installation of the Advance Warning Signs, the Open Lane Flagger Station and the Downstream Taper. The minimum distances that determine when conversion to this traffic control setup is required are found in Table 7. The Limits of the Work Activity Area nearest the intersection should not encroach upon a specific location point no less than the cumulative distance from the intersection as specified by the "Total Distance Required for Conversion" in Table 7.
3. On each roadway approach intersecting the roadway where the work activities are being conducted, install Multiple Flagger Flagging Operations to control all traffic approaching the intersection from those roads.
4. Station the Flaggers controlling traffic from these roads immediately adjacent to the intersection as illustrated in Drawing 9.
5. No less than 1 Flagger is required on each approach to control traffic flow.
6. On the roadway where the work is being conducted, station the Closed Lane Flagger, controlling traffic approaching the Work Activity Area and the intersection, adjacent to the first TCD in the Approach Taper as illustrated in Drawing 9.
7. On each roadway approach intersecting the roadway where the work activities are being conducted, measure the Advance Warning Sign locations from each Flagger Station at the intersection.

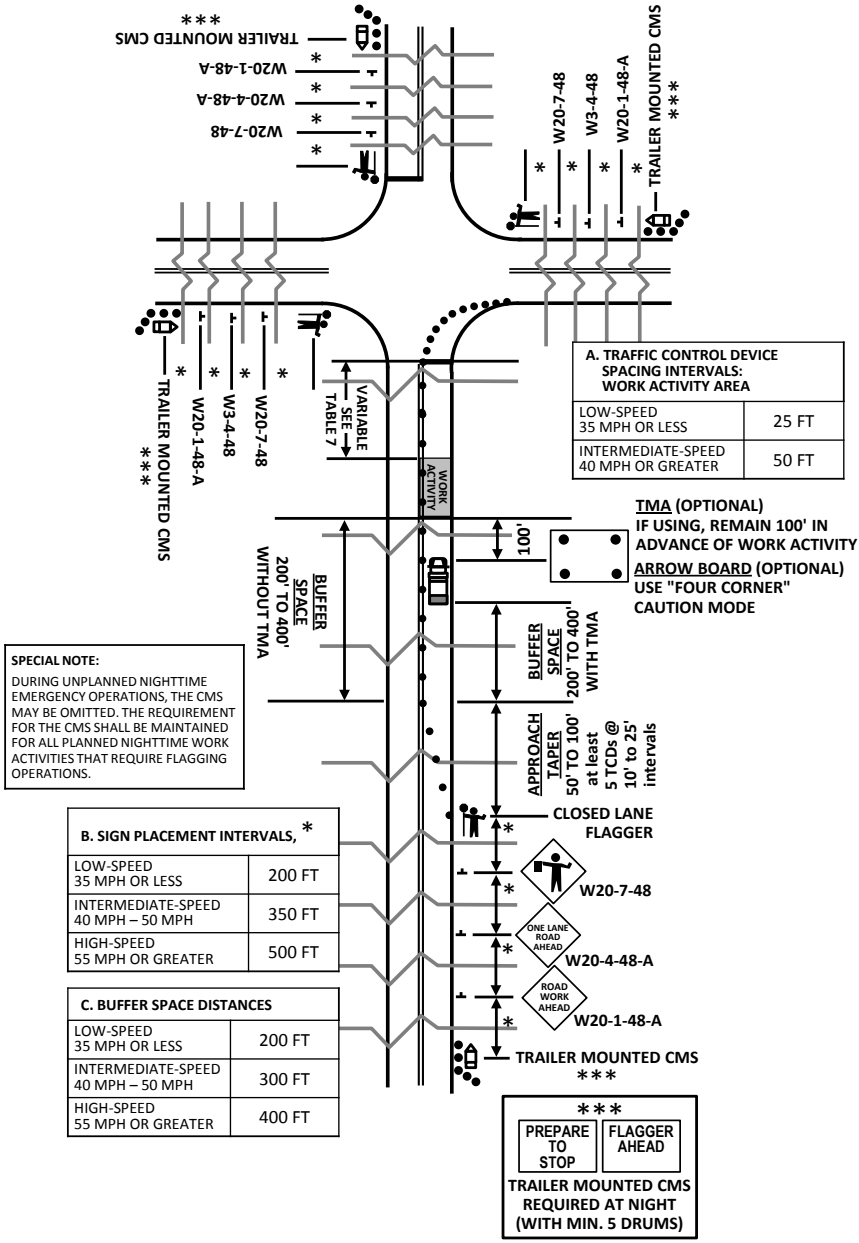
8. On the roadway where the work is being conducted, measure the Advance Warning Sign locations from the Closed Lane Flagger Station located 100’ beyond the last TCD in the Downstream Taper.
9. When conducting Nighttime Flagging Operations in accordance with Drawing 9, supplement the Advance Warning Sign array on each approach to the intersection with a trailer mounted CMS. The messages should be PREPARE TO STOP, FLAGGER AHEAD.
10. During a Nighttime Flagging Operation scenario where the Work Activity Area ends at an intersection as illustrated in Drawing 9, utilization of a trailer mounted CMS to supplement the Advance Warning Signs array on each leg of the intersection is required.
11. Install, operate and maintain trailer mounted CMSs as illustrated in Drawing 9.

Table 7. Approach Lane to the Intersection Minimum Distance Intervals from Intersection Required for Conversion to Standard Multiple Flagger Flagging Operation Installation (see Drawing 9)

	Low-Speed 35 MPH or Less	Intermediate-Speed 40 MPH – 50 MPH	High-Speed 55 MPH or Greater
Daytime	Space for stopped Traffic to Queue 100' Min.	Space for stopped Traffic to Queue 100' Min.	Space for stopped Traffic to Queue 100' Min.
	Advance Warning Sign Placement Intervals Interval / Total 200' / 600'	Advance Warning Sign Placement Intervals Interval / Total 350' / 1050'	Advance Warning Sign Placement Intervals Interval / Total 500' / 1500'
	Downstream Taper 100'	Downstream Taper 100'	Downstream Taper 100'
	Interval Between End of Downstream Taper and Open Lane Flagger 100'	Interval Between End of Downstream Taper and Open Lane Flagger 100'	Interval Between End of Downstream Taper and Open Lane Flagger 100'
	Total Distance Required for Conversion 900'	**Total Distance Required for Conversion 1350'**	**Total Distance Required for Conversion 1800'**
Nighttime	CMS Placement Interval 200'	CMS Placement Interval 350'	CMS Placement Interval 500'
	Total Distance Required for Conversion 1100'	**Total Distance Required for Conversion 1700'**	**Total Distance Required for Conversion 2300'**

- The “Total Distance Required for Conversion” distances are calculated based upon the posted regulatory speed limit of the road prior to beginning the work.
- The distance intervals required for a Downstream Taper vary from 50’ to 100’. The maximum distance of 100’ is utilized for these scenarios.
- The total distances for Nighttime Operations are increased due to the requirement for inclusion of a trailer mounted CMS.

Drawing 9. Work Activity Area Terminating at an Intersection with a Two-Lane, Two-Way Approach Lane



A. TRAFFIC CONTROL DEVICE SPACING INTERVALS: WORK ACTIVITY AREA	
LOW-SPEED 35 MPH OR LESS	25 FT
INTERMEDIATE-SPEED 40 MPH OR GREATER	50 FT

SPECIAL NOTE:

DURING UNPLANNED NIGHTTIME EMERGENCY OPERATIONS, THE CMS MAY BE OMITTED. THE REQUIREMENT FOR THE CMS SHALL BE MAINTAINED FOR ALL PLANNED NIGHTTIME WORK ACTIVITIES THAT REQUIRE FLAGGING OPERATIONS.

B. SIGN PLACEMENT INTERVALS, *	
LOW-SPEED 35 MPH OR LESS	200 FT
INTERMEDIATE-SPEED 40 MPH – 50 MPH	350 FT
HIGH-SPEED 55 MPH OR GREATER	500 FT

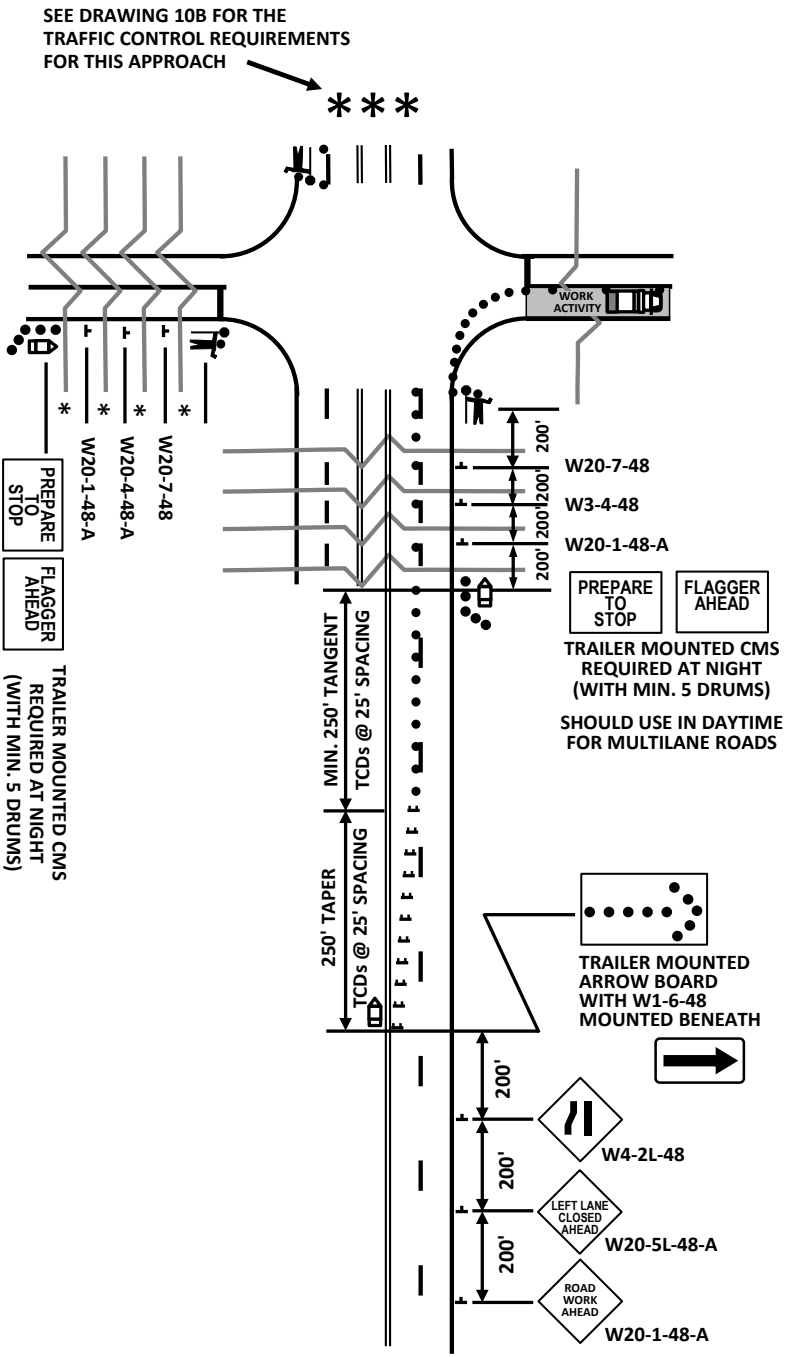
C. BUFFER SPACE DISTANCES	
LOW-SPEED 35 MPH OR LESS	200 FT
INTERMEDIATE-SPEED 40 MPH – 50 MPH	300 FT
HIGH-SPEED 55 MPH OR GREATER	400 FT

Work Activity Area Intersections with Low-Speed (35 MPH or less) Multilane Roadways – Drawing 10

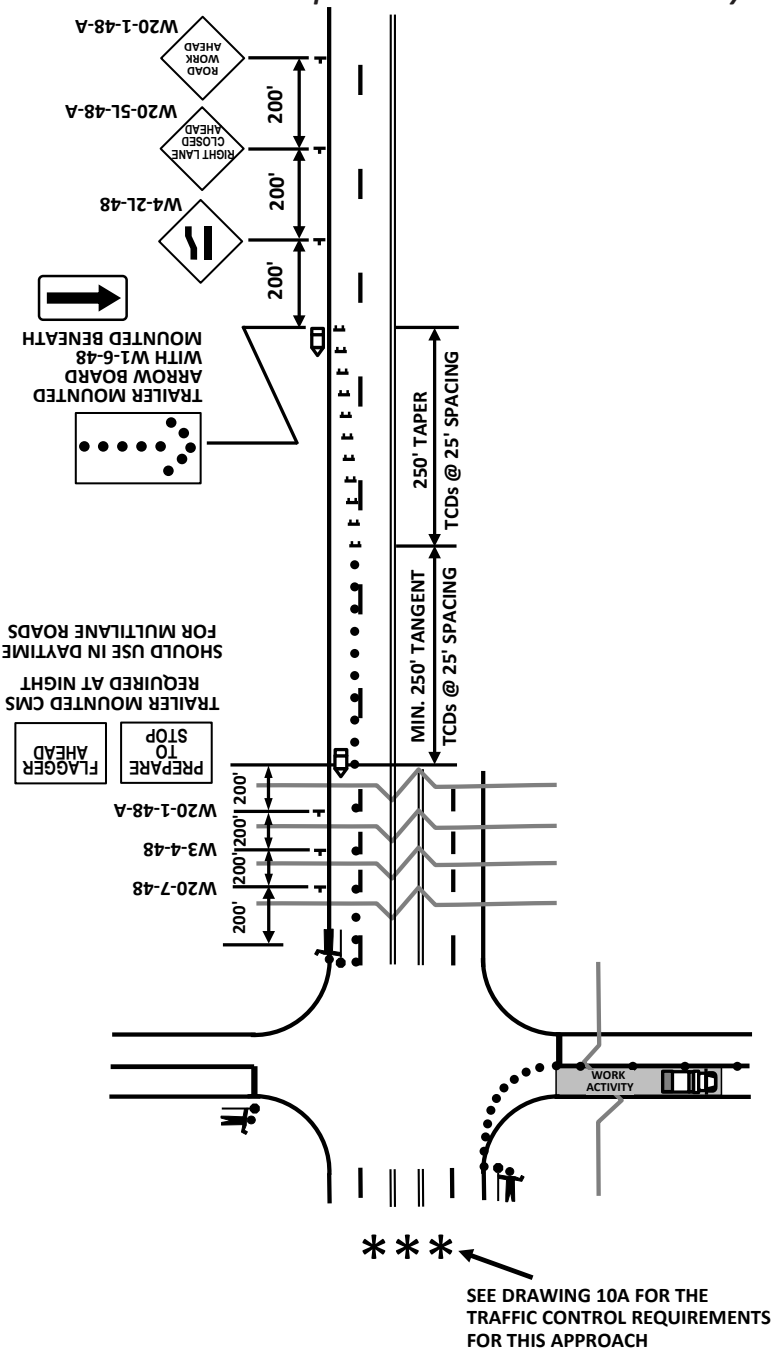
1. Install, maintain and conduct Multiple Flagger Flagging Operations for Work Zones that are present within the Departure Lane or the Approach Lane of a two-lane, two-way roadway intersecting with a low-speed (≤ 35 MPH) multilane roadway as illustrated by this drawing. Install and maintain all Advance Warning Signs and TCDs as illustrated.
2. When the Work Activity Area is present within the Departure Lane, conduct the Multiple Flagger Flagging Operations on the twolane, twoway roadway in accordance with the requirements specific to Drawing 8. (The requirements specified for the intersecting roadway on Drawing 8 will be superseded by the requirements specified in Drawing 10.)
3. When the Work Activity Area is present within the Approach Lane, conduct the Multiple Flagger Flagging Operations on the twolane, twoway roadway in accordance with the requirements specific to Drawing 9. (The requirements specified for the intersecting roadway on Drawing 9 will be superseded by the requirements specified in Drawing 10.)
4. If the intersection is a “traffic signal controlled” intersection, the traffic signal may or may not be placed on “normal flashing operations” when LEOs are present to control and direct traffic entering and passing through the intersection.
5. The traffic signal SHALL be placed on “normal flashing operations” when Side Road Flaggers in conjunction with the Open Lane Flagger and the Closed Lane Flagger are present to control and direct traffic entering and passing through the intersection.
6. Upon clearance of the Limits of the Intersection by the work train and all portions of the Lane Closure, ensure the traffic signal is returned to normal operational status and operating in accordance with all operational functions prior to the work train and/or Lane Closure encroaching upon the Limits of Intersection.
7. On each roadway approach of the lowspeed multilane roadway, reduce the multiple travel lanes in each direction to a single travel lane to permit control of the traffic by the Side Road Flagger.

8. Relocate all traffic on these approaches into the through travel lanes nearest to the intersecting two-lane, two-way roadway where work activities are being conducted.
9. Reduce the multiple travel lanes to a single travel lane through installation and maintenance of left and right Lane Closures, as necessary.
10. Install the Lane Closures and Flagging Operation as illustrated in Drawing 10.
11. A tangent area no less than 250' is required between the downstream end of the Merging Taper of the Lane Closure and the initial Advance Warning Sign array of the Flagging Operation or the trailer mounted CMS when utilized.
12. Dependent upon traffic volumes, the tangent section may be extended to mitigate development of traffic queues in advance of the beginning of the Merging Taper of the Lane Closure.
13. On high-volume roads, Spotters placed at the beginning of the Merging Taper of the Lane Closure should be utilized to notify Flaggers of status of any traffic queues to allow Flaggers the opportunity to minimize time durations of stops in an effort to minimize traffic queues.
14. On each roadway approach intersecting the roadway where the work activities are being conducted, station the Flaggers controlling traffic at the intersection immediately adjacent to the intersection as illustrated in Drawing 10.
15. No less than 1 Flagger is required on each approach to the control traffic flow.
16. When the Work Activity Area is in the Departure Lane of the twolane, twoway roadway use the conversion distances listed in Table 6 as the Work Activity Area progresses to a location that requires this Multiple Flagger Flagging Operation to be converted to a standard Two Flagger Operation as shown on Drawing 2. In addition, comply with the requirements of Drawing 8 as necessary.
17. When the Work Activity Area is in the Approach Lane of the twolane, twoway roadway use the conversion distances listed in Table 7 as the Work Activity Area progresses to a location that requires this Multiple Flagger Flagging Operation to be converted to a standard Two Flagger Operation as shown on Drawing 2. In addition, comply with the requirements of Drawing 9 as necessary.

Drawing 10A. Multiple Flaggers – Intersections Work Activity Area
Intersections with Low-Speed ≤ 35 MPH Multilane Roadways



Drawing 10B. Multiple Flaggers – Intersections Work Activity Area
Intersections with Low-Speed ≤ 35 MPH Multilane Roadways

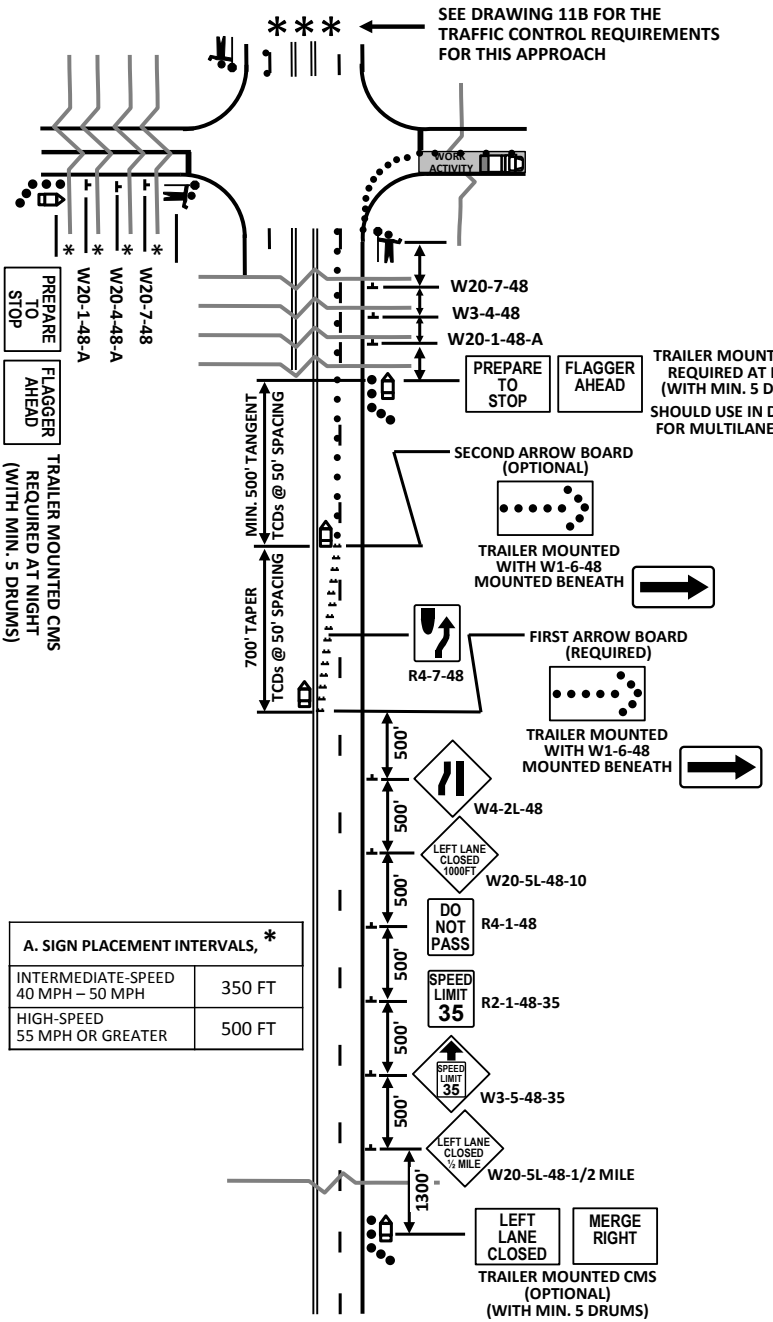


Two-Lane, Two-Way Roadways Intersections with Intermediate-Speed to High-Speed (40 MPH – 60 MPH) Multilane Roadways – Drawing 11

1. Install, maintain and conduct Multiple Flagger Flagging Operations for work zones that are present within the Departure Lane or the Approach Lane of a twolane, twoway roadway intersecting with an intermediatespeed to highspeed (40 MPH – 60 MPH) multilane roadway as illustrated by this standard drawing. Install and maintain all Advance Warning Signs and TCDs as illustrated.
2. When the Work Activity Area is present within the Departure Lane, conduct the Multiple Flagger Flagging Operations on the twolane, twoway roadway in accordance with the requirements specific to Drawing 8. (The requirements specified for the intersecting roadway on Drawing 8 will be superseded by the requirements specified in Drawing 11.)
3. When the Work Activity Area is present within the Approach Lane, conduct the Multiple Flagger Flagging Operations on the twolane, twoway roadway in accordance with the requirements specific to Drawing 9. (The requirements specified for the intersecting roadway on Drawing 9 will be superseded by the requirements specified in Drawing 11.)
4. If the intersection is a “traffic signal controlled” intersection, the traffic signal may or may not be placed on “normal flashing operations” when LEOs are present to control and direct traffic entering and passing through the intersection.
5. The traffic signal SHALL be placed on “normal flashing operations” when Side Road Flaggers in conjunction with the Open Lane Flagger and the Closed Lane Flagger of the Lane Closure are present to control and direct traffic entering and passing through the intersection.
6. Upon clearance of the Limits of the Intersection by the work train and all portions of the Lane Closure, ensure the traffic signal is returned to normal operational status and is operating in accordance with all operational functions prior to the work train and/or the Lane Closure encroaching upon the Limits of Intersection.
7. On each roadway approach of the intermediate-speed to highspeed (40 MPH – 60 MPH) multi-lane roadway, reduce the multiple travel lanes in each direction to a single travel lane to permit control of the traffic by a Side Road Flagger.
8. Relocate all traffic on these approaches into the through travel lanes nearest to the intersecting two-lane, two-way roadway where the work activities are being conducted.

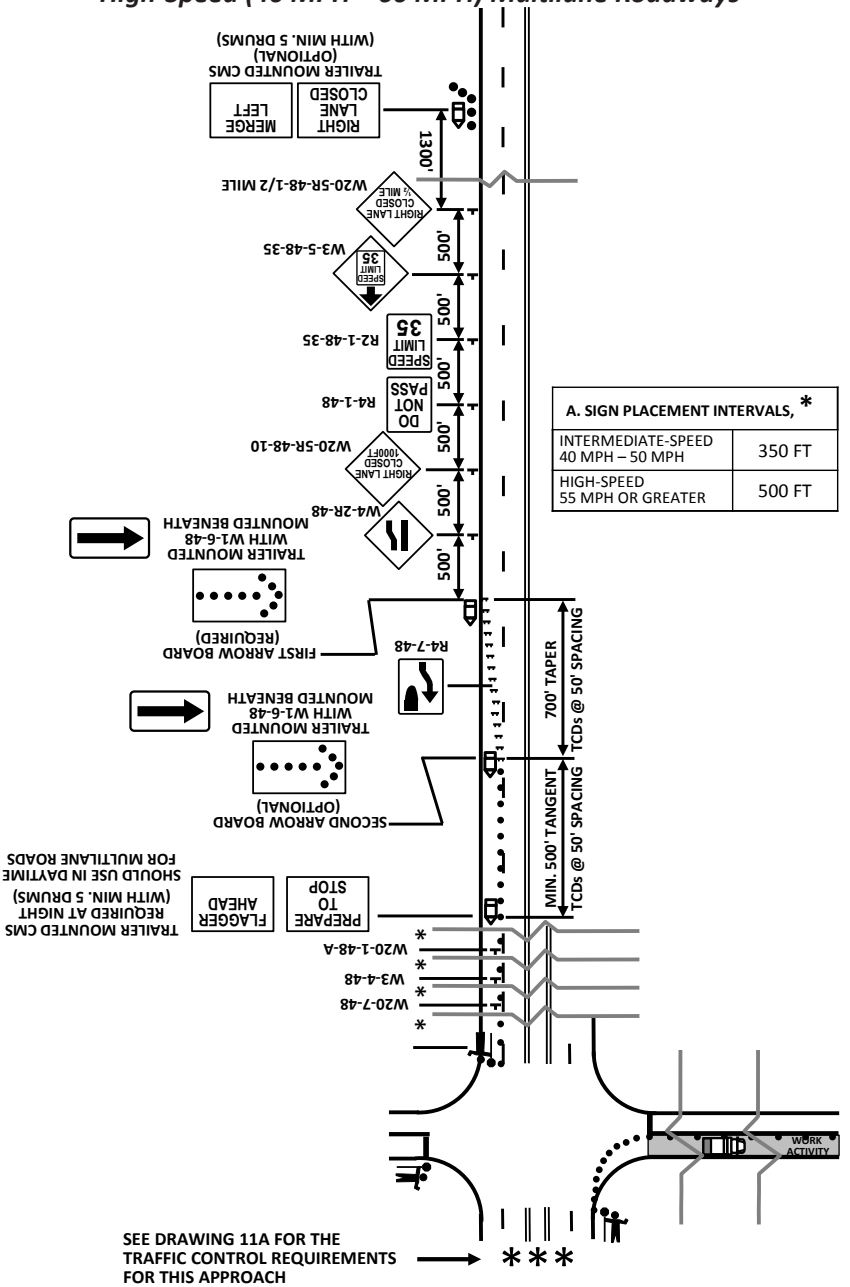
9. Reduce the multiple travel lanes to a single travel lane through installation and maintenance of left and right Lane Closures as necessary.
10. Install the Lane Closures and Flagging Operation as illustrated in Drawing 11.
11. A tangent area no less than 500' is required between the downstream end of the Merging Taper of the Lane Closure and the initial Advance Warning Sign array of the Flagging Operation or the trailer mounted CMS when utilized.
12. Dependent upon the traffic volumes, the tangent section may be extended to reduce the development of traffic queues in advance of the beginning of the Merging Taper of the Lane Closure.
13. On highvolume roads, Spotters placed at the beginning of the Merging Taper of the Lane Closure should be utilized to notify Flaggers of the status of any traffic queues to allow Flaggers the opportunity to minimize the time durations of the stops in an effort to minimize the traffic queues.
14. On each roadway approach intersecting the roadway where work activities are being conducted, station the Flaggers controlling traffic at the intersection immediately adjacent to the intersection as illustrated in Drawing 11.
15. No less than 1 Flagger required on each approach to control traffic flow.
16. When the Work Activity Area is in the Departure Lane of the twolane, twoway roadway use the conversion distances listed in Table 6 as the Work Activity Area progresses to a location that requires this Multiple Flagger Flagging Operation to be converted to a standard Two Flagger Operation as shown on Drawing 2. In addition, comply with the requirements of Drawing 8 as necessary.
17. When the Work Activity Area is in the Approach Lane of the twolane, twoway roadway use the conversion distances listed in Table 7 as the Work Activity Area progresses to a location that requires this Multiple Flagger Flagging Operation to be converted to a standard Two Flagger Operation as shown on Drawing 2. In addition, comply with the requirements of Drawing 9 as necessary.

Drawing 11A. Multiple Flaggers – Intersections, Two-Lane, Two-Way Roadways Intersections with Intermediate-Speed to High-Speed (40 MPH – 60 MPH) Multilane Roadways



A. SIGN PLACEMENT INTERVALS, *	
INTERMEDIATE-SPEED 40 MPH – 50 MPH	350 FT
HIGH-SPEED 55 MPH OR GREATER	500 FT

Drawing 11B. Multiple Flaggers – Intersections, Two-Lane, Two-Way Roadways Intersections with Intermediate-Speed to High-Speed (40 MPH – 60 MPH) Multilane Roadways



A. SIGN PLACEMENT INTERVALS, *	
INTERMEDIATE-SPEED 40 MPH – 50 MPH	350 FT
HIGH-SPEED 55 MPH OR GREATER	500 FT

Single Lane Circular Intersection – Drawing 12

1. Install and conduct Single Lane Circular Intersection Operations as specified by the MUTCD and the SCDOT Flagger's Handbook, latest editions.
2. Utilize Flaggers to control the traffic from all legs of the circular intersection.
3. Clear communication by radio or other effective method between Flaggers is required.
4. One Flagger should be designated as the Lead Flagger for coordinating the operation.
5. Measure all Advance Warning Sign locations from the beginning of theTapers.
6. The BE PREPARED TO STOP sign may be added to the sign series and will be located between the "Flagger" sign and the ONE LANE ROAD AHEAD sign. If used, then the spacing of all four signs in the series will be spaced at equal intervals based on speed.

Drawing 12. Single Lane Circular Intersection

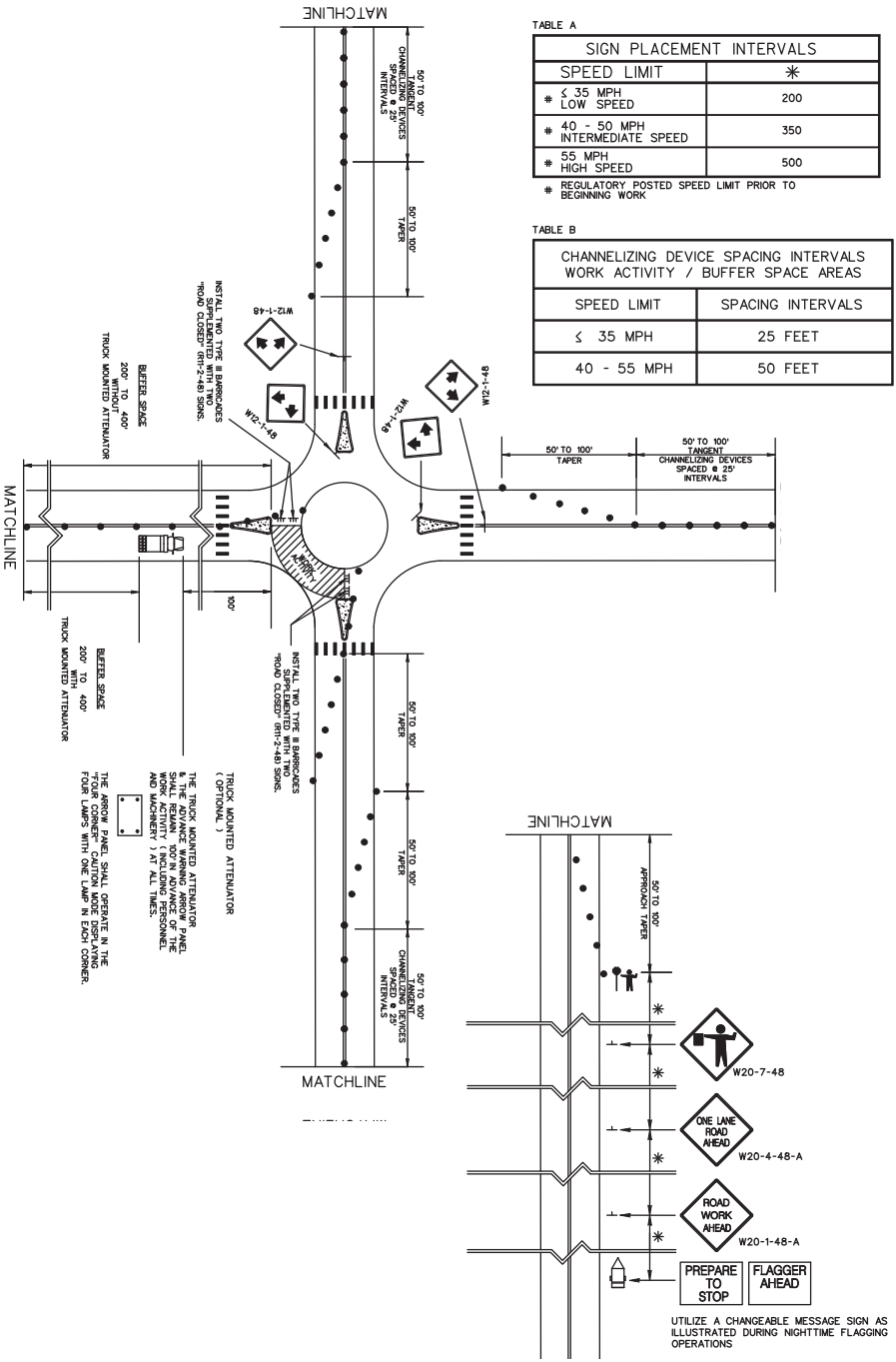


TABLE A

SIGN PLACEMENT INTERVALS	
SPEED LIMIT	✳
* ≤ 35 MPH LOW SPEED	200
* 40 - 50 MPH INTERMEDIATE SPEED	350
* 55 MPH HIGH SPEED	500

* REGULATORY POSTED SPEED LIMIT PRIOR TO BEGINNING WORK

TABLE B

CHANNELIZING DEVICE SPACING INTERVALS WORK ACTIVITY / BUFFER SPACE AREAS	
SPEED LIMIT	SPACING INTERVALS
≤ 35 MPH	25 FEET
40 - 55 MPH	50 FEET

UTILIZE A CHANGEABLE MESSAGE SIGN AS ILLUSTRATED DURING NIGHTTIME FLAGGING OPERATIONS

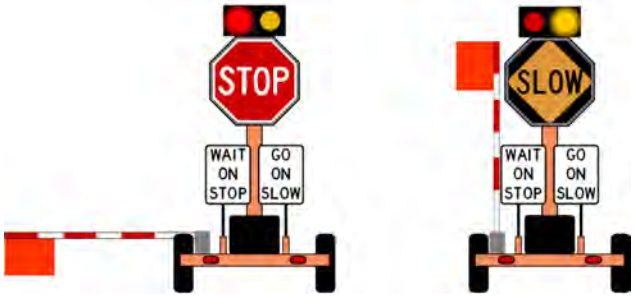
Automated Flagger Assistance Devices (AFADs)

AFADs are considered a safety enhancement because they minimize Flaggers' direct exposure to traffic by allowing them to control the Flagging device from an area away from traffic, such as behind a guardrail. As a result, the AFAD increases worker safety compared to traditional Flagging methods. AFADs are mounted on either a trailer or a movable cart system.

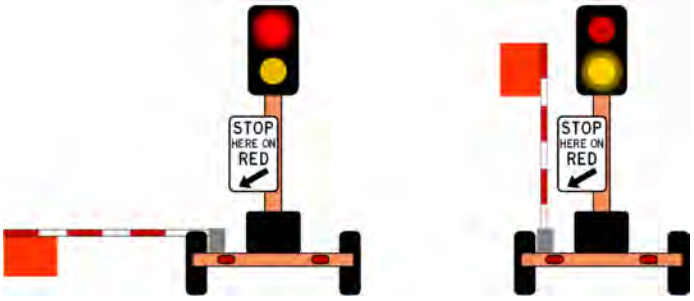
It is important to recognize that AFADs do not eliminate the need for qualified Flaggers at the Work Zone. Each AFAD operator SHALL have successfully completed a Flagger Training Course offered by a SCDOT approved provider. Each AFAD operator SHALL have successfully completed instruction in the operation of the AFAD from the manufacturer approved provider of the AFAD being operated. The operator must be able to step in and manually control the Lane Closure in the event that an AFAD malfunctions.

There are two types of AFADs:

- An AFAD that uses remotely controlled STOP/SLOW signs and a gate arm to alternately control right-of-way.



- An AFAD that uses remotely controlled Red/Yellow lens and a gate arm to alternately control right-of-way.



In many situations, AFADs may be an appropriate alternative that can potentially increase the safety of Flaggers by removing them from the direct flow of traffic, especially when there is no viable Escape Route for a standard Flagger position during operations.

It is preferable to place the AFAD within the shoulder of the road; however, if the shoulder is not adequate, the AFAD may encroach on the traveled lane provided that the appropriate sight distance is available. If this is the case, the gate arm must not extend into the adjacent lane.

In accordance with the MUTCD and crashworthiness standards, Advance Warning Signs must alert traffic in both directions of an impending stop and when not in use, the AFADs must be removed from the Clear Zone and the Advance Warning Signs covered. The standards limit the distance between Flagger Stations to less than 2 miles between two AFADs. Regardless of the distance between AFADs, Contractors are encouraged to have a plan in place to act as a failsafe in case of an equipment malfunction.

SCDOT Requirements

Traffic Control Devices – Delineate the tangent area of a Lane Closure unless otherwise directed by SCDOT.

Delineate the tangent area of a Lane Closure with either portable plastic drums or 42” oversized traffic cones during Nighttime AFAD Flagging Operations.

Remote Operation Prohibition – The AFAD system SHALL be operated only by operator(s) that are on-site.

Additional Trained Flaggers – An AFAD system may consist of one or more AFAD units. An AFAD unit SHALL only control one direction of traffic. An AFAD system may be operated by one trained AFAD operator, provided that the single operator SHALL have clear line of sight from their single vantage point to all AFAD units and their approaching traffic. Additional trained flaggers SHALL be on site, but may be engaged in other work activities, until such time as may be necessary to flag traffic manually due to a failure of the AFAD system. For every AFAD unit there SHALL be a corresponding trained flagger on site; these additional trained flaggers are not required to have the manufacturer approved AFAD training unless they will operate an AFAD.

AFAD Flagging Operations – Type I Red/Yellow Lens – Drawing 13

1. Install, conduct and maintain AFAD Flagging Operations in accordance with this drawing, the MUTCD, and the SCDOT Flagger's Handbook.
2. Erect all signs relative to an AFAD Flagging Operation prior to initiation of the operation and remove or cover all signs immediately upon termination of the operation.
3. Each AFAD operator SHALL be a recipient of and have successfully completed a Flagger Training Course sponsored by a SCDOT approved Work Zone Traffic Control Training provider.
4. Each AFAD operator SHALL be a recipient of and have successfully completed instruction in the operation of the AFAD by the manufacturer of the AFAD being operated.
5. Instruction in the operation of one unit does not qualify the operator to operate an AFAD manufactured by another manufacturer.
6. The AFAD operator SHALL control the AFAD from a location with an unobstructed view of the AFAD and the approaching traffic.
7. Install and maintain the proper array of Advance Warning Signs for each approach when an AFAD Flagging Operation is in place and active.
8. During Nighttime AFAD Flagging Operations, illuminate each AFAD Flagger Station with any combination of portable lights, standard electric lights, existing street lights, etc., that provide a minimum illumination level of 108 lux or 10 footcandles.
9. During Nighttime AFAD Flagging Operations, AFAD Operators SHALL wear properly retroreflectorized hard hats and high visibility safety apparel consisting of a safety vest and safety pants that meet the ANSI/ISEA 107 Performance Class 3 requirements.
10. During Nighttime AFAD Flagging Operations, supplement each array of Advance Warning Signs on each approach with a trailer mounted CMS. These CMSs are not required during Daytime AFAD Flagging Operations.

11. Install the CMSs in advance of the Advance Warning Sign arrays. The messages should be PREPARE TO STOP, FLAGGER AHEAD. A truck mounted CMS is not an acceptable alternative to a trailer mounted CMS.

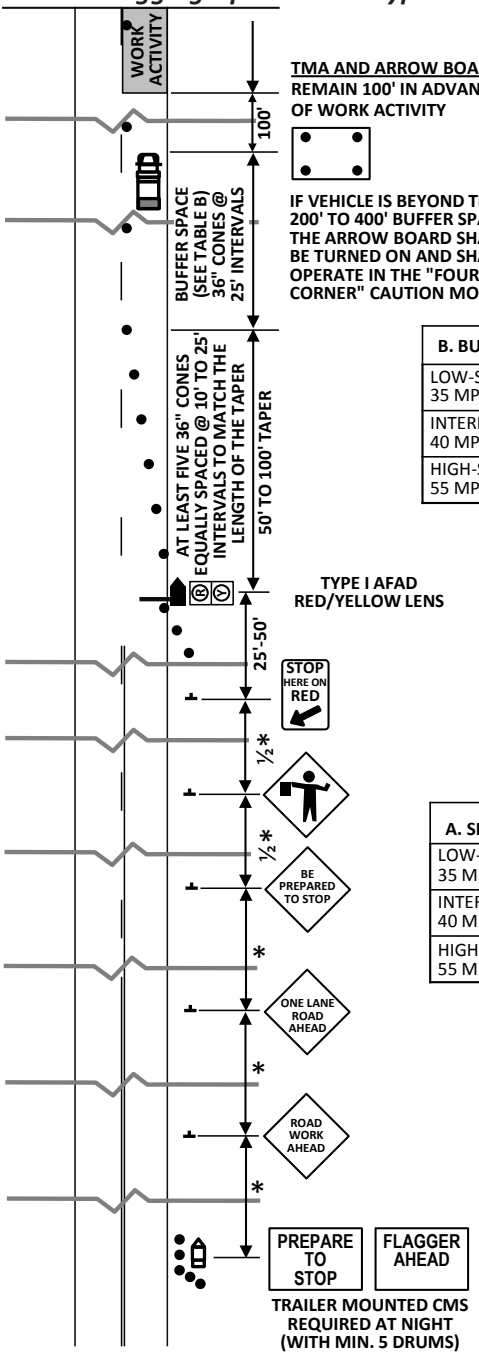
12. Conduct the work in such a manner so as not to encroach onto the adjacent travel lane open to traffic. Install, maintain and adjust the TCD as necessary to ensure proper delineation of the Work Activity Area.

13. During AFAD Flagging Operations, an arrow board shall operate in the “Four Corner” Caution Mode only. Display of an Arrow or Chevron operating mode or any other type of Caution Mode other than the “Four Corner” is PROHIBITED during AFAD Flagging Operations.

14. All arrow boards shall be 48” × 96” with a minimum legibility distance of 1 mile. Placement of an arrow board may require adjustments due to horizontal and/or vertical alignment or other sight distance restrictions. The board face shall be non-reflective black. All arrow boards shall comply with SCDOT specifications.

15. A TMA supplemented with an arrow board may be replaced with a trailer mounted arrow board when this traffic control setup is utilized for asphalt concrete placement operations. Replacement with a trailer mounted arrow board SHALL require SCDOT’s approval.

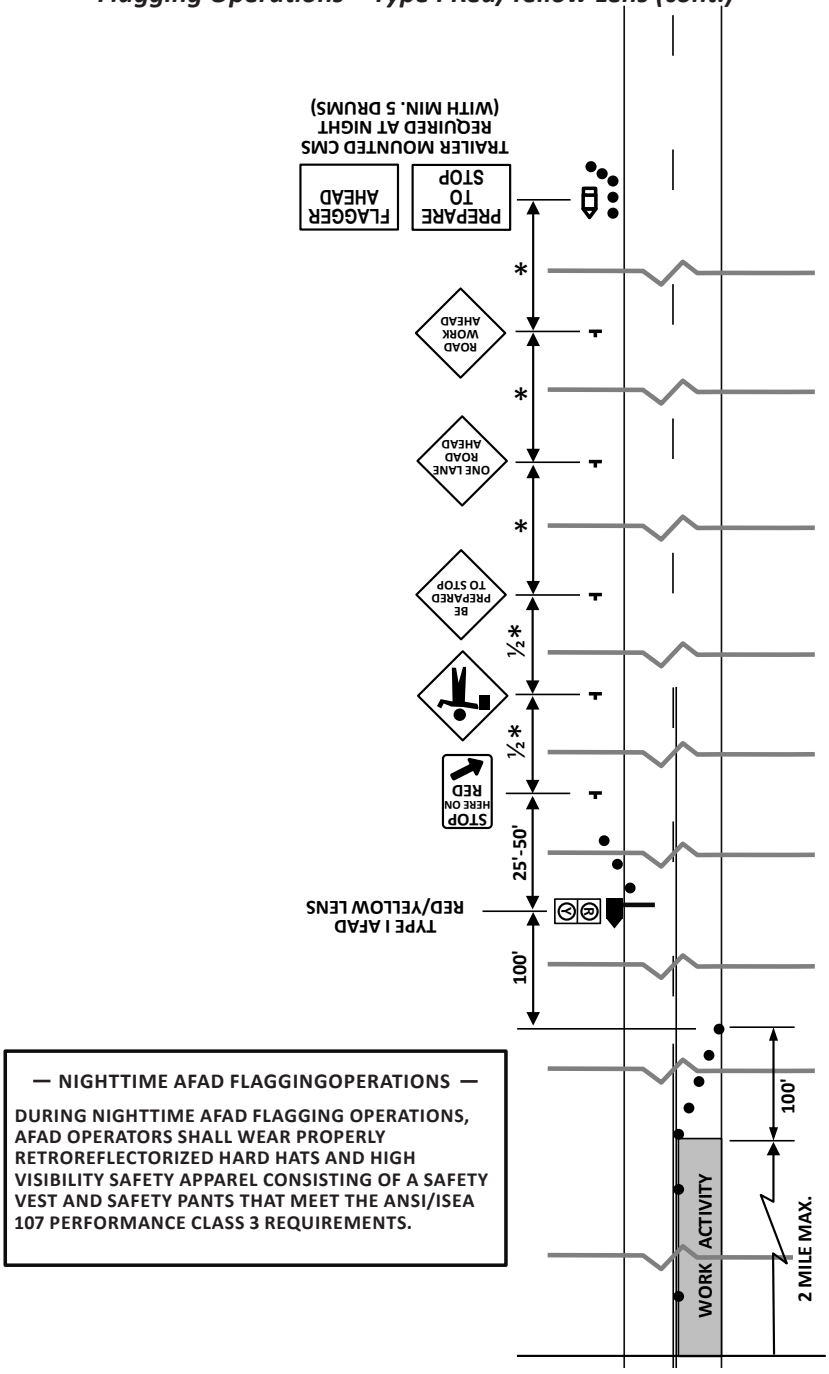
Drawing 13. Automated Flagger Assistance Device (AFADs) – Flagging Operations – Type I Red/Yellow Lens



B. BUFFER SPACE DISTANCES	
LOW-SPEED 35 MPH OR LESS	200 FT
INTERMEDIATE-SPEED 40 MPH – 50 MPH	300 FT
HIGH-SPEED 55 MPH OR GREATER	400 FT

A. SIGN PLACEMENT INTERVALS, *	
LOW-SPEED 35 MPH OR LESS	200 FT
INTERMEDIATE-SPEED 40 MPH – 50 MPH	350 FT
HIGH-SPEED 55 MPH OR GREATER	500 FT

Drawing 13. Automated Flagger Assistance Device (AFADs) – Flagging Operations – Type I Red/Yellow Lens (cont.)



AFAD Flagging Operations – Type II STOP/SLOW Sign – Drawing 14

1. Install, conduct and maintain AFAD Flagging Operations in accordance with this drawing, the MUTCD, and the SCDOT Flagger's Handbook.
2. Erect all signs relative to an AFAD Flagging Operation prior to initiation of the operation and remove or cover all signs immediately upon termination of the operation.
3. Each AFAD operator SHALL be a recipient of and have successfully completed a Flagger Training Course sponsored by a SCDOT approved Work Zone Traffic Control Training provider.
4. Each AFAD operator SHALL be a recipient of and have successfully completed instruction in the operation of the AFAD by the manufacturer of the AFAD being operated.
5. Instruction in the operation of one unit does not qualify the operator to operate an AFAD manufactured by another manufacturer.
6. The AFAD operator SHALL control the AFAD from a location with an unobstructed view of the AFAD and the approaching traffic.
7. Install and maintain the proper array of Advance Warning Signs for each approach when an AFAD Flagging Operation is in place and active.
8. During Nighttime AFAD Flagging Operations, illuminate each AFAD Flagger Station with any combination of portable lights, standard electric lights, existing street lights, etc., that provide a minimum illumination level of 108 lux or 10 footcandles.
9. During Nighttime AFAD Flagging Operations, AFAD Operators SHALL wear properly retroreflectorized hard hats and high visibility safety apparel consisting of a safety vest and safety pants that meet the ANSI/ISEA 107 Performance Class 3 requirements.
10. During Nighttime AFAD Flagging Operations, supplement each array of Advance Warning Signs on each approach with a trailer mounted CMS. These CMSs are not required during Daytime AFAD Flagging Operations.

11. Install the CMSs in advance of the Advance Warning Sign arrays. The messages should be PREPARE TO STOP, FLAGGER AHEAD. A truck mounted CMS is not an acceptable alternative to a trailer mounted CMS.

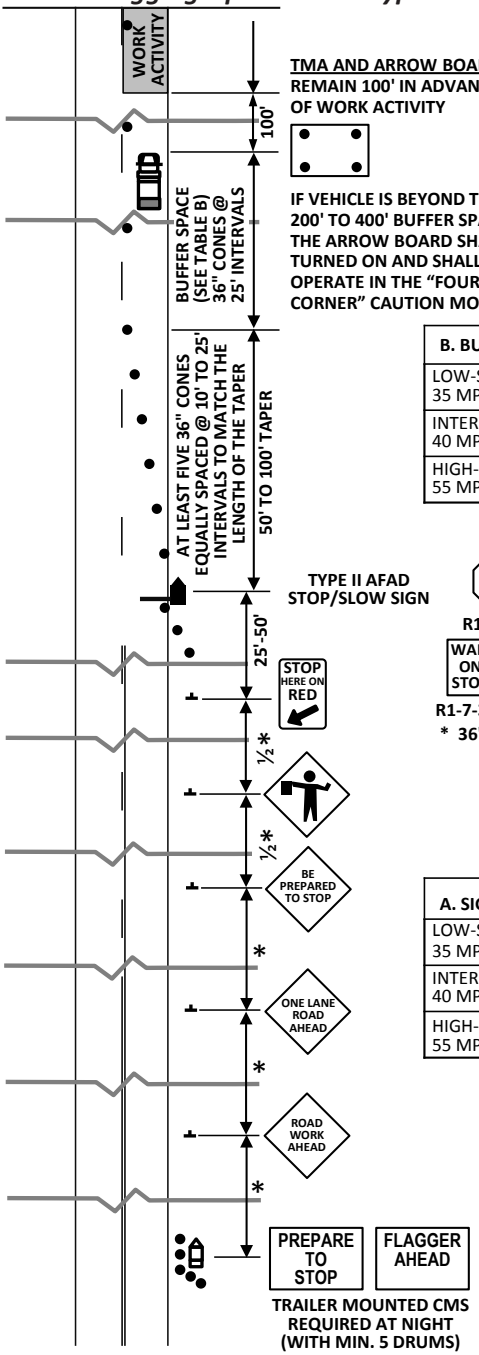
12. Conduct the work in such a manner so as not to encroach onto the adjacent travel lane open to traffic. Install, maintain and adjust the TCD as necessary to ensure proper delineation of the Work Activity Area.

13. During AFAD Flagging Operations, an arrow board shall operate in the “Four Corner” Caution Mode only. Display of an Arrow or Chevron operating mode or any other type of Caution Mode other than the “Four Corner” is PROHIBITED during AFAD Flagging Operations.

14. All arrow boards shall be 48” × 96” with a minimum legibility distance of 1 mile. Placement of an arrow board may require adjustments due to horizontal and/or vertical alignment or other sight distance restrictions. The board face shall be non-reflective black. All arrow boards shall comply with SCDOT specifications.

15. A TMA supplemented with an arrow board may be replaced with a trailer mounted arrow board when this traffic control setup is utilized for asphalt concrete placement operations. Replacement with a trailer mounted arrow board SHALL require SCDOT’s approval.

Drawing 14. Automated Flagger Assistance Device (AFADs) – Flagging Operations – Type II STOP/SLOW Sign



B. BUFFER SPACE DISTANCES	
LOW-SPEED 35 MPH OR LESS	200 FT
INTERMEDIATE-SPEED 40 MPH – 50 MPH	300 FT
HIGH-SPEED 55 MPH OR GREATER	400 FT

A. SIGN PLACEMENT INTERVALS, *	
LOW-SPEED 35 MPH OR LESS	200 FT
INTERMEDIATE-SPEED 40 MPH – 50 MPH	350 FT
HIGH-SPEED 55 MPH OR GREATER	500 FT

Drawing 14. Automated Flagger Assistance Device (AFADs) – Flagging Operations – Type II STOP/SLOW Sign (cont.)

— NIGHTTIME AFAD FLAGGINGOPERATIONS —

DURING NIGHTTIME AFAD FLAGGING OPERATIONS, AFAD OPERATORS SHALL WEAR PROPERLY RETROREFLECTORIZED HARD HATS AND HIGH VISIBILITY SAFETY APPAREL CONSISTING OF A SAFETY VEST AND SAFETY PANTS THAT MEET THE ANSI/ISEA 107 PERFORMANCE CLASS 3 REQUIREMENTS.

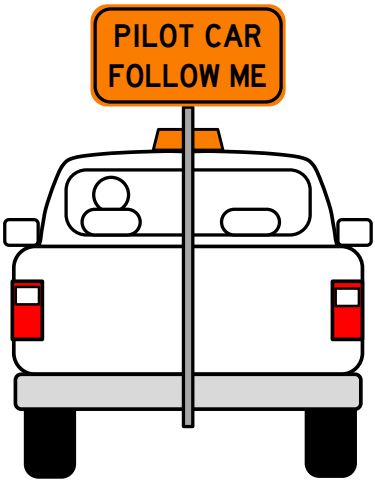
Flagging Operations – Pilot Car

A Pilot Car is used to guide a queue of vehicles through a Work Area or Detour. This operation uses a Flagger at each end of the one-lane section. Control of traffic at side roads and intersections also needs to be considered when using a Pilot Car.

This method works best when the route is particularly long or unclear for the road user, or where the Work Area changes so often that proper signing and channelization are difficult.

In this operation, the Flaggers hold all traffic on each end of the Work Area until the Pilot Car arrives and leads the traffic through the Work Zone. Do not allow a late vehicle to try to catch up.

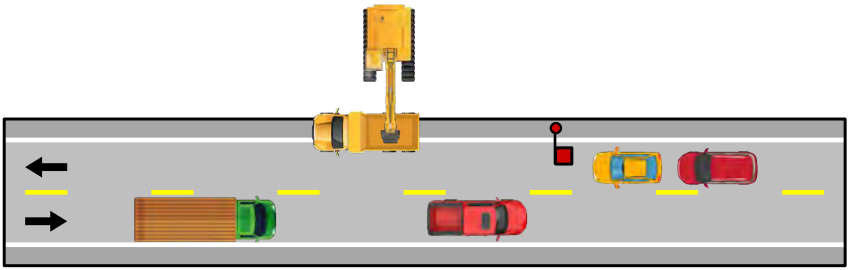
A safe turn-around location should be provided for the Pilot Car at each end of the Work Zone. A Pilot Car Operation does not take the place of Flagger communication. Provisions need to be made for identification of the last vehicle in the column.



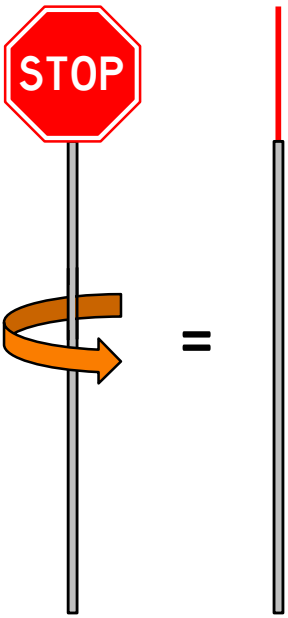
Flagging Operations – One-Direction Control

This is when Work Vehicles occasionally block one lane of a two-lane road, such as when loading or unloading. A Flagger can be used to control just one direction of traffic when the work needs to block the roadway. The other direction of traffic is not stopped.

Stop traffic in the usual manner, and release the vehicles when work does not block the lane.



When releasing traffic, turn the paddle a quarter-turn so that the word STOP faces you. This way, the STOP message will not confuse the traffic coming from behind you.

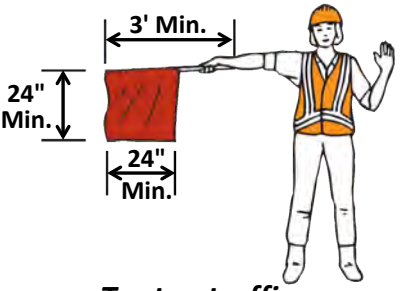


Flagging Operations – Emergency Flagging

In an emergency, 24” x 24” red flags may be used to control traffic until STOP/SLOW paddles can be obtained. The staff should be at least 3’ in length, and the free edge of the flag should be weighted so the flag will hang vertically. When used at night, flags shall be retroreflectorized.

Stopping Traffic

To stop traffic, stand on the shoulder of the road and extend the flag into the roadway. Raise your other hand to the stop position.



To stop traffic

Releasing Traffic

To release traffic, drop the flag to your side and with your free arm motion traffic to proceed. Do not use the flag to motion traffic through.



To release traffic

Alerting and Slowing Traffic

To alert and slow traffic, the flag should be waved from the ground to shoulder height.



To alert and slow traffic

Replace flags with STOP/SLOW paddles as soon as they arrive.

The Do's of Flagging

Do Stay alert at all times.

Do Use clear and deliberate hand signals when directing traffic.

Do Stand on the shoulder of the road out of the path of oncoming traffic.

Do Have a good idea of the day's work schedule to answer road users' questions.

Do Treat road users courteously.

Do Use proper equipment and warning signs.

Do Stand alone.

Do Plan an Escape Route.

Do Be prepared for changing weather by bringing a raincoat, sweater, or warm coat.

Do Consult the SCDOT Flagger's Handbook, latest edition, or your supervisor if you have any questions regarding your Flagging duties.

The Don'ts of Flagging

Don't Stand in an open lane.

Don't Make unnecessary conversation with workers, pedestrians, or road users.

Don't Give Flagging directions against a traffic signal.

Don't Stand in the shade, over the crest of a hill, or around a sharp curve.

Don't Leave your station until properly relieved.

Don't Stand near equipment.

Don't Stand with a group of people.

Don't Daydream.

Don't Read while on duty.

Don't Bring radios or cell phones.

Don't Leave Flagger signs in place when done Flagging.

Remember

- Your job is important.
- Keep alert.
- Wear the proper clothing.
- Stand at the proper location.
- Know the correct Flagging procedure.
- Make certain proper Advance Warning Signs are in place.
- Slow down traffic for safer approach.
- Use proper equipment for Nighttime Flagging.
- Treat every driver courteously.
- Be alert to changing conditions on the work site.

Important Notice

This booklet is provided by the South Carolina Transportation Technology Transfer Service (T^3S). To the best of our knowledge, the procedures shown in this booklet are consistent with SCDOT policies as of the date of publication of the booklet. This booklet has been reviewed by and approved by SCDOT.

Ordering Information

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Transportation Technology Transfer Service
Clemson University
Glenn Department of Civil Engineering
202 Hugo Drive
Clemson, SC 29634-0950
Telephone: (864) 656-4183